SECTION 8

Utility Analysis for Wet Weather Bypass of Secondary Treatment

Wet Weather Blending Documentation and No Feasible Alternatives Analysis for the Sewerage Agency of Southern Marin Wastewater Treatment Plant

During peak wet weather flow events, the Sewerage Agency of Southern Marin (SASM) Wastewater Treatment Plant (WWTP) must divert a portion of its primary treated wastewater around the secondary treatment system. The diverted flows are blended with secondary effluent prior to disinfection and discharge to the San Francisco Bay. SASM and the agencies that own and operate their respective collection systems continue to implement sewer rehabilitation programs that will reduce the volume of flow sent to the WWTP. In addition, SASM has upgraded equipment and facilities at the WWTP to reduce the volume of blended effluent produced. SASM Capital Improvement Projects over the next 5 years will total approximately $4.1 million. Expenditures by the agencies that own and operate their respective collection systems will total approximately $26.7 million. When completed, the rehabilitation efforts will reduce the amount of infiltration/inflow (I/I) to the collection systems and improve operations at the WWTP. As a result, the probability of future blending events occurring at the WWTP will be reduced. As part of the NPDES Permit renewal process, SASM is requesting that the San Francisco Bay Regional Water Quality Control Board (Regional Water Board) grant approval for the continuation of wet weather diversions and blending based on the information provided in the following paragraphs.

Current Treatment System and Capacity

The Sewerage Agency of Southern Marin (SASM) was formed under a Joint Exercise of Powers Agreement (the JPA) in 1979. SASM is comprised of six member agencies: Almonte Sanitary District, Alto Sanitary District, Homestead Valley Sanitary District, City of Mill Valley, Richardson Bay Sanitary District, and Tamalpais Community Services District (Member Agencies). SASM was formed to provide sub-regional wastewater treatment and disposal services for the Member Agencies.

Sewers were first built in the SASM service area in 1892. Significant development did not occur until the 1940's and 1950's and the first primary treatment plant was built on the current treatment plant site in 1952. The plant was upgraded to secondary treatment (rock trickling filters) in 1958. SASM qualified for and received approximately $25,000,000 in Clean Water Grant program funding in the early 1980's that led to the completion of the current plant in 1984. Primary features of the 1984 facilities included a secondary treatment plant with a dry weather capacity of 2.90 million gallons per day (MGD) (re-rated to 3.60 MGD in 1989) and a wet weather capacity of 24.7 MGD; a six mile long effluent pipeline to the deep waters of Raccoon Strait (Central San Francisco Bay); and collection system repairs (infiltration/inflow reduction) that reduced peak wet weather flow rates by 24.6%. Since that time, SASM has completed major upgrades and improvements to the gravity thickener, sludge conveyance systems, recirculation pump station, and six of SASM's eight satellite pump stations. Aggressive preventive maintenance and repair programs have been in place for all facilities since the late 1980's.

A flow schematic depicting the wastewater treatment processes is presented as **Figure 1.** The current treatment process consists of screening facilities, Pista grit removal, primary sedimentation, biological treatment using trickling filters, secondary clarification, disinfection (chlorination), and dechlorination (sulfonation).

SASM and Member Agency Wet Weather Flow Management

During peak wet weather flow events, diversion and blending procedures are implemented to protect the secondary treatment system. As stated in the previous section, the WWTP has a maximum wet weather secondary treatment capacity of 24.7 MGD; however, peak wet weather flows of greater than 24.7 MGD do not always result in a blending event. If peak wet weather flows do not occur for an extended period of time, blending may be prevented by directing influent flows above 24.7 MGD to the Equalization Ponds. These flows are returned to the treatment process when peak wet weather flows have subsided. Blending occurs when the Equalization Ponds are full. In recent years, maximum influent peak wet weather flows of 23.2 to 43.8 MGD have caused blending events to occur. More recently, due to WWTP upgrades, maximum influent peak wet weather flows of up to 37.4 MGD (duration of 30 minutes or less) have not caused blending events to occur.

After primary treatment, a maximum of 24.7 MGD of primary effluent can be directed to the trickling filters and clarifiers. Any primary flows above 24.7 MGD may be blended with secondary effluent and sent directly to disinfection. All blended effluent meets secondary treatment standards and is dechlorinated prior to disposal in the Central San Francisco Bay. The system described above represents the greatest amount of treatment and the highest quality effluent that can be produced at the WWTP using the existing treatment facilities.

SASM as an agency owns only main trunk lines and force mains. Each Member Agency operates and maintains the collection systems for their respective districts. Each Member Agency appropriates funds for maintenance and repairs of their collection systems. Each Member Agency's collection system is regulated under the Statewide General Waste Discharge Requirements for Sanitary Sewer Systems (State Water Resources Control Board Order No. 2006-0003-DWQ). SASM shares technical information and offers equipment/maintenance assistance to the Member Agencies when requested.

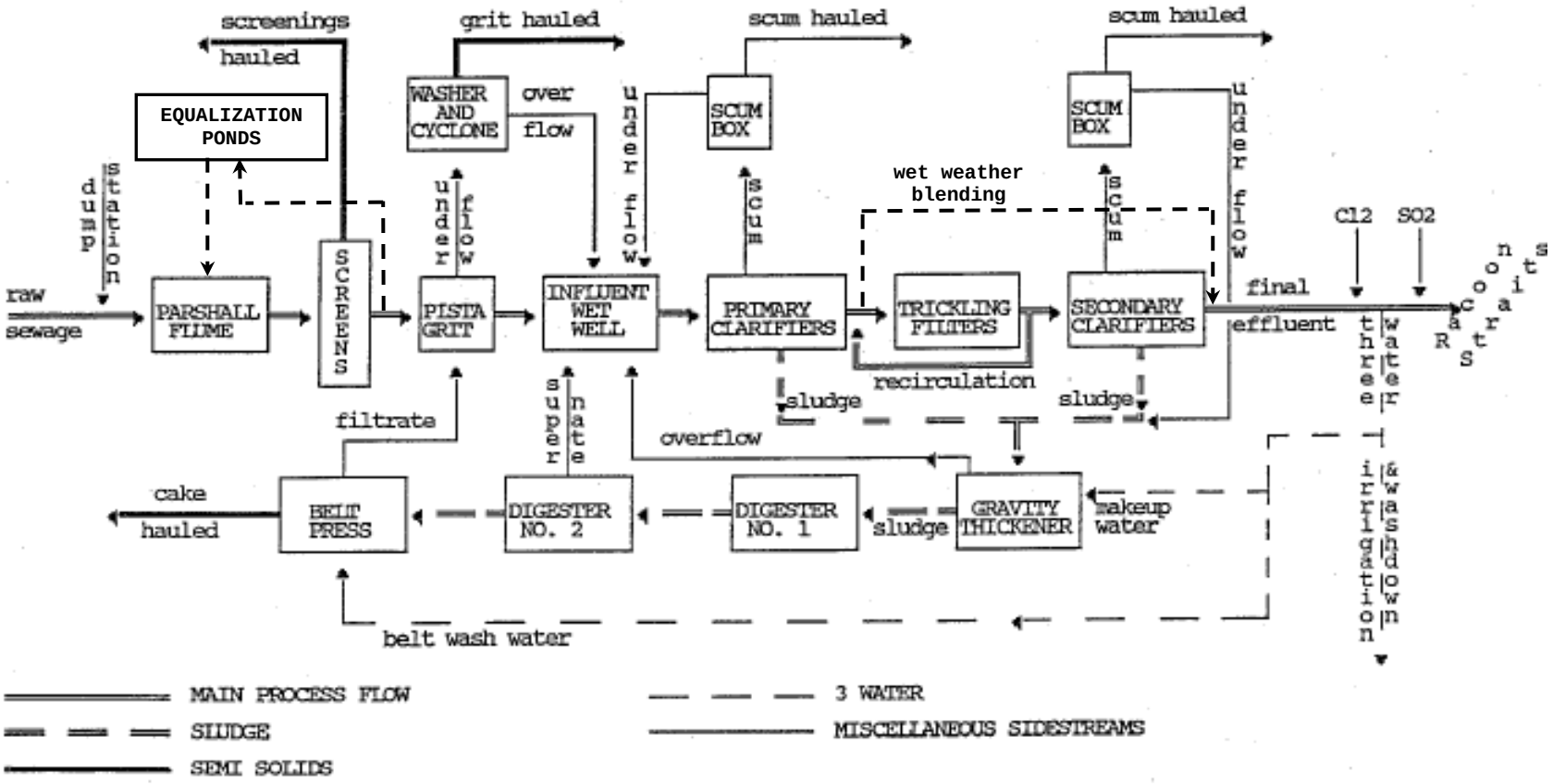

Figure 1. Flow Schematic for the Sewerage Agency of Southern Marin Wastewater Treatment Plant

No Feasible Alternatives Analysis

The following analysis is conducted to comply with NPDES Permit Provision VI.C.7.c. and to demonstrate that the WWTP has no feasible alternatives to its system of diverting and blending peak wet weather flows. The requests outlined in items *a* through *k* below were excerpted from the proposed EPA policy entitled "*NPDES Requirements for Peak Wet Weather Discharges from POTW Treatment Plants Serving Separate Sanitary Sewer System Collection Systems" (January 2006).*

a. Document current treatment plant design capacity for all treatment units, the maximum flow that can be processed through those units, and the feasibility of increasing treatment capacity and related costs;

The information presented in **Table 1** documents the existing treatment capacity for SASM's WWTP. The maximum flow that can be processed through the secondary treatment system is 24.7 MGD.

Table 1. Existing Capacity of the SASM WWTP

Treatment Unit	Hydraulic Capacity	Process Capacity
Grit Chamber	32.7	32.7
Primary Settling Tanks	32.7	24.7*
Trickling Filters	32.7	24.7*
Secondary Clarifiers	32.7	10.5**
Recirculation Pumping	34.5	N/A
Effluent Pumping/Outfall	26.0***	N/A

*Note: The equalized flow through the wastewater treatment plant is 24.7 mgd using both flow equalization ponds.
** Note: Secondary Clarifier process capacity without chemical addition.
*** Note: Effluent flow limited by 6.5 mile outfall line and tidal influence. This line is also shared by Sanitary District #5 of Marin County (Tiburon).

SASM has increased the storage capacity of the Equalization Ponds from about 1.7 million gallons (Mgal) to 3.3 Mgal. A two year Capital Improvement Project (CIP) was initiated in 2008 for the Primary Settling Tanks. This CIP was developed to replace chains, flights, and sprockets in the four Primary Settling Tanks. Tanks 1 and 2 were completed in FY 2008/2009. Tanks 3 and 4 were completed in the summer of 2011. There are six Recirculation Pumps at the Wastewater Treatment Plant. The Recirculation Pumps deliver primary effluent to the two trickling filters. Through testing in 2010, staff determined that the pumps were not operating at design capacity and failure to pump properly could result in pre-mature use of the Equalization Ponds and increased blending of primary and secondary effluents. Installation of all six replacement pumps was completed in January 2011, increasing pump capacity by about 500 gpm each (for a total of 34.5 MGD). In conjunction with replacing the Recirculation Pumps, the existing original control system was replaced. SASM also replaced five of the Effluent Pumps and rebuilt the sixth Effluent Pump. As a result of these upgrades, the WWTP is able to treat all inflows to secondary standards during instantaneous peak wet weather flows of 37.4 MGD. The maximum

(instantaneous) peak wet weather inflow to the WWTP measured during the past 5 years was estimated at 43.8 MGD.

Staff conducted a condition assessment of the operating equipment within the WWTP and Pump Stations. The equipment was assessed based on age and total hours, scheduled and unscheduled maintenance repairs, and availability of replacement parts. Based on this information, the Board of Commissioners of SASM adopted a Capital Improvement Plan to replace equipment identified by staff over a 5 year period. SASM is currently in the process of preparing for the sale of approximately $4.1 million in revenue bonds to fund the 5 year CIP Plan. Increasing treatment capacity through the purchase of and construction on bordering property is prohibited because the bordering property is in close proximity to tidal wetlands.

b. Estimate the frequency, duration, and volume of current wet weather diversions, and evaluate alternatives to reduce the frequency, duration, and volume of such occurrences and related costs;

Wet weather diversions have occurred four times since NPDES permit adoption (October 2007). These blending events are detailed in **Table 2**. During this period, wet weather diversions occurred approximately once a year with an average of 1.0 Mgal of blended effluent produced during each event. The largest blending event (2.45 Mgal) occurred from January 25 to January 26, 2008. During this event, the instantaneous peak influent flow rate was 35 MGD. The influent flows exceeded secondary treatment capacity (24.7 MGD) for a period of approximately 14 hours (1400 to 0200).

Table 2. Blending Events at SASM WWTP (October 2007 - Present)

Date	Blended Volume (Mgal)	Storm Event Total Rainfall (Inches)
1/25/2008 – 1/26/2008	2.45	3.38
1/31/2008	0.96	1.04
10/24/2010	0.054	1.28
12/28/2010 – 12/29/2010	0.64	2.16
Avg. # of events/yr = 1	**Avg. vol. blended = 1.0**	**-**

In addition to the WWTP upgrades described in **item a**, SASM and its Member Agencies have taken steps to reduce the frequency, duration, and volume of wet weather diversions by reducing I/I in their collection systems. SASM and its Member Agencies prepared a Capacity Assessment and Capacity Assurance Plan, a Collection System Condition Assessment and Infrastructure Renewal Plan, and update the Pump Station Reliability Certification. In addition, SASM and its Member Agencies have conducted extensive CCTV inspection of sewers in their collection systems. The inspections identified defects that are common to most sewer systems in the San Francisco Bay Area that experience significant I/I during wet weather, including cracks in pipes, offset and open joints, and root intrusion. It can be assumed that similar defects in laterals are also sources of infiltration in these systems.

A summary of additional activities is presented in the following paragraphs.

SASM

In October 2011, SASM completed a hydraulic profile of the SASM service area and condition assessment on the SASM owned sanitary sewer system. Short term (5 year) and long term (10 year) capital replacement programs were developed and implementation has started. These programs will focus on repair or replacement of SASM owned sanitary sewer lines with poor to severe condition ratings, as well as maintaining Capacity Assurance for the Pump Stations. As part of the long term capital replacement program, a total of $1 million was budgeted for pipe replacement and/or repair and rehabilitation.

Starting in FY 2008/2009, SASM targeted cleaning the entire collection system (approximately 20,000 feet). By the end of FY 2009/2010, SASM had cleaned all but about 2,100 feet on the southwestern most area of the system (Tamalpais Junction/Shoreline). SASM contracted to have the remaining footage cleaned as well as inspected for condition assessment in FY 2010/2011 and this work was completed in January 2011. SASM will now re-start the cleaning cycle as required. SASM plans to smoke test approximately 2,500 feet on the "A" Line which feeds to the Rosemont Pump Station.

SASM plans to install Transient Voltage Suppressors (TVSS) or Line Reactors (LR) at the Ricardo Road, Camino Alto, and Sutton Manor Pump Stations during FY 2011/2012. Both units (TVSS and LR) are designed to prevent overvoltage from reaching operating equipment. In addition, SASM plans to add a dry well alarm to the Camino Alto Pump Station.

SASM and the Member Agencies submitted a preliminary "Report of Flow Monitoring Results" in October 2009 and a follow up report in October 2010 to the Regional Water Board and U.S. EPA. Flow monitoring was conducted at the same locations each year with additional monitoring stations added during the second wet season flow monitoring. Following the short term (5 year) improvements to the sanitary sewer systems, flow monitoring will be conducted again to compare pre- and post-rehabilitation flows.

Almonte Sanitary District

Almonte Sanitary District (Almonte) has maintained an aggressive cleaning program. Almonte cleans the entire collection system (approximately 34,000 feet of pipe) every year. The vast majority of cleaning is by rodding. Hydroflushing in conjunction with rodding is used on one hotspot line where grease has been a problem in the past and hydroflushing alone is used on plastic or HDPE pipe. Almonte completed a year of smoke testing in its collection system in September 2011 and detected 56 defects. Short term (5 year) and long term (10 year) capital replacement programs were developed and implementation has started. In 2011, Almonte replaced almost 3,000 feet of sewer main (over 8% of the district's collection system). As part of the long term capital replacement program, a total of $1.2 million ($120,000/yr) was budgeted

for pipe replacement and/or repair and rehabilitation and Almonte has committed to replacing 2% of its collection system per year.

Alto Sanitary District

The Alto Sanitary District (Alto) conducted a smoke testing program in 2011. Alto is following up on the findings from the smoke testing program with a lateral repair/replacement program intended to reduce the I/I into the system. Over the past 21.5 years Alto Sanitary District (Alto) has corrected structural issues identified in the sewer system through sewer pipe repair, rehabilitation, and replacement projects. Based on review of available records, Alto has repaired, rehabilitated, or replaced approximately 3,300 feet of sewer pipe in the last 21.5 years. This represents about a 20 percent pipe replacement of the entire District. Alto has recently lined, replaced, or inspected all 14,874 feet of its collection system. As part of the long term capital replacement program, a total of $1.1 million was budgeted for pipe replacement and/or repair and rehabilitation and Alto has committed to an ongoing replacement and rehabilitation plan targeting between 2.5% and 3% replacement per year. This will allow for a total system replacement in the next 25 to 30 years. .

Homestead Valley Sanitary District

In 2009 and again in 2011, the Homestead Valley Sanitary District (Homestead Valley) conducted a smoke testing program. Homestead Valley is following up on the findings from the smoke testing program with a lateral repair/replacement program intended to reduce the I/I into the system. Over the past 21.5 years, Homestead Valley has corrected structural issues identified in the sewer system through sewer pipe repair, rehabilitation, and replacement projects. Based on review of available records, Homestead Valley has repaired, rehabilitated, or replaced approximately 11,000 feet of sewer pipe (10,800 feet of pipe replacement plus approximately 500 feet of spot repairs) in the last 21.5 years. This represents 16 percent of the total Homestead Valley sewer system. Homestead Valley inspected 35,415 feet of its collection system between April 10, 2003 and April 10, 2008 and, since then, has inspected the remaining 27,240 feet of its collection system. As part of the long term capital replacement program, a total of $4.4 million was budgeted for pipe replacement and/or repair and rehabilitation and Homestead Valley plans to continue sewer repairs and replacement at an annual rate of about 3%, which will result in total replacement of the system in about 26 years.

City of Mill Valley

The City of Mill Valley (Mill Valley) has 6-month (semiannual), 12-month (annual), 24-month (bi-annual), and 36-month (tri-annual) cleaning frequencies. Root control has been performed using a combination of chemical root treatment, hydroflushing, rodding, and snaking. During FY 2010/2011, Mill Valley performed 22,386 feet of cleaning on pipes (including repeats) with a semi-annual, annual, or bi-annual cleaning schedule and 92,893 feet of cleaning on pipes with a tri-annual cleaning schedule. Mill Valley cleaned a total of 281,599 feet of pipe (98% of the collection

system) between FY 2008/2009 and 2010/2011. Mill Valley performed a number of pump station and force main renovations and upgrades during FY 2010/2011 and will install TVSS at both of its pump stations during FY 2011/2012. Mill Valley currently has a sewer project which is scheduled to begin in June 2012. Mill Valley has budgeted approximately $1,500,000 during FY 2011/2012 for sewer repair, rehabilitation, and replacement. Mill Valley anticipates spending the majority of this budget on repair, rehabilitation, and replacement of pipes that are identified in Mill Valley's CIP plan. As part of the long term capital replacement program, a total of $15 million ($1,500,000/yr) has been budgeted for sewer replacement and rehabilitation.

Richardson Bay Sanitary District

Richardson Bay Sanitary District (Richardson Bay) inspected its entire collection system prior to FY 2010/2011. Between FY 2008/2009 and FY 2010/2011, Richardson Bay repaired, rehabilitated and replaced 31,800 feet of its sewer collection system. During FY 2010/2011, Richardson Bay cleaned approximately 104,400 feet of its collection system and repaired, rehabilitated, and/or replaced approximately 11,000 feet of its collection system. During FY 2011/2012, Richardson Bay plans to repair, rehabilitate, and/or replace another 5,200 feet of its collection system. As part of the long term capital replacement program, a total of $5 million was budgeted for pipe replacement and/or repair and rehabilitation.

Tamalpais Community Services District

The Tamalpais Community Services District's (Tamalpais) collection system directs a portion of its flow to the SASM WWTP and the rest to Sausalito Marin City Sanitary District's wastewater treatment plant. The entire portion of Tamalpais' collection system that directs flow to the SASM WWTP was rebuilt between 2004 and 2008. This included new sewer mains and new lower lateral extensions. Of the 174 parcels served by this portion of Tamalpais' collection system, over 100 participated in Tamalpais' lateral assistance program and replaced their upper laterals. Many of the remaining 74 units had previously replaced their laterals. It is estimated that only 10 to 15 of the parcels need additional lateral work. Tamalpais continues to work with these parcels to achieve 100% lateral replacement within this portion of its collection system. Because the entire portion of Tamalpais' collection system that directs flow to the SASM WWTP was rebuilt between 2004 and 2008, a budget has not been established for pipe replacement and/or rehabilitation.

c. Estimate the potential for future peak wet weather diversions based on information such as predicted weather patterns, population growth, and treatment plant and collection system changes (e.g.; upgrades, extensions, deterioration) and evaluate options for reducing diversions based on these variables;

It is anticipated that weather patterns will remain similar to what has occurred over the past years. Although some storm events in recent years have triggered wet weather diversions, blending is not anticipated to occur in the future because the Recirculation Pumps (that were the cause of the wet weather diversions at the WWTP during 2010) have been replaced and are capable of handling the flows generated during this size of storm event. Maximum (instantaneous) peak wet weather inflows to the WWTP of 37.4 MGD have been recorded since the Recirculation Pumps were replaced and did not result in a wet weather diversion.

The SASM service area includes all of the City of Mill Valley, about half of the Town of Tiburon and unincorporated areas in between including Homestead Valley, the Kay Park portion of Tamalpais Valley, Strawberry, Almonte and Alto. The entire service area is primarily residential in nature. Equivalent Dwelling Units (EDUs) are counted each year for all sewer connections in the SASM service area. Each connection is identified by type (single family home, multiple family home, second unit, nonresidential) and a calculation of the number of EDUs is made for each connection. There are currently 14,994 EDUs connected to the SASM system (based on a population of approximately 29,000). Residential connections comprise 85.1% of the connections. The total EDU capacity allocation for SASM is 18,946. The population of the SASM service area remains stable because all areas are almost completely built out. The worst case increase in plant flows when the service area is completely built out is expected to be the current flow rate plus 15%, but there should still be approximately 10% of excess capacity in the plant at that time. As SASM's population is projected to remain virtually unchanged, there is no need for expansion of treatment plant capacity in order to accommodate flows from future population increases.

As outlined in **item a**, reducing diversions by increasing treatment capacity through the purchase of and construction on bordering property is prohibited because the property is in close proximity to tidal wetlands. As outlined in **item b**, SASM and its Member Agencies have an ongoing I/I reduction program to reduce peak flows to the WWTP.

d. Assess existing storage within the collection system or on-site and options for enhanced utilization or expansion (taking into account physical and technological considerations) of storage to reduce the frequency, duration, and volume of peak wet weather diversions and the related costs;

The existing storage within the collection system is minimal. Surcharging does occur at peak wet weather flow. In 2008, SASM increased the on-site storage capacity of the Equalization Ponds from about 1.7 Mgal to 3.3 Mgal. The expansion of the Equalization Ponds cost approximately $485,000. SASM also replaced five of the Effluent Pumps, rebuilt the sixth Effluent Pump, and replaced the six Recirculation Pumps. The Recirculation Pumps deliver Primary Effluent to the two trickling filters. The capacity of the Recirculation Pumps increased by about 500 gpm each (for a total of 34.5 MGD). The increased capacity of these pumps helps to prevent pre-mature use of the Equalization Ponds; therefore, enhancing the utilization of on-site storage. Expanding the capacity of the Effluent and Recirculation Pumps cost approximately $260,000.

e. Assess other ways to reduce peak wet weather flow volumes, such as limiting collection system extensions or slug loadings from indirect dischargers;

The population in the WWTP collection service area is projected to remain virtually unchanged; thus, a very limited number of new connections are expected in the future and extensions of the collection systems are not anticipated. SASM's Member Agencies have no indirect dischargers; therefore, limiting flow from these users is not possible.

f. Evaluate technologies (such as supplemental biological treatment, physical chemical treatment, ballasted flocculation, deep bed filtration, or membrane technology) that are or could be used to provide additional treatment to peak wet weather flows or peak wet weather diversions at the POTW treatment plant and the costs of implementing those technologies;

As stated in **item a**, the addition or expansion of the treatment plant units is infeasible due to site constraints. Additional treatment units that could be used to provide treatment to all peak wet weather flows cannot be built due to a lack of available land, either onsite or adjacent to the site. Regardless, due to the recent upgrades to the capacity of the Recirculation Pumps, wet weather diversions are not expected unless extreme wet weather conditions occur.

g. Evaluate the extent to which the permittee is maximizing its ability to reduce I/I throughout the entire collection system (i.e., not only the portions operated by the utility, but also portions operated by any municipal satellite community), including the use of existing legal authorities, potential improvement in the timing or quality of such efforts, and options for obtaining or expanding legal authorities to reduce I/I from satellite collection systems;

Due to the structure of the JPA, SASM does not have legal authority to plan, initiate or implement any I/I reduction programs for the Member Agencies' collection systems. I/I reduction programs are the responsibility of each Member Agency and SASM can only encourage and assist them at their request. **Item b** details activities and improvements made by SASM and its Member Agencies. Efforts to reduce I/I throughout the entire collection system are summarized below.

SASM

- SASM has an ongoing Supplemental Environmental Project (SEP) designed to assist private residence owners in the SASM service area with replacing defective private lateral lines. The Private Lateral Replacement Program provides funding in the form of grants and loans as well as funds for video inspections of private lateral lines. It is believed that private laterals may contribute up to 50% of I/I to the SASM WWTP. This program began in 2009 and is scheduled to run through May, 2014.
- SASM conducted extensive CCTV inspection and cleaning of sewers in its collection system.
- In October 2010, SASM completed a hydraulic profile of the SASM service area and condition assessment on the SASM owned sanitary sewer system.
- Short term (5 year) and long term (10 year) capital replacement programs have been developed and implementation has started. These programs will focus on repair or replacement of SASM owned sanitary sewer lines with poor to severe condition ratings, as well as maintaining Capacity Assurance for the Pump Stations.
- SASM completed smoke testing in approximately 2,500 feet on the "A" Line which feeds to the Rosemont Pump Station.
- SASM and the Member Agencies submitted a preliminary "Report of Flow Monitoring Results" in October 2009 and a follow up report in October 2010 to the Regional Water Board and U.S. EPA. Flow monitoring was conducted at the same locations each year with additional monitoring stations added during the second wet season flow monitoring. Following the short term (5 year) improvements to the sanitary sewer systems, flow monitoring will be conducted again to compare pre and post-rehabilitation flows.

Almonte Sanitary District

- Almonte conducted extensive CCTV inspection of sewers in its collection system.
- Almonte completed a year of smoke testing in its collection system and detected 56 defects.
- Short term (5 year) and long term (10 year) capital replacement programs have been developed and implementation has started.

- In 2011, Almonte replaced almost 3,000 feet of sewer main (over 8% of the district's collection system).
- As part of the long term capital replacement program, a total of $1.2 million ($120,000/yr) has been budgeted for pipe replacement and/or repair and rehabilitation and Almonte has committed to replacing 2% of its collection system per year.

Alto Sanitary District

- Alto conducted extensive CCTV inspection of sewers in its collection system.
- Alto conducted a smoke testing program in 2011 and is following up on the findings from the smoke testing program with a lateral repair/replacement program intended to reduce the I/I into the system.
- Alto has repaired, rehabilitated, or replaced approximately 3,300 feet of sewer pipe in the last 21.5 years. This represents about a 20 percent pipe replacement of the entire District.
- Alto has recently lined, replaced, or inspected all 14,874 feet of its collection system.
- As part of the long term capital replacement program, a total of $1.1 million was budgeted for pipe replacement and/or repair and rehabilitation and Alto has committed to an ongoing replacement and rehabilitation plan targeting between 2.5% and 3% replacement per year. This will allow for a total system replacement in the next 25 to 30 years.

Homestead Valley Sanitary District

- Homestead Valley conducted extensive CCTV inspection of sewers in its collection system.
- Homestead Valley conducted a smoke testing program and is following up on the findings from the smoke testing program with a lateral repair/replacement program intended to reduce the I/I into the system.
- Homestead Valley has repaired, rehabilitated, or replaced approximately 11,000 feet of sewer pipe (10,800 feet of pipe replacement plus approximately 500 feet of spot repairs) in the last 21.5 years. This represents 16 percent of the total Homestead Valley sewer system.
- Homestead Valley inspected 35,415 feet of its collection system between April 10, 2003 and April 10, 2008 and, since then, has inspected the remaining 27,240 feet of its collection system.
- As part of the long term capital replacement program, a total of $4.4 million was budgeted for pipe replacement and/or repair and rehabilitation and Homestead Valley plans to continue sewer repairs and replacement at an annual rate of about 3%, which will result in total replacement of the system in about 26 years. .

City of Mill Valley

- Mill Valley conducted extensive CCTV inspection of sewers in its collection system.
- Mill Valley has budgeted approximately $1,500,000 for FY 2011/2012 for sewer repair, rehabilitation, and replacement. Mill Valley anticipates spending the majority of this budget on repair, rehabilitation, and replacement of pipes that are identified in Mill Valley's CIP plan.
- As part of the long term CIP, a total of $15 million ($1,500,000/yr) has been budgeted for sewer replacement and rehabilitation.

Richardson Bay Sanitary District

- Richardson Bay conducted extensive CCTV inspection of sewers in its collection system.
- Richardson Bay inspected its entire collection system prior to FY 2010/2011.
- Between FY 2008/2009 and FY 2010/2011, Richardson Bay repaired, rehabilitated and replaced 31,800 feet of its sewer collection system.
- During FY 2011/2012, Richardson Bay plans to repair, rehabilitate, and/or replace another 5,200 feet of its collection system.

Tamalpais Community Services District

- Tamalpais conducted extensive CCTV inspection of sewers in its collection system.
- The entire portion of Tamalpais' collection system that directs flow to the SASM WWTP was rebuilt between 2004 and 2008. This included new sewer mains and new lower lateral extensions.
- Of the 174 parcels served by this portion of Tamalpais' collection system, over 100 participated in Tamalpais' lateral assistance program and replaced their upper laterals. Many of the remaining 74 units had previously replaced their laterals. Tamalpais continues to work with these parcels to achieve 100% lateral replacement within this portion of its collection system.

h. Evaluate peak flow reductions obtainable through implementation of existing Capacity, Management, Operations, and Maintenance (C-MOM) programs and potential improvements in the timing or enhancement of those programs and related costs; or, if no such program exists, reductions obtainable through the development and implementation of a C-MOM program and the related costs;

SASM does not have a documented C-MOM program. SASM and its Member Agencies are each currently undertaking extensive Sewage Spill Reduction Action Plans (SSRAPs), detailed in **items b and g**, that include on-going repair, replacement, rehabilitation, cleaning, and maintenance projects that each collection system will

undertake to reduce I/I, and thus, reduce the need for wet weather diversions. The Member Agencies are permitees under the Statewide General Permit for Sanitary Sewer Systems and are implementing Sewer System Management Plans (SSMPs) according to the permit conditions.

i. Assess the community's ability to fund the peak wet weather flow improvements discussed in the utility analysis, taking into consideration: current sewer rates, planned rate increases, and the costs, schedules, anticipated financial impacts to the community of other planned water and wastewater expenditures, and other relevant factors impacting the utility's rate base, using as a guide EPA's CSP Guidance for Financial Capability Assessment and Schedule Development, EPA 832-B-97-004;

SASM currently has a reserve account that is utilized for emergencies and capital improvements and is in the process of preparing for the sale of approximately $4.1 million in revenue bonds to fund its 5 year CIP Plan. SASM charges a sewer service fee to its Member Agencies. That fee is embedded in the sewer service charge that each Member Agency bills to its customers. Beginning in FY 2011/2012, SASM began implementing sewer service fee increases of 15%, 15%, 10%, and 10%.

For each Member Agency, planned or recent rate increases and other relevant factors impacting the Member Agency's rate base are provided in the following statements.

Almonte Sanitary District

Almonte does not have any planned rate increases in the immediate future. Rates were raised in July 2010 to the current $400 per EDU.

Using the EPA's CSO Guidance for Financial Capability Assessment and Schedule Development, EPA 832-B-97-004 as a guideline, the following information was prepared for Almonte's service area:

1. Total annual wastewater and SSO control cost per household as a percent of median household income: $33.33/mo. x 12 mos/yr ÷ $89,268 (median household income) x 100% = **0.45%**
2. Bond ratings: **Not rated**
3. Unemployment rate (County of Marin): **7.0 %**
4. Median household income (County of Marin): **$89,268**
5. Property tax revenue collection rate (County of Marin): **99.6%**
6. Property tax revenues as a percent of full market property value (County of Marin): **1.35%**

Alto Sanitary District

Recently, Alto raised sewer service charges from $285/yr to $500/yr. At this time, there is no plan for a further increase.

Using the EPA's CSO Guidance for Financial Capability Assessment and Schedule Development, EPA 832-B-97-004 as a guideline, the following information was prepared for Alto's service area:

1. Total annual wastewater and SSO control cost per household as a percent of median household income: $41.67/mo. x 12 mos/yr ÷ $89,268 (median household income) x 100% = **0.56%**
2. Bond ratings: **Not rated**
3. Unemployment rate (County of Marin): **7.0 %**
4. Median household income (County of Marin): **$89,268**
5. Property tax revenue collection rate (County of Marin): **99.6%**
6. Property tax revenues as a percent of full market property value (County of Marin): **1.35%**

Homestead Valley Sanitary District

Recently, Homestead Valley raised sewer service charges from $350/yr to $575/yr. At this time, there is no plan for a further increase.

Using the EPA's CSO Guidance for Financial Capability Assessment and Schedule Development, EPA 832-B-97-004 as a guideline, the following information was prepared for Homestead Valley's service area:

1. Total annual wastewater and SSO control cost per household as a percent of median household income: $47.92/mo. x 12 mos/yr ÷ $89,268 (median household income) x 100% = **0.64%**
2. Bond ratings: **Not rated**
3. Unemployment rate (County of Marin): **7.0%**
4. Median household income (County of Marin): **$89,268**
5. Property tax revenue collection rate (County of Marin): **99.6%**
6. Property tax revenues as a percent of full market property value (County of Marin): **1.35%**

City of Mill Valley

Mill Valley is proposing to increase sewer charges on 2012-13 property tax bills. Mill Valley has completed and filed with the City Clerk a report indicating the estimated cost of sewer improvements, identifying the sources of revenue for sewer improvements and each parcel upon which the charge shall be imposed, and calculating the amount of the charge for each parcel. The Mill Valley City Council is in the process of authorizing a notice of proposed sewer charge increase to be mailed to property owners.

Using the EPA's CSO Guidance for Financial Capability Assessment and Schedule Development, EPA 832-B-97-004 as a guideline, the following information was prepared for Mill Valley's service area:

1. Total annual wastewater and SSO control cost per household as a percent of median household income: $50.00/mo. x 12 mos/yr ÷ $105,478 (median household income) x 100% = **0.57%**
2. Bond ratings: **AAA**
3. Unemployment rate (County of Marin): **7.0%**
4. Median household income: **$105,478**
5. Property tax revenue collection rate (County of Marin): **99.6%**
6. Property tax revenues as a percent of full market property value: **1.08%**

Richardson Bay Sanitary District

At this time, Richardson Bay does not plan to increase its sewer service charge.

Using the EPA's CSO Guidance for Financial Capability Assessment and Schedule Development, EPA 832-B-97-004 as a guideline, the following information was prepared for Richardson Bay's service area:

1. Total annual wastewater and SSO control cost per household as a percent of median household income: $20.50/mo. x 12 mos/yr ÷ $147,232 (median household income) x 100% = **0.17%**
2. Bond ratings: **Not rated**
3. Unemployment rate (County of Marin): **7.0%**
4. Median household income: **$147,232**
5. Property tax revenue collection rate (County of Marin): **99.6%**
6. Property tax revenues as a percent of full market property value (County of Marin): **1.35%**

Tamalpais Community Services District

Tamalpais is undertaking a flow based rate study at the present time which may result in an alternative to the present fixed rate system that was put in place in 2009. Rates are presently $1,013/yr per EDU. The study has a rate neutral foundation and further rate increases are not anticipated beyond some class adjustments based on water flows.

Using the EPA's CSO Guidance for Financial Capability Assessment and Schedule Development, EPA 832-B-97-004 as a guideline, the following information was prepared for Tamalpais' service area:

1. Total annual wastewater and SSO control cost per household as a percent of median household income: $84.42/mo. x 12 mos/yr ÷ $89,268 (median household income) x 100% = **1.1%**
2. Bond ratings: **Not rated**
3. Unemployment rate: **4.3%**

4. Median household income (County of Marin): **$89,268**
5. Property tax revenue collection rate (County of Marin): **99.6%**
6. Property tax revenues as a percent of full market property value (County of Marin): **1.35%**

j. Propose a protocol for monitoring the recombined flow at least once daily during diversions for all parameters for which the POTW treatment plant has daily effluent limitations or other requirements (e.g., monitoring only requirements) and ensures appropriate representative monitoring for other monitoring requirements of the permit, the total volume diverted, and the duration of the peak wet weather diversion event; and

SASM installed a level monitoring system in 2009 at the recirculation wet well where blending occurs during diversions. A local level detection system was added to the plant SCADA system and an electronic chart is generated by the SCADA program. The recirculation and effluent wet wells lay side-by-side. The wall that separates the two wells has ports running the length of the wall at a height of 13.0 ft. When the level of the recirculation wet well rises above the 13.0 ft level, primary effluent will flow into the effluent wet well and blended effluent will be pumped to the discharge outfall. An alarm has been installed on the SCADA system to notify operations when the recirculation wet well rises to 11.5 ft. The duration and volume of the peak wet weather diversion event are determined from data reported through the SCADA system. Plant staff follows an established Standard Operating Procedures (SOP) for monitoring the recombined flow. The Laboratory Analyst is notified immediately when blending occurs and sampling has happened or is in progress.

Current Monitoring Protocols

The composite sampler (located at the effluent compliance point) is turned on immediately after receiving notification that blending has started. Composite samples are collected during the length of the blending event in 24-hour or less increments. The samples are analyzed for total suspended solids (TSS), biochemical oxygen demand (BOD), copper, silver, and zinc. Composite samples of blended effluent (collected at the outfall) are utilized in a 96-hr static renewal aquatic bioassay. Grab samples are collected once per day during the length of the blending event. Grab samples are obtained from the effluent wet well and analyzed for bis(2-ethylhexyl)phthalate, oil and grease, mercury, cyanide, ammonia. Grab samples collected near the outfall are analyzed for total coliform and chlorine residual.

Monitoring Protocols when Approval to Blend is Granted in the NPDES Permit

Composite samples will be collected at the effluent compliance points for the length of the blending event in 24-hour or less increments. Grab samples will be collected daily at the effluent compliance points for the length of the blending event. The composite and grab samples will be preserved and properly retained for future analysis. An aliquot of the composite sample will be analyzed immediately for TSS.

An aliquot of the grab sample will be analyzed immediately for Total Coliform. If the TSS result exceeds 45 mg/L, the retained samples will be analyzed for copper, silver, zinc, cyanide, bis(2-ethylhexyl)phthalate, and total ammonia. All retained samples will comply with holding time requirements. The SCADA system will continuously monitor and record flow, pH, and chlorine residual for the duration of the blending event. Once a year, the retained samples for one approved blending event will be analyzed for all constituents with effluent limits, except oil and grease, mercury, dioxin-TEQ, total PCBs, and acute/chronic toxicity.

k. Project the POTW treatment plant effluent improvements and other improvements in the collection system and the treatment plant performance that could be expected should the technologies, practices, and/or other measures discussed in the utility analysis be implemented.

SASM and its Member Agencies are currently implementing short term (5 year) and long term (10 year) capital replacement programs which are expected to significantly reduce the volume of I/I and the probability of wet-weather blending events. The details of this plan are discussed in **items b and g** of the preceding analysis.

Given the upgrades that have already taken place at the WWTP, the collection system improvements and anticipated I/I reductions are expected to eliminate the need to divert and blend; however, during very wet years or during the occurrence of an extreme wet weather blending may be necessary to protect the secondary treatment process.

Conclusions

Peak wet weather diversions are needed at the SASM WWTP to protect operation of the existing secondary treatment system. Recently, maximum instantaneous (less than 30 minutes) peak wet weather inflows of up to 37.4 MGD have not resulted in a blending event; however, because the hydraulic capacity of the secondary system is 24.7 MGD, diversion and blending may be undertaken to prevent solids from escaping the secondary treatment system when peak wet weather inflows of greater than 24.7 MGD are experienced for an extended period of time. Protection of the secondary system ensures that the microbial population remains constant and it is critical in preventing the exceedance of permit limits for total suspended solids, BOD, and coliform concentrations.

During wet weather events, the WWTP is run at peak secondary treatment capacity, producing the highest quality effluent that is possible under existing conditions. Any additions or expansions of the WWTP treatment units are not feasible at this time, mainly due to site constraints. The WWTP operating staff strives to minimize the number of peak wet weather diversions, and ensure that effluent quality is in compliance with permit limits. Important collection system rehabilitation efforts are underway and will continue to take place as part of each Member Agency's capital improvement/replacement program. These improvements will not completely eliminate I/I in the collection system, but given the upgrades that have already taken place at the WWTP, they are expected to

eliminate the need to divert and blend in most cases, ensuring that all WWTP effluent is treated to secondary treatment standards. However, because storms of a severe magnitude may occur and the WWTP is designed to blend, NPDES permit approval is requested to utilize wet weather diversions and blending and ensure the integrity of the existing secondary treatment system.