NOTICE OF THE BOARD OF DIRECTORS' REGULAR BI-MONTHLY MEETING

Tuesday, October 06, 2026 at 5:00 PM

AGENDA

LOCATIONS:

Open Session to start at or after 5:00 p.m.

Marin Water Board Room – 220 Nellen Avenue, Corte Madera, CA 94925

Outside location for Director Larry Russell – Courtyard by Marriott Glassgow Scottish Event Campus, Business Center, 16 Stobcross Road, Glasgow, Scottland, United Kingdom, G3 8GS

Closed Session to immediately follow Open Session

Marin Water Mt. Tam Conference Room, 220 Nellen Avenue, Corte Madera, CA 94925

Public Participation:

The public may attend this meeting in-person or remotely using one of the following methods:

On a computer or smart device, go to: **https://marinwater.zoom.us/j/88134852296**

By phone, dial: **1-669-444-9171** and use Webinar ID: **881 3485 2296.**

HOW TO PROVIDE PUBLIC COMMENT:

During the Meeting: Typically, you will have 3 minutes to make your public comment, however, the board president may shorten the amount of time for public comment due to a large number of attendees. Furthermore, pursuant to Government Code, section 54954.2 (the Brown Act), the Board may not take action or discuss any item that does not appear on the agenda.

-- In-Person Attendee: Fill out a speaker card and provide to the board secretary. List the number/letter (ex: 6a) of the agenda item(s), for which you would like to provide a comment. Once you're called, proceed to the lectern to make your comment.

-- Remote Attendee: Use the "raise hand" button on the bottom of the Zoom screen. If you are joining by phone and would like to comment, press *9. The board secretary will use the last four digits of your phone number to call on you (dial *6 to mute/unmute).

In Advance of the Meeting: Submit your comments by email in advance of the meeting to boardcomment@marinwater.org. To ensure that your comment is provided to the Board of Directors prior to the meeting, please email your comment 24 hours in advance of the meeting start time. Comments received after this cut off time will be sent to the Board after the meeting. Please do not

include personal information in your comment such as phone numbers and home addresses.

AGENDA ITEMS:

1. **Call to Order and Roll Call**
2. **Adoption of Agenda**
3. **Public Comment on Non-Agenda Matters**

   This is the time when any person may address the Board of Directors on matters not listed on this agenda, but which are within the subject matter jurisdiction of the Board.

4. **Directors' and General Manager's Announcements** (5:05 p.m. – Time Approximate)
5. **Board Committee Reports**

   Each Committee Chair or Vice Chair will provide a report on recent committee meetings. Directors may ask questions or provide brief comments or requests for additional information on an item.

6. **Consent Items** (5:10 p.m. – Time Approximate)

   All Consent Items will be enacted by a single action of the Board, unless specific items are pulled from Consent by the Board during adoption of the agenda for separate discussion and action.

   a. September 15, 2026 Board of Directors' Regular Meeting Minutes

      RECOMMENDATION: Accept the minutes of the Board of Directors' meeting held on September 15, 2026

   b. Amended and Restated Cooperative Agreement with the Golden Gate National Parks Conservancy

      RECOMMENDATION: Approve the Amended and Restated Cooperative Agreement with the Golden Gate National Parks Conservancy and Authorize the General Manager to execute the agreement

   c. Adopt the Marin Municipal Water District Local Hazard Mitigation Plan

      RECOMMENDATION: Adopt a resolution to adopt the Marin Municipal Water District Local Hazard Mitigation Plan

7. **Regular Items** (5:15 p.m. – Time Approximate)

   a. Capital Program Update

      RECOMMENDATION: Receive a staff update on Fiscal Year 2027 (FY27) first quarter Capital Improvement Program

8. **Future Board and Committee Meetings and Upcoming Agenda Items**

   This schedule lists upcoming board and committee meetings as well as upcoming agenda items for the next month, which may include Board interest in adding future meeting items. The schedule is tentative and subject to change pending final publication and posting of the meeting agendas.

   a. Upcoming Meetings

9. Announcement of Closed Session Item(s); Public Comments on Closed Session Item(s)

Following announcement of Closed Session items and prior to recess into Closed Session, the public may speak up to three minutes on items to be addressed in Closed Session. The Board will convene to Closed Session in the Mt. Tam Conference Room after public comment.

a. Liability Claim
(California Government Code §54956.9(d)(2), (e)(3))

Claimant: Point Tiburon Lagoon Homeowners Association (1801 Mar West, Tiburon)

Agency Claimed Against: Marin Municipal Water District

b. Liability Claim
(California Government Code §54956.9(d)(2), (e)(3))

Claimant: Hartford Casualty Insurance Company as subrogee of James Harrison

Agency Claimed Against: Marin Municipal Water District

c. Pending Litigation
(California Government Code §54956.9 (d)(1))

Marshall Miller and Linda Applewhite v. Marin Municipal Water District (Marin County) Superior Court Case No. CV0011032

Adjourn closed session and reconvene to open session in the Board Room and via Zoom.

10. Reconvene to Open Session; Closed Session Report Out

11. Adjournment (6:15 p.m. – Time Approximate)

ADA NOTICE AND HEARING-IMPAIRED PROVISIONS

In accordance with the Americans with Disabilities Act (ADA) and California Law, it is Marin Water's policy to offer its public programs, services, and meetings in a manner that is readily accessible to everyone, including those with disabilities. If you are an individual with a disability and require a copy of a public hearing notice, an agenda, and/or agenda packet in an appropriate alternative format, or if you require other accommodations, please contact the Board Secretary/ADA Coordinator at 415.945.1448, at least two business days in advance of the meeting. Advance notification will enable Marin Water to make reasonable arrangements to ensure accessibility.

Information agendas are available for review at the Civic Center Library, Corte Madera Library, Fairfax Library, Mill Valley Library, Marin Water Administration Building, and marinwater.org.

Posted: 10-02-2026

STAFF REPORT

Meeting Type:	Board of Directors
Title:	September 15, 2026 Board of Directors' Regular Meeting Minutes
From:	Terrie Gillen, Board Secretary
Through:	Shaun Horne, General Manager
Meeting Date:	October 6, 2026

TYPE OF ITEM: X Action Information

RECOMMENDATION: Accept the minutes of the Board of Directors' meeting held on September 15, 2026

SUMMARY: The Board of Directors held their regular bi-monthly meeting on September 15, 2026. The minutes from that meeting are attached for your approval.

DISCUSSION: None.

ENVIRONMENTAL REVIEW: Not applicable.

FISCAL IMPACT: None.

ATTACHMENT(S):

1. Draft September 15, 2026 Regular Meeting Minutes

DEPARTMENT OR DIVISION	DIVISION MANAGER	APPROVED
Communications & Public Affairs Department	Terrie Gillen **Terrie Gillen** **Board Secretary**	**Shaun Horne** **General Manager**

Attachment 1

NOTICE OF THE BOARD OF DIRECTORS' REGULAR BI-MONTHLY MEETING

Tuesday, September 15, 2026 at 5:00 PM

MINUTES

LOCATIONS:
Open Session to start at or after 5:00 p.m.
Marin Water Board Room – 220 Nellen Avenue, Corte Madera, CA 94925

Closed Session to immediately follow open session
Marin Water Mt. Tam Conference Room – 220 Nellen Avenue, Corte Madera, CA 94925

Public Participation:
The public attended this meeting in-person or remotely using one of the following methods: on a computer or smart device, https://marinwater.zoom.us/j/88134852296, or by phone, 1-669-444-9171, using Webinar ID: 881 3485 2296.

DRAFT

AGENDA ITEMS:

1. **Call to Order and Roll Call**

   Board President Jed Smith called the meeting to order at 5 PM.

   DIRECTORS PRESENT
   Ranjiv Khush
   Diana Maier
   Matt Samson
   Larry Russell (*arrived at 5:02 PM*)
   Jed Smith

2. Adoption of Agenda

Director Maier motioned to adopt the agenda. Director Samson seconded the motion.

There were no public comments.

Voting Yea: Directors Maier, Samson, Khush, and Smith

Motion passed.

3. Public Comment on Non-Agenda Matters

There were two (2) public comments.

Vice President Russell arrived at 5:02 PM.

4. Directors' and General Manager's Announcements

There were no announcements from the Board or General Manager.

5. Board Committee Reports

Director Samson mentioned that both he and Vice President Russell attended the North Bay Watershed Association Meeting and reported on what was discussed at that meeting.

There were no other committee reports.

6. Consent Items

a. September 1, 2026 Board of Directors' Regular Meeting Minutes

RECOMMENDATION: Accept the minutes of the Board of Directors' meeting held on September 1, 2026

b. General Manager's Report August 2026

RECOMMENDATION: Approve Report

c. Purchase of Corrosion Control Chemical

RECOMMENDATION: Approve the purchase of corrosion control chemical (Zinc Orthophosphate) in an amount not to exceed $270,840 and authorize the General Manager to negotiate and execute an agreement

d. Amendment No. 3 to Professional Services Agreement MA-6211 with VistaVu Solutions for SAP Support Services

RECOMMENDATION: Approve Amendment No. 3 to Professional Services Agreement MA-6211 with VistaVu Solutions for SAP software consulting, operational support and enhancements to the District's existing SAP software environment for an additional $356,400 for a total contract amount not to exceed $656,400, and Authorize the General Manager to execute the amendment

Director Khush motioned to adopt the Consent Calendar. Director Maier seconded the motion.

There were no public comments.

Voting Yea: Directors Maier, Russell, Samson, Khush, and Smith

Motion passed.

7. Regular Items

a. Water Rate Setting Update

RECOMMENDATION: Receive an update on the District's rate setting process

Finance Director Bret Uppendahl presented this item.

Discussion ensued.

There were three (3) public comments.

This was an information item. No formal Board action was taken.

b. Nicasio Creek Hydrology Study Update

RECOMMENDATION: Receive an update on the Nicasio Creek Hydrology Study

Water Resources Director Paul Sellier and Environmental Sciences Consultant Andy Paulson presented this item.

Discussion between the Board and staff occurred during and after the presentation.

There was one (1) public comment.

This was an information item. No formal Board action was taken.

8. Future Board and Committee Meetings and Upcoming Agenda Items

a. Upcoming Meetings

The Board Secretary announced the upcoming District committee meetings, as well as the volunteer event and the RIPPLE sponsor event scheduled for Saturday, September 26, 2026.

9. Announcement of Closed Session Item(s); Public Comments on Closed Session Item(s)

There were no public comments on the Closed Session items.

The Board convened to Closed Session and went to the Mt. Tam Conference Room at 6:54 PM.

a. Conference with Legal Counsel – Existing Litigation
(*California Government Code §54956.9(d)(1)*)

Delta Grinding Company, Inc. v. Town of Fairfax; Marin Municipal Water District

Marin County Superior Court

Case No. CV0006328

b. Conference with Legal Counsel – Anticipated Litigation
(*Significant exposure to litigation pursuant to §54956.9(d)(4)*)

One potential case

The Closed Session was adjourned. The Board left the Mt. Tam Conference Room and went back to the Board Room.

10. Reconvene to Open Session; Closed Session Report Out

The Board reconvened to Open Session. Board President Smith reported that no reportable action occurred during the Closed Session.

11. Adjournment

There being no further business, the Board of Directors' regular bi-monthly meeting on September 15, 2026, adjourned at 7:35 PM.

_____
Board Secretary

STAFF REPORT

Meeting Type:	Board of Directors
Title:	Amended and Restated Cooperative Agreement with the Golden Gate National Parks Conservancy
From:	Jonathan Koehler, Acting Watershed Resources Director
Through:	Shaun Horne, General Manager
Meeting Date:	October 06, 2026

TYPE OF ITEM: X Action Information

RECOMMENDATION: Approve the Amended and Restated Cooperative Agreement with the Golden Gate National Parks Conservancy and Authorize the General Manager to execute the agreement

SUMMARY: In 2014, the District entered into a Cooperative Agreement (Agreement) with the Golden Gate National Parks Conservancy (Parks Conservancy) to support collaborative projects and programs on District watershed lands. The Agreement complements the broader Tamalpais Lands Collaborative (TLC), now known as One Tam, which brings together Marin Water, the National Park Service, California State Parks, Marin County Parks, and the Parks Conservancy to support the conservation, restoration, stewardship, and public enjoyment of Mt. Tamalpais.

The Cooperative Agreement provides a framework for the District and the Parks Conservancy to work together on fundraising, resource stewardship, project implementation, education, outreach, volunteer programs, and other activities that support the District's watershed goals.

Staff has worked with the Parks Conservancy to update and restate the Cooperative Agreement to reflect the current One Tam partnership and clarify roles, responsibilities, project approvals, financial authority, insurance, and other administrative provisions. The updated Agreement also clarifies that the General Manager may approve Project Statements that do not exceed $100,000 annually, with Board review and approval required for projects exceeding that amount.

Staff recommends that the Board approve the Amended and Restated Cooperative Agreement and authorize the General Manager to execute the Agreement.

DISCUSSION: The District and the Parks Conservancy entered into Cooperative Agreement No. MA-5311 in 2014 to establish a framework for working together on projects and programs supporting the District's watershed lands. On March 14, 2024, the Memorandum of Understanding was signed by the Tamalpais Lands Collaborative (One Tam or collaborative) partner agencies. In alignment with the

MOU, every five years the One Tam partners develop a Strategic Plan with a "5 Year List" of projects and programs that are compatible with the purpose, vision, and agencies' interests. Since that time, the partnership has continued through One Tam, providing a collaborative structure for the participating agencies and Parks Conservancy to advance shared stewardship priorities on Mt. Tamalpais. At the January 20, 2025 Board of Director meeting, the Board approved the One Tam 2026-2027 Work Plan.

The Cooperative Agreement establishes the specific roles and responsibilities of the District and the Parks Conservancy. Under the Agreement, the parties may cooperatively develop work plans, prioritize and manage projects, plan and implement programs, conduct resource stewardship and monitoring, support community engagement and education, and coordinate fundraising and philanthropic support. The Agreement maintains District oversight of activities occurring on watershed lands and requires projects and programs to remain consistent with District plans, policies, operations, and resource protection responsibilities.

The proposed Amended and Restated Cooperative Agreement updates the original agreement to reflect the current structure and operation of the One Tam partnership and incorporates updated administrative and legal provisions. Importantly, the Agreement clarifies the approval process for projects in which the District participates in that the Proposed Agreement provides that the General Manager may approve Project Statements that do not exceed $100,000 annually, while projects exceeding that amount require Board review and approval. Individual Project Statements will continue to identify the work to be completed and any associated funding commitments.

The Agreement also continues to recognize the Parks Conservancy's role in cultivating philanthropic support and administering external funding for collaborative projects and programs, while preserving the District's discretion regarding the commitment of District staff, funding, equipment, and other resources.

Approval of the Amended and Restated Cooperative Agreement will allow Marin Water and the Parks Conservancy to continue working together under an updated framework that reflects the current One Tam partnership and District approval authorities.

ENVIRONMENTAL REVIEW: None.

FISCAL IMPACT: None.

ATTACHMENT(S):

1. Proposed Amended and Restated Cooperative Agreement with the Golden Gate National Parks Conservancy

DEPARTMENT OR DIVISION	DIVISION MANAGER	APPROVED
Watershed	Jonathan Koehler Acting Watershed Resources Director	Shaun Horne General Manager

Agreement Number MA - 5311

AMENDED AND RESTATED COOPERATIVE AGREEMENT
between the
GOLDEN GATE NATIONAL PARKS CONSERVANCY
and the
MARIN MUNICIPAL WATER DISTRICT
for
THE TAMALPAIS LANDS COLLABORATIVE AND ONE TAM

THIS AMENDED AND RESTATED COOPERATIVE AGREEMENT (Agreement) is made and entered by and between the MARIN MUNICIPAL WATER DISTRICT (District) and the GOLDEN GATE NATIONAL PARKS CONSERVANCY (Parks Conservancy), which may hereinafter be referred to as a "Party," or collectively the "Parties."

For good and valuable consideration, the Parties agree as follows:

This Agreement is the successor to Cooperative Agreement No. MA-5311 between the Parties, dated October 14, 2014, which was extended on August 19, 2025 to run through June 30, 2034 (Original Agreement).

Article 1. Background

A. Mt. Tamalpais is an iconic natural landmark in the San Francisco Bay Area, and an important source of drinking water, recreational opportunities, and ecologically significant protected natural habitats as part of the California Central Coast Biosphere Reserve (per 1992 MOU signed by the National Park Service (NPS), California State Parks, and the District).

B. The District is a public agency established in 1912 that provides high-quality drinking water to residents in south and central Marin County from its 22,000 acres of Mt. Tamalpais watershed lands.

C. The Parks Conservancy is a California not-for-profit public benefit corporation organized and operated exclusively for charitable purposes, including a primary purpose to cooperate with the NPS and with other relevant public agencies and nonprofit organizations in accomplishing educational, interpretive, conservation, research, fiscal agency, planning and improvement projects and programs.

D. The District and the Parks Conservancy entered into a Memorandum of Understanding for the creation of the Tamalpais Lands Collaborative (TLC), dated March 21, 2014 acknowledging that the Parties may enter into further agreements to complete plans, programs and services of mutual interest in furtherance of the MOU objectives, which MOU included the National Park Service, California State Parks, Marin County Open Space and was extended in June 2025 for an additional term of ten years to June, 2035 (MOU).

E. Since 2014, the TLC partnership has grown into the One Tam initiative, a collaborative stewardship effort among the District, NPS, California State Parks, Marin County Parks, and the Parks Conservancy focused on the conservation, restoration, and public enjoyment of Mt. Tamalpais. This Agreement supports and continues that collaborative framework as set forth in the MOU.

Article 2. Purpose and Vision

A. The District is seeking outside support, through a nonprofit partner, to cultivate, nurture and deliver philanthropic and volunteer support for its mission and goals; and

B. The Parties believe a collective vision to preserve, restore, and interpret Mt. Tamalpais will galvanize public support, volunteerism and philanthropy; and

C. The Parties share overall goals to promote, advance, and secure philanthropic donations, government grants and other sources of funds to increase resources in support of resource management, visitor experience, volunteer stewardship, research and education; and

D. The District does not itself have the financial and personnel resources to provide all of the programs and services of the kind herein described and therefore desires that the Parks Conservancy, under the general oversight of and subject to the approval of the District's Board of Directors, provide supplemental support and organizational infrastructure to expand, develop, establish and operate various programs and services that may be prioritized and implemented over time; and

E. The District and the Parks Conservancy desire to continue the work the Parties have pursued under the Original Agreement, which will provide for projects and programs on District lands, and memorialize and set the terms of a cooperative relationship to plan and implement future projects and activities.

The Parties agree that this Agreement shall benefit the Parties through greater efficiency and cost savings derived from cooperative fundraising, resource stewardship, signage, project management and implementation, education and outreach.

GENERAL TERMS

Article 3. Statement of Work

A. The terms of the MOU are incorporated herein. If there is a conflict between the MOU and the terms of this Agreement, the terms of the Agreement shall apply.

B. To the extent deemed appropriate, each Party at its own discretion, shall:

1. Utilize their respective resources, staff, equipment and facilities for the common protection, enhancement and restoration of resources contained within District lands, as well as for the appropriate enjoyment and appreciation of the same by the public.

2. Designate staff as needed for purposes of working cooperatively to develop shared work plans, prioritize and manage projects, plan and execute programs and discuss and resolve coordination matters. Executive management staff will resolve substantive issues, including those not resolved at the staff level.

3. To the extent practicable and subject to this Agreement, develop and employ operating procedures and standards to ensure accomplishment of agreed upon activities, subject to District oversight and District Board approvals. This may include but is not limited to: resource monitoring and restoration, community engagement, interpretation and publications, volunteer management, resource management, research, project design and construction, planning, trail improvements and signage.

4. To the extent practicable, produce, review and approve documents for this partnership by cooperative means. Existing District plans will serve as current direction, pending their revision or replacement. The Parties shall coordinate review of other documents that affect their collective interests.

5. Designate equipment and facilities as necessary for purposes of implementing this Agreement and meeting operational priorities.

C. The District, in consultation and cooperation with the Parks Conservancy, shall carry out the objectives of this Agreement including, but not limited to, the following:

1. Ensure that planned visitor improvements are compatible with the District's primary mission to deliver drinking water, as well as its plans, policies, operations and safety, and security requirements including District Code, Board Policies and management plans.

2. Provide review and approval by the District Board of Directors for any construction of new facilities; any major modification of use or physical alteration of existing facilities, lands, or resources; and any proposed plans for projects located within or affecting District watershed lands. The District's General Manager shall have the authority to approve other projects with a cost not in excess of $100,000 annually, in which the District may participate.

3. Provide staff support, advisement and expertise on required compliance and statutory requirements, and upon review and as appropriate, issue environmental documents, consistency determinations, research or other permits as required.

4. Permit the Parks Conservancy to conduct mutually agreed upon projects, programs and other activities on District properties and share District equipment, when approved by the District Board, to accomplish shared goals.

5. Contribute staff and resources to priority planning, projects and programs as available.

6. Provide when practicable, information, sources, material, staff expertise, access to historic collections and oral histories that may be relevant to improving the interpretation and visitor experience of Mt. Tamalpais.

7. Monitor programs and services provided by the Parks Conservancy in the furtherance of this Agreement, provided that in all situations requiring the written approval of the District unless specified otherwise, every attempt shall be made by District to give said approval, disapproval or other determination in response to the Parks Conservancy's request within sixty (60) days of receipt thereof by the District.

D. The Parks Conservancy, in consultation and cooperation with the District, shall carry out the objectives of this Agreement including, but not limited to, the following:

1. Serve as the philanthropic lead to cultivate and secure philanthropic contributions from individuals, foundations, corporations, government grants, mitigation fund sources and sources of pro bono expertise relative to the purposes of the Agreement.
2. Serve as spokesperson to all donors, grantors, volunteers or other external funding sources and provide for donor appreciation, other communications, meetings and funding reports for projects and programs developed under this Agreement.
3. Work closely with District staff to inventory shared program opportunities, expand existing and develop new program priorities that build on the momentum of existing District programs.
4. As practicable, facilitate the planning, funding and completion of the District-approved projects by using non-District funds or by leveraging limited amounts of District funds, when available.
5. Bring specialized knowledge of fee-based visitor programs and facilities, interpretive sales, community outreach and philanthropy to planning and projects advanced through this Agreement.
6. Identify, develop and administer a platform to strategically partner with environmental groups across the watershed for stronger coordination of volunteer capacity, fundraising, planning and knowledge sharing.
7. Collaboratively maximize educational opportunities provided within the watershed possibly including guided hikes, docent programs, workshops/symposia and/or lectures focused on the ecology and resources of Mt. Tamalpais as well as emerging regional issues.
8. Operate in accordance with the District's land use policies and District Board direction.
9. Not engage in advocacy regarding District plans or policies.
10. Not consider the employees of the Parks Conservancy to be agents or employees of the District, and Parks Conservancy employees and agents are not entitled to participate in any District pension plan, insurance, bonus or similar benefits the District provides its employees.

Article 4. Philanthropic Approach and Expenditure of Funds and Resources

A. The Parks Conservancy shall work closely with the District and community volunteers to identify funding sources for priority collaborative projects and activities identified under this Agreement. In light of the Parks Conservancy's unique fundraising capability and experience as a philanthropic organization, it shall assume responsibility for carrying out fundraising feasibility assessments, campaigns and activities.

B. The Parties agree that funds and resources shall be allocated and shared as follows:

1. The Parks Conservancy will restrict contributions to specific projects and programs when requested by a donor or donors, provided these funds benefit the general interests of the Agreement.
2. All funds received and all funds expended by the Parks Conservancy under this Agreement shall be maintained as specific accounts through the Parks Conservancy.
3. The Parks Conservancy will report on the status of funds relative to this Agreement to the District on an annual basis or upon specific request, though no more frequently than quarterly.
4. The Parks Conservancy shall cover direct costs of its staff, consultants, communications materials and other expenses specifically hired, allocated or procured for the purposes of this Agreement from funds raised for the Tamalpais Lands Collaborative.
5. The Parks Conservancy will provide the general services of its existing senior management staff at no cost to the District unless approved by District Board.
6. The District shall make available administrative and project office space, sufficient for joint operations at no cost to the Parks Conservancy.
7. The Parks Conservancy will maintain all financial accounts for philanthropic and external funds supporting and ensuring their compliance with GAAP (Generally Accepted Accounting Principles) and FASB (Financial Accounting Standards Board) standards, including filing of all state and federal reports.
8. The Parks Conservancy will conduct annual financial audits and provide an independent auditor's report and financial statement upon request.
9. The capability of the District to provide financial assistance, if at all, shall be determined on a year-by-year, project-by-project basis, and is subject to the availability of funds in the discretion of the District Board. It is not expected that water utility revenues will be used. Any commitment of District revenues shall require approval by the District's Board of Directors.
10. Any tools, equipment, material or other personal property shall remain the property of the Party that supplied them.
11. The commitment of District funds in furtherance of this Agreement may be authorized by individual Project Statements, which shall require the prior approval by the District's

Board of Directors, provided however that the General Manager shall have the authority to approve Project Statements not to exceed $100,000 annually. When work to be accomplished and a cooperative work program are mutually agreed upon by both Parties, an appropriate Project Statement shall be consummated by obligating funds identified therein and such Project Statement shall be construed as an addendum to this Agreement and subject to all the terms herein.

12. The District and the Parks Conservancy shall agree to the projected costs of component projects and determine the level of funding available when developing cooperative work plans. Once the Project Statements are mutually agreed to by the Parties, those Project Statements shall only be changed by written mutual agreement by the Parties in advance of any expenditure of additional funds.
13. Fees and assessments for late payments shall be waived, subject to any applicable laws. All direct costs relating to a specific project shall be reimbursed by the Parties as mutually agreed upon.
14. Each of the Parties agrees to make good faith efforts to implement this Agreement and will contribute use of its available staff, equipment and facilities as mutually agreed upon toward implementation of this Agreement at their discretion, but nothing in this Agreement shall be construed as obligating the Parties in the expenditure of funds, staff, property or other resources. The Parties agree that implementation of this Agreement is subject to funding and staff limitations, as well as other priorities of each Party.

Article 5. Reports

A. Accounting System: The Parks Conservancy maintains an accounting system which identifies all revenues, expenses, assets, liabilities and net-assets in accordance with current Generally Accepted Accounting Principles (GAAP) and in compliance with all applicable FASB (Financial Accounting Standards Board) standards. The Parks Conservancy shall administer all financial functions. All revenues and expenses associated with capital projects, restoration efforts, program support, retail, visitor experience activities or related functions, all underwriting, sponsorship and support shall be recorded and managed by the Parks Conservancy. All assets and liabilities shall be recorded and managed solely by the Parks Conservancy. Detailed accounting records shall be maintained in a manner which easily satisfies reasonable reporting requirements of either party and is consistent with current provisions of GAAP.

The Parks Conservancy shall annually submit a Statement of Financial Activities (including gross sales, cost of merchandise, labor costs and other related expenses) for all donations, sales, programs, activities and sales covered by this Agreement.

The Parks Conservancy shall also submit separate audited financial statements for the preceding fiscal year to the District. Such statements shall be submitted to the District upon completion of the Parks Conservancy's annual audit. The financial statements shall be

audited by an independent certified public accountant or by an independent licensed public accountant who has been certified or licensed in the State of California and is mutually agreed to by the Parties.

B. Inspection of Records: the District and any of its duly authorized representatives shall, until the expiration of five (5) calendar years after the close of the business year of the Parks Conservancy and its cooperators and contractors, have access to and the right to examine any of the pertinent books, documents, papers and financial records related to this Agreement, including Federal and State information returns.

C. Annual Reports: The Parks Conservancy shall prepare and submit to the District an annual report of the Parks Conservancy's activities after the close of each Parks Conservancy fiscal year during the term of this Agreement. The report shall include, but need not be limited to the following:

1. Statement of achievements during the preceding year; and
2. Description of activities and services offered in furtherance of this Agreement; and
3. Financial statements as required above; and
4. Other information as may be requested by the District.

Article 6. Indemnification

A. The Parks Conservancy hereby warrants that all its work will be performed in accordance with generally accepted professional practices and standards, as well as the requirements of applicable federal, state and local laws and District Code and policies. It is understood that acceptance of the Parks Conservancy's work by the District shall not operate as a waiver or release.

B. Each Party will indemnify, defend, and hold harmless the other Party, its directors, officers, employees, agents, and volunteers from any and all claims, demands, damages, losses, penalties, fines, costs, liabilities, causes of action, orders, judgments, and expenses (including reasonable attorneys' fees) arising out of or resulting from the indemnifying Party's negligence or willful misconduct in connection with this Agreement, except to the extent caused by the negligence or willful misconduct of the indemnified Party.

C. The indemnification obligations under this Article will not be limited by the amount or type of damages or compensation payable under workers' compensation, disability benefit, or other employee benefit acts, but will be limited to claims arising from the indemnifying Party's negligence or willful misconduct as described above.

Article 7. Insurance

A. General

1. The types and amounts of insurance coverage purchased by the Parks Conservancy shall, as a minimum, meet requirements detailed in this Article. One or more certificates evidencing said insurance coverage shall be reviewed annually for adequacy by the District. Any adjustments to the Parks Conservancy's insurance program must be mutually agreed upon by the Parties in writing, with reasonable justification provided by the requesting Party.
2. The Parks Conservancy shall annually, or at the time insurance is purchased, provide the District with Certificates of Insurance, to evidence compliance with this section and shall provide the District thirty (30) days advance written notice of any material change in the Parks Conservancy's approved insurance program hereunder, including any reduction or elimination in existing coverage.
3. The District will not be responsible for any omissions or inadequacies of insurance coverage and amounts in the event the insurance purchased by the Parks Conservancy proves to be inadequate or otherwise insufficient for any reason whatsoever.
4. All insurance policies required by this Agreement shall specify that the insurance companies shall have no right of subrogation against the District; and shall provide that the District, its Directors, officers, employees and agents are named as additional insured; and shall provide that the insurance companies shall have no recourse against the District for payment of any premiums or assessments.
5. The Parks Conservancy shall not commence work nor shall it allow its employees or subcontractors or anyone to commence work until all insurance required hereunder has been submitted and approved.
6. The District shall maintain documentation of all Parks Conservancy employees permitted to operate District owned vehicles, clearly establishing the District's consent to such use, as well as the necessary licensing and insurance coverage for all such Parks Conservancy employees.

B. Workers' Compensation Insurance

1. The Parks Conservancy shall maintain at all times during the term of this Agreement and furnish to the District satisfactory proof on an annual basis, of workers' compensation insurance with an insurance carrier in compliance with the District's standard requirements. Such insurance shall cover all persons employed in carrying out the work contemplated under this Agreement in accordance with the Act of the Legislature of the State of California known as the "Workers' Compensation Insurance and Safety Act", approved May 26, 1913, and all acts amendatory thereof or supplemental thereto. The Parks Conservancy shall ensure that any contractors or consultants performing work hereunder shall have and maintain in effect, the coverage required under this section B. Such insurance shall include a waiver of subrogation in favor of the District and shall be maintained in full force and effect during the term of this Agreement.

2. All workers' compensation policies shall be endorsed with the following specific language: "This policy shall not be cancelled without first giving thirty (30) days prior notice to Marin Municipal Water District by certified mail."

3. No work shall be allowed to continue hereunder unless such insurance coverage is in effect and a current certificate of coverage has been provided to the District. In the event that the Parks Conservancy fails to maintain such insurance coverage, it shall immediately stop and continue to suspend any work hereunder until such time as coverage is restored. A failure by the Parks Conservancy to restore such insurance coverage within thirty (30) days' notice of its lapse shall be deemed a breach of contract for which the District may terminate this Agreement.

4. The Parks Conservancy shall require all subcontractors similarly to provide proof of Workers' Compensation Insurance as required by the Labor Code of the State of California for all of the subcontractors' employees.

C. Commercial General Liability Insurance

1. The Parks Conservancy shall purchase and maintain during the term of this Agreement Comprehensive General Liability insurance against claims occasioned by actions or omissions of the Parks Conservancy in carrying out any activities under this Agreement, including coverage for personal injury and property damage, in an amount not less than $1,000,000 per occurrence and $2,000,000 annual aggregate. The Parks Conservancy shall ensure that any contractor or consultant providing work hereunder shall have in effect and maintain the liability insurance coverage hereunder required. Parks Conservancy shall furnish to the District, satisfactory proof of the Commercial General Liability insurance required herein, which shall be provided either by insurers admitted to do business in the State of California with at least an A.M. Best rating "A" or by nonadmitted insurers with at least an A.M. Best rating of "A", to protect against losses from liability for damages on account of bodily injuries, death, and/or property damage (including loss of use suffered or alleged to have been suffered by any person or persons), caused by or arising from the Parks Conservancy's performance under this Agreement. The District shall have the right to approve/disapprove any insurance carriers or forms.

2. The Parties anticipate that the Parks Conservancy shall provide additional insurance for specific projects undertaken, which will be evaluated at that time in terms of the insurance amounts required by the District.

3. The Parks Conservancy shall also provide the District with automobile insurance including non-owned automobile liability coverage in an amount not less than $1,000,000 per occurrence, which shall cover all Parks Conservancy employees, including those using District vehicles. The District may require the Parks Conservancy to provide additional insurance based upon the risk involved in any specific project undertaken by the Parties.

4. The Parks Conservancy shall provide the District with crime insurance which includes coverage for money and security losses, employee dishonesty, forgery and alteration, computer fraud and funds transfer fraud in the amount of $500,000 or up to policy limits, whichever is greater.

Article 8. Health and Safety

A. The Parks Conservancy shall provide for the safety of its employees, contractors, field program staff, volunteers and the general public in their use of any District property or facilities under this Agreement. The Parks Conservancy shall take such steps as are necessary to ensure a safe and healthful work environment for its employees, contractors, volunteers and the general public.

Article 9. Miscellaneous

A. Use of Area: This Agreement is entered into by the Parks Conservancy with the knowledge that the historic, natural and recreational qualities of the District lands are to be preserved. The Parks Conservancy shall not use any premises, or exercise any of the rights or privileges herein provided for, except to the extent necessary for the purposes of this Agreement and unless authorized in advance by the District.

B. Non-Profit Status: During the term of this Agreement, the Parks Conservancy shall retain its non-profit status pursuant to the Non-Profit Corporation Law of the State of California. Loss of this status shall be cause for termination of this Agreement. This provision does not apply to any financially independent subsidiary of the Parks Conservancy.

C. Dispute Resolution: (1) Any dispute arising out of this Agreement will first be submitted to good-faith discussion between designated representatives of each Party for fifteen (15) business days from written notice. The Party initiating the discussion will include with the written notice sufficient detail of the complaint or issue to enable discussion thereof. (2) If not resolved, the Parties will submit the dispute to mediation before a mutually acceptable mediator in Marin County, California, with costs shared equally. (3) If mediation does not resolve the dispute, either Party may pursue remedies in the Superior Court of the County of Marin or the United States District Court for the Northern District of California.

D. Notices:

1. Any notice which the Parks Conservancy may desire or may be required hereunder to give or deliver to the District shall be deemed sufficiently given or delivered if in writing and sent by registered or certified mail, return receipt requested, first class, postage prepaid, addressed to General Manager, Marin Municipal Water District, 220 Nellen Ave., Corte Madera, CA 94925, or such other person and/or address as the District may designate by written notice to the other Parties. The time of delivery of such notice shall be deemed to be the time when the same is received.

2. Any notice which the District may desire or may be required hereunder to give or deliver to the Parks Conservancy shall be deemed sufficiently given or delivered if in writing and sent by registered or certified mail, return receipt requested, first class, postage prepaid, addressed to President and CEO, Golden Gate National Parks Conservancy, Building 201, Fort Mason, San Francisco, CA 94123 or such other person and/or address as the Parks Conservancy may designate by written notice to the other Parties. The time of the delivery of such notice shall be deemed to be the time when the same is received.

Article 10. Term of Agreement

A. This Agreement will be effective as of the date of the last signature below and will remain in effect for a period of ten (10) years from the effective date, unless prior thereto it is terminated or modified pursuant to the provisions of this Agreement or of any applicable law or regulation.

B. Either Party may seek to renew this Agreement for one additional five (5) year term by providing written notice to the other Party at least one hundred eighty (180) days before the expiration of the initial term. If the other Party agrees to the additional five-year term, then it shall so notify the other Party and each will seek any necessary approvals.

C. The Parties will conduct an annual review of this Agreement to evaluate the partnership's progress and to identify any operational adjustments that can be implemented without requiring formal amendment.

Article 11. Modification and Termination

A. Modification: This Agreement may only be modified by written mutual agreement of the Parties which include mutual consent and signatures of all Parties. Request for modifications will be forwarded in writing by one party to the other, enclosing the proposed form of modification, at least sixty (60) days prior to the proposed date of said modification(s).

B. Assignment/Delegation: Neither party hereto shall assign, or transfer any interest in or duty under this Agreement without written consent of the other, and no assignment shall be of any force or effect whatsoever unless and until the other party shall have so consented.

C. Severability: Each provision of this agreement is intended to be severable. If any term of any provision shall be determined by a court of competent jurisdiction to be illegal or invalid for any reason whatsoever, such provision shall be severed from this agreement and shall not affect the validity of the remainder of the agreement.

D. Termination:

1. Termination for Cause: Termination of the Agreement means the cancellation of this Agreement, in whole or in part, at any time prior to the completion of the Term of the Agreement. Either party may terminate this Agreement in whole or in part at any time, whenever such party reasonably determines that the other party has failed to comply with the conditions of the Agreement. The terminating party shall notify the other party in

writing of such determination and the reasons for the termination, together with the effective date of the termination which must provide at least ninety (90) days' notice and opportunity to correct the perceived failure. The Parks Conservancy shall not incur new obligations after receipt of such termination notice and shall cancel as many outstanding obligations as possible. Payments made to the Parks Conservancy or recoveries by the District under Agreements terminated for cause shall be in accordance with the legal rights and liabilities of the Parties.

2. Termination for Convenience: Notwithstanding the Termination for Cause provision contained above, this Agreement may be terminated in whole or in part whenever the Parks Conservancy or the District determines, in its sole discretion, that the continuation of the Agreement or any part of it will not produce beneficial results commensurate with the further expenditure of funds. The Parks Conservancy and the District shall agree upon the termination conditions, including the effective date of such termination and, in the case of partial termination, the portion of the work to be terminated. In the event that the Parks Conservancy and the District cannot agree on such termination conditions, they each reserve the right to unilaterally terminate the Agreement by giving 90 days written notice of termination to the other party. The Parks Conservancy shall not incur new obligations for the terminated portion of work, including the entirety of the Agreement if applicable, after the effective date of such termination notice and shall cancel as many outstanding obligations as possible.

3. Wind-Down: Upon termination for any reason, the Parks Conservancy will: (a) complete or transition any in-progress projects funded by restricted donations, in consultation with the District; (b) provide a final financial accounting within ninety (90) days of the effective termination date; (c) return any District property in the Parks Conservancy's possession; and (d) cooperate with the District to ensure an orderly transition of ongoing programs and donor relationships.

Article 12. Governing Law and Venue

This Agreement will be governed by and construed in accordance with the laws of the State of California. Any legal action arising out of this Agreement will be filed in the Superior Court of the County of Marin, California, or the United States District Court for the Northern District of California.

Article 13. Force Majeure

A. Neither Party will be liable for any delay or failure to perform its obligations under this Agreement to the extent such delay or failure is caused by circumstances beyond the Party's reasonable control, including but not limited to: acts of God, fire, wildfire, flood, earthquake, epidemic or pandemic, government orders or restrictions, NPS-directed or District-directed closures of watershed lands or project sites, drought-related water supply emergencies, labor disputes, war, terrorism, or civil unrest.

B. The affected Party will provide prompt written notice to the other Party describing the force majeure event and its expected duration. Performance obligations will be suspended for the duration of the force majeure event.

C. If a force majeure event continues for more than one hundred eighty (180) days, either Party may terminate this Agreement upon thirty (30) days' written notice.

Article 14. Confidentiality

A. Each Party will maintain the confidentiality of information received from the other Party that is designated as confidential or that a reasonable person would understand to be confidential, including but not limited to donor information, financial data, personnel information, proprietary information or trade secrets, deliberative process or similarly protected information ("Confidential Information").

B. Confidential Information does not include information that: (1) is or becomes publicly available through no fault of the receiving Party; (2) was known to the receiving Party prior to disclosure; (3) is independently developed by the receiving Party; or (4) is required to be disclosed by law, including the California Public Records Act.

C. If either Party receives a request under the California Public Records Act or otherwise that it believes may include Confidential Information that Party will provide notice to the other Party before disclosure, to the extent permitted by law.

D. The obligations of confidentiality will survive termination of this Agreement for a period of three (3) years.

Article 15. Intellectual Property

A. Each Party retains all right, title, and interest in its pre-existing intellectual property.

B. Materials jointly developed by the Parties under this Agreement, including but not limited to TLC and One Tam branding, educational content, interpretive materials, and trail signage designs ("Joint Materials"), will be jointly owned. Each Party grants the other a non-exclusive, royalty-free license to use Joint Materials in support of the work undertaken pursuant to this Agreement.

C. Except as provided in the One Tam MOU with respect to One Tam intellectual property (MOU Article 10), neither Party will register trademarks, copyrights, or other intellectual property rights in Joint Materials without the prior written consent of the other Party.

D. Upon termination, each Party will retain a perpetual, non-exclusive, royalty-free license to continue using Joint Materials for the purposes described in this Agreement.

Article 16. Data Privacy

A. Each Party will handle personal data shared under this Agreement (including donor records, volunteer information, and program participant data) in compliance with applicable privacy laws, including the California Consumer Privacy Act (CCPA) as amended.

B. Neither Party will use the other Party's data, deliverables, or Confidential Information to train, develop, or improve artificial intelligence or machine learning models without the prior written consent of the other Party.

C. Each Party will promptly notify the other Party of any confirmed data breach affecting personal data shared under this Agreement.

D. Upon termination, each Party will return or destroy the other Party's Confidential Information and shared personal data in accordance with mutually agreed retention schedules, except as required to be retained by law.

Article 17. Limitation of Liability

A. Neither Party will be liable to the other for any indirect, incidental, consequential, special, or punitive damages arising out of or relating to this Agreement, regardless of the form of action or theory of liability.

B. The limitation above will not apply to: (1) fraud or willful misconduct; (2) a Party's indemnification obligations under Article 6; or (3) a breach of the confidentiality obligations under Article 14.

Article 18. Counterparts

This Agreement may be executed in multiple originals, each of which is deemed to be an original, and may be signed in counterparts.

Article 19. Authorized Signatures

A. For the Parks Conservancy:

Christine S. Lehnertz

President & CEO

Golden Gate National Parks Conservancy

Fort Mason, Building 201

San Francisco, CA 94123

B. For the District:

General Manager

Marin Municipal Water District

220 Nellen Ave.

Corte Madera, CA 94925

IN WITNESS WHEREOF, the Parties hereto have signed their names and executed this Cooperative Agreement.

_____ Date _____

Christine S. Lehnertz

President & CEO

Golden Gate National Parks Conservancy

_____ Date _____

Shaun Horne

General Manager

Marin Municipal Water District

STAFF REPORT

Meeting Type:	Board of Directors
Title:	Adopt the Marin Municipal Water District Local Hazard Mitigation Plan
From:	Alex Anaya, Director of Engineering
Through:	Shaun Horne, General Manager
Meeting Date:	October 6, 2026

TYPE OF ITEM: X Action Information

RECOMMENDATION: Adopt a resolution to adopt the Marin Municipal Water District Local Hazard Mitigation Plan

SUMMARY: The District has been in the process of updating the 2022 Local Hazard Mitigation Plan (LHMP) to evaluate the District's risk to natural hazards and develop mitigation strategies to reduce long-term risk and loss to people and property from natural hazards. The purpose of the LHMP is to ensure the District is more resistant and resilient when disasters occur. The LHMP must be updated every five years, and adoption of the updated LHMP is required for the District to remain eligible to receive mitigation grant funding awarded through State and Federal grant programs and to be eligible to receive and maximize post-disaster recovery funding. The District executed a Professional Services Agreement with Black and Veatch to update the District's 2022 LHMP.

The Planning Committee reviewed the draft Local Hazard Mitigation Plan in September 2026. Staff recommends the Board of Directors adopt a resolution to adopt the Marin Municipal Water District Local Hazard Mitigation Plan.

DISCUSSION: A Local Hazard Mitigation Plan (LHMP) is a document that identifies natural hazard vulnerabilities and outlines strategies to reduce those risks. Natural disasters such as wildfires, earthquakes, and flooding can cause loss of life, damage to buildings and infrastructure, and severe economic and environmental consequences. Hazard mitigation planning is the process through which hazards that threaten communities are identified, risks of those hazards are determined, mitigation goals are set, and appropriate strategies to lessen impacts are determined, prioritized, and implemented.

The Federal Disaster Mitigation Act of 2000 requires special districts to have a FEMA-approved LHMP to be eligible to receive federal disaster grant assistance. A FEMA-approved LHMP ensures the District's continued eligibility for project grants under FEMA's Hazard Mitigation Assistance grant programs, which include the Hazard Mitigation Grant Program (HMGP), the Building Resilient Infrastructure and

Communities (BRIC) program, and the Post Fire Grant Program. These programs provide funds for mitigation projects, along with disaster recovery funds after a disaster occurs.

In December of 2025, the District entered into an agreement with Black and Veatch to update the District's 2022 LHMP. The LHMP must be updated every five years for the District to remain eligible for grant funding. This update to the 2022 LHMP will allow the District to continue focusing on resources on the greatest risks to customers. The major tasks for the update to the LHMP include conducting a risk assessment, evaluating the District's infrastructure vulnerabilities, developing mitigation actions, and determining implementation priorities. The risk assessment identifies and profiles all credible natural hazards that could impact the District. The District's infrastructure vulnerabilities were evaluated, and an inventory was compiled of the facilities that are vulnerable to each of the identified hazards. The LHMP identifies and analyzes a comprehensive range of mitigation actions, with a goal of reducing long-term vulnerabilities. The implementation actions have been developed and prioritized based on the potential impact on the District's ability to meet customer needs.

Since the project kickoff, four Steering Committee meetings were held, which included representatives from Marin County Fire Department, Marin County Office of Emergency Management, Sonoma County Water Agency, along with District staff from multiple departments to provide input on key planning decisions. Additionally, public outreach efforts were completed, which included updates to the District's Emergency Preparedness webpage where the draft plan can be viewed, monthly E-news updates, and a community survey to collect feedback on customer perceptions and concerns related to natural hazards. Per FEMA requirements, a two-week public comment period was held during which time the draft LHMP was made available for review and public comment on the District's website between September 14 and September 28, 2026, and no comments were received. Following Board adoption, the updated LHMP will be submitted to FEMA and to the California Office of Emergency Services (Cal OES) for review and approval.

The Planning Committee reviewed the updated LHMP in September 2026. Staff recommends that the Board of Directors adopt a resolution adopting the updated Marin Municipal Water District Local Hazard Mitigation Plan.

ENVIRONMENTAL REVIEW: Not applicable.

FISCAL IMPACT: The Local Hazard Mitigation Plan update is funded in the Fiscal Year 2026/2027 Adopted Capital Budget and is in the five-year Capital Improvement Plan.

ATTACHMENT(S):

1. Proposed Resolution adopting MMWD Local Hazard Mitigation Plan
2. Final Board Draft Marin Municipal Water District Local Hazard Mitigation Plan

DEPARTMENT OR DIVISION	DIVISION MANAGER	APPROVED
Engineering	**Alex Anaya** **Engineering Director**	**Shaun Horne** **General Manager**

Attachment 1

MARIN MUNICIPAL WATER DISTRICT

RESOLUTION NO.

RESOLUTION OF THE BOARD OF DIRECTORS OF THE MARIN MUNICIPAL WATER DISTRICT ADOPTING THE MARIN MUNICIPAL WATER DISTRICT LOCAL HAZARD MITIGATION PLAN

WHEREAS, the Federal Disaster Mitigation Act of 2000 requires all cities, counties, and special districts to adopt a Local Hazard Mitigation Plan (LHMP) to receive disaster mitigation funding from Federal Emergency Management Agency (FEMA); and

WHEREAS, to be eligible for FEMA funding for disaster mitigation and emergency funding, the District must have an approved Local Hazard Mitigation Plan; and

WHEREAS, the District entered into an agreement with Black and Veatch (Consultant) in December 2025 to update the District's existing 2022 LHMP; and

WHEREAS, the District seeks to maintain and enhance a disaster-resistant service area by reducing potential loss of life, property damage, and environmental degradation from natural disasters, while accelerating economic recovery from those disasters; and

WHEREAS, staff, with the assistance of Consultant, developed the proposed updated LHMP and will submit it for review to the California Office of Emergency Services (CalOES) and the Federal Emergency Management Agency (FEMA) upon adoption of the LHMP by the District's Board of Directors*;* and

WHEREAS, FEMA as the lead agency will review and approve of the LHMP pending no outstanding comments to the plan.

NOW, THEREFORE, BE IT RESOLVED that the Marin Municipal Water District Board of Directors hereby adopts the Marin Municipal Water District Local Hazard Mitigation Plan dated October 2026.

PASSED AND ADOPTED this 6th day of October, 2026, by the following vote of the Board of Directors.

AYES:

NOES:

ABSENT:

_____

Jed Smith
President, Board of Directors

ATTEST:

_____

Terrie Gillen, CMC
Board Secretary

Attachment: Marin Municipal Water District Local Hazard Mitigation Plan dated October 2026

MARIN WATER

Marin Municipal Water District Hazard Mitigation Plan 2026 Update

Adoption Draft

Marin Municipal Water District Hazard Mitigation Plan

October 2026

PREPARED FOR

Marin Municipal Water District

220 Nellen Avenue
Corte Madera, CA 94925
415.945.1455 | marinwater.org

PREPARED BY

Black & Veatch

10995 Gold Center Drive, Suite 100
Rancho Cordova, CA 95670

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DEFINITIONS AND ACRONYMS

%g—Percent acceleration force of gravity

1% annual chance flood—The flood that has a 1% chance of being equaled or exceeded in any given year; often referred to as the 100-year flood.

44 CFR—Code of Federal Regulations, Title 44

asset—Any manmade or natural feature that has value, including people; buildings; infrastructure, such as bridges, roads, sewers and water systems; lifelines, such as electricity and communication resources; and environmental, cultural or recreational features such as parks, wetlands and landmarks.

ABAG—Association of Bay Area Governments

ACCP—American concrete cylinder pipe

AWIA—America's Water Infrastructure Act (2018)

base flood—The flood having a 1% chance of being equaled or exceeded in any given year, also known as the "100-year" or "1% annual chance" flood. The base flood is a statistical concept used to ensure that all properties subject to the National Flood Insurance Program (NFIP) are protected to the same degree against flooding.

basin—The area within which all surface water, whether from rainfall, snowmelt, springs or other sources—flows to a single water body or watercourse. The boundary of a river basin is defined by natural topography, such as hills, mountains and ridges. Basins are also referred to as "watersheds."

benefit/cost —A systematic, quantitative method of comparing projected benefits to projected costs of a project or policy. It is used as a measure of cost effectiveness.

benefit—A net project outcome and is usually defined in monetary terms. Benefits may include direct and indirect effects. For the purposes of benefit/cost analysis of proposed mitigation measures, benefits are limited to specific, measurable, risk reduction factors, including reduction in expected property losses (buildings, contents and functions) and protection of human life.

C-SMART—Collaboration: Sea Level Marin Adaptation Response Team

CAL FIRE—California Department of Forestry and Fire Protection

Cal OES—California Governor's Office of Emergency Services

CAP—Climate Action Plan

capability assessment—An analysis of a jurisdiction's capacity to address threats associated with hazards. The assessment includes two components: an inventory of an agency's mission, programs and policies and an analysis of its capacity to carry them out.

CCR—California Code of Regulations

CDBG—Community Development Block Grant

CDC—U.S. Centers for Disease Control and Prevention

CFR—Code of Federal Regulations

community lifeline—As defined by FEMA, a community lifeline enables the continuous operation of critical government and business functions and is essential to human health and safety or economic security.

COVID-19—Coronavirus Disease 2019

CPT—Core Planning Team

CPUC—California Public Utilities Commission

critical facilities/critical infrastructure—In this HMP, critical facilities and infrastructure are defined as any assets owned and operated by Marin Water that are essential for continuity of operations as a critical service provider including but not limited to dams, reservoirs, pump stations and buildings

CUPA— Certified Unified Program Agency

debris flow—Dense mixtures of water-saturated debris that move down-valley, looking and behaving much like flowing concrete. They form when loose masses of unconsolidated material are saturated, become unstable and move down slope. The source of water varies but includes rainfall, melting snow or ice.

DFIRM—Digital Flood Insurance Rate Map

Disaster Mitigation Act (DMA; Public Law 106-390)—The latest federal legislation enacted to encourage and promote proactive, pre-disaster planning as a condition of receiving certain federal financial assistance.

DMA—Disaster Mitigation Act

drought—The cumulative impacts of long periods of dry weather. These can include deficiencies in surface and subsurface water supplies and general impacts on health, well-being and quality of life.

DWR—Department of Water Resources (California)

EAP— emergency action plan

earthquake—The shaking of the ground caused by an abrupt shift of rock along a fracture in the earth or a contact zone between tectonic plates.

epicenter—The point on the earth's surface directly above the hypocenter of an earthquake. The location of an earthquake is commonly described by the geographic position of its epicenter and by its focal depth.

ESA—Endangered Species Act

exposure—Exposure is defined as the number and dollar value of assets considered to be at risk during the occurrence of a specific hazard.

extent—The extent is the range of anticipated intensities of the identified hazards. Extent is most expressed using various scientific scales. For this planning effort, the extent of each hazard of concern is profiled by discussing intensity, warning times and the worst-case scenarios for the hazard.

fault—A fracture in the earth's crust along which two blocks of the crust have slipped with respect to each other.

federal disaster declaration—Declarations for events that cause more damage than state and local

governments and resources can handle without federal government assistance. A federal disaster declaration puts into motion long-term federal recovery programs, some of which are matched by state programs, to help disaster victims, businesses and public entities.

FEMA—Federal Emergency Management Agency

FERC—Federal Energy Regulatory Commission

fire behavior—Fire behavior refers to the physical characteristics of a fire and is a function of the interaction between the fuel characteristics (such as type of vegetation and structures that could burn), topography and weather. Variables that affect fire behavior include the rate of spread, intensity, fuel consumption and fire type (such as underbrush versus crown fire).

flash flood—A flood that occurs with little or no warning when water levels rise at an extremely fast rate.

Flood Insurance Rate Map (FIRM)—The official maps on which the Federal Emergency Management Agency delineates the Special Flood Hazard Area.

floodplain—The land area along the sides of a river that becomes inundated with water during a flood.

flood—The inundation of normally dry land resulting from the rising and overflowing of a body of water.

floodway—Floodways are areas within a floodplain that are reserved for the purpose of conveying flood discharge without increasing the base flood elevation more than 1 foot. Generally speaking, no development is allowed in floodways, as any structures located there would block the flow of floodwaters.

frequency—How often a hazard of specific magnitude, duration and/or extent is expected to occur on average. Statistically, a hazard with a 100-year frequency is expected to occur about once every 100 years on average and has a 1% chance of occurring any given year. Frequency reliability varies depending on the type of hazard considered.

geographic information system (GIS)—A computer software application that relates data regarding physical and other features on the earth to a database for mapping and analysis.

goal—A general guideline that explains what is to be achieved. Goals are usually broad-based, long-term, policy-type statements and represent global visions. Goals help define the benefits that a plan is trying to achieve. The success of a hazard mitigation plan is measured by the degree to which its goals have been met.

greenhouse gases—Methane, nitrous oxide and other gases that trap heat and warm the Earth, as a greenhouse traps heat from the sun.

ground shaking—The result of rapid ground acceleration caused by seismic waves passing beneath buildings, roads and other structures.

HAB—harmful algal bloom

Hazard Mitigation Grant Program (HMGP)—Authorized under Section 202 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, the HMGP is administered by FEMA and provides grants to states, tribes and local governments to implement hazard mitigation actions after a major disaster declaration. The purpose of the program is to reduce the loss of life and property due to disasters and to enable mitigation activities to be implemented as a community recovers from a disaster.

hazard—A source of potential danger or adverse condition that could harm people and/or cause property damage.

hazardous material—A substance or combination of substances (biological, chemical, radiological and/or physical) that, because of its quantity, concentration or physical, chemical or infectious characteristics, has the potential to cause harm to humans, animals or the environment, either by itself or through interaction with other factors.

Hazus—Hazus is a GIS-based software program created by FEMA to estimate potential physical, economic, and social losses from natural disasters

HMA—Hazard Mitigation Assistance

HMP—Hazard Mitigation Plan

HVAC—heating, ventilation and air conditioning

hypocenter—The region underground where an earthquake's energy originates.

intensity—The measure of the effects of a hazard.

inventory—The assets identified in a study region. Inventories include assets that could be lost when a disaster occurs and community resources are at risk. Assets include people, buildings, transportation and other valued community resources.

landslide—The movement of masses of rock and soil down a hillside or slope. Slope failures occur when the strength of the soils forming the slope is exceeded by the pressure, such as weight or saturation, acting upon them.

LHMP—local hazard mitigation plan

liquefaction—Loosely packed, water-logged sediments losing their strength in response to strong shaking, causing major damage during earthquakes.

LOMR—Letter of Map Revision. An official document issued by FEMA that revises the information shown on an existing FIRM.

magnitude—The measure of the strength of an earthquake.

mass movement—A collective term for landslides, mudslides, mud flows, debris flows and lahars.

mitigation actions—Specific actions to achieve goals that minimize the effects from a disaster and reduce the loss of life and property.

mitigation—A preventive action taken in advance of an event to reduce or eliminate risk to life or property.

Mw—Moment Magnitude Scale

NASA—National Aeronautics and Space Administration

NCEI—National Centers for Environmental Information

NEHRP—National Earthquake Hazards Reduction Program

NFIP—National Flood Insurance Program

NRI—National Risk Index

NOAA—National Oceanic and Atmospheric Administration

NWS—National Weather Service

pandemic—An epidemic of infectious disease that has spread through human populations across a large region, multiple continents or worldwide.

peak ground acceleration (PGA)—A measure of the highest amplitude of ground shaking that accompanies an earthquake, based on a percentage of the force of gravity.

PFAS—per-and polyfluoroalkyl substance

PGA—peak ground acceleration

post-fire debris flow—A fast-moving, destructive slurry of water, mud, ash, rocks and vegetation, triggered by rainfall, that surges down a slope after a wildfire.

ppm—parts per million

presidential disaster declaration (same as federal disaster declaration)—These declarations are typically made for events that cause more damage than state and local governments and resources can handle without federal government assistance. Generally, no specific dollar loss threshold has been established for such declarations. A presidential disaster declaration puts into motion long-term federal recovery programs, some of which are matched by state programs, designed to help disaster victims, businesses and public entities.

probability of occurrence—A statistical measure or estimate of the likelihood that a hazard will occur. This probability is generally based on past hazard events in the area and a forecast of events that could

occur in the future. A probability factor based on yearly values of occurrence is used to estimate probability of occurrence.

public safety power shutoff (PSPS)—An event in which a major electric power provider temporarily shuts off electrical power to a selected area to prevent power lines from sparking wildfires.

residual risk—The risk that remains after controls are accounted for.

risk assessment—The process of measuring potential loss of life, personal injury, economic injury and property damage resulting from hazards. This process assesses the vulnerability of people, buildings and infrastructure to hazards

risk ranking—Process to score and rank hazards based on the probability that they will occur and the impact they will have if they do.

riverine—Of or produced by a river. Riverine floodplains have readily identifiable channels.

Robert T. Stafford Act—The statutory authority for most federal disaster response activities, especially as they pertain to FEMA and its programs (Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 100-107). Signed into law November 23, 1988; amended by the Disaster Relief Act of 1974 (Public Law 93-288).

SC—Steering Committee

SCADA—Supervisory Control and Data Acquisition is a system of software and hardware used to monitor, gather data and control physical processes and machines for the water system.

SFHA—Special Flood Hazard Area is the base floodplain delineated on a Flood Insurance Rate Map. The SFHA is mapped as a Zone A in riverine situations.

stakeholder—Business leaders, civic groups, academia, non-profit organizations, major employers, managers of critical facilities, farmers, developers, special purpose districts and others whose actions could impact hazard mitigation.

UCERF3—Uniform California Earthquake Rupture Forecast 3

USACE—U.S. Army Corps of Engineers

USDA—U.S. Department of Agriculture

USDM—U.S. Drought Monitor

USGS—U.S. Geological Survey

vulnerability—Assessment of how exposed or susceptible an asset is to damage. Vulnerability depends on an asset's construction, contents and the economic value of its functions.

watershed—An area that drains downgradient from areas of higher land to areas of lower land to the lowest point.

wildland-urban interface area (WUI)—An area susceptible to wildfires and where wildland vegetation and urban or suburban development occur together.

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Executive Summary

Mount Tamalpais and Surrounding Watershed

Hazard mitigation means taking cost-effective, sustainable steps to reduce the risk that hazards pose to human life, property, infrastructure and the ability to provide critical services. The Marin Municipal Water District (Marin Water or the District) provides water services in central and southern Marin County, and its ability to continue to provide these services will be critical to the area's ability to recover from a hazard event. To address this need, the District has updated the Marin Municipal Water District Hazard Mitigation Plan (Plan or HMP) to provide a current framework to mitigate impacts from natural hazards that may affect the service area.

The hazard mitigation plan strives to reduce risk for District assets that are vital for its continuity of operations following hazard events. The plan's goals and recommendations lay the groundwork for implementing local mitigation activities. The contents of the plan comply with requirements of the federal Disaster Mitigation Act (DMA), under which communities with approved hazard mitigation plans are eligible for various hazard mitigation funding programs provided by the Federal Emergency Management Agency (FEMA).

The plan was prepared by a planning team of District staff and professional consultants, with oversight by a 13-member Steering Committee of local stakeholders representing interests within the District's service area boundaries (Figure ES-1-1). Public input for the Plan was solicited through a survey, a webpage, the District's email newsletter, Marin Water News, and board meetings.

Figure ES-1-1. Marin Water Service Area

DISTRICT DESCRIPTION

Chartered on April 25, 1912, Marin Water was the first municipal water district in California. Prior to its formation, water in central and southern Marin had been provided by several small, private companies, many of them subsidiaries to local real estate developers. Recognizing the critical importance of reliable water service, the community came together to create a publicly owned and managed water system.

The District serves more than 191,000 people in central and southern Marin County and provides 100% locally sourced drinking water. About 75% of the District's water supply comes from reservoirs on Mt. Tamalpais and in west Marin County. The remaining supply comes from neighboring Sonoma County's Russian River water system.

The Hazard Mitigation Plan assesses the potential risk that natural hazards pose to buildings, infrastructure and equipment owned by the District. The District's key assets generally consist of buildings, pumps, tanks and pipelines, which are defined for this plan as the District's critical facilities. Table ES-1-1 and Table ES-1-2 summarize the District's critical facilities and their value. Note that throughout this Plan, estimated replacement costs are rounded to the nearest thousand. Pipelines include mains and laterals. The four main types of structures and facilities include eight sub-categories in the risk assessment. See Chapter 5 to review the risk assessment methodology. Detailed risk assessment results can be reviewed in Appendix E.

Table ES-1-1. Marin Water Structures and Facilities

Structures/Facilities	Quantity	Estimated Replacement Cost
Buildings	25	$44,100,000
Potable Water Structures	99,551	$1,213,343,000
Raw Water Facilities	285	$25,280,000
Recycled Water Structures	792	$25,128,000
Total	100,653	$1,307,851,000

Table ES-1-2. Marin Water Pipelines

Pipelines	Length in Miles	Estimated Replacement Cost
Potable Water	1,082.5	$2,780,600,000
Raw Water	30.3	$121,716,000
Recycled Water	26.8	$73,312,000
Total	1,139.6	$2,975,628,000

RISK ASSESSMENT

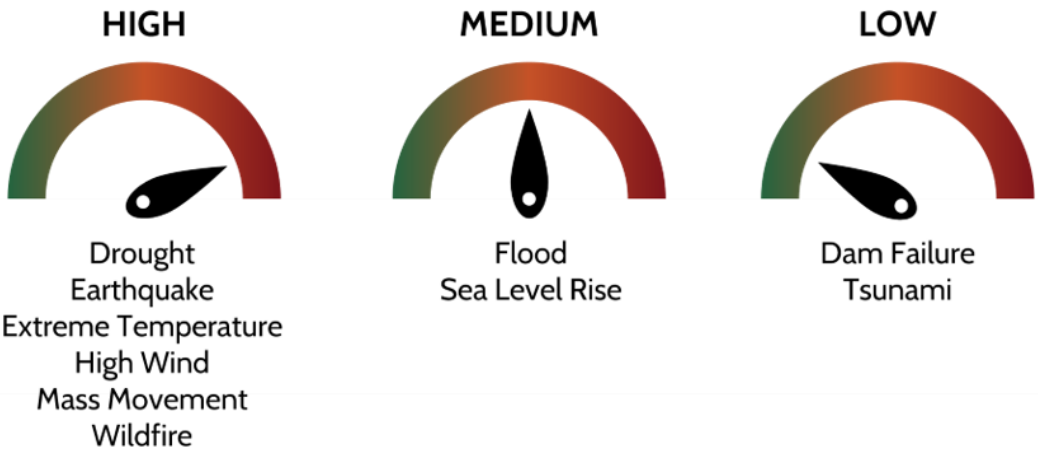
Risk assessments in the hazard mitigation plan describe the risks associated with each identified hazard of concern. The Steering Committee considered the full range of natural hazards of concern that could impact the District.

In addition to the hazards of concern, the Steering Committee recognized other hazards that present risks to the District but are difficult to quantify. These other hazards of interest are algae blooms, cyber-attack, hazardous materials, public health emergencies and terrorism. The hazard mitigation plan provides general descriptions of the nature of these hazards.

Risk assessment models for hazards of concern are based on current data and technologies. The assessment of each hazard of concern includes discussion of the following:

- Hazard identification and profile.
- The exposure of the District's critical facilities to the hazards.
- The estimated cost of potential damage, where applicable.

Based on the risk assessment, the hazards of concern were ranked for the risk they pose to Marin Water.



MITIGATION

Based on the risk assessment and hazard ranking, the Steering Committee identified 24 actions the District should take to mitigate the loss potential associated with the hazards of concern. These actions were chosen from a range of alternatives, using the mission statement, goals and objectives of the plan for guidance.

Mission Statement

The mission of the hazard mitigation plan is to reduce risk and increase the resiliency of our water system during natural disasters by maintaining a mitigation program that focuses on protecting life, property, infrastructure and the environment.

Goals

1. Protect life and property, including equity priority communities, during disasters
2. Minimize damage to critical infrastructure to maintain continuity of essential water services
3. Protect natural resources, including local water supply sources
4. Increase public awareness of the risk of loss of water

Objectives

1. Implement projects that assist in protecting lives by making infrastructure, critical facilities and other property more resistant to natural hazards and other hazards of interest
2. Address aging infrastructure issues to reduce/minimize the impacts from future hazards and disasters
3. Implement projects that reduce/minimize the impacts on our natural resources from future hazards and disasters
4. Raise awareness and communicate risk to District assets

Table ES-1-3 lists the recommended hazard mitigation actions that make up the action plan.

Table ES-1-3. Recommended Hazard Mitigation Actions

Action Number and Description
1—Replace existing wood-roofed concrete tank at Ross Reservoir with new steel and/or concrete tanks after Pine Mountain Tunnel project is complete in 2029.

Action Number and Description
2—Wildfire Service Continuity and Infrastructure Hardening Program: Harden and maintain defensible space around pump stations and treatment plants and improve backup capabilities to maintain service during major wildfire incidents. Includes: • Replacement of roofs, vents and siding with non-combustible materials at treatment plants and pump stations • Maintenance of defensible space at treatment plants and pump stations
3—Replace 4 miles of ACCP transmission line pipe on North Marin Line from Shafter Bridge to San Geronimo Treatment Plant.
4—Install a full-scale automated meter infrastructure to allow for real-time analysis of water usage.
5—Facility Seismic Resilience Improvements: Conduct seismic evaluation and retrofit of critical facilities, operational centers, SCADA infrastructure, and essential water system components. Includes: • Steel water storage tanks seismic upgrades • San Geronimo Treatment Plant clarifier replacement • EOC seismic upgrades
6—Install ozone at the following treatment plants as a green alternative to reduce chemical delivery needs, provide sustainability and improve long-term water quality: • San Geronimo Treatment Plant • Bon Tempe Treatment Plant
7—Expand reclaimed water system including: • Las Gallinas Sanitary District to Peacock Gap golf course
8—Replace existing redwood tank at the following locations: • Bolsa • Hind • Madera Park • Scenic
9—Improve functionality and seismic reliability of emergency operations center with current technology.
10—Improve seismic reliability and install permanent generators at the following locations: • Administration building • Corporation yard
11—Install Automated Dam Gate and Actuator Systems: Install automated actuators, controls, and remote operation capabilities at district dams to improve emergency response and dam operations during hazard events.
12—Implement Dam Spillway Improvement Program: Design and construct spillway improvements at priority dams to address identified deficiencies and reduce dam failure risk during extreme storm events including the following locations: • Seeger Dam • Phoenix Dam
13—Dam Safety Grant Readiness and Engineering Design Program: Advance engineering, environmental review, and preliminary design activities to position priority dam projects for Prop 4, DWR, FEMA, USBR, and other funding opportunities.
14—Southern Marin Transmission Pipeline Reliability Improvements: Upgrade, harden, or replace vulnerable segments of the Southern Marin transmission pipeline to improve seismic and emergency reliability.
15—Capacity Enhancement Projects: Increase conveyance capacity, redundancy, and operational reliability associated with the following systems: • Phoenix Transfer • Federal Works
16—Continuity of Operations (COOP) Enhancement: Formalize COOP procedures focused on maintaining water service following earthquakes and other major disasters.
17—Emergency Operations Plan (EOP) Update: Update the existing EOP to enhance District capabilities to prepare for, respond to and recover from damaging events.

Action Number and Description
18—Flood-Resilient Access to SCADA and Emergency Operations Facilities: Improve backup communications and operational continuity measures for SCADA and emergency operations facilities during flood events.
19—Sea Level Rise Adaptation Strategy for Vulnerable Facilities: Develop facility-specific adaptation strategies for infrastructure exposed to future sea level rise, including elevation, floodproofing, relocation, or protection measures.
20—Administrative Facility Flood and Tsunami Resilience Assessment: Evaluate and mitigate flood and tsunami vulnerabilities at administration and operational facilities.
21—Regional Water Supply Reliability Partnership with Sonoma County Water Agency: Coordinate regional drought resilience projects and water-supply reliability improvements with SCWA.
22—Ecosystem and Water Quality Protection Program: Implement projects to reduce drought-related ecological impacts and protect reservoir water quality including: • Enhance monitoring, early warning, and response procedures for harmful algal blooms.
23—Emergency Access Improvement for Remote Facilities: Identify and improve district-owned access routes to critical facilities vulnerable to wildfire, landslide, flooding, earthquake or roadway failure.
24—SCADA and Cybersecurity Resilience Enhancements: Implement cybersecurity improvements, redundancy, and recovery measures for critical operational technology systems in coordination with AWIA Risk and Resilience and Emergency Response Plan compliance.

IMPLEMENTING, ADOPTING AND MAINTAINING THE PLAN

Implementing the mitigation actions in this plan will take time and resources over its 5-year performance period. The CPT developed an implementation and maintenance strategy that includes the following:

- Monitoring mitigation action implementation.
- Progress reporting.
- A strategy for continued public involvement.
- Plan integration with other relevant plans and programs.

This HMP is designed with an adaptive management approach that can evolve along with funding sources and state and federal mandates. The framework established by this Plan will enable the District to continue to pursue FEMA Hazard Mitigation Assistance (HMA) grant funding for feasible, eligible, cost-effective actions. Marin Water updated its existing plan with opportunities for public and stakeholder involvement and input. Community support of the mitigation actions identified in this HMP will ensure its success.

The Marin Water Board of Directors assumes responsibility for adopting this HMP and committing resources toward its implementation.

Part 1. Introduction and Planning Process

1. INTRODUCTION

1.1 THE BIG PICTURE

Hazard mitigation is defined as any action taken to reduce or alleviate the loss of life, personal injury and property damage that can result from a disaster. It involves long- and short-term actions implemented before, during and after disasters. Hazard mitigation activities include planning efforts, policy changes, programs, studies, improvement projects and other steps to reduce the impacts of hazards.

The federal Disaster Mitigation Act of 2000 (DMA 2000) emphasizes planning for disasters before they occur. The DMA 2000 requires state and local governments to develop hazard mitigation plans as a condition for federal disaster grant assistance. Regulations developed to fulfill the DMA's requirements are included in Title 44 of the Code of Federal Regulations (44 CFR). The DMA 2000 promotes sustainability in hazard mitigation. To be sustainable, hazard mitigation needs to incorporate sound management of natural resources and address hazards and mitigation in the largest possible social and economic context.

1.2 PREVIOUS PLAN

Marin Water developed and adopted its initial Hazard Mitigation Plan in 2022. This 2026 HMP serves as an update to the initial Plan.

1.2.1 Why Update

The prior HMP needed to be updated for funding eligibility and to recognize changes in District priorities and risk to natural hazards. Throughout the planning process, the entire Plan was updated with a focus on assessing changes in vulnerability caused by hazard events, evaluating capabilities and their utilization in implementing hazard mitigation measures, reviewing the 2022 mitigation strategy and identifying new initiatives to enhance overall resilience in the District and to reflect changes in priorities.

Federal and State Requirements

In response to the requirements of the DMA 2000, which requires local governmental agencies to develop and update their HMP every 5 years, this plan serves as the 2026 update to the 2022 Plan. This update aligns with FEMA's Local Mitigation Planning Policy Guide (April 2025), FEMA's Local Mitigation Planning Handbook (June 2025) and State of California planning requirements.

Changes in Hazards

Natural hazards of concern have been reorganized in this Plan update. Instead of a stand-alone chapter, climate change is discussed in each of the hazard profiles under future conditions, Sea Level Rise is a stand-alone chapter rather than being included in a chapter on climate change and the Extreme Temperature and High Wind hazards are stand-alone chapters rather than being combined in a severe weather chapter.

Local Plan Requirement E1—44 CFR Part 201.6(d)(3)

A local jurisdiction must review and revise its plan to reflect changes in development.

Changes in Development

Looking at past and future growth in hazard-prone areas shows how exposure to hazards may be increasing in the community. This requirement helps ensure the mitigation strategy continues to address current and future risk and vulnerability from existing and potential development.

Plan Integration

Plan integration has been done through coordination with the 2025 America's Water Infrastructure Act (AWIA) Risk and Resilience Assessment and the 2025 Urban Water Management Plan. This update provides a current Plan to align and integrate with other District Planning Efforts.

1.3 PLAN ORGANIZATION

The Marin Water Hazard Mitigation Plan consists of the following parts:

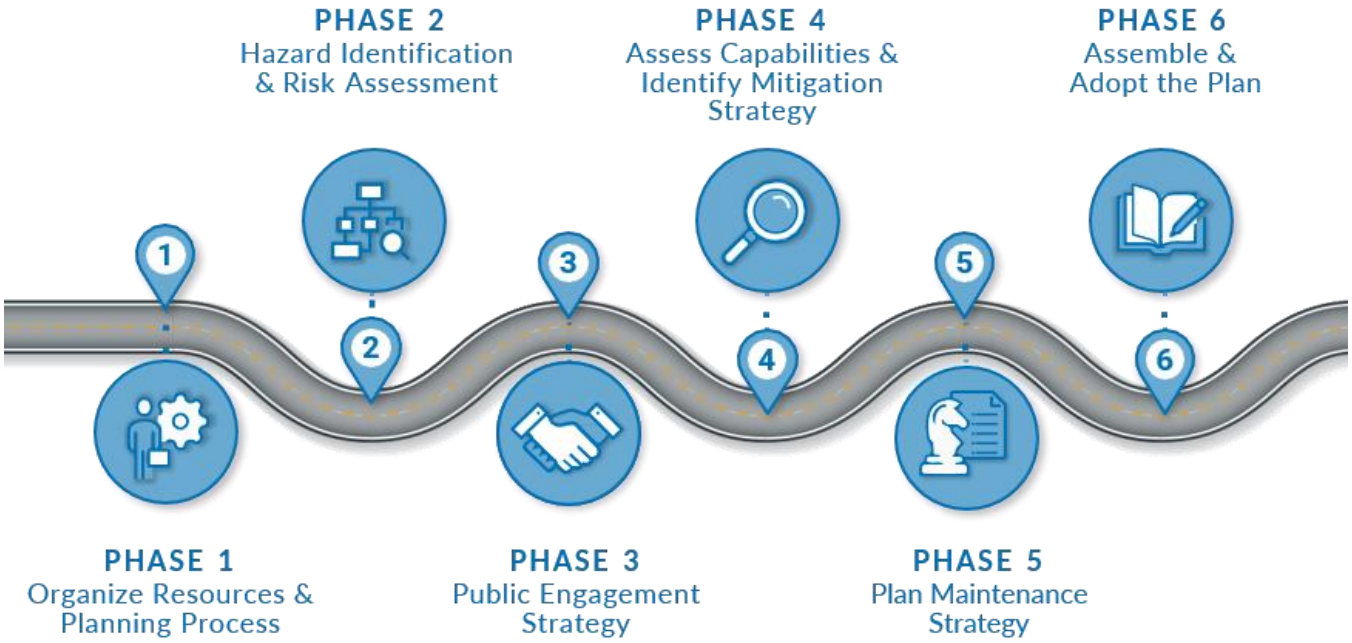
- Executive Summary
- Part 1 – Introduction & Planning Process (Chapters 1 – 3)
- Part 2 – Risk Assessment (Chapters 4 – 17)
- Part 3 – Capability Assessment, Mitigation Strategy & Plan Maintenance (Chapters 18 – 21)
- Appendix A – Public Survey
- Appendix B – Meeting Documentation
- Appendix C – Hazard Selection
- Appendix D – Federal & State Agencies, Programs & Regulations
- Appendix E – Detailed Risk Assessment Results
- Appendix F – FEMA Approval & District Board Adoption
- Appendix G – Plan Maintenance Agendas

2. PLANNING PROCESS

2.1 INTRODUCTION

The following section describes the overall process of developing the HMP, including how it was prepared, who was involved and how stakeholders and the public participated. To adhere to the requirements of the DMA 2000 and ensure that the planning process received wide and robust support from regional and local stakeholders and the public, the approach to the planning process and plan documentation includes the following:

- The 2026 Marin Municipal Water District HMP is a single jurisdictional plan and considers all natural hazards that pose a threat to the planning area. This satisfies the natural hazards requirements specified in DMA 2000 and Element B of FEMA's Local Mitigation Planning Policy Guide (April 2025).
- The District selected a contract consultant, Black & Veatch, to assist with the development and implementation of the plan.
- A Core Planning Team was formed to lead the planning effort, as shown in Table 2-1.
- Marin Water invited key staff and other stakeholders in the planning area to participate in the HMP update process as Steering Committee members. Overall, 13 participated, as shown in Table 2-1.
- This HMP was developed following the process outlined by DMA 2000, FEMA's Local Mitigation Planning Policy Guide (April 2025) and the State of California requirements for mitigation planning. Following these processes ensures that all requirements have been met and supports state and federal reviews of the Plan.



The planning process shown above consisted of the following six steps:

1. Organize Resources & Planning Process
2. Hazard Identification & Risk Assessment
3. Public Engagement Strategy
4. Assess Capabilities & Identify Mitigation Strategy
5. Plan Maintenance Strategy
6. Assemble & Adopt the Plan

2.2 PLANNING AREA

The planning area is defined as Marin Water's entire service area as illustrated in Figure 2-1.

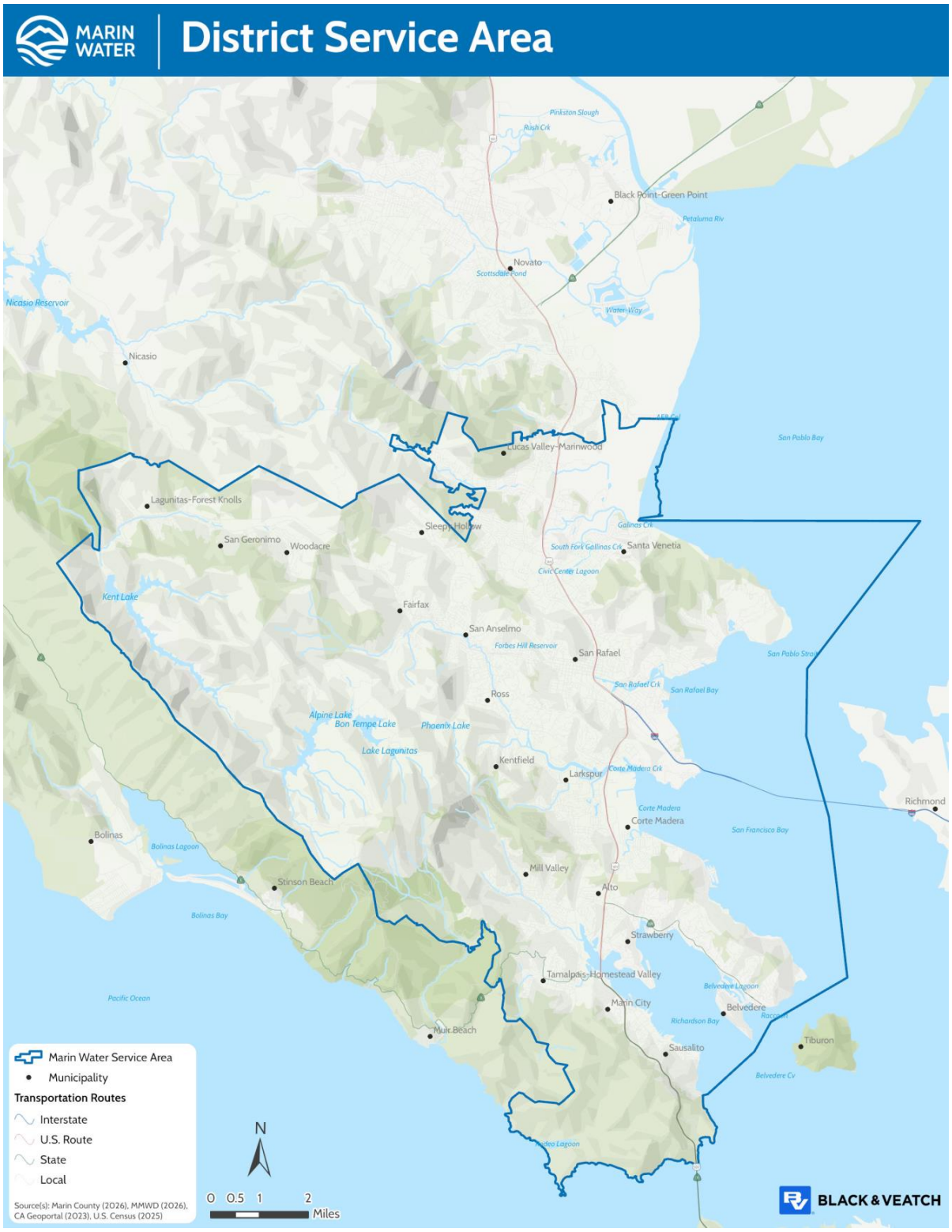


Figure 2-1. Marin Water Service Area

2.3 CONTRACT CONSULTANT

Marin Water hired Black & Veatch to assist in the facilitation of the planning process.

2.4 FORMATION OF THE PLANNING TEAMS

A successful planning effort includes active participation and buy-in from the whole community including individuals and communities, all levels of government, private and non-profit sectors, non-governmental establishments, community lifelines and members of the public. For this HMP, the planning teams included a Core Planning Team (CPT) and a Steering Committee (SC). Members of the planning teams are listed in Table 2-1.

CORE PLANNING TEAM (CPT)

The CPT was comprised of key personnel from the District and discipline leads from the contract consultant, Black & Veatch. They were responsible for monitoring plan progress milestones and identifying input needed from the SC.

STEERING COMMITTEE (SC)

A 13-member SC was comprised of CPT members, District personnel and local stakeholders. They were responsible for participating throughout the process, reviewing information, providing input, informing the risk assessment and developing mitigation strategies.

Table 2-1. Core Planning Team and Steering Committee Members

Name	Title	Department or Agency	CPT	SC
Elysha Irish (Chair)	Engineering Planning Manager	Marin Water	■	■
Emma Ressler (Vice Chair)	Associate Engineer	Marin Water	■	■
Adriane Mertens	Communications and Public Affairs Manager	Marin Water	■	■
Tyler Silvy	Communications Specialist	Marin Water	■	■
Ross Barlow	Superintendent of Operations	Marin Water		■
Berenice Davidson	Assistant Director	Marin County Public Works		■
Haley Eligio	Principal Grant and Legislative Analyst	Marin Water		■
Kent Gylfe	Director of Engineering	Sonoma County Water Agency		■
Shaun Horne	Director of Watershed Resources	Marin Water		■
Mike Marcucci	Fire Chief	Marin County Fire Department		■
Brett Pedisich	Safety and Emergency Response Manager	Marin Water		■
Hannah Tarling	Emergency Management Coordinator	Marin County Office of Emergency Management		■

Name	Title	Department or Agency	CPT	SC
Steven Torrence	Director of Emergency Management	Marin County Office of Emergency Management		■ (alternate)
Rob Flaner	Project Manager	Black & Veatch	■	
Megan Brotherton	Lead Planner	Black & Veatch	■	
Carol Baumann	Risk Assessment Lead	Black & Veatch	■	
Erin Schanen	Outreach Lead	Black & Veatch	■	
Aspen Wilkins	Planner	Black & Veatch	■	

2.5 STAKEHOLDER OUTREACH AND INVOLVEMENT

During the process to update the Plan, residents and officials from neighboring agencies and municipalities were invited to contribute by sharing local knowledge of the area's vulnerability to hazards and by suggesting ways Marin Water can mitigate disasters. The following agencies were invited to participate as key stakeholders on the Steering Committee:

- Marin County Office of Emergency Services
- Marin County Fire Department
- Marin County Public Works
- Sonoma County Water Agency

These agencies received meeting announcements, meeting agendas and meeting minutes by email throughout the plan development process or were kept apprised through other outreach methods. They supported the effort by attending meetings or providing feedback on issues. They were provided an opportunity to comment on this plan, primarily through the hazard mitigation plan website. In addition, municipalities and rate-payers, including large employers, academia, institutions, non-profit organizations, and others were sent an email or received a notice in the District newsletter informing them when the plan was available for review. For a complete list of stakeholders, please contact Marin Water. In addition, the complete draft plan was sent to the California Governor's Office of Emergency Services (Cal OES) and FEMA Region 9 for a pre-adoption review to ensure program compliance.

Federal and State Agencies

The following table describes how federal and state agencies participated in the 2026 HMP update. Those listed in the table below were directly or indirectly involved in the process and provided crucial information for the Plan.

Agency	Federal	State	Participation
CAL FIRE		■	Provided updated maps for Local Responsibility Areas that were used in the wildfire risk assessment.
Cal OES – Mitigation Planning Division		■	Oversaw the planning process.
California Department of Conservation (DOC)		■	Provided data for the tsunami hazard risk assessment.
California Department of Water Resources (DWR)		■	Provided dam inundation maps for use in the dam failure risk assessment.
California Geological Survey (CGS)		■	Provided data and mapping for the earthquake and landslide hazard risk assessments.
FEMA Region 9	■		FEMA provided updated planning guidance and conducted a plan review.
National Centers for Environmental Information (NCEI)	■		NCEI's online tools were accessed to obtain information regarding hazard identification, hazard details and risk assessments to incorporate into this HMP.
United States Geological Survey (USGS)	■		Provided ShakeMap and other data relevant to the earthquake hazard risk assessment.

2.6 REVIEW OF EXISTING PROGRAMS

Marin Water utilized the most current technical information, plans, studies and reports during the planning process to assist in hazard profiling, risk and vulnerability assessment, reviewing mitigation capabilities and identifying, developing and prioritizing mitigation strategies at local levels. The following provides examples of sources reviewed for the development of this plan.

Overall Planning Process – The 2025 FEMA Local Mitigation Planning Policy Guide and Handbook were reviewed and used to develop the Plan update. The 2023 California State HMP was reviewed for alignment with mitigation goals, identified hazards, risk assessments and mitigation actions. In addition, the County of Marin Hazard Mitigation Plan was reviewed for alignment with identified goals, hazards and mitigation actions.

Risk Assessment – Asset and inventory data collected was used to complete the risk assessment of the HMP. This included local, state and federal hazard technical information (e.g., US Geological Survey [USGS] earthquake data, CAL FIRE wildfire data, FEMA disaster declarations).

Capability Assessment – Numerous plans, reports, regulations, codes and technical information were obtained from the Steering Committee and stakeholders involved in the planning process, as well as through independent research conducted by the planning consultant. The District was responsible for providing the inventory of its planning capabilities and submitting relevant documents as needed.

Mitigation Strategy – The District included 24 mitigation actions to address the results of the risk assessment and input received from the public and local stakeholders. These actions considered the current capabilities of District departments to implement each strategy.

2.7 PUBLIC INVOLVEMENT

An important component of the mitigation planning process involved public participation. Input from the public increases understanding of local concerns and the likelihood of successfully implementing mitigation actions by developing community buy-in from those directly affected by the decisions of the District. Public awareness is a

key component of a successful mitigation strategy and is aimed at making the community safer from the potential effects of hazards.

2.7.1 Webpage

At the beginning of the plan development process, the established Marin Water hazard mitigation webpage was updated to include information about the planning process (https://www.marinwater.org/emergency-preparedness; see Figure 2-2).

Throughout the process, the website was used to keep the public informed on milestones and to solicit relevant input. The site's address was publicized in the survey and Steering Committee meetings. Information on the plan development process, the Steering Committee, the survey and drafts of the plan was made available to the public on the site throughout the process. Marin Water intends to keep a website active after the plan's completion to keep the public informed about successful mitigation projects and future updates.

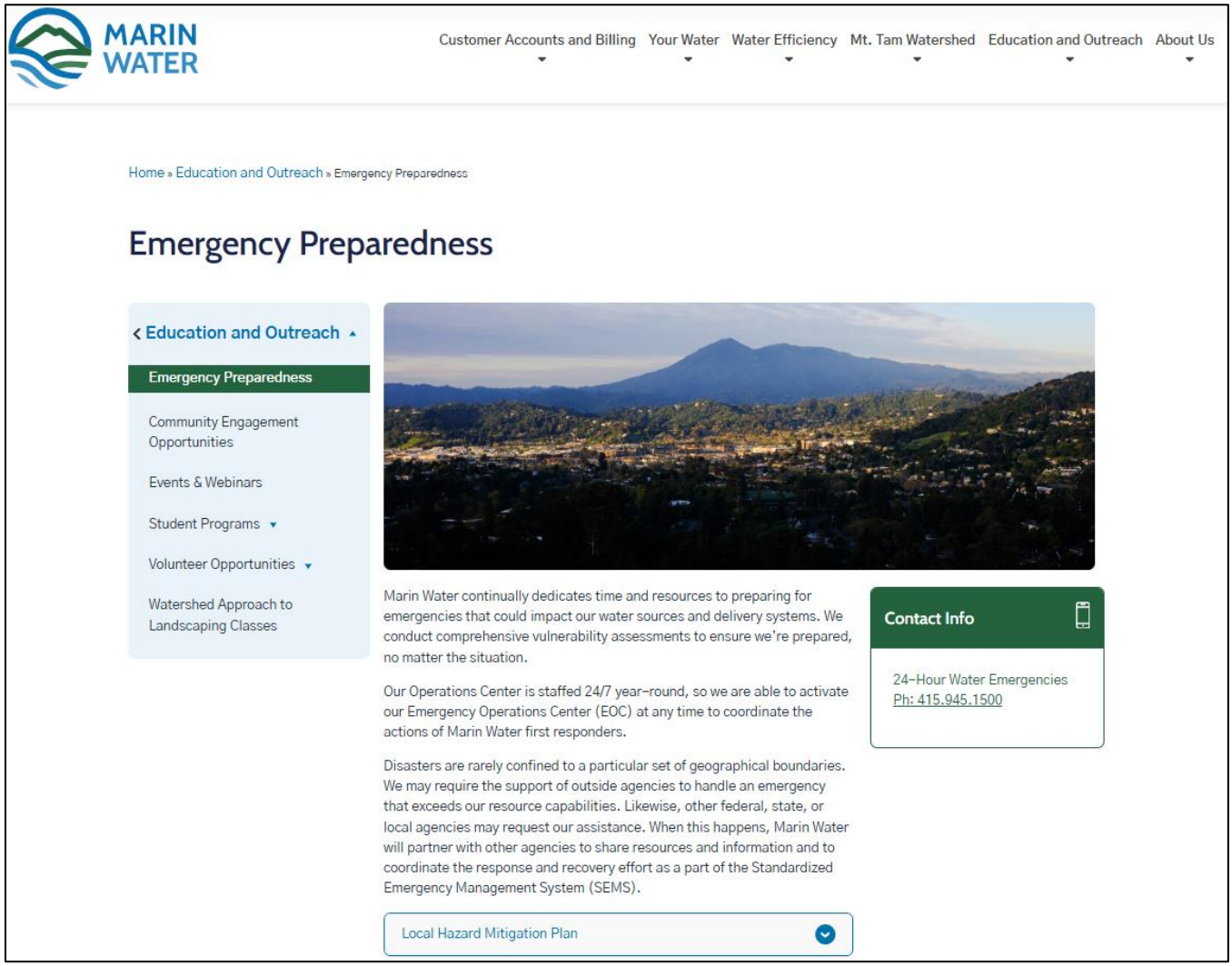


Figure 2-2. Hazard Mitigation Webpage

2.7.2 Survey

The Core Planning Team developed a hazard mitigation plan survey with guidance from the Steering Committee. The survey was used to gauge household preparedness for natural hazards and the level of knowledge of tools and techniques that assist in reducing risk and loss from natural hazards. The survey was available through a link on the District website, a printed notice in the District Administration Lobby and in the District's Monthly E-News newsletter. Between March and August 2026, 33 members of the public completed the survey. The survey and detailed results are included in Appendix A. The following highlights key takeaways that informed mitigation actions included in the Plan:

- About half of the respondents could be self-sufficient for only 1-3 days without drinking water after a disaster.
    - Marin Water included multiple mitigation actions in the Plan to increase continuity of critical water services after a disaster (Chapter 20).
- On average, respondents think that Marin Water is "somewhat prepared" to provide water service following a disaster.
    - Mitigation project successes are included in this Plan to inform customers of efforts the District has made and will continue to make for continuity of operations after a disaster (Chapter 20).

2.7.3 Public Meeting

The April 28, 2026 Marin Water Special Board of Director / Planning Committee meeting agenda included an informational item about mitigation planning and the local hazard mitigation plan (LHMP) update process presented by Elysha Irish and Alex Anaya. Twelve people attended the meeting, but no members of the public provided comments. The District Board members asked questions on topics including which hazards are being assessed in the LHMP and what types of mitigation grants are eligible opportunities for the District.

Figure 2-3. April 28, 2026 Marin Water Special Board of Director Meeting / Planning Committee Meeting

2.7.4 Public Comment Period

Members of the public were provided with an opportunity to comment on the draft plan from September 14 through September 28, 2026. The Marin Water website included a link to the draft plan and an online tool that allowed community members to submit comments. The public comment period was promoted through the District's newsletter. No comments were received from members of the public on the draft plan.

2.8 PLAN DEVELOPMENT MILESTONES

Table 2-2 summarizes important milestones in the plan development process.

Table 2-2. Plan Development Chronology/Milestones

Date	Event	Description	Attendance
December 11, 2025	Project Kickoff Meeting	• Introductions • Scope & Schedule • Core Planning Team • Steering Committee Membership • Risk Assessment Needs • Communication Protocols • Next Steps	5
January 6, 2026	CPT Meeting #1	• Welcome and Introductions • Project Schedule • GIS Needs • Steering Committee Membership • Next Steps	6
January 13, 2026	CPT Meeting #2	• Welcome • Hazard Selection • GIS Needs • Steering Committee Organization • Public Outreach • Next Steps	5
January 27, 2026	CPT Meeting #3	• Welcome • GIS Needs • Public Outreach • Steering Committee Organization • Confirm/Revise 2022 Mission Statement, Goals and Objectives • Next Steps	5
February 10, 2026	CPT Meeting #4	• Welcome • Public Outreach • GIS Update • Crosswalk Marin County Goals & Objectives • Steering Committee Agenda 02.25 • Next Steps	7
February 25, 2026	Steering Committee Meeting #1	• Welcome & Introductions • Planning Process Overview • Role of the Steering Committee • Meeting Ground Rules • Confirm Hazards • Confirm Mission Statement, Goals and Objectives • Public Outreach Strategy • Next Steps	11
March 7, 2026	Public Outreach	• Survey Open	N/A

Date	Event	Description	Attendance
March 10, 2026	CPT Meeting #5	• Welcome • Public Outreach • Define Equity Priority Communities • Capabilities Assessment Update Working Session • Next Steps	4
March 24, 2026	CPT Meeting #6	• Welcome • Public Outreach • Review Equity Priority Communities Preliminary Analysis • Preview 04.28 Board Presentation • Steering Committee Agenda 04.01 • Next Steps	6
April 1, 2026	Steering Committee Meeting #2	• Welcome & Verify Quorum • Approve February Meeting Summary • Public Outreach Strategy Update • Discuss & Confirm Hazard Scenario • Discuss & Confirm Equity Priority Communities Definition & Threshold • CalEnviroScreen • Discuss & Update Hazard “Issues” • Next Meeting July 8 • Next Steps	11
April 21, 2026	CPT Meeting #7	• Welcome • Public Outreach Update • CPT Meeting Schedule Adjustments • Status of Plans Related to Hazard Mitigation (Planning Capabilities) • Mitigation Action Updates • Next Steps	4
April 28, 2026	Public Outreach	• District Board Meeting	12
May 5, 2026	CPT Meeting #8	• Welcome • Risk Assessment Updates • Source data • Public Outreach Update • Mitigation Accomplishments to Highlight • Plan Maintenance Strategy Updates • Next Steps	4
May 26, 2026	CPT Meeting #9	• Welcome • Risk Assessment Updates • Public Outreach Update • Mitigation Accomplishments Follow-Ups • Mitigation Best Practices • Steering Committee Meeting Coordination • Next Steps	5

Date	Event	Description	Attendance
June 30, 2026	CPT Meeting #10	• Welcome • Risk Assessment Updates • Public Outreach Update • Mitigation Accomplishments Overview • Steering Committee Meeting Agenda 07.08 • Dam Vulnerabilities and Funding Discussion • Next Steps	4
July 8, 2026	Steering Committee Meeting #3	• Welcome & Verify Quorum • Approve April Meeting Summary • Public Outreach Strategy Update • Preliminary Risk Assessment Results • Discuss & Update Hazard "Issues" • Next Steps	11
July 14, 2026	CPT Meeting #11	• Data and Analysis Questions	5
July 28, 2026	CPT Meeting #12	• Steering Committee Meeting Coordination and Scheduling	4
August 26, 2026	CPT Meeting #13	• Public Outreach • Stakeholder Outreach • Hazard Event History • New Mitigation Actions • Internal Draft Plan Review • Steering Committee Meeting Agenda 09.02 • Next Steps	3
August 31, 2026	Public Outreach	• Survey Close	33
September 2, 2026	Steering Committee Meeting #4	• Welcome & Verify Quorum • Approve July Meeting Summary • Public Outreach Strategy Update • Present Draft Plan Overview • LHMP Organization and Chapters • What's Changed • Mitigation Actions • Next Steps	8
September 2-9, 2026	Stakeholder Outreach	1-week Steering Committee review of the draft plan	N/A
September 14-28, 2026	Public Outreach	2-week Public Comment period	N/A
September 22, 2026	CPT Meeting #14	• Adoption Timeline • Next Steps	4
October 6, 2026	Plan Adoption	District Board meeting to adopt the draft plan	TBD
TBD	Plan Review	Plan sent to Cal OES for review	N/A
TBD	Approval Pending Adoption	Final approval received from FEMA Region 9	N/A

Note: Appendix B contains Steering Committee meeting attendance documentation.

3. MARIN WATER PROFILE

Marin Water was the first municipal water district in California. Today, the District serves more than 191,000 people in central and southern Marin County, providing 100% locally sourced drinking water. The District owns and manages about 22,000 acres of watershed land on Mt. Tamalpais and in west Marin County. The primary source of water supply is rainfall captured in seven District-owned reservoirs, providing 75% of the water consumed. The remaining 25% is imported from the Russian River through an agreement with the Sonoma County Water Agency. Marin Water also manages its own recycled water system, with recycled water imported from Las Gallinas Valley Sanitary District.

3.1 DISTRICT HISTORY

Chartered on April 25, 1912, Marin Water is the first municipal water district in California. Prior to that, water in central and southern Marin had been provided by several small, private companies, many of them subsidiaries to local real estate developers. Recognizing the critical importance of reliable water service, the community came together to create a publicly owned and managed water system (Marin Municipal Water District 2025).

3.2 SERVICE AREA

The District serves more than 191,000 people in a service area of 147 square miles along the eastern corridor of Marin County from the Golden Gate Bridge northward. In addition to many unincorporated Marin County communities, Marin Water serves 10 incorporated cities and towns: San Rafael, Mill Valley, Fairfax, San Anselmo, Ross, Larkspur, Corte Madera, Tiburon, Belvedere and Sausalito. Figure 3-1 shows the District's water service area.

3.3 DISTRICT FACILITIES

This hazard mitigation plan assesses the potential risk that natural hazards pose to buildings, infrastructure and equipment owned by the District. This assessment of risk requires that an inventory of key facilities be developed. The inventory created for this plan includes two parts: an overview count of specific types of assets that the District owns and a listing of the estimated replacement value of key assets. The key assets generally consist of buildings, pumps, tanks, valves and pipelines, which are defined for this plan as the District's critical facilities (Figure 3-2).

Figure 3-1. Marin Water Service Area

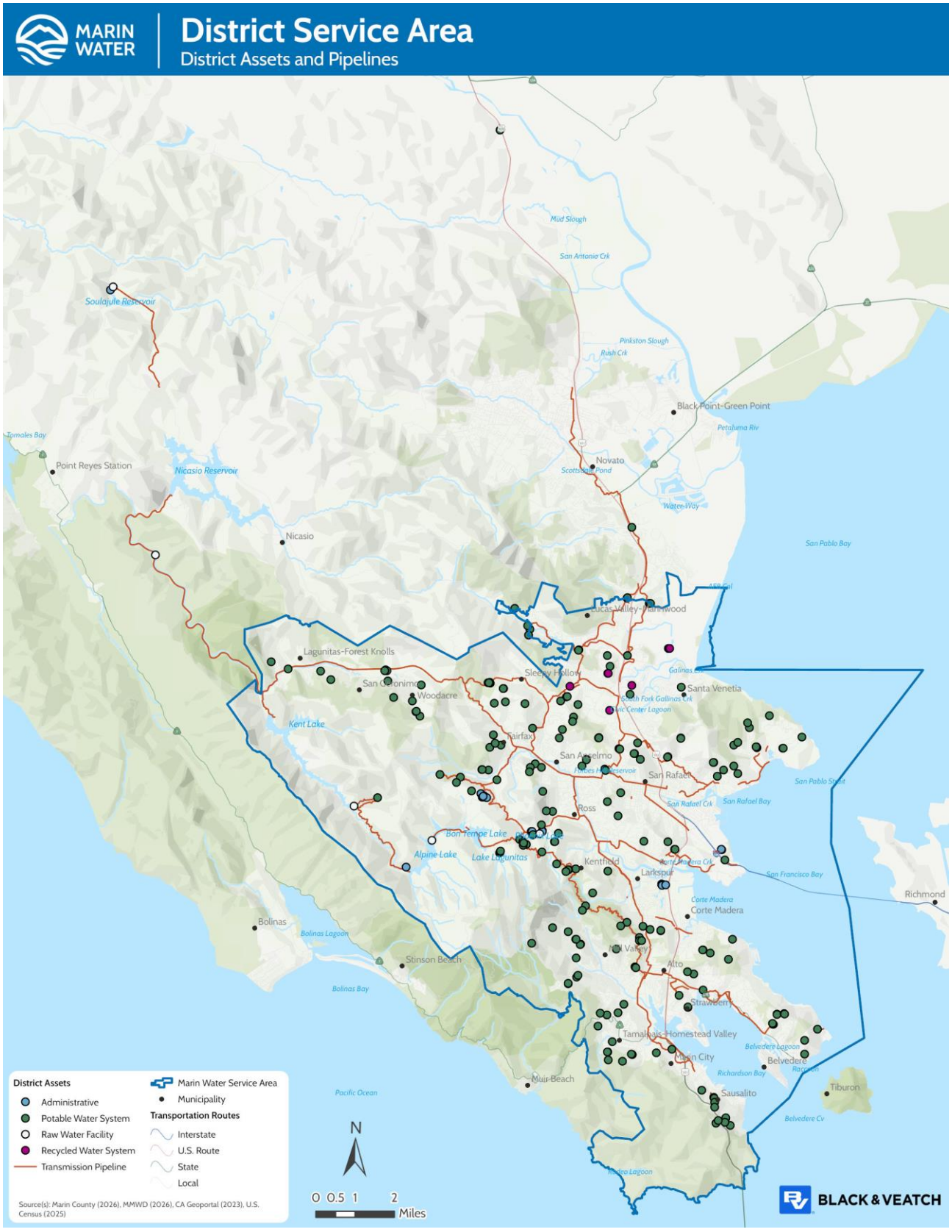


Figure 3-2. District Facilities

Table 3-1 and Table 3-2 summarize the District's critical facilities and their value.

Table 3-1. Marin Water Structures and Facilities

Structures/Facilities	Quantity	Estimated Replacement Cost
Buildings	25	$44,100,000
Potable Water Structures	99,551	$1,213,343,000
Raw Water Facilities	285	$25,280,000
Recycled Water Structures	792	$25,128,000
Total	100,653	$1,307,851,000

Table 3-2. Marin Water Pipelines

Pipelines	Length in Miles	Estimated Replacement Cost
Potable Water	1,082.5	$2,780,600,000
Raw Water	30.3	$121,716,000
Recycled Water	26.8	$73,312,000
Total	1,139.6	$2,975,628,000

3.4 ADMINISTRATION

Marin Water is governed by a five-member Board of Directors, each representing a district division (see Figure 3-1). Directors serve overlapping four-year terms. The Board elects one of its members to serve as board president each year. The Board appoints the general manager, administrative services division manager/treasurer, board secretary and legal counsel, each of whom serves at the pleasure of the Board. The general manager is the chief executive and is responsible for hiring all division managers and administering programs in accordance with the policies of and the annual budget adopted by the Board of Directors.

3.5 PHYSICAL CHARACTERISTICS

3.5.1 Topography

The District is entirely within Marin County, a southeast facing peninsula across the Golden Gate Strait from San Francisco. The county is bordered by San Francisco Bay and San Pablo Bay on the east, the city of Novato to the north, and the Point Reyes Golden Gate National Recreation Area on the west. Elevations range from sea level at the shorelines to 2,572 feet on Mount Tamalpais. Part of the mountain's watershed is included within Marin Water's boundaries.

3.5.2 Climate

The District has a Mediterranean coastal climate. Summers are mild and dry and winters are cool and wet. Based on data downloaded from the California Irrigation Management Information System (CIMIS) for 2002 through 2026, most rainfall occurs between November and March (Table 3-3). On average, the District receives 50.9 inches of rainfall annually. Maximum daily air temperature averages 67.5 degrees Fahrenheit (°F) while minimum daily air temperature averages 45.4°F.

Table 3-3. Climate Characteristics

Month	Average Minimum Temperature (°F)	Average Maximum Temperature (°F)	Average Rainfall (inches)	Evapotranspiration (inches)
January	39.6	57.4	9.0	1.4
February	39.8	60.7	9.9	2.0
March	41.5	63.4	6.8	3.2
April	43.5	66.6	3.0	4.6
May	46.8	70.1	1.6	5.6
June	50.4	73.9	0.3	6.2
July	52.3	73.7	0.0	6.3
August	52.6	74.7	0.1	5.6
September	50.4	76.2	0.2	4.5
October	46.2	72.7	2.7	3.3
November	41.8	63.9	5.8	1.8
December	39.6	56.6	11.5	1.3
Annual	**45.4**	**67.5**	**50.9**	**45.8**

Source: 2025 Urban Water Management Plan. Average temperature and evapotranspiration data taken from the CIMIS Point San Pedro station (157) and has a period of record from 2002-2026. Average rainfall data is from Marin Water's Lake Lagunitas weather station averages from 1997-2026.

3.5.3 Soils and Geology

The 1985 *Soil Survey of Marin County, California* identifies 17 soil types (U.S. Soil Conservation Service 1985). They have been grouped into three landscape types, as summarized in Table 3-4.

Table 3-4. Identified Soil Types in the Marin County Area

Soil/Landscape Group	Soil Description
Soils on alluvial fans and plains, in basins and on tidal flats	The four soil types in this group make up 15% of the survey area, dominantly on the lower positions of the landscape in the eastern part of the area. These soils are deep or very deep and somewhat poorly drained or very poorly drained. The surface layer is silt loam to clay.
Coastal soils on dunes, terraces, hills, mountains and uplands	The eight soil types in this group make up 42% of the survey area, dominantly near the coast. These soils are shallow to very deep and are somewhat excessively drained to somewhat poorly drained. The surface layer is sand to clay loam.
Inland soils on uplands	The five soil types in this group make up 43% of the survey area, in the central and eastern part of the area. These soils are shallow or moderately deep and are somewhat excessively drained or well drained. The surface layer is loam or gravelly loam.

Source: (U.S. Soil Conservation Service 1985)

3.6 DEVELOPMENT PROFILE

3.6.1 Current Land Use

As a water provider, the District has no land use authority. Such authority lies with the municipal governments that intersect the service area. However, a land use analysis can provide a gauge of service demand for the District. Much of the county is undeveloped and mountainous. Lower density residential uses are concentrated in the eastern portion of the county, often adjacent to commercial areas. Most of the developed area lies along the main transportation corridor, U.S. Highway 101. Some smaller developments are located along the western coast.

Protected land, open space and agricultural lands comprise the majority of the land in the County, with less than 15% residential, commercial and industrial.

3.6.2 Development Trends

Future growth within the District's service area will impact the demand for its services. The following is an overview of the expected future development trends for the portions of Marin County that interface with the Marin Water service area.

The Association of Bay Area Governments' (ABAG's) regional housing needs allocation identifies the total number of housing units, separated into four affordability levels, that every local government in the Bay Area must plan to accommodate for the period from 2023 to 2031 in order to meet the needs of all residents. ABAG updated a regional housing needs allocation report in June 2026 and Marin County needs 14,405 new housing units to accommodate the County's expected growth rate. The Cities of Belvedere, Corte Madera, Fairfax, Larkspur, Mill Valley, Ross, San Anselmo and San Rafael need a combined 7,383 housing units (Association of Bay Area Governments 2026). Given this allocation, Marin Water can expect to see an increase in demand within its service area in the next few years.

As noted in the population discussion below, the overall population of Marin County is decreasing. Increased regional housing targets are not driven by population counts. Rather, housing targets are driven by many factors including the following:

- Shrinking household size—Older adults often live alone or in pairs in larger homes. Birth rates are trending lower so there are fewer children in each household.
- Large commuter workforce—Many people who work in Marin County cannot afford to live in the area. They commute from other areas. State housing goals aim to build homes closer to jobs to reduce traffic and long commutes.
- State mandates to address historical housing shortages—The County has built few affordable rental housing units in past decades. State mandates plan for affordable housing to give lower-income families an opportunity to live in Marin County.

3.7 POPULATION

This Plan recognizes the importance of the people who live in the Marin Water service area and identifies mitigation strategies to help protect the District's ability to provide critical water services to community members.

3.7.1 General Population

The California Department of Finance population estimate for Marin County as of January 1, 2026, is 250,823. This is a 2.7% decrease in population since the last Plan.

3.7.2 Population Projections

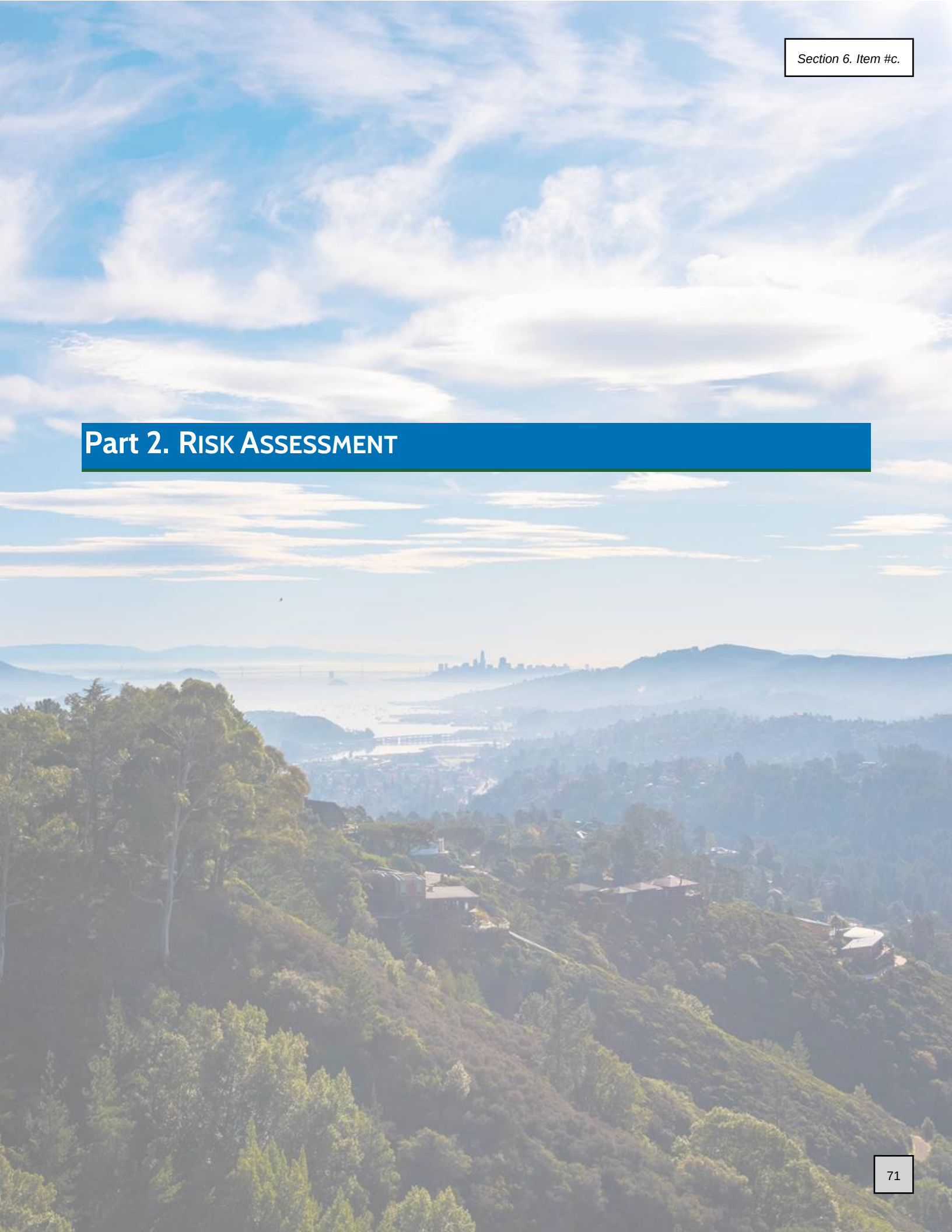
According to the California Department of Finance, the population of Marin County is expected to continue to decrease over the next five years by about 1.5%.

3.8 FINANCIAL SUMMARY

The District has two budgets that are planned and administered annually. The Marin Water Fiscal Year runs from July 1 - June 30. Each budget provides a detailed spending plan for each of the major functions performed by Marin Water. A brief explanation of the background behind each budget is discussed below:

- **Operating Budget**—These funds are budgeted for day-to-day operations.
- **Capital Improvement Program Budget**—These funds are used to pay for the building, replacement or rehabilitation of large capital facilities.

Part 2. Risk Assessment



4. HAZARDS OF CONCERN

Defining the hazards that present the greatest risk to the planning area is the first step in assessing overall risk to the community. The Steering Committee considered the full range of natural hazards that could impact the planning area, based on hazards assessed in the prior HMP, FEMA's National Risk Index (NRI) and hazards included in the 2023 California State HMP.

Natural hazards are eligible for FEMA HMA grant funding and generally occur because of natural processes. Human-caused hazards are not reviewed by FEMA for plan approval and are not eligible for FEMA HMA grant funding. The Core Planning Team and Steering Committee chose to include human-caused hazards in the Plan update because of their current and potential impact and to align with other local plans and programs.

4.1 FEDERAL DISASTER DECLARATIONS

Presidential disaster declarations are typically issued for hazard events that cause more damage than state and local governments can handle without federal assistance. A presidential disaster declaration puts federal recovery programs into motion to help disaster victims, businesses and public entities. Table 4-1 lists declared hazard events whose effective area included the Marin Water service area (declared events within Marin County). Such a declaration does not necessarily indicate that any District assets were damaged by the event.

Table 4-1. Presidential Disaster Declarations for Marin County, 1964-2026

Event Title	Date of Declaration	Disaster Declaration Number
California Severe Winter Storms, Tornadoes, Flooding, Landslides and Mudslides	04/13/2024	DR-4769
Severe Storms and Flooding	02/19/2024	DR-4758
Severe Winter Storms, Flooding, Landslides and Mudslides	01/14/2023	DR-4683
COVID-19 Pandemic	03/22/2020	DR-4482
Severe Storms, Flooding and Landslides	06/17/2019	DR-4447
Severe Winter Storms, Flooding, Landslides and Mudslides	05/17/2019	DR-4434
Severe Winter Storms, Flooding, Landslides and Mudslides	05/01/2019	DR-4431
Severe Winter Storms, Flooding, Landslides and Mudslides	04/01/2017	DR-4308
Severe Winter Storms, Flooding and Mudslides	02/14/2017	DR-4301
Severe Storms, Flooding, Landslides and Mudslides	06/05/2006	DR-1646
Severe Storms, Flooding, Mudslides and Landslides	02/03/2006	DR-1628
Severe Winter Storms and Flooding	02/09/1998	DR-1203
Severe Storms/Flooding	01/04/1997	DR-1155
Severe Winter Storms, Flooding, Landslides, Mud Flows	03/12/1995	DR-1046
Severe Winter Storms, Flooding, Landslides, Mud Flows	01/10/1995	DR-1044
Severe Freeze	02/11/1991	DR-894
Loma Prieta Earthquake	10/18/1989	DR-845
Severe Storms, Flooding	02/21/1986	DR-758
Coastal Storms, Floods, Slides, Tornadoes	02/09/1983	DR-677
Severe Storms, Flood, Mudslides, High Tides	01/07/1982	DR-651
Severe Storms, High Tides, Flooding	02/08/1973	DR-364

Event Title	Date of Declaration	Disaster Declaration Number
Severe Storms, Flooding	02/16/1970	DR-283
Severe Storms, Flooding	01/26/1969	DR-253
Heavy Rains & Flooding	12/24/1964	DR-183

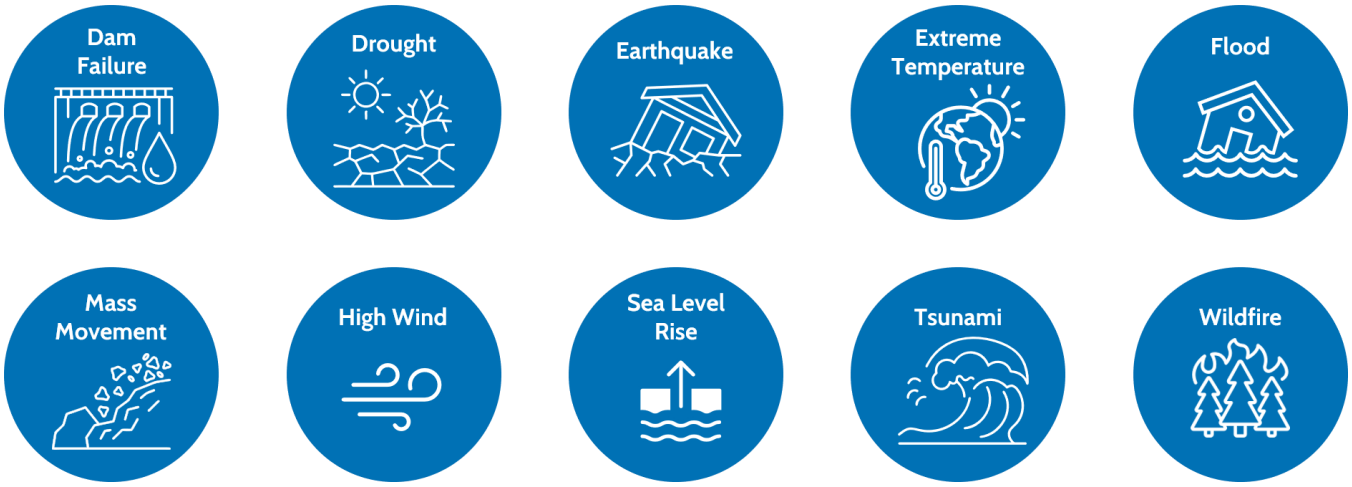
4.2 NOTABLE HAZARD EVENTS SINCE 2022

Since the 2022 HMP was developed, Marin Water has experienced impacts from notable hazard events as described below:

- Winter 2023/2024 – A landslide occurred at Tennessee Valley Tank site in Mill Valley as a result of severe winter storms. This resulted in an estimated $50,000 in costs associated with geotechnical evaluation and installation of rock slope stabilization to protect the tank site.
- Winter 2023 - Three known landslides impacted Bolinas Road, which is a main access road for the Bon Tempe Treatment Plant and the District's watershed, resulting in traffic delays and costs associated with survey, inspection, and geotechnical assessment to confirm road stability. This road is maintained by the County, but the District contributed resources and staff time to support repairs as it is a critical access road for many District facilities.
- March 2023 – The Redwood Boulevard landslide impacted the North Marin Aqueduct. This pipeline is owned by North Marin Water District but conveys water to Marin Water's Ignacio Water Quality Station. Following the landslide, the pipeline was isolated and pressure tested as a precaution, resulting in outages at Ignacio.
- January 2023 – The Loma Alta landslide on Old Railroad Grade Road threatened integrity of the Northern Marin Line transmission pipe, which is the primary transmission line from the San Geronimo Treatment Plant supplying the District's water system. This resulted in several shutdowns at the treatment plant while the integrity of the pipeline was evaluated. Over $300,000 was spent relocating the 24" pipeline to a stable location.
- January 2023 - A winter storm caused a landslide that impacted Worn Spring Road near Phoenix Lake. This road is the primary access road for Ross Reservoir and contains a critical 18" transmission pipeline that supplies water to Ross Reservoir. This resulted in more than $350,000 in repairs to stabilize the road and pipeline.

4.3 HAZARDS OF CONCERN AND HAZARDS OF INTEREST

Based on a review of the 2023 California State Hazard Mitigation Plan, the National Risk Index, the District's prior HMP and input from the Steering Committee, ten natural hazards of concern affect the planning area and are addressed in this plan:



In addition to the hazards of concern listed above, the Steering Committee recognized other hazards that present risks to the District and are included to acknowledge a coordinated approach to address hazards. The hazards listed below are not currently eligible for FEMA mitigation grant funding but may be eligible for other state and federal grants. These other hazards of interest are:

See Appendix C for a comparison of hazards included in the 2023 California State HMP, the prior HMP and this Plan update.

5. RISK ASSESSMENT METHODOLOGY

The risk assessments in this hazard mitigation plan describe the risks associated with each identified hazard of concern. Each chapter describes the hazard, the planning area's vulnerabilities and probable event scenarios. The following steps were used to define the risk of each hazard:

- Identify and profile each hazard—The following information is given for each hazard:
  - Past Events: Past occurrences of the hazard affecting the planning area
  - Location: Geographic areas most affected by the hazard
  - Future Conditions: Event probability estimates and anticipated climate change impacts
  - Extent: Extent or severity and the warning time likely to be available for response
- Determine exposure to each hazard—Exposure was determined by overlaying hazard maps with an inventory of structures, facilities and systems to determine which of them would be exposed to each hazard. For each identified hazard of concern, the best available existing data delineating a hazard area was selected. Data sets were evaluated based on scale, currency and source. Data available in a GIS-compatible format with coverage of the full extent of the planning area were preferred for the analysis.
- Assess the vulnerability of exposed facilities—Vulnerability of exposed structures and infrastructure was determined by interpreting the probability of occurrence of each event and assessing structures, facilities and systems that are exposed to each hazard. FEMA's hazard-modeling program called Hazus was used to perform this assessment for the flood, dam failure and earthquake hazards. Outputs similar to those from Hazus were generated for other hazards using GIS.

5.1 MAPPING

A review of national, state and county databases was performed to locate available spatially based data relevant to this planning effort. Maps were produced using GIS software to show the spatial extent and location of identified hazards when such data was available. These maps are included in the hazard profile chapters of this document.

5.2 HAZARD RISK MODELING

5.2.1 Overview

In 1997, FEMA developed the standardized Hazards U.S. or Hazus, model to estimate losses caused by earthquakes and identify areas that face the highest risk and potential for loss. Hazus was later expanded into a multi-hazard methodology with new models for estimating potential losses from hurricanes and floods.

Hazus is a GIS-based software program used to support risk assessments, mitigation planning and emergency planning and response. It provides a wide range of inventory data–such as demographics, building stock, critical facilities, transportation infrastructure and utility lifelines–and uses multiple models to estimate potential losses from natural disasters. The program maps and displays hazard data and the results of damage and economic loss estimates for buildings and infrastructure. Its advantages include the following:

- Provides a consistent methodology for assessing risk across geographic and political entities
- Provides a way to save data so that it can readily be updated as population, inventory and other factors change and as mitigation planning efforts evolve

- Facilitates the review of mitigation plans because it helps to ensure that FEMA methodologies are incorporated
- Supports grant applications by calculating benefits using FEMA definitions and terminology
- Produces hazard data and loss estimates that can be used in communication with local stakeholders
- Is administered by the local government and can be used to manage and update a hazard mitigation plan throughout its implementation

5.2.2 Levels of Detail for Evaluation

Hazus provides default data for inventory, vulnerability and hazards; this default data can be supplemented with detailed local data to provide a more refined analysis. The model can carry out three levels of analysis, depending on the format and level of detail of information about the planning area:

- **Level 1**—All of the information needed to produce an estimate of losses is included in the software's default data. This data is derived from national databases and describes in general terms the characteristic parameters of the planning area.
- **Level 2**—More accurate estimates of losses require more detailed information about the planning area. To produce Level 2 estimates of losses, detailed information is required about local geology, hydrology, hydraulics and building inventory, as well as data about utilities and critical facilities. This information is needed in a GIS format.
- **Level 3**—This level of analysis generates the most accurate estimate of losses. It requires detailed engineering and geotechnical information to customize it for the planning area.

5.2.3 Application for This Plan

The following hazards were evaluated using Hazus:

- **Flood**—A Level 2 user-defined analysis was performed for the District's facilities and infrastructure in flood zones. Current flood mapping for the planning area was used to delineate flood hazard areas and estimate potential losses from the 1%-annual-chance and 0.2%-annual-chance flood event (commonly known as the 100-year and 500-year floods). To estimate damage that would result from a flood, Hazus uses pre-defined relationships between flood depth at a structure and resulting damage, with damage given as a percent of total replacement value. Curves defining these relationships have been developed for damage to structures and for damage to typical contents within a structure. By inputting flood depth data and known structure replacement cost values, dollar-value estimates of damage were generated.
- **Dam Failure**—A Level 2 analysis was run using the flood methodology described above. The analysis assessed the combined mapped inundation areas for failure of seven dams: Alpine, Bon Tempe, Lagunitas, Peters Dam (Kent), Phoenix, Seeger Dam (Nicasio) and Soulajule.
- **Earthquake**—A Level 2 analysis was performed to assess earthquake exposure and vulnerability for four scenario events and one probabilistic event:
  - A Magnitude-7.58 event on the Hayward/Rodgers Creek fault with an epicenter 10.5 miles east-northeast of Corte Madera
  - A Magnitude-7.88 event on the North San Andreas fault with an epicenter 10 miles west of Corte Madera
  - A Magnitude-7.44 event on the San Gregorio North fault with an epicenter 36 miles south of Corte Madera
  - A Magnitude-6.97 event on the West Napa fault with an epicenter 29 miles north-northeast of Corte Madera
  - The standard Hazus 100-year probabilistic event (represents a specific level of ground shaking that has a 1% chance of happening in any given year)

The Hazus methodology uses ground motion and ground failure fragility curves to estimate damage state probabilities which are then used to estimate losses at the structure level.

5.3 RISK ASSESSMENT WITHOUT MODELING

For most of the hazards evaluated in this risk assessment, historical data was not adequate to model future losses. However, GIS is able to map hazard areas and calculate exposures if geographic information is available on the locations of the hazards and inventory data. A qualitative analysis was conducted for some hazards using the best available data and professional judgment. The risk assessment for drought was more limited and qualitative than the assessment for the other hazards of concern because drought generally does not affect structures.

5.4 SOURCES OF DATA USED IN HAZUS MODELING

5.4.1 Facilities and Infrastructure Cost Data

Replacement cost values and detailed structure information were derived from data provided by the District on its raw, potable and recycled water system facilities and infrastructure. The exposure of the facilities and infrastructure to the hazards was analyzed using GIS overlays. Hazus was used to determine damage to pipelines (earthquake hazard only) and to the following facilities: pump stations, water treatment plants, tanks and buildings.

The Hazus earthquake module calculates the economic loss to pipelines using the number of leaks and the number of breaks multiplied by cost to repair each leak or break. Default cost-to-repair values included in Hazus were updated with the following information provided by the District:

- Cost to repair a pipeline leak: $10,000
- Cost to repair a pipeline break: $10,000

Hazus default values for pipeline restoration time were also updated with information provided by the District. Marin Water normally operates with four crews of three to six workers per crew, with a surge capacity of six to seven crews at a time. A capacity of seven crews, with six workers per crew, was used for the Hazus analyses. A crew can repair one leak, per day, or one break, per two days, for the analyses.

5.4.2 Hazus Data Inputs

The following hazard datasets were used for the Hazus Level 2 analysis conducted for the risk assessment:

- **Flood**—The effective Digital Flood Insurance Rate Map (DFIRM) for the planning area was used to delineate flood hazard areas and estimate potential losses from the 1%-annual-chance and 0.2%-annual-chance flood events. Using the DFIRM floodplain boundaries and U.S. Geological Survey (USGS) 1/3 Arc Second digital elevation model data, a flood depth grid was generated and integrated into the Hazus model.
- **Dam Failure**—Dam-failure inundation depth grids for the Alpine Dam, Bon Tempe Dam, Lagunitas Dam, Peters Dam (Kent), Phoenix Dam, Seeger Dam (Nicasio), and Soulajule Dam were provided by the California Department of Water Resources. The individual dam depth grids were combined using the maximum depth where the dam inundation areas overlapped and the combined depth grid was integrated into the Hazus model.
- **Earthquake**—ShakeMaps and probabilistic data prepared by the USGS were used for the analysis of the earthquake hazard (see Section 8.1.5 for a discussion of ShakeMaps). Liquefaction susceptibility information from Marin County, and landslide susceptibility and National Earthquake Hazard Reduction Program (NEHRP) soils data from the California Geological Survey (CGS) were also integrated into the Hazus model.

5.4.3 Other Local Hazard Data

Locally relevant information on hazards was gathered from a variety of sources. Frequency and severity indicators include past events and the expert opinions of geologists, emergency management specialists and others. Data sources for specific hazards were as follows:

- **Landslide**—Deep-seated landslide susceptibility data was provided by CGS. This data differentiates areas based on rock strength and steepness of slopes combined to create susceptibility classes. For the purposes of the exposure analysis, the classes were grouped as follows:
  - High – Susceptibility Classes VII, VIII, and IX
  - Very High – Susceptibility Class X
- **Sea Level Rise**—Sea level rises of 0.8 feet (year 2050) and 6.6 feet (year 2100 High), with 100-year storm surge and shallow groundwater rise, data were downloaded from San Francisco Bay Conservation and Development Commission's (BCDC) Regional Shoreline Adaptation Plan Atlas Open Data portal. The portal provides coastal hazard data for sea level rise scenarios based on the California Sea Level Rise Guidance (2024) statewide averages. These data were compiled from BCDC's Adapting to Rising Tides (ART) sea level rise and USGS' Coastal Storm Modeling System (CoSMoS) shallow groundwater rise datasets.
- **Tsunami—**Tsunami inundation area data provided by the California Department of Conservation.
- **Wildfire**— Fire hazard severity zones data originated from CAL FIRE. These zones were mapped based on fuel loading, slope, fire weather, and other relevant factors including winds. The zones are classified as Moderate, High, or Very High fire hazard.

5.4.4 Data Source Summary

Table 5-1 summarizes the data sources used for the risk assessment for this project:

Table 5-1. Data Sources

Data	Source	Date	Format
Potable and recycled system data including treatment plants, pump stations, tanks, valves, hydrants, service connections and pipelines	MMWD	2026	Digital (GIS)
District buildings	MMWD	2026	Geographic coordinates in a text document
Dams	CA DWR	2025	Digital (GIS)
District service area	MMWD	2026	Digital (GIS)
California Dam Breach Inundation Maps, Approved Inundation Boundaries	CA DWR	2026	Digital (GIS)
California Dam Breach Inundation Maps, Inundation Depth Grids	CA DWR	2018-2020	Digital (GIS)
Hayward/Rodgers Creek (RC+HN+HS+HE) M7.58 ShakeMap	USGS	2017	Digital (GIS)
North San Andreas (SAN+SAP+SAS) M7.88 ShakeMap	USGS	2017	Digital (GIS)
San Gregorio North M7.44 ShakeMap	USGS	2017	Digital (GIS)
West Napa M6.97 ShakeMap	USGS	2017	Digital (GIS)
Liquefaction susceptibility	Marin County (originally USGS)	2006	Digital (GIS)

Shear-wave Velocity in Upper 30m of Surficial Geology (Vs30) / NEHRP Soils	CGS	2015	Digital (GIS)
DFIRM for Marin County (effective 8/15/2017; latest LOMR 8/4/2023)	FEMA	2023	Digital (GIS)
CGS Map Sheet 58: Susceptibility to Deep-Seated Landslides in California	CGS	2018	Digital (GIS)
Regional Shoreline Adaptation Plan (RSAP) Coastal Flood Hazards - 0.8 ft (2050) SLR Scenario	San Francisco Bay Conservation and Development Commission	Downloaded 2026	Digital (GIS)
Regional Shoreline Adaptation Plan (RSAP) Coastal Flood Hazards – 6.6 ft (2100 High) SLR Scenario	San Francisco Bay Conservation and Development Commission	2025	Digital (GIS)
Tsunami Hazard Area Map, Marin County	CA Dept of Conservation	2022	Digital (GIS)
Fire Hazard Severity Zones, in Local Responsibility Area	CAL FIRE	2025	Digital (GIS)
Fire Hazard Severity Zones, in State Responsibility Area	CAL FIRE	2023	Digital (GIS)
USGS 1/3 Arc Second Digital Elevation Model (DEM)	USGS	Downloaded 2026	Digital (GIS)

5.5 LIMITATIONS

Loss estimates, exposure assessments and hazard-specific vulnerability evaluations rely on the best available data and methodologies. Uncertainties are inherent in any loss estimation methodology and arise in part from incomplete scientific knowledge concerning natural hazards and their effects on the built environment. Uncertainties also result from the following:

- Approximations and simplifications necessary to conduct a study
- Incomplete or outdated inventory, demographic or economic parameter data
- The unique nature, geographic extent and severity of each hazard
- Mitigation measures already employed
- The amount of advance notice residents have to prepare for a specific hazard event.

These factors can affect loss estimates by a factor of two or more. Therefore, potential exposure and loss estimates are approximate and should be used only to understand relative risk. Over the long term, the District will collect additional data to assist in estimating potential losses associated with other hazards.

6. DAM FAILURE

6.1 GENERAL BACKGROUND

A dam is an artificial barrier that can store water, wastewater or liquid-borne materials for many reasons—flood control, human water supply, irrigation, livestock water supply, energy generation, containment of mine tailings, recreation or pollution control. Many dams fulfill a combination of these functions. They are an important resource in the United States.

Dams can be classified according to their purpose, construction material, slope, cross-section or means of controlling seepage. Materials used to construct dams include earth, rock, tailings from mining or milling, concrete, masonry, steel, timber, plastic, rubber and combinations of these.

6.1.1 Causes of Dam Failures

Failure of a dam, whether partial or complete, can result from a range of natural or human-caused factors. Dam-related risk is determined by the interaction between the hazard, the performance of the structure under those conditions and the potential consequences to downstream communities, infrastructure and environmental resources. Potential causes of dam failure are as follows (FEMA 2023):

- Overtopping caused by floods that exceed the dam capacity (inadequate spillway capacity)
- Prolonged periods of rainfall and flooding
- Deliberate acts of sabotage (terrorism)
- Structural failure of materials used in dam construction
- Movement and/or failure of the foundation supporting the dam
- Settlement and cracking of concrete or embankment dams
- Piping and internal erosion of soil in embankment dams
- Inadequate or negligent operation, maintenance and upkeep
- Failure of upstream dams on the same waterway
- Earthquake (liquefaction/landslides).

Many dam failures in the United States have been secondary results of other disasters. The most common causes are earthquakes, landslides, extreme storms, equipment malfunction, structural damage, foundation failures and sabotage. Poor construction, lack of maintenance and repair and deficient operational procedures are preventable or correctable by a program of regular inspections. Terrorism and vandalism are serious concerns that all operators of public facilities must plan for; these threats are under continuous review by public safety agencies.

6.1.2 Residual Risk

All dams face a “residual risk” of failure, which represents the risk that conditions may exceed those for which the dam was designed. For example, dams may be designed to withstand a probable maximum precipitation, defined as the greatest depth of precipitation for a given duration that is theoretically possible over a given storm area at a particular geographical location at a given time of the year. The chance of occurrence of a precipitation event of a greater magnitude than that represents residual risk for such dams.

6.1.3 Dam Regulation and Hazard Ratings

Regulatory oversight of dams is assigned to various agencies (see Appendix D):

- FEMA monitors dams under the National Dam Safety Act.
- The Federal Energy Regulatory Commission promotes safety of power-producing dams through its Dam Safety Program.
- The U.S. Army Corps of Engineers operates and maintains hundreds of dams nationwide and is responsible for safety inspections of dams that meet size and storage limitations specified in the National Dam Safety Act.
- California's Department of Water Resources, Division of Safety of Dams (DSOD) monitors the Dam Safety Program at the state level and maintains a working list of dams in the state. Marin Water incorporates information from its engineering, operations, water resources and dam safety staff and coordinates with DSOD through existing dam safety reporting, inspection and consultation processes.

FEMA uses the following classification system for the hazard potential of dam failures (FEMA 2004):

- **Low Hazard Potential**—Dams where failure or mis-operation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the dam owner's property.
- **Significant Hazard Potential**—Dams where failure or mis-operation results in no probable loss of human life but can cause economic loss, environmental damage or disruption of lifeline facilities or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.
- **High Hazard Potential**—Dams where failure or mis-operation will probably cause loss of human life.

DSOD developed a hazard potential classification system for state-jurisdiction dams, as shown on Table 6-1. The state system is modified from the three-tier federal guidelines, adding a fourth hazard classification of "extremely high." Dams classified as extremely high hazard may impact highly populated areas or critical infrastructure or have short evacuation warning times. The federal and state rating systems are both based on the potential consequences of a dam failure; they do not address the probability of such failures.

Table 6-1. State of California Downstream Hazard Potential Classification

Hazard Category	Direct Loss of Life	Economic, Environmental and Lifeline Losses
Low	None expected	Low and principally limited to dam owner's property
Significant	None expected	Yes
High	Probable (one or more expected)	Yes, but not necessary for this classification
Extremely High	Considerable	Yes, major impacts to critical infrastructure or property

Source: (California Department of Water Resources Division of Safety of Dams 2021)

6.1.4 Planning Requirements

State of California

All dams whose inundation areas may affect the planning area are required to maintain Emergency Action Plans (EAPs) consistent with California law and FEMA guidance. EAPs are developed in coordination with local, state and federal agencies and are designed to provide early warning and coordinated response actions to protect life and property (Cal OES Governor's Office of Emergency Service 2025). At a minimum, EAPs include:

- Emergency notification flowcharts and warning procedures
- Defined emergency levels and response protocols for incident detection, evaluation and classification
- Roles and responsibilities of dam operators and responding agencies
- Pre-incident preparedness and response actions
- Inundation maps identifying areas at risk and supporting evacuation planning

- Administrative information such as revision records and distribution lists

EAPs must be regularly updated (at least every 10 years or when conditions change) and are subject to periodic training, exercises and coordination with emergency management agencies to ensure effective implementation during a dam-related incident (Cal OES Governor's Office of Emergency Service 2025).

Federal Energy Regulatory Commission

Dams that fall under the jurisdiction of the Federal Energy Regulatory Commission (FERC) also have specified planning requirements. FERC has the largest dam safety program in the United States. It cooperates with a large number of federal and state agencies to ensure and promote dam safety and, more recently, homeland security. FERC requires licensees to prepare EAPs and conducts training sessions on how to develop and test these plans. The plans are designed to serve as an early warning system if there is a potential for or a sudden release of water from, a dam failure or accident to the dam. The plans include operational procedures that may be used, such as reducing reservoir levels and reducing downstream flows and procedures for notifying affected residents and agencies responsible for emergency management. These plans are frequently updated and tested to ensure that in emergency situations everyone knows what to do, thus saving lives and minimizing property damage (FERC 2020).

Marin Water does not own any FERC-regulated dams.

6.1.5 Secondary Hazards

Dam failure can cause severe downstream flooding. Overland flows from dam breach are likely to transport large amounts of debris, which can impact District assets such as buildings, pumps and tanks. Other potential secondary hazards of dam failure are landslides around the reservoir perimeter, bank erosion on streams and destruction of downstream habitat. Dam failure may worsen the severity of a drought by releasing water that might have been used as a potable water source.

6.2 HAZARD PROFILE

6.2.1 Past Events

According to the 2023 California State Hazard Mitigation Plan, there have been few dam failures in California since 1950, none of which occurred in Marin County. Overtopping caused two of the failures and the others were caused by seepage or leaks. California has had about 45 failures of non-federal dams. The most common cause of failure was overtopping (Cal OES Governor's Office of Emergency Services 2023).

There have been no federal disaster declarations or state proclamations for dam failures in Marin County (FEMA n.d.) (Cal OES 2026).

6.2.2 Location

According to DSOD, there are 13 dams in Marin County. Marin Water owns and operates seven of these dams and 5 are rated as high, with one rated as significant and one as extremely high. Table 6-2 lists key information about dams that are owned by the District or that have an inundation area with potential to impact Marin Water assets.

Figure 6-1 shows dam locations and aggregate dam-failure inundation areas.

Table 6-2. Dams Owned by Marin Water or with Potential to Impact District Assets

Name	Alpine	Bon Tempe	Lagunitas	Peters (Kent)	Phoenix Lake	Seeger (Nicasio)	Soulajule	Novato Creek (Stafford)
Hazard Potential	High	High	Significant	High	Extremely High	High	High	Extremely High
Condition Assessment	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Fair	Satisfactory	Satisfactory
Owner	Marin Water	Marin Water	Marin Water	Marin Water	Marin Water	Marin Water	Marin Water	North Marin County Water District
Year Built	1917	1949	1872	1954	1907	1961	1979	1951
Dam Type	Gravity	Earthen	Earthen	Earthen	Earthen	Earthen	Earthen	Earthen
Crest Length (feet)	524	1,150	433	700	320	400	700	650
Height (feet)	143	98	48	230	90	115	122	71
Storage Capacity (acre-feet)	8,892	4,300	341	32,900	421	22,400	10,700	4,430

6.2.3 Future Conditions

Probability

A major dam failure is a rare event for which there is no defined recurrence interval. For the risk ranking in this plan, the District chose to assign a probability value of medium (an event to likely occur within 100 years) to account for increased frequency due to the impacts from climate change.

While the probability of dam failure is very low, the probability of flooding associated with changes to dam operational parameters in response to climate change is higher. Dam designs and operations are developed based on hydrographs from historical records. If these hydrographs experience significant changes over time due to the impacts of climate change, dam design and operations may no longer be valid for the changed condition. This could have significant impacts on dams that provide flood control. Specified release rates and impound thresholds may have to be changed. This would result in increased discharges downstream of these facilities, increasing the probability and severity of flooding.

Climate Change

Property exposure and vulnerability to the dam failure hazard are unlikely to change because of climate change. Dam owners and operators may need to alter maintenance and operations to account for changes in the hydrograph and increased sedimentation. Small changes in rainfall and runoff conditions may have significant impacts for dam operations. Dams are designed partly based on assumptions about a river's flow behavior, expressed as hydrographs. A hydrograph is a graph showing, for a given point on a stream, the discharge, stage (depth), velocity, or other property of water with respect to time (USDA 2007). Changes in weather patterns can have significant effects on the hydrograph used for the design of a dam. If the hydrograph changes, it is conceivable that the dam can lose some or all of its designed margin of safety, also known as freeboard. If freeboard is reduced, dam operators may be forced to release increased volumes earlier in a storm cycle to maintain the required margins of safety. Such early releases of increased volumes can increase flood potential downstream.

Dams are constructed with safety features known as spillways. Spillways are put in place on dams as a safety measure in the event of the reservoir filling too quickly. Spillway overflow events, often referred to as "design failures," result in increased discharges downstream and increased flooding potential. Although climate change will not increase the probability of catastrophic dam failure, it may increase the probability of design failures.

6.2.4 Extent

Table 6-2 lists the hazard potential of dams that could impact the District, using the State of California rating system described in Section 6.1.3. These ratings indicate the potential extent of dam failure impacts in the District.

DSOD uses the National Inventory of Dam's condition rating definitions as a guideline in assigning condition assessments. A dam safety deficiency is defined as a load capacity limit or other issue that can result in a failure of the dam or appurtenant structure. It is a characteristic or condition that does not meet the applicable minimum regulatory criteria. Condition assessment ratings are described below (FEMA 2026):

- **Satisfactory**—No existing or potential dam safety deficiencies are recognized. Acceptable performance is expected under all loading conditions (static, hydrologic, seismic) in accordance with the minimum applicable state or federal regulatory criteria or tolerable risk guidelines.
- **Fair**—No existing dam safety deficiencies are recognized for normal operating conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency. Risk may be in the range to take further action. Note: Rare or extreme events are defined by the regulatory agency based on their minimum applicable state or federal criteria.
- **Poor**—A dam safety deficiency is recognized for normal operating conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Investigations and studies are necessary.
- **Unsatisfactory**—A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.
- **Not Rated**—The dam has not been inspected, is not under state jurisdiction, or has been inspected but, for whatever reason, has not been rated.

Warning Time

Warning time for dam failure depends on the cause of the failure. In case of extreme precipitation, evacuations can be planned with sufficient time. In the event of a structural failure due to earthquake, there may be no warning time. A dam's structural type also affects warning time. Earthen dams do not tend to fail completely or instantaneously. Once a breach is initiated, discharging water erodes the breach until the reservoir is empty or the breach resists further erosion. Concrete dams also tend to begin with a partial breach. The time of breach formation ranges from a few minutes to a few hours (USACE 2026).

The County of Marin has a system for warning citizens in the event of an emergency, including dam failure. AlertMarin is a mass notification system designed to keep Marin County residents, employees, students and businesses informed of emergencies and community events. Interested parties can register their cell phone or VoIP (voice over internet protocol) phone to receive emergency alerts sent by call, text, email or smartphone application from the County of Marin. Listed, unlisted and blocked Marin County landline phone numbers are already included in the emergency notification system.

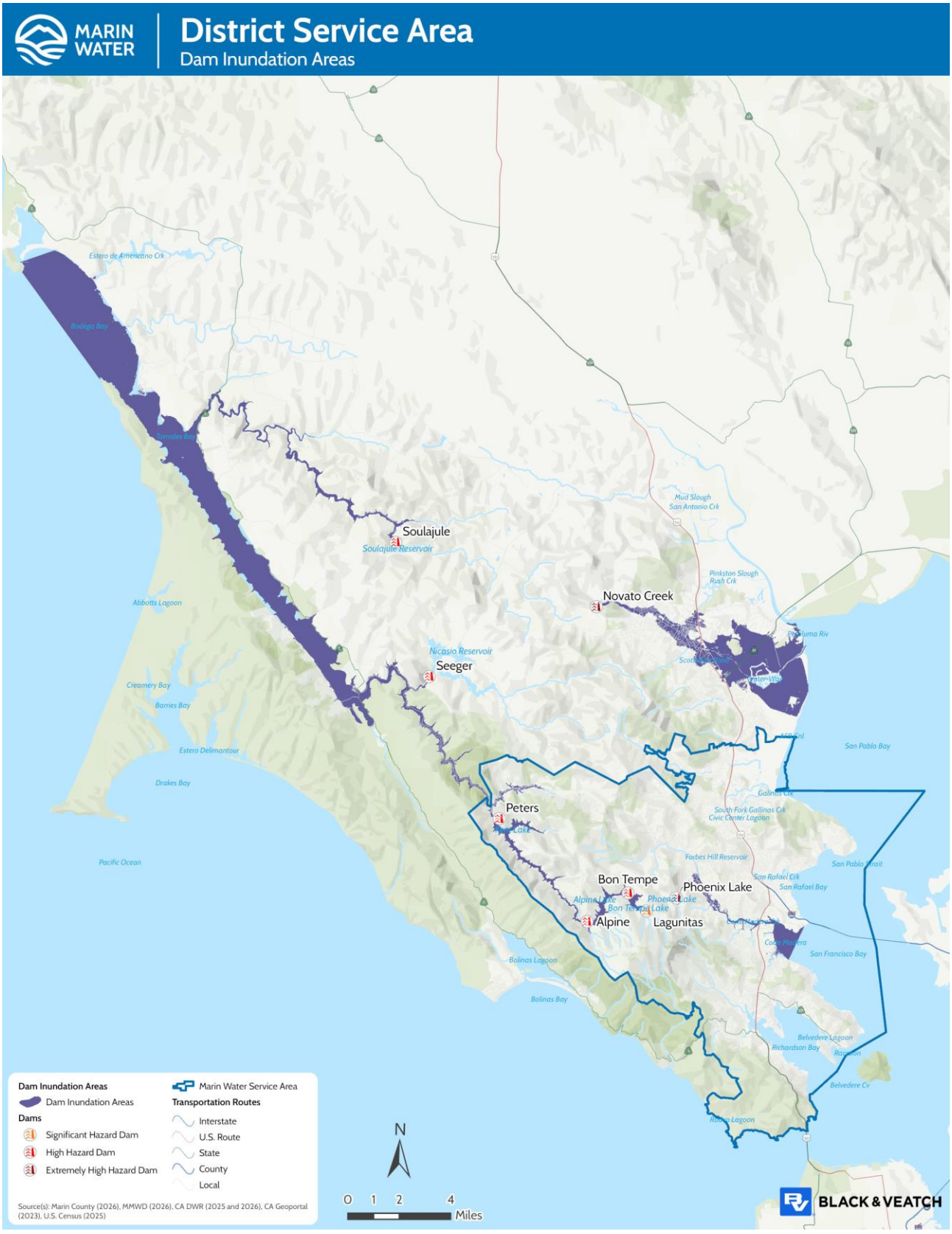


Figure 6-1. Dam Locations and Combined Dam Inundation Area

6.3 VULNERABILITY ASSESSMENT

The risk assessment for dam failure evaluated District assets that lie within the aggregate mapped dam-failure inundation areas shown in Figure 6-1. Table 6-3 and Table 6-4 summarize the number of each type of facility found to be within the aggregate mapped inundation area and the total replacement cost value of those exposed facilities.

The flood module of Hazus was used for a Level 2 assessment of vulnerability to the dam failure hazard. Hazus estimated damage to critical District facilities from the combined dam inundation area as follows:

- 1 potable water pump station with 40% estimated damage equal to $2 million potential loss
- 5 raw water pump stations with 40% estimated damage equal to $10 million potential loss

Detailed results for each facility are provided in Appendix E.

The exposure analysis included the District's pipeline assets. While most of these assets are underground and not susceptible to impacts from overland flows associated with dam failures, there are sections of pipelines that are exposed as they cross drainageways and channels. The exact location of these exposed pipelines was not available in a geospatial dataset to support this exposure analysis.

Table 6-3. Marin Water Structures and Facilities Exposed to the Dam Failure Hazard

Structures/Facilities	Quantity	Estimated Replacement Cost Value
Buildings	0	$0
Potable Water Structures	1,351	$6,476,000
Raw Water Facilities	174	$25,169,000
Recycled Water Structures	0	$0
Total	1,525	$31,645,000

Table 6-4. Marin Water Pipelines Exposed to the Dam Failure Hazard

Pipelines	Length in Miles	Estimated Replacement Cost Value
Potable Water	20.3	$60,228,000
Raw Water	16.1	$65,450,000
Recycled Water	0	$0
Total	36.4	$125,678,000

6.4 DEVELOPMENT TRENDS

The demand for critical services may increase with growth in the surrounding area. Repair or replacement of assets will be governed by codes and standards applied by the County of Marin and service provided cities, depending on the location of the asset. The State of California's adoption of bills expanding property owners' rights to build accessory dwelling units will increase densities in most of Marin Water's service area.

Marin County and the municipalities of Corte Madera, Tiburon, Sausalito, Mill Valley, Larkspur, Fairfax, Belvedere, Ross, San Rafael and San Anselmo participate in the National Flood Insurance Program (NFIP) and have adopted floodplain management standards pursuant to that program's requirements. Applications of these codes and standards to any new or redeveloped District assets will reduce the risk of potential impacts from dam failure inundation.

6.5 ISSUES

Flooding as a result of a dam failure would significantly impact properties and populations in the inundation areas. There is often limited warning time for such failures. These events are frequently associated with other natural hazard events such as earthquakes, landslides or severe weather, which limits their predictability and compounds the hazard. Important issues associated with dam failure hazards include the following:

1. **Critical asset exposure to dam failure:** Although the exposed percentage is small, the District has critical assets located within the aggregate dam failure inundation area.
2. **Loss of stored water supply from dam failure:** Because the District owns and maintains all dams to which it has exposure, failure of any one dam would significantly impair the District's ability to provide services, as each dam is critical to its stored water supply.
3. **Gap in downstream notification protocols:** While federally regulated dams have emergency action plans with adequate public notification requirements, notification of downstream citizens is not adequately tied to local emergency response planning.
4. **Limited mapping for non-federal dams under realistic failure scenarios:** Federal dam failure mapping is typically based on the probable maximum flood, a low-probability worst-case event; non-federally regulated dams lack mapping of more frequent, less extreme failure scenarios needed to support emergency response and preparedness.
5. **Unaddressed residual risk behind flood control structures:** Residual risk associated with structural flood control projects is not consistently factored into capital project design or land use regulation.

6.6 MITIGATION OPPORTUNITIES

Local Plan Requirement C3 – 44 CFR Part 201.6(c)(3)(ii)

The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effect of each hazard, with particular emphasis on new and existing buildings and infrastructure.

Marin Water owns and operates dams and reservoirs that impound the majority of the District's local water supply and a failure of these structures would threaten both downstream communities and the District's ability to deliver water. The following table presents a range of alternatives for mitigating the dam failure hazard organized by the scale at which each action can be carried out and by whether it manipulates the hazard, reduces exposure and vulnerability or builds local capacity. The alternatives are intended to inform the selection of candidate mitigation actions; not all will be appropriate or feasible for the District.

Table 6-5. Potential Opportunities to Mitigate the Dam Failure Hazard

Community / Customer Scale	Utility Operational Scale
Manipulate the Hazard	
• None; the dam failure hazard can only be manipulated by the dam owner and operator	• Temporarily lower reservoir operating levels when monitoring or inspection identifies a deficiency • Remove or decommission obsolete dams and appurtenant structures • Harden dams and enlarge spillway capacity to safely pass the design flood under updated hydrology • Implement dam safety improvements identified through Division of Safety of Dams inspections and orders

Community / Customer Scale	Utility Operational Scale
Reduce Exposure and Vulnerability	
• Determine whether your property lies within a mapped dam failure inundation area • Relocate out of dam failure inundation areas • Elevate structures and utilities above mapped inundation levels	• Replace or rehabilitate District dams with identified seepage, seismic deformation or spillway capacity deficiencies • Flood-proof treatment plants, pump stations and corporation yards located within dam failure inundation areas • Install remotely operated outlet and isolation valves to allow controlled drawdown • Relocate critical water system facilities out of dam failure inundation areas • Provide system redundancy, such as interties and alternate transmission routes, so that a single dam or reservoir outage does not interrupt service • Retrofit critical facilities that must remain within dam failure inundation areas • Coordinate with the County and cities to support open space land uses and higher floodplain standards within mapped inundation areas • Restore and reconnect floodplains downstream of District dams that have been degraded by development and structural flood control • Use soft approaches for stream bank restoration and hardening below dams, such as the introduction of large woody debris • Acquire and preserve District-owned land within inundation areas as open space in perpetuity
Build Local Capacity	
• Learn about risk reduction for the dam failure hazard • Learn the evacuation routes for a dam failure event • Sign up for county emergency alerts and become familiar with how warnings are issued • Store an emergency water supply in case service is interrupted	• Educate employees on the probable impacts of a dam failure and their response roles • Develop and maintain a continuity of operations plan • Update dam failure inundation mapping using current modeling and share it with local jurisdictions • Maintain, review and exercise Emergency Action Plans for each District dam • Institute routine communications checks between dam operators, the County Office of Emergency Services and downstream jurisdictions • Expand dam safety instrumentation and monitoring, including piezometers, survey monuments and remote sensors • Inform downstream residents and businesses about dam failure risk and risk reduction techniques • Consider the probable impacts of climate change, including more intense atmospheric river events, in assessing dam failure risk • Establish or enhance early warning capability downstream of high-hazard dams • Include dam rehabilitation and instrumentation projects in the capital improvement program and pursue grant funding

7. DROUGHT

7.1 GENERAL BACKGROUND

Drought is a significant decrease in water supply relative to what is typical in a given location. It is a normal phase in the climate cycle of most regions originating from a deficiency of precipitation over an extended period of time, usually a season or more. This leads to a water shortage for some activity, group or environmental sector. Drought can be characterized based on various impacts or measurements (NWS n.d.):

- Meteorological measurements such as rainfall deficit compared to normal or expected rainfall
- Agricultural impacts due to reduced rainfall and water supply (e.g., crop loss, herd culling, etc.)
- Hydrological measurements of stream flows, groundwater and reservoir levels relative to normal conditions
- Direct and indirect socio-economic impacts on society and the economy (e.g., increased unemployment due to failure of an industry because of drought).

Drought is a normal phase in the climatic cycle of most geographical regions. If the weather pattern that causes a drought lasts a short time (a few weeks or a couple of months), the drought is considered short-term. If the weather pattern becomes entrenched and the precipitation deficits last for several months or years, the drought is considered to be long-term. It is possible for a region to experience a long-term circulation pattern that produces drought and to have short-term changes in this long-term pattern that result in short-term wet spells. Likewise, it is possible for a long-term wet circulation pattern to be interrupted by short-term weather spells that result in short-term drought.

7.1.1 Monitoring Drought

National Oceanic and Atmospheric Administration Drought Indices

The National Oceanic and Atmospheric Administration has developed several indices to measure drought impacts and severity and to map their extent and locations (National Drought Mitigation Center 2024):

- The ***Crop Moisture Index*** measures weekly short-term drought to quantify drought impacts on agriculture during the growing season.
- The ***Palmer Z Index*** measures monthly short-term drought.
- The ***Palmer Drought Severity Index*** measures the duration and intensity of long-term drought-inducing circulation patterns. Long-term drought is cumulative, so the intensity of drought during a given month is dependent on the current weather patterns plus the cumulative patterns of previous months. Weather patterns can change quickly from a long-term drought pattern to a long-term wet pattern and the Palmer Drought Index can respond fairly rapidly.
- The hydrological impacts of drought (e.g., reservoir levels, groundwater levels, etc.) take longer to develop and it takes longer to recover from them. The ***Palmer Hydrological Drought Index*** quantifies long-term hydrological effects. It responds more slowly to changing conditions than the Palmer Drought Index.
- While the Palmer indices consider precipitation, evapotranspiration and runoff, the ***Standardized Precipitation Index*** considers only precipitation. In the Standardized Precipitation Index, an index of zero indicates the median precipitation amount; the index is negative for drought and positive for wet conditions. The Standardized Precipitation Index is computed for time scales ranging from one month to 24 months.

Figure 7-1 shows examples of these indices as of mid-2026.

U.S. Drought Monitor

The U.S. Drought Monitor (USDM) is a map that is updated weekly to show the location and intensity of drought across the country. The USDM uses a five-category system (National Weather Service 2024):

- D0—Abnormally Dry
  - Short-term dryness slowing planting, growth of crops
  - Some lingering water deficits
  - Pastures or crops not fully recovered
- D1—Moderate Drought
  - Some damage to crops, pastures
  - Some water shortages developing
  - Voluntary water-use restrictions requested
- D2—Severe Drought
  - Crop or pasture loss likely
  - Water shortages common
  - Water restrictions imposed
- D3—Extreme Drought
  - Major crop/pasture losses
  - Widespread water shortages or restrictions
- D4—Exceptional Drought
  - Exceptional and widespread crop/pasture losses
  - Shortages of water creating water emergencies

The USDM categories show experts' assessments of conditions related to drought. These experts check variables including temperature, soil moisture, water levels in streams and lakes, snow cover and meltwater runoff. They also check whether areas are showing drought impacts such as water shortages and business interruptions. Associated statistics show what proportion of various geographic areas are in each category of dryness or drought and how many people are affected. U.S. Drought Monitor data go back to 2000.

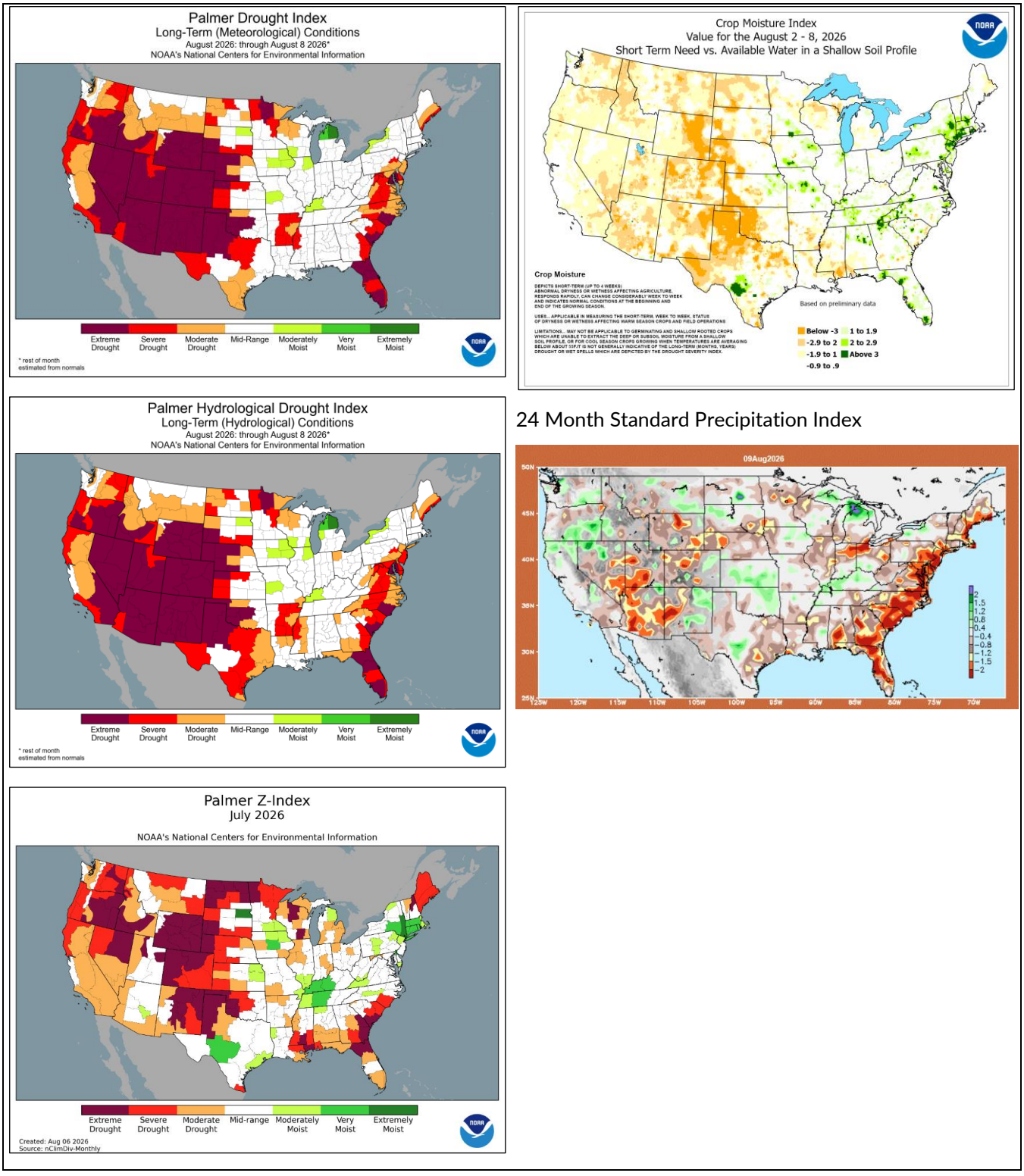


Figure 7-1. Example Drought Index Maps, Current as of Mid-2026

7.1.2 Drought Impacts

Drought can have a widespread impact on the environment and the economy, although it typically does not result in loss of life or damage to structures, as do other natural disasters. The National Drought Mitigation Center uses three categories to describe likely drought impacts (NDMC 2026):

- **Economic Impacts**—These impacts of drought cost people (or businesses) money. Farmers' crops are destroyed; low water supply necessitates spending on irrigation or drilling of new wells; water-related businesses (such as sales of boats and fishing equipment) may experience reduced revenue.
- **Environmental Impacts**—Plants and animals depend on water. When a drought occurs, their food supply can shrink and their habitat can be damaged.
- **Social Impacts**—Social impacts include public safety, health, conflicts between people when there is not enough water to go around and changes in lifestyle.

The demand that society places on water systems and supplies—such as expanding populations, irrigation and environmental needs—contributes to drought impacts. Drought can lead to difficult decisions regarding the allocation of water, as well as stringent water use restrictions and water quality problems. There are also issues such as growing conflicts between agricultural uses of surface water and in-stream uses, surface water and groundwater interrelationships and the effects of growing water demand on uses of water.

Vulnerability of an activity to drought depends on its water demand and the water supplies available to meet the demand. The impacts of drought vary between sectors of the community in both timing and severity (NIDIS 2026):

- **Water supply—**The water supply sector encompasses urban and rural drinking water systems that are affected when a drought depletes water supplies due to sub-average rainfall.
- **Agriculture and commerce—**The agriculture and commerce sector includes the reduction of crop yield and livestock sizes due to insufficient water supply for crop irrigation and maintenance of ground cover for grazing.
- **Environment, public health and safety—**The environmental, public health and safety sector focuses on the cascading impacts of drought on wildfires that are both detrimental to the forest ecosystem and hazardous to the public. It also includes the impact of desiccating streams, such as the reduction of in-stream habitats for native species.

Drought generally does not affect groundwater sources as quickly as surface water supplies, but groundwater supplies generally take longer to recover. Reduced precipitation during a drought means that groundwater supplies are not replenished at a normal rate. This can lead to a reduction in groundwater levels and problems such as reduced pumping capacity or wells going dry. Droughts can affect groundwater storage as reserves are drawn down in anticipation of drought impacts. Such conjunctive use assists in drought resilience, but it can take years to replenish the water that was stored. Shallow wells are more susceptible than deep wells. Reduced replenishment of groundwater affects streams. Much of the flow in streams comes from groundwater, especially during the summer when there is less precipitation and after snowmelt ends. Reduced groundwater levels mean that even less water will enter streams when stream flows are lowest.

7.1.3 Defined Drought Stages in California

During critically dry years, the California State Water Resources Control Board can mandate water entitlements on water right holders to address statewide water shortages. Table 7-1 shows the state drought management program stages mandated to water right holders.

Table 7-1. State Drought Management Program

Drought Stage	State Mandated Customer Demand Reduction	Rate Impacts
Stage 0 or 1	<10%	Normal rates
Stage 2	10 to 15%	Normal rates; Drought surcharge
Stage 3	15 to 20%	Normal rates; Drought surcharge
Stage 4	>20%	Normal rates, Drought surcharge

7.1.4 Secondary Hazards

The secondary impact most associated with drought is wildfire. A prolonged lack of precipitation dries out vegetation, which becomes increasingly susceptible to ignition as the duration of the drought extends. In addition, lack of sufficient water resources can stress trees and other vegetation, making them more vulnerable to infestation from pests, which in turn, can make them more vulnerable to ignition.

7.2 HAZARD PROFILE

7.2.1 Local Water Supply

Until 1976, Marin Water obtained water solely from rainfall collected from a watershed of 28 square miles of District-owned lands and 36 square miles not owned by the District. Six reservoirs in the watershed had a storage capacity of 17.3 billion gallons. Through a bond issue authorized during the drought of the 1970s, a seventh reservoir was completed in 1980—the Soulajule Reservoir, which added 3.4 billion gallons to the total storage. The District's Kent Lake facility was expanded in 1982 by raising Peters Dam 45 feet, increasing the storage capacity from 5.4 billion gallons to 10.6 billion gallons. As of 2022, the total reservoir storage operated by the District is 25.9 billion gallons (Marin Municipal Water District 2026).

The District receives supplemental water from the Sonoma Water's transmission system, which provides treated water purchased from Sonoma Water's Russian River Project. The Russian River flows are augmented by Pacific Gas and Electric's Potter Valley Project, which diverts a portion of the Eel River flows to the East Fork of the Russian River (Marin Municipal Water District 2026).

The Sonoma Municipal Service Review as referenced in the Urban Water Management Plan notes that water is diverted and extracted from the stretch of the Russian River just upstream of Wohler Bridge via six radial wells. The diverted river water percolates through sand and gravel and only needs the addition of chlorine to meet drinking water quality standards. Although the water extracted via the six radial wells does percolate through the ground, due to the connection to the surface water source, this diversion is permitted as a surface water supply under existing surface water rights to the Russian River and Dry Creek water. The Sonoma Water supply also includes a relatively small amount of groundwater from wells in the central Santa Rosa Plain subbasin (Marin Municipal Water District 2026).

All three groundwater basins within Marin County are categorized by the California Statewide Groundwater Elevation Monitoring program as low or very low priority basins. Studies conducted by the District over the last 40 years have determined that groundwater within the District's service area is very limited as it is either found in fractures in the Franciscan Formation (bedrock) or in shallow alluvial deposits in valleys. Therefore, groundwater is not currently or planned to be used as a water supply source by the District (Marin Municipal Water District 2026).

7.2.2 Past Events

Marin County was included in a federal declaration for drought in 1977 (EM-3023) and state proclamations for drought in 1976, 2014, 2015 and 2021 (FEMA n.d.) (Cal OES 2026).

Statewide Droughts

The California Department of Water Resources has state hydrologic data back to the early 1900s. The hydrologic data show multi-year droughts from 1912 to 1913, 1918 to 1920, 1922 to 1924 and 1928 to 1934. The following sections describe additional prolonged periods of drought in California since then, all of which impacted Marin County to some degree.

1976 to 1977 Drought

California had one of its most severe droughts due to lack of rainfall during the winters of 1976 and 1977. 1977 was the driest period on record in California to that time, with the previous winter recorded as the fourth driest. The cumulative impact led to widespread water shortages and severe water conservation measures throughout the state. Only 37% of the average Sacramento Valley runoff was received, with just 6.6 million acre-feet recorded. A federal disaster declaration was declared that included Marin County.

1987 to 1992 Drought

California received precipitation well below average levels for four consecutive years. During this drought, only 56% of average runoff for the Sacramento Valley was received, totaling just 10 million acre-feet. By February 1991, all 58 counties in California were suffering from drought conditions. Urban areas as well as rural and agricultural areas were impacted.

2007 to 2009 Drought

The governor issued an Executive Order that proclaimed a statewide drought emergency on June 4, 2008 after spring 2008 was the driest spring on record and snowmelt runoff was low. On February 27, 2009, the governor proclaimed a state of emergency for the entire state as the severe drought conditions continued widespread impacts and the largest court-ordered water restriction in state history (at the time).

2012 to 2017 Drought

This drought set several records:

- The period from 2012 to 2014 ranked as the driest three consecutive years for statewide precipitation.
- 2014 set new climate records for statewide average temperatures and for record-low water allocations in the State Water Project and federal Central Valley Project.
- 2013 set minimum annual precipitation records for many communities.

On January 17, 2014, the governor declared a state of emergency for drought throughout California. This declaration followed release of a report that stated that California had had the least amount of rainfall in its 163-year history. Californians were asked to voluntarily reduce their water consumption by 20%. Drought conditions worsened into 2015.

On April 1, 2015, following the lowest snowpack ever recorded, the governor announced actions to save water, increase enforcement to prevent wasteful water use, streamline the state's drought response and invest in new technologies to make California more drought resilient. The governor directed the State Water Resources Control Board to implement mandatory water reductions in cities and towns across California to reduce water usage by 25% on average.

The drought ended with a wet water year of 2017—the second-wettest year on record in terms of statewide runoff and wettest year of record in the Sacramento River Basin. Responding to the wet conditions, Executive Order B-40-17 in April 2017 terminated the statewide drought proclamation (California DWR, 2020).

2021 Drought

The Marin County Board of Supervisors voted unanimously May 18, 2021, to declare a local drought emergency and acknowledge the imminent threat of disaster. In July 2021, the state expanded its drought emergency declaration to include Marin County. With reservoirs at historical lows, Marin Water's board of directors declared a water shortage emergency and adopted water use restrictions, with a goal of reducing water use districtwide by 40%.

7.2.3 Location

Drought is a regional phenomenon that has the potential to impact the entire planning area. A drought affects all aspects of the environment and the community simultaneously and has the potential to impact every person, directly or indirectly, in the planning area as well as adversely affect the local economy.

7.2.4 Future Conditions

Probability

Drought has a high probability of occurrence in the planning area. From January 2000 to August 2026, some part of Marin County experienced a USDM rating of D1 or higher in 496 out of 1,388 weeks—slightly more than 3 out of every 10 weeks (see Figure 7-2). Historical drought data for the planning area indicate there have been six significant multi-year droughts in the last 40 years (1980 to 2026), amounting to a severe drought every 6 to 7 years on average. As temperatures increase, the probability of future droughts will likely increase as well.

Source: U.S. Drought Monitor, 2026

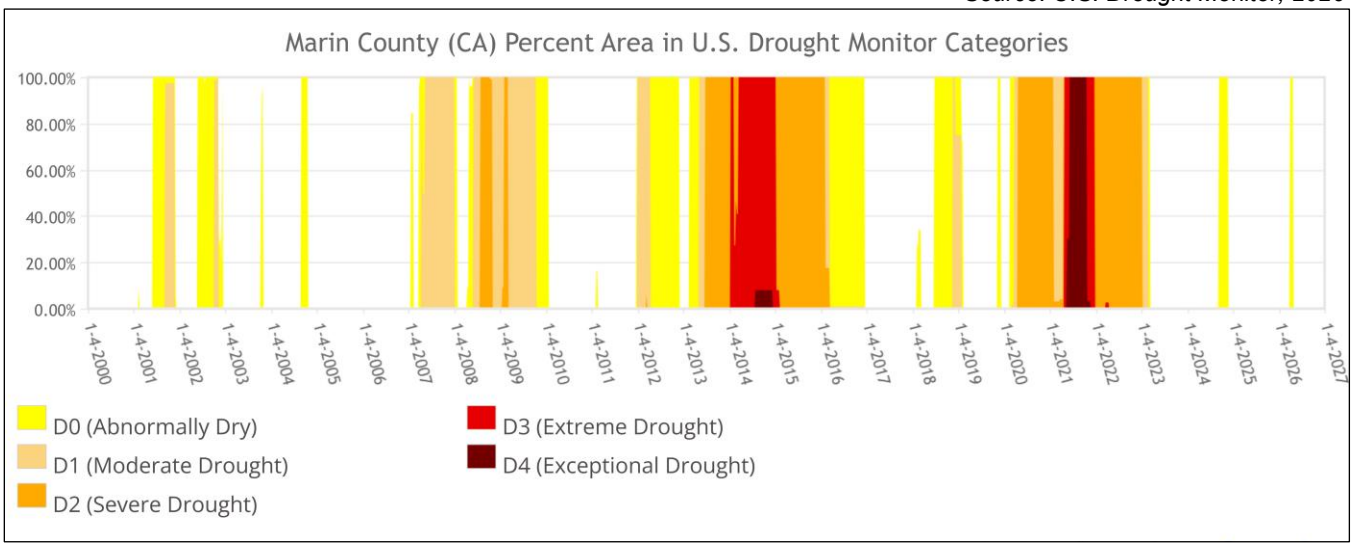


Figure 7-2. Percent of Marin County Affected by Each USDM Rating, 2000 – 2026

Climate Change

The long-term effects of climate change on regional water resources are unknown, but global water resources are already experiencing the following stresses without climate change:

- Growing populations
- Increased competition for available water
- Poor water quality
- Environmental claims
- Uncertain reserved water rights
- Groundwater overdraft
- Aging urban water infrastructure.

With a warmer climate, droughts could become more frequent, more severe and longer lasting. According to the National Climate Assessment, "higher surface temperatures brought about by global warming increase the potential for drought. Evaporation and the higher rate at which plants lose moisture through their leaves both increase with temperature. Unless higher evapotranspiration rates are matched by increases in precipitation, environments will tend to dry, promoting drought conditions." Because expected changes in precipitation patterns are still uncertain, the potential impacts and likelihood of drought are uncertain.

Property exposure and vulnerability may increase because of increased drought resulting from climate change, although this would most likely occur in non-structural property such as crops and landscaping. It is unlikely that structure exposure and vulnerability would increase as a direct result of drought, although secondary impacts of drought, such as wildfire, may increase and threaten structures.

7.2.5 Extent

U.S. Drought Monitor Ratings

Marin County has a history of severe droughts. As shown in Figure 7-2, at least part of the county has experienced extreme (D3) or exceptional (D4) droughts more than once since 2000.

Drought Impact Reporter

The National Drought Mitigation Center developed the Drought Impact Reporter in response to the need for a national drought impact database for the United States. Information comes from a variety of sources: on-line, drought-related news stories and scientific publications, members of the public who visit the website and submit a drought-related impact for their region, members of the media and members of relevant government agencies. The Drought Impact Reporter contains information on 559 impacts from droughts that specifically affected Marin County from January 1970 through August 2026. The following are the categories and reported number of impacts (note that some impacts have been assigned to more than one category) (NDMC n.d.):

- Agriculture—54
- Business and Industry—23
- Energy—6
- Fire—13
- Plants and Wildlife—63
- Relief, Response and Restrictions—150
- Society and Public Health—66
- Tourism and Recreation—13
- Water Supply and Quality—171

Warning Time

Predicting drought depends on the ability to forecast precipitation and temperature. Scientists at this time do not know how to predict drought more than a month in advance for most locations. Only generalized warning can take place due to the numerous variables that scientists have not pieced together well enough to make accurate and precise predictions.

Determination of when drought begins is based on impacts on water users and assessments of available water supply, including water stored in reservoirs or groundwater basins. Different water agencies have different criteria for defining drought. Some issue drought watch or drought warning announcements. Marin Water uses its Water Shortage Contingency Plan to evaluate drought conditions and initiate drought response actions. Drought stages are triggered primarily by annual assessments of water supply reliability and local reservoir storage levels rather than solely by meteorological drought indicators (Marin Water 2025).

Table 7-2. Water Shortage Contingency Plan Levels

Shortage Level	Percent Shortage Range	Shortage Response Actions
0	0%	• Includes water waste prohibitions effective at all times.
1	Up to 10%	• Total reservoir storage is at or is projected to be, or is, in the vicinity of 70,000 acre-feet on April 1st. • Includes implementation of mandatory restrictions on end uses as well as agency actions.
2	Up to 20%	• Total reservoir storage is at or is projected to be, or is, in the vicinity of 65,000 acre-feet on April 1st. • Includes implementation of mandatory restrictions on end uses as well as agency actions.
3	Up to 30%	• Total reservoir storage is at or is projected to be, or is, in the vicinity of 55,000 acre-feet on April 1st. • Includes implementation of mandatory restrictions on end uses as well as agency actions.
4	Up to 40%	• Total reservoir storage is at or is projected to be, or is, in the vicinity of 45,000 acre-feet on April 1st. • Includes implementation of mandatory restrictions on end uses as well as agency actions.
5	Up to 50%	• Total reservoir storage is at or is projected to be, or is, in the vicinity of 35,000 acre-feet on April 1st. • Includes implementation of mandatory restrictions on end uses as well as agency actions.
6	>50%	• Total reservoir storage is at or is projected to be, or is, in the vicinity of 25,000 acre-feet on April 1st. • Includes implementation of mandatory restrictions on end uses as well as agency actions.

Source: (Marin Water 2025)

7.3 VULNERABILITY ASSESSMENT

Drought produces a complex web of impacts that spans many sectors of the economy and reaches well beyond the area experiencing physical drought. This complexity exists because water is integral to the ability to produce goods and provide services. Drought can affect a wide range of economic, environmental and social activities. The

vulnerability of an activity to the effects of drought usually depends on its water demand, how the demand is met and what water supplies are available to meet the demand.

All district assets would be exposed to some degree to the impacts of moderate to extreme drought conditions. No structures will be directly affected by drought conditions, though droughts can have significant impacts on landscapes. However, landscape impacts are not considered critical in planning for impacts from the drought hazard. Critical facilities as defined for this plan will continue to be operational during a drought.

7.4 DEVELOPMENT TRENDS

While droughts typically do not impact physical structures and assets, they could impact the supply of water. The demand for critical District services may increase with growth in the surrounding area. The State of California's adoption of bills expanding property owners' rights to build accessory dwelling units will increase densities in most of the District's service area.

7.5 ISSUES

The planning team has identified the following drought-related issues:

1. **Heavy reliance on rainfall-dependent supply:** 75% of District supplies rely primarily on rainfall and consumption, creating vulnerability to drought; the District should consider regional interties—a state priority—as an effective mitigation strategy.
2. **Surface water dependency:** Most of the water supply is dependent on surface water, exposing the District to drought-driven shortages.
3. **Ecosystem risk:** Drought increases risks to the ecosystem at District-owned lakes and reservoirs.
4. **Limited alternative water supply development:** The District lacks sufficient identification and development of alternative water supplies, such as regional interties and storage and expansion of the recycled water program.
5. **Underutilized groundwater recharge partnerships:** The District has not established regional partnerships to utilize groundwater recharge techniques to stabilize the groundwater supply.
6. **Increasing drought frequency and duration from climate change:** Climate change increases the probability of more frequent and prolonged droughts, heightening the District's exposure to this hazard.
7. **Gaps in public education on water conservation:** The District lacks adequate public education on water conservation practices.

7.6 MITIGATION OPPORTUNITIES

Local Plan Requirement C3 – 44 CFR Part 201.6(c)(3)(ii)

The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effect of each hazard, with particular emphasis on new and existing buildings and infrastructure.

Drought is a defining hazard for the District, which relies primarily on local rainfall and reservoir storage for the majority of its supply, making it acutely sensitive to consecutive dry years. The alternatives presented below address supply diversification, demand management and conservation, water loss reduction and the operational

and financial capacity needed to manage extended shortage. The table organizes these alternatives by the scale at which they can be carried out and by mitigation category.

Table 7-3. Potential Opportunities to Mitigate the Drought Hazard

Community / Customer Scale	Utility Operational Scale
Manipulate the Hazard	
• Landscape transformation and efficient irrigation programs • Rainwater harvesting and onsite water storage • Residential greywater systems where appropriate	• Reservoir operations optimization to maximize available water supplies • Expand recycled water production and utilization • Aquifer recharge and conjunctive-use projects (where feasible) • Regional watershed and source-water management programs • Regional water transfers and interconnections
Reduce Exposure and Vulnerability	
• Indoor and outdoor water conservation measures • Water-efficient plumbing fixture retrofits • Drought-tolerant landscaping and irrigation upgrades • Participation in conservation rebate programs • Voluntary demand reduction during drought emergencies	• Reduce non-revenue water through leak detection and pipe replacement • Expand advanced metering and demand monitoring • Harden critical water infrastructure against drought-related outages • Diversify water supply portfolio to reduce dependence on a single source • Improve drought forecasting and demand modeling capabilities • Regional drought contingency planning • Drought emergency regulations and water shortage ordinances • Regional water use efficiency programs • Interagency mutual aid and emergency water supply agreements • Watershed protection and forest health programs that support water supply resilience • Participate in regional collaborations exploring the potential feasibility of a regional water banking program.
Build Local Capacity	
• Public education on water conservation and drought preparedness • Promote long-term water stewardship behaviors • Encourage participation in rebate and conservation programs • Community awareness of drought impacts on water reliability • Support customer emergency preparedness for service interruptions	• Develop and maintain a comprehensive Water Shortage Contingency Plan • Establish drought trigger thresholds tied to operational response actions • Increase emergency and operational water storage capacity • Expand recycled water distribution infrastructure • Evaluate alternative and supplemental water supplies • Maintain mutual aid agreements with neighboring utilities • Enhance source-water monitoring and supply forecasting • Conduct drought preparedness training and exercises • Public outreach on regional water supply conditions and drought response • Support state and federal drought resilience grant programs • Regional water supply reliability planning • Collaborative watershed monitoring and climate adaptation initiatives

8. EARTHQUAKE

8.1 GENERAL BACKGROUND

An earthquake is the vibration of the earth's surface following a release of energy in the earth's crust. This energy can be generated by a sudden dislocation of the crust or by a volcanic eruption. Most destructive quakes are caused by dislocations of the crust. The crust may first bend and then, when the stress exceeds the strength of the rocks, break and snap to a new position. In the process of breaking, vibrations called "seismic waves" are generated. These waves travel outward from the source of the earthquake at varying speeds.

8.1.1 Earthquake Location

The location of an earthquake is commonly described by its focal depth and the geographic position of its epicenter. The focal depth of an earthquake is the depth from the Earth's surface to the region where an earthquake's energy originates (the focus or hypocenter). The epicenter of an earthquake is the point on the Earth's surface directly above the hypocenter.

8.1.2 Earthquake Geology

Tectonic Plates

The Earth's crust, which is the rigid outermost shell of the planet, is broken into seven or eight major tectonic plates (depending on how they are defined) and many minor plates. Where the plates meet, they move in one of three ways along their mutual boundary: convergent (two plates moving together), divergent (plates moving apart) or transform (plates moving parallel to one another). Earthquakes, volcanic activity, mountain-building and oceanic trench formation occur along these plate boundaries. Subduction is a geological process that takes place at convergent boundaries of tectonic plates, in which one plate moves under another. Regions where this process occurs are known as subduction zones and they have the potential to generate highly damaging earthquakes.

California is seismically active because of movement of the North American Plate, east of the San Andreas Fault and the Pacific Plate to the west, which includes the state's coastal communities. The transform (parallel) movement of these tectonic plates against one another creates stresses that build as the rocks are gradually deformed. The rock deformation, or strain, is stored in the rocks as elastic strain energy. When the strength of the rock is exceeded, rupture occurs along a fault. The rocks on opposite sides of the fault slide past each other as they spring back into a relaxed position. The strain energy is released partly as heat and partly as elastic waves called seismic waves. The passage of these seismic waves produces the ground shaking in earthquakes.

Faults

Geologists have found that earthquakes reoccur along faults, which are zones of weakness in the earth's crust. When a fault experiences an earthquake, there is no guarantee that all the stress has been relieved. Another earthquake can still occur. In fact, relieving stress along one part of a fault may increase it in another part.

Faults are more likely to have future earthquakes on them if they have more rapid rates of movement, have had recent earthquakes along them, experience greater total displacements and are aligned so that movement can relieve the accumulating tectonic stresses. Geologists classify faults by their relative hazards. "Active" faults, which represent the highest hazard, are those that have ruptured to the ground surface during the Holocene period

(about the last 11,000 years). "Potentially active" faults are those that displaced layers of rock from the Quaternary period (the last 1,800,000 years) (USGS 2019).

Determining if a fault is "active" or "potentially active" depends on geologic evidence, which may not be available for every fault. The majority of the seismic hazards are on well-known active faults. However, inactive faults, where no displacements have been recorded, also have the potential to reactivate or experience displacement along a branch sometime in the future. An example of a fault zone that has been reactivated is the Foothills Fault Zone. The zone was considered inactive until evidence of an earthquake (approximately 1.6 million years ago) was found near Spenceville, California. Then, in 1975, an earthquake occurred on another branch of the zone near Oroville, California (now known as the Cleveland Hills Fault). The State Division of Mines and Geology indicates that increased earthquake activity throughout California may cause tectonic movement along currently inactive fault systems (CA DIvision of Mines and Geology 1980).

8.1.3 Earthquake Classifications

Earthquakes are typically classified in one of two ways: By the amount of energy released, measured as magnitude; or by the impact on people and structures, measured as intensity.

Magnitude

An earthquake's magnitude is a measure of the energy released at the source of the earthquake. Magnitude is commonly expressed by ratings on the moment magnitude scale (M_W), the most common scale used today. This scale is based on the total moment release of the earthquake (the product of the distance a fault moved and the force required to move it). The scale is as follows (USGS n.d.):

- Great—Mw > 8
- Major—Mw = 7.0 – 7.9
- Strong—Mw = 6.0 – 6.9
- Moderate—Mw = 5.0 – 5.9
- Light—Mw = 4.0 – 4.9
- Minor—Mw = 3.0 – 3.9
- Micro—Mw < 3

Intensity

The most commonly used intensity scale is the modified Mercalli intensity scale. Ratings of the scale as well as the perceived shaking and damage potential for structures are shown in Table 8-1. The modified Mercalli intensity scale is generally represented visually using shake maps, which show the expected ground shaking at any given location produced by an earthquake with a specified magnitude and epicenter.

An earthquake has only one magnitude and one epicenter, but it produces a range of ground shaking at sites throughout the region, depending on the distance from the earthquake, the rock and soil conditions at sites and variations in the propagation of seismic waves from the earthquake due to complexities in the structure of the earth's crust. A shake map shows the variation of ground shaking in a region immediately following significant earthquakes.

Table 8-1. Mercalli Scale and Peak Ground Acceleration Comparison

Modified Mercalli Scale		Potential Structure Damage		
	Perceived Shaking	Resistant Buildings	Vulnerable Buildings	Estimated PGA[a] (%g)
I	Not Felt	None	None	<0.17%
II-III	Weak	None	None	0.17% – 1.4%
IV	Light	None	None	1.4% – 3.9%
V	Moderate	Very Light	Light	3.9% – 9.2%
VI	Strong	Light	Moderate	9.2% – 18%

Modified Mercalli Scale	Perceived Shaking	Potential Structure Damage		Estimated PGA[a] (%g)
		Resistant Buildings	Vulnerable Buildings	
VII	Very Strong	Moderate	Moderate/Heavy	18% – 34%
VIII	Severe	Moderate/Heavy	Heavy	34% – 65%
IX	Violent	Heavy	Very Heavy	65% – 124%
X – XII	Extreme	Very Heavy	Very Heavy	>124%

a. *PGA measured in percent of g, where g is the acceleration of gravity*
Source: (USGS 1999)

8.1.4 Ground Motion

Earthquake hazard assessment is also based on expected ground motion. During an earthquake when the ground is shaking, it also experiences acceleration. The peak acceleration is the largest increase in velocity recorded by a particular station during an earthquake. Estimates are developed of the annual probability that certain ground motion accelerations will be exceeded; the annual probabilities can then be summed over a time period of interest.

The most commonly mapped ground motion parameters are horizontal and vertical peak ground accelerations (PGA) for a given soil type. PGA is a measure of how hard the earth shakes or accelerates, in a given geographic area. Instruments called accelerographs record levels of ground motion due to earthquakes at stations throughout a region. PGA is measured in multiples of "g" (the acceleration due to gravity) or expressed as a percent acceleration force of gravity (%g). These readings are recorded by state and federal agencies that monitor and predict seismic activity (USGS 2019).

Maps of PGA values form the basis of seismic zone maps that are included in building codes such as the International Building Code. Building codes that include seismic provisions specify the horizontal force due to lateral acceleration that a building should be able to withstand during an earthquake. PGA values are directly related to these lateral forces that could damage "short period structures" (e.g. single-family dwellings). Longer period response components determine the lateral forces that damage larger structures with longer natural periods (apartment buildings, factories, high-rises, bridges) (USGS 2019).

8.1.5 U.S. Geological Survey Earthquake Mapping Programs

ShakeMaps

The U.S. Geological Survey (USGS) Earthquake Hazards Program produces maps called ShakeMaps that map ground motion and shaking intensity following significant earthquakes. ShakeMaps focus on the ground shaking caused by the earthquake, rather than on characteristics of the earthquake source, such as magnitude and epicenter. An earthquake has only one magnitude and one epicenter, but it produces a range of ground shaking at sites throughout the region, depending on the distance from the earthquake, the rock and soil conditions at sites and variations in the propagation of seismic waves from the earthquake due to complexities in the structure of the earth's crust.

A ShakeMap shows the extent and variation of ground shaking immediately across the surrounding region following significant earthquakes. Such mapping is derived from peak ground motion amplitudes recorded on seismic sensors, with interpolation where data are lacking based on estimated amplitudes. Color-coded instrumental intensity maps are derived from empirical relations between peak ground motions and Modified Mercalli intensity. In addition to the maps of recorded events, the USGS creates the following:

- Scenario ShakeMaps of hypothetical earthquakes of an assumed magnitude on known faults

- Probabilistic ShakeMaps, based on predicted shaking from all possible earthquakes over a 10,000-year period. In a probabilistic map, information from millions of scenario maps are combined to make a forecast for the future. The maps indicate the ground motion at any given point that has a given probability of being exceeded in a given timeframe, such as a 100-year (1%-annual chance) event.

National Seismic Hazard Map

National probabilistic maps of earthquake shaking hazards have been produced since 1948. The USGS last updated its National Seismic Hazard Maps in 2023, incorporating the best available seismic, geologic and geodetic information on earthquake rates and associated ground shaking. The map produced for this update included maps of the PGA expected at various probability levels of different soil types.

Figure 8-1 shows the peak ground acceleration with 2% probability of exceedance in 50 years. This level of ground shaking has been used for designing buildings in high seismic areas.

The National Seismic Hazard Maps provide information essential to creating and updating seismic design requirements for building codes, insurance rate structures, earthquake loss studies, retrofit priorities and land use planning used in the U.S. Scientists frequently revise these maps to reflect new information and knowledge. Buildings, bridges, highways and utilities built to meet modern seismic design requirements are typically able to withstand earthquakes better, with less damage and disruption. After thorough review of the studies, professional organizations of engineers update the seismic-risk maps and seismic design requirements contained in building codes (USGS 2023).

Source: (California Department of Conservation 2026)

Figure 8-1. Peak Acceleration (%g) with 2% Probability of Exceedance in 50 Years in the Bay Area

8.1.6 Liquefaction and Soil Types

Soil liquefaction occurs when water-saturated sands, silts or gravelly soils are shaken so violently that the individual grains lose contact with one another and float freely in the water, turning the ground into a pudding-like liquid. Building and road foundations lose load-bearing strength and may sink into what was previously solid ground.

A program called the National Earthquake Hazard Reduction Program (NEHRP) creates maps based on soil characteristics to help identify locations subject to liquefaction. Table 8-2 summarizes NEHRP soil classifications. NEHRP Soils B and C typically can sustain ground shaking without much effect, dependent on the earthquake magnitude. The areas that are commonly most affected by ground shaking have NEHRP Soils D, E and F. In general, these areas are also most susceptible to liquefaction.

Table 8-2. NEHRP Soil Classification System

NEHRP Soil Type	Description	Mean Shear Velocity to 30 meters (m/s)
A	Hard Rock	1,500
B	Firm to Hard Rock	760-1,500
C	Dense Soil/Soft Rock	360-760
D	Stiff Soil	180-360
E	Soft Clays	< 180
F	Special Study Soils (liquefiable soils, sensitive clays organic soils, soft clays >36 meters thick)	

Source: (FEMA 2020)

Soil liquefaction maps are useful tools to assess potential damage from earthquakes. In general, areas with NEHRP Soils D, E and F are also susceptible to liquefaction. If there is a dry soil crust, excess water will sometimes come to the surface through cracks in the confining layer, bringing liquefied sand with it, creating sand boils. This is a vital need for assessing seismic risk within the planning area. Liquefaction data tracks with where NEHRP soil data is available.

8.1.7 Potential Damage

Earthquakes can last from a few seconds to over five minutes; they may also occur as a series of tremors over several days. The actual movement of the ground in an earthquake is seldom the direct cause of injury or death. Casualties generally result from falling objects and debris as the shocks shake buildings and other structures. Soil liquefaction can undermine building and road foundations.

Disruption of communications, electrical power supplies and gas, sewer and water lines should be expected. Earthquakes may trigger fires, dam failures, landslides or releases of hazardous material, compounding their disastrous effects.

The severity of a seismic event is correlated to the stability of the ground close to the epicenter. A poorly built structure on a stable site is more likely to survive a large earthquake than a well-built structure on an unstable site.

8.1.8 Secondary Hazards

Earthquakes can cause large and sometimes disastrous landslides and mudslides. River valleys are vulnerable to slope failure, often as a result of loss of cohesion in clay-rich soils. Soil liquefaction occurs when water-saturated sands, silts or gravelly soils are shaken so violently that the individual grains lose contact with one another and float freely in the water, turning the ground into a pudding-like liquid. Building and road foundations lose load-bearing strength and may sink into what was previously solid ground. Unless properly secured, hazardous materials can be released, causing significant damage to the environment and people. Earthen dams and levees are highly susceptible to seismic events and the impacts of their eventual failures can be considered secondary risks for earthquakes.

Earthquakes can also trigger tsunamis. Tsunamis significantly damage many locations beyond where the earthquake struck. Coastal communities near the earthquake epicenter that are also vulnerable to tsunamis could experience devastating impacts. Additionally, fires can result from gas lines or power lines that are broken or downed during the earthquake. It may be difficult to control a fire, particularly if the water lines feeding fire hydrants are also broken.

According to the USGS Earthquake Hazards Program, an earthquake hazard is anything associated with an earthquake that may affect residents' normal activities. This includes the following:

- **Surface Faulting**—Displacement that reaches the earth's surface during slip along a fault. Commonly occurs with shallow earthquakes, those with an epicenter less than 20 kilometers.
- **Ground Motion (shaking)**—The movement of the earth's surface from earthquakes or explosions. Ground motion or shaking is produced by waves that are generated by sudden slip on a fault or sudden pressure at the explosive source and travel through the earth and along its surface.
- **Landslide**—A movement of surface material down a slope.
- **Liquefaction**—A process by which water-saturated sediment temporarily loses strength and acts as a fluid. Earthquake shaking can cause this effect.
- **Tectonic Deformation**—A change in the original shape of a material due to stress and strain.
- **Tsunami**—A sea wave of local or distant origin that results from large-scale seafloor displacements associated with large earthquakes, major submarine slides or violent underwater volcanic eruptions.

8.2 HAZARD PROFILE

8.2.1 Past Events

Marin County has been included in one federal declaration for earthquake: the October 17, 1989, Loma Prieta Earthquake (DR-845). That event also triggered a state proclamation (FEMA n.d.) (Cal OES 2026). Table 8-3 lists earthquakes of magnitude 5.0 or greater within a 100-mile radius of the planning area.

Table 8-3. Earthquakes Magnitude 5.0 or Larger Within 100-Mile Radius of the Planning Area

Date	Magnitude	Epicenter Location
August 6, 1979	5.8	Coyote Lake, California
January 24, 1980	5.8	Livermore, California
January 24, 1980	5.1	E of Blackhawk, California
January 27, 1980	5.4	NE of Livermore, California
April 24, 1984	6.2	Morgan Hill, California
March 31, 1986	5.7	NE of East Foothills, California
June 13, 1988	5.3	E of East Foothills, California
June 27, 1988	5.3	ESE of Lexington Hills, California
August 8, 1989	5.4	ESE of Lexington Hills, California
October 17, 1989	6.9	Loma Prieta, California
October 17, 1989	5.1	SW of Monte Sereno, California
April 18, 1990	5.4	NNW of Aromas, California
April 18, 1990	5.1	E of Interlaken, California
October 31, 2007	5.45	NNE of East Foothills, California
August 24, 2014	6.02	South Napa, California
August 10, 2016	5.09	NNE of Upper Lake, California
December 14, 2016	5.01	W of Cobb, California
October 25, 2022	5.06	ESE of Alum Rock, California
June 24, 2026	5.59	N of Redwood Valley, California

Source: USGS Earthquake Hazards Program ComCat Data, 2026

The 1989 Loma Prieta Earthquake was the most significant damaging earthquake event affecting Northern California in the recent past. The epicenter was on the San Andreas fault 56 miles south of San Francisco and 10 miles northeast of Santa Cruz, near Mt. Loma Prieta in the Santa Cruz Mountains. The focal depth was 11 miles (typical California earthquake focal depths are 4 to 6 miles). The earthquake ruptured the southernmost 30 miles of the break that caused the 1906 San Francisco Earthquake. Its magnitude was established at 6.9 after consultation with monitoring stations around the world (California Department of Conservation 2019).

The Loma Prieta quake was felt as far away as San Diego and western Nevada. Thousands of aftershocks were recorded. A magnitude 5.2 aftershock occurred 2.5 minutes after the main shock. In the following week, 20 aftershocks of magnitude 4.0 or greater were recorded, as well as more than 300 of magnitude 2.5 or greater. The aftershock zone stretched 25 miles, from north of Los Gatos near Highway 17 to south of Watsonville near Highway 101 (California Department of Conservation 2019). The quake caused damage to water system facilities around the Bay Area, including the Rinconada Water Treatment Plant and storage tanks that were damaged by sloshing.

In total, 63 people were killed, 3,757 were reported injured and 12,053 were displaced. Damage and business interruption estimates reached as high as $10 billion, with direct damage estimated at $6.8 billion. The earthquake caused damage to 18,306 houses and 2,575 businesses and destroyed 963 houses and 147 businesses. The most notable damage included the collapse of the elevated Cypress Structure section of Interstate 880 in Oakland, the collapse of a section of roadbed on the Bay Bridge and extensive damage to downtown Santa Cruz and San Francisco's Marina District. The Bay Bridge was unusable for a month. The World Series between the San Francisco Giants and Oakland A's was postponed (California Department of Conservation 2019).

8.2.2 Location

Faults

Earthquakes are considered a major threat to Marin County due to the proximity of several fault zones, notably including the Hayward/Rodgers Creek Fault and the San Andreas Fault Zone. Figure 8-2 shows large faults that could affect Marin County. A significant earthquake along one of the major faults could cause substantial casualties, extensive damage to buildings, roads and bridges, fires and other threats to life and property. The effects could be aggravated by aftershocks and by secondary effects such as fire, landslide and dam failure. A major earthquake could be catastrophic in its effect on the population and could exceed the response capability of the local communities and even the State. The following section describes major faults near the planning area.

Hayward Fault

The Hayward Fault runs along the foot of the East Bay hills and connects directly to the Rodgers Creek Fault. The last major earthquake on the Hayward Fault occurred on October 21, 1868, destroying downtown Hayward, killing 5 people and injuring an additional 30. With an estimated magnitude of 6.8, it caused damage throughout the area. San Francisco suffered about $350,000 in property damage and it was considered the "Great Earthquake" until the San Francisco Earthquake in 1906.

Paleoseismic investigations indicate that major earthquakes on the Hayward Fault have occurred at irregular intervals averaging approximately 140 years over the past two millennia. The most recent major event occurred in 1868. While recurrence intervals do not predict the timing of future earthquakes, the Hayward/Rodgers Creek Fault remains a significant seismic source within the San Francisco Bay Area. The Uniform California Earthquake Rupture Forecast 3 (UCERF3) model estimates a 28% probability of a magnitude 6.7 or greater earthquake occurring on the Hayward Fault within the next 30 years (California Department of Conservation 2025).

North San Andreas Fault

The San Andreas fault system is more than 800 miles long, at depths of at least 10 miles below ground. The San Andreas fault forms a continuous narrow break in the Earth's crust that extends from northern California southward to Cajon Pass near San Bernardino. Southeastward from Cajon Pass, several branching faults, including the San Jacinto and Banning faults, share the movement of the crustal plates. In this stretch of the fault zone, the name "San Andreas" generally is applied to the northeastern most branch (Schulz and Wallace 2016).

Mapping along the San Andreas fault between San Francisco and Cape Mendocino has revealed that many strands of the fault are active. Uplifts within the fault interrupt sediment movement in several locations and help control the shape of the coast. Sediment-filled basins can amplify ground motion and shaking in an earthquake, Fault strands can indicate possible fault movement along other branches, making it challenging to calculate slip rates.

San Gregorio North Fault

The San Gregorio Fault Zone is a major part of the San Andreas Fault system and is the main active fault west of the San Andreas Fault. Extending from the Monterey Bay region northward to Bolinas Bay, the fault zone is predominantly offshore and generally parallels the coastline. Onshore segments occur near Point Año Nuevo, Pescadero Point, Pillar Point and Moss Beach. The San Gregorio Fault Zone houses right-lateral strike-slip motion and is a significant contributor to regional seismic hazard; however, because much of the fault system is submerged beneath the Pacific Ocean, uncertainties remain regarding slip distribution, fault geometry and recurrence characteristics (U.S. Geological Survey 2014).

West Napa Fault Zone

The West Napa Fault Zone is an active fault system that extends along the western side of Napa Valley and continues southeast toward San Pablo Bay. The fault is part of the complex network of faults within the greater San Francisco Bay Area and is characterized primarily by right-lateral strike-slip motion. The fault gained significant attention following the magnitude 6.0 South Napa Earthquake on August 24, 2014, which produced surface rupture, ground deformation and widespread damage throughout Napa County (Ponti, Rosa and Luke Blair 2019).

Susceptible Areas

Although the intensity of an earthquake is not likely to vary significantly across the planning area, impacts can vary based on local soil characteristics. The areas that are commonly most affected by ground shaking have NEHRP Soils D, E and F. NEHRP soil classifications in the planning area are shown on Figure 8-3. Risk is similarly increased in areas of mapped liquefaction susceptibility. These areas are shown on Figure 8-4.

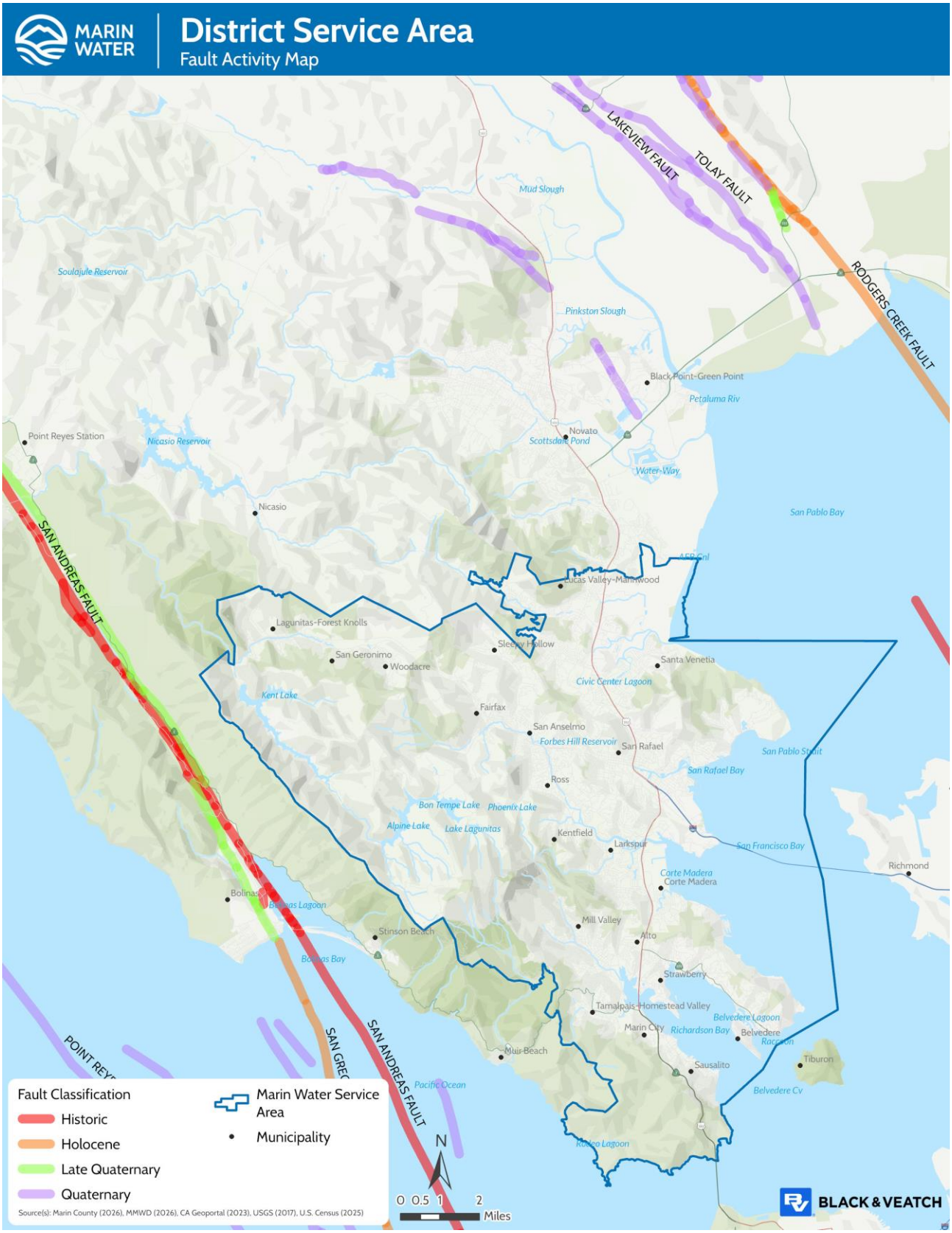


Figure 8-2. Earthquake Fault Zones Near the Planning Area

Figure 8-3. NEHRP Soil Class

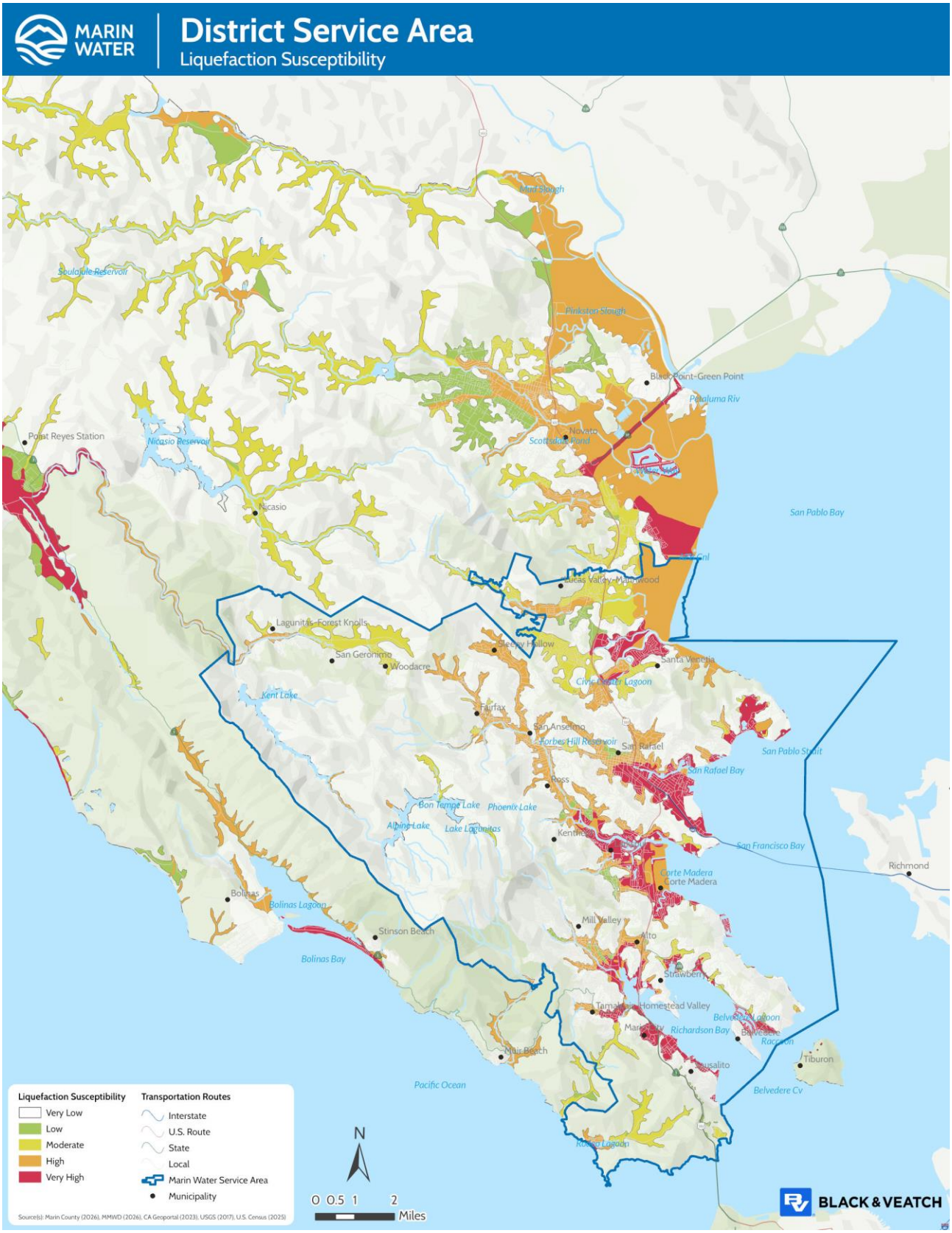


Figure 8-4. Liquefaction Susceptibility

8.2.3 Extent

USGS probabilistic mapping is an indication of potential earthquake intensity in an area.

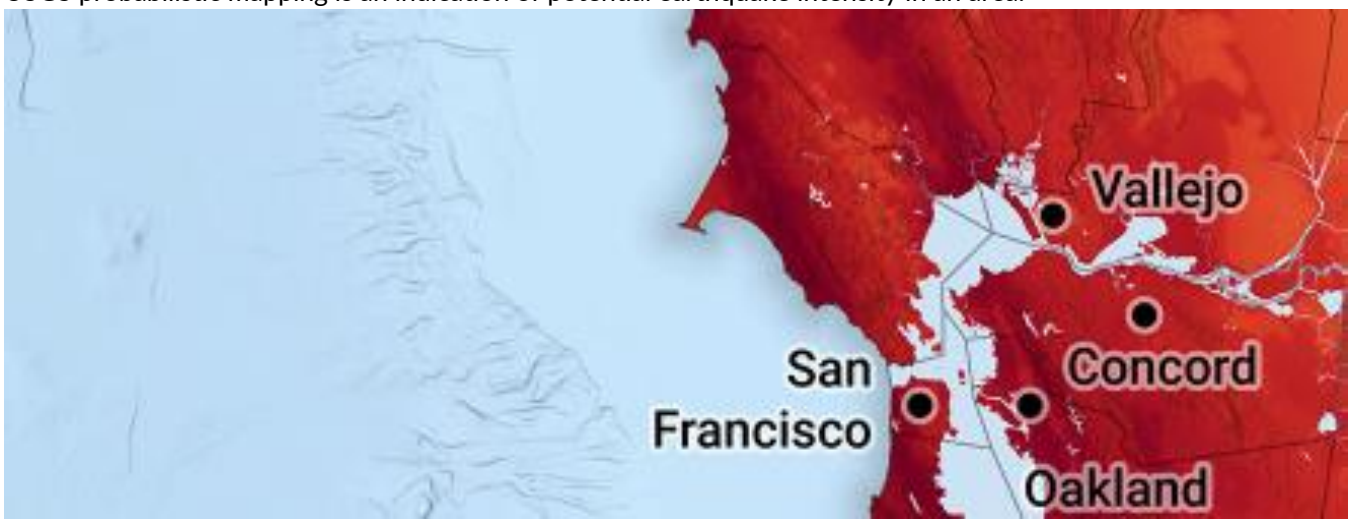


Figure 8-1 shows the intensity with a 10% exceedance chance in 50 years in Northern California. For the District service area, this PGA is in the approximate range of 0.3g (see Section 8.1.4 for an explanation of PGA).

Intensity also is shown in locally specific ShakeMaps. Intensity for four ShakeMap scenarios, as described in Table 8-4, is shown on Figure 8-5 through Figure 8-8.

Table 8-4. ShakeMap Scenarios Used for This Risk Assessment

Affected Fault	Magnitude	Focal Depth	Epicenter Location	Map Figure
Hayward/Rodgers Creek	7.58	7.5 km	North Richmond (N37.99, W122.34)	Figure 8-5
North San Andreas	7.88	6.6 km	4 miles west of Alpine Lake (N37.93, W122.70)	Figure 8-6
San Gregorio North	7.44	7.0 km	4 miles south of Half Moon Bay (N37.41, W122.43)	Figure 8-7
West Napa	6.97	8.1 km	5 miles northwest of Central Napa (N38.33, W122.37)	Figure 8-8

Warning Time

There is no current reliable way to predict the day or month that an earthquake will occur at any given location. Research is being done with warning systems that use the low energy waves that precede major earthquakes. These potential warning systems would give approximately 40 seconds notice that a major earthquake is about to occur. The warning time is very short, but it could allow for someone to get under a desk, step away from a hazardous material or shut down a computer system.

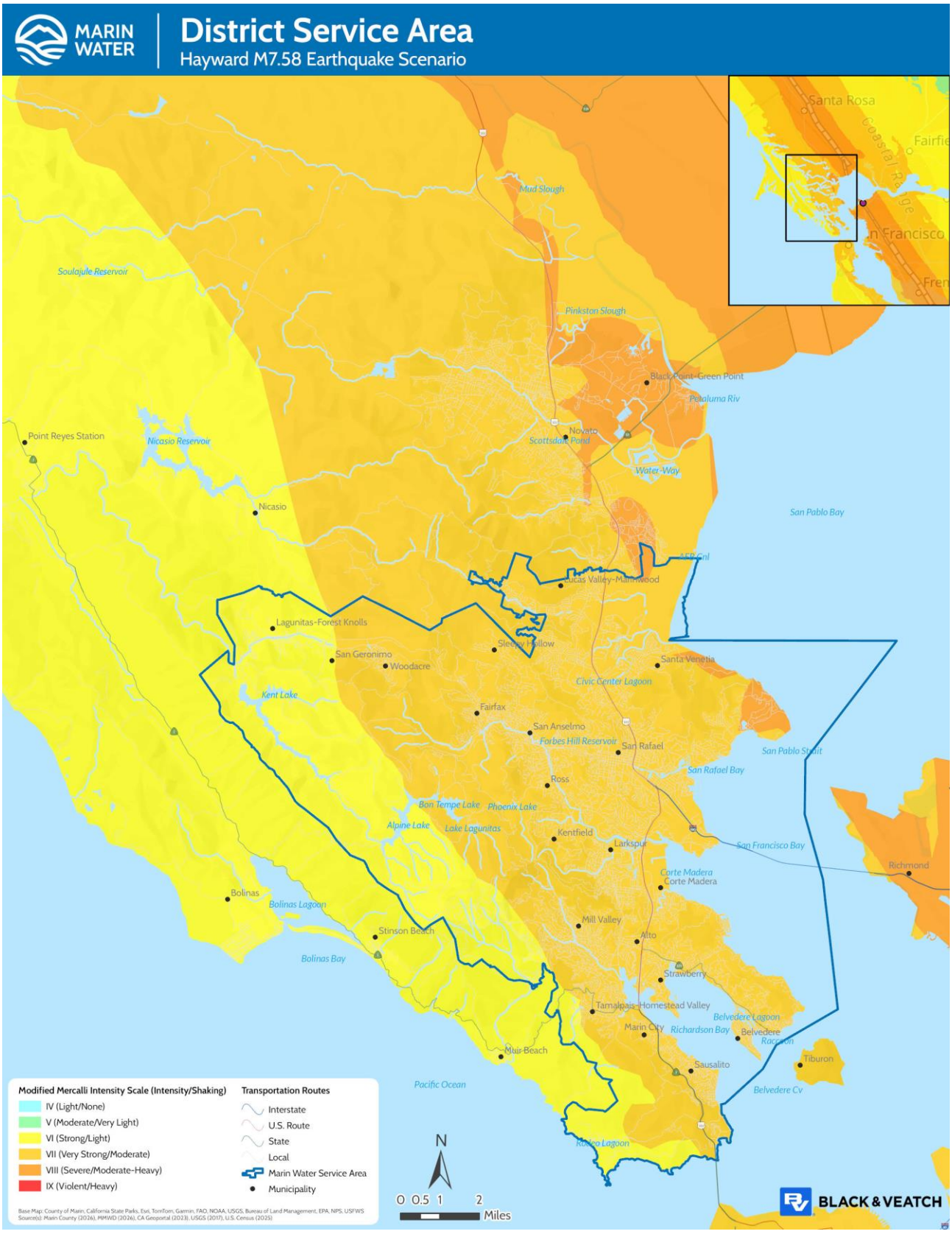


Figure 8-5. Hayward/Rodgers Creek M 7.58 Earthquake Scenario

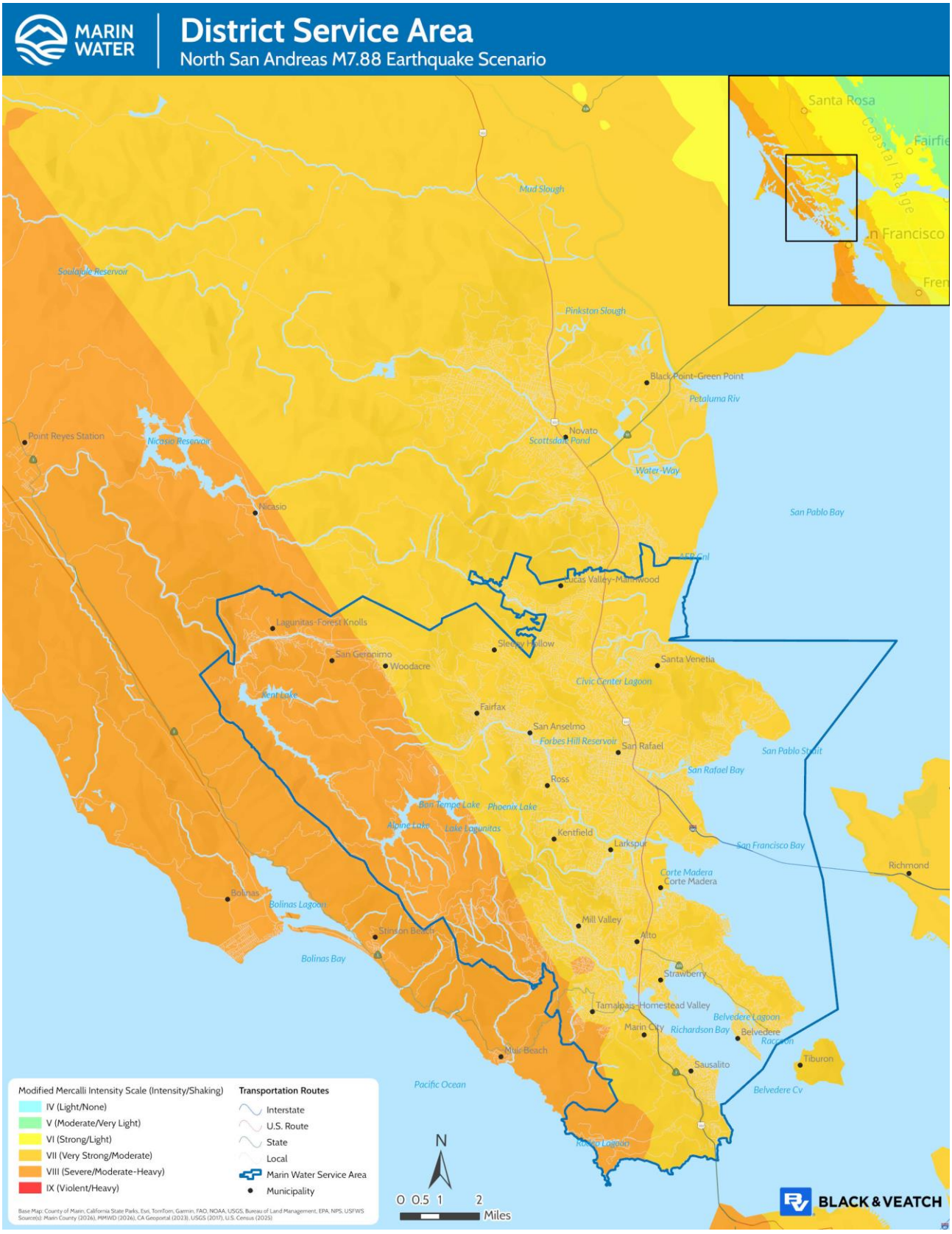


Figure 8-6. North San Andreas M7.88 Earthquake Scenario

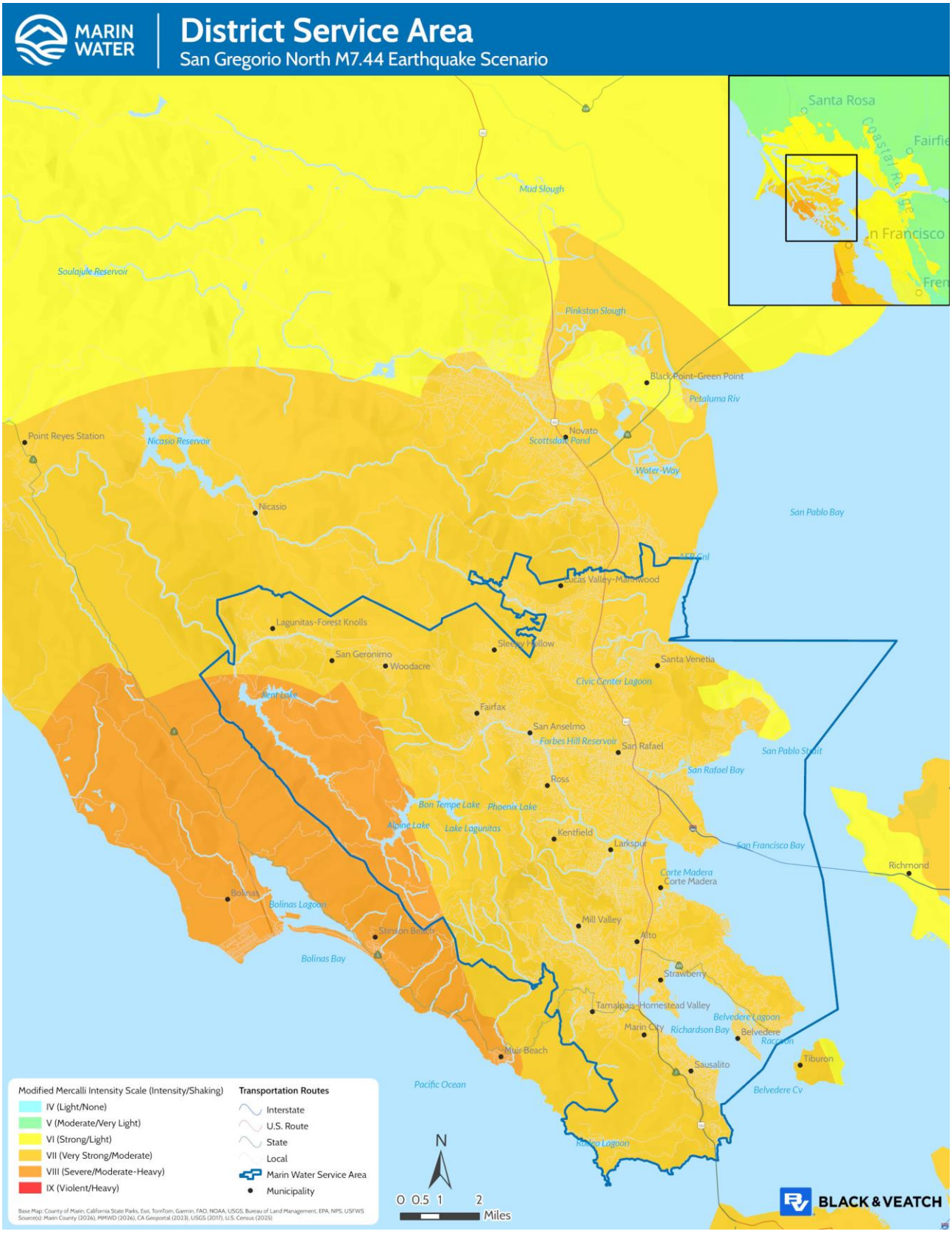


Figure 8-7. San Gregorio North M7.44 Earthquake Scenario

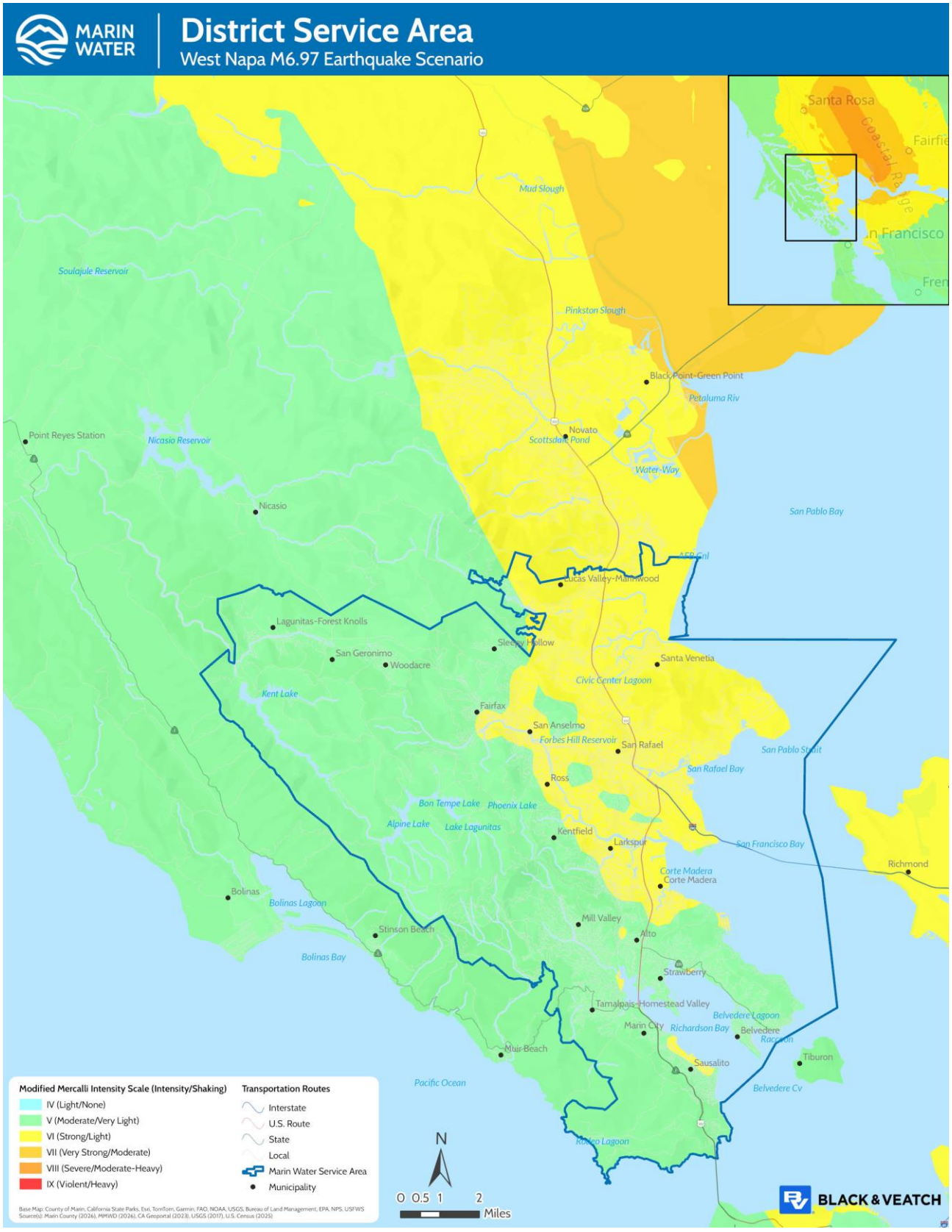


Figure 8-8. West Napa, M6.97 Earthquake Scenario

8.2.4 Future Conditions

Probability

Seismic activity in the Bay Area was more frequent from 1830 to 1930 than it has been since. This leads some scientists to suspect that pressure is building along the faults in the Bay Area that can result in a large quake. Such a quake could have dramatic and devastating effects throughout the Bay Area. In 2015, the USGS concluded that there is a 72% probability of at least one M6.7 or greater earthquake striking in the San Francisco Bay region before 2045, a 31% chance along the Hayward/Rodgers Creek fault and a 21% chance of occurrence along the Northern San Andreas Fault. An earthquake of this magnitude on either of these fault systems could result in serious damage to buildings, facilities and infrastructure in densely populated areas of the Bay Area (USGS 2016).

In March 2015, the USGS released updated earthquake probabilities using the Uniform California Earthquake Rupture Forecast 3 (UCERF3) model. In the updated analysis, the USGS estimates there is a 72% chance of at least one earthquake of M 6.7 or larger in the next 30 years on one of the Bay Area's faults. This new analysis changed the probability along the San Andreas Fault to 33% and lowered the Rodgers Creek Fault to 15%. Smaller magnitude earthquakes are more likely to occur, potentially producing significant local damage. The results of the USGS 2015 earthquake probability assessment are summarized in Table 8-5.

Table 8-5. Likelihood of an Earthquake of M6.7 or Greater Over the Next 30 Years

Earthquake Fault	Probability of M6.7 or Greater Earthquake Over the Next 30 Years
San Andreas (Mendocino Coast to San Benito County)	33%
Hayward	28%
Calaveras	24%
Hunting Creek, Berryessa, Green Valley, Concord	24%
Maacama	23%
Rodgers Creek	15%
San Gregorio	5%
Greenville	6%
Mt. Diablo	3%
West Napa	2%

Source: Uniform Earthquake Rupture Forecast

Differences between the 2008 and 2015 probability assessments reflect updates incorporated into the UCERF3 model, including revised fault segmentation, treatment of fault interactions and consideration of recent seismic activity. The UCERF3 assessment remains a commonly cited source for long-term earthquake probabilities in California.

The UCERF3 also defined the following recurrence intervals for the earthquake scenarios used for the risk assessment in this hazard mitigation plan:

- Hayward/Rodgers Creek M7.58 recurrence interval = 168 years
- North San Andreas M7.88 recurrence interval = 160 years
- San Gregorio North M7.44 recurrence interval = 481 years
- West Napa, M6.97 recurrence interval = 1,508 years

Climate Change

The impacts of global climate change on earthquake probability are unknown. Some scientists say that melting glaciers could induce tectonic activity, though not likely in areas that would affect the planning area. NASA and USGS scientists found that retreating glaciers in southern Alaska may be opening the way for future earthquakes there.

Secondary impacts of earthquakes could be magnified by climate change. Soils saturated by repetitive storms or heavy precipitation could experience liquefaction or an increased propensity for slides during seismic activity due to the increased saturation. Dams storing increased volumes of water due to changes in the hydrograph could have increased probability of failure during seismic events.

Because impacts on the earthquake hazard are not well understood, increases in exposure and vulnerability of local resources are not able to be determined.

8.3 VULNERABILITY ASSESSMENT

Earthquake vulnerability results for the risk assessment were generated using a Hazus Level 2 (user-defined) analysis for the four ShakeMap scenarios shown in Figure 8-5 through Figure 8-8 as well as the Hazus-defined 100-year probabilistic earthquake.

8.3.1 Level of Damage to Structures

Hazus classifies the vulnerability of structures to earthquake damage in five categories: no damage, slight damage, moderate damage, extensive damage or complete damage. The model was used to assign a vulnerability category to each District asset. The estimates of damage level were then used to estimate the dollar cost of damage to the structures. Detailed results for each facility are provided in Appendix E. Table 8-6 and Table 8-7 summarize the results by category of asset type.

Table 8-6. Earthquake Scenario Loss Estimates for District Structures

	Average Probability of Damage to Structure					
	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total Damage
Administrative Facilities						
Hayward/Rodgers Creek, M7.58	43%	18%	19%	16%	5%	$7,064,000
North San Andreas, M7.88	12%	25%	32%	26%	6%	$8,927,000
San Gregorio, M7.44	27%	27%	27%	16%	3%	$4,609,000
West Napa, M6.97	86%	9%	3%	2%	0%	$618,000
100-Year Probabilistic	61%	18%	12%	8%	1%	$1,406,000
Raw Water Facilities						
Hayward/Rodgers Creek, M7.58	57%	24%	16%	2%	0%	$2,364,000
North San Andreas, M7.88	3%	8%	38%	44%	7%	$14,250,000

San Gregorio, M7.44	34%	20%	32%	13%	1%	$6,122,000
West Napa, M6.97	99%	1%	0%	0%	0%	$27,000
100-Year Probabilistic	67%	13%	13%	5%	0%	$2,595,000
Potable Water Structures						
Hayward/Rodgers Creek, M7.58	21%	21%	34%	21%	4%	$383,196,000
North San Andreas, M7.88	5%	11%	39%	39%	6%	$580,937,000
San Gregorio, M7.44	24%	23%	33%	17%	3%	$348,367,000
West Napa, M6.97	92%	6%	2%	0%	0%	$19,919,000
100-Year Probabilistic	50%	15%	18%	14%	2%	$216,335,000
Recycled Water Facilities						
Hayward/Rodgers Creek, M7.58	2%	6%	28%	38%	27%	$15,208,000
North San Andreas, M7.88	2%	6%	29%	46%	17%	$14,803,000
San Gregorio, M7.44	14%	21%	39%	23%	3%	$9,164,000
West Napa, M6.97	67%	16%	13%	4%	0%	$2,121,000
100-Year Probabilistic	43%	15%	19%	20%	3%	$6,930,000

8.3.2 Level of Damage to Pipelines

For pipelines, Hazus estimates earthquake damage in several categories: number of repairs needed (leaks and breaks), days required to implement repairs and economic loss. Table 8-7 summarizes the results for the District's potable water, raw water and recycled water pipelines.

Table 8-7. Earthquake Scenario Loss Estimates for District Pipelines

	Total Number of Leaks	Total Number of Breaks	Total Number of Repairs	Days to Repair Leaks	Days to Repair Breaks	Total Days of Repairs	Economic Loss
Potable Water Pipelines							
Hayward/Rodgers Creek, M7.58	170.1	42.5	212.7	24.3	6.1	30.3	$2,127,000
North San Andreas, M7.88	285.1	71.3	356.4	40.5	10.1	50.6	$3,564,000
San Gregorio, M7.44	162.4	40.6	203.0	23.1	5.8	28.8	$2,030,000
West Napa. M6.97	18.7	4.7	23.4	2.7	0.7	3.3	$234,000
100-Year Probabilistic	59.8	14.9	74.7	8.5	2.1	10.6	$747,000
Raw Water Pipelines							
Hayward/Rodgers Creek, M7.58	0.9	0.2	1.2	0.2	0.1	0.3	$12,000
North San Andreas, M7.88	9.4	2.3	11.7	2.4	0.6	3.1	$117,000
San Gregorio, M7.44	4.0	1.0	5.0	1.0	0.2	1.2	$50,000
West Napa. M6.97	0.1	0.0	0.1	0.0	0.0	0.0	$1,000

100-Year Probabilistic	0.6	0.2	0.8	0.2	0.0	0.2	$8,000
Recycled Water Pipelines							
Hayward/Rodgers Creek, M7.58	4.3	1.1	5.4	0.6	0.2	0.8	$54,000
North San Andreas, M7.88	3.5	0.9	4.3	0.5	0.1	0.6	$43,000
San Gregorio, M7.44	2.4	0.6	2.9	0.3	0.1	0.4	$29,000
West Napa. M6.97	0.5	0.1	0.6	0.1	0.0	0.1	$6,000
100-Year Probabilistic	0.8	0.2	1.1	0.1	0.0	0.1	$11,000

8.3.3 Time to Return Structures to Functionality

Hazus estimates the time to restore critical facilities to fully functional use. Results are presented as probability of being functional at specified time increments: 1, 3, 7, 14, 30 and 90 days after the event. For example, Hazus may estimate that a facility has 5% chance of being fully functional at Day 3 and a 95% chance of being fully functional at Day 90. The analysis of District structures was performed for all earthquake scenarios for each facility found to be damaged. Results are summarized by asset type category in Figure 8-9 through Figure 8-13.

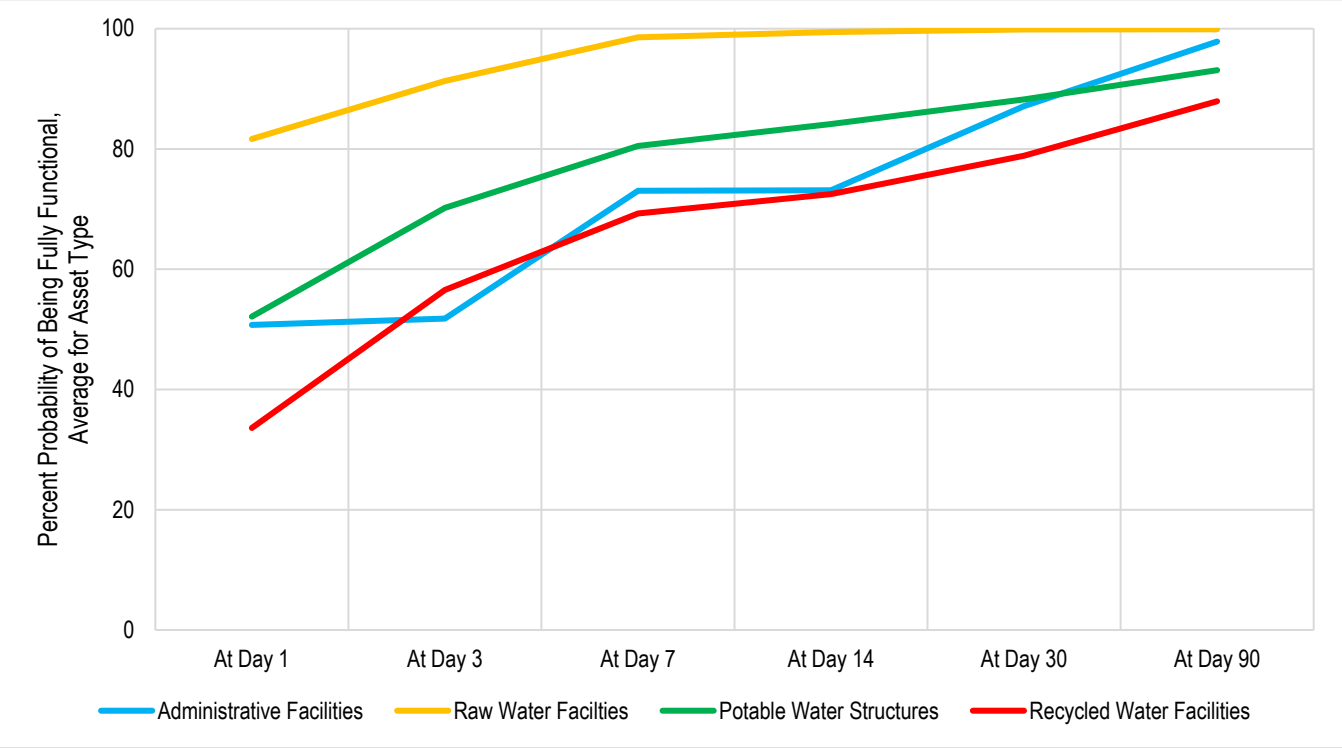


Figure 8-9. Average Probability of Full Functionality After Hayward/Rodgers Creek M7.58 Event

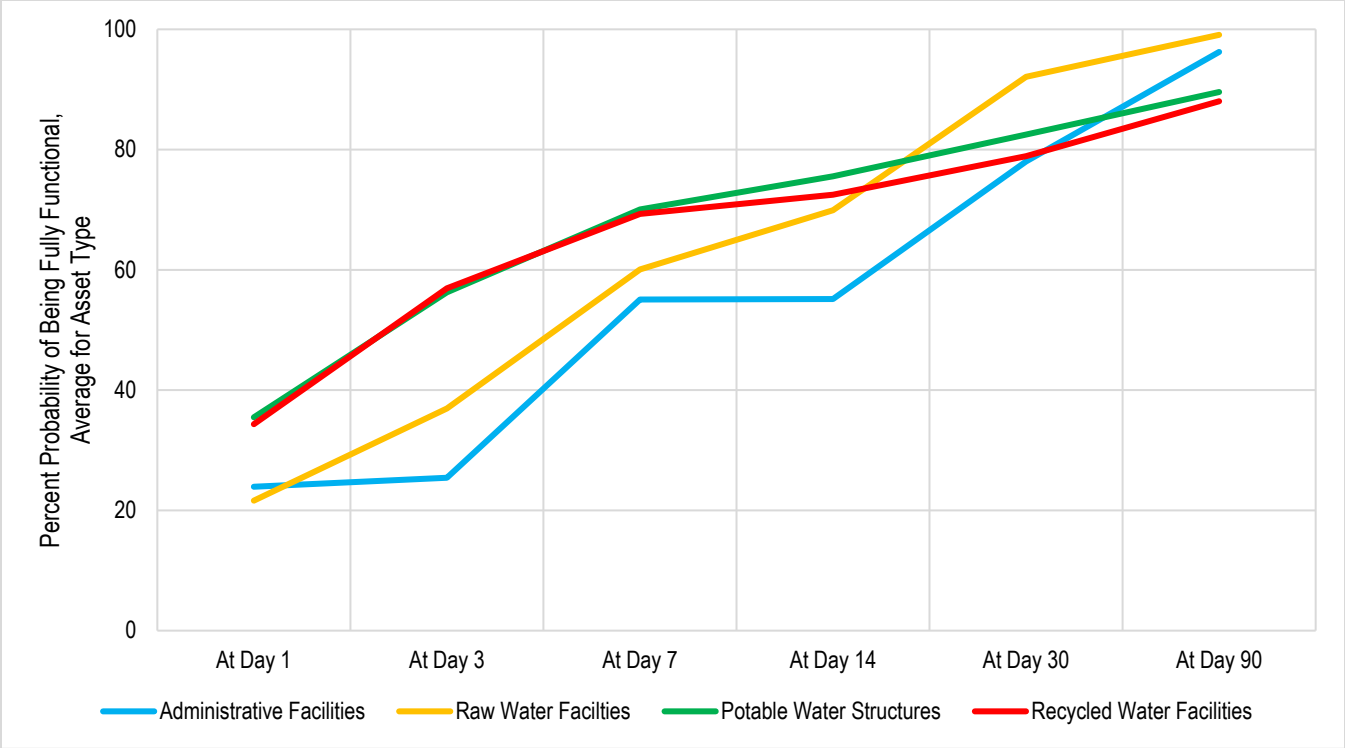


Figure 8-10. Average Probability of Full Functionality After N. San Andreas M 7.88 Event

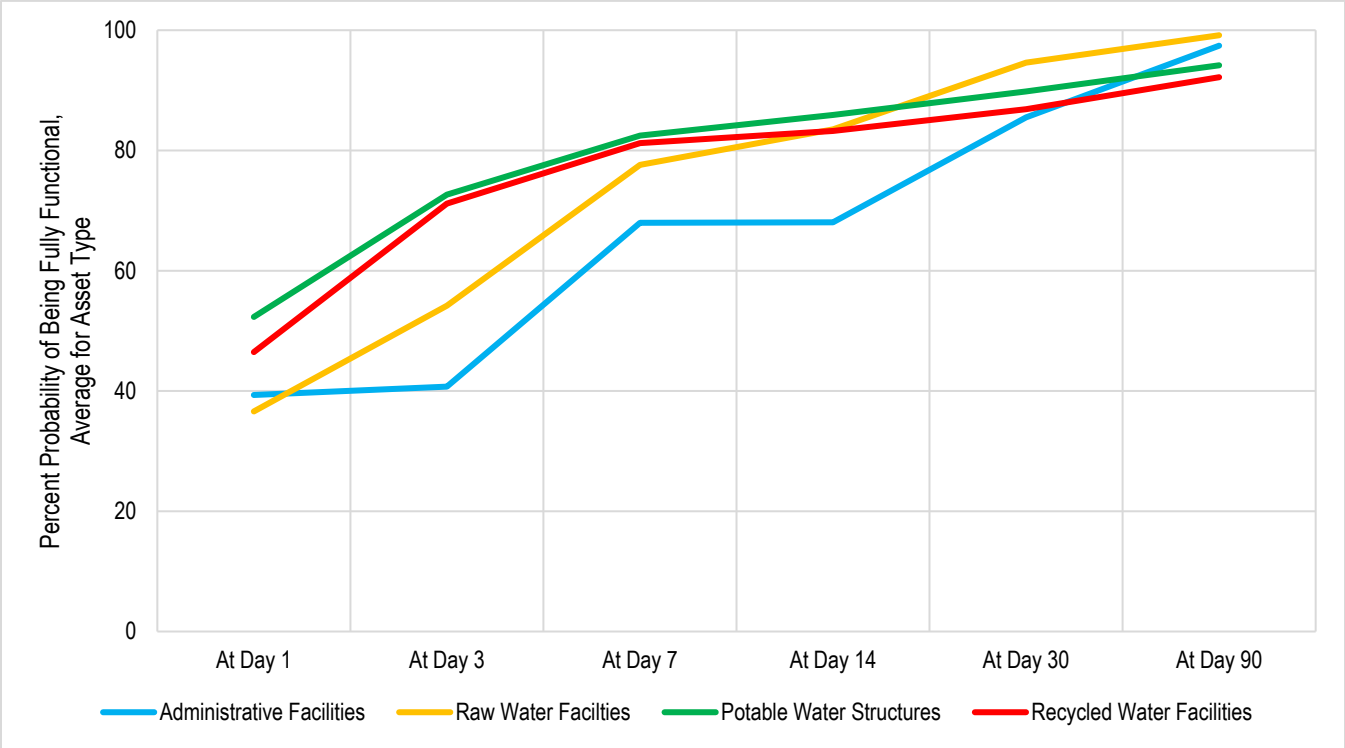


Figure 8-11. Average Probability of Full Functionality After San Gregorio M7.44 Event

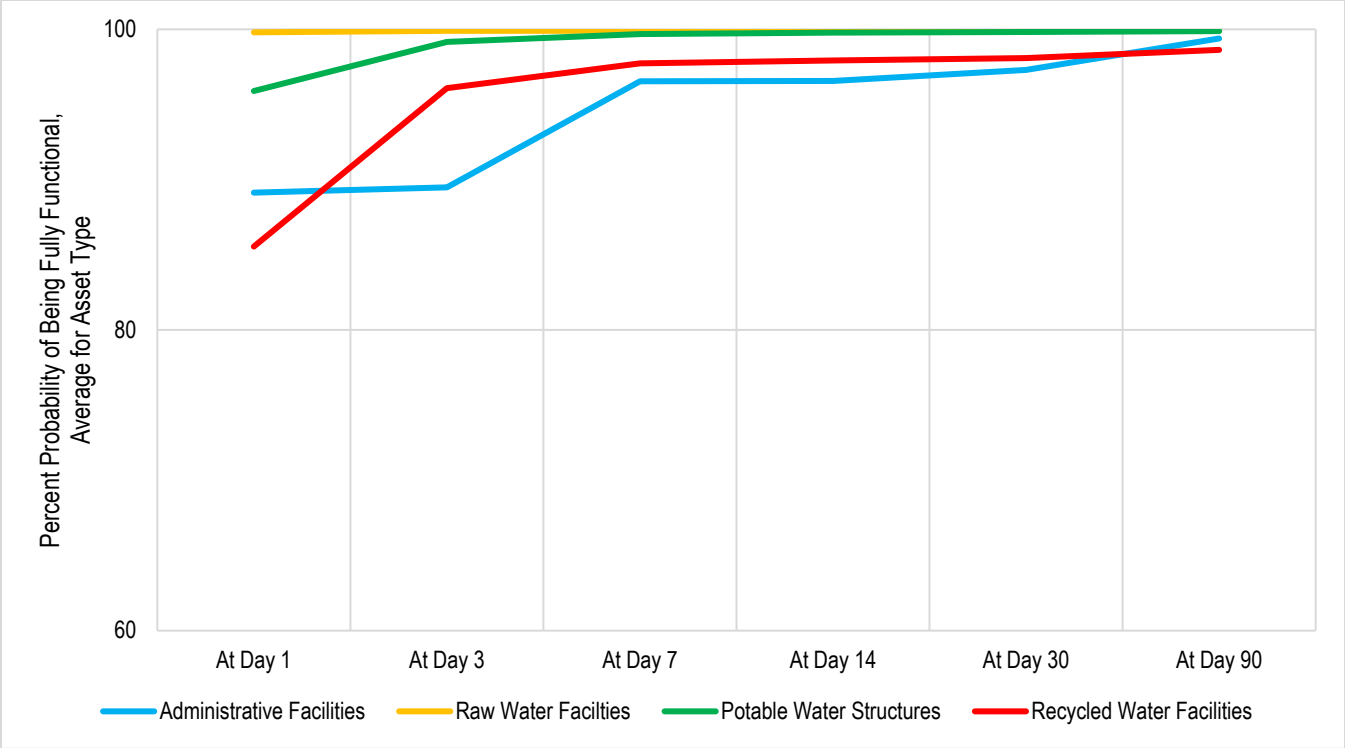


Figure 8-12. Average Probability of Full Functionality After West Napa M6 Event

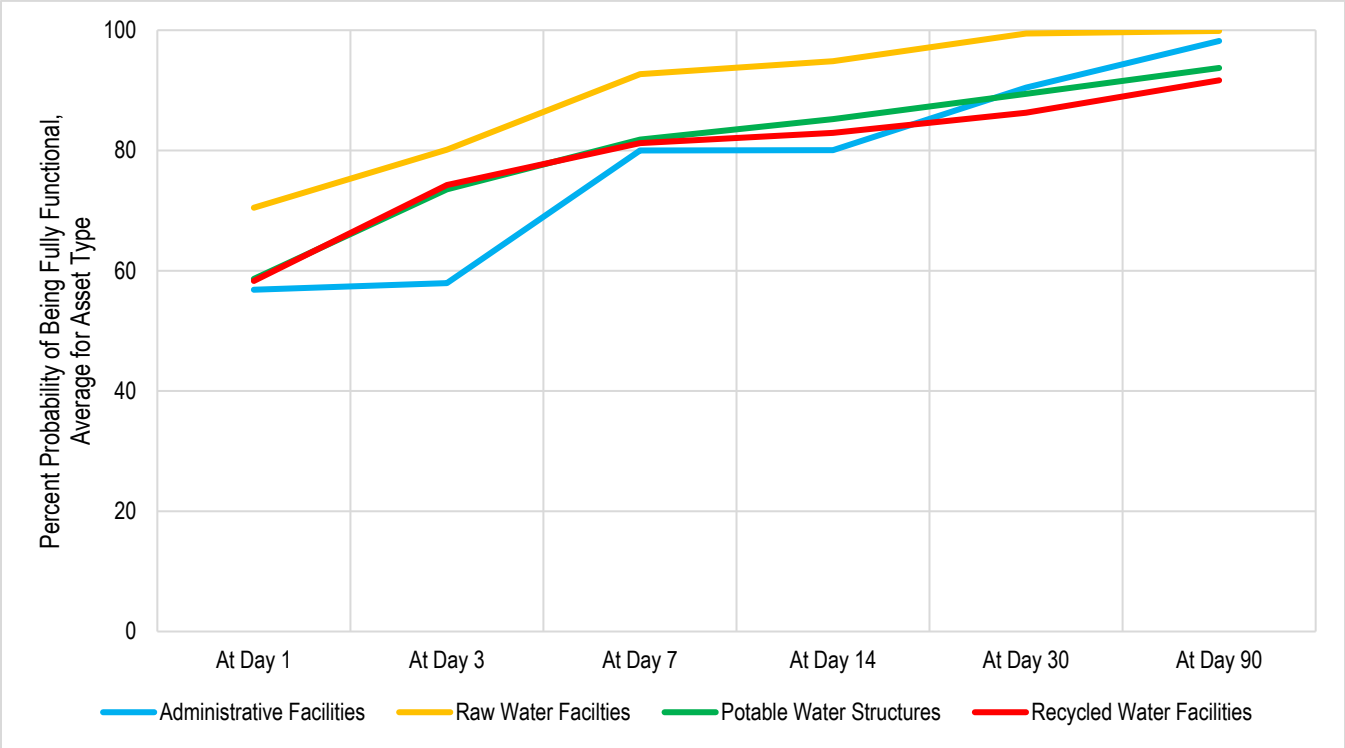


Figure 8-13. Average Probability of Full Functionality After 100-Year Probabilistic Event

8.4 DEVELOPMENT TRENDS

The demand for critical services may increase with growth in the surrounding area. The State of California's adoption of bills expanding property owners' rights to build accessory dwelling units will increase densities in most of Marin Water's service area.

Per Government Code 53091(d) District facilities required for the production, generation, storage, treatment, or transmission of water are exempt from building codes. For structures that are governed by codes and standards, Marin Water will repair or replace structures in accordance with the 2025 California Building Code adopted by the jurisdiction where the structure is located. Applications of these codes and standards to any applicable new or redeveloped Marin Water structures will reduce the risk of potential impacts from earthquakes.

8.5 ISSUES

Important issues associated with an earthquake include the following:

1. **High seismic vulnerability of critical infrastructure:** The District has numerous critical facilities and infrastructure with a high degree of vulnerability to earthquake.
2. **Significant estimated damage from worst-case scenario:** The most severe earthquake scenario evaluated (North San Andreas Fault) represents an estimated 4.4% of the replacement cost of all identified critical facilities.
3. **High number of facilities at risk of severe damage:** Modeling indicates a high number of facilities in the planning area are expected to sustain complete or extensive damage from scenario events, making them prime candidates for structural retrofits.
4. **Continuity of operations planning not aligned with current risk data:** The District's continuity of operations plan should be enhanced using the risk and vulnerability information contained in this plan, including the most current seismic risk assessment results.
5. **Design standards lack seismic risk integration:** Design standards for new or enhanced facilities do not consistently account for probable earthquake impacts.
6. **Outdated dam failure warning and evacuation procedures:** With numerous earthen dams in the planning area, dam failure warning and evacuation plans and procedures need review and updating to reflect earthquake-related risk potential.
7. **Cascading hazard risk from earthquakes:** Earthquakes could trigger secondary hazards, such as dam failures and landslides, that could severely impact the planning area.

8.6 MITIGATION OPPORTUNITIES

Local Plan Requirement C3 – 44 CFR Part 201.6(c)(3)(ii)

The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effect of each hazard, with particular emphasis on new and existing buildings and infrastructure.

The District's service area is near active faults and includes areas of soft soil and liquefaction potential, placing treatment plants, storage tanks, pump stations and buried pipe at risk of damage during a significant earthquake. Because the hazard itself cannot be manipulated, the alternatives below concentrate on reducing the vulnerability of system components and on building the capacity to restore service quickly. The table organizes these alternatives by the scale at which they can be carried out and by mitigation category.

Table 8-8. Potential Opportunities to Mitigate the Earthquake Hazard

Community / Customer Scale	Utility Operational Scale
Manipulate the Hazard	
• None; the earthquake hazard cannot be manipulated	• None; the earthquake hazard cannot be manipulated
Reduce Exposure and Vulnerability	
• Locate outside of hazard areas, such as soft soils and liquefaction zones • Strap and anchor water heaters so that stored water remains available after an event • Secure household items that can cause injury or damage to plumbing and service connections • Know how to shut off the water service at the meter and repair damaged private service lines promptly	• Locate or relocate critical functions outside hazard areas where possible • Seismically retrofit treatment plants, storage tanks, pump stations and buildings housing critical functions • Anchor and brace chemical storage, generators and control equipment • Replace brittle pipe, such as cast iron and asbestos cement, with earthquake-resistant ductile iron pipe in high-consequence and liquefaction-prone corridors • Install flexible couplings, restrained joints and seismically rated tank connections at fault and creek crossings • Install isolation and seismic shutoff valves to limit uncontrolled loss of stored water • Provide redundancy for critical functions, including standby power, alternate treatment capacity, interties, alternate supply routes and looped transmission • Adopt higher regulatory and design standards for critical water facilities

Community / Customer Scale	Utility Operational Scale
Build Local Capacity	
• Practice "drop, cover and hold on" and participate in the Great California ShakeOut • Store an emergency water supply sufficient for at least 14 days, since water service may be interrupted after a major earthquake • Develop a household mitigation plan, including a retrofit savings account and self-sufficiency during an extended outage • Become informed on the hazard and the risk reduction alternatives available • Understand realistic service restoration timeframes and where emergency water distribution points would be located	• Adopt a higher standard for new construction and consider performance-based design for critical facilities • Maintain reserve funds and emergency contracting mechanisms for rapid repair • Train employees on post-earthquake damage assessment, valve operation and emergency repair procedures • Participate in mutual aid networks such as CalWARN • Use improved fault, liquefaction and ground shaking mapping to target system vulnerabilities • Provide technical information and guidance to customers on post-earthquake water use, boil water notices and leak reporting • Include seismic retrofit and replacement of critical system elements in the capital improvement program • Develop a strategy to take advantage of post-disaster funding and reconstruction opportunities • Warehouse critical infrastructure components such as pipe, fittings, valves, hydrants and repair clamps • Solidify supplemental power supply to tanks and pump stations through a generator program • Develop and adopt a continuity of operations plan and maintain emergency response plans required under America's Water Infrastructure Act • Enhance the seismic risk assessment of the distribution and transmission system to target high-consequence assets for mitigation • Plan and pre-position emergency water distribution, portable treatment and temporary bypass piping capability • Coordinate with fire agencies and local jurisdictions on post-earthquake fire flow and emergency water supply • Develop a post-disaster action plan that includes grant funding and debris removal components

9. EXTREME TEMPERATURE

9.1 GENERAL BACKGROUND

Extreme temperature for this Plan is specifically referring to extreme heat. It can be defined as temperatures that hover 10 °F or more above the average high temperature for the region, last for prolonged periods of time and are often accompanied by high humidity. The National Weather Service (NWS) monitors a heat index that takes both temperature and humidity into account (Figure 9-1).

Source: National Weather Service

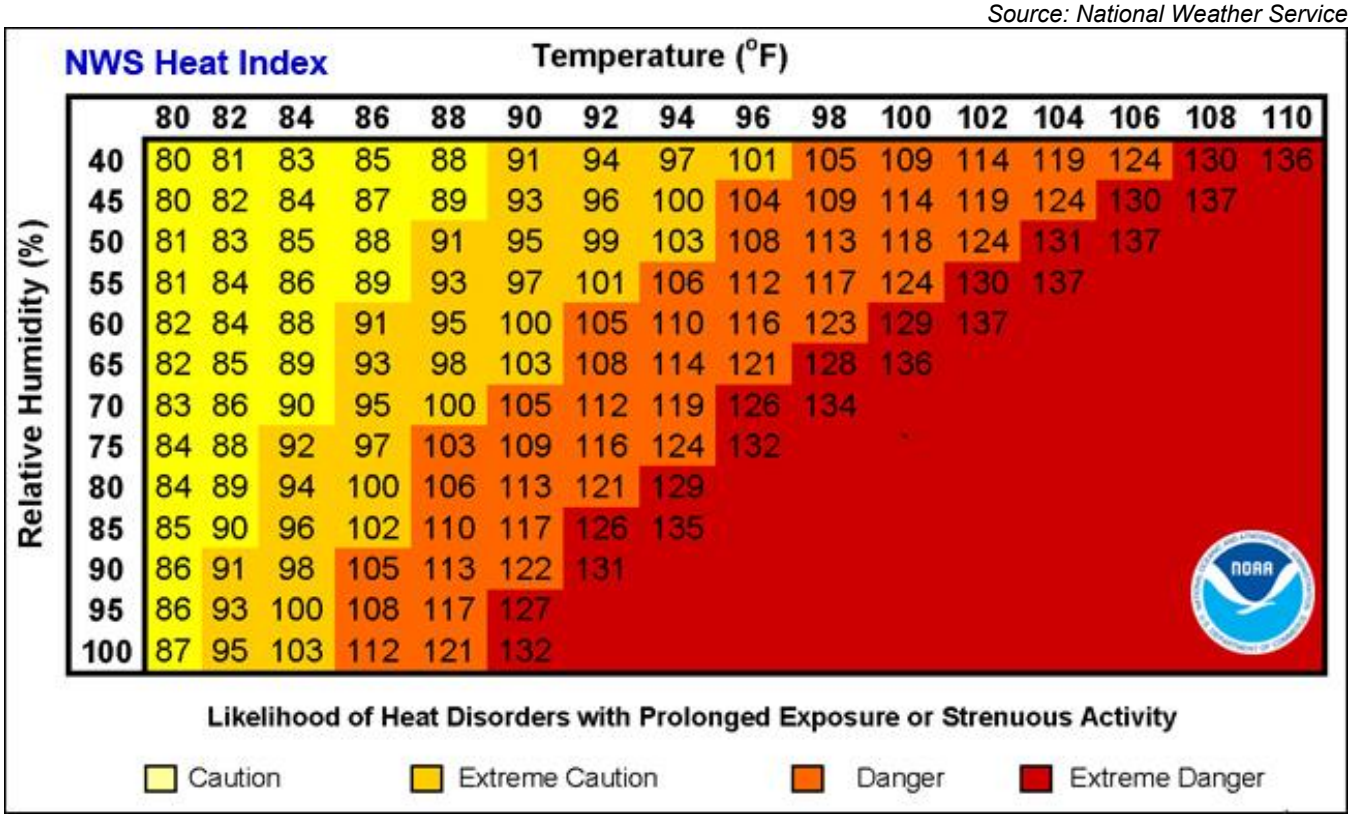


Figure 9-1. Extreme Heat Index

According to the *California Climate Adaptation Strategy*, heat waves have claimed more lives in California than all other declared disaster events combined. Despite this history, few heat emergencies have been proclaimed at the state or federal level. Heat emergencies are often slow to develop and usually hurt vulnerable populations. It can take a number of days of oppressive heat for a heat wave to have a significant or quantifiable impact. Heat waves do not strike victims immediately, but rather their cumulative effects slowly take the lives of people from vulnerable populations.

The “urban heat island effect” can produce significantly higher nighttime temperatures where asphalt and concrete (which store heat longer) gradually release heat at night. Urban heat islands develop in urban areas where natural surfaces are paved with asphalt or covered by buildings. Radiation from the sun is absorbed by these surfaces during the day and re-radiated at night, raising ambient temperatures. Urban heat islands have high nighttime minimum temperatures compared to neighboring areas. Waste heat from air conditioners, vehicles and other equipment contributes to the urban heat island effect (US EPA 2025).

9.1.1 Secondary Hazards

Extreme heat can contribute to drought conditions. For more information on drought, refer to Chapter 7. High temperatures, extreme dryness and high winds can create conditions that can lead to a major wildfire. For more information on wildfire, refer to Chapter 15. Heat can make the occurrence of harmful algal blooms (HAB) more likely in surface waters, including reservoirs. For more information about HAB, refer to Section 17-1.

9.2 HAZARD PROFILE

9.2.1 Past Events

Marin County has not been included in any federal declarations or state proclamations for extreme heat (FEMA n.d.) (Cal OES 2026). The National Centers for Environmental Information storm event database lists the following severe weather events in the planning area (NOAA NCEI 2026):

- **July 9 – 11, 2021—**Strong high pressure building over the region in early to mid-July brought warm to hot temperatures across the interior. Daytime highs rose into the 100s with locations across the East Bay up to 110 degrees between July 9th and 11th. Overnight lows remained warm, particularly across higher elevations where temperatures were still in the 70s and 80s in the early mornings. Additionally, prolonged dry conditions resulted in near record dry fuels for July.
- **September 6 – 7, 2020—**A large area of high pressure brought excessive heat and dry conditions to the region. Numerous record high temperatures were broken, including 13 broken records on September 6 alone. Temperatures reached 110 °F across the interior, the 90s along the coast and 100 °F in San Francisco. Two locations in the North Bay Valleys tied previous record high temperatures for the month of September: Kentfield with 108 °F and Napa with 110 °F. Once the ridge began to break down, offshore winds increased, flaring up some existing wildfires. These winds also enabled smoke from wildfires across the state to blanket much of the Bay Area.

9.2.2 Location

Extreme heat events have the potential to happen anywhere in the planning area and may be exacerbated where reduced air flow, reduced vegetation and increased generation of waste heat can contribute to temperatures that are several degrees higher than in surrounding less urbanized areas.

9.2.3 Future Conditions

Probability

Although documented excessive heat events in Marin County have historically been infrequent, elevated temperature events occur each year throughout the planning area.

Climate Change

Climate change is expected to substantially increase the frequency, duration, and intensity of extreme heat events throughout California, including Marin County. According to California's Climate Adaptation Strategy and the California Fourth Climate Change Assessment, statewide temperatures have already increased by more than 1°F across much of California, and average daily maximum temperatures are projected to increase an additional 4.4°F to 5.8°F by mid-century and 5.6°F to 8.8°F by late century, depending on future greenhouse gas emissions. As

temperatures rise, heat waves are expected to occur more often, last longer, and produce higher daytime and nighttime temperatures.

The California Local Climate Impacts program identifies extreme heat as one of the state's most significant climate-related hazards because of its effects on public health, infrastructure, energy systems, water resources, and vulnerable populations. Increasing temperatures are expected to increase cooling demand and place additional stress on electrical infrastructure, elevating the potential for power disruptions during periods of peak energy use. Extended heat events may also exacerbate drought conditions, reduce water supply reliability, increase wildfire risk, and contribute to declining water quality in reservoirs through conditions favorable to harmful algal blooms.

For Marin Water, future extreme heat conditions may affect both operations and customers. Increased temperatures can raise water demand, particularly during prolonged dry periods, while heat-related power outages could disrupt water treatment, pumping, and distribution facilities that rely on electrical power. Although coastal influences may moderate temperatures in portions of the service area, climate projections indicate that even historically temperate regions of the San Francisco Bay Area are likely to experience more frequent extreme heat days and warm nights in coming decades. As a result, extreme heat is expected to become a more significant hazard for the District, with increased implications for system reliability, emergency response, and community resilience.

9.2.4 Extent

Extreme heat is the leading weather-related cause of death in the United States. According to NOAA and the Centers for Disease Control and Prevention (CDC), extreme heat is responsible for an estimated 1,220 deaths annually nationwide, exceeding the average annual fatalities associated with flooding, tornadoes, hurricanes and lightning. As temperatures continue to rise, the frequency, duration and intensity of extreme heat events are expected to increase, resulting in greater risks to public health and vulnerable populations (National Oceanic and Atmospheric Administration 2024). Extreme heat can cause heat exhaustion, in which the body becomes dehydrated, resulting in an imbalance of electrolytes. Without intervention, heat exhaustion can lead to collapse and heatstroke. Heatstroke occurs when perspiration cannot occur and the body overheats. It can lead to confusion, coma and death. Hot weather also can increase levels of ozone, a major component of smog that is created in the presence of sunlight. High ozone levels often cause or worsen respiratory problems. The longer a heat wave lasts and the hotter the temperature is, the greater the risk of adverse impacts on human health or infrastructure.

Extreme heat events do not typically impact buildings; however, losses may be associated with strained power grids and the overheating and failure of HVAC systems.

Warning Time

Meteorologists can often predict the likelihood of extreme heat. This can give several days of warning time. However, meteorologists cannot predict the exact time of onset or severity of any given weather condition. The NWS issues advisories, watches and warnings associated with temperature as listed in Table 9-1.

Table 9-1. NWS Heat Warnings, Watches and Advisories

	Warning	Watch	Advisory
Excessive heat[a]	Heat index values are forecast to meet or exceed locally defined warning criteria for more than three hours over at least two consecutive days; issued within 12 hours of the onset of the high heat index	Conditions are favorable in the next 24 to 72 hours for extreme heat index values during the day, combined with nighttime low temperatures of 80 °F or higher that limit perspiration recovery,	Heat index values are forecast to meet or exceed locally defined warning criteria for one or two days; usually issued within 12 hours of the onset of the high heat index

Source: (NWS n.d.)
a. Specific criteria varies among local weather forecast offices due to climate variability and the effect of excessive heat on the local population. Typical criteria are maximum daytime temperatures above 105 °F to 110 °F for up to three hours per day, with minimum nighttime temperatures above 75 °F for two consecutive days. Criteria may be lowered if the heat event occurs early in the season or during a multi-day heat wave or a widespread power outage

9.3 VULNERABILITY ASSESSMENT

It can be assumed that all District assets are exposed to some extent to extreme heat events. Power outages or roaming blackouts may occur as a result of extreme heat events that strain and overheat circuits. During a blackout, all critical facilities that rely on electricity for power will be severely impacted unless they are connected to a backup power source.

Weather-related vulnerability is tied predominantly to the loss of power, as most of the District critical facilities are power dependent. Marin Water has backup power for most but not all of its critical facilities, so there is some degree of vulnerability associated with this core capability. There are portable sources for emergency power supply, but these sources are not as efficient as fixed-place backup power for each facility.

9.4 DEVELOPMENT TRENDS

The demand for critical services may increase with growth in the surrounding area. The State of California's adoption of bills expanding property owners' rights to build accessory dwelling units will increase densities in most of the Marin Water service area.

Per Government code 53091(d) District facilities required for the production, generation, storage, treatment or transmission of water are exempt from building codes. For structures that are governed by codes and standards, Marin Water will repair or replace structures in accordance with the 2025 California Building Code adopted by the jurisdiction where the structure is located. The building code includes provisions for structure insulation requirements that can mitigate the impacts from extreme heat.

9.5 ISSUES

Important issues associated with an extreme heat event in the planning area include the following:

1. **Insufficient backup power capability:** Marin Water's backup power capability should be enhanced to maintain operations during power disruptions caused by severe weather events.
2. **Increasing severe weather frequency from climate change:** Climate change is likely to increase the frequency and severity of extreme weather events, including the potential for extreme heat.

9.6 MITIGATION OPPORTUNITIES

Local Plan Requirement C3 – 44 CFR Part 201.6(c)(3)(ii)

The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effect of each hazard, with particular emphasis on new and existing buildings and infrastructure.

Rising temperatures and more frequent heat waves drive sharp increases in peak-day demand, stress pumping and treatment equipment, degrade water quality in reservoirs and the distribution system and create safety risks for field crews. The following table presents alternatives for mitigating the extreme heat hazard organized by the scale at which each action can be carried out and by whether it manipulates the hazard, reduces exposure and vulnerability or builds local capacity.

Table 9-2. Potential Opportunities to Mitigate the Extreme Temperature Hazard

Community / Customer Scale	Utility Operational Scale
Manipulate the Hazard	
• Plant and maintain shade trees around homes and along streets to reduce local heat buildup • Use light-colored roofing, paving and surfaces that reflect rather than store heat • Replace hardscape with permeable surfaces and climate-appropriate landscaping	• Add shade structures and tree canopy at treatment plants, corporation yards and pump stations • Use cool roofs, reflective coatings and light-colored surfaces on District buildings and tanks • Maintain riparian shading on District watershed lands to moderate stream and reservoir temperatures • Partner with cities and the County on green infrastructure that pairs heat reduction with stormwater capture
Reduce Exposure and Vulnerability	
• Install water-efficient fixtures, drip irrigation and drought-tolerant landscaping to reduce peak-day demand • Irrigate during early morning or evening hours to reduce evaporative loss and system stress • Insulate and weatherize homes and shade exterior plumbing and pressure regulators • Repair private leaks promptly so that supply is available when demand peaks	• Size storage, pumping and transmission capacity to meet extended peak-day and peak-hour demand • Upgrade cooling and ventilation for control rooms, electrical rooms and supervisory control equipment • Provide standby power so that pumping and cooling continue during heat-driven outages and public safety power shutoffs • Shade, insulate or bury exposed piping, meters and chemical storage subject to heat damage or degradation • Manage distribution system water quality during high temperatures, including disinfectant residual, nitrification and disinfection byproduct formation • Monitor and manage reservoir conditions that promote harmful algal blooms and taste and odor events • Provide treatment flexibility, such as intake depth selection and enhanced oxidation, to respond to warm-water quality changes • Reduce distribution system water loss so that limited supply is not lost during high-demand periods • Adopt design standards that account for higher ambient temperatures in equipment, coating and material selection • Support cooling centers and public facilities with reliable water service and drinking water access

Community / Customer Scale	Utility Operational Scale
	Build Local Capacity
• Learn the signs of heat illness and how to stay hydrated and cool • Know the location of nearby cooling centers and public drinking water access points • Check on older adults, people with disabilities and neighbors with access and functional needs during heat events • Take advantage of District conservation rebates and water use efficiency programs	• Maintain a heat illness prevention program for field crews, including water, shade, rest and acclimatization • Adjust work schedules and shift start times during forecasted extreme heat • Monitor National Weather Service heat advisories and excessive heat warnings to trigger operating protocols • Develop a continuity of operations plan that addresses extended heat events and concurrent power outages • Forecast and plan for peak-day demand increases driven by rising temperatures • Integrate extreme heat and climate change projections into the urban water management plan, asset management program and capital improvement program • Coordinate with the County Office of Emergency Services and public health on cooling center water needs and heat emergency response • Expand conservation, water use efficiency and demand management programs to shave peak demand • Develop public messaging on wise water use, water quality and hydration during heat events, including materials for access and functional needs communities • Expand reservoir and distribution system water quality monitoring during warm-weather months • Coordinate with the electric utility on grid reliability and load reduction so that pumping and treatment remain in service • Include energy efficiency, solar and battery storage projects at facilities to reduce heat-related grid dependence • Pursue grant funding for heat resilience, energy resilience and water quality protection projects

10. FLOOD

10.1 GENERAL BACKGROUND

10.1.1 River Flooding

River flooding occurs when a river rises to overflow its natural banks due to causes such as prolonged, general rainfall, locally intense thunderstorms, snowmelt or ice jams (FEMA 2019).

Measuring Floods on Rivers

River flooding is measured using a discharge probability, which is the probability that a certain river discharge (flow) will be equaled or exceeded in a given year. Flood studies use historical records to determine the probability of occurrence for different discharge levels. The flow that historical data show to have a 1% chance of being equaled or exceeded in any given year is called the 1%-annual-chance flood (commonly called the 100-year flood). Also called the "base flood," this flood event is a regulatory standard used in assessing flood risk, regulating new development and setting requirements for purchasing flood insurance (FEMA 2025).

Discharge probabilities have an inverse relationship to river flows—that is, a lower probability indicates a higher flow. The 0.2%-annual chance flood (commonly called the 500-year flood) represents a higher river flow than a 1%-annual-chance flood. These probabilities reflect statistical averages only; it is possible for two or more low-probability floods to occur in a short time period. The probabilities also can vary along a single river: The same storm event can cause a 1%-annual-chance flood at one location on a river and only a 10%-annual-chance flood at a point further upstream or downstream (FEMA 2025).

River Floodplains

A floodplain is the area adjacent to a river, creek or lake that becomes inundated during a flood. Floodplains may be broad, as when a river crosses an extensive flat landscape or narrow, as when a river is confined in a canyon. When floodwaters recede after a flood event, they leave behind layers of rock and mud. These gradually build up to create a new floor of the floodplain. Floodplains generally contain unconsolidated sediments (accumulations of sand, gravel, loam, silt and/or clay), often extending below the bed of the stream. These sediments provide a natural filtering system, with water percolating back into the ground and replenishing groundwater. These are often important aquifers, the water drawn from them being filtered compared to the water in the stream. Fertile, flat reclaimed floodplain lands are commonly used for agriculture, commerce and residential development (FEMA 2025).

Connections between a river and its floodplain are most apparent during and after major flood events. These areas form a complex physical and biological system that not only supports a variety of natural resources but also provides natural flood and erosion control. When a river is separated from its floodplain with levees and other flood control facilities, natural, built-in benefits can be lost, altered or significantly reduced (FEMA 2025).

Floodplains can support ecosystems that are rich in plant and animal species. A floodplain can contain 100 or even 1,000 times as many species as a river. Wetting of the floodplain soil releases an immediate surge of nutrients: those left over from the last flood and those that result from the rapid decomposition of organic matter that has accumulated since then. Microscopic organisms thrive and larger species enter a rapid breeding cycle. Opportunistic feeders (particularly birds) move in to take advantage. The production of nutrients peaks and falls away quickly, but the surge of new growth endures for some time. This makes floodplains valuable for agriculture. Species growing in floodplains are markedly different from those that grow outside floodplains. For instance,

riparian trees (trees that grow in floodplains) tend to be very tolerant of root disturbance and very quick-growing compared to non-riparian trees (FEMA 2025).

Floodplain Mapping

The extent of the floodplain during a 1%-annual-chance flood is called the special flood hazard area and often is used as a regulatory boundary. Many communities have maps that show the extent and likely depth of flooding for the base flood. Corresponding water-surface elevations describe the elevation of water that will result from a given discharge level, which is used in estimating flood damage.

10.1.2 Coastal Flooding

Coastal floods are usually caused by coastal storms that, when combined with normal tides, push water toward the shore. This is commonly referred to as storm surge. The result can be waves that extend further inland, causing damage to development that would not normally be subject to wave action. Coastal floodplains are adjacent to the ocean and other tidally influenced areas. Like riverine floodplains, coastal floodplains may be broad or narrow, depending on local topography and natural flood defenses such as dune systems or tidal wetlands (NOAA n.d.).

10.1.3 Urban Flooding

Drainage facilities in urbanized areas consist of series of pipes, roadside ditches and channels. Urban flooding occurs when these conveyance systems lack the capacity to convey rainfall runoff to nearby creeks, streams and rivers. As drainage facilities are overwhelmed, roads and transportation corridors become conveyance facilities. The key factors that contribute to urban flooding are rainfall intensity and rainfall duration. Topography, soil conditions, urbanization and groundcover also play an important role.

Urban floods can be a great disturbance of daily life in urban areas. Roads can be blocked and people may be unable to go to work or school. Economic damage can be high, but the number of casualties is usually limited, depending on the nature of the flood. The water may rise relatively slowly and usually does not reach life endangering depths.

Urban floods can occur suddenly as flash floods after a brief but intense downpour. In these cases, they can move rapidly, end suddenly and occur in areas not generally associated with flooding (such as subdivisions not adjacent to a water body). Although the duration of these events is usually brief, the damage they cause can be severe (National Academies of Sciences 2019).

10.1.4 Secondary Hazards

The most problematic secondary hazard for riverine flooding is bank erosion, which can be more harmful than actual flooding. Floodwaters may scour stream banks, edging properties closer to the floodplain or causing them to fall in. Flooding is also responsible for hazards such as landslides when high flows over-saturate soils on steep slopes, causing them to fail. Hazardous materials spills are also a secondary hazard of flooding if storage tanks rupture and spill into streams, rivers or storm sewers. For more information on hazardous material spills, refer to Section 17.4.

10.2 HAZARD PROFILE

There are six types of flood events that can impact the planning area: riverine flooding, urban flooding, coastal flooding, tsunami flooding, flooding from sea level rise and flooding from a dam failure. This hazard profile focuses

on the coastal, riverine and urban flood hazards. Floods resulting from a dam failure are discussed in Chapter 6. Sea level rise is discussed in Chapter 13.Tsunami flooding is discussed in Chapter 14.

The major flooding causes in the District are short-duration, high-intensity storms. Water courses in the service area can flood in response to a succession of intense winter rainstorms, usually between early November and late March. A series of such weather events can cause severe flooding in the District due to the large percentage of impervious area and the age and capacity of the drainage system.

A series of storms that floods numerous drainage basins in a short time could overwhelm response and floodplain management capabilities within the District. Major roads could be blocked, preventing critical access to District assets, resulting in interruption of critical functions. High in-channel flows could cause water courses to scour, possibly washing out roads and creating more isolation problems. Floodplain management resources would not be able to make repairs quickly enough to restore critical facilities and infrastructure. Additionally, as ground becomes saturated, groundwater flooding issues typical for the District would be significantly enhanced.

10.2.1 Local Flooding Characteristics

Flood Timing and Causes

In areas such as Marin County that do not have extended periods of below-freezing temperatures or significant snowfall, floods usually occur during the season of highest precipitation or during heavy rainfalls after prolonged dry periods. Marin County is dry during late spring, summer and early fall and receives most of its rain during winter. Most rainfall occurs from November through April. Due to varying microclimates, inland-area rainfall during 2016-2017 ranged from 47 inches in Novato to over 82 inches in Kentfield. Along the coast, rainfall ranged from 36 inches at Oceana Marin to 45 inches at Point Reyes Station (County of Marin 2018, County of Marin 2023). All of Marin County's watersheds are small and largely prone to flash flooding.

In the Bay Area, winter storms represent significant flood risks. Flooding associated with severe storms has occurred nearly annually from 1950 to the present. Heavy rainfall brings many areas of localized flooding, especially in low-lying areas (Association of Bay Area Governments 2026).

Other types of flooding in Marin include isolated ponding and stormwater overflow. Isolated ponding is when pools form on the ground and can occur in any area that does not drain effectively—for example, in a natural depression in the landscape. Stormwater overflow is when storm drains back up. Stormwater drainage systems quickly convey rainwater through underground pipes to creeks and the Bay. When the storm drains are obstructed or broken or when the water bodies to which they lead are already full, water backs up onto the streets. Although stormwater overflow and isolated ponding occur throughout the County, the effects are typically not widespread or significantly damaging (County of Marin 2023).

Flood Protection

Several Marin communities, such as Tamalpais Valley, Santa Venetia, Corte Madera, Belvedere and parts of Strawberry, Novato and Ross Valley, are protected by levees. Levees are typically earthen embankments designed to contain, control or divert the flow of water to provide some level of protection from flooding. No levee system provides full protection from all flooding events to the people and structures located behind it. Some level of flood risk exists in the levee-protected areas. Except for one levee system in Novato-Hamilton, none of Marin County's levees are FEMA-accredited. Many were built decades ago without an engineered design by farmers or developers and material may have been added over the years (County of Marin 2018, County of Marin 2023).

The Marin County Flood Control and Water Conservation District maintains 3.6 miles of channels (17% of the total channel length) and related flood control infrastructure in the Southern Marin Watershed. The flood control district is divided into zones that perform functions such as the construction, operation and maintenance of levees,

pumping stations, culverts and drainage ways and the cleaning and maintenance of creeks. All major actions by the zones require authorization by the Board of Supervisors of the flood control district. Marin Water boundaries fall within five of the flood control district's zones (County of Marin 2023):

- **Zone 3, Richardson Bay—**Zone 3 covers over 13 square miles, including the City of Mill Valley and numerous unincorporated communities including Marin City, Alto, Sutton Manor, Almonte, Tamalpais Valley, Homestead Valley and portions of Strawberry Point. There are 12,560 parcels and the boundaries of the zone include the sub-watersheds of Arroyo Corte Madera del Presidio, Warner Creek and Coyote Creek, all of which drain to Richardson Bay.
- **Zone 4, Bel Aire—**Zone 4 is small, covering only 0.85 square miles and includes parts of the Town of Tiburon and Bel Aire and Strawberry Circle. There are 850 parcels in the zone and its boundaries include the sub-watersheds of East and West Creeks and Salt Works Canal, all of which drain to Richardson Bay.
- **Zone 6, San Rafael Meadows—**Zone 6 is the County's smallest flood control zone, covering only 0.16 square miles, entirely within the City of San Rafael. It was created in the 1960s to address frequent flooding in the low-lying neighborhood just west of Highway 101 across from the County Civic Center and occupies a very small part of the Gallinas Creek Watershed. The neighborhood was unincorporated when the zone was established but was later annexed by the City of San Rafael, which now owns and maintains the zone's drainage easements. There are 440 parcels in the zone.
- **Zone 7, Santa Venetia—**Zone 7 is the second-smallest flood control zone in the county and covers 0.42 square miles in entirely unincorporated lands in the community of Santa Venetia. There are 890 parcels in the zone. Santa Venetia was one of the first developments in Marin County to be constructed on fill over bay mud, which occurred in an era before the County had the authority to regulate or control development. Due to the low initial elevation of the fill and the compressible nature of the underlying bay mud, the area has subsided and is now below the high tide level.
- **Zone 9, Ross Valley—**Zone 9 covers 29 square miles, including the towns of Fairfax, San Anselmo, Ross and Larkspur as well as the unincorporated communities of San Anselmo, Fairfax, Kentfield and Greenbrae. There are 21,095 parcels in the zone. The zone boundary was amended in January 2007 to include all territories within the incorporated areas of the towns of San Anselmo and Fairfax. This change was undertaken in response to the flood of December 31, 2005 and the subsequent creation of the Ross Valley Flood Control and Watershed Program.

10.2.2 Past Events

Marin County has experienced 23 flooding events since 1969 for which federal disaster declarations and/or state proclamations were issued, as summarized in Table 10-1. Many flood events do not trigger federal disaster declaration or state proclamation protocol but have significant impacts on their communities. These events are also important to consider in establishing recurrence intervals for flooding. The sections below describe significant recent flood events in Marin County.

Table 10-1. History of Flood Events

Date	Federal Declaration	State Proclamation ?	Type of event
01/13 – 01/20/2026	-	-	County-proclaimed Flooding and Storms
02/21-07/10/2023	DR-4699	Yes	Severe Winter Storms, Straight-Line Winds, Flooding, Landslides and Mudslides
12/27/2022-01/31/2023	DR-4683	Yes	Severe Winter Storms, Flooding, Landslides and Mudslides

03/23/2022	-	Yes	Atmospheric River
02/24 – 03/01/2019	DR-4434	Yes	Severe Winter Storms, Flooding, Landslides and Mudslides
02/13 – 02/15/2019	DR-4431	Yes	Severe Winter Storms, Flooding, Landslides and Mudslides
02/01 – 02/23/2017	DR-4308	Yes	Severe Winter Storms, Flooding, Mudslides
01/03 – 01/12/2017	DR-4301	Yes	Severe Winter Storms, Flooding and Mudslides
03/29 – 04/16/2006	DR-1646	Yes	Severe Storms, Flooding, Landslides and Mudslides
12/17/2005 – 01/03/2006	DR-1628	Yes	Severe Storms, Flooding, Mudslides and Landslides
01/01/2003	-	Yes	State Road Damage - Flood
02/02 – 04/30/1998	DR-1203	Yes	Severe Winter Storms and Flooding
12/28/1996 – 04/01/1997	DR-1155	Yes	Severe Storms and Flooding
02/13 – 04/19/1995	DR-1046	Yes	Severe Winter Storms, Flooding, Landslides, Mud Flows
01/03 – 02/10/1995	DR-1044	Yes	Severe Winter Storms, Flooding, Landslides, Mud Flows
02/12 – 03/10/1986	DR-758	Yes	Severe Storms, Flooding
01/21 – 03/30/1983	DR-677	Yes	Coastal Storms, Floods, Slides, Tornadoes
12/19/1982 – 01/08/1983	DR-651	Yes	Severe Storms, Flood, Mudslides, High Tide
04/01/1980	-	Yes	1980 April Storms - Flood
01/01/1978	-	Yes	Heavy Rains - Flood
02/08/1973	DR-364	Yes	Severe Storms, High Tides, Flooding
02/16/1970	DR-283	Yes	Severe Storms, Flooding
01/26/1969	DR-253	Yes	Severe Storms, Flooding
12/22/1964 – 01/14/1965	DR-183	Yes	1964 Late Winter Storms

Source: (FEMA n.d.) (Cal OES 2026).

December 31, 2025 – January 5, 2026

Between December 31, 2025, and January 5, 2026, Marin County experienced severe compound flooding driven by a powerful atmospheric river that coincided with seasonal king tides and ground saturation from prior rainfall. The peak of the disaster occurred on January 3, 2026, when intense cloudbursts overwhelmed localized drainage systems, causing widespread overland flooding, creek overflows, and mudslides. The hazardous conditions were severely compounded in coastal and low-lying zones, where high-tide actions backwatered storm runoff and

prevented proper drainage into San Francisco and San Pablo Bays. The storm system caused an estimated $4.35 million in initial public infrastructure damages across the county, heavily impacting communities like Santa Venetia and disrupting critical transportation corridors. The severity of the impacts prompted Marin County to issue a local emergency proclamation on January 13, 2026.

February 21 – July 10, 2023

Additional severe winter storms impacted California with heavy rainfall, straight-line winds, flooding, landslides and mudslides. Repeated storm systems saturated soils, triggered slope failures and roadway erosion, damaged infrastructure, caused widespread power outages and extended recovery efforts in many communities already affected by the earlier winter storms (NOAA National Centers for Environmental Information n.d.).

December 27, 2022 – January 31, 2023

A series of powerful atmospheric river storms brought prolonged heavy rainfall across California, resulting in widespread flooding, landslides, mudslides, erosion, infrastructure damage, power outages and transportation disruptions. The event caused significant impacts to public facilities, roadways, drainage systems and residential properties throughout much of the state (NOAA National Centers for Environmental Information n.d.).

February 24 – March 1, 2019

On April 13, 2019, the state requested a major federal disaster declaration for Public Assistance due to severe winter storms, flooding, landslides and mudslides from February 24 to March 1, 2019. The request covered 19 counties, including Marin County (Federal Emergency Management Agency 2020).

February 13 – 15, 2019

The County of Marin proclaimed a local state of emergency on February 15, 2019, because of the severe impacts of storm damage. Beginning February 13, heavy rains combined with saturated ground and high tides to topple trees, as well as wash out County-maintained roads and creek banks. The impacts from the storm included mudslides and levee breaches. On February 14, stormwater exceeded the capacity of Novato Creek where it passes under Highway 37. Stormwater broke through the embankment on land owned by SMART along the south side of Highway 37. Flooding in the area stemmed from damage at that intersection (County of Marin 2019).

February 1 – 23, 2017

On March 19, 2017, the state requested a major federal disaster declaration for Public Assistance due to severe winter storms, flooding and mudslides during the period of February 1 to 23, 2017. The request covered 42 counties, including Marin County (Federal Emergency Management Agency 2020a).

January 3 – 12, 2017

On February 10, 2017, the state requested a major federal disaster declaration for Public Assistance due to severe winter storms, flooding and mudslides during the period of January 3 to 12, 2017. The request covered 34 counties, including Marin County (Federal Emergency Management Agency 2020b).

December 2005/January 2006, April 2006

The storms of December 2005, January 2006 and April 2006 generated damage at 151 locations, including an estimated $15 million in damage to County-maintained property. Of that, $10 million eventually was reimbursed by the state or federal government (County of Marin 2017).

10.2.3 Location

FEMA Digital Flood Insurance Rate Maps (DFIRMs) provide the official delineation of Special Flood Hazard Areas (SFHAs) in Marin County (see Figure 10-1) and serve as the basis for the exposure and vulnerability analyses presented in this chapter. DFIRMs identify floodways, coastal flood hazard areas, shallow flooding areas and other mapped flood risks. While these maps represent the best available FEMA flood hazard information, they may not capture all sources of flooding, including localized drainage issues, future sea level rise impacts or other flood hazards that fall outside FEMA's mapping program.

10.2.4 Future Conditions

Probability

Marin County has experienced 16 flood events that triggered a federal disaster declaration since 1969 an average of one such flood event every 3.25 years. Records show that the County can expect to experience some degree of localized flooding annually.

The chance of heavy flooding and flash flooding is greatest during California's rainy season from November to April. However, the diversity of climate patterns in California makes flooding more than a seasonal risk. The following are some of the weather and climate conditions that have a significant impact on the occurrence of flooding (Cal OES 2023):

- El Niño conditions
- La Niña conditions
- Desert monsoons
- Tropical storms
- Gulf of Alaska storms
- Atmospheric river patterns

The number of years between floods of any given size varies because of the natural variations in climate and weather events. FEMA conducts flood studies that use historical records to determine the probability of occurrence for different flood levels in a community. FEMA FIRMs identify the flood hazard area as the area that would be inundated by a flood with a 1% chance of occurring in any given year (the 1% annual chance flood). FIRMs also typically show the extent of the flood with a 0.2% chance of occurring in any given year (0.2% annual chance flood). These measurements reflect statistical averages only and it is possible for two or more floods with a 1% annual chance to occur in a short time period (USGS n.d.). Table 10-2 summarizes the concept of recurrence intervals and probabilities.

Table 10-2. Flood Recurrence Intervals and Probabilities of Occurrence

Recurrence Interval (in years)	Probability of Being Equaled or Exceeded in Any Given Year	Percent Chance of Being Equaled or Exceeded in Any Given Year
100	1 in 100	1%
50	1 in 50	2%
25	1 in 25	4%
10	1 in 10	10%
5	1 in 5	20%

Source: (USGS n.d.).

Climate Change

Use of historical hydrologic data has long been the standard of practice for designing and operating water supply and flood protection projects. For example, historical data are used for flood forecasting models and to forecast runoff for water supply. This method of forecasting assumes that the climate of the future will be similar to that of the period of historical record. However, the hydrologic record cannot be used to predict changes in frequency and severity of extreme climate events such as floods. Going forward, model calibration or statistical relation development must happen more frequently, new forecast-based tools must be developed and a standard of practice that explicitly considers climate change must be adopted. Climate change is already impacting water resources and resource managers have observed the following (U.S. Department of the Interior 2011):

- Historical hydrologic patterns can no longer be solely relied upon to forecast the water future.
- Precipitation and runoff patterns are changing, increasing the uncertainty for water supply and quality, flood management and ecosystem functions.
- Extreme climatic events will become more frequent, necessitating improvement in flood protection, drought preparedness and emergency response.

High frequency flood events (e.g., 10-year floods) will likely increase with a changing climate. Scientists are projecting greater storm intensity, resulting in more direct runoff and flooding. Changes in watershed vegetation and soil moisture conditions will also change runoff and recharge patterns. As stream flows and velocities change, erosion patterns will change, altering channel shapes and depths, possibly increasing sedimentation behind dams. With potential increases in the frequency and intensity of wildfires due to climate change, there is potential for more floods following fire, which increase sediment loads and water quality impacts.

Property exposure and vulnerability to the flood hazard may increase as a result of climate change impacts. As hydrology changes, what is currently considered a 1%-annual-chance (100-year flood) may strike more often, leaving many communities at greater risk. Runoff patterns may change, resulting in risk to facilities that have not historically been at risk from flooding. Additionally, changes in the management and design of flood protection for critical facilities may be needed as additional stress is placed on these systems.

10.2.5 Extent

The principal factors affecting flood damage are flood depth and velocity. The deeper and faster flood flows become, the more damage they can cause. Shallow flooding with high velocities can cause as much damage as deep flooding with slow velocity. This is especially true when a channel migrates over a broad floodplain, redirecting high velocity flows and transporting debris and sediment.

FEMA calculates peak flows, in cubic feet per second, on local rivers and streams to develop its flood maps. Those flow rates indicate how much water is conveyed down each stream's channel at one or more locations for various flood levels. These flow values do not directly indicate flood severity, since the flooding associated with them depends on how much flow can be contained within the stream channel. However, they do allow an assessment of the relative flood flows between different streams and between different flood recurrence levels (from the 10-year flood to the 500-year flood). Peak stream flows used in the FEMA flood study for Marin County are listed in Table 10-3.

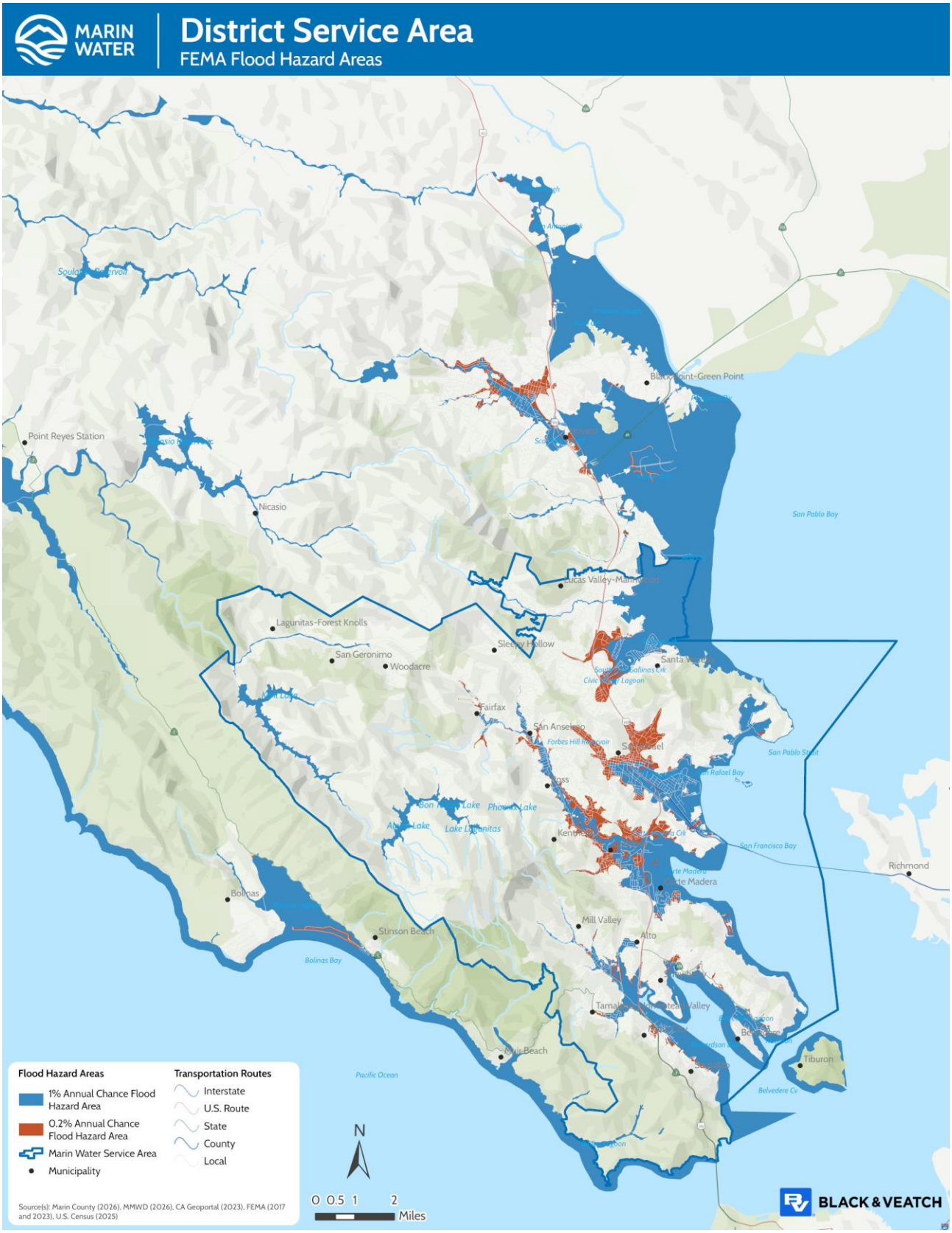


Figure 10-1. Flood Hazard Areas

Table 10-3. Summary of Peak Discharges in the Planning Area

Source/Location	Drainage Area (square miles)	Discharge (cubic feet/second) 10-Year	50-Year	100-Year	500-Year
ARROYO AVICHI					
At Novato Creek	1.78	550	770	890	1,140
ARROYO CORTE MADERA DEL PRESIDIO CREEK					
At Northwestern Pacific Railroad	6.01	1,440	2,330	2,710	3,550
At Stream Gaging Station	4.69	1,120	1,810	2,110	2,760
Downstream of La Goma Street	4..69	594	840	930	1,094
Just upstream of confluence with Warner Canyon Creek	3.62	900	1,460	1,700	2,220
Just upstream of confluence with Old Mill Creek	1.54	380	610	710	2,200
ARROYO SAN JOSE					
Approximately 1,800 feet downstream of Bel Marin Keys bridge	5.4	1,200	1,900	2,300	2,900
At U.S. Highway 101	5.4	1,200	1,900	2,300	2,900
CORTE MADERA CREEK					
At U.S. Highway 101	24.7	5,500	8,000	9,000	2,900
At Bon Air Road	21.6	5,000	7,400	8,300	9,000
At Tamalpais Creek	20.2	8,800	7,100	8,000	8,700
Above confluence of Tamalpais Creek	18.1	4,300	6,400	7,300	8,000
At the City of San Anselmo/Town of Ross corporate limits	14.4	3,200	4,700	5,300	6,800
COYOTE CREEK					
At State Highway 1 bridge	3.48	1,240	1,860	2,100	2,630
Downstream of confluence with Tennessee Creek	3.37	1,200	1,800	2,040	2,550
At Ash Street	1.32	540	800	910	1,130
CREST MARIN CREEK					
Upstream of confluence with Tennessee Creek	0.30	110	160	180	240
ESKOOT CREEK					
At Bolinas Lagoon	1.59	666	970	1,090	1,350
At State Highway 1	1.32	540	810	910	1,130
FAIRFAX CREEK					
Confluence with San Anselmo Creek	4.10	810	1,450	1,720	2,400
White Hill School (near Town of Fairfax corporate limits)	1.8	450	770	960	1,600
IGNACIO CREEK					
At confluence with Arroyo San Jose	1.3	400	650	800	1000
KITTLE CREEK					
At Sir Francis Drake Boulevard	0.28	70	135	150	290
At Walters Road	0.25	60	115	150	260
LAGUNITAS CREEK					
At Point Reyes Station Bridge	107.3	14,700	25,000	28,050	34,840

Source/Location	Drainage Area (square miles)	Discharge (cubic feet/second) 10-Year	50-Year	100-Year	500-Year
MURPHY CREEK					
At Brookwood Lane	0.15	50	90	115	190
NOVATO CREEK					
Downstream of confluence of Arroyo Avichi	25.40	3,420	5,140	6,230	8,150
Downstream of confluence of Warner Creek	23.62	3,110	4,690	5,690	7,460
At upstream corporate limits of City of Novato	13.80	1,300	2,100	2,500	3,800
At Stafford Dam	8.4	1,330	1,980	2,340	3,360
OLD MILL CREEK					
At confluence with Arroyo Corte Madera del Presidio Creek	1.85	470	750	870	1,140
OLEMA CREEK					
At Bear Valley Road Bridge	14.6	3,590	5,150	5,720	6,810
PACHECO CREEK					
At Northwestern Pacific Railroad	1.69	470	670	770	980
REED CREEK					
At Evergreen Avenue	0.84	250	380	430	540
ROSS CREEK					
At confluence with Corte Madera	3.00	720	1,220	1,400	2,000
At corporate limits of Town of Ross	2.15	500	850	990	1,500
SAN ANSELMO CREEK					
Mouth of Fairfax Creek	9.00	1,970	3,100	3,500	4,500
Mouth of Deer Park Creek	4.96	1,080	1,780	2,100	3,000
Mouth of Wood Lane Drainage	4.19	930	1,620	1,900	2,780
At corporate limits of Town of Fairfax	3.10	725	1,300	1,480	2,100
SAN RAFAEL CREEK					
At Grand Avenue	4.3	1,430	1,865	1,995	2,500
At Lindaro Street	1.8	640	670	690	600
Upstream end of 2nd Street culvert	1.3	400	705	830	1,100
SUTTON-MANOR CREEK					
At the Mouth	1.00	300	535	625	765
TENNESSEE CREEK					
Upstream of confluence with Coyote Creek	1.81	550	840	960	1,220
Upstream of confluence with Crest Marin Creek	1.51	440	680	780	980
VINEYARD CREEK					
At mouth	2.60	580	830	960	1,230
WARNER CANYON CREEK					
At confluence with Arroyo Corte Madera del Presidio	0.98	210	330	390	500
WARNER CREEK					
Upstream of confluence of Novato Creek	5.18	1,260	1,800	2,080	2,680
Downstream of confluence of Wilson Creek	4.47	1,80	1,540	1,770	2,280

Source/Location	Drainage Area (square miles)	Discharge (cubic feet/second) 10-Year	50-Year	100-Year	500-Year
WILSON CREEK					
At the mouth	1.88	520	750	860	1,100
At Mill Road	1.42	470	680	780	1,000

Source: (FEMA 2017)

Warning Time

The warning time that a community has to take action to protect lives and property from a flooding threat is a function of the time between the first predictions of heavy rainfall, the first rainfall and the first occurrence of flooding. Each watershed has unique qualities that affect its response to rainfall. A hydrograph, which is a graph or chart of stream flow in relation to time (see Figure 10-2), is a useful tool for examining a stream's response to rainfall. Once rainfall starts falling over a watershed, runoff begins and the stream begins to rise. Water depth in the stream channel (stage of flow) will continue to rise in response to runoff even after rainfall ends. Eventually, the runoff will reach a peak and the stage of flow will crest. At this peak, the stream stage remains at a constant level until it begins to fall and eventually subside to a level below flooding stage. The length of time that floodwaters remain above flood stage is an important characteristic of the flood hazard.

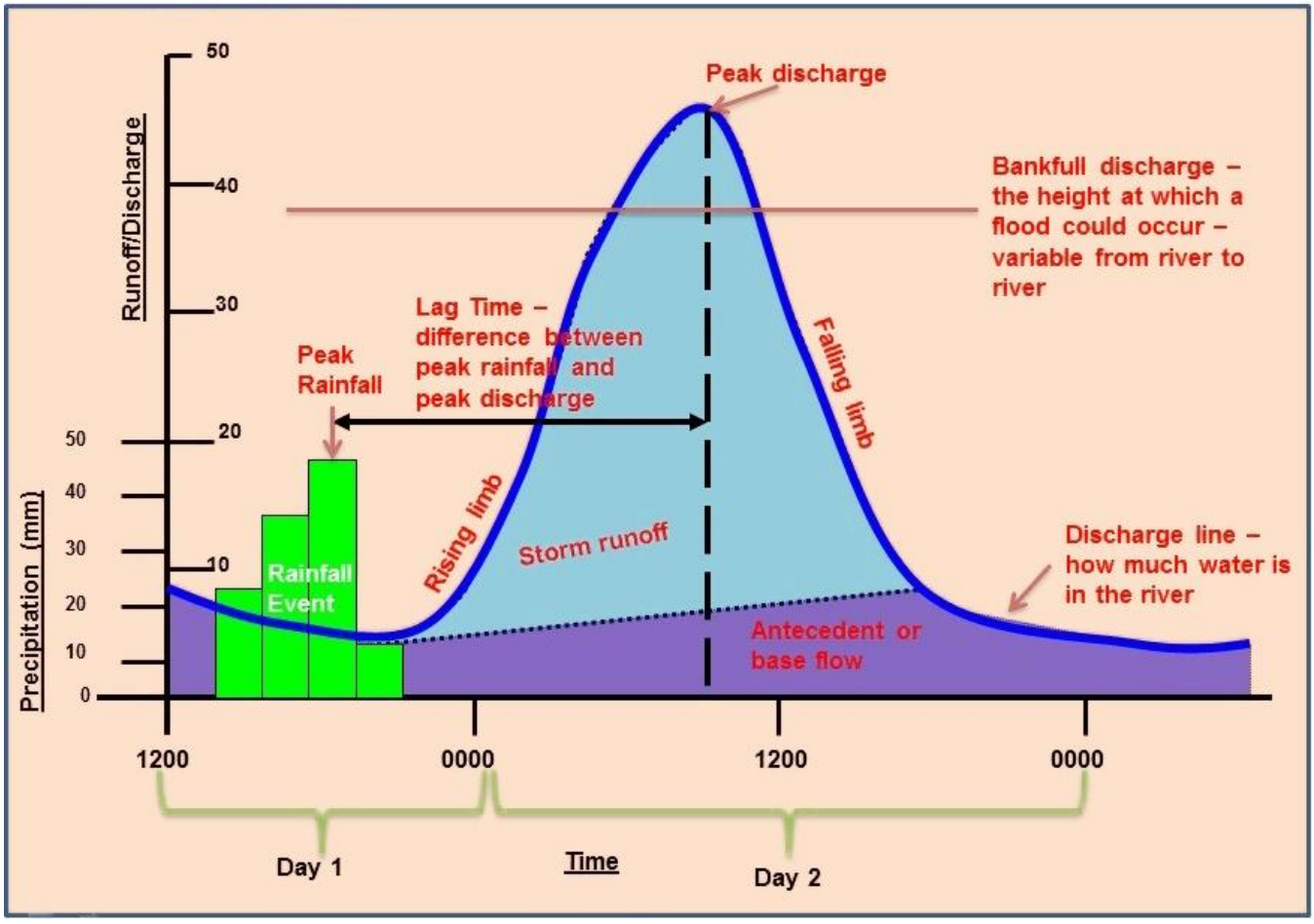


Figure 10-2. Example Hydrograph

Due to the sequential pattern of meteorological conditions needed to cause serious flooding, it is unusual for a flood to occur without warning. Warning times for river and stream floods can be between 24 and 48 hours. Flash flooding can be less predictable, but communities can be warned of the potential for flash flooding to occur.

To provide quantitative information for flood warning and detection, Marin County uses several systems to alert residents. The Marin County Sheriff's Office of Emergency Services (OES) is an approved "alerting authority" for the Emergency Alert System and for Wireless Emergency Alerts. The OES also uses the AlertMarin Emergency Notification System to deliver incident-specific information or potentially life-saving instruction to the precise geographic areas affected. Anyone 18 and over who lives, works or attends school in Marin County can register their cell phone for AlertMarin. Agencies across the County also use the Nixle alert system to disseminate zip code specific information, as well as post-disaster information about logistics and any issues affecting larger areas (road closures, updates, etc.) (Marin County Sheriff's Office 2021).

10.3 VULNERABILITY ASSESSMENT

The risk assessment for flood evaluated District assets that lie within the 1%-annual-chance and 0.2%-annual-chance flood zones shown in Figure 10-1. Table 10-4 and Table 10-5 summarize the number of each type of facility found to be within the flood hazard area and the total replacement cost value of those exposed facilities.

The flood module of Hazus was used for a Level 2 assessment of vulnerability to the flood hazard. Hazus estimated damage to critical District assets from the 1%-annual-chance flood as follows:

- 3 buildings with an average of 8% estimated damage equal to $126,421 potential loss
- 1 potable water pump station with 40% estimated damage equal to $2 million potential loss
- 1 raw water pump station with 40% estimated damage equal to $2 million potential loss

Hazus estimated damage to critical District assets from the 0.2%-annual-chance flood as follows:

- 7 buildings with an average of 36% estimated damage equal to $14.5 million potential loss
- 1 potable water pump station with 40% estimated damage equal to $2 million potential loss
- 1 raw water pump station with 40% estimated damage equal to $2 million potential loss

Detailed results for each facility are provided in Appendix E.

The exposure analysis included the District's pipeline assets. While most of these assets are underground and not susceptible to impacts from flood events, there are sections of pipelines that are exposed as they cross drainageways and channels. The exact location of these exposed pipelines was not available in a geospatial dataset to support this exposure analysis.

Table 10-4. Marin Water Structures and Facilities Exposed to the Flood Hazard

Structures/Facilities	Quantity	Estimated Replacement Cost Value	% of Total Structures/Facilities Exposed
1%-Annual-Chance			
Buildings	3	$1,800,000	12.%
Potable Water Structures	14,759	$25,420,000	7%
Raw Water Facilities	50	$20,046,000	48%
Recycled Water Structures	25	$16,600	1%
Total	**14,837**	**$47,282,600**	
0.2%-Annual-Chance			
Buildings	8	$44,100,000	32%
Potable Water Structures	26,536	$42,724,000	12%
Raw Water Facilities	51	$20,047,000	48%

Structures/Facilities	Quantity	Estimated Replacement Cost Value	% of Total Structures/Facilities Exposed
Recycled Water Structures	220	$146,000	9%
Total	**26,815**	**$107,017,000**	

Table 10-5. Marin Water Pipelines Exposed to the Flood Hazard

Pipelines	Length in Miles	Estimated Replacement Cost Value	% of Total Pipelines Exposed
1%-Annual-Chance			
Potable Water	141.7	$347,781,000	10%
Raw Water	5.4	$21,572,000	19%
Recycled Water	1.2	$3,376,000	3%
Total	**148.3**	**$372,729,000**	
0.2%-Annual-Chance			
Potable Water	257.5	$640,504,000	19%
Raw Water	5.4	$21,572,000	19%
Recycled Water	7.0	$18,761,000	23%
Total	**269.9**	**$680,837,000**	

10.4 DEVELOPMENT TRENDS

The demand for critical services may increase with growth in the surrounding area. The State of California's adoption of bills expanding property owners' rights to build accessory dwelling units will increase densities in most of the District's service area.

Per Government code 53091(d) District facilities required for the production, generation, storage, treatment, or transmission of water are exempt from building codes. For structures that are governed by codes and standards, Marin Water will repair or replace structures in accordance with the 2025 California Building Code adopted by the jurisdiction where the structure is located. The County and all its incorporated cities participate in the National Flood Insurance Program (NFIP) and have adopted floodplain management standards pursuant to that program's requirements. Applications of these codes and standards to any applicable new or redeveloped assets will reduce the risk of potential impacts from flood.

10.5 ISSUES

The planning team has identified the following flood-related issues relevant to the planning area:

1. **Inadequate flood hazard mapping:** Currently effective flood hazard mapping does not accurately reflect the true flood risk in the District service area, as FEMA mapping does not recognize flooding associated with urban drainage issues.
2. **Reduced effectiveness of planning tools:** Planning tools that depend on flood hazard mapping are less effective due to deficiencies in the currently available mapping.
3. **Insufficient historical damage data collection:** The District lacks a sustained effort to gather historical damage data, such as high water marks and damage reports, needed to measure the cost-effectiveness of future mitigation projects.

4. **Multi-source funding needs for mitigation:** Ongoing flood hazard mitigation will require funding from multiple sources.
5. **Limited interjurisdictional coordination:** There is limited hazard mitigation coordination between jurisdictions affected by flood hazards across Marin County.
6. **Gaps in floodplain resident education:** Floodplain residents need continued education about flood preparedness and available resources during and after floods through interagency coordination.
7. **Low property owner concern limits political will:** A lack of concern regarding flood risk among property owners can translate into a lack of political will to make changes.
8. **Limited access to critical systems during flood events:** Access to SCADA and the emergency operations center needs improvement during flood events.
9. **Limited understanding of climate change impacts on flooding:** The potential impact of climate change on flood conditions needs to be better understood for future risk analysis.
10. **Underutilized floodplain restoration opportunities:** Floodplain restoration and reconnection opportunities have not been identified as a means to reduce flood risk.
11. **Unresolved post-flood recovery procedures:** Post-flood disaster response and recovery actions need to be solidified.
12. **Fragmented floodplain management coordination:** Floodplain management actions require improved interagency coordination.
13. **Declining open space and increased runoff:** Open spaces available for infiltration have decreased substantially with no plans to reverse this trend and increased impervious surface is leading to more runoff.

10.6 MITIGATION OPPORTUNITIES

Local Plan Requirement C3 – 44 CFR Part 201.6(c)(3)(ii)

The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effect of each hazard, with particular emphasis on new and existing buildings and infrastructure.

Flooding can inundate pump stations and treatment facilities, scour pipeline creek crossings, cut off access to critical sites and overwhelm treatment processes with turbidity and debris. The alternatives presented below address both the protection of District assets and the District's role as a partner in watershed and floodplain management. The table organizes these alternatives by the scale at which they can be carried out and by mitigation category.

Table 10-6. Potential Opportunities to Mitigate the Flood Hazard

Community / Customer Scale	Utility Operational Scale
Manipulate the Hazard	

Community / Customer Scale	Utility Operational Scale
• Clear storm drains and culverts on your property • Use low-impact development techniques such as rain gardens and permeable surfaces • Capture and reuse rainwater to reduce runoff and supplement outdoor water use	• Maintain culverts, ditches and drainage crossings along District access and watershed roads • Use low-impact development and green infrastructure techniques on District property • Control road and site drainage to reduce erosion and sediment delivery to reservoirs • Provide bank stabilization, revetment or scour protection where pipelines and facilities are exposed to stream flows • Manage reservoir operations and releases to balance flood, supply and fishery needs • Restore and reconnect floodplains on District watershed lands that have been degraded by development and structural flood control • Retain vacant District land in open space and vegetated cover to control increases in runoff
Reduce Exposure and Vulnerability	
• Locate outside of the hazard area • Elevate utilities, meters, pumps and backflow assemblies above base flood elevation • Raise structures above base flood elevation and flood-proof where relocation is not feasible • Protect private wells and plumbing from floodwater contamination and install backflow prevention • Use low-impact development techniques	• Locate new facilities outside of the floodplain • Relocate critical water system facilities outside of the hazard area • Elevate or flood-proof electrical gear, controls, chemical storage and standby power at pump stations and treatment plants • Build critical function redundancy or retrofit critical buildings • Provide flood-proofing when new critical infrastructure must be located in floodplains • Harden and protect pipeline creek crossings, exposed mains and bridge-mounted pipelines against scour and debris impact • Use soft approaches for stream bank restoration and hardening where District assets are threatened • Elevate or relocate access roads needed to reach tanks, pump stations and treatment plants during flooding • Protect raw water intakes and treatment processes from high turbidity and debris loading • Provide redundancy for critical functions and infrastructure, including alternate supply and transmission routes • Adopt freeboard and other higher design standards for new and replacement District facilities in flood-prone areas • Design or upgrade site drainage to convey larger design storms • Improve unpaved watershed and access roads to reduce their likelihood of failing during floods • Incorporate green infrastructure into stormwater management facilities • Protect and restore riparian buffers on District lands • Support “no adverse impact” floodplain management so that District and partner projects do not increase downstream flood risk

Community / Customer Scale	Utility Operational Scale
	Build Local Capacity
• Buy flood insurance • Develop a household plan that includes 72-hour self-sufficiency and stored drinking water in case service or access is disrupted • Report main breaks, sinkholes and washouts to the District promptly	• Maintain reserve funds and emergency contracts for flood response and repair • Train crews on flood response, dewatering and system isolation procedures • Solicit cost sharing through partnerships on projects with multiple benefits, such as habitat and flood risk reduction • Map District assets against current flood hazard data and maintain the results in the asset management system • Provide technical information and guidance to local floodplain managers on water system exposure • Incorporate retrofitting or replacement of flood-exposed system elements in the capital improvement program • Develop a strategy to take advantage of post-disaster funding opportunities • Warehouse critical infrastructure components and pre-position pumps, sandbags and portable generators • Develop and adopt a continuity of operations plan • Maintain and collect data to define flood risk and vulnerability to the water system • Use streamflow, reservoir and precipitation gauge networks and National Weather Service forecasts to trigger preparedness actions • Develop and implement a public information strategy for flood-related service disruptions and water quality advisories • Integrate floodplain management and flood risk considerations into District planning mechanisms, including the urban water management plan and asset management program • Consider the impacts of climate change, including more intense atmospheric river events, on flood risk • Consider the residual risk associated with structural flood control in siting and design decisions • Coordinate with the County and cities on flood warning, road closures and access to critical facilities

11. HIGH WIND

11.1 GENERAL BACKGROUND

High winds are generally short-duration events involving straight-line winds or gusts of over 60 mph, strong enough to cause property damage. Straight-line wind is any wind that is not associated with rotation; this term is used mainly to differentiate from tornadic winds. Most thunderstorms produce some straight-line winds because of outflow generated by the thunderstorm downdraft.

High winds are especially dangerous in areas with significant tree stands and areas with exposed property, poorly constructed buildings, manufactured housing units, major infrastructure and above-ground utility lines. A windstorm can topple trees and power lines, cause damage to residential, commercial and critical facilities and leave tons of debris in its wake.

Types of Damaging Winds

Damaging winds are classified as those exceeding 60 mph. Damage from such winds is more common than damage from tornadoes. Wind speeds can reach up to 100 mph and can produce a damage path extending for hundreds of miles. Damaging straight-line winds include the following (NOAA n.d.):

- **Downdraft**—A small-scale column of air that rapidly sinks toward the ground.
- **Downburst**—A strong downdraft with horizontal dimensions larger than 2.5 miles resulting in an outward burst or damaging winds on or near the ground. Downburst winds may begin as a microburst and spread out over a wider area, sometimes producing damage similar to a strong tornado. Although usually associated with thunderstorms, downbursts can occur with showers too weak to produce thunder.
- **Microburst**—A small, concentrated downburst that produces an outward burst of damaging winds at the surface. Microbursts are generally less than 2.5 miles across and short-lived, lasting only 5 to 10 minutes, with maximum wind speeds up to 168 mph.
- **Gust front**—The leading edge of rain-cooled air that clashes with warmer thunderstorm inflow. Gust fronts are characterized by a wind shift, temperature drop and gusty winds out ahead of a thunderstorm. Sometimes the winds push up air above them, forming a shelf cloud or detached roll cloud.
- **Derecho**—A widespread thunderstorm wind caused when new thunderstorms form along the leading edge of an outflow boundary (the boundary formed by horizontal spreading of thunderstorm-cooled air). The word "derecho" is of Spanish origin and means "straight ahead." Thunderstorms feed on the boundary and continue to reproduce. Derechos typically occur in summer when complexes of thunderstorms form over plains, producing heavy rain and severe wind. The damaging winds can last a long time and cover a large area.
- **Bow Echo**—A linear wind front bent outward in a bow shape. Damaging straight-line winds often occur near the center of a bow echo. Bow echoes can be 200 miles long, last for several hours and produce extensive wind damage at the ground.
- **Tornado**—A narrow, violently rotating column of air that extends from a thunderstorm to the ground. Because wind is invisible, it is hard to see a tornado unless it forms a condensation funnel made up of water droplets, dust and debris. Tornadoes can be among the most violent phenomena of all atmospheric storms we experience.

Rating Wind Strength

As shown in Table 11-1, the Beaufort Wind Scale is an empirical measure that relates wind speed to observed conditions at sea or on land.

Table 11-1. Beaufort Wind Scale

Beaufort Number	Speed (mph)	Terminology	Description
0	0	Calm	Calm. Smoke rises vertically.
1	1-3	Light air	Wind motion visible in smoke.
2	4-7	Light breeze	Wind felt on exposed skin. Leaves rustle.
3	8-12	Gentle breeze	Leaves and smaller twigs in constant motion.
4	13-18	Moderate breeze	Dust and loose paper is raised. Small branches begin to move.
5	19-24	Fresh breeze	Smaller trees sway.
6	25-31	Strong breeze	Large branches in motion. Whistling heard in overhead wires. Umbrella use is difficult.
7	32-38	Near gale	Whole trees in motion. Some difficulty when walking into the wind.
8	39-46	Gale	Twigs broken from trees. Cars veer on road.
9	47-54	Severe gale	Light structure damage.
10	55-63	Storm	Trees uprooted. Considerable structural damage.
11	64-73	Violent storm	Widespread structural damage.
12	>73	Hurricane	Considerable and widespread damage to structures.

Source: (NOAA NWS n.d.)

11.1.2 Public Safety Power Shutoffs

Under certain severe weather conditions, utility service providers shut off power to help prevent wildfire and keep communities safe. A combination of dry vegetation and high winds can uproot trees, blow branches onto power lines or create sparks if power lines contact one another. These conditions call for a public safety power shutoff (PSPS). These outages occur across the state to prevent wildfires and keep communities safe. Due to the grid nature of electrical power distribution systems, they can impact areas beyond where severe weather conditions are being observed. Sustained periods of downtime could lead to significant economic impacts. Pacific Gas and Electric Company is expanding its Community Wildfire Safety Program that includes PSPS events when extreme fire danger conditions are forecasted (PG&E n.d.). Figure 11-1 shows the factors considered by utility service providers that trigger PSPS events.

Source: (PGE 2024)

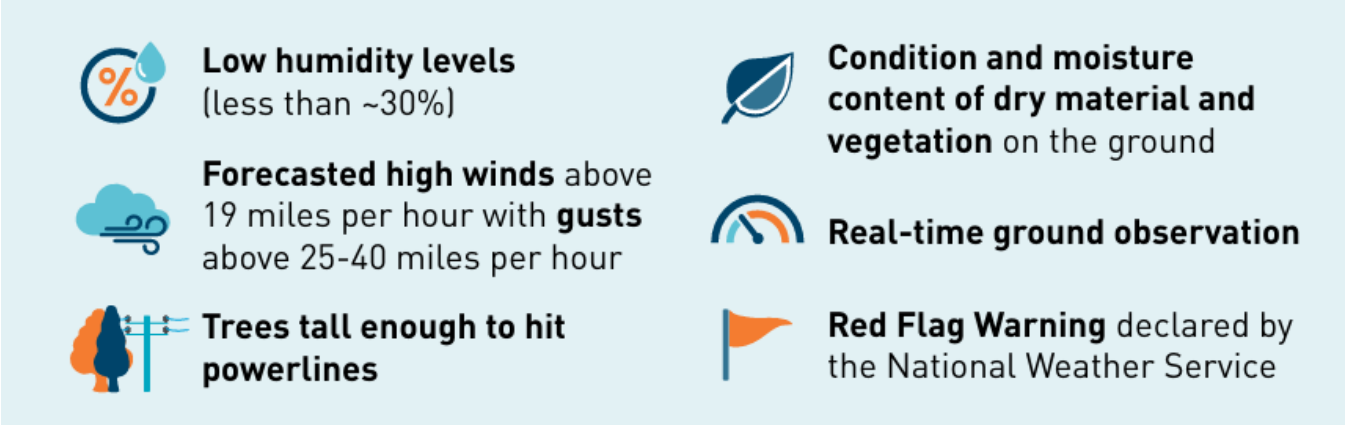


Figure 11-1. Factors Considered for a Public Safety Power Shutoff

11.1.3 Secondary Hazards

High winds can create conditions that can lead to a major wildfire. For more information on wildfire, refer to Chapter 15.

11.2 HAZARD PROFILE

11.2.1 Past Events

Marin County has not been included in any federal declarations or state proclamations for high winds, however many of the storm and flood declarations may have included high winds so the hazard may be underreported in declared events (FEMA n.d.) (Cal OES 2026). The National Centers for Environmental Information storm event database lists the following high wind events in the planning area (NOAA NCEI 2026):

- Marin County experienced the following wind events from 2020 to current:
    - 30 high wind events, with 1 categorized as a damaging wind event
    - 3 thunderstorm events, with none categorized as damaging wind events

11.2.2 Location

High wind events have the potential to happen anywhere in the planning area.

11.2.3 Future Conditions

Probability

Recent records documented 33 high wind events have occurred over about five years since the last plan was developed, indicating that high wind events occur multiple times per year on average (NOAA NCEI 2026). Based on this documented history, high wind events are expected to continue occurring every year throughout the planning area and represent an ongoing hazard.

Climate Change

The Bay Area's largest winter storms will likely become more intense and potentially more damaging, in the coming decades (California's Fourth Climate Change Assessment 2018). It is uncertain whether high wind events are becoming more or less frequent under a changing climate. However, impacts from climate change are increasing the intensity and frequence of wildfires which spread quickly by high winds.

11.2.4 Extent

The most common problems associated with severe winds are blocked transportation routes and loss of function for utilities caused by power outage. Fatalities are uncommon but can occur. Power lines may be downed due to high winds and services such as water or phone may not be able to operate without power. Physical damage to homes and facilities can be caused by wind induced falling objects such as trees. High winds are a frequent problem in the planning area and have been known to damage utilities. The wind speed given in wind warnings issued by the NWS is for a one-minute average; gusts may be 25 to 30% higher.

Warning Time

Meteorologists can often predict the likelihood of high winds. This can give several days of warning time. However, meteorologists cannot predict the exact time of onset of any given weather condition. Some events may come on more quickly and have only a few hours of warning time. The NWS issues advisories, watches and warnings associated with wind as listed in Table 11-2.

Table 11-2. NWS Weather Warnings, Watches and Advisories

	Warning	Watch	Advisory
Wind[a]	Strong sustained winds for one hour or longer or wind gusts for any duration that are not associated with thunderstorms are occurring or will occur within six to 12 hours	Strong sustained winds for one hour or longer or wind gusts for any duration that are not associated with thunderstorms are occurring or will occur within 12 to 48 hours	Strong winds are occurring or will occur within 12 to 24 hours but are not so strong as to warrant a high wind warning

Source: (NWS n.d.)
a. NWS offices issue wind-related products based on local criteria for strong sustained winds or gusts

11.3 VULNERABILITY ASSESSMENT

It can be assumed that all District assets are exposed to some extent to high wind events. Facilities on higher ground may be exposed to wind damage or damage from falling trees.

High wind vulnerability is tied predominantly to the loss of power, as most of the District's critical facilities are power dependent. Weather-induced loss of power for the planning area is prevalent, especially considering the impact of Public Safety Power Shutoff protocols being deployed by electric utility service providers in California. The Public Safety Power Shutoff is a procedure in which a utility service provider may turn off electricity in the interest of public safety if severe weather threatens a portion of the electric system. The District has backup power for most but not all of its critical facilities, so there is some degree of vulnerability associated with this core capability. There are portable sources for emergency power supply, but these sources are not as efficient as fixed-place backup power for each facility.

11.4 DEVELOPMENT TRENDS

The demand for critical services may increase with growth in the surrounding area. The State of California's adoption of bills expanding property owners' rights to build accessory dwelling units will increase densities in most of the Marin Water service area.

Per Government code 53091(d) District facilities required for the production, generation, storage, treatment, or transmission of water are exempt from building codes. For structures that are governed by codes and standards, Marin Water will repair or replace applicable structures in accordance with the 2025 California Building Code adopted by the jurisdiction where the structure is located. The building code includes provisions for mitigating the impacts from high winds.

11.5 ISSUES

Important issues associated with a high wind event in the planning area include the following:

1. **Limited backup power capacity:** The District's backup power capability may be insufficient to maintain reliable operations during high wind events that cause power outages or public safety power shutoffs.

2. **Tree fall risk from drought-stressed vegetation:** Dead or dying trees caused by drought conditions are more susceptible to falling during high wind events, which could damage District infrastructure, block access routes and disrupt operations.
3. **Increasing high wind risk from climate change:** High wind events may become more frequent or severe as climate change affects atmospheric conditions, increasing risks to District facilities, power reliability and continuity of water service.
4. **Localized tornado risk:** Although tornadoes are rare in the District's service area, past occurrences indicate a potential hazard that could cause localized damage to District facilities and operations.

11.6 MITIGATION OPPORTUNITIES

Local Plan Requirement C3 – 44 CFR Part 201.6(c)(3)(ii)

The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effect of each hazard, with particular emphasis on new and existing buildings and infrastructure.

High wind events bring down trees and power lines, interrupting the electrical service that pumping, treatment and control systems depend on and can damage exposed equipment and communication facilities. The alternatives presented below focus on vegetation management, power and communication redundancy and coordination with the electric utility on outage notification and restoration. The table organizes these alternatives by the scale at which they can be carried out and by mitigation category.

Table 11-3. Potential Opportunities to Mitigate the High Wind Hazard

Community / Customer Scale	Utility Operational Scale
Manipulate the Hazard	
• Remove or prune hazard trees and limbs that could fall on structures, power lines or water facilities • Follow "right tree, right place" guidance when planting near overhead utility lines	• Conduct routine vegetation management and hazard tree removal along District access roads, easements and electrical service corridors • Maintain clearance around tanks, pump stations, communication sites and treatment plants • Coordinate with the electric utility on line clearance and circuit reliability work affecting District facilities

Community / Customer Scale	Utility Operational Scale
Reduce Exposure and Vulnerability	
• Provide redundant power for private wells, boosters and fire pumps • Plant appropriate trees near homes and power lines ("right tree, right place," National Arbor Day Foundation program) • Secure loose outdoor items, roofing and equipment that can become windborne debris • Store an emergency water supply in case a wind event or public safety power shutoff disrupts service	• Install permanent standby generators, transfer switches and quick-connect receptacles at tanks and pump stations • Design roofs, doors, chemical tanks and appurtenances at District sites to withstand high wind loads • Harden radio, antenna and communication towers that support the control system • Harden infrastructure, including undergrounding utilities serving critical water facilities • Trim trees back from power lines and District facilities • Maintain operational storage and gravity-fed service capability so that pressure zones can ride through extended outages • Provide redundant communications for supervisory control and data acquisition and field crews • Use the best available technology to enhance warning systems for all severe weather events
Build Local Capacity	
• Trim or remove trees that could affect power lines and water service connections • Promote 72-hour self-sufficiency, including stored drinking water • Obtain a NOAA weather radio and sign up for utility outage and public safety power shutoff alerts • Obtain an emergency generator for critical household needs	• Maintain a fleet of portable generators, fuel contracts and pre-tested connection points • Create redundancy for power, communications and transmission • Equip facilities with NOAA weather radios and monitor red flag and high wind warnings • Train staff on outage response and participate in mutual aid networks • Increase communication alternatives for staff, customers and response partners • Coordinate with the electric utility on public safety power shutoff notification, critical facility designation and restoration priority • Coordinate severe weather warning capabilities and dissemination among agencies with the highest degree of capability • Encourage appropriate planting near overhead power, cable and phone lines • Promote programs that support microgrids, solar and battery storage at critical water facilities • Include a generator and power resilience program in the capital improvement program and pursue grant funding • Establish debris clearance agreements so that crews can reach facilities after wind events

12. MASS MOVEMENT

12.1 GENERAL BACKGROUND

Ground saturation by water, steepening of slopes by erosion or construction, alternate freezing and thawing and earthquake shaking are all factors that contribute to mass movements such as landslides. Mass movements are typically associated with periods of heavy rainfall or rapid snow melt. Rain-saturated hill slopes and increased groundwater pressure on porous hillsides are triggering agents of slope failure. In areas burned by forest and brushfires, a lower threshold of precipitation may initiate mass movements. The following are common types of mass movements (see Figure 12-1) (U.S. Geological Survey 2006):

- **Rotational Slides**—Blocks of fine-grained sediment that rotate and move down slope
- **Translational Slides**—Sediments that move along a flat surface without a rotational component
- **Block Slides**—Blocks of rock that slide along a slip plane as a unit down a slope.
- **Rock Falls**—Blocks of rock that fall away from a bedrock unit without a rotational component
- **Rock Topples**—Blocks of rock that fall away from a bedrock unit with a rotational component
- **Debris Flows (Mudslides)**—Rivers of rock, earth organic matter and other soil materials saturated with water. They develop in the soil overlying bedrock on sloping surfaces when water rapidly accumulates in the ground, such as during heavy rainfall or rapid snowmelt.
- **Debris Avalanche**—A debris flow that travels faster than about 10 miles per hour (mph). Speeds in excess of 20 mph are not uncommon and speeds in excess of 100 mph, although rare, can occur. The slurry can travel miles from its source, growing as it descends, picking up trees, boulders, cars and anything else in its path.
- **Earth Flows**—Fine-grained sediments that flow downhill and typically form a fan structure
- **Creep**—A slow-moving landslide often only noticed through crooked trees and disturbed structures
- **Lateral Spread**—Landslides that commonly form on gentle slopes and that have rapid fluid-like flow movement, like water

12.1.1 Mass Movement Causes

Landslides are caused by a combination of geological and climate conditions, as well as encroaching urbanization. Vulnerable areas are affected by residential, agricultural, commercial and industrial development and the infrastructure that supports it.

Source: (U.S. Geological Survey 2006)

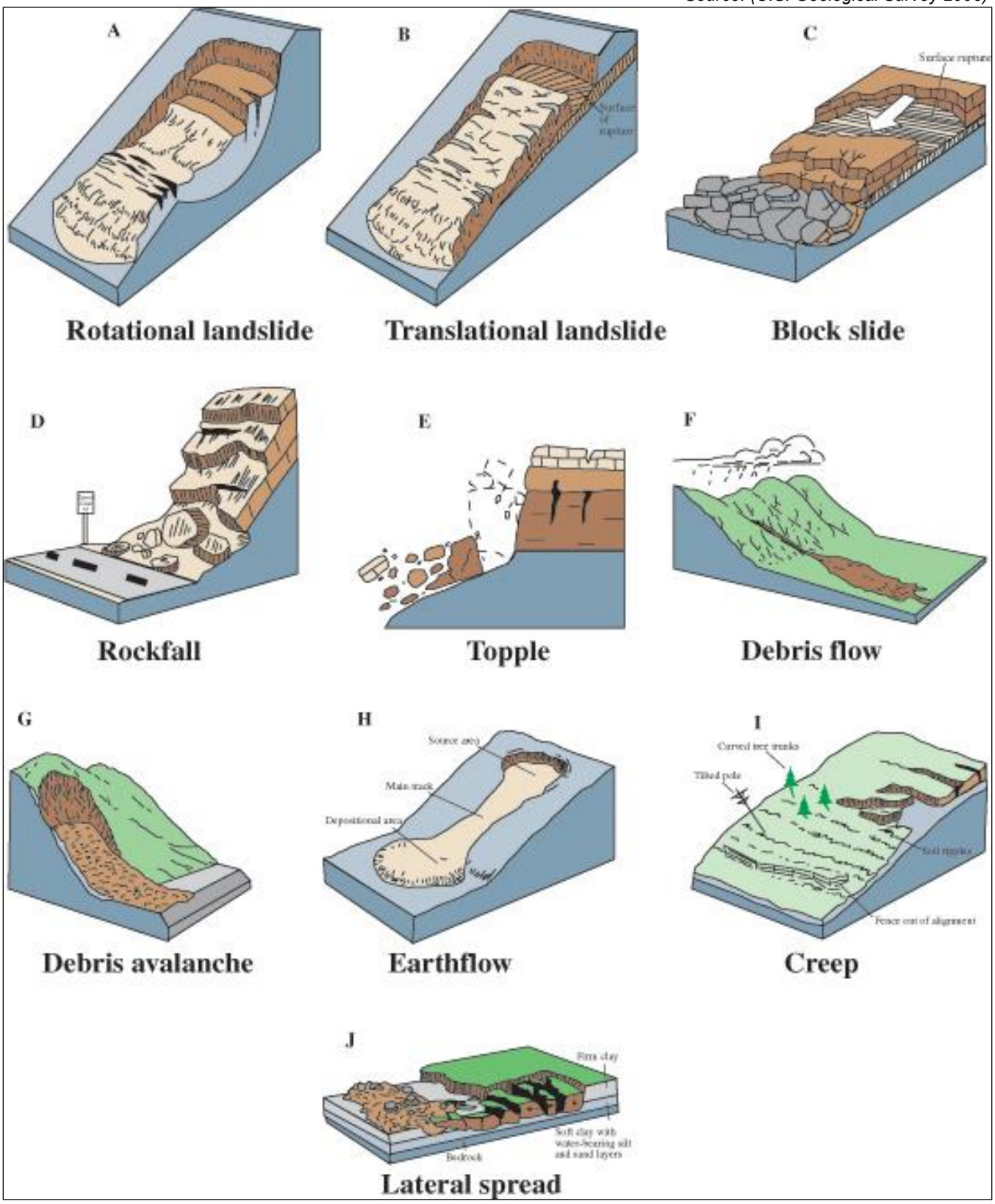


Figure 12-1. Common Mass Movement Types

Factors causing landslides fall into two categories:

- Factors that increase driving forces:
    - Steepening the slope
    - Adding weight to (loading) the slope, especially the upper parts
    - Increasing the height of a slope (either by human or natural downcutting)
    - Seismic shaking
- Factors that reduce resisting forces:
    - Adding water to the slope, which causes increased pore pressure, which reduces frictional strength
    - Steepening the slope, which reduces normal stress and thus reduces internal friction
    - Bedding, jointing or foliation parallel to slope or dipping out of slope—these discontinuities are low-strength zones along which the rock can fail and slide out of the slope
    - Intrinsically weak materials (e.g., deeply weathered, sheared, unconsolidated or clay-rich materials)
    - Undercutting the slope, which reduces support
    - Removing vegetation, especially trees, which reduces root strength and leads to increased water in soil due to reduced evaporation losses
    - Seismic shaking
    - Coastal bluff erosion caused by wave action

12.1.2 Secondary Hazards

Mass movements have the potential to block rivers or streams, which can result in flooding. For more information on flooding, refer to Chapter 10.

12.2 HAZARD PROFILE

12.2.1 Past Events

Marin County has been included in 11 federal declarations and state proclamations for mass movements such as landslides, mudslides and mud flows as described in Table 12-1 (FEMA n.d.) (Cal OES 2026).

12.2.2 Location

Factors that influence the mass movement hazard include steep slopes, weak rocks and heavy rains. In 2011, the California Geological Survey conducted an analysis using rock strength and slope data to create classes of susceptibility to deep-seated landslides. Figure 12-2 shows landslide hazard mapping for the planning area.

The locations of past mass movements are often likely sites of future mass movements. These locations range from a few acres to several square miles. Although most show no evidence of recent movement, a small portion may become active in any given year. Ancient dormant mass movements sites can be reactivated by earthquakes or by exceptionally wet weather. These dormant sites also are vulnerable to construction-triggered sliding. As development spreads into hillsides, unstable soil and erosion often contribute to mass movements.

The USGS has developed mass movement mapping for the Bay Area that indicates historical landslide occurrence throughout the area as illustrated in Figure 12-3.

Table 12-1. Mass Movement Events In and Near the District Planning Area

Event Date	Event Type	Federal Declaration	State Proclamation	Description
04/03/2023	Severe winter storms, straight-line winds, flooding, landslides and mudslides	DR-4699	Yes	Successive winter storm systems produced flooding, straight-line winds, landslides, mudslides and infrastructure impacts, extending recovery from earlier storm events.
01/14/2023	Severe winter storms, flooding, landslides and mudslides	DR-4683	Yes	Severe winter storms and atmospheric river events caused widespread flooding, landslides, mudslides, erosion and infrastructure damage across California.
01/16/2020	Debris Flow	-	-	Mud/dirt/rocks reported on US-101 S and Marin City on-ramp. Mud and dirt falling from right hand side.
02/24/2019 – 03/01/2019	Severe Winter Storms, Flooding, Landslides and Mudslides	DR-4434	Yes	An atmospheric river moved through the region near the end of the month, with the bulk of the debris flows experienced in the North Bay.
02/13 – 02/15/2019	Severe Winter Storms, Flooding, Landslides and Mudslides	DR-4431	Yes	An atmospheric river with an associated cold front moved through the region February 12 – 15 bringing widespread flooding and debris flows.
01/16/2019	Debris Flow	-	-	Mud slide shutdown SB 101 Waldo Grade.
01/06/2019	Debris Flow	-	-	Mud slide covering lanes on Sir Francis Drake Blvd. at Lagunitas Rd.
02/01 – 02/23/2017	Severe Winter Storms, Flooding, Mudslides	DR-4308	Yes	Potent atmospheric river brought copious amounts of rain to the region causing widespread flooding, debris flow, accidents and overtopping of reservoir spillways.
01/03 – 01/12/2017	Severe Winter Storms, Flooding and Mudslides	DR-4301	Yes	State Highway 1 in Marin County was closed between Bolinas and Stinson Beach due to mudslides. The District sustained more than $2 million in damage.
01/16/2016	Debris Flow	-	-	Minor mudslide on SR1 at Steep Ravine Trail blocked one lane.
12/11/2014	Debris Flow	-	-	A significant mudslide along Tennessee Valley Road caused $1 million in property damage.
12/11/2014	Debris Flow	-	-	A slide under 60 feet of Highway 1 near Muir Beach resulted in a full closure of the road, causing $1 million in damage.
02/28/2014	Debris Flow	-	-	Rock and mudslide blocking portions of Highway 1 at Panoramic.

Event Date	Event Type	Federal Declaration	State Proclamation	Description
03/29/2006 – 04/16/2006	Severe Storms, Flooding, Landslides and Mudslides	DR-1646	Yes	Heavy rainfall caused a massive number of landslides across the Sonoma and Marin county valleys. About $20 million of damage was done to agriculture. In Marin County the hardest hit areas were Mill Valley, Fairfax and San Rafael. In Mill Valley, a man was killed after he was buried in a mudslide in his backyard.
12/17/2005 – 01/03/2006	Severe Storms, Flooding, Mudslides and Landslides	DR-1628	Yes	Declaration of emergency for Marin County declared due to severe winter storms. These caused flash floods, mudslides and damage to roads and other infrastructure.
01/03 – 02/10/1995	Severe Winter Storms, Flooding, Landslides, Mud Flows	DR-1044	Yes	A series of winter storms caused several mudslides in Marin County, blocking roads and damaging residential and public property.
01/21 – 03/30/1983	Coastal Storms, Floods, Slides, Tornadoes	DR-677	Yes	A series of winter storms along the California coast caused widespread property damage. As of January 29, 11 deaths were reported, along with damage to over 2,600 homes and 30 public roads.
12/19/1981 – 01/08/1983	Severe Storms, Flood, Mudslides, High Tide	DR-651	Yes	Heavy rainfall in the San Francisco Bay region January 3 – 5 triggered thousands of debris flows from Santa Cruz County to Contra Costa and Sonoma counties. The landslides caused at least $66 million in damage. Landslides caused 25 of the 33 storm-caused deaths. Total estimated storm-related losses were $280 million.

Source: (FEMA n.d.) (Cal OES 2026) (NOAA National Centers for Environmental Information n.d.)

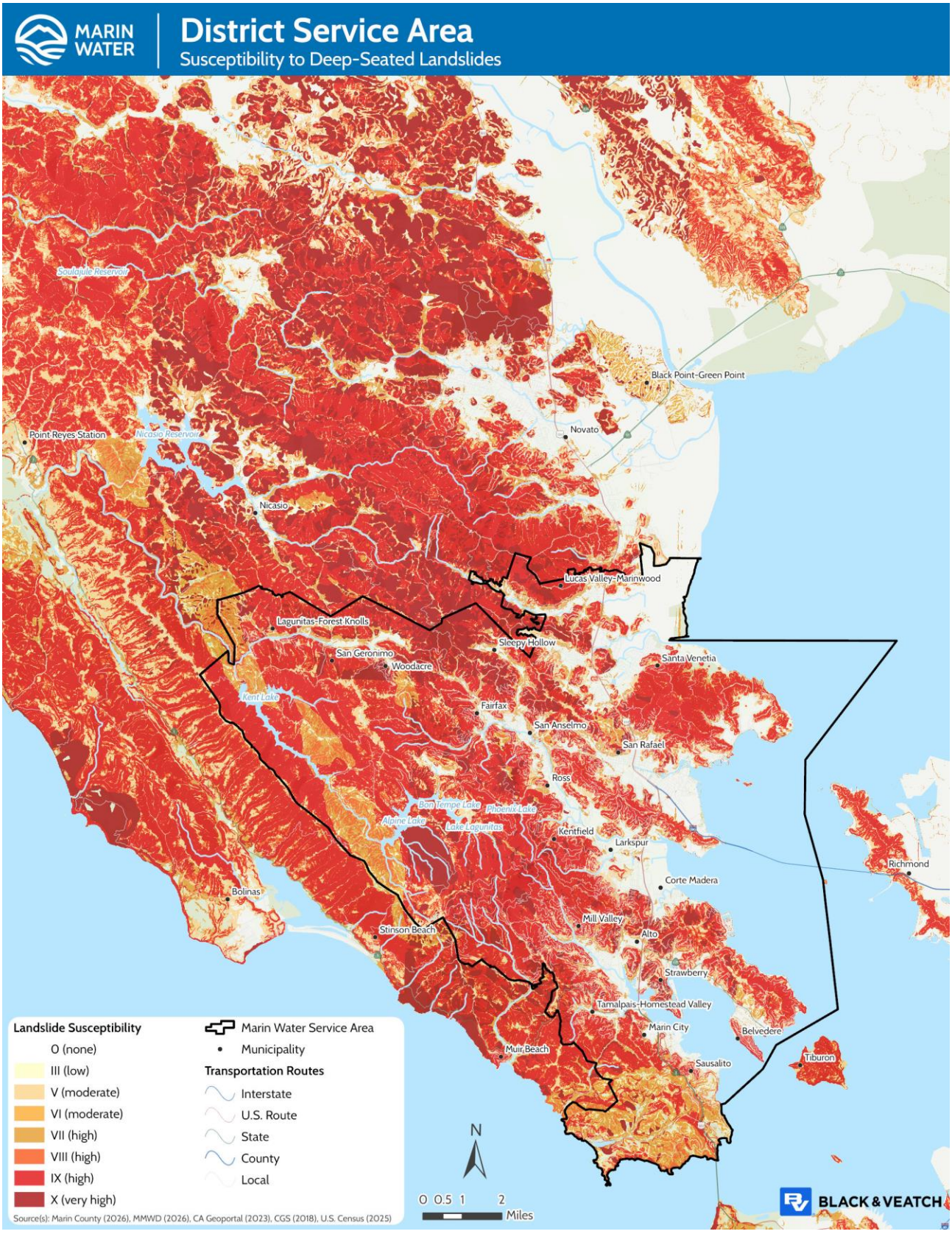


Figure 12-2. Susceptibility to Deep-Seated Landslides

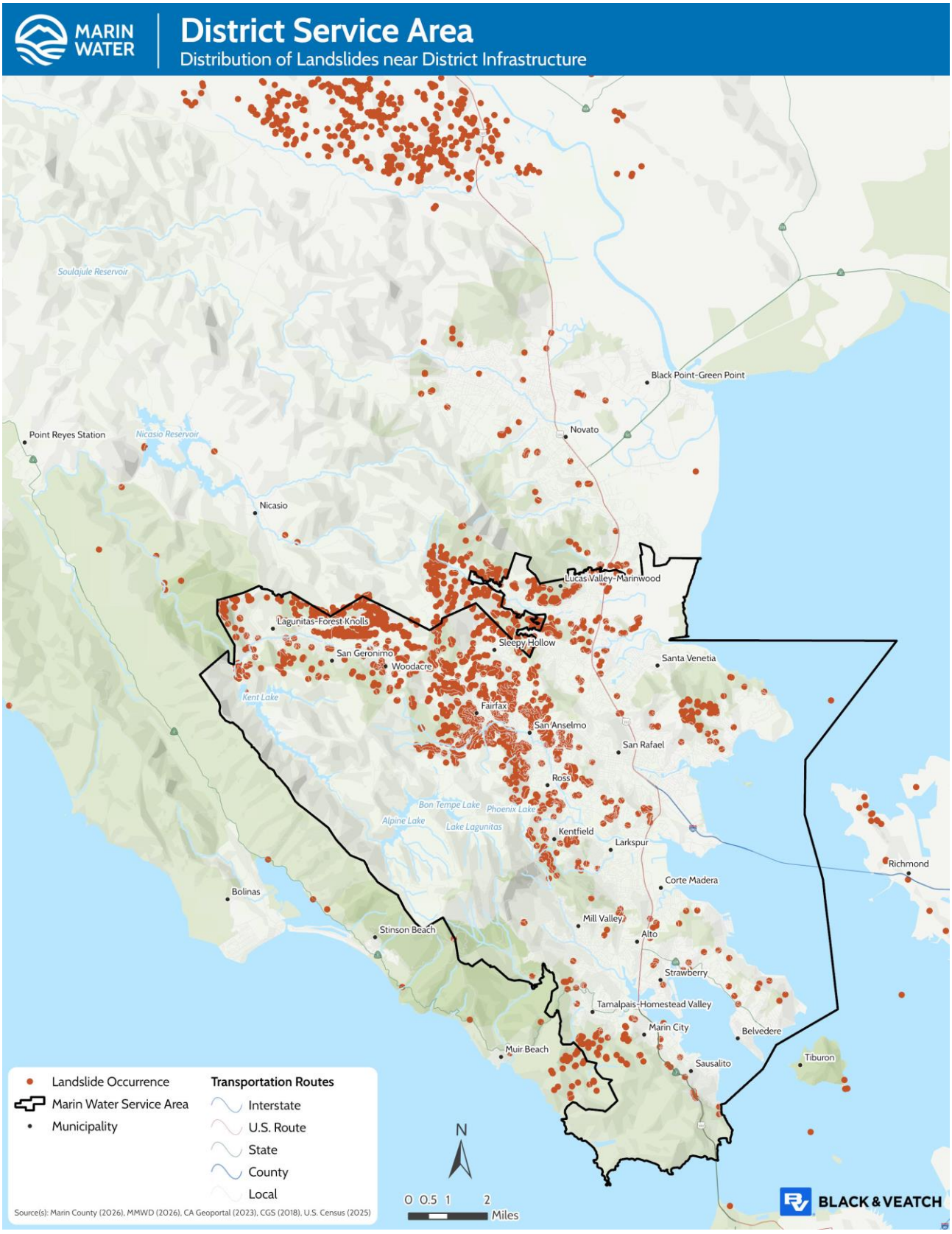


Figure 12-3. Distribution of Landslides Evident in the Region, on Land and Under the Ocean

12.2.3 Future Conditions

Probability

Mass movements are commonly triggered by heavy rainfall, flooding, wildfire and seismic activity. In Marin County, steep terrain, unstable slopes, coastal bluffs and recurring winter storm events contribute to ongoing landslide susceptibility. Recent federally declared disasters, including DR-4683 and DR-4699, resulted in landslides and mudslides throughout the region, demonstrating that conditions necessary for slope failure occur regularly. Given the prevalence of landslide-prone terrain and the recurring occurrence of triggering events, future mass movement events are considered likely (California Governor's Office of Emergency Services 2023).

Climate Change

Climate change may impact storm patterns, increasing the probability of more frequent, intense storms with varying duration. Warming temperatures could increase the occurrence and duration of droughts, which would increase the probability of wildfire, reducing the vegetation that helps to support steep slopes. In addition, removing vegetation to maintain defensible space and reduce increasing wildfire risk, can increase the risk of landslides. All these factors would increase the probability of mass movement occurrences.

Property exposure and vulnerability would be unlikely to increase because of climate change impacts on the mass movement hazard. Mass movement events may occur more frequently, but the extent and location should be contained within mapped hazard areas or recently burned areas. Disruption of water service may become more frequent because of mass movement hazards. For example, transportation systems may experience more frequent delays if slides blocking these systems occur more frequently.

12.2.4 Extent

Mass movements destroy property and infrastructure and can take the lives of people. They pose a serious hazard to properties on or below hillsides. Landslides directly damage structures in two ways (USGS n.d.):

- Disruption of structural foundations caused by differential movement of the ground upon which the structure sits—As a landslide breaks away from a slope, it deforms the ground into an undulating surface broken up by fissures and scarps. This deformation distresses foundations and structures situated on top of a landslide by settlement, cracking and tilting. This can occur slowly, over years or rapidly within days or hours.
- The physical impact of debris moving down-slope against structures located in the debris flow's path—A water-saturated, fast-moving debris flow can destroy all in its path, collapsing walls and shifting structures off their foundations.

Slope failures in the United States result in an average of 25 to 50 lives lost per year and an annual cost to society of about $1.5 billion. Landslides and debris flows cause millions of dollars in cumulative damage to Northern California's homes, businesses and infrastructure every year (USGS n.d.).

Warning Time

The velocity of mass movements range from a slow creep of inches per year to many feet per second, depending on slope angle, material and water content. Some methods used to monitor mass movements can provide an idea of the type of movement and the amount of time prior to failure. It is also possible to determine what areas are at risk during general time periods. Assessing the geology, vegetation and amount of predicted precipitation for an area can help in these predictions.

There is no practical warning system for individual mass movements. The current standard operating procedure is to monitor situations on a case-by-case basis and respond after the event has occurred. Generally accepted warning signs for mass movement activity include the following (USGS n.d.):

- Springs, seeps or saturated ground in areas that have not typically been wet before
- New cracks or unusual bulges in the ground, street pavements or sidewalks
- Soil moving away from foundations
- Ancillary structures such as decks and patios tilting and/or moving relative to the main house
- Tilting or cracking of concrete floors and foundations
- Broken water lines and other underground utilities
- Leaning telephone poles, trees, retaining walls or fences
- Offset fence lines
- Sunken or down-dropped road beds
- Rapid increase in creek water levels, possibly accompanied by increased turbidity (soil content)
- Sudden decrease in creek water levels though rain is still falling or just recently stopped
- Sticking doors and windows and visible open spaces indicating jambs and frames out of plumb
- A faint rumbling sound that increases in volume as the landslide nears
- Unusual sounds, such as trees cracking or boulders knocking together.

12.3 VULNERABILITY ASSESSMENT

The risk assessment for landslide evaluated District assets that lie within landslide susceptibility zones. Table 12-2 and Table 12-3 summarize the number of each type of facility in each mapped landslide susceptibility zone and the total replacement cost value of those exposed facilities. Although complete historical documentation of the landslide threat in the planning area is lacking, the available history of landslides in the region suggests a significant vulnerability to such hazards.

Table 12-2. Number and Value of Structures and Facilities Exposed to the Landslide Hazard

	High Susceptibility		Very High Susceptibility	
Assets	**Exposed Number**	**Exposed Replacement Cost Value**	**Exposed Number**	**Exposed Replacement Cost Value**
Administrative	11	$4,600,000	1	$500,000
Potable Water Structures	42,360	$715,871,000	5,323	$53,267,000
Raw Water Facilities	132	$10,130,000	47	$47,000
Recycled Water Facilities	259	$14,718,000	18	$19,000
Total	**42,762**	**$**745,319,000	**5,389**	**$53,833,000**

Table 12-3. Length and Value of Pipelines Exposed to the Landslide Hazard

	High Susceptibility		Very High Susceptibility	
Assets	**Exposed Length in Miles**	**Exposed Replacement Cost Value**	**Exposed Length in Miles**	**Exposed Replacement Cost Value**
Potable Water	483.4	$1,262,958,000	64.6	$173,881,000
Raw Water	16.5	$66,340,000	3.0	$12,312,000
Recycled Water	8.3	$23,019,000	0.3	$908,000
Total	508.2	**$1,352,317,000**	67.9	**$187,101,000**

Damage attributable to landslides has the potential to affect any exposed Marin Water assets. At this time all assets exposed to the landslide hazard are considered vulnerable until more information becomes available. A more in-depth analysis of mitigation measures taken to protect these facilities in the event of landslides should be done to determine if they could withstand the potential impacts. In the Marin Water pipeline system, pipes made of more brittle materials, such as clay or concrete, are more likely to be damaged by landslide movements than pipes of more ductile materials such as ductile iron or polyvinyl chloride.

12.4 DEVELOPMENT TRENDS

The demand for critical services may increase with growth in the surrounding area. The State of California's adoption of bills expanding property owners' rights to build accessory dwelling units will increase densities in most of the service area; areas that, as recently as 2019, were thought to be built out.

Per Government code 53091(d) District facilities required for the production, generation, storage, treatment, or transmission of water are exempt from building codes. For structures that are governed by codes and standards, Marin Water will repair or replace structures in accordance with the 2025 California Building Code adopted by the jurisdiction where the structure is located. The building code includes provisions for geotechnical analyses in steep slope areas that have soil types that are susceptible to landslide hazards. These provisions ensure that new construction is built to standards that reduce the vulnerability to landslide risk. Applications of these codes and standards to any applicable new or redeveloped assets will reduce the risk of potential impacts from landslides.

12.5 ISSUES

Important issues associated with landslides in the planning area include the following:

1. **Critical facility exposure to landslide hazards:** The District has critical facilities exposed to landslide hazards.
2. **Outdated landslide risk assessments:** Mapping and assessment of landslide hazards are constantly evolving, requiring landslide risk assessments to be reevaluated as new data and science become available.
3. **Uncertain climate change impacts on landslide risk:** The impact of climate change on landslides is uncertain; if climate change affects atmospheric conditions, exposure to landslide risk is likely to increase.
4. **Environmental degradation from landslides:** Landslides may cause negative environmental consequences, including water quality degradation.
5. **Overlapping multi-hazard risk:** Landslide risk overlaps with risks from other hazards, such as earthquake, flood and wildfire, presenting an opportunity to pursue mitigation alternatives with multiple objectives that reduce risk across hazards.
6. **Access restrictions from non-District transportation infrastructure failures:** Roadway failures on non–Marin Water-owned facilities could restrict access to Marin Water assets and hinder operations, resulting in loss of service.

12.6 MITIGATION OPPORTUNITIES

Local Plan Requirement C3 – 44 CFR Part 201.6(c)(3)(ii)

The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effect of each hazard, with particular emphasis on new and existing buildings and infrastructure.

Steep terrain, saturated soils and post-fire conditions across the District's watershed lands create landslide and debris flow potential that can rupture pipelines, undermine tanks and roads and block access to remote facilities. The following table presents alternatives for mitigating the landslide hazard organized by the scale at which each action can be carried out and by whether it manipulates the hazard, reduces exposure and vulnerability or builds local capacity.

Table 12-4. Potential Opportunities to Mitigate the Mass Movement Hazard

Community / Customer Scale	Utility Operational Scale
Manipulate the Hazard	
• Stabilize slopes on your property (dewater, armor toe) • Direct roof, driveway and irrigation runoff away from slopes and District easements • Repair private line leaks promptly and avoid over-irrigation that saturates unstable ground • Minimize vegetation removal and the addition of impervious surfaces	• Stabilize slopes at District facilities and along pipeline alignments (dewater, armor toe) • Maintain drainage and culverts on watershed and access roads to prevent saturation and road fill failures • Detect and repair leaks quickly so that system water does not destabilize slopes • Reduce loading at the top of slopes supporting tanks, roads and pipelines
Reduce Exposure and Vulnerability	
• Locate structures outside of the hazard area, off unstable land and away from slide run-out areas • Retrofit structures and private service lines with flexible connections where ground movement is expected	• Site new tanks, pump stations and pipelines outside of unstable land and slide run-out areas • Retrofit at-risk facilities and provide retaining structures or slope protection • Install isolation valves so that a pipeline failure on an unstable slope can be quickly isolated • Adopt higher design standards and require geotechnical review for new facilities within unstable slope areas • Armor or retrofit critical infrastructure against the impacts of landslides and debris flows • Reroute or replace pipeline segments crossing documented landslide areas with ductile, restrained-joint pipe • Provide alternate access routes and transmission redundancy where a single slide could isolate a facility or service area

Community / Customer Scale	Utility Operational Scale
	Build Local Capacity
• Subscribe to warning systems and develop an evacuation plan • Report seepage, ground cracking or slope movement near water lines and easements to the District • Educate yourself on risk reduction techniques for landslide and post-fire debris flow hazards	• Monitor and instrument high-risk slopes that support critical facilities and pipelines • Maintain reserve funds, emergency contracts and stockpiles of pipe repair materials • Develop a continuity of operations plan • Educate employees on potential exposure to landslide hazards and emergency response protocols • Produce better landslide and post-fire debris flow susceptibility maps for District lands and pipeline corridors • Use rainfall thresholds and National Weather Service advisories to trigger inspections and pre-event staffing • Include slope stabilization and pipeline relocation projects in the capital improvement program • Develop a strategy to take advantage of post-disaster funding opportunities • Warehouse critical infrastructure components and maintain equipment for emergency road and slope repair • Develop and adopt a continuity of operations plan • Replace or restore native vegetation known to stabilize steep slopes on watershed lands • Use hybrid solutions that combine engineering with nature-based approaches and appropriate vegetation

13. SEA LEVEL RISE

13.1 GENERAL BACKGROUND

Sea level rise is the increase in the average height of the ocean's surface, caused primarily by two factors related to global warming: the added water from melting ice sheets and glaciers; and the expansion of seawater as it warms. In the past century, global mean sea level has increased by 9 to 12 inches, with human influence the dominant cause of observed atmospheric and oceanic warming. Given current trends in greenhouse gas emissions and increasing global temperatures, sea level rise has accelerated in the last decade and is expected to continue to accelerate in the coming decades. Impacts will generally become more frequent and more severe in the latter half of this century (NOAA 2023).

13.1.1 Secondary Hazards

Storm surge, high tides, coastal erosion and wetland loss are amplified with rising sea levels even if storm frequency does not increase. Longer, more frequent and more extensive flooding will occur as well as worsened shoreline erosion and loss of land.

13.2 HAZARD PROFILE

13.2.1 Past Events

There have been no federal disaster declarations or state proclamations for sea level rise in Marin County (FEMA n.d.) (Cal OES 2026).

While an increase of several inches of sea levels over the course of several decades may seem like a small change, coastline flooding has gotten increasingly worse with relatively small increases in the past few decades.

Sea level rise is an ongoing phenomenon that progresses over time. Scientists measure long-term values of historical rise and use those data, combined with climate projections, to predict ongoing sea level rise over defined time periods.

13.2.2 Location

Sea level rise will cause currently dry areas to be permanently or chronically inundated. Temporary inundation from extreme tide events and storm surge also will change. Unlike many other impacts resulting from climate change, sea level rise will have a defined extent and location. This allows for a more detailed risk assessment to be conducted for this climate change impact. Although the extent and timing of sea level rise is still uncertain, assessing potential areas at risk provides information appropriate for planning purposes.

The risk assessment for sea level rise determined District assets that lie within the inundation zone for two sea level rise scenarios mapped by the San Francisco Bay Conservation and Development Commission's Regional Shoreline Adaptation Plan (RSAP) program: a 0.8-foot sea level rise and a 6.6-foot sea level rise, as shown on Figure 13-1 and Figure 13-2, respectively. These scenarios were adopted by the San Francisco Bay Conservation and Development Commission to represent mid-century and end-of-century planning horizons based on the California Sea Level Rise Guidance (BCDC 2024).

Figure 13-1. Area Inundated by a Sea Level Rise of 0.8-Feet

Figure 13-2. Area Inundated by a Sea Level Rise of 6.6-Feet

13.2.3 Future Conditions

Probability

Sea level rise is already occurring in the San Francisco Bay Area and is expected to continue. In Marin County, sea level rise is considered highly likely because it is a gradual, ongoing hazard driven by long-term climate trends rather than a discrete event. Current state and regional guidance projects continued increases in sea level by mid-century, with greater uncertainty but potentially much higher levels by 2100. As sea levels rise, low-lying shoreline areas, transportation corridors, utilities, and other infrastructure in Marin County will experience increasing exposure to tidal flooding, storm surge, groundwater rise, and shoreline erosion. For planning purposes, the probability of sea level rise affecting vulnerable areas of the Marin Water service area should be considered high, with impacts expected to increase over time.

Climate Change

Sea level rise is driven by the changing and increasing temperatures of earth's surface. As humans continue to burn fossil fuels, greenhouse gases will continue to accumulate in the atmosphere, driving up the earth's temperature and ultimately melting glaciers and ice sheets. The oceans respond to an increase in the earth's temperature over a prolonged period of time, meaning that even if greenhouse gas emissions slow, sea levels will continue to rise due to warming that has already occurred. Scenarios for sea level rise are intrinsically linked to climate change and how much the earth continues to warm (National Oceanic and Atmospheric Administration 2022).

13.2.4 Extent

The analysis for this Plan includes scenarios for the years 2050 with a rise of 0.8 feet and 2100 with a rise of 6.6 feet.

The severity of sea level rise is projected to evolve from chronic to more severe over the next 20 to 80 years. The specific level of severity could be exacerbated by the following conditions (NOAA n.d.):

- Daily tidal inundation—As sea level rises, the amount of land and infrastructure subjected to daily inundation by high tides will increase. This would result in increased permanent future inundation of low-lying areas.
- Annual high tide inundation (king tides)—King tides are abnormally high, predictable astronomical tides that occur each year generally during the winter when the Earth, moon and sun are aligned. In the winter (December, January and February), king tides may be amplified by winter weather, making these events more dramatic. King tides result in temporary inundation, particularly associated with nuisance flooding, such as inundation of low-lying roads, boardwalks and waterfront promenades.
- Extreme high tide inundation (storm surge)—When Pacific Ocean storms coincide with high tides, storm surge due to meteorological effects can elevate Pacific Ocean water levels and produce extreme high tides, resulting in temporary inundation. Extreme high tides can cause severe inundation of low-lying roads, boardwalks and promenades; can exacerbate coastal and riverine flooding and cause upstream flooding; and can interfere with stormwater outfalls.
- El Niño winter storms—During El Niño winters, atmospheric and oceanographic conditions in the Pacific Ocean produce severe winter storms that impact the planning area shorelines. Pacific Ocean storms follow a more southerly route and bring intense rainfall and storm conditions to the Bay Area. Tides are often elevated 0.5 to 1.0 feet above normal along the coast and wind setup can elevate water levels even further. Typical impacts include severe inundation of low-lying roads, boardwalks and waterfront promenades; storm drain backup; wave damage to coastal structures; and erosion of natural shorelines.
- Ocean swell and wind-wave events (storm waves)—Pacific Ocean storms and strong thermal gradients can produce strong winds that blow across the ocean and the Bay. When the wind blows over long reaches of

open water, large waves can be generated that impact the shoreline and cause damage. Typical impacts include wave damage along the shoreline, particularly to coastal structures such as levees, docks and piers, wharves and revetments; backshore inundation due to wave overtopping of structures; and erosion of natural shorelines.

Warning Time

Sea level rise is not a hazard that requires near-term advance warning systems to support response and recovery operations. Agencies such as NOAA's sea level rise program are keeping an active watch on the sea level rise phenomena to keep communities informed of the progression.

13.3 VULNERABILITY ASSESSMENT

The tables below summarize the number of each type of facility found to be within each mapped inundation area and the total replacement cost value of those exposed facilities.

Table 13-1. Number and Value of Structures and Facilities Exposed to the Sea Level Rise Hazard

	0.8-Foot Scenario, Year 2050		6.6-Foot Scenario, Year 2100	
Assets	**Exposed Number**	**Exposed Replacement Cost Value**	**Exposed Number**	**Exposed Replacement Cost Value**
Administrative	6	$24,300,000	7	$36,600,000
Potable Water Structures	15,154	$26,357,000	21,554	$38,596,000
Raw Water Facilities	0	$0	1	$1,000
Recycled Water Facilities	66	$52,300	211	$161,000
Total	**15,226**	**$**50,709,300	**21,773**	**$75,358,000**

Table 13-2. Length and Value of Pipelines Exposed to the Sea Level Rise Hazard

	0.8-Foot Scenario, year 2050		6.6-Foot Scenario, year 2100	
Assets	**Exposed Length, Miles**	**Exposed Replacement Cost Value**	**Exposed Length, Miles**	**Exposed Replacement Cost Value**
Potable Water	148.1	$362,331,000	220.9	$556,610,000
Raw Water	0	$0	0	$0
Recycled Water	2.7	$7,454,000	8.1	$22,111,000
Total	150.8	**$369,785,000**	229.**0**	**$578,721,000**

The exposure analysis included the District's pipeline assets. While most of these assets are underground and not susceptible to impacts from inundation associated with sea level rise, there are sections of pipelines that are exposed as they cross drainageways and channels. The exact location of these exposed pipelines was not available in a geospatial dataset to support this exposure analysis.

13.4 DEVELOPMENT TRENDS

The demand for critical services may increase with growth in the surrounding area. The State of California's adoption of bills expanding property owners' rights to build accessory dwelling units will increase densities in most of the service area.

Per Government code 53091(d) District facilities required for the production, generation, storage, treatment, or transmission of water are exempt from building codes. For structures that are governed by codes and standards, Marin Water will repair or replace structures in accordance with the 2025 California Building Code adopted by the jurisdiction where the structure is located. Applications of these codes and standards to any applicable new or redeveloped assets will reduce the risk of potential impacts from sea level rise.

13.5 ISSUES

Important issues associated with sea level rise in the planning area include the following:

1. **Exposure of shoreline facilities:** District facilities and pipelines located in low-lying shoreline areas are exposed to permanent inundation and increasingly frequent tidal flooding, which could result in loss or reduction of water service to customers.
2. **Loss of revenue:** Damage to the general building stock within inundated areas could reduce the District's customer base and result in a loss of revenue.
3. **Evolving science and data:** The data and science measuring sea level rise impacts are progressing rapidly, and exposure estimates used in this plan may become outdated before the next plan update, creating uncertainty in siting, design and capital planning decisions.
4. **Compounded flood risk:** Rising bay levels reduce the capacity of creeks, channels and storm drainage to discharge runoff, broadly increasing flood risk to District assets, including areas outside currently mapped flood hazard areas, particularly when high tides or king tides coincide with storm events.
5. **Cost of mitigation:** The cost to mitigate sea level rise impacts to District infrastructure will be extensive and will compete with other capital and asset-replacement priorities.
6. **Access and emergency response:** Future permanent inundation of currently dry areas could disrupt local and regional travel, restricting staff and contractor access to District facilities and hindering emergency response and repair.
7. **Risk communication:** The long-time horizon and gradual onset of sea level rise make risk communication difficult, which could limit public and Board support for near-term investment in adaptation measures.
8. **Lack of an adaptation strategy:** The District does not currently have a strategy addressing the potential need for retreat from, or acquisition/relocation of, assets in coastal areas that become chronically inundated.
9. **Multi-hazard overlap:** Sea level rise risk overlaps with the flood and tsunami hazards, creating compounding exposure at shoreline facilities and an opportunity for multi-hazard mitigation.

13.6 MITIGATION OPPORTUNITIES

Local Plan Requirement C3 – 44 CFR Part 201.6(c)(3)(ii)

The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effect of each hazard, with particular emphasis on new and existing buildings and infrastructure.

Sea level rise will gradually expose low-lying District facilities, buried pipe and access roads to more frequent tidal flooding, rising groundwater and saline conditions that accelerate corrosion. Because the hazard advances over decades, the alternatives below emphasize adaptive planning, updated design criteria and nature-based shoreline

protection alongside traditional hardening. The table organizes these alternatives by the scale at which they can be carried out and by mitigation category.

Table 13-3. Potential Opportunities to Mitigate the Sea Level Rise Hazard

Community / Customer Scale	Utility Operational Scale
Manipulate the Hazard	
• Support protection, preservation and restoration of marshes, beaches and dunes that buffer shoreline utility corridors • Barriers (sea wall), only when no nature-based alternative is feasible • Pumps and improved site drainage to manage tidal and groundwater intrusion	• Install living shorelines, ecotone levees or berms to protect low-lying District facilities • Barriers (sea wall), only when no nature-based alternative is feasible • Protect, preserve and restore wetlands, beaches and dunes on District-owned shoreline parcels • Partner on regional shoreline protection projects that shield critical water infrastructure • Pump stations and upsized drainage systems serving low-lying service areas
Reduce Exposure and Vulnerability	
• Voluntary retreat from areas exposed to permanent inundation • Elevate structures and utilities, including meters, pumps and backflow assemblies, above projected sea level rise elevations • Use low-impact development to limit runoff that compounds tidal flooding • Floodproof structures and protect private plumbing from saline water intrusion	• Relocate or replace pipelines, pump stations and appurtenances in areas projected to experience permanent or frequent inundation • Elevate electrical gear, controls, chemical storage and standby power above projected sea level rise plus storm surge • Provide corrosion protection and cathodic protection for pipelines and appurtenances exposed to saline soils and groundwater • Build redundancy for critical functions or retrofit critical buildings • Maintain drainage facilities that serve District sites • Provide flood-proofing when new critical infrastructure must be located in coastal areas • Harden shoreline infrastructure and provide redundancy for critical system nodes • Adopt higher design standards that require accounting for sea level rise in the siting and design of new District facilities • Protect raw water sources, intakes and groundwater supplies from saltwater intrusion • Elevate or protect roads that provide critical access to water system facilities • Facilitate managed retreat from, or upgrade of, the most at-risk assets • Include nature-based elements in infrastructure adaptation projects, such as living shorelines, ecotone levees and habitat restoration • Design or enhance existing drainage systems for higher design storms to provide increased capacity

Community / Customer Scale	Utility Operational Scale
	Build Local Capacity
• Buy flood insurance • Review sea level rise inundation maps to understand future exposure of your property and local utility services • Develop a household plan that includes retrofit savings and self-sufficiency during and after an event	• Be informed and understand the future impacts of sea level rise on facilities and service delivery • Complete an asset-level sea level rise vulnerability assessment and update it as projections change • Develop a continuity of operations plan • Participate in regional sea level rise and shoreline adaptation planning efforts • Update District design criteria and standard details to incorporate current sea level rise projections • Incorporate retrofitting or replacement of exposed system elements in the capital improvement program • Develop a strategy to take advantage of post-disaster and adaptation funding opportunities • Monitor groundwater levels and salinity in areas where buried infrastructure may be affected by rising water tables • Develop an adaptive management plan that phases actions as sea level rise thresholds are reached • Restore wetlands, marshes, mudflats, eelgrass and living shorelines to enhance resilience and reduce wave impacts during storms • Conserve and protect coastal habitat and areas suitable for habitat restoration adjacent to District lands • Integrate sea level rise findings into the risk and resilience assessment and emergency response plan

14. TSUNAMI

14.1 GENERAL BACKGROUND

A tsunami is a series of high-energy waves that radiate outward like pond ripples from an area where a generating event occurs, arriving at shorelines over an extended period. Tsunamis can be induced by earthquakes, landslides and submarine volcanic explosions (see Figure 14-1). Tsunamis are typically classified as local or distant, depending on the location of their source in comparison to where waves occur (NOAA 2023):

- The waves nearest to the generating source represent a local tsunami. Such events have minimal warning time, leaving few options except to run to high ground after a strong, prolonged local earthquake. Damage from the tsunami adds to damage from the triggering earthquake due to ground shaking, surface faulting, liquefaction and landslides.
- The waves far from the generating source represent a distant tsunami. Distant tsunamis may travel for hours before striking a coastline, giving a community a chance to implement evacuation plans if a warning is received.

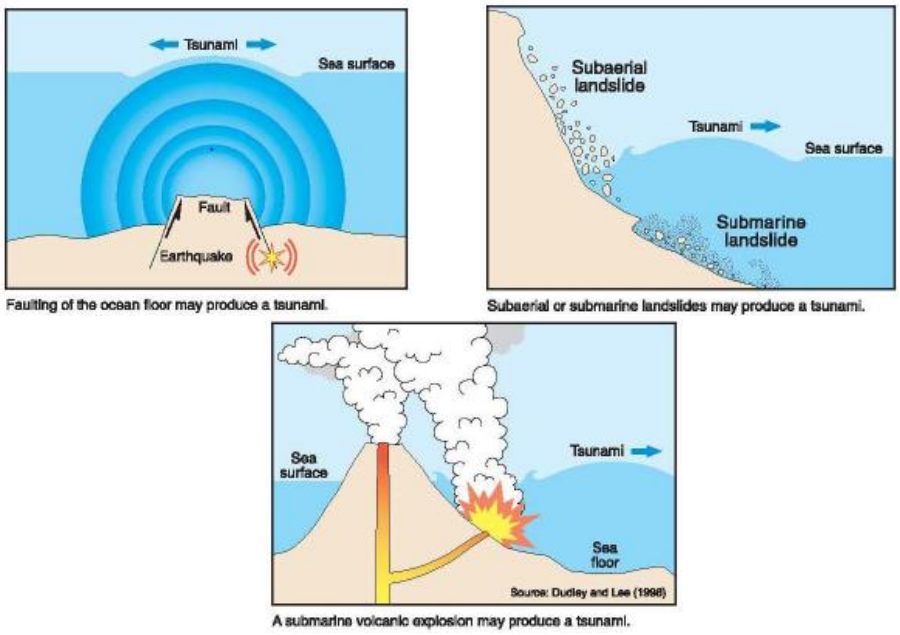


Figure 14-1. Common Sources of Tsunamis

Historical records suggest that tsunami wave heights on the order of 15 to 60 feet on the West Coast could be generated by a powerful earthquake near the coast. Significant damage would result from the ground shaking, tsunami wave forces and impacts associated with debris.

14.1.1 Tsunami Characteristics

In the open ocean, a tsunami may be only a few inches or feet high, but it can travel with speeds approaching 600 miles per hour. As a tsunami enters the shoaling waters near a coastline, its speed diminishes, its wavelength decreases and its height increases greatly. At the shoreline, tsunamis may take the form of a fast-rising tide, a cresting wave or a bore (a large, turbulent wall-like wave). The bore phenomenon resembles a step-like change in

the water level that advances rapidly (from 10 to 60 miles per hour). The first wave is usually followed by several larger and more destructive waves (NOAA 2023).

The configuration of the coastline, the shape of the ocean floor and the characteristics of advancing waves play important roles in the destructiveness of the waves. Bays, sounds, inlets, rivers, streams, offshore canyons, islands and flood control channels may cause various effects that alter the level of damage. Offshore canyons can focus tsunami wave energy and islands can filter the energy. It has been estimated that a tsunami wave entering a flood control channel could reach a mile or more inland, especially if it enters at high tide. The orientation of the coastline determines whether the waves strike head-on or are refracted from other parts of the coastline. A wave may be small at one point on a coast and much larger at other points (NOAA 2023). The inundation area for a tsunami event is often described as runup as illustrated in Figure 14-2.

Source: UNESCO, 2006

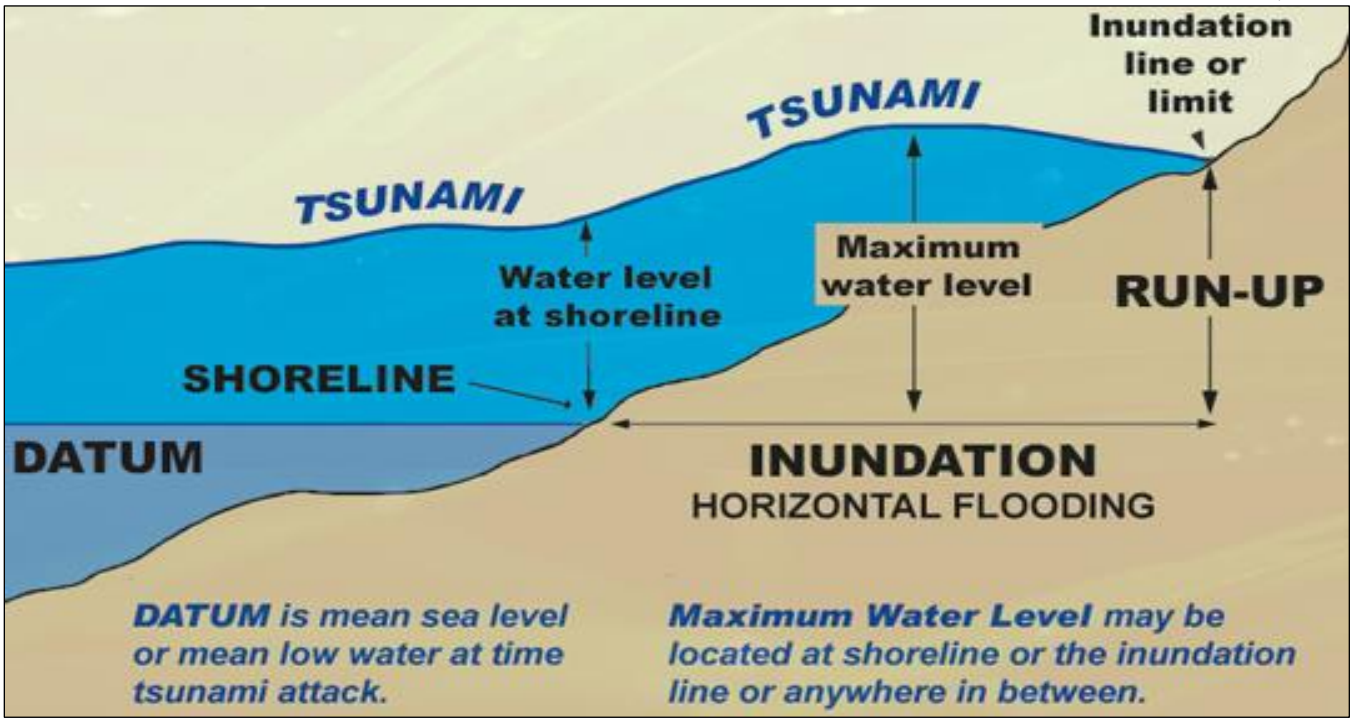


Figure 14-2. Runup Distance and Height in Relation to the Datum and Shoreline

14.1.2 Secondary Hazards

A major tsunami in the planning area would result in flooding near the coastline. For more information about flooding, refer to Chapter 10.

14.2 HAZARD PROFILE

14.2.1 Past Events

Marin County has not been included in any federal declarations for tsunami but has been included in one state proclamation for the event in 1964, described below (FEMA n.d.) (Cal OES 2026). California is at risk from both local and distant tsunamis. About 80 possible or confirmed tsunamis in California have been observed or recorded, including the following:

- The most recent recorded tsunamis affecting California were on January 15, 2022 and December 4, 2024. The January 15, 2022, tsunami was generated by the Hunga Tonga-Hunga Ha'apai volcanic eruption. This event produced measurable tsunami activity along the California coast, including flooding and damage to harbor infrastructure in several coastal communities. On December 5, 2024, a magnitude 7.0 earthquake offshore of Cape Mendocino generated a tsunami that produced three measured runups along the California coast, with maximum wave heights of approximately 0.09 meters (0.3 feet). Although no significant damage was reported, tsunami advisories were issued and coastal communities activated warning and notification procedures.
- On March 11, 2011 a tsunami caused by an earthquake near Japan resulted in nearly $100 million in damage to the California maritime community,
- On February 27, 2010, minor recorded tsunami inundation in California was caused by an earthquake near Chile.
- A 1960 Chilean earthquake produced a tsunami that impacted the entire Pacific basin. Damage was reported in California ports and harbors from San Diego to Crescent City and losses exceeded $1 million.
- A 1964 tsunami generated by a Magnitude-9.2 Alaska earthquake (see Figure 14-3) killed 12 in Northern California and caused over $15 million in damage. Wave oscillations in San Francisco Bay lasted more than 12 hours, causing nearly $200,000 in damage to boats and harbor structures. Marin County sustained an estimated $1 million in property damages from this event.

Source: National Centers for Environmental Information, 2018

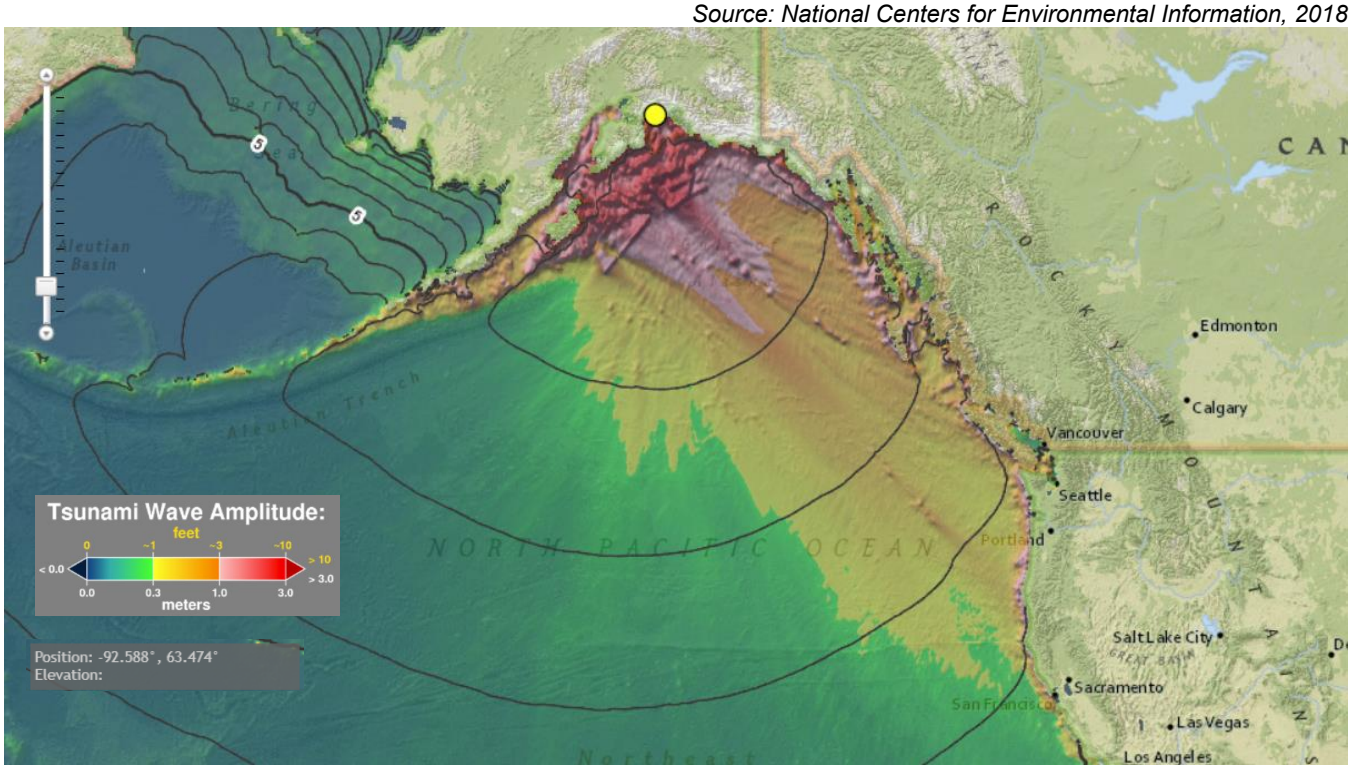


Figure 14-3. 1964 Alaska Earthquake Tsunami Event

14.2.2 Location

The California Geological Survey (CGS), in coordination with the California Governor's Office of Emergency Services (Cal OES), maintains tsunami hazard area maps for Marin County to support emergency planning and evacuation efforts. Tsunami hazard areas have been mapped for coastal communities including Dillon Beach, Tomales Bay Eastshore, Inverness, Stinson Beach, Bolinas and Muir Beach, as well as for inner bay communities including the San Rafael/San Quentin area, the Sausalito-Marin City-Mill Valley corridor and the Novato/Petaluma

Point area. Marin County also maintains countywide tsunami hazard maps and an interactive natural hazards viewer that incorporates current tsunami hazard area mapping (California Department of Conservation 2022).Figure 14-4 shows the extent and the location of the tsunami inundation areas for the planning area. This map does not represent risk from a single event but shows a composite area of risk that combines the inundation areas from a number of local and distant potential sources, including the Cascadia subduction zone, the Central Aleutians Island subduction zone, historical earthquake events and others. The inundation areas represent the maximum considered tsunami runup from a number of extreme, yet realistic, tsunami sources. The tsunami hazard zone is mostly influenced by a local source Cascadia event; however, distant sources can result in notable wave run ups (California Department of Conservation 2022)).

14.2.3 Future Conditions

Probability

Tsunamis are a relatively infrequent hazard in Marin County; however, California has experienced more than 80 recorded or observed tsunamis over the past 150 years. Since 1946, five tsunamis have caused damage to California ports and harbors. Several of these events affected Marin County, including the 1960 Chile tsunami that caused minor inundation at Stinson Beach and the 1964 Alaska tsunami that damaged Lawson's Pier in Tomales Bay and resulted in a fatality in Bolinas. The 2011 Tōhoku tsunami generated by the Japan earthquake caused up to $100 million in damage to ports, harbors and marinas throughout California. Based on its exposure to both local and distant tsunami events, the 2023 Marin County Operational Area Multi-Jurisdictional Hazard Mitigation Plan identifies tsunami as a high-risk hazard with a highly likely probability of future occurrence and extreme potential severity (County of Marin 2023).

Climate Change

The impacts of global climate change on tsunami probability are unknown. Even if climate change does not increase the frequency with which tsunamis occur, it may result in more destructive waves. As sea levels continue to rise, tsunami inundation areas would likely reach further into communities than current mapping indicates.

As land area likely to be inundated by tsunami waves increases, exposure and vulnerability to the tsunami hazard may increase for population, property, critical facilities and the environment. Changes to the tsunami hazard from climate change may result in more direct economic impacts on a greater number of businesses and economic centers, as well as the infrastructure systems that support those businesses.

14.2.4 Extent

A tsunami's size and speed, as well as the coastal area's form and depth, affect the impact of the tsunami. At some locations, the advancing turbulent wave front will be the most destructive part of the tsunami wave. In other situations, the greatest damage will be caused by the outflow of water back to the sea between crests, sweeping away items on the surface and undermining roads, buildings, bulkheads and other structures. This outflow action can carry enormous amounts of highly damaging debris, resulting in further destruction (National Tsunami Hazard Mitigation Program, 2001).

Earlier tsunami inundation modeling for Marin County projected that tsunami wave heights could exceed 25 feet in some coastal locations during extreme events. More recent California Geological Survey tsunami hazard mapping incorporates probabilistic inundation modeling and multiple credible tsunami sources to identify areas at risk from tsunami flooding and strong currents. According to the National Tsunami Hazard Mitigation Program, tsunami runups greater than 3 feet are capable of causing injuries, fatalities and significant damage to property and infrastructure (California Department of Conservation 2022).

Figure 14-4. Tsunami Inundation Area

Warning Time

Visible Indications

Tsunamis are difficult to detect in the open ocean; with waves generally less than 3 feet high. The first visible indication of an approaching tsunami may be either a rise or drop in water surface levels (National Tsunami Hazard Mitigation Program, 2001):

- A drop in water level (draw down) can be caused by the trough preceding the advancing, large inbound wave crest. Rapid draw down can create strong currents in harbor inlets and channels that can severely damage coastal structures due to erosive scour around piers and pilings. As the water's surface drops, piers can be damaged by boats or ships straining at or breaking their mooring lines. The vessels can overturn or sink due to strong currents, collisions with other objects or impact with the harbor bottom.
- The advancing tsunami may initially arrive as a strong surge increasing the sea level. This can be similar to the rising tide, but the tsunami surge rises faster and does not stop at the shoreline. Even if the wave height appears to be small, 3 to 6 feet for example, the strength of the accompanying surge can be deadly. Waist-high surges can cause strong currents that float cars, small structures, other debris and hazardous materials. Boats and debris are often carried inland by the surge and left stranded when the water recedes.

Estimated Travel Times

The NOAA National Center for Environmental Information website provides maps that show estimated travel times to coastal locations for various tsunami-generating events. Figure 14-5 shows one example of the travel time for a tsunami generated in Aburatsu, Japan to reach the planning area—approximately 11 hours.

Warning System

Tsunami Warning System for the Pacific Ocean

The tsunami warning system for the Pacific Ocean is a cooperative effort involving 26 nations. The National Weather Service operates two regional information distribution centers for this system: The Pacific Tsunami Warning Center in Ewa Beach, Hawaii; and the National Tsunami Warning Center covering the California coast in Palmer, Alaska. The warning centers issue tsunami watches, warnings and advisories. The system is activated when a Pacific basin earthquake of magnitude 6.5 occurs or an earthquake is widely felt along the North American coast. When this occurs, the following sequence of actions occurs (NOAA n.d.):

- Data is interpolated to determine epicenter and magnitude of the event.
- If the earthquake is of the right type, depth, magnitude and is far away from California coast, a TSUNAMI WATCH is typically issued for the California coastline.
- A TSUNAMI WATCH is upgraded to a TSUNAMI WARNING if tsunami wave heights are forecast to be 1 meter or larger. A TSUNAMI ADVISORY is issued if tsunami wave heights are forecast to be 0.3 meters to less than 1 meter.
- Tsunami travel times are calculated and the warning is transmitted to disseminating agencies who relay it to the public.
- The National Tsunami Warning Center will cancel/expire watches, warnings or advisories if tide gauges and buoys indicate no significant tsunami was generated or if tsunami waves no longer meet the criteria for at least 3 hours.

Source: National Centers for Environmental Information, 2018a

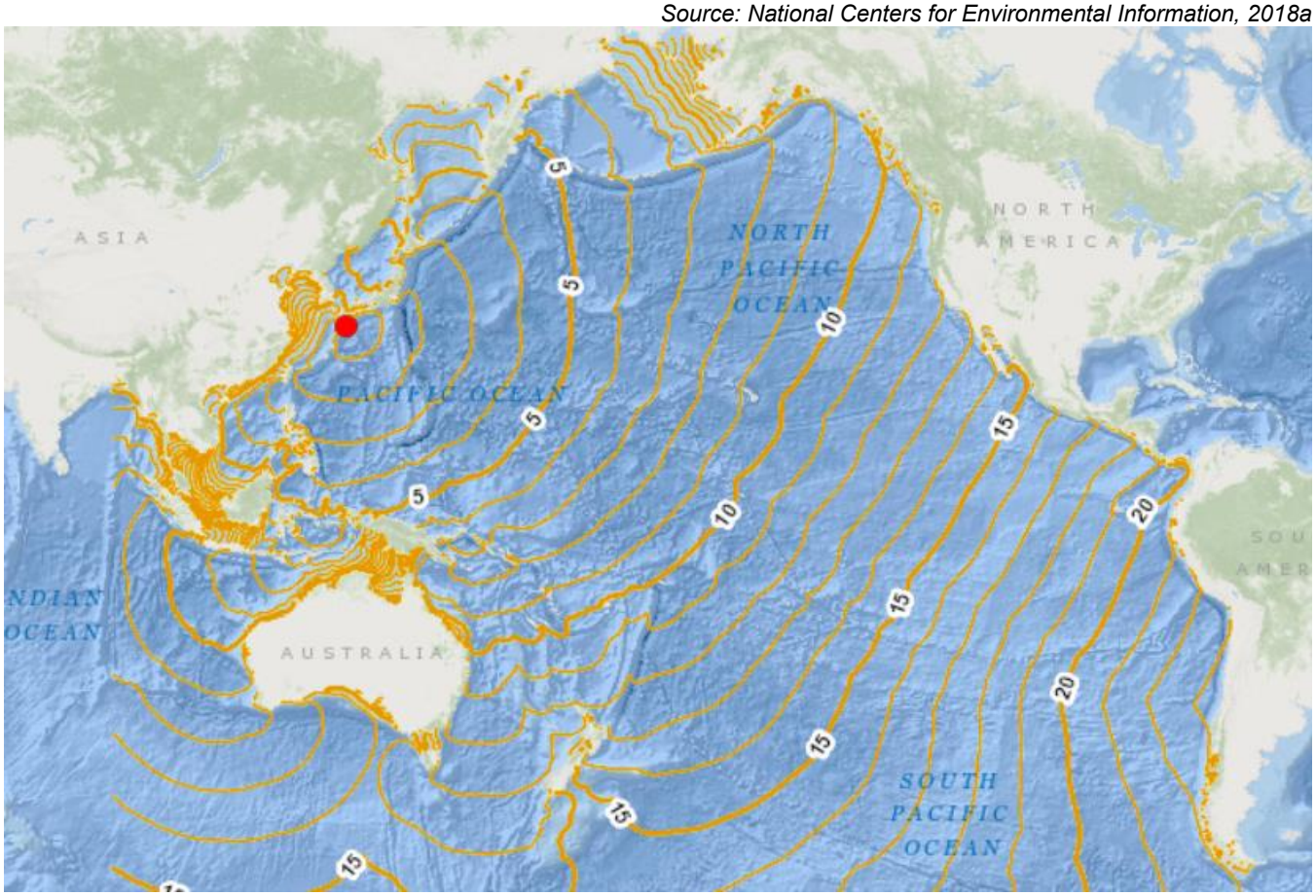


Figure 14-5. Potential Tsunami Travel Times in the Pacific Ocean, in Hours

This system is not considered to be effective for communities close to the tsunami source, because the first wave would arrive before the data could be processed and analyzed and communications systems may be impacted by the precipitating event. In this case, strong ground shaking would provide the first warning of a potential tsunami and evacuations should begin immediately.

2026 Marin Operational Area Emergency Operations Plan; Tsunami Annex

In its Tsunami Annex, the *Marin County Emergency Operations Plan* states that in the event of a tsunami warning, population in designated tsunami inundation hazard areas will be warned and advised to evacuate to higher ground or safe refuge areas. The public will be instructed to move by the quickest method available to a point no less than 30 feet above sea level. The expected arrival time of the tsunami will also be provided if available.

After warning the public, the highest priority goes to alerting and moving populations at campgrounds, beaches, schools or convalescent care facilities. Members of the public may receive warnings directly via the AlertMarin notification system, the Emergency Alert System or the NOAA Weather Radio network. West Marin's Radio Station KWMR will provide follow-up messaging with verified updates to the public via airwaves and internet streaming. Public alerting for watches and advisories will follow standard NOAA guidance (Marin County Sheriff's Office 2018).

NOAA, Cal OES and local emergency managers coordinate tsunami warning communications for the planning area. This emergency notification system is routinely tested and includes broadcasts on NOAA Weather Radio All

Hazards, social media, local television and radio stations, sirens and aircraft public address system. AlertMarin and the Wireless Emergency Alert System will also be activated during a real event.

14.3 VULNERABILITY ASSESSMENT

The risk assessment for tsunami evaluated District assets that lie within the mapped tsunami inundation area. Table 14-1 and

Table 14-2 summarize the number of each type of facility found to be within the mapped inundation area and the total replacement cost value of those exposed facilities.

Table 14-1. Number and Value of Structures and Facilities Exposed to the Tsunami Hazard

Assets	Exposed Number	Exposed Replacement Cost Value
Administrative	6	$24,300,000
Potable Water Structures	17,467	$29,310,000
Raw Water Facilities	1	$1,000
Recycled Water Facilities	1	$1,000
Total	**17,475**	**$53,612,000**

Table 14-2. Length and Value of Pipelines Exposed to the Tsunami Hazard

Assets	Exposed Length, Miles	Exposed Replacement Cost Value
Potable Water	177.0	$436,953,000
Raw Water	0.0	$0
Recycled Water	0.1	$139,000
Total	**177.1**	**$437,092,000**

The exposure analysis included the District's pipeline assets. While most of these assets are underground and not susceptible to impacts from overland flows associated with tsunamis, there are sections of pipelines that are exposed as they cross drainageways and channels. The exact location of these exposed pipelines was not available in a geospatial dataset to support this exposure analysis.

The following are general potential impacts from tsunami:

- The populations most vulnerable to the tsunami hazard are the elderly, disabled and very young who reside near beaches, low-lying coastal areas, tidal flats and river deltas that empty into ocean going waters.
- In the event of a local tsunami generated in or near the planning area, there would be little warning time, so more of the population would be vulnerable.
- The impact of tsunami waves and the scouring associated with debris that may be carried in the water could be damaging to all structures along beaches, low-lying coastal areas, tidal flats and river deltas. The most vulnerable structures are those in the front line of tsunami impact and those that are structurally unsound. Structures that were built to current floodplain regulations in the tsunami inundation area may have some level of protection, particularly if they were built to withstand wave action.
- In addition to structure damage, ships moored at piers and in harbors often are swamped and sunk or left battered and stranded high on the shore.
- The following infrastructure is vulnerable to damage:

  - **Water Proximate Infrastructure**—Breakwaters and piers collapse, sometimes because of scouring actions that sweep away their foundation material and sometimes because of the sheer impact of the tsunami waves.
  - **Flood Control Systems**—Floodwaters can back up drainage systems, causing localized flooding. Culverts can be blocked by debris from tsunami events, also causing localized urban flooding.
  - **Utility Systems—**Floodwaters can get into drinking water supplies, causing contamination. Sewer systems can be backed up, causing waste to spill into homes, neighborhoods, rivers and streams. Tsunami waves can knock down power lines and radio/cellular communication towers. Power generation facilities can be severely impacted by wave action and by inundation from floodwater.
- Tsunami waves can carry destructive debris and pollutants that can have devastating impacts on all facets of the environment. Environmental impacts on local waterways and wildlife would be most significant in areas closest to the point of impact. The vulnerability of aquatic habitat and associated ecosystems in low-lying areas close to the coastline is high.

14.4 DEVELOPMENT TRENDS

The demand for critical services may increase with growth in the surrounding area. Repair or replacement of assets will be governed by codes and standards applied by the County of Marin, depending on the location of the asset. The State of California's adoption of bills expanding property owners' rights to build accessory dwelling units will increase densities in most of the service area; areas that, as recently as 2019, were thought to be built out. The County of Marin, the cities of Belvedere, Corte Madera, Larkspur, Mill Valley, San Anselmo and the Town of Ross also participate in the National Flood Insurance Program and have adopted floodplain management standards pursuant to that program's requirements. Applications of these codes and standards to any new or redeveloped assets will reduce the risk of potential impacts from tsunami inundation.

14.5 ISSUES

Important issues associated with a tsunami in the planning area include the following:

1. **Insufficient warning time for local-source tsunamis:** A local source tsunami presents the highest risk to the planning area, as the first surge could arrive in as few as 10 minutes, leaving no time to initiate evacuation; preceding ground shaking would also damage buildings, communications, electric utility infrastructure, roads and bridges.
2. **Lack of probabilistic tsunami mapping:** Probabilistic tsunami hazard mapping is needed to effectively measure and evaluate probable tsunami impacts, as the underlying science and technology are emerging; this mapping is a key component for effective mitigation programs and is anticipated to be available for the next plan update.
3. **Building codes inadequate for tsunami impacts:** Present building codes and guidelines do not adequately address tsunami impacts on structures and current hazard mapping is not appropriate for code enforcement; future updates to the California Building Code are anticipated to address these gaps.
4. **Uncertain sea level rise impacts on tsunami inundation:** Future climate change impacts on sea level rise may become an important consideration as probable tsunami inundation areas are identified through future studies.

14.6 MITIGATION OPPORTUNITIES

Local Plan Requirement C3 – 44 CFR Part 201.6(c)(3)(ii)

The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effect of each hazard, with particular emphasis on new and existing buildings and infrastructure.

Although tsunami inundation is limited to shoreline areas, a tsunami could damage low-lying District facilities, introduce contamination into the distribution system and endanger staff working near the water. The following table presents alternatives for mitigating the tsunami hazard organized by the scale at which each action can be carried out and by whether it manipulates the hazard, reduces exposure and vulnerability or builds local capacity.

Table 14-3. Potential Opportunities to Mitigate the Tsunami Hazard

Community / Customer Scale	Utility Operational Scale
Manipulate the Hazard	
• Implement tsunami construction measures at a project level, including elevated living spaces and debris deflection structures	Implement tsunami-resistant design measures at shoreline facilities, including elevated equipment platforms and debris deflection structures
Reduce Exposure and Vulnerability	
• Construct or relocate structures outside of the hazard area • Elevate structures and utilities above the inundation levels • Apply property mitigation techniques such as anchoring foundations and providing openings that allow flow through	• Locate facilities and mission critical functions outside of the hazard area whenever possible • Elevate electrical equipment, controls and standby power above inundation levels • Anchor tanks, chemical storage and fuel storage that could float, rupture or release contaminants • Identify vertical evacuation options for staff working in inundation zones • Harden pipelines, pump stations and appurtenances located in tsunami inundation areas • Relocate identified critical facilities located in tsunami high hazard areas • Install isolation valves and backflow protection to limit system contamination if inundated mains are damaged • Adopt higher design standards that provide greater levels of protection for facilities built in tsunami inundation areas

Community / Customer Scale	Utility Operational Scale
Build Local Capacity	
• Develop and practice a household evacuation plan • Become educated about tsunami risk exposure and ways to minimize that risk • Understand tsunami warning signs and signals • Store an emergency water supply and follow District advisories before using water after an event	• Educate employees on tsunami risk exposure and ways to minimize that risk • Maintain a continuity of operations plan that addresses loss of shoreline facilities • Use probabilistic tsunami mapping and land use guidance from the State to evaluate exposure of District assets • Improve tsunami warning and notification for staff, contractors and facilities in inundation zones • Develop and communicate evacuation routes and timing for District sites and work crews • Participate in NOAA's TsunamiReady program and county coastal preparedness efforts • Establish protocols for post-event system inspection, water quality sampling, flushing and disinfection of inundated infrastructure • Pre-plan emergency water distribution for service areas that could be isolated by inundation • Restore wetlands, marshes and install living shorelines on District land to help reduce wave impacts • Include tsunami scenarios in the risk and resilience assessment and emergency response plan

15. WILDFIRE

15.1 GENERAL BACKGROUND

A wildfire is any uncontrolled fire occurring on undeveloped land that requires fire suppression. Wildfires can occur naturally, such as those ignited by lightning and are important to many ecosystem processes; however, most are started by human activity such as smoking, campfires, equipment use and arson.

15.1.1 Factors Influencing Wildfire Behavior

Fire behavior is based on factors such as the following (National Park Service 2017):

- **Fuel**—Fuel may include living and dead vegetation on the ground, along the surface as brush and small trees and above the ground in tree canopies. Lighter fuels such as grasses, leaves and needles quickly expel moisture and burn rapidly, while heavier fuels such as tree branches, logs and trunks take longer to warm and ignite. Trees killed or defoliated by forest insects and diseases are more susceptible to wildfire.
- **Weather**—Relevant weather conditions include temperature, relative humidity, wind speed and direction, cloud cover, precipitation amount and duration and the stability of the atmosphere. When the temperature is high, relative humidity is low, wind speed is increasing and coming from the east (offshore flow) and there has been little or no precipitation, so vegetation is dry, conditions are very favorable for extensive and severe wildfires. These conditions occur more frequently inland where temperatures are higher and fog is less prevalent.
- **Terrain**—Topography includes slope and elevation. The topography of a region influences the amount and moisture of fuel; the impact of weather conditions such as temperature and wind; potential barriers to fire spread, such as highways and lakes; and elevation and slope of landforms (fire spreads more easily uphill than downhill).

15.1.2 Marin Water Wildfire Resilience Plan

District staff developed a *Wildfire Resilience Plan* to summarize existing District programs and operations related to wildfire preparedness, identify data gaps and develop recommended actions that will lead to a more wildfire resilient and reliable water system that protects communities throughout the service area (Marin Municipal Water District 2020a). The District will use this plan to:

- Inform the board, community, internal organization and agency partners of preparedness status and needs
- Develop, implement and track recommended actions
- Provide a basis for future investments related to wildfire resilience
- Marin Water continues to coordinate its wildfire resilience efforts with countywide initiatives, including implementation of the Marin County Community Wildfire Protection Plan and ongoing updates led by Marin Wildfire and regional partners

15.1.3 Marin County Community Wildfire Protection Plan

The *Marin County Community Wildfire Protection Plan* provides an assessment of wildfire hazards and threats to homes in the wildland urban interface of Marin County. The plan was first published in 2016 and updated in 2020. It was developed through a collaborative process involving Fire Safe Marin, Marin County fire agencies, county officials, county, state and federal land management agencies, community members and the District. In 2025,

Marin Wildfire and Fire Safe Marin initiated a comprehensive update to the CWPP to incorporate new data, emerging wildfire risks and ongoing mitigation activities, with completion anticipated in 2026.

The purpose of the *Community Wildfire Protection Plan* is to provide fire agencies, land managers and other stakeholders in Marin County with guidance and strategies to reduce fire hazard and the risk of catastrophic wildfires in the wildland urban interface, while promoting the protection and enhancement of the county's economic assets and ecological resources.

15.1.4 Secondary Hazards

Wildfire can lead to secondary hazards such as landslides and flooding (due to the impacts of silt in local watersheds). It can strip slopes of vegetation, exposing them to greater amounts of runoff, which can weaken soils and lead to landslides with potential impacts to source water and water supply. Major landslides can occur several years after a wildfire. Most wildfires can bake soils, thus increasing the imperviousness of the ground, which increases the runoff generated by storm events and therefore the chance of flooding. Vulnerability to flooding also increases due to the destruction of watersheds. For more information on flooding, refer to Chapter 10. For more information about landslides, refer to Chapter 12.

15.2 HAZARD PROFILE

15.2.1 Past Events

Marin County has not been included in any federal declarations for wildfire but has been included in two state proclamations for the Chileno Valley Fire in 1965 (8,000 acres) and the Vision Fire 1995 (13,000 acres) (FEMA n.d.) (Cal OES 2026).

Fire records for the county are incomplete, but historical newspaper articles and old fire planning studies document an active fire history going back to the early 20th century. CAL FIRE incident information identifies 11 wildfires in Marin County since 2017.

The most recent fire in Marin County was the Queenstone Fire, which was started on August 13, 2024. The fire was contained by August 15, 2024, at 18 acres. The last fire in Marin that resulted in significant acreage loss was the Woodward Fire in 2020, which destroyed 4,929 acres after 45 days.

In 1929, the base of Mt. Tamalpais—specifically the community of Mill Valley—experienced a significant fire known as the Great Mill Valley Fire. That fire's footprint is now developed with more than 1,100 homes (valued at over $1 billion) which have significantly altered the natural vegetation through urban and suburban development (*Marin Community Wildfire Protection Plan*, December 2020).

15.2.2 Location

California's seasonally dry Mediterranean climate lends itself to wildfires, and in an effort to better prepare, CAL FIRE is required to classify the severity of fire hazard in areas of California. The State Fire Marshal is mandated to classify lands within both State Responsibility Areas and Local Responsibility Areas into FHSZs. FHSZs fall into one of the following classifications (CAL FIRE 2026):

- Moderate
- High
- Very High

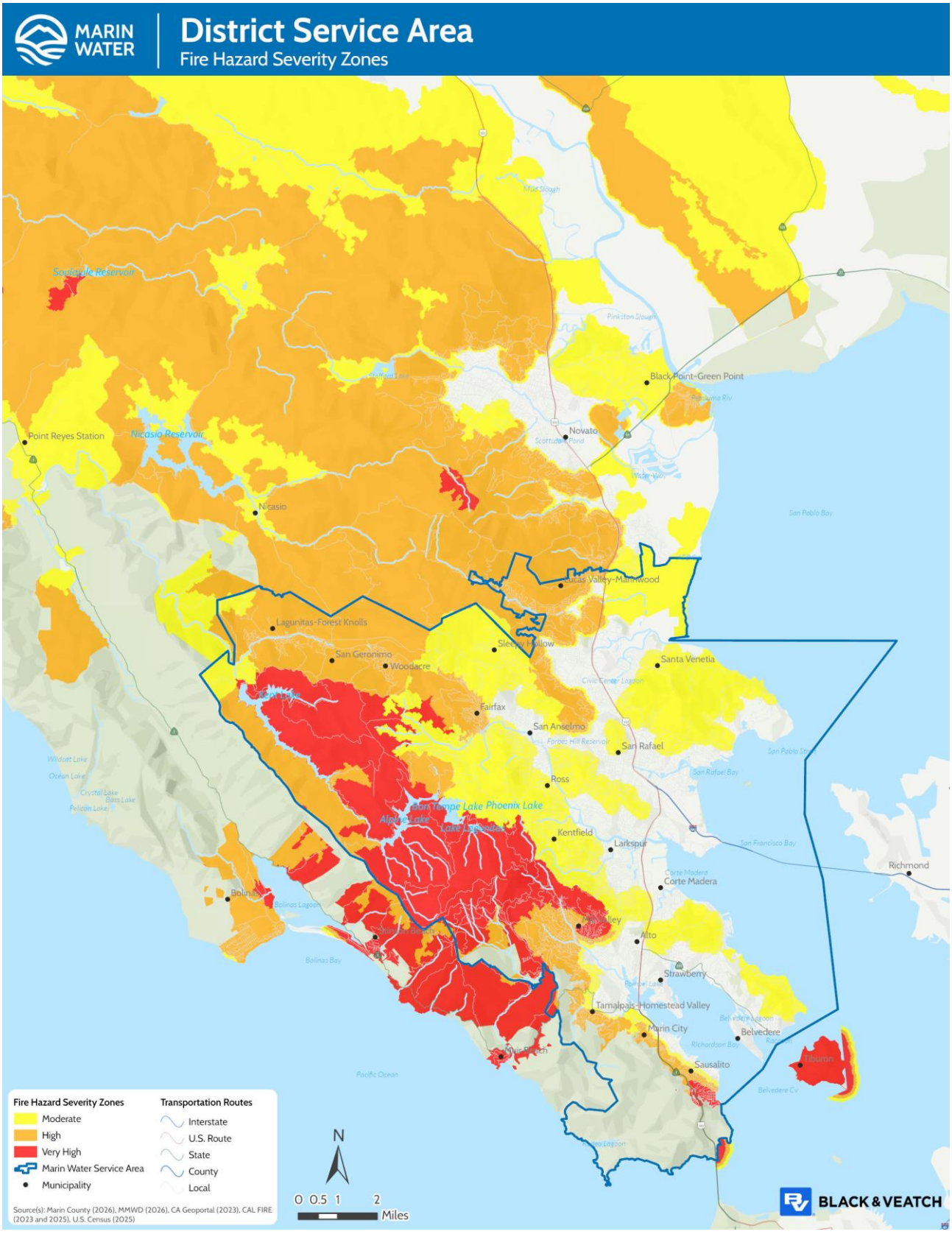


Figure 15-1. Fire Hazard Severity Zones

The FHSZ maps are developed using a science-based and field-tested model that assigns a hazard score based on the factors that influence fire likelihood and fire behavior. Many factors are considered such as fire history, existing and potential fuel (natural vegetation), predicted flame length, blowing embers, terrain and typical fire weather for the area. Figure 15-1 shows the FHSZ mapped by CAL FIRE within the planning area.

15.2.3 Future Conditions

Probability

Wildfires will continue to present a risk to Marin County and the planning area. It is difficult to estimate the number of wildfires that will occur in the planning area because of the number of factors that impact the potential for a fire and because some conditions exert increasing pressure on the wildland urban interface zone (e.g., ongoing development).

An analysis of the frequency of past occurrences can give a rough guide as to how many events may occur each year if current trends continue. CAL FIRE incident information identifies 11 wildfires, 2 of which exceeded 100 acres, in Marin County in the 9 years since 2017, more than one event per year on average.

Climate Change

Wildfire is determined by climate variability, local topography and human intervention. Climate change has the potential to affect multiple elements of the wildfire system: fire behavior, ignitions, fire management and vegetation fuels. Hot dry spells create the highest fire risk. Increased temperatures may intensify wildfire danger by warming and drying out vegetation. Additionally, changes in climate patterns may impact the distribution and perseverance of insect outbreaks that create dead trees (increase fuel). When climate alters fuel loads and fuel moisture, forest susceptibility to wildfires changes. Climate change also may increase winds that spread fires which are harder to contain and thus are more likely to expand into residential neighborhoods. Larger, more severe and more frequent fires may impact critical facilities by increasing the risk of ignition from nearby fire sources.

15.2.4 Extent

Potential losses from wildfire include human life, structures and other improvements and natural resources. The potential for significant damage to life and property exists in areas designated as “wildland-urban interface areas,” where development is adjacent to densely vegetated areas. There are no recorded incidents of loss of life from wildfires in the planning area.

Fire hazards present a considerable risk to vegetation and wildlife habitats. Short-term loss caused by a wildfire can include the destruction of timber, wildlife habitat, scenic vistas and watersheds. Long-term effects include smaller timber harvests, reduced access to affected recreational areas and destruction of cultural and economic resources and community infrastructure. Wildfires can have a significant impact on air quality, especially with prolonged periods of burning and can cause the contamination of reservoirs.

Warning Time

Wildfires are often caused by humans, intentionally or accidentally. There is no way to predict when one might break out. Since fireworks often cause brush fires, extra diligence is warranted around the Fourth of July when the use of fireworks is highest.

Dry seasons and droughts are factors that greatly increase fire likelihood. Dry lightning may trigger wildfires. Adverse weather can be predicted, so special attention can be paid during weather events that may include

lightning. The National Weather Service and Storm Prediction Center can often identify conditions favorable for severe thunderstorms one to several days in advance and issue severe weather outlooks.

If a fire does break out and spread rapidly, residents may need to evacuate within days or hours. A fire's peak burning period generally is between 1 p.m. and 6 p.m. Once a fire has started, fire alerting is reasonably rapid in most cases. The rapid spread of cellular and two-way radio communications in recent years has further contributed to a significant improvement in warning time.

15.3 VULNERABILITY ASSESSMENT

The risk assessment for wildfire evaluated District assets that lie within the CAL FIRE Hazard Severity Zones. Structures, above-ground infrastructure and critical facilities are all vulnerable to the wildfire hazard. There is currently no validated damage function available to support wildfire mitigation planning. Vulnerable assets are assumed to include all those identified as exposed to the wildfire hazard. Critical facilities of wood frame construction or with wood roofs are especially vulnerable during wildfire events.

Table 15-1 and Table 15-2 summarize the number of structures and pipes in these zones and the total replacement cost value of those exposed assets. While most of the pipeline assets are underground and not susceptible to impacts from wildfire, there are sections of pipelines that are exposed. The exact location of these exposed pipelines was not available in a geospatial dataset to support this exposure analysis.

Table 15-1. Number and Value of Structures and Facilities Exposed to the Wildfire Hazard Severity Zones

Assets	Exposed Number	Exposed Replacement Cost Value
Very High Fire Hazard Severity Zone		
Administrative	0	$0
Potable Water Structures	2,495	$28,679,000
Raw Water Facilities	0	$0
Recycled Water Facilities	0	$0
Total	**2,495**	**$28,679,000**
High Hazard Severity Zone		
Administrative	0	$0
Potable Water Structures	12,735	$145,725,000
Raw Water Facilities	1	$1,000
Recycled Water Facilities	86	$5,088,000
Total	**12,822**	**$150,814,000**
Moderate Hazard Severity Zone		
Administrative	0	$0
Potable Water Structures	23,316	$236,965,000
Raw Water Facilities	0	$0
Recycled Water Facilities	68	$58,000
Total	**23,384**	**$237,023,000**

Table 15-2. Length and Value of Pipelines Exposed to the Wildfire Hazard Severity Zones

Assets	Very High Fire Hazard Severity Zone		High Fire Hazard Severity Zone		Moderate Fire Hazard Severity Zone	
	Exposed Length, Miles	Exposed Replacement Cost Value	Exposed Length, Miles	Exposed Replacement Cost Value	Exposed Length, Miles	Exposed Replacement Cost Value
Potable Water	24.9	$62,328,000	137.7	$346,580,000	255.8	$661,498,000
Raw Water	0.0	$0	0.0	$0	0.0	$0
Recycled Water	0.0	$0	3.7	$10,198,000	2.7	$7,471,000
Total	**24.9**	**$62,328,000**	**141.4**	**$**356,778,000	**258.5**	**$**668,969,000

15.4 DEVELOPMENT TRENDS

Urbanization alters the natural fire regime and can create the potential for expansion of urbanized areas into wildland areas. The demand for critical District services may increase with growth in the surrounding area. The State of California's adoption of bills expanding property owners' rights to build accessory dwelling units will increase densities in most of the District's service area.

Per Government code 53091(d) District facilities required for the production, generation, storage, treatment, or transmission of water are exempt from building codes. For structures that are governed by codes and standards, Marin Water will repair or replace structures in accordance with the 2025 California Building Code adopted by the jurisdiction where the structure is located.

15.5 ISSUES

The major issues for wildfire are the following:

1. **Significant wildfire threat to critical infrastructure:** The wildfire hazard presents a significant threat to the District's infrastructure, including two treatment plants and dozens of tanks and pump stations directly threatened by wildfire.
2. **Public education and outreach responsibility deferred to the County:** Public education and outreach for people living in or near fire hazard zones—covering mitigation activities such as defensible space and advance identification of evacuation routes and safe zones—will be conducted by the County.
3. **Secondary hazard risk from wildfire-triggered landslides:** Wildfires could cause landslides as a secondary natural hazard, compounding risk to the planning area.
4. **Uncertain climate change impacts on wildfire risk:** Climate change could affect the frequency, severity or extent of the wildfire hazard.
5. **Limited scope and resources for vegetation management:** Current vegetation management activities require enhancement through expansion of target areas and allocation of additional resources.

15.6 MITIGATION OPPORTUNITIES

Local Plan Requirement C3 – 44 CFR Part 201.6(c)(3)(ii)

The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effect of each hazard, with particular emphasis on new and existing buildings and infrastructure.

Wildfire is among the most consequential hazards facing the District, with the potential to damage facilities, interrupt power and access, drive extraordinary fire flow demand and degrade source water quality for years through post-fire erosion and ash loading. The alternatives presented below span watershed fuel management, facility hardening, system capacity and post-fire recovery. The table organizes these alternatives by the scale at which they can be carried out and by mitigation category.

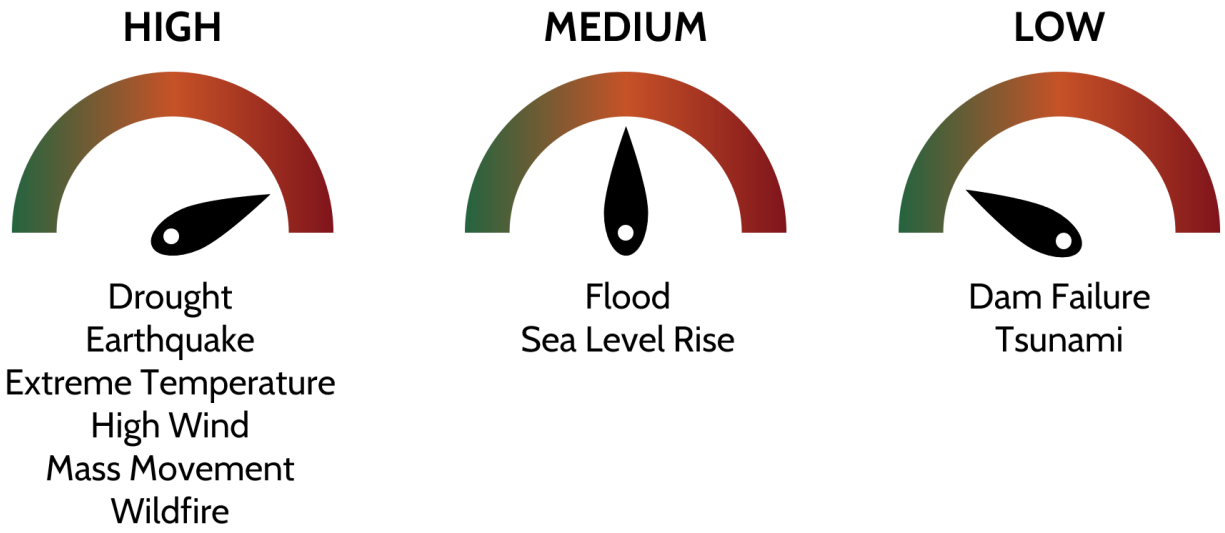
Table 15-3. Potential Opportunities to Mitigate the Wildfire Hazard

Community / Customer Scale	Utility Operational Scale
Manipulate the Hazard	
• Clear potential fuels on property such as dry overgrown underbrush and dead, dying or diseased trees • Maintain vegetation clearance around water meters, hydrants and utility easements	• Reduce hazardous fuels on District watershed lands through thinning, mowing, grazing and prescribed fire • Maintain shaded fuel breaks along District access roads, ridgelines and pipeline corridors
Reduce Exposure and Vulnerability	
• Create and maintain defensible space around structures • Locate outside of the hazard area • Use fire-resistant building materials and ember-resistant vents • Keep hydrants and water system access points visible and unobstructed	• Create and maintain defensible space around tanks, pump stations, treatment plants and communication sites • Use fire-resistant materials and non-combustible enclosures for facility structures and equipment • Protect exposed control panels, conduit and wiring from radiant heat and ember intrusion • Provide standby power at critical facilities to maintain pressure during outages and public safety power shutoffs • Site new facilities outside of very high fire hazard severity zones where feasible • In high-risk areas, use heat-resistant materials such as welded steel and avoid heat-susceptible materials such as polyvinyl chloride and high-density polyethylene • Increase storage, pumping and transmission capacity to sustain fire flow during extended events • Use fire-resistant plantings in buffer areas of high wildfire threat • Protect raw water quality by planning for post-fire erosion, sediment and ash loading to reservoirs

Community / Customer Scale	Utility Operational Scale
	Build Local Capacity
• Employ techniques from the National Fire Protection Association's Firewise USA program to safeguard your home • Store an emergency water supply and understand that pressure may be reduced during a major fire • Install or replace roofing with non-combustible materials • Use water wisely during fire weather so that storage remains available for firefighting	• Support Firewise community initiatives and local fire safe councils • Train staff on fire weather operating protocols, facility shutdown and evacuation • Maintain a continuity of operations plan addressing loss of watershed access and power • Identify fire response and alternative evacuation and access routes for watershed lands and facilities • Seek alternative and supplemental water supplies for firefighting, including tanks, drafting points and portable systems • Establish and maintain mutual aid agreements with fire service agencies and neighboring utilities • Develop, adopt and implement integrated plans for mitigating wildfire impacts in wildland areas bordering development • Establish post-fire water quality monitoring, flushing and sampling protocols to detect contamination from damaged or heat-affected pipe • Pre-plan post-fire watershed recovery, including erosion control, debris management and turbidity treatment • Use detection, monitoring and forecasting tools such as cameras, weather stations and fire behavior modeling to take action ahead of wildfire • Consider the probable impacts of climate change on wildfire risk in siting, design and land management decisions • Manage invasive species that increase wildfire risk on watershed lands • Maintain riparian corridors and nature-based buffers in wildfire hazard areas as fire breaks • Partner with academic and agency researchers to study wildfire impacts on water supply and watershed health

16. Risk Ranking

The prioritization of natural hazards in the Planning Area is based on the Priority Risk Index (PRI), a tool used to measure relative risk. The PRI helps the District identify which hazards pose the greatest threat. Results are shown below.



The PRI assigns a numerical score to each hazard, allowing them to be compared and ranked (higher values indicate greater risk). Scores are calculated using five categories: probability, impact, spatial extent, warning time and climate change. Each category is assigned a risk value (1 to 4) and a weighting factor.

The PRI is calculated as follows:

PRI = (Probability × 0.30) + (Impact × 0.30) + (Spatial Extent × 0.20) + (Warning Time × 0.10) + (Climate Change × 0.10)

The maximum possible PRI score is 4.0. Table 16-1 shows the weighting schemes for each category. Weighting factors are typical for hazard mitigation planning, though they may be adjusted as needed.

Many PRI categories are described in the hazard profiles. Hazards are assigned rankings based on their resulting PRI scores as outlined below:

- PRI Value 1 to 1.9 = Low Hazard Risk Ranking
- PRI Value 2.0 to 2.9 = Medium Hazard Risk Ranking
- PRI Value 3.0 to 4.0 = High Hazard Risk Ranking

The final PRI results for each hazard in the Planning Area are in

Table 16-2.

Table 16-1. Priority Risk Index Scoring Criteria

PRI Category	Degree of Risk			Assigned Weighting Factor
	Level	Criteria	Index Value	
Probability	Unlikely	Less than 1% annual probability	1	30%
	Possible	Between 1 and 10% annual probability	2	
	Likely	Between 10 and 90% annual probability	3	
	Highly Likely	90%+ annual probability	4	
Impact	Minor	Between 1 and 10% of service area population and/or assets impacted	1	30%
	Limited	Between 10 and 30% of service area population and/or assets impacted	2	
	Critical	Between 30 and 50% of service area population and/or assets impacted	3	
	Catastrophic	More than 50% of service area population and/or assets impacted	4	
Spatial Extent	Negligible	Limited to one specific area.	1	20%
	Small	Small areas affected.	2	
	Moderate	Large areas affected.	3	
	Large	All areas affected.	4	
Warning Time	More than 24 hours	Self-explanatory	1	10%
	12 to 24 hours	Self-explanatory	2	
	6 to 12 hours	Self-explanatory	3	
	Less than 6 hours	Self-explanatory	4	
Climate Change	Decreasing Risk	Climate change is likely to result in a decrease in the frequency and/or severity of hazard events.	1	10%
	No Impact	Climate change is not expected to impact frequency and/or severity of hazard events.	2	
	Risk Unknown	Not enough data currently exists to make accurate projections on the impact of climate change on hazard events.	3	
	Increasing Risk	Climate change is likely to result in an increase in the frequency/severity of hazard events.	4	

Table 16-2. Planning Area Hazard Risk Ranking Summary

Hazard	Weighted Risk Factors					PRI	Risk Ranking
	Probability	Impact	Spatial Extent	Warning Time	Climate Change		
Dam Failure	0.3	0.3	0.4	0.1	0.3	1.4	Low
Drought	1.2	1.2	0.8	0.1	0.4	3.7	High

Hazard	Weighted Risk Factors					PRI	Risk Ranking
	Probability	Impact	Spatial Extent	Warning Time	Climate Change		
Earthquake	1.2	1.2	0.8	0.4	0.2	3.8	High
Extreme Temperature	1.2	1.2	0.8	0.1	0.4	3.7	High
Flood	1.2	0.6	0.4	0.1	0.4	2.7	Medium
High Wind	1.2	1.2	0.8	0.1	0.4	3.7	High
Mass Movement	1.2	1.2	0.6	0.1	0.3	3.4	High
Sea Level Rise	1.2	0.3	0.2	0.1	0.4	2.2	Medium
Tsunami	0.6	0.3	0.2	0.3	0.2	1.6	Low
Wildfire	1.2	1.2	0.8	0.4	0.4	4.0	High

17. Other Hazards of Interest

The hazards of concern assessed in this plan are those that present significant risks in the service area. Additional hazards, both natural and human-caused, were identified by the Steering Committee as having some potential to impact the planning area, but at a much lower risk level than the hazards of concern. These other hazards are identified as hazards of interest.

The sections below provide short profiles of each hazard of interest, including qualitative discussion of their potential to impact Marin Water. No formal risk assessment of these hazards was performed and no mitigation initiatives have been developed to address them. However, Marin Water should be aware of these hazards and should take steps to reduce the risks they present whenever it is practical to do so.

17.1 ALGAE BLOOM

Algae blooms occur when algae or cyanobacteria (commonly called blue-green algae) rapidly increase in number and accumulate in lakes, reservoirs, ponds and slow-moving waterways. Under favorable environmental conditions, including warm temperatures, abundant sunlight, elevated nutrient concentrations and low-flow or stagnant water conditions, algae populations can grow rapidly and form visible surface accumulations known as blooms. Some cyanobacterial blooms produce toxins and are classified as Harmful Algal Blooms (HABs). HABs can adversely affect drinking water supplies, aquatic ecosystems, recreational uses and public health. EPA identifies cyanobacteria and cyanotoxins as an emerging challenge for public water systems because blooms can create taste and odor issues, increase treatment costs and potentially introduce toxins into source waters (USEPA 2025).

For water utilities, harmful algal blooms represent both a water quality hazard and an operational hazard. Cyanobacteria may produce compounds such as geosmin and 2-methylisoborneol (MIB), which create objectionable tastes and odors in finished drinking water even at very low concentrations. Some species may also produce cyanotoxins, including microcystins, cylindrospermopsin, anatoxins and saxitoxins. These toxins can create health concerns if they enter drinking water supplies at elevated concentrations. California and EPA guidance recommend proactive monitoring, early warning systems and cyanotoxin management planning to reduce risks to public water systems (USEPA 2025).

Climate change is expected to increase the likelihood of bloom formation in many regions. Warmer air and water temperatures, longer dry periods, changing precipitation patterns and increased nutrient runoff following storm events can all create favorable conditions for algae growth. As a result, harmful algal blooms are increasingly recognized as a water resource management issue throughout California.

For Marin Water, algae blooms are primarily a concern because the District relies on reservoirs and surface water resources that may periodically experience conditions conducive to algae growth. Algae blooms could affect treatment operations, reservoir management practices, public confidence in drinking water quality and ecosystem health within the watershed.

17.1.1 Location, Extent and Probability

The hazard is most likely to occur within surface water bodies, reservoirs and impoundments where water residence times are relatively long and where nutrient loading, warm temperatures and low circulation occur. Potential areas of concern include Marin Water reservoirs, where seasonal environmental conditions may support algae growth.

Bloom severity can vary considerably from year to year. Minor events may cause only aesthetic impacts such as discoloration and taste and odor complaints. More significant harmful algal blooms may require increased

monitoring, modifications to treatment processes, public notifications, operational adjustments, recreational restrictions or source-water management actions.

Although harmful algal blooms are generally considered seasonal hazards, California water quality monitoring programs note that blooms can occur throughout the year and may persist for extended periods during drought conditions. The likelihood of occurrence generally increases during warm, dry periods and during years with elevated nutrient availability.

17.1.2 Previous Occurrences and Historical Perspective

No major historical harmful algal bloom event with documented impacts to Marin Water operations was identified in the planning record reviewed for this update. However, the planning process recognized algae blooms as a hazard of interest requiring further evaluation and GIS analysis.

Across California, harmful algal blooms have become increasingly common and are monitored through statewide programs administered by the California State Water Resources Control Board and other agencies. State monitoring programs report recurring bloom events in reservoirs, lakes, rivers and estuarine environments throughout California. Drought conditions, elevated nutrient concentrations and warming water temperatures have contributed to growing concern over HAB occurrence and severity.

Water utilities throughout the United States have experienced HAB-related operational challenges, including increased treatment costs, customer complaints regarding taste and odor, expanded monitoring requirements and implementation of emergency source-water management measures. EPA guidance notes that severe bloom events can challenge conventional treatment systems and require utility-specific response actions to maintain drinking water quality (USEPA 2025).

Because Marin Water relies on surface-water resources, the District faces many of the same vulnerabilities identified for drinking water providers throughout California and the western United States, particularly during extended droughts and periods of elevated reservoir temperatures.

17.1.3 Vulnerability and Potential Impacts

The principal concern associated with algae blooms is degradation of source-water quality. Potential impacts to Marin Water include:

- Increased treatment complexity and operational costs
- Taste and odor complaints
- Potential cyanotoxin occurrence requiring additional monitoring and treatment response
- Increased laboratory testing and regulatory reporting requirements
- Reduced recreational use of reservoirs and associated public concerns
- Ecological impacts to fisheries, aquatic habitat and water quality
- Increased public information and risk communication needs
- Potential service disruptions if source-water conditions become severe enough to affect treatment operations

Water treatment facilities, reservoir operations, water quality monitoring programs, public communications and watershed management functions could all be affected by significant bloom events.

The hazard may also interact with other hazards identified in this Plan. Drought, extreme heat and climate change can increase the likelihood and duration of algae blooms. Wildfire impacts within watersheds may increase nutrient loading through erosion and sediment transport, potentially contributing to future bloom development.

17.1.4 Responding to Algae Blooms in the Marin Water Service Area

An effective algae bloom response program emphasizes preparedness, monitoring, rapid assessment, operational flexibility and public communication. EPA and California guidance recommend source-water monitoring and cyanotoxin management planning as key best practices for public water systems (USEPA 2025).

Marin Water's response to an algae bloom should include the following components:

Monitoring and Early Detection

- Conduct routine reservoir and source-water monitoring during bloom-prone seasons
- Monitor environmental conditions that support bloom formation, including temperature, nutrient concentrations and reservoir stratification
- Establish bloom trigger levels and response thresholds
- Collect samples for laboratory analysis when blooms are observed or suspected

Operational Response

- Increase water quality monitoring frequencies
- Evaluate treatment process performance and make operational adjustments as necessary
- Coordinate with regulatory agencies regarding testing requirements and response protocols
- Implement alternative source-water management strategies where feasible

Public Information and Risk Communication

- Provide timely public notification regarding observed blooms and associated risks
- Coordinate messaging with local public health and environmental agencies
- Develop clear communication materials explaining recreational and drinking water implications
- Maintain transparency regarding monitoring results and mitigation actions

Recovery and Long-Term Mitigation

- Document bloom occurrence, response actions and operational impacts
- Evaluate watershed management opportunities that reduce nutrient loading
- Incorporate climate adaptation considerations into long-range water resource planning
- Periodically update monitoring and response procedures as scientific understanding and regulatory guidance evolve

Consistent with the mitigation strategy developed through this planning effort, Marin Water may further enhance resilience through implementation of a Harmful Algal Bloom Monitoring and Response Program focused on improved monitoring, early warning capabilities and coordinated response procedures for water quality threats.

17.2 PUBLIC HEALTH EMERGENCY

An outbreak is defined by the U.S. Centers for Disease Control and Prevention (CDC) as the occurrence of more cases of disease than normally expected within a specific place or group of people over a given period of time. Title 17 of the California Code of Regulations (Sections 2500, 2502, 2505 and 2508), most recently revised in June 2025, requires immediate reporting of known or suspected outbreaks by health care providers, health care facilities, laboratories, veterinarians, schools, child day care facilities and food service establishments.

An epidemic is a localized outbreak that spreads rapidly and affects a large number of people or animals in a community. A pandemic is an epidemic that occurs worldwide or over a very large area and affects a large number of people or animals (WHO 2026).

A public health emergency does not damage District infrastructure, but it can significantly disrupt Marin Water's ability to operate that infrastructure. Treatment, distribution, watershed and administrative functions all depend on a specialized workforce and widespread illness, quarantine or a public health order could reduce the availability of certified treatment and distribution operators, water quality staff and field crews at the same time that demand for reliable service and clear public information is highest. Drinking water treatment is also itself a public health barrier: the District's treatment processes, water quality monitoring and cross-connection control programs are a primary defense against waterborne disease for the approximately 191,000 people served in central and southern Marin County.

17.2.1 Identified Hazards

The California Department of Public Health has identified the conditions described in Table 17-1 as human diseases that could contribute to a serious epidemic in the state. Several of these conditions—including cryptosporidiosis, giardiasis, Legionnaires' disease, norovirus and campylobacteriosis—are of direct interest to Marin Water because they can be transmitted through drinking water, source water or premise plumbing systems.

Table 17-1. Naturally Spread Diseases Seen in California

Description	Examples	
Animal Transmitted		
These are diseases that are transmitted to humans by domestic or non-domestic animals.	• Brucellosis • Campylobacteriosis • Cryptosporidiosis • Escherichia coli (E. coli) • Giardiasis • Plague • Psittacosis	• Q Fever • Rabies • Ringworm • Salmonellosis • Toxoplasmosis • Tularemia
Bloodborne		
Viruses, bacteria and parasites that can be carried in blood and cause disease are known as bloodborne pathogens. Transmission of these diseases may be from direct blood contact, needle sticks, intravenous drug use, sexual behavior, insects or other vectors.	• Ebola • Hepatitis B and C • HIV/AIDS • Malaria	

Description	Examples	
Community-Acquired Infections		
Community-acquired infections are infections that are contracted outside of a hospital or diagnosed shortly after admission without any previous health care encounter.	• Adenovirus • Conjunctivitis • COVID-19 • Enterovirus, non-polio • Hand, foot and mouth disease • Impetigo • Influenza • Invasive Group A Streptococcus • Legionnaires' Disease/Pontiac Fever • Measles • Meningococcal disease	• Methicillin-Resistant Staphylococcus Aureus • Mumps • Norovirus/viral gastroenteritis • Pertussis • Respiratory syncytial virus • Shigellosis • Staphylococcus aureus • Strep throat/scarlet fever • Tuberculosis • Varicella/chickenpox • Viral meningitis
Foodborne		
Foodborne diseases can be spread when food becomes contaminated with bacteria, viruses or parasites. These illnesses often cause gastrointestinal symptoms such as diarrhea, vomiting, nausea, stomachache and fever.	• Amebiasis • Botulism • Brucellosis • Campylobacteriosis • Cholera • Cryptosporidiosis • Cyclosporiasis • Escherichia coli (E. coli) • Giardiasis	• Hepatitis A • Listeriosis • Norovirus • Salmonellosis • Shigellosis • Typhoid Fever • Vibriosis • Yersinia
Influenza		
Influenza is an infectious viral disease commonly transmitted through airborne aerosols such as coughing or sneezing. Symptoms can include chills, headache, fever, nausea, muscle pain and occasionally pneumonia.	• Seasonal influenza • Novel influenza A • Pandemic influenza	
Mosquito-Transmitted		
Mosquito-borne diseases are established in California. West Nile virus is detected in Marin County and neighboring Bay Area counties in most years and invasive Aedes mosquitoes capable of transmitting dengue, chikungunya and Zika continue to expand their range in the state. Surveillance, source reduction and control in the planning area are led by the Marin/Sonoma Mosquito and Vector Control District. Standing water associated with District facilities—including uncovered vaults, valve boxes, tanks and watershed features—can create mosquito habitat, making routine facility maintenance and coordination with the vector control district a relevant District practice.		

Description	Examples	
Respiratory Viruses		
Respiratory viruses can cause influenza-like illness, the common cold and more severe respiratory disease. People at higher risk include those with certain underlying conditions, older adults, very young children and pregnant people.	• Adenovirus • COVID-19 • Coronaviruses • Influenza • Measles • MERS • Parainfluenza	• Pertussis • Respiratory syncytial virus • Rhinovirus/common cold • SARS
Waterborne Diseases		
Diseases caused by micro-organisms transmitted in water can be spread while bathing, washing, drinking water or eating food exposed to contaminated water. For a public water system such as Marin Water, waterborne disease is the public health condition with the most direct operational connection: source water contamination, a treatment upset, a loss of system pressure, a main break or a cross-connection could expose customers to these pathogens and require a boil water notice, do-not-drink notice or other public notification in coordination with Marin County Public Health and the State Water Board Division of Drinking Water.	• Cholera • Cryptosporidiosis • Escherichia coli (E. coli) • Giardiasis • Legionnaires' Disease /Pontiac Fever	• Leptospirosis • Norovirus • Shigellosis • Typhoid Fever • Vibriosis
Sexually Transmitted Disease		
HIV/AIDS, chlamydia, gonorrhea and syphilis are the predominant sexually transmitted infections handled by local departments of health, whose responsibilities include awareness, prevention and control of these infections.	• Chlamydia • Gonorrhea • Hepatitis A, B and C • HIV/AIDS	• Human papillomavirus • Syphilis • Zika

17.2.2 Planning Capability for Pandemic

The following are key agencies involved in public health planning for the planning area:

- The California Department of Public Health works to protect the public's health. The Department's programs and services, implemented in collaboration with local health departments and state, federal and private partners, touch the lives of every Californian and visitor to the state. CDPH maintains the list of reportable diseases and conditions under Title 17 of the California Code of Regulations, which was last revised in June 2025.
- Marin County Health and Human Services is the largest department in the County of Marin and is charged with promoting and protecting the health, well-being, self-sufficiency and safety of all people in Marin County.
- Marin County Public Health protects the community by promoting health, preventing disease and preparing for public health emergencies. Its Communicable Disease and Community Preparedness branch receives reports of suspected and confirmed reportable conditions, investigates cases and outbreaks, issues health alerts and advisories and provides guidance to health care providers, schools, childcare centers and congregate living facilities. Marin County Public Health also maintains public health dashboards and leads countywide public health emergency preparedness in coordination with the Marin County Office of Emergency Management.

- Marin Water protects public health through drinking water treatment, distribution system operation and water quality monitoring in compliance with the Safe Drinking Water Act and State Water Board Division of Drinking Water requirements. District capabilities relevant to this hazard include its Emergency Response Plan prepared under the America's Water Infrastructure Act (AWIA), continuity of operations procedures for maintaining staffing of critical positions, its cross-connection control program and established public notification channels for water quality events.

17.3 CYBER-ATTACK

A cyber-attack is an intentional and malicious crime that compromises the digital infrastructure of a person or organization, often for financial or terror-related reasons. Such attacks vary in nature and are perpetrated using digital mediums or sometimes social engineering to target human operators. Generally, attacks last minutes to days, but large-scale events and their impacts can last much longer. As information technology continues to grow in capability and interconnectivity, cyber-attacks become increasingly frequent and destructive. Water and wastewater utilities have become a specific focus of these attacks because operational technology—supervisory control and data acquisition (SCADA) systems, programmable logic controllers and remote telemetry that monitor and control treatment plants, pump stations, tanks and pressure zones—is often remotely accessible and, at many utilities, was installed before modern security controls were standard practice.

17.3.1 Types of Cyber-Attack

Cyberthreats differ by motive, attack type and perpetrator profile. Motives range from the pursuit of financial gain to political or social aims. Cyberthreats are difficult to identify and comprehend. Types of threats include using viruses to erase entire systems, breaking into systems and altering files, using someone's personal computer to attack others or stealing confidential information. The spectrum of cyber risks is limitless, with threats having a wide range of effects on the individual, community, organizational and national threat (CISA n.d.).

This risk assessment includes cyber-attacks and cyber terrorism under the inclusive hazard of cyber threats. The terms often are used interchangeably, though they are not the same. While all cyber terrorism is a form of cyber-attack, not all cyber-attacks are cyber terrorism.

Public and private computer systems are likely to experience a variety of cyber-attacks, from blanket malware infection to targeted attacks on system capabilities. Cyber-attacks specifically seek to breach information technology security measures designed to protect an individual or organization. The initial attack is followed by more severe attacks for the purpose of causing harm, stealing data or financial gain. Organizations are prone to different types of attacks that can be either automated or targeted in nature. Table 17-2 describes the most common cyber-attack mechanisms faced by organizations today.

17.3.2 Cyberterrorism

Cyberterrorism is the use of computers and information, particularly over the internet, to recruit others to an organization's cause, cause physical or financial harm or cause a severe disruption of infrastructure service. Such disruptions can be driven by religious, political or other motives. Like traditional terrorism tactics, cyberterrorism seeks to evoke very strong emotional reactions, but it does so through information technology rather than a physically violent or disruptive action. Cyberterrorism has three main types of objectives (Kostadinov 2012):

- **Organizational**—Cyberterrorism with an organizational objective includes specific functions outside of or in addition to a typical cyber-attack. Terrorist groups today use the internet on a daily basis. This daily use may include recruitment, training, fundraising, communication or planning. Organizational cyberterrorism can use platforms such as social media as a tool to spread a message beyond country borders and instigate physical

forms of terrorism. Additionally organizational goals may use systematic attacks as a tool for training new members of a faction in cyber warfare.

- **Undermining**—Cyberterrorism with undermining as an objective seeks to hinder the normal functioning of computer systems, services or websites. Such methods include defacing, denying and exposing information. While undermining tactics are typically used due to high dependence on online structures to support vital operational functions, they typically do not result in grave consequences unless undertaken as part of a larger attack. Undermining attacks on computers include the following:
  - Directing conventional kinetic weapons against computer equipment, a computer facility or transmission lines to create a physical attack that disrupts the reliability of equipment.
  - Using electromagnetic energy, most commonly in the form of an electromagnetic pulse, to create an electronic attack against computer equipment or data transmissions. By overheating circuitry or jamming communications, an electronic attack disrupts the reliability of equipment and the integrity of data.
  - Using malicious code directed against computer processing code, instruction logic or data. The code can generate a stream of malicious network packets that disrupt data or logic by exploiting vulnerability in computer software or a weakness in computer security practices. This type of cyber-attack can disrupt the reliability of equipment, the integrity of data and the confidentiality of communications.
- **Destructive**—The destructive objective for cyberterrorism is what organizations fear most. Through the use of computer technology and the internet, the terrorists seek to inflict destruction or damage on tangible property or assets and even death or injury to individuals. There are no cases of pure cyberterrorism as of the date of this plan.

Table 17-2. Common Mechanisms for Cyber-Attacks

Type	Description
Advanced Persistent Threat	An attack in which the attacker gains access to a network and remains undetected. Advanced persistent threat attacks are designed to steal data instead of cause damage.
Denial of Service Attacks	Attacks that focus on disrupting service to a network in which attackers send high volumes of data until the network becomes overloaded and can no longer function.
Drive-by Downloads	Malware is downloaded unknowingly by the victims when they visit an infected site.
Malvertising	Malware downloaded to a system when the victim clicks on an affected ad.
Man in the Middle	Man-in-the-Middle attacks mirror victims and endpoints for online information exchange. In this type of attack, the attacker communicates with the victims, who believe they are interacting with a legitimate endpoint website. The attacker is also communicating with the actual endpoint website by impersonating the victim. As the process goes through, the attacker obtains entered and received information from both the victim and endpoint.
Password Attacks	Third party attempts to crack a user's password and subsequently gain access to a system. Password attacks do not typically require malware, but rather stem from software applications on the attacker's system. These applications may use a variety of methods to gain access, including generating large numbers of generated guesses or dictionary attacks, in which passwords are systematically tested against all of the words in a dictionary.
Phishing	Malicious email messages that ask users to click a link or download a program. Phishing attacks may appear as legitimate emails from trusted third parties.
Ransomware	Occurs when an individual downloads ransom malware or ransomware, often through phishing or drive-by download and the subsequent execution of code results in encryption of all data and personal files stored on the system. The victim then receives a message that demands a fee in the form of electronic currency or cryptocurrency, such as Bitcoin, for the decryption code.

Type	Description
Socially Engineered Trojans	Programs designed to mimic legitimate processes (e.g. updating software, running antivirus software) with the end goal of a system infection. When the victim runs the fake process, the Trojan is installed on the system.
Unpatched Software	Nearly all software has weak points that may be exploited by malware. Most common software exploitations occur with Java, Adobe Reader and Adobe Flash. These vulnerabilities are often exploited as small amounts of malicious code are often downloaded via drive-by download.

17.3.3 Impacts of Cyber-Attack

The financial consequences of cyber-attacks continue to grow. According to IBM's *Cost of a Data Breach Report 2025*, the global average cost of a data breach was $4.44 million, while the average cost in the United States reached a record $10.22 million. Ransomware-related breaches averaged $5.08 million and organizations took an average of 241 days to identify and contain a breach. For a public water utility, however, the more consequential risk is operational rather than financial: a compromise of process control systems can interrupt the treatment, distribution and storage of water, damage pumps and valves or alter chemical dosing to hazardous levels.

Cyber-attacks are experienced on a daily basis, often without being noticed. They can originate from any computer to affect any other computer in the world. If a system is connected to the internet or operating on a wireless frequency, it is susceptible to exploitation. Targets of cyber-attacks can be individual computers, networks, organizations, business sectors or governments. Financial institutions and retailers are often targeted to extract personal and financial data that can be used to steal money from individuals and banks. The most affected sectors are finance, energy and utilities and defense and aerospace, as well as communications and health care. Both public and private operations are threatened on a near-daily basis by the millions of currently engineered cyber-attacks developed to automatically seek technological vulnerabilities.

A catastrophic cyber-attack can have far-ranging effects on District assets. All critical facilities operated by electricity and/or a computer system are vulnerable to cyber-attacks. Cyber-attacks may affect structures if any critical electronic systems suffer service disruption. For instance, a cyber-attack may cripple the electronic system that controls a cooling system or pressure system within critical infrastructure. This may result in physical damage to the structure from components overheating or an explosion if pressure relief systems are rendered inoperable. Such failures may not be immediately recognizable as cyber-attacks, appearing at first to be attributable to mechanical malfunctions. For Marin Water, the greatest exposure is to the systems that monitor and control the District's treatment plants, pump stations, tanks and pressure zones across a geographically dispersed service area. A successful intrusion could alter chemical feed rates, disable pumps or valves, obscure system conditions from operators or force extended manual operation that strains available staff. Business systems—including billing, customer data, engineering records and GIS—are also targets, as demonstrated by the October 2024 cyber-attack on American Water, the nation's largest water utility, which took its customer portal and billing systems offline for an extended period.

17.3.4 Responding to Cyber-Attack

The District and all of Marin County will continue to be impacted by cyber-attacks in the future. The nature of these attacks is projected to evolve in sophistication over time. The County has taken a proactive position in its cybersecurity efforts and is expected to remain vigilant in its efforts to prevent attacks from occurring or disrupting business operations. This vigilance applies to the District as well, which has a vested interest in securing its cyber-based systems. The District completed its America's Water Infrastructure Act (AWIA) Risk and Resilience Assessment (RRA) in 2025 and certified it to the U.S. Environmental Protection Agency in accordance with Section 1433 of the Safe Drinking Water Act, with the companion Emergency Response Plan updated and certified

in 2026. The 2025 RRA included a significant cybersecurity assessment covering both information technology and operational technology, along with prioritized risk reduction recommendations. This Hazard Mitigation Plan has been coordinated with the 2025 RRA and the District will continue to integrate the two efforts—including carrying SCADA and cybersecurity resilience improvements into the mitigation action plan—as each document is implemented and updated on its five-year cycle.

Basic cyber hygiene remains the most effective mitigation available to water systems. EPA's May 2024 enforcement alert and its July 2025 report, *Securing the Future of Water: Addressing Cyber Threats Today*, identify priority actions for community water systems, including reducing exposure of control systems to the public internet, eliminating default and shared passwords, requiring multi-factor authentication, maintaining and testing offline backups, exercising incident response procedures and setting cybersecurity expectations for vendors, integrators and consultants. Sector resources such as WaterISAC advisories and guidance from the Cybersecurity and Infrastructure Security Agency provide timely threat information and ongoing staff training on phishing and social engineering—still the most common entry points—reinforces these technical controls.

17.4 HAZARDOUS MATERIALS

A hazardous material is a substance or combination of substances that, because of quantity, concentration or physical, chemical or infectious characteristics, may cause or contribute to an increase in mortality or an increase in serious illness or otherwise pose a hazard to human life, property or the environment. Hazardous material releases can pose a risk to life, public health, air quality, water quality and the environment. They may result in the evacuation of a facility or an entire neighborhood. In addition to the immediate risk, long-term public health and environmental impacts may result from sustained exposure to certain substances.

Title 49 of the Code of Federal Regulations lists thousands of hazardous materials, including gasoline, insecticides, household cleaning products and radioactive materials. Even the natural gas used in homes and businesses is a dangerous substance when a leak occurs. According to the 2023 California State Hazard Mitigation Plan, hazardous materials are substances that are flammable, combustible, explosive, toxic, noxious, corrosive, an oxidizer, an irritant or radioactive. State-regulated substances that have the greatest probability of adversely impacting communities are listed in Title 19 of the California Code of Regulations.

Hazardous materials are present in facilities that produce, store or use them. The following are the principal sources of hazardous materials risk for Marin Water:

- The District's water treatment plants store and use treatment chemicals—such as chlorine or sodium hypochlorite, coagulants and pH-adjustment chemicals—that are regulated as hazardous materials and are subject to hazardous materials business plan and California Accidental Release Prevention program requirements.
- Fuel is stored at District facilities for standby generators, fleet vehicles and portable equipment used to maintain operations during outages and emergencies.
- Hazardous materials are transported daily along U.S. Highway 101, Sir Francis Drake Boulevard and other corridors that cross or parallel District pipelines, watershed lands and reservoir drainages.
- The natural gas used in homes and businesses—and the distribution lines that frequently share alignments with District pipelines—is a dangerous substance when a leak occurs.
- Many businesses and past land uses, through intentional action, lack of awareness or accidental occurrences, have left contamination in and around properties adjacent to District facilities and pipeline alignments, which can complicate construction, maintenance and excavation work.

17.4.1 Types of Incidents

The following are the most common types of hazardous material incidents:

- **Fixed-Facility Hazardous Materials Incident**—This is the uncontrolled release from a fixed site of materials that pose a risk to health, safety and property. It is possible to identify and prepare for fixed-site incidents because federal and state laws require those facilities to notify state and local authorities about materials being used or produced at the site.
- **Hazardous Materials Transportation Incident**—A hazardous materials transportation incident is any event during transport resulting in uncontrolled release of materials that can pose a risk to health, safety and property. Transportation incidents are difficult to prepare for because there is little if any notice about what materials could be involved should an accident happen. Transported hazardous wastes include thousands of shipments of radiological materials moved across the United States by ground transportation, mostly medical materials and low-level radioactive waste. Hazardous materials transportation incidents can occur on any transportation corridor, although most occur on interstate highways, other major federal or state highways or major rail lines. Many incidents occur in sparsely populated areas and affect very few people. Others are in areas with much higher population densities, such as the January 6, 2005 train accident in Graniteville, South Carolina that released chlorine gas killing nine, injuring 500 and causing the evacuation of 5,400 residents.
- **Interstate Pipeline Hazardous Materials Incident**—There are a significant number of interstate natural gas, heating oil and petroleum pipelines running through the State of California. These are used to provide natural gas to utilities and to transport these materials from production facilities to end-users.

Hazardous materials are likely accidentally released or spilled numerous times each day. Eliminating these widespread substances would be nearly impossible, but the threat of accidental releases or spills may be reduced by mitigation. For Marin Water, the greatest concern is a release that reaches a reservoir, a watershed drainage or the imported supply conveyed from Sonoma Water's Russian River system, because source water contamination could require a treatment plant or intertie to be taken out of service at a time when alternative supplies are limited. A release at or near a treatment plant, pump station or administrative facility could also require evacuation of District staff and temporary loss of operational control.

17.4.2 Responding to the Hazardous Materials Risk

The following mitigation efforts for hazardous substances are implemented through state and federal regulation:

- Fixed Facilities:
  - Process hazard analysis through the California Division of Occupational Safety and Health
  - Policies and procedures, hazard communication and training
  - Placarding and labeling of containers
  - Hazard assessment
  - Security
  - Process and equipment maintenance
  - Mitigating techniques (flares, showers, mists, containment vessels, failsafe devices)
  - Use of inherently safer alternative products
  - Emergency plans and coordination
  - Response procedures
- Transported:
  - Placards and labeling of containers
  - Proper container for material type
  - Random inspections of transporters
  - Safe handling policies and procedures
  - Hazard communications
  - Training for handlers
  - Permitting
  - Transportation flow studies, e.g., restricting HAZMAT transportation over certain routes.

17.4.3 Oversight

The County of Marin Department of Public Works is designated as the Certified Unified Program Agency (CUPA) for Marin County. The CUPA is the local administrative agency that coordinates the regulation of hazardous materials and hazardous wastes in the unincorporated county and in the incorporated cities and towns and CUPA staff also support hazardous materials emergency response activities countywide. The Marin CUPA administers six consolidated programs—including hazardous materials business plans, the California Accidental Release Prevention program, hazardous waste generators, underground storage tanks and aboveground petroleum storage—and conducts regulatory inspections at more than 900 facilities. The program provides regulated businesses a single point of contact for permitting, billing and inspections; uniformity and consistency in enforcement; and a single fee system incorporating all applicable fees. District facilities that store reportable quantities of hazardous materials are regulated under this program and report through the California Environmental Reporting System (CERS).

The District's 2025 AWIA Risk and Resilience Assessment evaluated chemical storage, handling and delivery at District facilities as part of its review of physical security, access control and site monitoring at treatment plants and other critical facilities. Recommendations from that assessment, combined with hazardous materials business plan, spill prevention and reporting requirements administered through the Marin CUPA, form the District's primary mitigation capability for this hazard. Marin Water will continue to coordinate implementation of this Hazard Mitigation Plan with the 2025 Risk and Resilience Assessment and its Emergency Response Plan.

17.5 TERRORISM

17.5.1 Types of Terrorism

Acts of terrorism are intentional, criminal, malicious acts that involve the use of illegal force, are intended to intimidate or coerce and are committed in support of political or social objectives. Table 17-3 provides a hazard profile summary for terrorism-related events. Drinking water systems are recognized as critical infrastructure and are addressed directly in federal law: Section 1433 of the Safe Drinking Water Act, as amended by the America's Water Infrastructure Act (AWIA) of 2018, requires community water systems serving more than 3,300 people to assess the risk from malevolent acts—including physical attack on facilities, intentional contamination of source or finished water and attacks on control systems—and to maintain and certify an emergency response plan addressing those risks.

Table 17-3. Event Profiles for Terrorism

Hazard	Application Mode[a]	Hazard Duration[b]	Static/Dynamic Characteristics[c]	Mitigating and Exacerbating Conditions[d]
Conventional Bomb	Detonation of explosive device on or near target; delivery via person, vehicle or projectile.	Instantaneous; additional secondary devices or diversionary activities may be used, lengthening the duration of the hazard until the attack site is determined to be clear.	Extent of damage is determined by type and quantity of explosive. Effects generally static other than cascading consequences, incremental structural failure, etc.	Blast force is inversely proportional to the cube of the distance from the blast; thus, each additional increment of distance provides progressively more protection. Terrain, forestation, structures, etc. can provide shielding by absorbing and/or deflecting energy and debris. Exacerbating conditions include ease of access to target; lack of barriers and shielding; poor construction; and ease of concealment of device.

Hazard	Application Mode[a]	Hazard Duration[b]	Static/Dynamic Characteristics[c]	Mitigating and Exacerbating Conditions[d]
Chemical Agent	Liquid/aerosol contaminants can be dispersed using sprayers or other aerosol generators; liquids vaporizing from puddles/ containers; or munitions.	Chemical agents may pose viable threats for hours to weeks depending on the agent and the conditions in which it exists.	Contamination can be carried out of the initial target area by persons, vehicles, water and wind. Chemicals may be corrosive or otherwise damaging over time if not remediated.	Air temperature can affect evaporation of aerosols. Ground temperature affects evaporation of liquids. Humidity can enlarge aerosol particles, reducing inhalation hazard. Precipitation can dilute and disperse agents but can spread contamination. Wind can disperse vapors but also cause target area to be dynamic. The micro-meteorological effects of buildings and terrain can alter travel and duration of agents. Shielding in the form of sheltering in place can protect people and property from harmful effects.
Arson/ Incendiary Attack	Initiation of fire or explosion on or near target via direct contact or remotely via projectile.	Generally, minutes to hours.	Extent of damage is determined by type and quantity of device, accelerant and materials present at or near target. Effects generally static other than cascading consequences, incremental structural failure, etc.	Mitigation factors include built-in fire detection and protection systems and fire-resistive construction techniques. Inadequate security can allow easy access to target, easy concealment of an incendiary device and undetected initiation of a fire. Non-compliance with fire and building codes, as well as failure to maintain existing fire protection systems, can substantially increase the effectiveness of a fire weapon.
Armed Attack	Tactical assault or sniping from remote location or random attack based on fear, emotion or mental instability.	Generally, minutes to days.	Varies based on the perpetrators' intent and capabilities.	Inadequate security can allow easy access to target, easy concealment of weapons and undetected initiation of an attack.
Biological Agent	Liquid or solid contaminants can be dispersed using sprayers/aerosol generators or by point or line sources such as munitions, covert deposits and moving sprayers.	Biological agents may pose viable threats for hours to years depending on the agent and the conditions in which it exists.	Depending on the agent used and the effectiveness with which it is deployed, contamination can be spread via wind and water. Infection can spread via human or animal vectors.	Altitude of release above ground can affect dispersion; sunlight is destructive to many bacteria and viruses; light to moderate wind will disperse agents but higher winds can break up aerosol clouds; the micro-meteorological effects of buildings and terrain can influence aerosolization and travel of agents.
Cyberterrorism	Electronic attack using one computer system against another.	Minutes to days.	Generally no direct effects on built environment.	Inadequate security can facilitate access to critical computer systems, allowing them to be used to conduct attacks.

Hazard	Application Mode[a]	Hazard Duration[b]	Static/Dynamic Characteristics[c]	Mitigating and Exacerbating Conditions[d]
Agroterrorism	Direct, generally covert contamination of food supplies or introduction of pests and/or disease agents to crops and livestock.	Days to months.	Varies by type of incident. Food contamination events may be limited to specific distribution sites, whereas pests and diseases may spread widely. Generally, no effects on built environment.	Inadequate security can facilitate adulteration of food and introduction of pests and disease agents to crops and livestock.
Radiological Agent	Radioactive contaminants can be dispersed using sprayers/ aerosol generators or by point or line sources such as munitions.	Contaminants may remain hazardous for seconds to years depending on material used.	Initial effects will be localized to site of attack; depending on meteorological conditions, subsequent behavior of radioactive contaminants may be dynamic.	Duration of exposure, distance from source of radiation and the amount of shielding between source and target determine exposure to radiation.
Nuclear Bomb	Detonation of nuclear device underground, at the surface, in the air or at high altitude.	Light/heat flash and blast/shock wave last for seconds; nuclear radiation and fallout hazards can persist for years. Electromagnetic pulse from a high-altitude detonation lasts for seconds and affects only unprotected electronic systems.	Initial light, heat and blast effects of a subsurface, ground or air burst are static and determined by the device's characteristics and employment; fallout of radioactive contaminants may be dynamic, depending on meteorological conditions.	Harmful effects of radiation can be reduced by minimizing the time of exposure. Light, heat and blast energy decrease logarithmically as a function of distance from seat of blast. Terrain, forestation, structures, etc. can provide shielding by absorbing and/or deflecting radiation and radioactive contaminants.
Intentional Hazardous Material Release (fixed facility or transportation)	Solid, liquid and/or gaseous contaminants may be released from fixed or mobile containers	Hours to days.	Chemicals may be corrosive or otherwise damaging over time. Explosion and/or fire may be subsequent. Contamination may be carried out of the incident area by persons, vehicles, water and wind.	As with chemical weapons, weather conditions directly affect how the hazard develops. The micro-meteorological effects of buildings and terrain can alter travel and duration of agents. Shielding in the form of sheltering in place can protect people and property from harmful effects. Non-compliance with fire and building codes, as well as failure to maintain existing fire protection and containment features, can substantially increase the damage from a hazardous materials release.

Source: FEMA 386-7

a. ***Application Mode****—The human acts necessary to cause the event to occur.*

b. ***Hazard Duration****—The length of time the hazard is present. For example, a chemical warfare agent such as mustard gas, if un-remediated, can persist for hours or weeks under the right conditions.*

c. ***Dynamic or Static Characteristics****—An event's tendency to expand, contract or remain confined in time, magnitude and space. For example, a cloud of chlorine gas leaking from a storage tank can change location by drifting with the wind and can diminish in danger by dissipating over time.*

d. Mitigation and Exacerbating Conditions:
Mitigation Conditions—Characteristics of the target and its physical environment that can reduce the effects of a hazard. For example, earthen berms can provide protection from bombs; exposure to sunlight can render some biological agents ineffective; and effective perimeter lighting and surveillance can minimize the likelihood of someone approaching a target unseen.

Exacerbating conditions—Characteristics that can enhance or magnify the effects of a hazard. For example, depressions or low areas in terrain can trap heavy vapors and a proliferation of street furniture (trash receptacles, newspaper vending machines, mail boxes, etc.) can provide hiding places for explosive devices.

The Federal Bureau of Investigation (FBI) categorizes two types of terrorism in the United States:

- Domestic terrorism involves groups or individuals whose terrorist activities are directed at elements of our government or population without foreign direction. The FBI is the primary response agency for domestic terrorism. The FBI coordinates domestic preparedness programs and activities of the United States to limit acts posed by terrorists, including the use of weapons of mass destruction.
- International terrorism involves groups or individuals whose terrorist activities are foreign-based or directed by countries or groups outside the United States or whose activities transcend national boundaries. Examples include the 1993 bombing of the World Trade Center and the attacks of September 11, 2001 at the World Trade Center and the Pentagon.

Bioterrorism agents are divided into three categories based on their ease of spread and the severity of illness they cause. Category A agents are most dangerous and Category C agents are current emerging threats:

- Category A pathogens—Organisms or biological agents that pose the highest risk to national security and public health because they:
  - Can be easily spread or transmitted from person to person
  - Result in high death rates and have the potential for major public health impact
  - Might cause public panic and social disruption
  - Require special action for public health preparedness.
- Category B pathogens—The second highest priority organisms/biological agents. They:
  - Are moderately easy to disseminate
  - Result in moderate morbidity rates and low mortality rates
  - Require specific enhancements for diagnostic capacity and enhanced disease surveillance.
- Category C pathogens—The third highest priority, including emerging pathogens that could be engineered for mass dissemination in the future because of:
  - Availability
  - Ease of production and dissemination
  - Potential for high morbidity and mortality rates and major health impact.

17.5.2 Impacts of Terrorism

Most terrorist events in the United States have been bombing attacks, involving detonated or undetonated explosive devices, tear gas, pipe bombs or firebombs. The effects of terrorism can vary from loss of life and injuries to property damage and disruptions in services such as electricity, water supplies, transportation or communications. The event may have an immediate effect or a delayed effect. Terrorists often choose targets that offer limited danger to themselves and areas with relatively easy public access. Foreign terrorists look for visible targets where they can avoid detection before and after an attack such as international airports, large cities, major special events and high-profile landmarks.

Three factors distinguish terrorism hazards from other types of hazards:

- In the case of chemical, biological and radioactive agents, their presence may not be immediately obvious, making it difficult to determine when and where they may have been released, who has been exposed and what danger is present for first responders and emergency medical technicians.
- There is limited scientific understanding of how these agents affect the population at large.
- Terrorism evokes strong emotional reactions, ranging from anxiety to fear to anger to despair to depression.

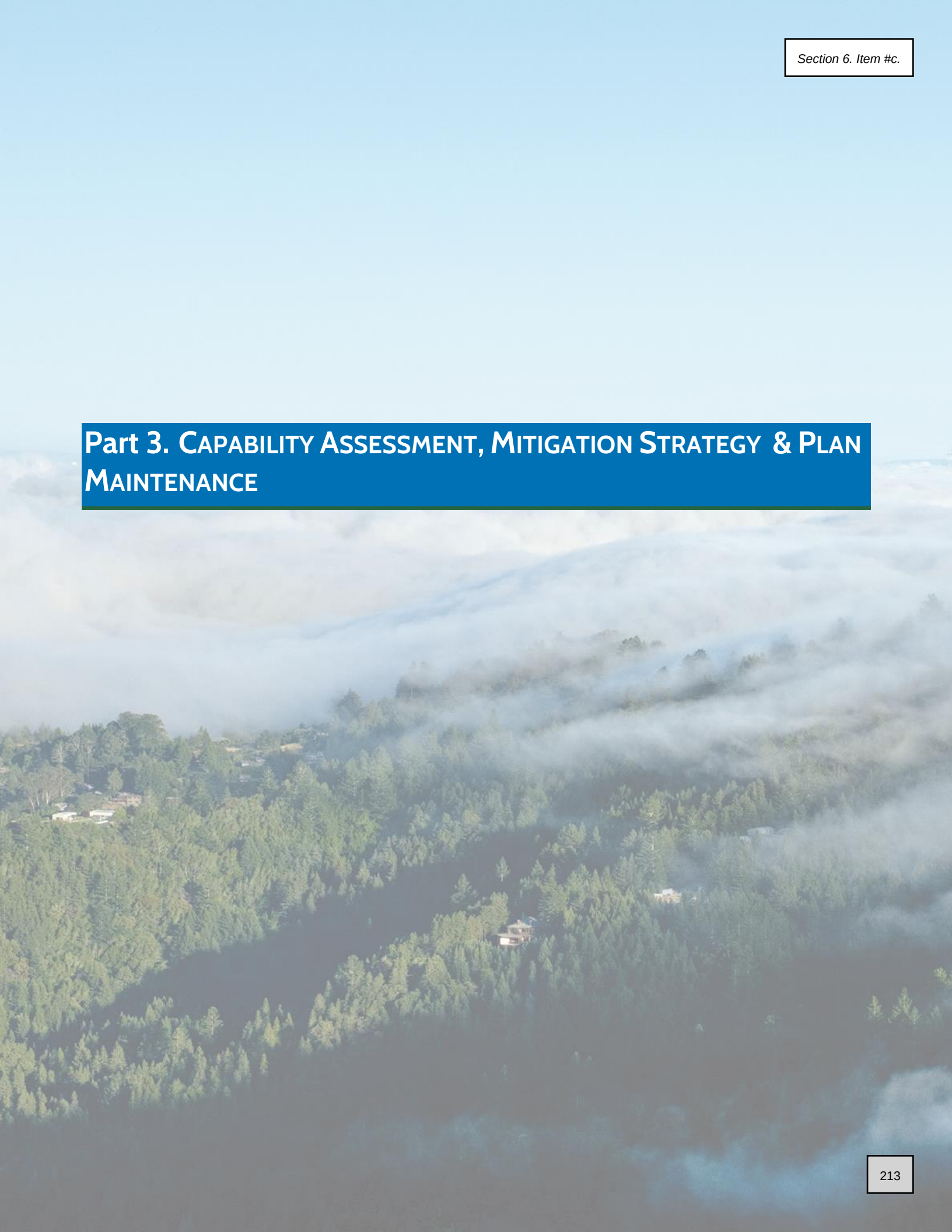
17.5.3 Responding to Terrorism

While education, heightened awareness and early warning of unusual circumstances may deter crime and terrorism, intentional acts that harm people and property are possible at any time. Public safety entities react to the threat, locating, isolating and neutralizing further damage and investigating potential scenes and suspects to bring criminals to justice. Those involved with terrorism response, including public health and public information staff, are trained to deal swiftly with the public's emotional reaction. The area of the event must be clearly identified in all emergency alert messages to prevent those not affected by the incident from overwhelming local emergency rooms and response resources, which would reduce service to those actually affected. The public must be informed clearly and frequently about what government agencies are doing to mitigate the impacts of the event. The public will also be given clear directions on how to protect the health of individuals and families.

In dealing with terrorism, the unpredictability of human beings must be considered. People with a desire to perform criminal acts may seek out targets of opportunity that may not fall into established lists of critical areas or facilities. First responders train not only to respond to organized terrorism events, but also to respond to random acts by individuals who, for a variety of reasons ranging from fear to emotional trauma to mental instability, may choose to harm others and destroy property.

The District completed its AWIA Risk and Resilience Assessment in 2025. That assessment included a detailed evaluation of malevolent acts—such as unauthorized physical access, sabotage or vandalism, intentional contamination of source or finished water and attacks on control systems—at the District's treatment plants, tanks, pump stations, watershed lands and administrative facilities, together with prioritized security and risk reduction recommendations. The District's Emergency Response Plan, certified in 2026, establishes the corresponding detection, notification and response procedures, including coordination with the Marin County Office of Emergency Management, local law enforcement and the State Water Board Division of Drinking Water. Marin Water will continue to integrate this Hazard Mitigation Plan with the 2025 Risk and Resilience Assessment and the Emergency Response Plan as those documents are implemented and updated.

Part 3. Capability Assessment, Mitigation Strategy & Plan Maintenance



18. Relevant Laws, Ordinances, Programs and Capabilities

Existing laws, ordinances, plans and capabilities at the federal, state and local level can support or impact hazard mitigation initiatives identified in this plan. Hazard mitigation plans are required to include a review and incorporation, if appropriate, of existing plans, studies, reports and technical information as part of the planning process, as stated in 44 CFR, Section 201.6(b)(3). Pertinent federal, state and local laws are described below.

18.1 RELEVANT FEDERAL AND STATE AGENCIES, PROGRAMS AND REGULATIONS

State and federal regulations and programs that need to be considered in hazard mitigation are constantly evolving. For this plan, a review was performed to determine which regulations and programs are currently most relevant to hazard mitigation planning. The findings are summarized in Table 18-1 and Table 18-2. Short descriptions of each program are provided in Appendix D.

18.2 COUNTY, CITY OR OTHER DISTRICT

The following local jurisdictions' plans provide information and guidance relevant to hazard mitigation planning for the District:

- **Marin County Emergency Operations Plan**—Informs emergency management protocol for the county including the service area.
- **Marin County Multi-Jurisdictional Hazard Mitigation Plan**—Includes risk and vulnerability assessments and targeted mitigation strategies for the County and Cities within the service area.
- **Marin Countywide Plan**—Informs land use within the County which can impact demands on District services.
- General Plans for the Cities of Belvedere, Corte Madera, Fairfax, Larkspur, Mill Valley, Ross, San Anselmo, San Rafael, Sausalito and Tiburon—Informs land use within the Cities which can impact demands on Marin Water services.
- **Marin Community Wildfire Protection Plan**—Provides a science-based assessment of wildfire hazards and threats to homes in the wildland urban interface within the service area.
- **Sonoma County Water Agency's Local Hazard Mitigation Plan**—The FEMA approved local hazard mitigation plan for a principal water supply partner for Marin Water.

Table 18-1. Summary of Relevant Federal Agencies, Programs and Regulations

Agency, Program or Regulation	Hazard Mitigation Area Affected	Relevance
America's Water Infrastructure Act	Infrastructure Improvements	This act provides for water infrastructure improvements throughout the country.
Americans with Disabilities Act	Action Plan Implementation	FEMA hazard mitigation project grant applications require full compliance with applicable federal acts.
Civil Rights Act of 1964	Action Plan Implementation	FEMA hazard mitigation project grant applications require full compliance with applicable federal acts.
Clean Water Act	Action Plan Implementation	FEMA hazard mitigation project grant applications require full compliance with applicable federal acts.

Agency, Program or Regulation	Hazard Mitigation Area Affected	Relevance
Community Development Block Grant Disaster Resilience Program	Action Plan Funding	This is a potential alternative source of funding for actions identified in this plan.
Disaster Mitigation Act	Hazard Mitigation Planning	This is the current federal legislation addressing hazard mitigation planning.
Endangered Species Act	Action Plan Implementation	FEMA hazard mitigation project grant applications require full compliance with applicable federal acts.
Federal Energy Regulatory Commission Dam Safety Program	Dam Failure Hazard	This program cooperates with a large number of federal and state agencies to ensure and promote dam safety.
Federal Wildfire Management Policy and Healthy Forests Restoration Act	Wildfire Hazard	These documents mandate community-based collaboration to reduce risks from wildfire.
National Dam Safety Act	Dam Failure Hazard	This act requires a periodic engineering analysis of most dams in the country
National Environmental Policy Act	Action Plan Implementation	FEMA hazard mitigation project grant applications require full compliance with applicable federal acts.
National Fire Plan (2023)	Wildfire Hazard	This plan calls for joint risk reduction planning and implementation by federal, state and local agencies.
National Flood Insurance Program	Flood Hazard	This program makes federally backed flood insurance available to homeowners, renters and business owners in exchange for communities enacting floodplain regulations. The District is not eligible to participate in the NFIP as it lacks the authorities to regulate new development within the Special Flood Hazard Area.
National Incident Management System	Action Plan Development	Adoption of this system for government, nongovernmental organizations and the private sector to work together to manage incidents involving hazards is a prerequisite for federal preparedness grants and awards.
Presidential Executive Order 11988 (Floodplain Management)	Flood Hazard	This order requires federal agencies to avoid long- and short-term adverse impacts associated with modification of floodplains.
Presidential Executive Order 11990 (Protection of Wetlands)	Action Plan Implementation	FEMA hazard mitigation project grant applications require full compliance with applicable presidential executive orders.
U.S. Army Corps of Engineers Dam Safety Program	Dam Failure Hazard	This program is responsible for safety inspections of dams that meet size and storage limitations specified in the National Dam Safety Act.
U.S. Army Corps of Engineers Flood Hazard Management	Flood Hazard, Action Plan Implementation, Action Plan Funding	The Corps of Engineers offers multiple funding and technical assistance programs available for flood hazard mitigation actions.
U.S. Fire Administration	Wildfire Hazard	This agency provides leadership, advocacy, coordination and support for fire agencies and organizations.

Agency, Program or Regulation	Hazard Mitigation Area Affected	Relevance
U.S. Fish and Wildlife Service	Wildfire Hazard	This service's fire management strategy employs prescribed fire throughout the National Wildlife Refuge System to maintain ecological communities.

Table 18-2. Summary of Relevant State Agencies, Programs and Regulations

Agency, Program or Regulation	Hazard Mitigation Area Affected	Relevance
AB 32: The California Global Warming Solutions Act	Action Plan Development	This act originally mandated reaching 1990 emission levels by 2020 (a goal the state met early), its core regulatory mechanisms, such as the Cap-and-Trade (now Cap-and-Invest) program, have been extended and updated to match long-term climate goals.
AB 756: Public Water System PFAS	Public Water System polyfluoroalkyl substances (PFAS)	This act requires the State Water Resources Control Board to administer provisions relating to the regulation of drinking water to protect public health, including conducting research, studies and demonstration programs, enforcing the federal Safe Drinking Water Act, adopting regulations and assessing the quality of water in private domestic water supplies
AB 2242: Urban Water Management Planning Act	Drought Hazard	Requires an urban water management plan, among other things, to describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable and provide data for average, single-dry and multiple-dry water years.
AB 2800: Climate Change—Infrastructure Planning	Action Plan Development	This act requires state agencies to take into account the impacts of climate change when developing state infrastructure.
Alquist-Priolo Earthquake Fault Zoning Act	Earthquake Hazard	This act restricts construction of buildings used for human occupancy on the surface trace of active faults.
California Department of Forestry and Fire Protection (CAL FIRE)	Wildfire Hazard	CAL FIRE has responsibility for wildfires in areas that are not under the jurisdiction of the Forest Service or a local fire organization.
California Department of Parks and Recreation	Wildfire Hazard	State Parks Resources Management Division has wildfire protection resources available to suppress fires on State Park lands.
California Department of Water Resources	Flood Hazard	This state department is the state coordinating agency for floodplain management.
California Division of Safety of Dams	Dam Failure Hazard	This division monitors the dam safety program at the state level and maintains a working list of dams in the state.
California Environmental Quality Act	Action Plan Implementation	This act establishes a protocol of analysis and public disclosure of the potential environmental impacts of development projects. Any project action identified in this plan will seek full California Environmental Quality Act compliance upon implementation.
California Fire Alliance	Wildfire Hazard	The alliance works with communities at risk from wildfires to facilitate the development of community fire loss mitigation plans.

Agency, Program or Regulation	Hazard Mitigation Area Affected	Relevance
California Fire Safe Council	Wildfire Hazard	This council facilitates the distribution of National Fire Plan grants for wildfire risk reduction and education.
California Fire Service and Rescue Emergency Mutual Aid Plan	Wildfire Hazard	This plan provides guidance and procedures for agencies developing emergency operations plans
California State Hazard Mitigation Plan	Hazard Mitigation Planning	Local hazard mitigation plans must be consistent with their state's hazard mitigation plan.
California Water-Use Efficiency Legislation	Hazard Mitigation Planning	Could be a program promoted by Marin Water outreach efforts.
Disadvantaged and Low-Income Communities Investments	Action Plan Funding	This is a potential source of funding for actions located in disadvantaged or low-income communities.
Governor's Executive Order B-37-16	Drought Hazard	Water districts must conduct a "stress test," that is, examine the projected reliability of all their water supply resources over the next three years and assume that water demand is high and that precipitation levels are low. Results of this analysis could support the identification of projects for this hazard mitigation plan.
Governor's Executive Order S-13-08 (Climate Impacts)	Action Plan Implementation	This order includes guidance on planning for sea level rise in designated coastal and floodplain areas for new projects.
Office of the State Fire Marshal	Wildfire Hazard	This office has a wide variety of fire safety and training responsibilities.
Senate Bill 97: Guidelines for Greenhouse Gas Emissions	Action Plan Implementation	This bill establishes that greenhouse gas emissions and the effects of greenhouse gas emissions are appropriate subjects for California Environmental Quality Act analysis.
Standardized Emergency Management System	Emergency Management including Hazard Mitigation	Cal OES oversees emergency management compliance including the use of Standardized Emergency Management System and approval of submitted hazard mitigation plans. Local governments must use this system to be eligible for state funding of response-related personnel costs.
Senate Bill 1153	Wildfire Hazard	The bill clarifies that public water systems are designed to provide safe drinking water rather than function as active wildfire suppression infrastructure. (In enrollment process before presentation to the Governor as of September 8, 2026.)

18.3 DISTRICT CORE CAPABILITIES

The planning team performed an inventory and analysis of existing authorities and capabilities called a "capability assessment." A capability assessment creates an inventory of an agency's mission, programs and policies and evaluates its capacity to carry them out. It presents a toolkit for implementation of the hazard mitigation plan.

The assessment identifies potential gaps in core capabilities and filling those gaps may eventually become actions in the plan. Assessment findings were shared with the Steering Committee as it developed the action plan shown in Chapter 20. If the review identified an opportunity to add or expand a capability, then doing so has been identified as a mitigation action. The District views each core capability to be fully adaptable as needed to meet the best interests of the District. This adaptability is considered to be an overarching District capability that is acknowledged by this reference.

18.3.1 Ordinances and Plans

Ordinance No. 449

This ordinance establishes mandatory water conservation measures to enhance the District's water conservation program pursuant to Water Code section 375. The conservation measures are aimed at reducing the quantity of water used indoors and outdoors by all District customers to preserve the District's limited water supply during drought.

Ordinance No. 450

The District adopted Ordinance No. 450, amending Ordinance No. 449 to add additional water conservation measures to help reach a goal of 40% water use reduction while providing customers flexibility in achieving individual water use reductions.

Water Resources Plan 2040

The District prepared *Water Resources Plan 2040* to evaluate resiliency in the face of threats to water resources in its service area and to identify options to enhance resiliency. The Water Resources Plan provides information for making informed water supply planning decisions in the face of reliability threats. The District used WaterSim to simulate reliability events and the resulting futures that could impact supply conditions. Events considered in the Water Resources Plan included earthquakes, drought, climate change, wildfire, landslides and water quality issues. Forty resiliency options were developed to improve the District's resiliency and ability to meet demand in times of potential supply shortages (Marin Municipal Water District 2017).

2025 Urban Water Management Plan

The *Urban Water Management Plan* is a foundational document and source of information about the District's historical and projected water demand, water supplies, supply reliability and potential vulnerabilities, water shortage contingency planning and demand management programs (Marin Municipal Water District 2025).

Water Shortage Contingency Plan

The Water Shortage Contingency Plan is a stand-alone component of the *Urban Water Management Plan* that details stages of drought and actions that the District should take in response to each stage. Key components of the Water Shortage Contingency Plan, as required by the State Water Code, include the following:

- Create six standard water shortage levels corresponding to: 10-, 20-, 30-, 40-, 50- and >50%
- Define locally appropriate "shortage response actions" for each shortage level, with a corresponding estimate of the extent to which the action will address the gap between supply and demand
- By July 1 each year beginning in 2022, submit an annual water shortage assessment report to the California Department of Water Resources (DWR)

Wildfire Resilience Plan 2020

Marin Water's *Wildfire Resilience Plan* summarizes existing District programs and operations related to wildfire preparedness, identifies data gaps and recommends actions that will lead to a more wildfire resilient water system. It captures the perspectives, observations and input of the District personnel who operate the system and identifies strengths, weaknesses and potential vulnerabilities related to wildfire. The plan will be updated periodically to address changing conditions and new wildfire resiliency best practices.

America's Water Infrastructure Act Plan

In 2025, Marin Water completed the requirements of the America's Water Infrastructure Act.

18.3.2 Opportunities to Expand Ordinances and Planning Capabilities

The District has a high degree of core capability for funding, administrative and technical functions and public outreach with its existing plans and programs. These capabilities represent opportunities for future integration with this hazard mitigation plan. The District has begun this integration process with the concurrent planning efforts for this hazard mitigation plan and the planning requirements of the America's Water Infrastructure Act. This hazard mitigation plan includes information that can be used for future updates such as the following:

- Updates to the District's Strategic Plan
- Updates to the District's Water System Master Plan
- Updates to the District's Urban Water Management Plan
- Updates to the District's adopted Capital Improvement Budget
- Updates to the Wildfire Resilience Plan

The District is fully committed to plan integration where feasible and valuable, as evidenced by the identification of plan integration in the action plan provided in Chapter 20.

This hazard mitigation plan does not identify specific actions for the expansion of these local ordinances as they are currently adequately equipped to meet the District's needs and capabilities.

18.3.3 Financial Capabilities

Assessing a jurisdiction's fiscal capability provides an understanding of the ability to fulfill the financial needs associated with hazard mitigation projects. This assessment identifies both outside resources, such as grant-funding eligibility and local jurisdictional authority to generate internal financial capability, such as through fees. An assessment of fiscal capabilities is presented in Table 18-3.

Table 18-3. Fiscal Capability

Financial Resources	Accessible or Eligible to Use?
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes
User Fees for Utility Service	Yes
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	Yes
State-Sponsored Grant Programs	Yes
Federal-Sponsored Grant Programs	Yes
Development Fees for New Services	Yes

18.3.4 Opportunities to Expand Financial Capabilities

One primary District objective for the creation of this local hazard mitigation plan is to gain eligibility to pursue hazard mitigation grant funding under FEMA's suite of Hazard Mitigation Assistance (HMA) grant programs, thus leveraging the District's funding for capital improvement projects. This plan identifies 24 actions representing a comprehensive range of mitigation alternatives. Each action, once implemented, will expand the District's capabilities to provide services to its customers.

The HMA grant programs typically fund projects at 75%, and communities must have sources for the remaining 25% local match. The financial capability assessment found that the District has all eight of the capabilities assessed, providing a sound local footing for funding mitigation actions. Based on this assessment, the District sees no need to identify specific actions for the expansion of financial capabilities beyond the implementation and maintenance of this plan.

18.3.5 Administrative and Technical Capabilities

Administrative and technical capabilities focus on the availability of personnel resources responsible for implementing all the facets of hazard mitigation. An assessment of administrative and technical capabilities is presented in Table 18-4.

Table 18-4. Administrative and Technical Capability

Staff/Personnel Resources	Available?	Department/Agency/Position
Planners or engineers with knowledge of water supply infrastructure	Yes	Engineering Manager can perform or can contract for this service
Planners or engineers with an understanding of natural hazards	Yes	Engineering Manager can perform or can contract for this service
Staff with training in benefit/cost analysis	Yes	Contract for service
Personnel skilled or trained in GIS applications	Yes	Engineering Manager can perform or contract for service
Scientists familiar with natural hazards in local area	Yes	Contract for service
Emergency manager	Yes	Safety and Emergency Response Manager
Grant writers	Yes	Grant Manager can perform or contract for service

18.3.6 Opportunities to Expand Administrative and Technical Capabilities

The capability assessment for this category found that the District has in-house capability or can contract for service for all core capabilities assessed. Therefore, the District sees no need to identify specific actions for the expansion of these administrative and technical capabilities as of this planning effort.

18.3.7 Public Outreach Capabilities

Regular engagement with the public on issues regarding hazard mitigation provides an opportunity to directly interface with community members. Assessing this outreach and education capability illustrates the connection between the government and community members, which opens a two-way dialogue that can result in a more resilient community based on education and public engagement. An assessment of education and outreach capabilities is presented in Table 18-5.

Table 18-5. Education and Outreach Capability

Criterion	Response
Do you have a public information officer or communications office?	Yes
Do you have personnel skilled or trained in website development?	Yes
Do you have hazard mitigation information available on your website?	https://www.marinwater.org/emergency-preparedness

Do you use social media for hazard mitigation education and outreach?	Yes – Facebook, Instagram, Nextdoor, X
Do you have any citizen boards or commissions that address issues related to hazard mitigation?	No
Do you have any other programs already in place that could be used to communicate hazard-related information?	Yes – Marin Water E-News. Marin Water is part of AlertMarin, the Countywide Emergency Notification System. The County provides related advertising of the system and provides hazard-related information.
Do you have any established warning systems for hazard events?	Yes - SCADA System, County Emergency Operations Center, AlertMarin

18.3.8 Opportunities to Expand Public Outreach Capabilities

The District has identified opportunities for continued collaboration with Marin County and the state for areawide public outreach initiatives including the following:

- Monthly meetings with Marin County Office of Emergency Management for coordinated outreach
- Special meetings with Marin County Office of Emergency Management ahead of wildfire season and king tide/winter flood season
- Regular meetings with DSOD on dam safety
- Annual reports submitted to DSOD on dam safety

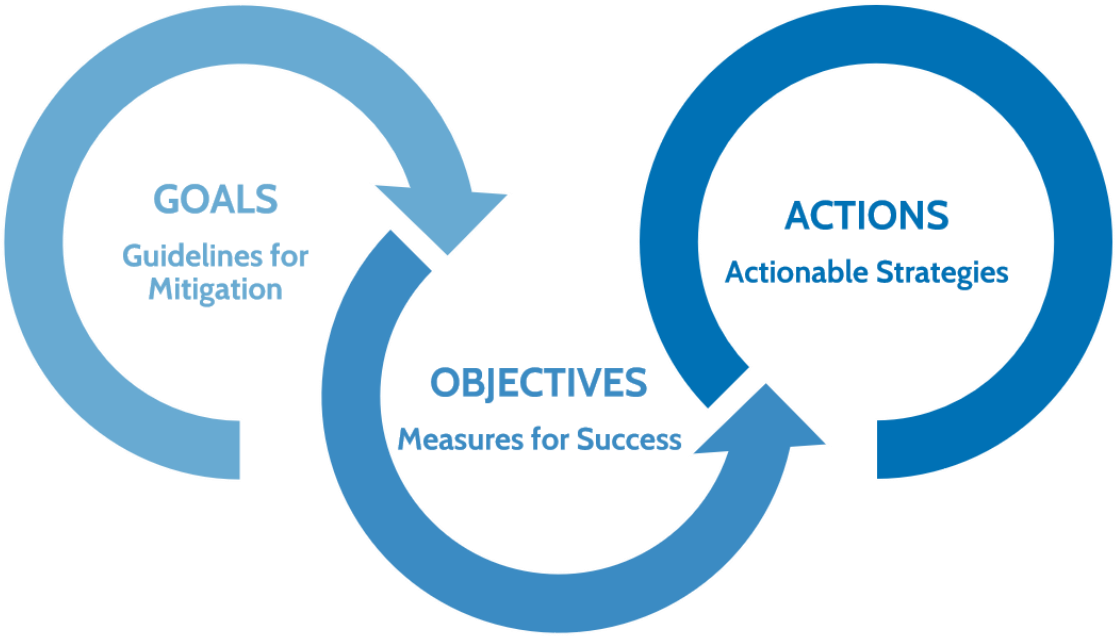
19. MISSION STATEMENT, GOALS AND OBJECTIVES

Hazard mitigation plans must identify goals for reducing long-term vulnerabilities to identified hazards (44 CFR Section 201.6(c)(3)(i)). The Steering Committee established a set of goals and measurable objectives for this plan, based on data from the preliminary risk assessment and the results of the public involvement strategy. The mission statement, goals, objectives and actions in this plan all support each other. Objectives were selected that meet multiple goals. Actions were prioritized based on ability to accomplish multiple goals and objectives.

19.1 MISSION STATEMENT

A mission statement focuses the range of objectives and actions to be considered. This is not a goal because it does not describe a hazard mitigation outcome and it is broader than a hazard-specific objective. The mission statement for this hazard mitigation plan is as follows:

The mission of the hazard mitigation plan is to reduce risk and increase the resiliency of our water system during natural disasters by maintaining a mitigation program that focuses on protecting life, property, infrastructure and the environment.



19.2 GOALS

The Steering Committee established a set of goals for the Plan update that were based on goals in the prior plan and aligned with the goals in the 2023 State of California HMP. The updated mitigation goals are as follows:

1. Protect life and property, including equity priority communities, during disasters
2. Minimize damage to critical infrastructure to maintain continuity of essential water services
3. Protect natural resources, including local water supply sources
4. Increase public awareness of the risk of loss of water

19.3 OBJECTIVES

The Steering Committee made a minor revision to the list of objectives in the prior Plan by including wording to acknowledge other hazards of interest. The updated list of mitigation objectives is as follows:

1. Implement projects that assist in protecting lives by making infrastructure, critical facilities and other property more resistant to natural hazards and other hazards of interest
2. Address aging infrastructure issues to reduce/minimize the impacts from future hazards and disasters
3. Implement projects that reduce/minimize the impacts on our natural resources from future hazards and disasters
4. Raise awareness and communicate risk to District assets

20. MITIGATION STRATEGY

20.1 MITIGATION ACCOMPLISHMENTS SINCE 2022

The following examples of action implementation demonstrate Marin Water's commitment to community resilience.

MMD-2 Pine Mountain Tunnel

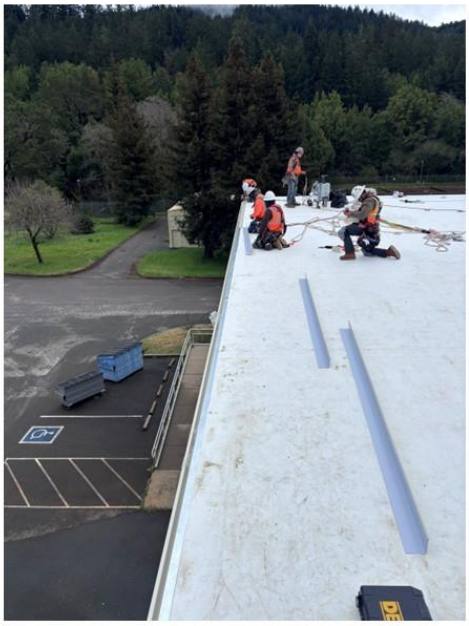
The Gibson Tanks (formerly known as the Pine Mountain Tanks) are in construction with a completion date of 2029. Once installed and integrated into the District's water supply infrastructure, the Gibson Tanks will bolster the District's water quality, improve firefighting capabilities on the watershed, increase water system capacity for Ross Valley, and improve water supply resiliency due to improved seismic stability compared to the existing Pine Mountain Tunnel.

MMD-4 Kastania Pump Station Refurbishment

The Kastania Pump Station Rehabilitation project is in construction, with a completion date of 2027. This project increases system resilience by restoring operational flexibility, allowing the District to receive up to 5,000 additional acre-feet of water per year of supplemental water from Sonoma Water. This improved capacity, combined with the potential to capture excess winter water from the Russian River in wet months, strengthens reliability during droughts and future water shortages.

MMD-5 Replace roofs and vents of treatment plants with non-combustible materials.

Work is underway for the removal and replacement of the existing leaky roof membrane with a new Class A Fire Rated Thermoplastic Polyolefin (TPO) roof and add fall protection to the San Geronimo Treatment Plant. The new roof will be more durable and fire resistant. Pump station hardening is also underway to replace doors and vents with non-combustible materials and create defensible space around structures.



MMD-7 Create Defensible Space around Treatment Plants

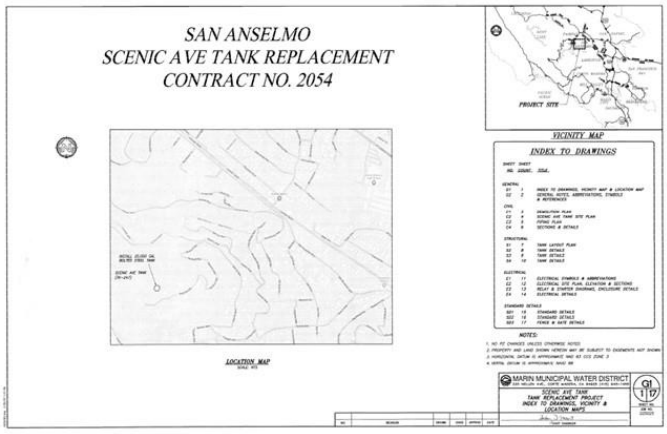
Work is ongoing and regularly maintained by vegetation crews to ensure defensible space requirements are met at Bon Tempe Treatment Plant (BTTP) and San Geronimo Treatment Plant. BTTP has been the focus of this effort due to its location in a densely wooded area.

MMD-8 AMI

The District is in the process of installing full-scale advanced metering infrastructure (AMI) to allow for real time data collection that supports early leak detection, demand management, and rapid identification of system damage. This project will help prioritize emergency response and restore service more efficiently in the event of a disaster. This project is underway and will be completed within 10 years.

MMD-15 Replace Scenic Redwood Tank

The Scenic Avenue tank replacement design is complete, and construction is anticipated to be completed by 2027. The existing tank, which is nearly 50 years old and seismically unstable, will be replaced with a bolted steel tank to improve overall system resilience in the event of an earthquake.



MMD-16 Replace Madera Park Tank

Planning is complete for the Madera Park Tank replacement. The existing tank, which is over 60 years old and seismically unstable, will be replaced with a bolted steel tank to improve overall system resilience in the event of an earthquake.

MMD-17 Install Permanent Generators at 29 Pump Stations

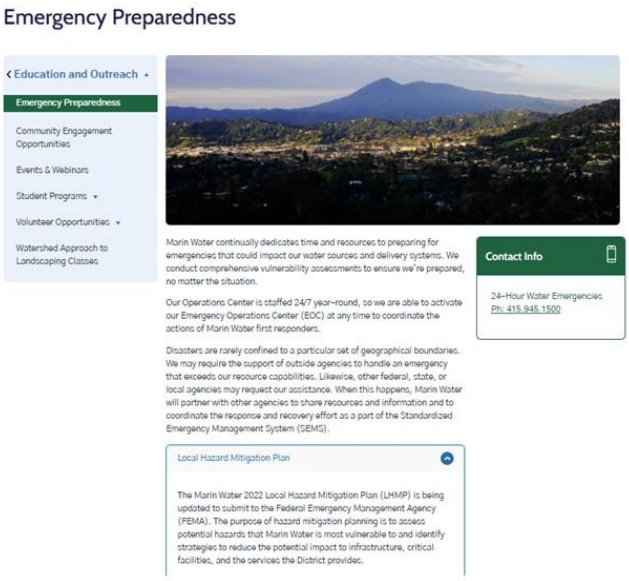
The district has acquired portable generators to increase resilience and maintain adequate pressure and supply during outages or PSPS events. This approach allows for flexible deployment across facilities and provides greater operational flexibility and cost-effectiveness than installing permanent generators at each pump station.

MMD-18 Hind Tank Replacement

This project will replace the two redwood Hind Tanks with two new 200,000-gallon tanks made of welded steel. The existing tanks are seismically deficient and leak-prone. The new welded steel tanks will be seismically resilient and fire hardened, resulting in a more resilient water infrastructure system. This project is in design, with construction beginning in 2027 and complete in 2029.

MMD-23 Maintain HMP on Website

Marin Water has continued to maintain an Emergency Preparedness webpage that houses the LHMP and provides customers with guidance on emergency preparedness and information on the District's ongoing preparedness efforts.



20.1.1 Status of 2022 Mitigation Actions

Action Number	Description	Status Comment	Include in the 2026 Update?
MMD-1	Construct an emergency intertie across the Richmond San Rafael Bridge for water transfers to provide an alternative imported water supply to the District's capacity.	No action – This project has been combined into other water resiliency supply projects.	No
MMD-2	Pine Mountain Tunnel Project Mitigation. Reconstruction of an existing facility to reduce vulnerability to hazards.	In construction with a completion date of 2029.	No
MMD-3	Replace existing wood-roofed concrete tank at Ross Reservoir with new steel and/or concrete tanks.	MMD-2 needs to be completed prior to starting this project	Yes #1
MMD-4	Refurbish pump station at Kastania to increase imported water capacity.	In construction with a completion date of 2027	No
MMD-5	Replace roofs and vents of treatment plants with non-combustible materials.	Some actions have been taken, but needs further action.	Yes #2
MMD-6	Replace 4 miles of ACCP transmission line pipe on North Marin Line from Shafter Bridge to San Geronimo Treatment Plant.	No progress due to lack of identified funding source.	Yes #3
MMD-7	Create a defensible space around treatment plants.	In progress and needs to continue	Yes #2
MMD-8	Install a full-scale automated meter infrastructure to allow for real-time analysis of water usage.	Project has started and is on track to be completed within 10 years	Yes #4
MMD-9	Perform seismic upgrades on 14 steel storage tanks in distribution system, including anchoring and flexible connections.	No progress due to lack of identified funding source.	Yes #5
MMD-10	Retrofit the exterior of 64 pump stations with non-combustible materials.	No significant progress due to lack of identified funding source.	Yes #2
MMD-11	Replace clarifiers at San Geronimo Treatment Plant to increase seismic resilience.	Planning is underway with the Treatment Plant Master Plan and funding is still to be secured for design and construction.	Yes #5
MMD-12	Install ozone at the San Geronimo Treatment Plant as a green alternative to chemical treatment.	Planning is underway with the Treatment Plant Master Plan and funding is still to be secured for design and construction.	Yes #6
MMD-13	Expand recycled water infrastructure from Las Gallinas Sanitary District to Peacock Gap golf course.	No progress due to lack of identified funding source.	Yes #7
MMD-14	Replace existing redwood tank at Bolsa.	Installed a regulator in 2023	Yes #8
MMD-15	Replace existing redwood tank at Scenic.	Construction will start in 2026 and be completed by 2027	Yes #8
MMD-16	Replace existing redwood tank at Madera Park.	Planning completed. Design and construction will progress when funding is secured	Yes #8

Action Number	Description	Status Comment	Include in the 2026 Update?
MMD-17	Install permanent generators at 29 pump stations.	No permanent generators, but portable generators have been purchased.	No
MMD-18	Replace existing redwood tanks at Hind.	In design. These tanks will be replaced with a pair of steel tanks of the same size. The steel tanks are seismically resilient and fire hardened, resulting in a more resilient water infrastructure system. Construction will start in 2027 and be complete in 2029.	Yes #8
MMD-19	Improve functionality and seismic reliability of emergency operations center with current technology.	No progress due to lack of identified funding source.	Yes #9
MMD-20	Improve seismic reliability and install permanent generators at administration building.	No progress due to lack of identified funding source.	Yes #10
MMD-21	Improve seismic reliability and install permanent generators at the corporation yard.	No progress due to lack of identified funding source.	Yes #10
MMD-22	Install ozone at the Bon Tempe Treatment Plant to reduce chemical delivery needs, provide sustainability and improve long-term water quality.	Planning is underway with the Treatment Plant Master Plan and funding is still to be secured for design and construction.	Yes #6
MMD-23	Continue to maintain the Hazard Mitigation Planning portion of the District's website for continued risk communication and hazard mitigation plan implementation over the performance period of this plan.	Ongoing capability	No

20.2 MITIGATION OPPORTUNITIES

Local Plan Requirement C3 – 44 CFR Part 201.6(c)(3)(ii)

The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effect of each hazard, with particular emphasis on new and existing buildings and infrastructure.

A range of potential mitigation opportunities is included in each natural hazard risk assessment (refer to "Mitigation Opportunities in Chapters 6 through 15). The potential actions are categorized by:

- Who may implement the action:
  - Community / Customer Scale (individuals or groups)
  - Utility Operational Scale (Marin Water and/or other local water agencies)
- What the alternative would do:
  - Manipulate the hazard (actions to prevent hazard events from occurring)
  - Reduce exposure and vulnerability (actions to safeguard people, property, services and the environment from the impacts of the hazard)
  - Build local capacity (actions to improve abilities to mitigate and respond to hazard events)

20.3 RECOMMENDED MITIGATION ACTIONS & IMPLEMENTATION

Local Plan Requirement C3 – 44 CFR Part 201.6(c)(3)(iii)

The hazard mitigation strategy shall include an action plan, describing how the action identified in paragraph (c)(3)(ii) of this section will be prioritized, implemented, and administered by the local jurisdiction.

The Steering Committee selected Districtwide actions to be included in a hazard mitigation action plan based on the risk assessment of identified hazards of concern and the defined hazard mitigation goals and objectives. Table 20-1 lists the recommended hazard mitigation actions that make up the action plan.

Table 20-1. Hazard Mitigation Action Plan Matrix

Hazards Addressed	Benefits New or Existing Assets	Goals & Objectives Met	Lead and Support Implementers	Estimated Cost	Potential Funding Sources	Timeline
1—Replace existing wood-roofed concrete tank at Ross Reservoir with new steel and/or concrete tanks after Pine Mountain Tunnel project is complete in 2029.						
Drought Earthquake Flood Mass Movement Wildfire	Existing	Goals: 1, 2 Objectives 1, 2, 3	Lead: Director of Engineering	High (more than $20M)	Staff Time, Capital Improvement Program Budget, FEMA HMA Grants	Long-Term (5 years or more)
2—Wildfire Service Continuity and Infrastructure Hardening Program: Harden and maintain defensible space around pump stations and treatment plants and improve backup capabilities to maintain service during major wildfire incidents. Includes: • **Replacement of roofs, vents and siding with non-combustible materials at treatment plants and pump stations** • **Maintenance of defensible space at treatment plants and pump stations**						
Wildfire	Both	Goals: 1, 2, 3 Objectives 1, 3	Lead: Director of Engineering	Moderate ($1M-$20M)	Staff Time, Capital Improvement Program Budget, FEMA HMA Grants, Prop 4 Funding	Short-Term (less than 5 years)
3—Replace 4 miles of ACCP transmission line pipe on North Marin Line from Shafter Bridge to San Geronimo Treatment Plant.						
Drought Earthquake	Existing	Goals: 1, 2, 3 Objectives 1, 2	Lead: Director of Engineering	High (more than $20M)	Staff Time, Capital Improvement Program Budget, FEMA HMA Grants	Long-Term (5 years or more)
4—Install a full-scale automated meter infrastructure to allow for real-time analysis of water usage.						
Drought	Existing	Goals: 1, 2, 3, 4 Objectives 1, 2, 3, 4	Lead: Director of Engineering	High (more than $20M)	Staff Time, Capital Improvement Program Budget, FEMA HMA Grants	Short-Term (less than 5 years)
5—Facility Seismic Resilience Improvements: Conduct seismic evaluation and retrofit of critical facilities, operational centers, SCADA infrastructure, and essential water system components. Includes: • **Steel water storage tanks seismic upgrades** • **San Geronimo Treatment Plant clarifier replacement** • **EOC seismic upgrades**						

Hazards Addressed	Benefits New or Existing Assets	Goals & Objectives Met	Lead and Support Implementers	Estimated Cost	Potential Funding Sources	Timeline
Dam Failure **Earthquake**	Existing	Goals: 1, 2, 3 Objectives 1, 2, 3	Lead: Director of Engineering	High (more than $20M)	Staff Time, Capital Improvement Program Budget, FEMA HMA Grants	Long-Term (5 years or more)
6—Install ozone at the following treatment plants as a green alternative to reduce chemical delivery needs, provide sustainability and improve long-term water quality: • **San Geronimo Treatment Plant** • **Bon Tempe Treatment Plant**						
Drought	Existing	Goals: 1, 2, 3 Objectives 1, 2, 3	Lead: Director of Engineering	High (more than $20M)	Staff Time, Capital Improvement Program Budget	Long-Term (5 years or more)
7—Expand reclaimed water system including: • **Las Gallinas Sanitary District to Peacock Gap golf course**						
Drought	New	Goals: 3 Objectives 3	Lead: Director of Engineering	High (more than $20M)	Staff Time, Capital Improvement Program Budget, FEMA HMA Grants	Long-Term (5 years or more)
8—Replace existing redwood tank at the following locations: • **Bolsa** • **Hind** • **Madera Park** • **Scenic**						
Drought **Earthquake** **Wildfire**	Existing	Goals: 1, 2, 3 Objectives 1, 2, 3	Lead: Director of Engineering	High (more than $20M)	Staff Time, Capital Improvement Program Budget, FEMA HMA Grants	Short-Term (less than 5 years)
9—Improve functionality and seismic reliability of emergency operations center with current technology.						
Earthquake	Existing	Goals: 1, 2 Objectives 1, 2, 4	Lead: Director of Engineering	High (more than $20M)	Staff Time, Capital Improvement Program Budget, FEMA HMA Grants	Short-Term (less than 5 years)
10—Improve seismic reliability and install permanent generators at the following locations: • **Administration building** • **Corporation yard**						

Hazards Addressed	Benefits New or Existing Assets	Goals & Objectives Met	Lead and Support Implementers	Estimated Cost	Potential Funding Sources	Timeline
Earthquake	Existing	Goals: 1, 2 Objectives 1, 2, 4	Lead: Director of Engineering	High (more than $20M)	Staff Time, Capital Improvement Program Budget, FEMA HMA Grants	Short-Term (less than 5 years)
11—Install Automated Dam Gate and Actuator Systems: Install automated actuators, controls, and remote operation capabilities at district dams to improve emergency response and dam operations during hazard events.						
Dam Failure **Earthquake** **Flood**	Existing	Goals: 1, 2, 3 Objectives 1, 2, 3	Lead: Director of Engineering Support: DSOD	Moderate ($1M-$20M)	Staff Time, Capital Improvement Program Budget, FEMA HMA Grants, DWR	Short-Term (less than 5 years)
12—Implement Dam Spillway Improvement Program: Design and construct spillway improvements at priority dams to address identified deficiencies and reduce dam failure risk during extreme storm events including the following locations: • **Seeger Dam** • **Phoenix Dam**						
Dam Failure **Earthquake** **Flood**	Existing	Goals: 1, 2, 3 Objectives 1, 2, 3	Lead: Director of Engineering Support: DSOD	High (more than $20M)	Staff Time, Capital Improvement Program Budget, FEMA HMA Grants, DWR	Short-Term (less than 5 years)
13—Dam Safety Grant Readiness and Engineering Design Program: Advance engineering, environmental review, and preliminary design activities to position priority dam projects for Prop 4, DWR, FEMA, USBR, and other funding opportunities.						
Dam Failure **Drought** **Earthquake** **Extreme Temperature** **Flood** **High Wind** **Mass Movement** **Sea Level Rise** **Tsunami** **Wildfire**	Both	Goals: 2, 3 Objectives 1, 2, 3	Lead: Director of Engineering and Principal Grant & Legislative Analyst	Low ($0-$1M)	Staff Time, Operating Budget	Short-Term (less than 5 years)
14—Southern Marin Transmission Pipeline Reliability Improvements: Upgrade, harden, or replace vulnerable segments of the Southern Marin transmission pipeline to improve seismic and emergency reliability.						

Hazards Addressed	Benefits New or Existing Assets	Goals & Objectives Met	Lead and Support Implementers	Estimated Cost	Potential Funding Sources	Timeline
Drought **Earthquake**	Existing	Goals: 1, 2, 3, 4 Objectives 1, 2, 3, 4	Lead: Director of Engineering	Moderate ($1M-$20M)	Staff Time, Capital Improvement Program Budget, FEMA HMA Grants	Short-Term (less than 5 years)
15—Capacity Enhancement Projects: Increase conveyance capacity, redundancy, and operational reliability associated with the following systems: • **Phoenix Transfer** • **Federal Works**						
Drought **Flood** **Mass Movement**	Both	Goals: 1, 2 Objectives 1, 2	Lead: Director of Engineering	Moderate ($1M-$20M)	Staff Time, Capital Improvement Program Budget, FEMA HMA Grants, Prop 4	Long-Term (5 years or more)
16—Continuity of Operations (COOP) Enhancement: Formalize COOP procedures focused on maintaining water service following earthquakes and other major disasters.						
Dam Failure **Drought** **Earthquake** **Extreme Temperature** **Flood** **High Wind** **Mass Movement** **Sea Level Rise** **Tsunami** **Wildfire**	Both	Goals: 1, 2, 3, 4 Objectives 1	Lead: Safety and Emergency Response Manager	Low ($0-$1M)	Staff Time, Operating Budget, HSGP Grant	Short-Term (less than 5 years)
17—Emergency Operations Plan (EOP) Update: Update the existing EOP to enhance District capabilities to prepare for, respond to and recover from damaging events.						

Hazards Addressed	Benefits New or Existing Assets	Goals & Objectives Met	Lead and Support Implementers	Estimated Cost	Potential Funding Sources	Timeline
Dam Failure **Drought** **Earthquake** **Extreme Temperature** **Flood** **High Wind** **Mass Movement** **Sea Level Rise** **Tsunami** **Wildfire**	Both	Goals: 1, 2, 3, 4 Objectives 1	Lead: Safety and Emergency Response Manager	Low ($0-$1M)	Staff Time, Operating Budget, HSGP Grant, EPA Grant	Short-Term (less than 5 years)
18—Flood-Resilient Access to SCADA and Emergency Operations Facilities: Improve backup communications and operational continuity measures for SCADA and emergency operations facilities during flood events.						
Flood	Both	Goals: 2 Objectives 1, 4	Lead: Director of Engineering	Moderate ($1M-$20M)	Staff Time, Capital Improvement Program Budget, FEMA HMA Grants, DWR	Short-Term (less than 5 years)
19—Sea Level Rise Adaptation Strategy for Vulnerable Facilities: Develop facility-specific adaptation strategies for infrastructure exposed to future sea level rise, including elevation, floodproofing, relocation, or protection measures.						
Sea Level Rise	Existing	Goals: 1, 2 Objectives 1	Lead: Director of Engineering	Low ($0-$1M)	Staff Time, Operating Budget, FEMA HMA Grants	Short-Term (less than 5 years)
20—Administrative Facility Flood and Tsunami Resilience Assessment: Evaluate and mitigate flood and tsunami vulnerabilities at administration and operational facilities.						
Flood **Tsunami**	Existing	Goals: 1, 2 Objectives 1	Lead: Director of Engineering	Low ($0-$1M)	Staff Time, Operating Budget, FEMA HMA Grants	Short-Term (less than 5 years)
21—Regional Water Supply Reliability Partnership with Sonoma County Water Agency: Coordinate regional drought resilience projects and water-supply reliability improvements with SCWA.						

Hazards Addressed	Benefits New or Existing Assets	Goals & Objectives Met	Lead and Support Implementers	Estimated Cost	Potential Funding Sources	Timeline
Drought	Existing	Goals: 1 Objectives 1, 2	Lead: Director of Engineering and Director of Water Resources	Moderate ($1M-$20M)	Staff Time, Operating Budget, Capital Improvement Program Budget, USACE Water Resources Development Act (WRDA)	Long-Term (5 years or more)
22—Ecosystem and Water Quality Protection Program: Implement projects to reduce drought-related ecological impacts and protect reservoir water quality including: • **Enhance monitoring, early warning, and response procedures for harmful algal blooms.**						
Drought	Existing	Goals: 1, 2, 3 Objectives 1, 3	Lead: Director of Water Resources	Low ($0-$1M)	Staff Time, Operating Budget, Capital Improvement Program Budget	Short-Term (less than 5 years)
23—Emergency Access Improvement for Remote Facilities: Identify and improve district-owned access routes to critical facilities vulnerable to wildfire, landslide, flooding, earthquake or roadway failure.						
Earthquake **Flood** **Mass Movement** **Wildfire**	Both	Goals: 1, 2 Objectives 1	Lead: Director of Engineering	Moderate ($1M-$20M)	Staff Time, Operating Budget, FEMA HMA (HHPD, HMGP) Grants	Short-Term (less than 5 years)
24—SCADA and Cybersecurity Resilience Enhancements: Implement cybersecurity improvements, redundancy, and recovery measures for critical operational technology systems in coordination with AWIA Risk and Resilience and Emergency Response Plan compliance.						
Cyber-Attack **Terrorism**	Both	Goals: 1, 2 Objectives 1, 4	Lead: Director of Operations	Moderate ($1M-$20M)	Staff Time, Operating Budget	Short-Term (less than 5 years)

20.4 ACTION PLAN PRIORITIZATION

For this Plan update, the District followed the same prioritization method used in the 2023 California State HMP. Each action is reviewed and scored based on 15 questions, listed below.

1. **Life Safety**—Will the action result in life safety?

2. **Property Protection**—Will the action result in property protection?
3. **Cost-Effective**—Will the action be cost-effective (future benefits exceed cost)?
4. **Technically Feasible**—Is the action technically feasible?
5. **Legal Authority**—Does the District have the legal authority to implement?
6. **Funding Available**—Is funding available for the action?
7. **Environmental**—Will the action have a positive impact on the natural environment?
8. **Climate Change**—Will the action mitigate impacts from climate change?
9. **Equity Priority Community**—Does the action benefit Equity Priority Communities?
10. **Administrative Capacity**—Does the District have the administrative capability to execute the action?
11. **Multi-Hazard**—Will the action reduce risk to more than one hazard?
12. **Timeline**—Can the action be completed in less than 5 years?
13. **Stakeholder Support**—Is there stakeholder (outside of District staff) support for the action?
14. **Other Local Objective**—Will the action meet other local objectives (such as capital improvements, economic development, environmental quality, or open space preservation?)
15. **Support Policies**—Does the action support the policies of other plans and programs?

The answers to each of these questions are weighted as follows:

- Yes = 3 points
- Not sure/could be either yes or no/question is difficult to quantify = 1 point
- No = 0 points

Following the scoring of each action, priorities are assigned based on the following:

- 31 or more = High Priority
- 15 to 30 = Medium Priority
- 0 to 14 = Low Priority

Table 20-2 indicates the priority for each action in Marin Water's mitigation action plan.

Table 20-2. Mitigation Action Prioritization

Action Number	Life Safety	Property Protection	Cost-Effectiveness	Technically Feasible	Legal Authority	Funding Available	Environmental	Climate Change	Equity Priority Community	Administrative Capacity	Multi-Hazard	Timeline	Stakeholder Support	Other Local Objective	Support Policies	Total Score	Priority
#1	0	3	3	3	3	0	0	3	3	3	3	0	3	3	3	33	High
#2	1	3	3	3	3	0	3	3	3	3	0	3	3	3	3	33	High
#3	0	3	3	3	3	0	0	3	3	3	3	3	3	3	3	36	High
#4	0	1	3	3	3	0	0	3	3	3	0	0	3	3	3	28	Medium
#5	3	3	3	3	3	0	0	3	3	3	3	0	3	3	3	36	High
#6	1	1	3	3	3	3	3	3	3	3	0	0	3	3	3	35	High
#7	0	1	3	3	3	0	3	3	0	3	0	0	3	3	3	28	Medium
#8	1	3	3	3	3	0	0	3	3	3	3	3	3	3	3	37	High
#9	3	3	3	3	3	0	0	0	3	3	0	3	3	3	3	33	High
#10	3	3	3	3	3	0	0	0	3	3	0	3	3	3	3	33	High
#11	0	3	3	3	3	0	0	3	3	3	3	3	3	3	3	36	High
#12	3	3	3	3	3	0	1	3	3	3	3	3	3	3	3	40	High
#13	1	3	3	3	3	0	1	1	3	3	3	3	3	3	3	36	High
#14	0	3	3	3	3	0	0	3	3	3	3	3	3	3	3	36	High
#15	0	3	3	3	3	3	0	3	3	3	3	0	3	3	3	36	High
#16	0	3	3	3	3	0	0	1	3	3	3	3	3	3	3	34	High
#17	0	3	3	3	3	0	0	1	3	3	3	3	3	3	3	34	High
#18	0	3	3	3	3	0	0	3	3	3	3	3	3	3	3	36	High
#19	0	3	3	3	3	0	0	3	3	3	3	3	3	3	3	36	High
#20	1	3	3	3	3	0	0	1	3	3	3	3	3	3	3	35	High
#21	0	3	3	3	3	0	1	3	3	3	0	0	3	3	3	31	High
#22	1	3	3	3	3	0	3	3	3	3	0	3	3	3	3	37	High
#23	3	3	3	3	3	0	0	1	3	3	3	3	3	3	3	37	High
#24	1	3	3	3	3	3	0	1	3	3	3	3	3	3	3	38	High

21. PLAN ADOPTION AND IMPLEMENTATION

21.1 PLAN ADOPTION

A hazard mitigation plan must document that it has been formally adopted by the governing body of the jurisdiction requesting federal approval of the plan (44 CFR Section 201.6(c)(5)). This plan was submitted for review to Cal OES and FEMA Region 9 concurrent with Marin Water Board adoption. FEMA then issued final approval of the plan. Appendix F includes FEMA's approval notice and the District Board of Directors' adoption resolution. DMA compliance and its benefits are achieved with the Plan's adoption.

21.2 PLAN MAINTENANCE STRATEGY

Plan maintenance is the formal process for achieving the following:

- Ensuring that the hazard mitigation plan remains an active and relevant document and that the adopting jurisdiction maintains its eligibility for applicable funding sources
- Monitoring and evaluating the plan annually and producing an updated plan every five years
- Integrating public participation throughout the plan maintenance and implementation process
- Incorporating the mitigation actions outlined in the plan into existing planning mechanisms and programs

To achieve these ends, a hazard mitigation plan must present a plan maintenance process that includes the following (44 CFR Section 201.6(c)(4)):

- A method and schedule for monitoring, evaluating and updating the mitigation plan within a 5-year cycle
- An approach for how the community will continue public participation in the plan maintenance process
- A process by which local governments will incorporate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate

Table 21-1 summarizes the plan maintenance strategy. Recommended agendas for annual plan maintenance are located in Appendix G. The sections below further describe each element.

21.2.1 Plan Implementation and Monitoring

The mitigation action plan presents a range of action items for reducing loss from hazard events. The District has prioritized actions and can begin to implement the highest-priority actions over the next five years. Some action items can be implemented through the creation of new educational programs, continued interagency coordination or improved public participation.

Table 21-1. Plan Maintenance Matrix

Task	Approach	Timeline	Lead Responsibility	Support Responsibility
Monitoring	Review of status updates and action implementation.	Annually	Associate Engineer	Appropriate staff as needed

Task	Approach	Timeline	Lead Responsibility	Support Responsibility
Evaluation	Review the status of previous actions as submitted by the monitoring task lead and support the assessment of the effectiveness of the plan; assess appropriate action for preparing next hazard mitigation plan update.	Annually or upon update to CIP or major disaster	Associate Engineer	Appropriate staff as needed
Update	The District will complete a comprehensive update to this plan every 5 years. Plan update to be facilitated through oversight of a stakeholder Steering Committee	Beginning two years prior to plan expiration or following a major disaster event that significantly impacts the District	Associate Engineer	Steering Committee
Continuing Public Involvement	The principal means for providing the public access to the implementation of this plan will be the Hazard Mitigation Plan webpage and social media channels. Public information campaigns on wildfire and drought preparedness. https://www.marinwater.org/emergency-preparedness#button-3	Annually or as needed	Associate Engineer	Appropriate staff as needed
Plan Integration	Integrate relevant information from hazard mitigation plan into other plans and programs where viable and opportunities arise including AWIA ERP/RRA, CIP	Ongoing	Associate Engineer	Appropriate staff as needed

The effectiveness of the hazard mitigation plan depends on monitoring and incorporation of its actions into existing Marin Water plans, policies and programs. The District will have lead responsibility for overseeing the implementation. The Associate Engineer will have responsibility for overseeing the plan monitoring and implementation strategy as summarized in Table 21-1.

21.2.2 Plan Evaluation

The plan will be evaluated by how successfully the implementation of identified actions has helped to achieve the goals and objectives identified in this plan. This will be assessed by a review of the changes in risk that occur over the performance period and by the degree to which mitigation goals and objectives are incorporated into existing plans, policies and programs. The minimum task of Marin Water will be the evaluation of the progress of its action plan during a 12-month performance period. This review will include the following:

- Summary of any hazard events that occurred during the performance period and the impact these events had on the planning area
- Review of mitigation success stories
- Review of continuing public involvement
- Brief discussion about why targeted strategies were not completed
- Re-evaluation of the action plan to determine if the timeline for identified projects needs to be amended (such as changing a long-term project to a short-term one because of new funding)
- Recommendations for new projects

- Changes in or potential for new funding options (grant opportunities)
- Impact of any other planning programs or initiatives that involve hazard mitigation

21.2.3 Plan Update

Federal regulations require that local hazard mitigation plans be reviewed, revised if appropriate and resubmitted for approval in order to remain eligible for benefits awarded under the Disaster Mitigation Act (44 CFR Section 201.6.d(3)). This plan's format allows Marin Water to review and update sections when new data become available. New data can be easily incorporated, resulting in a plan that will remain current and relevant. Marin Water intends to update the plan on a five-year cycle from the date of plan approval. This cycle may be accelerated to less than 5 years based on the following triggers:

- A presidential disaster declaration that impacts the planning area
- A hazard event that causes loss of life
- It will not be the intent of the update process to develop a completely new hazard mitigation plan. Based on needs identified by the planning team, the update will, at a minimum, include the following elements:
- The update process will be convened through a new steering committee.
- The hazard risk assessment will be reviewed and, if necessary, updated using best available information and technologies.
- The action plan will be reviewed and revised to account for any actions completed, dropped or changed and to account for changes in the risk assessment or Marin Water policies identified under other planning mechanisms.
- The draft update will be sent to appropriate agencies and organizations for comment.
- The public will be given an opportunity to comment on the update prior to adoption.
- The Board of Directors will adopt the updated plan.

Future plan updates will be overseen by a steering committee similar to the one that participated in this update process, so keeping an interim steering committee intact will provide a head start on future updates. The steering committee's role will be to review the progress report in an effort to identify issues needing to be addressed by future plan updates.

21.2.4 Continuing Public Involvement

The public will continue to be apprised of the plan's progress through the Marin Water website. This site will not only house the final plan, but it will also become the one-stop shop for information regarding the plan and plan implementation. The website will include contact information for anyone with questions on the plan's implementation or maintenance. This website will be maintained by the District throughout the performance period for this plan. Upon initiation of future update processes, a new public involvement strategy will be initiated based on guidance from a new steering committee. This strategy will be based on the needs and capabilities of Marin Water at the time of the update.

21.2.5 Incorporation into Other Planning Mechanisms

The information on hazard, risk, vulnerability and mitigation contained in this plan is based on the best science and technology available at the time this update was prepared. This planning process provided Marin Water with the opportunity to identify, review and expand on core capabilities of Marin Water that could support or enhance the outcomes of this plan. Opportunities for integration identified by this planning process include:

- Marin Water Strategic Plan
- Marin Water Master Plans

- Marin Water emergency response plans
- AWIA plan
- Capital improvement programs
- Marin Water vulnerability assessment

Some action items do not need to be implemented through regulation. Instead, they can be implemented through the creation of new educational programs, continued interagency coordination or improved public participation. As information becomes available from other planning mechanisms that can enhance this plan, that information will be incorporated via the update process.

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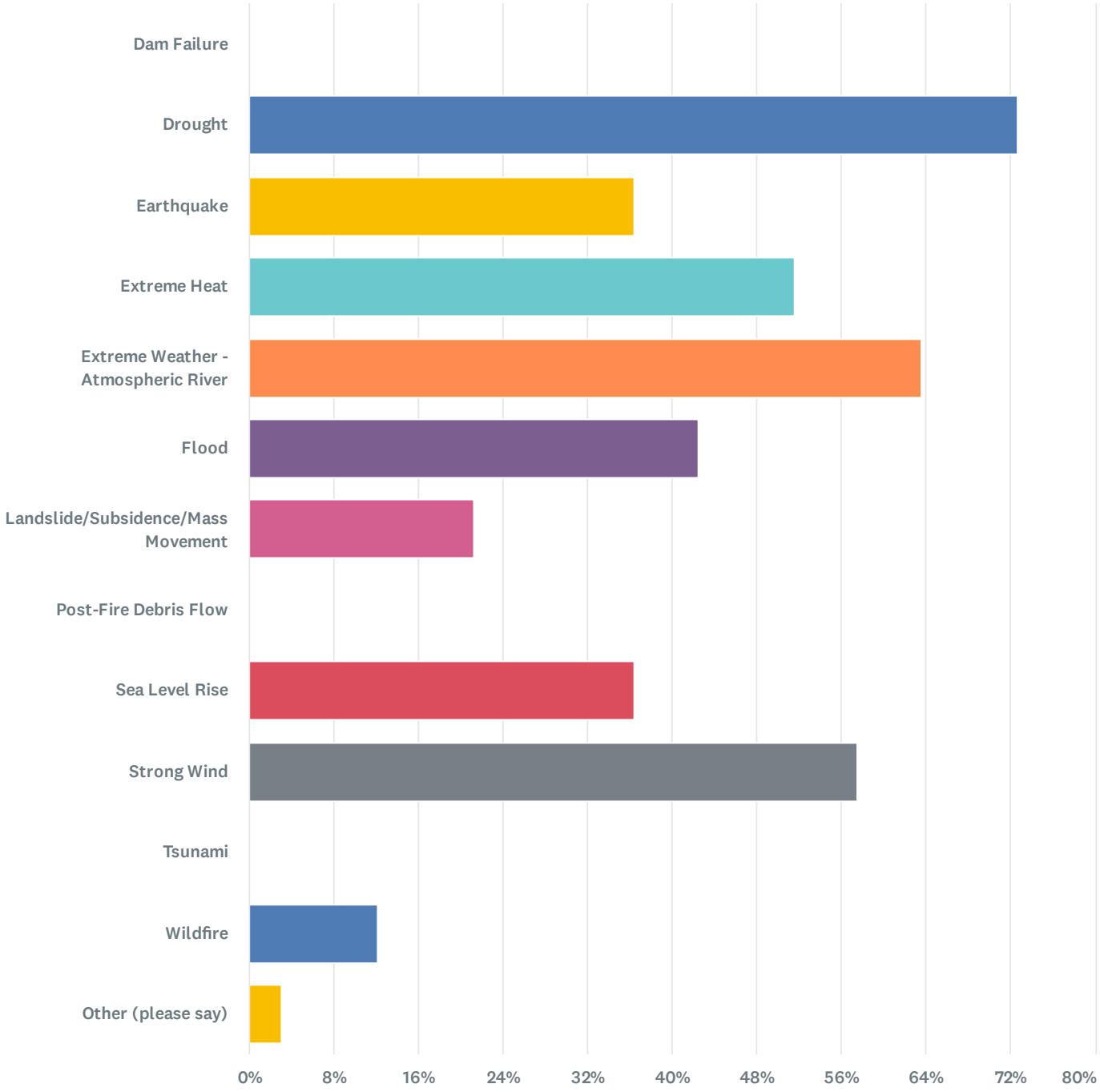
A. PUBLIC SURVEY

Q1 33 responses

Which of these natural hazards have you experienced in your area? Choose all that apply.



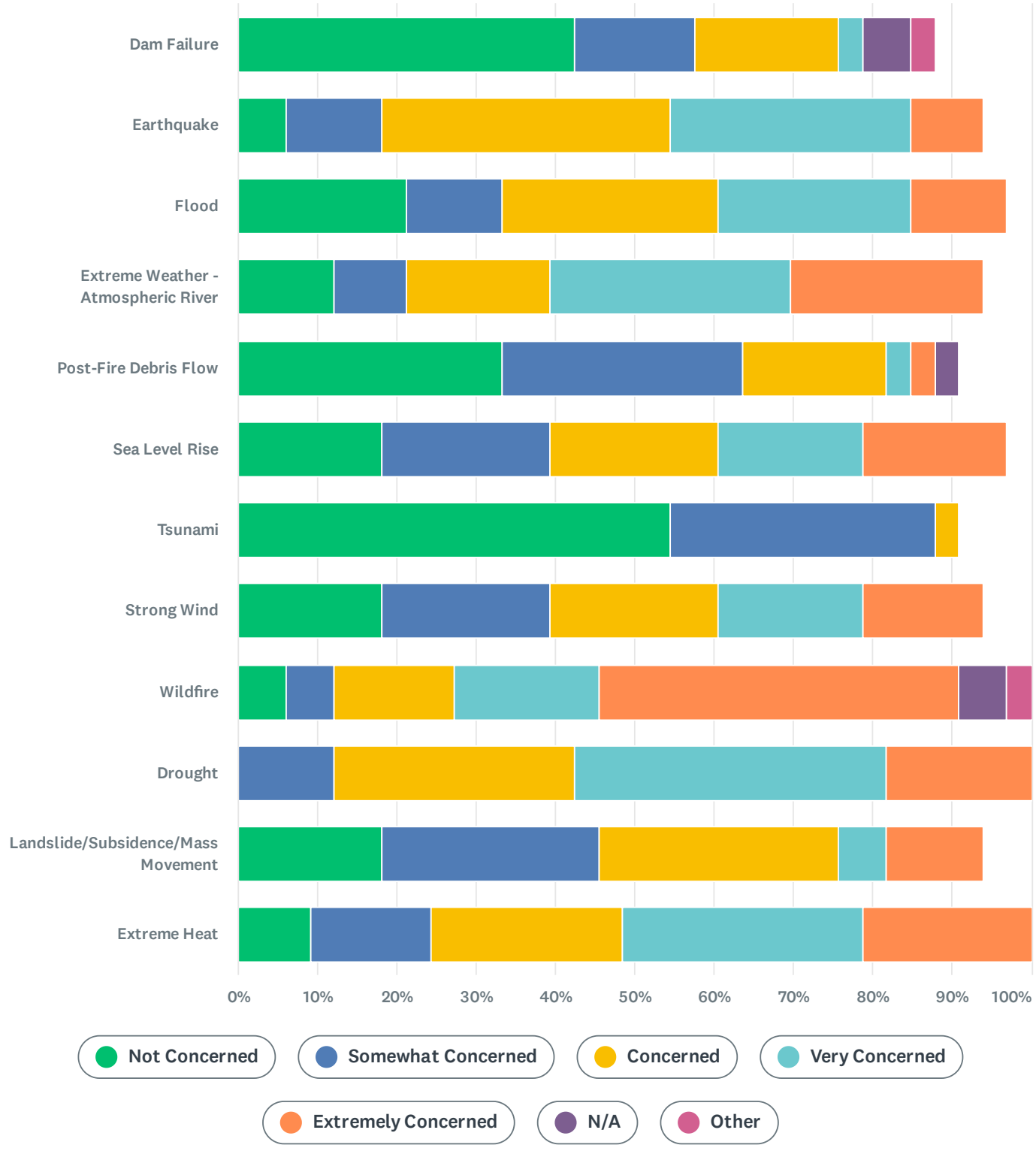
Answer Choices	Percentage	Responses
Dam Failure	0%	0
Total		**131**

Answer Choices	Percentage	Responses
Drought	72.73%	24
Earthquake	36.36%	12
Extreme Heat	51.52%	17
Extreme Weather - Atmospheric River	63.64%	21
Flood	42.42%	14
Landslide/Subsidence/Mass Movement	21.21%	7
Post-Fire Debris Flow	0%	0
Sea Level Rise	36.36%	12
Strong Wind	57.58%	19
Tsunami	0%	0
Wildfire	12.12%	4
Other (please say)	3.03%	1
Total		**131**

#	OTHER (PLEASE SAY)	DATE
1	WHY HAS THE PHOENIX-BON TEMPE CONNECTOR PROJECT BEEN DROPPED?!	3/12/2026 7:56 AM

Q2 33 responses

How worried are you about these natural dangers in the area?



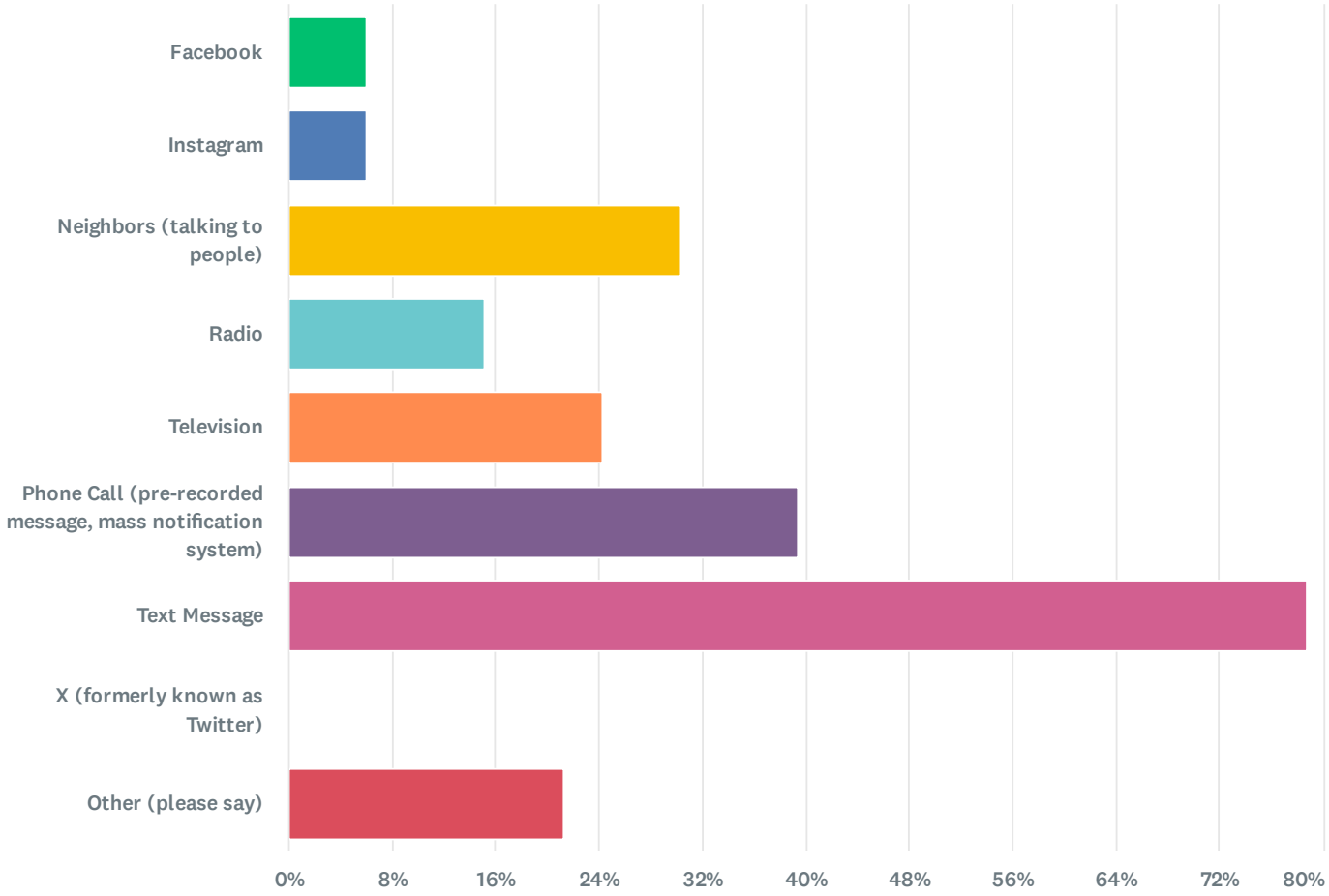
	Not Concerned	Somewhat Concerned	Concerned	Very Concerned	Extremely Concerned	N/A	Other	Tota
Dam Failure	42.42% 14	15.15% 5	18.18% 6	3.03% 1	0% 0	6.06% 2	3.03% 1	29
Earthquake	6.06% 2	12.12% 4	36.36% 12	30.30% 10	9.09% 3	0% 0	0% 0	31
Flood	21.21% 7	12.12% 4	27.27% 9	24.24% 8	12.12% 4	0% 0	0% 0	32
Extreme Weather - Atmospheric River	12.12% 4	9.09% 3	18.18% 6	30.30% 10	24.24% 8	0% 0	0% 0	31
Post-Fire Debris Flow	33.33% 11	30.30% 10	18.18% 6	3.03% 1	3.03% 1	3.03% 1	0% 0	30
Sea Level Rise	18.18% 6	21.21% 7	21.21% 7	18.18% 6	18.18% 6	0% 0	0% 0	32
Tsunami	54.55% 18	33.33% 11	3.03% 1	0% 0	0% 0	0% 0	0% 0	30
Strong Wind	18.18% 6	21.21% 7	21.21% 7	18.18% 6	15.15% 5	0% 0	0% 0	31
Wildfire	6.06% 2	6.06% 2	15.15% 5	18.18% 6	45.45% 15	6.06% 2	3.03% 1	33
Drought	0% 0	12.12% 4	30.30% 10	39.39% 13	18.18% 6	0% 0	0% 0	33
Landslide/Subsidence/Mass Movement	18.18% 6	27.27% 9	30.30% 10	6.06% 2	12.12% 4	0% 0	0% 0	31
Extreme Heat	9.09% 3	15.15% 5	24.24% 8	30.30% 10	21.21% 7	0% 0	0% 0	33
								376

#	IF YOU SELECTED 'OTHER' ABOVE, PLEASE EXPLAIN YOUR ANSWER.	DATE
1	Extreme allergic reactions and fire fuel associated with Poison Oak, it should be removed from within 10 feet of all trails for both fire break and sever allergic reactions (including those inhaled as a result of fire). Invasive broom plants should also be removed due to their fire potential and out of control spreading.	3/10/2026 11:13 AM

2	Why did MMWD halt the Phoenix-Bon Tempe Connector project? USE PHOENIX AS A DETENTION BASIN TO HELP PROTECT LOWER ROSS VALLEY FROM FLOODING!!!!	3/6/2026 8:01 PM
3	We have a levee system for bay water - which is in need of repair and has had some failures. However this is not what you are probably looking for with Dam.	3/5/2026 1:00 PM

Q3 33 responses

How would you like to learn about hazards before they occur? Check all that apply.



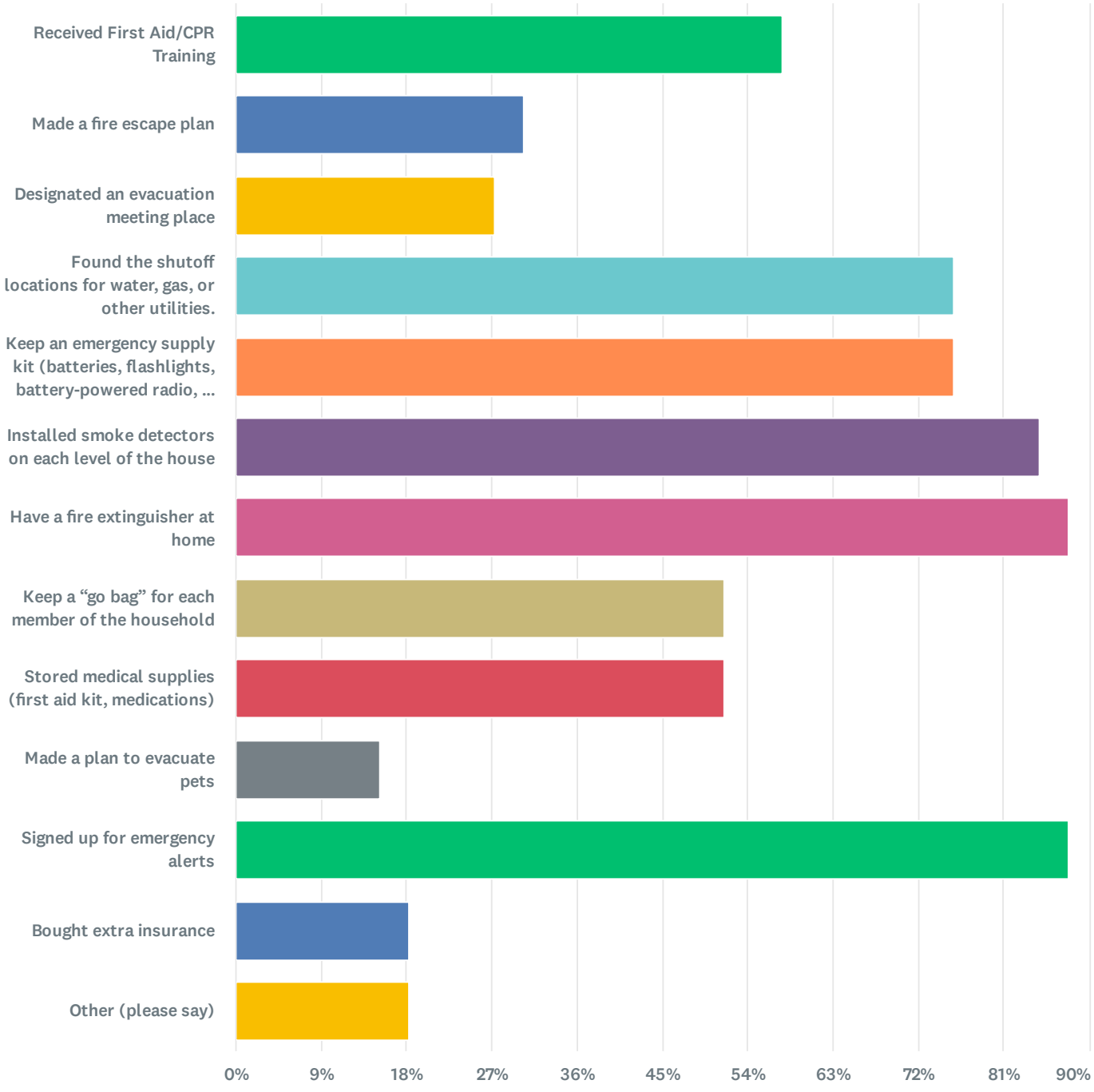
Answer Choices	Percentage	Responses
Facebook	6.06%	2
Instagram	6.06%	2
Neighbors (talking to people)	30.30%	10
Radio	15.15%	5
Television	24.24%	8
Phone Call (pre-recorded message, mass notification system)	39.39%	13
Text Message	78.79%	26
Total		**73**

Answer Choices	Percentage	Responses
X (formerly known as Twitter)	0%	0
Other (please say)	21.21%	7
Total		**73**

#	OTHER (PLEASE SAY)	DATE
1	email	5/4/2026 9:44 AM
2	MMWD Newsletter	3/12/2026 7:56 AM
3	E-mail	3/7/2026 12:05 PM
4	Nextdoor, email	3/6/2026 8:01 PM
5	I assume this means before they are imminent. If anything were imminent, I'd prefer a phone call or text.	3/5/2026 9:53 PM
6	NextDoor, Bluesky	3/5/2026 8:51 PM
7	Email	3/5/2026 11:36 AM

Q4 33 responses

What has your family or household done to prepare for a disaster? Check all that apply.



Answer Choices	Percentage	Responses
Received First Aid/CPR Training	57.58%	19
Total		**225**

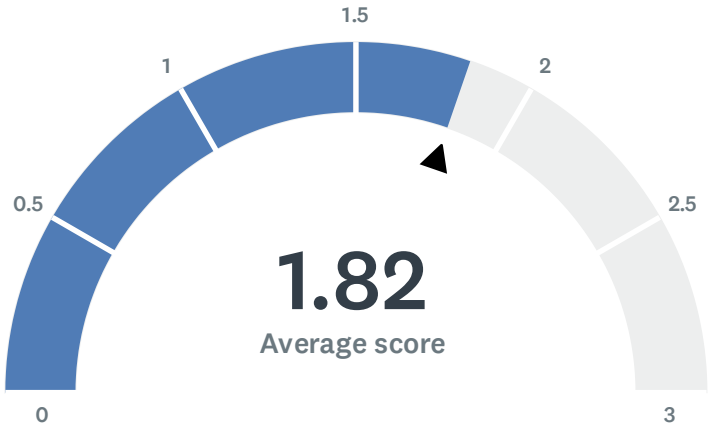
258

Answer Choices	Percentage	Responses
Made a fire escape plan	30.30%	10
Designated an evacuation meeting place	27.27%	9
Found the shutoff locations for water, gas, or other utilities.	75.76%	25
Keep an emergency supply kit (batteries, flashlights, battery-powered radio, food/water)	75.76%	25
Installed smoke detectors on each level of the house	84.85%	28
Have a fire extinguisher at home	87.88%	29
Keep a “go bag” for each member of the household	51.52%	17
Stored medical supplies (first aid kit, medications)	51.52%	17
Made a plan to evacuate pets	15.15%	5
Signed up for emergency alerts	87.88%	29
Bought extra insurance	18.18%	6
Other (please say)	18.18%	6
Total		**225**

#	OTHER (PLEASE SAY)	DATE
1	URGE MMWD TO USE PHOENIX LAKE AS A DETENTION BASIN!	3/12/2026 7:56 AM
2	constant removal of poison oak, broom, and other fire potential plants from our property.	3/10/2026 11:13 AM
3	Installed a Generac.	3/7/2026 12:05 PM
4	Wrote a book on emergency prep	3/6/2026 8:01 PM
5	Hardened home	3/6/2026 8:07 AM
6	You need a "Not applicable" option or your results will be scewed by things that don't apply to every household.	3/5/2026 9:53 PM

Q5 33 responses

How prepared is your household to deal with a water disruption from a disaster or big emergency?



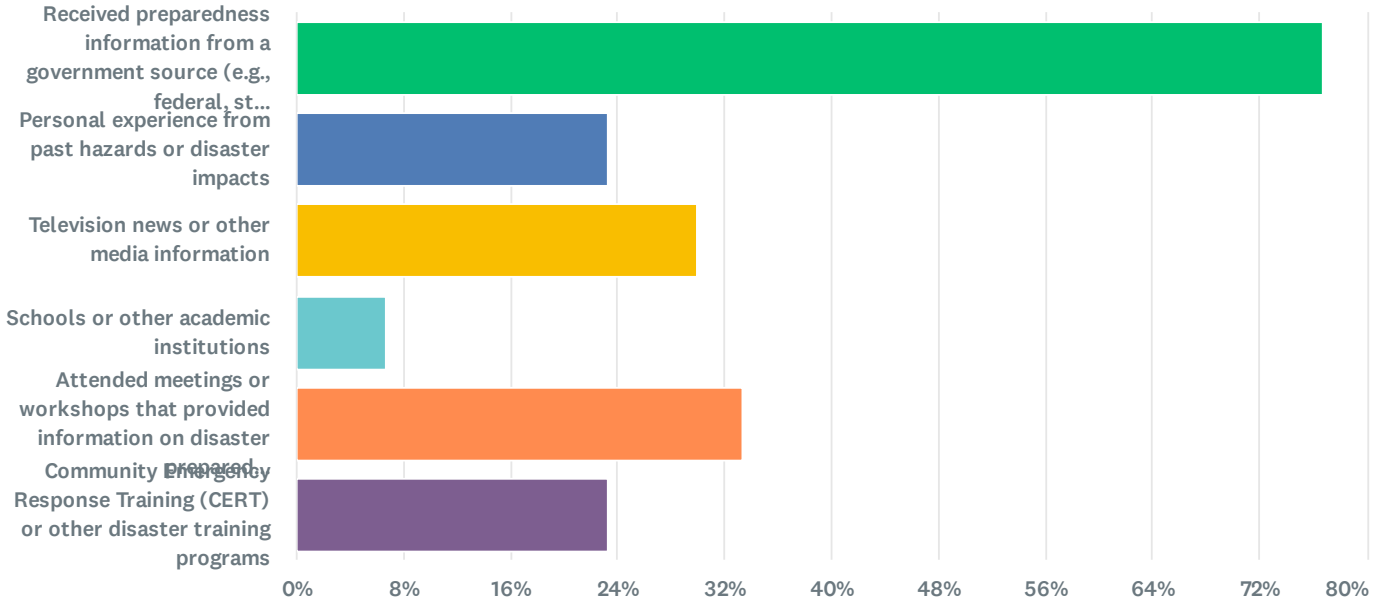
Basic statistics				
Minimum	**Maximum**	**Median**	**Mean**	**Standard Deviation**
1.00	3.00	2.00	1.82	0.57

#		DATE
1	2	6/30/2026 11:40 AM
2	1	5/4/2026 9:44 AM
3	2	4/18/2026 3:10 PM
4	2	3/26/2026 12:52 PM
5	2	3/16/2026 3:26 PM
6	3	3/12/2026 7:56 AM
7	2	3/10/2026 11:13 AM
8	1	3/7/2026 3:18 PM
9	2	3/7/2026 12:05 PM
10	1	3/7/2026 9:59 AM
11	3	3/6/2026 8:01 PM
12	3	3/6/2026 6:38 PM
13	2	3/6/2026 2:29 PM
14	2	3/6/2026 11:47 AM
15	2	3/6/2026 9:57 AM
16	2	3/6/2026 9:32 AM
17	2	3/6/2026 9:18 AM
18	1	3/6/2026 8:07 AM

19	2	3/5/2026 10:55 PM
20	2	3/5/2026 9:53 PM
21	1	3/5/2026 8:51 PM
22	2	3/5/2026 5:44 PM
23	1	3/5/2026 5:03 PM
24	1	3/5/2026 3:53 PM
25	2	3/5/2026 2:42 PM
26	2	3/5/2026 1:22 PM
27	2	3/5/2026 1:16 PM
28	2	3/5/2026 1:07 PM
29	2	3/5/2026 1:00 PM
30	1	3/5/2026 12:31 PM
31	1	3/5/2026 12:01 PM
32	2	3/5/2026 11:45 AM
33	2	3/5/2026 11:36 AM

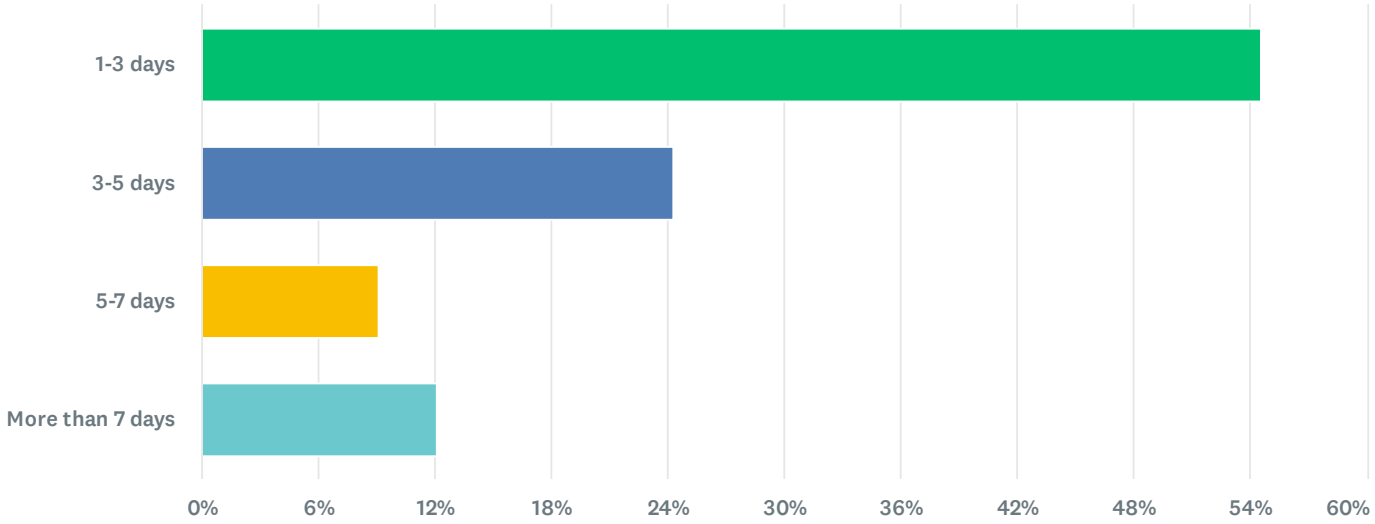
Q6 30 responses

What resources have helped your household to be better prepared for emergencies and disasters? (check all that apply)



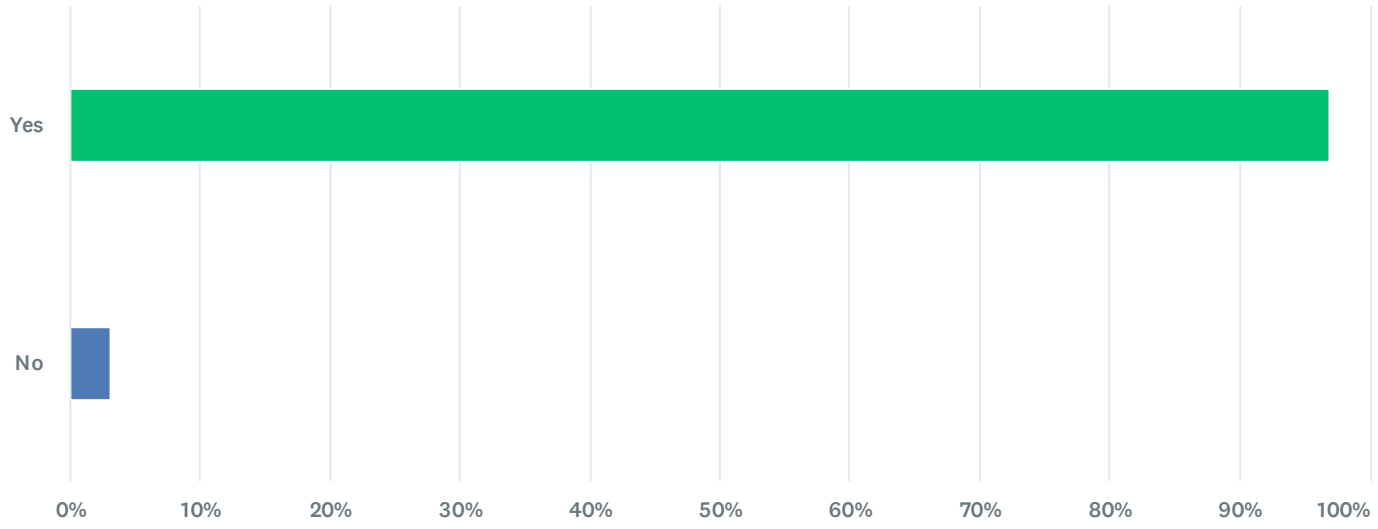
Q7 33 responses

If water service was temporarily disrupted, how long could you continue without drinking water?



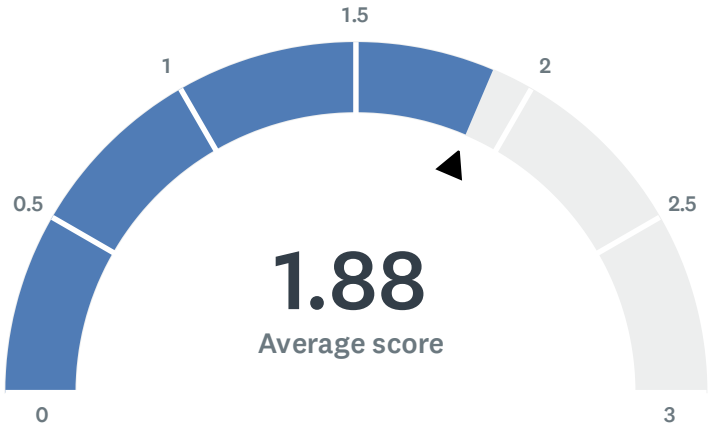
Q8 33 responses

Is Marin Water your water service provider?



Q9 26 responses

How prepared do you think Marin Water is to provide you with water service following a disaster?



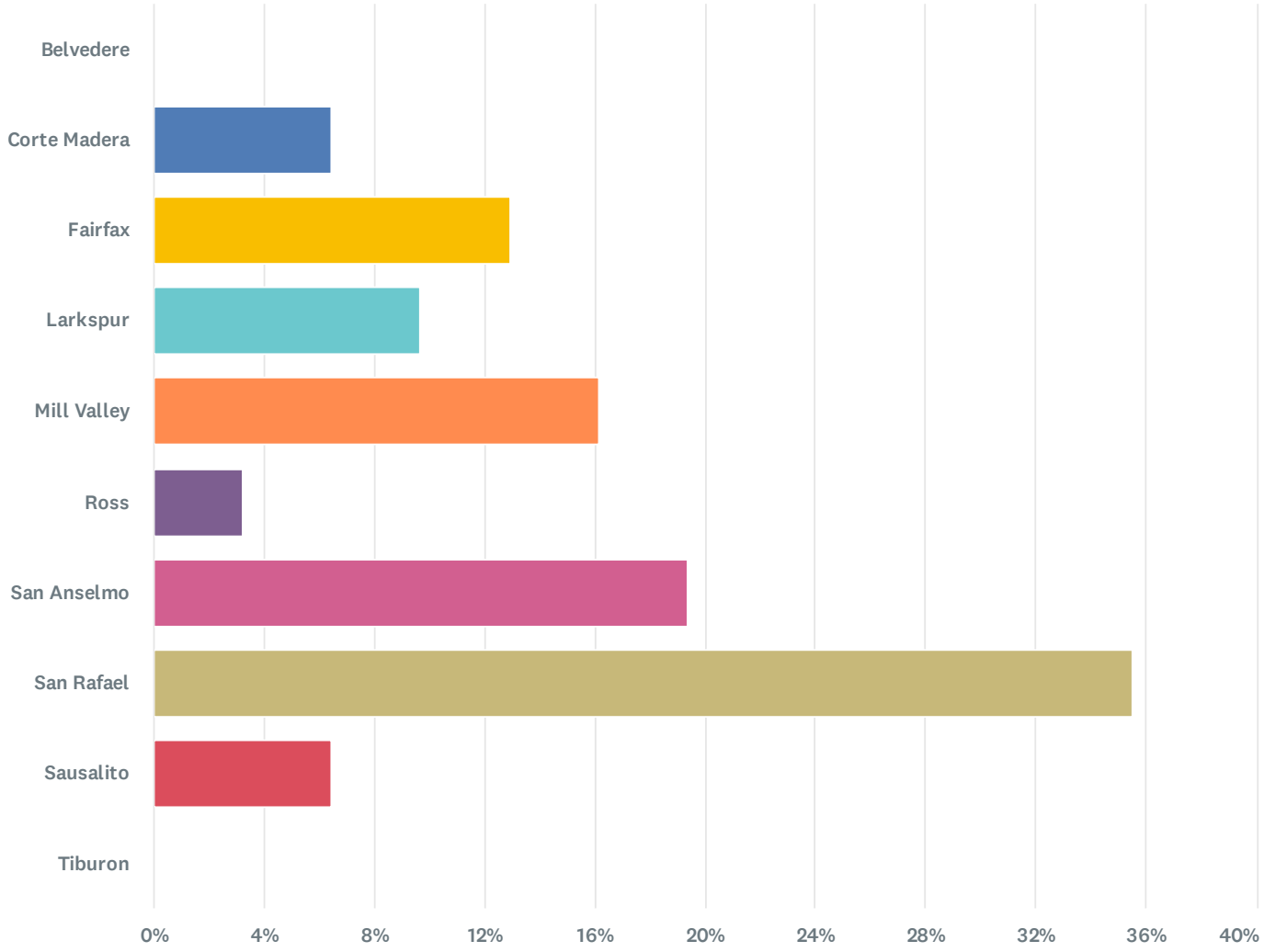
Basic statistics				
Minimum	**Maximum**	**Median**	**Mean**	**Standard Deviation**
1.00	3.00	2.00	1.88	0.42

#		DATE
1	2	4/18/2026 3:10 PM
2	2	3/26/2026 12:52 PM
3	1	3/12/2026 7:56 AM
4	2	3/10/2026 11:13 AM
5	2	3/7/2026 3:18 PM
6	2	3/7/2026 12:05 PM
7	1	3/7/2026 9:59 AM
8	1	3/6/2026 8:01 PM
9	2	3/6/2026 6:38 PM
10	2	3/6/2026 2:29 PM
11	2	3/6/2026 11:47 AM
12	2	3/6/2026 9:57 AM
13	2	3/6/2026 9:32 AM
14	2	3/6/2026 8:07 AM
15	2	3/5/2026 10:55 PM
16	1	3/5/2026 9:53 PM
17	2	3/5/2026 8:51 PM
18	2	3/5/2026 3:53 PM

19	2	3/5/2026 2:42 PM
20	3	3/5/2026 1:22 PM
21	2	3/5/2026 1:16 PM
22	2	3/5/2026 1:07 PM
23	2	3/5/2026 1:00 PM
24	2	3/5/2026 12:31 PM
25	2	3/5/2026 11:45 AM
26	2	3/5/2026 11:36 AM

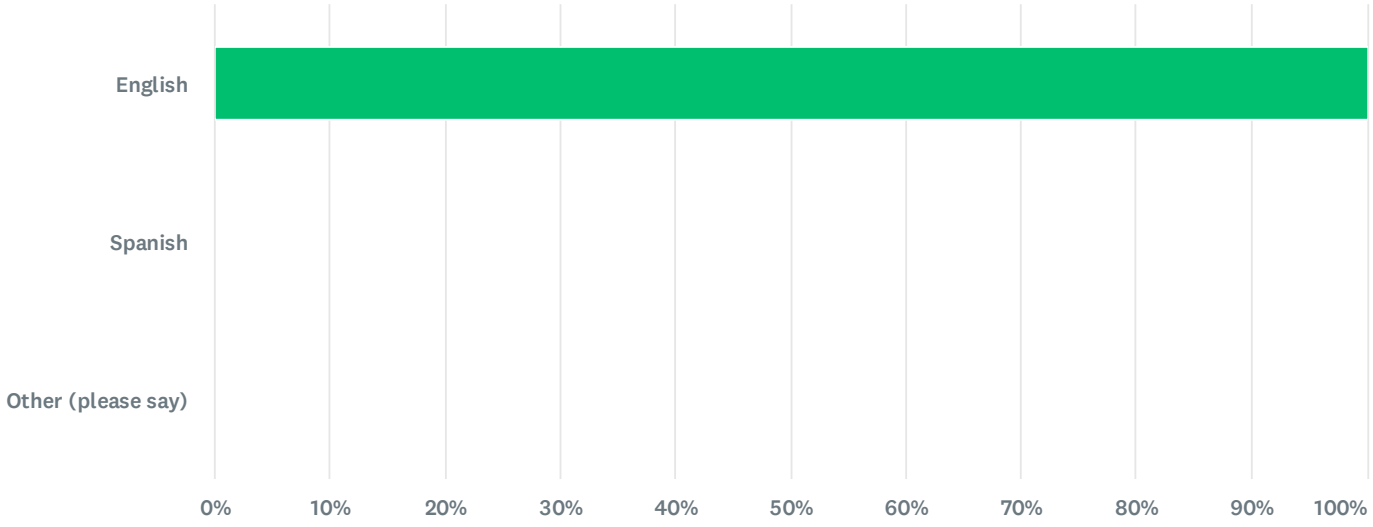
Q10 31 responses

What is the community where you live or work? (select all that apply)



Q11 31 responses

What is the main language spoken or written in your home?



Answer Choices	Percentage	Responses
English	100.00%	31
Spanish	0%	0
Other (please say)	0%	0
Total		**31**

#	OTHER (PLEASE SAY)	DATE
	There are no responses.	

B. Meeting Documentation

The following table provides documentation of Steering Committee meeting attendance. Some members who were invited to participate on the Steering Committee could not attend meetings but were provided with opportunities for input and decision-making via email. Meeting agenda items are listed in Table 2-2. Plan Development Chronology/Milestones.

Name	Title	Department or Agency	02/25 2026	04/01 2026	07/08 2026	09/02 2026
Elysha Irish (Chair)	Engineering Planning Manager	Marin Water	■	■	■	■
Emma Ressler (Vice Chair)	Associate Engineer	Marin Water	■	■	■	■
Adriane Mertens	Communications and Public Affairs Manager	Marin Water	■			
Tyler Silvy	Communications Specialist	Marin Water	■		■	
Ross Barlow	Superintendent of Operations	Marin Water				
Berenice Davidson	Assistant Director	Marin County Public Works				
Haley Eligio	Principal Grant and Legislative Analyst	Marin Water	■	■	■	
Kent Gylfe	Director of Engineering	Sonoma County Water Agency	■	■	■	■
Shaun Horne	Director of Watershed Resources	Marin Water		■		
Mike Marcucci	Fire Chief	Marin County Fire Department				
Brett Pedisich	Safety and Emergency Response Manager	Marin Water	■	■	■	■
Hannah Tarling	Emergency Management Coordinator	Marin County Office of Emergency Management	■	■	■	■
Steven Torrence	Director of Emergency Management	Marin County Office of Emergency Management		■		

C. Hazard Selection

The following table provides a comparison of hazards included in the 2023 California State Hazard Mitigation Plan, the prior hazard mitigation plan for Marin Water and this update.

2023 California State Hazard Mitigation Plan	2022 Marin Municipal Water District Hazard Mitigation Plan	2027 Marin Municipal Water District Hazard Mitigation Plan	Comment
Air Pollution	Not included	Not included	May be addressed in local municipal plans; not a priority to address by the District
Civil Disorder	Not included	Not included	May be addressed in local municipal plans; not a priority to address by the District
Cyber Threats	Not included	Cyber-Attach	This local hazard aligns with the SHMP
Dam Failure	Dam Failure	Dam Failure	This local hazard aligns with the SHMP
Drought	Drought	Drought	This local hazard aligns with the SHMP
Earthquake	Earthquakes	Earthquake	This local hazard aligns with the SHMP
Electromagnetic Pulse Attack	Not included	Not included	May be addressed in local municipal plans; not a priority to address by the District
Energy Shortage	Not included	Not included	May be addressed in local municipal plans; not a priority to address by the District
Epidemic/Pandemic/Vector-Borne Disease	Public Health Emergency	Public Health Emergency	May be addressed in local municipal plans; not a priority to address by the District
Extreme Cold or Freeze	Not included	Not included	May be addressed in local municipal plans; not a priority to address by the District
Extreme Heat	Severe Weather	Extreme Temperature	This local hazard aligns with the SHMP
Geomagnetic Storm	Not included	Not included	May be addressed in local municipal plans; not a priority to address by the District
Hazardous Materials Release	Hazardous Materials	Hazardous Materials	This local hazard aligns with the SHMP

2023 California State Hazard Mitigation Plan	2022 Marin Municipal Water District Hazard Mitigation Plan	2027 Marin Municipal Water District Hazard Mitigation Plan	Comment
Invasive and Nuisance Species	Not included	Not included	May be addressed in local municipal plans; not a priority to address by the District
Landslide, Debris Flow, and other Mass Movements	Mass Movement	Mass Movement	This local hazard aligns with the SHMP
Levee Failure	Not included	Not included	May be addressed in local municipal plans; not a priority to address by the District
Natural Gas Pipeline Hazards	Not included	Not included	May be addressed in local municipal plans; not a priority to address by the District
Oil Spills	Not included	Not included	May be addressed in local municipal plans; not a priority to address by the District
Other Potential Long-Term Electrical Outrages	Not included	Not included	May be addressed in local municipal plans; not a priority to address by the District
Public Safety Power Shutoff	Not included	Discussed in the High Wind chapter	This local hazard aligns with the SHMP
Radiological Accidents	Not included	Not included	May be addressed in local municipal plans; not a priority to address by the District
Riverine, Stream and Alluvial Flood	Flood	Flood	This local hazard aligns with the SHMP
Sea Level Rise, Coastal Flooding and Erosion	Climate Change	Sea Level Rise	This local hazard aligns with subsections in the SHMP
Severe Wind, Weather, and Storms	Severe Weather	High Wind	This local hazard aligns with subsections in the SHMP
Snow Avalanche	Not included	Not included	Not a concern for the service area
Subsidence	Not included	Not included	Not a concern for the service area
Terrorism	Terrorism	Terrorism	This local hazard aligns with the SHMP
Transportation accidents Resulting in Explosions or Toxic Releases	Not included	Not included	May be addressed in local municipal plans; not a priority to address by the District

2023 California State Hazard Mitigation Plan	2022 Marin Municipal Water District Hazard Mitigation Plan	2027 Marin Municipal Water District Hazard Mitigation Plan	Comment
Tree Mortality	Not included	Not included	May be addressed in local municipal plans; not a priority to address by the District
Tsunami and Seiche	Tsunami	Tsunami	This local hazard aligns with subsections in the SHMP
Urban Structural Fire	Not included	Not included	May be addressed in local municipal plans; not a priority to address by the District
Volcano	Not included	Not included	Not a concern for the service area
Well Stimulation and Hydraulic Fracturing	Not included	Not included	Not a concern for the service area
Wildfire	Wildfire	Wildfire	This local hazard aligns with the SHMP

D. Federal & State Agencies, Programs & Regulations

Existing laws ordinances, plans and programs at the federal and state level can support or impact hazard mitigation actions identified in this plan. Hazard mitigation plans are required to include a review and incorporation, if appropriate, of existing plans, studies, reports and technical information as part of the planning process (44 CFR, Section 201.6(b)(3)). The following federal and state programs have been identified as programs that may interface with the actions identified in this plan. Each program enhances capabilities to implement mitigation actions or has a nexus with a mitigation action in this plan. Information presented in this section can be used to review local capabilities to implement mitigation actions. A review of local plans, studies, reports and technical information is provided in Chapter 4 of the hazard mitigation plan.

FEDERAL

America's Water Infrastructure Act

AWIA improves drinking water and water quality, deepens infrastructure investments, enhances public health and quality of life, increases jobs and bolsters the economy. The AWIA provisions are the most far-reaching changes to the Safe Drinking Water Act since the 1996 Amendments, with over 30 mandated programs.

Included in this act is the requirement that community (drinking) water systems serving more than 3,300 people to develop or update risk assessments and emergency response plans (ERPs). The law specifies the components that the risk assessments and ERPs must address and establishes deadlines by which water systems must certify to the U.S. Environmental Protection Agency completion of the risk assessment and ERP.

Americans with Disabilities Act

The Americans with Disabilities Act (ADA) seeks to prevent discrimination against people with disabilities in employment, transportation, public accommodation, communications and government activities. Title II of the ADA deals with compliance with the Act in emergency management and disaster-related programs, services and activities. It applies to state and local governments as well as third parties, including religious entities and private nonprofit organizations.

The ADA has implications for sheltering requirements and public notifications. During an emergency alert, officials must use a combination of warning methods to ensure that all residents have all necessary information. Those with hearing impairments may not hear radio, television, sirens or other audible alerts, while those with visual impairments may not see flashing lights or other visual alerts. Two technical documents for shelter operators address physical accessibility needs of people with disabilities, as well as medical needs and service animals.

The ADA intersects with disaster preparedness programs in regards to transportation, social services, temporary housing and rebuilding. Persons with disabilities may require additional assistance in evacuation and transit (e.g., vehicles with wheelchair lifts or paratransit buses). Evacuation and other response plans should address the unique needs of residents. Local governments may be interested in implementing a special-needs registry to identify the home addresses, contact information and needs for residents who may require more assistance.

FEMA hazard mitigation project grant applications require full compliance with applicable federal acts. Any action identified in this plan that falls within the scope of this act will need to meet its requirements.

Civil Rights Act of 1964

The Civil Rights Act of 1964 prohibits discrimination based on race, color, religion, sex or national origin and requires equal access to public places and employment. The Act is relevant to emergency management and hazard mitigation in that it prohibits local governments from favoring the needs of one population group over another. Local government and emergency response must ensure the continued safety and well-being of all residents equally, to the extent possible. FEMA hazard mitigation project grant applications require full compliance with applicable federal acts. Any action identified in this plan that falls within the scope of this act will need to meet its requirements.

Clean Water Act

The federal Clean Water Act (CWA) employs regulatory and non-regulatory tools to reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities and manage polluted runoff. These tools are employed to achieve the broader goal of restoring and maintaining the chemical, physical and biological integrity of the nation's surface waters so that they can support "the protection and propagation of fish, shellfish and wildlife and recreation in and on the water."

Evolution of CWA programs over the last decade has included a shift from a program-by-program, source-by-source and pollutant-by-pollutant approach to more holistic watershed-based strategies. Under the watershed approach, equal emphasis is placed on protecting healthy waters and restoring impaired ones. Numerous issues are addressed, not just those subject to CWA regulatory authority. Involvement of stakeholder groups in the development and implementation of strategies for achieving and maintaining water quality and other environmental goals is a hallmark of this approach.

The CWA is important to hazard mitigation in several ways. There are often permitting requirements for any construction within 200 feet of water of the United States, which may have implications for mitigation projects identified by a local jurisdiction. Additionally, CWA requirements apply to wetlands, which serve important functions related to preserving and protecting the natural and beneficial functions of floodplains and are linked with a community's floodplain management program. Finally, the National Pollutant Discharge Elimination System is part of the CWA and addresses local stormwater management programs. Stormwater management plays a critical role in hazard mitigation by addressing urban drainage or localized flooding issues within jurisdictions.

FEMA hazard mitigation project grant applications require full compliance with applicable federal acts. Any action identified in this plan that falls within the scope of this act will need to meet its requirements.

Community Development Block Grant Disaster Resilience Program

In response to disasters, Congress may appropriate additional funding for the U.S. Department of Housing and Urban Development Community Development Block Grant programs to be distributed as Disaster Recovery grants (CDBG-DR). These grants can be used to rebuild affected areas and provide seed money to start the recovery process. CDBG-DR assistance may fund a broad range of recovery activities, helping communities and neighborhoods that otherwise might not recover due to limited resources. CDBG-DR grants often supplement disaster programs of FEMA, the Small Business Administration and the U.S. Army Corps of Engineers. Housing and Urban Development generally awards noncompetitive, nonrecurring CDBG-DR grants by a formula that considers disaster recovery needs unmet by other federal disaster assistance programs. To be eligible for CDBG-DR funds, projects must meet the following criteria:

- Address a disaster-related impact (direct or indirect) in a presidentially declared county for the covered disaster
- Be a CDBG-eligible activity (according to regulations and waivers)

- Meet a national objective

Incorporating preparedness and mitigation into these actions is encouraged, as the goal is to rebuild in ways that are safer and stronger. CDBG-DR funding is a potential alternative source of funding for actions identified in this plan.

Disaster Mitigation Act

The DMA is the current federal legislation addressing hazard mitigation planning. It emphasizes planning for disasters before they occur. It specifically addresses planning at the local level, requiring plans to be in place before Hazard Mitigation Assistance grant funds are available to communities. This plan is designed to meet the requirements of DMA, improving eligibility for future hazard mitigation funds.

Endangered Species Act

The federal Endangered Species Act (ESA) was enacted in 1973 to conserve species facing depletion or extinction and the ecosystems that support them. The act sets forth a process for determining which species are threatened and endangered and requires the conservation of the critical habitat in which those species live. The ESA provides broad protection for species of fish, wildlife and plants that are listed as threatened or endangered. Provisions are made for listing species, as well as for recovery plans and the designation of critical habitat for listed species. The ESA outlines procedures for federal agencies to follow when taking actions that may jeopardize listed species and contains exceptions and exemptions. It is the enabling legislation for the Convention on International Trade in Endangered Species of Wild Fauna and Flora. Criminal and civil penalties are provided for violations of the ESA and the Convention.

Federal agencies must seek to conserve endangered and threatened species and use their authorities in furtherance of the ESA's purposes. The ESA defines three fundamental terms:

- Endangered means that a species of fish, animal or plant is "in danger of extinction throughout all or a significant portion of its range." (For salmon and other vertebrate species, this may include subspecies and distinct population segments.)
- Threatened means that a species "is likely to become endangered within the foreseeable future." Regulations may be less restrictive for threatened species than for endangered species.
- Critical habitat means "specific geographical areas that are…essential for the conservation and management of a listed species, whether occupied by the species or not."

Five sections of the ESA are of critical importance to understanding it:

- Section 4: Listing of a Species—The National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries) is responsible for listing marine species; the U.S. Fish and Wildlife Service is responsible for listing terrestrial and freshwater aquatic species. The agencies may initiate reviews for listings or citizens may petition for them. A listing must be made "solely on the basis of the best scientific and commercial data available." After a listing has been proposed, agencies receive comment and conduct further scientific reviews for 12 to 18 months, after which they must decide if the listing is warranted. Economic impacts cannot be considered in this decision, but it may include an evaluation of the adequacy of local and state protections. Critical habitat for the species may be designated at the time of listing.
- Section 7: Consultation—Federal agencies must ensure that any action they authorize, fund or carry out is not likely to jeopardize the continued existence of a listed or proposed species or adversely modify its critical habitat. This includes private and public actions that require a federal permit. Once a final listing is made, non-federal actions are subject to the same review, termed a "consultation." If the listing agency finds that an

action will "take" a species, it must propose mitigations or "reasonable and prudent" alternatives to the action; if the proponent rejects these, the action cannot proceed.

- Section 9: Prohibition of Take—It is unlawful to "take" an endangered species, including killing or injuring it or modifying its habitat in a way that interferes with essential behavioral patterns, including breeding, feeding or sheltering.
- Section 10: Permitted Take—Through voluntary agreements with the federal government that provide protections to an endangered species, a non-federal applicant may commit a take that would otherwise be prohibited as long as it is incidental to an otherwise lawful activity (such as developing land or building a road). These agreements often take the form of a "Habitat Conservation Plan."
- Section 11: Citizen Lawsuits—Civil actions initiated by any citizen can require the listing agency to enforce the ESA's prohibition of taking or to meet the requirements of the consultation process.

FEMA hazard mitigation project grant applications require full compliance with applicable federal acts. Any action identified in this plan that falls within the scope of this act will need to meet its requirements.

Federal Energy Regulatory Commission Dam Safety Program

The Federal Energy Regulatory Commission (FERC) cooperates with a large number of federal and state agencies to ensure and promote dam safety. More than 3,000 dams are part of regulated hydroelectric projects in the FERC program. Two-thirds of these are more than 50 years old. As dams age, concern about their safety and integrity grows, so oversight and regular inspection are important. FERC inspects hydroelectric projects on an unscheduled basis to investigate the following:

- Potential dam safety problems
- Complaints about constructing and operating a project
- Safety concerns related to natural disasters
- Issues concerning compliance with the terms and conditions of a license.

Every five years, an independent engineer approved by the FERC must inspect and evaluate projects with dams higher than 32.8 feet (10 meters) or with a total storage capacity of more than 2,000 acre-feet.

FERC monitors seismic research and applies it in performing structural analyses of hydroelectric projects. FERC also evaluates the effects of potential and actual large floods on the safety of dams. During and following floods, FERC visits dams and licensed projects, determines the extent of damage, if any and directs any necessary studies or remedial measures the licensee must undertake. The FERC publication Engineering Guidelines for the Evaluation of Hydropower Projects guides the FERC engineering staff and licensees in evaluating dam safety. The publication is frequently revised to reflect current information and methodologies.

FERC requires licensees to prepare emergency action plans and conducts training sessions on how to develop and test these plans. The plans outline an early warning system if there is an actual or potential sudden release of water from a dam due to failure. The plans include operational procedures that may be used, such as reducing reservoir levels and reducing downstream flows, as well as procedures for notifying affected residents and agencies responsible for emergency management. These plans are frequently updated and tested to ensure that everyone knows what to do in emergency situations.

Federal Wildfire Management Policy and Healthy Forests Restoration Act

Federal Wildfire Management Policy and Healthy Forests Restoration Act (2003). These documents call for a single comprehensive federal fire policy for the Interior and Agriculture Departments (the agencies using federal fire management resources). They mandate community-based collaboration to reduce risks from wildfire.

National Dam Safety Act

Potential for catastrophic flooding due to dam failures led to passage of the National Dam Inspection Act in 1972, creation of the National Dam Safety Program in 1996 and reauthorization of the program through the Dam Safety Act in 2006. National Dam Safety Program, administered by FEMA requires a periodic engineering analysis of the majority of dams in the country; exceptions include the following:

- Dams under jurisdiction of the Bureau of Reclamation, Tennessee Valley Authority or International Boundary and Water Commission
- Dams constructed pursuant to licenses issued under the Federal Power Act
- Dams that the Secretary of the Army determines do not pose any threat to human life or property.

The goal of this FEMA-monitored effort is to identify and mitigate the risk of dam failure so as to protect lives and property of the public. The National Dam Safety Program is a partnership among the states, federal agencies and other stakeholders that encourages individual and community responsibility for dam safety. Under FEMA's leadership, state assistance funds have allowed all participating states to improve their programs through increased inspections, emergency action planning and purchases of needed equipment. FEMA has also expanded existing and initiated new training programs. Grant assistance from FEMA provides support for improvement of dam safety programs that regulate most of the dams in the United States.

National Environmental Policy Act

The National Environmental Policy Act requires federal agencies to consider the environmental impacts of proposed actions and reasonable alternatives to those actions, alongside technical and economic considerations. The National Environmental Policy Act established the Council on Environmental Quality, whose regulations (40 CFR Parts 1500-1508) set standards for compliance. Consideration and decision-making regarding environmental impacts must be documented in an environmental impact statement or environmental assessment. Environmental impact assessment requires the evaluation of reasonable alternatives to a proposed action, solicitation of input from organizations and individuals that could be affected and an unbiased presentation of direct, indirect and cumulative environmental impacts. FEMA hazard mitigation project grant applications require full compliance with applicable federal acts. Any action identified in this plan that falls within the scope of this act will need to meet its requirements.

National Fire Plan (2023)

The 2001 National Fire Plan was developed based on the National Fire Policy and significantly updated in 2023 to promote landscape-level risk management, cross-boundary jurisdiction sharing, and climate-adaptive ecosystems. A major aspect of the National Fire Plan is joint risk reduction planning and implementation carried out by federal, state and local agencies and communities.

National Flood Insurance Program

The National Flood Insurance Program (NFIP) makes federally backed flood insurance available to homeowners, renters and business owners in participating communities that enact floodplain regulations. Participation and good standing under NFIP are prerequisites to grant funding eligibility under the Robert T. Stafford Act.

For most participating communities, FEMA has prepared a detailed Flood Insurance Study. The study presents water surface elevations for floods of various magnitudes, including the 1%-annual-chance flood and the 0.2%-annual-chance flood. Base flood elevations and the boundaries of the flood hazard areas are shown on Flood Insurance Rate Maps, which are the principal tool for identifying the extent and location of the flood hazard. Flood Insurance Rate Maps are the most detailed and consistent data source available and for many communities they

represent the minimum area of oversight under the local floodplain management program. In recent years, Flood Insurance Rate Maps have been digitized as Digital Flood Insurance Rate Maps, which are more accessible to residents, local governments and stakeholders.

NFIP participants must, at a minimum, regulate development in floodplain areas in accordance with NFIP criteria. Before issuing a permit to build in a floodplain, participating jurisdictions must ensure that three criteria are met:

- New buildings and those undergoing substantial improvements must, at a minimum, be elevated to protect against damage by the 1%-annual-chance flood.
- New floodplain development must not aggravate existing flood problems or increase damage to other properties.
- New floodplain development must exercise a reasonable and prudent effort to reduce its adverse impacts on threatened salmonid species.

Marin Water does not participate in the NFIP. NFIP participation is limited to local governments that possess permit authority and have the ability to adopt and enforce regulations that govern land use. This does not typically apply to special purpose districts.

National Incident Management System

The National Incident Management System (NIMS) is a systematic approach for government, non-governmental organizations and the private sector to work together to manage incidents involving hazards. The NIMS provides a flexible but standardized set of incident management practices. Incidents typically begin and end locally and they are managed at the lowest possible geographical organizational and jurisdictional level. In some cases, success depends on the involvement of multiple jurisdictions, levels of government, functional agencies and emergency responder disciplines. These cases necessitate coordination across a spectrum of organizations. Communities using NIMS follow a comprehensive national approach that improves the effectiveness of emergency management and response personnel across the full spectrum of potential hazards (including natural hazards, technological hazards and human-caused hazards) regardless of size or complexity.

Although participation is voluntary, federal departments and agencies are required to make adoption of NIMS by local and state jurisdictions a condition to receive federal preparedness grants and awards. The content of this plan is considered to be a viable support tool for any phase of emergency management. The NIMS program is considered as a response function and information in this hazard mitigation plan can support the implementation and update of all NIMS-compliant plans within the planning area.

Presidential Executive Order 11988, Floodplain Management

Executive Order 11988 requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. It requires federal agencies to provide leadership and take action to reduce the risk of flood loss, minimize the impact of floods on human safety, health and welfare and restore and preserve the natural and beneficial values of floodplains. The requirements apply to the following activities:

- Acquiring, managing and disposing of federal lands and facilities
- Providing federally undertaken, financed or assisted construction and improvements
- Conducting federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulation and licensing

Presidential Executive Order 11990, Protection of Wetlands

Executive Order 11990 requires federal agencies to provide leadership and take action to minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. The requirements apply to the following activities (National Archives 2016):

- Acquiring, managing and disposing of federal lands and facilities
- Providing federally undertaken, financed or assisted construction and improvements
- Conducting federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulation and licensing.

All actions identified in this plan will seek full compliance with all applicable presidential executive orders.

U.S. Army Corps of Engineers Dam Safety Program

The U.S. Army Corps of Engineers operates and maintains approximately 700 dams nationwide. It is also responsible for safety inspections of some federal and non-federal dams in the United States that meet the size and storage limitations specified in the National Dam Safety Act. The Corps has inventoried dams; surveyed each state and federal agency's capabilities, practices and regulations regarding design, construction, operation and maintenance of the dams; and developed guidelines for inspection and evaluation of dam safety. The Corps maintains the National Inventory of Dams, which contains information about a dam's location, size, purpose, type, last inspection and regulatory status (U.S. Army Corps of Engineers 2017).

U.S. Army Corps of Engineers Flood Hazard Management

The following U.S. Army Corps of Engineers authorities and programs related to flood hazard management:

- The Floodplain Management Services program offers 100% federally funded technical services such as development and interpretation of site-specific data related to the extent, duration and frequency of flooding. Special studies may be conducted to help a community understand and respond to flood risk. These may include flood hazard evaluation, flood warning and preparedness or flood modeling.
- For more extensive studies, the Corps of Engineers offers a cost-shared program called Planning Assistance to States and Tribes. Studies under this program generally range from $25,000 to $100,000 with the local jurisdiction providing 50% of the cost.
- The Corps of Engineers has several cost-shared programs (typically 65% federal and 35% non-federal) aimed at developing, evaluating and implementing structural and non-structural capital projects to address flood risks at specific locations or within a specific watershed:
    - The Continuing Authorities Program for smaller-scale projects includes Section 205 for Flood Control, with a $7 million federal limit and Section 14 for Emergency Streambank Protection with a $1.5 million federal limit. These can be implemented without specific authorization from Congress.
    - Larger scale studies, referred to as General Investigations and projects for flood risk management, for ecosystem restoration or to address other water resource issues, can be pursued through a specific authorization from Congress and are cost-shared, typically at 65% federal and 35% non-federal.
    - Watershed management planning studies can be specifically authorized and are cost-shared at 50% federal and 50% non-federal.
- The Corps of Engineers provides emergency response assistance during and following natural disasters. Public Law 84-99 enables the Corps to assist state and local authorities in flood fight activities and cost share in the repair of flood protective structures. Assistance is provided in the following categories:
- Preparedness—The Flood Control and Coastal Emergency Act establishes an emergency fund for preparedness for emergency response to natural disasters; for flood fighting and rescue operations; for rehabilitation of flood control and hurricane protection structures. Funding for Corps of Engineers emergency response under

this authority is provided by Congress through the annual Energy and Water Development Appropriation Act. Disaster preparedness activities include coordination, planning, training and conduct of response exercises with local, state and federal agencies.

- Response Activities—Public Law 84-99 allows the Corps of Engineers to supplement state and local entities in flood fighting urban and other non-agricultural areas under certain conditions (Engineering Regulation 500-1-1 provides specific details). All flood fight efforts require a project cooperation agreement signed by the public sponsor and the sponsor must remove all flood fight material after the flood has receded. Public Law 84-99 also authorizes emergency water support and drought assistance in certain situations and allows for "advance measures" assistance to prevent or reduce flood damage conditions of imminent threat of unusual flooding.
- Rehabilitation—Under Public Law 84-99, an eligible flood protection system can be rehabilitated if damaged by a flood event. The flood system would be restored to its pre-disaster status at no cost to the federal system owner and at 20% cost to the eligible non-federal system owner. All systems considered eligible for Public Law 84-99 rehabilitation assistance have to be in the Rehabilitation and Inspection Program prior to the flood event. Acceptable operation and maintenance by the public levee sponsor are verified by levee inspections conducted by the Corps on a regular basis. The Corps has the responsibility to coordinate levee repair issues with interested federal, state and local agencies following natural disaster events where flood control works are damaged.

These authorities and programs are all available to support any related hazard mitigation actions.

U.S. Fire Administration

There are federal agencies that provide technical support to fire agencies/organizations. For example, the U.S. Fire Administration, which is a part of FEMA, provides leadership, advocacy, coordination and support for fire agencies and organizations.

U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service fire management strategy uses prescribed fire to maintain early successional fire-adapted grasslands and other ecological communities throughout the National Wildlife Refuge system.

STATE

AB 32: The California Global Warming Solutions Act

While the original law targeted 1990 emission levels by 2020, subsequent updates and laws (such as SB 32 and later scoping plans extending rules through 2045) have built directly upon AB 32's regulatory mechanisms, including the Cap-and-Invest market program.

AB 756: Public Water System PFAS

Existing law, the California Safe Drinking Water Act, requires the State Water Resources Control Board to administer provisions relating to the regulation of drinking water to protect public health, including, but not limited to, conducting research, studies and demonstration programs relating to the provision of a dependable, safe supply of drinking water, enforcing the federal Safe Drinking Water Act, adopting implementing regulations and conducting studies and investigations to assess the quality of water in private domestic water supplies. Under the California Safe Drinking Water Act, the implementing regulations are required to include, but are not limited to,

monitoring of contaminants and requirements for notifying the public of the quality of the water delivered to customers.

This bill authorizes the state Water Resources Control Board to order a public water system to monitor for perfluoroalkyl substances and polyfluoroalkyl substances (PFAS). It requires a community water system or a non-transient noncommunity water system, upon a detection of these substances, to report that detection, as specified. The bill requires a community water system or a non-transient noncommunity water system where a detected level of these substances exceeds the response level to take a water source where the detected levels exceed the response level out of use or provide a prescribed public notification.

AB 2242: Urban Water Management Planning Act

The Urban Water Management Planning Act requires every public and private urban water supplier that directly or indirectly provides water for municipal purposes to prepare and adopt an urban water management plan and to update its plan once every 5 years on or before December 31 in years ending in 5 and zero, except as specified. Existing law requires an urban water management plan, among other things, to describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable and provide data for average, single-dry and multiple-dry water years. Existing law requires that an urban water management plan provides an urban water shortage contingency analysis that includes, among other things, an estimate of the minimum water supply available during each of the following 3 water years based on the driest 3-year historic sequence for the agency's water supply.

This bill would require an urban water supplier to include in its urban water management plan an assessment of the reliability of its water service, as specified, to its customers during normal, dry and multiple dry years, including a repeat of the 5 consecutive historic driest years the urban water supplier has experienced.

AB 2800: Climate Change—Infrastructure Planning

This California State Assembly bill passed in 2016 and until July 1, 2020, requires state agencies to take into account the current and future impacts of climate change when planning, designing, building, operating, maintaining and investing in state infrastructure. The bill, by July 1, 2017 and until July 1, 2020, requires an agency to establish a Climate-Safe Infrastructure Working Group to examine how to integrate scientific data concerning projected climate change impacts into state infrastructure engineering.

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act was enacted in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. The Alquist-Priolo Earthquake Fault Zoning Act's main purpose is to prevent construction of buildings used for human occupancy on the surface trace of active faults. Before a new project is permitted, cities and counties require a geologic investigation to demonstrate that proposed buildings will not be constructed on active faults. The act addresses only the hazard of surface fault rupture and is not directed toward other earthquake hazards, such as liquefaction or seismically induced landslides. The law requires the State of California Geologist to establish regulatory zones around the surface traces of active faults and to issue appropriate maps. The maps are distributed to all affected cities, counties and state agencies for their use in planning and controlling new or renewed construction. Local agencies must regulate most development projects within the zones. Projects include all land divisions and most structures for human occupancy. All seismic hazard mitigation actions identified in this plan will seek full compliance with the Alquist-Priolo Earthquake Fault Zoning Act.

California Department of Forestry and Fire Protection

CAL FIRE has responsibility for wildfires in areas that are not under the jurisdiction of the Forest Service or a local fire organization, including lands designated as State Responsibility Areas. CAL FIRE also has fire protection responsibilities by contract and mutual aid agreements. For example, CAL FIRE provides year-round fire protection under Amador Plan agreements with certain local government agencies (Public Resources Code §4144). Through these agreements, CAL FIRE provides local structural and wildfire protection or dispatch services to a community and maintains a staffing level that otherwise would be available only during the fire season. The local entity pays the additional cost of the service.

California Department of Parks and Recreation (State Parks)

State Parks manages portions of the California coastline including coastal wetlands, estuaries, beaches and dune systems. The State Parks Resources Management Division has limited wildfire protection resources available to suppress fires on State Park lands.

California Department of Water Resources

In California, the DWR is the coordinating agency for floodplain management. The DWR works with FEMA and local governments by providing grants and technical assistance, evaluating community floodplain management programs, reviewing local floodplain ordinances, participating in statewide flood hazard mitigation planning and facilitating annual statewide workshops. Compliance is monitored by FEMA regional staff and by the DWR.

California Division of Safety of Dams

California's Division of Safety of Dams (a division of the DWR) monitors the dam safety program at the state level and maintains a working list of dams in the state. When a new dam is proposed, Division engineers and geologists inspect the site and the subsurface. Upon submittal of an application, the Division reviews the plans and specifications prepared by the owner to ensure that the dam is designed to meet minimum requirements and that the design is appropriate for the known geologic conditions. After approval of the application, the Division inspects all aspects of the construction to ensure that the work is done in accordance with the approved plans and specifications. After construction, the Division inspects each dam to ensure that it is performing as intended and is not developing problems. The Division periodically reviews the stability of dams and their major appurtenances in light of improved design approaches and requirements, as well as new findings regarding earthquake hazards and hydrologic estimates in California. Over 1,200 dams are inspected by Division engineers on a yearly schedule to ensure performance and maintenance of dams.

California Environmental Quality Act

The California Environmental Quality Act (CEQA) was passed in 1970, shortly after the federal government enacted the National Environmental Policy Act, to institute a statewide policy of environmental protection. CEQA requires state and local agencies in California to follow a protocol of analysis and public disclosure of the potential environmental impacts of development projects. CEQA makes environmental protection a mandatory part of every California state and local agency's decision-making process.

CEQA establishes a statewide environmental policy and mandates actions all state and local agencies must take to advance the policy. Jurisdictions conduct analysis of the project to determine if there are potentially significant environmental impacts, identify mitigation measures and possible project alternatives by preparing environmental reports for projects that require CEQA review. This environmental review is required before an agency takes

action on any policy, program or project. Any project action identified in this plan will seek full CEQA compliance upon implementation.

California Fire Alliance

The California Fire Alliance (CFA) was established in response to directives from the 2001 National Fire Plan. The CFA pursues four strategies to deal with the National Fire Plan's community assistance initiative:

- Work with communities at risk from wildfires to develop community-based planning leadership and facilitate the development of community fire loss mitigation plans, which transcend jurisdiction and ownership boundaries
- Assist communities in development of fire loss mitigation planning, education and projects to reduce the threat of wildfire losses on public and private lands
- Develop an information and education outreach plan to increase awareness of wildfire protection program opportunities available to communities at risk
- Work collaboratively to develop, modify and maintain a comprehensive list of communities at risk

California Fire Safe Council

In 1993, the statewide Fire Safe Council, consisting of private and public membership, was formed to educate and encourage Californians to plan and prepare for wildfires by reducing the risk of fire to property, communities and natural/structural resources. In 2002, this group created a nonprofit organization and board of directors, called the California Fire Safe Council. The Council works with the California Fire Alliance to facilitate the distribution of National Fire Plan grants for wildfire risk reduction and education (www.grants.firesafecouncil.org). The Council also provides assistance to local Fire Safe Councils through its website (www.firesafecouncil.org), the distribution of educational materials and technical assistance, primarily through regional representatives. More than 130 local Fire Safe Councils have formed in California to plan, coordinate and implement fire prevention activities.

California Fire Service and Rescue Emergency Mutual Aid Plan

The Governor's Office of Emergency Services Fire and Rescue Branch administers the California Fire Service and Rescue Emergency Mutual Aid Plan. The agency provides guidance and procedures for agencies developing emergency operations plans, as well as training and technical support, primarily to overall emergency service organizations and urban search and rescue teams.

California State Hazard Mitigation Plan

Under the DMA, California must adopt a federally approved state multi-hazard mitigation plan to be eligible for certain disaster assistance and mitigation funding. The intent of the State of California Multi-Hazard Mitigation Plan is to reduce or prevent injury and damage from hazards in the state through the following:

- Documenting statewide hazard mitigation planning in California
- Describing strategies and priorities for future mitigation activities
- Facilitating the integration of local and tribal hazard mitigation planning activities into statewide efforts
- Meeting state and federal statutory and regulatory requirements.

The plan is an annex to the State Emergency Plan and it identifies past and present mitigation activities, current policies and programs and mitigation strategies for the future. It also establishes hazard mitigation goals and objectives. The plan will be reviewed and updated annually to reflect changing conditions and new information, especially information on local planning activities.

Under 44 CFR Section 201.6, local hazard mitigation plans must be consistent with their state's hazard mitigation plan. In updating this plan, the Steering Committee reviewed the California State Hazard Mitigation Plan to identify key relevant state plan elements.

California Water Use Efficiency Legislation

Two long-term water-use efficiency/conservation bills signed into law in 2018 (SB 606 and AB 1668) are intended to help the state better prepare for droughts and climate change. One of the biggest components of the bills is the creation of water-use objectives for water agencies (not individual households or businesses). Local water agencies are responsible for calculating their water-use objective and determining whether their systemwide, aggregate water use meets that objective. If necessary, they will also have flexibility in how best to help customers use water more efficiently, such as conservation rebates and educational programs.

Starting in 2027, the State Water Board could issue fines to local water agencies that have not met their water-use objectives. These fines would be levied on agencies, not individuals. The bills also establish new planning and submittal requirements for Agricultural Water Management and Urban Water Management plans. Water agencies must calculate their system-wide, water-use objectives by November 2023 based on the following components:

- Water efficiency standards for indoor water use—This will be based on a provisional standard of 55 gallons of water a day per person served by the water agency
- Outdoor water use—This standard is still being determined, but will account for local climate and irrigable acres
- Commercial, industrial and institutional landscape irrigation
- Water loss (system leaks)
- Unique local circumstances (e.g., livestock water use)
- Credit for recycled water use

Disadvantaged and Low-Income Communities Investments

Senate Bill (SB) 535 directs state and local agencies to make investments that benefit California's disadvantaged communities. It also directs the California Environmental Protection Agency to identify disadvantaged communities for the purposes of these investments based on geographic, socio-economic, public health and environmental hazard criteria. Assembly Bill (AB) 1550 increased the percent of funds for projects located in disadvantaged communities from 10 to 25% and added a focus on investments in low-income communities and households. This program is a potential alternative source of funding for actions identified in this plan.

Governor's Executive Order B-37-16

Governor's Executive Order B-37-16 requires water districts to conduct a "stress test;" that is, examine the projected reliability of all their water supply resources over the next three years and assume that water demand is high and that precipitation levels are low. Results of this analysis could support the identification of projects for this hazard mitigation plan.

Governor's Executive Order S-13-08

Governor's Executive Order S-13-08 enhances the state's management of climate impacts from sea level rise, increased temperatures, shifting precipitation and extreme weather events. There are four key actions in the executive order:

- Initiate California's first statewide climate change adaptation strategy to assess expected climate change impacts, identify where California is most vulnerable and recommend adaptation policies. This effort will improve coordination within state government so that better planning can more effectively address climate impacts on human health, the environment, the state's water supply and the economy.
- Request that the National Academy of Science establish an expert panel to report on sea level rise impacts in California, to inform state planning and development efforts.
- Issue interim guidance to state agencies for how to plan for sea level rise in designated coastal and floodplain areas for new projects.
- Initiate a report on critical infrastructure projects vulnerable to sea level rise.

Office of the State Fire Marshal

The Office of the State Fire Marshal is a division of CAL FIRE that has a wide variety of fire safety and training responsibilities and provides technical support to fire agencies/organizations.

Senate Bill 97: Guidelines for Greenhouse Gas Emissions

Senate Bill 97, enacted in 2007, amends CEQA to clearly establish that greenhouse gas emissions and the effects of greenhouse gas emissions are appropriate subjects for CEQA analysis. It directs the Governor's Office of Planning and Research to develop draft CEQA guidelines for the mitigation of greenhouse gas emissions or their effects by July 1, 2009 and directs the California Natural Resources Agency to certify and adopt the CEQA Guidelines by January 1, 2010.

Standardized Emergency Management System

CCR Title 19 establishes the Standardized Emergency Management System to standardize the response to emergencies involving multiple jurisdictions. The system is intended to be flexible and adaptable to the needs of all emergency responders in California. It requires emergency response agencies to use basic principles and components of emergency management. Local governments must use the system by December 1, 1996, to be eligible for state funding of response-related personnel costs under CCR Title 19 (Sections 2920, 2925 and 2930). The roles and responsibilities of Individual agencies contained in existing laws or the state emergency plan are not superseded by these regulations. This hazard mitigation plan is considered to be a support document for all phases of emergency management, including those associated with the system.

California Senate Bill 1153

The bill is in the enrollment process before presentation to the Governor as of September 8, 2026. The bill clarifies that public water systems are designed to provide safe drinking water rather than function as active wildfire suppression infrastructure, while requiring urban retail water suppliers within high and very high fire hazard severity zones to maintain and update incident-specific wildfire response procedures, ensuring operational coordination with local fire protection agencies and the Governor's Office of Emergency Services without imposing unfeasible infrastructure mandates that compromise drinking water affordability.

E. Detailed Risk Assessment Results

Pipelines						
Type	**Miles of Pipeline Exposed to Hazard**	**Replacement Cost of Pipeline Exposed to**	**Total Miles of Pipeline**	**Total Replacement Cost**	**% Exposed to Hazard**	**% Replacement Cost Exposed to Hazard**
Potable Water - Distribution Main	11.8	$34,359,737	761.0	$2,209,823,037	1.6%	1.6%
Potable Water - Lateral	2.9	$2,332,198	229.4	$181,682,836	1.3%	1.3%
Potable Water - Main	0.0	$0	0.1	$200,899	0.0%	0.0%
Potable Water - Transmission Main	5.6	$23,536,096	92.1	$388,893,185	6.1%	6.1%
Raw Water - Distribution Main	2.1	$6,081,396	4.7	$13,679,943	44.5%	44.5%
Raw Water - Transmission Main	14.1	$59,369,040	25.6	$108,036,492	55.0%	55.0%
Recycled Water - Lateral	0.0	$0	2.1	$1,676,612	0.0%	0.0%
Recycled Water - Main	0.0	$0	24.4	$70,806,587	0.0%	0.0%
Recycled Water - Other	0.0	$0	0.3	$828,973	0.0%	0.0%
Total	**36.5**	**$125,678,466**	**1,139.6**	**$2,975,628,563**	3.2%	4.2%

Facilities						
Type	**Number of Facilities Exposed to Hazard**	**Replacement Cost of Facilities Exposed to Hazard**	**Total Number of Facilities**	**Total Replacement Cost**	**% Exposed to Hazard**	**% Replacement Cost Exposed to Hazard**
Building	0	$0	25	$44,100,000	0.00%	0.00%
Dam	0	$0	7		0.00%	#DIV/0!
Potable Fireline	19	$7,600	1426	$570,400	1.33%	1.33%
Potable Hydrant	88	$660,000	7492	$56,190,000	1.17%	1.17%
Potable Pump Station	1	$5,000,000	90	$495,000,000	1.11%	1.01%
Potable Service Connection	724	$289,600	61796	$24,718,400	1.17%	1.17%
Potable Tank - Clearwell	0	$0	3	$35,000,000	0.00%	0.00%
Potable Tank - Distribution	0	$0	84	$70,738,620	0.00%	0.00%
Potable Tank - Gravity	0	$0	23	$114,950,000	0.00%	0.00%
Potable Tank - Pressure System	0	$0	7	$60,000	0.00%	0.00%
Potable Tank - Reservoir	0	$0	2	$25,000,000	0.00%	0.00%
Potable Tank - Transmission	0	$0	10	$162,500,000	0.00%	0.00%
Potable Treatment Plant	0	$0	2	$200,000,000	0.00%	0.00%
Potable Valve	519	$519,000	28616	$28,616,000	1.81%	1.81%
Raw Pump Station	5	$25,000,000	5	$25,000,000	100.00%	100.00%
Raw Valve	169	$169,000	280	$280,000	60.36%	60.36%
Recycled Fireline	0	$0	1	$400	0.00%	0.00%
Recycled Hydrant	0	$0	14	$105,000	0.00%	0.00%
Recycled Pump Station	0	$0	3	$15,000,000	0.00%	0.00%
Recycled Service Connection	0	$0	413	$165,200	0.00%	0.00%
Recycled Tank - Gravity	0	$0	2	$5,000,000	0.00%	0.00%
Recycled Tank - Reservoir	0	$0	1	$4,500,000	0.00%	0.00%
Recycled Treatment Plant (owned by LGVSD)	0	$0	1		0.00%	#DIV/0!
Recycled Valve	0	$0	357	$357,000	0.00%	0.00%
Total	**1525**	**$31,645,200**	**100660**	**$1,307,851,020**	1.52%	2.42%

Facility Name	**Type**	**Replacement Cost**	**Damage Percent**	**Loss**		
PS-026 - Lagunitas Booster Station	Potable Pump Station	$5,000,000	40.0%	$2,000,000		
PS-028 - Kent Lake Pump Station	Raw Pump Station	$5,000,000	40.0%	$2,000,000		
PS-029 - Phoenix Lake Barge Pump	Raw Pump Station	$5,000,000	40.0%	$2,000,000		
PS-031 - Soulajule Pump Station	Raw Pump Station	$5,000,000	40.0%	$2,000,000		
PS-097 - Tocaloma Booster Pump Station	Raw Pump Station	$5,000,000	40.0%	$2,000,000		
PS-128 - Alpine Bon-Tempe Pump Station	Raw Pump Station	$5,000,000	40.0%	$2,000,000		
			Total	**$12,000,000**		

Pipelines

Type	Miles of Pipeline	Replacement Cost
Potable Water - Distribution Main	761.0	$2,209,823,037
Potable Water - Lateral	229.4	$181,682,836
Potable Water - Main	0.1	$200,899
Potable Water - Transmission Main	92.1	$388,893,185
Raw Water - Distribution Main	4.7	$13,679,943
Raw Water - Transmission Main	25.6	$108,036,492
Recycled Water - Lateral	2.1	$1,676,612
Recycled Water - Main	24.4	$70,806,587
Recycled Water - Other	0.3	$828,973
Total	**1,139.6**	**$2,975,628,563**

Number of Leaks	Number of Leaks	Number of Breaks	Total Number of Repairs	Days to Repair Leaks	Days to Repair Breaks	Total Days to Repair
Potable Water - Distribution Main	37.7	9.4	47.1	5.3	1.3	6.6
Potable Water - Lateral	18.8	4.7	23.5	2.6	0.7	3.3
Potable Water - Main	0.0	0.0	0.0	0.0	0.0	0.0
Potable Water - Transmission Main	3.3	0.8	4.1	0.6	0.1	0.7
Potable Totals	**59.8**	**14.9**	**74.7**	**8.5**	**2.1**	**10.6**
Economic Loss	**$597,774.27**	**$149,443.57**	**$747,217.83**			
Raw Water - Distribution Main	0.1	0.0	0.2	0.0	0.0	0.0
Raw Water - Transmission Main	0.5	0.1	0.6	0.1	0.0	0.2
Raw Totals	**0.6**	**0.2**	**0.8**	**0.2**	**0.0**	**0.2**
Economic Loss	**$6,071.81**	**$1,517.95**	**$7,589.76**			
Recycled Water - Lateral	0.2	0.0	0.2	0.0	0.0	0.0
Recycled Water - Main	0.7	0.2	0.9	0.1	0.0	0.1
Recycled Water - Other	0.0	0.0	0.0	0.0	0.0	0.0
Recycled Totals	**0.8**	**0.2**	**1.1**	**0.1**	**0.0**	**0.1**
Economic Loss	**$8,465.38**	**$2,116.35**	**$10,581.73**			
Total	**603967.7**	**150991.9**	**754959.6**	**17.4**	**4.4**	**21.8**

Cost to Repair a Leak	Cost to Repair a Break	Economic Loss
$10,000	$10,000	$7,549,596,112

Facilities

Facility Name	Type	Replacement Cost	Probability of Damage State								Percent Functionality After						Economic Loss				
			None	Slight	Moderate	Extensive	Complete	Exceed Slight	Exceed Moderate	Exceed Extensive	Day 1	Day 3	Day 7	Day 14	Day 30	Day 90	Structure Loss	Nonstructural Drift-Sensitive Loss	Nonstructural Acceleration-Sensitive Loss	Total	% of Replacement Cost
Administration Building - Headquarter Office	Building	$12,300,000	0.41	0.37	0.20	0.02	0.00	0.59	0.22	0.02	41.0	42.8	77.5	77.6	98.0	99.6	$52,959	$136,721	$169,409	$359,089	2.9%
Corporation Yard - Boat Barn	Building	$1,000,000	0.28	0.18	0.30	0.21	0.02	0.72	0.54	0.23	28.2	29.1	46.1	46.2	76.6	97.9	$33,679	$17,438	$15,591	$66,708	6.7%
Corporation Yard - Facilities Offices	Building	$15,000,000	0.41	0.37	0.20	0.02	0.00	0.59	0.22	0.02	41.0	42.8	77.5	77.6	98.0	99.6	$64,584	$166,733	$206,597	$437,913	2.9%
Corporation Yard - Laboratory	Building	$6,500,000	0.41	0.37	0.20	0.02	0.00	0.59	0.22	0.02	41.0	42.8	77.5	77.6	98.0	99.6	$27,986	$72,251	$89,525	$189,762	2.9%
Corporation Yard - Satellite Office	Building	$500,000	0.29	0.26	0.14	0.25	0.06	0.71	0.46	0.31	28.7	29.9	54.2	54.3	68.6	93.6	$18,785	$33,444	$36,495	$88,723	17.7%
Pelican Yard - Vehicle Storage	Building	$500,000	0.21	0.14	0.23	0.36	0.07	0.79	0.65	0.42	21.1	21.8	34.6	34.6	57.4	93.0	$36,944	$26,369	$28,546	$91,858	18.4%
Pelican Yard - Vehicle Storage	Building	$800,000	0.28	0.18	0.30	0.21	0.02	0.72	0.54	0.23	28.2	29.1	46.1	46.2	76.6	97.9	$26,943	$13,950	$12,473	$53,366	6.7%
Ranger Housing - Alpine Dam - Residence	Building	$500,000	0.81	0.16	0.04	0.00	0.00	0.19	0.04	0.00	80.6	81.3	96.1	96.1	99.7	99.9	$223	$770	$2,154	$3,147	0.6%
Ranger Housing - Lagunitas Dam - Garage	Building	$300,000	0.65	0.14	0.15	0.06	0.00	0.35	0.21	0.06	64.9	65.6	79.3	79.3	94.3	99.8	$1,281	$908	$2,486	$4,675	1.6%
Ranger Housing - Lagunitas Dam - Residence	Building	$500,000	0.80	0.16	0.04	0.00	0.00	0.20	0.04	0.00	79.5	80.3	95.8	95.8	99.6	99.9	$252	$860	$2,352	$3,463	0.7%
Ranger Housing - Phoenix Dam - Log Cabin	Building	$100,000	0.80	0.16	0.04	0.00	0.00	0.20	0.04	0.00	79.5	80.3	95.8	95.8	99.6	99.9	$50	$172	$470	$693	0.7%
Ranger Housing - Phoenix Dam - Residence	Building	$500,000	0.80	0.16	0.04	0.00	0.00	0.20	0.04	0.00	79.5	80.3	95.8	95.8	99.6	99.9	$252	$860	$2,352	$3,463	0.7%
Ranger Housing - Phoenix Dam - Shed	Building	$100,000	0.53	0.12	0.12	0.20	0.04	0.47	0.36	0.24	52.5	53.0	64.1	64.2	76.3	96.0	$4,051	$3,268	$4,129	$11,449	11.4%
Ranger Housing - Porteous House	Building	$600,000	0.80	0.16	0.04	0.00	0.00	0.20	0.04	0.00	79.5	80.3	95.8	95.8	99.6	99.9	$302	$1,032	$2,822	$4,156	0.7%
Ranger Housing - Porteous House - Garage	Building	$300,000	0.65	0.14	0.15	0.06	0.00	0.35	0.21	0.06	64.9	65.6	79.3	79.3	94.3	99.8	$1,281	$908	$2,486	$4,675	1.6%
Ranger Housing - Porteous House - Shed	Building	$100,000	0.53	0.12	0.12	0.20	0.04	0.47	0.36	0.24	52.5	53.0	64.1	64.2	76.3	96.0	$4,051	$3,268	$4,129	$11,449	11.4%
Ranger Housing - Porteous House - Shed	Building	$100,000	0.53	0.12	0.12	0.20	0.04	0.47	0.36	0.24	52.5	53.0	64.1	64.2	76.3	96.0	$4,051	$3,268	$4,129	$11,449	11.4%
Ranger Housing - Sky Oaks - Residence	Building	$1,700,000	0.80	0.16	0.04	0.00	0.00	0.20	0.04	0.00	79.5	80.3	95.8	95.8	99.6	99.9	$857	$2,924	$7,995	$11,776	0.7%
Ranger Housing - Soulajule Residence	Building	$500,000	0.76	0.12	0.03	0.07	0.02	0.24	0.12	0.09	75.7	76.3	88.1	88.1	90.7	98.1	$6,482	$14,060	$6,829	$27,371	5.5%
Sky Oaks Headquarters - Entrance Kiosk	Building	$100,000	0.78	0.18	0.03	0.00	0.00	0.22	0.03	0.00	78.3	79.2	96.6	96.6	99.9	99.9	$43	$120	$662	$825	0.8%
Sky Oaks Headquarters - Fisheries Office (Fish Box)	Building	$300,000	0.78	0.18	0.03	0.00	0.00	0.22	0.03	0.00	78.3	79.2	96.6	96.6	99.9	99.9	$129	$361	$1,985	$2,475	0.8%
Sky Oaks Headquarters - Headquarter Office	Building	$700,000	0.78	0.18	0.03	0.00	0.00	0.22	0.03	0.00	78.3	79.2	96.6	96.6	99.9	99.9	$300	$843	$4,631	$5,774	0.8%
Sky Oaks Headquarters - Natural Resources Office (Sky Box	Building	$700,000	0.78	0.18	0.03	0.00	0.00	0.22	0.03	0.00	78.3	79.2	96.6	96.6	99.9	99.9	$300	$843	$4,631	$5,774	0.8%
Sky Oaks Headquarters - Seed Shed	Building	$200,000	0.65	0.14	0.15	0.06	0.00	0.35	0.21	0.06	64.9	65.6	79.3	79.3	94.3	99.8	$854	$605	$1,657	$3,116	1.6%
Sky Oaks Headquarters - Storage Shed	Building	$200,000	0.65	0.14	0.15	0.06	0.00	0.35	0.21	0.06	64.9	65.6	79.3	79.3	94.3	99.8	$854	$605	$1,657	$3,116	1.6%
Administrative Total/Averages			**61%**	**18%**	**12%**	**8%**	**1%**													**$1,406,265**	
PS-001 - Federal Works Booster Pump Station	Potable Pump Station	$5,000,000	0.63	0.15	0.16	0.06	0.00	0.37	0.22	0.06	76.7	86.6	94.2	96.9	99.6	99.9	$581,255	$0	$0	$581,255	11.6%
PS-002 - Chapman Park Pump Station	Potable Pump Station	$5,000,000	0.58	0.16	0.18	0.08	0.00	0.42	0.26	0.08	72.7	83.9	92.7	96.1	99.4	99.9	$700,920	$0	$0	$700,920	14.0%
PS-003 - Summit Drive Pump Station PS-003	Potable Pump Station	$5,000,000	0.63	0.15	0.16	0.06	0.00	0.37	0.22	0.06	76.7	86.6	94.2	96.9	99.6	99.9	$581,255	$0	$0	$581,255	11.6%
PS-005 - H-Line Booster Station	Potable Pump Station	$5,000,000	0.28	0.16	0.26	0.26	0.04	0.72	0.55	0.29	47.1	61.1	75.5	84.4	96.4	99.9	$1,744,315	$0	$0	$1,744,315	34.9%
PS-006 - Madera Park Pump Station	Potable Pump Station	$5,000,000	0.44	0.12	0.14	0.25	0.05	0.56	0.43	0.29	57.7	67.1	76.1	83.9	95.8	99.9	$1,523,425	$0	$0	$1,523,425	30.5%
PS-007 - Mariner Highlands Pump Station	Potable Pump Station	$5,000,000	0.57	0.16	0.18	0.09	0.00	0.43	0.27	0.09	71.7	82.8	91.6	95.3	99.2	99.9	$754,375	$0	$0	$754,375	15.1%
PS-010 - Cascade Pump Station	Potable Pump Station	$5,000,000	0.64	0.15	0.16	0.06	0.00	0.36	0.22	0.06	76.9	86.8	94.3	97.0	99.6	99.9	$574,580	$0	$0	$574,580	11.5%
PS-011 - Fairfax Manor 1st Pump Station	Potable Pump Station	$5,000,000	0.64	0.15	0.16	0.06	0.00	0.36	0.22	0.06	76.9	86.8	94.3	97.0	99.6	99.9	$574,580	$0	$0	$574,580	11.5%
PS-012 - Fairfax Manor 2nd Lift Pump Station	Potable Pump Station	$5,000,000	0.51	0.12	0.13	0.20	0.04	0.49	0.37	0.24	63.8	72.4	80.3	86.7	96.5	99.9	$1,275,640	$0	$0	$1,275,640	25.5%
PS-013 - Oak Manor 1st Lift Pump Station	Potable Pump Station	$5,000,000	0.64	0.15	0.16	0.06	0.00	0.36	0.22	0.06	76.9	86.8	94.3	97.0	99.6	99.9	$574,580	$0	$0	$574,580	11.5%
PS-014 - Oak Manor 2nd Lift Pump Station	Potable Pump Station	$5,000,000	0.51	0.12	0.13	0.20	0.04	0.49	0.37	0.24	63.8	72.4	80.3	86.7	96.5	99.9	$1,275,640	$0	$0	$1,275,640	25.5%
PS-016 - Scott Pump Station	Potable Pump Station	$5,000,000	0.51	0.12	0.13	0.20	0.04	0.49	0.37	0.24	63.8	72.4	80.3	86.7	96.5	99.9	$1,275,640	$0	$0	$1,275,640	25.5%
PS-017 - Smith Saddle Booster Station	Potable Pump Station	$5,000,000	0.64	0.15	0.16	0.06	0.00	0.36	0.22	0.06	76.9	86.8	94.3	97.0	99.6	99.9	$574,580	$0	$0	$574,580	11.5%
PS-019 - Bret Harte Pump Station	Potable Pump Station	$5,000,000	0.21	0.14	0.23	0.35	0.07	0.79	0.65	0.42	38.6	51.2	65.4	76.8	93.9	99.9	$2,233,270	$0	$0	$2,233,270	44.7%
PS-020 - Greenbrae Pump Station	Potable Pump Station	$5,000,000	0.24	0.14	0.22	0.34	0.06	0.76	0.62	0.40	41.2	53.6	67.2	78.1	94.3	99.9	$2,124,450	$0	$0	$2,124,450	42.5%
PS-022 - Ignacio Boosters	Potable Pump Station	$50,000,000	0.59	0.15	0.17	0.08	0.01	0.41	0.25	0.09	73.5	83.9	92.1	95.5	99.2	99.9	$7,071,550	$0	$0	$7,071,550	14.1%
PS-023 - Kent Fire Trail 1st Pump Station	Potable Pump Station	$5,000,000	0.28	0.16	0.26	0.26	0.04	0.72	0.55	0.29	47.1	61.1	75.5	84.4	96.4	99.9	$1,744,315	$0	$0	$1,744,315	34.9%
PS-025 - Kent Woodlands 2nd Pump Station	Potable Pump Station	$5,000,000	0.32	0.18	0.29	0.19	0.02	0.68	0.50	0.21	51.9	67.2	82.2	89.5	98.1	99.9	$1,437,360	$0	$0	$1,437,360	28.7%
PS-026 - Lagunitas Booster Station	Potable Pump Station	$5,000,000	0.65	0.13	0.13	0.09	0.01	0.35	0.22	0.10	76.7	85.1	91.6	94.9	98.8	99.9	$667,485	$0	$0	$667,485	13.3%
PS-030 - Phoenix Transfer Pump Station	Potable Pump Station	$5,000,000	0.65	0.14	0.15	0.06	0.00	0.35	0.21	0.06	77.8	87.4	94.6	97.2	99.6	99.9	$547,430	$0	$0	$547,430	10.9%
PS-032 - Elinor Avenue Pump Station	Potable Pump Station	$5,000,000	0.63	0.15	0.16	0.06	0.00	0.37	0.22	0.06	76.6	86.5	94.1	96.9	99.6	99.9	$584,815	$0	$0	$584,815	11.7%
PS-033 - Fern Canyon Pump Station	Potable Pump Station	$5,000,000	0.50	0.12	0.12	0.22	0.04	0.50	0.38	0.26	62.3	70.9	78.8	85.7	96.2	99.9	$1,348,485	$0	$0	$1,348,485	27.0%
PS-034 - Lapachet Pump Station	Potable Pump Station	$5,000,000	0.63	0.15	0.16	0.06	0.00	0.37	0.22	0.06	76.6	86.5	94.1	96.9	99.6	99.9	$584,815	$0	$0	$584,815	11.7%
PS-035 - Mine Ridge Pump Station	Potable Pump Station	$5,000,000	0.63	0.15	0.16	0.06	0.00	0.37	0.22	0.06	76.7	86.6	94.2	96.9	99.6	99.9	$581,255	$0	$0	$581,255	11.6%
PS-036 - Scott Highlands Pump (OUT OF SERVICE)	Potable Pump Station	$5,000,000	0.50	0.12	0.12	0.22	0.04	0.50	0.38	0.26	62.3	70.9	78.8	85.7	96.2	99.9	$1,348,485	$0	$0	$1,348,485	27.0%
PS-040 - Summit Avenue Upper Pump Station	Potable Pump Station	$5,000,000	0.63	0.15	0.16	0.06	0.00	0.37	0.22	0.06	76.6	86.5	94.1	96.9	99.6	99.9	$584,815	$0	$0	$584,815	11.7%
PS-041 - Kastania Booster Pump Station	Potable Pump Station	$5,000,000	0.60	0.16	0.17	0.07	0.00	0.40	0.24	0.07	74.3	85.0	93.3	96.5	99.5	99.9	$651,520	$0	$0	$651,520	13.0%
PS-042 - Del Mesa Pump Station	Potable Pump Station	$5,000,000	0.32	0.18	0.29	0.19	0.02	0.68	0.50	0.21	51.9	67.2	82.2	89.5	98.1	99.9	$1,437,360	$0	$0	$1,437,360	28.7%
PS-043 - Fawn Drive Pump Station	Potable Pump Station	$5,000,000	0.48	0.17	0.22	0.13	0.01	0.52	0.35	0.14	64.3	76.9	87.9	92.9	98.7	99.9	$1,014,730	$0	$0	$1,014,730	20.3%
PS-044 - Mann Pump Station	Potable Pump Station	$5,000,000	0.64	0.15	0.16	0.06	0.00	0.36	0.22	0.06	76.9	86.8	94.3	97.0	99.6	99.9	$574,580	$0	$0	$574,580	11.5%
PS-046 - Scenic Avenue Pump Station	Potable Pump Station	$5,000,000	0.64	0.15	0.16	0.06	0.00	0.36	0.22	0.06	76.9	86.8	94.3	97.0	99.6	99.9	$574,580	$0	$0	$574,580	11.5%
PS-047 - Sequoia Park Pump Station	Potable Pump Station	$5,000,000	0.48	0.17	0.22	0.13	0.01	0.52	0.35	0.14	64.3	76.9	87.9	92.9	98.7	99.9	$1,014,730	$0	$0	$1,014,730	20.3%
PS-050 - Chula Vista Pump Station	Potable Pump Station	$5,000,000	0.48	0.17	0.22	0.13	0.01	0.52	0.35	0.14	64.3	76.9	87.9	92.9	98.7	99.9	$1,014,730	$0	$0	$1,014,730	20.3%
PS-052 - Elda Drive Pump Station	Potable Pump Station	$5,000,000	0.37	0.13	0.17	0.27	0.05	0.63	0.49	0.32	52.4	63.0	73.5	82.3	95.4	99.9	$1,703,940	$0	$0	$1,703,940	34.1%
PS-053 - Fairhills 1st Lift Pump Station	Potable Pump Station	$5,000,000	0.48	0.17	0.22	0.13	0.01	0.52	0.35	0.14	64.3	76.9	87.9	92.9	98.7	99.9	$1,014,730	$0	$0	$1,014,730	20.3%
PS-054 - Fairhills 2nd Lift Pump Station	Potable Pump Station	$5,000,000	0.48	0.17	0.22	0.13	0.01	0.52	0.35	0.14	64.3	76.9	87.9	92.9	98.7	99.9	$1,014,730	$0	$0	$1,014,730	20.3%
PS-055 - Grove Hill Pump Station	Potable Pump Station	$5,000,000	0.49	0.18	0.22	0.11	0.00	0.51	0.33	0.11	66.1	79.0	89.9	94.4	99.2	99.9	$914,100	$0	$0	$914,100	18.3%
PS-056 - Rafael Highlands Pump Station	Potable Pump Station	$5,000,000	0.49	0.18	0.22	0.11	0.00	0.51	0.33	0.11	66.1	79.0	89.9	94.4	99.2	99.9	$914,100	$0	$0	$914,100	18.3%

PS-057 - Hind Pump Station	Potable Pump Station	$5,000,000	0.59	0.16	0.17	0.08	0.00	0.41	0.25	0.08	73.4	84.1	92.6	95.9	99.3	99.9	$694,145	$0	$0	$694,145	13.9%
PS-058 - Knight Drive Pump Station	Potable Pump Station	$5,000,000	0.46	0.12	0.13	0.24	0.05	0.54	0.42	0.29	59.0	68.1	76.7	84.3	95.8	99.9	$1,477,295	$0	$0	$1,477,295	29.5%
PS-060 - Lockwood Drive Pump Station	Potable Pump Station	$5,000,000	0.46	0.12	0.13	0.24	0.05	0.54	0.42	0.29	59.0	68.1	76.7	84.3	95.8	99.9	$1,477,295	$0	$0	$1,477,295	29.5%
PS-061 - Lucas Valley Pump Station	Potable Pump Station	$5,000,000	0.48	0.17	0.22	0.13	0.01	0.52	0.35	0.14	64.3	76.9	87.9	92.9	98.7	99.9	$1,014,730	$0	$0	$1,014,730	20.3%
PS-062 - Manderly Pump Station	Potable Pump Station	$5,000,000	0.46	0.12	0.13	0.24	0.05	0.54	0.42	0.29	59.0	68.1	76.7	84.3	95.8	99.9	$1,477,295	$0	$0	$1,477,295	29.5%
PS-064 - Marinwood Pump Station (NOT IS USE)	Potable Pump Station	$5,000,000	0.47	0.12	0.13	0.23	0.04	0.53	0.41	0.27	60.3	69.4	77.8	85.1	96.1	99.9	$1,417,195	$0	$0	$1,417,195	28.3%
PS-065 - McNear Drive Pump Station	Potable Pump Station	$5,000,000	0.46	0.12	0.13	0.24	0.05	0.54	0.42	0.29	59.0	68.1	76.7	84.3	95.8	99.9	$1,477,295	$0	$0	$1,477,295	29.5%
PS-066 - Mesa Vista Pump Station	Potable Pump Station	$5,000,000	0.24	0.14	0.22	0.34	0.06	0.76	0.62	0.40	41.2	53.6	67.2	78.1	94.3	99.9	$2,124,450	$0	$0	$2,124,450	42.5%
PS-069 - San Quentin Pump Station	Potable Pump Station	$5,000,000	0.21	0.14	0.23	0.36	0.07	0.79	0.65	0.42	38.6	51.2	65.3	76.8	93.9	99.9	$2,236,050	$0	$0	$2,236,050	44.7%
PS-070 - Santa Margarita Pump Station	Potable Pump Station	$5,000,000	0.37	0.13	0.17	0.27	0.05	0.63	0.49	0.32	52.4	63.0	73.5	82.3	95.4	99.9	$1,703,940	$0	$0	$1,703,940	34.1%
PS-071 - Sky View Terrace Pump Station	Potable Pump Station	$5,000,000	0.49	0.18	0.22	0.11	0.00	0.51	0.33	0.11	66.1	79.0	89.9	94.4	99.2	99.9	$914,100	$0	$0	$914,100	18.3%
PS-073 - Swig Pump Station	Potable Pump Station	$5,000,000	0.64	0.15	0.16	0.06	0.00	0.36	0.22	0.06	76.9	86.7	94.3	97.0	99.6	99.9	$575,600	$0	$0	$575,600	11.5%
PS-074 - Via Montebello Pump Station	Potable Pump Station	$5,000,000	0.57	0.16	0.19	0.08	0.00	0.43	0.27	0.08	72.1	83.4	92.5	96.0	99.4	99.9	$720,670	$0	$0	$720,670	14.4%
PS-077 - Beacon Hill Pump Station	Potable Pump Station	$5,000,000	0.65	0.14	0.15	0.05	0.00	0.35	0.20	0.06	78.1	87.6	94.7	97.2	99.6	99.9	$539,850	$0	$0	$539,850	10.8%
PS-078 - Crescent Avenue Pump Station	Potable Pump Station	$5,000,000	0.65	0.14	0.15	0.05	0.00	0.35	0.20	0.06	78.1	87.6	94.7	97.2	99.6	99.9	$539,850	$0	$0	$539,850	10.8%
PS-079 - Marin City Pump Station	Potable Pump Station	$5,000,000	0.44	0.12	0.14	0.25	0.05	0.56	0.43	0.29	57.7	67.1	76.1	83.9	95.8	99.9	$1,523,425	$0	$0	$1,523,425	30.5%
PS-080 - Monte Mar Vista Pump Station	Potable Pump Station	$5,000,000	0.51	0.11	0.12	0.22	0.04	0.49	0.38	0.26	63.2	71.3	78.9	85.7	96.2	99.9	$1,330,690	$0	$0	$1,330,690	26.6%
PS-081 - Sausalito Pumphouse Pump Station	Potable Pump Station	$5,000,000	0.51	0.11	0.12	0.22	0.04	0.49	0.38	0.26	63.2	71.3	78.9	85.7	96.2	99.9	$1,330,690	$0	$0	$1,330,690	26.6%
PS-082 - Sausalito Boulevard Pump Station	Potable Pump Station	$5,000,000	0.65	0.14	0.15	0.05	0.00	0.35	0.20	0.06	78.1	87.6	94.7	97.2	99.6	99.9	$539,850	$0	$0	$539,850	10.8%
PS-083 - Richardson Drive Pump Station	Potable Pump Station	$5,000,000	0.57	0.16	0.18	0.09	0.00	0.43	0.27	0.09	71.7	82.8	91.6	95.3	99.2	99.9	$754,375	$0	$0	$754,375	15.1%
PS-084 - Eastwood Way Pump Station	Potable Pump Station	$5,000,000	0.50	0.12	0.12	0.22	0.04	0.50	0.38	0.26	62.3	70.9	78.8	85.7	96.2	99.9	$1,348,485	$0	$0	$1,348,485	27.0%
PS-085 - Fairview Park Pump Station	Potable Pump Station	$5,000,000	0.50	0.12	0.12	0.22	0.04	0.50	0.38	0.26	62.3	70.9	78.8	85.7	96.2	99.9	$1,348,485	$0	$0	$1,348,485	27.0%
PS-087 - Marinview Pump Station	Potable Pump Station	$5,000,000	0.66	0.14	0.15	0.05	0.00	0.34	0.20	0.05	78.5	87.8	94.8	97.3	99.6	99.9	$527,700	$0	$0	$527,700	10.6%
PS-088 - Tam Woods 1st Lift Pump Station	Potable Pump Station	$5,000,000	0.50	0.12	0.12	0.22	0.04	0.50	0.38	0.26	62.3	70.9	78.8	85.7	96.2	99.9	$1,348,485	$0	$0	$1,348,485	27.0%
PS-089 - Tam Woods 2nd Lift Pump Station	Potable Pump Station	$5,000,000	0.66	0.14	0.15	0.05	0.00	0.34	0.20	0.05	78.5	87.8	94.8	97.3	99.6	99.9	$527,700	$0	$0	$527,700	10.6%
PS-090 - Hill Haven Pump Station	Potable Pump Station	$5,000,000	0.47	0.12	0.13	0.24	0.05	0.53	0.41	0.28	59.8	68.6	76.9	84.3	95.8	99.9	$1,457,350	$0	$0	$1,457,350	29.1%
PS-091 - Sugarloaf Pump Station	Potable Pump Station	$5,000,000	0.61	0.15	0.16	0.08	0.00	0.39	0.24	0.08	74.4	84.7	92.7	96.0	99.3	99.9	$669,625	$0	$0	$669,625	13.4%
PS-092 - Tiburon Belvedere Pump Station	Potable Pump Station	$5,000,000	0.61	0.15	0.17	0.07	0.00	0.39	0.23	0.07	75.4	85.7	93.7	96.7	99.5	99.9	$620,330	$0	$0	$620,330	12.4%
PS-093 - Tiburon Booster Pump Station	Potable Pump Station	$5,000,000	0.46	0.13	0.14	0.23	0.04	0.54	0.41	0.27	59.4	69.0	77.9	85.2	96.2	99.9	$1,431,095	$0	$0	$1,431,095	28.6%
PS-095 - Pine Mountain Tunnel Pump Station	Potable Pump Station	$5,000,000	0.66	0.14	0.14	0.05	0.00	0.34	0.19	0.05	78.9	88.1	95.0	97.4	99.6	99.9	$515,675	$0	$0	$515,675	10.3%
PS-096 - Southern Marin Line Boosters	Potable Pump Station	$5,000,000	0.65	0.14	0.15	0.06	0.00	0.35	0.21	0.06	77.8	87.4	94.6	97.2	99.6	99.9	$547,430	$0	$0	$547,430	10.9%
PS-101 - Redwood Drive Lower Pump	Potable Pump Station	$5,000,000	0.60	0.16	0.17	0.07	0.00	0.40	0.24	0.07	74.5	85.2	93.4	96.5	99.5	99.9	$644,895	$0	$0	$644,895	12.9%
PS-102 - North Marin Line Boosters	Potable Pump Station	$5,000,000	0.60	0.15	0.17	0.08	0.00	0.40	0.25	0.08	73.7	84.2	92.5	95.9	99.3	99.9	$689,705	$0	$0	$689,705	13.8%
PS-103 - San Geronimo Valley Pump Station	Potable Pump Station	$5,000,000	0.60	0.15	0.17	0.08	0.00	0.40	0.25	0.08	73.7	84.2	92.5	95.9	99.3	99.9	$689,705	$0	$0	$689,705	13.8%
PS-104 - Conifer Way Pump Station	Potable Pump Station	$5,000,000	0.48	0.13	0.14	0.21	0.04	0.52	0.39	0.25	61.6	70.8	79.3	86.2	96.4	99.9	$1,345,080	$0	$0	$1,345,080	26.9%
PS-106 - Los Altos Pump Station	Potable Pump Station	$5,000,000	0.58	0.16	0.18	0.08	0.00	0.42	0.26	0.08	72.7	83.9	92.7	96.1	99.4	99.9	$700,920	$0	$0	$700,920	14.0%
PS-108 - Indian Rock Pump Station	Potable Pump Station	$5,000,000	0.49	0.18	0.22	0.11	0.00	0.51	0.33	0.11	66.1	79.0	89.9	94.4	99.2	99.9	$914,100	$0	$0	$914,100	18.3%
PS-109 - Cibrian Pump Station	Potable Pump Station	$5,000,000	0.57	0.16	0.18	0.09	0.00	0.43	0.27	0.09	71.7	82.8	91.6	95.3	99.2	99.9	$754,375	$0	$0	$754,375	15.1%
PS-113 - Lag Picnic Grounds Pump Station	Potable Pump Station	$5,000,000	0.65	0.14	0.15	0.06	0.00	0.35	0.21	0.06	77.8	87.4	94.6	97.2	99.6	99.9	$547,430	$0	$0	$547,430	10.9%
PS-114 - Cortez Avenue Pump Station	Potable Pump Station	$5,000,000	0.59	0.12	0.11	0.15	0.03	0.41	0.29	0.18	70.6	78.6	85.3	90.3	97.5	99.9	$985,065	$0	$0	$985,065	19.7%
PS-115 - Redwood Drive Upper Pump Station	Potable Pump Station	$5,000,000	0.60	0.16	0.17	0.07	0.00	0.40	0.24	0.07	74.5	85.2	93.4	96.5	99.5	99.9	$644,895	$0	$0	$644,895	12.9%
PS-116 - North Redwood Drive Boosters	Potable Pump Station	$5,000,000	0.49	0.18	0.22	0.11	0.00	0.51	0.33	0.11	66.1	79.0	89.9	94.4	99.2	99.9	$914,100	$0	$0	$914,100	18.3%
PS-117 - Wolfback Ridge Pump Station	Potable Pump Station	$5,000,000	0.65	0.14	0.15	0.05	0.00	0.35	0.20	0.06	78.1	87.6	94.7	97.2	99.6	99.9	$539,850	$0	$0	$539,850	10.8%
PS-118 - Fire Road Pump Station	Potable Pump Station	$5,000,000	0.48	0.13	0.14	0.21	0.04	0.52	0.39	0.25	61.6	70.8	79.3	86.2	96.4	99.9	$1,345,080	$0	$0	$1,345,080	26.9%
PS-122 - Upper Road Pump Station	Potable Pump Station	$5,000,000	0.32	0.18	0.29	0.19	0.02	0.68	0.50	0.21	51.9	67.2	82.2	89.5	98.1	99.9	$1,437,360	$0	$0	$1,437,360	28.7%
PS-123 - Southern Marin Line Syphon	Potable Pump Station	$5,000,000	0.53	0.12	0.12	0.20	0.04	0.47	0.36	0.24	64.7	73.1	80.7	87.0	96.6	99.9	$1,244,480	$0	$0	$1,244,480	24.9%
PS-124 - Throckmorton Booster New Pumpstation	Potable Pump Station	$5,000,000	0.63	0.15	0.16	0.06	0.00	0.37	0.22	0.06	76.7	86.6	94.2	96.9	99.6	99.9	$581,255	$0	$0	$581,255	11.6%
PS-125 - Kent Fire Trail 2nd Lift Pump Station	Potable Pump Station	$5,000,000	0.28	0.16	0.26	0.26	0.04	0.72	0.55	0.29	47.1	61.1	75.5	84.4	96.4	99.9	$1,744,315	$0	$0	$1,744,315	34.9%
PS-126 - Oak Woodlands Pump Station	Potable Pump Station	$5,000,000	0.46	0.12	0.13	0.24	0.05	0.54	0.42	0.29	59.0	68.1	76.7	84.3	95.8	99.9	$1,477,295	$0	$0	$1,477,295	29.5%
PS-127 - Marin Terrace Pump Station	Potable Pump Station	$5,000,000	0.63	0.15	0.16	0.06	0.00	0.37	0.22	0.06	76.6	86.5	94.1	96.9	99.6	99.9	$584,815	$0	$0	$584,815	11.7%
PS-129 - Slide Gulch Pump Station	Potable Pump Station	$5,000,000	0.63	0.15	0.16	0.06	0.00	0.37	0.22	0.06	76.6	86.5	94.1	96.9	99.6	99.9	$584,815	$0	$0	$584,815	11.7%
PS-130 - Smith Conifer Pump Station	Potable Pump Station	$5,000,000	0.64	0.15	0.16	0.06	0.00	0.36	0.22	0.06	76.9	86.8	94.3	97.0	99.6	99.9	$574,580	$0	$0	$574,580	11.5%
TK-156 - BON TEMPE CLEARWELL TANK	Potable Tank - Clearwell	$10,000,000	0.65	0.14	0.15	0.06	0.00	0.35	0.21	0.06	73.4	87.4	94.0	95.3	95.6	97.0	$1,341,400	$0	$0	$1,341,400	13.4%
TK-157 - SAN GERONIMO CLEARWELL TANK #1	Potable Tank - Clearwell	$10,000,000	0.60	0.15	0.17	0.08	0.00	0.40	0.25	0.08	69.1	84.2	91.8	93.2	93.6	95.7	$1,644,000	$0	$0	$1,644,000	16.4%
TK-186 - SAN GERONIMO CLEARWELL TANK #2	Potable Tank - Clearwell	$15,000,000	0.60	0.15	0.17	0.08	0.00	0.40	0.25	0.08	69.1	84.2	91.8	93.2	93.6	95.7	$2,466,000	$0	$0	$2,466,000	16.4%
TK-006 - MADERA PARK TANK #1	Potable Tank - Distribution	$500,000	0.55	0.17	0.04	0.19	0.05	0.45	0.27	0.24	64.4	77.6	79.5	80.2	81.4	86.9	$124,220	$0	$0	$124,220	24.8%
TK-008 - MARINER HIGHLANDS TANK	Potable Tank - Distribution	$300,000	0.55	0.17	0.04	0.19	0.05	0.45	0.27	0.24	64.4	77.6	79.5	80.2	81.4	86.9	$74,532	$0	$0	$74,532	24.8%
TK-015 - MEADOW CLUB UPPER TANK	Potable Tank - Distribution	$1,500,000	0.47	0.14	0.15	0.20	0.04	0.53	0.39	0.24	57.6	71.5	78.5	80.1	81.3	86.9	$431,370	$0	$0	$431,370	28.8%
TK-019 - OAK MANOR TOP TANK	Potable Tank - Distribution	$1,250,000	0.56	0.18	0.20	0.06	0.00	0.44	0.26	0.06	66.9	84.4	93.2	94.8	95.1	96.7	$206,150	$0	$0	$206,150	16.5%
TK-025 - BRET HARTE TANK	Potable Tank - Distribution	$2,500,000	0.15	0.12	0.26	0.38	0.09	0.85	0.73	0.47	30.4	45.8	57.9	60.7	63.0	74.0	$1,308,200	$0	$0	$1,308,200	52.3%
TK-033 - INDIAN FIRE TRAIL TANK	Potable Tank - Distribution	$1,250,000	0.21	0.15	0.31	0.28	0.06	0.79	0.64	0.34	36.3	55.0	68.8	71.7	73.4	81.5	$542,925	$0	$0	$542,925	43.4%
TK-060 - SCOTT HIGHLANDS TANK	Potable Tank - Distribution	$1,250,000	0.56	0.18	0.20	0.06	0.00	0.44	0.27	0.07	66.4	84.0	92.9	94.6	94.9	96.5	$210,000	$0	$0	$210,000	16.8%
TK-066 - SUMMIT AVENUE UPPER TANK	Potable Tank - Distribution	$600,000	0.77	0.19	0.04	0.00	0.00	0.23	0.04	0.00	83.6	97.9	99.5	99.8	99.8	99.8	$32,700	$0	$0	$32,700	5.4%
TK-068 - ELDA DRIVE TANK	Potable Tank - Distribution	$750,000	0.39	0.18	0.27	0.14	0.02	0.61	0.42	0.15	52.7	72.7	84.8	87.1	87.9	91.7	$203,760	$0	$0	$203,760	27.2%
TK-074 - SCENIC AVENUE TANK	Potable Tank - Distribution	$100,000	0.77	0.19	0.04	0.00	0.00	0.23	0.04	0.00	83.8	98.0	99.6	99.9	99.9	99.9	$5,320	$0	$0	$5,320	5.3%
TK-078 - CHULA VISTA TANK	Potable Tank - Distribution	$1,250,000	0.40	0.19	0.28	0.12	0.01	0.60	0.41	0.13	53.9	74.6	87.0	89.3	90.0	93.2	$317,025	$0	$0	$317,025	25.4%
TK-081 - FAIRHILLS TOP TANK #1	Potable Tank - Distribution	$300,000	0.40	0.19	0.28	0.12	0.01	0.60	0.41	0.13	53.9	74.6	87.0	89.3	90.0	93.2	$76,086	$0	$0	$76,086	25.4%
TK-085 - HIND TANK #1	Potable Tank - Distribution	$500,000	0.57	0.17	0.04	0.19	0.05	0.43	0.27	0.23	65.6	78.1	79.9	80.6	81.7	87.1	$120,970	$0	$0	$120,970	24.2%
TK-086 - HIND TANK #2	Potable Tank - Distribution	$1,000,000	0.57	0.17	0.04	0.19	0.05	0.43	0.27	0.23	65.6	78.1	79.9	80.6	81.7	87.1	$241,940	$0	$0	$241,940	24.2%
TK-097 - RAFAEL HIGHLANDS TANK	Potable Tank - Distribution	$2,500,000	0.40	0.19	0.28	0.12	0.01	0.60	0.41	0.13	53.9	74.6	87.0	89.3	90.0	93.2	$634,050	$0	$0	$634,050	25.4%
TK-100 - SKYVIEW TERRACE TANK	Potable Tank - Distribution	$750,000	0.40	0.19	0.28	0.12	0.01	0.60	0.41	0.13	53.9	74.6	87.0	89.3	90.0	93.2	$190,215	$0	$0	$190,215	25.4%
TK-108 - CLOUDVIEW TANK	Potable Tank - Distribution	$1,100,000	0.58	0.17	0.19	0.05	0.00	0.42	0.25	0.06	68.4	85.3	93.7	95.2	95.5	97.0	$171,380	$0	$0	$171,380	15.6%
TK-115 - ROMER TANK	Potable Tank - Distribution	$1,550,000	0.46	0.14	0.15	0.22	0.05	0.54	0.41	0.26	56.4	69.9	76.6	78.2	79.5	85.7	$470,642	$0	$0	$470,642	30.4%
TK-116 - SAUSALITO BLVD. TANK	Potable Tank - Distribution	$1,150,000	0.58	0.17	0.19	0.05	0.00	0.42	0.25	0.06	68.4	85.3	93.7	95.2	95.5	97.0	$179,170	$0	$0	$179,170	15.6%
TK-117 - MESA VISTA TANK #1	Potable Tank - Distribution	$2,500,000	0.17	0.13	0.26	0.36	0.08	0.83	0.70	0.44	32.7	48.6	60.4	63.2	65.3	75.7	$1,244,350	$0	$0	$1,244,350	49.8%
TK-118 - COUNTYVIEW DRIVE TANK	Potable Tank - Distribution	$750,000	0.59	0.17	0.18	0.05	0.00	0.41	0.24	0.05	69.0	85.8	93.9	95.4	95.7	97.1	$113,805	$0	$0	$113,805	15.2%
TK-119 - LATTIE LANE TANK	Potable Tank - Distribution	$1,250,000	0.44	0.14	0.16	0.22	0.04	0.56	0.42	0.26	55.2	69.2	76.4	78.1	79.3	85.6	$387,650	$0	$0	$387,650	31.0%
TK-126 - HILL HAVEN TANK	Potable Tank - Distribution	$825,000	0.54	0.18	0.21	0.07	0.00	0.46	0.28	0.07	64.9	83.0	92.4	94.1	94.5	96.2	$146,504	$0	$0	$146,504	17.8%
TK-128 - MOUNT TIBURON TANK #1	Potable Tank - Distribution	$2,500,000	0.41	0.14	0.16	0.24	0.05	0.59	0.45	0.29	52.8	66.8	74.2	75.9	77.3	84.2	$831,400	$0	$0	$831,400	33.3%
TK-139 - BUCKEYE CIRCLE TANK	Potable Tank - Distribution	$150,000	0.42	0.15	0.18	0.21	0.04	0.58	0.43	0.26	53.8	68.7	76.7	78.5	79.7	85.9	$47,070	$0	$0	$47,070	31.4%
TK-150 - LOS ALTOS TANK	Potable Tank - Distribution	$300,000	0.50	0.19	0.23	0.08	0.00	0.50	0.32	0.09	61.6	80.6	91.0	92.9	93.3	95.4	$59,772	$0	$0	$59,772	19.9%
TK-158 - FAWN DRIVE TANK	Potable Tank - Distribution	$450,000	0.40	0.19	0.28	0.12	0.01	0.60	0.41	0.13	53.9	74.6	87.0	89.3	90.0	93.2	$114,129	$0	$0	$114,129	25.4%
TK-163 - UPPER ROAD TANK	Potable Tank - Distribution	$200,000	0.34	0.27	0.13	0.21	0.05	0.66	0.39	0.26	48.6	70.8	76.9	78.4	79.6	85.7	$64,760	$0	$0	$64,760	32.4%
TK-164 - TOMAHAWK DRIVE TANK	Potable Tank - Distribution	$200,000	0.39	0.18	0.27	0.14	0.02	0.61	0.42	0.15	52.7	72.7	84.8	87.1	87.9	91.7	$54,336	$0	$0	$54,336	27.2%
TK-166 - RING MOUNTAIN TANK	Potable Tank - Distribution	$750,000	0.50	0.19	0.23	0.08	0.00	0.50	0.32	0.09	61.6	80.6	91.0	92.9	93.3	95.4	$149,430	$0	$0	$149,430	19.9%
TK-167 - CREEKSIDE DRIVE TANK	Potable Tank - Distribution	$900,000	0.56	0.18	0.20	0.06	0.00	0.44	0.26	0.06	66.8	84.3	93.1	94.7	95.1	96.6	$148,698	$0	$0	$148,698	16.5%
TK-180 - BON TEMPE WASHWATER TANK	Potable Tank - Distribution	$1,000,000	0.58	0.17	0.19	0.06	0.00	0.42	0.25	0.06	68.1	85.2	93.6	95.1	95.5	96.9	$157,380	$0	$0	$157,380	15.7%
TK-181 - REDWOOD DRIVE UPPER TANK	Potable Tank - Distribution	$300,000	0.52	0.18	0.22	0.07	0.00	0.48	0.29	0.08	63.8	82.2	91.9	93.7	94.1	96.0	$55,422	$0	$0	$55,422	18.5%
TK-182 - ALTA AVENUE TANK	Potable Tank - Distribution	$2,500,000	0.60	0.17	0.18	0.05	0.00	0.40	0.23	0.05	70.2	86.5	94.3	95.8	96.0	97.3	$362,450	$0	$0	$362,450	14.5%
TK-183 - MINE RIDGE TANK	Potable Tank - Distribution	$1,100,000	0.59	0.17	0.19	0.05	0.00	0.41	0.24	0.06	68.9	85.7	93.9	95.4	95.7	97.1	$167,992	$0	$0	$167,992	15.3%
TK-187 - MANZANITA TANK	Potable Tank - Distribution	$300,000	0.52	0.14	0.15	0.15	0.03	0.48	0.33	0.18	62.4	76.5	83.4	84.9	85.8	90.1	$72,102	$0	$0	$72,102	24.0%
TK-188 - WOLFBACK RIDGE TANK #1	Potable Tank - Distribution	$125,000	0.58	0.17	0.19	0.05	0.00	0.42	0.25	0.06	68.4	85.3	93.7	95.2	95.5	97.0	$19,475	$0	$0	$19,475	15.6%
TK-189 - WOLFBACK RIDGE TANK #2	Potable Tank - Distribution	$125,000	0.58	0.17	0.19	0.05	0.00	0.42	0.25	0.06	68.4	85.3	93.7	95.2	95.5	97.0	$19,475	$0	$0	$19,475	15.6%
TK-190 - INVERNESS DRIVE TANK	Potable Tank - Distribution	$700,000	0.40	0.14	0.17	0.24	0.05	0.60	0.46	0.29	51.7	66.1	73.9	75.7	77.1	84.0	$237,118	$0	$0	$237,118	33.9%
TK-191 - LONE TREE AVENUE TANK	Potable Tank - Distribution	$500,000	0.56	0.18	0.20	0.06	0.00	0.44	0.27	0.07	66.4	84.0	92.9	94.6	94.9	96.5	$84,000	$0	$0	$84,000	16.8%
TK-192 - VERNAL AVE TANK	Potable Tank - Distribution	$1,500,000	0.56	0.18	0.20	0.06	0.00	0.44	0.26	0.06	66.5	84.1	93.0	94.6	95.0	96.6	$251,160	$0	$0	$251,160	16.7%
TK-193 - H-LINE ROAD TANK	Potable Tank - Distribution	$2,500,000	0.17	0.13	0.26	0.36	0.08	0.83	0.70	0.44	32.7	48.6	60.4	63.2	65.3	75.7	$1,244,350	$0	$0	$1,244,350	49.8%
TK-196 - WILSON WAY TANK	Potable Tank - Distribution	$500,000	0.23	0.17	0.34	0.22	0.03	0.77	0.60	0.26	39.2	60.1	75.6	78.6	79.9	86.1	$191,640	$0	$0	$191,640	38.3%
TK-197 - SUMMIT TRAIL TANK	Potable Tank - Distribution	$650,000	0.56	0.18	0.20	0.06	0.00	0.44	0.26	0.06	66.5	84.1	93.0	94.6	95.0	96.6	$108,836	$0	$0	$108,836	16.7%
TK-198 - SCOTT TANKS	Potable Tank - Distribution	$300,000	0.58	0.17	0.19	0.06	0.00	0.42	0.25	0.06	68.1	85.2	93.6	95.1	95.5	96.9	$47,214	$0	$0	$47,214	15.7%
TK-199 - SCOTT TANKS	Potable Tank - Distribution	$300,000	0.58	0.17	0.19	0.06	0.00	0.42	0.25	0.06	68.1	85.2	93.6	95.1	95.5	96.9	$47,214	$0	$0	$47,214	15.7%
TK-200 - OAK WOODLANDS TANK #1	Potable Tank - Distribution	$575,000	0.40	0.14	0.17	0.24	0.05	0.60	0.46	0.29	51.7	66.1	73.9	75.7	77.1	84.0	$194,776	$0	$0	$194,776	33.9%
TK-201 - OAK WOODLANDS TANK #2	Potable Tank - Distribution	$575,000	0.51	0.18	0.22	0.08	0.01	0.49	0.31	0.09	62.8	81.2	91.0	92.8	93.2	95.4	$111,792	$0	$0	$111,792	19.4%
TK-202 - Fairfax Manor 1st Lift Tank	Potable Tank - Distribution	$100,000	0.45	0.14	0.16	0.20	0.04	0.55	0.40	0.24	56.5	70.7	78.0	79.6	80.8	86.6	$29,564	$0	$0	$29,564	29.6%
TK-203 - MONTE MAR VISTA TANK	Potable Tank - Distribution	$300,000	0.58	0.17	0.19	0.05	0.00	0.42	0.25	0.06	68.4	85.3	93.7	95.2	95.5	97.0	$46,740	$0	$0	$46,740	15.6%
TK-204 - Bay Road Tank	Potable Tank - Distribution	$600,000	0.56	0.18	0.20	0.06	0.00	0.44	0.26	0.06	66.9	84.4	93.2	94.8	95.1	96.7	$98,952	$0	$0	$98,952	16.5%
TK-206 - SANTA VENETIA TANK	Potable Tank - Distribution	$1,550,000	0.52	0.18	0.22	0.07	0.00	0.48	0.30	0.08	63.3	81.9	91.7	93.5	93.9	95.9	$291,648	$0	$0	$291,648	18.8%
TK-207 - GOODHILL ROAD TANK	Potable Tank - Distribution	$300,000	0.23	0.17	0.34	0.22	0.03	0.77	0.60	0.26	39.2	60.1	75.6	78.6	79.9	86.1	$114,984	$0	$0	$114,984	38.3%
TK-208 - SPRING LANE TANK #2	Potable Tank - Distribution	$7,500,000	0.54	0.18	0.21	0.07	0.00	0.46	0.28	0.07	64.9	83.0	92.4	94.1	94.5	96.2	$1,331,850	$0	$0	$1,331,850	17.8%

TK-209 - FAIRHILLS TOP TANK #2	Potable Tank - Distribution	$300,000	0.40	0.19	0.28	0.12	0.01	0.60	0.41	0.13	53.9	74.6	87.0	89.3	90.0	93.2	$76,086	$0	$0	$76,086	25.4%
TK-210 - BEACON HILL TANK	Potable Tank - Distribution	$500,000	0.58	0.17	0.19	0.06	0.00	0.42	0.25	0.06	68.3	85.2	93.6	95.1	95.4	96.9	$78,480	$0	$0	$78,480	15.7%
TK-211 - Kent Fire Trail Tank #1	Potable Tank - Distribution	$500,000	0.21	0.15	0.31	0.28	0.06	0.79	0.64	0.34	36.3	55.0	68.8	71.7	73.4	81.5	$217,170	$0	$0	$217,170	43.4%
TK-212 - Kent Fire Trail Tank #2	Potable Tank - Distribution	$500,000	0.21	0.15	0.31	0.28	0.06	0.79	0.64	0.34	36.3	55.0	68.8	71.7	73.4	81.5	$217,170	$0	$0	$217,170	43.4%
TK-213 - MARIN CITY TANK	Potable Tank - Distribution	$1,000,000	0.46	0.14	0.15	0.22	0.05	0.54	0.41	0.26	56.4	69.9	76.6	78.2	79.5	85.7	$303,640	$0	$0	$303,640	30.4%
TK-214 - SLIDE GULCH TANK	Potable Tank - Distribution	$485,870	0.44	0.14	0.16	0.22	0.04	0.56	0.42	0.26	55.2	69.2	76.4	78.1	79.3	85.6	$150,678	$0	$0	$150,678	31.0%
TK-215 - SEQUOIA PARK TANK #1	Potable Tank - Distribution	$550,000	0.40	0.19	0.28	0.12	0.01	0.60	0.41	0.13	53.9	74.6	87.0	89.3	90.0	93.2	$139,491	$0	$0	$139,491	25.4%
TK-216 - SEQUOIA PARK TANK #2	Potable Tank - Distribution	$250,000	0.40	0.19	0.28	0.12	0.01	0.60	0.41	0.13	53.9	74.6	87.0	89.3	90.0	93.2	$63,405	$0	$0	$63,405	25.4%
TK-217 - KENT WOODLANDS 1ST LIFT TANK	Potable Tank - Distribution	$500,000	0.23	0.17	0.34	0.22	0.03	0.77	0.60	0.26	39.2	60.1	75.6	78.6	79.9	86.1	$191,640	$0	$0	$191,640	38.3%
TK-218 - MOUNT TIBURON TANK #2	Potable Tank - Distribution	$2,950,000	0.41	0.14	0.16	0.24	0.05	0.59	0.45	0.29	52.8	66.8	74.2	75.9	77.3	84.2	$981,052	$0	$0	$981,052	33.3%
TK-219 - OAK MANOR FIRST LIFT TANK	Potable Tank - Distribution	$500,000	0.45	0.14	0.16	0.20	0.04	0.55	0.40	0.24	56.5	70.7	78.0	79.6	80.8	86.6	$147,820	$0	$0	$147,820	29.6%
TK-220 - TAM WOODS TOP TANK	Potable Tank - Distribution	$400,000	0.47	0.14	0.15	0.21	0.04	0.53	0.40	0.25	57.4	70.8	77.5	79.0	80.3	86.2	$117,784	$0	$0	$117,784	29.4%
TK-221 - SUMMIT AVENUE LOWER TANK	Potable Tank - Distribution	$500,000	0.56	0.18	0.20	0.06	0.00	0.44	0.26	0.06	66.5	84.1	93.0	94.6	95.0	96.6	$83,720	$0	$0	$83,720	16.7%
TK-222 - FRIAR TUCK LANE TANK	Potable Tank - Distribution	$625,000	0.51	0.18	0.22	0.08	0.01	0.49	0.31	0.09	62.8	81.2	91.0	92.8	93.2	95.4	$121,513	$0	$0	$121,513	19.4%
TK-223 - CASCADE TANK #1	Potable Tank - Distribution	$300,000	0.56	0.18	0.20	0.06	0.00	0.44	0.26	0.06	66.9	84.4	93.2	94.8	95.1	96.7	$49,476	$0	$0	$49,476	16.5%
TK-224 - CASCADE TANK #2	Potable Tank - Distribution	$300,000	0.56	0.18	0.20	0.06	0.00	0.44	0.26	0.06	66.9	84.4	93.2	94.8	95.1	96.7	$49,476	$0	$0	$49,476	16.5%
TK-225 - SUGARLOAF TANK #1	Potable Tank - Distribution	$635,000	0.41	0.14	0.16	0.24	0.05	0.59	0.45	0.29	52.8	66.8	74.2	75.9	77.3	84.2	$211,176	$0	$0	$211,176	33.3%
TK-226 - SUGARLOAF TANK #2	Potable Tank - Distribution	$635,000	0.41	0.14	0.16	0.24	0.05	0.59	0.45	0.29	52.8	66.8	74.2	75.9	77.3	84.2	$211,176	$0	$0	$211,176	33.3%
TK-228 - GLENWOOD FOREST TANK	Potable Tank - Distribution	$450,000	0.40	0.14	0.17	0.24	0.05	0.60	0.46	0.29	51.7	66.1	73.9	75.7	77.1	84.0	$152,433	$0	$0	$152,433	33.9%
TK-229 - KENT FIRE TRAIL TOP TANK	Potable Tank - Distribution	$50,000	0.21	0.15	0.31	0.28	0.06	0.79	0.64	0.34	36.3	55.0	68.8	71.7	73.4	81.5	$21,717	$0	$0	$21,717	43.4%
TK-230 - SWIG TANK	Potable Tank - Distribution	$250,000	0.56	0.18	0.20	0.06	0.00	0.44	0.26	0.06	66.8	84.3	93.1	94.7	95.1	96.6	$41,305	$0	$0	$41,305	16.5%
TK-232 - SKY RANCH TANK	Potable Tank - Distribution	$600,000	0.56	0.18	0.20	0.06	0.00	0.44	0.26	0.06	66.9	84.4	93.2	94.8	95.1	96.7	$98,952	$0	$0	$98,952	16.5%
TK-233 - FAIRFAX MANOR TOP TANK	Potable Tank - Distribution	$540,000	0.45	0.14	0.16	0.20	0.04	0.55	0.40	0.24	56.5	70.7	78.0	79.6	80.8	86.6	$159,646	$0	$0	$159,646	29.6%
TK-234 - TAM WOODS FIRST LIFT TANK	Potable Tank - Distribution	$425,000	0.59	0.17	0.18	0.05	0.00	0.41	0.24	0.05	69.0	85.8	93.9	95.4	95.7	97.1	$64,592	$0	$0	$64,592	15.2%
TK-235 - FAIRVIEW PARK TANK	Potable Tank - Distribution	$500,000	0.44	0.14	0.16	0.22	0.04	0.56	0.42	0.26	55.2	69.2	76.4	78.1	79.3	85.6	$155,060	$0	$0	$155,060	31.0%
TK-236 - FERN CANYON TANK	Potable Tank - Distribution	$150,000	0.56	0.18	0.20	0.06	0.00	0.44	0.26	0.06	66.5	84.1	93.0	94.6	95.0	96.6	$25,116	$0	$0	$25,116	16.7%
TK-237 - CONIFER WAY UPPER TANK	Potable Tank - Distribution	$500,000	0.52	0.18	0.22	0.07	0.00	0.48	0.29	0.08	63.8	82.2	91.9	93.7	94.1	96.0	$92,330	$0	$0	$92,330	18.5%
TK-238 - OAK AVENUE TANK	Potable Tank - Distribution	$500,000	0.47	0.14	0.15	0.20	0.04	0.53	0.39	0.24	57.6	71.5	78.5	80.1	81.3	86.9	$143,790	$0	$0	$143,790	28.8%
TK-239 - ELINOR AVE TANK	Potable Tank - Distribution	$565,000	0.44	0.14	0.16	0.22	0.04	0.56	0.42	0.26	55.2	69.2	76.4	78.1	79.3	85.6	$175,218	$0	$0	$175,218	31.0%
TK-241 - LAGUNITAS PICNIC GROUNDS TANK	Potable Tank - Distribution	$2,750	0.65	0.14	0.15	0.06	0.00	0.35	0.21	0.06	73.4	87.4	94.0	95.3	95.6	97.0	$369	$0	$0	$369	13.4%
TK-009 - SAN CLEMENTE TANK	Potable Tank - Gravity	$7,500,000	0.50	0.19	0.23	0.08	0.00	0.50	0.32	0.09	61.6	80.6	91.0	92.9	93.3	95.4	$1,494,300	$0	$0	$1,494,300	19.9%
TK-011 - CA ¯ætON VILLAGE TANK	Potable Tank - Gravity	$7,500,000	0.45	0.14	0.16	0.20	0.04	0.55	0.40	0.24	56.5	70.7	78.0	79.6	80.8	86.6	$2,217,300	$0	$0	$2,217,300	29.6%
TK-012 - FAIRFAX GRADE TANK	Potable Tank - Gravity	$2,500,000	0.58	0.17	0.19	0.06	0.00	0.42	0.25	0.06	68.1	85.2	93.6	95.1	95.5	96.9	$393,450	$0	$0	$393,450	15.7%
TK-027 - GREENBRAE TANK	Potable Tank - Gravity	$7,500,000	0.15	0.12	0.26	0.38	0.09	0.85	0.73	0.47	30.4	45.8	57.9	60.7	63.0	74.0	$3,904,600	$0	$0	$3,904,600	52.3%
TK-030 - ESCALLE TANK	Potable Tank - Gravity	$5,000,000	0.17	0.13	0.26	0.36	0.08	0.83	0.70	0.44	32.7	48.6	60.4	63.2	65.3	75.7	$2,488,700	$0	$0	$2,488,700	49.8%
TK-064 - STRAWBERRY TANK	Potable Tank - Gravity	$7,500,000	0.38	0.14	0.18	0.25	0.05	0.62	0.48	0.30	50.2	64.9	73.0	74.9	76.4	83.5	$2,624,850	$0	$0	$2,624,850	35.0%
TK-083 - GLENWOOD TANK	Potable Tank - Gravity	$7,500,000	0.52	0.18	0.22	0.07	0.00	0.48	0.30	0.08	63.3	81.9	91.7	93.5	93.9	95.9	$1,411,200	$0	$0	$1,411,200	18.8%
TK-087 - LOCH LOMOND TANK	Potable Tank - Gravity	$5,000,000	0.51	0.18	0.22	0.08	0.01	0.49	0.31	0.09	62.8	81.2	91.0	92.8	93.2	95.4	$972,100	$0	$0	$972,100	19.4%
TK-089 - LOS RANCHITOS TANK	Potable Tank - Gravity	$5,000,000	0.39	0.18	0.27	0.14	0.02	0.61	0.42	0.15	52.7	72.7	84.8	87.1	87.9	91.7	$1,358,400	$0	$0	$1,358,400	27.2%
TK-090 - MARINWOOD TANK	Potable Tank - Gravity	$2,500,000	0.53	0.18	0.22	0.07	0.00	0.47	0.29	0.08	64.0	82.3	91.9	93.6	94.0	95.9	$460,200	$0	$0	$460,200	18.4%
TK-091 - MARIN PROFESSIONAL CENTER TANK	Potable Tank - Gravity	$1,250,000	0.31	0.14	0.21	0.28	0.06	0.69	0.55	0.34	44.1	59.9	69.6	71.8	73.5	81.5	$493,625	$0	$0	$493,625	39.5%
TK-094 - MILLER CREEK TANK	Potable Tank - Gravity	$2,500,000	0.56	0.18	0.20	0.06	0.00	0.44	0.26	0.06	66.8	84.3	93.1	94.7	95.1	96.6	$413,050	$0	$0	$413,050	16.5%
TK-096 - PUERTO SUELLO TANK	Potable Tank - Gravity	$7,500,000	0.40	0.14	0.17	0.24	0.05	0.60	0.46	0.29	51.7	66.1	73.9	75.7	77.1	84.0	$2,540,550	$0	$0	$2,540,550	33.9%
TK-098 - SANTA MARGARITA TANK	Potable Tank - Gravity	$7,500,000	0.39	0.18	0.27	0.14	0.02	0.61	0.42	0.15	52.7	72.7	84.8	87.1	87.9	91.7	$2,037,600	$0	$0	$2,037,600	27.2%
TK-106 - LUCAS VALLEY TANK	Potable Tank - Gravity	$7,500,000	0.31	0.14	0.21	0.28	0.06	0.69	0.55	0.34	44.1	59.9	69.6	71.8	73.5	81.5	$2,961,750	$0	$0	$2,961,750	39.5%
TK-113 - SAUSALITO PUMP HOUSE TANK #1	Potable Tank - Gravity	$1,550,000	0.46	0.14	0.15	0.22	0.05	0.54	0.41	0.26	56.4	69.9	76.6	78.2	79.5	85.7	$470,642	$0	$0	$470,642	30.4%
TK-114 - SAUSALITO PUMP HOUSE TANK #2	Potable Tank - Gravity	$1,550,000	0.46	0.14	0.15	0.22	0.05	0.54	0.41	0.26	56.4	69.9	76.6	78.2	79.5	85.7	$470,642	$0	$0	$470,642	30.4%
TK-125 - TENNESSEE VALLEY TANK	Potable Tank - Gravity	$5,000,000	0.59	0.17	0.18	0.05	0.00	0.41	0.24	0.05	69.0	85.8	93.9	95.4	95.7	97.1	$759,900	$0	$0	$759,900	15.2%
TK-127 - PARADISE DRIVE TANK	Potable Tank - Gravity	$5,000,000	0.41	0.14	0.16	0.24	0.05	0.59	0.45	0.29	52.8	66.8	74.2	75.9	77.3	84.2	$1,662,800	$0	$0	$1,662,800	33.3%
TK-130 - SPRING LANE TANK #1	Potable Tank - Gravity	$7,500,000	0.54	0.18	0.21	0.07	0.00	0.46	0.28	0.07	64.9	83.0	92.4	94.1	94.5	96.2	$1,331,850	$0	$0	$1,331,850	17.8%
TK-159 - PEACOCK GAP TANK	Potable Tank - Gravity	$2,500,000	0.43	0.12	0.14	0.25	0.05	0.57	0.44	0.30	54.1	66.6	73.1	74.7	76.2	83.4	$833,300	$0	$0	$833,300	33.3%
TK-160 - MARIN BAY TANK	Potable Tank - Gravity	$600,000	0.47	0.18	0.23	0.11	0.01	0.53	0.35	0.12	59.2	77.8	88.0	89.9	90.5	93.5	$135,744	$0	$0	$135,744	22.6%
TK-175 - MARINSHIP TANK	Potable Tank - Gravity	$7,500,000	0.65	0.14	0.15	0.06	0.00	0.35	0.21	0.06	73.6	87.4	94.0	95.2	95.5	97.0	$1,002,600	$0	$0	$1,002,600	13.4%
TK-152 - MADERA PARK (H/P) TANK	Potable Tank - Pressure System	$7,500	0.38	0.14	0.18	0.25	0.05	0.62	0.48	0.30	50.2	64.9	73.0	74.9	76.4	83.5	$2,625	$0	$0	$2,625	35.0%
TK-153 - RAFAEL HIGHLANDS (H/P) TANK	Potable Tank - Pressure System	$12,500	0.40	0.19	0.28	0.12	0.01	0.60	0.41	0.13	53.9	74.6	87.0	89.3	90.0	93.2	$3,170	$0	$0	$3,170	25.4%
TK-168 - MCNEAR DRIVE #1 (H/P) TANK	Potable Tank - Pressure System	$5,000	0.40	0.14	0.17	0.24	0.05	0.60	0.46	0.29	51.7	66.1	73.9	75.7	77.1	84.0	$1,694	$0	$0	$1,694	33.9%
TK-169 - MCNEAR DRIVE #2 (H/P) TANK	Potable Tank - Pressure System	$7,500	0.40	0.14	0.17	0.24	0.05	0.60	0.46	0.29	51.7	66.1	73.9	75.7	77.1	84.0	$2,541	$0	$0	$2,541	33.9%
TK-174 - VIA MONTEBELLO (H/P) TANK	Potable Tank - Pressure System	$17,500	0.49	0.19	0.24	0.08	0.00	0.51	0.33	0.09	60.9	80.2	90.7	92.6	93.1	95.3	$3,563	$0	$0	$3,563	20.4%
TK-195 - Fire Road Pressure Tank	Potable Tank - Pressure System	$5,000	0.42	0.15	0.18	0.21	0.04	0.58	0.43	0.26	53.8	68.7	76.7	78.5	79.7	85.9	$1,569	$0	$0	$1,569	31.4%
TK-205 - RICHARDSON DRIVE (H/P) TANK	Potable Tank - Pressure System	$5,000	0.50	0.19	0.23	0.08	0.00	0.50	0.32	0.09	61.6	80.6	91.0	92.9	93.3	95.4	$996	$0	$0	$996	19.9%
TK-145 - ROSS RESERVOIR	Potable Tank - Reservoir	$5,000,000	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.0	100.0	100.0	100.0	100.0	100.0	$0	$0	$0	$0	0.0%
TK-146 - FORBES HILL RESERVOIR	Potable Tank - Reservoir	$20,000,000	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.0	100.0	100.0	100.0	100.0	100.0	$0	$0	$0	$0	0.0%
TK-046 - ALTO TANK #1	Potable Tank - Transmission	$15,000,000	0.56	0.18	0.20	0.06	0.00	0.44	0.26	0.06	66.5	84.1	93.0	94.6	95.0	96.6	$2,511,600	$0	$0	$2,511,600	16.7%
TK-055 - MILL VALLEY TANK	Potable Tank - Transmission	$25,000,000	0.56	0.18	0.20	0.06	0.00	0.44	0.26	0.06	66.5	84.1	93.0	94.6	95.0	96.6	$4,186,000	$0	$0	$4,186,000	16.7%
TK-069 - HAWTHORNE HILLS UPPER TANK	Potable Tank - Transmission	$10,000,000	0.56	0.18	0.20	0.06	0.00	0.44	0.26	0.06	66.9	84.4	93.2	94.8	95.1	96.7	$1,649,200	$0	$0	$1,649,200	16.5%
TK-131 - CONIFER WAY TANK	Potable Tank - Transmission	$2,500,000	0.42	0.15	0.18	0.21	0.04	0.58	0.43	0.26	53.8	68.7	76.7	78.5	79.7	85.9	$784,500	$0	$0	$784,500	31.4%
TK-147 - SMITH SADDLE TANK #1	Potable Tank - Transmission	$25,000,000	0.45	0.14	0.16	0.20	0.04	0.55	0.40	0.24	56.5	70.7	78.0	79.6	80.8	86.6	$7,391,001	$0	$0	$7,391,001	29.6%
TK-148 - SMITH SADDLE TANK #2	Potable Tank - Transmission	$25,000,000	0.56	0.18	0.20	0.06	0.00	0.44	0.26	0.06	66.9	84.4	93.2	94.8	95.1	96.7	$4,123,000	$0	$0	$4,123,000	16.5%
TK-155 - PINE MOUNTAIN TUNNEL TANK	Potable Tank - Transmission	$15,000,000	0.75	0.02	0.04	0.07	0.12	0.25	0.23	0.19	78.5	80.7	82.7	83.3	84.0	87.6	$2,983,800	$0	$0	$2,983,800	19.9%
TK-165 - ALTO TANK #2	Potable Tank - Transmission	$15,000,000	0.44	0.14	0.16	0.22	0.04	0.56	0.42	0.26	55.2	69.2	76.4	78.1	79.3	85.6	$4,651,800	$0	$0	$4,651,800	31.0%
TK-184 - PACHECO RIDGE TANK #1	Potable Tank - Transmission	$15,000,000	0.41	0.14	0.17	0.23	0.05	0.59	0.45	0.28	53.0	67.4	75.1	76.9	78.3	84.8	$4,893,300	$0	$0	$4,893,300	32.6%
TK-185 - PACHECO RIDGE TANK #2	Potable Tank - Transmission	$15,000,000	0.53	0.18	0.22	0.07	0.00	0.47	0.29	0.08	64.0	82.3	91.9	93.6	94.0	95.9	$2,761,200	$0	$0	$2,761,200	18.4%
Bon Tempe Treatment Plant	Potable Treatment Plant	$100,000,000	0.65	0.14	0.15	0.06	0.00	0.35	0.21	0.06	78.2	92.6	95.4	95.8	96.9	99.7	$11,514,400	$0	$0	$11,514,400	11.5%
San Geronimo Treatment Plant	Potable Treatment Plant	$100,000,000	0.60	0.15	0.17	0.08	0.00	0.40	0.25	0.08	74.3	90.1	93.4	94.0	95.5	99.5	$14,359,800	$0	$0	$14,359,800	14.4%
Potable Water Total/Averages			**50%**	**15%**	**18%**	**14%**	**2%**													**$216,334,891**	
PS-028 - Kent Lake Pump Station	Raw Pump Station	$5,000,000	0.66	0.14	0.14	0.05	0.00	0.34	0.19	0.05	78.9	88.1	95.0	97.4	99.6	99.9	$515,675	$0	$0	$515,675	10.3%
PS-029 - Phoenix Lake Barge Pump	Raw Pump Station	$5,000,000	0.65	0.14	0.15	0.06	0.00	0.35	0.21	0.06	77.8	87.4	94.6	97.2	99.6	99.9	$547,430	$0	$0	$547,430	10.9%
PS-031 - Soulajule Pump Station	Raw Pump Station	$5,000,000	0.71	0.13	0.12	0.04	0.00	0.29	0.16	0.04	82.3	90.3	96.0	98.0	99.7	99.9	$420,550	$0	$0	$420,550	8.4%
PS-097 - Tocaloma Booster Pump Station	Raw Pump Station	$5,000,000	0.68	0.12	0.12	0.07	0.01	0.32	0.20	0.08	78.7	86.7	92.7	95.6	99.0	99.9	$595,355	$0	$0	$595,355	11.9%
PS-128 - Alpine Bon-Tempe Pump Station	Raw Pump Station	$5,000,000	0.66	0.14	0.14	0.05	0.00	0.34	0.19	0.05	78.9	88.1	95.0	97.4	99.6	99.9	$515,675	$0	$0	$515,675	10.3%
Raw Water Total/Averages			**67%**	**13%**	**13%**	**5%**	**0%**													**$2,594,685**	
PS-049 - Channing Way Pump Station	Recycled Pump Station	$5,000,000	0.37	0.13	0.17	0.27	0.05	0.63	0.49	0.32	52.4	63.0	73.5	82.3	95.4	99.9	$1,703,940	$0	$0	$1,703,940	34.1%
PS-111 - Quail Hill Pump Station	Recycled Pump Station	$5,000,000	0.49	0.18	0.22	0.11	0.00	0.51	0.33	0.11	66.1	79.0	89.9	94.4	99.2	99.9	$914,100	$0	$0	$914,100	18.3%
PS-112 - Freitas Parkway Pump Station	Recycled Pump Station	$5,000,000	0.49	0.18	0.22	0.11	0.00	0.51	0.33	0.11	66.1	79.0	89.9	94.4	99.2	99.9	$914,100	$0	$0	$914,100	18.3%
TK-103 - TERRA LINDA TANK #1	Recycled Tank - Gravity	$2,500,000	0.31	0.14	0.21	0.28	0.06	0.69	0.55	0.34	44.1	59.9	69.6	71.8	73.5	81.5	$987,250	$0	$0	$987,250	39.5%
TK-170 - TERRA LINDA TANK #2	Recycled Tank - Gravity	$2,500,000	0.31	0.14	0.21	0.28	0.06	0.69	0.55	0.34	44.1	59.9	69.6	71.8	73.5	81.5	$987,250	$0	$0	$987,250	39.5%
TK-227 - LGWRP Clearwell	Recycled Tank - Reservoir	$4,500,000	0.46	0.12	0.13	0.24	0.05	0.54	0.42	0.29	56.3	68.4	74.5	76.1	77.5	84.3	$1,423,350	$0	$0	$1,423,350	31.6%
Las Gallinas Treatment Plant	Recycled Treatment Plant	$0	0.59	0.16	0.17	0.08	0.00	0.41	0.25	0.08	66.5	80.7	90.5	92.2	93.0	99.0	$0	$0	$0	$0	#DIV/0!
Recycled Water Total/Averages			**43%**	**15%**	**19%**	**20%**	**3%**													**$6,929,990**	

Pipelines						
Type	**Miles of Pipeline**	**Replacement Cost**				
Potable Water - Distribution Main	761.0	$2,209,823,037				
Potable Water - Lateral	229.4	$181,682,836				
Potable Water - Main	0.1	$200,899				
Potable Water - Transmission Main	92.1	$388,893,185				
Raw Water - Distribution Main	4.7	$13,679,943				
Raw Water - Transmission Main	25.6	$108,036,492				
Recycled Water - Lateral	2.1	$1,676,612				
Recycled Water - Main	24.4	$70,806,587				
Recycled Water - Other	0.3	$828,973				
Total	**1,139.6**	**$2,975,628,563**				

Number of Leaks	**Number of Leaks**	**Number of Breaks**	**Total Number of Repairs**	**Days to Repair Leaks**	**Days to Repair Breaks**	**Total Days to Repair**
Potable Water - Distribution Main	105.4	26.3	131.7	14.8	3.7	18.4
Potable Water - Lateral	55.4	13.8	69.2	7.8	1.9	9.7
Potable Water - Main	0.0	0.0	0.0	0.0	0.0	0.0
Potable Water - Transmission Main	9.4	2.3	11.7	1.7	0.4	2.2
Potable Total	**170.1**	**42.5**	**212.7**	**24.3**	**6.1**	**30.3**
Economic Loss	**$1,701,485.24**	**$425,371.31**	**$2,126,856.56**			
Raw Water - Distribution Main	0.2	0.1	0.3	0.0	0.0	0.0
Raw Water - Transmission Main	0.7	0.2	0.9	0.2	0.1	0.3
Raw Total	**0.9**	**0.2**	**1.2**	**0.2**	**0.1**	**0.3**
Economic Loss	**$9,287.82**	**$2,321.95**	**$11,609.77**			
Recycled Water - Lateral	0.9	0.2	1.1	0.1	0.0	0.1
Recycled Water - Main	3.4	0.9	4.3	0.5	0.1	0.6
Recycled Water - Other	0.1	0.0	0.1	0.0	0.0	0.0
Recycled Total	**4.3**	**1.1**	**5.4**	**0.6**	**0.2**	**0.8**
Economic Loss	**$43,381.20**	**$10,845.30**	**$54,226.50**			
Grand Total	**175.4**	**43.9**	**219.3**	**25.1**	**6.3**	**31.4**

Cost to Repair a Leak	**Cost to Repair a Break**	**Economic Loss**
$10,000	$10,000	$2,192,693

Facilities																						
Facility Name	**Type**	**Replacement Cost**	**Probability of Damage State**								**Percent Functionality After**						**Economic Loss**				
			None	**Slight**	**Moderate**	**Extensive**	**Complete**	**Exceed Slight**	**Exceed Moderate**	**Exceed Extensive**	**Day 1**	**Day 3**	**Day 7**	**Day 14**	**Day 30**	**Day 90**	**Structure Loss**	**Nonstructural Drift-Sensitive Loss**	**Nonstructural Acceleration-Sensitive Loss**	**Total**	**% of Replacement Cost**
Administration Building - Headquarter Office	Building	$12,300,000	0.00	0.09	0.65	0.24	0.02	1.00	0.91	0.26	0.2	0.6	8.8	8.8	73.7	97.9	$488,320	$1,247,615	$322,523	$2,058,458	16.7%
Corporation Yard - Boat Barn	Building	$1,000,000	0.00	0.01	0.19	0.59	0.21	1.00	0.99	0.80	0.0	0.1	0.9	1.0	20.2	78.9	$169,434	$114,297	$86,840	$370,571	37.1%
Corporation Yard - Facilities Offices	Building	$15,000,000	0.00	0.09	0.65	0.24	0.02	1.00	0.91	0.26	0.2	0.6	8.8	8.8	73.7	97.9	$595,512	$1,521,482	$393,321	$2,510,315	16.7%
Corporation Yard - Laboratory	Building	$6,500,000	0.00	0.09	0.65	0.24	0.02	1.00	0.91	0.26	0.2	0.6	8.8	8.8	73.7	97.9	$258,055	$659,309	$170,439	$1,087,803	16.7%
Corporation Yard - Satellite Office	Building	$500,000	0.00	0.06	0.45	0.40	0.08	1.00	0.94	0.48	0.1	0.4	6.1	6.1	51.6	92.1	$31,402	$67,121	$41,433	$139,955	28.0%
Pelican Yard - Vehicle Storage	Building	$500,000	0.00	0.00	0.10	0.56	0.34	1.00	1.00	0.90	0.0	0.0	0.3	0.3	10.4	66.1	$101,527	$75,328	$72,944	$249,799	50.0%
Pelican Yard - Vehicle Storage	Building	$800,000	0.00	0.00	0.13	0.56	0.30	1.00	1.00	0.86	0.0	0.0	0.4	0.4	13.9	69.6	$154,278	$109,803	$93,280	$357,360	44.7%
Ranger Housing - Alpine Dam - Residence	Building	$500,000	0.91	0.09	0.00	0.00	0.00	0.09	0.00	0.00	90.7	91.1	99.7	99.7	99.9	99.9	$251	$856	$2,154	$3,261	0.7%
Ranger Housing - Lagunitas Dam - Garage	Building	$300,000	0.62	0.23	0.14	0.01	0.00	0.38	0.15	0.01	61.8	63.0	85.2	85.3	99.1	99.9	$2,152	$1,397	$3,136	$6,685	2.2%
Ranger Housing - Lagunitas Dam - Residence	Building	$500,000	0.82	0.12	0.00	0.04	0.01	0.18	0.05	0.05	82.4	83.0	94.6	94.6	95.0	99.0	$3,799	$8,537	$5,913	$18,248	3.6%
Ranger Housing - Phoenix Dam - Log Cabin	Building	$100,000	0.87	0.13	0.00	0.00	0.00	0.13	0.00	0.00	86.6	87.2	99.5	99.5	99.9	99.9	$74	$244	$638	$957	1.0%
Ranger Housing - Phoenix Dam - Residence	Building	$500,000	0.77	0.17	0.01	0.04	0.01	0.23	0.06	0.05	77.3	78.1	94.2	94.3	95.0	98.9	$3,956	$9,020	$6,263	$19,239	3.8%
Ranger Housing - Phoenix Dam - Shed	Building	$100,000	0.27	0.23	0.23	0.23	0.05	0.73	0.50	0.27	27.0	28.1	49.5	49.6	72.5	95.0	$6,115	$4,651	$5,377	$16,144	16.1%
Ranger Housing - Porteous House	Building	$600,000	0.87	0.13	0.00	0.00	0.00	0.13	0.00	0.00	86.6	87.2	99.5	99.5	99.9	99.9	$447	$1,466	$3,827	$5,740	1.0%
Ranger Housing - Porteous House - Garage	Building	$300,000	0.34	0.28	0.29	0.08	0.01	0.66	0.37	0.08	34.1	35.4	62.5	62.6	91.4	98.9	$7,881	$5,153	$6,114	$19,148	6.4%
Ranger Housing - Porteous House - Shed	Building	$100,000	0.27	0.23	0.23	0.23	0.05	0.73	0.50	0.27	27.0	28.1	49.5	49.6	72.5	95.0	$6,115	$4,651	$5,377	$16,144	16.1%
Ranger Housing - Porteous House - Shed	Building	$100,000	0.27	0.23	0.23	0.23	0.05	0.73	0.50	0.27	27.0	28.1	49.5	49.6	72.5	95.0	$6,115	$4,651	$5,377	$16,144	16.1%
Ranger Housing - Sky Oaks - Residence	Building	$1,700,000	0.82	0.12	0.00	0.04	0.01	0.18	0.05	0.05	82.4	83.0	94.6	94.6	95.0	99.0	$12,916	$29,024	$20,105	$62,045	3.6%
Ranger Housing - Soulajule Residence	Building	$500,000	0.74	0.07	0.00	0.15	0.04	0.26	0.19	0.18	74.0	74.4	81.3	81.4	81.6	96.3	$13,104	$28,260	$12,528	$53,892	10.8%
Sky Oaks Headquarters - Entrance Kiosk	Building	$100,000	0.60	0.37	0.03	0.00	0.00	0.40	0.03	0.00	60.3	62.1	96.7	96.9	99.9	99.9	$204	$539	$1,015	$1,758	1.8%
Sky Oaks Headquarters - Fisheries Office (Fish Box)	Building	$300,000	0.60	0.37	0.03	0.00	0.00	0.40	0.03	0.00	60.3	62.1	96.7	96.9	99.9	99.9	$613	$1,618	$3,045	$5,275	1.8%
Sky Oaks Headquarters - Headquarter Office	Building	$700,000	0.60	0.37	0.03	0.00	0.00	0.40	0.03	0.00	60.3	62.1	96.7	96.9	99.9	99.9	$1,431	$3,774	$7,104	$12,309	1.8%
Sky Oaks Headquarters - Natural Resources Office (Sky Box	Building	$700,000	0.60	0.37	0.03	0.00	0.00	0.40	0.03	0.00	60.3	62.1	96.7	96.9	99.9	99.9	$1,431	$3,774	$7,104	$12,309	1.8%
Sky Oaks Headquarters - Seed Shed	Building	$200,000	0.36	0.30	0.30	0.04	0.00	0.64	0.34	0.04	35.9	37.3	65.7	65.8	96.2	99.9	$3,518	$1,972	$2,411	$7,901	4.0%
Sky Oaks Headquarters - Storage Shed	Building	$200,000	0.34	0.28	0.29	0.08	0.01	0.66	0.37	0.08	34.1	35.4	62.5	62.6	91.4	98.9	$5,254	$3,435	$4,076	$12,765	6.4%
Administrative Total/Averages			**43%**	**18%**	**19%**	**16%**	**5%**	**0.57**	**0.40**	**0.21**										**$7,064,224**	
PS-001 - Federal Works Booster Pump Station	Potable Pump Station	$5,000,000	0.18	0.27	0.44	0.11	0.00	0.82	0.55	0.11	45.6	67.7	88.3	94.5	99.2	99.9	$1,353,385	$0	$0	$1,353,385	27.1%
PS-002 - Chapman Park Pump Station	Potable Pump Station	$5,000,000	0.18	0.27	0.45	0.10	0.00	0.82	0.55	0.10	46.0	68.3	89.1	95.0	99.4	99.9	$1,321,810	$0	$0	$1,321,810	26.4%
PS-003 - Summit Drive Pump Station PS-003	Potable Pump Station	$5,000,000	0.36	0.30	0.30	0.04	0.00	0.64	0.34	0.04	61.8	81.1	94.9	98.1	99.7	99.9	$801,765	$0	$0	$801,765	16.0%
PS-005 - H-Line Booster Station	Potable Pump Station	$5,000,000	0.34	0.28	0.29	0.08	0.01	0.66	0.37	0.08	59.2	77.7	91.3	95.4	98.9	99.9	$968,565	$0	$0	$968,565	19.4%
PS-006 - Madera Park Pump Station	Potable Pump Station	$5,000,000	0.14	0.20	0.33	0.28	0.05	0.86	0.66	0.33	36.7	54.3	72.2	82.3	95.5	99.9	$2,040,795	$0	$0	$2,040,795	40.8%
PS-007 - Mariner Highlands Pump Station	Potable Pump Station	$5,000,000	0.07	0.16	0.42	0.30	0.04	0.93	0.77	0.34	29.8	48.5	70.6	82.0	96.1	99.9	$2,254,620	$0	$0	$2,254,620	45.1%
PS-010 - Cascade Pump Station	Potable Pump Station	$5,000,000	0.36	0.30	0.30	0.04	0.00	0.64	0.34	0.04	61.8	81.1	94.9	98.1	99.7	99.9	$801,765	$0	$0	$801,765	16.0%
PS-011 - Fairfax Manor 1st Pump Station	Potable Pump Station	$5,000,000	0.18	0.27	0.45	0.10	0.00	0.82	0.55	0.10	46.0	68.3	89.1	95.0	99.4	99.9	$1,321,810	$0	$0	$1,321,810	26.4%
PS-012 - Fairfax Manor 2nd Lift Pump Station	Potable Pump Station	$5,000,000	0.27	0.23	0.23	0.23	0.05	0.73	0.50	0.27	48.8	64.2	76.9	84.8	95.8	99.9	$1,638,870	$0	$0	$1,638,870	32.8%
PS-013 - Oak Manor 1st Lift Pump Station	Potable Pump Station	$5,000,000	0.36	0.30	0.30	0.04	0.00	0.64	0.34	0.04	61.8	81.1	94.9	98.1	99.7	99.9	$801,765	$0	$0	$801,765	16.0%
PS-014 - Oak Manor 2nd Lift Pump Station	Potable Pump Station	$5,000,000	0.27	0.23	0.23	0.23	0.05	0.73	0.50	0.27	48.8	64.2	76.9	84.8	95.8	99.9	$1,638,870	$0	$0	$1,638,870	32.8%
PS-016 - Scott Pump Station	Potable Pump Station	$5,000,000	0.27	0.23	0.23	0.23	0.05	0.73	0.50	0.27	48.8	64.2	76.9	84.8	95.8	99.9	$1,638,870	$0	$0	$1,638,870	32.8%
PS-017 - Smith Saddle Booster Station	Potable Pump Station	$5,000,000	0.36	0.30	0.30	0.04	0.00	0.64	0.34	0.04	61.8	81.1	94.9	98.1	99.7	99.9	$801,765	$0	$0	$801,765	16.0%
PS-019 - Bret Harte Pump Station	Potable Pump Station	$5,000,000	0.06	0.15	0.39	0.35	0.05	0.94	0.79	0.40	27.9	45.3	66.3	78.6	95.0	99.9	$2,426,645	$0	$0	$2,426,645	48.5%
PS-020 - Greenbrae Pump Station	Potable Pump Station	$5,000,000	0.14	0.20	0.33	0.28	0.05	0.86	0.66	0.33	36.7	54.3	72.2	82.3	95.5	99.9	$2,040,795	$0	$0	$2,040,795	40.8%
PS-022 - Ignacio Boosters	Potable Pump Station	$50,000,000	0.00	0.00	0.02	0.28	0.69	1.00	1.00	0.98	5.5	7.9	13.6	25.5	56.3	99.9	$46,419,000	$0	$0	$46,419,000	92.8%
PS-023 - Kent Fire Trail 1st Pump Station	Potable Pump Station	$5,000,000	0.34	0.28	0.29	0.08	0.01	0.66	0.37	0.08	59.2	77.7	91.3	95.4	98.9	99.9	$968,565	$0	$0	$968,565	19.4%
PS-025 - Kent Woodlands 2nd Pump Station	Potable Pump Station	$5,000,000	0.36	0.30	0.30	0.04	0.00	0.64	0.34	0.04	61.8	81.1	94.9	98.1	99.7	99.9	$801,765	$0	$0	$801,765	16.0%
PS-026 - Lagunitas Booster Station	Potable Pump Station	$5,000,000	0.58	0.22	0.13	0.05	0.01	0.42	0.20	0.07	75.6	87.4	93.8	96.3	98.9	99.9	$579,665	$0	$0	$579,665	11.6%
PS-030 - Phoenix Transfer Pump Station	Potable Pump Station	$5,000,000	0.36	0.30	0.30	0.04	0.00	0.64	0.34	0.04	61.8	81.1	94.9	98.1	99.7	99.9	$801,765	$0	$0	$801,765	16.0%
PS-032 - Elinor Avenue Pump Station	Potable Pump Station	$5,000,000	0.17	0.26	0.42	0.14	0.01	0.83	0.57	0.15	44.2	65.6	85.8	92.5	98.6	99.9	$1,463,310	$0	$0	$1,463,310	29.3%
PS-033 - Fern Canyon Pump Station	Potable Pump Station	$5,000,000	0.47	0.18	0.10	0.20	0.05	0.53	0.36	0.25	62.3	72.5	79.4	85.8	95.9	99.9	$1,301,330	$0	$0	$1,301,330	26.0%
PS-034 - Lapachet Pump Station	Potable Pump Station	$5,000,000	0.59	0.22	0.13	0.05	0.01	0.41	0.19	0.06	76.2	88.2	94.5	96.8	99.1	99.9	$543,585	$0	$0	$543,585	10.9%
PS-035 - Mine Ridge Pump Station	Potable Pump Station	$5,000,000	0.62	0.23	0.14	0.01	0.00	0.38	0.15	0.01	79.7	92.1	98.3	99.5	99.9	99.9	$354,380	$0	$0	$354,380	7.1%
PS-036 - Scott Highlands Pump (OUT OF SERVICE)	Potable Pump Station	$5,000,000	0.14	0.20	0.34	0.27	0.05	0.86	0.66	0.32	36.9	54.5	72.5	82.5	95.5	99.9	$2,030,585	$0	$0	$2,030,585	40.6%
PS-040 - Summit Avenue Upper Pump Station	Potable Pump Station	$5,000,000	0.59	0.22	0.13	0.05	0.01	0.41	0.19	0.06	76.2	88.2	94.5	96.8	99.1	99.9	$543,585	$0	$0	$543,585	10.9%
PS-041 - Kastania Booster Pump Station	Potable Pump Station	$5,000,000	0.00	0.00	0.09	0.50	0.41	1.00	1.00	0.91	8.6	13.5	24.0	40.3	72.7	99.9	$4,205,020	$0	$0	$4,205,020	84.1%
PS-042 - Del Mesa Pump Station	Potable Pump Station	$5,000,000	0.18	0.27	0.45	0.10	0.00	0.82	0.55	0.10	46.0	68.3	89.1	95.0	99.4	99.9	$1,321,810	$0	$0	$1,321,810	26.4%
PS-043 - Fawn Drive Pump Station	Potable Pump Station	$5,000,000	0.15	0.22	0.37	0.22	0.04	0.85	0.63	0.26	39.4	58.4	77.1	86.0	96.6	99.9	$1,831,955	$0	$0	$1,831,955	36.6%
PS-044 - Mann Pump Station	Potable Pump Station	$5,000,000	0.07	0.16	0.42	0.30	0.04	0.93	0.77	0.34	29.8	48.5	70.6	82.0	96.1	99.9	$2,254,620	$0	$0	$2,254,620	45.1%
PS-046 - Scenic Avenue Pump Station	Potable Pump Station	$5,000,000	0.08	0.20	0.52	0.20	0.00	0.92	0.72	0.20	34.3	56.2	81.2	90.2	98.8	99.9	$1,835,360	$0	$0	$1,835,360	36.7%
PS-047 - Sequoia Park Pump Station	Potable Pump Station	$5,000,000	0.15	0.22	0.37	0.22	0.04	0.85	0.63	0.26	39.4	58.4	77.1	86.0	96.6	99.9	$1,831,955	$0	$0	$1,831,955	36.6%
PS-050 - Chula Vista Pump Station	Potable Pump Station	$5,000,000	0.07	0.16	0.41	0.32	0.04	0.93	0.77	0.36	29.3	47.6	69.4	81.0	95.8	99.9	$2,303,155	$0	$0	$2,303,155	46.1%
PS-052 - Elda Drive Pump Station	Potable Pump Station	$5,000,000	0.06	0.15	0.39	0.35	0.05	0.94	0.79	0.40	28.0	45.3	66.3	78.6	95.0	99.9	$2,426,435	$0	$0	$2,426,435	48.5%
PS-053 - Fairhills 1st Lift Pump Station	Potable Pump Station	$5,000,000	0.15	0.22	0.37	0.22	0.04	0.85	0.63	0.26	39.4	58.4	77.1	86.0	96.6	99.9	$1,831,955	$0	$0	$1,831,955	36.6%
PS-054 - Fairhills 2nd Lift Pump Station	Potable Pump Station	$5,000,000	0.15	0.22	0.37	0.22	0.04	0.85	0.63	0.26	39.4	58.4	77.1	86.0	96.6	99.9	$1,831,955	$0	$0	$1,831,955	36.6%
PS-055 - Grove Hill Pump Station	Potable Pump Station	$5,000,000	0.18	0.27	0.45	0.10	0.00	0.82	0.55	0.10	46.0	68.3	89.1	95.0	99.4	99.9	$1,321,810	$0	$0	$1,321,810	26.4%
PS-056 - Rafael Highlands Pump Station	Potable Pump Station	$5,000,000	0.18	0.27	0.45	0.10	0.00	0.82	0.55	0.10	46.0	68.3	89.1	95.0	99.4	99.9	$1,321,810	$0	$0	$1,321,810	26.4%
PS-057 - Hind Pump Station	Potable Pump Station	$5,000,000	0.07	0.16	0.41	0.32	0.04	0.93	0.77	0.36	29.3	47.6	69.4	81.0	95.8	99.9	$2,303,155	$0	$0	$2,303,155	46.1%
PS-058 - Knight Drive Pump Station	Potable Pump Station	$5,000,000	0.03	0.09	0.38	0.44	0.06	0.97	0.88	0.50	21.7	37.3	59.1	73.7	94.1	99.9	$2,794,015	$0	$0	$2,794,015	55.9%

PS-060 - Lockwood Drive Pump Station	Potable Pump Station	$5,000,000	0.06	0.15	0.39	0.35	0.05	0.94	0.79	0.40	27.9	45.3	66.3	78.6	95.0	99.9	$2,426,645	$0	$0	$2,426,645	48.5%
PS-061 - Lucas Valley Pump Station	Potable Pump Station	$5,000,000	0.15	0.22	0.36	0.24	0.04	0.85	0.64	0.28	38.7	57.2	75.8	84.9	96.3	99.9	$1,891,300	$0	$0	$1,891,300	37.8%
PS-062 - Manderly Pump Station	Potable Pump Station	$5,000,000	0.06	0.15	0.39	0.35	0.05	0.94	0.79	0.40	27.9	45.3	66.3	78.6	95.0	99.9	$2,426,645	$0	$0	$2,426,645	48.5%
PS-064 - Marinwood Pump Station (NOT IS USE)	Potable Pump Station	$5,000,000	0.03	0.09	0.38	0.44	0.06	0.97	0.88	0.50	21.7	37.3	59.1	73.7	94.1	99.9	$2,794,015	$0	$0	$2,794,015	55.9%
PS-065 - McNear Drive Pump Station	Potable Pump Station	$5,000,000	0.01	0.06	0.34	0.52	0.08	0.99	0.93	0.60	17.6	30.8	51.6	68.2	92.6	99.9	$3,118,625	$0	$0	$3,118,625	62.4%
PS-066 - Mesa Vista Pump Station	Potable Pump Station	$5,000,000	0.06	0.15	0.39	0.35	0.05	0.94	0.79	0.40	28.0	45.3	66.3	78.6	95.0	99.9	$2,426,435	$0	$0	$2,426,435	48.5%
PS-069 - San Quentin Pump Station	Potable Pump Station	$5,000,000	0.00	0.01	0.20	0.61	0.17	1.00	0.98	0.78	12.4	20.9	37.0	55.5	86.4	99.9	$3,688,385	$0	$0	$3,688,385	73.8%
PS-070 - Santa Margarita Pump Station	Potable Pump Station	$5,000,000	0.06	0.15	0.39	0.35	0.05	0.94	0.79	0.40	28.0	45.3	66.3	78.6	95.0	99.9	$2,426,435	$0	$0	$2,426,435	48.5%
PS-071 - Sky View Terrace Pump Station	Potable Pump Station	$5,000,000	0.04	0.13	0.51	0.32	0.01	0.96	0.84	0.33	26.0	45.6	71.6	83.8	97.7	99.9	$2,322,765	$0	$0	$2,322,765	46.5%
PS-073 - Swig Pump Station	Potable Pump Station	$5,000,000	0.18	0.27	0.45	0.10	0.00	0.82	0.55	0.10	46.0	68.3	89.1	95.0	99.4	99.9	$1,321,810	$0	$0	$1,321,810	26.4%
PS-074 - Via Montebello Pump Station	Potable Pump Station	$5,000,000	0.01	0.04	0.36	0.53	0.07	0.99	0.96	0.60	16.5	29.6	51.4	68.4	93.1	99.9	$3,155,620	$0	$0	$3,155,620	63.1%
PS-077 - Beacon Hill Pump Station	Potable Pump Station	$5,000,000	0.36	0.30	0.30	0.04	0.00	0.64	0.34	0.04	61.8	81.1	94.9	98.1	99.7	99.9	$801,765	$0	$0	$801,765	16.0%
PS-078 - Crescent Avenue Pump Station	Potable Pump Station	$5,000,000	0.36	0.30	0.30	0.04	0.00	0.64	0.34	0.04	61.8	81.1	94.9	98.1	99.7	99.9	$801,765	$0	$0	$801,765	16.0%
PS-079 - Marin City Pump Station	Potable Pump Station	$5,000,000	0.14	0.20	0.34	0.27	0.05	0.86	0.66	0.32	36.9	54.5	72.5	82.5	95.5	99.9	$2,030,585	$0	$0	$2,030,585	40.6%
PS-080 - Monte Mar Vista Pump Station	Potable Pump Station	$5,000,000	0.14	0.20	0.34	0.27	0.05	0.86	0.66	0.32	36.9	54.5	72.5	82.5	95.5	99.9	$2,030,585	$0	$0	$2,030,585	40.6%
PS-081 - Sausalito Pumphouse Pump Station	Potable Pump Station	$5,000,000	0.06	0.15	0.39	0.35	0.05	0.94	0.79	0.40	28.0	45.3	66.3	78.6	95.0	99.9	$2,426,435	$0	$0	$2,426,435	48.5%
PS-082 - Sausalito Boulevard Pump Station	Potable Pump Station	$5,000,000	0.36	0.30	0.30	0.04	0.00	0.64	0.34	0.04	61.8	81.1	94.9	98.1	99.7	99.9	$801,765	$0	$0	$801,765	16.0%
PS-083 - Richardson Drive Pump Station	Potable Pump Station	$5,000,000	0.17	0.26	0.42	0.14	0.01	0.83	0.57	0.15	44.2	65.6	85.8	92.5	98.6	99.9	$1,463,310	$0	$0	$1,463,310	29.3%
PS-084 - Eastwood Way Pump Station	Potable Pump Station	$5,000,000	0.51	0.19	0.11	0.15	0.04	0.49	0.30	0.19	66.7	77.5	84.2	89.3	96.9	99.9	$1,061,245	$0	$0	$1,061,245	21.2%
PS-085 - Fairview Park Pump Station	Potable Pump Station	$5,000,000	0.27	0.23	0.23	0.23	0.05	0.73	0.50	0.27	48.8	64.2	76.9	84.8	95.8	99.9	$1,638,870	$0	$0	$1,638,870	32.8%
PS-087 - Marinview Pump Station	Potable Pump Station	$5,000,000	0.34	0.28	0.29	0.08	0.01	0.66	0.37	0.08	59.2	77.7	91.3	95.4	98.9	99.9	$968,565	$0	$0	$968,565	19.4%
PS-088 - Tam Woods 1st Lift Pump Station	Potable Pump Station	$5,000,000	0.47	0.18	0.10	0.20	0.05	0.53	0.36	0.25	62.3	72.5	79.4	85.8	95.9	99.9	$1,301,330	$0	$0	$1,301,330	26.0%
PS-089 - Tam Woods 2nd Lift Pump Station	Potable Pump Station	$5,000,000	0.59	0.22	0.13	0.05	0.01	0.41	0.19	0.06	76.2	88.2	94.5	96.8	99.1	99.9	$543,585	$0	$0	$543,585	10.9%
PS-090 - Hill Haven Pump Station	Potable Pump Station	$5,000,000	0.14	0.20	0.33	0.28	0.05	0.86	0.66	0.33	36.7	54.3	72.2	82.3	95.5	99.9	$2,040,795	$0	$0	$2,040,795	40.8%
PS-091 - Sugarloaf Pump Station	Potable Pump Station	$5,000,000	0.15	0.22	0.37	0.22	0.04	0.85	0.63	0.26	39.4	58.4	77.1	86.0	96.6	99.9	$1,831,955	$0	$0	$1,831,955	36.6%
PS-092 - Tiburon Belvedere Pump Station	Potable Pump Station	$5,000,000	0.36	0.30	0.30	0.04	0.00	0.64	0.34	0.04	61.8	81.1	94.9	98.1	99.7	99.9	$801,765	$0	$0	$801,765	16.0%
PS-093 - Tiburon Booster Pump Station	Potable Pump Station	$5,000,000	0.14	0.20	0.33	0.28	0.05	0.86	0.66	0.33	36.7	54.3	72.2	82.3	95.5	99.9	$2,041,695	$0	$0	$2,041,695	40.8%
PS-095 - Pine Mountain Tunnel Pump Station	Potable Pump Station	$5,000,000	0.62	0.23	0.14	0.01	0.00	0.38	0.15	0.01	79.7	92.1	98.3	99.5	99.9	99.9	$354,380	$0	$0	$354,380	7.1%
PS-096 - Southern Marin Line Boosters	Potable Pump Station	$5,000,000	0.36	0.30	0.30	0.04	0.00	0.64	0.34	0.04	61.8	81.1	94.9	98.1	99.7	99.9	$801,765	$0	$0	$801,765	16.0%
PS-101 - Redwood Drive Lower Pump	Potable Pump Station	$5,000,000	0.36	0.30	0.30	0.04	0.00	0.64	0.34	0.04	61.8	81.1	94.9	98.1	99.7	99.9	$801,765	$0	$0	$801,765	16.0%
PS-102 - North Marin Line Boosters	Potable Pump Station	$5,000,000	0.35	0.29	0.29	0.06	0.01	0.65	0.36	0.07	60.1	78.9	92.5	96.4	99.2	99.9	$910,135	$0	$0	$910,135	18.2%
PS-103 - San Geronimo Valley Pump Station	Potable Pump Station	$5,000,000	0.35	0.29	0.29	0.06	0.01	0.65	0.36	0.07	60.1	78.9	92.5	96.4	99.2	99.9	$910,135	$0	$0	$910,135	18.2%
PS-104 - Conifer Way Pump Station	Potable Pump Station	$5,000,000	0.27	0.23	0.23	0.23	0.05	0.73	0.50	0.27	48.8	64.2	76.9	84.8	95.8	99.9	$1,638,870	$0	$0	$1,638,870	32.8%
PS-106 - Los Altos Pump Station	Potable Pump Station	$5,000,000	0.18	0.27	0.45	0.10	0.00	0.82	0.55	0.10	46.0	68.3	89.1	95.0	99.4	99.9	$1,321,810	$0	$0	$1,321,810	26.4%
PS-108 - Indian Rock Pump Station	Potable Pump Station	$5,000,000	0.08	0.20	0.52	0.20	0.00	0.92	0.72	0.20	34.3	56.2	81.2	90.2	98.8	99.9	$1,835,360	$0	$0	$1,835,360	36.7%
PS-109 - Cibrian Pump Station	Potable Pump Station	$5,000,000	0.15	0.22	0.37	0.22	0.04	0.85	0.63	0.26	39.4	58.4	77.1	86.0	96.6	99.9	$1,831,955	$0	$0	$1,831,955	36.6%
PS-113 - Lag Picnic Grounds Pump Station	Potable Pump Station	$5,000,000	0.34	0.28	0.29	0.08	0.01	0.66	0.37	0.08	59.2	77.7	91.3	95.4	98.9	99.9	$968,565	$0	$0	$968,565	19.4%
PS-114 - Cortez Avenue Pump Station	Potable Pump Station	$5,000,000	0.51	0.19	0.11	0.15	0.04	0.49	0.30	0.19	66.7	77.5	84.2	89.3	96.9	99.9	$1,061,245	$0	$0	$1,061,245	21.2%
PS-115 - Redwood Drive Upper Pump Station	Potable Pump Station	$5,000,000	0.34	0.28	0.29	0.08	0.01	0.66	0.37	0.08	59.2	77.7	91.3	95.4	98.9	99.9	$968,565	$0	$0	$968,565	19.4%
PS-116 - North Redwood Drive Boosters	Potable Pump Station	$5,000,000	0.01	0.07	0.45	0.43	0.03	0.99	0.91	0.46	20.5	37.0	61.7	76.6	96.0	99.9	$2,750,450	$0	$0	$2,750,450	55.0%
PS-117 - Wolfback Ridge Pump Station	Potable Pump Station	$5,000,000	0.36	0.30	0.30	0.04	0.00	0.64	0.34	0.04	61.8	81.1	94.9	98.1	99.7	99.9	$801,765	$0	$0	$801,765	16.0%
PS-118 - Fire Road Pump Station	Potable Pump Station	$5,000,000	0.27	0.23	0.23	0.23	0.05	0.73	0.50	0.27	48.8	64.2	76.9	84.8	95.8	99.9	$1,638,870	$0	$0	$1,638,870	32.8%
PS-122 - Upper Road Pump Station	Potable Pump Station	$5,000,000	0.36	0.30	0.30	0.04	0.00	0.64	0.34	0.04	61.8	81.1	94.9	98.1	99.7	99.9	$801,765	$0	$0	$801,765	16.0%
PS-123 - Southern Marin Line Syphon	Potable Pump Station	$5,000,000	0.27	0.23	0.23	0.23	0.05	0.73	0.50	0.27	48.8	64.2	76.9	84.8	95.8	99.9	$1,638,870	$0	$0	$1,638,870	32.8%
PS-124 - Throckmorton Booster New Pumpstation	Potable Pump Station	$5,000,000	0.62	0.23	0.14	0.01	0.00	0.38	0.15	0.01	79.7	92.1	98.3	99.5	99.9	99.9	$354,380	$0	$0	$354,380	7.1%
PS-125 - Kent Fire Trail 2nd Lift Pump Station	Potable Pump Station	$5,000,000	0.34	0.28	0.29	0.08	0.01	0.66	0.37	0.08	59.2	77.7	91.3	95.4	98.9	99.9	$968,565	$0	$0	$968,565	19.4%
PS-126 - Oak Woodlands Pump Station	Potable Pump Station	$5,000,000	0.06	0.15	0.39	0.35	0.05	0.94	0.79	0.40	27.9	45.3	66.3	78.6	95.0	99.9	$2,426,645	$0	$0	$2,426,645	48.5%
PS-127 - Marin Terrace Pump Station	Potable Pump Station	$5,000,000	0.34	0.28	0.29	0.08	0.01	0.66	0.37	0.08	59.2	77.7	91.3	95.4	98.9	99.9	$968,565	$0	$0	$968,565	19.4%
PS-129 - Slide Gulch Pump Station	Potable Pump Station	$5,000,000	0.59	0.22	0.13	0.05	0.01	0.41	0.19	0.06	76.2	88.2	94.5	96.8	99.1	99.9	$543,585	$0	$0	$543,585	10.9%
PS-130 - Smith Conifer Pump Station	Potable Pump Station	$5,000,000	0.36	0.30	0.30	0.04	0.00	0.64	0.34	0.04	61.8	81.1	94.9	98.1	99.7	99.9	$801,765	$0	$0	$801,765	16.0%
TK-156 - BON TEMPE CLEARWELL TANK	Potable Tank - Clearwell	$10,000,000	0.34	0.28	0.29	0.08	0.01	0.66	0.37	0.08	50.3	77.8	90.6	92.9	93.3	95.4	$2,422,200	$0	$0	$2,422,200	24.2%
TK-157 - SAN GERONIMO CLEARWELL TANK #1	Potable Tank - Clearwell	$10,000,000	0.35	0.29	0.29	0.06	0.01	0.65	0.36	0.07	51.0	78.9	91.9	94.3	94.6	96.3	$2,314,200	$0	$0	$2,314,200	23.1%
TK-186 - SAN GERONIMO CLEARWELL TANK #2	Potable Tank - Clearwell	$15,000,000	0.35	0.29	0.29	0.06	0.01	0.65	0.36	0.07	51.0	78.9	91.9	94.3	94.6	96.3	$3,471,300	$0	$0	$3,471,300	23.1%
TK-006 - MADERA PARK TANK #1	Potable Tank - Distribution	$500,000	0.29	0.39	0.07	0.20	0.05	0.71	0.32	0.25	45.9	74.6	78.0	79.1	80.3	86.1	$158,100	$0	$0	$158,100	31.6%
TK-008 - MARINER HIGHLANDS TANK	Potable Tank - Distribution	$300,000	0.29	0.39	0.07	0.20	0.05	0.71	0.32	0.25	45.9	74.6	78.0	79.1	80.3	86.1	$94,860	$0	$0	$94,860	31.6%
TK-015 - MEADOW CLUB UPPER TANK	Potable Tank - Distribution	$1,500,000	0.16	0.21	0.33	0.25	0.05	0.84	0.63	0.30	33.5	57.2	72.0	75.0	76.5	83.6	$635,250	$0	$0	$635,250	42.4%
TK-019 - OAK MANOR TOP TANK	Potable Tank - Distribution	$1,250,000	0.21	0.28	0.44	0.07	0.00	0.79	0.51	0.07	40.2	71.4	90.8	94.2	94.5	96.3	$359,375	$0	$0	$359,375	28.8%
TK-025 - BRET HARTE TANK	Potable Tank - Distribution	$2,500,000	0.02	0.08	0.39	0.45	0.06	0.98	0.90	0.52	19.7	35.6	53.2	57.1	59.7	72.2	$1,489,250	$0	$0	$1,489,250	59.6%
TK-033 - INDIAN FIRE TRAIL TANK	Potable Tank - Distribution	$1,250,000	0.20	0.27	0.42	0.11	0.01	0.80	0.53	0.12	38.8	68.6	87.0	90.3	90.9	93.8	$393,375	$0	$0	$393,375	31.5%
TK-060 - SCOTT HIGHLANDS TANK	Potable Tank - Distribution	$1,250,000	0.07	0.16	0.45	0.29	0.04	0.93	0.78	0.33	25.6	48.5	68.5	72.4	74.1	82.2	$602,850	$0	$0	$602,850	48.2%
TK-066 - SUMMIT AVENUE UPPER TANK	Potable Tank - Distribution	$600,000	0.79	0.16	0.00	0.04	0.01	0.21	0.05	0.05	84.3	95.4	95.7	95.8	96.1	97.2	$44,904	$0	$0	$44,904	7.5%
TK-068 - ELDA DRIVE TANK	Potable Tank - Distribution	$750,000	0.07	0.16	0.45	0.29	0.04	0.93	0.78	0.33	25.6	48.5	68.5	72.4	74.1	82.2	$361,710	$0	$0	$361,710	48.2%
TK-074 - SCENIC AVENUE TANK	Potable Tank - Distribution	$100,000	0.39	0.51	0.10	0.00	0.00	0.61	0.10	0.00	56.8	94.9	99.2	99.9	99.9	99.9	$14,180	$0	$0	$14,180	14.2%
TK-078 - CHULA VISTA TANK	Potable Tank - Distribution	$1,250,000	0.08	0.19	0.54	0.18	0.00	0.92	0.73	0.19	28.3	56.0	80.1	84.5	85.5	90.3	$506,500	$0	$0	$506,500	40.5%
TK-081 - FAIRHILLS TOP TANK #1	Potable Tank - Distribution	$300,000	0.08	0.19	0.54	0.18	0.00	0.92	0.73	0.19	28.3	56.0	80.1	84.5	85.5	90.3	$121,560	$0	$0	$121,560	40.5%
TK-085 - HIND TANK #1	Potable Tank - Distribution	$500,000	0.17	0.42	0.15	0.20	0.05	0.83	0.41	0.25	36.8	70.3	77.3	78.9	80.1	86.0	$178,780	$0	$0	$178,780	35.8%
TK-086 - HIND TANK #2	Potable Tank - Distribution	$1,000,000	0.17	0.42	0.15	0.20	0.05	0.83	0.41	0.25	36.8	70.3	77.3	78.9	80.1	86.0	$357,560	$0	$0	$357,560	35.8%
TK-097 - RAFAEL HIGHLANDS TANK	Potable Tank - Distribution	$2,500,000	0.08	0.19	0.54	0.18	0.00	0.92	0.73	0.19	28.3	56.0	80.1	84.5	85.5	90.3	$1,013,000	$0	$0	$1,013,000	40.5%
TK-100 - SKYVIEW TERRACE TANK	Potable Tank - Distribution	$750,000	0.01	0.05	0.41	0.49	0.05	0.99	0.95	0.54	18.4	32.7	51.2	55.3	58.1	71.3	$459,555	$0	$0	$459,555	61.3%
TK-108 - CLOUDVIEW TANK	Potable Tank - Distribution	$1,100,000	0.21	0.28	0.44	0.07	0.00	0.79	0.51	0.07	40.2	71.4	90.8	94.2	94.5	96.3	$316,250	$0	$0	$316,250	28.8%
TK-115 - ROMER TANK	Potable Tank - Distribution	$1,550,000	0.06	0.14	0.41	0.33	0.05	0.94	0.80	0.39	24.6	45.6	64.0	67.7	69.7	79.0	$794,251	$0	$0	$794,251	51.2%
TK-116 - SAUSALITO BLVD. TANK	Potable Tank - Distribution	$1,150,000	0.21	0.28	0.44	0.07	0.00	0.79	0.51	0.07	40.2	71.4	90.8	94.2	94.5	96.3	$330,625	$0	$0	$330,625	28.8%
TK-117 - MESA VISTA TANK #1	Potable Tank - Distribution	$2,500,000	0.06	0.14	0.41	0.34	0.05	0.94	0.80	0.39	24.5	45.4	63.7	67.5	69.4	78.9	$1,284,750	$0	$0	$1,284,750	51.4%
TK-118 - COUNTYVIEW DRIVE TANK	Potable Tank - Distribution	$750,000	0.21	0.28	0.44	0.07	0.00	0.79	0.51	0.07	40.2	71.4	90.8	94.2	94.5	96.3	$215,625	$0	$0	$215,625	28.8%
TK-119 - LATTIE LANE TANK	Potable Tank - Distribution	$1,250,000	0.16	0.21	0.33	0.25	0.05	0.84	0.63	0.30	33.5	57.2	72.0	75.0	76.5	83.6	$529,375	$0	$0	$529,375	42.4%
TK-126 - HILL HAVEN TANK	Potable Tank - Distribution	$825,000	0.08	0.19	0.54	0.18	0.00	0.92	0.73	0.19	28.3	56.0	80.1	84.5	85.5	90.3	$334,290	$0	$0	$334,290	40.5%
TK-128 - MOUNT TIBURON TANK #1	Potable Tank - Distribution	$2,500,000	0.06	0.14	0.41	0.34	0.05	0.94	0.80	0.39	24.5	45.4	63.7	67.5	69.4	78.9	$1,284,750	$0	$0	$1,284,750	51.4%
TK-139 - BUCKEYE CIRCLE TANK	Potable Tank - Distribution	$150,000	0.16	0.21	0.33	0.25	0.05	0.84	0.63	0.30	33.5	57.2	72.0	75.0	76.5	83.6	$63,525	$0	$0	$63,525	42.4%
TK-150 - LOS ALTOS TANK	Potable Tank - Distribution	$300,000	0.21	0.28	0.44	0.07	0.00	0.79	0.51	0.07	40.2	71.4	90.8	94.2	94.5	96.3	$86,250	$0	$0	$86,250	28.8%
TK-158 - FAWN DRIVE TANK	Potable Tank - Distribution	$450,000	0.08	0.19	0.54	0.18	0.00	0.92	0.73	0.19	28.3	56.0	80.1	84.5	85.5	90.3	$182,340	$0	$0	$182,340	40.5%
TK-163 - UPPER ROAD TANK	Potable Tank - Distribution	$200,000	0.46	0.28	0.02	0.20	0.05	0.54	0.27	0.25	57.7	77.5	78.7	79.4	80.6	86.3	$54,216	$0	$0	$54,216	27.1%
TK-164 - TOMAHAWK DRIVE TANK	Potable Tank - Distribution	$200,000	0.07	0.16	0.45	0.29	0.04	0.93	0.78	0.33	25.6	48.5	68.5	72.4	74.1	82.2	$96,456	$0	$0	$96,456	48.2%
TK-166 - RING MOUNTAIN TANK	Potable Tank - Distribution	$750,000	0.08	0.19	0.54	0.18	0.00	0.92	0.73	0.19	28.3	56.0	80.1	84.5	85.5	90.3	$303,900	$0	$0	$303,900	40.5%
TK-167 - CREEKSIDE DRIVE TANK	Potable Tank - Distribution	$900,000	0.07	0.16	0.45	0.29	0.04	0.93	0.78	0.33	25.6	48.5	68.5	72.4	74.1	82.2	$434,052	$0	$0	$434,052	48.2%
TK-180 - BON TEMPE WASHWATER TANK	Potable Tank - Distribution	$1,000,000	0.20	0.27	0.42	0.11	0.01	0.80	0.53	0.12	38.8	68.6	87.0	90.3	90.9	93.8	$314,700	$0	$0	$314,700	31.5%
TK-181 - REDWOOD DRIVE UPPER TANK	Potable Tank - Distribution	$300,000	0.20	0.27	0.42	0.11	0.01	0.80	0.53	0.12	38.8	68.6	87.0	90.3	90.9	93.8	$94,410	$0	$0	$94,410	31.5%
TK-182 - ALTA AVENUE TANK	Potable Tank - Distribution	$2,500,000	0.46	0.29	0.23	0.01	0.00	0.54	0.24	0.01	60.4	86.9	97.0	98.7	98.8	99.2	$405,650	$0	$0	$405,650	16.2%
TK-183 - MINE RIDGE TANK	Potable Tank - Distribution	$1,100,000	0.46	0.29	0.23	0.01	0.00	0.54	0.24	0.01	60.4	86.9	97.0	98.7	98.8	99.2	$178,486	$0	$0	$178,486	16.2%
TK-187 - MANZANITA TANK	Potable Tank - Distribution	$300,000	0.38	0.24	0.19	0.16	0.04	0.62	0.38	0.20	51.7	73.4	81.8	83.6	84.5	89.1	$86,064	$0	$0	$86,064	28.7%
TK-188 - WOLFBACK RIDGE TANK #1	Potable Tank - Distribution	$125,000	0.21	0.28	0.44	0.07	0.00	0.79	0.51	0.07	40.2	71.4	90.8	94.2	94.5	96.3	$35,938	$0	$0	$35,938	28.8%
TK-189 - WOLFBACK RIDGE TANK #2	Potable Tank - Distribution	$125,000	0.21	0.28	0.44	0.07	0.00	0.79	0.51	0.07	40.2	71.4	90.8	94.2	94.5	96.3	$35,938	$0	$0	$35,938	28.8%
TK-190 - INVERNESS DRIVE TANK	Potable Tank - Distribution	$700,000	0.02	0.08	0.39	0.45	0.06	0.98	0.90	0.52	19.7	35.6	53.2	57.1	59.7	72.2	$416,990	$0	$0	$416,990	59.6%
TK-191 - LONE TREE AVENUE TANK	Potable Tank - Distribution	$500,000	0.46	0.29	0.23	0.01	0.00	0.54	0.24	0.01	60.4	86.9	97.0	98.7	98.8	99.2	$81,130	$0	$0	$81,130	16.2%
TK-192 - VERNAL AVE TANK	Potable Tank - Distribution	$1,500,000	0.21	0.28	0.44	0.07	0.00	0.79	0.51	0.07	40.2	71.4	90.8	94.2	94.5	96.3	$431,250	$0	$0	$431,250	28.8%
TK-193 - H-LINE ROAD TANK	Potable Tank - Distribution	$2,500,000	0.16	0.21	0.33	0.25	0.05	0.84	0.63	0.30	33.5	57.2	72.0	75.0	76.5	83.6	$1,058,750	$0	$0	$1,058,750	42.4%
TK-196 - WILSON WAY TANK	Potable Tank - Distribution	$500,000	0.21	0.28	0.44	0.07	0.00	0.79	0.51	0.07	40.2	71.4	90.8	94.2	94.5	96.3	$143,750	$0	$0	$143,750	28.8%
TK-197 - SUMMIT TRAIL TANK	Potable Tank - Distribution	$650,000	0.21	0.28	0.44	0.07	0.00	0.79	0.51	0.07	40.2	71.4	90.8	94.2	94.5	96.3	$186,875	$0	$0	$186,875	28.8%
TK-198 - SCOTT TANKS	Potable Tank - Distribution	$300,000	0.21	0.28	0.44	0.07	0.00	0.79	0.51	0.07	40.2	71.4	90.8	94.2	94.5	96.3	$86,250	$0	$0	$86,250	28.8%
TK-199 - SCOTT TANKS	Potable Tank - Distribution	$300,000	0.21	0.28	0.44	0.07	0.00	0.79	0.51	0.07	40.2	71.4	90.8	94.2	94.5	96.3	$86,250	$0	$0	$86,250	28.8%
TK-200 - OAK WOODLANDS TANK #1	Potable Tank - Distribution	$575,000	0.02	0.08	0.39	0.45	0.06	0.98	0.90	0.52	19.7	35.6	53.2	57.1	59.7	72.2	$342,528	$0	$0	$342,528	59.6%
TK-201 - OAK WOODLANDS TANK #2	Potable Tank - Distribution	$575,000	0.02	0.08	0.41	0.43	0.05	0.98	0.90	0.48	20.2	37.1	55.9	59.9	62.3	74.1	$332,707	$0	$0	$332,707	57.9%
TK-202 - Fairfax Manor 1st Lift Tank	Potable Tank - Distribution	$100,000	0.16	0.21	0.33	0.25	0.05	0.84	0.63	0.30	33.5	57.2	72.0	75.0	76.5	83.6	$42,350	$0	$0	$42,350	42.4%
TK-203 - MONTE MAR VISTA TANK	Potable Tank - Distribution	$300,000	0.21	0.28	0.44	0.07	0.00	0.79	0.51	0.07	40.2	71.4	90.8	94.2	94.5	96.3	$86,250	$0	$0	$86,250	28.8%
TK-204 - Bay Road Tank	Potable Tank - Distribution	$600,000	0.21	0.28	0.44	0.07	0.00	0.79	0.51	0.07	40.2	71.4	90.8	94.2	94.5	96.3	$172,500	$0	$0	$172,500	28.8%
TK-206 - SANTA VENETIA TANK	Potable Tank - Distribution	$1,550,000	0.00	0.00	0.11	0.56	0.33	1.00	1.00	0.89	13.5	17.0	22.6	24.9	28.8	48.0	$1,271,155	$0	$0	$1,271,155	82.0%
TK-207 - GOODHILL ROAD TANK	Potable Tank - Distribution	$300,000	0.21	0.28	0.44	0.07	0.00	0.79	0.51	0.07	40.2	71.4	90.8	94.2	94.5	96.3	$86,250	$0	$0	$86,250	28.8%
TK-208 - SPRING LANE TANK #2	Potable Tank - Distribution	$7,500,000	0.21	0.28	0.44	0.07	0.00	0.79	0.51	0.07	40.2	71.4	90.8	94.2	94.5	96.3	$2,156,250	$0	$0	$2,156,250	28.8%
TK-209 - FAIRHILLS TOP TANK #2	Potable Tank - Distribution	$300,000	0.08	0.19	0.54	0.18	0.00	0.92	0.73	0.19	28.3	56.0	80.1	84.5	85.5	90.3	$121,560	$0	$0	$121,560	40.5%
TK-210 - BEACON HILL TANK	Potable Tank - Distribution	$500,000	0.20	0.27	0.42	0.11	0.01	0.80	0.53	0.12	38.8	68.6	87.0	90.3	90.9	93.8	$157,350	$0	$0	$157,350	31.5%

TK-211 - Kent Fire Trail Tank #1	Potable Tank - Distribution	$500,000	0.20	0.27	0.42	0.11	0.01	0.80	0.53	0.12	38.8	68.6	87.0	90.3	90.9	93.8	$157,350	$0	$0	$157,350	31.5%
TK-212 - Kent Fire Trail Tank #2	Potable Tank - Distribution	$500,000	0.20	0.27	0.42	0.11	0.01	0.80	0.53	0.12	38.8	68.6	87.0	90.3	90.9	93.8	$157,350	$0	$0	$157,350	31.5%
TK-213 - MARIN CITY TANK	Potable Tank - Distribution	$1,000,000	0.16	0.21	0.33	0.25	0.05	0.84	0.63	0.30	33.5	57.2	72.0	75.0	76.5	83.6	$423,500	$0	$0	$423,500	42.4%
TK-214 - SLIDE GULCH TANK	Potable Tank - Distribution	$485,870	0.35	0.22	0.17	0.21	0.05	0.65	0.43	0.26	48.8	68.8	76.7	78.5	79.7	85.7	$159,900	$0	$0	$159,900	32.9%
TK-215 - SEQUOIA PARK TANK #1	Potable Tank - Distribution	$550,000	0.08	0.19	0.54	0.18	0.00	0.92	0.73	0.19	28.3	56.0	80.1	84.5	85.5	90.3	$222,860	$0	$0	$222,860	40.5%
TK-216 - SEQUOIA PARK TANK #2	Potable Tank - Distribution	$250,000	0.08	0.19	0.54	0.18	0.00	0.92	0.73	0.19	28.3	56.0	80.1	84.5	85.5	90.3	$101,300	$0	$0	$101,300	40.5%
TK-217 - KENT WOODLANDS 1ST LIFT TANK	Potable Tank - Distribution	$500,000	0.21	0.28	0.44	0.07	0.00	0.79	0.51	0.07	40.2	71.4	90.8	94.2	94.5	96.3	$143,750	$0	$0	$143,750	28.8%
TK-218 - MOUNT TIBURON TANK #2	Potable Tank - Distribution	$2,950,000	0.06	0.14	0.41	0.34	0.05	0.94	0.80	0.39	24.5	45.4	63.7	67.5	69.4	78.9	$1,516,005	$0	$0	$1,516,005	51.4%
TK-219 - OAK MANOR FIRST LIFT TANK	Potable Tank - Distribution	$500,000	0.16	0.21	0.33	0.25	0.05	0.84	0.63	0.30	33.5	57.2	72.0	75.0	76.5	83.6	$211,750	$0	$0	$211,750	42.4%
TK-220 - TAM WOODS TOP TANK	Potable Tank - Distribution	$400,000	0.38	0.24	0.19	0.16	0.04	0.62	0.38	0.20	51.7	73.4	81.8	83.6	84.5	89.1	$114,752	$0	$0	$114,752	28.7%
TK-221 - SUMMIT AVENUE LOWER TANK	Potable Tank - Distribution	$500,000	0.46	0.29	0.23	0.01	0.00	0.54	0.24	0.01	60.4	86.9	97.0	98.7	98.8	99.2	$81,130	$0	$0	$81,130	16.2%
TK-222 - FRIAR TUCK LANE TANK	Potable Tank - Distribution	$625,000	0.02	0.08	0.41	0.43	0.06	0.98	0.90	0.48	20.2	37.1	55.8	59.8	62.2	74.0	$362,063	$0	$0	$362,063	57.9%
TK-223 - CASCADE TANK #1	Potable Tank - Distribution	$300,000	0.21	0.28	0.44	0.07	0.00	0.79	0.51	0.07	40.2	71.4	90.8	94.2	94.5	96.3	$86,250	$0	$0	$86,250	28.8%
TK-224 - CASCADE TANK #2	Potable Tank - Distribution	$300,000	0.21	0.28	0.44	0.07	0.00	0.79	0.51	0.07	40.2	71.4	90.8	94.2	94.5	96.3	$86,250	$0	$0	$86,250	28.8%
TK-225 - SUGARLOAF TANK #1	Potable Tank - Distribution	$635,000	0.06	0.14	0.41	0.34	0.05	0.94	0.80	0.39	24.5	45.4	63.7	67.5	69.4	78.9	$326,327	$0	$0	$326,327	51.4%
TK-226 - SUGARLOAF TANK #2	Potable Tank - Distribution	$635,000	0.06	0.14	0.41	0.34	0.05	0.94	0.80	0.39	24.5	45.4	63.7	67.5	69.4	78.9	$326,327	$0	$0	$326,327	51.4%
TK-228 - GLENWOOD FOREST TANK	Potable Tank - Distribution	$450,000	0.01	0.03	0.31	0.56	0.10	0.99	0.96	0.65	17.0	27.9	42.0	45.5	48.8	64.5	$302,166	$0	$0	$302,166	67.1%
TK-229 - KENT FIRE TRAIL TOP TANK	Potable Tank - Distribution	$50,000	0.20	0.27	0.42	0.11	0.01	0.80	0.53	0.12	38.8	68.6	87.0	90.3	90.9	93.8	$15,735	$0	$0	$15,735	31.5%
TK-230 - SWIG TANK	Potable Tank - Distribution	$250,000	0.07	0.16	0.45	0.29	0.04	0.93	0.78	0.33	25.6	48.5	68.5	72.4	74.1	82.2	$120,570	$0	$0	$120,570	48.2%
TK-232 - SKY RANCH TANK	Potable Tank - Distribution	$600,000	0.08	0.19	0.54	0.18	0.00	0.92	0.73	0.19	28.3	56.0	80.1	84.5	85.5	90.3	$243,120	$0	$0	$243,120	40.5%
TK-233 - FAIRFAX MANOR TOP TANK	Potable Tank - Distribution	$540,000	0.16	0.21	0.33	0.25	0.05	0.84	0.63	0.30	33.5	57.2	72.0	75.0	76.5	83.6	$228,690	$0	$0	$228,690	42.4%
TK-234 - TAM WOODS FIRST LIFT TANK	Potable Tank - Distribution	$425,000	0.44	0.28	0.22	0.05	0.01	0.56	0.28	0.06	58.1	83.3	92.9	94.7	95.0	96.5	$83,105	$0	$0	$83,105	19.6%
TK-235 - FAIRVIEW PARK TANK	Potable Tank - Distribution	$500,000	0.35	0.22	0.17	0.21	0.05	0.65	0.43	0.26	48.8	68.8	76.7	78.5	79.7	85.7	$164,550	$0	$0	$164,550	32.9%
TK-236 - FERN CANYON TANK	Potable Tank - Distribution	$150,000	0.46	0.29	0.23	0.01	0.00	0.54	0.24	0.01	60.4	86.9	97.0	98.7	98.8	99.2	$24,339	$0	$0	$24,339	16.2%
TK-237 - CONIFER WAY UPPER TANK	Potable Tank - Distribution	$500,000	0.21	0.28	0.44	0.07	0.00	0.79	0.51	0.07	40.2	71.4	90.8	94.2	94.5	96.3	$143,750	$0	$0	$143,750	28.8%
TK-238 - OAK AVENUE TANK	Potable Tank - Distribution	$500,000	0.16	0.21	0.33	0.25	0.05	0.84	0.63	0.30	33.5	57.2	72.0	75.0	76.5	83.6	$211,750	$0	$0	$211,750	42.4%
TK-239 - ELINOR AVE TANK	Potable Tank - Distribution	$565,000	0.16	0.21	0.33	0.25	0.05	0.84	0.63	0.30	33.5	57.2	72.0	75.0	76.5	83.6	$239,278	$0	$0	$239,278	42.4%
TK-241 - LAGUNITAS PICNIC GROUNDS TANK	Potable Tank - Distribution	$2,750	0.59	0.22	0.13	0.05	0.01	0.41	0.19	0.06	69.3	88.2	94.1	95.2	95.5	96.8	$398	$0	$0	$398	14.5%
TK-009 - SAN CLEMENTE TANK	Potable Tank - Gravity	$7,500,000	0.03	0.10	0.52	0.34	0.02	0.97	0.87	0.35	22.0	43.0	66.1	70.7	72.5	81.4	$3,851,700	$0	$0	$3,851,700	51.4%
TK-011 - CA ⊢æON VILLAGE TANK	Potable Tank - Gravity	$7,500,000	0.16	0.21	0.33	0.25	0.05	0.84	0.63	0.30	33.5	57.2	72.0	75.0	76.5	83.6	$3,176,250	$0	$0	$3,176,250	42.4%
TK-012 - FAIRFAX GRADE TANK	Potable Tank - Gravity	$2,500,000	0.21	0.28	0.44	0.07	0.00	0.79	0.51	0.07	40.2	71.4	90.8	94.2	94.5	96.3	$718,750	$0	$0	$718,750	28.8%
TK-027 - GREENBRAE TANK	Potable Tank - Gravity	$7,500,000	0.02	0.08	0.39	0.45	0.06	0.98	0.90	0.52	19.7	35.6	53.2	57.1	59.7	72.2	$4,467,750	$0	$0	$4,467,750	59.6%
TK-030 - ESCALLE TANK	Potable Tank - Gravity	$5,000,000	0.02	0.08	0.39	0.45	0.06	0.98	0.90	0.52	19.7	35.6	53.2	57.1	59.7	72.2	$2,978,700	$0	$0	$2,978,700	59.6%
TK-064 - STRAWBERRY TANK	Potable Tank - Gravity	$7,500,000	0.16	0.21	0.33	0.25	0.05	0.84	0.63	0.30	33.5	57.2	72.0	75.0	76.5	83.6	$3,176,250	$0	$0	$3,176,250	42.4%
TK-083 - GLENWOOD TANK	Potable Tank - Gravity	$7,500,000	0.00	0.02	0.28	0.58	0.12	1.00	0.98	0.70	16.2	25.3	38.4	41.9	45.3	61.9	$5,228,850	$0	$0	$5,228,850	69.7%
TK-087 - LOCH LOMOND TANK	Potable Tank - Gravity	$5,000,000	0.02	0.08	0.41	0.43	0.05	0.98	0.90	0.48	20.2	37.1	55.9	59.9	62.3	74.1	$2,893,100	$0	$0	$2,893,100	57.9%
TK-089 - LOS RANCHITOS TANK	Potable Tank - Gravity	$5,000,000	0.07	0.16	0.45	0.29	0.04	0.93	0.78	0.33	25.6	48.5	68.5	72.4	74.1	82.2	$2,411,400	$0	$0	$2,411,400	48.2%
TK-090 - MARINWOOD TANK	Potable Tank - Gravity	$2,500,000	0.01	0.04	0.33	0.54	0.09	0.99	0.96	0.63	17.3	28.8	43.9	47.5	50.6	65.8	$1,649,300	$0	$0	$1,649,300	66.0%
TK-091 - MARIN PROFESSIONAL CENTER TANK	Potable Tank - Gravity	$1,250,000	0.00	0.01	0.13	0.61	0.25	1.00	0.99	0.86	14.1	18.4	25.2	27.7	31.6	50.9	$991,075	$0	$0	$991,075	79.3%
TK-094 - MILLER CREEK TANK	Potable Tank - Gravity	$2,500,000	0.08	0.19	0.54	0.18	0.00	0.92	0.73	0.19	28.3	56.0	80.1	84.5	85.5	90.3	$1,013,000	$0	$0	$1,013,000	40.5%
TK-096 - PUERTO SUELLO TANK	Potable Tank - Gravity	$7,500,000	0.02	0.08	0.39	0.45	0.06	0.98	0.90	0.52	19.7	35.6	53.2	57.1	59.7	72.2	$4,467,750	$0	$0	$4,467,750	59.6%
TK-098 - SANTA MARGARITA TANK	Potable Tank - Gravity	$7,500,000	0.02	0.08	0.43	0.42	0.05	0.98	0.89	0.47	20.4	37.7	57.0	61.0	63.4	74.9	$4,288,650	$0	$0	$4,288,650	57.2%
TK-106 - LUCAS VALLEY TANK	Potable Tank - Gravity	$7,500,000	0.06	0.14	0.41	0.34	0.05	0.94	0.80	0.39	24.5	45.4	63.7	67.5	69.4	78.9	$3,854,250	$0	$0	$3,854,250	51.4%
TK-113 - SAUSALITO PUMP HOUSE TANK #1	Potable Tank - Gravity	$1,550,000	0.02	0.08	0.39	0.45	0.06	0.98	0.90	0.52	19.7	35.6	53.2	57.1	59.7	72.2	$923,397	$0	$0	$923,397	59.6%
TK-114 - SAUSALITO PUMP HOUSE TANK #2	Potable Tank - Gravity	$1,550,000	0.02	0.08	0.39	0.45	0.06	0.98	0.90	0.52	19.7	35.6	53.2	57.1	59.7	72.2	$923,397	$0	$0	$923,397	59.6%
TK-125 - TENNESSEE VALLEY TANK	Potable Tank - Gravity	$5,000,000	0.20	0.27	0.42	0.11	0.01	0.80	0.53	0.12	38.8	68.6	87.0	90.3	90.9	93.8	$1,573,500	$0	$0	$1,573,500	31.5%
TK-127 - PARADISE DRIVE TANK	Potable Tank - Gravity	$5,000,000	0.06	0.14	0.41	0.34	0.05	0.94	0.80	0.39	24.5	45.4	63.7	67.5	69.4	78.9	$2,569,500	$0	$0	$2,569,500	51.4%
TK-130 - SPRING LANE TANK #1	Potable Tank - Gravity	$7,500,000	0.21	0.28	0.44	0.07	0.00	0.79	0.51	0.07	40.2	71.4	90.8	94.2	94.5	96.3	$2,156,250	$0	$0	$2,156,250	28.8%
TK-159 - PEACOCK GAP TANK	Potable Tank - Gravity	$2,500,000	0.03	0.09	0.38	0.44	0.06	0.97	0.88	0.50	20.6	37.6	54.9	58.8	61.2	73.3	$1,451,650	$0	$0	$1,451,650	58.1%
TK-160 - MARIN BAY TANK	Potable Tank - Gravity	$600,000	0.00	0.01	0.23	0.61	0.15	1.00	0.98	0.76	15.5	22.9	33.6	36.7	40.3	58.1	$437,664	$0	$0	$437,664	72.9%
TK-175 - MARINSHIP TANK	Potable Tank - Gravity	$7,500,000	0.08	0.19	0.49	0.23	0.01	0.92	0.73	0.24	27.8	54.1	76.0	80.1	81.4	87.4	$3,213,900	$0	$0	$3,213,900	42.9%
TK-152 - MADERA PARK (H/P) TANK	Potable Tank - Pressure System	$7,500	0.06	0.14	0.41	0.34	0.05	0.94	0.80	0.39	24.5	45.4	63.7	67.5	69.4	78.9	$3,854	$0	$0	$3,854	51.4%
TK-153 - RAFAEL HIGHLANDS (H/P) TANK	Potable Tank - Pressure System	$12,500	0.08	0.19	0.54	0.18	0.00	0.92	0.73	0.19	28.3	56.0	80.1	84.5	85.5	90.3	$5,065	$0	$0	$5,065	40.5%
TK-168 - MCNEAR DRIVE #1 (H/P) TANK	Potable Tank - Pressure System	$5,000	0.00	0.01	0.21	0.61	0.16	1.00	0.98	0.77	15.3	22.3	32.4	35.4	39.1	57.1	$3,688	$0	$0	$3,688	73.8%
TK-169 - MCNEAR DRIVE #2 (H/P) TANK	Potable Tank - Pressure System	$7,500	0.00	0.01	0.21	0.61	0.16	1.00	0.98	0.77	15.3	22.3	32.4	35.4	39.1	57.1	$5,532	$0	$0	$5,532	73.8%
TK-174 - VIA MONTEBELLO (H/P) TANK	Potable Tank - Pressure System	$17,500	0.00	0.01	0.18	0.60	0.21	1.00	0.99	0.81	14.6	20.2	28.9	31.6	35.4	54.0	$13,417	$0	$0	$13,417	76.7%
TK-195 - Fire Road Pressure Tank	Potable Tank - Pressure System	$5,000	0.16	0.21	0.33	0.25	0.05	0.84	0.63	0.30	33.5	57.2	72.0	75.0	76.5	83.6	$2,118	$0	$0	$2,118	42.4%
TK-205 - RICHARDSON DRIVE (H/P) TANK	Potable Tank - Pressure System	$5,000	0.21	0.28	0.44	0.07	0.00	0.79	0.51	0.07	40.2	71.4	90.8	94.2	94.5	96.3	$1,438	$0	$0	$1,438	28.8%
TK-145 - ROSS RESERVOIR	Potable Tank - Reservoir	$5,000,000	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.0	100.0	100.0	100.0	100.0	100.0	$0	$0	$0	$0	0.0%
TK-146 - FORBES HILL RESERVOIR	Potable Tank - Reservoir	$20,000,000	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.0	100.0	100.0	100.0	100.0	100.0	$0	$0	$0	$0	0.0%
TK-046 - ALTO TANK #1	Potable Tank - Transmission	$15,000,000	0.21	0.28	0.44	0.07	0.00	0.79	0.51	0.07	40.2	71.4	90.8	94.2	94.5	96.3	$4,312,500	$0	$0	$4,312,500	28.8%
TK-055 - MILL VALLEY TANK	Potable Tank - Transmission	$25,000,000	0.46	0.29	0.23	0.01	0.00	0.54	0.24	0.01	60.4	86.9	97.0	98.7	98.8	99.2	$4,056,500	$0	$0	$4,056,500	16.2%
TK-069 - HAWTHORNE HILLS UPPER TANK	Potable Tank - Transmission	$10,000,000	0.08	0.19	0.54	0.18	0.00	0.92	0.73	0.19	28.3	56.0	80.1	84.5	85.5	90.3	$4,052,000	$0	$0	$4,052,000	40.5%
TK-131 - CONIFER WAY TANK	Potable Tank - Transmission	$2,500,000	0.16	0.21	0.33	0.25	0.05	0.84	0.63	0.30	33.5	57.2	72.0	75.0	76.5	83.6	$1,058,750	$0	$0	$1,058,750	42.4%
TK-147 - SMITH SADDLE TANK #1	Potable Tank - Transmission	$25,000,000	0.16	0.21	0.33	0.25	0.05	0.84	0.63	0.30	33.5	57.2	72.0	75.0	76.5	83.6	$10,587,500	$0	$0	$10,587,500	42.4%
TK-148 - SMITH SADDLE TANK #2	Potable Tank - Transmission	$20,000,000	0.20	0.27	0.42	0.11	0.01	0.80	0.53	0.12	38.8	68.6	87.0	90.3	90.9	93.8	$7,867,500	$0	$0	$7,867,500	31.5%
TK-155 - PINE MOUNTAIN TUNNEL TANK	Potable Tank - Transmission	$15,000,000	0.75	0.00	0.00	0.02	0.23	0.25	0.25	0.25	77.6	77.7	78.0	78.4	79.1	82.9	$3,665,100	$0	$0	$3,665,100	24.4%
TK-165 - ALTO TANK #2	Potable Tank - Transmission	$15,000,000	0.16	0.21	0.33	0.25	0.05	0.84	0.63	0.30	33.5	57.2	72.0	75.0	76.5	83.6	$6,352,500	$0	$0	$6,352,500	42.4%
TK-184 - PACHECO RIDGE TANK #1	Potable Tank - Transmission	$15,000,000	0.00	0.01	0.21	0.61	0.16	1.00	0.98	0.77	15.3	22.3	32.4	35.4	39.1	57.1	$11,063,100	$0	$0	$11,063,100	73.8%
TK-185 - PACHECO RIDGE TANK #2	Potable Tank - Transmission	$15,000,000	0.00	0.01	0.23	0.61	0.15	1.00	0.98	0.76	15.5	22.9	33.6	36.7	40.3	58.1	$10,941,600	$0	$0	$10,941,600	72.9%
Bon Tempe Treatment Plant	Potable Treatment Plant	$100,000,000	0.34	0.28	0.29	0.08	0.01	0.66	0.37	0.08	59.8	87.6	93.1	93.6	95.1	99.2	$20,578,200	$0	$0	$20,578,200	20.6%
San Geronimo Treatment Plant	Potable Treatment Plant	$100,000,000	0.35	0.29	0.29	0.06	0.01	0.65	0.36	0.07	60.7	88.9	94.5	94.9	96.1	99.4	$19,475,400	$0	$0	$19,475,400	19.5%
Potable Total/Averages			**21%**	**21%**	**34%**	**21%**	**4%**	**0.79**	**0.59**	**0.25**										**$383,195,711**	
PS-028 - Kent Lake Pump Station	Raw Pump Station	$5,000,000	0.62	0.23	0.14	0.01	0.00	0.38	0.15	0.01	79.7	92.1	98.3	99.5	99.9	99.9	$354,380	$0	$0	$354,380	7.1%
PS-029 - Phoenix Lake Barge Pump	Raw Pump Station	$5,000,000	0.36	0.30	0.30	0.04	0.00	0.64	0.34	0.04	61.8	81.1	94.9	98.1	99.7	99.9	$801,765	$0	$0	$801,765	16.0%
PS-031 - Soulajule Pump Station	Raw Pump Station	$5,000,000	0.62	0.23	0.14	0.01	0.00	0.38	0.15	0.01	79.4	91.8	98.0	99.3	99.8	99.9	$369,505	$0	$0	$369,505	7.4%
PS-097 - Tocaloma Booster Pump Station	Raw Pump Station	$5,000,000	0.66	0.19	0.09	0.05	0.01	0.34	0.16	0.06	80.2	89.7	94.3	96.4	99.0	99.9	$484,375	$0	$0	$484,375	9.7%
PS-128 - Alpine Bon-Tempe Pump Station	Raw Pump Station	$5,000,000	0.62	0.23	0.14	0.01	0.00	0.38	0.15	0.01	79.7	92.1	98.3	99.5	99.9	99.9	$354,380	$0	$0	$354,380	7.1%
Raw Total/Averages			**57%**	**24%**	**16%**	**2%**	**0%**	**0.43**	**0.19**	**0.03**										**$2,364,405**	
PS-049 - Channing Way Pump Station	Recycled Pump Station	$5,000,000	0.00	0.03	0.27	0.58	0.11	1.00	0.97	0.70	14.5	25.3	43.9	61.9	90.1	99.9	$3,424,015	$0	$0	$3,424,015	68.5%
PS-111 - Quail Hill Pump Station	Recycled Pump Station	$5,000,000	0.04	0.13	0.51	0.32	0.01	0.96	0.84	0.33	26.0	45.6	71.6	83.8	97.7	99.9	$2,322,765	$0	$0	$2,322,765	46.5%
PS-112 - Freitas Parkway Pump Station	Recycled Pump Station	$5,000,000	0.08	0.20	0.52	0.20	0.00	0.92	0.72	0.20	34.3	56.2	81.2	90.2	98.8	99.9	$1,835,360	$0	$0	$1,835,360	36.7%
TK-103 - TERRA LINDA TANK #1	Recycled Tank - Gravity	$2,500,000	0.01	0.03	0.31	0.56	0.10	0.99	0.96	0.65	17.0	27.9	42.0	45.5	48.8	64.5	$1,678,700	$0	$0	$1,678,700	67.1%
TK-170 - TERRA LINDA TANK #2	Recycled Tank - Gravity	$2,500,000	0.01	0.03	0.31	0.56	0.10	0.99	0.96	0.65	17.0	27.9	42.0	45.5	48.8	64.5	$1,678,700	$0	$0	$1,678,700	67.1%
TK-227 - LGWRP Clearwell	Recycled Tank - Reservoir	$4,500,000	0.00	0.00	0.01	0.22	0.77	1.00	1.00	0.99	10.9	11.6	12.9	14.3	17.7	34.4	$4,268,610	$0	$0	$4,268,610	94.9%
Las Gallinas Treatment Plant	Recycled Treatment Plant	$0	0.00	0.00	0.01	0.22	0.77	1.00	1.00	0.99	0.8	1.3	2.2	3.0	6.0	30.8	$0	$0	$0	**$15,208,150**	#DIV/0!
Recycled Total/Averages			**2%**	**6%**	**28%**	**38%**	**27%**	**0.98**	**0.92**	**0.64**											

Pipelines		
Type	**Miles of Pipeline**	**Replacement Cost**
Potable Water - Distribution Main	761.0	$2,209,823,037
Potable Water - Lateral	229.4	$181,682,836
Potable Water - Main	0.1	$200,899
Potable Water - Transmission Main	92.1	$388,893,185
Raw Water - Distribution Main	4.7	$13,679,943
Raw Water - Transmission Main	25.6	$108,036,492
Recycled Water - Lateral	2.1	$1,676,612
Recycled Water - Main	24.4	$70,806,587
Recycled Water - Other	0.3	$828,973
Total	**1,139.6**	**$2,975,628,563**

Number of Leaks	**Number of Leaks**	**Number of Breaks**	**Total Number of Repairs**	**Days to Repair Leaks**	**Days to Repair Breaks**	**Total Days to Repair**
Potable Water - Distribution Main	181.0	45.2	226.2	25.3	6.3	31.7
Potable Water - Lateral	90.1	22.5	112.6	12.6	3.2	15.8
Potable Water - Main	0.0	0.0	0.0	0.0	0.0	0.0
Potable Water - Transmission Main	14.1	3.5	17.6	2.5	0.6	3.1
Potable Total	**285.1**	**71.3**	**356.4**	**40.5**	**10.1**	**50.6**
Economic Loss	**$2,851,245.83**	**$712,811.46**	**$3,564,057.29**			
Raw Water - Distribution Main	1.5	0.4	1.9	0.2	0.1	0.3
Raw Water - Transmission Main	7.9	2.0	9.9	2.2	0.6	2.8
Raw Total	**9.4**	**2.3**	**11.7**	**2.4**	**0.6**	**3.1**
Economic Loss	**$93,858.61**	**$23,464.65**	**$117,323.26**			
Recycled Water - Lateral	0.7	0.2	0.9	0.1	0.0	0.1
Recycled Water - Main	2.7	0.7	3.4	0.4	0.1	0.5
Recycled Water - Other	0.0	0.0	0.1	0.0	0.0	0.0
Recycled Total	**3.5**	**0.9**	**4.3**	**0.5**	**0.1**	**0.6**
Economic Loss	**$34,784.21**	**$8,696.05**	**$43,480.26**			
Grand Total	**298.0**	**74.5**	**372.5**	**43.4**	**10.8**	**54.2**

Cost to Repair a Leak	**Cost to Repair a Break**	**Economic Loss**
$10,000	$10,000	$3,724,861

Facilities

Facility Name	**Type**	**Replacement Cost**	**Probability of Damage State**								**Percent Functionality After**						**Economic Loss**				
			None	**Slight**	**Moderate**	**Extensive**	**Complete**	**Exceed Slight**	**Exceed Moderate**	**Exceed Extensive**	**Day 1**	**Day 3**	**Day 7**	**Day 14**	**Day 30**	**Day 90**	**Structure Loss**	**Nonstructural Drift-Sensitive Loss**	**Nonstructural Acceleration-Sensitive Loss**	**Total**	**% of Replacement Cost**
Administration Building - Headquarter Office	Building	$12,300,000	0.00	0.05	0.59	0.32	0.04	1.00	0.95	0.36	0.1	0.3	5.2	5.2	64.2	96.4	$603,925	$1,503,965	$394,788	$2,502,679	20.3%
Corporation Yard - Boat Barn	Building	$1,000,000	0.00	0.00	0.09	0.50	0.41	1.00	1.00	0.91	0.0	0.0	0.2	0.2	9.3	59.3	$215,544	$159,930	$151,008	$526,481	52.6%
Corporation Yard - Facilities Offices	Building	$15,000,000	0.00	0.05	0.59	0.32	0.04	1.00	0.95	0.36	0.1	0.3	5.2	5.2	64.2	96.4	$736,494	$1,834,104	$522,380	$3,092,978	20.6%
Corporation Yard - Laboratory	Building	$6,500,000	0.00	0.05	0.59	0.32	0.04	1.00	0.95	0.36	0.1	0.3	5.2	5.2	64.2	96.4	$319,147	$794,778	$208,628	$1,322,554	20.3%
Corporation Yard - Satellite Office	Building	$500,000	0.00	0.04	0.41	0.46	0.09	1.00	0.96	0.55	0.0	0.2	3.6	3.7	44.9	90.6	$34,872	$75,333	$43,960	$154,164	30.8%
Pelican Yard - Vehicle Storage	Building	$500,000	0.00	0.01	0.20	0.61	0.17	1.00	0.98	0.78	0.1	0.2	1.5	1.5	21.7	82.7	$80,596	$55,668	$48,244	$184,508	36.9%
Pelican Yard - Vehicle Storage	Building	$800,000	0.00	0.02	0.27	0.58	0.13	1.00	0.98	0.71	0.1	0.2	2.0	2.1	29.0	87.0	$115,653	$72,828	$48,619	$237,100	29.6%
Ranger Housing - Alpine Dam - Residence	Building	$500,000	0.12	0.46	0.26	0.13	0.03	0.88	0.42	0.16	11.6	13.8	57.7	57.8	83.9	96.9	$15,256	$37,254	$19,110	$71,620	14.3%
Ranger Housing - Lagunitas Dam - Garage	Building	$300,000	0.04	0.12	0.50	0.32	0.01	0.96	0.84	0.34	3.5	4.1	15.9	16.0	66.4	98.6	$21,982	$11,568	$8,923	$42,473	14.2%
Ranger Housing - Lagunitas Dam - Residence	Building	$500,000	0.23	0.44	0.12	0.16	0.04	0.77	0.33	0.20	23.3	25.4	67.2	67.4	79.7	95.9	$16,685	$38,188	$19,597	$74,469	14.9%
Ranger Housing - Phoenix Dam - Log Cabin	Building	$100,000	0.44	0.48	0.08	0.00	0.00	0.56	0.08	0.00	43.6	45.9	91.5	91.6	99.9	99.9	$439	$1,360	$1,591	$3,390	3.4%
Ranger Housing - Phoenix Dam - Residence	Building	$500,000	0.35	0.38	0.07	0.16	0.04	0.65	0.27	0.20	34.9	36.7	73.2	73.3	79.9	95.9	$15,782	$35,440	$18,129	$69,351	13.9%
Ranger Housing - Phoenix Dam - Shed	Building	$100,000	0.06	0.15	0.39	0.35	0.05	0.94	0.79	0.40	6.3	7.0	21.1	21.2	59.9	94.7	$8,666	$5,904	$6,229	$20,799	20.8%
Ranger Housing - Porteous House	Building	$600,000	0.44	0.48	0.08	0.00	0.00	0.56	0.08	0.00	43.6	45.9	91.5	91.6	99.9	99.9	$2,834	$8,158	$9,546	$20,338	3.4%
Ranger Housing - Porteous House - Garage	Building	$300,000	0.07	0.16	0.41	0.32	0.04	0.93	0.77	0.36	6.7	7.4	22.5	22.6	63.9	95.7	$23,834	$15,710	$16,286	$55,830	18.6%
Ranger Housing - Porteous House - Shed	Building	$100,000	0.06	0.15	0.39	0.35	0.05	0.94	0.79	0.40	6.3	7.0	21.1	21.2	59.9	94.7	$8,666	$5,904	$6,229	$20,799	20.8%
Ranger Housing - Porteous House - Shed	Building	$100,000	0.06	0.15	0.39	0.35	0.05	0.94	0.79	0.40	6.3	7.0	21.1	21.2	59.9	94.7	$8,666	$5,904	$6,229	$20,799	20.8%
Ranger Housing - Sky Oaks - Residence	Building	$1,700,000	0.29	0.42	0.09	0.16	0.04	0.71	0.29	0.20	28.8	30.8	70.5	70.6	79.8	95.9	$55,076	$124,824	$62,733	$242,634	14.3%
Ranger Housing - Soulajule Residence	Building	$500,000	0.22	0.41	0.12	0.20	0.05	0.78	0.37	0.25	21.9	23.9	63.0	63.2	74.7	94.9	$20,032	$45,176	$22,059	$87,267	17.5%
Sky Oaks Headquarters - Entrance Kiosk	Building	$100,000	0.10	0.45	0.29	0.12	0.03	0.90	0.45	0.15	10.4	12.6	55.3	55.4	84.7	97.0	$2,475	$4,923	$4,936	$12,335	12.3%
Sky Oaks Headquarters - Fisheries Office (Fish Box)	Building	$300,000	0.12	0.53	0.34	0.01	0.00	0.88	0.35	0.01	12.2	14.7	64.7	64.9	99.1	99.9	$2,819	$7,211	$6,146	$16,576	5.5%
Sky Oaks Headquarters - Headquarter Office	Building	$700,000	0.12	0.53	0.34	0.01	0.00	0.88	0.35	0.01	12.2	14.7	64.7	64.9	99.1	99.9	$6,578	$16,827	$15,274	$38,678	5.5%
Sky Oaks Headquarters - Natural Resources Office (Sky Box	Building	$700,000	0.12	0.53	0.34	0.01	0.00	0.88	0.35	0.01	12.2	14.7	64.7	64.9	99.1	99.9	$6,578	$16,827	$15,274	$38,678	5.5%
Sky Oaks Headquarters - Seed Shed	Building	$200,000	0.04	0.13	0.51	0.32	0.01	0.96	0.84	0.33	3.5	4.1	16.1	16.1	67.2	98.9	$14,387	$7,446	$5,090	$26,923	13.5%
Sky Oaks Headquarters - Storage Shed	Building	$200,000	0.03	0.10	0.41	0.41	0.05	0.97	0.87	0.46	2.8	3.3	12.9	12.9	53.7	94.9	$19,335	$12,349	$11,411	$43,095	21.5%
Administrative Total/Averages			**12%**	**25%**	**32%**	**26%**	**6%**													**$8,926,517**	
PS-001 - Federal Works Booster Pump Station	Potable Pump Station	$5,000,000	0.01	0.06	0.37	0.49	0.06	0.99	0.93	0.55	18.5	32.8	54.8	70.8	93.6	99.9	$3,002,825	$0	$0	$3,002,825	60.1%
PS-002 - Chapman Park Pump Station	Potable Pump Station	$5,000,000	0.01	0.07	0.45	0.43	0.03	0.99	0.91	0.46	20.5	37.0	61.7	76.6	96.0	99.9	$2,750,450	$0	$0	$2,750,450	55.0%
PS-003 - Summit Drive Pump Station PS-003	Potable Pump Station	$5,000,000	0.04	0.13	0.51	0.32	0.01	0.96	0.84	0.33	26.0	45.6	71.6	83.8	97.7	99.9	$2,322,765	$0	$0	$2,322,765	46.5%
PS-005 - H-Line Booster Station	Potable Pump Station	$5,000,000	0.07	0.16	0.41	0.32	0.04	0.93	0.77	0.36	29.2	47.5	69.3	80.9	95.8	99.9	$2,308,355	$0	$0	$2,308,355	46.2%
PS-006 - Madera Park Pump Station	Potable Pump Station	$5,000,000	0.01	0.06	0.34	0.52	0.08	0.99	0.93	0.60	17.6	30.8	51.6	68.2	92.6	99.9	$3,118,625	$0	$0	$3,118,625	62.4%
PS-007 - Mariner Highlands Pump Station	Potable Pump Station	$5,000,000	0.01	0.06	0.36	0.50	0.07	0.99	0.93	0.57	18.2	32.1	53.7	69.9	93.3	99.9	$3,043,160	$0	$0	$3,043,160	60.9%
PS-010 - Cascade Pump Station	Potable Pump Station	$5,000,000	0.04	0.13	0.51	0.32	0.01	0.96	0.84	0.33	26.0	45.6	71.6	83.8	97.7	99.9	$2,322,765	$0	$0	$2,322,765	46.5%
PS-011 - Fairfax Manor 1st Pump Station	Potable Pump Station	$5,000,000	0.04	0.13	0.51	0.32	0.01	0.96	0.84	0.33	26.0	45.6	71.6	83.8	97.7	99.9	$2,322,765	$0	$0	$2,322,765	46.5%
PS-012 - Fairfax Manor 2nd Lift Pump Station	Potable Pump Station	$5,000,000	0.03	0.09	0.38	0.44	0.06	0.97	0.88	0.50	21.7	37.3	59.1	73.7	94.1	99.9	$2,794,015	$0	$0	$2,794,015	55.9%
PS-013 - Oak Manor 1st Lift Pump Station	Potable Pump Station	$5,000,000	0.08	0.20	0.52	0.20	0.00	0.92	0.72	0.20	34.3	56.2	81.2	90.2	98.8	99.9	$1,835,360	$0	$0	$1,835,360	36.7%
PS-014 - Oak Manor 2nd Lift Pump Station	Potable Pump Station	$5,000,000	0.06	0.15	0.39	0.35	0.05	0.94	0.79	0.40	27.9	45.3	66.3	78.6	95.0	99.9	$2,426,645	$0	$0	$2,426,645	48.5%
PS-016 - Scott Pump Station	Potable Pump Station	$5,000,000	0.03	0.09	0.38	0.44	0.06	0.97	0.88	0.50	21.7	37.3	59.1	73.7	94.1	99.9	$2,794,015	$0	$0	$2,794,015	55.9%
PS-017 - Smith Saddle Booster Station	Potable Pump Station	$5,000,000	0.08	0.20	0.52	0.20	0.00	0.92	0.72	0.20	34.3	56.2	81.2	90.2	98.8	99.9	$1,835,360	$0	$0	$1,835,360	36.7%
PS-019 - Bret Harte Pump Station	Potable Pump Station	$5,000,000	0.00	0.03	0.27	0.58	0.11	1.00	0.97	0.70	14.5	25.3	43.9	61.9	90.1	99.9	$3,424,015	$0	$0	$3,424,015	68.5%
PS-020 - Greenbrae Pump Station	Potable Pump Station	$5,000,000	0.03	0.09	0.38	0.44	0.06	0.97	0.88	0.50	21.7	37.3	59.1	73.7	94.1	99.9	$2,794,015	$0	$0	$2,794,015	55.9%
PS-022 - Ignacio Boosters	Potable Pump Station	$50,000,000	0.00	0.02	0.25	0.59	0.14	1.00	0.98	0.73	13.4	23.4	41.3	59.5	88.5	99.9	$35,324,752	$0	$0	$35,324,752	70.6%
PS-023 - Kent Fire Trail 1st Pump Station	Potable Pump Station	$5,000,000	0.07	0.16	0.41	0.32	0.04	0.93	0.77	0.36	29.2	47.5	69.3	80.9	95.8	99.9	$2,308,355	$0	$0	$2,308,355	46.2%
PS-025 - Kent Woodlands 2nd Pump Station	Potable Pump Station	$5,000,000	0.04	0.13	0.51	0.32	0.01	0.96	0.84	0.33	26.0	45.6	71.6	83.8	97.7	99.9	$2,322,765	$0	$0	$2,322,765	46.5%
PS-026 - Lagunitas Booster Station	Potable Pump Station	$5,000,000	0.00	0.03	0.29	0.57	0.11	1.00	0.97	0.68	14.9	26.2	45.4	63.2	90.7	99.9	$3,368,800	$0	$0	$3,368,800	67.4%
PS-030 - Phoenix Transfer Pump Station	Potable Pump Station	$5,000,000	0.08	0.20	0.52	0.20	0.00	0.92	0.72	0.20	34.3	56.2	81.2	90.2	98.8	99.9	$1,835,360	$0	$0	$1,835,360	36.7%
PS-032 - Elinor Avenue Pump Station	Potable Pump Station	$5,000,000	0.03	0.10	0.41	0.41	0.05	0.97	0.87	0.46	22.6	38.9	61.6	75.7	94.8	99.9	$2,699,365	$0	$0	$2,699,365	54.0%
PS-033 - Fern Canyon Pump Station	Potable Pump Station	$5,000,000	0.03	0.09	0.38	0.44	0.06	0.97	0.88	0.50	21.7	37.3	59.1	73.7	94.1	99.9	$2,794,015	$0	$0	$2,794,015	55.9%
PS-034 - Lapachet Pump Station	Potable Pump Station	$5,000,000	0.03	0.10	0.41	0.41	0.05	0.97	0.87	0.46	22.6	38.9	61.6	75.7	94.8	99.9	$2,699,365	$0	$0	$2,699,365	54.0%
PS-035 - Mine Ridge Pump Station	Potable Pump Station	$5,000,000	0.04	0.12	0.50	0.32	0.01	0.96	0.84	0.34	25.8	45.2	71.1	83.3	97.5	99.9	$2,343,265	$0	$0	$2,343,265	46.9%
PS-036 - Scott Highlands Pump (OUT OF SERVICE)	Potable Pump Station	$5,000,000	0.03	0.09	0.38	0.44	0.06	0.97	0.88	0.50	21.7	37.3	59.1	73.7	94.1	99.9	$2,794,015	$0	$0	$2,794,015	55.9%
PS-040 - Summit Avenue Upper Pump Station	Potable Pump Station	$5,000,000	0.03	0.10	0.41	0.41	0.05	0.97	0.87	0.46	22.6	38.9	61.6	75.7	94.8	99.9	$2,699,365	$0	$0	$2,699,365	54.0%
PS-041 - Kastania Booster Pump Station	Potable Pump Station	$5,000,000	0.04	0.13	0.51	0.32	0.01	0.96	0.84	0.33	26.0	45.6	71.6	83.8	97.7	99.9	$2,322,765	$0	$0	$2,322,765	46.5%
PS-042 - Del Mesa Pump Station	Potable Pump Station	$5,000,000	0.04	0.13	0.51	0.32	0.01	0.96	0.84	0.33	26.0	45.6	71.6	83.8	97.7	99.9	$2,322,765	$0	$0	$2,322,765	46.5%
PS-043 - Fawn Drive Pump Station	Potable Pump Station	$5,000,000	0.07	0.16	0.41	0.32	0.04	0.93	0.77	0.36	29.2	47.5	69.3	81.0	95.8	99.9	$2,305,555	$0	$0	$2,305,555	46.1%
PS-044 - Mann Pump Station	Potable Pump Station	$5,000,000	0.00	0.03	0.29	0.57	0.11	1.00	0.97	0.68	14.9	26.2	45.4	63.2	90.7	99.9	$3,368,990	$0	$0	$3,368,990	67.4%
PS-046 - Scenic Avenue Pump Station	Potable Pump Station	$5,000,000	0.01	0.04	0.34	0.54	0.08	0.99	0.96	0.61	16.2	29.0	50.3	67.4	92.6	99.9	$3,195,460	$0	$0	$3,195,460	63.9%
PS-047 - Sequoia Park Pump Station	Potable Pump Station	$5,000,000	0.03	0.10	0.41	0.41	0.05	0.97	0.87	0.46	22.6	39.0	61.6	75.8	94.8	99.9	$2,697,340	$0	$0	$2,697,340	53.9%
PS-050 - Chula Vista Pump Station	Potable Pump Station	$5,000,000	0.07	0.16	0.41	0.32	0.04	0.93	0.77	0.36	29.2	47.5	69.3	81.0	95.8	99.9	$2,305,555	$0	$0	$2,305,555	46.1%
PS-052 - Elda Drive Pump Station	Potable Pump Station	$5,000,000	0.03	0.09	0.38	0.44	0.06	0.97	0.88	0.50	21.7	37.3	59.1	73.7	94.1	99.9	$2,794,015	$0	$0	$2,794,015	55.9%
PS-053 - Fairhills 1st Lift Pump Station	Potable Pump Station	$5,000,000	0.07	0.16	0.41	0.32	0.04	0.93	0.77	0.36	29.2	47.5	69.3	81.0	95.8	99.9	$2,305,555	$0	$0	$2,305,555	46.1%
PS-054 - Fairhills 2nd Lift Pump Station	Potable Pump Station	$5,000,000	0.07	0.16	0.41	0.32	0.04	0.93	0.77	0.36	29.2	47.5	69.3	81.0	95.8	99.9	$2,305,555	$0	$0	$2,305,555	46.1%
PS-055 - Grove Hill Pump Station	Potable Pump Station	$5,000,000	0.08	0.20	0.52	0.20	0.00	0.92	0.72	0.20	34.3	56.2	81.2	90.2	98.8	99.9	$1,835,360	$0	$0	$1,835,360	36.7%
PS-056 - Rafael Highlands Pump Station	Potable Pump Station	$5,000,000	0.08	0.20	0.52	0.20	0.00	0.92	0.72	0.20	34.3	56.2	81.2	90.2	98.8	99.9	$1,835,360	$0	$0	$1,835,360	36.7%

EQ - N San Andreas M7.88

Section 6. Item #c.

PS-057 - Hind Pump Station	Potable Pump Station	$5,000,000	0.07	0.16	0.42	0.31	0.04	0.93	0.77	0.35	29.6	48.1	70.1	81.6	96.0	99.9	$2,273,230	$0	$0	$2,273,230	45.5%
PS-058 - Knight Drive Pump Station	Potable Pump Station	$5,000,000	0.14	0.20	0.33	0.28	0.05	0.86	0.66	0.33	36.7	54.3	72.2	82.3	95.5	99.9	$2,041,295	$0	$0	$2,041,295	40.8%
PS-060 - Lockwood Drive Pump Station	Potable Pump Station	$5,000,000	0.14	0.20	0.33	0.28	0.05	0.86	0.66	0.33	36.7	54.3	72.2	82.3	95.5	99.9	$2,041,295	$0	$0	$2,041,295	40.8%
PS-061 - Lucas Valley Pump Station	Potable Pump Station	$5,000,000	0.15	0.22	0.36	0.23	0.04	0.85	0.63	0.27	39.1	58.0	76.6	85.6	96.5	99.9	$1,854,780	$0	$0	$1,854,780	37.1%
PS-062 - Manderly Pump Station	Potable Pump Station	$5,000,000	0.14	0.20	0.33	0.28	0.05	0.86	0.66	0.33	36.7	54.3	72.2	82.3	95.5	99.9	$2,041,295	$0	$0	$2,041,295	40.8%
PS-064 - Marinwood Pump Station (NOT IS USE)	Potable Pump Station	$5,000,000	0.14	0.20	0.33	0.28	0.05	0.86	0.66	0.33	36.7	54.3	72.2	82.3	95.5	99.9	$2,041,295	$0	$0	$2,041,295	40.8%
PS-065 - McNear Drive Pump Station	Potable Pump Station	$5,000,000	0.14	0.20	0.33	0.28	0.05	0.86	0.66	0.33	36.7	54.3	72.2	82.3	95.5	99.9	$2,041,295	$0	$0	$2,041,295	40.8%
PS-066 - Mesa Vista Pump Station	Potable Pump Station	$5,000,000	0.06	0.15	0.39	0.35	0.05	0.94	0.79	0.40	27.9	45.3	66.3	78.6	95.0	99.9	$2,426,645	$0	$0	$2,426,645	48.5%
PS-069 - San Quentin Pump Station	Potable Pump Station	$5,000,000	0.01	0.06	0.34	0.52	0.08	0.99	0.93	0.60	17.6	30.8	51.6	68.2	92.6	99.9	$3,118,625	$0	$0	$3,118,625	62.4%
PS-070 - Santa Margarita Pump Station	Potable Pump Station	$5,000,000	0.06	0.15	0.39	0.35	0.05	0.94	0.79	0.40	27.9	45.3	66.3	78.6	95.0	99.9	$2,426,645	$0	$0	$2,426,645	48.5%
PS-071 - Sky View Terrace Pump Station	Potable Pump Station	$5,000,000	0.08	0.20	0.52	0.20	0.00	0.92	0.72	0.20	34.3	56.2	81.2	90.2	98.8	99.9	$1,835,360	$0	$0	$1,835,360	36.7%
PS-073 - Swig Pump Station	Potable Pump Station	$5,000,000	0.18	0.27	0.45	0.10	0.00	0.82	0.55	0.10	46.0	68.3	89.1	95.0	99.4	99.9	$1,321,810	$0	$0	$1,321,810	26.4%
PS-074 - Via Montebello Pump Station	Potable Pump Station	$5,000,000	0.18	0.27	0.45	0.10	0.00	0.82	0.55	0.10	46.0	68.3	89.1	95.0	99.4	99.9	$1,321,810	$0	$0	$1,321,810	26.4%
PS-077 - Beacon Hill Pump Station	Potable Pump Station	$5,000,000	0.04	0.13	0.51	0.32	0.01	0.96	0.84	0.33	26.0	45.6	71.6	83.8	97.7	99.9	$2,322,765	$0	$0	$2,322,765	46.5%
PS-078 - Crescent Avenue Pump Station	Potable Pump Station	$5,000,000	0.08	0.20	0.52	0.20	0.00	0.92	0.72	0.20	34.3	56.2	81.2	90.2	98.8	99.9	$1,835,360	$0	$0	$1,835,360	36.7%
PS-079 - Marin City Pump Station	Potable Pump Station	$5,000,000	0.03	0.09	0.38	0.44	0.06	0.97	0.88	0.50	21.7	37.3	59.1	73.7	94.1	99.9	$2,794,015	$0	$0	$2,794,015	55.9%
PS-080 - Monte Mar Vista Pump Station	Potable Pump Station	$5,000,000	0.00	0.03	0.27	0.58	0.11	1.00	0.97	0.70	14.5	25.3	43.9	61.9	90.1	99.9	$3,424,015	$0	$0	$3,424,015	68.5%
PS-081 - Sausalito Pumphouse Pump Station	Potable Pump Station	$5,000,000	0.00	0.03	0.27	0.58	0.11	1.00	0.97	0.70	14.5	25.3	43.9	61.9	90.1	99.9	$3,424,015	$0	$0	$3,424,015	68.5%
PS-082 - Sausalito Boulevard Pump Station	Potable Pump Station	$5,000,000	0.07	0.18	0.46	0.26	0.02	0.93	0.75	0.29	31.5	51.4	74.6	85.1	97.1	99.9	$2,095,090	$0	$0	$2,095,090	41.9%
PS-083 - Richardson Drive Pump Station	Potable Pump Station	$5,000,000	0.07	0.16	0.41	0.32	0.04	0.93	0.77	0.36	29.2	47.5	69.3	81.0	95.8	99.9	$2,305,555	$0	$0	$2,305,555	46.1%
PS-084 - Eastwood Way Pump Station	Potable Pump Station	$5,000,000	0.03	0.09	0.38	0.44	0.06	0.97	0.88	0.50	21.7	37.3	59.1	73.7	94.1	99.9	$2,794,015	$0	$0	$2,794,015	55.9%
PS-085 - Fairview Park Pump Station	Potable Pump Station	$5,000,000	0.03	0.09	0.38	0.44	0.06	0.97	0.88	0.50	21.7	37.3	59.1	73.7	94.1	99.9	$2,794,015	$0	$0	$2,794,015	55.9%
PS-087 - Marinview Pump Station	Potable Pump Station	$5,000,000	0.01	0.06	0.36	0.50	0.07	0.99	0.93	0.57	18.2	32.1	53.6	69.9	93.3	99.9	$3,044,975	$0	$0	$3,044,975	60.9%
PS-088 - Tam Woods 1st Lift Pump Station	Potable Pump Station	$5,000,000	0.03	0.09	0.38	0.44	0.06	0.97	0.88	0.50	21.7	37.3	59.1	73.7	94.1	99.9	$2,794,015	$0	$0	$2,794,015	55.9%
PS-089 - Tam Woods 2nd Lift Pump Station	Potable Pump Station	$5,000,000	0.03	0.10	0.41	0.41	0.05	0.97	0.87	0.46	22.6	38.9	61.6	75.7	94.8	99.9	$2,699,740	$0	$0	$2,699,740	54.0%
PS-090 - Hill Haven Pump Station	Potable Pump Station	$5,000,000	0.14	0.20	0.33	0.28	0.05	0.86	0.66	0.33	36.7	54.3	72.2	82.3	95.5	99.9	$2,041,295	$0	$0	$2,041,295	40.8%
PS-091 - Sugarloaf Pump Station	Potable Pump Station	$5,000,000	0.15	0.22	0.36	0.23	0.04	0.85	0.63	0.27	39.1	58.0	76.6	85.6	96.5	99.9	$1,854,780	$0	$0	$1,854,780	37.1%
PS-092 - Tiburon Belvedere Pump Station	Potable Pump Station	$5,000,000	0.18	0.27	0.45	0.10	0.00	0.82	0.55	0.10	46.0	68.3	89.1	95.0	99.4	99.9	$1,321,810	$0	$0	$1,321,810	26.4%
PS-093 - Tiburon Booster Pump Station	Potable Pump Station	$5,000,000	0.06	0.15	0.39	0.35	0.05	0.94	0.79	0.40	27.9	45.3	66.3	78.6	95.0	99.9	$2,426,645	$0	$0	$2,426,645	48.5%
PS-095 - Pine Mountain Tunnel Pump Station	Potable Pump Station	$5,000,000	0.00	0.03	0.29	0.57	0.11	1.00	0.97	0.68	14.9	26.2	45.4	63.2	90.7	99.9	$3,368,800	$0	$0	$3,368,800	67.4%
PS-096 - Southern Marin Line Boosters	Potable Pump Station	$5,000,000	0.04	0.13	0.51	0.32	0.01	0.96	0.84	0.33	26.0	45.6	71.6	83.8	97.7	99.9	$2,322,765	$0	$0	$2,322,765	46.5%
PS-101 - Redwood Drive Lower Pump	Potable Pump Station	$5,000,000	0.04	0.13	0.51	0.32	0.01	0.96	0.84	0.33	26.0	45.6	71.6	83.8	97.7	99.9	$2,322,765	$0	$0	$2,322,765	46.5%
PS-102 - North Marin Line Boosters	Potable Pump Station	$5,000,000	0.03	0.10	0.39	0.43	0.06	0.97	0.88	0.49	22.0	37.8	59.8	74.3	94.2	99.9	$2,767,225	$0	$0	$2,767,225	55.3%
PS-103 - San Geronimo Valley Pump Station	Potable Pump Station	$5,000,000	0.03	0.10	0.39	0.43	0.06	0.97	0.88	0.49	22.0	37.8	59.8	74.3	94.2	99.9	$2,767,225	$0	$0	$2,767,225	55.3%
PS-104 - Conifer Way Pump Station	Potable Pump Station	$5,000,000	0.03	0.09	0.38	0.44	0.06	0.97	0.88	0.50	21.7	37.3	59.1	73.7	94.1	99.9	$2,794,015	$0	$0	$2,794,015	55.9%
PS-106 - Los Altos Pump Station	Potable Pump Station	$5,000,000	0.08	0.20	0.52	0.20	0.00	0.92	0.72	0.20	34.3	56.2	81.2	90.2	98.8	99.9	$1,835,360	$0	$0	$1,835,360	36.7%
PS-108 - Indian Rock Pump Station	Potable Pump Station	$5,000,000	0.08	0.20	0.52	0.20	0.00	0.92	0.72	0.20	34.3	56.2	81.2	90.2	98.8	99.9	$1,835,360	$0	$0	$1,835,360	36.7%
PS-109 - Cibrian Pump Station	Potable Pump Station	$5,000,000	0.07	0.16	0.41	0.32	0.04	0.93	0.77	0.36	29.2	47.5	69.3	81.0	95.8	99.9	$2,305,555	$0	$0	$2,305,555	46.1%
PS-113 - Lag Picnic Grounds Pump Station	Potable Pump Station	$5,000,000	0.03	0.10	0.41	0.41	0.05	0.97	0.87	0.46	22.6	38.9	61.6	75.7	94.8	99.9	$2,699,365	$0	$0	$2,699,365	54.0%
PS-114 - Cortez Avenue Pump Station	Potable Pump Station	$5,000,000	0.01	0.06	0.34	0.52	0.08	0.99	0.93	0.60	17.6	30.8	51.6	68.2	92.6	99.9	$3,118,625	$0	$0	$3,118,625	62.4%
PS-115 - Redwood Drive Upper Pump Station	Potable Pump Station	$5,000,000	0.03	0.10	0.41	0.41	0.05	0.97	0.87	0.46	22.6	38.9	61.6	75.7	94.8	99.9	$2,699,740	$0	$0	$2,699,740	54.0%
PS-116 - North Redwood Drive Boosters	Potable Pump Station	$5,000,000	0.01	0.07	0.45	0.43	0.03	0.99	0.91	0.46	20.5	37.0	61.7	76.6	96.0	99.9	$2,750,450	$0	$0	$2,750,450	55.0%
PS-117 - Wolfback Ridge Pump Station	Potable Pump Station	$5,000,000	0.07	0.18	0.46	0.26	0.02	0.93	0.75	0.29	31.5	51.4	74.6	85.1	97.1	99.9	$2,095,090	$0	$0	$2,095,090	41.9%
PS-118 - Fire Road Pump Station	Potable Pump Station	$5,000,000	0.03	0.09	0.38	0.44	0.06	0.97	0.88	0.50	21.7	37.3	59.1	73.7	94.1	99.9	$2,794,015	$0	$0	$2,794,015	55.9%
PS-122 - Upper Road Pump Station	Potable Pump Station	$5,000,000	0.04	0.13	0.51	0.32	0.01	0.96	0.84	0.33	26.0	45.6	71.6	83.8	97.7	99.9	$2,322,765	$0	$0	$2,322,765	46.5%
PS-123 - Southern Marin Line Syphon	Potable Pump Station	$5,000,000	0.03	0.09	0.38	0.44	0.06	0.97	0.88	0.50	21.7	37.3	59.1	73.7	94.1	99.9	$2,794,015	$0	$0	$2,794,015	55.9%
PS-124 - Throckmorton Booster New Pumpstation	Potable Pump Station	$5,000,000	0.04	0.13	0.51	0.32	0.01	0.96	0.84	0.33	26.0	45.6	71.6	83.8	97.7	99.9	$2,322,765	$0	$0	$2,322,765	46.5%
PS-125 - Kent Fire Trail 2nd Lift Pump Station	Potable Pump Station	$5,000,000	0.07	0.16	0.41	0.32	0.04	0.93	0.77	0.36	29.2	47.5	69.3	80.9	95.8	99.9	$2,308,355	$0	$0	$2,308,355	46.2%
PS-126 - Oak Woodlands Pump Station	Potable Pump Station	$5,000,000	0.06	0.15	0.39	0.35	0.05	0.94	0.79	0.40	27.9	45.3	66.3	78.6	95.0	99.9	$2,426,645	$0	$0	$2,426,645	48.5%
PS-127 - Marin Terrace Pump Station	Potable Pump Station	$5,000,000	0.01	0.06	0.36	0.50	0.07	0.99	0.93	0.57	18.2	32.1	53.6	69.9	93.3	99.9	$3,044,975	$0	$0	$3,044,975	60.9%
PS-129 - Slide Gulch Pump Station	Potable Pump Station	$5,000,000	0.03	0.10	0.41	0.41	0.05	0.97	0.87	0.46	22.6	38.9	61.6	75.7	94.8	99.9	$2,699,365	$0	$0	$2,699,365	54.0%
PS-130 - Smith Conifer Pump Station	Potable Pump Station	$5,000,000	0.08	0.20	0.52	0.20	0.00	0.92	0.72	0.20	34.3	56.2	81.2	90.2	98.8	99.9	$1,835,360	$0	$0	$1,835,360	36.7%
TK-156 - BON TEMPE CLEARWELL TANK	Potable Tank - Clearwell	$10,000,000	0.03	0.10	0.41	0.41	0.05	0.97	0.87	0.46	21.1	39.2	57.6	61.6	63.9	75.2	$5,632,000	$0	$0	$5,632,000	56.3%
TK-157 - SAN GERONIMO CLEARWELL TANK #1	Potable Tank - Clearwell	$10,000,000	0.03	0.10	0.39	0.43	0.06	0.97	0.88	0.49	20.7	38.1	55.8	59.6	62.0	73.8	$5,757,601	$0	$0	$5,757,601	57.6%
TK-186 - SAN GERONIMO CLEARWELL TANK #2	Potable Tank - Clearwell	$15,000,000	0.03	0.10	0.39	0.43	0.06	0.97	0.88	0.49	20.7	38.1	55.8	59.6	62.0	73.8	$8,636,401	$0	$0	$8,636,401	57.6%
TK-006 - MADERA PARK TANK #1	Potable Tank - Distribution	$500,000	0.05	0.33	0.36	0.22	0.05	0.95	0.63	0.27	26.0	58.3	74.5	77.7	79.0	85.2	$216,560	$0	$0	$216,560	43.3%
TK-008 - MARINER HIGHLANDS TANK	Potable Tank - Distribution	$300,000	0.09	0.39	0.26	0.21	0.05	0.91	0.51	0.26	30.3	64.6	76.2	78.6	79.8	85.8	$118,992	$0	$0	$118,992	39.7%
TK-015 - MEADOW CLUB UPPER TANK	Potable Tank - Distribution	$1,500,000	0.01	0.03	0.31	0.56	0.10	0.99	0.96	0.65	17.0	27.9	42.0	45.5	48.8	64.5	$1,007,220	$0	$0	$1,007,220	67.1%
TK-019 - OAK MANOR TOP TANK	Potable Tank - Distribution	$1,250,000	0.03	0.10	0.52	0.34	0.02	0.97	0.87	0.35	22.0	43.0	66.1	70.7	72.5	81.4	$641,950	$0	$0	$641,950	51.4%
TK-025 - BRET HARTE TANK	Potable Tank - Distribution	$2,500,000	0.00	0.01	0.21	0.61	0.16	1.00	0.98	0.77	15.3	22.3	32.4	35.4	39.1	57.1	$1,843,850	$0	$0	$1,843,850	73.8%
TK-033 - INDIAN FIRE TRAIL TANK	Potable Tank - Distribution	$1,250,000	0.02	0.08	0.41	0.43	0.06	0.98	0.90	0.48	20.2	37.1	55.8	59.8	62.2	74.0	$724,175	$0	$0	$724,175	57.9%
TK-060 - SCOTT HIGHLANDS TANK	Potable Tank - Distribution	$1,250,000	0.01	0.04	0.33	0.54	0.09	0.99	0.96	0.63	17.3	28.8	43.9	47.5	50.6	65.8	$824,650	$0	$0	$824,650	66.0%
TK-066 - SUMMIT AVENUE UPPER TANK	Potable Tank - Distribution	$600,000	0.10	0.42	0.27	0.17	0.04	0.90	0.48	0.21	31.5	68.0	80.3	82.7	83.7	88.6	$220,128	$0	$0	$220,128	36.7%
TK-068 - ELDA DRIVE TANK	Potable Tank - Distribution	$750,000	0.02	0.08	0.41	0.43	0.05	0.98	0.90	0.48	20.2	37.1	55.9	59.9	62.3	74.1	$434,250	$0	$0	$434,250	57.9%
TK-074 - SCENIC AVENUE TANK	Potable Tank - Distribution	$100,000	0.03	0.32	0.60	0.05	0.00	0.97	0.65	0.05	26.5	64.7	91.1	95.6	95.9	97.2	$34,536	$0	$0	$34,536	34.5%
TK-078 - CHULA VISTA TANK	Potable Tank - Distribution	$1,250,000	0.03	0.10	0.52	0.34	0.02	0.97	0.87	0.35	22.0	43.0	66.1	70.7	72.5	81.4	$641,950	$0	$0	$641,950	51.4%
TK-081 - FAIRHILLS TOP TANK #1	Potable Tank - Distribution	$300,000	0.03	0.10	0.52	0.34	0.02	0.97	0.87	0.35	22.0	43.0	66.1	70.7	72.5	81.4	$154,068	$0	$0	$154,068	51.4%
TK-085 - HIND TANK #1	Potable Tank - Distribution	$500,000	0.29	0.39	0.07	0.20	0.05	0.71	0.32	0.25	45.9	74.6	78.0	79.0	80.2	86.1	$158,070	$0	$0	$158,070	31.6%
TK-086 - HIND TANK #2	Potable Tank - Distribution	$1,000,000	0.29	0.39	0.07	0.20	0.05	0.71	0.32	0.25	45.9	74.6	78.0	79.0	80.2	86.1	$316,140	$0	$0	$316,140	31.6%
TK-097 - RAFAEL HIGHLANDS TANK	Potable Tank - Distribution	$2,500,000	0.03	0.10	0.52	0.34	0.02	0.97	0.87	0.35	22.0	43.0	66.1	70.7	72.5	81.4	$1,283,900	$0	$0	$1,283,900	51.4%
TK-100 - SKYVIEW TERRACE TANK	Potable Tank - Distribution	$750,000	0.01	0.05	0.41	0.49	0.05	0.99	0.95	0.54	18.4	32.7	51.2	55.3	58.1	71.3	$459,555	$0	$0	$459,555	61.3%
TK-108 - CLOUDVIEW TANK	Potable Tank - Distribution	$1,100,000	0.01	0.05	0.41	0.49	0.05	0.99	0.95	0.54	18.4	32.7	51.2	55.3	58.1	71.3	$674,014	$0	$0	$674,014	61.3%
TK-115 - ROMER TANK	Potable Tank - Distribution	$1,550,000	0.00	0.01	0.13	0.61	0.25	1.00	0.99	0.86	14.1	18.4	25.2	27.7	31.6	50.9	$1,228,933	$0	$0	$1,228,933	79.3%
TK-116 - SAUSALITO BLVD. TANK	Potable Tank - Distribution	$1,150,000	0.02	0.09	0.46	0.39	0.04	0.98	0.89	0.43	21.0	39.7	60.4	64.7	66.9	77.4	$632,247	$0	$0	$632,247	55.0%
TK-117 - MESA VISTA TANK #1	Potable Tank - Distribution	$2,500,000	0.01	0.03	0.31	0.56	0.10	0.99	0.96	0.65	17.0	27.9	42.0	45.5	48.8	64.5	$1,678,700	$0	$0	$1,678,700	67.1%
TK-118 - COUNTYVIEW DRIVE TANK	Potable Tank - Distribution	$750,000	0.01	0.04	0.40	0.49	0.05	0.99	0.95	0.54	18.3	32.5	50.8	54.9	57.6	71.0	$461,505	$0	$0	$461,505	61.5%
TK-119 - LATTIE LANE TANK	Potable Tank - Distribution	$1,250,000	0.01	0.03	0.31	0.56	0.10	0.99	0.96	0.65	17.0	27.9	42.0	45.5	48.8	64.5	$839,350	$0	$0	$839,350	67.1%
TK-126 - HILL HAVEN TANK	Potable Tank - Distribution	$825,000	0.08	0.19	0.54	0.18	0.00	0.92	0.73	0.19	28.3	56.0	80.1	84.5	85.5	90.3	$334,290	$0	$0	$334,290	40.5%
TK-128 - MOUNT TIBURON TANK #1	Potable Tank - Distribution	$2,500,000	0.06	0.14	0.41	0.34	0.05	0.94	0.80	0.39	24.5	45.4	63.7	67.5	69.4	78.8	$1,284,850	$0	$0	$1,284,850	51.4%
TK-139 - BUCKEYE CIRCLE TANK	Potable Tank - Distribution	$150,000	0.01	0.03	0.31	0.56	0.10	0.99	0.96	0.65	17.0	27.9	42.0	45.5	48.8	64.5	$100,722	$0	$0	$100,722	67.1%
TK-150 - LOS ALTOS TANK	Potable Tank - Distribution	$300,000	0.03	0.10	0.52	0.34	0.02	0.97	0.87	0.35	22.0	43.0	66.1	70.7	72.5	81.4	$154,068	$0	$0	$154,068	51.4%
TK-158 - FAWN DRIVE TANK	Potable Tank - Distribution	$450,000	0.03	0.10	0.52	0.34	0.02	0.97	0.87	0.35	22.0	43.0	66.1	70.7	72.5	81.4	$231,102	$0	$0	$231,102	51.4%
TK-163 - UPPER ROAD TANK	Potable Tank - Distribution	$200,000	0.09	0.39	0.26	0.21	0.05	0.91	0.51	0.26	30.3	64.6	76.2	78.6	79.8	85.8	$79,328	$0	$0	$79,328	39.7%
TK-164 - TOMAHAWK DRIVE TANK	Potable Tank - Distribution	$200,000	0.02	0.08	0.41	0.43	0.05	0.98	0.90	0.48	20.2	37.1	55.9	59.9	62.3	74.1	$115,800	$0	$0	$115,800	57.9%
TK-166 - RING MOUNTAIN TANK	Potable Tank - Distribution	$750,000	0.03	0.10	0.52	0.34	0.02	0.97	0.87	0.35	22.0	43.0	66.1	70.7	72.5	81.4	$385,170	$0	$0	$385,170	51.4%
TK-167 - CREEKSIDE DRIVE TANK	Potable Tank - Distribution	$900,000	0.06	0.15	0.43	0.31	0.04	0.94	0.78	0.35	25.3	47.6	67.1	71.0	72.7	81.2	$442,548	$0	$0	$442,548	49.2%
TK-180 - BON TEMPE WASHWATER TANK	Potable Tank - Distribution	$1,000,000	0.01	0.04	0.33	0.54	0.09	0.99	0.96	0.63	17.3	28.8	43.9	47.5	50.6	65.8	$659,720	$0	$0	$659,720	66.0%
TK-181 - REDWOOD DRIVE UPPER TANK	Potable Tank - Distribution	$300,000	0.01	0.04	0.33	0.54	0.09	0.99	0.96	0.63	17.3	28.8	43.9	47.5	50.6	65.8	$197,916	$0	$0	$197,916	66.0%
TK-182 - ALTA AVENUE TANK	Potable Tank - Distribution	$2,500,000	0.00	0.01	0.14	0.61	0.24	1.00	0.99	0.85	14.2	18.8	25.9	28.5	32.4	51.5	$1,968,500	$0	$0	$1,968,500	78.7%
TK-183 - MINE RIDGE TANK	Potable Tank - Distribution	$1,100,000	0.01	0.04	0.33	0.54	0.09	0.99	0.96	0.63	17.3	28.8	43.9	47.5	50.6	65.8	$725,692	$0	$0	$725,692	66.0%
TK-187 - MANZANITA TANK	Potable Tank - Distribution	$300,000	0.00	0.01	0.21	0.61	0.16	1.00	0.98	0.77	15.3	22.3	32.4	35.4	39.1	57.1	$221,262	$0	$0	$221,262	73.8%
TK-188 - WOLFBACK RIDGE TANK #1	Potable Tank - Distribution	$125,000	0.03	0.10	0.52	0.34	0.02	0.97	0.87	0.35	22.0	43.0	66.1	70.7	72.5	81.4	$64,195	$0	$0	$64,195	51.4%
TK-189 - WOLFBACK RIDGE TANK #2	Potable Tank - Distribution	$125,000	0.03	0.10	0.52	0.34	0.02	0.97	0.87	0.35	22.0	43.0	66.1	70.7	72.5	81.4	$64,195	$0	$0	$64,195	51.4%
TK-190 - INVERNESS DRIVE TANK	Potable Tank - Distribution	$700,000	0.06	0.14	0.41	0.34	0.05	0.94	0.80	0.39	24.5	45.4	63.7	67.5	69.4	78.8	$359,758	$0	$0	$359,758	51.4%
TK-191 - LONE TREE AVENUE TANK	Potable Tank - Distribution	$500,000	0.01	0.04	0.33	0.54	0.09	0.99	0.96	0.63	17.3	28.8	43.9	47.5	50.6	65.8	$329,860	$0	$0	$329,860	66.0%
TK-192 - VERNAL AVE TANK	Potable Tank - Distribution	$1,500,000	0.01	0.05	0.41	0.49	0.05	0.99	0.95	0.54	18.4	32.7	51.2	55.3	58.1	71.3	$919,110	$0	$0	$919,110	61.3%
TK-193 - H-LINE ROAD TANK	Potable Tank - Distribution	$2,500,000	0.02	0.08	0.39	0.45	0.06	0.98	0.90	0.52	19.7	35.6	53.2	57.1	59.7	72.2	$1,489,250	$0	$0	$1,489,250	59.6%
TK-196 - WILSON WAY TANK	Potable Tank - Distribution	$500,000	0.03	0.10	0.52	0.34	0.02	0.97	0.87	0.35	22.0	43.0	66.1	70.7	72.5	81.4	$256,780	$0	$0	$256,780	51.4%
TK-197 - SUMMIT TRAIL TANK	Potable Tank - Distribution	$650,000	0.03	0.10	0.52	0.34	0.02	0.97	0.87	0.35	22.0	43.0	66.1	70.7	72.5	81.4	$333,814	$0	$0	$333,814	51.4%
TK-198 - SCOTT TANKS	Potable Tank - Distribution	$300,000	0.01	0.05	0.41	0.49	0.05	0.99	0.95	0.54	18.4	32.7	51.2	55.3	58.1	71.3	$183,822	$0	$0	$183,822	61.3%
TK-199 - SCOTT TANKS	Potable Tank - Distribution	$300,000	0.01	0.05	0.41	0.49	0.05	0.99	0.95	0.54	18.4	32.7	51.2	55.3	58.1	71.3	$183,822	$0	$0	$183,822	61.3%
TK-200 - OAK WOODLANDS TANK #1	Potable Tank - Distribution	$575,000	0.06	0.14	0.41	0.34	0.05	0.94	0.80	0.39	24.5	45.4	63.7	67.5	69.4	78.8	$295,516	$0	$0	$295,516	51.4%
TK-201 - OAK WOODLANDS TANK #2	Potable Tank - Distribution	$575,000	0.07	0.15	0.44	0.30	0.04	0.93	0.78	0.34	25.5	48.1	68.0	71.9	73.6	81.8	$279,324	$0	$0	$279,324	48.6%
TK-202 - Fairfax Manor 1st Lift Tank	Potable Tank - Distribution	$100,000	0.01	0.03	0.31	0.56	0.10	0.99	0.96	0.65	17.0	27.9	42.0	45.5	48.8	64.5	$67,148	$0	$0	$67,148	67.1%
TK-203 - MONTE MAR VISTA TANK	Potable Tank - Distribution	$300,000	0.00	0.02	0.28	0.58	0.12	1.00	0.98	0.70	16.2	25.3	38.4	41.9	45.3	61.9	$209,154	$0	$0	$209,154	69.7%
TK-204 - Bay Road Tank	Potable Tank - Distribution	$600,000	0.01	0.05	0.41	0.49	0.05	0.99	0.95	0.54	18.4	32.7	51.2	55.3	58.1	71.3	$367,644	$0	$0	$367,644	61.3%
TK-206 - SANTA VENETIA TANK	Potable Tank - Distribution	$1,550,000	0.00	0.01	0.18	0.60	0.21	1.00	0.99	0.81	14.6	20.3	29.0	31.8	35.6	54.1	$1,187,083	$0	$0	$1,187,083	76.6%
TK-207 - GOODHILL ROAD TANK	Potable Tank - Distribution	$300,000	0.01	0.05	0.41	0.49	0.05	0.99	0.95	0.54	18.4	32.7	51.2	55.3	58.1	71.3	$183,822	$0	$0	$183,822	61.3%
TK-208 - SPRING LANE TANK #2	Potable Tank - Distribution	$7,500,000	0.08	0.19	0.54	0.18	0.00	0.92	0.73	0.19	28.3	56.0	80.1	84.5	85.5	90.3	$3,039,000	$0	$0	$3,039,000	40.5%

TK-209 - FAIRHILLS TOP TANK #2	Potable Tank - Distribution	$300,000	0.03	0.10	0.52	0.34	0.02	0.97	0.87	0.35	22.0	43.0	66.1	70.7	72.5	81.4	$154,068	$0	$0	$154,068	51.4%
TK-210 - BEACON HILL TANK	Potable Tank - Distribution	$500,000	0.02	0.08	0.41	0.43	0.05	0.98	0.90	0.48	20.2	37.1	55.9	59.9	62.3	74.1	$289,500	$0	$0	$289,500	57.9%
TK-211 - Kent Fire Trail Tank #1	Potable Tank - Distribution	$500,000	0.02	0.08	0.41	0.43	0.06	0.98	0.90	0.48	20.2	37.1	55.8	59.8	62.2	74.0	$289,670	$0	$0	$289,670	57.9%
TK-212 - Kent Fire Trail Tank #2	Potable Tank - Distribution	$500,000	0.02	0.08	0.41	0.43	0.06	0.98	0.90	0.48	20.2	37.1	55.8	59.8	62.2	74.0	$289,670	$0	$0	$289,670	57.9%
TK-213 - MARIN CITY TANK	Potable Tank - Distribution	$1,000,000	0.01	0.03	0.31	0.56	0.10	0.99	0.96	0.65	17.0	27.9	42.0	45.5	48.8	64.5	$671,480	$0	$0	$671,480	67.1%
TK-214 - SLIDE GULCH TANK	Potable Tank - Distribution	$485,870	0.01	0.03	0.31	0.56	0.10	0.99	0.96	0.65	17.0	27.9	42.0	45.5	48.8	64.5	$326,252	$0	$0	$326,252	67.1%
TK-215 - SEQUOIA PARK TANK #1	Potable Tank - Distribution	$550,000	0.03	0.10	0.52	0.34	0.02	0.97	0.87	0.35	22.0	43.0	66.1	70.7	72.5	81.4	$282,458	$0	$0	$282,458	51.4%
TK-216 - SEQUOIA PARK TANK #2	Potable Tank - Distribution	$250,000	0.03	0.10	0.52	0.34	0.02	0.97	0.87	0.35	22.0	43.0	66.1	70.7	72.5	81.4	$128,390	$0	$0	$128,390	51.4%
TK-217 - KENT WOODLANDS 1ST LIFT TANK	Potable Tank - Distribution	$500,000	0.01	0.05	0.41	0.49	0.05	0.99	0.95	0.54	18.4	32.7	51.2	55.3	58.1	71.3	$306,370	$0	$0	$306,370	61.3%
TK-218 - MOUNT TIBURON TANK #2	Potable Tank - Distribution	$2,950,000	0.06	0.14	0.41	0.34	0.05	0.94	0.80	0.39	24.5	45.4	63.7	67.5	69.4	78.8	$1,516,123	$0	$0	$1,516,123	51.4%
TK-219 - OAK MANOR FIRST LIFT TANK	Potable Tank - Distribution	$500,000	0.02	0.08	0.39	0.45	0.06	0.98	0.90	0.52	19.7	35.6	53.2	57.1	59.7	72.2	$297,850	$0	$0	$297,850	59.6%
TK-220 - TAM WOODS TOP TANK	Potable Tank - Distribution	$400,000	0.01	0.03	0.31	0.56	0.10	0.99	0.96	0.65	17.0	27.9	42.0	45.5	48.8	64.5	$268,592	$0	$0	$268,592	67.1%
TK-221 - SUMMIT AVENUE LOWER TANK	Potable Tank - Distribution	$500,000	0.01	0.05	0.41	0.49	0.05	0.99	0.95	0.54	18.4	32.7	51.2	55.3	58.1	71.3	$306,370	$0	$0	$306,370	61.3%
TK-222 - FRIAR TUCK LANE TANK	Potable Tank - Distribution	$625,000	0.07	0.15	0.44	0.30	0.04	0.93	0.78	0.34	25.5	48.1	68.0	71.9	73.6	81.8	$303,613	$0	$0	$303,613	48.6%
TK-223 - CASCADE TANK #1	Potable Tank - Distribution	$300,000	0.01	0.05	0.41	0.49	0.05	0.99	0.95	0.54	18.4	32.7	51.2	55.3	58.1	71.3	$183,822	$0	$0	$183,822	61.3%
TK-224 - CASCADE TANK #2	Potable Tank - Distribution	$300,000	0.01	0.05	0.41	0.49	0.05	0.99	0.95	0.54	18.4	32.7	51.2	55.3	58.1	71.3	$183,822	$0	$0	$183,822	61.3%
TK-225 - SUGARLOAF TANK #1	Potable Tank - Distribution	$635,000	0.06	0.14	0.41	0.34	0.05	0.94	0.80	0.39	24.5	45.4	63.7	67.5	69.4	78.8	$326,352	$0	$0	$326,352	51.4%
TK-226 - SUGARLOAF TANK #2	Potable Tank - Distribution	$635,000	0.06	0.14	0.41	0.34	0.05	0.94	0.80	0.39	24.5	45.4	63.7	67.5	69.4	78.8	$326,352	$0	$0	$326,352	51.4%
TK-228 - GLENWOOD FOREST TANK	Potable Tank - Distribution	$450,000	0.06	0.14	0.41	0.34	0.05	0.94	0.80	0.39	24.5	45.4	63.7	67.5	69.4	78.8	$231,273	$0	$0	$231,273	51.4%
TK-229 - KENT FIRE TRAIL TOP TANK	Potable Tank - Distribution	$50,000	0.02	0.08	0.41	0.43	0.06	0.98	0.90	0.48	20.2	37.1	55.8	59.8	62.2	74.0	$28,967	$0	$0	$28,967	57.9%
TK-230 - SWIG TANK	Potable Tank - Distribution	$250,000	0.06	0.15	0.43	0.31	0.04	0.94	0.78	0.35	25.3	47.6	67.1	71.0	72.7	81.2	$122,930	$0	$0	$122,930	49.2%
TK-232 - SKY RANCH TANK	Potable Tank - Distribution	$600,000	0.00	0.02	0.27	0.59	0.12	1.00	0.98	0.71	16.0	24.8	37.4	40.7	44.2	61.1	$422,436	$0	$0	$422,436	70.4%
TK-233 - FAIRFAX MANOR TOP TANK	Potable Tank - Distribution	$540,000	0.01	0.03	0.31	0.56	0.10	0.99	0.96	0.65	17.0	27.9	42.0	45.5	48.8	64.5	$362,599	$0	$0	$362,599	67.1%
TK-234 - TAM WOODS FIRST LIFT TANK	Potable Tank - Distribution	$425,000	0.01	0.04	0.33	0.54	0.09	0.99	0.96	0.63	17.3	28.8	43.9	47.5	50.6	65.8	$280,381	$0	$0	$280,381	66.0%
TK-235 - FAIRVIEW PARK TANK	Potable Tank - Distribution	$500,000	0.01	0.03	0.31	0.56	0.10	0.99	0.96	0.65	17.0	27.9	42.0	45.5	48.8	64.5	$335,740	$0	$0	$335,740	67.1%
TK-236 - FERN CANYON TANK	Potable Tank - Distribution	$150,000	0.01	0.05	0.41	0.49	0.05	0.99	0.95	0.54	18.4	32.7	51.2	55.3	58.1	71.3	$91,911	$0	$0	$91,911	61.3%
TK-237 - CONIFER WAY UPPER TANK	Potable Tank - Distribution	$500,000	0.00	0.02	0.28	0.58	0.12	1.00	0.98	0.70	16.2	25.3	38.4	41.9	45.3	61.9	$348,590	$0	$0	$348,590	69.7%
TK-238 - OAK AVENUE TANK	Potable Tank - Distribution	$500,000	0.01	0.03	0.31	0.56	0.10	0.99	0.96	0.65	17.0	27.9	42.0	45.5	48.8	64.5	$335,740	$0	$0	$335,740	67.1%
TK-239 - ELINOR AVE TANK	Potable Tank - Distribution	$565,000	0.01	0.03	0.31	0.56	0.10	0.99	0.96	0.65	17.0	27.9	42.0	45.5	48.8	64.5	$379,386	$0	$0	$379,386	67.1%
TK-241 - LAGUNITAS PICNIC GROUNDS TANK	Potable Tank - Distribution	$2,750	0.03	0.10	0.41	0.41	0.05	0.97	0.87	0.46	21.1	39.2	57.6	61.6	63.9	75.2	$1,549	$0	$0	$1,549	56.3%
TK-009 - SAN CLEMENTE TANK	Potable Tank - Gravity	$7,500,000	0.00	0.02	0.28	0.58	0.12	1.00	0.98	0.70	16.2	25.3	38.4	41.9	45.3	61.9	$5,228,850	$0	$0	$5,228,850	69.7%
TK-011 - CA ¯æON VILLAGE TANK	Potable Tank - Gravity	$7,500,000	0.02	0.08	0.39	0.45	0.06	0.98	0.90	0.52	19.7	35.6	53.2	57.1	59.7	72.2	$4,467,750	$0	$0	$4,467,750	59.6%
TK-012 - FAIRFAX GRADE TANK	Potable Tank - Gravity	$2,500,000	0.01	0.05	0.41	0.49	0.05	0.99	0.95	0.54	18.4	32.7	51.2	55.3	58.1	71.3	$1,531,850	$0	$0	$1,531,850	61.3%
TK-027 - GREENBRAE TANK	Potable Tank - Gravity	$7,500,000	0.00	0.01	0.13	0.61	0.25	1.00	0.99	0.86	14.1	18.4	25.2	27.7	31.6	50.9	$5,946,450	$0	$0	$5,946,450	79.3%
TK-030 - ESCALLE TANK	Potable Tank - Gravity	$5,000,000	0.00	0.01	0.13	0.61	0.25	1.00	0.99	0.86	14.1	18.4	25.2	27.7	31.6	50.9	$3,964,300	$0	$0	$3,964,300	79.3%
TK-064 - STRAWBERRY TANK	Potable Tank - Gravity	$7,500,000	0.02	0.08	0.39	0.45	0.06	0.98	0.90	0.52	19.7	35.6	53.2	57.1	59.7	72.2	$4,467,750	$0	$0	$4,467,750	59.6%
TK-083 - GLENWOOD TANK	Potable Tank - Gravity	$7,500,000	0.08	0.19	0.54	0.18	0.00	0.92	0.73	0.19	28.3	56.0	80.1	84.5	85.5	90.3	$3,039,000	$0	$0	$3,039,000	40.5%
TK-087 - LOCH LOMOND TANK	Potable Tank - Gravity	$5,000,000	0.07	0.15	0.44	0.30	0.04	0.93	0.78	0.34	25.5	48.1	68.0	71.9	73.6	81.8	$2,428,900	$0	$0	$2,428,900	48.6%
TK-089 - LOS RANCHITOS TANK	Potable Tank - Gravity	$5,000,000	0.02	0.08	0.41	0.43	0.05	0.98	0.90	0.48	20.2	37.1	55.9	59.9	62.3	74.1	$2,895,000	$0	$0	$2,895,000	57.9%
TK-090 - MARINWOOD TANK	Potable Tank - Gravity	$2,500,000	0.07	0.15	0.44	0.30	0.04	0.93	0.78	0.34	25.5	48.1	68.0	71.9	73.6	81.8	$1,214,450	$0	$0	$1,214,450	48.6%
TK-091 - MARIN PROFESSIONAL CENTER TANK	Potable Tank - Gravity	$1,250,000	0.00	0.01	0.21	0.61	0.16	1.00	0.98	0.77	15.3	22.3	32.4	35.4	39.1	57.1	$921,925	$0	$0	$921,925	73.8%
TK-094 - MILLER CREEK TANK	Potable Tank - Gravity	$2,500,000	0.08	0.19	0.54	0.18	0.00	0.92	0.73	0.19	28.3	56.0	80.1	84.5	85.5	90.3	$1,013,000	$0	$0	$1,013,000	40.5%
TK-096 - PUERTO SUELLO TANK	Potable Tank - Gravity	$7,500,000	0.02	0.08	0.39	0.45	0.06	0.98	0.90	0.52	19.7	35.6	53.2	57.1	59.7	72.2	$4,467,750	$0	$0	$4,467,750	59.6%
TK-098 - SANTA MARGARITA TANK	Potable Tank - Gravity	$7,500,000	0.02	0.08	0.41	0.43	0.05	0.98	0.90	0.48	20.2	37.1	55.9	59.9	62.3	74.1	$4,342,500	$0	$0	$4,342,500	57.9%
TK-106 - LUCAS VALLEY TANK	Potable Tank - Gravity	$7,500,000	0.06	0.14	0.41	0.34	0.05	0.94	0.80	0.39	24.5	45.4	63.7	67.5	69.4	78.8	$3,854,550	$0	$0	$3,854,550	51.4%
TK-113 - SAUSALITO PUMP HOUSE TANK #1	Potable Tank - Gravity	$1,550,000	0.00	0.01	0.13	0.61	0.25	1.00	0.99	0.86	14.1	18.4	25.2	27.7	31.6	50.9	$1,228,933	$0	$0	$1,228,933	79.3%
TK-114 - SAUSALITO PUMP HOUSE TANK #2	Potable Tank - Gravity	$1,550,000	0.00	0.01	0.13	0.61	0.25	1.00	0.99	0.86	14.1	18.4	25.2	27.7	31.6	50.9	$1,228,933	$0	$0	$1,228,933	79.3%
TK-125 - TENNESSEE VALLEY TANK	Potable Tank - Gravity	$5,000,000	0.00	0.01	0.23	0.61	0.15	1.00	0.98	0.76	15.5	22.9	33.6	36.7	40.3	58.1	$3,647,200	$0	$0	$3,647,200	72.9%
TK-127 - PARADISE DRIVE TANK	Potable Tank - Gravity	$5,000,000	0.06	0.14	0.41	0.34	0.05	0.94	0.80	0.39	24.5	45.4	63.7	67.5	69.4	78.8	$2,569,700	$0	$0	$2,569,700	51.4%
TK-130 - SPRING LANE TANK #1	Potable Tank - Gravity	$7,500,000	0.08	0.19	0.54	0.18	0.00	0.92	0.73	0.19	28.3	56.0	80.1	84.5	85.5	90.3	$3,039,000	$0	$0	$3,039,000	40.5%
TK-159 - PEACOCK GAP TANK	Potable Tank - Gravity	$2,500,000	0.14	0.20	0.34	0.27	0.05	0.86	0.66	0.32	31.5	54.7	69.8	72.9	74.5	82.3	$1,110,850	$0	$0	$1,110,850	44.4%
TK-160 - MARIN BAY TANK	Potable Tank - Gravity	$600,000	0.08	0.18	0.51	0.22	0.02	0.92	0.75	0.24	27.3	53.2	75.8	80.1	81.3	87.3	$260,148	$0	$0	$260,148	43.4%
TK-175 - MARINSHIP TANK	Potable Tank - Gravity	$7,500,000	0.00	0.03	0.29	0.57	0.11	1.00	0.97	0.68	16.6	26.8	40.1	43.5	46.9	63.1	$5,131,050	$0	$0	$5,131,050	68.4%
TK-152 - MADERA PARK (H/P) TANK	Potable Tank - Pressure System	$7,500	0.00	0.01	0.21	0.61	0.16	1.00	0.98	0.77	15.3	22.3	32.4	35.4	39.1	57.1	$5,532	$0	$0	$5,532	73.8%
TK-153 - RAFAEL HIGHLANDS (H/P) TANK	Potable Tank - Pressure System	$12,500	0.03	0.10	0.52	0.34	0.02	0.97	0.87	0.35	22.0	43.0	66.1	70.7	72.5	81.4	$6,420	$0	$0	$6,420	51.4%
TK-168 - MCNEAR DRIVE #1 (H/P) TANK	Potable Tank - Pressure System	$5,000	0.06	0.14	0.41	0.34	0.05	0.94	0.80	0.39	24.5	45.4	63.7	67.5	69.4	78.8	$2,570	$0	$0	$2,570	51.4%
TK-169 - MCNEAR DRIVE #2 (H/P) TANK	Potable Tank - Pressure System	$7,500	0.06	0.14	0.41	0.34	0.05	0.94	0.80	0.39	24.5	45.4	63.7	67.5	69.4	78.8	$3,855	$0	$0	$3,855	51.4%
TK-174 - VIA MONTEBELLO (H/P) TANK	Potable Tank - Pressure System	$17,500	0.08	0.19	0.54	0.18	0.00	0.92	0.73	0.19	28.3	56.0	80.1	84.5	85.5	90.3	$7,091	$0	$0	$7,091	40.5%
TK-195 - Fire Road Pressure Tank	Potable Tank - Pressure System	$5,000	0.01	0.03	0.31	0.56	0.10	0.99	0.96	0.65	17.0	27.9	42.0	45.5	48.8	64.5	$3,357	$0	$0	$3,357	67.1%
TK-205 - RICHARDSON DRIVE (H/P) TANK	Potable Tank - Pressure System	$5,000	0.03	0.10	0.52	0.34	0.02	0.97	0.87	0.35	22.0	43.0	66.1	70.7	72.5	81.4	$2,568	$0	$0	$2,568	51.4%
TK-145 - ROSS RESERVOIR	Potable Tank - Reservoir	$5,000,000	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.0	100.0	100.0	100.0	100.0	100.0	$0	$0	$0	$0	0.0%
TK-146 - FORBES HILL RESERVOIR	Potable Tank - Reservoir	$20,000,000	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.0	100.0	100.0	100.0	100.0	100.0	$0	$0	$0	$0	0.0%
TK-046 - ALTO TANK #1	Potable Tank - Transmission	$15,000,000	0.01	0.05	0.41	0.49	0.05	0.99	0.95	0.54	18.4	32.7	51.2	55.3	58.1	71.3	$9,191,100	$0	$0	$9,191,100	61.3%
TK-055 - MILL VALLEY TANK	Potable Tank - Transmission	$25,000,000	0.01	0.05	0.41	0.49	0.05	0.99	0.95	0.54	18.4	32.7	51.2	55.3	58.1	71.3	$15,318,500	$0	$0	$15,318,500	61.3%
TK-069 - HAWTHORNE HILLS UPPER TANK	Potable Tank - Transmission	$10,000,000	0.01	0.05	0.41	0.49	0.05	0.99	0.95	0.54	18.4	32.7	51.2	55.3	58.1	71.3	$6,127,400	$0	$0	$6,127,400	61.3%
TK-131 - CONIFER WAY TANK	Potable Tank - Transmission	$2,500,000	0.01	0.03	0.31	0.56	0.10	0.99	0.96	0.65	17.0	27.9	42.0	45.5	48.8	64.5	$1,678,700	$0	$0	$1,678,700	67.1%
TK-147 - SMITH SADDLE TANK #1	Potable Tank - Transmission	$25,000,000	0.02	0.08	0.39	0.45	0.06	0.98	0.90	0.52	19.7	35.6	53.2	57.1	59.7	72.2	$14,892,501	$0	$0	$14,892,501	59.6%
TK-148 - SMITH SADDLE TANK #2	Potable Tank - Transmission	$25,000,000	0.02	0.08	0.41	0.43	0.05	0.98	0.90	0.48	20.2	37.1	55.9	59.9	62.3	74.1	$14,475,000	$0	$0	$14,475,000	57.9%
TK-155 - PINE MOUNTAIN TUNNEL TANK	Potable Tank - Transmission	$15,000,000	0.75	0.00	0.00	0.00	0.25	0.25	0.25	0.25	77.4	77.5	77.7	78.0	78.7	82.3	$3,748,500	$0	$0	$3,748,500	25.0%
TK-165 - ALTO TANK #2	Potable Tank - Transmission	$15,000,000	0.01	0.03	0.31	0.56	0.10	0.99	0.96	0.65	17.0	27.9	42.0	45.5	48.8	64.5	$10,072,200	$0	$0	$10,072,200	67.1%
TK-184 - PACHECO RIDGE TANK #1	Potable Tank - Transmission	$15,000,000	0.02	0.08	0.39	0.45	0.06	0.98	0.90	0.52	19.7	35.6	53.2	57.1	59.7	72.2	$8,936,101	$0	$0	$8,936,101	59.6%
TK-185 - PACHECO RIDGE TANK #2	Potable Tank - Transmission	$15,000,000	0.02	0.08	0.42	0.42	0.05	0.98	0.90	0.47	20.3	37.5	56.5	60.6	63.0	74.6	$8,617,500	$0	$0	$8,617,500	57.5%
Bon Tempe Treatment Plant	Potable Treatment Plant	$100,000,000	0.03	0.10	0.41	0.41	0.05	0.97	0.87	0.46	25.3	54.0	62.8	65.8	74.0	96.0	$53,871,396	$0	$0	$53,871,396	53.9%
San Geronimo Treatment Plant	Potable Treatment Plant	$100,000,000	0.03	0.11	0.46	0.36	0.03	0.97	0.85	0.40	26.7	58.8	68.4	71.0	78.2	97.2	$50,382,400	$0	$0	$50,382,400	50.4%
Potable Total/Averages			**5%**	**11%**	**39%**	**39%**	**6%**													**$580,936,711**	
PS-028 - Kent Lake Pump Station	Raw Pump Station	$5,000,000	0.01	0.04	0.36	0.53	0.07	0.99	0.96	0.60	16.5	29.8	51.6	68.6	93.1	99.9	$3,147,210	$0	$0	$3,147,210	62.9%
PS-029 - Phoenix Lake Barge Pump	Raw Pump Station	$5,000,000	0.08	0.20	0.52	0.20	0.00	0.92	0.72	0.20	34.3	56.2	81.2	90.2	98.8	99.9	$1,835,360	$0	$0	$1,835,360	36.7%
PS-031 - Soulajule Pump Station	Raw Pump Station	$5,000,000	0.03	0.10	0.39	0.43	0.06	0.97	0.88	0.49	22.0	37.8	59.8	74.3	94.2	99.9	$2,767,225	$0	$0	$2,767,225	55.3%
PS-097 - Tocaloma Booster Pump Station	Raw Pump Station	$5,000,000	0.00	0.01	0.18	0.61	0.19	1.00	0.99	0.80	11.9	20.0	35.3	53.9	85.4	99.9	$3,749,750	$0	$0	$3,749,750	75.0%
PS-128 - Alpine Bon-Tempe Pump Station	Raw Pump Station	$5,000,000	0.01	0.07	0.45	0.43	0.03	0.99	0.91	0.46	20.5	37.0	61.7	76.6	96.0	99.9	$2,750,450	$0	$0	$2,750,450	55.0%
Raw Total/Averages			**3%**	**8%**	**38%**	**44%**	**7%**													**$14,249,995**	
PS-049 - Channing Way Pump Station	Recycled Pump Station	$5,000,000	0.00	0.03	0.27	0.58	0.11	1.00	0.97	0.70	14.5	25.3	43.9	61.9	90.1	99.9	$3,424,015	$0	$0	$3,424,015	68.5%
PS-111 - Quail Hill Pump Station	Recycled Pump Station	$5,000,000	0.04	0.13	0.51	0.32	0.01	0.96	0.84	0.33	26.0	45.6	71.6	83.8	97.7	99.9	$2,322,765	$0	$0	$2,322,765	46.5%
PS-112 - Freitas Parkway Pump Station	Recycled Pump Station	$5,000,000	0.08	0.20	0.52	0.20	0.00	0.92	0.72	0.20	34.3	56.2	81.2	90.2	98.8	99.9	$1,835,360	$0	$0	$1,835,360	36.7%
TK-103 - TERRA LINDA TANK #1	Recycled Tank - Gravity	$2,500,000	0.01	0.03	0.31	0.56	0.10	0.99	0.96	0.65	17.0	27.9	42.0	45.5	48.8	64.5	$1,678,700	$0	$0	$1,678,700	67.1%
TK-170 - TERRA LINDA TANK #2	Recycled Tank - Gravity	$2,500,000	0.01	0.03	0.31	0.56	0.10	0.99	0.96	0.65	17.0	27.9	42.0	45.5	48.8	64.5	$1,678,700	$0	$0	$1,678,700	67.1%
TK-227 - LGWRP Clearwell	Recycled Tank - Reservoir	$4,500,000	0.00	0.00	0.07	0.49	0.44	1.00	1.00	0.93	12.7	15.1	18.9	20.9	24.8	43.8	$3,863,970	$0	$0	$3,863,970	85.9%
Las Gallinas Treatment Plant	Recycled Treatment Plant	$0	0.00	0.00	0.07	0.50	0.43	1.00	1.00	0.92	2.1	4.3	8.5	10.4	16.1	58.3	$0	$0	$0	$0	#DIV/0!
Recycled Total/Averages		**$1,196,848,620**	**2%**	**6%**	**29%**	**46%**	**17%**													**$14,803,510**	

Pipelines																							
Type	**Miles of Pipeline**	**Replacement Cost**																					
Potable Water - Distribution Main	761.0	$2,209,823,037																					
Potable Water - Lateral	229.4	$181,682,836																					
Potable Water - Main	0.1	$200,899																					
Potable Water - Transmission Main	92.1	$388,893,185																					
Raw Water - Distribution Main	4.7	$13,679,943																					
Raw Water - Transmission Main	25.6	$108,036,492																					
Recycled Water - Lateral	2.1	$1,676,612																					
Recycled Water - Main	24.4	$70,806,587																					
Recycled Water - Other	0.3	$828,973																					
Total	**1,139.6**	**$2,975,628,563**																					
Number of Leaks	**Number of Leaks**	**Number of Breaks**	**Total Number of Repairs**	**Days to Repair Leaks**	**Days to Repair Breaks**	**Total Days to Repair**																	
Potable Water - Distribution Main	101.7	25.4	127.2	14.3	3.6	17.8																	
Potable Water - Lateral	52.4	13.1	65.4	7.3	1.8	9.2																	
Potable Water - Main	0.0	0.0	0.0	0.0	0.0	0.0																	
Potable Water - Transmission Main	8.3	2.1	10.4	1.5	0.4	1.9																	
Potable Total	**162.4**	**40.6**	**203.0**	**23.1**	**5.8**	**28.8**																	
Economic Loss	**$1,624,075.35**	**$406,018.84**	**$2,030,094.19**																				
Raw Water - Distribution Main	0.9	0.2	1.2	0.1	0.0	0.2																	
Raw Water - Transmission Main	3.0	0.8	3.8	0.8	0.2	1.1																	
Raw Total	**4.0**	**1.0**	**5.0**	**1.0**	**0.2**	**1.2**																	
Economic Loss	**$39,751.79**	**$9,937.95**	**$49,689.74**																				
Recycled Water - Lateral	0.5	0.1	0.6	0.1	0.0	0.1																	
Recycled Water - Main	1.8	0.5	2.3	0.3	0.1	0.3																	
Recycled Water - Other	0.0	0.0	0.0	0.0	0.0	0.0																	
Recycled Total	**2.4**	**0.6**	**2.9**	**0.3**	**0.1**	**0.4**																	
Economic Loss	**$23,564.05**	**$5,891.01**	**$29,455.07**																				
Total	**168.7**	**42.2**	**210.9**	**24.4**	**6.1**	**30.5**																	
Cost to Repair a Leak	**Cost to Repair a Break**	**Economic Loss**																					
$10,000	$10,000	$2,109,239																					
Facilities																							
Facility Name	**Type**	**Replacement Cost**	**Probability of Damage State**							**Percent Functionality After**						**Economic Loss**					
			None	**Slight**	**Moderate**	**Extensive**	**Complete**	**Exceed Slight**	**Exceed Moderate**	**Exceed Extensive**	**Day 1**	**Day 3**	**Day 7**	**Day 14**	**Day 30**	**Day 90**	**Structure Loss**	**Nonstructural Drift-Sensitive Loss**	**Nonstructural Acceleration-Sensitive Loss**	**Total**	**% of Replacement Cost**	
Administration Building - Headquarter Office	Building	$12,300,000	0.01	0.24	0.66	0.09	0.00	0.99	0.75	0.09	1.4	2.6	25.0	25.1	90.8	99.6	$276,922	$729,926	$213,310	$1,220,159	9.9%		
Corporation Yard - Boat Barn	Building	$1,000,000	0.01	0.04	0.38	0.51	0.06	0.99	0.95	0.57	0.6	0.8	4.9	4.9	42.6	94.0	$114,695	$65,775	$36,105	$216,576	21.7%		
Corporation Yard - Facilities Offices	Building	$15,000,000	0.01	0.24	0.66	0.09	0.00	0.99	0.75	0.09	1.4	2.6	25.0	25.1	90.8	99.6	$337,710	$890,154	$260,135	$1,487,999	9.9%		
Corporation Yard - Laboratory	Building	$6,500,000	0.01	0.24	0.66	0.09	0.00	0.99	0.75	0.09	1.4	2.6	25.0	25.1	90.8	99.6	$146,341	$385,733	$112,725	$644,799	9.9%		
Corporation Yard - Satellite Office	Building	$500,000	0.01	0.17	0.46	0.30	0.06	0.99	0.82	0.36	1.0	1.8	17.5	17.5	63.5	93.6	$25,197	$50,970	$37,828	$113,995	22.8%		
Pelican Yard - Vehicle Storage	Building	$500,000	0.02	0.08	0.38	0.45	0.06	0.98	0.89	0.52	2.2	2.6	10.6	10.6	48.2	93.6	$53,289	$35,041	$31,026	$119,356	23.9%		
Pelican Yard - Vehicle Storage	Building	$800,000	0.03	0.11	0.50	0.34	0.01	0.97	0.86	0.36	2.9	3.4	14.1	14.2	64.2	98.6	$61,385	$32,035	$17,146	$110,566	13.8%		
Ranger Housing - Alpine Dam - Residence	Building	$500,000	0.31	0.45	0.10	0.12	0.03	0.69	0.25	0.15	30.6	32.7	75.0	75.1	85.0	97.0	$12,746	$29,468	$16,709	$58,923	11.8%		
Ranger Housing - Lagunitas Dam - Garage	Building	$300,000	0.18	0.27	0.45	0.10	0.00	0.82	0.55	0.10	17.7	19.0	44.4	44.5	89.5	99.9	$9,891	$5,131	$5,559	$20,581	6.9%		
Ranger Housing - Lagunitas Dam - Residence	Building	$500,000	0.48	0.29	0.03	0.16	0.04	0.52	0.23	0.20	47.7	49.1	77.1	77.2	80.2	96.0	$14,930	$32,980	$16,627	$64,536	12.9%		
Ranger Housing - Phoenix Dam - Log Cabin	Building	$100,000	0.66	0.32	0.03	0.00	0.00	0.34	0.03	0.00	65.5	67.0	97.1	97.2	99.9	99.9	$222	$694	$1,202	$2,118	2.1%		
Ranger Housing - Phoenix Dam - Residence	Building	$500,000	0.53	0.26	0.02	0.16	0.04	0.47	0.22	0.20	52.5	53.8	78.0	78.1	80.2	96.0	$14,727	$32,348	$16,397	$63,472	12.7%		
Ranger Housing - Phoenix Dam - Shed	Building	$100,000	0.23	0.22	0.26	0.24	0.05	0.77	0.55	0.29	22.8	23.9	45.2	45.3	71.2	94.9	$6,435	$4,827	$5,852	$17,114	17.1%		
Ranger Housing - Porteous House	Building	$600,000	0.66	0.32	0.03	0.00	0.00	0.34	0.03	0.00	65.5	67.0	97.1	97.2	99.9	99.9	$1,332	$4,166	$7,213	$12,710	2.1%		
Ranger Housing - Porteous House - Garage	Building	$300,000	0.24	0.24	0.28	0.20	0.04	0.76	0.51	0.24	24.4	25.6	48.4	48.5	76.2	96.0	$16,555	$12,145	$14,948	$43,648	14.5%		
Ranger Housing - Porteous House - Shed	Building	$100,000	0.23	0.22	0.26	0.24	0.05	0.77	0.55	0.29	22.8	23.9	45.2	45.3	71.2	94.9	$6,435	$4,827	$5,852	$17,114	17.1%		
Ranger Housing - Porteous House - Shed	Building	$100,000	0.23	0.22	0.26	0.24	0.05	0.77	0.55	0.29	22.8	23.9	45.2	45.3	71.2	94.9	$6,435	$4,827	$5,852	$17,114	17.1%		
Ranger Housing - Sky Oaks - Residence	Building	$1,700,000	0.48	0.29	0.03	0.16	0.04	0.52	0.23	0.20	47.7	49.1	77.1	77.2	80.2	96.0	$50,761	$112,130	$56,531	$219,422	12.9%		
Ranger Housing - Soulajule Residence	Building	$500,000	0.78	0.05	0.00	0.14	0.03	0.22	0.18	0.17	77.6	77.8	82.4	82.4	82.5	96.4	$12,358	$26,594	$11,704	$50,655	10.1%		
Sky Oaks Headquarters - Entrance Kiosk	Building	$100,000	0.33	0.48	0.10	0.07	0.02	0.67	0.19	0.09	33.3	35.5	80.9	81.1	90.8	98.1	$1,427	$2,775	$3,458	$7,660	7.7%		
Sky Oaks Headquarters - Fisheries Office (Fish Box)	Building	$300,000	0.37	0.53	0.11	0.00	0.00	0.63	0.11	0.00	36.6	39.1	89.0	89.2	99.9	99.9	$1,256	$3,242	$5,070	$9,568	3.2%		
Sky Oaks Headquarters - Headquarter Office	Building	$700,000	0.37	0.53	0.11	0.00	0.00	0.63	0.11	0.00	36.6	39.1	89.0	89.2	99.9	99.9	$2,932	$7,565	$11,829	$22,326	3.2%		
Sky Oaks Headquarters - Natural Resources Office (Sky Box	Building	$700,000	0.37	0.53	0.11	0.00	0.00	0.63	0.11	0.00	36.6	39.1	89.0	89.2	99.9	99.9	$2,932	$7,565	$11,829	$22,326	3.2%		
Sky Oaks Headquarters - Seed Shed	Building	$200,000	0.18	0.27	0.45	0.10	0.00	0.82	0.55	0.10	17.7	19.0	44.4	44.5	89.5	99.9	$6,594	$3,421	$3,706	$13,720	6.9%		
Sky Oaks Headquarters - Storage Shed	Building	$200,000	0.14	0.22	0.36	0.24	0.04	0.86	0.64	0.28	14.2	15.2	35.7	35.7	71.9	95.9	$12,958	$9,004	$10,145	$32,107	16.1%		
Administrative Total/Averages			**27%**	**27%**	**27%**	**16%**	**3%**													**$4,608,562**			
PS-001 - Federal Works Booster Pump Station	Potable Pump Station	$5,000,000	0.10	0.21	0.50	0.18	0.00	0.90	0.69	0.19	35.9	57.9	82.2	90.8	98.8	99.9	$1,765,775	$0	$0	$1,765,775	35.3%		
PS-002 - Chapman Park Pump Station	Potable Pump Station	$5,000,000	0.10	0.21	0.51	0.18	0.00	0.90	0.69	0.18	36.2	58.4	82.8	91.2	98.9	99.9	$1,742,300	$0	$0	$1,742,300	34.8%		
PS-003 - Summit Drive Pump Station PS-003	Potable Pump Station	$5,000,000	0.30	0.30	0.35	0.05	0.00	0.70	0.40	0.05	57.4	77.9	93.6	97.5	99.7	99.9	$931,840	$0	$0	$931,840	18.6%		
PS-005 - H-Line Booster Station	Potable Pump Station	$5,000,000	0.25	0.25	0.29	0.18	0.03	0.75	0.50	0.21	49.0	66.6	81.2	88.3	96.9	99.9	$1,496,175	$0	$0	$1,496,175	29.9%		
PS-006 - Madera Park Pump Station	Potable Pump Station	$5,000,000	0.12	0.19	0.35	0.29	0.05	0.88	0.69	0.34	34.5	52.2	71.0	81.6	95.4	99.9	$2,130,040	$0	$0	$2,130,040	42.6%		
PS-007 - Mariner Highlands Pump Station	Potable Pump Station	$5,000,000	0.25	0.25	0.29	0.18	0.03	0.75	0.50	0.21	49.0	66.6	81.2	88.3	96.9	99.9	$1,496,175	$0	$0	$1,496,175	29.9%		
PS-010 - Cascade Pump Station	Potable Pump Station	$5,000,000	0.18	0.27	0.45	0.10	0.00	0.82	0.55	0.10	45.5	67.9	88.8	94.9	99.4	99.9	$1,339,350	$0	$0	$1,339,350	26.8%		
PS-011 - Fairfax Manor 1st Pump Station	Potable Pump Station	$5,000,000	0.10	0.21	0.51	0.18	0.00	0.90	0.69	0.18	36.2	58.4	82.8	91.2	98.9	99.9	$1,742,300	$0	$0	$1,742,300	34.8%		
PS-012 - Fairfax Manor 2nd Lift Pump Station	Potable Pump Station	$5,000,000	0.13	0.20	0.34	0.28	0.05	0.87	0.67	0.33	36.4	54.0	72.1	82.2	95.5	99.9	$2,054,450	$0	$0	$2,054,450	41.1%		
PS-013 - Oak Manor 1st Lift Pump Station	Potable Pump Station	$5,000,000	0.30	0.30	0.35	0.05	0.00	0.70	0.40	0.05	57.4	77.9	93.6	97.5	99.7	99.9	$931,840	$0	$0	$931,840	18.6%		
PS-014 - Oak Manor 2nd Lift Pump Station	Potable Pump Station	$5,000,000	0.23	0.22	0.26	0.24	0.05	0.77	0.55	0.29	45.3	61.5	75.7	84.1	95.7	99.9	$1,748,060	$0	$0	$1,748,060	35.0%		
PS-016 - Scott Pump Station	Potable Pump Station	$5,000,000	0.13	0.20	0.34	0.28	0.05	0.87	0.67	0.33	36.4	54.0	72.1	82.2	95.5	99.9	$2,054,425	$0	$0	$2,054,425	41.1%		
PS-017 - Smith Saddle Booster Station	Potable Pump Station	$5,000,000	0.30	0.30	0.35	0.05	0.00	0.70	0.40	0.05	57.4	77.9	93.6	97.5	99.7	99.9	$931,840	$0	$0	$931,840	18.6%		
PS-019 - Bret Harte Pump Station	Potable Pump Station	$5,000,000	0.37	0.21	0.16	0.21	0.05	0.63	0.42	0.26	56.0	69.0	78.5	85.5	95.9	99.9	$1,444,475	$0	$0	$1,444,475	28.9%		
PS-020 - Greenbrae Pump Station	Potable Pump Station	$5,000,000	0.23	0.22	0.26	0.24	0.05	0.77	0.55	0.29	45.3	61.5	75.7	84.1	95.7	99.9	$1,748,060	$0	$0	$1,748,060	35.0%		
PS-022 - Ignacio Boosters	Potable Pump Station	$50,000,000	0.08	0.19	0.50	0.22	0.01	0.92	0.74	0.23	32.8	54.0	78.7	88.3	98.2	99.9	$19,441,700	$0	$0	$19,441,700	38.9%		
PS-023 - Kent Fire Trail 1st Pump Station	Potable Pump Station	$5,000,000	0.25	0.25	0.29	0.18	0.03	0.75	0.50	0.21	49.0	66.6	81.2	88.3	96.9	99.9	$1,496,175	$0	$0	$1,496,175	29.9%		
PS-025 - Kent Woodlands 2nd Pump Station	Potable Pump Station	$5,000,000	0.30	0.30	0.35	0.05	0.00	0.70	0.40	0.05	57.4	77.9	93.6	97.5	99.7	99.9	$931,840	$0	$0	$931,840	18.6%		
PS-026 - Lagunitas Booster Station	Potable Pump Station	$5,000,000	0.14	0.21	0.36	0.24	0.04	0.86	0.64	0.28	38.2	56.8	75.4	84.7	96.3	99.9	$1,911,350	$0	$0	$1,911,350	38.2%		
PS-030 - Phoenix Transfer Pump Station	Potable Pump Station	$5,000,000	0.30	0.30	0.35	0.05	0.00	0.70	0.40	0.05	57.4	77.9	93.6	97.5	99.7	99.9	$931,840	$0	$0	$931,840	18.6%		
PS-032 - Elinor Avenue Pump Station	Potable Pump Station	$5,000,000	0.25	0.25	0.29	0.18	0.03	0.75	0.50	0.21	49.0	66.6	81.2	88.3	96.9	99.9	$1,496,175	$0	$0	$1,496,175	29.9%		
PS-033 - Fern Canyon Pump Station	Potable Pump Station	$5,000,000	0.23	0.22	0.26	0.24	0.05	0.77	0.55	0.29	45.3	61.5	75.7	84.1	95.7	99.9	$1,748,770	$0	$0	$1,748,770	35.0%		
PS-034 - Lapachet Pump Station	Potable Pump Station	$5,000,000	0.24	0.24	0.28	0.20	0.04	0.76	0.51	0.24	47.9	65.0	79.5	87.0	96.5	99.9	$1,576,090	$0	$0	$1,576,090	31.5%		
PS-035 - Mine Ridge Pump Station	Potable Pump Station	$5,000,000	0.30	0.30	0.35	0.05	0.00	0.70	0.40	0.05	57.4	77.9	93.6	97.5	99.7	99.9	$931,840	$0	$0	$931,840	18.6%		
PS-036 - Scott Highlands Pump (OUT OF SERVICE)	Potable Pump Station	$5,000,000	0.27	0.22	0.23	0.23	0.05	0.73	0.50	0.28	48.7	64.0	76.6	84.6	95.8	99.9	$1,647,515	$0	$0	$1,647,515	33.0%		
PS-040 - Summit Avenue Upper Pump Station	Potable Pump Station	$5,000,000	0.24	0.24	0.28	0.20	0.04	0.76	0.51	0.24	47.9	65.0	79.5	87.0	96.5	99.9	$1,576,090	$0	$0	$1,576,090	31.5%		
PS-041 - Kastania Booster Pump Station	Potable Pump Station	$5,000,000	0.62	0.24	0.14	0.01	0.00	0.38	0.15	0.01	79.5	92.0	98.3	99.5	99.9	99.9	$358,950	$0	$0	$358,950	7.2%		
PS-042 - Del Mesa Pump Station	Potable Pump Station	$5,000,000	0.30	0.30	0.35	0.05	0.00	0.70	0.40	0.05	57.4	77.9	93.6	97.5	99.7	99.9	$931,840	$0	$0	$931,840	18.6%		
PS-043 - Fawn Drive Pump Station	Potable Pump Station	$5,000,000	0.25	0.25	0.29	0.18	0.03	0.75	0.50	0.21	49.0	66.6	81.2	88.3	96.9	99.9	$1,496,175	$0	$0	$1,496,175	29.9%		
PS-044 - Mann Pump Station	Potable Pump Station	$5,000,000	0.04	0.13	0.42	0.37	0.05	0.96	0.83	0.41	25.2	42.6	65.2	78.2	95.3	99.9	$2,528,565	$0	$0	$2,528,565	50.6%		
PS-046 - Scenic Avenue Pump Station	Potable Pump Station	$5,000,000	0.05	0.16	0.52	0.26	0.01	0.95	0.79	0.27	29.2	50.0	75.9	86.7	98.2	99.9	$2,116,760	$0	$0	$2,116,760	42.3%		
PS-047 - Sequoia Park Pump Station	Potable Pump Station	$5,000,000	0.25	0.25	0.29	0.18	0.03	0.75	0.50	0.21	49.0	66.6	81.2	88.3	96.9	99.9	$1,496,175	$0	$0	$1,496,175	29.9%		
PS-050 - Chula Vista Pump Station	Potable Pump Station	$5,000,000	0.25	0.25	0.29	0.18	0.03	0.75	0.50	0.21	49.0	66.6	81.2	88.3	96.9	99.9	$1,496,175	$0	$0	$1,496,175	29.9%		
PS-052 - Elda Drive Pump Station	Potable Pump Station	$5,000,000	0.13	0.20	0.34	0.28	0.05	0.87	0.67	0.33	36.4	54.0	72.1	82.2	95.5	99.9	$2,054,240	$0	$0	$2,054,240	41.1%		
PS-053 - Fairhills 1st Lift Pump Station	Potable Pump Station	$5,000,000	0.30	0.25	0.25	0.17	0.03	0.70	0.45	0.20	52.8	69.3	82.3	88.8	97.0	99.9	$1,384,860	$0	$0	$1,384,860	27.7%		
PS-054 - Fairhills 2nd Lift Pump Station	Potable Pump Station	$5,000,000	0.30	0.25	0.25	0.17	0.03	0.70	0.45	0.20	52.8	69.3	82.3	88.8	97.0	99.9	$1,384,860	$0	$0	$1,384,860	27.7%		
PS-055 - Grove Hill Pump Station	Potable Pump Station	$5,000,000	0.30	0.30	0.35	0.05	0.00	0.70	0.40	0.05	57.4	77.9	93.6	97.5	99.7	99.9	$931,840	$0	$0	$931,840	18.6%		
PS-056 - Rafael Highlands Pump Station	Potable Pump Station	$5,000,000	0.49	0.28	0.21	0.02	0.00	0.51	0.23	0.02	71.3	87.3	97.0	99.0	99.8	99.9	$549,900	$0	$0	$549,900	11.0%		

PS-057 - Hind Pump Station	Potable Pump Station	$5,000,000	0.59	0.23	0.13	0.04	0.01	0.41	0.18	0.05	76.5	88.6	95.0	97.2	99.2	99.9	$521,240	$0	$0	$521,240	10.4%
PS-058 - Knight Drive Pump Station	Potable Pump Station	$5,000,000	0.51	0.19	0.12	0.15	0.03	0.49	0.30	0.18	67.2	78.1	84.9	89.8	97.1	99.9	$1,028,315	$0	$0	$1,028,315	20.6%
PS-060 - Lockwood Drive Pump Station	Potable Pump Station	$5,000,000	0.46	0.18	0.11	0.20	0.05	0.54	0.36	0.25	62.2	72.5	79.5	85.9	95.9	99.9	$1,300,330	$0	$0	$1,300,330	26.0%
PS-061 - Lucas Valley Pump Station	Potable Pump Station	$5,000,000	0.47	0.27	0.20	0.05	0.01	0.53	0.26	0.06	68.6	84.2	93.8	96.7	99.2	99.9	$704,060	$0	$0	$704,060	14.1%
PS-062 - Manderly Pump Station	Potable Pump Station	$5,000,000	0.46	0.18	0.11	0.20	0.05	0.54	0.36	0.25	62.2	72.5	79.5	85.9	95.9	99.9	$1,300,330	$0	$0	$1,300,330	26.0%
PS-064 - Marinwood Pump Station (NOT IS USE)	Potable Pump Station	$5,000,000	0.37	0.21	0.16	0.21	0.05	0.63	0.42	0.26	56.0	69.0	78.5	85.5	95.9	99.9	$1,444,475	$0	$0	$1,444,475	28.9%
PS-065 - McNear Drive Pump Station	Potable Pump Station	$5,000,000	0.37	0.21	0.16	0.21	0.05	0.63	0.42	0.26	56.0	69.0	78.5	85.5	95.9	99.9	$1,444,475	$0	$0	$1,444,475	28.9%
PS-066 - Mesa Vista Pump Station	Potable Pump Station	$5,000,000	0.23	0.22	0.26	0.24	0.05	0.77	0.55	0.29	45.3	61.5	75.7	84.1	95.7	99.9	$1,748,060	$0	$0	$1,748,060	35.0%
PS-069 - San Quentin Pump Station	Potable Pump Station	$5,000,000	0.12	0.20	0.36	0.28	0.05	0.88	0.69	0.33	35.0	53.0	72.0	82.3	95.6	99.9	$2,087,410	$0	$0	$2,087,410	41.7%
PS-070 - Santa Margarita Pump Station	Potable Pump Station	$5,000,000	0.23	0.22	0.26	0.24	0.05	0.77	0.55	0.29	45.3	61.5	75.7	84.1	95.7	99.9	$1,748,060	$0	$0	$1,748,060	35.0%
PS-071 - Sky View Terrace Pump Station	Potable Pump Station	$5,000,000	0.30	0.30	0.35	0.05	0.00	0.70	0.40	0.05	57.4	77.9	93.6	97.5	99.7	99.9	$931,840	$0	$0	$931,840	18.6%
PS-073 - Swig Pump Station	Potable Pump Station	$5,000,000	0.49	0.28	0.21	0.02	0.00	0.51	0.23	0.02	71.3	87.3	97.0	99.0	99.8	99.9	$549,900	$0	$0	$549,900	11.0%
PS-074 - Via Montebello Pump Station	Potable Pump Station	$5,000,000	0.36	0.30	0.30	0.04	0.00	0.64	0.34	0.04	61.9	81.2	94.9	98.1	99.7	99.9	$797,290	$0	$0	$797,290	15.9%
PS-077 - Beacon Hill Pump Station	Potable Pump Station	$5,000,000	0.36	0.30	0.30	0.04	0.00	0.64	0.34	0.04	61.9	81.2	94.9	98.1	99.7	99.9	$797,290	$0	$0	$797,290	15.9%
PS-078 - Crescent Avenue Pump Station	Potable Pump Station	$5,000,000	0.49	0.28	0.21	0.02	0.00	0.51	0.23	0.02	71.3	87.3	97.0	99.0	99.8	99.9	$549,900	$0	$0	$549,900	11.0%
PS-079 - Marin City Pump Station	Potable Pump Station	$5,000,000	0.13	0.20	0.34	0.28	0.05	0.87	0.67	0.33	36.4	54.0	72.1	82.2	95.5	99.9	$2,054,240	$0	$0	$2,054,240	41.1%
PS-080 - Monte Mar Vista Pump Station	Potable Pump Station	$5,000,000	0.13	0.20	0.34	0.28	0.05	0.87	0.67	0.33	36.4	54.0	72.1	82.2	95.5	99.9	$2,054,240	$0	$0	$2,054,240	41.1%
PS-081 - Sausalito Pumphouse Pump Station	Potable Pump Station	$5,000,000	0.13	0.20	0.34	0.28	0.05	0.87	0.67	0.33	36.4	54.0	72.1	82.2	95.5	99.9	$2,054,240	$0	$0	$2,054,240	41.1%
PS-082 - Sausalito Boulevard Pump Station	Potable Pump Station	$5,000,000	0.49	0.28	0.21	0.02	0.00	0.51	0.23	0.02	71.1	87.1	96.7	98.9	99.8	99.9	$561,345	$0	$0	$561,345	11.2%
PS-083 - Richardson Drive Pump Station	Potable Pump Station	$5,000,000	0.30	0.25	0.25	0.17	0.03	0.70	0.45	0.20	52.8	69.3	82.3	88.8	97.0	99.9	$1,384,860	$0	$0	$1,384,860	27.7%
PS-084 - Eastwood Way Pump Station	Potable Pump Station	$5,000,000	0.23	0.22	0.26	0.24	0.05	0.77	0.55	0.29	45.3	61.5	75.7	84.1	95.7	99.9	$1,748,770	$0	$0	$1,748,770	35.0%
PS-085 - Fairview Park Pump Station	Potable Pump Station	$5,000,000	0.23	0.22	0.26	0.24	0.05	0.77	0.55	0.29	45.3	61.5	75.7	84.1	95.7	99.9	$1,748,770	$0	$0	$1,748,770	35.0%
PS-087 - Marinview Pump Station	Potable Pump Station	$5,000,000	0.14	0.22	0.36	0.24	0.04	0.86	0.64	0.28	38.3	56.9	75.6	84.9	96.3	99.9	$1,902,995	$0	$0	$1,902,995	38.1%
PS-088 - Tam Woods 1st Lift Pump Station	Potable Pump Station	$5,000,000	0.23	0.22	0.26	0.24	0.05	0.77	0.55	0.29	45.3	61.5	75.7	84.1	95.7	99.9	$1,748,770	$0	$0	$1,748,770	35.0%
PS-089 - Tam Woods 2nd Lift Pump Station	Potable Pump Station	$5,000,000	0.24	0.24	0.28	0.20	0.04	0.76	0.51	0.24	47.9	65.0	79.5	87.0	96.5	99.9	$1,576,090	$0	$0	$1,576,090	31.5%
PS-090 - Hill Haven Pump Station	Potable Pump Station	$5,000,000	0.37	0.21	0.16	0.21	0.05	0.63	0.42	0.26	56.0	69.0	78.5	85.5	95.9	99.9	$1,444,475	$0	$0	$1,444,475	28.9%
PS-091 - Sugarloaf Pump Station	Potable Pump Station	$5,000,000	0.47	0.27	0.20	0.05	0.01	0.53	0.26	0.06	68.6	84.2	93.8	96.7	99.2	99.9	$704,060	$0	$0	$704,060	14.1%
PS-092 - Tiburon Belvedere Pump Station	Potable Pump Station	$5,000,000	0.49	0.28	0.21	0.02	0.00	0.51	0.23	0.02	71.3	87.3	97.0	99.0	99.8	99.9	$549,900	$0	$0	$549,900	11.0%
PS-093 - Tiburon Booster Pump Station	Potable Pump Station	$5,000,000	0.23	0.22	0.26	0.24	0.05	0.77	0.55	0.29	45.3	61.5	75.7	84.1	95.7	99.9	$1,748,770	$0	$0	$1,748,770	35.0%
PS-095 - Pine Mountain Tunnel Pump Station	Potable Pump Station	$5,000,000	0.04	0.12	0.42	0.37	0.05	0.96	0.83	0.42	25.1	42.5	65.0	78.1	95.3	99.9	$2,534,590	$0	$0	$2,534,590	50.7%
PS-096 - Southern Marin Line Boosters	Potable Pump Station	$5,000,000	0.30	0.30	0.35	0.05	0.00	0.70	0.40	0.05	57.4	77.9	93.6	97.5	99.7	99.9	$931,840	$0	$0	$931,840	18.6%
PS-101 - Redwood Drive Lower Pump	Potable Pump Station	$5,000,000	0.18	0.27	0.45	0.10	0.00	0.82	0.55	0.10	45.5	67.9	88.8	94.9	99.4	99.9	$1,339,350	$0	$0	$1,339,350	26.8%
PS-102 - North Marin Line Boosters	Potable Pump Station	$5,000,000	0.15	0.22	0.38	0.22	0.03	0.85	0.63	0.25	39.5	58.7	77.8	86.5	96.7	99.9	$1,812,720	$0	$0	$1,812,720	36.3%
PS-103 - San Geronimo Valley Pump Station	Potable Pump Station	$5,000,000	0.15	0.22	0.38	0.22	0.03	0.85	0.63	0.25	39.5	58.7	77.8	86.5	96.7	99.9	$1,812,720	$0	$0	$1,812,720	36.3%
PS-104 - Conifer Way Pump Station	Potable Pump Station	$5,000,000	0.13	0.20	0.34	0.28	0.05	0.87	0.67	0.33	36.4	54.0	72.1	82.2	95.5	99.9	$2,054,450	$0	$0	$2,054,450	41.1%
PS-106 - Los Altos Pump Station	Potable Pump Station	$5,000,000	0.49	0.28	0.21	0.02	0.00	0.51	0.23	0.02	71.3	87.3	97.0	99.0	99.8	99.9	$549,900	$0	$0	$549,900	11.0%
PS-108 - Indian Rock Pump Station	Potable Pump Station	$5,000,000	0.18	0.27	0.45	0.10	0.00	0.82	0.55	0.10	45.5	67.9	88.8	94.9	99.4	99.9	$1,339,350	$0	$0	$1,339,350	26.8%
PS-109 - Cibrian Pump Station	Potable Pump Station	$5,000,000	0.47	0.27	0.20	0.05	0.01	0.53	0.26	0.06	68.6	84.2	93.8	96.7	99.2	99.9	$704,060	$0	$0	$704,060	14.1%
PS-113 - Lag Picnic Grounds Pump Station	Potable Pump Station	$5,000,000	0.24	0.24	0.28	0.20	0.04	0.76	0.51	0.24	47.9	65.0	79.5	87.0	96.5	99.9	$1,576,090	$0	$0	$1,576,090	31.5%
PS-114 - Cortez Avenue Pump Station	Potable Pump Station	$5,000,000	0.13	0.20	0.34	0.28	0.05	0.87	0.67	0.33	36.4	54.0	72.1	82.2	95.5	99.9	$2,054,425	$0	$0	$2,054,425	41.1%
PS-115 - Redwood Drive Upper Pump Station	Potable Pump Station	$5,000,000	0.14	0.21	0.36	0.24	0.04	0.86	0.64	0.28	38.2	56.8	75.4	84.7	96.3	99.9	$1,911,140	$0	$0	$1,911,140	38.2%
PS-116 - North Redwood Drive Boosters	Potable Pump Station	$5,000,000	0.24	0.29	0.39	0.07	0.00	0.76	0.47	0.07	52.0	73.6	91.8	96.5	99.6	99.9	$1,104,450	$0	$0	$1,104,450	22.1%
PS-117 - Wolfback Ridge Pump Station	Potable Pump Station	$5,000,000	0.49	0.28	0.21	0.02	0.00	0.51	0.23	0.02	71.1	87.1	96.7	98.9	99.8	99.9	$561,345	$0	$0	$561,345	11.2%
PS-118 - Fire Road Pump Station	Potable Pump Station	$5,000,000	0.13	0.20	0.34	0.28	0.05	0.87	0.67	0.33	36.4	54.0	72.1	82.2	95.5	99.9	$2,054,450	$0	$0	$2,054,450	41.1%
PS-122 - Upper Road Pump Station	Potable Pump Station	$5,000,000	0.30	0.30	0.35	0.05	0.00	0.70	0.40	0.05	57.4	77.9	93.6	97.5	99.7	99.9	$931,840	$0	$0	$931,840	18.6%
PS-123 - Southern Marin Line Syphon	Potable Pump Station	$5,000,000	0.23	0.22	0.26	0.24	0.05	0.77	0.55	0.29	45.3	61.5	75.7	84.1	95.7	99.9	$1,748,770	$0	$0	$1,748,770	35.0%
PS-124 - Throckmorton Booster New Pumpstation	Potable Pump Station	$5,000,000	0.30	0.30	0.35	0.05	0.00	0.70	0.40	0.05	57.4	77.9	93.6	97.5	99.7	99.9	$931,840	$0	$0	$931,840	18.6%
PS-125 - Kent Fire Trail 2nd Lift Pump Station	Potable Pump Station	$5,000,000	0.25	0.25	0.29	0.18	0.03	0.75	0.50	0.21	49.0	66.6	81.2	88.3	96.9	99.9	$1,496,175	$0	$0	$1,496,175	29.9%
PS-126 - Oak Woodlands Pump Station	Potable Pump Station	$5,000,000	0.27	0.23	0.23	0.22	0.05	0.73	0.50	0.27	49.0	64.4	77.0	84.9	95.8	99.9	$1,631,125	$0	$0	$1,631,125	32.6%
PS-127 - Marin Terrace Pump Station	Potable Pump Station	$5,000,000	0.14	0.22	0.36	0.24	0.04	0.86	0.64	0.28	38.3	56.9	75.6	84.9	96.3	99.9	$1,902,995	$0	$0	$1,902,995	38.1%
PS-129 - Slide Gulch Pump Station	Potable Pump Station	$5,000,000	0.24	0.24	0.28	0.20	0.04	0.76	0.51	0.24	47.9	65.0	79.5	87.0	96.5	99.9	$1,576,090	$0	$0	$1,576,090	31.5%
PS-130 - Smith Conifer Pump Station	Potable Pump Station	$5,000,000	0.30	0.30	0.35	0.05	0.00	0.70	0.40	0.05	57.4	77.9	93.6	97.5	99.7	99.9	$931,840	$0	$0	$931,840	18.6%
TK-156 - BON TEMPE CLEARWELL TANK	Potable Tank - Clearwell	$10,000,000	0.24	0.24	0.28	0.20	0.04	0.76	0.51	0.24	41.1	65.2	77.6	80.1	81.3	87.0	$3,568,200	$0	$0	$3,568,200	35.7%
TK-157 - SAN GERONIMO CLEARWELL TANK #1	Potable Tank - Clearwell	$10,000,000	0.15	0.22	0.38	0.22	0.03	0.85	0.63	0.25	33.3	58.9	75.7	79.0	80.2	86.3	$4,036,600	$0	$0	$4,036,600	40.4%
TK-186 - SAN GERONIMO CLEARWELL TANK #2	Potable Tank - Clearwell	$15,000,000	0.15	0.22	0.38	0.22	0.03	0.85	0.63	0.25	33.3	58.9	75.7	79.0	80.2	86.3	$6,054,900	$0	$0	$6,054,900	40.4%
TK-006 - MADERA PARK TANK #1	Potable Tank - Distribution	$500,000	0.18	0.42	0.15	0.20	0.05	0.82	0.40	0.25	37.4	70.7	77.4	78.9	80.2	86.0	$177,130	$0	$0	$177,130	35.4%
TK-008 - MARINER HIGHLANDS TANK	Potable Tank - Distribution	$300,000	0.40	0.32	0.04	0.20	0.05	0.60	0.28	0.25	53.8	76.9	78.7	79.5	80.6	86.4	$85,140	$0	$0	$85,140	28.4%
TK-015 - MEADOW CLUB UPPER TANK	Potable Tank - Distribution	$1,500,000	0.06	0.15	0.41	0.33	0.05	0.94	0.79	0.38	24.9	46.0	64.3	68.0	69.9	79.2	$763,560	$0	$0	$763,560	50.9%
TK-019 - OAK MANOR TOP TANK	Potable Tank - Distribution	$1,250,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$385,000	$0	$0	$385,000	30.8%
TK-025 - BRET HARTE TANK	Potable Tank - Distribution	$2,500,000	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.5	55.0	70.6	73.8	75.3	82.8	$1,102,050	$0	$0	$1,102,050	44.1%
TK-033 - INDIAN FIRE TRAIL TANK	Potable Tank - Distribution	$1,250,000	0.14	0.22	0.37	0.23	0.04	0.86	0.64	0.27	32.8	57.9	74.6	77.8	79.1	85.5	$516,100	$0	$0	$516,100	41.3%
TK-060 - SCOTT HIGHLANDS TANK	Potable Tank - Distribution	$1,250,000	0.15	0.22	0.38	0.21	0.04	0.85	0.63	0.24	33.4	59.2	76.4	79.7	80.9	86.7	$499,775	$0	$0	$499,775	40.0%
TK-066 - SUMMIT AVENUE UPPER TANK	Potable Tank - Distribution	$600,000	0.43	0.34	0.04	0.16	0.04	0.57	0.23	0.20	56.4	81.0	82.8	83.5	84.4	89.0	$149,040	$0	$0	$149,040	24.8%
TK-068 - ELDA DRIVE TANK	Potable Tank - Distribution	$750,000	0.15	0.22	0.38	0.21	0.04	0.85	0.63	0.24	33.4	59.2	76.4	79.7	80.9	86.7	$299,865	$0	$0	$299,865	40.0%
TK-074 - SCENIC AVENUE TANK	Potable Tank - Distribution	$100,000	0.24	0.56	0.20	0.00	0.00	0.76	0.20	0.00	45.4	89.7	98.3	99.8	99.8	99.8	$19,270	$0	$0	$19,270	19.3%
TK-078 - CHULA VISTA TANK	Potable Tank - Distribution	$1,250,000	0.35	0.31	0.32	0.03	0.00	0.65	0.35	0.03	51.4	81.1	95.1	97.5	97.6	98.4	$264,775	$0	$0	$264,775	21.2%
TK-081 - FAIRHILLS TOP TANK #1	Potable Tank - Distribution	$300,000	0.35	0.31	0.32	0.03	0.00	0.65	0.35	0.03	51.4	81.1	95.1	97.5	97.6	98.4	$63,546	$0	$0	$63,546	21.2%
TK-085 - HIND TANK #1	Potable Tank - Distribution	$500,000	0.54	0.20	0.01	0.20	0.05	0.46	0.26	0.25	63.8	78.2	78.9	79.5	80.6	86.4	$125,310	$0	$0	$125,310	25.1%
TK-086 - HIND TANK #2	Potable Tank - Distribution	$1,000,000	0.54	0.20	0.01	0.20	0.05	0.46	0.26	0.25	63.8	78.2	78.9	79.5	80.6	86.4	$250,620	$0	$0	$250,620	25.1%
TK-097 - RAFAEL HIGHLANDS TANK	Potable Tank - Distribution	$2,500,000	0.35	0.31	0.32	0.03	0.00	0.65	0.35	0.03	51.4	81.1	95.1	97.5	97.6	98.4	$529,550	$0	$0	$529,550	21.2%
TK-100 - SKYVIEW TERRACE TANK	Potable Tank - Distribution	$750,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$231,000	$0	$0	$231,000	30.8%
TK-108 - CLOUDVIEW TANK	Potable Tank - Distribution	$1,100,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$338,800	$0	$0	$338,800	30.8%
TK-115 - ROMER TANK	Potable Tank - Distribution	$1,550,000	0.06	0.15	0.41	0.33	0.05	0.94	0.79	0.38	24.9	46.0	64.3	68.0	69.9	79.2	$788,795	$0	$0	$788,795	50.9%
TK-116 - SAUSALITO BLVD. TANK	Potable Tank - Distribution	$1,150,000	0.35	0.31	0.32	0.03	0.00	0.65	0.35	0.03	51.3	80.9	94.8	97.2	97.4	98.2	$245,916	$0	$0	$245,916	21.4%
TK-117 - MESA VISTA TANK #1	Potable Tank - Distribution	$2,500,000	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.5	55.0	70.6	73.8	75.3	82.8	$1,102,050	$0	$0	$1,102,050	44.1%
TK-118 - COUNTYVIEW DRIVE TANK	Potable Tank - Distribution	$750,000	0.09	0.20	0.54	0.18	0.00	0.91	0.72	0.18	28.8	56.8	80.8	85.2	86.1	90.7	$298,890	$0	$0	$298,890	39.9%
TK-119 - LATTIE LANE TANK	Potable Tank - Distribution	$1,250,000	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.5	55.0	70.6	73.8	75.3	82.8	$551,275	$0	$0	$551,275	44.1%
TK-126 - HILL HAVEN TANK	Potable Tank - Distribution	$825,000	0.35	0.31	0.32	0.03	0.00	0.65	0.35	0.03	51.4	81.1	95.1	97.5	97.6	98.4	$174,752	$0	$0	$174,752	21.2%
TK-128 - MOUNT TIBURON TANK #1	Potable Tank - Distribution	$2,500,000	0.26	0.23	0.24	0.22	0.05	0.74	0.51	0.27	42.0	64.5	75.3	77.6	78.9	85.2	$914,650	$0	$0	$914,650	36.6%
TK-139 - BUCKEYE CIRCLE TANK	Potable Tank - Distribution	$150,000	0.06	0.15	0.41	0.33	0.05	0.94	0.79	0.38	24.9	46.0	64.3	68.0	69.9	79.2	$76,356	$0	$0	$76,356	50.9%
TK-150 - LOS ALTOS TANK	Potable Tank - Distribution	$300,000	0.35	0.31	0.32	0.03	0.00	0.65	0.35	0.03	51.4	81.1	95.1	97.5	97.6	98.4	$63,546	$0	$0	$63,546	21.2%
TK-158 - FAWN DRIVE TANK	Potable Tank - Distribution	$450,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$138,600	$0	$0	$138,600	30.8%
TK-163 - UPPER ROAD TANK	Potable Tank - Distribution	$200,000	0.40	0.32	0.04	0.20	0.05	0.60	0.29	0.25	53.6	76.5	78.3	79.1	80.3	86.1	$57,452	$0	$0	$57,452	28.7%
TK-164 - TOMAHAWK DRIVE TANK	Potable Tank - Distribution	$200,000	0.15	0.22	0.38	0.21	0.04	0.85	0.63	0.24	33.4	59.2	76.4	79.7	80.9	86.7	$79,964	$0	$0	$79,964	40.0%
TK-166 - RING MOUNTAIN TANK	Potable Tank - Distribution	$750,000	0.35	0.31	0.32	0.03	0.00	0.65	0.35	0.03	51.4	81.1	95.1	97.5	97.6	98.4	$158,865	$0	$0	$158,865	21.2%
TK-167 - CREEKSIDE DRIVE TANK	Potable Tank - Distribution	$900,000	0.29	0.25	0.26	0.16	0.03	0.71	0.46	0.20	44.8	69.4	81.2	83.5	84.4	89.1	$288,306	$0	$0	$288,306	32.0%
TK-180 - BON TEMPE WASHWATER TANK	Potable Tank - Distribution	$1,000,000	0.14	0.22	0.37	0.23	0.04	0.86	0.64	0.27	32.8	57.9	74.6	77.8	79.1	85.5	$412,880	$0	$0	$412,880	41.3%
TK-181 - REDWOOD DRIVE UPPER TANK	Potable Tank - Distribution	$300,000	0.07	0.16	0.43	0.30	0.04	0.93	0.78	0.34	25.7	48.2	67.6	71.5	73.2	81.5	$146,064	$0	$0	$146,064	48.7%
TK-182 - ALTA AVENUE TANK	Potable Tank - Distribution	$2,500,000	0.07	0.16	0.43	0.30	0.04	0.93	0.78	0.34	25.7	48.2	67.6	71.5	73.2	81.5	$1,217,200	$0	$0	$1,217,200	48.7%
TK-183 - MINE RIDGE TANK	Potable Tank - Distribution	$1,100,000	0.07	0.16	0.43	0.30	0.04	0.93	0.77	0.34	25.7	48.3	67.8	71.6	73.3	81.6	$534,226	$0	$0	$534,226	48.6%
TK-187 - MANZANITA TANK	Potable Tank - Distribution	$300,000	0.06	0.15	0.41	0.33	0.05	0.94	0.79	0.38	24.9	46.0	64.3	68.0	69.9	79.2	$152,712	$0	$0	$152,712	50.9%
TK-188 - WOLFBACK RIDGE TANK #1	Potable Tank - Distribution	$125,000	0.35	0.31	0.32	0.03	0.00	0.65	0.35	0.03	51.4	81.1	95.1	97.5	97.6	98.4	$26,478	$0	$0	$26,478	21.2%
TK-189 - WOLFBACK RIDGE TANK #2	Potable Tank - Distribution	$125,000	0.35	0.31	0.32	0.03	0.00	0.65	0.35	0.03	51.4	81.1	95.1	97.5	97.6	98.4	$26,478	$0	$0	$26,478	21.2%
TK-190 - INVERNESS DRIVE TANK	Potable Tank - Distribution	$700,000	0.26	0.23	0.24	0.22	0.05	0.74	0.51	0.27	42.0	64.5	75.3	77.6	78.9	85.2	$256,102	$0	$0	$256,102	36.6%
TK-191 - LONE TREE AVENUE TANK	Potable Tank - Distribution	$500,000	0.14	0.22	0.37	0.23	0.04	0.86	0.64	0.27	32.8	57.9	74.6	77.8	79.1	85.5	$206,440	$0	$0	$206,440	41.3%
TK-192 - VERNAL AVE TANK	Potable Tank - Distribution	$1,500,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$462,000	$0	$0	$462,000	30.8%
TK-193 - H-LINE ROAD TANK	Potable Tank - Distribution	$2,500,000	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.5	55.0	70.6	73.8	75.3	82.8	$1,102,050	$0	$0	$1,102,050	44.1%
TK-196 - WILSON WAY TANK	Potable Tank - Distribution	$500,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$154,000	$0	$0	$154,000	30.8%
TK-197 - SUMMIT TRAIL TANK	Potable Tank - Distribution	$650,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$200,200	$0	$0	$200,200	30.8%
TK-198 - SCOTT TANKS	Potable Tank - Distribution	$300,000	0.09	0.20	0.54	0.18	0.00	0.91	0.72	0.18	28.8	56.8	80.8	85.2	86.1	90.7	$119,556	$0	$0	$119,556	39.9%
TK-199 - SCOTT TANKS	Potable Tank - Distribution	$300,000	0.09	0.20	0.54	0.18	0.00	0.91	0.72	0.18	28.8	56.8	80.8	85.2	86.1	90.7	$119,556	$0	$0	$119,556	39.9%
TK-200 - OAK WOODLANDS TANK #1	Potable Tank - Distribution	$575,000	0.26	0.23	0.24	0.22	0.05	0.74	0.51	0.27	42.0	64.5	75.3	77.6	78.9	85.2	$210,370	$0	$0	$210,370	36.6%
TK-201 - OAK WOODLANDS TANK #2	Potable Tank - Distribution	$575,000	0.33	0.29	0.30	0.06	0.01	0.67	0.37	0.07	49.8	78.2	91.7	94.0	94.4	96.1	$137,103	$0	$0	$137,103	23.8%
TK-202 - Fairfax Manor 1st Lift Tank	Potable Tank - Distribution	$100,000	0.06	0.15	0.41	0.33	0.05	0.94	0.79	0.38	24.9	46.0	64.3	68.0	69.9	79.2	$50,904	$0	$0	$50,904	50.9%
TK-203 - MONTE MAR VISTA TANK	Potable Tank - Distribution	$300,000	0.09	0.20	0.54	0.18	0.00	0.91	0.72	0.18	28.8	56.8	80.8	85.2	86.1	90.7	$119,556	$0	$0	$119,556	39.9%
TK-204 - Bay Road Tank	Potable Tank - Distribution	$600,000	0.09	0.20	0.54	0.18	0.00	0.91	0.72	0.18	28.8	56.8	80.8	85.2	86.1	90.7	$239,112	$0	$0	$239,112	39.9%
TK-206 - SANTA VENETIA TANK	Potable Tank - Distribution	$1,550,000	0.04	0.13	0.54	0.29	0.01	0.96	0.83	0.30	23.6	46.9	70.9	75.5	77.0	84.5	$743,132	$0	$0	$743,132	47.9%
TK-207 - GOODHILL ROAD TANK	Potable Tank - Distribution	$300,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$92,400	$0	$0	$92,400	30.8%
TK-208 - SPRING LANE TANK #2	Potable Tank - Distribution	$7,500,000	0.35	0.31	0.32	0.03	0.00	0.65	0.35	0.03	51.4	81.1	95.1	97.5	97.6	98.4	$1,588,650	$0	$0	$1,588,650	21.2%

TK-209 - FAIRHILLS TOP TANK #2	Potable Tank - Distribution	$300,000	0.35	0.31	0.32	0.03	0.00	0.65	0.35	0.03	51.4	81.1	95.1	97.5	97.6	98.4	$63,546	$0	$0	$63,546	21.2%
TK-210 - BEACON HILL TANK	Potable Tank - Distribution	$500,000	0.29	0.25	0.26	0.16	0.03	0.71	0.46	0.20	44.8	69.4	81.2	83.5	84.4	89.1	$160,170	$0	$0	$160,170	32.0%
TK-211 - Kent Fire Trail Tank #1	Potable Tank - Distribution	$500,000	0.15	0.22	0.38	0.21	0.04	0.85	0.63	0.24	33.4	59.2	76.4	79.7	80.9	86.7	$199,910	$0	$0	$199,910	40.0%
TK-212 - Kent Fire Trail Tank #2	Potable Tank - Distribution	$500,000	0.15	0.22	0.38	0.21	0.04	0.85	0.63	0.24	33.4	59.2	76.4	79.7	80.9	86.7	$199,910	$0	$0	$199,910	40.0%
TK-213 - MARIN CITY TANK	Potable Tank - Distribution	$1,000,000	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.5	55.0	70.6	73.8	75.3	82.8	$440,820	$0	$0	$440,820	44.1%
TK-214 - SLIDE GULCH TANK	Potable Tank - Distribution	$485,870	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.5	55.0	70.6	73.8	75.3	82.8	$214,278	$0	$0	$214,278	44.1%
TK-215 - SEQUOIA PARK TANK #1	Potable Tank - Distribution	$550,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$169,400	$0	$0	$169,400	30.8%
TK-216 - SEQUOIA PARK TANK #2	Potable Tank - Distribution	$250,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$77,000	$0	$0	$77,000	30.8%
TK-217 - KENT WOODLANDS 1ST LIFT TANK	Potable Tank - Distribution	$500,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$154,000	$0	$0	$154,000	30.8%
TK-218 - MOUNT TIBURON TANK #2	Potable Tank - Distribution	$2,950,000	0.26	0.23	0.24	0.22	0.05	0.74	0.51	0.27	42.0	64.5	75.3	77.6	78.9	85.2	$1,079,287	$0	$0	$1,079,287	36.6%
TK-219 - OAK MANOR FIRST LIFT TANK	Potable Tank - Distribution	$500,000	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.5	55.0	70.6	73.8	75.3	82.8	$220,410	$0	$0	$220,410	44.1%
TK-220 - TAM WOODS TOP TANK	Potable Tank - Distribution	$400,000	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.5	55.0	70.6	73.8	75.3	82.8	$176,408	$0	$0	$176,408	44.1%
TK-221 - SUMMIT AVENUE LOWER TANK	Potable Tank - Distribution	$500,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$154,000	$0	$0	$154,000	30.8%
TK-222 - FRIAR TUCK LANE TANK	Potable Tank - Distribution	$625,000	0.33	0.29	0.30	0.06	0.01	0.67	0.37	0.07	49.8	78.2	91.7	94.0	94.4	96.1	$149,025	$0	$0	$149,025	23.8%
TK-223 - CASCADE TANK #1	Potable Tank - Distribution	$300,000	0.09	0.20	0.54	0.18	0.00	0.91	0.72	0.18	28.8	56.8	80.8	85.2	86.1	90.7	$119,556	$0	$0	$119,556	39.9%
TK-224 - CASCADE TANK #2	Potable Tank - Distribution	$300,000	0.09	0.20	0.54	0.18	0.00	0.91	0.72	0.18	28.8	56.8	80.8	85.2	86.1	90.7	$119,556	$0	$0	$119,556	39.9%
TK-225 - SUGARLOAF TANK #1	Potable Tank - Distribution	$635,000	0.26	0.23	0.24	0.22	0.05	0.74	0.51	0.27	42.0	64.5	75.3	77.6	78.9	85.2	$232,321	$0	$0	$232,321	36.6%
TK-226 - SUGARLOAF TANK #2	Potable Tank - Distribution	$635,000	0.26	0.23	0.24	0.22	0.05	0.74	0.51	0.27	42.0	64.5	75.3	77.6	78.9	85.2	$232,321	$0	$0	$232,321	36.6%
TK-228 - GLENWOOD FOREST TANK	Potable Tank - Distribution	$450,000	0.49	0.21	0.12	0.14	0.03	0.51	0.30	0.18	60.3	78.2	83.7	84.9	85.8	90.0	$108,495	$0	$0	$108,495	24.1%
TK-229 - KENT FIRE TRAIL TOP TANK	Potable Tank - Distribution	$50,000	0.15	0.22	0.38	0.21	0.04	0.85	0.63	0.24	33.4	59.2	76.4	79.7	80.9	86.7	$19,991	$0	$0	$19,991	40.0%
TK-230 - SWIG TANK	Potable Tank - Distribution	$250,000	0.29	0.25	0.26	0.16	0.03	0.71	0.46	0.20	44.8	69.4	81.2	83.5	84.4	89.1	$80,085	$0	$0	$80,085	32.0%
TK-232 - SKY RANCH TANK	Potable Tank - Distribution	$600,000	0.09	0.20	0.54	0.18	0.00	0.91	0.72	0.18	28.8	56.8	80.8	85.2	86.1	90.7	$239,112	$0	$0	$239,112	39.9%
TK-233 - FAIRFAX MANOR TOP TANK	Potable Tank - Distribution	$540,000	0.06	0.15	0.41	0.33	0.05	0.94	0.79	0.38	24.9	46.0	64.3	68.0	69.9	79.2	$274,882	$0	$0	$274,882	50.9%
TK-234 - TAM WOODS FIRST LIFT TANK	Potable Tank - Distribution	$425,000	0.14	0.22	0.37	0.23	0.04	0.86	0.64	0.27	32.8	57.9	74.6	77.8	79.1	85.5	$175,474	$0	$0	$175,474	41.3%
TK-235 - FAIRVIEW PARK TANK	Potable Tank - Distribution	$500,000	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.5	55.0	70.6	73.8	75.3	82.8	$220,510	$0	$0	$220,510	44.1%
TK-236 - FERN CANYON TANK	Potable Tank - Distribution	$150,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$46,200	$0	$0	$46,200	30.8%
TK-237 - CONIFER WAY UPPER TANK	Potable Tank - Distribution	$500,000	0.09	0.20	0.54	0.18	0.00	0.91	0.72	0.18	28.8	56.8	80.8	85.2	86.1	90.7	$199,260	$0	$0	$199,260	39.9%
TK-238 - OAK AVENUE TANK	Potable Tank - Distribution	$500,000	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.5	55.0	70.6	73.8	75.3	82.8	$220,510	$0	$0	$220,510	44.1%
TK-239 - ELINOR AVE TANK	Potable Tank - Distribution	$565,000	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.5	55.0	70.6	73.8	75.3	82.8	$249,063	$0	$0	$249,063	44.1%
TK-241 - LAGUNITAS PICNIC GROUNDS TANK	Potable Tank - Distribution	$2,750	0.14	0.22	0.36	0.24	0.04	0.86	0.64	0.28	32.5	57.2	73.4	76.6	78.0	84.7	$1,155	$0	$0	$1,155	42.0%
TK-009 - SAN CLEMENTE TANK	Potable Tank - Gravity	$7,500,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$2,310,000	$0	$0	$2,310,000	30.8%
TK-011 - CA ¯æON VILLAGE TANK	Potable Tank - Gravity	$7,500,000	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.5	55.0	70.6	73.8	75.3	82.8	$3,306,150	$0	$0	$3,306,150	44.1%
TK-012 - FAIRFAX GRADE TANK	Potable Tank - Gravity	$2,500,000	0.09	0.20	0.54	0.18	0.00	0.91	0.72	0.18	28.8	56.8	80.8	85.2	86.1	90.7	$996,300	$0	$0	$996,300	39.9%
TK-027 - GREENBRAE TANK	Potable Tank - Gravity	$7,500,000	0.26	0.23	0.24	0.22	0.05	0.74	0.51	0.27	42.0	64.5	75.3	77.6	78.9	85.2	$2,743,950	$0	$0	$2,743,950	36.6%
TK-030 - ESCALLE TANK	Potable Tank - Gravity	$5,000,000	0.01	0.05	0.36	0.50	0.08	0.99	0.93	0.58	18.4	31.9	48.2	52.0	54.9	68.8	$3,149,800	$0	$0	$3,149,800	63.0%
TK-064 - STRAWBERRY TANK	Potable Tank - Gravity	$7,500,000	0.26	0.23	0.24	0.22	0.05	0.74	0.51	0.27	41.8	64.2	75.0	77.2	78.6	85.0	$2,765,700	$0	$0	$2,765,700	36.9%
TK-083 - GLENWOOD TANK	Potable Tank - Gravity	$7,500,000	0.35	0.31	0.32	0.03	0.00	0.65	0.35	0.03	51.4	81.1	95.1	97.5	97.6	98.4	$1,588,650	$0	$0	$1,588,650	21.2%
TK-087 - LOCH LOMOND TANK	Potable Tank - Gravity	$5,000,000	0.33	0.29	0.30	0.06	0.01	0.67	0.37	0.07	49.8	78.2	91.7	94.0	94.4	96.1	$1,192,200	$0	$0	$1,192,200	23.8%
TK-089 - LOS RANCHITOS TANK	Potable Tank - Gravity	$5,000,000	0.15	0.22	0.38	0.21	0.04	0.85	0.63	0.24	33.4	59.2	76.4	79.7	80.9	86.7	$1,999,100	$0	$0	$1,999,100	40.0%
TK-090 - MARINWOOD TANK	Potable Tank - Gravity	$2,500,000	0.33	0.29	0.30	0.06	0.01	0.67	0.37	0.07	49.8	78.2	91.7	94.0	94.4	96.1	$596,100	$0	$0	$596,100	23.8%
TK-091 - MARIN PROFESSIONAL CENTER TANK	Potable Tank - Gravity	$1,250,000	0.06	0.15	0.41	0.33	0.05	0.94	0.79	0.38	24.9	46.0	64.3	68.0	69.9	79.2	$636,125	$0	$0	$636,125	50.9%
TK-094 - MILLER CREEK TANK	Potable Tank - Gravity	$2,500,000	0.35	0.31	0.32	0.03	0.00	0.65	0.35	0.03	51.4	81.1	95.1	97.5	97.6	98.4	$529,550	$0	$0	$529,550	21.2%
TK-096 - PUERTO SUELLO TANK	Potable Tank - Gravity	$7,500,000	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.6	55.2	71.0	74.2	75.7	83.1	$3,288,000	$0	$0	$3,288,000	43.8%
TK-098 - SANTA MARGARITA TANK	Potable Tank - Gravity	$7,500,000	0.15	0.22	0.38	0.21	0.04	0.85	0.63	0.24	33.4	59.2	76.4	79.7	80.9	86.7	$2,998,650	$0	$0	$2,998,650	40.0%
TK-106 - LUCAS VALLEY TANK	Potable Tank - Gravity	$7,500,000	0.26	0.23	0.24	0.22	0.05	0.74	0.51	0.27	42.0	64.5	75.3	77.6	78.9	85.2	$2,743,950	$0	$0	$2,743,950	36.6%
TK-113 - SAUSALITO PUMP HOUSE TANK #1	Potable Tank - Gravity	$1,550,000	0.06	0.15	0.41	0.33	0.05	0.94	0.79	0.38	24.9	46.0	64.3	68.0	69.9	79.2	$788,795	$0	$0	$788,795	50.9%
TK-114 - SAUSALITO PUMP HOUSE TANK #2	Potable Tank - Gravity	$1,550,000	0.06	0.15	0.41	0.33	0.05	0.94	0.79	0.38	24.9	46.0	64.3	68.0	69.9	79.2	$788,795	$0	$0	$788,795	50.9%
TK-125 - TENNESSEE VALLEY TANK	Potable Tank - Gravity	$5,000,000	0.07	0.16	0.43	0.30	0.04	0.93	0.77	0.34	25.7	48.3	67.8	71.6	73.3	81.6	$2,428,300	$0	$0	$2,428,300	48.6%
TK-127 - PARADISE DRIVE TANK	Potable Tank - Gravity	$5,000,000	0.26	0.23	0.24	0.22	0.05	0.74	0.51	0.27	42.0	64.5	75.3	77.6	78.9	85.2	$1,829,300	$0	$0	$1,829,300	36.6%
TK-130 - SPRING LANE TANK #1	Potable Tank - Gravity	$7,500,000	0.35	0.31	0.32	0.03	0.00	0.65	0.35	0.03	51.4	81.1	95.1	97.5	97.6	98.4	$1,588,650	$0	$0	$1,588,650	21.2%
TK-159 - PEACOCK GAP TANK	Potable Tank - Gravity	$2,500,000	0.60	0.15	0.07	0.14	0.03	0.40	0.25	0.18	68.5	81.0	84.3	85.1	86.0	90.2	$519,000	$0	$0	$519,000	20.8%
TK-160 - MARIN BAY TANK	Potable Tank - Gravity	$600,000	0.35	0.31	0.32	0.03	0.00	0.65	0.35	0.03	51.4	81.1	95.1	97.5	97.6	98.4	$127,092	$0	$0	$127,092	21.2%
TK-175 - MARINSHIP TANK	Potable Tank - Gravity	$7,500,000	0.13	0.21	0.39	0.24	0.04	0.87	0.66	0.27	31.3	56.4	73.8	77.2	78.6	85.2	$3,171,900	$0	$0	$3,171,900	42.3%
TK-152 - MADERA PARK (H/P) TANK	Potable Tank - Pressure System	$7,500	0.03	0.09	0.40	0.41	0.06	0.97	0.88	0.47	21.0	38.5	56.8	60.7	63.1	74.5	$4,274	$0	$0	$4,274	57.0%
TK-153 - RAFAEL HIGHLANDS (H/P) TANK	Potable Tank - Pressure System	$12,500	0.35	0.31	0.32	0.03	0.00	0.65	0.35	0.03	51.4	81.1	95.1	97.5	97.6	98.4	$2,648	$0	$0	$2,648	21.2%
TK-168 - MCNEAR DRIVE #1 (H/P) TANK	Potable Tank - Pressure System	$5,000	0.26	0.23	0.24	0.22	0.05	0.74	0.51	0.27	42.0	64.5	75.3	77.6	78.9	85.2	$1,829	$0	$0	$1,829	36.6%
TK-169 - MCNEAR DRIVE #2 (H/P) TANK	Potable Tank - Pressure System	$7,500	0.26	0.23	0.24	0.22	0.05	0.74	0.51	0.27	42.0	64.5	75.3	77.6	78.9	85.2	$2,744	$0	$0	$2,744	36.6%
TK-174 - VIA MONTEBELLO (H/P) TANK	Potable Tank - Pressure System	$17,500	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$5,390	$0	$0	$5,390	30.8%
TK-195 - Fire Road Pressure Tank	Potable Tank - Pressure System	$5,000	0.06	0.15	0.41	0.33	0.05	0.94	0.79	0.38	24.9	46.0	64.3	68.0	69.9	79.2	$2,545	$0	$0	$2,545	50.9%
TK-205 - RICHARDSON DRIVE (H/P) TANK	Potable Tank - Pressure System	$5,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$1,540	$0	$0	$1,540	30.8%
TK-145 - ROSS RESERVOIR	Potable Tank - Reservoir	$5,000,000	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.0	100.0	100.0	100.0	100.0	100.0	$0	$0	$0	$0	0.0%
TK-146 - FORBES HILL RESERVOIR	Potable Tank - Reservoir	$20,000,000	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.0	100.0	100.0	100.0	100.0	100.0	$0	$0	$0	$0	0.0%
TK-046 - ALTO TANK #1	Potable Tank - Transmission	$15,000,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$4,620,000	$0	$0	$4,620,000	30.8%
TK-055 - MILL VALLEY TANK	Potable Tank - Transmission	$25,000,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$7,700,001	$0	$0	$7,700,001	30.8%
TK-069 - HAWTHORNE HILLS UPPER TANK	Potable Tank - Transmission	$10,000,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$3,080,000	$0	$0	$3,080,000	30.8%
TK-131 - CONIFER WAY TANK	Potable Tank - Transmission	$2,500,000	0.06	0.15	0.41	0.33	0.05	0.94	0.79	0.38	24.9	46.0	64.3	68.0	69.9	79.2	$1,272,600	$0	$0	$1,272,600	50.9%
TK-147 - SMITH SADDLE TANK #1	Potable Tank - Transmission	$25,000,000	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.5	55.0	70.6	73.8	75.3	82.8	$11,020,501	$0	$0	$11,020,501	44.1%
TK-148 - SMITH SADDLE TANK #2	Potable Tank - Transmission	$25,000,000	0.15	0.22	0.38	0.21	0.04	0.85	0.63	0.24	33.4	59.2	76.4	79.7	80.9	86.7	$9,995,500	$0	$0	$9,995,500	40.0%
TK-155 - PINE MOUNTAIN TUNNEL TANK	Potable Tank - Transmission	$15,000,000	0.75	0.00	0.00	0.00	0.25	0.25	0.25	0.25	77.4	77.5	77.7	78.0	78.7	82.3	$3,748,500	$0	$0	$3,748,500	25.0%
TK-165 - ALTO TANK #2	Potable Tank - Transmission	$15,000,000	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.5	55.0	70.6	73.8	75.3	82.8	$6,612,301	$0	$0	$6,612,301	44.1%
TK-184 - PACHECO RIDGE TANK #1	Potable Tank - Transmission	$15,000,000	0.26	0.23	0.24	0.22	0.05	0.74	0.51	0.27	42.0	64.5	75.3	77.6	78.9	85.2	$5,487,901	$0	$0	$5,487,901	36.6%
TK-185 - PACHECO RIDGE TANK #2	Potable Tank - Transmission	$15,000,000	0.33	0.29	0.30	0.06	0.01	0.67	0.37	0.07	49.8	78.2	91.7	94.0	94.4	96.1	$3,576,600	$0	$0	$3,576,600	23.8%
Bon Tempe Treatment Plant	Potable Treatment Plant	$100,000,000	0.24	0.24	0.28	0.20	0.04	0.76	0.51	0.24	49.3	75.0	80.7	82.2	86.2	97.2	$32,203,200	$0	$0	$32,203,200	32.2%
San Geronimo Treatment Plant	Potable Treatment Plant	$100,000,000	0.16	0.25	0.41	0.16	0.02	0.84	0.59	0.18	43.8	77.7	85.7	86.9	90.1	98.5	$32,526,300	$0	$0	$32,526,300	32.5%
Potable Total/Averages			**24%**	**23%**	**33%**	**17%**	**3%**													**$348,366,788**	
PS-028 - Kent Lake Pump Station	Raw Pump Station	$5,000,000	0.05	0.16	0.52	0.26	0.01	0.95	0.79	0.27	29.2	50.0	75.9	86.7	98.2	99.9	$2,116,760	$0	$0	$2,116,760	42.3%
PS-029 - Phoenix Lake Barge Pump	Raw Pump Station	$5,000,000	0.30	0.30	0.35	0.05	0.00	0.70	0.40	0.05	57.4	77.9	93.6	97.5	99.7	99.9	$931,840	$0	$0	$931,840	18.6%
PS-031 - Soulajule Pump Station	Raw Pump Station	$5,000,000	0.82	0.13	0.05	0.00	0.00	0.18	0.05	0.01	91.2	97.1	99.2	99.7	99.9	99.9	$140,360	$0	$0	$140,360	2.8%
PS-097 - Tocaloma Booster Pump Station	Raw Pump Station	$5,000,000	0.40	0.23	0.18	0.16	0.04	0.60	0.37	0.19	60.3	74.2	83.8	89.4	97.0	99.9	$1,191,035	$0	$0	$1,191,035	23.8%
PS-128 - Alpine Bon-Tempe Pump Station	Raw Pump Station	$5,000,000	0.10	0.21	0.51	0.18	0.00	0.90	0.69	0.18	36.2	58.4	82.8	91.2	98.9	99.9	$1,742,300	$0	$0	$1,742,300	34.8%
Raw Total/Averages			**34%**	**20%**	**32%**	**13%**	**1%**													**$6,122,295**	
PS-049 - Channing Way Pump Station	Recycled Pump Station	$5,000,000	0.07	0.16	0.38	0.33	0.05	0.93	0.77	0.38	29.4	46.9	67.5	79.4	95.1	99.9	$2,356,130	$0	$0	$2,356,130	47.1%
PS-111 - Quail Hill Pump Station	Recycled Pump Station	$5,000,000	0.18	0.27	0.45	0.10	0.00	0.82	0.55	0.10	45.5	67.9	88.8	94.9	99.4	99.9	$1,339,350	$0	$0	$1,339,350	26.8%
PS-112 - Freitas Parkway Pump Station	Recycled Pump Station	$5,000,000	0.30	0.30	0.35	0.05	0.00	0.70	0.40	0.05	57.4	77.9	93.6	97.5	99.7	99.9	$931,840	$0	$0	$931,840	18.6%
TK-103 - TERRA LINDA TANK #1	Recycled Tank - Gravity	$2,500,000	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.5	55.0	70.6	73.8	75.3	82.8	$1,102,050	$0	$0	$1,102,050	44.1%
TK-170 - TERRA LINDA TANK #2	Recycled Tank - Gravity	$2,500,000	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.5	55.0	70.6	73.8	75.3	82.8	$1,102,050	$0	$0	$1,102,050	44.1%
TK-227 - LGWRP Clearwell	Recycled Tank - Reservoir	$4,500,000	0.06	0.15	0.39	0.35	0.05	0.94	0.79	0.40	24.4	45.1	62.8	66.5	68.5	78.2	$2,332,260	$0	$0	$2,332,260	51.8%
Las Gallinas Treatment Plant	Recycled Treatment Plant	$1	0.08	0.19	0.50	0.23	0.01	0.92	0.74	0.24	21.0	45.4	72.0	76.9	79.4	97.0	$0	$0	$0	$0	0.0%
Recycled Total/Averages			**14%**	**21%**	**39%**	**23%**	**3%**													**$9,163,680**	

Pipelines

Type	Miles of Pipeline	Replacement Cost
Potable Water - Distribution Main	761.0	$2,209,823,037
Potable Water - Lateral	229.4	$181,682,836
Potable Water - Main	0.1	$200,899
Potable Water - Transmission Main	92.1	$388,893,185
Raw Water - Distribution Main	4.7	$13,679,943
Raw Water - Transmission Main	25.6	$108,036,492
Recycled Water - Lateral	2.1	$1,676,612
Recycled Water - Main	24.4	$70,806,587
Recycled Water - Other	0.3	$828,973
Total	**1,139.6**	**$2,975,628,563**

Number of Leaks	Number of Leaks	Number of Breaks	Total Number of Repairs	Days to Repair Leaks	Days to Repair Breaks	Total Days to Repair
Potable Water - Distribution Main	101.7	25.4	127.2	14.3	3.6	17.8
Potable Water - Lateral	52.4	13.1	65.4	7.3	1.8	9.2
Potable Water - Main	0.0	0.0	0.0	0.0	0.0	0.0
Potable Water - Transmission Main	8.3	2.1	10.4	1.5	0.4	1.9
Potable Total	**162.4**	**40.6**	**203.0**	**23.1**	**5.8**	**28.8**
Economic Loss	**$1,624,075.35**	**$406,018.84**	**$2,030,094.19**			
Raw Water - Distribution Main	0.9	0.2	1.2	0.1	0.0	0.2
Raw Water - Transmission Main	3.0	0.8	3.8	0.8	0.2	1.1
Raw Total	**4.0**	**1.0**	**5.0**	**1.0**	**0.2**	**1.2**
Economic Loss	**$39,751.79**	**$9,937.95**	**$49,689.74**			
Recycled Water - Lateral	0.5	0.1	0.6	0.1	0.0	0.1
Recycled Water - Main	1.8	0.5	2.3	0.3	0.1	0.3
Recycled Water - Other	0.0	0.0	0.0	0.0	0.0	0.0
Recycled Total	**2.4**	**0.6**	**2.9**	**0.3**	**0.1**	**0.4**
Economic Loss	**$23,564.05**	**$5,891.01**	**$29,455.07**			
Total	**168.7**	**42.2**	**210.9**	**24.4**	**6.1**	**30.5**

Cost to Repair a Leak	Cost to Repair a Break	Economic Loss
$10,000	$10,000	$2,109,239

Facilities

Facility Name	Type	Replacement Cost	Probability of Damage State								Percent Functionality After						Economic Loss				
			None	Slight	Moderate	Extensive	Complete	Exceed Slight	Exceed Moderate	Exceed Extensive	Day 1	Day 3	Day 7	Day 14	Day 30	Day 90	Structure Loss	Nonstructural Drift-Sensitive Loss	Nonstructural Acceleration-Sensitive Loss	Total	% of Replacement Cost
Administration Building - Headquarter Office	Building	$12,300,000	0.01	0.24	0.66	0.09	0.00	0.99	0.75	0.09	1.4	2.6	25.0	25.1	90.8	99.6	$276,922	$729,926	$213,310	$1,220,159	9.9%
Corporation Yard - Boat Barn	Building	$1,000,000	0.01	0.04	0.38	0.51	0.06	0.99	0.95	0.57	0.6	0.8	4.9	4.9	42.6	94.0	$114,695	$65,775	$36,105	$216,576	21.7%
Corporation Yard - Facilities Offices	Building	$15,000,000	0.01	0.24	0.66	0.09	0.00	0.99	0.75	0.09	1.4	2.6	25.0	25.1	90.8	99.6	$337,710	$890,154	$260,135	$1,487,999	9.9%
Corporation Yard - Laboratory	Building	$6,500,000	0.01	0.24	0.66	0.09	0.00	0.99	0.75	0.09	1.4	2.6	25.0	25.1	90.8	99.6	$146,341	$385,733	$112,725	$644,799	9.9%
Corporation Yard - Satellite Office	Building	$500,000	0.01	0.17	0.46	0.30	0.06	0.99	0.82	0.36	1.0	1.8	17.5	17.5	63.5	93.6	$25,197	$50,970	$37,828	$113,995	22.8%
Pelican Yard - Vehicle Storage	Building	$500,000	0.02	0.08	0.38	0.45	0.06	0.98	0.89	0.52	2.2	2.6	10.6	10.6	48.2	93.6	$53,289	$35,041	$31,026	$119,356	23.9%
Pelican Yard - Vehicle Storage	Building	$800,000	0.03	0.11	0.50	0.34	0.01	0.97	0.86	0.36	2.9	3.4	14.1	14.2	64.2	98.6	$61,385	$32,035	$17,146	$110,566	13.8%
Ranger Housing - Alpine Dam - Residence	Building	$500,000	0.31	0.45	0.10	0.12	0.03	0.69	0.25	0.15	30.6	32.7	75.0	75.1	85.0	97.0	$12,746	$29,468	$16,709	$58,923	11.8%
Ranger Housing - Lagunitas Dam - Garage	Building	$300,000	0.18	0.27	0.45	0.10	0.00	0.82	0.55	0.10	17.7	19.0	44.4	44.5	89.5	99.9	$9,891	$5,131	$5,559	$20,581	6.9%
Ranger Housing - Lagunitas Dam - Residence	Building	$500,000	0.48	0.29	0.03	0.16	0.04	0.52	0.23	0.20	47.7	49.1	77.1	77.2	80.2	96.0	$14,930	$32,980	$16,627	$64,536	12.9%
Ranger Housing - Phoenix Dam - Log Cabin	Building	$100,000	0.66	0.32	0.03	0.00	0.00	0.34	0.03	0.00	65.5	67.0	97.1	97.2	99.9	99.9	$222	$694	$1,202	$2,118	2.1%
Ranger Housing - Phoenix Dam - Residence	Building	$500,000	0.53	0.26	0.02	0.16	0.04	0.47	0.22	0.20	52.5	53.8	78.0	78.1	80.2	96.0	$14,727	$32,348	$16,397	$63,472	12.7%
Ranger Housing - Phoenix Dam - Shed	Building	$100,000	0.23	0.22	0.26	0.24	0.05	0.77	0.55	0.29	22.8	23.9	45.2	45.3	71.2	94.9	$6,435	$4,827	$5,852	$17,114	17.1%
Ranger Housing - Porteous House	Building	$600,000	0.66	0.32	0.03	0.00	0.00	0.34	0.03	0.00	65.5	67.0	97.1	97.2	99.9	99.9	$1,332	$4,166	$7,213	$12,710	2.1%
Ranger Housing - Porteous House - Garage	Building	$300,000	0.24	0.24	0.28	0.20	0.04	0.76	0.51	0.24	24.4	25.6	48.4	48.5	76.2	96.0	$16,555	$12,145	$14,948	$43,648	14.5%
Ranger Housing - Porteous House - Shed	Building	$100,000	0.23	0.22	0.26	0.24	0.05	0.77	0.55	0.29	22.8	23.9	45.2	45.3	71.2	94.9	$6,435	$4,827	$5,852	$17,114	17.1%
Ranger Housing - Porteous House - Shed	Building	$100,000	0.23	0.22	0.26	0.24	0.05	0.77	0.55	0.29	22.8	23.9	45.2	45.3	71.2	94.9	$6,435	$4,827	$5,852	$17,114	17.1%
Ranger Housing - Sky Oaks - Residence	Building	$1,700,000	0.48	0.29	0.03	0.16	0.04	0.52	0.23	0.20	47.7	49.1	77.1	77.2	80.2	96.0	$50,761	$112,130	$56,531	$219,422	12.9%
Ranger Housing - Soulajule Residence	Building	$500,000	0.78	0.05	0.00	0.14	0.03	0.22	0.18	0.17	77.6	77.8	82.4	82.4	82.5	96.4	$12,358	$26,594	$11,704	$50,655	10.1%
Sky Oaks Headquarters - Entrance Kiosk	Building	$100,000	0.33	0.48	0.10	0.07	0.02	0.67	0.19	0.09	33.3	35.5	80.9	81.1	90.8	98.1	$1,427	$2,775	$3,458	$7,660	7.7%
Sky Oaks Headquarters - Fisheries Office (Fish Box)	Building	$300,000	0.37	0.53	0.11	0.00	0.00	0.63	0.11	0.00	36.6	39.1	89.0	89.2	99.9	99.9	$1,256	$3,242	$5,070	$9,568	3.2%
Sky Oaks Headquarters - Headquarter Office	Building	$700,000	0.37	0.53	0.11	0.00	0.00	0.63	0.11	0.00	36.6	39.1	89.0	89.2	99.9	99.9	$2,932	$7,565	$11,829	$22,326	3.2%
Sky Oaks Headquarters - Natural Resources Office (Sky Box	Building	$700,000	0.37	0.53	0.11	0.00	0.00	0.63	0.11	0.00	36.6	39.1	89.0	89.2	99.9	99.9	$2,932	$7,565	$11,829	$22,326	3.2%
Sky Oaks Headquarters - Seed Shed	Building	$200,000	0.18	0.27	0.45	0.10	0.00	0.82	0.55	0.10	17.7	19.0	44.4	44.5	89.5	99.9	$6,594	$3,421	$3,706	$13,720	6.9%
Sky Oaks Headquarters - Storage Shed	Building	$200,000	0.14	0.22	0.36	0.24	0.04	0.86	0.64	0.28	14.2	15.2	35.7	35.7	71.9	95.9	$12,958	$9,004	$10,145	$32,107	16.1%
Administrative Total/Averages			**27%**	**27%**	**27%**	**16%**	**3%**													**$4,608,562**	
PS-001 - Federal Works Booster Pump Station	Potable Pump Station	$5,000,000	0.10	0.21	0.50	0.18	0.00	0.90	0.69	0.19	35.9	57.9	82.2	90.8	98.8	99.9	$1,765,775	$0	$0	$1,765,775	35.3%
PS-002 - Chapman Park Pump Station	Potable Pump Station	$5,000,000	0.10	0.21	0.51	0.18	0.00	0.90	0.69	0.18	36.2	58.4	82.8	91.2	98.9	99.9	$1,742,300	$0	$0	$1,742,300	34.8%
PS-003 - Summit Drive Pump Station PS-003	Potable Pump Station	$5,000,000	0.30	0.30	0.35	0.05	0.00	0.70	0.40	0.05	57.4	77.9	93.6	97.5	99.7	99.9	$931,840	$0	$0	$931,840	18.6%
PS-005 - H-Line Booster Station	Potable Pump Station	$5,000,000	0.25	0.25	0.29	0.18	0.03	0.75	0.50	0.21	49.0	66.6	81.2	88.3	96.9	99.9	$1,496,175	$0	$0	$1,496,175	29.9%
PS-006 - Madera Park Pump Station	Potable Pump Station	$5,000,000	0.12	0.19	0.35	0.29	0.05	0.88	0.69	0.34	34.5	52.2	71.0	81.6	95.4	99.9	$2,130,040	$0	$0	$2,130,040	42.6%
PS-007 - Mariner Highlands Pump Station	Potable Pump Station	$5,000,000	0.25	0.25	0.29	0.18	0.03	0.75	0.50	0.21	49.0	66.6	81.2	88.3	96.9	99.9	$1,496,175	$0	$0	$1,496,175	29.9%
PS-010 - Cascade Pump Station	Potable Pump Station	$5,000,000	0.18	0.27	0.45	0.10	0.00	0.82	0.55	0.10	45.5	67.9	88.8	94.9	99.4	99.9	$1,339,350	$0	$0	$1,339,350	26.8%
PS-011 - Fairfax Manor 1st Pump Station	Potable Pump Station	$5,000,000	0.10	0.21	0.51	0.18	0.00	0.90	0.69	0.18	36.2	58.4	82.8	91.2	98.9	99.9	$1,742,300	$0	$0	$1,742,300	34.8%
PS-012 - Fairfax Manor 2nd Lift Pump Station	Potable Pump Station	$5,000,000	0.13	0.20	0.34	0.28	0.05	0.87	0.67	0.33	36.4	54.0	72.1	82.2	95.5	99.9	$2,054,450	$0	$0	$2,054,450	41.1%
PS-013 - Oak Manor 1st Lift Pump Station	Potable Pump Station	$5,000,000	0.30	0.30	0.35	0.05	0.00	0.70	0.40	0.05	57.4	77.9	93.6	97.5	99.7	99.9	$931,840	$0	$0	$931,840	18.6%
PS-014 - Oak Manor 2nd Lift Pump Station	Potable Pump Station	$5,000,000	0.23	0.22	0.26	0.24	0.05	0.77	0.55	0.29	45.3	61.5	75.7	84.1	95.7	99.9	$1,748,060	$0	$0	$1,748,060	35.0%
PS-016 - Scott Pump Station	Potable Pump Station	$5,000,000	0.13	0.20	0.34	0.28	0.05	0.87	0.67	0.33	36.4	54.0	72.1	82.2	95.5	99.9	$2,054,425	$0	$0	$2,054,425	41.1%
PS-017 - Smith Saddle Booster Station	Potable Pump Station	$5,000,000	0.30	0.30	0.35	0.05	0.00	0.70	0.40	0.05	57.4	77.9	93.6	97.5	99.7	99.9	$931,840	$0	$0	$931,840	18.6%
PS-019 - Bret Harte Pump Station	Potable Pump Station	$5,000,000	0.37	0.21	0.16	0.21	0.05	0.63	0.42	0.26	56.0	69.0	78.5	85.5	95.9	99.9	$1,444,475	$0	$0	$1,444,475	28.9%
PS-020 - Greenbrae Pump Station	Potable Pump Station	$5,000,000	0.23	0.22	0.26	0.24	0.05	0.77	0.55	0.29	45.3	61.5	75.7	84.1	95.7	99.9	$1,748,060	$0	$0	$1,748,060	35.0%
PS-022 - Ignacio Boosters	Potable Pump Station	$50,000,000	0.08	0.19	0.50	0.22	0.01	0.92	0.74	0.23	32.8	54.0	78.7	88.3	98.2	99.9	$19,441,700	$0	$0	$19,441,700	38.9%
PS-023 - Kent Fire Trail 1st Pump Station	Potable Pump Station	$5,000,000	0.25	0.25	0.29	0.18	0.03	0.75	0.50	0.21	49.0	66.6	81.2	88.3	96.9	99.9	$1,496,175	$0	$0	$1,496,175	29.9%
PS-025 - Kent Woodlands 2nd Pump Station	Potable Pump Station	$5,000,000	0.30	0.30	0.35	0.05	0.00	0.70	0.40	0.05	57.4	77.9	93.6	97.5	99.7	99.9	$931,840	$0	$0	$931,840	18.6%
PS-026 - Lagunitas Booster Station	Potable Pump Station	$5,000,000	0.14	0.21	0.36	0.24	0.04	0.86	0.64	0.28	38.2	56.8	75.4	84.7	96.3	99.9	$1,911,350	$0	$0	$1,911,350	38.2%
PS-030 - Phoenix Transfer Pump Station	Potable Pump Station	$5,000,000	0.30	0.30	0.35	0.05	0.00	0.70	0.40	0.05	57.4	77.9	93.6	97.5	99.7	99.9	$931,840	$0	$0	$931,840	18.6%
PS-032 - Elinor Avenue Pump Station	Potable Pump Station	$5,000,000	0.25	0.25	0.29	0.18	0.03	0.75	0.50	0.21	49.0	66.6	81.2	88.3	96.9	99.9	$1,496,175	$0	$0	$1,496,175	29.9%
PS-033 - Fern Canyon Pump Station	Potable Pump Station	$5,000,000	0.23	0.22	0.26	0.24	0.05	0.77	0.55	0.29	45.3	61.5	75.7	84.1	95.7	99.9	$1,748,770	$0	$0	$1,748,770	35.0%
PS-034 - Lapachet Pump Station	Potable Pump Station	$5,000,000	0.24	0.24	0.28	0.20	0.04	0.76	0.51	0.24	47.9	65.0	79.5	87.0	96.5	99.9	$1,576,090	$0	$0	$1,576,090	31.5%
PS-035 - Mine Ridge Pump Station	Potable Pump Station	$5,000,000	0.30	0.30	0.35	0.05	0.00	0.70	0.40	0.05	57.4	77.9	93.6	97.5	99.7	99.9	$931,840	$0	$0	$931,840	18.6%
PS-036 - Scott Highlands Pump (OUT OF SERVICE)	Potable Pump Station	$5,000,000	0.27	0.22	0.23	0.23	0.05	0.73	0.50	0.28	48.7	64.0	76.6	84.6	95.8	99.9	$1,647,515	$0	$0	$1,647,515	33.0%
PS-040 - Summit Avenue Upper Pump Station	Potable Pump Station	$5,000,000	0.24	0.24	0.28	0.20	0.04	0.76	0.51	0.24	47.9	65.0	79.5	87.0	96.5	99.9	$1,576,090	$0	$0	$1,576,090	31.5%
PS-041 - Kastania Booster Pump Station	Potable Pump Station	$5,000,000	0.62	0.24	0.14	0.01	0.00	0.38	0.15	0.01	79.5	92.0	98.3	99.5	99.9	99.9	$358,950	$0	$0	$358,950	7.2%
PS-042 - Del Mesa Pump Station	Potable Pump Station	$5,000,000	0.30	0.30	0.35	0.05	0.00	0.70	0.40	0.05	57.4	77.9	93.6	97.5	99.7	99.9	$931,840	$0	$0	$931,840	18.6%
PS-043 - Fawn Drive Pump Station	Potable Pump Station	$5,000,000	0.25	0.25	0.29	0.18	0.03	0.75	0.50	0.21	49.0	66.6	81.2	88.3	96.9	99.9	$1,496,175	$0	$0	$1,496,175	29.9%
PS-044 - Mann Pump Station	Potable Pump Station	$5,000,000	0.04	0.13	0.42	0.37	0.05	0.96	0.83	0.41	25.2	42.6	65.2	78.2	95.3	99.9	$2,528,565	$0	$0	$2,528,565	50.6%
PS-046 - Scenic Avenue Pump Station	Potable Pump Station	$5,000,000	0.05	0.16	0.52	0.26	0.01	0.95	0.79	0.27	29.2	50.0	75.9	86.7	98.2	99.9	$2,116,760	$0	$0	$2,116,760	42.3%
PS-047 - Sequoia Park Pump Station	Potable Pump Station	$5,000,000	0.25	0.25	0.29	0.18	0.03	0.75	0.50	0.21	49.0	66.6	81.2	88.3	96.9	99.9	$1,496,175	$0	$0	$1,496,175	29.9%
PS-050 - Chula Vista Pump Station	Potable Pump Station	$5,000,000	0.25	0.25	0.29	0.18	0.03	0.75	0.50	0.21	49.0	66.6	81.2	88.3	96.9	99.9	$1,496,175	$0	$0	$1,496,175	29.9%
PS-052 - Elda Drive Pump Station	Potable Pump Station	$5,000,000	0.13	0.20	0.34	0.28	0.05	0.87	0.67	0.33	36.4	54.0	72.1	82.2	95.5	99.9	$2,054,240	$0	$0	$2,054,240	41.1%
PS-053 - Fairhills 1st Lift Pump Station	Potable Pump Station	$5,000,000	0.30	0.25	0.25	0.17	0.03	0.70	0.45	0.20	52.8	69.3	82.3	88.8	97.0	99.9	$1,384,860	$0	$0	$1,384,860	27.7%
PS-054 - Fairhills 2nd Lift Pump Station	Potable Pump Station	$5,000,000	0.30	0.25	0.25	0.17	0.03	0.70	0.45	0.20	52.8	69.3	82.3	88.8	97.0	99.9	$1,384,860	$0	$0	$1,384,860	27.7%
PS-055 - Grove Hill Pump Station	Potable Pump Station	$5,000,000	0.30	0.30	0.35	0.05	0.00	0.70	0.40	0.05	57.4	77.9	93.6	97.5	99.7	99.9	$931,840	$0	$0	$931,840	18.6%
PS-056 - Rafael Highlands Pump Station	Potable Pump Station	$5,000,000	0.49	0.28	0.21	0.02	0.00	0.51	0.23	0.02	71.3	87.3	97.0	99.0	99.8	99.9	$549,900	$0	$0	$549,900	11.0%

PS-057 - Hind Pump Station	Potable Pump Station	$5,000,000	0.59	0.23	0.13	0.04	0.01	0.41	0.18	0.05	76.5	88.6	95.0	97.2	99.2	99.9	$521,240	$0	$0	$521,240	10.4%
PS-058 - Knight Drive Pump Station	Potable Pump Station	$5,000,000	0.51	0.19	0.12	0.15	0.03	0.49	0.30	0.18	67.2	78.1	84.9	89.8	97.1	99.9	$1,028,315	$0	$0	$1,028,315	20.6%
PS-060 - Lockwood Drive Pump Station	Potable Pump Station	$5,000,000	0.46	0.18	0.11	0.20	0.05	0.54	0.36	0.25	62.2	72.5	79.5	85.9	95.9	99.9	$1,300,330	$0	$0	$1,300,330	26.0%
PS-061 - Lucas Valley Pump Station	Potable Pump Station	$5,000,000	0.47	0.27	0.20	0.05	0.01	0.53	0.26	0.06	68.6	84.2	93.8	96.7	99.2	99.9	$704,060	$0	$0	$704,060	14.1%
PS-062 - Manderly Pump Station	Potable Pump Station	$5,000,000	0.46	0.18	0.11	0.20	0.05	0.54	0.36	0.25	62.2	72.5	79.5	85.9	95.9	99.9	$1,300,330	$0	$0	$1,300,330	26.0%
PS-064 - Marinwood Pump Station (NOT IS USE)	Potable Pump Station	$5,000,000	0.37	0.21	0.16	0.21	0.05	0.63	0.42	0.26	56.0	69.0	78.5	85.5	95.9	99.9	$1,444,475	$0	$0	$1,444,475	28.9%
PS-065 - McNear Drive Pump Station	Potable Pump Station	$5,000,000	0.37	0.21	0.16	0.21	0.05	0.63	0.42	0.26	56.0	69.0	78.5	85.5	95.9	99.9	$1,444,475	$0	$0	$1,444,475	28.9%
PS-066 - Mesa Vista Pump Station	Potable Pump Station	$5,000,000	0.23	0.22	0.26	0.24	0.05	0.77	0.55	0.29	45.3	61.5	75.7	84.1	95.7	99.9	$1,748,060	$0	$0	$1,748,060	35.0%
PS-069 - San Quentin Pump Station	Potable Pump Station	$5,000,000	0.12	0.20	0.36	0.28	0.05	0.88	0.69	0.33	35.0	53.0	72.0	82.3	95.6	99.9	$2,087,410	$0	$0	$2,087,410	41.7%
PS-070 - Santa Margarita Pump Station	Potable Pump Station	$5,000,000	0.23	0.22	0.26	0.24	0.05	0.77	0.55	0.29	45.3	61.5	75.7	84.1	95.7	99.9	$1,748,060	$0	$0	$1,748,060	35.0%
PS-071 - Sky View Terrace Pump Station	Potable Pump Station	$5,000,000	0.30	0.30	0.35	0.05	0.00	0.70	0.40	0.05	57.4	77.9	93.6	97.5	99.7	99.9	$931,840	$0	$0	$931,840	18.6%
PS-073 - Swig Pump Station	Potable Pump Station	$5,000,000	0.49	0.28	0.21	0.02	0.00	0.51	0.23	0.02	71.3	87.3	97.0	99.0	99.8	99.9	$549,900	$0	$0	$549,900	11.0%
PS-074 - Via Montebello Pump Station	Potable Pump Station	$5,000,000	0.36	0.30	0.30	0.04	0.00	0.64	0.34	0.04	61.9	81.2	94.9	98.1	99.7	99.9	$797,290	$0	$0	$797,290	15.9%
PS-077 - Beacon Hill Pump Station	Potable Pump Station	$5,000,000	0.36	0.30	0.30	0.04	0.00	0.64	0.34	0.04	61.9	81.2	94.9	98.1	99.7	99.9	$797,290	$0	$0	$797,290	15.9%
PS-078 - Crescent Avenue Pump Station	Potable Pump Station	$5,000,000	0.49	0.28	0.21	0.02	0.00	0.51	0.23	0.02	71.3	87.3	97.0	99.0	99.8	99.9	$549,900	$0	$0	$549,900	11.0%
PS-079 - Marin City Pump Station	Potable Pump Station	$5,000,000	0.13	0.20	0.34	0.28	0.05	0.87	0.67	0.33	36.4	54.0	72.1	82.2	95.5	99.9	$2,054,240	$0	$0	$2,054,240	41.1%
PS-080 - Monte Mar Vista Pump Station	Potable Pump Station	$5,000,000	0.13	0.20	0.34	0.28	0.05	0.87	0.67	0.33	36.4	54.0	72.1	82.2	95.5	99.9	$2,054,240	$0	$0	$2,054,240	41.1%
PS-081 - Sausalito Pumphouse Pump Station	Potable Pump Station	$5,000,000	0.13	0.20	0.34	0.28	0.05	0.87	0.67	0.33	36.4	54.0	72.1	82.2	95.5	99.9	$2,054,240	$0	$0	$2,054,240	41.1%
PS-082 - Sausalito Boulevard Pump Station	Potable Pump Station	$5,000,000	0.49	0.28	0.21	0.02	0.00	0.51	0.23	0.02	71.1	87.1	96.7	98.9	99.8	99.9	$561,345	$0	$0	$561,345	11.2%
PS-083 - Richardson Drive Pump Station	Potable Pump Station	$5,000,000	0.30	0.25	0.25	0.17	0.03	0.70	0.45	0.20	52.8	69.3	82.3	88.8	97.0	99.9	$1,384,860	$0	$0	$1,384,860	27.7%
PS-084 - Eastwood Way Pump Station	Potable Pump Station	$5,000,000	0.23	0.22	0.26	0.24	0.05	0.77	0.55	0.29	45.3	61.5	75.7	84.1	95.7	99.9	$1,748,770	$0	$0	$1,748,770	35.0%
PS-085 - Fairview Park Pump Station	Potable Pump Station	$5,000,000	0.23	0.22	0.26	0.24	0.05	0.77	0.55	0.29	45.3	61.5	75.7	84.1	95.7	99.9	$1,748,770	$0	$0	$1,748,770	35.0%
PS-087 - Marinview Pump Station	Potable Pump Station	$5,000,000	0.14	0.22	0.36	0.24	0.04	0.86	0.64	0.28	38.3	56.9	75.6	84.9	96.3	99.9	$1,902,995	$0	$0	$1,902,995	38.1%
PS-088 - Tam Woods 1st Lift Pump Station	Potable Pump Station	$5,000,000	0.23	0.22	0.26	0.24	0.05	0.77	0.55	0.29	45.3	61.5	75.7	84.1	95.7	99.9	$1,748,770	$0	$0	$1,748,770	35.0%
PS-089 - Tam Woods 2nd Lift Pump Station	Potable Pump Station	$5,000,000	0.24	0.24	0.28	0.20	0.04	0.76	0.51	0.24	47.9	65.0	79.5	87.0	96.5	99.9	$1,576,090	$0	$0	$1,576,090	31.5%
PS-090 - Hill Haven Pump Station	Potable Pump Station	$5,000,000	0.37	0.21	0.16	0.21	0.05	0.63	0.42	0.26	56.0	69.0	78.5	85.5	95.9	99.9	$1,444,475	$0	$0	$1,444,475	28.9%
PS-091 - Sugarloaf Pump Station	Potable Pump Station	$5,000,000	0.47	0.27	0.20	0.05	0.01	0.53	0.26	0.06	68.6	84.2	93.8	96.7	99.2	99.9	$704,060	$0	$0	$704,060	14.1%
PS-092 - Tiburon Belvedere Pump Station	Potable Pump Station	$5,000,000	0.49	0.28	0.21	0.02	0.00	0.51	0.23	0.02	71.3	87.3	97.0	99.0	99.8	99.9	$549,900	$0	$0	$549,900	11.0%
PS-093 - Tiburon Booster Pump Station	Potable Pump Station	$5,000,000	0.23	0.22	0.26	0.24	0.05	0.77	0.55	0.29	45.3	61.5	75.7	84.1	95.7	99.9	$1,748,770	$0	$0	$1,748,770	35.0%
PS-095 - Pine Mountain Tunnel Pump Station	Potable Pump Station	$5,000,000	0.04	0.12	0.42	0.37	0.05	0.96	0.83	0.42	25.1	42.5	65.0	78.1	95.3	99.9	$2,534,590	$0	$0	$2,534,590	50.7%
PS-096 - Southern Marin Line Boosters	Potable Pump Station	$5,000,000	0.30	0.30	0.35	0.05	0.00	0.70	0.40	0.05	57.4	77.9	93.6	97.5	99.7	99.9	$931,840	$0	$0	$931,840	18.6%
PS-101 - Redwood Drive Lower Pump	Potable Pump Station	$5,000,000	0.18	0.27	0.45	0.10	0.00	0.82	0.55	0.10	45.5	67.9	88.8	94.9	99.4	99.9	$1,339,350	$0	$0	$1,339,350	26.8%
PS-102 - North Marin Line Boosters	Potable Pump Station	$5,000,000	0.15	0.22	0.38	0.22	0.03	0.85	0.63	0.25	39.5	58.7	77.8	86.5	96.7	99.9	$1,812,720	$0	$0	$1,812,720	36.3%
PS-103 - San Geronimo Valley Pump Station	Potable Pump Station	$5,000,000	0.15	0.22	0.38	0.22	0.03	0.85	0.63	0.25	39.5	58.7	77.8	86.5	96.7	99.9	$1,812,720	$0	$0	$1,812,720	36.3%
PS-104 - Conifer Way Pump Station	Potable Pump Station	$5,000,000	0.13	0.20	0.34	0.28	0.05	0.87	0.67	0.33	36.4	54.0	72.1	82.2	95.5	99.9	$2,054,450	$0	$0	$2,054,450	41.1%
PS-106 - Los Altos Pump Station	Potable Pump Station	$5,000,000	0.49	0.28	0.21	0.02	0.00	0.51	0.23	0.02	71.3	87.3	97.0	99.0	99.8	99.9	$549,900	$0	$0	$549,900	11.0%
PS-108 - Indian Rock Pump Station	Potable Pump Station	$5,000,000	0.18	0.27	0.45	0.10	0.00	0.82	0.55	0.10	45.5	67.9	88.8	94.9	99.4	99.9	$1,339,350	$0	$0	$1,339,350	26.8%
PS-109 - Cibrian Pump Station	Potable Pump Station	$5,000,000	0.47	0.27	0.20	0.05	0.01	0.53	0.26	0.06	68.6	84.2	93.8	96.7	99.2	99.9	$704,060	$0	$0	$704,060	14.1%
PS-113 - Lag Picnic Grounds Pump Station	Potable Pump Station	$5,000,000	0.24	0.24	0.28	0.20	0.04	0.76	0.51	0.24	47.9	65.0	79.5	87.0	96.5	99.9	$1,576,090	$0	$0	$1,576,090	31.5%
PS-114 - Cortez Avenue Pump Station	Potable Pump Station	$5,000,000	0.13	0.20	0.34	0.28	0.05	0.87	0.67	0.33	36.4	54.0	72.1	82.2	95.5	99.9	$2,054,425	$0	$0	$2,054,425	41.1%
PS-115 - Redwood Drive Upper Pump Station	Potable Pump Station	$5,000,000	0.14	0.21	0.36	0.24	0.04	0.86	0.64	0.28	38.2	56.8	75.4	84.7	96.3	99.9	$1,911,140	$0	$0	$1,911,140	38.2%
PS-116 - North Redwood Drive Boosters	Potable Pump Station	$5,000,000	0.24	0.29	0.39	0.07	0.00	0.76	0.47	0.07	52.0	73.6	91.8	96.5	99.6	99.9	$1,104,450	$0	$0	$1,104,450	22.1%
PS-117 - Wolfback Ridge Pump Station	Potable Pump Station	$5,000,000	0.49	0.28	0.21	0.02	0.00	0.51	0.23	0.02	71.1	87.1	96.7	98.9	99.8	99.9	$561,345	$0	$0	$561,345	11.2%
PS-118 - Fire Road Pump Station	Potable Pump Station	$5,000,000	0.13	0.20	0.34	0.28	0.05	0.87	0.67	0.33	36.4	54.0	72.1	82.2	95.5	99.9	$2,054,450	$0	$0	$2,054,450	41.1%
PS-122 - Upper Road Pump Station	Potable Pump Station	$5,000,000	0.30	0.30	0.35	0.05	0.00	0.70	0.40	0.05	57.4	77.9	93.6	97.5	99.7	99.9	$931,840	$0	$0	$931,840	18.6%
PS-123 - Southern Marin Line Syphon	Potable Pump Station	$5,000,000	0.23	0.22	0.26	0.24	0.05	0.77	0.55	0.29	45.3	61.5	75.7	84.1	95.7	99.9	$1,748,770	$0	$0	$1,748,770	35.0%
PS-124 - Throckmorton Booster New Pumpstation	Potable Pump Station	$5,000,000	0.30	0.30	0.35	0.05	0.00	0.70	0.40	0.05	57.4	77.9	93.6	97.5	99.7	99.9	$931,840	$0	$0	$931,840	18.6%
PS-125 - Kent Fire Trail 2nd Lift Pump Station	Potable Pump Station	$5,000,000	0.25	0.25	0.29	0.18	0.03	0.75	0.50	0.21	49.0	66.6	81.2	88.3	96.9	99.9	$1,496,175	$0	$0	$1,496,175	29.9%
PS-126 - Oak Woodlands Pump Station	Potable Pump Station	$5,000,000	0.27	0.23	0.23	0.22	0.05	0.73	0.50	0.27	49.0	64.4	77.0	84.9	95.8	99.9	$1,631,125	$0	$0	$1,631,125	32.6%
PS-127 - Marin Terrace Pump Station	Potable Pump Station	$5,000,000	0.14	0.22	0.36	0.24	0.04	0.86	0.64	0.28	38.3	56.9	75.6	84.9	96.3	99.9	$1,902,995	$0	$0	$1,902,995	38.1%
PS-129 - Slide Gulch Pump Station	Potable Pump Station	$5,000,000	0.24	0.24	0.28	0.20	0.04	0.76	0.51	0.24	47.9	65.0	79.5	87.0	96.5	99.9	$1,576,090	$0	$0	$1,576,090	31.5%
PS-130 - Smith Conifer Pump Station	Potable Pump Station	$5,000,000	0.30	0.30	0.35	0.05	0.00	0.70	0.40	0.05	57.4	77.9	93.6	97.5	99.7	99.9	$931,840	$0	$0	$931,840	18.6%
TK-156 - BON TEMPE CLEARWELL TANK	Potable Tank - Clearwell	$10,000,000	0.24	0.24	0.28	0.20	0.04	0.76	0.51	0.24	41.1	65.2	77.6	80.1	81.3	87.0	$3,568,200	$0	$0	$3,568,200	35.7%
TK-157 - SAN GERONIMO CLEARWELL TANK #1	Potable Tank - Clearwell	$10,000,000	0.15	0.22	0.38	0.22	0.03	0.85	0.63	0.25	33.3	58.9	75.7	79.0	80.2	86.3	$4,036,600	$0	$0	$4,036,600	40.4%
TK-186 - SAN GERONIMO CLEARWELL TANK #2	Potable Tank - Clearwell	$15,000,000	0.15	0.22	0.38	0.22	0.03	0.85	0.63	0.25	33.3	58.9	75.7	79.0	80.2	86.3	$6,054,900	$0	$0	$6,054,900	40.4%
TK-006 - MADERA PARK TANK #1	Potable Tank - Distribution	$500,000	0.18	0.42	0.15	0.20	0.05	0.82	0.40	0.25	37.4	70.7	77.4	78.9	80.2	86.0	$177,130	$0	$0	$177,130	35.4%
TK-008 - MARINER HIGHLANDS TANK	Potable Tank - Distribution	$300,000	0.40	0.32	0.04	0.20	0.05	0.60	0.28	0.25	53.8	76.9	78.7	79.5	80.6	86.4	$85,140	$0	$0	$85,140	28.4%
TK-015 - MEADOW CLUB UPPER TANK	Potable Tank - Distribution	$1,500,000	0.06	0.15	0.41	0.33	0.05	0.94	0.79	0.38	24.9	46.0	64.3	68.0	69.9	79.2	$763,560	$0	$0	$763,560	50.9%
TK-019 - OAK MANOR TOP TANK	Potable Tank - Distribution	$1,250,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$385,000	$0	$0	$385,000	30.8%
TK-025 - BRET HARTE TANK	Potable Tank - Distribution	$2,500,000	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.5	55.0	70.6	73.8	75.3	82.8	$1,102,050	$0	$0	$1,102,050	44.1%
TK-033 - INDIAN FIRE TRAIL TANK	Potable Tank - Distribution	$1,250,000	0.14	0.22	0.37	0.23	0.04	0.86	0.64	0.27	32.8	57.9	74.6	77.8	79.1	85.5	$516,100	$0	$0	$516,100	41.3%
TK-060 - SCOTT HIGHLANDS TANK	Potable Tank - Distribution	$1,250,000	0.15	0.22	0.38	0.21	0.04	0.85	0.63	0.24	33.4	59.2	76.4	79.7	80.9	86.7	$499,775	$0	$0	$499,775	40.0%
TK-066 - SUMMIT AVENUE UPPER TANK	Potable Tank - Distribution	$600,000	0.43	0.34	0.04	0.16	0.04	0.57	0.23	0.20	56.4	81.0	82.8	83.5	84.4	89.0	$149,040	$0	$0	$149,040	24.8%
TK-068 - ELDA DRIVE TANK	Potable Tank - Distribution	$750,000	0.15	0.22	0.38	0.21	0.04	0.85	0.63	0.24	33.4	59.2	76.4	79.7	80.9	86.7	$299,865	$0	$0	$299,865	40.0%
TK-074 - SCENIC AVENUE TANK	Potable Tank - Distribution	$100,000	0.24	0.56	0.20	0.00	0.00	0.76	0.20	0.00	45.4	89.7	98.3	99.8	99.8	99.8	$19,270	$0	$0	$19,270	19.3%
TK-078 - CHULA VISTA TANK	Potable Tank - Distribution	$1,250,000	0.35	0.31	0.32	0.03	0.00	0.65	0.35	0.03	51.4	81.1	95.1	97.5	97.6	98.4	$264,775	$0	$0	$264,775	21.2%
TK-081 - FAIRHILLS TOP TANK #1	Potable Tank - Distribution	$300,000	0.35	0.31	0.32	0.03	0.00	0.65	0.35	0.03	51.4	81.1	95.1	97.5	97.6	98.4	$63,546	$0	$0	$63,546	21.2%
TK-085 - HIND TANK #1	Potable Tank - Distribution	$500,000	0.54	0.20	0.01	0.20	0.05	0.46	0.26	0.25	63.8	78.2	78.9	79.5	80.6	86.4	$125,310	$0	$0	$125,310	25.1%
TK-086 - HIND TANK #2	Potable Tank - Distribution	$1,000,000	0.54	0.20	0.01	0.20	0.05	0.46	0.26	0.25	63.8	78.2	78.9	79.5	80.6	86.4	$250,620	$0	$0	$250,620	25.1%
TK-097 - RAFAEL HIGHLANDS TANK	Potable Tank - Distribution	$2,500,000	0.35	0.31	0.32	0.03	0.00	0.65	0.35	0.03	51.4	81.1	95.1	97.5	97.6	98.4	$529,550	$0	$0	$529,550	21.2%
TK-100 - SKYVIEW TERRACE TANK	Potable Tank - Distribution	$750,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$231,000	$0	$0	$231,000	30.8%
TK-108 - CLOUDVIEW TANK	Potable Tank - Distribution	$1,100,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$338,800	$0	$0	$338,800	30.8%
TK-115 - ROMER TANK	Potable Tank - Distribution	$1,550,000	0.06	0.15	0.41	0.33	0.05	0.94	0.79	0.38	24.9	46.0	64.3	68.0	69.9	79.2	$788,795	$0	$0	$788,795	50.9%
TK-116 - SAUSALITO BLVD. TANK	Potable Tank - Distribution	$1,150,000	0.35	0.31	0.32	0.03	0.00	0.65	0.35	0.03	51.3	80.9	94.8	97.2	97.4	98.2	$245,916	$0	$0	$245,916	21.4%
TK-117 - MESA VISTA TANK #1	Potable Tank - Distribution	$2,500,000	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.5	55.0	70.6	73.8	75.3	82.8	$1,102,050	$0	$0	$1,102,050	44.1%
TK-118 - COUNTYVIEW DRIVE TANK	Potable Tank - Distribution	$750,000	0.09	0.20	0.54	0.18	0.00	0.91	0.72	0.18	28.8	56.8	80.8	85.2	86.1	90.7	$298,890	$0	$0	$298,890	39.9%
TK-119 - LATTIE LANE TANK	Potable Tank - Distribution	$1,250,000	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.5	55.0	70.6	73.8	75.3	82.8	$551,275	$0	$0	$551,275	44.1%
TK-126 - HILL HAVEN TANK	Potable Tank - Distribution	$825,000	0.35	0.31	0.32	0.03	0.00	0.65	0.35	0.03	51.4	81.1	95.1	97.5	97.6	98.4	$174,752	$0	$0	$174,752	21.2%
TK-128 - MOUNT TIBURON TANK #1	Potable Tank - Distribution	$2,500,000	0.26	0.23	0.24	0.22	0.05	0.74	0.51	0.27	42.0	64.5	75.3	77.6	78.9	85.2	$914,650	$0	$0	$914,650	36.6%
TK-139 - BUCKEYE CIRCLE TANK	Potable Tank - Distribution	$150,000	0.06	0.15	0.41	0.33	0.05	0.94	0.79	0.38	24.9	46.0	64.3	68.0	69.9	79.2	$76,356	$0	$0	$76,356	50.9%
TK-150 - LOS ALTOS TANK	Potable Tank - Distribution	$300,000	0.35	0.31	0.32	0.03	0.00	0.65	0.35	0.03	51.4	81.1	95.1	97.5	97.6	98.4	$63,546	$0	$0	$63,546	21.2%
TK-158 - FAWN DRIVE TANK	Potable Tank - Distribution	$450,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$138,600	$0	$0	$138,600	30.8%
TK-163 - UPPER ROAD TANK	Potable Tank - Distribution	$200,000	0.40	0.32	0.04	0.20	0.05	0.60	0.29	0.25	53.6	76.5	78.3	79.1	80.3	86.1	$57,452	$0	$0	$57,452	28.7%
TK-164 - TOMAHAWK DRIVE TANK	Potable Tank - Distribution	$200,000	0.15	0.22	0.38	0.21	0.04	0.85	0.63	0.24	33.4	59.2	76.4	79.7	80.9	86.7	$79,964	$0	$0	$79,964	40.0%
TK-166 - RING MOUNTAIN TANK	Potable Tank - Distribution	$750,000	0.35	0.31	0.32	0.03	0.00	0.65	0.35	0.03	51.4	81.1	95.1	97.5	97.6	98.4	$158,865	$0	$0	$158,865	21.2%
TK-167 - CREEKSIDE DRIVE TANK	Potable Tank - Distribution	$900,000	0.29	0.25	0.26	0.16	0.03	0.71	0.46	0.20	44.8	69.4	81.2	83.5	84.4	89.1	$288,306	$0	$0	$288,306	32.0%
TK-180 - BON TEMPE WASHWATER TANK	Potable Tank - Distribution	$1,000,000	0.14	0.22	0.37	0.23	0.04	0.86	0.64	0.27	32.8	57.9	74.6	77.8	79.1	85.5	$412,880	$0	$0	$412,880	41.3%
TK-181 - REDWOOD DRIVE UPPER TANK	Potable Tank - Distribution	$300,000	0.07	0.16	0.43	0.30	0.04	0.93	0.78	0.34	25.7	48.2	67.6	71.5	73.2	81.5	$146,064	$0	$0	$146,064	48.7%
TK-182 - ALTA AVENUE TANK	Potable Tank - Distribution	$2,500,000	0.07	0.16	0.43	0.30	0.04	0.93	0.78	0.34	25.7	48.2	67.6	71.5	73.2	81.5	$1,217,200	$0	$0	$1,217,200	48.7%
TK-183 - MINE RIDGE TANK	Potable Tank - Distribution	$1,100,000	0.07	0.16	0.43	0.30	0.04	0.93	0.77	0.34	25.7	48.3	67.8	71.6	73.3	81.6	$534,226	$0	$0	$534,226	48.6%
TK-187 - MANZANITA TANK	Potable Tank - Distribution	$300,000	0.06	0.15	0.41	0.33	0.05	0.94	0.79	0.38	24.9	46.0	64.3	68.0	69.9	79.2	$152,712	$0	$0	$152,712	50.9%
TK-188 - WOLFBACK RIDGE TANK #1	Potable Tank - Distribution	$125,000	0.35	0.31	0.32	0.03	0.00	0.65	0.35	0.03	51.4	81.1	95.1	97.5	97.6	98.4	$26,478	$0	$0	$26,478	21.2%
TK-189 - WOLFBACK RIDGE TANK #2	Potable Tank - Distribution	$125,000	0.35	0.31	0.32	0.03	0.00	0.65	0.35	0.03	51.4	81.1	95.1	97.5	97.6	98.4	$26,478	$0	$0	$26,478	21.2%
TK-190 - INVERNESS DRIVE TANK	Potable Tank - Distribution	$700,000	0.26	0.23	0.24	0.22	0.05	0.74	0.51	0.27	42.0	64.5	75.3	77.6	78.9	85.2	$256,102	$0	$0	$256,102	36.6%
TK-191 - LONE TREE AVENUE TANK	Potable Tank - Distribution	$500,000	0.14	0.22	0.37	0.23	0.04	0.86	0.64	0.27	32.8	57.9	74.6	77.8	79.1	85.5	$206,440	$0	$0	$206,440	41.3%
TK-192 - VERNAL AVE TANK	Potable Tank - Distribution	$1,500,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$462,000	$0	$0	$462,000	30.8%
TK-193 - H-LINE ROAD TANK	Potable Tank - Distribution	$2,500,000	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.5	55.0	70.6	73.8	75.3	82.8	$1,102,050	$0	$0	$1,102,050	44.1%
TK-196 - WILSON WAY TANK	Potable Tank - Distribution	$500,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$154,000	$0	$0	$154,000	30.8%
TK-197 - SUMMIT TRAIL TANK	Potable Tank - Distribution	$650,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$200,200	$0	$0	$200,200	30.8%
TK-198 - SCOTT TANKS	Potable Tank - Distribution	$300,000	0.09	0.20	0.54	0.18	0.00	0.91	0.72	0.18	28.8	56.8	80.8	85.2	86.1	90.7	$119,556	$0	$0	$119,556	39.9%
TK-199 - SCOTT TANKS	Potable Tank - Distribution	$300,000	0.09	0.20	0.54	0.18	0.00	0.91	0.72	0.18	28.8	56.8	80.8	85.2	86.1	90.7	$119,556	$0	$0	$119,556	39.9%
TK-200 - OAK WOODLANDS TANK #1	Potable Tank - Distribution	$575,000	0.26	0.23	0.24	0.22	0.05	0.74	0.51	0.27	42.0	64.5	75.3	77.6	78.9	85.2	$210,370	$0	$0	$210,370	36.6%
TK-201 - OAK WOODLANDS TANK #2	Potable Tank - Distribution	$575,000	0.33	0.29	0.30	0.06	0.01	0.67	0.37	0.07	49.8	78.2	91.7	94.0	94.4	96.1	$137,103	$0	$0	$137,103	23.8%
TK-202 - Fairfax Manor 1st Lift Tank	Potable Tank - Distribution	$100,000	0.06	0.15	0.41	0.33	0.05	0.94	0.79	0.38	24.9	46.0	64.3	68.0	69.9	79.2	$50,904	$0	$0	$50,904	50.9%
TK-203 - MONTE MAR VISTA TANK	Potable Tank - Distribution	$300,000	0.09	0.20	0.54	0.18	0.00	0.91	0.72	0.18	28.8	56.8	80.8	85.2	86.1	90.7	$119,556	$0	$0	$119,556	39.9%
TK-204 - Bay Road Tank	Potable Tank - Distribution	$600,000	0.09	0.20	0.54	0.18	0.00	0.91	0.72	0.18	28.8	56.8	80.8	85.2	86.1	90.7	$239,112	$0	$0	$239,112	39.9%
TK-206 - SANTA VENETIA TANK	Potable Tank - Distribution	$1,550,000	0.04	0.13	0.54	0.29	0.01	0.96	0.83	0.30	23.6	46.9	70.9	75.5	77.0	84.5	$743,132	$0	$0	$743,132	47.9%
TK-207 - GOODHILL ROAD TANK	Potable Tank - Distribution	$300,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$92,400	$0	$0	$92,400	30.8%
TK-208 - SPRING LANE TANK #2	Potable Tank - Distribution	$7,500,000	0.35	0.31	0.32	0.03	0.00	0.65	0.35	0.03	51.4	81.1	95.1	97.5	97.6	98.4	$1,588,650	$0	$0	$1,588,650	21.2%

TK-209 - FAIRHILLS TOP TANK #2	Potable Tank - Distribution	$300,000	0.35	0.31	0.32	0.03	0.00	0.65	0.35	0.03	51.4	81.1	95.1	97.5	97.6	98.4	$63,546	$0	$0	$63,546	21.2%
TK-210 - BEACON HILL TANK	Potable Tank - Distribution	$500,000	0.29	0.25	0.26	0.16	0.03	0.71	0.46	0.20	44.8	69.4	81.2	83.5	84.4	89.1	$160,170	$0	$0	$160,170	32.0%
TK-211 - Kent Fire Trail Tank #1	Potable Tank - Distribution	$500,000	0.15	0.22	0.38	0.21	0.04	0.85	0.63	0.24	33.4	59.2	76.4	79.7	80.9	86.7	$199,910	$0	$0	$199,910	40.0%
TK-212 - Kent Fire Trail Tank #2	Potable Tank - Distribution	$500,000	0.15	0.22	0.38	0.21	0.04	0.85	0.63	0.24	33.4	59.2	76.4	79.7	80.9	86.7	$199,910	$0	$0	$199,910	40.0%
TK-213 - MARIN CITY TANK	Potable Tank - Distribution	$1,000,000	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.5	55.0	70.6	73.8	75.3	82.8	$440,820	$0	$0	$440,820	44.1%
TK-214 - SLIDE GULCH TANK	Potable Tank - Distribution	$485,870	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.5	55.0	70.6	73.8	75.3	82.8	$214,278	$0	$0	$214,278	44.1%
TK-215 - SEQUOIA PARK TANK #1	Potable Tank - Distribution	$550,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$169,400	$0	$0	$169,400	30.8%
TK-216 - SEQUOIA PARK TANK #2	Potable Tank - Distribution	$250,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$77,000	$0	$0	$77,000	30.8%
TK-217 - KENT WOODLANDS 1ST LIFT TANK	Potable Tank - Distribution	$500,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$154,000	$0	$0	$154,000	30.8%
TK-218 - MOUNT TIBURON TANK #2	Potable Tank - Distribution	$2,950,000	0.26	0.23	0.24	0.22	0.05	0.74	0.51	0.27	42.0	64.5	75.3	77.6	78.9	85.2	$1,079,287	$0	$0	$1,079,287	36.6%
TK-219 - OAK MANOR FIRST LIFT TANK	Potable Tank - Distribution	$500,000	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.5	55.0	70.6	73.8	75.3	82.8	$220,410	$0	$0	$220,410	44.1%
TK-220 - TAM WOODS TOP TANK	Potable Tank - Distribution	$400,000	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.5	55.0	70.6	73.8	75.3	82.8	$176,408	$0	$0	$176,408	44.1%
TK-221 - SUMMIT AVENUE LOWER TANK	Potable Tank - Distribution	$500,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$154,000	$0	$0	$154,000	30.8%
TK-222 - FRIAR TUCK LANE TANK	Potable Tank - Distribution	$625,000	0.33	0.29	0.30	0.06	0.01	0.67	0.37	0.07	49.8	78.2	91.7	94.0	94.4	96.1	$149,025	$0	$0	$149,025	23.8%
TK-223 - CASCADE TANK #1	Potable Tank - Distribution	$300,000	0.09	0.20	0.54	0.18	0.00	0.91	0.72	0.18	28.8	56.8	80.8	85.2	86.1	90.7	$119,556	$0	$0	$119,556	39.9%
TK-224 - CASCADE TANK #2	Potable Tank - Distribution	$300,000	0.09	0.20	0.54	0.18	0.00	0.91	0.72	0.18	28.8	56.8	80.8	85.2	86.1	90.7	$119,556	$0	$0	$119,556	39.9%
TK-225 - SUGARLOAF TANK #1	Potable Tank - Distribution	$635,000	0.26	0.23	0.24	0.22	0.05	0.74	0.51	0.27	42.0	64.5	75.3	77.6	78.9	85.2	$232,321	$0	$0	$232,321	36.6%
TK-226 - SUGARLOAF TANK #2	Potable Tank - Distribution	$635,000	0.26	0.23	0.24	0.22	0.05	0.74	0.51	0.27	42.0	64.5	75.3	77.6	78.9	85.2	$232,321	$0	$0	$232,321	36.6%
TK-228 - GLENWOOD FOREST TANK	Potable Tank - Distribution	$450,000	0.49	0.21	0.12	0.14	0.03	0.51	0.30	0.18	60.3	78.2	83.7	84.9	85.8	90.0	$108,495	$0	$0	$108,495	24.1%
TK-229 - KENT FIRE TRAIL TOP TANK	Potable Tank - Distribution	$50,000	0.15	0.22	0.38	0.21	0.04	0.85	0.63	0.24	33.4	59.2	76.4	79.7	80.9	86.7	$19,991	$0	$0	$19,991	40.0%
TK-230 - SWIG TANK	Potable Tank - Distribution	$250,000	0.29	0.25	0.26	0.16	0.03	0.71	0.46	0.20	44.8	69.4	81.2	83.5	84.4	89.1	$80,085	$0	$0	$80,085	32.0%
TK-232 - SKY RANCH TANK	Potable Tank - Distribution	$600,000	0.09	0.20	0.54	0.18	0.00	0.91	0.72	0.18	28.8	56.8	80.8	85.2	86.1	90.7	$239,112	$0	$0	$239,112	39.9%
TK-233 - FAIRFAX MANOR TOP TANK	Potable Tank - Distribution	$540,000	0.06	0.15	0.41	0.33	0.05	0.94	0.79	0.38	24.9	46.0	64.3	68.0	69.9	79.2	$274,882	$0	$0	$274,882	50.9%
TK-234 - TAM WOODS FIRST LIFT TANK	Potable Tank - Distribution	$425,000	0.14	0.22	0.37	0.23	0.04	0.86	0.64	0.27	32.8	57.9	74.6	77.8	79.1	85.5	$175,474	$0	$0	$175,474	41.3%
TK-235 - FAIRVIEW PARK TANK	Potable Tank - Distribution	$500,000	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.5	55.0	70.6	73.8	75.3	82.8	$220,510	$0	$0	$220,510	44.1%
TK-236 - FERN CANYON TANK	Potable Tank - Distribution	$150,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$46,200	$0	$0	$46,200	30.8%
TK-237 - CONIFER WAY UPPER TANK	Potable Tank - Distribution	$500,000	0.09	0.20	0.54	0.18	0.00	0.91	0.72	0.18	28.8	56.8	80.8	85.2	86.1	90.7	$199,260	$0	$0	$199,260	39.9%
TK-238 - OAK AVENUE TANK	Potable Tank - Distribution	$500,000	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.5	55.0	70.6	73.8	75.3	82.8	$220,510	$0	$0	$220,510	44.1%
TK-239 - ELINOR AVE TANK	Potable Tank - Distribution	$565,000	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.5	55.0	70.6	73.8	75.3	82.8	$249,063	$0	$0	$249,063	44.1%
TK-241 - LAGUNITAS PICNIC GROUNDS TANK	Potable Tank - Distribution	$2,750	0.14	0.22	0.36	0.24	0.04	0.86	0.64	0.28	32.5	57.2	73.4	76.6	78.0	84.7	$1,155	$0	$0	$1,155	42.0%
TK-009 - SAN CLEMENTE TANK	Potable Tank - Gravity	$7,500,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$2,310,000	$0	$0	$2,310,000	30.8%
TK-011 - CA ├æON VILLAGE TANK	Potable Tank - Gravity	$7,500,000	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.5	55.0	70.6	73.8	75.3	82.8	$3,306,150	$0	$0	$3,306,150	44.1%
TK-012 - FAIRFAX GRADE TANK	Potable Tank - Gravity	$2,500,000	0.09	0.20	0.54	0.18	0.00	0.91	0.72	0.18	28.8	56.8	80.8	85.2	86.1	90.7	$996,300	$0	$0	$996,300	39.9%
TK-027 - GREENBRAE TANK	Potable Tank - Gravity	$7,500,000	0.26	0.23	0.24	0.22	0.05	0.74	0.51	0.27	42.0	64.5	75.3	77.6	78.9	85.2	$2,743,950	$0	$0	$2,743,950	36.6%
TK-030 - ESCALLE TANK	Potable Tank - Gravity	$5,000,000	0.01	0.05	0.36	0.50	0.08	0.99	0.93	0.58	18.4	31.9	48.2	52.0	54.9	68.8	$3,149,800	$0	$0	$3,149,800	63.0%
TK-064 - STRAWBERRY TANK	Potable Tank - Gravity	$7,500,000	0.26	0.23	0.24	0.22	0.05	0.74	0.51	0.27	41.8	64.2	75.0	77.2	78.6	85.0	$2,765,700	$0	$0	$2,765,700	36.9%
TK-083 - GLENWOOD TANK	Potable Tank - Gravity	$7,500,000	0.35	0.31	0.32	0.03	0.00	0.65	0.35	0.03	51.4	81.1	95.1	97.5	97.6	98.4	$1,588,650	$0	$0	$1,588,650	21.2%
TK-087 - LOCH LOMOND TANK	Potable Tank - Gravity	$5,000,000	0.33	0.29	0.30	0.06	0.01	0.67	0.37	0.07	49.8	78.2	91.7	94.0	94.4	96.1	$1,192,200	$0	$0	$1,192,200	23.8%
TK-089 - LOS RANCHITOS TANK	Potable Tank - Gravity	$5,000,000	0.15	0.22	0.38	0.21	0.04	0.85	0.63	0.24	33.4	59.2	76.4	79.7	80.9	86.7	$1,999,100	$0	$0	$1,999,100	40.0%
TK-090 - MARINWOOD TANK	Potable Tank - Gravity	$2,500,000	0.33	0.29	0.30	0.06	0.01	0.67	0.37	0.07	49.8	78.2	91.7	94.0	94.4	96.1	$596,100	$0	$0	$596,100	23.8%
TK-091 - MARIN PROFESSIONAL CENTER TANK	Potable Tank - Gravity	$1,250,000	0.06	0.15	0.41	0.33	0.05	0.94	0.79	0.38	24.9	46.0	64.3	68.0	69.9	79.2	$636,125	$0	$0	$636,125	50.9%
TK-094 - MILLER CREEK TANK	Potable Tank - Gravity	$2,500,000	0.35	0.31	0.32	0.03	0.00	0.65	0.35	0.03	51.4	81.1	95.1	97.5	97.6	98.4	$529,550	$0	$0	$529,550	21.2%
TK-096 - PUERTO SUELLO TANK	Potable Tank - Gravity	$7,500,000	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.6	55.2	71.0	74.2	75.7	83.1	$3,288,000	$0	$0	$3,288,000	43.8%
TK-098 - SANTA MARGARITA TANK	Potable Tank - Gravity	$7,500,000	0.15	0.22	0.38	0.21	0.04	0.85	0.63	0.24	33.4	59.2	76.4	79.7	80.9	86.7	$2,998,650	$0	$0	$2,998,650	40.0%
TK-106 - LUCAS VALLEY TANK	Potable Tank - Gravity	$7,500,000	0.26	0.23	0.24	0.22	0.05	0.74	0.51	0.27	42.0	64.5	75.3	77.6	78.9	85.2	$2,743,950	$0	$0	$2,743,950	36.6%
TK-113 - SAUSALITO PUMP HOUSE TANK #1	Potable Tank - Gravity	$1,550,000	0.06	0.15	0.41	0.33	0.05	0.94	0.79	0.38	24.9	46.0	64.3	68.0	69.9	79.2	$788,795	$0	$0	$788,795	50.9%
TK-114 - SAUSALITO PUMP HOUSE TANK #2	Potable Tank - Gravity	$1,550,000	0.06	0.15	0.41	0.33	0.05	0.94	0.79	0.38	24.9	46.0	64.3	68.0	69.9	79.2	$788,795	$0	$0	$788,795	50.9%
TK-125 - TENNESSEE VALLEY TANK	Potable Tank - Gravity	$5,000,000	0.07	0.16	0.43	0.30	0.04	0.93	0.77	0.34	25.7	48.3	67.8	71.6	73.3	81.6	$2,428,300	$0	$0	$2,428,300	48.6%
TK-127 - PARADISE DRIVE TANK	Potable Tank - Gravity	$5,000,000	0.26	0.23	0.24	0.22	0.05	0.74	0.51	0.27	42.0	64.5	75.3	77.6	78.9	85.2	$1,829,300	$0	$0	$1,829,300	36.6%
TK-130 - SPRING LANE TANK #1	Potable Tank - Gravity	$7,500,000	0.35	0.31	0.32	0.03	0.00	0.65	0.35	0.03	51.4	81.1	95.1	97.5	97.6	98.4	$1,588,650	$0	$0	$1,588,650	21.2%
TK-159 - PEACOCK GAP TANK	Potable Tank - Gravity	$2,500,000	0.60	0.15	0.07	0.14	0.03	0.40	0.25	0.18	68.5	81.0	84.3	85.1	86.0	90.2	$519,000	$0	$0	$519,000	20.8%
TK-160 - MARIN BAY TANK	Potable Tank - Gravity	$600,000	0.35	0.31	0.32	0.03	0.00	0.65	0.35	0.03	51.4	81.1	95.1	97.5	97.6	98.4	$127,092	$0	$0	$127,092	21.2%
TK-175 - MARINSHIP TANK	Potable Tank - Gravity	$7,500,000	0.13	0.21	0.39	0.24	0.04	0.87	0.66	0.27	31.3	56.4	73.8	77.2	78.6	85.2	$3,171,900	$0	$0	$3,171,900	42.3%
TK-152 - MADERA PARK (H/P) TANK	Potable Tank - Pressure System	$7,500	0.03	0.09	0.40	0.41	0.06	0.97	0.88	0.47	21.0	38.5	56.8	60.7	63.1	74.5	$4,274	$0	$0	$4,274	57.0%
TK-153 - RAFAEL HIGHLANDS (H/P) TANK	Potable Tank - Pressure System	$12,500	0.35	0.31	0.32	0.03	0.00	0.65	0.35	0.03	51.4	81.1	95.1	97.5	97.6	98.4	$2,648	$0	$0	$2,648	21.2%
TK-168 - MCNEAR DRIVE #1 (H/P) TANK	Potable Tank - Pressure System	$5,000	0.26	0.23	0.24	0.22	0.05	0.74	0.51	0.27	42.0	64.5	75.3	77.6	78.9	85.2	$1,829	$0	$0	$1,829	36.6%
TK-169 - MCNEAR DRIVE #2 (H/P) TANK	Potable Tank - Pressure System	$7,500	0.26	0.23	0.24	0.22	0.05	0.74	0.51	0.27	42.0	64.5	75.3	77.6	78.9	85.2	$2,744	$0	$0	$2,744	36.6%
TK-174 - VIA MONTEBELLO (H/P) TANK	Potable Tank - Pressure System	$17,500	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$5,390	$0	$0	$5,390	30.8%
TK-195 - Fire Road Pressure Tank	Potable Tank - Pressure System	$5,000	0.06	0.15	0.41	0.33	0.05	0.94	0.79	0.38	24.9	46.0	64.3	68.0	69.9	79.2	$2,545	$0	$0	$2,545	50.9%
TK-205 - RICHARDSON DRIVE (H/P) TANK	Potable Tank - Pressure System	$5,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$1,540	$0	$0	$1,540	30.8%
TK-145 - ROSS RESERVOIR	Potable Tank - Reservoir	$5,000,000	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.0	100.0	100.0	100.0	100.0	100.0	$0	$0	$0	$0	0.0%
TK-146 - FORBES HILL RESERVOIR	Potable Tank - Reservoir	$20,000,000	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.0	100.0	100.0	100.0	100.0	100.0	$0	$0	$0	$0	0.0%
TK-046 - ALTO TANK #1	Potable Tank - Transmission	$15,000,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$4,620,000	$0	$0	$4,620,000	30.8%
TK-055 - MILL VALLEY TANK	Potable Tank - Transmission	$25,000,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$7,700,001	$0	$0	$7,700,001	30.8%
TK-069 - HAWTHORNE HILLS UPPER TANK	Potable Tank - Transmission	$10,000,000	0.18	0.27	0.46	0.08	0.00	0.82	0.55	0.09	37.6	68.7	89.3	92.9	93.4	95.5	$3,080,000	$0	$0	$3,080,000	30.8%
TK-131 - CONIFER WAY TANK	Potable Tank - Transmission	$2,500,000	0.06	0.15	0.41	0.33	0.05	0.94	0.79	0.38	24.9	46.0	64.3	68.0	69.9	79.2	$1,272,600	$0	$0	$1,272,600	50.9%
TK-147 - SMITH SADDLE TANK #1	Potable Tank - Transmission	$25,000,000	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.5	55.0	70.6	73.8	75.3	82.8	$11,020,501	$0	$0	$11,020,501	44.1%
TK-148 - SMITH SADDLE TANK #2	Potable Tank - Transmission	$25,000,000	0.15	0.22	0.38	0.21	0.04	0.85	0.63	0.24	33.4	59.2	76.4	79.7	80.9	86.7	$9,995,500	$0	$0	$9,995,500	40.0%
TK-155 - PINE MOUNTAIN TUNNEL TANK	Potable Tank - Transmission	$15,000,000	0.75	0.00	0.00	0.00	0.25	0.25	0.25	0.25	77.4	77.5	77.7	78.0	78.7	82.3	$3,748,500	$0	$0	$3,748,500	25.0%
TK-165 - ALTO TANK #2	Potable Tank - Transmission	$15,000,000	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.5	55.0	70.6	73.8	75.3	82.8	$6,612,301	$0	$0	$6,612,301	44.1%
TK-184 - PACHECO RIDGE TANK #1	Potable Tank - Transmission	$15,000,000	0.26	0.23	0.24	0.22	0.05	0.74	0.51	0.27	42.0	64.5	75.3	77.6	78.9	85.2	$5,487,901	$0	$0	$5,487,901	36.6%
TK-185 - PACHECO RIDGE TANK #2	Potable Tank - Transmission	$15,000,000	0.33	0.29	0.30	0.06	0.01	0.67	0.37	0.07	49.8	78.2	91.7	94.0	94.4	96.1	$3,576,600	$0	$0	$3,576,600	23.8%
Bon Tempe Treatment Plant	Potable Treatment Plant	$100,000,000	0.24	0.24	0.28	0.20	0.04	0.76	0.51	0.24	49.3	75.0	80.7	82.2	86.2	97.2	$32,203,200	$0	$0	$32,203,200	32.2%
San Geronimo Treatment Plant	Potable Treatment Plant	$100,000,000	0.16	0.25	0.41	0.16	0.02	0.84	0.59	0.18	43.8	77.7	85.7	86.9	90.1	98.5	$32,526,300	$0	$0	$32,526,300	32.5%
Potable Total/Averages			**24%**	**23%**	**33%**	**17%**	**3%**													**$348,366,788**	
PS-028 - Kent Lake Pump Station	Raw Pump Station	$5,000,000	0.05	0.16	0.52	0.26	0.01	0.95	0.79	0.27	29.2	50.0	75.9	86.7	98.2	99.9	$2,116,760	$0	$0	$2,116,760	42.3%
PS-029 - Phoenix Lake Barge Pump	Raw Pump Station	$5,000,000	0.30	0.30	0.35	0.05	0.00	0.70	0.40	0.05	57.4	77.9	93.6	97.5	99.7	99.9	$931,840	$0	$0	$931,840	18.6%
PS-031 - Soulajule Pump Station	Raw Pump Station	$5,000,000	0.82	0.13	0.05	0.00	0.00	0.18	0.05	0.01	91.2	97.1	99.2	99.7	99.9	99.9	$140,360	$0	$0	$140,360	2.8%
PS-097 - Tocaloma Booster Pump Station	Raw Pump Station	$5,000,000	0.40	0.23	0.18	0.16	0.04	0.60	0.37	0.19	60.3	74.2	83.8	89.4	97.0	99.9	$1,191,035	$0	$0	$1,191,035	23.8%
PS-128 - Alpine Bon-Tempe Pump Station	Raw Pump Station	$5,000,000	0.10	0.21	0.51	0.18	0.00	0.90	0.69	0.18	36.2	58.4	82.8	91.2	98.9	99.9	$1,742,300	$0	$0	$1,742,300	34.8%
Raw Total/Averages			**34%**	**20%**	**32%**	**13%**	**1%**													**$6,122,295**	
PS-049 - Channing Way Pump Station	Recycled Pump Station	$5,000,000	0.07	0.16	0.38	0.33	0.05	0.93	0.77	0.38	29.4	46.9	67.5	79.4	95.1	99.9	$2,356,130	$0	$0	$2,356,130	47.1%
PS-111 - Quail Hill Pump Station	Recycled Pump Station	$5,000,000	0.18	0.27	0.45	0.10	0.00	0.82	0.55	0.10	45.5	67.9	88.8	94.9	99.4	99.9	$1,339,350	$0	$0	$1,339,350	26.8%
PS-112 - Freitas Parkway Pump Station	Recycled Pump Station	$5,000,000	0.30	0.30	0.35	0.05	0.00	0.70	0.40	0.05	57.4	77.9	93.6	97.5	99.7	99.9	$931,840	$0	$0	$931,840	18.6%
TK-103 - TERRA LINDA TANK #1	Recycled Tank - Gravity	$2,500,000	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.5	55.0	70.6	73.8	75.3	82.8	$1,102,050	$0	$0	$1,102,050	44.1%
TK-170 - TERRA LINDA TANK #2	Recycled Tank - Gravity	$2,500,000	0.14	0.20	0.35	0.26	0.05	0.86	0.66	0.31	31.5	55.0	70.6	73.8	75.3	82.8	$1,102,050	$0	$0	$1,102,050	44.1%
TK-227 - LGWRP Clearwell	Recycled Tank - Reservoir	$4,500,000	0.06	0.15	0.39	0.35	0.05	0.94	0.79	0.40	24.4	45.1	62.8	66.5	68.5	78.2	$2,332,260	$0	$0	$2,332,260	51.8%
Las Gallinas Treatment Plant	Recycled Treatment Plant	$1	0.08	0.19	0.50	0.23	0.01	0.92	0.74	0.24	21.0	45.4	72.0	76.9	79.4	97.0	$0	$0	$0	$0	0.0%
Recycled Total/Averages			**14%**	**21%**	**39%**	**23%**	**3%**													**$9,163,680**	

Pipelines

Type	Miles of Pipeline	Replacement Cost
Potable Water - Distribution Main	761.0	$2,209,823,037
Potable Water - Lateral	229.4	$181,682,836
Potable Water - Main	0.1	$200,899
Potable Water - Transmission Main	92.1	$388,893,185
Raw Water - Distribution Main	4.7	$13,679,943
Raw Water - Transmission Main	25.6	$108,036,492
Recycled Water - Lateral	2.1	$1,676,612
Recycled Water - Main	24.4	$70,806,587
Recycled Water - Other	0.3	$828,973
Total	**1,139.6**	**$2,975,628,563**

Number of Leaks	Number of Leaks	Number of Breaks	Total Number of Repairs	Days to Repair Leaks	Days to Repair Breaks	Total Days to Repair
Potable Water - Distribution Main	11.5	2.9	14.4	1.6	0.4	2.0
Potable Water - Lateral	6.3	1.6	7.8	0.9	0.2	1.1
Potable Water - Main	0.0	0.0	0.0	0.0	0.0	0.0
Potable Water - Transmission Main	0.9	0.2	1.2	0.2	0.0	0.2
Potable Water Totals	**18.7**	**4.7**	**23.4**	**2.7**	**0.7**	**3.3**
Economic Loss	**$187,198.57**	**$46,799.64**	**$233,998.21**			
Raw Water - Distribution Main	0.0	0.0	0.0	0.0	0.0	0.0
Raw Water - Transmission Main	0.1	0.0	0.1	0.0	0.0	0.0
Raw Water Totals	**0.1**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**
Economic Loss	**$722.88**	**$180.72**	**$903.60**			
Recycled Water - Lateral	0.1	0.0	0.1	0.0	0.0	0.0
Recycled Water - Main	0.4	0.1	0.5	0.1	0.0	0.1
Recycled Water - Other	0.0	0.0	0.0	0.0	0.0	0.0
Recycled Water Totals	**0.5**	**0.1**	**0.6**	**0.1**	**0.0**	**0.1**
Economic Loss	**$4,683.95**	**$1,170.99**	**$5,854.94**			
Total	**19.3**	**4.8**	**24.1**	**2.7**	**0.7**	**3.4**

Cost to Repair a Leak	Cost to Repair a Break	Economic Loss
$10,000	$10,000	$240,757

Facilities

Facility Name	Type	Replacement Cost	Probability of Damage State								Percent Functionality After						Economic Loss				
			None	Slight	Moderate	Extensive	Complete	Exceed Slight	Exceed Moderate	Exceed Extensive	Day 1	Day 3	Day 7	Day 14	Day 30	Day 90	Structure Loss	Nonstructural Drift-Sensitive Loss	Nonstructural Acceleration-Sensitive Loss	Total	% of Replacement Cost
Administration Building - Headquarter Office	Building	$12,300,000	0.53	0.42	0.05	0.00	0.00	0.47	0.05	0.00	53.1	55.1	95.1	95.3	99.9	99.9	$31,657	$82,955	$75,320	$189,932	1.5%
Corporation Yard - Boat Barn	Building	$1,000,000	0.62	0.24	0.14	0.01	0.00	0.38	0.15	0.01	61.5	62.6	85.0	85.1	99.1	99.9	$7,272	$4,714	$6,420	$18,406	1.8%
Corporation Yard - Facilities Offices	Building	$15,000,000	0.68	0.30	0.02	0.00	0.00	0.32	0.02	0.00	67.9	69.4	98.0	98.1	99.9	99.9	$23,379	$62,091	$81,725	$167,195	1.1%
Corporation Yard - Laboratory	Building	$6,500,000	0.68	0.30	0.02	0.00	0.00	0.32	0.02	0.00	67.9	69.4	98.0	98.1	99.9	99.9	$10,131	$26,906	$35,414	$72,451	1.1%
Corporation Yard - Satellite Office	Building	$500,000	0.48	0.21	0.01	0.23	0.06	0.52	0.30	0.29	48.3	49.3	69.7	69.7	71.1	94.2	$17,181	$29,906	$32,415	$79,502	15.9%
Pelican Yard - Vehicle Storage	Building	$500,000	0.31	0.26	0.26	0.14	0.03	0.69	0.43	0.17	31.1	32.3	56.8	56.9	82.9	97.2	$20,953	$15,180	$16,749	$52,882	10.6%
Pelican Yard - Vehicle Storage	Building	$800,000	0.36	0.30	0.30	0.04	0.00	0.64	0.34	0.04	36.1	37.5	65.9	66.0	96.2	99.9	$13,980	$7,848	$7,843	$29,671	3.7%
Ranger Housing - Alpine Dam - Residence	Building	$500,000	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.7	99.7	99.9	99.9	99.9	99.9	$7	$38	$211	$256	0.1%
Ranger Housing - Lagunitas Dam - Garage	Building	$300,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.1	99.2	99.8	99.8	99.9	99.9	$23	$34	$313	$370	0.1%
Ranger Housing - Lagunitas Dam - Residence	Building	$500,000	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.7	99.7	99.9	99.9	99.9	99.9	$7	$38	$211	$256	0.1%
Ranger Housing - Phoenix Dam - Log Cabin	Building	$100,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.4	99.4	99.9	99.9	99.9	99.9	$3	$15	$56	$74	0.1%
Ranger Housing - Phoenix Dam - Residence	Building	$500,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.4	99.4	99.9	99.9	99.9	99.9	$14	$73	$282	$369	0.1%
Ranger Housing - Phoenix Dam - Shed	Building	$100,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	97.5	97.6	99.5	99.6	99.9	99.9	$24	$30	$173	$227	0.2%
Ranger Housing - Porteous House	Building	$600,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.4	99.4	99.9	99.9	99.9	99.9	$17	$88	$338	$443	0.1%
Ranger Housing - Porteous House - Garage	Building	$300,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	97.5	97.6	99.5	99.6	99.9	99.9	$73	$89	$520	$682	0.2%
Ranger Housing - Porteous House - Shed	Building	$100,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	97.5	97.6	99.5	99.6	99.9	99.9	$24	$30	$173	$227	0.2%
Ranger Housing - Porteous House - Shed	Building	$100,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	97.5	97.6	99.5	99.6	99.9	99.9	$24	$30	$173	$227	0.2%
Ranger Housing - Sky Oaks - Residence	Building	$1,700,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.4	99.4	99.9	99.9	99.9	99.9	$48	$248	$959	$1,255	0.1%
Ranger Housing - Soulajule Residence	Building	$500,000	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.7	99.7	99.9	99.9	99.9	99.9	$7	$38	$211	$256	0.1%
Sky Oaks Headquarters - Entrance Kiosk	Building	$100,000	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.9	99.9	99.9	99.9	99.9	99.9	$0	$2	$75	$77	0.1%
Sky Oaks Headquarters - Fisheries Office (Fish Box)	Building	$300,000	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.9	99.9	99.9	99.9	99.9	99.9	$1	$5	$226	$231	0.1%
Sky Oaks Headquarters - Headquarter Office	Building	$700,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.4	99.4	99.9	99.9	99.9	99.9	$14	$58	$976	$1,049	0.1%
Sky Oaks Headquarters - Natural Resources Office (Sky Box	Building	$700,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.4	99.4	99.9	99.9	99.9	99.9	$14	$58	$976	$1,049	0.1%
Sky Oaks Headquarters - Seed Shed	Building	$200,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	97.5	97.6	99.5	99.6	99.9	99.9	$49	$59	$347	$455	0.2%
Sky Oaks Headquarters - Storage Shed	Building	$200,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	97.5	97.6	99.5	99.6	99.9	99.9	$49	$59	$347	$455	0.2%
Administrative Total/Averages			**86%**	**9%**	**3%**	**2%**	**0%**													$617,997	
PS-001 - Federal Works Booster Pump Station	Potable Pump Station	$5,000,000	0.90	0.08	0.02	0.00	0.00	0.10	0.02	0.00	95.1	98.7	99.7	99.9	99.9	99.9	$67,080	$0	$0	$67,080	1.3%
PS-002 - Chapman Park Pump Station	Potable Pump Station	$5,000,000	0.90	0.08	0.02	0.00	0.00	0.10	0.02	0.00	95.1	98.7	99.7	99.9	99.9	99.9	$67,080	$0	$0	$67,080	1.3%
PS-003 - Summit Drive Pump Station PS-003	Potable Pump Station	$5,000,000	0.94	0.04	0.01	0.00	0.00	0.06	0.01	0.00	97.5	99.4	99.8	99.9	99.9	99.9	$31,475	$0	$0	$31,475	0.6%
PS-005 - H-Line Booster Station	Potable Pump Station	$5,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.6	99.9	99.9	99.9	99.9	99.9	$3,700	$0	$0	$3,700	0.1%
PS-006 - Madera Park Pump Station	Potable Pump Station	$5,000,000	0.90	0.08	0.02	0.00	0.00	0.10	0.02	0.00	95.2	98.7	99.7	99.9	99.9	99.9	$65,350	$0	$0	$65,350	1.3%
PS-007 - Mariner Highlands Pump Station	Potable Pump Station	$5,000,000	0.94	0.04	0.01	0.00	0.00	0.06	0.01	0.00	97.5	99.4	99.8	99.9	99.9	99.9	$31,475	$0	$0	$31,475	0.6%
PS-010 - Cascade Pump Station	Potable Pump Station	$5,000,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	98.9	99.7	99.9	99.9	99.9	99.9	$12,320	$0	$0	$12,320	0.2%
PS-011 - Fairfax Manor 1st Pump Station	Potable Pump Station	$5,000,000	0.94	0.04	0.01	0.00	0.00	0.06	0.01	0.00	97.5	99.4	99.8	99.9	99.9	99.9	$31,475	$0	$0	$31,475	0.6%
PS-012 - Fairfax Manor 2nd Lift Pump Station	Potable Pump Station	$5,000,000	0.94	0.04	0.01	0.00	0.00	0.06	0.01	0.00	97.5	99.4	99.8	99.9	99.9	99.9	$31,475	$0	$0	$31,475	0.6%
PS-013 - Oak Manor 1st Lift Pump Station	Potable Pump Station	$5,000,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	98.9	99.7	99.9	99.9	99.9	99.9	$12,320	$0	$0	$12,320	0.2%
PS-014 - Oak Manor 2nd Lift Pump Station	Potable Pump Station	$5,000,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	98.9	99.7	99.9	99.9	99.9	99.9	$12,320	$0	$0	$12,320	0.2%
PS-016 - Scott Pump Station	Potable Pump Station	$5,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.6	99.9	99.9	99.9	99.9	99.9	$3,700	$0	$0	$3,700	0.1%
PS-017 - Smith Saddle Booster Station	Potable Pump Station	$5,000,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	98.9	99.7	99.9	99.9	99.9	99.9	$12,320	$0	$0	$12,320	0.2%
PS-019 - Bret Harte Pump Station	Potable Pump Station	$5,000,000	0.94	0.04	0.01	0.00	0.00	0.06	0.01	0.00	97.5	99.4	99.8	99.9	99.9	99.9	$31,475	$0	$0	$31,475	0.6%
PS-020 - Greenbrae Pump Station	Potable Pump Station	$5,000,000	0.94	0.04	0.01	0.00	0.00	0.06	0.01	0.00	97.4	99.4	99.8	99.9	99.9	99.9	$31,875	$0	$0	$31,875	0.6%
PS-022 - Ignacio Boosters	Potable Pump Station	$50,000,000	0.36	0.30	0.30	0.04	0.00	0.64	0.34	0.04	61.8	81.0	94.7	98.0	99.7	99.9	$8,056,700	$0	$0	$8,056,700	16.1%
PS-023 - Kent Fire Trail 1st Pump Station	Potable Pump Station	$5,000,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	98.9	99.7	99.9	99.9	99.9	99.9	$12,320	$0	$0	$12,320	0.2%
PS-025 - Kent Woodlands 2nd Pump Station	Potable Pump Station	$5,000,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	98.9	99.7	99.9	99.9	99.9	99.9	$12,320	$0	$0	$12,320	0.2%
PS-026 - Lagunitas Booster Station	Potable Pump Station	$5,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.6	99.9	99.9	99.9	99.9	99.9	$3,700	$0	$0	$3,700	0.1%
PS-030 - Phoenix Transfer Pump Station	Potable Pump Station	$5,000,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	98.9	99.7	99.9	99.9	99.9	99.9	$12,320	$0	$0	$12,320	0.2%
PS-032 - Elinor Avenue Pump Station	Potable Pump Station	$5,000,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	98.9	99.7	99.9	99.9	99.9	99.9	$12,320	$0	$0	$12,320	0.2%
PS-033 - Fern Canyon Pump Station	Potable Pump Station	$5,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.6	99.9	99.9	99.9	99.9	99.9	$3,700	$0	$0	$3,700	0.1%
PS-034 - Lapachet Pump Station	Potable Pump Station	$5,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.6	99.9	99.9	99.9	99.9	99.9	$3,700	$0	$0	$3,700	0.1%
PS-035 - Mine Ridge Pump Station	Potable Pump Station	$5,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.6	99.9	99.9	99.9	99.9	99.9	$3,700	$0	$0	$3,700	0.1%
PS-036 - Scott Highlands Pump (OUT OF SERVICE)	Potable Pump Station	$5,000,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	98.9	99.7	99.9	99.9	99.9	99.9	$12,320	$0	$0	$12,320	0.2%
PS-040 - Summit Avenue Upper Pump Station	Potable Pump Station	$5,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.6	99.9	99.9	99.9	99.9	99.9	$3,700	$0	$0	$3,700	0.1%
PS-041 - Kastania Booster Pump Station	Potable Pump Station	$5,000,000	0.62	0.24	0.14	0.01	0.00	0.38	0.15	0.01	79.5	92.0	98.3	99.5	99.9	99.9	$358,950	$0	$0	$358,950	7.2%
PS-042 - Del Mesa Pump Station	Potable Pump Station	$5,000,000	0.94	0.04	0.01	0.00	0.00	0.06	0.01	0.00	97.5	99.4	99.8	99.9	99.9	99.9	$31,475	$0	$0	$31,475	0.6%
PS-043 - Fawn Drive Pump Station	Potable Pump Station	$5,000,000	0.94	0.04	0.01	0.00	0.00	0.06	0.01	0.00	97.5	99.4	99.8	99.9	99.9	99.9	$31,475	$0	$0	$31,475	0.6%
PS-044 - Mann Pump Station	Potable Pump Station	$5,000,000	0.90	0.08	0.02	0.00	0.00	0.10	0.02	0.00	95.1	98.7	99.7	99.9	99.9	99.9	$67,080	$0	$0	$67,080	1.3%
PS-046 - Scenic Avenue Pump Station	Potable Pump Station	$5,000,000	0.90	0.08	0.02	0.00	0.00	0.10	0.02	0.00	95.1	98.7	99.7	99.9	99.9	99.9	$67,080	$0	$0	$67,080	1.3%
PS-047 - Sequoia Park Pump Station	Potable Pump Station	$5,000,000	0.94	0.04	0.01	0.00	0.00	0.06	0.01	0.00	97.5	99.4	99.8	99.9	99.9	99.9	$31,475	$0	$0	$31,475	0.6%
PS-050 - Chula Vista Pump Station	Potable Pump Station	$5,000,000	0.90	0.08	0.02	0.00	0.00	0.10	0.02	0.00	95.2	98.7	99.7	99.9	99.9	99.9	$65,350	$0	$0	$65,350	1.3%
PS-052 - Elda Drive Pump Station	Potable Pump Station	$5,000,000	0.90	0.08	0.02	0.00	0.00	0.10	0.02	0.00	95.2	98.7	99.7	99.9	99.9	99.9	$65,350	$0	$0	$65,350	1.3%
PS-053 - Fairhills 1st Lift Pump Station	Potable Pump Station	$5,000,000	0.94	0.04	0.01	0.00	0.00	0.06	0.01	0.00	97.5	99.4	99.8	99.9	99.9	99.9	$31,475	$0	$0	$31,475	0.6%
PS-054 - Fairhills 2nd Lift Pump Station	Potable Pump Station	$5,000,000	0.94	0.04	0.01	0.00	0.00	0.06	0.01	0.00	97.5	99.4	99.8	99.9	99.9	99.9	$31,475	$0	$0	$31,475	0.6%
PS-055 - Grove Hill Pump Station	Potable Pump Station	$5,000,000	0.94	0.04	0.01	0.00	0.00	0.06	0.01	0.00	97.5	99.4	99.8	99.9	99.9	99.9	$31,475	$0	$0	$31,475	0.6%
PS-056 - Rafael Highlands Pump Station	Potable Pump Station	$5,000,000	0.94	0.04	0.01	0.00	0.00	0.06	0.01	0.00	97.5	99.4	99.8	99.9	99.9	99.9	$31,475	$0	$0	$31,475	0.6%

EQ - West Napa M6.97

PS-057 - Hind Pump Station	Potable Pump Station	$5,000,000	0.94	0.04	0.01	0.00	0.00	0.06	0.01	0.00	97.5	99.4	99.8	99.9	99.9	99.9	$31,475	$0	$0	$31,475	0.6%
PS-058 - Knight Drive Pump Station	Potable Pump Station	$5,000,000	0.90	0.08	0.02	0.00	0.00	0.10	0.02	0.00	95.2	98.7	99.7	99.9	99.9	99.9	$65,350	$0	$0	$65,350	1.3%
PS-060 - Lockwood Drive Pump Station	Potable Pump Station	$5,000,000	0.90	0.08	0.02	0.00	0.00	0.10	0.02	0.00	95.2	98.7	99.7	99.9	99.9	99.9	$65,350	$0	$0	$65,350	1.3%
PS-061 - Lucas Valley Pump Station	Potable Pump Station	$5,000,000	0.94	0.04	0.01	0.00	0.00	0.06	0.01	0.00	97.5	99.4	99.8	99.9	99.9	99.9	$31,475	$0	$0	$31,475	0.6%
PS-062 - Manderly Pump Station	Potable Pump Station	$5,000,000	0.94	0.04	0.01	0.00	0.00	0.06	0.01	0.00	97.4	99.4	99.8	99.9	99.9	99.9	$31,875	$0	$0	$31,875	0.6%
PS-064 - Marinwood Pump Station (NOT IS USE)	Potable Pump Station	$5,000,000	0.90	0.08	0.02	0.00	0.00	0.10	0.02	0.00	95.2	98.7	99.7	99.9	99.9	99.9	$65,350	$0	$0	$65,350	1.3%
PS-065 - McNear Drive Pump Station	Potable Pump Station	$5,000,000	0.90	0.08	0.02	0.00	0.00	0.10	0.02	0.00	95.2	98.7	99.7	99.9	99.9	99.9	$65,350	$0	$0	$65,350	1.3%
PS-066 - Mesa Vista Pump Station	Potable Pump Station	$5,000,000	0.94	0.04	0.01	0.00	0.00	0.06	0.01	0.00	97.4	99.4	99.8	99.9	99.9	99.9	$31,875	$0	$0	$31,875	0.6%
PS-069 - San Quentin Pump Station	Potable Pump Station	$5,000,000	0.68	0.17	0.08	0.05	0.01	0.32	0.14	0.06	81.6	90.4	94.5	96.5	99.0	99.9	$454,365	$0	$0	$454,365	9.1%
PS-070 - Santa Margarita Pump Station	Potable Pump Station	$5,000,000	0.94	0.04	0.01	0.00	0.00	0.06	0.01	0.00	97.4	99.4	99.8	99.9	99.9	99.9	$31,875	$0	$0	$31,875	0.6%
PS-071 - Sky View Terrace Pump Station	Potable Pump Station	$5,000,000	0.90	0.08	0.02	0.00	0.00	0.10	0.02	0.00	95.1	98.7	99.7	99.9	99.9	99.9	$67,080	$0	$0	$67,080	1.3%
PS-073 - Swig Pump Station	Potable Pump Station	$5,000,000	0.94	0.04	0.01	0.00	0.00	0.06	0.01	0.00	97.5	99.4	99.8	99.9	99.9	99.9	$31,475	$0	$0	$31,475	0.6%
PS-074 - Via Montebello Pump Station	Potable Pump Station	$5,000,000	0.73	0.18	0.09	0.00	0.00	0.27	0.09	0.00	86.1	95.2	99.0	99.8	99.9	99.9	$224,615	$0	$0	$224,615	4.5%
PS-077 - Beacon Hill Pump Station	Potable Pump Station	$5,000,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	98.9	99.7	99.9	99.9	99.9	99.9	$12,320	$0	$0	$12,320	0.2%
PS-078 - Crescent Avenue Pump Station	Potable Pump Station	$5,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.6	99.9	99.9	99.9	99.9	99.9	$3,700	$0	$0	$3,700	0.1%
PS-079 - Marin City Pump Station	Potable Pump Station	$5,000,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	98.9	99.7	99.9	99.9	99.9	99.9	$12,320	$0	$0	$12,320	0.2%
PS-080 - Monte Mar Vista Pump Station	Potable Pump Station	$5,000,000	0.94	0.04	0.01	0.00	0.00	0.06	0.01	0.00	97.5	99.4	99.8	99.9	99.9	99.9	$31,475	$0	$0	$31,475	0.6%
PS-081 - Sausalito Pumphouse Pump Station	Potable Pump Station	$5,000,000	0.94	0.04	0.01	0.00	0.00	0.06	0.01	0.00	97.5	99.4	99.8	99.9	99.9	99.9	$31,475	$0	$0	$31,475	0.6%
PS-082 - Sausalito Boulevard Pump Station	Potable Pump Station	$5,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.6	99.9	99.9	99.9	99.9	99.9	$3,700	$0	$0	$3,700	0.1%
PS-083 - Richardson Drive Pump Station	Potable Pump Station	$5,000,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	98.9	99.7	99.9	99.9	99.9	99.9	$12,320	$0	$0	$12,320	0.2%
PS-084 - Eastwood Way Pump Station	Potable Pump Station	$5,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.6	99.9	99.9	99.9	99.9	99.9	$3,700	$0	$0	$3,700	0.1%
PS-085 - Fairview Park Pump Station	Potable Pump Station	$5,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.6	99.9	99.9	99.9	99.9	99.9	$3,700	$0	$0	$3,700	0.1%
PS-087 - Marinview Pump Station	Potable Pump Station	$5,000,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	98.9	99.7	99.9	99.9	99.9	99.9	$12,320	$0	$0	$12,320	0.2%
PS-088 - Tam Woods 1st Lift Pump Station	Potable Pump Station	$5,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.6	99.9	99.9	99.9	99.9	99.9	$3,700	$0	$0	$3,700	0.1%
PS-089 - Tam Woods 2nd Lift Pump Station	Potable Pump Station	$5,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.6	99.9	99.9	99.9	99.9	99.9	$3,700	$0	$0	$3,700	0.1%
PS-090 - Hill Haven Pump Station	Potable Pump Station	$5,000,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	98.9	99.7	99.9	99.9	99.9	99.9	$12,320	$0	$0	$12,320	0.2%
PS-091 - Sugarloaf Pump Station	Potable Pump Station	$5,000,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	98.9	99.7	99.9	99.9	99.9	99.9	$12,320	$0	$0	$12,320	0.2%
PS-092 - Tiburon Belvedere Pump Station	Potable Pump Station	$5,000,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	98.9	99.7	99.9	99.9	99.9	99.9	$12,320	$0	$0	$12,320	0.2%
PS-093 - Tiburon Booster Pump Station	Potable Pump Station	$5,000,000	0.94	0.04	0.01	0.00	0.00	0.06	0.01	0.00	97.5	99.4	99.8	99.9	99.9	99.9	$31,475	$0	$0	$31,475	0.6%
PS-095 - Pine Mountain Tunnel Pump Station	Potable Pump Station	$5,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.6	99.9	99.9	99.9	99.9	99.9	$3,700	$0	$0	$3,700	0.1%
PS-096 - Southern Marin Line Boosters	Potable Pump Station	$5,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.6	99.9	99.9	99.9	99.9	99.9	$3,700	$0	$0	$3,700	0.1%
PS-101 - Redwood Drive Lower Pump	Potable Pump Station	$5,000,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	98.9	99.7	99.9	99.9	99.9	99.9	$12,320	$0	$0	$12,320	0.2%
PS-102 - North Marin Line Boosters	Potable Pump Station	$5,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.6	99.9	99.9	99.9	99.9	99.9	$3,700	$0	$0	$3,700	0.1%
PS-103 - San Geronimo Valley Pump Station	Potable Pump Station	$5,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.6	99.9	99.9	99.9	99.9	99.9	$3,700	$0	$0	$3,700	0.1%
PS-104 - Conifer Way Pump Station	Potable Pump Station	$5,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.6	99.9	99.9	99.9	99.9	99.9	$3,700	$0	$0	$3,700	0.1%
PS-106 - Los Altos Pump Station	Potable Pump Station	$5,000,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	98.9	99.7	99.9	99.9	99.9	99.9	$12,320	$0	$0	$12,320	0.2%
PS-108 - Indian Rock Pump Station	Potable Pump Station	$5,000,000	0.94	0.04	0.01	0.00	0.00	0.06	0.01	0.00	97.5	99.4	99.8	99.9	99.9	99.9	$31,475	$0	$0	$31,475	0.6%
PS-109 - Cibrian Pump Station	Potable Pump Station	$5,000,000	0.94	0.04	0.01	0.00	0.00	0.06	0.01	0.00	97.5	99.4	99.8	99.9	99.9	99.9	$31,475	$0	$0	$31,475	0.6%
PS-113 - Lag Picnic Grounds Pump Station	Potable Pump Station	$5,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.6	99.9	99.9	99.9	99.9	99.9	$3,700	$0	$0	$3,700	0.1%
PS-114 - Cortez Avenue Pump Station	Potable Pump Station	$5,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.6	99.9	99.9	99.9	99.9	99.9	$3,700	$0	$0	$3,700	0.1%
PS-115 - Redwood Drive Upper Pump Station	Potable Pump Station	$5,000,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	98.9	99.7	99.9	99.9	99.9	99.9	$12,320	$0	$0	$12,320	0.2%
PS-116 - North Redwood Drive Boosters	Potable Pump Station	$5,000,000	0.83	0.13	0.05	0.00	0.00	0.17	0.05	0.00	91.5	97.4	99.5	99.9	99.9	99.9	$125,740	$0	$0	$125,740	2.5%
PS-117 - Wolfback Ridge Pump Station	Potable Pump Station	$5,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.6	99.9	99.9	99.9	99.9	99.9	$3,700	$0	$0	$3,700	0.1%
PS-118 - Fire Road Pump Station	Potable Pump Station	$5,000,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	98.9	99.7	99.9	99.9	99.9	99.9	$12,320	$0	$0	$12,320	0.2%
PS-122 - Upper Road Pump Station	Potable Pump Station	$5,000,000	0.94	0.04	0.01	0.00	0.00	0.06	0.01	0.00	97.5	99.4	99.8	99.9	99.9	99.9	$31,475	$0	$0	$31,475	0.6%
PS-123 - Southern Marin Line Syphon	Potable Pump Station	$5,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.6	99.9	99.9	99.9	99.9	99.9	$3,700	$0	$0	$3,700	0.1%
PS-124 - Throckmorton Booster New Pumpstation	Potable Pump Station	$5,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.6	99.9	99.9	99.9	99.9	99.9	$3,700	$0	$0	$3,700	0.1%
PS-125 - Kent Fire Trail 2nd Lift Pump Station	Potable Pump Station	$5,000,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	98.9	99.7	99.9	99.9	99.9	99.9	$12,320	$0	$0	$12,320	0.2%
PS-126 - Oak Woodlands Pump Station	Potable Pump Station	$5,000,000	0.90	0.08	0.02	0.00	0.00	0.10	0.02	0.00	95.2	98.7	99.7	99.9	99.9	99.9	$65,350	$0	$0	$65,350	1.3%
PS-127 - Marin Terrace Pump Station	Potable Pump Station	$5,000,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	98.9	99.7	99.9	99.9	99.9	99.9	$12,320	$0	$0	$12,320	0.2%
PS-129 - Slide Gulch Pump Station	Potable Pump Station	$5,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.6	99.9	99.9	99.9	99.9	99.9	$3,700	$0	$0	$3,700	0.1%
PS-130 - Smith Conifer Pump Station	Potable Pump Station	$5,000,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	98.9	99.7	99.9	99.9	99.9	99.9	$12,320	$0	$0	$12,320	0.2%
TK-156 - BON TEMPE CLEARWELL TANK	Potable Tank - Clearwell	$10,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.4	99.9	99.9	99.9	99.9	99.9	$18,400	$0	$0	$18,400	0.2%
TK-157 - SAN GERONIMO CLEARWELL TANK #1	Potable Tank - Clearwell	$10,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.4	99.9	99.9	99.9	99.9	99.9	$18,400	$0	$0	$18,400	0.2%
TK-186 - SAN GERONIMO CLEARWELL TANK #2	Potable Tank - Clearwell	$15,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.4	99.9	99.9	99.9	99.9	99.9	$27,600	$0	$0	$27,600	0.2%
TK-006 - MADERA PARK TANK #1	Potable Tank - Distribution	$500,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	98.3	99.9	99.9	99.9	99.9	99.9	$2,400	$0	$0	$2,400	0.5%
TK-008 - MARINER HIGHLANDS TANK	Potable Tank - Distribution	$300,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	98.7	99.9	99.9	99.9	99.9	99.9	$1,062	$0	$0	$1,062	0.4%
TK-015 - MEADOW CLUB UPPER TANK	Potable Tank - Distribution	$1,500,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	98.9	99.9	99.9	99.9	99.9	99.9	$4,680	$0	$0	$4,680	0.3%
TK-019 - OAK MANOR TOP TANK	Potable Tank - Distribution	$1,250,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$19,425	$0	$0	$19,425	1.6%
TK-025 - BRET HARTE TANK	Potable Tank - Distribution	$2,500,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.1	99.6	99.9	99.9	99.9	$93,050	$0	$0	$93,050	3.7%
TK-033 - INDIAN FIRE TRAIL TANK	Potable Tank - Distribution	$1,250,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$19,425	$0	$0	$19,425	1.6%
TK-060 - SCOTT HIGHLANDS TANK	Potable Tank - Distribution	$1,250,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$19,425	$0	$0	$19,425	1.6%
TK-066 - SUMMIT AVENUE UPPER TANK	Potable Tank - Distribution	$600,000	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.9	99.9	99.9	99.9	99.9	99.9	$84	$0	$0	$84	0.0%
TK-068 - ELDA DRIVE TANK	Potable Tank - Distribution	$750,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.2	99.6	99.9	99.9	99.9	$27,915	$0	$0	$27,915	3.7%
TK-074 - SCENIC AVENUE TANK	Potable Tank - Distribution	$100,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	98.7	99.9	99.9	99.9	99.9	99.9	$354	$0	$0	$354	0.4%
TK-078 - CHULA VISTA TANK	Potable Tank - Distribution	$1,250,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.2	99.6	99.9	99.9	99.9	$46,525	$0	$0	$46,525	3.7%
TK-081 - FAIRHILLS TOP TANK #1	Potable Tank - Distribution	$300,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.2	99.6	99.9	99.9	99.9	$11,166	$0	$0	$11,166	3.7%
TK-085 - HIND TANK #1	Potable Tank - Distribution	$500,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	98.7	99.9	99.9	99.9	99.9	99.9	$1,770	$0	$0	$1,770	0.4%
TK-086 - HIND TANK #2	Potable Tank - Distribution	$1,000,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	98.7	99.9	99.9	99.9	99.9	99.9	$3,540	$0	$0	$3,540	0.4%
TK-097 - RAFAEL HIGHLANDS TANK	Potable Tank - Distribution	$2,500,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.2	99.6	99.9	99.9	99.9	$93,050	$0	$0	$93,050	3.7%
TK-100 - SKYVIEW TERRACE TANK	Potable Tank - Distribution	$750,000	0.70	0.21	0.09	0.00	0.00	0.30	0.10	0.00	78.0	94.9	99.0	99.7	99.7	99.8	$60,930	$0	$0	$60,930	8.1%
TK-108 - CLOUDVIEW TANK	Potable Tank - Distribution	$1,100,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$17,094	$0	$0	$17,094	1.6%
TK-115 - ROMER TANK	Potable Tank - Distribution	$1,550,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.2	99.6	99.9	99.9	99.9	$57,691	$0	$0	$57,691	3.7%
TK-116 - SAUSALITO BLVD. TANK	Potable Tank - Distribution	$1,150,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	98.9	99.9	99.9	99.9	99.9	99.9	$3,588	$0	$0	$3,588	0.3%
TK-117 - MESA VISTA TANK #1	Potable Tank - Distribution	$2,500,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.2	99.6	99.9	99.9	99.9	$93,050	$0	$0	$93,050	3.7%
TK-118 - COUNTYVIEW DRIVE TANK	Potable Tank - Distribution	$750,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	98.9	99.9	99.9	99.9	99.9	99.9	$2,340	$0	$0	$2,340	0.3%
TK-119 - LATTIE LANE TANK	Potable Tank - Distribution	$1,250,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	98.9	99.9	99.9	99.9	99.9	99.9	$3,900	$0	$0	$3,900	0.3%
TK-126 - HILL HAVEN TANK	Potable Tank - Distribution	$825,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$12,821	$0	$0	$12,821	1.6%
TK-128 - MOUNT TIBURON TANK #1	Potable Tank - Distribution	$2,500,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$38,850	$0	$0	$38,850	1.6%
TK-139 - BUCKEYE CIRCLE TANK	Potable Tank - Distribution	$150,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$2,331	$0	$0	$2,331	1.6%
TK-150 - LOS ALTOS TANK	Potable Tank - Distribution	$300,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$4,662	$0	$0	$4,662	1.6%
TK-158 - FAWN DRIVE TANK	Potable Tank - Distribution	$450,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.2	99.6	99.9	99.9	99.9	$16,749	$0	$0	$16,749	3.7%
TK-163 - UPPER ROAD TANK	Potable Tank - Distribution	$200,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.6	99.9	99.9	99.9	99.9	99.9	$204	$0	$0	$204	0.1%
TK-164 - TOMAHAWK DRIVE TANK	Potable Tank - Distribution	$200,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.2	99.6	99.9	99.9	99.9	$7,444	$0	$0	$7,444	3.7%
TK-166 - RING MOUNTAIN TANK	Potable Tank - Distribution	$750,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.2	99.6	99.9	99.9	99.9	$27,915	$0	$0	$27,915	3.7%
TK-167 - CREEKSIDE DRIVE TANK	Potable Tank - Distribution	$900,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.2	99.6	99.9	99.9	99.9	$33,498	$0	$0	$33,498	3.7%
TK-180 - BON TEMPE WASHWATER TANK	Potable Tank - Distribution	$1,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	98.9	99.9	99.9	99.9	99.9	99.9	$3,120	$0	$0	$3,120	0.3%
TK-181 - REDWOOD DRIVE UPPER TANK	Potable Tank - Distribution	$300,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$4,662	$0	$0	$4,662	1.6%
TK-182 - ALTA AVENUE TANK	Potable Tank - Distribution	$2,500,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	98.9	99.9	99.9	99.9	99.9	99.9	$7,800	$0	$0	$7,800	0.3%
TK-183 - MINE RIDGE TANK	Potable Tank - Distribution	$1,100,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	98.9	99.9	99.9	99.9	99.9	99.9	$3,432	$0	$0	$3,432	0.3%
TK-187 - MANZANITA TANK	Potable Tank - Distribution	$300,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	98.9	99.9	99.9	99.9	99.9	99.9	$936	$0	$0	$936	0.3%
TK-188 - WOLFBACK RIDGE TANK #1	Potable Tank - Distribution	$125,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	98.9	99.9	99.9	99.9	99.9	99.9	$390	$0	$0	$390	0.3%
TK-189 - WOLFBACK RIDGE TANK #2	Potable Tank - Distribution	$125,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	98.9	99.9	99.9	99.9	99.9	99.9	$390	$0	$0	$390	0.3%
TK-190 - INVERNESS DRIVE TANK	Potable Tank - Distribution	$700,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.1	99.6	99.9	99.9	99.9	$26,054	$0	$0	$26,054	3.7%
TK-191 - LONE TREE AVENUE TANK	Potable Tank - Distribution	$500,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	98.9	99.9	99.9	99.9	99.9	99.9	$1,560	$0	$0	$1,560	0.3%
TK-192 - VERNAL AVE TANK	Potable Tank - Distribution	$1,500,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	98.9	99.9	99.9	99.9	99.9	99.9	$4,680	$0	$0	$4,680	0.3%
TK-193 - H-LINE ROAD TANK	Potable Tank - Distribution	$2,500,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	98.9	99.9	99.9	99.9	99.9	99.9	$7,800	$0	$0	$7,800	0.3%
TK-196 - WILSON WAY TANK	Potable Tank - Distribution	$500,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$7,770	$0	$0	$7,770	1.6%
TK-197 - SUMMIT TRAIL TANK	Potable Tank - Distribution	$650,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$10,101	$0	$0	$10,101	1.6%
TK-198 - SCOTT TANKS	Potable Tank - Distribution	$300,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	98.9	99.9	99.9	99.9	99.9	99.9	$936	$0	$0	$936	0.3%
TK-199 - SCOTT TANKS	Potable Tank - Distribution	$300,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	98.9	99.9	99.9	99.9	99.9	99.9	$936	$0	$0	$936	0.3%
TK-200 - OAK WOODLANDS TANK #1	Potable Tank - Distribution	$575,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.1	99.6	99.9	99.9	99.9	$21,402	$0	$0	$21,402	3.7%
TK-201 - OAK WOODLANDS TANK #2	Potable Tank - Distribution	$575,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.2	99.6	99.9	99.9	99.9	$21,402	$0	$0	$21,402	3.7%
TK-202 - Fairfax Manor 1st Lift Tank	Potable Tank - Distribution	$100,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.2	99.6	99.9	99.9	99.9	$3,722	$0	$0	$3,722	3.7%
TK-203 - MONTE MAR VISTA TANK	Potable Tank - Distribution	$300,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$4,662	$0	$0	$4,662	1.6%
TK-204 - Bay Road Tank	Potable Tank - Distribution	$600,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.2	99.6	99.9	99.9	99.9	$22,332	$0	$0	$22,332	3.7%
TK-206 - SANTA VENETIA TANK	Potable Tank - Distribution	$1,550,000	0.35	0.31	0.32	0.03	0.00	0.65	0.35	0.03	51.4	81.1	95.1	97.5	97.6	98.4	$328,321	$0	$0	$328,321	21.2%
TK-207 - GOODHILL ROAD TANK	Potable Tank - Distribution	$300,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$4,662	$0	$0	$4,662	1.6%
TK-208 - SPRING LANE TANK #2	Potable Tank - Distribution	$7,500,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$116,550	$0	$0	$116,550	1.6%

TK-209 - FAIRHILLS TOP TANK #2	Potable Tank - Distribution	$300,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.2	99.6	99.9	99.9	99.9	$11,166	$0	$0	$11,166	3.7%
TK-210 - BEACON HILL TANK	Potable Tank - Distribution	$500,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	98.9	99.9	99.9	99.9	99.9	99.9	$1,560	$0	$0	$1,560	0.3%
TK-211 - Kent Fire Trail Tank #1	Potable Tank - Distribution	$500,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$7,770	$0	$0	$7,770	1.6%
TK-212 - Kent Fire Trail Tank #2	Potable Tank - Distribution	$500,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$7,770	$0	$0	$7,770	1.6%
TK-213 - MARIN CITY TANK	Potable Tank - Distribution	$1,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	98.9	99.9	99.9	99.9	99.9	99.9	$3,120	$0	$0	$3,120	0.3%
TK-214 - SLIDE GULCH TANK	Potable Tank - Distribution	$485,870	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	98.9	99.9	99.9	99.9	99.9	99.9	$1,516	$0	$0	$1,516	0.3%
TK-215 - SEQUOIA PARK TANK #1	Potable Tank - Distribution	$550,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.2	99.6	99.9	99.9	99.9	$20,471	$0	$0	$20,471	3.7%
TK-216 - SEQUOIA PARK TANK #2	Potable Tank - Distribution	$250,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.2	99.6	99.9	99.9	99.9	$9,305	$0	$0	$9,305	3.7%
TK-217 - KENT WOODLANDS 1ST LIFT TANK	Potable Tank - Distribution	$500,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$7,770	$0	$0	$7,770	1.6%
TK-218 - MOUNT TIBURON TANK #2	Potable Tank - Distribution	$2,950,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$45,843	$0	$0	$45,843	1.6%
TK-219 - OAK MANOR FIRST LIFT TANK	Potable Tank - Distribution	$500,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$7,770	$0	$0	$7,770	1.6%
TK-220 - TAM WOODS TOP TANK	Potable Tank - Distribution	$400,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	98.9	99.9	99.9	99.9	99.9	99.9	$1,248	$0	$0	$1,248	0.3%
TK-221 - SUMMIT AVENUE LOWER TANK	Potable Tank - Distribution	$500,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	98.9	99.9	99.9	99.9	99.9	99.9	$1,560	$0	$0	$1,560	0.3%
TK-222 - FRIAR TUCK LANE TANK	Potable Tank - Distribution	$625,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.2	99.6	99.9	99.9	99.9	$23,263	$0	$0	$23,263	3.7%
TK-223 - CASCADE TANK #1	Potable Tank - Distribution	$300,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$4,662	$0	$0	$4,662	1.6%
TK-224 - CASCADE TANK #2	Potable Tank - Distribution	$300,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$4,662	$0	$0	$4,662	1.6%
TK-225 - SUGARLOAF TANK #1	Potable Tank - Distribution	$635,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$9,868	$0	$0	$9,868	1.6%
TK-226 - SUGARLOAF TANK #2	Potable Tank - Distribution	$635,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$9,868	$0	$0	$9,868	1.6%
TK-228 - GLENWOOD FOREST TANK	Potable Tank - Distribution	$450,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.1	99.6	99.9	99.9	99.9	$16,749	$0	$0	$16,749	3.7%
TK-229 - KENT FIRE TRAIL TOP TANK	Potable Tank - Distribution	$50,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$777	$0	$0	$777	1.6%
TK-230 - SWIG TANK	Potable Tank - Distribution	$250,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.2	99.6	99.9	99.9	99.9	$9,305	$0	$0	$9,305	3.7%
TK-232 - SKY RANCH TANK	Potable Tank - Distribution	$600,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.2	99.6	99.9	99.9	99.9	$22,332	$0	$0	$22,332	3.7%
TK-233 - FAIRFAX MANOR TOP TANK	Potable Tank - Distribution	$540,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$8,392	$0	$0	$8,392	1.6%
TK-234 - TAM WOODS FIRST LIFT TANK	Potable Tank - Distribution	$425,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	98.9	99.9	99.9	99.9	99.9	99.9	$1,326	$0	$0	$1,326	0.3%
TK-235 - FAIRVIEW PARK TANK	Potable Tank - Distribution	$500,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	98.9	99.9	99.9	99.9	99.9	99.9	$1,560	$0	$0	$1,560	0.3%
TK-236 - FERN CANYON TANK	Potable Tank - Distribution	$150,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	98.9	99.9	99.9	99.9	99.9	99.9	$468	$0	$0	$468	0.3%
TK-237 - CONIFER WAY UPPER TANK	Potable Tank - Distribution	$500,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$7,770	$0	$0	$7,770	1.6%
TK-238 - OAK AVENUE TANK	Potable Tank - Distribution	$500,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$7,770	$0	$0	$7,770	1.6%
TK-239 - ELINOR AVE TANK	Potable Tank - Distribution	$565,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$8,780	$0	$0	$8,780	1.6%
TK-241 - LAGUNITAS PICNIC GROUNDS TANK	Potable Tank - Distribution	$2,750	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.4	99.9	99.9	99.9	99.9	99.9	$5	$0	$0	$5	0.2%
TK-009 - SAN CLEMENTE TANK	Potable Tank - Gravity	$7,500,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.2	99.6	99.9	99.9	99.9	$279,150	$0	$0	$279,150	3.7%
TK-011 - CA ¯æON VILLAGE TANK	Potable Tank - Gravity	$7,500,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$116,550	$0	$0	$116,550	1.6%
TK-012 - FAIRFAX GRADE TANK	Potable Tank - Gravity	$2,500,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$38,850	$0	$0	$38,850	1.6%
TK-027 - GREENBRAE TANK	Potable Tank - Gravity	$7,500,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.2	99.6	99.9	99.9	99.9	$279,150	$0	$0	$279,150	3.7%
TK-030 - ESCALLE TANK	Potable Tank - Gravity	$5,000,000	0.70	0.21	0.09	0.00	0.00	0.30	0.10	0.00	78.0	94.9	99.0	99.7	99.7	99.8	$406,500	$0	$0	$406,500	8.1%
TK-064 - STRAWBERRY TANK	Potable Tank - Gravity	$7,500,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$116,550	$0	$0	$116,550	1.6%
TK-083 - GLENWOOD TANK	Potable Tank - Gravity	$7,500,000	0.70	0.21	0.09	0.00	0.00	0.30	0.10	0.00	78.0	94.9	99.0	99.7	99.7	99.8	$609,300	$0	$0	$609,300	8.1%
TK-087 - LOCH LOMOND TANK	Potable Tank - Gravity	$5,000,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.2	99.6	99.9	99.9	99.9	$186,100	$0	$0	$186,100	3.7%
TK-089 - LOS RANCHITOS TANK	Potable Tank - Gravity	$5,000,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.2	99.6	99.9	99.9	99.9	$186,100	$0	$0	$186,100	3.7%
TK-090 - MARINWOOD TANK	Potable Tank - Gravity	$2,500,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.2	99.6	99.9	99.9	99.9	$93,050	$0	$0	$93,050	3.7%
TK-091 - MARIN PROFESSIONAL CENTER TANK	Potable Tank - Gravity	$1,250,000	0.59	0.25	0.15	0.01	0.00	0.41	0.15	0.01	70.3	91.8	98.3	99.4	99.4	99.6	$143,525	$0	$0	$143,525	11.5%
TK-094 - MILLER CREEK TANK	Potable Tank - Gravity	$2,500,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.2	99.6	99.9	99.9	99.9	$93,050	$0	$0	$93,050	3.7%
TK-096 - PUERTO SUELLO TANK	Potable Tank - Gravity	$7,500,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.1	99.6	99.9	99.9	99.9	$279,150	$0	$0	$279,150	3.7%
TK-098 - SANTA MARGARITA TANK	Potable Tank - Gravity	$7,500,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.2	99.6	99.9	99.9	99.9	$279,150	$0	$0	$279,150	3.7%
TK-106 - LUCAS VALLEY TANK	Potable Tank - Gravity	$7,500,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.1	99.6	99.9	99.9	99.9	$279,150	$0	$0	$279,150	3.7%
TK-113 - SAUSALITO PUMP HOUSE TANK #1	Potable Tank - Gravity	$1,550,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.2	99.6	99.9	99.9	99.9	$57,691	$0	$0	$57,691	3.7%
TK-114 - SAUSALITO PUMP HOUSE TANK #2	Potable Tank - Gravity	$1,550,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.2	99.6	99.9	99.9	99.9	$57,691	$0	$0	$57,691	3.7%
TK-125 - TENNESSEE VALLEY TANK	Potable Tank - Gravity	$5,000,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$77,700	$0	$0	$77,700	1.6%
TK-127 - PARADISE DRIVE TANK	Potable Tank - Gravity	$5,000,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$77,700	$0	$0	$77,700	1.6%
TK-130 - SPRING LANE TANK #1	Potable Tank - Gravity	$7,500,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$116,550	$0	$0	$116,550	1.6%
TK-159 - PEACOCK GAP TANK	Potable Tank - Gravity	$2,500,000	0.90	0.08	0.02	0.00	0.00	0.10	0.02	0.00	92.7	98.7	99.7	99.9	99.9	99.9	$63,300	$0	$0	$63,300	2.5%
TK-160 - MARIN BAY TANK	Potable Tank - Gravity	$600,000	0.59	0.25	0.15	0.01	0.00	0.41	0.15	0.01	70.3	91.8	98.3	99.4	99.5	99.6	$68,892	$0	$0	$68,892	11.5%
TK-175 - MARINSHIP TANK	Potable Tank - Gravity	$7,500,000	0.94	0.04	0.01	0.00	0.00	0.06	0.01	0.00	96.0	99.4	99.8	99.9	99.9	99.9	$98,850	$0	$0	$98,850	1.3%
TK-152 - MADERA PARK (H/P) TANK	Potable Tank - Pressure System	$7,500	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.1	99.6	99.9	99.9	99.9	$279	$0	$0	$279	3.7%
TK-153 - RAFAEL HIGHLANDS (H/P) TANK	Potable Tank - Pressure System	$12,500	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.2	99.6	99.9	99.9	99.9	$465	$0	$0	$465	3.7%
TK-168 - MCNEAR DRIVE #1 (H/P) TANK	Potable Tank - Pressure System	$5,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.1	99.6	99.9	99.9	99.9	$186	$0	$0	$186	3.7%
TK-169 - MCNEAR DRIVE #2 (H/P) TANK	Potable Tank - Pressure System	$7,500	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.1	99.6	99.9	99.9	99.9	$279	$0	$0	$279	3.7%
TK-174 - VIA MONTEBELLO (H/P) TANK	Potable Tank - Pressure System	$17,500	0.59	0.25	0.15	0.01	0.00	0.41	0.15	0.01	70.3	91.8	98.3	99.4	99.5	99.6	$2,009	$0	$0	$2,009	11.5%
TK-195 - Fire Road Pressure Tank	Potable Tank - Pressure System	$5,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$78	$0	$0	$78	1.6%
TK-205 - RICHARDSON DRIVE (H/P) TANK	Potable Tank - Pressure System	$5,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$78	$0	$0	$78	1.6%
TK-145 - ROSS RESERVOIR	Potable Tank - Reservoir	$5,000,000	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.0	100.0	100.0	100.0	100.0	100.0	$0	$0	$0	$0	0.0%
TK-146 - FORBES HILL RESERVOIR	Potable Tank - Reservoir	$20,000,000	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.0	100.0	100.0	100.0	100.0	100.0	$0	$0	$0	$0	0.0%
TK-046 - ALTO TANK #1	Potable Tank - Transmission	$15,000,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$233,100	$0	$0	$233,100	1.6%
TK-055 - MILL VALLEY TANK	Potable Tank - Transmission	$25,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	98.9	99.9	99.9	99.9	99.9	99.9	$78,000	$0	$0	$78,000	0.3%
TK-069 - HAWTHORNE HILLS UPPER TANK	Potable Tank - Transmission	$10,000,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.2	99.6	99.9	99.9	99.9	$372,200	$0	$0	$372,200	3.7%
TK-131 - CONIFER WAY TANK	Potable Tank - Transmission	$2,500,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	98.9	99.9	99.9	99.9	99.9	99.9	$7,800	$0	$0	$7,800	0.3%
TK-147 - SMITH SADDLE TANK #1	Potable Tank - Transmission	$25,000,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$388,500	$0	$0	$388,500	1.6%
TK-148 - SMITH SADDLE TANK #2	Potable Tank - Transmission	$25,000,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$388,500	$0	$0	$388,500	1.6%
TK-155 - PINE MOUNTAIN TUNNEL TANK	Potable Tank - Transmission	$15,000,000	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.0	100.0	100.0	100.0	100.0	100.0	$0	$0	$0	$0	0.0%
TK-165 - ALTO TANK #2	Potable Tank - Transmission	$15,000,000	0.93	0.06	0.01	0.00	0.00	0.07	0.01	0.00	95.2	99.4	99.8	99.9	99.9	99.9	$233,100	$0	$0	$233,100	1.6%
TK-184 - PACHECO RIDGE TANK #1	Potable Tank - Transmission	$15,000,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.1	99.6	99.9	99.9	99.9	$558,300	$0	$0	$558,300	3.7%
TK-185 - PACHECO RIDGE TANK #2	Potable Tank - Transmission	$15,000,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.2	99.6	99.9	99.9	99.9	$558,300	$0	$0	$558,300	3.7%
Bon Tempe Treatment Plant	Potable Treatment Plant	$100,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.6	99.9	99.9	99.9	99.9	99.9	$97,600	$0	$0	$97,600	0.1%
San Geronimo Treatment Plant	Potable Treatment Plant	$100,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.6	99.9	99.9	99.9	99.9	99.9	$97,600	$0	$0	$97,600	0.1%
Potable Total/Averages			**92%**	**6%**	**2%**	**0%**	**0%**													**$19,918,660**	
PS-028 - Kent Lake Pump Station	Raw Pump Station	$5,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.6	99.9	99.9	99.9	99.9	99.9	$3,700	$0	$0	$3,700	0.1%
PS-029 - Phoenix Lake Barge Pump	Raw Pump Station	$5,000,000	0.98	0.02	0.00	0.00	0.00	0.02	0.00	0.00	98.9	99.7	99.9	99.9	99.9	99.9	$12,320	$0	$0	$12,320	0.2%
PS-031 - Soulajule Pump Station	Raw Pump Station	$5,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.6	99.9	99.9	99.9	99.9	99.9	$3,700	$0	$0	$3,700	0.1%
PS-097 - Tocaloma Booster Pump Station	Raw Pump Station	$5,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.6	99.9	99.9	99.9	99.9	99.9	$3,095	$0	$0	$3,095	0.1%
PS-128 - Alpine Bon-Tempe Pump Station	Raw Pump Station	$5,000,000	0.99	0.01	0.00	0.00	0.00	0.01	0.00	0.00	99.6	99.9	99.9	99.9	99.9	99.9	$3,700	$0	$0	$3,700	0.1%
Raw Total/Averages			**99%**	**1%**	**0%**	**0%**	**0%**													**$26,515**	
PS-049 - Channing Way Pump Station	Recycled Pump Station	$5,000,000	0.73	0.18	0.09	0.00	0.00	0.27	0.09	0.00	86.1	95.2	99.0	99.7	99.9	99.9	$224,615	$0	$0	$224,615	4.5%
PS-111 - Quail Hill Pump Station	Recycled Pump Station	$5,000,000	0.90	0.08	0.02	0.00	0.00	0.10	0.02	0.00	95.1	98.7	99.7	99.9	99.9	99.9	$67,080	$0	$0	$67,080	1.3%
PS-112 - Freitas Parkway Pump Station	Recycled Pump Station	$5,000,000	0.90	0.08	0.02	0.00	0.00	0.10	0.02	0.00	95.2	98.7	99.7	99.9	99.9	99.9	$65,350	$0	$0	$65,350	1.3%
TK-103 - TERRA LINDA TANK #1	Recycled Tank - Gravity	$2,500,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.1	99.6	99.9	99.9	99.9	$93,050	$0	$0	$93,050	3.7%
TK-170 - TERRA LINDA TANK #2	Recycled Tank - Gravity	$2,500,000	0.85	0.12	0.03	0.00	0.00	0.15	0.03	0.00	89.2	98.1	99.6	99.9	99.9	99.9	$93,050	$0	$0	$93,050	3.7%
TK-227 - LGWRP Clearwell	Recycled Tank - Reservoir	$4,500,000	0.21	0.25	0.34	0.17	0.03	0.79	0.54	0.20	38.8	65.3	80.5	83.4	84.4	89.2	$1,578,150	$0	$0	$1,578,150	35.1%
Las Gallinas Treatment Plant	Recycled Treatment Plant	$0	0.24	0.29	0.39	0.07	0.00	0.76	0.47	0.07	39.3	67.6	89.6	93.2	94.0	99.3	$0	$0	$0	$0	#DIV/0!
Recycled Total/Averages			**67%**	**16%**	**13%**	**4%**	**0%**													**$2,121,295**	

Pipelines						
Type	**Miles of Pipeline Exposed to Hazard**	**Replacement Cost of Pipeline Exposed to**	**Total Miles of Pipeline**	**Total Replacement Cost**	**% Exposed to Hazard**	**% Replacement Cost Exposed to Hazard**
Potable Water - Distribution Main	94.1	$273,131,746	761.0	$2,209,823,037	12.4%	12.4%
Potable Water - Lateral	36.9	$29,233,878	229.4	$181,682,836	16.1%	16.1%
Potable Water - Main	0.0	$0	0.1	$200,899	0.0%	0.0%
Potable Water - Transmission Main	10.8	$45,415,658	92.1	$388,893,185	11.7%	11.7%
Raw Water - Distribution Main	0.9	$2,679,254	4.7	$13,679,943	19.6%	19.6%
Raw Water - Transmission Main	4.5	$18,893,225	25.6	$108,036,492	17.5%	17.5%
Recycled Water - Lateral	0.1	$60,458	2.1	$1,676,612	3.6%	3.6%
Recycled Water - Main	1.1	$3,315,337	24.4	$70,806,587	4.7%	4.7%
Recycled Water - Other	0.0	$0	0.3	$828,973	0.0%	0.0%
Total	**148.3**	**$372,729,555**	**1,139.6**	**$2,975,628,563**	13.0%	12.5%

Facilities						
Type	**Number of Facilities Exposed to Hazard**	**Replacement Cost of Facilities Exposed to Hazard**	**Total Number of Facilities**	**Total Replacement Cost**	**% Exposed to Hazard**	**% Replacement Cost Exposed to Hazard**
Building	3	$1,800,000	25	$44,100,000	12.00%	4.08%
Dam	0	$0	7		0.00%	#DIV/0!
Potable Fireline	496	$198,400	1426	$570,400	34.78%	34.78%
Potable Hydrant	1007	$7,552,500	7492	$56,190,000	13.44%	13.44%
Potable Pump Station	2	$10,000,000	90	$495,000,000	2.22%	2.02%
Potable Service Connection	9309	$3,723,600	61796	$24,718,400	15.06%	15.06%
Potable Tank - Clearwell	0	$0	3	$35,000,000	0.00%	0.00%
Potable Tank - Distribution	0	$0	84	$70,738,620	0.00%	0.00%
Potable Tank - Gravity	0	$0	23	$114,950,000	0.00%	0.00%
Potable Tank - Pressure System	0	$0	7	$60,000	0.00%	0.00%
Potable Tank - Reservoir	0	$0	2	$25,000,000	0.00%	0.00%
Potable Tank - Transmission	0	$0	10	$162,500,000	0.00%	0.00%
Potable Treatment Plant	0	$0	2	$200,000,000	0.00%	0.00%
Potable Valve	3945	$3,945,000	28616	$28,616,000	13.79%	13.79%
Raw Pump Station	4	$20,000,000	5	$25,000,000	80.00%	80.00%
Raw Valve	46	$46,000	280	$280,000	16.43%	16.43%
Recycled Fireline	0	$0	1	$400	0.00%	0.00%
Recycled Hydrant	0	$0	14	$105,000	0.00%	0.00%
Recycled Pump Station	0	$0	3	$15,000,000	0.00%	0.00%
Recycled Service Connection	14	$5,600	413	$165,200	3.39%	3.39%
Recycled Tank - Gravity	0	$0	2	$5,000,000	0.00%	0.00%
Recycled Tank - Reservoir	0	$0	1	$4,500,000	0.00%	0.00%
Recycled Treatment Plant (owned by LGVSD)	0	$0	1		0.00%	#DIV/0!
Recycled Valve	11	$11,000	357	$357,000	3.08%	3.08%
Total	**14837**	**$47,282,100**	**100660**	**$1,307,851,020**	14.74%	3.62%

Facility Name	Type	Replacement Cost	Damage Percent	Loss		
Pelican Yard - Vehicle Storage	Building	$500,000	4.3%	$21,581		
Pelican Yard - Vehicle Storage	Building	$800,000	3.3%	$26,107		
Ranger Housing - Soulajule Residence	Building	$500,000	15.7%	$78,734	8%	126421.5
PS-026 - Lagunitas Booster Station	Potable Pump Station	$5,000,000	40.0%	$2,000,000		
PS-128 - Alpine Bon-Tempe Pump Station	Raw Pump Station	$5,000,000	40.0%	$2,000,000		
			Total	$4,126,422		

Pipelines						
Type	**Miles of Pipeline Exposed to Hazard**	**Replacement Cost of Pipeline Exposed to**	**Total Miles of Pipeline**	**Total Replacement Cost**	**% Exposed to Hazard**	**% Replacement Cost Exposed to Hazard**
Potable Water - Distribution Main	170.1	$493,904,420	761.0	$2,209,823,037	22.4%	22.4%
Potable Water - Lateral	64.9	$51,428,295	229.4	$181,682,836	28.3%	28.3%
Potable Water - Main	0.0	$0	0.1	$200,899	0.0%	0.0%
Potable Water - Transmission Main	22.5	$95,170,752	92.1	$388,893,185	24.5%	24.5%
Raw Water - Distribution Main	0.9	$2,679,254	4.7	$13,679,943	19.6%	19.6%
Raw Water - Transmission Main	4.5	$18,893,225	25.6	$108,036,492	17.5%	17.5%
Recycled Water - Lateral	0.7	$568,874	2.1	$1,676,612	33.9%	33.9%
Recycled Water - Main	6.2	$18,124,782	24.4	$70,806,587	25.6%	25.6%
Recycled Water - Other	0.02	$67,244	0.3	$828,973	8.1%	8.1%
Total	**269.9**	**$680,836,847**	**1,139.6**	**$2,975,628,563**	23.7%	22.9%
Facilities						
Type	**Number of Facilities Exposed to Hazard**	**Replacement Cost of Facilities Exposed to Hazard**	**Total Number of Facilities**	**Total Replacement Cost**	**% Exposed to Hazard**	**% Replacement Cost Exposed to Hazard**
Building	8	$37,100,000	25	$44,100,000	32.00%	84.13%
Dam	0	$0	7		0.00%	#DIV/0!
Potable Fireline	851	$340,400	1426	$570,400	59.68%	59.68%
Potable Hydrant	1794	$13,455,000	7492	$56,190,000	23.95%	23.95%
Potable Pump Station	3	$15,000,000	90	$495,000,000	3.33%	3.03%
Potable Service Connection	16599	$6,639,600	61796	$24,718,400	26.86%	26.86%
Potable Tank - Clearwell	0	$0	3	$35,000,000	0.00%	0.00%
Potable Tank - Distribution	0	$0	84	$70,738,620	0.00%	0.00%
Potable Tank - Gravity	0	$0	23	$114,950,000	0.00%	0.00%
Potable Tank - Pressure System	0	$0	7	$60,000	0.00%	0.00%
Potable Tank - Reservoir	0	$0	2	$25,000,000	0.00%	0.00%
Potable Tank - Transmission	0	$0	10	$162,500,000	0.00%	0.00%
Potable Treatment Plant	0	$0	2	$200,000,000	0.00%	0.00%
Potable Valve	7289	$7,289,000	28616	$28,616,000	25.47%	25.47%
Raw Pump Station	4	$20,000,000	5	$25,000,000	80.00%	80.00%
Raw Valve	47	$47,000	280	$280,000	16.79%	16.79%
Recycled Fireline	0	$0	1	$400	0.00%	0.00%
Recycled Hydrant	2	$15,000	14	$105,000	14.29%	14.29%
Recycled Pump Station	0	$0	3	$15,000,000	0.00%	0.00%
Recycled Service Connection	145	$58,000	413	$165,200	35.11%	35.11%
Recycled Tank - Gravity	0	$0	2	$5,000,000	0.00%	0.00%
Recycled Tank - Reservoir	0	$0	1	$4,500,000	0.00%	0.00%
Recycled Treatment Plant (owned by LGVSD)	0	$0	1		0.00%	#DIV/0!
Recycled Valve	73	$73,000	357	$357,000	20.45%	20.45%
Total	**26815**	**$100,017,000**	**100660**	**$1,307,851,020**	26.64%	7.65%
Facility Name	**Type**	**Replacement Cost**	**Damage Percent**	**Loss**		
Corporation Yard - Boat Barn	Building	$1,000,000	55.3%	$552,627		
Corporation Yard - Facilities Offices	Building	$15,000,000	71.6%	$10,734,407		
Corporation Yard - Laboratory	Building	$6,500,000	43.0%	$2,797,710		
Corporation Yard - Satellite Office	Building	$500,000	57.9%	$289,421		
Pelican Yard - Vehicle Storage	Building	$500,000	4.3%	$21,581		
Pelican Yard - Vehicle Storage	Building	$800,000	3.3%	$26,107		
Ranger Housing - Soulajule Residence	Building	$500,000	15.7%	$78,734	36%	14500585.8
PS-026 - Lagunitas Booster Station	Potable Pump Station	$5,000,000	40.0%	$2,000,000		
PS-128 - Alpine Bon-Tempe Pump Station	Raw Pump Station	$5,000,000	40.0%	$2,000,000		
			Total	$18,500,586		

Pipelines						
Type	**Miles of Pipeline Exposed to Hazard**	**Replacement Cost of Pipeline Exposed to**	**Total Miles of Pipeline**	**Total Replacement Cost**	**% Exposed to Hazard**	**% Replacement Cost Exposed to Hazard**
Potable Water - Distribution Main	352.6	$1,023,901,702	761.0	$2,209,823,037	46.3%	46.3%
Potable Water - Lateral	91.4	$72,362,616	229.4	$181,682,836	39.8%	39.8%
Potable Water - Main	0.04	$109,290	0.1	$200,899	54.4%	54.4%
Potable Water - Transmission Main	39.4	$166,584,651	92.1	$388,893,185	42.8%	42.8%
Raw Water - Distribution Main	2.6	$7,673,696	4.7	$13,679,943	56.1%	56.1%
Raw Water - Transmission Main	13.9	$58,666,233	25.6	$108,036,492	54.3%	54.3%
Recycled Water - Lateral	0.6	$457,242	2.1	$1,676,612	27.3%	27.3%
Recycled Water - Main	7.5	$21,904,273	24.4	$70,806,587	30.9%	30.9%
Recycled Water - Other	0.2	$657,374	0.3	$828,973	79.3%	79.3%
Total	**508.3**	**$1,352,317,076**	**1,139.6**	**$2,975,628,563**	44.6%	45.4%
Facilities						
Type	**Number of Facilities Exposed to Hazard**	**Replacement Cost of Facilities Exposed to Hazard**	**Total Number of Facilities**	**Total Replacement Cost**	**% Exposed to Hazard**	**% Replacement Cost Exposed to Hazard**
Building	11	$4,600,000	25	$44,100,000	44.00%	10.43%
Dam	4		7		57.14%	#DIV/0!
Potable Fireline	369	$147,600	1,426	$570,400	25.88%	25.88%
Potable Hydrant	3,365	$25,237,500	7,492	$56,190,000	44.91%	44.91%
Potable Pump Station	58	$290,000,000	90	$495,000,000	64.44%	58.59%
Potable Service Connection	26,146	$10,458,400	61,796	$24,718,400	42.31%	42.31%
Potable Tank - Clearwell	3	$35,000,000	3	$35,000,000	100.00%	100.00%
Potable Tank - Distribution	50	$42,713,620	84	$70,738,620	59.52%	60.38%
Potable Tank - Gravity	18	$87,450,000	23	$114,950,000	78.26%	76.08%
Potable Tank - Pressure System	4	$25,000	7	$60,000	57.14%	41.67%
Potable Tank - Reservoir	0	$0	2	$25,000,000	0.00%	0.00%
Potable Tank - Transmission	7	$112,500,000	10	$162,500,000	70.00%	69.23%
Potable Treatment Plant	1	$100,000,000	2	$200,000,000	50.00%	50.00%
Potable Valve	12,339	$12,339,000	28,616	$28,616,000	43.12%	43.12%
Raw Pump Station	2	$10,000,000	5	$25,000,000	40.00%	40.00%
Raw Valve	130	$130,000	280	$280,000	46.43%	46.43%
Recycled Fireline	0	$0	1	$400	0.00%	0.00%
Recycled Hydrant	6	$45,000	14	$105,000	42.86%	42.86%
Recycled Pump Station	1	$5,000,000	3	$15,000,000	33.33%	33.33%
Recycled Service Connection	124	$49,600	413	$165,200	30.02%	30.02%
Recycled Tank - Gravity	2	$5,000,000	2	$5,000,000	100.00%	100.00%
Recycled Tank - Reservoir	1	$4,500,000	1	$4,500,000	100.00%	100.00%
Recycled Treatment Plant (owned by LGVSD)	1		1		100.00%	#DIV/0!
Recycled Valve	124	$124,000	357	$357,000	34.73%	34.73%
Total	**42,766**	**$745,319,720**	**100,660**	**$1,307,851,020**	42.49%	56.99%

Pipelines						
Type	**Miles of Pipeline Exposed to Hazard**	**Replacement Cost of Pipeline Exposed to**	**Total Miles of Pipeline**	**Total Replacement Cost**	**% Exposed to Hazard**	**% Replacement Cost Exposed to Hazard**
Potable Water - Distribution Main	45.5	$131,994,515	761.0	$2,209,823,037	6.0%	6.0%
Potable Water - Lateral	11.3	$8,956,670	229.4	$181,682,836	4.9%	4.9%
Potable Water - Main	0.0	$0	0.1	$200,899	0.0%	0.0%
Potable Water - Transmission Main	7.8	$32,929,753	92.1	$388,893,185	8.5%	8.5%
Raw Water - Distribution Main	0.1	$352,321	4.7	$13,679,943	2.6%	2.6%
Raw Water - Transmission Main	2.8	$11,959,890	25.6	$108,036,492	11.1%	11.1%
Recycled Water - Lateral	0.1	$39,915	2.1	$1,676,612	2.4%	2.4%
Recycled Water - Main	0.3	$868,207	24.4	$70,806,587	1.2%	1.2%
Recycled Water - Other	0.0	$0	0.3	$828,973	0.0%	0.0%
Total	**67.9**	**$187,101,271**	**1,139.6**	**$2,975,628,563**	6.0%	6.3%
Facilities						
Type	**Number of Facilities Exposed to Hazard**	**Replacement Cost of Facilities Exposed to Hazard**	**Total Number of Facilities**	**Total Replacement Cost**	**% Exposed to Hazard**	**% Replacement Cost Exposed to Hazard**
Building	1	$500,000	25	$44,100,000	4.00%	1.13%
Dam	1	$1	7		14.29%	#DIV/0!
Potable Fireline	27	$10,800	1,426	$570,400	1.89%	1.89%
Potable Hydrant	465	$3,487,500	7,492	$56,190,000	6.21%	6.21%
Potable Pump Station	9	$45,000,000	90	$495,000,000	10.00%	9.09%
Potable Service Connection	3,250	$1,300,000	61,796	$24,718,400	5.26%	5.26%
Potable Tank - Clearwell	0	$0	3	$35,000,000	0.00%	0.00%
Potable Tank - Distribution	3	$1,900,000	84	$70,738,620	3.57%	2.69%
Potable Tank - Gravity	0	$0	23	$114,950,000	0.00%	0.00%
Potable Tank - Pressure System	0	$0	7	$60,000	0.00%	0.00%
Potable Tank - Reservoir	0	$0	2	$25,000,000	0.00%	0.00%
Potable Tank - Transmission	0	$0	10	$162,500,000	0.00%	0.00%
Potable Treatment Plant	0	$0	2	$200,000,000	0.00%	0.00%
Potable Valve	1,569	$1,569,000	28,616	$28,616,000	5.48%	5.48%
Raw Pump Station	0	$0	5	$25,000,000	0.00%	0.00%
Raw Valve	47	$47,000	280	$280,000	16.79%	16.79%
Recycled Fireline	0	$0	1	$400	0.00%	0.00%
Recycled Hydrant	1	$7,500	14	$105,000	7.14%	7.14%
Recycled Pump Station	0	$0	3	$15,000,000	0.00%	0.00%
Recycled Service Connection	9	$3,600	413	$165,200	2.18%	2.18%
Recycled Tank - Gravity	0	$0	2	$5,000,000	0.00%	0.00%
Recycled Tank - Reservoir	0	$0	1	$4,500,000	0.00%	0.00%
Recycled Treatment Plant (owned by LGVSD)	0	$0	1		0.00%	#DIV/0!
Recycled Valve	8	$8,000	357	$357,000	2.24%	2.24%
Total	**5,390**	**$53,833,401**	**100,660**	**$1,307,851,020**	5.35%	4.12%

Pipelines						
Type	**Miles of Pipeline Exposed to Hazard**	**Replacement Cost of Pipeline Exposed to**	**Total Miles of Pipeline**	**Total Replacement Cost**	**% Exposed to Hazard**	**% Replacement Cost Exposed to Hazard**
Potable Water - Distribution Main	100.7	$292,537,450	761.0	$2,209,823,037	13.2%	13.2%
Potable Water - Lateral	37.9	$30,025,390	229.4	$181,682,836	16.5%	16.5%
Potable Water - Main	0.0	$0	0.1	$200,899	0.0%	0.0%
Potable Water - Transmission Main	9.4	$39,768,506	92.1	$388,893,185	10.2%	10.2%
Raw Water - Distribution Main	0.0	$0	4.7	$13,679,943	0.0%	0.0%
Raw Water - Transmission Main	0.0	$0	25.6	$108,036,492	0.0%	0.0%
Recycled Water - Lateral	0.2	$162,812	2.1	$1,676,612	9.7%	9.7%
Recycled Water - Main	2.5	$7,148,576	24.4	$70,806,587	10.1%	10.1%
Recycled Water - Other	0.05	$142,348	0.3	$828,973	17.2%	17.2%
Total	**150.8**	**$369,785,083**	**1,139.6**	**$2,975,628,563**	13.2%	12.4%
Facilities						
Type	**Number of Facilities Exposed to Hazard**	**Replacement Cost of Facilities Exposed to Hazard**	**Total Number of Facilities**	**Total Replacement Cost**	**% Exposed to Hazard**	**% Replacement Cost Exposed to Hazard**
Building	6	$24,300,000	25	$44,100,000	24.00%	55.10%
Dam	0	$0	7		0.00%	#DIV/0!
Potable Fireline	570	$228,000	1,426	$570,400	39.97%	39.97%
Potable Hydrant	1,093	$8,197,500	7,492	$56,190,000	14.59%	14.59%
Potable Pump Station	2	$10,000,000	90	$495,000,000	2.22%	2.02%
Potable Service Connection	9,262	$3,704,800	61,796	$24,718,400	14.99%	14.99%
Potable Tank - Clearwell	0	$0	3	$35,000,000	0.00%	0.00%
Potable Tank - Distribution	0	$0	84	$70,738,620	0.00%	0.00%
Potable Tank - Gravity	0	$0	23	$114,950,000	0.00%	0.00%
Potable Tank - Pressure System	0	$0	7	$60,000	0.00%	0.00%
Potable Tank - Reservoir	0	$0	2	$25,000,000	0.00%	0.00%
Potable Tank - Transmission	0	$0	10	$162,500,000	0.00%	0.00%
Potable Treatment Plant	0	$0	2	$200,000,000	0.00%	0.00%
Potable Valve	4,227	$4,227,000	28,616	$28,616,000	14.77%	14.77%
Raw Pump Station	0	$0	5	$25,000,000	0.00%	0.00%
Raw Valve	0	$0	280	$280,000	0.00%	0.00%
Recycled Fireline	0	$0	1	$400	0.00%	0.00%
Recycled Hydrant	1	$7,500	14	$105,000	7.14%	7.14%
Recycled Pump Station	0	$0	3	$15,000,000	0.00%	0.00%
Recycled Service Connection	32	$12,800	413	$165,200	7.75%	7.75%
Recycled Tank - Gravity	0	$0	2	$5,000,000	0.00%	0.00%
Recycled Tank - Reservoir	0	$0	1	$4,500,000	0.00%	0.00%
Recycled Treatment Plant (owned by LGVSD)	1		1		100.00%	#DIV/0!
Recycled Valve	32	$32,000	357	$357,000	8.96%	8.96%
Total	**15,226**	**$50,709,600**	**100,660**	**$1,307,851,020**	15.13%	3.88%
Facility Name	**Type**	**Replacement Cost**				
Corporation Yard - Boat Barn	Building	$1,000,000				
Corporation Yard - Facilities Offices	Building	$15,000,000				
Corporation Yard - Laboratory	Building	$6,500,000				
Corporation Yard - Satellite Office	Building	$500,000				
Pelican Yard - Vehicle Storage	Building	$500,000				
Pelican Yard - Vehicle Storage	Building	$800,000				
PS-069 - San Quentin Pump Station	Potable Pump Station	$5,000,000				
PS-093 - Tiburon Booster Pump Station	Potable Pump Station	$5,000,000				

Pipelines						
Type	**Miles of Pipeline Exposed to Hazard**	**Replacement Cost of Pipeline Exposed to**	**Total Miles of Pipeline**	**Total Replacement Cost**	**% Exposed to Hazard**	**% Replacement Cost Exposed to Hazard**
Potable Water - Distribution Main	145.6	$422,733,455	761.0	$2,209,823,037	19.1%	19.1%
Potable Water - Lateral	53.7	$42,547,660	229.4	$181,682,836	23.4%	23.4%
Potable Water - Main	0.0	$0	0.1	$200,899	0.0%	0.0%
Potable Water - Transmission Main	21.6	$91,328,761	92.1	$388,893,185	23.5%	23.5%
Raw Water - Distribution Main	0.0	$0	4.7	$13,679,943	0.0%	0.0%
Raw Water - Transmission Main	0.0	$0	25.6	$108,036,492	0.0%	0.0%
Recycled Water - Lateral	0.7	$532,927	2.1	$1,676,612	31.8%	31.8%
Recycled Water - Main	7.4	$21,435,795	24.4	$70,806,587	30.3%	30.3%
Recycled Water - Other	0.05	$142,348	0.3	$828,973	17.2%	17.2%
Total	**229.0**	**$578,720,946**	**1,139.6**	**$2,975,628,563**	20.1%	19.4%
Facilities						
Type	**Number of Facilities Exposed to Hazard**	**Replacement Cost of Facilities Exposed to Hazard**	**Total Number of Facilities**	**Total Replacement Cost**	**% Exposed to Hazard**	**% Replacement Cost Exposed to Hazard**
Building	7	$36,600,000	25	$44,100,000	28.00%	82.99%
Dam	0	$0	7		0.00%	#DIV/0!
Potable Fireline	787	$314,800	1,426	$570,400	55.19%	55.19%
Potable Hydrant	1,580	$11,850,000	7,492	$56,190,000	21.09%	21.09%
Potable Pump Station	3	$15,000,000	90	$495,000,000	3.33%	3.03%
Potable Service Connection	12,921	$5,168,400	61,796	$24,718,400	20.91%	20.91%
Potable Tank - Clearwell	0	$0	3	$35,000,000	0.00%	0.00%
Potable Tank - Distribution	0	$0	84	$70,738,620	0.00%	0.00%
Potable Tank - Gravity	0	$0	23	$114,950,000	0.00%	0.00%
Potable Tank - Pressure System	0	$0	7	$60,000	0.00%	0.00%
Potable Tank - Reservoir	0	$0	2	$25,000,000	0.00%	0.00%
Potable Tank - Transmission	0	$0	10	$162,500,000	0.00%	0.00%
Potable Treatment Plant	0	$0	2	$200,000,000	0.00%	0.00%
Potable Valve	6,263	$6,263,000	28,616	$28,616,000	21.89%	21.89%
Raw Pump Station	0	$0	5	$25,000,000	0.00%	0.00%
Raw Valve	1	$1,000	280	$280,000	0.36%	0.36%
Recycled Fireline	0	$0	1	$400	0.00%	0.00%
Recycled Hydrant	3	$22,500	14	$105,000	21.43%	21.43%
Recycled Pump Station	0	$0	3	$15,000,000	0.00%	0.00%
Recycled Service Connection	115	$46,000	413	$165,200	27.85%	27.85%
Recycled Tank - Gravity	0	$0	2	$5,000,000	0.00%	0.00%
Recycled Tank - Reservoir	0	$0	1	$4,500,000	0.00%	0.00%
Recycled Treatment Plant (owned by LGVSD)	1		1		100.00%	#DIV/0!
Recycled Valve	92	$92,000	357	$357,000	25.77%	25.77%
Total	**21,773**	**$75,357,700**	**100,660**	**$1,307,851,020**	21.63%	5.76%

Pipelines						
Type	**Miles of Pipeline Exposed to Hazard**	**Replacement Cost of Pipeline Exposed to**	**Total Miles of Pipeline**	**Total Replacement Cost**	**% Exposed to Hazard**	**% Replacement Cost Exposed to Hazard**
Potable Water - Distribution Main	118.0	$342,733,074	761.0	$2,209,823,037	15.5%	15.5%
Potable Water - Lateral	45.1	$35,729,756	229.4	$181,682,836	19.7%	19.7%
Potable Water - Main	0.0	$0	0.1	$200,899	0.0%	0.0%
Potable Water - Transmission Main	13.8	$58,489,751	92.1	$388,893,185	15.0%	15.0%
Potable Water Total	**177.0**	**$436,952,581**				
Raw Water - Distribution Main	0.0	$0	4.7	$13,679,943	0.0%	0.0%
Raw Water - Transmission Main	0.0	$0	25.6	$108,036,492	0.0%	0.0%
Raw Water Total	**0.0**	**$0**				
Recycled Water - Lateral	0.0	$0	2.1	$1,676,612	0.0%	0.0%
Recycled Water - Main	0.05	$136,528	24.4	$70,806,587	0.2%	0.2%
Recycled Water - Other	0.001	$2,562	0.3	$828,973	0.3%	0.3%
Recycled Water Total	**0.048**	**$139,090**				
Total	**177.0**	**$437,091,671**	**1,139.6**	**$2,975,628,563**	15.5%	14.7%
Facilities						
Type	**Number of Facilities Exposed to Hazard**	**Replacement Cost of Facilities Exposed to Hazard**	**Total Number of Facilities**	**Total Replacement Cost**	**% Exposed to Hazard**	**% Replacement Cost Exposed to Hazard**
Building	6	$24,300,000	25	$44,100,000	24.00%	55.10%
Building Total	**6**	**$24,300,000**				
Dam	0	$0	7		0.00%	#DIV/0!
Potable Fireline	703	$281,200	1,426	$570,400	49.30%	49.30%
Potable Hydrant	1,308	$9,810,000	7,492	$56,190,000	17.46%	17.46%
Potable Pump Station	2	$10,000,000	90	$495,000,000	2.22%	2.02%
Potable Service Connection	10,392	$4,156,800	61,796	$24,718,400	16.82%	16.82%
Potable Tank - Clearwell	0	$0	3	$35,000,000	0.00%	0.00%
Potable Tank - Distribution	0	$0	84	$70,738,620	0.00%	0.00%
Potable Tank - Gravity	0	$0	23	$114,950,000	0.00%	0.00%
Potable Tank - Pressure System	0	$0	7	$60,000	0.00%	0.00%
Potable Tank - Reservoir	0	$0	2	$25,000,000	0.00%	0.00%
Potable Tank - Transmission	0	$0	10	$162,500,000	0.00%	0.00%
Potable Treatment Plant	0	$0	2	$200,000,000	0.00%	0.00%
Potable Valve	5,062	$5,062,000	28,616	$28,616,000	17.69%	17.69%
Potable Total	**17,467**	**$29,310,000**				
Raw Pump Station	0	$0	5	$25,000,000	0.00%	0.00%
Raw Valve	1	$1,000	280	$280,000	0.36%	0.36%
Raw Total	**1**	**$1,000**				
Recycled Fireline	0	$0	1	$400	0.00%	0.00%
Recycled Hydrant	0	$0	14	$105,000	0.00%	0.00%
Recycled Pump Station	0	$0	3	$15,000,000	0.00%	0.00%
Recycled Service Connection	0	$0	413	$165,200	0.00%	0.00%
Recycled Tank - Gravity	0	$0	2	$5,000,000	0.00%	0.00%
Recycled Tank - Reservoir	0	$0	1	$4,500,000	0.00%	0.00%
Recycled Treatment Plant (owned by LGVSD)	0	$0	1		0.00%	#DIV/0!
Recycled Valve	1	$1,000	357	$357,000	0.28%	0.28%
Recycled Total	**1**	**$1,000**				
Total	**17,475**	**53,612,000**	**100,660**	**$1,307,851,020**	17.36%	4.10%

Pipelines						
Type	**Miles of Pipeline Exposed to Hazard**	**Replacement Cost of Pipeline Exposed to**	**Total Miles of Pipeline**	**Total Replacement Cost**	**% Exposed to Hazard**	**% Replacement Cost Exposed to Hazard**
Potable Water - Distribution Main	183.8	$533,811,274	761.0	$2,209,823,037	24.2%	24.2%
Potable Water - Lateral	51.4	$40,691,303	229.4	$181,682,836	22.4%	22.4%
Potable Water - Main	0.02	$55,990	0.1	$200,899	27.9%	27.9%
Potable Water - Transmission Main	20.6	$86,939,809	92.1	$388,893,185	22.4%	22.4%
Potable Water Total	**255.8**	**661,498,376.5**				
Raw Water - Distribution Main	0.0	$0	4.7	$13,679,943	0.0%	0.0%
Raw Water - Transmission Main	0.0	$0	25.6	$108,036,492	0.0%	0.0%
Raw Water Total	**0.0**	**$0**				
Recycled Water - Lateral	0.2	$120,038	2.1	$1,676,612	7.2%	7.2%
Recycled Water - Main	2.5	$7,337,273	24.4	$70,806,587	10.4%	10.4%
Recycled Water - Other	0.005	$13,655	0.3	$828,973	1.6%	1.6%
Recycled Total	**2.7**	**$7,470,966**				
Grand Total	**258.5**	**$668,969,342**	**1,139.6**	**$2,975,628,563**	22.7%	22.5%
Facilities						
Type	**Number of Facilities Exposed to Hazard**	**Replacement Cost of Facilities Exposed to Hazard**	**Total Number of Facilities**	**Total Replacement Cost**	**% Exposed to Hazard**	**% Replacement Cost Exposed to Hazard**
Building	0	$0	25	$44,100,000	0.00%	0.00%
Building Total	**0**	**$0**				
Dam	0	$0	7		0.00%	#DIV/0!
Potable Fireline	183	$73,200	1,426	$570,400	12.83%	12.83%
Potable Hydrant	1,859	$13,942,500	7,492	$56,190,000	24.81%	24.81%
Potable Pump Station	24	$120,000,000	90	$495,000,000	26.67%	24.24%
Potable Service Connection	14,329	$5,731,600	61,796	$24,718,400	23.19%	23.19%
Potable Tank - Clearwell	0	$0	3	$35,000,000	0.00%	0.00%
Potable Tank - Distribution	32	$25,320,000	84	$70,738,620	38.10%	35.79%
Potable Tank - Gravity	6	$35,000,000	23	$114,950,000	26.09%	30.45%
Potable Tank - Pressure System	3	$20,000	7	$60,000	42.86%	33.33%
Potable Tank - Reservoir	0	$0	2	$25,000,000	0.00%	0.00%
Potable Tank - Transmission	2	$30,000,000	10	$162,500,000	20.00%	18.46%
Potable Treatment Plant	0	$0	2	$200,000,000	0.00%	0.00%
Potable Valve	6,878	$6,878,000	28,616	$28,616,000	24.04%	24.04%
Potable Total	**23,316**	**$236,965,300**				
Raw Pump Station	0	$0	5	$25,000,000	0.00%	0.00%
Raw Valve	0	$0	280	$280,000	0.00%	0.00%
Raw Total	**0**	**$0**				
Recycled Fireline	0	$0	1	$400	0.00%	0.00%
Recycled Hydrant	1	$7,500	14	$105,000	7.14%	7.14%
Recycled Pump Station	0	$0	3	$15,000,000	0.00%	0.00%
Recycled Service Connection	27	$10,800	413	$165,200	6.54%	6.54%
Recycled Tank - Gravity	0	$0	2	$5,000,000	0.00%	0.00%
Recycled Tank - Reservoir	0	$0	1	$4,500,000	0.00%	0.00%
Recycled Treatment Plant (owned by LGVSD)	0	$0	1		0.00%	#DIV/0!
Recycled Valve	40	$40,000	357	$357,000	11.20%	11.20%
Recycled Total	**68**	**$58,300**				
Grand Total	**23,384**	**$237,023,600**	**100,660**	**$1,307,851,020**	23.23%	18.12%

Pipelines						
Type	**Miles of Pipeline Exposed to Hazard**	**Replacement Cost of Pipeline Exposed to**	**Total Miles of Pipeline**	**Total Replacement Cost**	**% Exposed to Hazard**	**% Replacement Cost Exposed to Hazard**
Potable Water - Distribution Main	96.0	$278,790,197	761.0	$2,209,823,037	12.6%	12.6%
Potable Water - Lateral	31.6	$24,991,116	229.4	$181,682,836	13.8%	13.8%
Potable Water - Main	0.0	$38,768	0.1	$200,899	19.3%	19.3%
Potable Water - Transmission Main	10.1	$42,759,896	92.1	$388,893,185	11.0%	11.0%
Potable Total	**137.7**	**$346,579,977**				
Raw Water - Distribution Main	0.0	$0	4.7	$13,679,943	0.0%	0.0%
Raw Water - Transmission Main	0.0	$0	25.6	$108,036,492	0.0%	0.0%
Raw Total	**0.0**	**$0**				
Recycled Water - Lateral	0.2	$168,174	2.1	$1,676,612	10.0%	10.0%
Recycled Water - Main	3.5	$10,029,364	24.4	$70,806,587	14.2%	14.2%
Recycled Water - Other	0.0	$0	0.3	$828,973	0.0%	0.0%
Recycled Total	**3.7**	**$10,197,538**				
Grand Total	**141.4**	**$356,777,514**	**1,139.6**	**$2,975,628,563**	12.4%	12.0%
Facilities						
Type	**Number of Facilities Exposed to Hazard**	**Replacement Cost of Facilities Exposed to Hazard**	**Total Number of Facilities**	**Total Replacement Cost**	**% Exposed to Hazard**	**% Replacement Cost Exposed to Hazard**
Building	0	$0	25	$44,100,000	0.00%	0.00%
Building Total	**0**	**$0**				
Dam	0	$0	7		0.00%	#DIV/0!
Potable Fireline	79	$31,600	1,426	$570,400	5.54%	5.54%
Potable Hydrant	934	$7,005,000	7,492	$56,190,000	12.47%	12.47%
Potable Pump Station	14	$70,000,000	90	$495,000,000	15.56%	14.14%
Potable Service Connection	8,240	$3,296,000	61,796	$24,718,400	13.33%	13.33%
Potable Tank - Clearwell	0	$0	3	$35,000,000	0.00%	0.00%
Potable Tank - Distribution	9	$6,340,000	84	$70,738,620	10.71%	8.96%
Potable Tank - Gravity	6	$30,600,000	23	$114,950,000	26.09%	26.62%
Potable Tank - Pressure System	0	$0	7	$60,000	0.00%	0.00%
Potable Tank - Reservoir	0	$0	2	$25,000,000	0.00%	0.00%
Potable Tank - Transmission	1	$25,000,000	10	$162,500,000	10.00%	15.38%
Potable Treatment Plant	0	$0	2	$200,000,000	0.00%	0.00%
Potable Valve	3,452	$3,452,000	28,616	$28,616,000	12.06%	12.06%
Potable Total	**12,735**	**$145,724,600**				
Raw Pump Station	0	$0	5	$25,000,000	0.00%	0.00%
Raw Valve	1	$1,000	280	$280,000	0.36%	0.36%
Raw Total	**1**	**$1,000**				
Recycled Fireline	0	$0	1	$400	0.00%	0.00%
Recycled Hydrant	4	$30,000	14	$105,000	28.57%	28.57%
Recycled Pump Station	1	$5,000,000	3	$15,000,000	33.33%	33.33%
Recycled Service Connection	38	$15,200	413	$165,200	9.20%	9.20%
Recycled Tank - Gravity	0	$0	2	$5,000,000	0.00%	0.00%
Recycled Tank - Reservoir	0	$0	1	$4,500,000	0.00%	0.00%
Recycled Treatment Plant (owned by LGVSD)	0	$0	1		0.00%	#DIV/0!
Recycled Valve	43	$43,000	357	$357,000	12.04%	12.04%
Recycled Total	**86**	**$5,088,200**				
Grand Total	**12,822**	**150,813,800**	**100,660**	**$1,307,851,020**	12.74%	11.53%

Pipelines						
Type	**Miles of Pipeline Exposed to Hazard**	**Replacement Cost of Pipeline Exposed to**	**Total Miles of Pipeline**	**Total Replacement Cost**	**% Exposed to Hazard**	**% Replacement Cost Exposed to Hazard**
Potable Water - Distribution Main	20.1	$58,455,349	761.0	$2,209,823,037	2.6%	2.6%
Potable Water - Lateral	4.8	$3,799,626	229.4	$181,682,836	2.1%	2.1%
Potable Water - Main	0.0	$0	0.1	$200,899	0.0%	0.0%
Potable Water - Transmission Main	0.02	$72,804	92.1	$388,893,185	0.02%	0.0%
Potable Water Total	**24.94**	**$62,327,778**				
Raw Water - Distribution Main	0.0	$0	4.7	$13,679,943	0.0%	0.0%
Raw Water - Transmission Main	0.0	$0	25.6	$108,036,492	0.0%	0.0%
Raw Water Total	**0.0**	**$0**				
Recycled Water - Lateral	0.0	$0	2.1	$1,676,612	0.0%	0.0%
Recycled Water - Main	0.0	$0	24.4	$70,806,587	0.0%	0.0%
Recycled Water - Other	0.0	$0	0.3	$828,973	0.0%	0.0%
Recycled Water Total	**0.0**	**$0**				
Grand Total	**24.9**	**$62,327,778**	**1,139.6**	**$2,975,628,563**	2.2%	2.1%
Facilities						
Type	**Number of Facilities Exposed to Hazard**	**Replacement Cost of Facilities Exposed to Hazard**	**Total Number of Facilities**	**Total Replacement Cost**	**% Exposed to Hazard**	**% Replacement Cost Exposed to Hazard**
Building	0	$0	25	$44,100,000	0.00%	0.00%
Building Total	**0**	**$0**				
Dam	0	$0	7		0.00%	#DIV/0!
Potable Fireline	5	$2,000	1,426	$570,400	0.35%	0.35%
Potable Hydrant	205	$1,537,500	7,492	$56,190,000	2.74%	2.74%
Potable Pump Station	4	$20,000,000	90	$495,000,000	4.44%	4.04%
Potable Service Connection	1,586	$634,400	61,796	$24,718,400	2.57%	2.57%
Potable Tank - Clearwell	0	$0	3	$35,000,000	0.00%	0.00%
Potable Tank - Distribution	5	$5,815,000	84	$70,738,620	5.95%	8.22%
Potable Tank - Gravity	0	$0	23	$114,950,000	0.00%	0.00%
Potable Tank - Pressure System	0	$0	7	$60,000	0.00%	0.00%
Potable Tank - Reservoir	0	$0	2	$25,000,000	0.00%	0.00%
Potable Tank - Transmission	0	$0	10	$162,500,000	0.00%	0.00%
Potable Treatment Plant	0	$0	2	$200,000,000	0.00%	0.00%
Potable Valve	690	$690,000	28,616	$28,616,000	2.41%	2.41%
Potable Total	**2,495**	**$28,678,900**				
Raw Pump Station	0	$0	5	$25,000,000	0.00%	0.00%
Raw Valve	0	$0	280	$280,000	0.00%	0.00%
Raw Total	**0**	**$0**				
Recycled Fireline	0	$0	1	$400	0.00%	0.00%
Recycled Hydrant	0	$0	14	$105,000	0.00%	0.00%
Recycled Pump Station	0	$0	3	$15,000,000	0.00%	0.00%
Recycled Service Connection	0	$0	413	$165,200	0.00%	0.00%
Recycled Tank - Gravity	0	$0	2	$5,000,000	0.00%	0.00%
Recycled Tank - Reservoir	0	$0	1	$4,500,000	0.00%	0.00%
Recycled Treatment Plant (owned by LGVSD)	0	$0	1		0.00%	#DIV/0!
Recycled Valve	0	$0	357	$357,000	0.00%	0.00%
Recycled Total	**0**	**$0**				
Grand Total	**2,495**	**$28,678,900**	**100,660**	**$1,307,851,020**	2.48%	2.19%

F. FEMA Approval & District Board Adoption

Placeholder for final approval letter from FEMA and District Board adoption documentation.

G. Plan Maintenance Agendas

MEETING AGENDA

Annual Plan Maintenance
October XX, 2027
X:00 – X:00 PM

Attendance

☐Elysha Irish
☐Emma Ressler

Agenda Item

1. Review 2026 Marin Municipal Water District HMP goals and revise if needed
2. Document natural hazard occurrences that occurred during the prior year and their impact on the District
3. Review mitigation actions
    a. Document implementation status
    b. Evaluate the mitigation actions that have been successful
    c. Discuss why mitigation actions were not completed
    d. Review the action plan if new timelines need to be established (e.g., changing a long-term project to a short-term project due to funding availability)
    e. Consider recommendations for new mitigation projects
4. Review new funding options, including grant opportunities, and determine if contract grant-writing support is needed to pursue the opportunities
5. Document potential losses avoided due to the implementation of specific mitigation measures or other planning programs, if feasible
6. Identify any new or additional vulnerabilities that may be faced by the District and may need to be addressed in a future update of this plan

MEETING AGENDA

Annual Plan Maintenance
October XX, 2028
X:00 – X:00 PM

Attendance

☐Elysha Irish
☐Emma Ressler

Agenda Item

1. Review 2026 Marin Municipal Water District HMP goals and revise if needed
2. Document natural hazard occurrences that occurred during the prior year and their impact on the District
3. Review mitigation actions
    a. Document implementation status
    b. Evaluate the mitigation actions that have been successful
    c. Discuss why mitigation actions were not completed
    d. Review the action plan if new timelines need to be established (e.g., changing a long-term project to a short-term project due to funding availability)
    e. Consider recommendations for new mitigation projects
4. Review new funding options, including grant opportunities, and determine if contract grant-writing support is needed to pursue the opportunities
5. Document potential losses avoided due to the implementation of specific mitigation measures or other planning programs, if feasible
6. Identify any new or additional vulnerabilities that may be faced by the District and may need to be addressed in a future update of this plan

MEETING AGENDA

Annual Plan Maintenance
October XX, 2029
X:00 – X:00 PM

Attendance

☐Elysha Irish
☐Emma Ressler

Agenda Item

1. Review 2026 Marin Municipal Water District HMP goals and revise if needed
2. Document natural hazard occurrences that occurred during the prior year and their impact on the District
3. Review mitigation actions
    a. Document implementation status
    b. Evaluate the mitigation actions that have been successful
    c. Discuss why mitigation actions were not completed
    d. Review the action plan if new timelines need to be established (e.g., changing a long-term project to a short-term project due to funding availability)
    e. Consider recommendations for new mitigation projects
4. Review new funding options, including grant opportunities, and determine if contract grant-writing support is needed to pursue the opportunities
5. Document potential losses avoided due to the implementation of specific mitigation measures or other planning programs, if feasible
6. Identify any new or additional vulnerabilities that may be faced by the District and may need to be addressed in a future update of this plan
7. Identify external funding opportunities (if needed) to perform the 5-year update to the HMP

MEETING AGENDA

Annual Plan Maintenance
October XX, 2030
X:00 – X:00 PM

Attendance

☐Elysha Irish
☐Emma Ressler

Agenda Item

1. Review 2026 Marin Municipal Water District HMP goals and revise if needed
2. Document natural hazard occurrences that occurred during the prior year and their impact on the District
3. Review mitigation actions
    a. Document implementation status
    b. Evaluate the mitigation actions that have been successful
    c. Discuss why mitigation actions were not completed
    d. Review the action plan if new timelines need to be established (e.g., changing a long-term project to a short-term project due to funding availability)
    e. Consider recommendations for new mitigation projects
4. Review new funding options, including grant opportunities, and determine if contract grant-writing support is needed to pursue the opportunities
5. Document potential losses avoided due to the implementation of specific mitigation measures or other planning programs, if feasible
6. Identify any new or additional vulnerabilities that may be faced by the District and may need to be addressed in a future update of this plan
7. If pursuing external funding, obtain a grant to perform the 5-year update to the HMP

MEETING AGENDA

Annual Plan Maintenance
October XX, 2031
X:00 – X:00 PM

Note: The 2031 agenda will be part of the plan update process to ensure that a completed update is approved prior to expiration of the 2026 HMP.

Attendance

☐Elysha Irish
☐Emma Ressler

Agenda Item

1. Review 2026 Marin Municipal Water District HMP goals and revise if needed
2. Document natural hazard occurrences that occurred during the prior year and their impact on the District
3. Review mitigation actions
    a. Document implementation status
    b. Evaluate the mitigation actions that have been successful
    c. Discuss why mitigation actions were not completed
    d. Review the action plan if new timelines need to be established (e.g., changing a long-term project to a short-term project due to funding availability)
    e. Consider recommendations for new mitigation projects
4. Review new funding options, including grant opportunities, and determine if contract grant-writing support is needed to pursue the opportunities
5. Document potential losses avoided due to the implementation of specific mitigation measures or other planning programs, if feasible
6. Identify any new or additional vulnerabilities that may be faced by the District and may need to be addressed in a future update of this plan

STAFF REPORT

Meeting Type:	Board of Directors
Title:	Capital Program Update
From:	Alex Anaya, Director of Engineering
Through:	Shaun Horne, General Manager
Meeting Date:	October 6, 2026

TYPE OF ITEM: Action X Information

RECOMMENDATION: Receive a staff update on Fiscal Year 2027 (FY27) first quarter Capital Improvement Program

SUMMARY: Staff have been working to advance capital projects identified in the District's adopted FY27 Budget since the last Capital Program Update to the Board on June 16, 2026. Projects identified in the adopted budget include tank, pump station, treatment plant and pipeline projects as well as unplanned capital projects. Over the past four years, the District has been able to make substantial headway on larger capital projects that have historically been backlogged since they were too costly to address with prior capital budgets.

DISCUSSION: At the June 3, 2025, Board of Directors' meeting, the Board adopted the Capital and Operating Budget for FY 2025-26 and FY 2026-27. Since that time, staff have been working to deliver capital projects identified in the District's adopted budget for FY27 ranging from treatment plant to pipeline projects. To support delivery of these projects, the District has hired consulting firms for design assistance on some of the pump station, tank, treatment plant and dam projects. Many projects identified in the current budget cycle span across multiple years due to the size and timing of the projects. Some of the projects currently underway in construction include highly visible pipeline projects such as the Bolinas Road Pipeline Replacement Project, where construction is currently paused due to unforeseen circumstances encountered during construction, Miracle Mile East Pipeline Replacement Project that will replace a total of 8,700 feet of pipe when completed, and Hillside Avenue Pipeline Replacement Project that will replace 7,900 feet of fire flow deficient pipe in the Town of San Anselmo and Fairfax. The first phase of the North Marin Line Creek Crossing project is in construction and will relocate isolation valves at Shafter Bridge and install approximately 200 feet of 24-inch pipe in preparation for the second phase of the project that will include the relocation of approximately 1,700 feet of 36-inch pipe and the replacement of one creek crossing.

The District is starting the fourth year of construction on the Gibson Tank Project, which will involve constructing both tank foundations, tank pads and tank walls. Once completed in 2029, the Gibson

Tanks will provide seismically resilient water storage with increased capacity to the Ross Valley Area which is approximately 23% of the District's service area. The Scenic Avenue Tank Replacement Project is currently in construction and will replace one of the four remaining redwood storage tanks with a new 20,000-gallon bolted steel tank. Staff continue working out an easement conflict that was identified during the completion of the 60% design of the Hind Tanks Replacement Project. Staff are working to resolve the easement conflict over the next couple of months, complete the design and advertise the project by Spring 2027. Staff will continue developing the design to replace the last remaining redwood storage tank by 2028.

The Kastania Pump Station Phase 2 Project and Tocaloma Pump Station Rehabilitation Project are both currently in construction and the review and procurement of electrical and mechanical equipment by the respective contractors is underway. Once completed, both projects will improve system reliability and ensure the District's continued ability to provide water for its customers. These complex projects will span a two-year construction window, where this first year involves the procurement of electrical and mechanical equipment before demolition and construction begins.

The District continues to work on unplanned projects including the replacement of the Fairfax Manor Pump Station. In addition to the Fairfax Manor Pump Station, other capital work has risen in priority due to water main breaks since the last Capital Update. Hilary Drive in Tiburon had a recent main break and staff evaluated the main break history and found a high break history in recent years causing staff to prioritize replacement of approximately 4,500 feet of mainline to remove this leak prone cast iron pipe. Oak Manor Drive in Sleepy Hollow also had a significant main break with a history of multiple breaks as well causing staff to prioritize design for replacement of approximately 2,600 feet of leaky mainline pipe.

Staff have also awarded a design contract for the Seeger Dam Spillway Modernization Project that came as a result of the notification from the Division of Safety of Dams (DSOD) on the downgrade of Seeger Dam. Staff are working with the consultant firm to develop and prepare a work plan to submit to DSOD by the December 1, 2026 deadline. Staff will continue to provide updates to the Board on this project.

Since the adoption of the current rates, the District has been able to target larger capital projects. These projects had historically been placed on a project backlog list as they were considered too large of a capital expense to address. Key among these projects is the Gibson Tank Project to replace Pine Mountain Tunnel that will have an estimated cost of $30 million over seven years once completed in 2029. Tocaloma Pump Station and Kastania Pump Station will have a cost of $12 million and $4 million respectively over the next two years with anticipated completion in 2028 and 2027. The Miracle Mile Pipeline Replacement Project that will replace a total of 8,700 feet of some of the oldest pipe in the distribution system installed in 1883 (143 years) at a total estimated cost of $6.6 million over the next two years. The Soulajule Electrification Project is also currently in design and once in place it will allow the District the ability to pump up to 6 MGD using PG&E power. The budgeting for construction of this project will be going into the next two-year Capital Budget cycle at an estimated cost of $5 million.

While substantial progress has been made on these large, backlogged projects, the District still has a substantial amount of large capital work remaining to address in addition to the core capital work. Staff is developing prioritization and timing on future capital work such as the Ross Reservoir Replacement Project, San Geronimo Treatment Plant Clarifiers, Smith Saddle Tanks Replacement,

Federal Works Pump Station, Lagunitas Booster Pump Station and Sky Oaks Road Widening to name a few. These capital projects represent a significant capital investment that needs to be sequenced over the next 20-30 years.

ENVIRONMENTAL REVIEW: Not Applicable.

FISCAL IMPACT: None.

ATTACHMENT(S): None.

DEPARTMENT OR DIVISION	DIVISION MANAGER	APPROVED
Engineering	**Alex Anaya** **Engineering Director**	**Shaun Horne** **General Manager**

MARIN WATER

UPCOMING MEETINGS

This schedule lists upcoming board and committee meetings as well as upcoming agenda items for the next month, which may include Board interest in adding future meeting items. The schedule is tentative and subject to change pending final publication and posting of each meeting agenda.

Internal Meetings		
Meeting Date	**Meeting Type**	**Key Item(s)**
Tuesday, Oct. 20, 2026 5:00 p.m.	Board of Directors' Regular Bi-Monthly Meeting and tentative Closed Session to follow	Lagunitas Creek Habitat Enhancement Project Update, and Water Efficiency Update
Thursday, Oct. 22, 2026 9:30 a.m.	Finance & Administration Committee Meeting	Monthly Financial Report, and tentative Preliminary Comprehensive Annual Report
Tuesday, Oct. 27, 2026 9:30 a.m.	Planning Committee Meeting/Special Meeting of the Board of Directors	Prescribed Fire Update, and Gibson Tanks Project Update

External Meetings	
Meeting Date	**Meeting Type**
Wednesday, Oct. 28, 2026 8:00 a.m.	ACWA Region 1 Event, *From Source to Storage: A Field Day at the Russian River* (tour of the Russian River Watershed)
Friday, Oct. 30, 2026 8:30 a.m.	Annual Tomales Bay Conference
Friday, Nov. 6, 2026 9:30 a.m.	North Bay Watershed Association Meeting
Friday, Nov. 13, 2026 9:00 a.m.	Lagunitas Creek Technical Advisory Committee Meeting