Executive Summary

Background

The Vista Grande Watershed Study (Study) is being developed jointly by the City of Daly City (Daly City) and City and County of San Francisco (CCSF). The study is intended to serve as a planning level document to identify potential solutions to meet the goal of resolving flooding at the Vista Grande canal and in the Vista Grande drainage basin for the 10-year storm event. The study takes a watershed approach by incorporating stakeholder input into the planning process, developing a set of objectives to help guide the development of alternatives, and looking watershed-wide, at both upstream and downstream alternatives.

Through this analysis, the watershed study recommends a combination of potential solutions that can be implemented as part of a long-term watershed program to solve flooding issues while meeting a number of multi-disciplinary objectives. Planning level cost estimates, conceptual level design, benefits and implementation strategies are evaluated for the preliminary program recommendations identified in the Study.

The alternatives presented in this Study are preliminary, planning level conceptualizations. The intent of this Study is to evaluate these initial alternatives and recommend a general approach to solving the flooding issues in the watershed. The potential projects presented in this document have not been selected for implementation. Further investigation and detailed design would be necessary prior to implementing any of the concepts presented as part of this study.

A number of different stakeholders have been consulted during the development of the Vista Grande Watershed Study. The stakeholder outreach process included meetings with stakeholders interested in the management of stormwater in the Vista Grande watershed, as well as public meetings on July 27, 2005 and March 30, 2006. Some of the organizations and agencies involved in these meetings included:

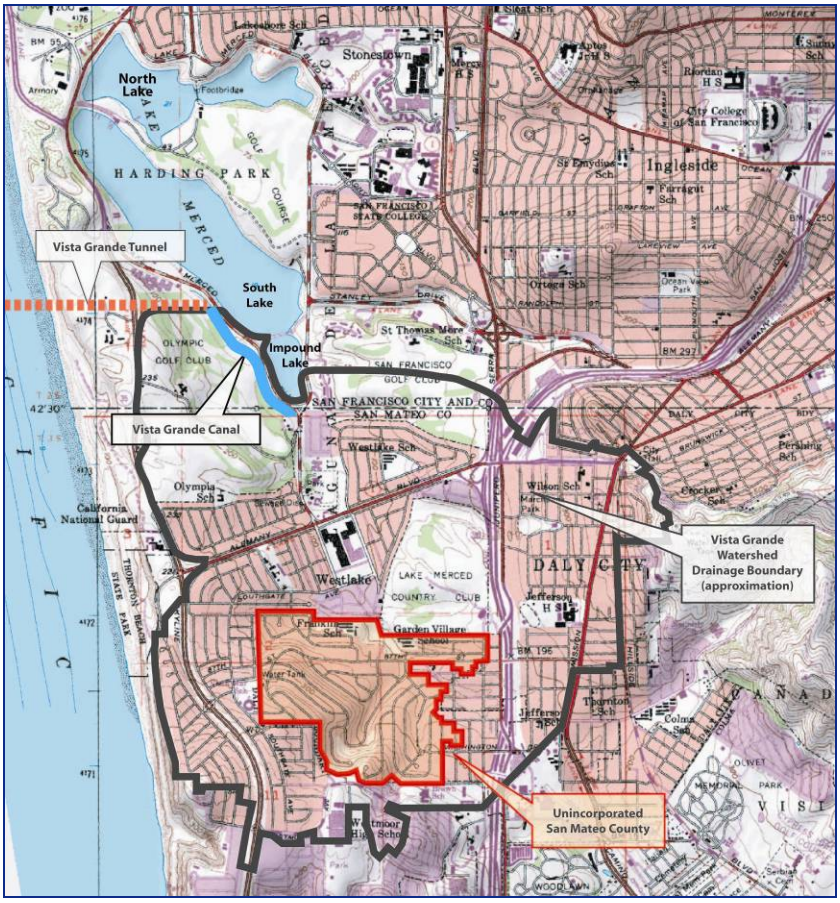
- City of Daly City Department of Public Works
- San Francisco Department of Public Works
- San Francisco Recreation and Park Department
- The Olympic Club
- Regional Water Quality Control Board
- California Coastal Commission
- Golden Gate National Recreation Area
- San Francisco Department of Public Health
- California Native Plant Society
- California State Parks
- San Francisco Public Utilities Commission
- City of Daly City Department of Water and Wastewater
- Lake Merced Task Force's Water Committee
- Friends of Lake Merced
- US Environmental Protection Agency
- US Army Corps of Engineers
- California Department of Fish and Game
- San Mateo County Department of Public Health
- Local Homeowners Associations
- Local Residents

The Watershed Study Area

The study area includes approximately 2.5 square mile Vista Grande watershed area in Daly City and unincorporated San Mateo County, and the Vista Grande canal and tunnel area in CCSF. This watershed area borders San Francisco County on the north, Colma Creek watershed to the south

and east, and the Pacific Ocean on the west. The watershed is drained through the Vista Grande canal and tunnel which are located in the CCSF near the southern shoreline of Lake Merced. Figure ES-1 illustrates the location of the overall watershed.

Figure ES-1 Location of the Vista Grande Drainage Basin



The major hydrologic features associated with the watershed area include the Vista Grande storm drain collection system, the Vista Grande canal and tunnel, and Lake Merced.

Vista Grande Stormwater Collection System

The Vista Grande portion of Daly City's stormwater collection system drains the northwestern area of Daly City and an unincorporated portion of San Mateo County. The underground collection system routes storm flows northwest to the Vista Grande canal and tunnel for discharge to an outfall structure at the beach below Fort Funston. During large rain events, the Vista Grande storm drain system experiences flooding and/or surcharging conditions throughout the stormwater collection system causing local flooding as shown in Figure ES-2.

Figure ES-2 Local Flooding in the Vista Grande Watershed

Vista Grande Canal and Tunnel

The Vista Grande canal and tunnel are the downstream conveyance structures of the stormwater collection system. The Vista Grande canal, shown in Figure ES-3, is a trapezoidal canal

with a capacity of 500 cubic feet per second (cfs) that runs adjacent to the west side of John Muir Drive, paralleling the southwest shores of Lake Merced.

At the terminus of the canal is the mouth of the Vista Grande tunnel, as shown in Figure ES-4. This tunnel is the primary outlet for stormwater from the Vista Grande watershed, and was constructed in 1897. The tunnel is 3,000-feet-long, with a capacity of 170 cfs. Historically, wet weather flows in excess of the capacity of the canal and tunnel resulted in local flooding and overflows across John Muir Drive into Lake Merced, causing property damage, bank erosion, traffic nuisances, and public safety issues. Stormwater exiting the tunnel discharges to the beach below Fort Funston through a beach outfall structure, as shown in Figure ES-5.

Figure ES-3 Upstream End of Vista Grande Canal

Figure ES-4 Vista Grande Tunnel Entrance

Figure ES-5 Vista Grande Outfall Located at the Beach below Fort Funston

Lake Merced

Lake Merced is comprised of four lakes: North, East, South, and Impound Lakes. South Lake and Impound Lake are the two lakes directly impacted by the Vista Grande canal overflows. Lake Merced, shown in Figure ES-6, is the largest freshwater lake in San Francisco, and is a valuable natural resource and recreational area for nearby communities. Lake Merced contains the largest expanse of wetland habitat in San Francisco and supports an array of sensitive plant and animal species. Wetland areas, particularly those at Impound Lake, are known to contain sensitive plant species.

Figure ES-6 Lake Merced

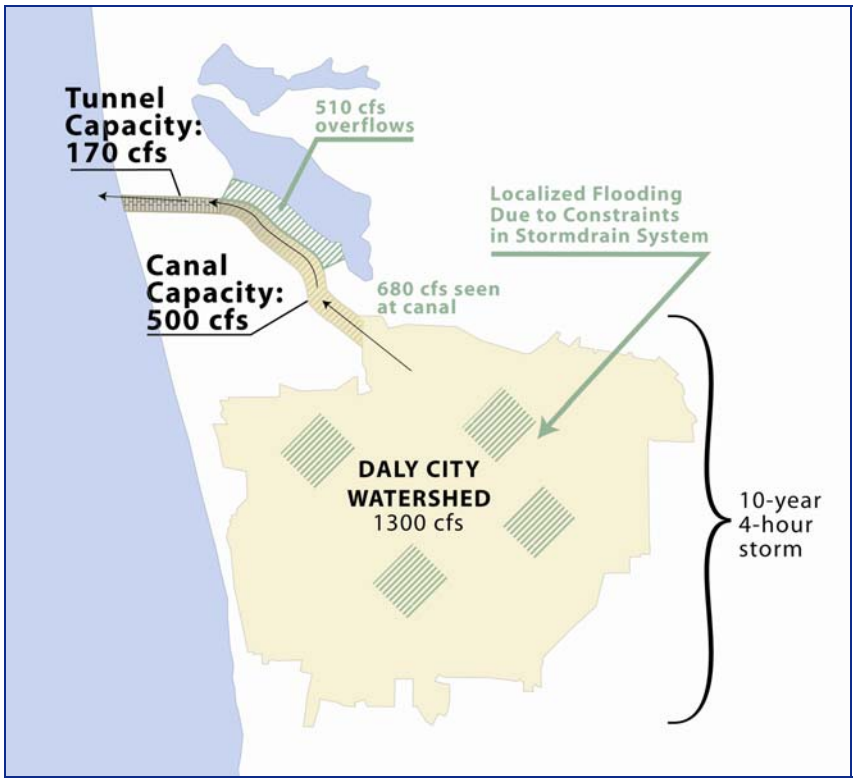
The quality and quantity of water in Lake Merced has been the focus of much study in recent years. Existing lake water quality is eutrophic for a majority of the year with high nutrient levels. Lake Merced's water level fluctuates seasonally but recent studies have concluded that drought, reduction in the natural stormwater flows from the Vista Grande and Lake

Merced watersheds, and groundwater pumping may all contribute to a long-term decline in lake levels. As a result, evaluations have been conducted to examine potential lake level augmentation alternatives, including the potential use of Vista Grande stormwater flows.

Watershed Hydrology

Previous hydrologic investigations and modeling for the Vista Grande stormwater conveyance system utilized rainfall data from the 10-year, 4-hour storm event to evaluate system performance. The resulting peak flow generated from the upstream collection system to the Vista Grande canal for this event was determined to be approximately 1,300 cfs. However, only a portion of this flow, approximately 680 cfs, is estimated to actually reach the canal under current conditions, as shown in Figure ES-7. The lower than predicted runoff volume downstream is a result of lack of storm drain system capacity, which produced upstream flooding in certain locations within the Vista Grande watershed.

Figure ES-7 Vista Grande Watershed Water Balance



The capacities of the Vista Grande canal and tunnel are approximately 500 and 170 cfs, respectively. Therefore, both are inadequate to covey the 680 cfs peak flow seen at the mouth of the canal during the design storm event. As a result, and as show in Figure ES-7 above, 510 cfs cannot be contained in the existing canal conveyance infrastructure. This lack of conveyance capacity results in surcharging at the tunnel entrance and flooding across John Muir Drive, as shown in Figure ES-8.

Figure ES-8 Sheet Flow from Vista Grande Canal Overflows

Study Goal and Objectives

The overall goal of the Study is to define improvements to resolve flooding at the Vista Grande canal and the residential areas of the watershed for a 10-year storm event in a manner that maximizes benefits and minimizes costs. In order to meet this goal, a number of objectives, listed in Table ES-1, have been developed to serve as the foundation for the identification, development and, ultimately, the selection of, conceptual projects to alleviate flooding issues at Vista Grande canal and within the drainage basin.

Table ES-1 Primary and Secondary Objectives Developed for the Vista Grande Watershed Study

Resource Area	Objectives
PRIMARY OBJECTIVES	
Flood Protection	Eliminate overflows from Vista Grande canal for the 10-year design storm Eliminate flooding throughout the Vista Grande drainage basin for the 10-year design storm
Erosion Reduction	Eliminate erosion along John Muir Drive and the banks of Lake Merced for the 10-year storm event Stabilize existing bank erosion as part of an overall flood protection and erosion reduction program
Public Safety	Eliminate flood flows and standing water on public roadways and property throughout the Vista Grande drainage basin Incorporate public safety measures into improvements
Water Quality Protection	Manage stormwater discharges to ensure public health protection Manage stormwater discharges to ensure beneficial uses of receiving waters
SECONDARY OBJECTIVES	
Water Supply Enhancement	Maximize recharge of the Westside Groundwater Basin Utilize stormwater to augment surface water supplies for appropriate uses
Lake Merced Level Enhancement	Utilize stormwater as appropriate to restore Lake Merced to desired levels Utilize stormwater as appropriate to maintain desired Lake Merced levels
Habitat Enhancement	Enhance Lake Merced shoreline and wetland habitats Protect aquatic habitats of Lake Merced
Recreation and Public Education	Protect and enhance recreational features Incorporate educational features into improvements

Preliminary Program Recommendations

The intent of this Study is to establish a general approach to flood protection within the watershed. In order to establish this approach and develop preliminary program recommendations, a number of upstream and downstream alternatives were analyzed. These alternatives were reviewed from a watershed perspective by looking at how potential upstream improvements might impact downstream improvements, and evaluating land availability and the

site constraints of the alternatives. Through this approach, the benefits and limitations of each alternative were identified.

As a result of this alternatives analysis, a preliminary program was developed that includes four major components:

- Tunnel South of County Line
- Vista Grande Wetland
- Upstream Storm Drain Improvements
- Ongoing implementation of Best Management Practices (BMPs) in compliance with the San Mateo Countywide National Pollutant Discharge Elimination System (NPDES) permit.

These four preliminary program components, shown conceptually in Figure ES-9, will solve the flooding issues within Daly City and along the Vista Grande canal while providing additional watershed benefits, such as Lake Merced lake level and habitat enhancement, in accordance with the goals and objectives of the watershed study. The preliminary alternatives and the preliminary program components have been evaluated at a planning level only and none of the potential projects presented in this document have been selected for implementation. Further investigation and detailed design would be necessary prior to implementing any of the concepts presented as part of this study.

For this study, the Tunnel South of County Line was evaluated for the 25-year, 4hr storm; the Storm Drain Improvements option was based on protection for the 10-year, 4hr storm. These levels of protection were used to establish a base line for the preliminary alternatives comparison and planning level cost estimates only. The final design storm for any alternative would be determined as part of future analyses associated with the development of that alternative.

Figure ES-9 Long-Term Program Components Recommended for Further Evaluation in the Vista Grande Watershed Study

Planning level cost estimates were developed for each preliminary program component and escalated to the midpoint of construction. The overall preliminary program is expected to cost from $118,000,000 to $165,000,000, as shown in Table ES-2.

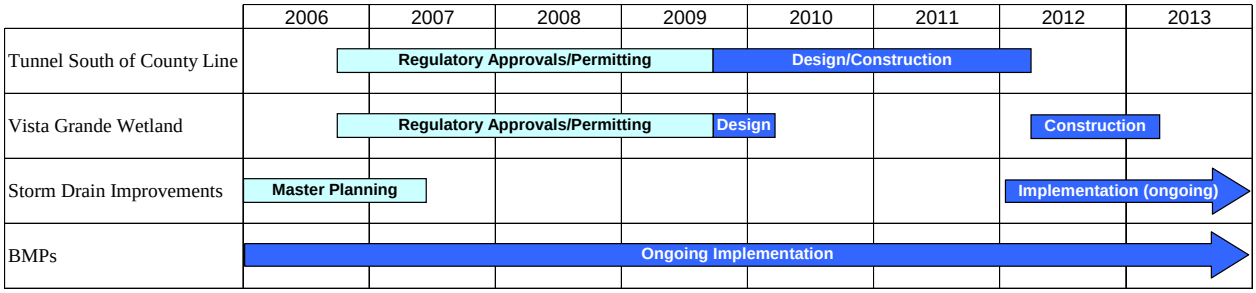
Table ES-2 Total Cost Estimate for the Vista Grande Watershed Study

Preliminary Program Component	Planning Level Cost Estimate Range[a]
Tunnel South of County Line	$72,000,000 - $104,000,000
Vista Grande Wetland	$11,000,000
Storm Drain Improvements	$35,000,000 - $49,000,000
Ongoing Best Management Practices	Not Applicable [b]
Total Cost for the Vista Grande Watershed Study	**$118,000,000 - $165,000,000**

a. Costs have been escalated to the midpoint of construction for each preliminary program component at a rate of 5% per year.
b. BMP implementation will be ongoing in accordance with the San Mateo County NPDES permit.

The preliminary program components build on each other to solve the flooding problems in the Vista Grande watershed. Developing program components together will improve their effectiveness as a comprehensive watershed-wide solution. Figure ES-10 shows the proposed schedule. This implementation schedule includes only permitting, design and construction phases and is dependent on funding availability. A brief description of each preliminary program component follows.

Figure ES-10 General Schedule for the Watershed Study

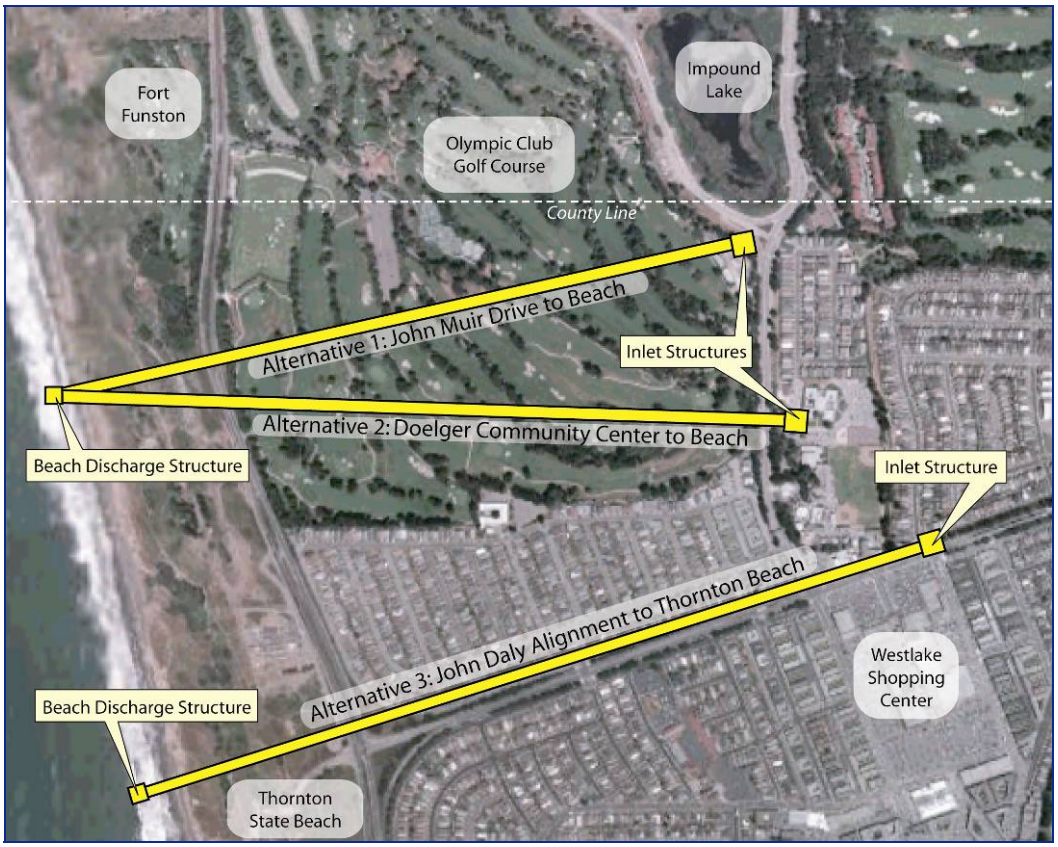


Tunnel South of County Line

The Tunnel South of County Line is the recommended long-term, downstream flood protection component to the Study. There are three alternate alignments for the tunnel identified as part of the Study (Figure ES-11). There is no preferred alternative at this point, and all three alignments will merit further investigation as part of the permitting and predesign process.

The primary objective of the Tunnel South of County Line is to eliminate flooding in the Vista Grande watershed. The existing Vista Grande canal and tunnel do not have adequate capacity to convey stormwater flows for design storm conditions. This insufficient capacity is responsible for recent overflows and flooding across John Muir Drive into Lake Merced. The new tunnel will circumvent the canal and tunnel by taking flow from the existing storm drain system before it is released into the canal, thereby providing flood protection and ensuring public safety in the Lake Merced area. The elimination of downstream flooding will reduce Lake Merced bank erosion and protect the water quality of the lake. Additionally, with the long-term, upstream component of improving the Daly City storm drain system to provide conveyance for the 10-year design storm event, increased flow will be conveyed downstream. The new tunnel will be sized to convey these increased flows.

Figure ES-11 Tunnel South of County Line Alignment Map



While the 10-year storm return period has become standard in California for the design of street drainage facilities, the 25-year or greater return period is used where flooding has the potential to cause property damage or endanger human health. As such, the Tunnel South of County Line was sized using the peak design flow rate for the 4-hour, 25-year event for this preliminary study. The final design storm would be determined as part of a detailed alternatives analysis to determine the optimal design for the Tunnel South of County Line. Table ES-3 provides additional hydraulic design criteria for the tunnel.

Table ES-3 Hydraulic Design Criteria

Criteria	Value	Units	Description
Tunnel Design Capacity	1,500	cfs	4-hour, 25-year storm event
Tunnel Interior Diameter	15.0	ft	Based on preliminary design calculations
Tunnel Length	4,400-5,400	ft	Based on preliminary tunnel layouts
Tunnel Material	Concrete	-	
Manning's n	0.013	-	Average value for concrete pipe
Initial Invert Elevation	8	ft	Based on SF city datum
Final Invert Elevation	4	ft	Based on SF city datum
Slope	0.0008	-	Based on invert elevations and tunnel lengths
Velocity	<10	fps	To reduce wear and tear on tunnel

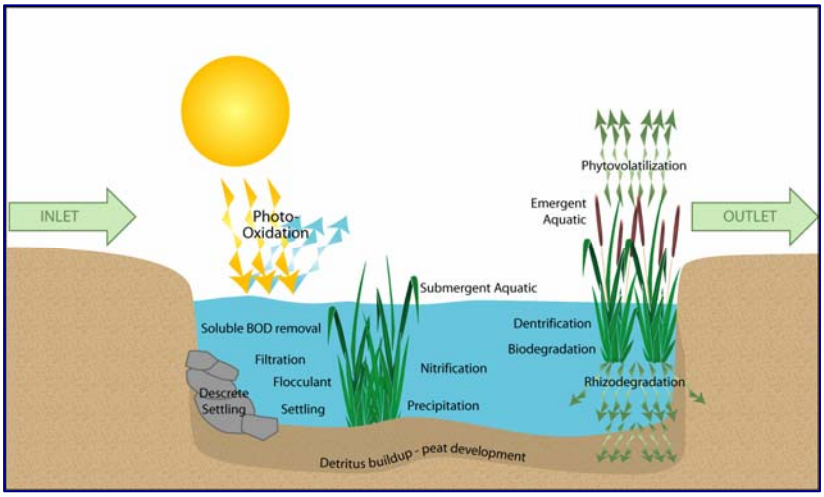
The construction of the Tunnel South of County Line would be conducted with an Earth Pressure Balance (EPB) tunnel boring machine, as shown in Figure ES-12. The tunnel boring machine operates primarily underground so there are minimal impacts on the surface to traffic and the surrounding community.

Figure ES-12 Typical Tunnel Boring Machine

Vista Grande Wetland

The Vista Grande constructed wetland is a downstream component recommended to provide water quality improvement for stormwater diverted to Lake Merced. Constructed stormwater wetlands are designed to mimic and improve on the treatment mechanisms of natural wetlands to provide effective treatment of stormwater runoff. Constructed wetlands remove pollutants through a variety of physical and biological mechanisms as shown in Figure ES-13. Additionally, wetlands can provide the added benefits of habitat enhancement, aesthetics, and recreational and educational opportunities.

Figure ES-13 Typical Processes Occurring in a Treatment Wetland



The Vista Grande Wetland, which would be constructed at the location of the existing Vista Grande canal, is designed to treat a portion of the stormwater diverted from the Vista Grande drainage basin. Water flowing through the wetland would be treated to a level of appropriate quality for diversion to Lake Merced for lake level augmentation. Implementation of the Vista Grande Wetland would need to occur after implementation of the Tunnel South of County Line, since the design requires the abandonment of the existing Vista Grande canal.

The Vista Grande Wetland is designed to meet several of the objectives of the Study in order to provide multi-faceted benefits and enhance watershed activities. The primary objective met by the wetland is to provide a supply water of an acceptable quality and quantity to augment Lake Merced water levels. In addition, the wetland would provide additional habitat for local and migratory birds adjacent to existing habitat along Lake Merced, and would provide additional recreational and educational opportunities for the users of Lake Merced.

Design Criteria and Layout

The proposed Vista Grande Wetland is located between the northeast limits of the Olympic Golf Course and John Muir Drive, in an 8 acre area along the existing Vista Grande canal as shown in Figure ES-14.

The Vista Grande Wetland design consists of three cells, each approximately 1,100 feet long, with an active treatment area of 5.5 acres. Cell No.1 and No. 3 would be planted with cattail,

while Cell No. 2 would be planted with bulrush. The cattail in Cell No. 1 and the bulrush in Cell No. 2 would be broken up by a deep open-water pool in each cell. Flow control facilities would limit stormwater flows into the wetland to a maximum of 2.0 mgd (3.1cfs). Stormwater would flow by gravity through the wetland into each consecutive treatment cell. It is assumed that water from the last cell would flow by gravity into South Lake through the existing Lake Merced overflow structure. The preliminary layout of the Vista Grande Wetland is provided in Figure ES-15.

Figure ES-14 Area Along Existing Canal Proposed for Construction of the Vista Grande Wetland

The water quality of both the source water and receiving waters are important considerations in the design of treatment wetlands. As such, the water quality of Lake Merced, the receiving water, and Vista Grande stormwater, the primary source water, have been considered as part of the wetland design. Additionally, because wetlands need a year-round source of water, the water quality of recycled water, a potential alternate source water supply during dry periods, was also considered in the wetland design. The inflow rate of each of the source waters varies based on the chemistry of the source water and water quality requirements of Lake Merced. As such the Vista Grande Wetland design would be able to treat up to 1.9 mgd of stormwater and 0.85 of recycled water (assuming Lake Merced is nitrogen limited) and still provide water of appropriate quality for Lake Merced lake level augmentation, as shown in Table ES-4.

Table ES-4 Maximum Recommended Wetland Treatment Rates for Stormwater and Recycled Water

Water Supply	Flow (mgd)	Estimated Chlorophyll in Lake Merced (mg/L) [a]		Coliform bacteria in L. Merced (MPN/100 mL) [b]	
		With wetland	Ambient	With wetland	Ambient
Stormwater					
	1.9	0.029	0.029	2,113	1,250
Recycled Water					
	0.85	0.027	0.029	NA [c]	1,250

a. Chlorophyll "a" levels based on the limiting nutrient. Nitrogen appears to be the limiting element for plant growth in Lake Merced based on the bioavailable N:P ratio of 0.5 where < 10 = N-limiting, > 15 = P-limiting. If P becomes the limiting nutrient, then water volumes would need to be reduced by about two-thirds to half.

b. The fecal coliform standard for non-contact recreation is 2,000 MPN/mL. Values are based on a simple die-off model but wetlands would actually remove more pathogens due to physical and biological processes.

c. NA = Not applicable, water source is disinfected at the waste water treatment plant (WWTP) prior to entry to the wetland.

There are multiple benefits associated with implementation of the Vista Grande Wetland. An important benefit is the use of the wetland for Lake Merced level enhancement. The variability of the water supply, the wetland treatment capacity and hydrologic conditions will combine to dictate the additional volume to Lake Merced and resulting lake level enhancement. Various water supply scenarios were considered for the purpose of this analysis based on a 5.5 acre wetland treatment capacity. For all scenarios, it is estimated that the lake level would be maintained at a minimum of about 8 feet SF city datum during normal year conditions and 5 feet SF city datum during dry year conditions.

In addition, the Vista Grande Wetland provides habitat and recreation benefits. Because of its proximity to South Lake and Impound Lake, it is likely that the Vista Grande Wetland will provide an extension of the nearby wetland habitat for local and migratory bird populations. The Vista Grande Wetland will incorporate an access road for maintenance purposes, which could be used as a public trail for recreational and educational benefits.

Upstream Storm Drain Improvements

The watershed area drained by the Vista Grande stormwater conveyance system regularly experiences localized flooding during the wet weather season due to capacity constraints throughout the system. Flooding is a public safety concern that causes property damage and traffic issues (Figure ES-16). As such, storm drain improvements are recommended as an upstream component of this Study.

Figure ES-16 Localized Flooding near Daly City's City Hall

Although implementation of the downstream tunnel is necessary to solve backwater and overflow issues at the canal, subsequent upstream solutions must be implemented to ensure a 10-year level of protection watershed-wide. The 10-year storm event was selected for this initial evaluation because 10-year level protection is the standard level of protection provided by most Bay Area communities. The actual level of protection to be used in the development of a storm drain master plan would be determined as part of future analyses associated with storm drain master planning. Upstream improvement options may include conveyance solutions, such as pipe or box replacements or new pump stations, or implementation of local detention storage. Any conveyance improvements to the upstream storm drain system will increase flows downstream, and therefore, must be implemented after downstream improvements are constructed.

In order to implement storm drain improvements, Daly City will need to develop a storm drain master plan to identify capital improvement projects necessary to convey the design storm event (the 10-year storm event was used for this study) throughout the storm drain system. Daly City has already begun a key component of the master planning process by developing a model of the Vista Grande storm drain system that includes all major pipes within the drainage basin. Additionally, in winter 2006, Daly City completed a flow monitoring program, which will be used to calibrate the storm drain system model.

Best Management Practices

As part of the implementation of the long-term components in the Study, it is intended that Daly City will continue to implement BMPs and other activities in compliance with San Mateo Countywide Stormwater Management Plan and Countywide Stormwater National Pollutant Discharge Elimination System (NPDES) permit. Implementation of BMPs by Daly City under the countywide NPDES will include nonstructural BMPs, such as those related to municipal maintenance, commercial/industrial/illicit discharge, new development and construction,

Figure ES-17 Ongoing Nonstructural BMP Implementation in Daly City

integrated pest management and watersheds and monitoring, as shown in Figure ES-17.

Additionally, as part of provision C.3 of the countywide NPDES permit, Daly City will continue to include conditions of approval in permits for applicable new development and redevelopment projects. The goal of the C.3 requirements is to address pollutant discharges and changes in runoff flows from new development and significant redevelopment projects, through implementation of post-construction and treatment measures, source control, and site design measures, to the maximum extent practicable. Such BMPs may include implementation of design characteristics to maximize infiltration where appropriate, providing landscape characteristics that slow runoff and maximize potential detention or retention, and minimization of impervious land cover.

Program Implementation Strategies

Implementation of the projects identified in this Study will be an involved, multi-year process. Successful implementation will depend on securing funding, developing a public outreach plan, complying with regulatory requirements, and establishing long-term agreements between the involved parties.

Financing Strategies

Financing a project of this magnitude requires a well planned strategy for acquiring funds from a variety of sources. Innovative local financing techniques combined with State and Federal funding opportunities will generate the support necessary to make these projects a reality.

Because of the unique nature of stormwater projects and relevant California law, potential revenue sources are restricted, and must be approved by voters. However, once a revenue source has been secured, it can be used to borrow funds through a debt issuance that can then be used to finance the projects. In addition, ongoing revenue streams are available for pay-as-you-go improvements on a continuing basis, as well as operating and maintenance expenses. The general approach for each of the long-term components of the Study is provided in Table ES-5.

Table ES-5 General Approach for funding Vista Grande Watershed Study components

Component	Funding Approaches
Tunnel South of County Line	The tunnel must be funded at one time, as phasing of construction costs is not a realistic option. Potential funding options include debt financing and/or State or Federal appropriations or grants. Debt financing would require an identified, steady revenue stream, such as service charges or parcel charges. Addtionally, State and Federal funding may be required to help with the costs of the tunnel.
Storm Drain Improvements	Storm drain improvements are most appropriately funded through a pay-as-you-go financing strategy. Revenues to fund these improvements may be funded from sewer service charges and/or new drainage service charges.
Vista Grande Wetland	Because of the enhancment benefits of this project, there would likely be opportunities for State and Federal grant fuding to help cover the costs of the Vista Grande Wetland.

The preliminary program recommendations of the Vista Grande Watershed Study integrate several water management elements, including flood protection, stormwater management, water quality and treatment, wetlands creation, and habitat creation. As a result, these preliminary program recommendations would potentially be eligible for funding through a variety of State and Local funding mechanisms such as Proposition 40 or 50 funding. Communication and support from State and Federal legislators will be essential to acquire funding through these

programs. Additionally, the Study components should be included in the Bay Area Integrated Regional Water Management Plan (IRWMP).

Regulatory Requirements

Regulatory compliance will include compliance with local jurisdictions including the CCSF, Daly City, and San Mateo County, environmental documentation under the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA), as well as compliance with a number of requirements to secure the appropriate State and Federal permits. Securing the appropriate State and Federal permits and agreements will be a significant part of implementing the projects identified in this Study. The permitting process is extensive and will require a significant investment of time and resources in the project. Overall the permitting process is expected to take approximately three years. Advance preparation and coordination with the agencies can help maximize efficiency in this process. Anticipated State and Federal permit requirements are provided in Table ES-6.

Table ES-6 Summary of State and Federal Regulatory Requirements

Agency	Permit or Requirement	Project Component Regulated
US Army Corps of Engineers	§404 Clean Water Act Permit	Tunnel, Wetland
	§10 Rivers and Harbors Act Permit	Tunnel, Wetland
US Fish and Wildlife Service	§7 Endangered Species Act Consultation	Tunnel, Wetland
National Marine Fisheries Service	§7 Endangered Species Act Consultation	Tunnel
San Francisco Regional Water Quality Control Board	§401 Clean Water Act Permit	Tunnel, Wetland
	§402 Clean Water Act Permit - NPDES: General Construction Activity Stormwater Permit	Tunnel, Wetland, Storm Drain Improvements
	Waste Discharge Requirements (WDRs)	Waived if §401 Permit required, Tunnel Inlet
CA Department of Fish and Game	Streambed Alteration Agreement (§1602 permit)	Wetland
CA Coastal Commission and/or Daly City Local Coastal Program, CCSF Local Coastal Program	Coastal Development Permit or Public Works Plan	Tunnel, Wetland
Golden Gate National Recreation Area and/or CA State Parks	Special Use Permit	Tunnel Construction
	Right-of-Way Permit	Tunnel
CA Department of Transportation	Encroachment Permit	Tunnel
CA State Lands Commission	General Lease – Right-of-Way	Tunnel, Wetland

Public Outreach and Community Involvement

The education and involvement of the community is essential to the successful implementation of the preliminary program laid out in the Study. A successful outreach strategy will help generate public understanding and support for the program. Effective public outreach requires a well developed, cohesive approach; ad hoc, sporadic actions are unlikely to result in the desired public understanding for the program. Key steps in development of an outreach program for the Study components include:

- Appointment of a public outreach coordinator
- Identification of community interests and concerns that must be addressed
- Establishment of clear and specific goals for outreach and community involvement
- Development of program message to raise community awareness and identify program benefits
- Identification of effective methods for distribution of messages to the public
- Establishment of a method to evaluate effectiveness of the program

Public support is necessary for the preliminary program's overall success. Therefore developing and implementing a well thought out program through proactive and ongoing stakeholder outreach to involve the public will improve support for the project, ease project financing, and increase the efficiency of the implementation process.

Institutional Arrangements

The Study involves many different organizations each with their own needs and interests and will require the long-term cooperation of many of the involved parties. Coordination agreements between the key agencies will need to be established to ensure a long-term commitment to the program and may be necessary to secure funding and regulatory approval for the project components as part of a comprehensive watershed plan. In addition, it will be necessary to secure the appropriate right-of-ways to the project areas. Table ES-7 summarizes the relationships that are involved in implementing the Study. This Study continues past cooperative efforts between CCSF and Daly City on resolving integrated water resources issues involving recycled water, groundwater, stormwater, and Lake Merced. However, participation of CCSF as a joint sponsor of this report should not be interpreted as a commitment by CCSF to contribute funding for projects outside of its jurisdiction.

Table ES-7 Summary of Recommended Institutional Arrangements

Agencies	Relationship
City of Daly City & San Mateo County	Stormwater from the portion of unincorporated San Mateo County that is located within the Vista Grande Drainage Basin contributes to the current capacity problems. An arrangement between the County and Daly City will be necessary to ensure the County participates in the funding and implementation of the tunnel and storm drain improvements.
City of Daly City & City and County of San Francisco	Historic conflicts over the flooding at the Vista Grande canal require that these two agencies enter into a Memorandum of Understanding (MOU) that clarifies each city's commitment to the program and establishes a plan for ongoing communication.
City of Daly City & Golden Gate National Recreation Area and/or California State Parks	The City of Daly City will need to establish a right-of-way agreement with GGNRA and/or California State Parks for the tunnel and its outlet structure depending on the final alignment selected. In addition a Special Use Permit will be required for access through the park area during the construction phase.
City of Daly City & Private property owners	An easement for the tunnel alignment will need to be obtained. When the final tunnel alignment is selected, the affected property owners would need to be identified and the appropriate easements secured (e.g. the Olympic Club if the John Muir Drive to Beach alignment is selected).

City of Daly City and/or the City and County of San Francisco & The Olympic Club	A portion of the Olympic Club near the wetland may need to be regraded to convey overland runoff into the upstream end of the wetland. Based on the conceptual level design of the Vista Grande Wetland, this grading is expected to be limited to the area immediately surrounding the Vista Grande canal, and is not expected to modify active portions of the golf course or interfere with course play. An agreement with the Olympic Club will need to be established to perform this work or the land will need to be acquired.

Next Steps

As discussed previously, the intent of this Study is to establish a general approach to flood protection within the watershed. Since this is a planning level document, the preliminary alternatives included in the preliminary program have not been selected for implementation and acceptance of this Study by the agencies does not constitute adoption of these alternatives. Rather, it is recommended that the agencies accept this study as a general approach for further investigation to solve flooding in the Vista Grande watershed.

The next steps in developing the preliminary program recommendations identified in this Study include:

- Defining the Recommended Program
- Defining a funding approach and establish a financing plan
- Maintaining coordination between key agencies
- Conducting preliminary design of the Recommended Program components
- Obtaining required permits and regulatory approvals
- Conducting final design of the Recommended Program components
- Constructing the Recommended Program components
- Performing maintenance on the Vista Grande drainage basin until a long-term solution is implemented

In order to streamline the implementation process, several critical path items have been identified within these next steps and are described in Table ES-8, below.

Table ES-8 Next Steps

Element	Steps
Continued Development and Refinement of the Preliminary Program Recommendations	The Vista Grande Watershed Study is a planning level document. As such, each of the preliminary long-term program components will require further planning and investigation including: <u>Storm Drain Improvements</u> • Calibrate existing model based on flow monitoring data • Conduct storm drain modeling to evaluate local storage and define design flow criteria • Develop a storm drain master plan <u>Tunnel South of County Line</u> • Conduct site survey and geotechnical investigation • Evaluate inlet hydraulics and need for interim bypass facilities • Evaluate the location and conceptual design for the beach outlet structure • Identify alternative locations and mechanisms for spoils disposal • Conduct alternatives analysis to refine concepts and define preliminary recommendations • Conduct CEQA/NEPA analyses and finalize recommendations <u>Vista Grande Wetland</u> • Conduct water quality monitoring to define seasonal variations in quality with respect to potential constituents of concern • Quantify dry-weather stormwater flows in the Vista Grande canal • Conduct alternatives analysis to refine concepts and define preliminary recommendations • Conduct CEQA/NEPA analyses and finalize recommendations
Funding	Further investigation and identification of the funding strategies will be essential to identify and secure the necessary backing to implement the preliminary program. Pursuing a variety of funding sources and developing a detailed financing plan will be necessary.
Coordination between Agencies	Successful implementation of the Vista Grande Watershed Study will depend on establishing a successful working arrangement between the key agencies. Clearly defining the long-term relationships between the interested parties may be necessary to secure funding and regulatory approval for the project components as part of a comprehensive watershed plan.
Regulatory Requirements / Permitting	Securing the appropriate permits and regulatory agreements is necessary prior to program implementation. This is expected to be a lengthy and involved process, thus it is essential to begin as soon as possible. Arranging or attending an interagency meeting will jumpstart this process, and will ensure that all of the appropriate regulatory requirements are met. In addition, the agencies should consider preparing a public works plan with the CA Coastal Commission, since a public works plan may make the permitting process more efficient.
Maintenance	Maintenance of the Vista Grande drainage system, especially the Vista Grande canal and the Vista Grande tunnel, will be essential in minimizing flooding damages until a long-term program is in place. This maintenance should include a pre-storm season walkthrough of the canal and adjacent areas to identify debris and other maintenance activities to be conducted prior to the storm season. Maintenance during storm events could be enhanced by installing a mechanical device to catch and remove debris to maintain flow through the canal and tunnel.