



STAFF REPORT

Creek Maintenance and Easements Study Session

March 23, 2004

Honorable Mayor and City Council:

Summary

City Council requested an assessment of the City's creek maintenance commitments and a description of the creek easements held by the City under Priority Calendar project PW05. This report describes the Belmont Creek drainage, the historical and current goals for its maintenance and improvement, and the types and locations of public easements along its channel. The report also discusses the work staff will conduct over the next several years to address flood control and creek channel protection. Creek restoration is not discussed in this report because it is a separate priority calendar item to be assigned to staff.

Background and Discussion

1. Belmont Creek Watershed and Channel

Approximately five square miles of watershed drain through the City of Belmont. Belmont Creek is the largest drainage, carrying about 62 percent of the flow through the developed central city. Its headwaters are in the hills above Hallmark Drive and it runs roughly parallel to Ralston Avenue through Water Dog Lake and Twin Pines Park. The creek exits the City just above Old County Road at Harbor Boulevard and then forms the boundary between the Harbor Industrial Area and the City of San Carlos. It reenters Belmont in the Island Park neighborhood as Belmont and O'Neill Sloughs before discharging to San Francisco Bay. The various segments of Belmont Creek have widely different properties. The creek passes through public and private lands, through undeveloped open channels and enclosed culverts, and through accessible parks/open spaces and inaccessible residential neighborhoods.

There are several good-sized tributaries to Belmont Creek from side canyons at Carlmont Drive, Alameda de las Pulgas and University of Notre Dame de Namur. East Laurel Creek carries

another 20 percent of stormwater flow from the San Juan Canyon to Laurel Creek in the City of San Mateo. The remaining 18 percent of Belmont's stormwater flows to San Mateo's Marina Lagoon from various stormdrains in the Sterling Downs neighborhood. This study focuses on Belmont Creek because it has the most potential to impact and be impacted by the City's residential and commercial development.

Development has both restricted the Belmont Creek channel and increased the magnitude of peak flow. Soil surfaces in the watershed have been covered with impermeable roofs and pavement. Rainwater that historically reached the creek by relatively slow overland flow or groundwater infiltration now is piped directly to creek outfalls from street gutters. The San Mateo Countywide Stormwater Pollution Prevention Program mapped the impervious surface area of the Belmont Creek watershed as ranging from 20 percent in the Western Hills to over 40 percent at City Hall.¹ Imperviousness increases the peak volume of runoff and the hydraulic force in creeks, resulting in more frequent flooding, increased channel erosion (scouring and widening), and increased sediment transport with downstream deposition of silt, sand and gravel. Some problems arise from conditions outside of the City limits. Staff has observed large depositions of gravel and cobbles in the downtown culvert under the train tracks. One reason is the bridge foundation at Old County Road backs up floodwaters into the culvert, allowing them to drop their gravel load. This bridge is in the unincorporated Harbor Industrial Area.

Development also encroaches on the creek's historic flood plain. FEMA mapped the 100- and 500-year flood plains along Belmont Creek in 1982.² This map shows that a 100-year flood will overtop the channel along Carlmont Drive, Escondido Way, O'Neill Avenue, Shoreway Drive, and Island Parkway. A 100-year storm produces flows of approximately 1200 cubic feet per second in the lower reaches of the creek, or about twice the capacity of the 8- by 12-foot box culvert beneath El Camino Real. A 500-year flood would inundate the downtown to up to Ralston and Sixth Avenue, the Harbor Industrial Area, and Island Park.

2. Changes in the City's Creek Management Role and Responsibilities

Although the Belmont hills were largely subdivided in the 1920s, development did not make significant inroads into the watershed until after World War II. With development came the need to protect property from erosion and flood damage. Property owners looked to the City to manage the municipal drainage system for this purpose. The City viewed the creeks as a component of the municipal drainage system to be improved and maintained. The City

¹ San Mateo Countywide Stormwater Pollution Prevention Program, "Characterization of Imperviousness and Creek Channel Modification for Seventeen Watersheds in San Mateo County," January 1, 2002.

² FEMA National Flood Insurance Program, Flood Insurance Rate Map, City of Belmont, California, San Mateo County, Community Panel Number 065016 0005 B, March 9, 1982.

completed the first 10-year storm drain master plan in 1963³ and updated this with a 20-year master plan in 1980.⁴ These plans modeled the drainage system as network of catchments consisting of roofs, driveways, and streets draining to gutters; gutters draining to catch basins and drainpipes; and pipes outfalling to open creeks. Flow calculations identified deficiencies in pipes and in the creek that required improvement.

The master plans recommended that the City acquire easements across private property for all channels more than two feet wide. This would both prohibit property owners from filling or constructing within the creek channel and would give the City the right to maintain flood capacity by clearing, widening, reshaping, and adding engineered structures to the channel. The City's 1982 subdivision ordinance also requires dedication of drainage right-of-way or easement in final maps for subdivisions containing creeks and open channels.

Belmont joined the Federal Emergency Management Agency (FEMA) National Flood Insurance Program in 1982. This program enables property owners in the 100-year flood plain to purchase flood insurance as required by federally-regulated loans. The program defines the City's role as the flood plain administrator and requires the City to adopt, administer, and enforce floodplain management regulations. Implicit in these regulations is the acceptance that floods are recurring events that cannot be wholly prevented. The City's responsibility is to require new construction to be designed and built in a manner that will withstand flooding.

The State of California issued Belmont a National Pollutant Discharge Elimination System (NPDES) permit to discharge stormwater into the creeks in 1992. This signaled a major change in the City's maintenance role and responsibilities. Creeks could no longer be considered part of the City's stormdrain system. Instead, creeks are "waters of the State of California."⁵ The State's NPDES permit defines the City's role as a regulated discharger and makes it responsible for managing discharges in a manner that preserves the creek water quality and channel. The permit assigns the City numerous detailed tasks to protect creeks. The State will not allow the City to directly maintain or improve the creek channels except through separate stream alteration and water quality certification permits. Regional Water Quality Control Board and Fish and Game staff have told City staff that their agencies oppose granting permits for any structure or construction that alters a natural creek.

3. Current and Planned Creek Maintenance and Management Activities

The City's responsibilities for the NPDES permit and FEMA flood insurance program compliance largely define its current creek management activities. In addition, staff is planning projects to desilt Water Dog Lake and complete a new storm drainage master plan.

³ Wilsey, Ham & Blair, "Storm Drain Master Plan," 1963.

⁴ Wilsey & Ham, "Sanitary Sewer and Storm Drain Master Plan," 1980.

⁵ California Porter-Cologne Water Quality Control Act of 1970.

3.1 NPDES Permit Requirements for Creek Protection

The City is a member of the San Mateo Countywide Stormwater Pollution Prevention Program (STOPPP), a C/CAG program formed in 1992 to support the municipalities' administration of the NPDES stormwater discharge permit. STOPPP recently submitted a new five-year work plan as part of a permit renewal application.⁶ This plan is available on the STOPPP web page (see link in footnote below) or from the Public Works Department. It draws from over a decade of work of RWQCB scientists, environmental consultants, and staff and represents the current consensus in this rapidly developing field for the best methods of creek maintenance. The work plan tasks are too numerous to list here, but the broad categories are summarized as follows:

- **New Development and Construction Controls:** The State views the tasks assigned to the City under this component as the most important for the long-term preservation and maintenance of creeks. The strategy of this component is for the City to use its development review and approval authority to halt and over time reverse the impact development has had on runoff from the watershed. The City is tasked to identify and review project-specific Best Management Practices (BMPs) to retain stormwater on new and reconstructed developments. Typical development BMPs are permeable pavement, grassy swales, and retention basins. The City has been tasked to review its ordinances and policies for provisions restricting use of BMPs. In addition, STOPPP is tasked to research and prepare a "Hydrograph Modification Plan" for San Mateo County watersheds including Belmont Creek to serve as a creek management tool. A hydrograph is the measure of flow volume over time. It indicates the intensity and duration of flow in response to a storm. This plan will allow staff to quantify the impact of new development and redevelopment on Belmont Creek and determine acceptable modifications, i.e., increases in peak flow.
- **Municipal Maintenance:** The City will continue street sweeping, catch basin cleaning, maintenance of parks and corporation yards, and other maintenance activities to protect water quality. Parks staff will implement an integrated pest management (IPM) program for city operations.
- **Commercial and Illicit Discharge Controls:** The City will continue its program of inspecting commercial properties for stormwater compliance and will investigate and enforce cleanup of illicit discharges. The City and STOPPP will provide educational outreach material and training to commercial operators to discourage the practice of dumping materials such as soap, oil, and paint into the City's drainage system.

⁶ San Mateo Countywide Stormwater Pollution Protection Program, "Stormwater Management Plan: April 2004 – June 2010," November 4, 2003, http://www.flowstobay.org/articles_links/index.html

- **Public Information and Participation:** The City will continue outreach programs to businesses and residents explaining the impact on creek water quality from streamside activities and discharges to driveways, streets, gutters, and catch basins. Attachment 1 is a list of informational brochures developed and distributed under this component. These brochures are available from the Department of Public Works or from STOPPP's website <http://www.flowstobay.org/p2business/bestmanagementpractices.html>.
- **Watershed Assessment and Monitoring:** Through STOPPP, the City will participate in the watershed monitoring program to collect data quantifying the impact of watershed discharges on the creeks. Representative samples of water and creek sediments will be tested for chemicals including polychlorinated biphenyl compounds (PCBs) and mercury, pathogens, and trash. This work supports RWQCB's establishment of Total Maximum Daily Loads (TMDLs) for these priority pollutants.

3.2 National Flood Insurance Program Development Standards

The City is required to adopt and enforce a floodplain management ordinance as a condition of membership in the National Flood Insurance Program. Belmont last adopted amendments to its ordinance in 2001 to bring it into agreement with current program requirements. The purpose of the ordinance is to protect human health, minimize the need for costly flood control projects, and minimize property damage. The ordinance includes methods and provisions to restrict construction in the flood plain, require construction to incorporate flood protection measures, and control alteration of the flood plain and stream channels. It designates the Director of Public Works as the City's Flood Plain Administrator and assigns him responsibility for building permit review to determine that construction in the flood plain will not adversely affect the flood plain and that standards of flood plain construction are met. These standards include anchoring buildings to prevent flotation, using flood resistant materials, using construction practices such as foundation openings to minimize flood damage, and raising base floor elevations above the 100-year flood level.

3.3 Water Dog Lake Operation, Maintenance and Planned Desiltation

The City leases Water Dog Lake from the University of Notre Dame de Namur and operates it as a flood control facility under a California Department of Water Resources (DWR), Division of Dam Safety permit. This reservoir serves to moderate peak flow in Belmont Creek by capturing and metering its release through two discharge valves in the standpipe near the spillway. Permit conditions require the City to open and monitor the discharge valves during the wet season, monitor water levels within the earthen dam on a monthly basis, and prepare an annual report. DWR inspects the dam semiannually and requires the City to maintain all structures and control vegetation on the dam face. A couple of years ago, DWR required the City to repair a landslide below the dam that damaged the 60-inch spillway pipe and to replace the damaged pipe. At this

time, they are requiring the City to rehabilitate the 40-year-old piezometers used to monitor water levels in the dam and establish survey monuments on the dam and dam buttresses. After the monuments are installed, the City will be required to make periodic surveys to assess the stability of the dam.

The lake also captures sediments suspended in stormwater where its quiescent waters allow them to settle. The resulting siltation has greatly reduced the lake's capacity. The Department of Public Works has a multi-year Capital Improvement Program project to remove the accumulated sediments. Staff plans to select a qualified consultant to manage this work this fiscal year. The consultant will complete the necessary studies and planning, obtain environmental permits and approvals and complete a process design in the following year. Staff anticipates that this will be a difficult, time-consuming process. If approved, Public Works will contract for the actual desiltation in FY06.

3.4 Storm Drain Master Plan

The Department of Public Works has a Capital Improvement Program project to prepare a new storm drain master plan. The 1980 master plan is out of date, both in concept and content. Staff plan to select a qualified consultant to prepare the new plan this fiscal year. As with previous plans, the consultant will be expected to collect and analyze data about the capacity and performance of the City's storm drain system and recommend improvements. Staff will also task this consultant to incorporate the modern management tools offered by the City's Information Technology Division such as the GIS and the NPDES program hydrograph modification research. For example, recommended drainage improvements could be construction of retention basins within the system to slow rather than speed the flow of runoff to the creeks.

3.5 Twin Pines Park

Staff has observed excessive bank erosion and bed scouring in Twin Pines Park above and below the pedestrian bridge to the group picnic area. This was especially damaging during the 1998 El Niño storms when several trees collapsed into the creek. A consultant is under contract to evaluate this problem and propose a remedy.

4. Inventory of Existing Creek Easements

As described in Section 2, the City sought easements from creekside property owners to protect the flood capacity of the creek. An easement is a right to use some part of another person's land. The easement does not necessarily place financial obligations on the holder for maintenance, improvements, or taxes on the land. Easement rights and obligations are governed by the language of the easement document. In some instances, the easement holder's will, by the express terms of the easement, be given a right to use the property but assume no maintenance

obligations. In other instances, the terms of the easement may require the holder to maintain the land. Cities seek and accept public easements for various purposes including street right-of-way, access, public utilities, preservation of views, and recreation. Staff reviewed the original subdivision maps and other City records and found eleven easements aligned on creek channels; all but one on Belmont Creek below Alameda de las Pulgas (Attachment 2 and Figure 1). These easements were difficult to locate. A formal property title search would likely identify others. The identified easements are all aligned on the creek centerline and are variously titled drainage, storm drain, public services, and water course and recreation:

1. **Drainage:** Staff located three drainage easements along Belmont Creek. The drainage easement is the most common for natural streams. This easement restricts the property owner from interfering with the natural channel and was intended to give the City the right to access and maintain the channel and banks. In the 1960s through the 1980s, staff also obtained drainage easements to allow future construction of storm drain utilities such as culverts and concrete channels. These easements no longer provide the City much benefit because the State of California asserts jurisdiction over creeks and regulates all activities from debris removal to construction for both property owners and the City.
2. **Storm Drain:** The storm drainage easement is typically used for engineered conveyance structures such as pipes, culverts, and concrete channels. Its purpose is to grant the right for the structure to cross the land and grant the City access to maintain the structure. The City holds three storm drain easements of 20-, 30- and 50-foot widths aligned along open channels that do not contain drainpipes. These were likely intended to function as drainage easements. These easements are also of limited benefit because the State does not intend to grant the City permits to build pipes or culvert in existing creeks.
3. **Public Services:** A public services easement is the most restrictive of the easements held by the City. This type of easement includes the restrictions of many other easements such as utility, recreation, air and light. Staff located one 20-foot wide public service easement on Belmont Creek at Misty Lane. The City could vacate its rights under this easement but that would not vacate rights held by other entities such as utility companies and the public.
4. **Public Access to Public Resources:** A public access easement grants the public the right to cross private property to a public stream. In 1986, the State Legislature amended the California Subdivision Map Act to require local agencies to provide reasonable public access to public rivers and streams when it approves subdivision maps. Belmont has four "Water Course and Recreation Easements" below Twin Pines Park that were likely obtained in response to this requirement.

Recommendations

The City should not plan or design major creek maintenance projects at this time but should instead wait for the State to complete research into best practices for urban creek protection. The creeks are waters of the state, regulated by the California Department of Fish and Game and the California Regional Water Quality Control Board. These agencies have a mandate to protect and preserve the creeks and water quality, but have not yet fully agreed on acceptable methods to protect urban creeks. Creeks are highly complex hydraulic and environmental systems that can respond in unforeseen ways to changes in flow or the channel. The State has observed that past actions to improve creek channels have resulted in upstream and downstream deterioration.

The City should take the following actions:

1. The State has required staff to review City ordinances, plans, and policies to identify conflicts or insufficient authority for the current NPDES permit best management practices. We recommend revising or modifying these ordinances, plans, and policies to align them with the permit. Specific revisions to consider include the following:
 - i. Revising the municipal code road development standards requiring curb and gutter and the grading drainage standards requiring runoff to be piped to the municipal drainage system;
 - ii. Incorporating current NPDES best management practices into the General Plan;
 - iii. Adding creek setback restrictions to the Zoning Code.
2. Staff will pursue the Capital Improvement Program project to removed sediments from Water Dog Lake to restore its flood capacity. The consequences of not completing this work would be loss of flood control capacity and potential damage or failure of the dam.
3. Staff recommends revising the subdivision ordinance requirement for drainage right-of-way easements. We believe that the City not expend resources obtaining additional drainage or storm drain easements in the creeks at this time. These easements provide limited benefit to the City because the State now regulates activities in and around creeks. Adding a creek setback requirement to the zoning ordinance would provide the City a more efficient method to control construction near the creek banks. The City may consider vacating drainage and storm drain easements if the property owners so request and pay fees to compensate staff time.

Conclusions

Belmont's creeks are asset to the community. They are part of the natural environment, providing habitat for riparian plants and animals. They are a prominent recreational feature of the Water Dog Lake open space, Twin Pines Park, and the Island Park walking trails. They also

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have an indispensable role in conveying municipal storm water from the City's streets, gutters and stormdrains to San Francisco Bay.

The creeks are not part of the City's municipal drainage system and are not under the City's direct control. They are waters of the state, regulated by the California Department of Fish and Game and the California Regional Water Quality Control Board. These environmental agencies understand that urban creeks need to receive and convey municipal stormwater. The State is currently researching the best methods for cities to manage stormwater discharges to minimize impact to the creeks and will provide direction through municipal stormwater NPDES permits and other environmental regulations.

Attachments

1. List of creek protection informational brochures.
2. Inventory of identified creek easements
3. Figure showing location of creeks and easements

Respectfully submitted,

Kathleen E. Phalen, PE
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City Manager

ATTACHMENT I

San Mateo County Stormwater Pollution Prevention Program

Best Management Practices provides guidance that will help homeowners, businesses, contractors, and service people reduce the amount of stormwater pollution that maintenance activities might generate.

General BMPs:

General BMPs for Everyone [72 KB]

Food Facility Series:

BMPs for Supermarkets & Grocery Stores [20 KB]

Restaurant BMPs [247 KB]

Restaurant BMPs (Spanish) [324 KB]

Construction Industry Series:

"Start at the Source" [56 kb]

(a new development & construction BMP guidebook, developed by the Bay Area Stormwater Management Agencies Association (BASMAA), can be ordered by calling 510-622-2465)

Fresh Concrete & Mortar Application [25 KB]

Earth-Moving Activities [65 KB]

General Construction and Site Supervision [40 KB]

Heavy Equipment Operation [19 KB]

Landscaping, Gardening, and Pool Maintenance [19 KB]

Painting and Application of Solvents and Adhesives [22 KB]

Roadwork and Paving [15 KB]

Conceptual Review Checklist for Stormwater Considerations [38 KB]

Guide to Creek & Wetland Permitting [530 KB]

Riparian Erosion and Sediment Control brochure [51 KB]

Guidelines for Home Repairs and Remodeling [155 KB]

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater [1590KB]

Pollution from Construction-Related Activities

Dewatering Best Management Practices [link to Caltrans website]

Notice to Builders [161KB]

Automotive Maintenance Series:

Pollution Prevention Practices for Automotive Service and Repair Shops [24 KB]

California EPA Fact Sheet on Antifreeze Recycling [204 KB]

Automotive Recyclers Association - Stormwater BMPs for Auto Recycling Yards [website]

Best Management Practice Guide Retail Gasoline Outlets [link]

Industrial Series:

Best Management Practices for Industrial Storm Water Pollution Control [link Sacramento]

Mobile Cleaner & Power Washing:

Mobile Cleaner BMPs for Waste Water Runoff [500 KB]

BASMAA Recognized Surface Cleaners List [12 KB]

(Mobile power washers and surface cleaners who have been trained by local member agencies in pollution prevention practices.)

Storm Drain Stencilling:

Stencil your Storm Drain [67 KB]

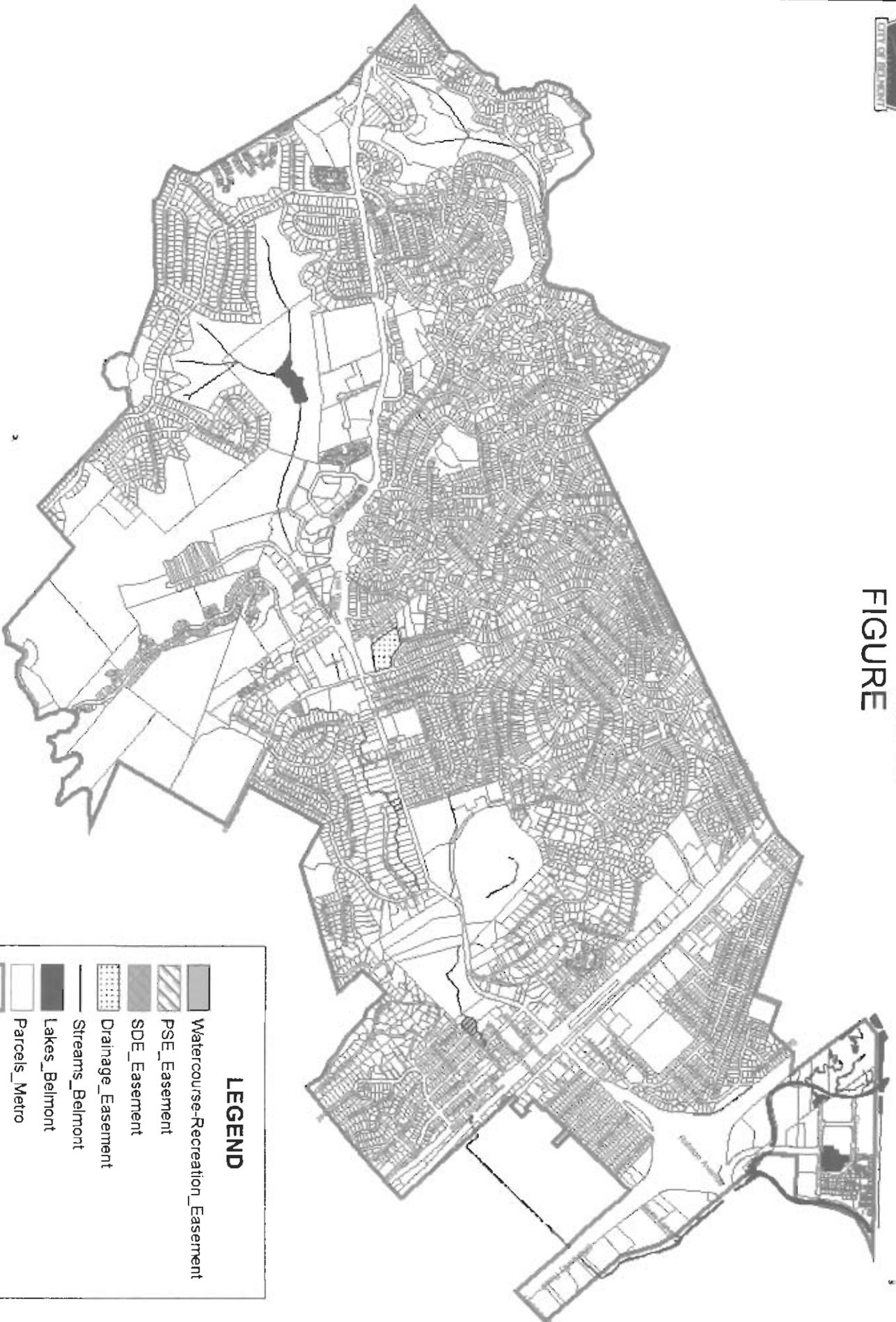
Municipal Brochures:

Public Employee Guidance Document [2.1 MB]

Addresses bordering creeks	Description	Type of Easement
900 Alameda	20' drainage easement. Vol. 39 Pg 45	drainage
1133 Alameda	PM Vol. 1 Page 20	50' S.D.E.
2321 Calrmont Drive	Lot 11 Blk 1 Carlmont Village #2 RSM 49/22-23	20' SDE & 30' SDE
1010 Misty Lane	Lot 5 Langbein Place; 20' PSE on creek	PSE
1050 O'Neill Avenue	The Cottages	watercourse & recreation easement
1100 O'Neill Avenue	The Cottages	watercourse & recreation easement
1120 O'Neill Avenue	The Cottages	watercourse & recreation easement
1130 O'Neill Avenue	The Cottages	watercourse & recreation easement
1631 Ralston Avenue	Parcel B 0.218 ac mol Parcel Map Vol. 32/9	20' drainage easement
1633 Ralston Avenue	Parcel A 0.281 ac mol Parcel Map Vol. 32/9	20' drainage easement



ATTACHMENT 3 FIGURE



LEGEND

- Watercourse-Recreation_Easement
- PSE_Easement
- SDE_Easement
- Drainage_Easement
- Streams_Belmont
- Lakes_Belmont
- Parcels_Metro
- CityLimits_Belmont