



2024 Hazard Mitigation Plan

Contra Costa County,
California

Bethel Island
Municipal
Improvement
District Annex

DRAFT



TABLE OF CONTENTS

1. Introduction	1
2. Local Planning Team	1
3. Jurisdiction Profile	1
3.1. Population	2
3.1.1. Underserved Population	2
3.2. Brief History	3
3.3. Governing Body Format	3
4. Development Trends	4
5. Capability Assessment	4
5.1. Planning and Regulatory Capabilities	4
5.2. Administrative and Technical Capabilities	6
5.3. Financial Resources	7
5.4. Education and Outreach Capabilities	8
5.5. Adaptive Capacity for Climate Change	9
6. Hazard Mitigation Plan Integration	11
6.1. Existing Plan Integration	11
6.2. Potential Future Integration	11
7. Significant Hazard Past Events	12
8. National Flood Insurance Program	12
9. Hazard Vulnerability and Impact Assessment	12
9.1. FEMA National Risk Index	14
9.1.1. Expected Annual Loss	14
9.1.2. Social Vulnerability	15
9.1.3. Community Resilience	16
9.1.4. Annualized Frequency	16
10. Hazard Risk Ranking	17
11. Mitigation Actions	19
Appendix A. Public Engagement	39
Appendix B. Plan Adoption	40



1. INTRODUCTION

This Annex details the hazard mitigation elements specific to Bethel Island Municipal Improvement District, a participating jurisdiction to the 2024 Contra Costa County Hazard Mitigation Plan update. This Annex is not intended to be a standalone document but supplements the information contained in **Volume 1 (Planning Area-wide Elements)**. Therefore, all sections of **Volume 1** including the planning process, hazard identification and risk assessment, mitigation strategy, and plan maintenance apply to and were met by the District. This Annex provides additional information specific to the District, with a focus on providing additional details on the hazard risk assessment and mitigation strategy (i.e., mitigation actions) for this community.

2. LOCAL PLANNING TEAM

The Bethel Island Municipal Improvement District Local Planning Team was comprised of the members listed on **Table 1**.

Table 1. Bethel Island Municipal Improvement District Local Planning Team Members

Name	Title	Department
Regina Espinoza	District Manager	Bethel Island Municipal Improvement District
Mike Mirmazaheri	District Engineer	Bethel Island Municipal Improvement District
Denece Bixby	District Clerk	Bethel Island Municipal Improvement District

3. JURISDICTION PROFILE

Bethel Island, California, is located in the unincorporated portion of eastern Contra Costa County and the only access to the island by road is across the Bethel Island Bridge (constructed originally around 1915), which is owned and maintained by Contra Costa County. The Island is not a city and thus relies on a combination of private and county public services. Bethel Island Municipal Improvement District (BIMID) is a special act district that has powers similar to, but somewhat less than, a city.

The District currently covers a land area of approximately 3,500 acres bounded by unincorporated territory. The Island sits in the Sacramento-San Joaquin River Delta and is bounded by Piper Slough to the north, Taylor Slough and Jersey Island to the west, City of Oakley to the southwest, and Holland Tract to the southeast.

BIMID, as a special district, is responsible for the maintenance and rehabilitation of 14.5 miles of earthen levee of which 11.5 miles surround Bethel Island and considered the exterior levee system protecting the island from flooding. The interior elevation of Bethel Island is below sea level; therefore, it relies on the levee system for flood protection. The remaining three (3) miles is associated with the interior levee within the Delta Coves master plan subdivision. Additionally, the levee on Bethel Island currently protects the island's 3,500 acres of agricultural land. Furthermore, BIMID owns and maintains approximately 107 acres located near the center of the island where 46 acres are used as a mitigation site for levee projects and potential borrow site for future levee improvement work. BIMID also owns approximately 1.5 acres on Stone Road which serves as the location for the District's administrative offices and equipment/maintenance yard.



BIMID is responsible for habitat mitigation, park services, as well as storm drain maintenance and repair for Bethel Island. The existing BIMID drainage pump station is capable of discharging excess drainage back into the nearby channels. The pump station is an important element in keeping floodwater out of the Island and is currently located below the 100-year flood elevation posing a threat to the area.

The majority of BIMID funding comes from ad valorem tax which is collected by Contra Costa County and is used to compete for State funding (in the form of cost share work agreements) from various sources including the California Department of Water Resources. Additionally, during FY 2015-16, the District began receiving Proposition 218 Assessment District funds (as approved by the Bethel Island voters in August 2015). The new Assessment District funds will provide a stabilized foundation for the District’s financial future for the next 10 years (at the very least, subject to voter renewal) by funding enhanced levee and drainage maintenance and administrative support and will provide local cost share funds for major levee improvement and drainage projects.

Currently, BIMID has eight (8) employees, consisting of legal counsel, a District Manager, a Financial Consultant, two (2) full-time field workers, one (1) part-time field worker/park maintenance, and two (2) part-time office workers. The District also has several sub-contractors which provide a variety of services for the District.

3.1. Population

Bethel Island had a population of 1,993 as of 2022.¹ The year round residents fluctuate seasonally and can be increased to about twice as many as normal season during the summer months to a total of approximately 4,600. Between 2010 and 2020, the population decreased by approximately 8.0% with an additional decrease of 1.1% between 2020 and 2022.^{2,3} **Table #** shows the Bethel Island’s population distribution between 2010 and 2022.

Table 2. Population Estimates

Jurisdiction	2010	2020	2022	Population Change (2010 – 2022)
Bethel Island	2,191	2,015	1,993	-9.0%

3.1.1. Underserved Population

The 2023 California State Hazard Mitigation Plan identifies the Centers for Disease Control and Prevention (CDC) Social Vulnerability Index (SVI) as the most appropriate and authoritative dataset to identify areas where efforts can be prioritized to ensure equitable outcomes from mitigation planning and actions.

CDC’s SVI combines 16 social factors, within four (4) themes (i.e., socioeconomic status, household characteristics, racial and ethnic minority status, and housing type and transportation), to identify areas of social vulnerability. **Table #** outlines the SVI information for BIMID’s planning area boundary.

¹ United States Census Bureau. (2022). DP05: ACS Demographics and Housing Estimates (2022: ACS 5-Year Estimates Data Profiles). Retrieved from <https://data.census.gov/table/ACSDP5Y2022.DP05?q=160XX00US0606210>.

² United States Census Bureau. (2020). DP05: ACS Demographics and Housing Estimates (2020: ACS 5-Year Estimates Data Profiles). Retrieved from <https://data.census.gov/table/ACSDP5Y2020.DP05?q=160XX00US0606210>.

³ United States Census Bureau. (2010). DP05: ACS Demographics and Housing Estimates (2010: ACS 5-Year Estimates Data Profiles). Retrieved from <https://data.census.gov/table/ACSDP5Y2010.DP05?q=160XX00US0606210>.



Note: ArcGIS mapping analysis was performed utilizing Census Tract data by overlaying Census Tracts with BIMID’s planning area boundary. The information outlined in this section includes data from the Census Tracts that intersect the jurisdiction.

Table 3. Social Vulnerability Index (2020)

Theme	Social Factors	Percent
Socioeconomic Status	People below 150% poverty estimate	45.1%
	Unemployed (Civilian 16 years old and older)	8.3%
	Housing Cost Burden	23.9%
	No High School Diploma	20.3%
	No Health Insurance	15.5%
Household Characteristics	65 years old and older	35.9%
	17 years and younger	60.4%
	Civilian with a Disability	41.3%
	Single-Parent Household	1.2%
	English Language Proficiency	4.0%
Racial and Ethnic Minority Status	<ul style="list-style-type: none"> • Hispanic or Latino (of any race) • Black or African American • Asian • American Indian or Alaska Native • Native Hawaiian or Pacific Islander • Two or More Races • Other Races 	54.6%
Housing Type and Transportation	Multi-Unit Structures	0.0%
	Mobile Homes	23.9%
	Crowding	0.0%
	No Vehicle	4.5%%
	Group Quarters	0.0%

3.2. Brief History

BIMID was formed in 1960 by the California State Legislature. The newly formed BIMID absorbed Reclamation District 1619.

3.3. Governing Body Format

The Board of Directors for BIMID consists of five (5) elected members, each director serving for a period of four (4) years. BIMID assumes responsibility for the adoption of this Plan, and it will oversee its implementation.



4. DEVELOPMENT TRENDS

The bulk of residential developments on the Island are located and concentrated along the perimeter of the island, principally on the southwestern, southern, southeastern, eastern, and northeastern perimeters. The new Delta Coves development will add over 550 new housing units (single-family homes and condos) to the Bethel Island community. This new development could potentially increase the year-round population by 1,265 residents, assuming 2.3 residents per household (the County average residents per household is 2.8). During the summer months, when there is a seasonal influx of visitors and transitory inhabitants, the population of the entire Bethel Island may double, resulting in a total of nearly 7,000 residents. The Delta Coves development will mainly consist of single-family residences, condos, commercial marina, and other recreational facilities when fully built out. The Delta Coves project adds operation and maintenance responsibility for new facilities to this District, including three (3) miles of levee, four (4) drainage pump stations to collect stormwater, and a breach structure.

5. CAPABILITY ASSESSMENT

Federal regulations require hazard mitigation plans to identify goals for reducing long-term vulnerabilities to the identified hazards in the planning area (Section 201.6(c)(3)(i)). A critical step in the development of specific hazard mitigation actions and projects is assessing existing authorities, policies, programs, and resources and capabilities to use or modify local tools to reduce losses and vulnerability from profiled hazards.

A capability assessment was conducted for BIMID and participating jurisdictions' authorities, policies, programs, and resources. Goals and mitigation actions were developed using input from this assessment.

The Local Planning Team assessed the District's capabilities that can contribute to the reduction of long-term vulnerabilities to hazards. The capabilities include the following categories:

- Planning and Regulatory Capabilities
- Administrative and Technical Capabilities
- Financial Capabilities
- Education and Outreach Capabilities

Additionally, ways to expand on and improve these existing policies and programs to integrate hazard mitigation into the day-to-day activities and programs of the District were considered.

5.1. Planning and Regulatory Capabilities

These include local ordinances, policies, and laws to manage growth and development (e.g., land use plans, capital improvement plans, transportation plans, emergency preparedness and response plans, building codes, and zoning ordinances). The description section of each Planning and Regulatory Capability includes a paragraph on expansion, implementation, and improvement. **Table 4** contains a list of legal and regulatory capabilities. The description section of each Planning and Regulatory Capability includes a paragraph on expansion, implementation, and improvement.



Table 4. Planning and Regulatory Capabilities

Hazard Mitigation Plan Levee Standard			
<p>The Hazard Mitigation Plan (HMP) design standard was defined following the 1983 and 1986 floods as a result of negotiations among the Federal Emergency Management Agency (FEMA), the State of California (Office of Emergency Services (OES) and Department of Water Resources (DWR)), and the Delta Levee Maintaining Agencies (LMAs).</p> <p>The District performed a survey and completed construction in 2015 to bring all of its levee system up to the minimum HMP criteria. This standard has a crown elevation of one (1) foot above the 100-year flood elevation of about 6.9 feet National Geodetic Vertical Datum of 1929 (NGVD 29).</p> <p>Expansion, Implementation, and Improvement: This Hazard Mitigation Plan will support mitigation measures that can make the Island’s levee system more effective at preventing losses and ensure the safety and protection of its residents.</p>			
Updated	2015	Hazards Addressed	Climate Change, Dam and Levee Failure, Flood, Sea Level Rise, Severe Weather, Tsunami
Public Law 84-99: Emergency Response to Natural Disasters (PL 84-99)			
<p>Public Law 84-99, Emergency Response to Natural Disasters (PL 84-99) is the United States Army Corps of Engineers basic authority to provide for emergency activities in support of state and local governments prior to, during, and after a flood event. PL 84-99 continues to improve and raise the levee to the Public Law 84-99 Standard. This Standard has a crown elevation of 1.5 feet above the 100-year flood elevation or about 8.4 feet NGVD 29. The PL 84-99 criteria for the Delta levees are not the same as the requirements for the federally built project levees as these standards are the results of negotiations between the parties and Levee Maintaining Agencies.</p> <p>Expansion, Implementation, and Improvement: This Hazard Mitigation Plan will support mitigation measures that can make the Island’s levee system more effective at preventing losses and ensure the safety and protection of its residents.</p>			
Updated	2023	Hazards Addressed	Climate Change, Dam and Levee Failure, Flood, Sea Level Rise, Severe Weather, Tsunami
Department of Water Resources Bulletin 192-82			
<p>The Bulletin 192, Delta Levees Investigation (DWR, 1982) examined the problems, feasibility, and costs of upgrading 537 miles of non-project levees protecting 56 islands and tracts in the Delta. The evaluations considered two (2) concepts for Delta islands – the Delta is a system of interdependent islands and tracts, and each Delta island and tract is essentially independent of all other islands and tracts. The report discusses alternative levee improvement plans for each concept.</p> <p>Bethel Island improved about 3.5 miles of levees to meet this standard and will continue to improve and raise various segments as feasible. This Standard has two (2) sets of standards; one (1) for agricultural levee which brings the crown elevation to 1.5 feet above the 300-year flood elevation, and another is for urban area raising the crown to three (3) feet above the 300-year flood elevation. The urban areas outside of the Delta are subject to other State and Federal standards.</p> <p>Expansion, Implementation, and Improvement: This Hazard Mitigation Plan will support mitigation measures that can make the Island’s levee system more effective at preventing losses and ensure the safety and protection of its residents.</p>			
Updated	1982	Hazards Addressed	Climate Change, Dam and Levee Failure, Flood, Sea Level Rise, Severe Weather, Tsunami



Storage Water Drainage Plan and Improvement			
The District is responsible for managing its storm and floodwater drainage to prevent flooding and degradation of water quality.			
Expansion, Implementation, and Improvement: This Hazard Mitigation Plan will support mitigation measures as the District plans to evaluate its existing pumping capacity and potential need for expansion.			
Updated	2023	Hazards Addressed	Climate Change, Dam and Levee Failure, Flood, Sea Level Rise, Severe Weather, Tsunami

5.2. Administrative and Technical Capabilities

The administrative and technical capabilities include community (i.e., public and private) staff and their skills and tools, which can be used for mitigation planning and implementation. This capability includes engineers, planners, emergency managers, GIS analysts, building inspectors, grant writers, and floodplain managers. Small communities may rely on other government entities, such as counties or special districts, for resources. These capabilities may be used to support mitigation activities. **Table 5** lists administrative and technical capabilities.

Table 5. Administrative and Technical Capabilities

District Engineer, Surveyors	
BIMID has hired a reputable engineering firm as the District Engineer possessing multiple expertise including land development and management practices. The District engineer and team have knowledge and experience in building or infrastructure construction practices, understanding of natural hazards to provide services, performed benefit/cost analysis and are available to address any issues. Additionally, the District Engineering team is licensed by the State of California as Professional Engineers and Land Surveyors and has access to surveyors and surveying equipment.	
Expansion and Improvement: Provide opportunities for continued education to the staff to maintain state of the art knowledge of new code and regulatory requirements.	
Department	Private Engineering Firm, Bethel Island Municipal Improvement District
Public Information Officer	
The Public Information Officer (PIO) provides public and media information regarding the District’s disaster response, mitigation, and recovery efforts.	
Expansion and Improvement: Continue to use PIOs to promote awareness of this Hazard Mitigation Plan and activities associated with individual mitigation projects as they are implemented.	
Department	Bethel Island Municipal Improvement District
Emergency Manager	
BIMID’s District Engineer and his team have several years of experience in emergency response, preparedness, and recovery.	
Expansion and Improvement: Provide opportunities for continued education to the staff to maintain state of the art knowledge of new code and regulatory requirements.	
Department	Private Engineering Firm, Bethel Island Municipal Improvement District



Grant Writing	
<p>Provide grant research, writing, legislative advocacy, and post award management for the District. BIMID's District Engineer and team have formulated grant applications for various levee work and pump station retrofit and are very capable in obtaining grant funding approval from State and federal agencies.</p> <p>Expansion and Improvement: Provide opportunities for continued education to the staff to maintain state of the art knowledge of all grant programs and opportunities.</p>	
Department	Private Engineering Firm, Bethel Island Municipal Improvement District
Information Technology and Geographic Information System	
<p>Information technology (IT) and Geographic Information Systems (GIS) provide the technical resources and support necessary to operate all of the applications relating to the District's information resources; respond to the service needs to all departments based on District priorities as established by the Board of Directors; responsible for the training and effective use of all District technology computer hardware, software, and peripherals; provide internal coordination of technology efforts to the District including substantial interface with all technology vendors to assure cost-effective, secure, and reliable technologies compatible with the long-range needs of the District, provide high-quality spatial data.</p> <p>BIMID's District Engineer and team have access to GIS applications and skilled staff.</p> <p>Expansion and Improvement: Ensure continued education to the staff to maintain state of the art knowledge of all IT and GIS technologies.</p>	
Department	Private Engineering Firm, Bethel Island Municipal Improvement District

5.3. Financial Resources

Table 6 contains a list of financial capabilities available to the District. These financial resources may be used to support mitigation activities based on procedures for each resource.

Table 6. Financial Resources

General Obligation Bonds	
<p>General Obligation Bonds are a form of long-term borrowing in which the state issues municipal securities and pledges its full faith and credit to their repayment. Bonds are repaid over many years through semi-annual debt service payments. The California Constitution requires that General Obligation Bonds be approved by a majority vote of the public and sets repayment of General Obligation Bonds debt before all other obligations of the state except those for the public school system and public institutions of higher education.</p> <p>Expansion and Improvement: General Obligation Bonds can be used on projects that provide mitigation to natural hazards.</p>	
Administrator	Contra Costa County Administration
Special Tax Bonds	
<p>Special Tax Bonds, a type of municipal bond, are typically repaid with either excise taxes or special assessment taxes, but not by ad valorem taxes. It is a hybrid security that combines features of a general obligation bond and a revenue bond.</p> <p>Expansion and Improvement: Special Tax Bonds can be used on projects that provide mitigation to natural hazards.</p>	
Administrator	Contra Costa County Administration



Private Activity Bonds	
Private Activity Bonds are bonds issued by or on behalf of a state or local Government for the purpose of providing special financial benefits for qualified projects.	
Expansion and Improvement: Private Activity Bonds can be used on projects that provide mitigation to natural hazards.	
Administrator	State of California, Contra Costa County Administration
Community Development Block Grant	
The Community Development Block Grant (CDBG) Program provides funding for eligible senior activities such as in-home care, art classes, counseling, and home-delivered meals. The United States Department of Housing and Urban Development (HUD) also provides Disaster Recovery Assistance in the form of flexible grants to help cities, counties, and states recover from Presidentially Declared Disasters, especially in low income areas, subject to the availability of supplemental appropriations.	
Expansion and Improvement: Where applicable, CDBG should be used to fund mitigation projects that enhance the resiliency of low income and underserved communities.	
Administrator	United States Department of Housing and Urban Development, Bethel Island Municipal Improvement District
Hazard Mitigation Grant Program	
The Hazard Mitigation Grant Program (HMPG) provides support for post-disaster mitigation plans and projects.	
Expansion and Improvement: Train staff on notice of intent (NOI) procedures and track opportunities on the Cal OES mitigation website to initiate applications for grant funding.	
Administrator	Federal Emergency Management Agency, Bethel Island Municipal Improvement District
Building Resilient Infrastructure and Communities	
Building Resilient Infrastructure and Communities (BRIC) provides support for pre-disaster mitigation plans and projects.	
Expansion and Improvement: Train staff on notice of intent (NOI) procedures and track opportunities on the Cal OES mitigation website to initiate applications for grant funding.	
Administrator	Federal Emergency Management Agency, Bethel Island Municipal Improvement District
Flood Mitigation Assistance Grant Program	
The Flood Mitigation Assistance (FMA) Grant Program mitigates structures and infrastructure with repetitive losses.	
Expansion and Improvement: Train staff on notice of intent (NOI) procedures and track opportunities on the California OES mitigation website to initiate applications for grant funding.	
Administrator	Federal Emergency Management Agency, Bethel Island Municipal Improvement District

5.4. Education and Outreach Capabilities

Table 7 lists the District's education and public outreach capabilities. These capabilities include fire safety programs, hazard awareness campaigns, public information, and communications offices. Education and outreach capabilities can be used to inform the public about current and potential mitigation activities.



Table 7. Education and Outreach Resources

District Website	
https://bimid.com/emergency-preparedness/	
Bethel Island Municipal Improvement District provides emergency preparedness information through their website under the <i>Emergency Preparedness Tab</i> .	
Expansion and Improvement: Develop a comprehensive outreach program to reach out to communities in the District to provide information on mitigation activities	
Lead Organization	Bethel Island Municipal Improvement District
District Social Media Accounts	
Facebook: https://www.facebook.com/people/Bethel-Island-Municipal-Improvement-District/	
The District uses its social media accounts to post information to collect input on updating this Hazard Mitigation Plan. These social media accounts can have links to other District webpages that provide details on mitigation projects and activities. They can also provide information and links to County, State and Federal emergency preparedness sites that provide information on individual and family preparedness.	
Expansion and Improvement: Develop a comprehensive program to utilize social media to reach out to communities in the District to provide information on mitigation activities.	
Lead Organization	Bethel Island Municipal Improvement District
County Public Safety and Emergency Information	
https://www.contracosta.ca.gov/5435/Public-Safety-Emergency-Info	
Provides resources and links for public safety and emergency information in Contra Costa County.	
Expansion and Improvement: Provide additional links to other organizations such as FEMA and PG&E.	
Lead Organization	Contra Costa County Office of Emergency Services
Sirens	
The system of sirens can alert residents and businesses within Bethel Island that are impacted by or are in danger of being impacted by an emergency.	
Expansion and Improvement: Coordinate community evacuation drills using sirens to implement the exercise.	
Lead Organization	Bethel Island Municipal Improvement District
Community Warning System	
The Community Warning System (CWS) can alert residents and businesses within Contra Costa County that are impacted by or are in danger of being impacted by an emergency. The CWS message will include basic information about the incident and what specific protective actions (e.g., shelter in place, lockdown, evacuate, avoid the area) are necessary for life safety and health.	
Expansion and Improvement: Coordinate community evacuation drills using the CWS to implement the exercise. Conduct post exercise information fairs at evacuation collection points.	
Lead Organization	Contra Costa County Office of the Sheriff

5.5. Adaptive Capacity for Climate Change

Given the uncertainties associated with how hazard risk may change with a changing climate, a jurisdiction’s ability to track such changes and adapt as needed is an important component of the mitigation strategy. The District’s immediate goal is to be able to manage and respond to local flooding



resulting from climate change and be prepared to protect its population. **Table 8** summarizes the District’s adaptive capacity for climate change.

Table 8. Adaptive Capacity for Climate Change

<i>Technical Capacity</i>	
Criterion	Jurisdiction Rating
Jurisdiction-level understanding of potential climate change impacts. Comments/Additional Information: The District monitors planning efforts for climate change by the Delta Protection Commission and Delta Stewardship Council for sea level rise due to climate change.	High (BIMID relies on its engineering team)
Jurisdiction-level monitoring of climate change impacts.	High (BIMID relies on its engineering team)
Technical resources to assess proposed strategies for feasibility and externalities.	High (BIMID relies on its engineering team)
Jurisdiction-level capacity for development of greenhouse gas emissions inventory.	Medium (BIMID relies on its engineering team)
Capital planning and land use decisions informed by potential climate impacts.	High (BIMID relies on its engineering team)
Participation in regional groups addressing climate risks.	Medium (BIMID relies on its engineering team)
<i>Implementation Capacity</i>	
Criterion	Jurisdiction Rating
Clear authority/mandate to consider climate change impacts during public decision-making processes.	High
Identified strategies for greenhouse gas mitigation efforts.	Medium
Identified strategies for adaptation to impacts.	Medium
Champions for climate action in local government departments.	Low
Political support for implementing climate change adaptation strategies.	Medium
Financial resources devoted to climate change adaptation.	Low
Local authority over sectors likely to be negative impacted.	Unsure
<i>Implementation Capacity</i>	
Criterion	Jurisdiction Rating
Local residents’ knowledge of and understanding of climate risk.	Low
Local residents support of adaptation efforts.	Low
Local residents’ capacity to adapt to climate impacts.	Low
Local economy current capacity to adapt to climate impacts.	Low
Local ecosystems capacity to adapt to climate impacts.	Low



6. HAZARD MITIGATION PLAN INTEGRATION

The information on hazards, risk, vulnerability, and mitigation contained in this Hazard Mitigation Plan is based on the best available data at the time of the Plan update. Plan integration consists of the incorporation of hazard mitigation into other relevant planning mechanisms (e.g., general planning and capital improvement planning). It includes the integration of natural hazard information and mitigation policies, principles, and actions into local planning mechanisms and vice versa. Additionally, plan integration is achieved through the involvement of key staff and community officials in collaborative hazard mitigation planning.

6.1. Existing Plan Integration

In the performance period since the adoption of the previous Hazard Mitigation Plan, BIMID made progress on integrating components of the hazard mitigation strategy (e.g., goals, objectives, and actions) into the planning initiatives listed in **Table 9**.

Table 9. Current Plan Integration

Planning Initiative	Description
Levee Improvement	BIMID has worked on bringing all of its levee system to the HMP Levee Standard (1.5 feet above 100-year). BIMID also improved 3.5 miles of its levees to the DWR Bulletin 192-82 Standard (three (3) feet above the 300-year flood elevation) to not only increase flood protection, but also to alleviate seepage and scour.
Retrofits of the Main Pump Station	BIMID has replaced one (1) of its three (3) pumps at its main pump station to effectively pump floodwater into the local channels.
Emergency Safety Plan	Contra Costa County has initiated to formulate emergency plans for BIMID, which is ongoing. BIMID has participated in this effort through working with County staff and its team of consultants. The plan has been adopted by the BIMID Board of Directors.
Environmental Plan	The Environmental Plan complies with the California Environmental Quality Act (CEQA) guidelines and enhances and restores habitats when an opportunity presents itself.

6.2. Potential Future Integration

As the Hazard Mitigation Plan is implemented, the District will use information from the Plan as the best available science and data on hazards. The capability assessment presented in Section 5 of this Annex identifies codes, plans, and programs that provide opportunities for integration. The countywide and local action plans developed for this Hazard Mitigation Plan are related to plan integration. The capability assessment identified plans and programs, listed in **Table 10**, that do not currently integrate goals and recommendations of this Plan but provide opportunities to do so in the future.

Table 10. Potential Future Integration

Planning Initiative	Description
Levee Improvement	BIMID has secured State grants to work on another 3.5 miles of its levee system to improve flood protection. This work was initiated in 2016 and the improvement in the most vulnerable segment of the levee system on the north and northwest portion of the island was successfully completed.



Planning Initiative	Description
Retrofits of the Main Pump Station	BIMID has replaced one (1) existing pump under the Community Development Block Grant (CDBG) Program while awaiting for CDBG grant approval in the amount of \$100,000 to replace the second pump and associated appurtenances. BIMID was planning to replace another drainage pump in the main station in 2017; however, the work was not completed due to lack of funding.
Encroachment	BIMID has improved portions of its levees using the DWR grant in the amount of about \$16 Million and is working with its engineering team to formulate a plan to minimize impacts of existing encroachments. The Plan will be examining various methods including installing sheet piles as a barrier for floodwater, elevating homes, relocation, removal, and possible buyout.

7. SIGNIFICANT HAZARD PAST EVENTS

A complete risk assessment, including past incidents, for each identified hazard of concern can be found in **Volume 1** of this Plan.

8. NATIONAL FLOOD INSURANCE PROGRAM

As a special district, the BIMID is not eligible to participate in FEMA’s National Flood Insurance Program (NFIP). Further information on Contra Costa County’s NFIP and Community Rating System (CRS) participation is available on **Volume 1** of this Plan.

9. HAZARD VULNERABILITY AND IMPACT ASSESSMENT

Exposure and vulnerability to certain hazards affect the entire County and others are geographically defined. Although the entire County may be vulnerable to these hazards, their impacts may vary based on existing community conditions (e.g., underserved, or functional access needs populations may be more susceptible based on certain conditions, vulnerabilities, or needs).

A complete risk assessment for each identified hazard of concern is in **Volume 1** of this Plan. **Table 11** provides information on a several key vulnerabilities for BIMID. The District’s property, critical infrastructure and equipment, critical facilities assets are listed in **Table 12**.

Table 11. Hazard Vulnerability and Impact Assessment

Hazards	Vulnerabilities and Impacts
Climate Change	Sea level rise threatens the existence of the district jurisdictional land, people, and public and private assets dependent on the levees.
Drought	The water supply in this area is either from local suppliers or individual water wells. Drought will severely impact the water supply.
Earthquake	Any seismic activities can cause levee failure and complete inundation of the region.
Severe Weather	Flooding is one of the main concerns for the district as the district jurisdictional land is below sea level.
Dam/Levee Failure	The levees are the only infrastructure protecting the area and mitigating the risk of flooding.
Flooding	The district is surrounded by waterways and is extremely vulnerable to flooding.
Tsunami	There is some risk to tsunami given its location.
Sea Level Rise	The lands in this area are below the sea level; therefore, the district is vulnerable to sea level rise.



Hazards	Vulnerabilities and Impacts
Utility Interruptions	The district is vulnerable to water, sewer, electricity and related utility disruptions.

Table 12. Special District Assets

<i>Property</i>	
Asset	Value
Approximately 110 acres (Park: 1 acre, District Yard: 1.5 acres; Mitigation Site and Surrounding Land: 107 acres)	\$647,000
<i>Critical Infrastructure and Equipment</i>	
Asset	Value
One main pump station with three stationary pumps	\$7,500,000
One secondary pump station with one stationary pump	\$150,000
19.1 miles of drainage ditch and canal easements	\$3,500,000
11.5 miles of levee and easements	\$64,400,000
3 miles of Delta Coves levee and easements	\$16,800,000
4 Delta Coves pump stations	\$3,800,000
Delta Coves breach structure	\$8,200,000
3 Community Warning sirens	\$30,000
One dump trucks	\$31,000
One equipment trailer	\$500
Five pieces of earth-moving equipment	\$325,000
One boat	\$2,000
Two pickups and one service truck	\$25,000
One flood fight service container	\$5,000
Light Utility Vehicle (for Levee Patrols)	\$21,000
One mobile flood fights enclosed trailer	\$7,000
One archive storage container	\$5,000
Total	\$103,802,500
<i>Critical Facilities</i>	
Assets	Value
Maintenance Shop	\$30,000
BIMID Hall (containing the District’s administrative offices and archived records)	\$150,000
Total	\$180,000



9.1. FEMA National Risk Index

In the National Risk Index (NRI), risk is defined as the potential for negative impacts as a result of a natural hazard. The Risk Index is based on three (3) components – a natural hazards component (Expected Annual Loss), a consequence enhancing component (Social Vulnerability), and a consequence reduction component (Community Resilience). Using these components, the composite and hazard type Risk Index values are calculated for each community (county and Census Tract). Risk Index values form an absolute basis for measuring Risk within the NRI and are used to generate Risk Index percentiles and ratings across communities.⁴ **Table 13** illustrates the Risk Index rating and score for BIMID’s planning area boundary.

Note: ArcGIS mapping analysis was performed utilizing Census Tract data by overlaying Census Tracts with BIMID’s planning area boundary. The information outlined in this section includes data from the Census Tracts that intersect the jurisdiction.

Table 13. Risk Index Score (FEMA National Risk Index)

Jurisdiction	Rating	Score
Bethel Island Municipal Improvement District	Very High	98.5

Risk Index scores are calculated using an equation that combines scores for Expected Annual Loss due to natural hazards, Social Vulnerability and Community Resilience (Expected Annual Loss x Social Vulnerability / Community Resilience = Risk Index).

9.1.1. Expected Annual Loss

The FEMA NRI Expected Annual Loss (EAL), the natural hazards component of the NRI, represents the average economic loss in dollars resulting from natural hazards each year. It is calculated for each hazard type and quantifies loss for relevant consequence types – buildings, people, and agriculture. The EAL score and rating represent a community’s relative level of expected losses each year when compared to all other communities at the same level. Since the score is associated to a community’s risk; the higher EAL score results in a higher Risk Index score.⁵ **Table 14** illustrates each hazard EAL for BIMID’s planning area boundary.

Table 14. Expected Annual Loss (FEMA National Risk Index)

Hazard	Population Equivalence	Building Value	Agriculture Value	Total Expected Annual Loss	Expected Annual Loss Score	Rating
Coastal Flooding (Sea Level Rise)	\$0	\$0	n/a	\$0	0.0	No Expected Annual Losses
Drought	n/a	n/a	\$3.3 Million	\$3.3 Million	99.9	Very High
Earthquake	\$378,513	\$1.1 Million	n/a	\$1.4 Million	95.4	Very High
Hail (Severe Weather)	\$67	\$258	\$449	\$773	39.9	Relatively Low

⁴ Federal Emergency Management Agency. (2023). Determining Risk. Retrieved from <https://hazards.fema.gov/nri/determining-risk>.

⁵ Federal Emergency Management Agency. (2023). Expected Annual Loss. Retrieved from <https://hazards.fema.gov/nri/expected-annual-loss>.



Hazard	Population Equivalence	Building Value	Agriculture Value	Total Expected Annual Loss	Expected Annual Loss Score	Rating
Heat Wave (Severe Weather)	\$13,498	\$2	\$6,709	\$20,210	68.5	Relatively High
Landslide	\$3	\$23	n/a	\$26	41.5	Relatively Moderate
Riverine Flooding (Flood)	\$427,038	\$461,546	\$184,027	\$1.1 Million	98.8	Very High
Strong Winds (Severe Weather)	\$66	\$24	\$25	\$115	6.5	Very Low
Tornado (Severe Weather)	\$1,517	\$3,830	\$70	\$5,417	16.4	Very Low
Tsunami	\$0	\$0	n/a	\$0	0.0	No Expected Annual Losses
Wildfire	\$204	\$8,205	\$0	\$8,409	83.5	Very High

Expected annual loss scores are calculated utilizing an equation that combines values for exposure, annualized frequency, and historic loss ratios (Expected Annual Loss = Exposure x Annualized Frequency x Historic Loss Ratio).

An EAL score and rating is calculated independently for each consequence type (i.e., buildings, population, and agriculture) for each county and Census Tract. The population EAL is measured in fatalities and injuries while the building and agriculture values are measured in dollars. However, for consistency in the unit of measurement, the population EAL was monetized into population equivalence using a value of statistical life (VSL) approach where each fatality or 10 injuries is treated as \$11.6 Million of economic loss.

9.1.2. Social Vulnerability

Social vulnerability, the consequence enhancing risk component of the NRI, measures the susceptibility of social groups to the adverse impacts of natural hazards, including disproportionate death, injury, loss, or disruption of livelihood. The Social Vulnerability score and rating represent the relative level of a community’s social vulnerability compared to all other communities at the same level. A higher Social Vulnerability score results in a higher Risk Index score.⁶ **Table 15** illustrates the Social Vulnerability rating and score for BIMID’s planning area boundary.

Table 15. Social Vulnerability (FEMA National Risk Index)

Jurisdiction	Rating	Score
Bethel Island Municipal Improvement District	Relatively Moderate	43.5

Social Vulnerability is measured using the Social Vulnerability Index (SoVI) published by the University of South Carolina’s Hazards and Vulnerability Research Institute (HVRI).

⁶ Federal Emergency Management Agency. (2023). Social Vulnerability. Retrieved from <https://hazards.fema.gov/nri/social-vulnerability>.



9.1.3. Community Resilience

Community resilience, the consequence reduction risk component, measures the ability of a community to prepare for anticipated natural hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions. The Community Resilience score and rating represent the relative level of a community’s resilience compared to all other communities at the same level. Since the score is inversely proportional to a community’s risk; the higher Community Resilience score results in a lower Risk Index score.⁷ **Table 16** illustrates the Community Resilience rating and score for BIMID’s planning area boundary.

Table 16. Community Resilience (FEMA National Risk Index)

Jurisdiction	Rating	Score
Bethel Island Municipal Improvement District	Relatively High	66.4

Community Resilience is measured using the Baseline Resilience Indicators for Communities (HVRI BRIC) published by the University of South Carolina’s Hazards and Vulnerability Research Institute (HVRI).

9.1.4. Annualized Frequency

Annualized frequency is defined as the expected frequency or probability of a hazard occurrence per year. It is a natural hazard incidence factor for Expected Annual Loss, the natural hazards component of the National Risk Index. A higher annualized frequency value results in higher Expected Annual Loss and Risk Index scores. The annualized frequency is derived from either the number of recorded hazard occurrences each year over a given period or the modeled probability of a hazard occurrence each year (e.g., earthquake).⁸ **Table 17** outlines the annualized frequency for each hazard, based on FEMA NRI data, for BIMID’s planning area boundary.

Table 17. Hazard Annualized Frequency (FEMA National Risk Index)

Hazard	Period of Record	Events on Record	Annualized Frequency
Coastal Flooding <i>(Sea Level Rise)</i>	Various datasets	n/a	0.0 events per year
Drought	22 years	1,386	63.0 events per year
Earthquake	2021 dataset	n/a	0.009% chance per year
Hail <i>(Severe Weather)</i>	34 years	2	0.1 events per year
Heat Wave <i>(Severe Weather)</i>	16 years	30.1	1.9 events per year
Landslide	12 years	0	0.0 events per year
Riverine Flooding <i>(Flood)</i>	24 years	31	1.3 events per year
Strong Winds <i>(Severe Weather)</i>	34 years	2	0.0 events per year
Tornado <i>(Severe Weather)</i>	72 years	0	0.0 events per year
Tsunami	222 years	0	0.0 events per year
Wildfire	2021 dataset	n/a	0.001% events per year

⁷ Federal Emergency Management Agency. (2023). Community Resilience. Retrieved from <https://hazards.fema.gov/nri/community-resilience>.

⁸ Federal Emergency Management Agency. (2023). Annualized Frequency. Retrieved from <https://hazards.fema.gov/nri/annualized-frequency>.



10. HAZARD RISK RANKING

Table 18 presents the local hazard ranking for BIMID of all hazards of concern listed in **Volume 1** of this Plan. This ranking summarizes how hazards vary for this jurisdiction. As described in detail in **Volume 1**, the ranking process involves an assessment of the likelihood of occurrence for each hazard, along with its potential impacts on people, property, and the economy.

Table 18. Hazard Risk Ranking

Hazard Event	Probability Factor	Sum of Weighted Extent Factors	Sum of Weighted Vulnerability Factors	Sum of Weighted Impact Factors	Consequence Score	Total Risk Score (Probability x Consequence)
Earthquake	2	18	17	36	71	68
Flood (Riverine/Creek)	2	18	18	34	70	67
Dam and Levee Failure	2	18	17	33	68	65
Heavy Rainfall (Severe Weather)	3	9	14	15	38	56
Flood (Urban/Flash Flood)	2	15	12	29	56	55
Severe Thunderstorm (Severe Weather)	3	6	16	14	36	54
Strong Winds/Damaging Winds (Severe Weather)	3	9	11	16	36	54
Wildfire	2	15	11	27	53	53
Utility Interruptions	3	9	7	18	34	51
Sea Level Rise	2	15	12	26	53	53
Drought	2	18	12	20	50	50
Heat Wave/Extreme Heat	3	9	10	12	31	47
Hazardous Materials Incidents	2	15	11	19	45	46
Climate Change	2	9	12	15	36	38
Cybersecurity Threats	2	12	7	13	32	34
Active Shooter Incidents	2	9	5	15	29	32
Terrorism (Weapons of Mass Destruction)	1	18	11	27	56	31
Landslide	1	6	9	21	36	21
Tornado (Severe Weather)	1	6	6	14	26	16



Hazard Event	Probability Factor	Sum of Weighted Extent Factors	Sum of Weighted Vulnerability Factors	Sum of Weighted Impact Factors	Consequence Score	Total Risk Score (Probability x Consequence)
Tsunami	1	6	5	13	24	15
<p><i>Consequence: Sum of all weighted factors.</i> <i>Extent: Sum of the weighted Extent factors.</i> <i>Vulnerability: Sum of the weighted Vulnerability factors.</i></p> <p><i>Impact: Sum of the weighted Impact factors.</i> <i>Total Risk Score* = Probability x Consequence</i> <i>* Normalized to 100</i></p>						
Total Risk Score Legend						
Classification	Probability Factor	Extent	Vulnerability	Impact	Consequence Score	Total Risk Score
Low (L)	1	0 – 6	0 – 6	0 – 12	0 – 24	0 – 24
Medium (M)	2	7 – 12	7 – 12	13 – 26	25 – 50	25 – 54
High (H)	3	13 – 18	13 – 18	27 – 39	51 – 75	55 and above
<p><i>The legend—specifically the assignment of low, medium, and high—provides an additional means to qualitatively assess the probability factor, sum of weighted factors, and the total risk scores for each hazard. The Consequence Score represents the sum of the Extent, Vulnerability, and Impact Factors. The Total Risk Score is a measure of Probability and Consequence.</i></p>						



11. MITIGATION ACTIONS

This section includes the mitigation actions that were developed to address identified risks and vulnerabilities to hazards identified in this Plan. This Plan serves only to recommend mitigation measures based on the potential for risk reduction and available funding. Implementation of mitigation actions is dependent on risk reduction priorities, feasibility, and available funding. It is also dependent on the cooperation and support of the jurisdiction and/or department responsible for each action item.

BIMID agreed upon **19** mitigation actions that apply to the jurisdiction’s properties where they have jurisdictional responsibility and authority. A summary of the District’s mitigation actions status is listed in **Table 19**.

Table 19. Bethel Island Municipal Improvement District Mitigation Actions Summary

Status		Mitigation Action Total	
Ongoing		4	
In Progress/In Work		0	
Not Started		4	
Delayed/Deferred		0	
New		11	
TOTAL		19	
Completed		0	
Deleted/No Longer Needed		0	
Mitigation Actions per Hazard			
Climate Change	4	Landslide	3
Dam and Levee Failure	8	Sea Level Rise	4
Drought	3	Severe Weather	4
Earthquake	3	Tsunami	3
Flood	9	Wildfire	3

These shared actions, some of which address all hazards, help to meet the following requirements:

- Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure?
- Does the Plan include one (1) or more action(s) per jurisdiction for each hazard identified within the risk assessment?

A detailed explanation of the Mitigation Strategy can be found in Chapter 5 of **Volume 1**.



Mitigation Action	Where appropriate, support retrofitting or relocation of structures in high-hazard areas, prioritizing structures that have experienced repetitive losses. This project increases resiliency of infrastructures and critical facilities.				
Action Number	BIMID-1	Year Initiated	2018 or before	Prioritization Score	High
Goal(s) / Objective(s) Addressed	Goals: 1, 2, 3, 4, 5 Objectives: 1, 4, 6, 7, 9, 10, 11, 15		Hazard(s) Mitigated	Climate Change, Dam and Levee Failure, Drought, Earthquake, Flood, Landslide, Sea Level Rise, Severe Weather, Tsunami, Wildfire	
Project Status	Not Started		<i>If Deleted/No Longer Needed, provide reason.</i>	N/A	
Benefits <i>(Loss Avoided)</i>	Medium				
Lead Agency / Organization	Bethel Island Municipal Improvement District		Supporting Agency / Organization <i>(If applicable)</i>	N/A	
Additional Participating Jurisdictions <i>(If applicable)</i>	N/A				
Project Duration	Short Term		Estimated Cost	High	
Potential Funding Source	BRIC, HMGP, FMA		<i>If Other, you must identify a funding source.</i>	N/A	
			<i>Please provide further detail on Potential Funding Source.</i>	N/A	
Implementation Priority	High	Integration Ideas <i>(Optional)</i>			



Mitigation Action	Actively participate in the Hazard Mitigation Plan maintenance protocols outlined in Volume 1 of the Contra Costa County Hazard Mitigation Plan.				
Action Number	BIMID-2	Year Initiated	2018 or before	Prioritization Score	High
Goal(s) / Objective(s) Addressed	Goals: 1, 2, 3, 4, 5 Objectives: 3, 6, 8, 10, 16, 17		Hazard(s) Mitigated	Climate Change, Dam and Levee Failure, Drought, Earthquake, Flood, Landslide, Sea Level Rise, Severe Weather, Tsunami, Wildfire	
Project Status	Ongoing	If Deleted/No Longer Needed, provide reason.		N/A	
Benefits <i>(Loss Avoided)</i>	Medium				
Lead Agency / Organization	Bethel Island Municipal Improvement District	Supporting Agency / Organization <i>(If applicable)</i>	N/A		
Additional Participating Jurisdictions <i>(If applicable)</i>	N/A				
Project Duration	Short Term	Estimated Cost	Low		
Potential Funding Source	Local Budgeted Funds	If Other, you must identify a funding source.	N/A		
		Please provide further detail on Potential Funding Source.	General Fund (Staff Time)		
Implementation Priority	High	Integration Ideas <i>(Optional)</i>			



Mitigation Action	Elevate the drainage pump station to above the 100-year flood elevation and replace at least one (1) of the three (3) pumps. The District will need to improve this pump station as the facility is old and sitting below the 100-year floodplain. The work will include installing new pump(s), improving the sump, replacing pipes, improving electrical circuits, and building a new platform at an elevation at or above the 100-year floodplain. This project enables the District and the residents to prepare for, respond to, and recover from the impact of flooding much quicker by maintaining the main drainage pumps operational during high water events.				
Action Number	BIMID-3	Year Initiated	2018 or before	Prioritization Score	High
Goal(s) / Objective(s) Addressed		Goals: 1, 2, 3, 4, 5 Objectives: 1, 2, 4, 10, 13	Hazard(s) Mitigated	Dam and Levee Failure, Flood	
Project Status	Not Started		<i>If Deleted/No Longer Needed, provide reason.</i>	N/A	
Benefits <i>(Loss Avoided)</i>	High				
Lead Agency / Organization	Bethel Island Municipal Improvement District		Supporting Agency / Organization <i>(If applicable)</i>	N/A	
Additional Participating Jurisdictions <i>(If applicable)</i>	N/A				
Project Duration	Short Term		Estimated Cost	High	
Potential Funding Source	BRIC, HMGP, FMA		<i>If Other, you must identify a funding source.</i>	N/A	
			Please provide further detail on Potential Funding Source.	N/A	
Implementation Priority	High	Integration Ideas <i>(Optional)</i>	Action was updated in 2024.		



Mitigation Action	Reinforce and install new rip rap to minimize or eliminate erosion on the waterside slope of the levee. Erosion can cause levee failure resulting in inundation, and loss of lives and properties. This project allows for the development and implementation of long-term, cost-effective, and environmental mitigation project.				
Action Number	BIMID-4	Year Initiated	2018 or before	Prioritization Score	High
Goal(s) / Objective(s) Addressed	Goals: 1, 2, 3, 4, 5 Objectives: 1, 4, 6, 12, 13		Hazard(s) Mitigated	Dam and Levee Failure, Flood	
Project Status	Ongoing	If Deleted/No Longer Needed, provide reason.		N/A	
Benefits <i>(Loss Avoided)</i>	Medium				
Lead Agency / Organization	Bethel Island Municipal Improvement District	Supporting Agency / Organization <i>(If applicable)</i>		N/A	
Additional Participating Jurisdictions <i>(If applicable)</i>	N/A				
Project Duration	Short Term	Estimated Cost		Medium	
Potential Funding Source	BRIC, HMGP, FMA	If Other, you must identify a funding source.		N/A	
		Please provide further detail on Potential Funding Source.		N/A	
Implementation Priority	High	Integration Ideas <i>(Optional)</i>			



Mitigation Action	Vegetation control is an ongoing maintenance required to prevent visual obstruction of levee damage, which may cause potential levee failure.				
Action Number	BIMID-5	Year Initiated	2018 or before	Prioritization Score	High
Goal(s) / Objective(s) Addressed	Goals: 1, 2, 3, 4, 5 Objectives: 4, 10, 13		Hazard(s) Mitigated	Dam and Levee Failure, Flood	
Project Status	Ongoing	If Deleted/No Longer Needed, provide reason.		N/A	
Benefits <i>(Loss Avoided)</i>	Medium				
Lead Agency / Organization	Bethel Island Municipal Improvement District	Supporting Agency / Organization <i>(If applicable)</i>		N/A	
Additional Participating Jurisdictions <i>(If applicable)</i>	N/A				
Project Duration	Short Term	Estimated Cost		Low	
Potential Funding Source	Local Budgeted Funds	If Other, you must identify a funding source.		N/A	
		Please provide further detail on Potential Funding Source.		General Fund (Staff Time)	
Implementation Priority	High	Integration Ideas <i>(Optional)</i>			



Mitigation Action	Several culverts traverse under local roads and carry flood water to the local ditches and end at the existing local drainage pump station. BIMID is also evaluating the storm and floodwater drainage on the Island and may decide adding additional pumping capacity to fully address its drainage deficiencies. The flood water, if not transferred to the pump, will cause island flooding resulting in loss of lives and properties. These culverts are aging and in need of maintenance or replacements.				
Action Number	BIMID-6	Year Initiated	2018 or before	Prioritization Score	High
Goal(s) / Objective(s) Addressed	Goals: 1, 2, 3, 4, 5 Objectives: 2, 4, 6, 9, 10, 13		Hazard(s) Mitigated	Flood, Severe Weather	
Project Status	Not Started	If Deleted/No Longer Needed, provide reason.		N/A	
Benefits <i>(Loss Avoided)</i>	High				
Lead Agency / Organization	Bethel Island Municipal Improvement District	Supporting Agency / Organization <i>(If applicable)</i>		N/A	
Additional Participating Jurisdictions <i>(If applicable)</i>	N/A				
Project Duration	Short Term	Estimated Cost		High	
Potential Funding Source	BRIC, HMGP, FMA	If Other, you must identify a funding source.		N/A	
		Please provide further detail on Potential Funding Source.		N/A	
Implementation Priority	High	Integration Ideas <i>(Optional)</i>			



Mitigation Action	Allocate staff time to support County initiatives in the Hazard Mitigation Plan.				
Action Number	BIMID-7	Year Initiated	2018 or before	Prioritization Score	High
Goal(s) / Objective(s) Addressed	Goals: 1, 2, 3, 4, 5 Objectives: 12, 13, 16, 17, 18		Hazard(s) Mitigated	Climate Change, Dam and Levee Failure, Drought, Earthquake, Flood, Landslide, Sea Level Rise, Severe Weather, Tsunami, Wildfire	
Project Status	Ongoing	If Deleted/No Longer Needed, provide reason.		N/A	
Benefits <i>(Loss Avoided)</i>	Medium				
Lead Agency / Organization	Bethel Island Municipal Improvement District	Supporting Agency / Organization <i>(If applicable)</i>	N/A		
Additional Participating Jurisdictions <i>(If applicable)</i>	N/A				
Project Duration	Short Term	Estimated Cost	Low		
Potential Funding Source	Local Budgeted Funds	If Other, you must identify a funding source.	N/A		
		Please provide further detail on Potential Funding Source.	General Fund (Staff Time)		
Implementation Priority	High	Integration Ideas <i>(Optional)</i>			



Mitigation Action	Address existing encroachments along the levees. There are many homes encroaching the levee system on the perimeter of the Island increasing flood hazard for all residents and property owners on Bethel Island. There is a need for a plan to address the best and most practical approach in minimizing the impacts of existing encroachments and reducing the risk of flooding. The plan will explore all possible options, including relocation, removal, acquisition, and floodproofing to meet FEMA guidelines. All encroachments will be examined closely, and the potential flood risk will be evaluated prior to categorizing and prioritizing the implementation of this work.				
Action Number	BIMID-8	Year Initiated	2018 or before	Prioritization Score	Medium
Goal(s) / Objective(s) Addressed		Goals: 1, 2, 3, 4, 5 Objectives: 1, 4, 6, 12, 13	Hazard(s) Mitigated	Dam and Levee Failure, Flood	
Project Status	Not Started	If Deleted/No Longer Needed, provide reason.		B/A	
Benefits <i>(Loss Avoided)</i>	High				
Lead Agency / Organization	Bethel Island Municipal Improvement District	Supporting Agency / Organization <i>(If applicable)</i>	N/A		
Additional Participating Jurisdictions <i>(If applicable)</i>	N/A				
Project Duration	Short Term	Estimated Cost	High		
Potential Funding Source	BRIC, HMGP, FMA	If Other, you must identify a funding source.	N/A		
		Please provide further detail on Potential Funding Source.	N/A		
Implementation Priority	Medium	Integration Ideas <i>(Optional)</i>			



Mitigation Action	Improve and/or maintain the District's coordination with other emergency responders.				
Action Number	BIMID-9	Year Initiated	2024	Prioritization Score	40/40
Goal(s) / Objective(s) Addressed	Goals: 1, 3		Hazard(s) Mitigated	Climate Change, Dam and Levee Failure, Drought, Earthquake, Flood, Landslide, Sea Level Rise, Severe Weather, Tsunami, Wildfire	
Project Status	New		<i>If Deleted/No Longer Needed, provide reason.</i>	N/A	
Benefits <i>(Loss Avoided)</i>	Medium				
Lead Agency / Organization	Bethel Island Municipal Improvement District		Supporting Agency / Organization <i>(If applicable)</i>	N/A	
Additional Participating Jurisdictions <i>(If applicable)</i>	N/A				
Project Duration	Ongoing		Estimated Cost	Low	
Potential Funding Source	Local Budgeted Funds		<i>If Other, you must identify a funding source.</i>	N/A	
			Please provide further detail on Potential Funding Source.	General Fund (Staff Time)	
Implementation Priority	High	Integration Ideas <i>(Optional)</i>			



Mitigation Action	Conduct tabletop and functional exercises, and annual pre-season flood fight training to ensure District staff remains updated on regulations and activities.				
Action Number	BIMID-10	Year Initiated	2024	Prioritization Score	40/40
Goal(s) / Objective(s) Addressed	Goals: 1, 5		Hazard(s) Mitigated	Climate Change, Dam and Levee Failure, Flood, Sea Level Rise, Severe Weather	
Project Status	New		<i>If Deleted/No Longer Needed, provide reason.</i>	N/A	
Benefits <i>(Loss Avoided)</i>	Medium				
Lead Agency / Organization	Bethel Island Municipal Improvement District		Supporting Agency / Organization <i>(If applicable)</i>	N/A	
Additional Participating Jurisdictions <i>(If applicable)</i>	N/A				
Project Duration	Ongoing		Estimated Cost	Low	
Potential Funding Source	Local Budgeted Funds		<i>If Other, you must identify a funding source.</i>	N/A	
			Please provide further detail on Potential Funding Source.	General Fund (Staff Time)	
Implementation Priority	High	Integration Ideas <i>(Optional)</i>			



Mitigation Action	Support formulation of Mutual Aid Agreements regarding storage and sharing of flood fight materials to maintain resources essential in emergency preparedness.				
Action Number	BIMID-11	Year Initiated	2024	Prioritization Score	40/40
Goal(s) / Objective(s) Addressed	Goals: 1, 5		Hazard(s) Mitigated	Climate Change, Dam and Levee Failure, Flood, Sea Level Rise, Severe Weather	
Project Status	New	If Deleted/No Longer Needed, provide reason.		N/A	
Benefits <i>(Loss Avoided)</i>	Medium				
Lead Agency / Organization	Bethel Island Municipal Improvement District	Supporting Agency / Organization <i>(If applicable)</i>	N/A		
Additional Participating Jurisdictions <i>(If applicable)</i>	N/A				
Project Duration	Ongoing	Estimated Cost	Low		
Potential Funding Source	Local Budgeted Funds	If Other, you must identify a funding source.	N/A		
		Please provide further detail on Potential Funding Source.	General Fund (Staff Time)		
Implementation Priority	High	Integration Ideas <i>(Optional)</i>			



Mitigation Action	Floodproof and elevate sensitive structures such as the District Yard.				
Action Number	BIMID-12	Year Initiated	2024	Prioritization Score	39/40
Goal(s) / Objective(s) Addressed	Goals: 1, 2, 3, 5		Hazard(s) Mitigated	Climate Change, Dam and Levee Failure, Flood, Sea Level Rise, Severe Weather	
Project Status	New		<i>If Deleted/No Longer Needed, provide reason.</i>	N/A	
Benefits <i>(Loss Avoided)</i>	Medium				
Lead Agency / Organization	Bethel Island Municipal Improvement District		Supporting Agency / Organization <i>(If applicable)</i>	N/A	
Additional Participating Jurisdictions <i>(If applicable)</i>	N/A				
Project Duration	Short Term		Estimated Cost	High	
Potential Funding Source	BRIC, HMGP, FMA		<i>If Other, you must identify a funding source.</i>	N/A	
			Please provide further detail on Potential Funding Source.	N/A	
Implementation Priority	High	Integration Ideas <i>(Optional)</i>			



Mitigation Action	Relocate, purchase, or demolish dilapidated and at-risk structures which increase hazards in the area.				
Action Number	BIMID-13	Year Initiated	2024	Prioritization Score	35/40
Goal(s) / Objective(s) Addressed	Goals: 1, 2, 3, 5		Hazard(s) Mitigated	Climate Change, Dam and Levee Failure, Flood, Sea Level Rise, Severe Weather	
Project Status	New		<i>If Deleted/No Longer Needed, provide reason.</i>	N/A	
Benefits <i>(Loss Avoided)</i>	Medium				
Lead Agency / Organization	Bethel Island Municipal Improvement District		Supporting Agency / Organization <i>(If applicable)</i>	N/A	
Additional Participating Jurisdictions <i>(If applicable)</i>	N/A				
Project Duration	Short Term		Estimated Cost	High	
Potential Funding Source	BRIC, HMGP, FMA		<i>If Other, you must identify a funding source.</i>	N/A	
			Please provide further detail on Potential Funding Source.	N/A	
Implementation Priority	High	Integration Ideas <i>(Optional)</i>			



Mitigation Action	Purchase standby pumps for emergency uses which will create redundancy in the District’s capability to evacuate drainage and flood water in the event the existing pumping capabilities are not functioning.				
Action Number	BIMID-14	Year Initiated	2024	Prioritization Score	40/40
Goal(s) / Objective(s) Addressed	Goals: 1, 2, 3, 5		Hazard(s) Mitigated	Dam and Levee Failure, Flood, Sea Level Rise, Severe Weather	
Project Status	New		<i>If Deleted/No Longer Needed, provide reason.</i>	N/A	
Benefits <i>(Loss Avoided)</i>	High				
Lead Agency / Organization	Bethel Island Municipal Improvement District		Supporting Agency / Organization <i>(If applicable)</i>	N/A	
Additional Participating Jurisdictions <i>(If applicable)</i>	N/A				
Project Duration	Short Term		Estimated Cost	High	
Potential Funding Source	BRIC, HMGP, FMA		<i>If Other, you must identify a funding source.</i>	N/A	
			<i>Please provide further detail on Potential Funding Source.</i>	N/A	
Implementation Priority	High	Integration Ideas <i>(Optional)</i>			



Mitigation Action	Install new stream gage station to provide a streamflow of information that helps forecast floods. The information would be available in real-time (offsite) as part of the dissemination of information to the public and all government and non-governmental agencies.				
Action Number	BIMID-15	Year Initiated	2024	Prioritization Score	40/40
Goal(s) / Objective(s) Addressed	Goals: 1, 2, 3, 5		Hazard(s) Mitigated	Dam and Levee Failure, Flood, Severe Weather	
Project Status	New	If Deleted/No Longer Needed, provide reason.		N/A	
Benefits <i>(Loss Avoided)</i>	Low				
Lead Agency / Organization	Bethel Island Municipal Improvement District	Supporting Agency / Organization <i>(If applicable)</i>		N/A	
Additional Participating Jurisdictions <i>(If applicable)</i>	N/A				
Project Duration	Short Term		Estimated Cost	High	
Potential Funding Source	BRIC, HMGP, FMA		If Other, you must identify a funding source.	N/A	
			Please provide further detail on Potential Funding Source.	N/A	
Implementation Priority	High	Integration Ideas <i>(Optional)</i>			



Mitigation Action	Conduct a Drainage Study. The District needs to better understand the drainage pattern on Bethel Island and proceed with improvement to the ditches and canals. The existing network has chock points clogged with vegetation and debris.				
Action Number	BIMID-16	Year Initiated	2024	Prioritization Score	40/40
Goal(s) / Objective(s) Addressed	Goals: 1, 2, 3, 5		Hazard(s) Mitigated	Climate Change, Dam and Levee Failure, Flood, Sea Level Rise, Severe Weather	
Project Status	New	If Deleted/No Longer Needed, provide reason.		N/A	
Benefits <i>(Loss Avoided)</i>	Low				
Lead Agency / Organization	Bethel Island Municipal Improvement District	Supporting Agency / Organization <i>(If applicable)</i>		N/A	
Additional Participating Jurisdictions <i>(If applicable)</i>	N/A				
Project Duration	Short Term		Estimated Cost	High	
Potential Funding Source	BRIC, HMGP, FMA		If Other, you must identify a funding source.	N/A	
			Please provide further detail on Potential Funding Source.	N/A	
Implementation Priority	High	Integration Ideas <i>(Optional)</i>			



Mitigation Action	Enhancement (raising and improving) to the levees is needed to better protect the lives and property. The district goal is to plan and design the levees to an acceptable standard and have a shovel-ready project for construction in 2025.				
Action Number	BIMID-17	Year Initiated	2025	Prioritization Score	40/40
Goal(s) / Objective(s) Addressed	Goals: 1, 2, 3, 5		Hazard(s) Mitigated	Climate Change, Dam and Levee Failure, Flood, Sea Level Rise, Severe Weather	
Project Status	New	If Deleted/No Longer Needed, provide reason.		N/A	
Benefits <i>(Loss Avoided)</i>	Medium				
Lead Agency / Organization	Bethel Island Municipal Improvement District	Supporting Agency / Organization <i>(If applicable)</i>		N/A	
Additional Participating Jurisdictions <i>(If applicable)</i>	N/A				
Project Duration	Long Term	Estimated Cost		High	
Potential Funding Source	BRIC, HMGP, FMA	If Other, you must identify a funding source.		N/A	
		Please provide further detail on Potential Funding Source.		N/A	
Implementation Priority	High	Integration Ideas <i>(Optional)</i>			



Mitigation Action	Obtain access to water to fight wildfires. District structures are vulnerable to fire as there are no fire hydrants on Bethel Island. The Fire Department may be able to use water from the waterways to fight fires if the structures are along the levee and near the waterway. Responding to fires in the other areas of the Island is a major challenge. The water lines are maintained and operated by the local water agencies; however, BIMID can collaborate with the water agencies to install hydrants on Bethel Island.				
Action Number	BIMID-18	Year Initiated	2025	Prioritization Score	35/40
Goal(s) / Objective(s) Addressed	Goals: 1, 2, 3, 5		Hazard(s) Mitigated	Wildfire	
Project Status	New	If Deleted/No Longer Needed, provide reason.		N/A	
Benefits <i>(Loss Avoided)</i>	Low				
Lead Agency / Organization	Bethel Island Municipal Improvement District	Supporting Agency / Organization <i>(If applicable)</i>		N/A	
Additional Participating Jurisdictions <i>(If applicable)</i>	N/A				
Project Duration	Short Term	Estimated Cost		High	
Potential Funding Source	BRIC, HMGP, FMA	If Other, you must identify a funding source.		N/A	
		Please provide further detail on Potential Funding Source.		N/A	
Implementation Priority	High	Integration Ideas <i>(Optional)</i>			

2024 Hazard Mitigation Plan **(DRAFT)**
 Contra Costa County, California



Mitigation Action	Continue to prepare and update the 5-year plan addressing flood hazards and the work needed in the area.				
Action Number	BIMID-19	Year Initiated	2024	Prioritization Score	40/40
Goal(s) / Objective(s) Addressed	Goals: 1, 2, 3, 4, 5		Hazard(s) Mitigated	Climate Change, Dam and Levee Failure, Flood, Sea Level Rise	
Project Status	New		<i>If Deleted/No Longer Needed, provide reason.</i>	N/A	
Benefits <i>(Loss Avoided)</i>	Medium				
Lead Agency / Organization	Bethel Island Municipal Improvement District		Supporting Agency / Organization <i>(If applicable)</i>	N/A	
Additional Participating Jurisdictions <i>(If applicable)</i>	N/A				
Project Duration	Short Term		Estimated Cost	Low	
Potential Funding Source	Local Budgeted Funds		<i>If Other, you must identify a funding source.</i>	N/A	
			Please provide further detail on Potential Funding Source.	General Fund (Staff Time)	
Implementation Priority	High	Integration Ideas <i>(Optional)</i>			



APPENDIX A. PUBLIC ENGAGEMENT

[This section will be populated after the Public Comment Period ends.]



APPENDIX B. PLAN ADOPTION

[Placeholder for adoption documentation after State and FEMA Approval]