



<b>Subject:</b>	<b>Combined Sewer Impacts Analysis</b>
<b>Project:</b>	Golden State Warriors Arena EIR
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<b>Reviewed By:</b>	
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<b>Reference:</b>	130001

## **1 Purpose**

The purpose of this analysis is to determine the changes, if any, to the frequency, duration or volume of combined sewer discharges (CSDs) from the City's combined sewer system (CSS) due to the contribution of dry weather flow (DWF) from the proposed Golden State Warriors (GSW) arena in the Mission Bay area of San Francisco, CA. This analysis considers only the impact to CSD from changes in DWF only, it does not analyze the impacts on dry weather capacity of the CSS (that analysis is being conducted by SFDPW)<sup>1</sup>.

## **2 Scenarios Analyzed**

Three scenarios were analyzed: base case, project, and cumulative. The base case scenario includes existing conditions plus developments and improvements expected to be substantially complete previous to occupancy of the GSW arena. The project scenario adds the DWF from the arena only and the cumulative scenario adds the project DWF plus DWF from reasonably foreseeable projects in the basin. In all three scenarios, the wet weather flow (stormwater runoff) is assumed to not contribute to the CSS; rather is treated and pumped directly to the Bay. All DWF from the proposed GSW arena is assumed to flow to the Mariposa pump station (MPS), therefore Mariposa is the only basin analyzed.

## **3 Description of Model**

The model used for this analysis is a single basin, mass balance hydrologic model developed by SFDPW called "hydrocalc". It takes static hydrologic inputs such as area, C factor, storage volume, pumping rate, and applies a user selected rainfall file as time varying input. The time step is 5 minute.

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<sup>1</sup> SFDPW, "Mariposa Pump Station (MPS) Dry Weather Flow Hydraulic Analysis", Technical Memorandum from Bassam Aldhafari to Manfred Wong and Bessie Tam, February 3, 2015.

## 4 Model Inputs

The following inputs were used in analyzing the three scenarios described in Section 2:

Annual Rain (inch) <sup>1</sup>	Contributing Acres <sup>2</sup>	C Factor <sup>1</sup>	WW Pump <sup>2</sup> (mgd)	DW Pump <sup>2</sup> (mgd)
26	180	0.76	10	1.2

Data Sources:

1. SFDPW ICM model
2. SFDPW TM, 2/3/15

The only input which varies between scenarios is the DWF contribution. The DWF contributions by scenario were derived from the SFDPW MPS TM (2/3/15) and are detailed in the table in Attachment 1. The contributing area outlined in the SFDPW TM is shown in Attachment 2.

## 5 Model Results

The model predicts the following changes to estimated CSD frequency, volume and duration assuming average DWF:

	Frequency (Count)	Volume (Mgal)	Duration (Hrs)
Baseline	10	5.34	17.2
Project	10	5.63	17.3
Cumulative	10	6.32	18.2

Assuming peak DWF for the arena only (a conservative assumption that every overflow occurs during maximum occupancy), the model predicts the following:

	Frequency (Count)	Volume (Mgal)	Duration (Hrs)
Baseline	10	5.34	17.2
Project	10	7.2	19.4
Cumulative	11	7.98	21.8

ATTACHMENT 1.

Dry Weather Flows (DWFs) from Mission Bay South (Basin "A")

BASELINE				PROJECT			CUMULATIVE		
Parcel	Average DWF (gpm)	Peak DWF (gpm)		Parcel	Average DWF (gpm)	Peak DWF (gpm)	Parcel	Average DWF (gpm)	Peak Flow (gpm)
24a/b	71	213		29-32	114	746	25b	39	117
24c	9	27					33-34	63	190
25a	32	96					hospital phase 2	77	405
hospital phase 1 (X3, 36-39)	90	474					40	40	118
X4, P23-24	16.7	50							
PHASE TOTAL (gpm)	219	860			114	746		219	830
PHASE TOTAL (mgd)	0.31	1.24			0.16	1.07		0.32	1.20
RUNNING TOTAL (gpm)	219	860			333	1606		552	2436
RUNNING TOTAL (mgd)	0.31	1.24			0.479	2.31		0.794	3.51
DWF from Basin "B"	0.6	1.00			0.6	1.00		0.6	1.00
I&I	0.3	0.3			0.3	0.3		0.3	0.3
TOTAL (mgd)	1.21	2.54			1.38	3.61		1.69	4.81

