

determination of a high, medium, or low priority for each mitigation action, and a comprehensive prioritized action plan for the HVLCSD Planning Area.

5.4 Mitigation Action Plan

Requirement §201.6(c)(3)(iii): [The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

This action plan was developed to present the recommendations developed by the HMPC for how the HVLCSD can reduce the risk and vulnerability of people, property, infrastructure, and the environment to future disaster losses. Emphasis was placed on both future and existing development. The action plan summarizes who is responsible for implementing each of the prioritized actions as well as when and how the actions will be implemented. Each action summary also includes a discussion of the benefit-cost review conducted to meet the regulatory requirements of the Disaster Mitigation Act.

Table 5-1 identifies the HVLCSD mitigation actions for this LHMP. For each mitigation action item included in Table 5-1 the section that follows includes a detailed mitigation implementation strategy by mitigation action for all District actions.

Table 5-1 identifies the mitigation actions for the HVLCSD. Following this summary table of mitigation actions, a detailed implementation description is included for each mitigation action identified in the table. The implementation of any mitigation action in this Plan is subject to available funding of the District as the primary implementing jurisdiction for this LHMP.

As described throughout this LHMP, the HVLCSD has many risks and vulnerabilities to identified hazards. Although many possible mitigation actions, as detailed in Appendix C, were brainstormed and prioritized during the mitigation strategy meetings, the resulting mitigation strategy presented in this Chapter 5 of this LHMP focuses only on those mitigation actions that are both reasonable and realistic for the District to consider for implementation over the next 5-years covered by this LHMP. Thus, only a portion of the actions identified in Appendix C have been carried forward into the mitigation strategy presented in Table 5-1. Although many good ideas were developed during the mitigation action brainstorming process, the reality of determining which priority actions to develop and include in this LHMP came down to the actual priorities of the District, individuals and departments based in part on department direction, staffing, and available funding. The overall value of the mitigation action table in Appendix C is that it represents a wide-range of mitigation actions that can be consulted and developed for this LHMP Update during annual plan reviews and the formal 5-year update process.

It is also important to note that the District has numerous existing, detailed action descriptions, which include benefit-cost estimates, in other planning documents and programs, such as their Strategic Plan, stormwater plan, and capital improvement budgets and reports. These actions are considered to be part of this LHMP, and the details, to avoid duplication, should be referenced in their original source document. The HMPC also realizes that new needs and priorities may arise as a result of a disaster or other

circumstances and reserves the right to support new actions, as necessary, as long as they conform to the overall goals of this LHMP.

Further, it should be clarified that the actions included in this mitigation strategy are subject to further review and refinement; alternatives analyses; reprioritization due to funding availability and/or other criteria; and District board approval. The HVLCSO is not obligated by this document to implement any or all of these projects. Rather this mitigation strategy represents the desires of the District to mitigate the risks and vulnerabilities from identified hazards. The actual selection, prioritization, and implementation of these actions will also be further evaluated in accordance with the mitigation categories and criteria contained in Appendix C.

It should be noted that some of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. **In addition, the public outreach and education action, as well as many of the emergency services and other multi-hazard actions, apply to all hazards regardless of hazard priority.** Collectively, this HVLCSO multi-hazard mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of the District to implement over the next 5-years covered by this LHMP.

Table 5-1 HVLCSD's Mitigation Actions

Action Title	Responsible Agencies and Partners	Address Current Development	Address Future Development	Continued Compliance with NFIP	Mitigation Type
Multi-Hazard Mitigation Actions					
Action 1. Water Distribution System Reliability	HVLCSD	X	X		Property Protection
Action 2. Generator Projects for all Critical Facilities and Infrastructure	HVLCSD	X	X		Property Protection Emergency Services
Action 3. Establish Fully Functioning GIS Capabilities	HVLCSD	X	X		Prevention Emergency Services
Action 4. Water Storage and Materials	HVLCSD	X	X		Property Protection Structural Projects
Action 5. Establish Additional Well(s)	HVLCSD	X	X		Prevention Property Protection
Action 6. Chlorine Automatic Shut-off Valve	HVLCSD	X	X		Prevention Property Protection
Action 7. Develop Risk and Resilience Plan (RRP), and Emergency Response Plan (ERP)	HVLCSD	X	X		Prevention Emergency Services
Action 8. Improve the SCADA system	HVLCSD	X	X		Prevention Property Protection
Action 9. Public Awareness Program	HVLCSD	X	X		Public Information
Action 10. Wastewater Treatment Plant Improvements	HVLCSD	X	X		Property Protection
Action 11. Update Water Master Plan	HVLCSD	X	X	X	Prevention
Climate Change Actions					
Action 12. Develop HVLCSD Climate Action Plan	HVLCSD	X	X	X	Prevention

Action Title	Responsible Agencies and Partners	Address Current Development	Address Future Development	Continued Compliance with NFIP	Mitigation Type
Dam Failure, Flood, Localized Flood, Levee Failure Actions					
Action 13. I & I Program	HVLCSD	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 14. Update and Implement Stormwater Master Plan	HVLCSD/Lake County Water Resources Department/HVLA	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 15. Establish Cross Functional Committee and Address Levee & Stream Issues	HVLCSD/Lake County Water Resources/HVLA	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 16. Chlorine Analyzers	HVLCSD	X	X		Property Protection
Action 17. Dam Inundation Mitigation	HVLCSD/Lake County Water Resources/HVLA	X	X	X	Property Protection Structural Projects Natural Resource Protection
Drought Actions					
Action 18. Rescind the Water Moratorium	HVLCSD	X	X		Property Protection
Action 19. Hexavalent Chromium	HVLCSD	X	X		Property Protection Natural Resource Protection
Earthquake Actions					
Action 20. Earthquake Vulnerability Assessment and Retrofit	HVLCSD	X	X		Property Protection Structural Projects
Wildfire Actions					
Action 21. Fuel Mitigation	HVLCSD	X	X		Prevention Property Protection Natural Resource Protection
Action 22. Add/Improve/Fortify Fire Hydrants	HVLCSD	X	X		Prevention Property Protection Natural Resource Protection Emergency Services

Multi-Hazard Actions

Action 1. Water Distribution System Reliability

Hazards Addressed: Climate Change, Drought and Water Shortage, Flood: 1%/0.2%; Flood: Localized Stormwater Flooding; Earthquake; Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background: The delivery of safe drinking water is dependent upon the safety of the water conveyance system. Buried underground the community of Hidden Valley Lake lies 20 miles of a water distribution system designed to bring safe drinking water to its residents. There are three aspects to HVLCSD's water distribution system that make it vulnerable to natural events.

- Hidden Valley Lake is located in a "Very High" earthquake hazard zone.
- The frequency and intensity of winter storms is increasing.
- Water Supply during times of drought makes efficient conveyance of water of paramount importance.

In the event of an earthquake, or the result of storm events that bring heavy rains, the soil that surrounds this conveyance system weakens. Pressure from groundwater on underground pipelines can create pinhole leaks, to cracks, to full circle breaks, interrupting the flow of potable water to the community. Soil liquefaction, ground displacement and settling are all earthquake effects that will have a devastating effect on water delivery. service.

Similarly, the loss of drinking water during times of drought is an unacceptable consequence of natural events, and an irresponsible position for HVLCSD.

Project Description: The Water Distribution System Reliability project will address the above mentioned hazards with three different facets of mitigation.

- Water Meters – At the nexus of the HVLCSD distribution systems and the individual household, these devices will be upgraded to modern standards of efficiency and leak detection. Water meters will also be installed at previously un-metered locations within the distribution system, such as fire hydrants. As is identified in the AWWA standards document for water meters, M6, Edition #5. Newer water meters provide the utility with the best protection against natural events and water loss.
- Correlators – Noise correlation techniques can pinpoint leaks within the 20 miles of pipeline throughout the community with a very high degree of accuracy. The identification process of identifying weak spots within the distribution system would then lead to prioritization of repair and replacement activities to mitigate the most vulnerable areas.
- Air Valves – Crucial to the success of a water distribution system, these devices regulate water pressure though all water pipelines. Natural events that may cause cracks in water pipes, have the dangerous effect of introducing air into a pressurized water main. Air from these events can cause cavitation and ultimately pipeline collapse, unless air valves are present to discharge this air. Improvements and implementation of these air valves into the distribution system help mitigate the effects of storms, earthquakes and drought upon the water utility.

Other Alternatives: The alternatives are either to replace pipes based on the date of install, or respond to leaks as they reach the surface. Neither of these solutions are proactive or cost-effective, because they are not taking into account the level of damage sustained by natural events.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Water Master Plan, Strategic Plan, Rate Study analysis, Rate increase, Bond issuance, Five-year budget plan for Operations and Capital Funds.

Responsible Office/Partners: Hidden Valley Lake Community Services District

Project Priority: High

Cost Estimate: \$5,500,000

Benefits (Losses Avoided):

- Threat to public safety (insufficient water supply, landslide)
- Wildfire conflagration (insufficient water supply)
- Damage to property (subsidence, landslide, wildfire)
- GHG reduction (insufficient water supply)

Potential Funding: In-kind services, Water Use Fees, Capital funds, Federal and State grant funding

Timeline: 36 months

Action 2. Generator Projects for all Critical Facilities and Infrastructure

Hazards Addressed: Dam Failure, Earthquake, Flood (1%/0.2%), Levee Failure, Localized Flood, Severe Weather: Heavy Rains and Storms, Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background: A loss of power can be brought about in a number of ways. Lake County's history of wildfire, flood, heavy windstorms and earthquakes are a testimony to the high risk of local power loss.

In the event of a grid-tied power loss, Hidden Valley Lake Community Services District's (HVLCSO) ability to deliver drinking water to the community will be compromised. Three groundwater wells, and three pump stations draw electricity to deliver drinking water to the community. None of these locations have redundant power capabilities. These key areas of the water distribution system represent a risk to the water delivery of approximately 2500 connections. As a municipality, the day-to-day operations of administrative staff are crucial to the fiscal health and longevity of the business, which is also rendered inoperable during a power loss.

Given the increase in extreme environmental events in the recent past, the value of implementing power redundancy has also increased.

Project Description: This project would place appropriately sized power generators at four water delivery pump stations. In order for water to be made available for households and firefighters, electricity required to pump up to water tanks would no longer be a weak spot in the water distribution system. This project would also necessarily include the switchgear needed to transition from grid-tied to generator power, as well as assuring proper access into pump locations.

Four generators in these key locations will have a positive effect on the entire community. This integral step in providing water storage to the community as well as fire flows to the firefighting community help to mitigate risks from the aforementioned hazards.

Ensuring the delivery and storage of water, as well as seamless administrative services is a commitment HVLCS D considers a continual monitoring and management process. HVLCS D remains vigilant in ensuring the reliability of water availability.

Other Alternatives: Rental of trailered generators on an as-needed basis, creates a dependency on the vendor's inventory, which is likely reduced during periods of extreme environmental events such as wildfire, flood, windstorms, and earthquakes. The reduction in inventory poses the risk of no generators available to keep the water and operations flowing, or a wrong-sized generator. Neither of these possibilities would be a fiscally responsible plan.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Water Master Plan, Strategic Plan, Rate Study analysis, Rate increase, Bond issuance, Five-year budget plan for Operations and Capital Funds

Responsible Office/Partners: Hidden Valley Lake Community Services District

Project Priority: High

Cost Estimate: \$2.6M

Benefits (Losses Avoided): Losses avoided:

- Threat to public safety
- Wildfire conflagration

Potential Funding: In-kind services, Water Use Fees, Capital funds, Federal and State grant funding

Timeline: 30 Months

Action 3. Establish Fully Functioning GIS Capabilities

Hazards Addressed: Climate Change, Dam Failure, Drought & Water Supply, Flood, Localized Flood, Levee Failure, Severe Weather, Wildfire, and any other natural hazards affecting infrastructure.

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background: Hidden Valley Lake was built in 1968 and was mapped on paper by a drafter. These initial maps that are more than a half a century old, are the most recent complete maps of the sewer and water infrastructure of HVLCSO. Over time some of these maps have been lost, there are no complete records of the spatial location of the infrastructure from those maps at HVLCSO or at the office of the developer that built them.

In recent years some GIS work has been conducted, mapping a portion of the above ground assets in the community as well as some of the sewer infrastructure. This project has more mapping to be done. The underground water infrastructure has not been documented in GIS at all.

During a drought, a reliable water supply is extremely important. In the event of a severe water leak, the speed in which that leak is resolved can depend on the accuracy of spatial information. If field personnel are not aware of the location of valves within the water conveyance system, more time is necessary to find a way to isolate that leak, and consequently more water is lost.

Preventative measures for flooding events include infrastructure upgrades such as manholes. Without an accurate spatial depiction of manhole replacements, the value of the project is diminished.

The severity of natural hazards is contingent upon how it may interact with the topography of the land, the natural features, and the human made developments. It is therefore crucial for these developments to be accurately mapped and rendered in a three-dimensional fashion to understand their potential impacts during an extreme event such as drought, flood, or wildfire.

Project Description: The Establish Fully Functioning GIS Capabilities project would resolve this issue by completing the needed mapping of all HVLCSO infrastructure. This mapping would take place in a cooperative effort between field personnel and administrative staff. The magnitude and complexity of the information that needs to be gathered and organized may also require outsourced assistance.

In the event of a break of a mainline, time is of the essence. A complete map of the water infrastructure would help staff quickly locate the valves to turn off the main in the field, instead of spending precious time looking for paper representations of valves, or relying on individual memories.

A complete map also lends itself to a streamlined, and easily accessible source of asset management activities. Initial asset assessments would be a benchmark for ongoing preventative maintenance such as hydrant flushing, which ensures water is available for fire-fighters. Geo-spatial maintenance documentation can also highlight areas where underground flood prevention work has been done and where it has not.

Spatial understanding of water and wastewater infrastructure is of vital importance to a water utility. This understanding helps in keeping up to date with infrastructure repairs from natural disasters as well as incorporating new technologies. GIS, or Geographic Information Systems, are the modern standard for mapping.

Not only would this project update the maps of HVLCSO, it would also get the utility to a place that can record upgrades and maintenance in a spatial fashion. A record of work done, spatially, enables staff to

recognize where problem areas are and how they relate to other areas that receive less attention. Understanding the spatial aspects of a system can lead to more effective ways of solving issues.

Other Alternatives: No additional updates to GIS database and rely on dated maps with faulty information. Much of the information needed to understand the impacts of past natural disasters are not recorded and are stored solely in the minds of staff. Without updates to the GIS database historical information will be lost with the loss of staff.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Water Master Plan, Strategic Plan, staffing to meet goals, Five-year budget plan for Operations and Capital Funds, Contracting agreement.

Responsible Office/Partners: Hidden Valley Lake Community Services District

Project Priority: High

Cost Estimate: \$.4M

Benefits (Losses Avoided): Mapping of assets, easy to spatially update maintenance, and enables the furthering of other projects. This project would increase and maintain wildfire prevention and protection. This project would improve HVLCSO's capabilities to plan for/prevent/mitigate hazard-related losses and to be prepared for, respond to, and recover from a disaster event. This project would minimize risk and vulnerability of HVLCSO to hazards and protect lives and prevent losses to property and the environment.

Potential Funding: FEMA HMGP 404 and 406 Grant Funding, Water and Sewer Use Fees, In-kind services, and State Funding

Timeline: 30 Months (and ongoing)

Action 4. Water Storage and Materials

Hazards Addressed: Wildfire/Drought & Water Supply/Earthquake/Heavy Rains and Storms, Localized Flooding

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background: The very real propensity for wildfire in Hidden Valley Lake is compounded by the density of the community and the proximity to wildland fuels. Wooden water storage structures present a hazard in this environment. Recent drought conditions have illustrated the need for sufficient water storage capabilities. Changing environmental conditions such as extended drought conditions necessitate increased water storage to address this hazard. Winter storms have increased in frequency and intensity which saturate the soil upon which tanks are situated. Soft soils have the potential of compromising the structural integrity of these tanks. One of the tanks is also located in an area subject to flooding. The community of Hidden Valley Lake is located in an Earthquake Hazard Zone of "Very High", which is the highest rating the EPA provides. Ground displacement, liquefaction, lateral spreading and settling are all impacts that could significantly interrupt water delivery.

Project Description: This project replaces five redwood tanks with four modern steel tanks. Steel will significantly reduce the potential damages to tanks due to wildfire. Steel tanks holding water will also provide firefighters with sufficient fire flows, and potentially reduce the extent of a wildfire. Ensuring increased storage capacity not only aids in firefighting, but also guards against potential drought conditions. Meeting our community’s water demands with a readily available stored supply fortifies the beneficial use of Hidden Valley Lake’s natural resources of waterways and aquifers. The fortification efforts involved in this project protect against the effects of wind and rain from winter storms, which in turn mitigates the danger that soft soil presents. These efforts would also include tank and foundation stabilization to protect against sloshing and ground movement during an earthquake. The HVLCSD remains committed to providing its residents with access to safe reliable drinking water while protecting the natural resources of the area, and this project is expected to provide the protection needed.

Other Alternatives: Replacing less than all tanks would be less effective in providing fire resilience and redundancy, as well as the previously mentioned earthquake protections.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Water Master Plan, Strategic Plan, Rate Study analysis, Rate increase, Bond issuance, Five-year budget plan for Operations and Capital Funds

Responsible Office/Partners: Hidden Valley Lake Community Services District

Project Priority: High

Cost Estimate: \$5.4M

Benefits (Losses Avoided): Losses avoided:

- Threat to public safety (tank collapse)
- Boil water notice (tank collapse)
- Fire damage reduction (insufficient water storage)
- GHG reduction (insufficient water storage)

Potential Funding: In-kind services, Water Use Fees, Capital funds, Federal and State grant funding

Timeline: 36 Months

Action 5. *Establish Additional Well(s)*

Hazards Addressed: Wildfire/Drought & Water Supply/ Flood 1%/0.2%

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background: While the location of multiple wells in a single area is efficient from an economy of scale perspective, one catastrophic failure at this location eliminates water availability from the entire community. The three groundwater wells that provide drinking water for the Hidden Valley Lake Community are adjacent to Putah Creek, and are all within approximately 1000 feet of each other. Electrical

service, pumping capabilities, water main tie-ins, and regular maintenance activities serve as benefits for having the wells in close proximity of each other, but also serve as a liability.

A wildfire in this vicinity would stop water conveyance, as illustrated in the Valley Fire in 2015. Supervisory Controls and Data Acquisition (SCADA) equipment, as well as power delivery are interrupted as a result of wildfire conflagration. A portion of the groundwater well location is located in the Flood Insurance Rate Map (FIRM), Special Flood Hazard area, and the water mains are conveying this groundwater under the Putah Creek floodway. Flooding near a well or water mains can be problematic in terms of groundwater saturation, sufficient air gap clearance (wells), and water treatment operations.

A result of Putah Creek adjudication, the Settlement Agreement of 1995, closely monitors water rights users' consumption according to their permits. Since the Hidden Valley Lake Community Services District's groundwater wells are defined as being under the influence of surface water, there does not currently exist an alternate source of water during extreme climactic events of drought or water shortage.

Project Description: This project would add redundancy and water delivery reliability to the community by developing a new well, and water delivery system in a location two miles away, and not under the influence of Putah Creek. The discovery process of developing a new well location involves water sampling and pump capacity testing. Once a suitable location is established, the buildout will include drilling of the production well, chlorination system, mixing, booster pumps, SCADA controls, transmission mains, power redundancy, access road, and security measures. The entire community of Hidden Valley Lake will benefit from this project. The new well and its water delivery system will improve water reliability as it is stored in tanks, and made available to residential households, commercial entities, and firefighters.

A wildfire near the existing groundwater well cluster has a reduced risk to water delivery, and a better chance at faster containment given the enhanced fire flows provided by the additional well. The new well location and its transmission mains will not be located in a Special Flood Hazard area, and therefore will not pose a risk of failure or complications related to groundwater saturation or water treatment capabilities. Having a water source that is not located near Putah Creek eliminates the risk of water shortage or drought conditions in that natural waterway. This alternate source of water further insulates the community from this risk. As a measure of stewardship of natural resources, Hidden Valley Lake Community Services District (HVLCS D) ensures water delivery for its present customers as well as future. Given the strong potential for development in this particular community of Lake County, a new well within HVLCS D's sphere of influence is a protection against individual household wells.

Other Alternatives: Developing a new water source and rehabilitating an existing groundwater well have been explored. Water quality, comprehensive hazard mitigation, and natural resource protection measures for alternate locations have not all been met with the same benefits as the aforementioned solution.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Water Master Plan, Strategic Plan, Rate Study analysis, Rate increase, Bond issuance, Five-year budget plan for Operations and Capital Funds

Responsible Office/Partners: Hidden Valley Lake Community Services District

Cost Estimate: \$4M

Benefits (Losses Avoided): Losses avoided:

- Threat to public safety (insufficient water supply)
- Wildfire conflagration (insufficient water supply)
- Boil water notice (contaminated water)

Potential Funding: In-kind services, Water Use Fees, Capital funds, Federal and State grant funding

Timeline: 36 Months

Project Priority: Medium

Action 6. Chlorine Automatic Shut-off Valve

Hazards Addressed: Wildfire/Earthquake

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background: Hidden Valley Lake Community Services District (HVLCSO) treats wastewater from Hidden Valley Lake, California by several processes, one of which utilizes chlorine gas. This process is highly regulated because of the dangerous nature of chlorine gas. HVLCSO has in place a Risk Management Plan (RMP) for their wastewater reclamation plant. In the latest edition of the RMP (2018), updated every 5 years, there is a recommendation to install an automatic shut-off valve of the chlorine feed lines that would protect employees and the public in the event of a chlorine gas leak.

The chemical CL₂ is an oxidant that is toxic to eyes, skin, and by inhalation. Immediate danger to life and health (IDLH) is recognized at concentrations of at least 10 ppm. With the potential maximum of 4,000 pounds of chlorine gas contained at the wastewater treatment plant, every precaution is taken to protect against accidental release.

Section 5 of the RMP identifies protections against accidental release. Further examination of potential release scenarios is located in Appendix D, Checklist. Installing automatic shut-off valves in feed lines, in addition to the existing vacuum alarms was identified as a protective measure.

The community of Hidden Valley Lake is located in an Earthquake Hazard Zone of “Very High”, which is the highest rating the EPA provides. An accidental release could occur in the event of ground subsidence due an earthquake.

Hidden Valley Lake is located in an “Elevated” fire threat zone as illustrated in the CPUC Fire-Threat Map of 2019. In this densely populated area, on the cusp of wildland fuels, the potential for catastrophic wildfire has been realized on several occasions in the recent past.

Safety to employees and the community is of the utmost importance to HVLCSO, and is therefore committed to following through with improvement opportunities identified in this Risk Management publication.

Project Description: HVLCSD follows the regulations set forth by the Federal Occupational Safety and Health Administration, California Occupational Safety and Health Administration, and the California Accidental Release Prevention Program, as detailed in their Risk Management Plan for the Wastewater Reclamation Plant (RMP). To fulfill amendments to the plan made in 2018 HVLCSD will seek out a contractor to install automatic shut-off valves in the chlorine feed lines.

HVLCSD will utilize their partnership with their contracted engineers to adjust their current chlorine treatment operation. This adjustment will involve the addition of two valves at chlorination feed lines.

With the addition of this new safety feature wastewater treatment plant operators, as part of the field operation team, will be trained in the new procedures surrounding the new equipment, and added to the annual training requirement. This RMP will subsequently be amended by this newest improvement.

Other Alternatives: The alternative is to implement an automatic shut-off valve. The lack of a chlorine automatic shut-off valve does not keep HVLCSD's employees and surrounding community as safe as possible against accidental chlorine releases in the event of a natural disaster.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Strategic Plan, Risk Management Plan, staffing to meet goals, Five-year budget plan for Operations and Capital Funds, Contracting agreement, and Wastewater Operations and Maintenance.

Responsible Office/Partners: Hidden Valley Lake Community Services District

Project Priority: High

Cost Estimate: \$46K

Benefits (Losses Avoided): This project would minimize risk and vulnerability of HVLCSD to hazards and protect lives and prevent losses to property and the environment by preventing chlorine gas from threatening the health of people and the environment.

This project would improve HVLCSD's capabilities to plan for/prevent/mitigate hazard-related losses and to be prepared for, respond to, and recover from a disaster event. By installing automatic shut-off valves, chlorine gas leaks will not create, or compound the effects of, a disaster.

This project would help HVLCSD increase and maintain wildfire prevention and protection by keeping chlorine leaks away from common chemicals, ammonia and turpentine, that it can react with and form an explosion.

Potential Funding: In-kind services, Water Use Fees, Capital funds, Federal and State grant funding

Timeline: 12 months

Action 7. *Develop Risk and Resilience Plan (RRP), and Emergency Response Plan (ERP)*

Hazards Addressed: Multi-hazard

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background: In accordance with America’s Water Infrastructure Act (AWIA) of October 23, 2018, Section 2013, HVLCSD must create and certify an RRP and ERP. There is currently no risk assessment for this community water system for malevolent acts, and this must be included in the RRP.

The procedures and protocols of an HVLCSD emergency, that calls upon the utility’s Incident Command Structure (ICS) is only partially completed. The existing Risk Management Plan’s (RMP) focus is solely on the event of a chlorine gas release. There are no documented plans in place for other types of emergencies. The certification deadline for these plans is 2021.

Project Description: The RPP and ERP project will be conducted in three phases, RPP development, development of the ERP document, then finally certification of these documents with the USEPA.

Upon the completion and acceptance of the LHMP, the RPP phase of this project will utilize the risks identified in the LHMP and add threats for malevolent acts. These threats are categorized in the “Baseline Information on Malevolent Acts for Community Water Systems” by the USEPA are also referenced in the AWWA J100-10 “Risk and Resilience Management of Water and Wastewater Systems”. Considerations for contamination, assault, and cyberattacks are amongst the topics for analysis. These three sources will provide guidelines, structure and milestones for the RPP.

The ERP phase of this project will also build upon existing capabilities within HVLCSD. The RMP ERP accepted in 2018 by LC EHS, identifies a straightforward Incident Command Structure specific to a release of chlorine gas. The Emergency Notification Plan (ENP) accepted in 2019 by SWRCB DDW illustrates the method and timelines for customer notification in the event of a water quality emergency. Additional development will be required to identify strategies, resources, plans, and procedures for other types of emergencies. The threats and risks from the RPP will be the building blocks for this response and recovery document, the ERP. Coordination with the Local Emergency Planning Committee (LEPC) and the development of a plan for resources in accordance with the AWWA Water Sector Resource Typing will be key performance indicators in this process.

The AWIA requirements are unique to the community water systems across the nation but can find similarities in Emergency Operations Plan (EOP) documents required for emergency managers in cities and counties, and Emergency Action Plan (EAP) documents for the private industry. As such, HVLCSD will incorporate the framework of California Standardized Emergency Management System (SEMS), and the Federal National Incident Management System (NIMS) when developing these documents.

The document deadlines are RRP 6/30/2021, and ERP 12/31/2021. The scheduled update of these documents (2026) is in line with the five-year LHMP schedule.

Other Alternatives: To not build upon the knowledge gained from the LHMP process and to no adhere to the law established under the AWIA of 2018 would be a disservice to HVLCSD, and could incur enforcement action for non-compliance.

Existing Planning Mechanism(s) through which Action Will Be Implemented: LHMP, Strategic Plan, RMP, ENP, Water Master Plan, Staffing plan, Five-year budget plan for Operations and Capital Funds

Responsible Office/Partners: Hidden Valley Lake Community Services District

Project Priority: High

Cost Estimate: \$.2M

Benefits (Losses Avoided): Minimizing risks and vulnerabilities to the District from hazards. Protection of life, the environment, and property. An increased capability of the District to defend from hazardous events.

Potential Funding: FEMA, Water and Sewer Use Fees, HMGP Funding, In-kind services, and State Funding

Timeline: 12 Months

Action 8. Improve the SCADA system

Hazards Addressed: Wildfire/Flood/Earthquake

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background: The important function of Supervisory Control and Data Acquisition (SCADA) is not currently impermeable to extreme natural weather events. Water and Wastewater processes such as pumping, tank levels and chlorination are managed by three different levels of SCADA: 1) programmable logic controllers (PLCs) in the field, 2) a Human Management Interface (HMI) in a control building, and 3) alarm conditions by field staff.

Key elements of this telemetry architecture are exposed to the open air. In the Valley Fire of 2015, PLCS that provided pumping telemetry were lost at HVLCSD's water source, and flood pumping station. The condition of being unable to pump water to fire hydrants, put the community at risk for catastrophic fire conflagration. The loss of the flood pumping station PLCs also subverted the area's future ability to protect against flooding caused by excessive runoff in the Valley Fire burn scar during the rainy season.

There does not currently exist any redundancy in SCADA, which is most hazardous at the HMI level. A natural event of wildfire or earthquake that causes this single PC to fail would essentially render any alarm visibility inoperable. Also, and perhaps the most hazardous consequence is that the PLCs located throughout the community would no longer be able to communicate to this central repository of data.

The rural nature of this municipality presents unique challenges in the protection against natural hazards. Standard operations and maintenances of the complex, and continually changing technology of SCADA can lead to staffing gaps that leave a level of exposure to HVLCSD and the community it serves.

Project Description: The project to improve the SCADA system would fortify the three levels of control; PLCs, HMI and alarms.

Changes to the controls needed at the PLC level would take advantage of the changes in technology to simplify yet expand functionality. These PLCs would come pre-configured and can be managed remotely.

New PLCs would be protected with earthquake-proof and weather resistant housing that meet the ASCE 7 Standard and NFPA 220 Standard.

Outsourcing the HMI aspect of SCADA removes this PC previously located in a local control building, and places cloud-sourced function and management in its place. In the event there is a physical disruption in service to this local building, the SCADA functionality remains fully functional, as well as the communication with PLCs and staff.

The critical assets throughout Hidden Valley Lake are dependent on a strong and reliable SCADA system to maintain their functionality and operate at the highest level of efficiency. This project is crucial to the success of a protected community, in that it pinpoints every single device that makes the municipality work.

Other Alternatives: An alternative to this project is the continuation of repair/replace activities with current technology. This reactive type of project doesn't resolve the imminent threat of natural disasters, and may not guarantee all equipment is in the best configuration or working order when disaster strikes.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Strategic Plan, Rate Study analysis, Rate increase, Bond issuance, Five-year budget plan for Operations and Capital Funds

Responsible Office/Partners: Hidden Valley Lake Community Services District

Project Priority: High

Cost Estimate: \$1M

Benefits (Losses Avoided): Achieving LHMP Goals of:

- Adequate and reliable sewer and water infrastructure that can withstand a higher level damage from natural disasters, and
- Continued improvements to infrastructure equipment and facilities

Potential Funding: In-kind services, Water/Sewer Use Fees, Capital funds, Federal and State grant funding

Timeline: 24 Months

Action 9. Public Awareness Program

Hazards Addressed: Multi-Hazard

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background: The Community of Hidden Valley Lake has been exposed to multiple natural disasters within the recent past (4240, 4301, 4308, 4344, 4431, 4434), all of which have significantly impacted HVLCS D's ability to continue to provide seamless water & wastewater services. The lack of public awareness and failure to provide advanced notification during the Valley Fire (4240) caused a significant delay to first responders and essential personnel. The inability to cross roadblocks severely jeopardized

HVLCSD's ability to prevent a loss of service of water & wastewater treatment and conveyance. Comprehensive prevention and preparation have been lacking during recent natural disasters and HVLCSD is committed to partnering with regional agencies who all play a part in the public awareness responsibility. The ever increasingly intense and frequent disasters make this mitigation need a high priority.

Project Description: Providing a consistent message, whether it is education opportunities that take place well in advance of an emergency, or timely and consistent messaging immediately prior or during an emergency is the cornerstone to the success of this project. Since the Valley Fire of 2015, numerous improvements have been made. Following this path of improvement are the following partnership activities that HVLCSD envisions:

- Advanced messaging
- HVLCSD website – Create a Community Preparedness page that is consistent with messaging from all regional agencies and a focus on self-reliability. The content will likely rotate on a seasonal basis, based on the potential threat.
- Brochures – Develop literature that provides the consistent message of preparedness, to be made available at public venues, such as the HVLCSD office, and community events.
- Community events – HVLCSD personnel to participate together with other regional agencies to deliver the consistent preparedness message. HVLCSD to continue, but also expand its presence at these events, such as Firewise, Concert on the Green, Community Organizations Active in Disaster (COAD), HVLA Concerts on the Green, etc.
- Emergency messaging
- Nixle alerts – Integrate efforts for a consistent message with the HVLA Nixle alert system, including the establishment of a chain of command.
- Radios – Train HVLCSD personnel on the use and methodology for emergency communication.

Mitigation against the myriad of hazards that HVLCSD faces must include a communication aspect. It is the lynchpin to the success of prevention and protection. Training of staff, having a chain of command, and having a prepared and educated public are the steps that HVLCSD is committed to conducting. Reducing the effects of disasters can be achieved through these education efforts, as well as the improved speed of response.

Other Alternatives: One alternative would be to continue public information and notification that is currently in place, and make no changes. Continuous improvement to a process ensures its continued relevance. In-place communication is a good foundation upon which to apply lessons learned. Information and notification that does not change as these lessons are learned, quickly makes those procedures obsolete, and leaves the community exposed.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Strategic Plan, staffing plan to meet partnering timelines, Memorandum of Agreement to partnership.

Responsible Office/Partners: Hidden Valley Lake Community Services District

Project Priority: High

Cost Estimate: \$.2M

Benefits (Losses Avoided):

- Increase residents' knowledge of potential hazards and activities on how to be better prepared.
- Reduce the risk to life and property.
- Improve communication and coordination of wildfire mitigation efforts

Potential Funding: In-kind services, Grant funding and District budgeting

Timeline: 12 months (And ongoing)

Action 10. Wastewater Treatment Plant Improvements

Hazards Addressed: Freeze & Cold/Extreme Heat/Heavy Rain

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background: Extreme weather poses a threat to the successful operations of the HVLCSD wastewater treatment plant. In the absence of a successfully operating wastewater treatment plant, inundation events are likely, which expose the public to viruses, bacteria, and parasites. Other harmful solids and chemicals in sewage can damage bodies of water that support wildlife.

The tertiary treatment at HVLCSD is designed to produce recycled water, fit for irrigation purposes. The five-step treatment process takes place in five open-air basins. Exposure to heavy rain events can overwhelm these processes and render an impure output, not fit for irrigation.

In extreme heat, the five open-air basins react to temperature fluctuations and can increase pH levels. A higher pH is not in compliance with the treatment plant's waste discharge orders and is an indicator of an impure recycled water product.

In extreme cold, the five open-air basins react to temperature fluctuations with a general "slowing down" of the settling process. Operators must offset this effect in order to keep up with flows in the winter months. This offset has the negative impact of increasing the risk of a sludge overflow. Sludge overflows destroy downstream treatment mechanisms, contribute to sewer system overflows, and essentially result in a loss of function of wastewater treatment. Overworked pumps decrease the useful life of this key infrastructure element. Freezing temperatures have caused frozen pipes which also cause a loss of function of wastewater treatment.

Project Description: A key component of the wastewater treatment process is the de-watering of sludge. One wastewater treatment plant improvement would be to cover the sludge drying beds. While the wastewater treatment plant continues to operate within its design standards, extreme weather events and excessive rains continue to push the plant's capacity. An increase in the amount of pumping power would help mitigate against the increased flow through the plant. An increase in the size of overflow storage also helps manage wastewater in times of high flow. The equalization is basin 1.2M gallons and could be doubled in size. This would allow for the wastewater treatment plant to remain the same, but also be able to manage a wider range of flow, by providing diurnal storage.

Existing Planning Mechanism(s) through which Action Will Be Implemented: RMP, Strategic Plan, Regional Waterboards Waste Discharge requirement 5-00-019, Staffing plan, Five-year budget plan for Operations and Capital Funds

Responsible Office/Partners: Hidden Valley Lake Community Services District/Central Valley Regional Water Quality Control Board

Project Priority: Medium

Cost Estimate: \$6M

Benefits (Losses Avoided): This project will minimize risk and vulnerability of HVLCSD to hazards and protect lives and prevent losses to property and the environment. This project will improve HVLCSD's capabilities to plan for/prevent/mitigate hazard-related losses and to be prepared for, respond to, and recover from a disaster event.

Potential Funding: In-kind services, Sewer Use Fees, Capital funds, Federal and State grant funding

Timeline: 10 Year

Action 11. Update Water Master Plan

Hazards Addressed: Multi-Hazard

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background: The current Water Master Plan for HVLCSD was written in 2001. With the myriad of changes that have taken place both directly (laws, population) and indirectly (weather), over the years since this plan was accepted, not having an updated plan is a vulnerability to HVLCSD.

Legal changes that amplify water agencies responsibilities and change procedures are listed in the California Water Code, California Health & Safety Code, and the California Code of Regulations. A water plan that does not include these changes is at risk of non-compliance and enforcement action.

Community growth and water demands have changed and will require an updated forecast model. The number of residents in Hidden Valley Lake may have increased, but water use patterns may have offset previously projected growth estimates based on the effects of drought in the recent past. HVLCSD must not be unaware of expected water demand and jeopardize the availability of water to their customers or appropriate conservation measures.

Some improvements identified in 2001 may have been realized and should now be listed as a capability of HVLCSD. Backup power has been implemented for the entire wastewater collection system, protecting the community from both expected and unexpected power fluctuations. GHG emissions has been reduced by the creation (2011), and later expansion (2017) of a photovoltaic power source. These projects offer a foundation upon which to build and should not be overlooked.

The increase in the frequency and intensity of extreme weather events will also change improvement opportunities. Federally declared disasters are on the rise, have caused significant damage to HVLCSO, and have made clear several new opportunities for improvement.

Without an update to the Water Master Plan, the mechanism by which HVLCSO remains prepared, active in improvements, and resilient to climate change is lost.

Project Description: Some bills that have been enacted into law, AB685, SB200, AB401, SB998, AB 668, SB606, have significantly changed the manner in which water agencies are allowed to conduct business. As good stewards of this natural resource, and having a commitment to its mission statement, HVLCSO should be including these and other relevant laws in the narrative of the new Water Master Plan. This narrative and adherence will help maintain the agency's regulatory compliance.

The year 2013 has been anecdotally recognized as the last year before a multi-year drought in most of California. Changes in human behavior, procedures and policies of water agencies, and state authority were all dramatically altered during the years following 2013. These altered activities will tangibly affect how HVLCSO views the priorities of improvement opportunities and should be reflected in the new Water Master Plan.

The new Local Hazard Mitigation Plan and a new Water Master Plan are tools that can provide mutual benefit to each other for HVLCSO. Improvement opportunities from the LHMP should parallel the Water Master Plan. Additional funding mechanisms should be added to the Water Master Plan that have become available to HVLCSO with recent influx of local disaster declarations.

The Water Master Plan of HVLCSO helps maintain a sustainable infrastructure for the community of Hidden Valley Lake, but also aligns with the goals of the State, and the Nation. The USEPA states:

"In September 2010, EPA released the Clean Water and Safe Drinking Water Infrastructure Sustainability Policy which described EPA's overall vision and priorities for ensuring the long-term sustainability of water infrastructure and communities throughout the nation. As the Policy was developed, stakeholders strongly emphasized the need to focus on the planning that takes place in the project development phase, before infrastructure solutions are designed and implemented."

A recent analysis of the California Water Master Plan Update 2013 in Maven's Notebook states:

"Three related themes distinguish California Water Plan Update 2013. DWR and other State agencies consider the three themes critical to securing California's water future: 1. Commit to Integrated Water Management, 2. Strengthen Government Agency Alignment, and 3. Invest in Innovation and Infrastructure."

The concepts of planning, alignment and innovation will be incorporated into the HVLCSO Water Master Plan. Remaining active in preparedness, developing appropriate and innovative improvements, with an eye towards resilience and sustainability will only serve to strengthen HVLCSO.

Other Alternatives: Alternatively, HVLCSO could simply align itself to the philosophy and commitments of the State and EPA water sustainability and infrastructure goals. This Resolution may not be specific enough, however, to address the issues and opportunities that are unique to HVLCSO.

Existing Planning Mechanism(s) through which Action Will Be Implemented: LHMP, California Water Master Plan Update 2013, IRWM, Strategic Plan, LAFCO, Staffing plan, Five-year budget plan for Operations and Capital Funds.

Responsible Office/Partners: Hidden Valley Lake Community Services District

Project Priority: Medium

Cost Estimate: 100k

Benefits (Losses Avoided): Improve sustainability and resiliency of HVLCSD. Protect, maintain, and provide safe drinking water and sewer services for existing and future development within the HVLCSD service area.

Potential Funding: FEMA, Water and Sewer Use Fees, HMGP Funding, In-kind services, State Funding

Timeline: 12 months

Climate Change Actions

Action 12. Develop HVLCSD Climate Action Plan

Hazards Addressed: Climate Change

Goals Addressed: 1, 2, 3, 6

Issue/Background: In accordance with SB379, local governments of California are required to plan for climate change by integrating considerations into a General Plan or adopting a separate Climate Action Plan. As water/wastewater utility, HVLCSD will adopt a separate Climate Action Plan. The California Governor's Office of Planning Research (OPR) provides recommendations for communities to satisfy this requirement which remain consistent with the messaging in the LHMP guidance materials, the California State Hazard Mitigation Plan, and the California State General Plan. Climate change requirements must be implemented by the next LHMP update.

Project Description: The HVLCSD Climate Action Plan project will meet this state requirement and receive guidance from the California General Plan guidelines. This plan will target greenhouse gas emissions (GHG), inventory these emissions and establish reduction targets. Energy expenditure at this water/wastewater utility includes pumping for both water conveyance and wastewater collection. Energy consumption during the process of wastewater treatment has been sourced by photovoltaic energy since 2012. Policies and measures will be developed, and the plan will include the tasks necessary to monitor and verify emissions reduction results.

Other Alternatives: The alternative of not developing a climate action plan puts HVLCSD in a position of non-compliance, and therefore at risks of enforcement actions and penalties.

Existing Planning Mechanism(s) through which Action Will Be Implemented: LHMP, CAP, Water Master Plan, Staffing plan, Five-year budget plan for Operations and Capital Funds

Responsible Office/Partners: Hidden Valley Lake Community Services District

Project Priority: Medium

Cost Estimate: \$.2M

Benefits (Losses Avoided): Improve sustainability and resiliency of HVLCSD. Ensure adequate and reliable sewer and water infrastructure that can withstand a higher level of damage from natural disasters.

Potential Funding: FEMA, Water and Sewer Use Fees, HMGP Funding, In-kind services, and State Funding

Timeline: 12 Months

Dam Failure, Flood, Localized Flood, Levee Failure Actions

Action 13. I & I Program

Hazards Addressed: Flooding, Localized Flood, Heavy Rains and Storms/Earthquake

Goals Addressed: 1, 2, 3, 5, 6

Issue/Background: The Hidden Valley Lake Community Services District (HVLCS D) has first-hand knowledge of the vulnerabilities it faces during extreme weather events. In the past three years, three disaster declarations, 4301, 4308, and 4434 have caused significant damage to the sewer collections system and the Wastewater Treatment Plant. This damage is reoccurring to the same equipment. With the quick succession of storms, HVLCS D has been able to work with engineering consultants to conduct research and analysis, as well as affect some incremental changes within the sewer infrastructure. It is apparent however, that a larger scale project effort is needed to overcome the cycle of repetitive loss.

A Sewer System Overflow is a critical vulnerability that HVLCS D is committed to addressing. Additionally, the inundation effect of Infiltration and Inflow from the sewer lines into the Wastewater Treatment Plant can cause of loss of function for this utility.

When the sewer system overflows onto land, the public as well as the local ecology, is exposed to dangerous bacteria, viruses, and parasites. While operating within its design capacity, the sewer collection system has overflowed onto land on multiple occasions. During storm events as seen in disasters 4301 4308 and 4434, stormwater is entering the sewer collection system, and pushing this collection system, as well as the wastewater treatment plant beyond its capacity.

The community of Hidden Valley Lake is located in an Earthquake Hazard Zone of “Very High”, which is the highest rating the EPA provides. Ground displacement, liquefaction, lateral spreading and settling are all impacts that could significantly interrupt wastewater collections and wastewater treatment.

Project Description: This project will reduce the amount of stormwater entering the sewer collection system, to aid in its design function of sewer treatment only, not stormwater. The Infiltration & Inflow (I & I) project will take the results of previous years research and analysis and enact upon the plan that will reduce the flow of effluent to the wastewater treatment plant.

The Infiltration & Inflow Reduction project is divided into two categories that correspond to the name of the project:

Infiltration occurs when groundwater seeps into sewer lines. The repair/replacement of sewer lines susceptible to infiltration is one category of this project that will reduce the amount of stormwater entering the system and consequently reduce the threat of Sewer System Overflows and Wastewater Treatment Plant inundation.

Inflow occurs when rain falls directly into sewer lines through openings such as manholes or cleanouts. Manhole lid replacement is the second category of this project that will also reduce the amount of

stormwater entering the system and consequently reduce the threat of Sewer System Overflows and Wastewater Treatment Plant inundation.

In recognition and commitment to the Governor's Executive order N-10-19, this resilience will be achieved through the most contemporary and innovative means that meet a multitude of benefits, such as cost effectiveness, and the long-term sewer collection needs of the community.

Other Alternatives: An alternative of Equalization Basin expansion was introduced and fully vetted. The extraordinary time and cost of this expansion to include permitting requirements, did not provide a sufficient long-term solution by simply treating the result (higher influent) than the cause (collections system I&I).

Existing Planning Mechanism(s) through which Action Will Be Implemented: Master Storm Drainage Plan, Strategic Plan, Regional Waterboards Waste Discharge Requirements 5-00-019, Five-year budget plan for Operations and Capital Funds

Responsible Office/Partners: Hidden Valley Lake Community Services District

Project Priority: High

Cost Estimate: \$1M

Benefits (Losses Avoided): Losses avoided:

- Threat to public safety (Sewer System Overflow)
- Loss of function (Wastewater Treatment Plant inundation)

Potential Funding: In-kind services, Sewer Use Fees, Capital funds, Federal and State grant funding

Timeline: 31 Months (and ongoing)

Action 14. Update and Implement Stormwater Master Plan

Hazards Addressed: Localized Flooding and Levee issues

Goals Addressed: 1, 2, 3, 5, 6

Issue/Background: In 2000, resulting from a partnership of local agencies (HVLCSD, HVLA, Lake County Flood Control, and Water Conservation District) a Master Storm Drainage Plan was published. There have been no updates to this plan since its inception. Some improvements to HVLCSD infrastructure have taken place and have become a capability for the utility. Joint efforts between agencies to achieve improvements, however, have proven to be more of a challenge. Localized flooding has increased in frequency and intensity in recent years.

The need for improvement has consequently increased. The damage resulting from these storms impact the local watershed, flood management, residents, roads, and infrastructure. For HVLCSD, unabated stormwater inundates sewer lines, and the wastewater treatment plant, and shortens the useful life of pumps

needing to move this unanticipated volume of stormwater. Inundation has caused sewer system overflows, which have likely drained into the waterways of the US. At the wastewater treatment plant, inundation has caused an interruption in the processing of waste.

Stormwater is of great concern to HVLCSO as our infrastructure is clearly affected by localized flooding events. Sewer system overflows are negatively impacting the watershed, and flood management teams cannot be successful under the current environment. Flood management teams are unable to attend to flood control structures and appurtenances. Repetitive loss to homeowners can create insurance consequences for homeowners. Roads and traffic control in the community is a safety and administrative concern for the homeowner's association and its members. Jurisdictional and fiscal roadblocks remain in place while the threat of extreme weather increases.

Updating the Master Storm Drainage Plan of 2000 to reflect the current issues arising from atmospheric river events and implementing the new plan would be a major way to avoid further damage to the community and HVLCSO's infrastructure and operations. This new plan would have to involve HVLCSO, Hidden Valley Lake Association (an HOA), and Lake County Flood Control and Water Conservation District.

Project Description: The Update and Implement Stormwater Master Plan project would clearly start with a review of the 2000 plan. Removing improvements and new capabilities from the plan would help pave the way to a renewed focus on the improvement opportunities within the community. Net present value of projects and newer technologies applied to these projects would need to be applied to these remaining improvement opportunities.

The determination of urgency may need to change based on the changing weather patterns, which may also change the scope of each project. Cooperation by all vested agencies will be highlighted as a key success factor in the plan, and its projects. This cooperation would include input, active participation, and fiscal commitment in the form of budget line items for all agencies, and these budgets line items should mirror each other. This mutual commitment cannot be overstated and is likely to require Memorandums of Agreement to move forward.

Salient projects will likely be:

- Financial solution to empower project implementation
- A drainage solution from the collection point for the entire community, adjacent to the Putah Creek levee.
- Improved stormwater drainage throughout the community
- Maintenance plan complete with roles, responsibilities, and timelines.
- Potential funding may require the election of a lead agency in concert with the aforementioned Memorandums of Agreement.

Other Alternatives: No update to stormwater plans and no change in constant reaction to disaster declarations, perpetuating a cycle of applications for emergency grant funding to solve urgent problems and not systemic issues.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Master Storm Drainage Plan (2000), Strategic Plan, staffing plan to meet partnering timelines, Memorandum of Agreement to Partnership, Service Agreement Contract, Five-year budget plan for Operations and Capital Funds.

Responsible Office/Partners: Hidden Valley Lake Community Services District/Lake County Water Resources Department/Hidden Valley Lake Association

Project Priority: High

Cost Estimate: \$10M

Benefits (Losses Avoided): This project will minimize risk and vulnerability of HVLCSD to hazards and protect lives and prevent losses to property and the environment. This project will improve HVLCSD's capabilities to plan for/prevent/mitigate hazard-related losses and to be prepared for, respond to, and recover from a disaster event. This project will improve HVLCSD's resiliency to flooding.

Potential Funding: FEMA HMGP 404 and 406 Grant Funding, Water and Sewer Use Fees, In-kind services, County Funding, tax base establishment, and State Funding.

Timeline: 10 years

Action 15. *Establish Cross Functional Committee and Address Levee & Stream Issues*

Hazards Addressed: Levee failure/Flood

Goals Addressed: 1, 2, 3, 5, 6

Issue/Background: Difficulties in verifying ownership of the levee are driving the District to create a cross functional committee that will determine its sole proprietor. Five other key vulnerabilities cannot be addressed until a consensus is reached on ownership as well as roles and responsibilities amongst all beneficial parties.

- Erosion – Rodent tunneling has been observed in the Putah Creek levee. Extreme rain events have become more frequent, and occur with higher intensity. The aggregate effect of these changes to the levee has become a threat to its integrity.
- Sediment – The multiple rain events that have resulted in federally declared disasters, coupled with the multiple wildfire disasters result in significant sedimentation in creekbeds surrounding Hidden Valley Lake.
- Drainage – The flood detention basin located in the Southeastern most section of the Putah Creek levee, is also the lowest point within the community. Drainage of stormflow from the community does not currently have an effective path back to Putah Creek.
- Maintenance – Preventative activities have not been fully vetted, and therefore prevention has not reached its full potential.
- Certification – The levee does not hold certification for a 100-year flood event.

Project Description: This project has many facets, but must begin with the determination of ownership. From this beginning, agreements can be developed to address the most salient of vulnerabilities. Each of

the three required entities in this project, HVLCSD, HVLA, and Lake County Water Resources Department will have a unique vested interest in participating in the various mitigation activities.

- Erosion – In concert with the appropriate regulatory and permitting agencies, tunnel eradication, and possible levee restoration (riprap) can help prevent a breach of the levee.
- Sediment – A process to restore creek depth and width will again likely involve all agencies with a vested interest, and the corresponding permitting entity. Removing sedimentation will deepen the creek, making the levee walls more effective and narrowing creek flow headed downstream.
- Drainage – Resolving this complex issue of stormwater flow to Putah Creek, despite the presence of a levee will require cooperation and coordination with all entities, and will have a profoundly positive effect on the constituents of these entities. Drainage can be categorized as both stormflow management throughout the community, and stormflow management at the flood control station. Taking control and responsibility for the maintenance and improvements of both categories, is likely to require the formation of a Special Assessment District. A vote of landowners within the boundary of this Special Assessment District will determine the success of this project. Constituents will need to make a fiscal commitment to infrastructure improvements, and the responsible agency will be empowered to act upon this new formation.
- Maintenance – Monitoring levee integrity and fuels mitigation are a few examples of how ongoing activities can help prevent the backlog of issues currently facing this community.
- Certification – In concert with engineering research, and support from the Army Corps of Engineers, a certification of the Putah Creek levee can support the resilience requirement of the National Flood Insurance Rate Map.

All five of these key levee issues can benefit HVLCSD by providing a secure environment for existing infrastructure. The expertise of HVLCSD personnel to flood protection and mitigation will lend support to the solution.

Other Alternatives: Not identify the proprietor of the levee and leave it unchecked, potentially leading to localized flooding and disrupting regular operations.

Existing Planning Mechanism(s) through which Action Will Be Implemented: LHMP, Memorandum of Agreement, Mutual Aid, Strategic Plan, LAFCO, CSDA, SAD, Master Storm Drainage Plan, Water Master Plan, Staffing Plan, Five-year budget plan for Operations and Capital Funds

Responsible Office/Partners: Hidden Valley Lake Community Services District/Lake County Water Resources/Hidden Valley Lake Association

Project Priority: High

Cost Estimate: TBD

Benefits (Losses Avoided): Protection of life and property by reducing flood likelihood, a thriving riparian environment, a naturally maintained ecosystem, a stronger District that is prepared, able to respond, and recover from disastrous events, and reduced localized flooding/increased resiliency to flooding .

Potential Funding: FEMA, Water and Sewer Use Fees, HMGP Funding, In-kind services, State Funding, Special Assessment District, Storm Control Use Fees

Timeline: TBD

Action 16. Chlorine Analyzers

Hazards Addressed: Heavy Rain & Storms

Goals Addressed: 1, 2, 3, 5, 6

Issue/Background: Hidden Valley Lake Community Services District (HVLCSO) treats wastewater from Hidden Valley Lake, California by several processes, one of which utilizes chlorine gas. This process is highly regulated because of the dangerous nature of chlorine gas. HVLCSO has in place a Risk Management Plan (RMP) for their wastewater reclamation plant.

In the Operations & Maintenance portion of the plan (Appendix E), the mechanisms by which chlorine is introduced is discussed and illustrated. A single chlorine analyzer located in a room several hundred feet from the actual chlorine contact basin, is responsible for maintaining a chlorine residual to a 6048 cubic foot body of water.

During the heavy rains of 2017 and 2019, which resulted in four federally declared disasters (4301, 4308, 4431, 4434), this single chlorine analyzer was unable to keep pace with the flow into the basin. The advent of more frequent and more intense storm events has revealed a risk of wastewater treatment plant loss of function.

Project Description: The chlorine analyzers project will improve the design of the wastewater treatment plant to better manage chlorination during periods of high flow. The chlorination basin is subject to influences of the upstream processes of wastewater treatment. Disinfection by chlorination is the final step before this tertiary treatment process becomes recycled water and is ready for irrigation.

Since maintaining a chlorine residual is a function of time and distance, the timely injection of chlorine is the key success factor in maintaining a chlorine residual that meets the Wastewater Discharge Requirements (WDR 5-00-019) of HVLCSO. To offset any disturbances in upstream processes, and to more quickly react to rain events in this open-air basin, two chlorine analyzers will be placed at the beginning and end of the chlorine contact basin. These chlorine analyzers will take the place of the single chlorine analyzer located hundreds of feet away from the basin.

The physical location of these chlorine analyzers will provide the benefit of a flow paced chlorination system. Incorporating this equipment into the normal operations of the wastewater treatment plant will greatly reduce the need for wasteful response activities that require an excess of chemicals and impose administrative complexity. Meeting the exact need of the wastewater treatment plant's disinfection needs instead of reacting to excessive flow, will make for a more resilient and sustainable process.

Other Alternatives: While many alternatives to address the impacts of heavy rain & storms exist for the wastewater treatment plant, the primary goal for these alternatives is more responsive in nature, and exorbitantly expensive. Recently identified alternatives include, increasing the size of the 1.2 M gallon concrete lined EQ basin, covering all open-air basins in the treatment process, or creating a third basin that provides raw sewage storage or recycled water storage, based on the season. Instead, this project to improve

the efficiency of operations with strategically placed chlorine analyzers, is much more cost-effective, and sustainable.

Existing Planning Mechanism(s) through which Action Will Be Implemented: RMP, LHMP, Strategic Plan, Five-year budget plan for Operations and Capital Funds

Responsible Office/Partners: Hidden Valley Lake Community Services District

Project Priority: Medium

Cost Estimate: \$100k

Benefits (Losses Avoided): Improve sustainability and resiliency of HVLCSD

Ensure adequate and reliable sewer and water infrastructure that can withstand a higher level of damage from natural disasters

Potential Funding: In-kind services, Water Use Fees, Capital funds, Federal and State grant funding

Timeline: 6 months

Action 17. Dam Inundation Mitigation

Hazards Addressed: Dam Failure

Goals Addressed: 1, 2, 3, 5, 6

Issue/Background: HVLCSD is at risk of severe infrastructure damage in the event of a complete dam breach.

As part of their Emergency Action Plan (EAP), the Hidden Valley Lake Association (HVLA) recently conducted a dam inundation study of the Coyote Creek dam in the community. This study is required by the California Division of Dam Safety and is a key element of the EAP. The 3500 AF lake has a typical water surface elevation of 1082 feet.

Using widely accepted modelling equations, a complete breach of this dam will flow at approximately 250,000 cubic feet per second (CFS) and will travel to the south and east areas of the Hidden Valley Lake community. The pressure of this water will decrease as the water flows to the southeast, but the water will have a velocity of 20 feet per second (fps) at the initial point of failure.

This initial velocity will cause an infrastructure failure at the fire hydrants located in the immediate vicinity. A single hydrant failure will cause a loss of pressure in an entire pressure zone and will risk air and vacuum in the otherwise pressurized drinking water conveyance system. Tanks supplying drinking water to this zone will quickly be depleted, and result in a loss of function for this zone.

The dam inundation simulation has calculated the speed in which this wall of water will travel through the community and at what height. Within the first 41 minutes of the initial dam breach, a 6-foot wall of water

will have flooded multiple elements of the sewer collection system within the southeast portion of the Hidden Valley Lake community. Approximately 100 manholes, and 4 lift stations would be affected by this inundation event. Direct inflow of this water into the sewer system will cause the sewer collection system to overflow, and deposit sewerage onto land, and likely into bodies of water. It is believed that although the dam breach will travel primarily across the top of land, these particular elements of the sewer system (manholes, lift stations), serve as holes on the top of the land into the underground sewer system, and are therefore subject to flooding and overflow.

Project Description: The dam inundation project will help reduce the effects to the HVLCSO infrastructure in the event of a dam breach.

A key component of mitigation is the inclusion of HVLCSO into the HVLA EAP, communication portion. In the event of a dam emergency, the notification process will be executed with the first few seconds or minutes of detection. Crucial mitigation steps to protect infrastructure can be taken by HVLCSO staff that will significantly improve the effects of this inundation to the drinking water system. Before, or immediately following damage to the fire hydrants in the direct path of this water, staff can isolate the loss of water at the water storage tank. Preventing a complete loss of water in this pressure zone prevents the loss of chlorine residual, which would have led to the lack of safe drinking water.

Traditional manholes lids are not airtight, and the mitigation activity of replacing manholes lids with newer airtight technology within the inundation zone will help reduce the effect of water reaching the sewer system, and overflowing. A current capability of HVLCSO is the manhole lid replacement project. Over time and within budget, manhole lids are being replaced. To protect against the effects of dam inundation, this activity would place a higher priority on replacement activities downstream of the dam. This renewed priority must incorporate a timeline more aggressive than the current activity, and more of a fiscal commitment.

The lift stations are collection points of the sewer system. They are installed at ground level, consisting of two submersible pumps, a wet well, and a concrete slab. All lift stations in Hidden Valley Lake are equipped with generators. To protect against the damaging effect of a dam breach, a significant retrofit of this equipment would be in order. To withstand the wall of water, a floodwall around the lift station and an extension of the wet well would be required. The generators would also need to be raised to a height above base flood elevation, as indicated in the “Pumping Station Improvements in Floodplains and Floodways” article found at www.ncsafewater.org

Other Alternatives: An alternative to this project may be to take no action. The Coyote Creek (Hidden Valley) Lake Dam Inundation Study states:

“The theoretical flooding from a failure of the Coyote Creek Dam presented in this document far exceeds any recorded, historical flooding in this area.”

Existing Planning Mechanism(s) through which Action Will Be Implemented: EAP(HVLA), RPP(HVLCSO), ERP(HVLCSO), LHMP, Strategic Plan, Storm Master Drainage Plan (HVLA, HVLCSO, Lake County Water Resources), Staffing plan, Five-year budget plan for Operations and Capital Funds

Responsible Office/Partners: Hidden Valley Lake Community Services District/Hidden Valley Lake Association

Project Priority: Low

Cost Estimate: TBD

Benefits (Losses Avoided): Provide protection and reduce damages to HVLCSD critical infrastructure and services and minimize disruption. Establish and maximize cross-functional and multi-agency cooperation and use of shared resources

Potential Funding: FEMA, Water and Sewer Use Fees, HMGP Funding, In-kind services, and State Funding

Timeline: TBD

Drought and Water Supply

Action 18. Rescind the Water Moratorium

Hazards Addressed: Drought & Water Supply

Goals Addressed: 1, 2, 3, 6

Issue/Background: In 2014 and 2015, severe drought conditions pushed the State Water Resources Control Board, Division of Water Rights (SWRCB DWR) to issue curtailments of diversions by more junior water right holders to protect the valid prior rights of downstream right holders. In October 2014, SWRCB Division of Drinking Water issued Compliance Order no. 02_03_14R_004 to HVLCSD. The primary directive of this order was that “[HVLCSD] shall not make any additional service connections to its water system”. Colloquially known as “the moratorium”, this Compliance Order continues to be in effect. SWRCB DWR contends that HVLCSD is in violation of the California Health and Safety Code Section 116555 because of drought conditions and senior water right demands. Section 116555 states that “[a water system] shall ensure that the system does...the following...Provide a reliable and adequate supply of pure, wholesome, healthful, and potable water.”

The Compliance Order was predicated on the notion that the District was not providing a reliable and adequate supply of water due to the curtailment of diversion under the District’s water rights due to drought conditions, and potential demands from downstream diverters having prior rights.

There is an economic hardship that has ensued from the moratorium issued over five years ago as it curtails HVLCSD’s ability to adequately maintain its infrastructure and fully meet its mission statement “To provide, maintain and protect our community’s water”. The cost of a water meter helps cover HVLCSD’s debt service to the California Infrastructure and Economic Development Bank as well as the on-going repair, replacement, and maintenance of the water system. No longer successful in its mission, the HVLCSD cannot adequately protect, maintain, and certainly not provide water under this moratorium.

Larger scale economic effects of this moratorium have reached individual lot owners, and the county tax assessor’s office. Lot owners that are unable to build, yet still subject to homeowner association dues, is yielding a negative return on investment on the land. Consideration to sell an unimproved lot must bear the market effect of this compliance order. The market effect for these lots is that the owners must sell at a significant reduction in value than prior to the moratorium. Selling at a loss affects the property taxes for the county. Lake County is now enduring a hardship with less tax revenue.

Project Description: The request to the SWRCB to rescind the Compliance Order includes data that HVLCSD is not in violation of the California Health and Safety Code Section 116555. If successful in its request, it will protect the community from actions related to drought curtailments.

In November of 2001 the SWRCB issued License 13527A (Application 30049A) allowing annual diversion of 651 acre-feet and Permit 20770B (Application 30049B) allowing annual diversion of up to 1,659 acre-feet on behalf of HVLCSD. These rights allow for the diversion of underflow of Putah Creek by means of its Grange Road and ag wells.

Since HVLCS D’s Grange Road wells are adjacent to Putah Creek, the source of this water has been in question. HVLCS D has undertaken a subterranean stream evaluation to evaluate the geologic and hydrologic characteristics of the Coyote Basin and the District’s Grange Road wells. The evaluation concludes that Grange Road Well 4 and the Ag Well are not located in a subterranean stream. The report further states that the Grange Road Well 4 and Ag Well produce percolating groundwater and are not subject to the SWRCB’s water right permitting authority.

The subterranean stream evaluation revealed that while the wells were in close proximity to Putah Creek, that there is a lack of a well-defined channel. The wells therefore do not meet the four-part criteria as set forth in SWRCB Decision 1639 for what constitutes a subterranean stream.

The Compliance Order requires the District “...requires you to...secure a reliable long-term supply of water.” Percolating groundwater from the Coyote Valley Basin is a secure long-term supply. The District’s annual Coyote Valley Basin Groundwater Reports demonstrate that groundwater is available at the District’s wells under all hydrologic conditions, and that the source is not subject to curtailment by the SWRCB. Further, the capacity of the District wells is more than sufficient to meet peak and annual water demands.

The Coyote Valley Basin has long since been defined as a low-priority basin by the California Department of Water Resources Bulletin 118. Groundwater monitoring activities over several decades have also underscored the robust nature of the Coyote Valley Basin. The HVLCS D’s subterranean evaluation is currently under review by the SWRCB DWR. The results of the SWRCB DWR analysis will dictate the next steps of this project.

Other Alternatives: Other alternatives to this project would adversely affect the costs of services to all ratepayers of HVLCS D. Drilling a new well or obtaining a new water right permit to use water stored in Hidden Valley Lake for meeting municipal demands are two extremely expensive potential projects. Also present in the California Water Code Section 106.3 is that “event human being has the right to safe, clean, affordable and accessible water” These alternate projects do not meet the “affordable” aspect of this law.

Existing Planning Mechanism(s) through which Action Will Be Implemented: LHMP, Strategic Plan, Water Master Plan, Staffing plan, Five-year budget plan for Operations and Capital Funds

Responsible Office/Partners: Hidden Valley Lake Community Services District

Project Priority: High

Cost Estimate: \$1M

Benefits (Losses Avoided): Continued improvements to infrastructure, equipment, and facilities. Improve sustainability and resiliency of HVLCS D

Potential Funding: Hidden Valley Lake Community Services District

Action 19. Hexavalent Chromium

Hazards Addressed: Drought & Water Supply

Goals Addressed: 1, 2, 3, 6

Issue/Background: Hexavalent Chromium (CR6) is a known carcinogen when present in the air. Concentrations of CR6 in drinking water has recently been under scrutiny in the state of California. It is present in the Coyote Valley aquifer due to the presence of serpentine rock formations in the valley. The water source for HVLCSD is located within this valley. This naturally occurring mineral is imparted into the water that is served to the Hidden Valley Lake community.

It has been observed that higher concentrations have been detected during the drier months of the year. During periods of drought when the aquifers are not as fully replenished, and water shortages last across multiple summers, the CR6 content in the water could reach levels that are of a health concern to members of the Hidden Valley Lake community.

A 10-fold reduction in the maximum contaminant level (MCL) was recently imposed on water agencies in California. The 10 ppm MCL was met with vigorous opposition and was temporarily rescinded. The State Water Resources Control Board (SWRCB) plans to re-establish an MCL to protect Californians at a level more aggressive than the EPA which is set at 100ppm.

For Hidden Valley Lake, the threat of drought coincides with the health concerns of higher levels of CR6. The primary well providing drinking water to the community currently reaches CR6 levels near 30ppm in the summer months.

Project Description: Rural water districts like HVLCSD will need to treat drinking water to the MCL that becomes the new standard. The technology of CR6 treatment continues to evolve on the eve of the new MCL requirement. HVLCSD will need to evaluate the best available treatment plan that keeps their ratepayers safe, while not over burdening water use costs to these ratepayers.

Ion exchange is a more mature technology that is very effective at removing CR6 but leaves a toxic waste product that is costly to remove. Another technology utilizing the sacrificial anode concept incorporates stannous chlorine in an electrically charged environment to alter the composition of CR6 to CR3. This compound is not hazardous yet leaves flocculent build-up in water tanks over time.

HVLCSD has been pro-active in researching existing and emerging technologies to find the most beneficial solution to ratepayers. A pilot program for the stannous chloride solution was recently conducted at HVLCSD that helped discover the side-effect of CR3 in a production environment.

Meeting the threat of drought-induced water contamination with the best treatment solution is of high priority to HVLCSD and will need to be completed in a timely manner.

Other Alternatives: There are several alternative methods to CR6 treatment. The EPA has set the following "best available technologies" for the removal of chromium (total) to below 0.1 mg/L or 100 ppb: a) coagulation/filtration, (b) ion exchange, (c) lime softening, and (d) reverse osmosis membrane processes.

Part of the discovery process of this project will be to determine the best solution for the anticipated Californian MCL

Existing Planning Mechanism(s) through which Action Will Be Implemented: SWRCB regulations compliance, Strategic Plan, Water Master Plan, Five-year budget plan for Operations and Capital Funds

Responsible Office/Partners: Hidden Valley Lake Community Services District/State Water Resources Control Board

Project Priority: Medium

Cost Estimate: \$2M

Benefits (Losses Avoided): Losses avoided: Threat to public health

Potential Funding: Grant funding prop1 Capital funding, water/wastewater budget line items

Timeline: 60 Months

Earthquake Actions

Action 20. Earthquake Vulnerability Assessment and Retrofit

Hazards Addressed: Earthquake

Goals Addressed: 1, 2, 3, 6

Issue/Background: Hidden Valley Lake Community Services District is in a “Very High” Relative Earthquake Hazard according to the United States Geological Survey (USGS) Seismic Hazards Map. HVLCSD is also adjacent to five named fault lines, Collayomi, Cobb Mountain, Konocti Bay, Berryessa, and Hunting Creek Faults. One of the largest geologic features in Lake County, Clear Lake, has a large volcanic field associated with it, with a current threat potential of ‘High’ as designated by the USGS. With all these seismic factors, Lake County, and Hidden Valley Lake by extension, is in a very geologically active area, and at risk of a significant earthquake event.

The nature of underground water and wastewater infrastructure, unless designed otherwise, is a stiff scaffolding of air and water filled pipes underground with scattered access points along the surface. The underground infrastructure is brittle and can break with large jarring movements or slowly weaken over repeated small tremors. In areas of liquefaction, air filled underground infrastructure has been known to ‘float’ as the land settles and sinks. Above ground infrastructure at HVLCSD can also be a vulnerability, water tanks and tanks without proper anchoring, and the wastewater treatment plant that could crack and leak. Infrastructure resilience can be greatly improved, in both areas of drinking water and wastewater.

The infrastructure of HVLCSD was built between fifty and twenty years ago. Given the increasing nature of natural hazards, the proximity to active fault zones, and the ever-changing building standards HVLCSD needs to assess the seismic vulnerability of their assets.

Project Description: Assessment will involve the application of American Society of Civil Engineers (ASCE) Standard 7-16 and rehabilitation Standard 41-06 to HVLCSD’s buildings and other structures. The results of this assessment will shape the remaining scope of the Earthquake Vulnerability Assessment and Retrofit project. Given the wide span of structure age (from 20-50 yrs), the detail of mitigation activities will be varied. The unique nature of the community’s geography and geology are considerations that will add complexity to both the assessment and the mitigation.

An existing capability of HVLCSD is its participation in the California-wide mutual aid organization called the California Water and Wastewater Agency Response Network (Cal WARN). This membership shall remain and be available in the possible event of an earthquake. Assistance from other water or wastewater agencies helps the speed of recovery from a catastrophic event, and fits into the framework of California Standardized Emergency Management System (NEMS), and the Federal National Incident Management System (NIMS).

Assessment results will also be integrated into the state mandated RRP (Risk and Resilience Plan), and ERP (Emergency Response Plan) for water and wastewater agencies, as well as the HVLA EAP (Emergency Action Plan) and the Lake County Operations of Emergency Services (OES). Agencies will also work together to maintain a consist message to the public is regards to preparedness and response.

Other Alternatives: History has proven that earthquakes are usually catastrophic in nature, and really do not offer an alternative to being prepared.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Strategic Plan, staffing plan to meet partner timelines, Service Agreement Contract, Five-year budget plan for Operations and Capital Funds.

Responsible Office/Partners: Hidden Valley Lake Community Services District

Project Priority: High

Cost Estimate: \$5M

Benefits (Losses Avoided): This project would improve the sustainability and resiliency of HVLCSD. This project would help protect, maintain, and provide safe drinking water and sewer services for existing and future development within the HVLCSD Service area. This project would ensure adequate and reliable sewer and water infrastructure that can withstand a higher level of damage from natural disasters. This project would improve HVLCSD's capability to plan for/prevent/mitigate hazard-related losses and to be prepared for, respond to, and recover from a disaster event. This project would increase HVLCSD and community outreach, education, and awareness of risk and vulnerability to hazards and promote preparedness and self-responsibility to reduce hazard-related losses.

Potential Funding: FEMA HMGP 404 Grant Funding, Water and Sewer Use Fees, In-kind services, and State Funding.

Timeline: 48 months

Wildfire Actions

Action 21. Fuel Mitigation

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background: The community of Hidden Valley Lake is a densely populated area, juxtaposed with areas of expansive forests, grasses, and rugged terrain. The wildland urban interface (WUI) is defined as a place where “humans and their development meet or intermix with wildland fuel”. The devastation of the 2015 Valley Fire to Hidden Valley Lake highlighted its vulnerability to wildfire. Seventy-three homes were lost, and extensive damage to HVLCSD infrastructure was sustained.

In the years following the Valley Fire, Lake County experienced several wildland fire events that resulted in several Federally declared disasters. To date, sixty percent of Lake County has burned. The frequency and intensity of these fires demand a change in preventative measures. Seasonally, “Diablo wind” patterns traverse northern California mountain ranges, including the Mayacama range, in which Hidden Valley Lake is situated.

These recent catastrophic natural events have underscored the destructive role that vegetation plays in the threat to public safety, and the threat to critical infrastructure.

Project Description: The fuel mitigation project will help HVLCSD and the community of Hidden Valley Lake take preventative action against wildfire and its spread.

With seasonal winds exacerbating the arid conditions of Spring and Fall, the timing of this project will be the cornerstone of its success. In accordance with the National Firewise Communities Program (NFCP), the fuel mitigation project will develop and implement a defensible space around critical and essential facilities. To continue to be able to provide water to fire-fighters, and safe drinking water to the community, the project would identify and maintain two zones of defensible space, making a 100’ perimeter around these facilities, as described in the CalFire readyforwildfire.org publication.

The implementation phase of this project will also address continuous improvement opportunities such as landscaping efforts with fire retardant plant species, possible structural improvements such as replacing an earthen basin with a concrete-lined basin, and erecting masonry buildings to protect key infrastructure.

Other Alternatives: Implementing continuous improvement projects prior to the fuel mitigation project is an option, but this would not provide tangible evidence of the effectiveness of the NFCP and CalFire guidelines. The cost benefit of concrete-lined basin, and masonry may be best vetted by implementing fuels mitigation first.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Strategic Plan, staffing to meet partnership timelines, Service Agreement contract, Five-year budget plan for Operations and Capital Funds

Responsible Office/Partners: Hidden Valley Lake Community Services District

Project Priority: High

Cost Estimate: \$0.4 million

Benefits (Losses Avoided): Fuels reduction to reduce wildfire emissions damage and loss to wildfires. Losses include Critical facilities That serve a vast public of a potential critical need of safe drinking water/Protecting the downstream user from harsh environmental impacts. Forest damage and loss to wildfires, insects and disease, or development can result in large CO2 emissions.

Potential Funding: Capital funding, water/wastewater budget line items and grant funding.

Timeline: 6 Months, and ongoing

Action 22. Add/Improve/Fortify Fire Hydrants

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background: Hidden Valley Lake is located in an “Elevated” fire threat zone as illustrated in the CPUC Fire-Threat Map of 2019. In this densely populated area, on the cusp of wildland fuels, the potential for catastrophic wildfire has been realized on several occasions in the recent past. The speed and extent of wildfire is largely dependent of the capabilities of the fire hydrants available to firefighters. Once a fire reaches a populated area, hydrants stand in the way of that fire reaching homes and families. Recent standards adopted by NFPA in 2016 (#24, #25) encourage water companies to optimize fire flow, provide reliable equipment, and to reduce distance between hydrants as feasible in order to provide the most protection against wildfire. The hydrants in Hidden Valley Lake were implemented long before these standards were developed and are a vulnerability to life and property within the community.

Project Description: The hydrant project would replace 350 standpipe, wet barrel, single port wharf hydrants with dry barrel, multi-port standard fire hydrants.

- **Reliability** - A dry barrel hydrant is more resistant to damage than a wet barrel. Due to its internal composition, there is no water under pressure in a dry barrel hydrant until it is activated. This eliminates the risk of freezing in cold weather, and extensive repair in the case of a traffic accident. Replacing a standpipe hydrant with a more traditional hydrant also supports the effort to increase reliability, as standard hydrants are significantly sturdier. This hydrant improves reliability and is more likely to be available when fire-fighters need them.
- **Fire flow** – A multi-port hydrant provides fire-fighters with the ability to connect hoses of different sizes, as well as more than one hose at a time to combat a fire. This provides a significant improvement reducing the effects of wildfire than a single port hydrant.
- **Proximity** – Another step towards reducing the effects of wildfire, hydrants would be place closer to each than they are currently. When fire-fighters arrive on the scene, having multiple fire hydrants available reduces set-up time, and increases efficiency.

Other Alternatives: Replacing less than all the hydrants would reduce the effectiveness of the project by the number of un-improved hydrants. This would pose the difficult question of which areas in the community are more deserving of improvements than others.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Water Master Plan, Strategic Plan, Rate Study analysis, Rate increase, Bond issuance, Five-year budget plan for Operations and Capital Funds

Responsible Office/Partners: Hidden Valley Lake Community Services District

Cost Estimate: \$4.1 million

Benefits (Losses Avoided): Losses avoided: Threat to public safety and property

Potential Funding: In-kind services, Water Use Fees, Capital funds, Federal and State grant funding

Timeline: 36 Month

Project Priority: High