Association of Bay Area Governments
Local Hazard Mitigation Plan

City of Belvedere
Annex

Introduction

The City of Belvedere is small city, less than one square mile in size, located in southern Marin County near the end of the Tiburon Peninsula. Belvedere is bordered by the City of Tiburon on the east and surrounded elsewhere by the waters of San Francisco Bay. The population of Belvedere is just over 2,000, mostly clustered in three neighborhoods: Belvedere Island, Belvedere Lagoon, and Corinthian Island. The City is completely built-out with single-family homes and approximately 100 rental units. The terrain is predominantly hilly and lush. The City has a 2010/2011 budget of $7.48 million and has 20 employees. Belvedere provides its own police services and receives fire services through the Tiburon Fire Protection District.

The Planning Process

Belvedere City staff is familiar with the planning process involved with the preparation of this document as it is not too dissimilar from general plan preparation and updating. The City recently completed its last general plan update in 2010 culminating with the release of the Belvedere 2030 document. Belvedere's 2030 General plan includes an Environmental Hazards: Safety and Stability Element that includes discussions regarding fire, earthquake, flooding and landslide hazards. Moreover, the City regularly enforces the requirements of the California Environmental Quality Act (CEQA), which, since 1988, mandates the mitigation of identified natural hazards.

In this regards, Belvedere has focused on building on these pre-existing programs, while noting where unintentional gaps in the programs may contribute to the City's vulnerability from the occurrence of a natural disaster. Obviously, those identified gaps have been well considered and mitigation efforts have either been undertaken or are under study.

Some of the activities conducted by the City were fed into the planning process for the multi-jurisdictional plan. The City of Belvedere participated in various Association of Bay Area Governments (ABAG) workshops and meetings, including the general "kick-off" meeting. In addition, Belvedere has provided written and oral comments on the multi-jurisdictional plan. Finally, when appropriate, the City provided information on facilities that are viewed as being "critical" to ABAG.

A number of senior City staff members have met on different occasions to identify and prioritize mitigation strategies that are appropriate for Belvedere. Key staff members involved in the meetings included the City Manager, Planning Manager, Building Official, Public Works Manager, City Engineer, Police Chief and the Tiburon Fire

District Fire Marshal. During those meetings mitigation priorities were identified, along with the appropriate department responsible for the planning and eventual mitigation oversight. Because of the City's small size and proactive mitigation efforts, only one "High Priority" item was identified and it related to the new FEMA FIRM and flood plain implementation.

In 2009, FEMA revised its FIRM map which identifies the flood hazard in Belvedere. The 2009 FEMA FIRM significantly expands the Special Flood Hazard Areas (SFHAs) delineated in Belvedere compared to its predecessor, the 1977 FIRM. This affects public safety and future land use and development on a number of private and public properties and requires affected property owners with home loans from federal lending institutions to purchase flood insurance. Recognizing these effects and the difficulties they present the City is implementing a program to reduce the flood hazard and work with FEMA to revise the 2009 FIRM.

As a first step, the City has prepared a Flood Management Plan in compliance with all federal grant and program requirements as outlined in 44 CFR Section 78.5 – Floodplain Management Plan. The Flood Management Plan is incorporated into this LHMP as Appendix I. The Flood Management Plan includes:

- A description of the planning process and public involvement;
- A description of the existing flood hazard and identification of the flood risk, including estimates of the number and type of structures at risk, repetitive loss properties, and the extent of flood depth and damage potential;
- The City of Belvedere floodplain management goals and objectives;
- Identification and evaluation of cost-effective and technically feasible mitigation actions considered;
- Presentation of the strategy for reducing flood risks and continued compliance with the National Flood Insurance Program;
- Procedures for ensuring implementation, reviewing progress, and recommending revisions to the plan; and,
- Documentation of formal plan adoption by the Belvedere City Council.

The City provided the opportunity for the public to comment on the draft Flood Mitigation Plan, including the mitigation strategies contained therein, at various public meetings in December 2010 and January, February and March 2011. The Resolution for the adoption of the strategies was approved by the City Council in March 2011. The mitigation strategies will become an implementation appendix to this Environmental Hazards Element.

Hazard and Risk Assessment

The City's hazards and risks are generally consistent with those identified in the ABAG multi-jurisdictional Local Hazard Mitigation Plan (LHMP), to which this is an Annex, except as described below.

The City has not undertaken hazard-mapping activities because of its small size, general lack of hazards and because of a proactive approach regarding the most prominent potential hazard—flooding at the Lagoon. Belvedere depends on those maps prepared by ABAG and shown on their website at http://quake.abag.ca.gov/mitigation/. The City's General Plan does, however, under the Environmental Hazards Element, indicate slope stability as an environmental hazard.

Over the years Belvedere has experienced several minor landslides, one occurring in 1998 when a roadside embankment failed, another in December 2005 at a private residence, and a third in 2009 along a section of public open space. Each minor slide caused some minor damage to public and private property. Because staff does consider landslides a potential hazard of some significance in our community, the subject was discussed during the numerous public meetings on the Environmental Hazards Element as part of the 2010 Belvedere General Plan update.

Historical information regarding declared disasters in Belvedere can be found by researching declared disasters in Marin County at http://quake.abag.ca.gov/mitigations/disaster-history.html.

The City of Belvedere examined the hazard exposure of the City's urban land based on information found on ABAG's website, which is located at http://quake.abag.ca.gov/mitigation/pickdbh2.html. Of the less than one square mile (only 312 acres) of urban area in Belvedere,

- Earthquake faulting – No active faults run within the City of Belvedere so rupture of a fault is not a direct concern.
- Earthquake shaking – From a general risk stand point, approximately 300 – 350 residential properties (in 43 acres) within the City have a shaking potential of *Violent* to *Very Strong* according to the ABAG Shaking Intensity Map due to certain soil conditions and relative proximity to the Northern San Andreas & the North Hayward/Rogers Creek faults.
- Earthquake-induced landslides – The California Geological Survey (CGS) has not completed mapping of this hazard in the City of Belvedere other than an interpretive description based aerial photographs. Because no areas have been mapped as landslides, other than the aerial photographic interpretations, this hazard is viewed as similar to that posed by weather-related hazards.
- Earthquake liquefaction – From a general risk stand point, approximately 200-250 residential properties (89 acres) within the City have a *Very High, High, or Moderate* liquefaction susceptibility, per the ABAG liquefaction map.
- Tsunamis – While tsunamis may be a hazard in the City of Belvedere, the mapping of the inundation area has not been completed at this time.

Flooding –

The Flood Management Plan identifies floodwaters emanating from surrounding hillsides, rising lagoon waters, and Richardson Bay overtopping of the San Rafael Avenue levee as potential sources of flooding. The Flood Management Plan

identifies structures that are within the FEMA 2009 SFHA Zone A. Included in these at-risk structures is the Tiburon Fire Station 11, which is a critical facility; 3.5 miles of roadway, including parts of San Rafael Avenue and Tiburon Blvd./Highway 131 which are key access routes to/from Belvedere; three commercial properties and 264 single-family residences surrounding the lagoon, including one repetitive loss property.

- Landslides – The City's General Plan mentions landslides as being a potential hazard. The USGS landslide hazard map indicates 50 urban acres are largely underlain by landslides.

- Wildfires – No areas within Belvedere City limits are subject to high, very high or extreme wildfire threats because of the urban nature of the City. Only 33 acres are in wildland-urban-interface areas.
- Dam inundation – This is not an applicable danger to the City because of its geographical location.
- Drought **–** Drought, though a potential problem in the City of Belvedere, is not fully assessed. The City will be working with ABAG and the various water supply agencies on this issue.

The City also examined the hazard exposure of infrastructure based on the information on ABAG's website at http://quake.abag.ca.gov/mitigation/pickdbh2.html. Of the 12.5 miles of roadway in the City,

- Earthquake faulting – No active faults run within the City so rupture of a fault is not a direct concern.
- Earthquake shaking – Approximately one mile of roadway are within the top two & three highest categories of shaking potential.
- Earthquake-induced landslides – The California Geological Survey has not completed mapping of this hazard in the City of Belvedere. However, this is unlikely to be an issue because no City roads are in existing landslide areas.
- Earthquake liquefaction – Approximately four miles of roadway is in an area of moderate susceptibility to earthquake-induced liquefaction.
- Tsunamis – While tsunamis may be a hazard in the City of Belvedere, the mapping of the inundation zone has not been completed at this time.
  Flooding – The Flood Management Plan identifies floodwaters emanating from surrounding hillsides, rising lagoon waters, and Richardson Bay overtopping of the San Rafael Avenue levee as potential sources of flooding. The Flood Management Plan identifies roads 3.5 miles of roadways that are within the FEMA 2009 FIRM SFHA Zone A. Included in these roadways are parts of San Rafael Avenue and Tiburon Blvd./Highway 131 which are key access routes to/from Belvedere.

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- Landslides – Three miles of roads are in an area susceptible to landslides.
- Wildfire – No roads are in area of high-to-extreme wildfire threat. However, one mile of roadway is in an wildland-urban-interface area.
- Dam Inundation – No roads are in an area susceptible to dam inundation.
- Drought – Drought is not a hazard for roadways.

Finally, the City of Belvedere examined the hazard exposure of critical health care facilities, schools and city owned building based on the information on ABAG's website at http://quake.abag.ca.gov/mitigation/pickcrit.html. Of the critical facilities within the City,

- Earthquake faulting – No active faults run within the City so fault rupture is not a direct concern. Additionally, the City's administrative and police facilities are contained in a building structurally designed, per the California Building Code, as an essential services facility. Moreover, the City of Belvedere does not currently contain any critical care facilities such as licensed hospitals, long-term care facilities, clinics, home health agencies, hospices, nor does the City contain any schools.
- Earthquake shaking – No active faults run within the City so fault rupture is not a direct concern. Additionally, the City's administrative and police facilities are contained in a building structurally designed, per the California Building Code, as an essential services facility. Additionally, no critical health care facilities or schools are in an area subject to earthquake shaking.
- Earthquake landslides – No critical health care facilities, schools, or City-owned facilities are in an area subject to liquefaction.
- Earthquake liquefaction – No critical health care facilities or schools, or City-owned facilities are in an area subject to liquefaction. While some City-owned facilities are in an area subject to liquefaction, none are critically significant at this time.
- Tsunamis – While tsunamis may be a hazard in the City of Belvedere, not mapping of the inundation zone has been completed at this time. Moreover, the City of Belvedere does not currently contain any critical care facilities such as licensed hospitals, long-term care facilities, clinics, home health agencies, hospices, nor does the City contain any schools.
  Flooding – The Flood Management Plan identifies floodwaters emanating from surrounding hillsides, rising lagoon waters, and Richardson Bay overtopping of the San Rafael Avenue levee as potential sources of flooding. The Flood Management Plan identifies structures that are within the FEMA 2009 FIRM SFHA Zone A. Included in these at-risk structures is the Tiburon Fire Station 11, which is a critical facility. No other critical facilities are located within the SFHA Zone A.

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- Landslides – No critical health care facilities or schools, or City-owned facilities are in an area subject to landslides.
- Wildfires – No critical health care facilities or schools. However, four City-owned facilities are in an area subject to wildland-urban-interface.
- Dam inundation – No critical health care facilities, schools, or City-owned facilities are in an area subject to dam inundation.
- Drought – Drought will not affect City buildings directly, Moreover, the City of Belvedere does not currently contain any licensed hospitals, long-term care facilities, clinics, home health agencies, hospices or schools.

Repetitive loss properties account for 25% to 30% of all claims paid by the NFIP, although they comprise only about 1% of the insured properties. As of 2010, 52

properties in Belvedere have reported historical flood losses, most of which were caused by the 1982 and 1983 flood events. Total insured losses to those 52 properties totals about $550,000. Of those 52 properties, one is listed as a repetitive loss property, with a total of two losses and insured repetitive losses totaling about $34,000.

The City plans to work with ABAG to improve the risk assessment information being compiled by ABAG. However, the City of Belvedere does not contain any unreinforced masonry and has identified two, possibly three, soft-story apartment buildings within the jurisdiction.

Drought, though it is a remote possibility for the potential problem in the City, it is not fully assessed at this time. However, the City will work with ABAG and the local water supplier, Marin Municipal Water District (MMWD) on this issue.

The City plans to work with ABAG to develop specific information about the kind and level of damage to buildings, infrastructure and critical facilities which might result from any of the hazards previously noted.

As these impacts are not fully developed, the City has reviewed the hazards identified and ranked the hazards based on past disasters and expected future impacts. The conclusion is that earthquakes—particularly shaking—poses the most significant risk for potential loss in Belvedere.

Mitigation Activities and Priorities

As a participant in the ABAG multi-jurisdictional planning process, the City of Belvedere staff helped in the development and review of the comprehensive lists of mitigation strategies in the overall multi-jurisdictional plan.

Regarding the City of Belvedere's mitigation strategies, the list was discussed at individual meetings in 2010 with the City Police Chief, Building Official, Public Works Director, Planning Manager, Public Works Manager, Fire Chief, Fire Marshal and City Manager. At the meetings all of the mitigation strategies were reviewed. Belvedere's decision regarding priorities, similar to the ABAG Plan, was made based on a variety of criteria, not simply on an economic cost-benefit analysis. These criteria include being technically and administratively feasible, politically acceptable, socially appropriate, legal, economically sound and not harmful to the environment or our heritage.

Over time, we are committed to developing better hazard and risk information to use in making those trade-offs. We are not trying to create a disaster-proof region, but rather a disaster-resistant one. In addition, several of the strategies are existing City or regional programs.

Included in the mitigation strategies for flooding are those set forth in the Flood Management Plan. The Flood Management Plan establishes as its overall goal the reduction of the flood hazard risk in Belvedere. Achieving this goal will protect the public and property as well as reduce the cost of flood insurance. The Flood Management Plan sets forth five specific objectives that tier off of the overall goal of flood hazard reduction. These include:

- Obtaining FEMA Accreditation of the Beach Road and San Rafael Avenue Levees and Revision of the FEMA Flood Insurance Rate Map;

- Implementing FEMA's Community Rating System

- Updating and Enforcing City Codes and Ordinances to Minimize the Flood Hazard Risk

- Increasing the Mitigation Capability of Residents, Business Owners, and Others Who Could be Affected by Floods

- Increasing the City's Capabilities to Respond and Recover from Emergencies and Disasters Caused by Flood Hazards

Obtaining FEMA accreditation of the levees has the highest priority and is the most urgent because flooding arising from overtopping of the levees and interior flooding, as are the main sources of potential flood hazard in Belvedere. The Flood Management Plan describes an implementation strategy for accomplishing these objectives and a timeframe.
These draft priorities were submitted to the City Manager for review. The draft priorities were then provided to the Planning Commission and ultimately the City Council for approval in 2011. The public was provided with an opportunity to comment on the Draft priorities during a 30-day public comment period. The final strategies, as indicated in the attached table, will become an Implementation Appendix to the City's Environmental Element.

The Plan Maintenance and Update Process

The City Manager will ensure that monitoring of this Annex will occur. The plan will be monitored on an on-going basis. However, the major disasters affecting our community, legal changes, notices from ABAG as the lead agency in this process and other triggers will also be used. Finally, the Annex will be a discussion item on the agenda of the meeting of City senior staff members at least once a year in April. At this meeting, the senior staff members will focus on evaluating the Annex in light of technological and political changes during the past year or other significant events. This group will be responsible for determining if the plan should be updated.

The City of Belvedere is committed to reviewing and updating this Plan Annex at least every five years, as required by the Disaster Mitigation Act of 2000. The City Manager will contact ABAG four years after this plan is approved to ensure that ABAG plans to undertake the plan update process. If so, the City will again participate in the multi-jurisdictional plan. If ABAG is unwilling or unable to act as the lead agency in the multi-jurisdictional effort, other agencies will be contacted, including Marin County Office of Emergency Services. Area counties should then be encouraged to work together to identify another regional forum for developing a multi-jurisdictional plan. In either case the City of Belvedere is committed to updating its Plan every five years.

The public will continue to be involved whenever the plan is updated and as appropriate during the monitoring and evaluation process. Prior to adoption of updates the City will

provide the opportunity for the public to comment on the updates. A public notice will be posted prior to the meeting to announce the comment period and meeting logistics.

City of Belvedere
Local Hazard Mitigation Strategy
Priorities

Priority Ranking	Mitigation Project	Responsible Department or Agency	Estimated Project Cost	Completion Date
1	**Implement the goals and objectives set forth in the Flood Mitigation Plan**	**City Manager/City Engineer/Building Official and Planning Department**		**2014**
1	**Fund study & possible repair to elevation of rip rap at Bay, adjacent to San Rafael Avenue**	**City Engineer**	**$100,000**	**Late 2007**

2	Update Tiburon Peninsula Joint Disaster Plan	City Manager, Joint Disaster Council & Town of Tiburon	$15,000	Late 2011
3	Educational & training outreach to community regarding disaster preparedness awareness, personal awareness & flood insurance	City Manager & Joint Disaster Council	$1,000	Ongoing, using City newsletter, website, e-network & community organizations
4	Update staff training under SEMs & other applicable disaster response training programs	City Manager	$2,500	Ongoing
5	Develop recommendations based on future California or US Geological landslide & tsunami mapping & studies	City Engineer	Unknown	Unknown
6	Implement recommendations based on future California or US Geological landslide & tsunami mapping & studies	City Engineer	Unknown	Unknown

CITY OF BELVEDERE, CALIFORNIA

FLOOD MITIGATION PLAN

February 2011

RESOLUTION NO. _____

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF BELVEDERE ADOPTING THE "CITY OF BELVEDERE, CALIFORNIA, FLOOD MITIGATION PLAN" AS AN OFFICIAL PLAN, AS AN ADDENDUM TO THE CITY OF BELVEDERE LOCAL HAZARD MITIGATION PLAN, AND AS AN APPENDIX TO THE UPDATE OF THE CITY OF BELVEDERE GENERAL PLAN ENVIRONMENTAL HAZARDS: SAFETY AND STABILITY ELEMENT UPDATE

WHEREAS, the City of Belvedere recognizes the potential threat of flood disasters and hazards to people, property and the environment in the City of Belvedere; and

WHEREAS, the City of Belvedere has been faced with flooding and drainage problems over the years that have flooded buildings and resulted in economic impacts; and

WHEREAS, the City of Belvedere has developed the Flood Mitigation Plan consistent with the federally prescribed planning process for the development of the Flood Mitigation Plan working with the Belvedere Citizens Flood Zone Committee, Planning Commission and the Community; and

WHEREAS, the City of Belvedere seeks to maintain and enhance a disaster resistant community by reducing the potential loss of life, property damage, and environmental degradation from floods, while accelerating economic recovery from those floods;

NOW, THEREFORE BE IT RESOLVED, that the City of Belvedere City Council hereby adopts the "City of Belvedere, California, Flood Mitigation Plan" as an official Plan, as an Addendum to the City of Belvedere Local Hazard Mitigation Plan, and as an Appendix to the Update of the City of Belvedere General Plan Environmental Hazards: Safety and Stability Element Update; and

BE IT FURTHER RESOLVED that the City of Belvedere shall submit this Adoption Resolution to the Governor's Office of Emergency Services and the Federal Emergency Management Agency, Region IX for Approval of the City of Belvedere, California, Flood Mitigation Plan.

The foregoing Resolution was duly passed and adopted at a Meeting of the City Council of the City of Belvedere held in said City on the 14th day of March, 2011, by the following vote, to wit:

AYES:
NOES:
ABSENT:

_____
John C. Telischak, Mayor

Attest:

_____
City Clerk

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Section 1: Introduction

1.1 Purpose of the Plan

The City of Belvedere, California, Flood Mitigation Plan (herein, Plan) presents a comprehensive strategy to guide community efforts designed to reduce the damage, loss and disruption from future flood events. Hazard mitigation is defined as any sustained action taken to reduce or eliminate long term risk to human life and property. Mitigation can reduce the enormous cost of disasters to property owners and all levels of government. In addition, it can protect critical community facilities, reduce exposure to liability and minimize community disruption.

This plan has been prepared in compliance with all federal grant and program requirements as outlined in 44 CFR Section 78.5 – Floodplain Management Plan Development and includes the following minimum elements as specified:

- A description of the planning process and public involvement;
- A description of the existing flood hazard and identification of the flood risk, including estimates of the number and type of structures at risk, repetitive loss properties, and the extent of flood depth and damage potential;
- The City of Belvedere floodplain management goals;
- Identification and evaluation of cost-effective and technically feasible mitigation actions considered;
- Presentation of the strategy for reducing flood risks and continued compliance with the National Flood Insurance Program;
- Procedures for ensuring implementation, reviewing progress, and recommending revisions to the plan; and,
- Documentation of formal plan adoption by the Belvedere City Council.

Adoption of this Flood Mitigation Plan by the Belvedere City Council and approval by CalEMA and FEMA qualifies the City of Belvedere to apply for and obtain pre- and post-disaster flood mitigation grants.

The primary purpose of this plan is to identify community policies, actions and tools for implementation over the long term that will result in a reduction in risk and potential for future flood losses community-wide. This is accomplished by using a systematic process of learning about the flood hazard that can affect the City of Belvedere, setting clear goals, identifying and implementing appropriate actions, and keeping the plan current.

An added benefit of the plan development process has been to identify and consolidate various data sources and activities currently underway. The plan relies primarily on

accessing existing, readily available information to the greatest extent possible before endeavoring to undertake new scientific or modeling efforts.

This plan is consistent with and supports the objectives of other existing or on-going planning efforts including the update of the General Plan Environmental Safety Element, the update of the Local Hazard Mitigation Plan, the FEMA Community Rating System, and the Belvedere Emergency Operations Plan.

1.2 Community Profile

Belvedere is a small city, less than one square mile in size, located in southern Marin County near the end of the Tiburon Peninsula. Belvedere is bordered by the City of Tiburon on the east and surrounded elsewhere by the waters of San Francisco Bay. The population of Belvedere is just over 2,000, mostly clustered in three neighborhoods: Belvedere Island, Belvedere Lagoon, and Corinthian Island. The city is completely built-out with single-family homes and approximately 100 rental units. The terrain is predominantly hilly and lush. Many residences were designed by famous architects and/or are considered historically significant. There are spectacular views of San Francisco, Angel Island, the Golden Gate Bridge, Sausalito, and Mt. Tamalpais, but there is no public beach or boat launching area.

The weather in Belvedere is extraordinary. Coastal breezes keep the air fresh and clear and the temperatures moderate all year; the average low in January is 42.9 degrees, the average high in July only 74.9. 260 days a year are mostly sunny.

The median age in Belvedere is 53. For many years the population has been predominantly 55+, however the number of young families with children is steadily growing and the City hosts swarms of children at its newly-renovated playground -- the most popular children's park in southern Marin. Most of Belvedere's working population commutes by car to San Francisco (30 minutes to downtown) or by ferry or bus; many work as consultants out of their homes. Belvedere is primarily a residential community with just a small fraction of the land devoted to commercial uses, including offices, services, and a handful of retail establishments. There is no downtown in Belvedere -- shoppers find the usual products and services immediately outside the City limits in the City of Tiburon's shopping centers and stores.

Physical Setting

In addition to being surrounded by water, Belvedere also has an interior lagoon (Belvedere Lagoon) formed by the Beach Road Levee and San Rafael Avenue Levee. Belvedere is, in fact, three distinct districts. Belvedere Island has the largest land area and is the most varied in terms of topography and landforms. Belvedere Lagoon forms a second, flatter portion of the City that surrounds the interior waterway. A third area is formed on Corinthian Island facing Belvedere Cove, where the island residents share borders with the Town of Tiburon. Smaller, distinct neighborhoods are associated with streets and blocks, such as San Rafael Avenue and West Shore Road.

History and Development

Belvedere was first settled in the late 1800s as a fishing-based community situated next to Tiburon, which was formerly the southern terminus of the Northern Pacific Railroad. This railroad carried passengers and freight, mostly lumber, to the town for transfer to barges for shipping to cities around San Francisco Bay. The Lagoon was formed in the 1940s by dredging and was subsequently subdivided with 260 lagoon-fronting homes and duplexes in the early 1950s when construction of two land "bridges" (Beach Road and San Rafael Avenue Levees) was also completed to connect the largest portion of the City to the rest of the Tiburon Peninsula.

The southwest-facing slopes of the Tiburon Peninsula above the Lagoon in the Reed Creek drainage area have undergone substantial development since 1960, including 200 single-family residences, several condominium projects, and a subsidized low-income housing project. This drainage area historically discharged to the Lagoon contributing to flooding along its interior shoreline. In 2001, the City completed construction of the Reed Drainage Diversion Project, a 2,400-foot long, 84-inch diameter pipeline designed to bypass the Lagoon and divert stormflows directly to Richardson Bay. The project cost of $1,230,000 was partially funded by a Hazard Mitigation Grant from FEMA ($750,000), with additional funding from Belvedere Lagoon Property Owners Association (BLPOA; $360,000) and the City ($120,000)

Demographics/Economics (Statistics per General Plan and Housing Element)

The City has a resident population of approximately 2,161 (2008 statistic). The estimated median household income in 2008 was $147, 967.00, higher than the median household income for California which was $57,014.00 and higher than the rest of Marin County. It is estimated that about 18% of Belvedere households fall in the low and very low income categories.

There are 987 parcels in Belvedere. Residential parcels are the predominant use, with 960 residential parcels providing 1,059 living units. The remaining parcels are split between commercial use, which accounts for 12 parcels, and 15 parcels designated for other uses such as Parks and Open Space.

The total assessed value of land and improvements in Belvedere is approximately $1.5 billion. The estimated median house/condo value in 2009 was $2.1 million, higher than the median value for California which was $211,500.00. Property values remain fairly stable in the area despite the recent housing market declines in the state and elsewhere in the country. Approximately 74% of homes are owner-occupied, and the average family household size in Belvedere in 2009 was 2.2.

Institutional Framework

Belvedere is governed by a five member elected City Council. The City Manager is the administrative head of the City organization, and provides coordination of all City departments through five department managers: Police Chief, Finance Manager, Public Works Manager, Planning Manager, and Building Official. Recreation and library

services are provided by the Belvedere-Tiburon Joint Recreation Department and Belvedere-Tiburon Library. The City currently has 20 budgeted full-time positions. Belvedere has an employee-population ratio of 108 residents per employee.

The work of the City Council, Department Managers and staff is supported by a number of Boards and Commissions which are staffed by citizen volunteers, including Planning Commission, Disaster Advisory Council, Recreation Committee, Library Agency Board, Historic Preservation Committee, Parks and Open Space Committee, Traffic Safety Committee, and Citizens Flood Zone Committee.

The City's budgeting structure consists of the general fund, capital projects fund, reserve fund, and fire fund. The general fund is the major fund of the City and is considered the operating fund. Personnel costs account for approximately 65.6% of the general fund budget in any given year. In addition to property tax revenues and other taxes levied and collected by the State, the general fund is supplemented by local voter-approved assessments including a fire services tax. The retail base which generates sales tax is rather limited, with sales tax providing only about 0.7% percent of the general fund budget.

Infrastructure

Roads and Highways:

There are a total of 12.5 miles of roads in Belvedere all of which are two lane roads through primarily residential neighborhoods. Travel into and out of Belvedere is accomplished by way of Highway 131, which is the sole arterial highway that runs east-west along Richardson Bay to Highway 101. Closure of Highway 131, such as during a disaster, would effectively shut-off the main access and isolate Belvedere, a condition that would pose challenges for residents and emergency services. The long, winding alternate route via Paradise Drive to the northeast is also susceptible to road closures during the same time.

Utilities:

Marin Municipal Water District (MMWD) provides drinking water to Belvedere. MMWD is a public agency with serves ten municipalities and other unincorporated areas of central and southern Marin County. MMWD is responsible for all aspects of water collection, treatment, storage, and distribution systems.

Sanitary District No.5 of Marin County provides collection and treatment of wastewater to Belvedere as well as other parts of the Tiburon Peninsula. The District serves over 3,500 households and has been servicing the area since the early 1940s. The District collects, processes, and treats wastewater in accordance with State and Federal Regulations under an NPDES (National Pollution Discharge Elimination System) Permit that regulates sanitary agencies. The District is an independent local agency governed by an elected Board of Directors composed of residents of the District.

Pacific Gas and Electric Company (PG&E) provides electricity and natural gas to Belvedere. PG&E served approximately 15 million people throughout a 70,000 square mile service area in northern and central California.

Mill Valley Refuse Service (MVRS) provides garbage, recycling and yard waste collection and disposal services to Belvedere and surrounding communities in southern Marin County. MVRS began operation as the "Mill Valley Garbage Company" in 1906 and has served Mill Valley and other southern Marin communities continuously since then.

Interior Storm Drainage System:

The City of Belvedere owns and operates the interior storm drainage system that drains the streets and other lands within the City limits. The Belvedere Lagoon Property Owners Association (BLPOA) owns the Lagoon and operates a hydraulic system that regulates the flow of water between the Lagoon and Richardson Bay. The hydraulic system includes gates fitted with one-way flaps that allow water to flow from the lagoon to the bay but not back from the bay to the lagoon unless the flaps are raised; and pumps (with backup diesel generators) that dewater the lagoon when needed to draw down the water level. BLPOA employs staff to operate the hydraulic system. In addition, BLPOA volunteers are also trained in operating the system and provide needed backup. During the rainy season BLPOA operators draw down the lagoon (from its summertime level) by 18 inches to provide capacity to attenuate storm inflow, and draw down further in anticipation of major storms. Temporary pumps are installed when extreme storms are forecasted and additional draw down capacity is needed.

Section 2: Planning Process and Public Involvement

2.1 Plan Development

The City of Belvedere, California, Flood Mitigation Plan is the culmination of planning efforts that address the flood hazard in Belvedere: the Local Hazard Mitigation Plan and the update of the General Plan Environmental Safety Element. This section describes each of those planning efforts, how they have contributed to the development of this Flood Mitigation Plan, and documents the planning process carried out in developing this Flood Mitigation Plan.

City of Belvedere Local Hazard Mitigation Plan (LHMP) Annex

The City of Belvedere Local Hazard Mitigation Plan Annex (2006 Annex) was adopted by the City Council on June 7, 2006 and approved by FEMA on August 4, 2006 (2006 Annex). The 2006 Annex was developed as part of the regional planning effort coordinated by the Association of Bay Area Governments (ABAG) that resulted in a Multi-jurisdictional Hazard Mitigation Plan for the San Francisco Bay area. The City of Belvedere participated in that effort and produced a Local Annex to that Plan which meets all planning process requirements under the Disaster Mitigation Act of 2000. As part of that process, key City staff prioritized mitigation actions to be included in the 2006 Annex from a list of several hundred mitigation strategies developed as part of the regional plan development process. The City assessed each of the strategies for appropriateness to their community and established a list of very high, high, and moderate priority actions to be pursued.

The 2006 Annex is valid for a period of five years from the date of FEMA approval; meaning, it's valid to August 4, 2011. It must be reviewed, updated and submitted to FEMA every five years. Accordingly, the City is currently reviewing and updating the 2006 Annex.

General Plan Environmental Hazards: Safety and Stability Element Update

The mitigation strategies identified in the 2006 Annex became an Implementation Appendix to the City's Environmental Hazards: Safety and Stability Element of the General Plan, which was evaluated by the City Planning Commission during the 2010 update of the General Plan Environmental Safety Element. The City Planning Commission approved the 2010 update of the General Plan Environmental Safety Element in May, 2010 and the City Council adopted it on June 9, 2010.

As before, the 2011 Annex will become an Implementation Appendix to the City's Environmental Hazards: Safety and Stability Element of the General Plan which was last evaluated and adopted by the City in 2010. The Annex is tentatively scheduled to be brought to the City Planning Commission for approval in February 2011, and to the City Council for adoption in March 2011.

2.2 Public Involvement

The City of Belvedere is committed to an open and participatory process in all aspects of planning and development that impact the City and the citizens it serves. Two approaches were used to involve the public in planning and development of this plan. The first approach included involving existing citizen boards in plan development, namely, the City Council, Planning Commission, and the Citizens Flood Zone Committee which has a special focus on flood hazard mitigation. The second approach included public outreach efforts designed to keep the public informed on scheduled meetings and dissemination of information generated during plan development.

Citizen Boards Involvement

City Council:

The City Council is composed of five elected members. The Council is the governing body for all City matters with the authority to adopt ordinances, resolutions, and approve official plans, such as the General Plan, Local Hazard Mitigation Plan, and Flood Mitigation Plan. Regular meetings of the City Council occur on the 2nd Monday of each month beginning at 7:30 p.m. in the City Hall Council Chambers located at 450 San Rafael Avenue.

The City Council's role in the planning and development of this Plan was its review of the Plan and consideration of the Planning Commission's recommendation concerning the LHMP Annex and this Plan.

Planning Commission:

This Planning Commission is composed of seven council-appointed Belvedere citizens who typically have some professional background in planning, architecture, or design. The commission is responsible for development of the General Plan and it reviews applications for design and zoning conformity in accordance with the Belvedere Municipal Code. The commission meets at City Hall on the 3rd Tuesday of each month at 6:30 PM. The Planning Manager serves as the City staff liaison to the Commission.

The commission's role in the planning and development of this Plan was its participation through the General Plan process with the Environmental Hazards: Safety and Stability Element and the public review of the Annex and recommendation to the City Council.

Citizens Flood Zone Committee:

The Citizens Flood Zone Committee is a relatively new committee that was created by the City Council in early 2010. Creation of the committee was prompted by the 2009 update of the FEMA Flood Insurance Rate Map (FIRM) for Belvedere which significantly increased the FEMA-designated Special Flood Hazard Area (SFHA).

The committee is composed of 15 members appointed by the City Council, including two members of the City Council and 13 citizens. Committee members are assigned to any of

three subcommittees corresponding to the committee's main purposes: (1) FEMA Map Subcommittee, responsible for coordinating with FEMA to reduce the SFHA in the upcoming 2012 revised FEMA FIRM for Belvedere; (2) Mitigation Measures Subcommittee, responsible for investigating ways to reduce flooding in Belvedere through coastal defenses (levees) and drainage system improvements; and, (3) Land Use Subcommittee, responsible for addressing land use issues related to the building code and zoning in the SFHA-designated areas.

The committee meets at City Hall on the 2nd Wednesday of each month at 6:30 pm. The City Manager serves as the City staff liaison to the Committee.

The Citizens Flood Zone Committee's role in the planning and development of this Plan was input into the plan through a public process, review at a public meeting, and recommendation to the Planning Commission.

Public Outreach

The City of Belvedere is committed to an open and participatory process in all aspects of planning and development that impact the City and the citizens it serves. Several methods of communication were used to keep the community informed of the plan development process, community meetings, and the plan review process. These include:

- The City of Belvedere website, where key events were posted on the home page and agendas, minutes, and audio recordings of meeting concerning the plan were posted on the pages of the City Council, Planning Commission, and Citizens Flood Zone Committee;

- The City of Belvedere email news, a resource of public information produced and distributed via the internet weekly to enrolled citizens by the City of Belvedere, where updates on plan development and key events were posted;

- The "Bella Belvedere," a seasonal newsletter of public information produced and distributed by U.S. mail to residents of the City of Belvedere, where progress on plan development and key events were posted;

- Media announcements of upcoming events and notices and articles of interest in two local newspapers; The Ark Newspaper or the Marin Independent Journal;

Three public meetings were held during the plan development process. The first was held on January 12, 2011 at the Citizens Flood Zone Committee Meeting. This meeting was held after distribution of the draft plan to the Citizens Flood Zone Committee and after providing hardcopies available for viewing at City Hall and the Library and posting on the City website. The purpose of this first meeting was to introduce the community to the draft plan with particular emphasis on the flood hazard risk in Belvedere and the flood mitigation planning process, to gather data on flood impacts, and to solicit community input on potential solutions to reduce future flood damage. A Community Flood Damage Survey was distributed at this meeting to collect information directly from

participants regarding their past flood experiences, mitigation actions, and future priorities. The survey was also made available through the City website so that individuals who could not attend the meeting were provided the opportunity to participate. The second meeting was held on January 18, 2010 at the Planning Commission meeting. This meeting was held to receive further comments from the community on the draft plan, present results of the Community Flood Damage Survey, provide additional recommendations for mitigation strategies based on community comments, and to solicit further community input. The third public meeting was held on February 14, 2011 at the City Council meeting to present the final draft plan, which incorporated public input, and receive further community input. Copies of meeting announcements and survey results are included in the Appendix.

2.3 Plan Review and Adoption

Plan review was incorporated into every step of the planning process. Following completion of the Administrative Draft, internal review was conducted by City Department manager and Citizens Flood Zone Committee. Subsequently, a Public Review Draft was posted for a thirty-day review period, consistent with standard City plan review procedures. Copies of the Public Review Draft were made available to the public at various City locations, including City Hall and the Library. Additionally, the Public Review Draft was posted on the City website. Public notices were published in The Ark Newspaper and Marin Independent Journal.

To ensure maximum opportunity for public input, three public meetings were held. All public input comments were reviewed and revisions to the Plan were made as appropriate. Immediately following the third public meeting, the City Council adopted the Flood Mitigation Plan. A copy of the signed resolution appears at the beginning of this Plan.

Section 3: Flood Risk Assessment

3.1 Description of the Flood Hazard

In 1976 and 1977, the Federal Insurance Administration (FIA; part of the Department of Housing and Urban Development) issued its "Flood Insurance Study" for the City of Belvedere (1976 FIS) and "Flood Insurance Rate Map" (1977 FIRM or 1977 Flood Map, which derives from the FIS), as authorized by the National Flood Insurance Act of 1968 (NFIA). The 1977 Flood Map delineates the Belvedere Lagoon and certain areas along the Richardson Bay and Belvedere Cove shorelines as Special Flood Hazard Areas, Zone A (SFHAs, Zone A[1]; Figure 1).

The 1976 FIS describes interior drainage and coastal flooding concerns in Belvedere as follows (Figure 2):

- Floodwaters from drainages emanating from the southwest-facing slopes of the Tiburon Peninsula can exceed the capacities of the conduits and flow overland through Belvedere to Richardson Bay (Hilarita Drainage) and Belvedere Lagoon (Reed Drainage #1, Reed Drainage #2, and Belvedere Drainage). In particular, a small, natural retarding pond in Tiburon, north of Tiburon Blvd., can fill when inflow exceeds the capacity of the existing pump station and spill over as sheet flow into Belvedere before flowing to the Lagoon.

- Floodwaters from drainages emanating from the north-facing slopes of Belvedere Island flow can exceed the capacities of the conduits and flow overland as sheet flow to the Lagoon.

- During the most extreme tidal events, Richardson Bay can overtop the San Rafael Avenue levee and flow to the Lagoon.

- The aforementioned inflows can cause the water level in the Lagoon to rise and flood adjacent properties. Calculations in the 1976 FIS of flood levels in Belvedere Lagoon are based on lowering the water level in the Lagoon prior to a storm or maximum tide, using a hydraulically operated tidal gate at San Rafael Avenue, down to elevation -0.4 ft[2] for increased flood storage.

The SFHA Zone A delineated in the 1977 Flood Map reflects interior drainage and coastal flooding. Importantly, the 1976 FIS and 1977 Flood Map credits the San Rafael Avenue and Beach Road levees as providing flood protection against coastal flooding caused by 100-year water levels from Richardson Bay and Belvedere Cove. Only two

[1] Special Flood Hazard Area, Zone A, is the area of the 100-year flood, or the area with a 1% probability of flooding in any given year, with the base flood elevation not provided.

[2] All elevations used in this letter refer to the NAVD88 datum.

properties in the Lagoon area (#42 and #44 Lagoon Road) are contained in SFHA Zone A due, presumably, to interior drainage flooding caused by localized concentration of storm water from the Reed Creek drainage. In 2001, the City of Belvedere completed the Reed Drainage Diversion Project which collects about one-half of the storm flow in Reed Creek and diverts it to Richardson Bay. Although this project has effectively protected the previously mentioned two remaining flood-prone properties from interior flooding, these properties were never removed by FEMA from the SFHA Zone A.

In 2009, FEMA (successor to FIA for administration of the NFIP) issued an updated FIS and FIRM (2009 FIS, 2009 Flood Map). In a major change from the 1976 FIS, the 2009 FIS does not credit the San Rafael and Beach Road levees as providing flood protection. For that reason the 2009 Flood Map delineates SFHA Zone AE[3] as the area that would be flooded by the 100-year water levels from Richardson Bay and Belvedere Cove as if the levees were not in place. The digital version of the 2009 Flood Map that was obtained from FEMA indicates that the 100-year water level is at elevation 9.0 feet. It is unclear from the 2009 FIS exactly how the interior sources of flooding described in the 1976 FIS and 1977 Flood Map were factored in to the 2009 Flood Map, except to say that the 100-year water level from Richardson Bay and Belvedere Cove appears to effectively "trump" those interior flooding sources. The resulting 2009 Zone AE delineation, which essentially follows the elevation 9.0-foot topographical contour, covers a much larger area and contains many more properties compared to the 1977 Zone A.

3.2 Flood History

Historical flooding has been limited to the Lagoon area. Property damage from flooding due to inadequate culverts and Lagoon flooding occurred during several years since the 1960s. In 1982, 1983, 1986, and 1995 there was flood damage in the Lagoon area due to storm inflows that raised water levels in the lagoon. In 1982 there was flooding of over 150 properties, including actual water intrusion into dozens of Lagoon area homes.

Since 1982, the City and BLPOA have implemented several measures to reduce the flood hazard. These measures include:

- Construction of the Reed Drainage Diversion Project which and diverts storm flows to Richardson Bay that had previously flowed to the Lagoon;
- Placement of rip-rap to protect the foreshore of the San Rafael Avenue levee;
- Removal of sediment from the lagoon to increase storm flow attenuation capacity;
- Installation of permanent pumps to augment capacity to draw down the lagoon;

[3] Like Zone A, Zone AE is the area of the 100-year flood, but with the base flood elevation provided.

- Installation of temporary pumps on an as-needed basis to remove lagoon water during tides too high for gravity release to Richardson Bay and also in preparation for forecasted severe storms.

Probability of Future Flood Events:

Based on the historical flooding described immediately above, it is reasonable to expect that Belvedere will experience flooding during periods of extended heavy rainfall and runoff that are coincident with very high tides. It is reasonably likely that significant flooding, such as occurred in 1982, will occur again if the City is unable to implement structural changes to the San Rafael Avenue levee that raise its height and improvements to the interior drainage system. Adding to this concern is the lack of localized information on the potential impacts of climate change/climate variability on future weather patterns that will affect the San Francisco Bay and, in particular, Belvedere. Some scientists believe that there is a trend toward more extreme weather events, including more intense storms, which would increase the potential for flooding.

3.3 Vulnerability Assessment and Loss Estimates

Critical to understanding the flood risk and determining cost effective risk reduction measures is identifying and quantifying community assets that are exposed to flood hazard. This section examines the exposure of public and private sector assets, generally by identifying which of those assets are within the 100-year (1% probability) floodplain as defined by the SFHA Zone A. Floods are often accompanied by landslide and debris flows, which can cause significant damage in areas that are located away from floodplains. While this hazard is related to flood risk, it is not directly addressed in this plan.

Critical Facilities

Critical facilities for Belvedere include Belvedere City Hall, Belvedere Police Station, and Belvedere Community Center, all of which are co-located in Belvedere at 450 San Rafael Avenue, and the Tiburon Fire Protection District Station 11, which serves Belvedere and is located at 1679 Tiburon Blvd. in Tiburon. The City of Belvedere buildings are located outside of the FEMA SFHA, but the Tiburon Fire Station 11 is located within the SFHA (Figure 1).

Roads

Approximately 3.5 linear miles of roadways are within the SFHA, including parts of San Rafael Avenue, Tiburon Blvd./Highway 131, and Beach Road and minor residential roads in the Lagoon area. Travel into and out of Belvedere is accomplished by way of Highway 131 and Paradise Drive. Highway 131 is the sole arterial highway that runs east-west along Richardson Bay to Highway 101. Closure of Highway 131, such as during a flood, would effectively shut-off major access and isolate Belvedere, a condition that would pose challenges for residents and emergency services. The long, winding

alternate route via Paradise Drive to the northeast is also susceptible to road closures during the same time.

Commercial and Residential Properties

Commercial and residential properties exposed to the flood hazard were identified by overlying County assessor parcel files with the SFHA map, and using current assessed value as the total dollar exposure. However, it should be noted that assessed value does not necessarily reflect either current market value or current replacement cost of structure or content.

Based on the above methodology, there are three commercial parcels with an assessed value of about $1.9 million located within the SFHA.

Using the same methodology, there are approximately 264 single family residential parcels exposed to the flood hazard. Using the current median home value of approximately $2.1 million for a single family residence, the total possible exposure, assuming total loss would be in excess of $550 million. The methodology also identified 15 parcels zoned for multifamily residential.

Repetitive Loss Structures

Repetitive Loss Structures, as defined by FEMA's NFIP, are residential buildings that have experienced one or more of the following since 1978, regardless of changes in ownership during that period:

- Four or more paid flood losses of more than $1,000 each;
- Three or more paid losses that, in the aggregate, equal or exceed the current value of the insured property; or,
- Two paid flood losses within a 10-year period that, in the aggregate, equal or exceed the current value of the insured property.

Repetitive loss properties account for 25% to 30% of all claims paid by the NFIP, although they comprise only about 1% of the insured properties. As of 2010, 52 properties in Belvedere that have reported historical flood losses, most of which were caused by the 1982 and 1983 flood events. Total insured losses to those 52 properties totals about $550,000. Of these 52 properties, one is listed as a repetitive loss property, with a total of two losses and insured repetitive losses totaling about $34,000. Left unmitigated either by individual action, such as home elevation, or through structural flood control measures, such as modifying the San Rafael Avenue Levee and improving the interior storm drain system, these properties will likely incur a similar level of damage in future flood events.

Section 4: Capability Assessment

The City of Belvedere can use a variety of tools, assets, and authorities to effectively reduce or mitigate the impacts of floods in the community. These include voluntary and mandatory measures; individual and community efforts; private and public actions; and preventive as well as responsive approaches. Examples of mitigation activities include educating citizens, enforcing building and zoning codes, carrying out capital improvement projects, adopting plans setting forth goals, policies and actions, establishing incentive programs and, in some cases, improving emergency response and preparation.

The capabilities available to the City of Belvedere fall into the following broad categories: Agencies and People, Codes and Regulations, Programs and Mitigation Activities, and Financial Resources. This capability assessment reviews who the City uses its capabilities available to mitigate its flood risks.

4.1 Agencies

The City of Belvedere has a number of departments, commissions, and councils that are involved in disaster-related issues, and it also benefits from the work of various state, federal, and non-governmental agencies. The most important players in the City's mitigation activities are described below.

City Departments, Boards, and Commissions

The table below summarizes the key City Departments, Boards, and Commissions that are involved in disaster-related issues.

Department	Role in Disaster Mitigation and Management
Tiburon Fire Protection District (JPA between Cities of Belvedere and Tiburon);	• Provides fire protection and emergency response services within the Tiburon-Belvedere areas • Conducts community preparedness and education trainings such as CERT and Get Ready
Belvedere Police Department (8 staff members)	• Leads the City emergency management function • Activates and coordinates actions for the City Emergency Operations Center (EOC) • Performs emergency response activities, including evacuation and security • Maintains dispatch center for all 9-1-1 and non-emergency calls

Belvedere City Engineer and Public Works Department (4 staff members)	• Manages the capital improvement program • Performs public street maintenance and repair • Performs storm drain and disaster-related repairs • Performs emergency drain cleaning and fallen tree clearing • Prepares storm water program management plans • Performs cleaning and maintenance of all parks and public landscaping • Performs City facilities management
Belvedere Planning and Building Departments (6 staff members)	• Facilitates the comprehensive period update of the General Plan • Processes planning and building permit applications • Conducts building inspections • Conducts resale inspections • Processes variances and Planning Commission items • Supports the Planning Commission and Design Review Board • Assures project compliance with environmental review requirements, including CEQA • City Building Official serves as the Floodplain Administrator
Boards and Commissions	**Role in Disaster Mitigation and Management**
City Council (5 elected members)	• Adopts Building and Fire Codes • Adopts Zoning Ordinances and other ordinances affecting residential and commercial development • Adopts Emergency Operations Plan • Adopts Hazard Mitigation Plans • Adopts General Plan and required elements
Planning Commission (7 appointed members)	• Develops, recommends adoption, and implements the City's General Plan • Administers the City's zoning and subdivision ordinances • Reviews and approves the design elements of proposals in the residential and commercial zones
Citizens Flood Zone Committee (15 appointed members)	• Investigates ways to reduce the FEMA SFHA in Belvedere and through structural improvements and floodplain management methods and addresses land use issues related to the building code and zoning in the SFHA-designated areas

Disaster Advisory Council (jointly w/Tiburon; 16 appointed members)	• Develops and recommends for adoption by the City Council emergency and mutual aid plans and agreements

County Agencies

Marin County Sheriff Office of Emergency Services:

The Sheriff's Office of Emergency Services (OES) provides emergency management services for the Marin County Operational Area including the eleven cities/towns and 300 + special districts. OES coordinates emergency operations activities among all the various local jurisdictions and develops written guidelines for emergency prevention, preparedness, response, recovery and mitigation to natural, man-made, and technological disasters. The Sheriff's OES serves as the liaison between the State and all the local government political subdivisions comprising the Marin County Operational Area, including the City of Belvedere.

State Agencies

Governor's Office of Emergency Services (OES):

The OES serves as the lead state agency for emergency management in California. Among many other activities, it administers federal mitigation programs in the State, prepares the State Multihazard Mitigation Plan, and supports and oversees hazard mitigation planning activities of local governments.

Department of Water Resources (DWR):

The Department of Water Resources is the state agency with primary responsibility for managing water in California and for flood disaster preparedness and response. DWR coordinates the NFIP in the State as well as the Floodplain Management Task Force. Under contract with FEMA, DWR performs Community Assistance Visits (CAVs) every 5 years for each community participating in the NFIP to ensure that the community is implementing the minimum floodplain management criteria of the NFIP. The most recent CAV for the City of Belvedere was completed in April 1998, and the City was found to be in compliance with all NFIP requirements. DWR also delivers floodplain management workshops for local officials in subjects such as compliance with the NFIP floodplain management criteria, preparation of elevation certificates, and flood-resistent construction. The next CAV is scheduled for April, 2011.

Federal Agencies

Federal Emergency Management Agency (FEMA):

FEMA, part of the U.S. Department of Homeland Security, is the key federal agency with responsibility to help communities prepare for, prevent, respond to, and recover from disasters. The Mitigation Directorate manages the NFIP and a range of programs

designed to reduce future losses to homes, businesses, schools, public buildings and critical facilities from floods, earthquakes, wildland fires, and other natural disasters.

FEMA also provides mitigation funds to state and local governments through a variety of grant programs, including the Hazard Mitigation Grant Program (HMGP), the Flood Mitigation Assistance Program (FMA), and the Pre-Disaster Mitigation Program (PDM).

U.S. Army Corps of Engineers:

The USACE, San Francisco District, has responsibility for civil works, flood control, flood fighting, environmental restoration, and Clean Water Act regulatory activities for a geographic area that covers about 40,000 square miles, including Belvedere. The USACE is involved in maintaining the navigability of the San Francisco Bay by dredging and other means.

Non-Governmental Organizations

There are numerous non-governmental groups that can contribute to flood risk reduction in the City of Belvedere. By working with these groups, the City can extend its resources and personnel to more effectively reach its mitigation goals. Some of the most active groups are described below.

Belvedere Lagoon Property Owners Association (BLPOA):

BLPOA owns the Lagoon and operates the hydraulic system that controls the water level in the lagoon by regulating the flow exchange with Richardson Bay. BLPOA employees, backed up by volunteers, draw down the lagoon during the rainy season to provide capacity to attenuate storm inflows, and draw down further when very heavy storms are forecasted. When needed to maintain capacity, BLPOA removes sediment from the lagoon. These activities reduce the risk of flooding to property owners along the lagoon and adjacent areas.

Marin Center for Volunteer and Nonprofit Leadership (MCVNL):

The Center promotes volunteerism, strengthens non profits, and enhances community leadership in Marin County. As one of the Volunteer Centers of the Bay Area, the Center works with local agencies coordinating emergency preparedness and mobilizing volunteer resources to help the community when disaster strikes. The main role in responding to disasters is to mobilize emergent volunteers who want to help and connect them with organizations that need assistance. Disaster-related volunteer work may include such tasks as damage assessment, food preparation, language interpretation, and message delivery. Other tasks run the gamut from cleaning up to entering data to transporting people to answering phones.

Marin Interagency Disaster Coalition:

Volunteer and private agencies are part of the Marin Operational Area's mutual aid system. The Marin Interagency Disaster Coalition (composed of the American Red

Cross, The Salvation Army, Marin Community Food Bank, Volunteer Center of Marin, Marin Interfaith Council, and Marin Humane Society) is an essential element of Marin County's response to meet the care and shelter needs of disaster victims. These agencies are represented at the Marin County EOC when activated.

American Red Cross – Marin:

American Red Cross – Marin, part of American Red Cross Bay Area, meets immediate emergency disaster-caused needs by providing shelter, food, clothing, and health and mental health services to address basic human needs. The Red Cross also feeds disaster victims and emergency workers, handles inquiries from concerned family members outside the disaster area, provides blood and blood products to disaster victims, and helps those affected by disaster to access other available resources. During non-disaster times, the Red Cross supports Belvedere by conducting emergency preparedness training and public education materials and presentations.

The Salvation Army:

The Salvation Army provides numerous disaster relief services. The Salvation Army's disaster response is community-based, varying from place to place dependent upon the community's situation and the magnitude of the disaster. In a disaster, The Salvation Army has the ability to provide both immediate emergency assistance and long-term recovery help. Emergency response services are activated on short notice according to an agreed-upon notification procedure, while long-term recovery is strategically planned in response to the situation, through working and partnering with many other community entities. The Salvation Army is also active in emergency preparedness and public education in the community.

Medical Aid Station:

The Medical Aid Station serves as the local resource repository for medical aid supplies for the Tiburon peninsula. In the event of a disaster, the peninsula may be cut off from the rest of Marin such that the Medical Aid Station will need to sustain the community until further assistance can reach the area.

Medical Reserve Corps:

The Medical Reserve Corps is a collection of local medical and non-medical professionals that have offered their expertise to the Tiburon peninsula in the event of a disaster. The Corps will assemble, as needed and as available at the Medical Aid Station and/or other designated areas to await assignment and deployment.

4.2 Plans

The City of Belvedere has plans that address disaster management. These plans define important City policies and support the ordinances and activities described elsewhere in this document. This section reviews City plans and highlights the elements that are

relevant to disaster mitigation and can support future implementation of flood mitigation actions.

General Plan

All cities and counties in California are required to adopt a General Plan that lays out major policy goals to guide future development. The General Plan includes required elements, which are sections that address a variety of important topics. The element most closely related to this Flood Mitigation Plan is the Environmental Hazards: Safety and Stability Element, which focuses on reducing geologic, flood, and wildfire risks. The Land Use Element also provides guidance relevant to flood mitigation.

Capital Improvement Program

The Capital Improvement Program funds projects that support flood mitigation. The 2010-2011 Program does not include funds for flood mitigation.

City of Belvedere Emergency Operations Plan (EOP)

The EOP establishes policies and procedures and assigns responsibilities to ensure the effective management of emergency operations with the City of Belvedere. It provides information on the City's emergency management structure and how the emergency management team is activated.

Additionally, the EOP includes threat assessments that provide a brief analysis of hazards and how those hazards could affect the City. The document serves as the legal and conceptual framework for emergency management in Belvedere. Belvedere is part of the Marin County Operational Area which serves as the county-wide coordination point for all major emergencies and disasters, and is the link to the State Office of Emergency Services under the Standardized Emergency Management System (SEMS).

Other documents supporting emergency preparedness and response are described below.

- Belvedere Police Department Uniform Evacuation Protocol: Includes Incident Commander Checklist, evacuation protocols, and supporting documents and forms.

- Disaster Preparedness Evacuation Planning Guide: Provides information to the public on how alerts, warnings, and evacuation orders are issued and includes guidance on pre-evacuation steps to take before an emergency occurs.

- Marin County Office of Emergency Services Telephone Emergency Notification System (TENS): Provides automatic telephone notifications of flood warnings.

4.3 Codes and Regulations

The City of Belvedere Municipal Code of Ordinances includes codes and regulations to govern development, construction and land use activities, in addition to administrative

and other functions. They include construction standards, site requirements, use limitations, study requirements and mitigation requirements which help directly or indirectly to minimize the exposure of people and property to loss or injury resulting from disasters. A brief summary description of each relevant Title and Chapter of the Code is described below, particularly as it relates to the flood hazard.

Title 2: Administration and Personnel; Chapter 2.32 Disaster Council and Emergency Services

This Chapter provides for the preparation and carrying out of plans for the protection of persons and property within this City in the event of an emergency; the direction of the emergency organization; and the coordination of the emergency functions of this City with all other public agencies, corporations, organizations and affected private persons.

Title 8: Health and Safety; Chapter 8.36 Urban Runoff and Pollution Prevention; Section 8.36.100 Watercourse Protection

This Section requires property owners to keep watercourse that pass through private properties free of obstructions that could retard the flow of water through the watercourse and not modify the natural flow of water in a watercourse.

Title16: Building and Construction; Chapter 16.20 Flood Damage Prevention

This Chapter prevents or minimizes flood damage in flood hazard areas by regulating construction and other land use activities.

4.4 Programs and Mitigation Activities

City of Belvedere Activities

Flood Warning and Notification:

The City uses the TENS to provide local residents with hazard information in a timely and effective manner. The Marin County Office of Emergency Services will provide the notifications according to protocols established jointly by the County and participating jurisdictions, including Belvedere.

Get Ready:

The Tiburon Fire Protection District in conjunction with Marin County Get Ready has conducted numerous neighborhood disaster preparedness trainings to residents, City employees, school districts, and other interested parties. This community-based program is designed to train resident trainers who can in turn provide the training in their neighborhood. The program emphasizes basic skills and preparation needed before, during and after a disaster to survive on our own for 72 hours and support community needs as well. Over 2,500 residents in the Tiburon Fire Protection District have received this training.

Federal and State Programs

National Flood Insurance Program (NFIP):

The NFIP is a congressionally authorized program to reduce the costs and impacts of flooding across the U.S. Under this program, the Federal government makes affordable flood insurance available to homeowners, business owners, and renters in participating communities. In exchange, those communities must adopt and enforce minimum floodplain management regulations to reduce the risk of damage from future floods. Belvedere meets the requirements of the NFIP through Chapter 16.20 of the City Code.

Flood insurance reduces the cost of Federal disaster assistance; according to FEMA, every three dollars paid in flood insurance reduces disaster assistance payments by one dollar. However, the NFIP achieves its greatest fiscal impact by encouraging communities to reduce flood risks. FEMA estimates that sound floodplain management practices reduce flood damage by $1 billion annually; and that buildings constructed in compliance with NFIP requirements are likely to suffer 80 per cent less damage annually than non-compliant buildings.

To encourage communities to increase the effectiveness of floodplain management programs, FEMA has implemented the Community Rating System (CRS). Under the CRS, communities receive credits for implementing floodplain management measures that go beyond the minimum criteria of the NFIP. For example, when a community moves from a Level 10 (the basic level of participating) to a Level 9, flood insurance policy holders receive a five percent discount on their insurance premiums. The CRS grants credits for eighteen different activities that fall under four categories: Public Information (six activities); Mapping and Regulations (five activities); Flood Damage Reduction (four activities); and Flood Preparedness (three activities). The maximum premium reduction a community can receive under CRS is 45%.

Currently, the City of Belvedere has a Class 10 rating, which is the base level rating for any community. As such, Belvedere does not receive any premium reduction. The City is exploring further participation in the CRS, as describe later in this document. As of September 30, 2010, there were 287 NFIP policies in effect in the city, at a total annual premium of $235,629.

4.5 Financial Resources

While some flood mitigation activities can be carried out without significant cost, others need a substantial expenditure. The federal financial resources listed below are potentially available to the City to pursue the flood mitigation measures identified in this plan.

Hazard Mitigation Grant Program (HMGP)

This FEMA-administered program provides grants to states and local governments following a presidential disaster declaration. The funds can be used to implement long-term hazard mitigation measures. According to the Disaster Mitigation Act of 2000,

communities must have an approved Local Hazard Mitigation Plan (LHMP) to receive HMGP funds after May 1, 2005. Funds will be granted only to projects that conform to local and state mitigation plans. Federal grant funds can provide 75 percent of a project's total cost; other sources must provide the 25 percent match.

Pre-Disaster Mitigation Program (PDM)

The PDM program provides funds to states, territories, Indian tribal governments, communities, and universities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. Funding these plans and projects reduces overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations. PDM grants are awarded on a competitive basis. Federal grant funds can provide 75 percent of a project's total cost; other sources must provide the 25 percent match.

Flood Mitigation Assistance (FMA)

FMA is a program under the NFIP that provides funding for states and communities to prepare Flood Mitigation Plans and conduct flood mitigation projects. Communities are encouraged to prioritize projects relating to repetitive loss properties. A community must have a Flood Mitigation Plan to receive a FMA grant, and only projects specified in that plan are eligible for grants. Federal grant funds can provide 75 percent of a project's total cost; other sources must provide the 25 percent match.

Repetitive Flood Claims (RFC) Grant Program

The RFC Grant Program provides funding to reduce or eliminate the long-term risk of flood damage to structures insured under the NFIP that have had one or more claims payments for flood damage. RFC funds may only mitigate structures that are located within a State or community that cannot meet the requirements of the FMA Program, for either cost share or capacity to manage the activities. The long-term goal of the FRC is to reduce or eliminate claims under the NFIP through mitigation activities that are in the best interest of the NFIP. Only mitigation projects for acquisition of insured properties that have one or more claim payments for flood damages, and either demolition or relocation of structures, with conversion of property to deed restricted open space uses, are eligible. All RFC grants are eligible for up to 100 percent Federal assistance.

Increased Cost of Compliance (ICC)

ICC provides NFIP-insured property owners with substantial flood damage with up to $30,000 to bring a home or business into compliance with the local floodplain ordinance through elevation, floodproofing, relocation, or demolition. Eligible properties must have sustained "repetitive damage," of damage by flooding twice in the past 10 years, where the cost of repairing the flood damage, on average, equaled or exceeded 25 percent of the property market value at the time of each flood. Also, there must have been flood insurance claim payments for each of the two flood losses and the community's floodplain management ordinance must have a repetitive loss provision. Through a separate claim process, owners of flood damaged property may apply for up to $30,000 to

help pay for flood mitigation projects carried out in compliance with local floodplain ordinance requirements, including floodproofing, relocation, elevation, or demolition.

Section 5: Goals, Objectives, and Strategies

5.1 Overall Goal

The overall goal of this Flood Mitigation Plan is to reduce the flood hazard risk in Belvedere and the cost of flood insurance to its citizens.

5.2 Considerations for Mitigation Planning and Risk Reduction

The 2009 FEMA Flood Insurance Rate Map significantly expands the SFHAs delineated in the City. This affects future land use and development on a number of private and public properties, and requires affected property owners with home loans from federal lending institutions to purchase flood insurance. Recognizing these effects, the difficulties they present, as well as public safety concerns, the City desires to reduce the flood hazard reflected in the 2009 Flood Map and work with FEMA to revise the 2009 Flood Map. In this regard, the City would like to explore opportunities for measures that would reduce the flood hazard.

FEMA has begun work on further revisions to the 2009 Flood Map. FEMA expects that the revised flood map will be completed and become effective in 2012 or 2013. The revisions will incorporate updated topographical data and hydrologic and hydraulic modeling. In this regard, FEMA anticipates that its new coastal hydrodynamic model of San Francisco Bay, which will account for tidal action, wave run-up, and storm surge, will raise the 100-year water levels from Richardson Bay and Belvedere Cove by two feet, to elevation 11.0 feet (NAVD88 datum). If so, this will further expand the SFHAs in the City. FEMA has indicated it could consider and incorporate flood hazard reduction measures planned by the City that meet FEMA standards in its revised flood map under the condition that the City supplies FEMA with the necessary information regarding those measures in time.

Actions aimed at reducing the flood hazard would need to address the aforementioned flood concerns (refer to Section 5.3 below). Chief among those concerns is overtopping of San Rafael Avenue and Beach Road Levees. In order for FEMA to consider their flood hazard reduction benefit, these levees would need to be accredited by FEMA. Requirements for accreditation are described in Code of Federal Regulations, Title 44, Section 65.10 (44 CFR 65.10) as summarized below:

- General Criteria
    - FEMA only recognizes flood hazard reduction benefits of levees meeting the design, operation and maintenance criteria established by FEMA. Communities must supply FEMA with information demonstrating that these criteria are met.

- Design Criteria
    - 1 foot of freeboard above the 1% probability wave or maximum wave run-up associated with the 1% probability stillwater surge.
    - Openings must have closure devices that are structural parts of the levee system.
    - No appreciable erosion of the levee can be expected.
    - The levee must be stable.
    - Future levee settlement must be analyzed and accounted for in freeboard.
    - Interior flooding must be analyzed and mapped.
- Operations Plans and Criteria
    - Formal plans are required for operation of closure devices and interior drainage systems, including periodic inspections and testing, and a flood warning system that will be used to trigger closure devices. Manual backup is required for activation of automatic systems.
- Maintenance Plans and Criteria
    - Levees must be maintained in accordance with an approved maintenance plan.

It is important to note that in complying with the above-described "Design Criteria" regarding interior flooding in 44 CFR 65.10, measures to reduce the flood hazard from the aforementioned interior flooding concerns (i.e., floodwaters from drainages emanating from the surrounding slopes that flow overland and cause the water level in the Lagoon to rise and flood adjacent properties) could be incorporated into the levee accreditation process.

5.3 Objectives, Strategies, and Actions

This section describes specific objectives that tier off of the overall goal of reducing the flood hazard in Belvedere and corresponding actions that should be taken to achieve those objectives.

Federal regulations guiding the development and approval of the Flood Mitigation Plan require that a priority be assigned to each action included in the Plan. Accordingly, each action has been assigned a rank of 1, 2, or 3, with a rank of 1 being the highest priority ranking. Factors considered when assigning a priority rank included:

- Potential effectiveness of the action in reducing future flood damage

- Ease of implementation
- Multiple objectives achieved
- Overall feasibility (given social and political acceptance, legal, environmental, technical, and economic considerations)

Objective 1: Obtain FEMA Accreditation of the Beach Road and San Rafael Avenue Levees and Revision of the FEMA Flood Insurance Rate Map

This objective has the highest priority and is the most urgent because flooding arising from overtopping of the levees and interior flooding, as described in Section 3.1, are the main sources of potential flood hazard in Belvedere. The City should embark on a program to get the San Rafael Avenue and Beach Road Levees accredited by FEMA in time for FEMA to consider and incorporate the flood hazard reduction benefits into their upcoming revised FIRM. Initial efforts should focus on formulating plans for necessary modifications to the levees themselves and to the interior drainage system. Subsequent efforts can focus on operations and maintenance plans and other requirements of 44 CFR 65.10. Accordingly, the City should initiate work on the following two studies:

- Feasibility Study of Needed Modifications to San Rafael and Beach Road Levees (Priority 1)

This study should identify options for modifying the levees to satisfy the accreditation criteria in 44 CFR 65.10 and recommend a preferred option based on effectiveness, life cycle cost, and other considerations determined by the City. The study should incorporate and build upon previous studies. The strength, stability, resistance to erosion, and settlement potential of the existing levees should be assessed. Options for raising the height of the levees should also be assessed, including sea walls, inflatable rubber dams, pneumatically operated gates, or other methods. Future sea level rise should be considered.

- Hydrology and Hydraulic Study of Interior Drainage System (Priority 1)

This study should analyze the existing interior drainage system and map the extent of interior flooding for the 1% probability flood. The study should incorporate and build upon previous studies. Where needed to reduce flood hazard, the study should identify deficiencies in the system, recommend necessary improvements or changes to Lagoon operations, and estimate costs.

These studies could be completed in approximately four to six months from the date of notice to proceed depending on data availability and the need for field work (e.g., surveying, geotechnical exploratory drilling and testing).

After the Feasibility Study and Hydrology/Hydraulic Study are completed and the City has selected the preferred alternative for levee modifications and interior drainage system

improvements, the City can move forward on the required environmental review and regulatory permitting and design. This process is anticipated to take about two years.

After required environmental approvals and permits have been obtained and design is completed, the City can proceed with construction of the levee modifications and interior drainage system improvements. Construction is estimated to take from five to ten months depending on the alternative that is selected.

FEMA will accredit the San Rafael Avenue and Beach Road Levees after approval of as-built design plans certified by a registered professional engineer.

Objective 2: Implement FEMA's Community Rating System

- Implement FEMA CRS (Priority 1)

The City should initiate efforts to implement FEMA's Community Rating System. Initial efforts should focus on updating the City's Multi-Hazard Mitigation Plan to include flood hazards and associated corrective actions. The City should submit the updated Plan to FEMA for approval.

Once the studies described in Objective 1 are completed and FEMA has approved the City's updated Plan, the City will be in a position to define its preferred project and be eligible to apply to FEMA for Flood Hazard Grant funding.

Objective 3: Update and Enforce City Codes and Ordinances to Minimize the Flood Hazard Risk

- Continue to enforce the City Flood Ordinance (Chapter 16.20 of the City Code) for all development, redevelopment, or substantial improvement projects in the SFHA through the permit review process administered by the City Planning and Building Departments. (Priority 1)

- Continue to comply with all requirements of the NFIP. (Priority 1)

- Explore potential for enhancing current building codes or design standards that will result in reduced surface runoff to interior drainage system. (Priority 3)

Objective 4: Increase the Mitigation Capability of Residents, Business Owners, and Others Who Could be Affected by Floods

- Continue to work with the Marin County Office of Emergency Services to use the TENS flood warning system to provide local residents with hazard information in a timely and effective manner. (Priority 1)

- Continue to work with the Tiburon Fire Protection District in conjunction with Marin County Get Ready to conduct neighborhood disaster preparedness trainings to residents, City employees, school districts, and other interested parties. (Priority 1)

- Work with the Belvedere Lagoon Property Owners Association (BLPOA) to explore methods of reducing the flood hazard in the Lagoon area through operation and management of Lagoon levels during severe storms. Include BLPOA in the review of the studies described in Objective 1. (Priority 1)

Objective 5: Increase the City's Capabilities to Respond and Recover from Emergencies and Disasters Caused by Flood Hazards

- Develop and disseminate protocols for activities of warning sirens, TENS and other flood notification measures and include them in the EOP. (Priority 2)

- Work with the Tiburon Fire Protection District in their Get Ready program to include educating residents of appropriate measures to take when an alarm is sounded and document flood evacuation procedures in the EOP. (Priority 2)

- Work with the Tiburon Fire Protection District to continue providing a Disaster Preparedness website that includes flood and disaster preparedness and links to flood prevention and mitigation resources. (Priority 1)

- Continue the Joint Disaster Council Advisory Committee. (Priority 1)

5.4 Implementation Strategy

The Implementation Strategy is designed to help the community achieve its overall goal and objectives for flood risk reduction. A strategy has been developed for each of the highest priority actions identified. There are three key elements included in the implementation strategy matrix that follows: responsible agency, timeframe, and funding.

Responsible Agency

Flood mitigation is not the responsibility of any single person or department, but rather involves many players from the public and private sector. For each mitigation action, key City Departments are identified as well as external governmental and multi-jurisdictional agencies. Additional partners may be identified as various actions are pursued.

Timeframe

The Implementation Strategy recognizes a five-year planning horizon. For mitigation actions identified as "ongoing", they are expected to continue on a periodic or annual basis. Others have been assigned a one or more year timeframe based on efforts underway or expected to be initiated and completed within that timeframe. Other, more complex projects are expected to take longer period of time to implement, and may extend beyond the five-year timeframe.

Funding

This column includes information on potential funding sources that could be applied to or pursued to implement each action. The City of Belvedere has limited resources and recognizes that external funding will be required to implement some of the structural measures.

Objective 1: Obtain FEMA Accreditation of the Beach Road and San Rafael Avenue Levees and Revision of the FEMA Flood Insurance Rate Map	**Responsibility**	**Timeframe**	**Funding**
Feasibility Study for Beach Road and San Rafael Avenue Levees	City Engineer/Public Works	2011	General Fund
Hydrology/Hydraulic Study of Interior Drainage System	City Engineer/Public Works	2011	General Fund
Permit, Design, and Construct Modifications to Levees and Improvements to Interior Drainage System	City Engineer/Public Work	2014	T.B.D.
FEMA Accreditation of Levees	City Engineer/Public Work	2014	N/A

Objective 2: FEMA's Community Rating System	**Responsibility**	**Timeframe**	**Funding**
Implement System	Planning/Building	2011	General Fund
Objective 3: Update and Enforce City Codes and Ordinances to Minimize the Flood Hazard Risk	**Responsibility**	**Timeframe**	**Funding**
Continue to enforce the City Flood Ordinance	Planning/Building	Ongoing	General Fund
Continue to comply with all requirements of the NFIP	Planning/Building	Ongoing	General Fund
Explore potential for enhancing current building codes or design standards that will result in reduced surface runoff to interior drainage system	Planning/Building, Public Works	Ongoing	General Fund

Objective 4: **Increase the mitigation capability of residents, business owners, and others who could be affected by floods**	**Responsibility**	**Timeframe**	**Funding**
Continue to use the TENS flood warning system	Police, Marin County Office of Emergency Services	Ongoing	General Fund
Continue Get Ready	Police, Tiburon Fire Protection District	Ongoing	General Fund
Explore use of Belvedere Lagoon for flood protection	City Engineer/Public Works, BLPOA	2011	General Fund
Objective 5: **Increase the City's Capabilities to Respond and Recover from Emergencies and Disasters Caused by Flood Hazards**	**Responsibility**	**Timeframe**	**Funding**
Develop/Disseminate Warning Protocols/Procedures	Police	2012	General Fund
Continue Disaster Preparedness Website	City Website Manager, Tiburon Fire Protection District	Ongoing	General Fund
Continue Joint Disaster Advisory Council	City Councils of Belvedere and Tiburon	Ongoing	General Fund

Section 6: Plan Maintenance Process

To ensure the Plan stays current and incremental progress is made on implementing the mitigation strategies, the City of Belvedere will make every effort to update this Plan every five years. However, the City may update this Plan at its own discretion any time prior to that if new hazard information becomes available, priorities for implementation change, an actual flood event occurs, or other circumstances prompt an update.

6.1 Monitoring, Evaluation, and Updating the Plan

The City of Belvedere will use similar mechanisms to monitor and update the Plan as were used to develop the Plan. The City Manager will assume the leadership role in monitoring the progress of plan implementation, with a focus on the highest priority actions. Key departments with responsibility for mitigation implementation will continue to actively participate in the process. All plan updates will be subject to the public input and review process that is a part of all plan development in the City of Belvedere. On an annual basis the City Manager will solicit progress reports from the department(s) assigned responsibility for implementation of each of the highest priority mitigation actions outlined in the Implementation Strategy. Data will be collected on the status of the mitigation action in order to identify those actions that have been completed, those that have been delayed, obstacles encountered, resources required, and other items that impact implementation. The progress reports will be compiled, and adjustments made to the Implementation Strategy to reflect the current status of each mitigation initiative. Suggestions for changes in priorities of existing actions may be made at that time, as well as suggestions for new mitigation actions to be incorporated into the next update of the Plan.

6.2 Implementation Through Existing Programs

The mitigation objectives and actions outlined in the previous section are designed to be carried out through the normal governmental and operational mechanisms used by the City in the performance of its duties and responsibilities on a day to day basis. For example, any code revisions or updates will be accomplished using standard procedures for code development. Structural improvements to buildings and infrastructure will be incorporated into the City of Belvedere Capital Projects Plan and be subject to that process. To the extent possible, mitigation projects are most successful when fully integrated into on-going programs and mechanisms rather than establishing parallel or new mechanisms for implementation. Therefore, the City will strive to fully incorporate the Implementation Strategy Plan into existing programs.

Additionally, to ensure consistency with overall City development policies, the City Council Resolution adopting this Plan also stipulated the Flood Mitigation Plan as an Annex to the Belvedere Local Hazard Mitigation Plan and an Appendix to the General Plan Environmental Hazards: Safety and Stability Element.

However, in this era of increased demands and constrained resources at all levels of government, the lack of resources, especially from external sources, may hamper the ability of the City to implement some mitigation actions identified in the plan or to implement them within the timeframe specified.

6.3 Continued Public Involvement

The City of Belvedere values the role its community members play in the plan development process, and the contributions made in support of this Plan. The City Manager will post any progress reports or proposed updates to the Plan on the City website. At such time as the City proceeds with a formal update of the Plan, a community stakeholders meeting will be held to solicit public comment and input. All draft updates will be posted on the website and a public review period and meeting will be conducted prior to finalizing the draft for submission to the City Council.

List of Acronyms

ABAG	Association of Bay Area Governments
BLPOA	Belvedere Lagoon Property Owners Association
CAV	Community Assistance Visits
CERT	Community Emergency Response Team
CFS	Cubic Feet per Second
CFR	Code of Federal Regulations
CRS	Community Rating System
DWR	Department of Water Resources
EOC	Emergency Operations Center
ESE	Environmental Safety Element
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FMA	Flood Mitigation Assistance
FMAP	Flood Mitigation Assistance Planning Grant
HMGP	Hazard Mitigation Grant Program
JPA	Joint Powers Agreement
'LHMP	Local Hazard Mitigation Plan
MCSTOPP	Marin County Stormwater Pollution and Prevention Program
MCVNL	Marin Center for Volunteer and Nonprofit Leadership
MMWD	Marin Municipal Water District
NFIP	National Flood Insurance Program

OES	Office of Emergency Services
PDM	Pre Disaster Mitigation
SFHA	Special Flood Hazard Area
USACE	United States Army Corps of Engineers

APPENDICES

- Completed flood survey forms
- Notices of Public Meetings