A G E N D A

Meeting of the
Scotts Valley City Council
REMOTE ACCESS ONLY
Date: February 2, 2022
Time: 6:00 PM

CONTACT INFORMATION	MEETING LOCATION	POSTING
City of Scotts Valley 1 Civic Center Drive Scotts Valley, CA 95066 (831) 440-5600	Zoom Videoconference https://us02web.zoom.us/j/83534216595 *See information below for how to participate.*	The agenda was posted 1-28-2022 at City Hall and on the Internet at www.scottsvalley.org.

PUBLIC ADVISORY REGARDING COVID-19 AND PUBLIC PARTICIPATION

On September 16, 2021, Governor Newsom signed Assembly Bill 361 ("AB 361"), an urgency measure effective upon adoption, amending the Brown Act to allow legislative bodies to continue teleconferencing during a proclaimed State of Emergency, and either state or local officials have imposed or recommended measures to promote social distancing, or the legislative body determines that meeting in person would present imminent risks to the health or safety of attendees. In accordance with AB 361, the Scotts Valley City Council adopted Resolution No. 2007.3 on January 12, 2022, authorizing the continued use of teleconferenced meetings pursuant to AB 361. Elected Officials and City Staff Members will be participating remotely via videoconference.

Public Participation:
The meeting will be available on Zoom and broadcast through Community Television of Santa Cruz on Channel 25 and via their website at the following link: https://communitytv.org/watch/ (be sure to click on Channel 25). For those wishing to participate via Zoom you can join the following ways:

- Join from a PC, Mac, iPad, iPhone or Android device:
  Please click this URL to join. https://us02web.zoom.us/j/83534216595
- Or iPhone one-tap:
  +16699009128,,88999122100# US (San Jose)
  +12532158782,,88999122100# US (Tacoma)
- Or join by phone:
  Dial (for higher quality, dial a number based on your current location):
  US: +1 669 900 9128 or +1 253 215 8782 or +1 346 248 7799 or +1 646 558 8656 or +1 301 715 8592 or +1 312 626 6799

Webinar ID: 835 3421 6595

You will be given opportunities to provide public comment at the appropriate times throughout the meeting via Zoom. If you are participating via dial-up only, use *9 to raise your hand at the requested time.

How to comment via Zoom:

1. At the appropriate times during the meeting for public comment, on items not on the agenda, and on specific agenda items, the Mayor will announce that public comment will be accepted. Our usual time limits of 3 minutes per individual, or 5 minutes for an individual who is representing a group of three or more, will apply. Please note that per our standard practice, this is not a question and answer time, but simply a time for you to provide your comments to the Council.
2. There is an option on Zoom to raise your hand. Please click on this option when the Mayor announces that public comment will be taken. Zoom places people in line automatically. If you are participating via dial-up, you can raise your hand at the appropriate time by pressing *9. When it is your turn, the City Clerk will unmute you, and you will be able to make your comments based on the above time frames. Once your time is up, you will once again be muted and the next person in line will be given their opportunity to speak.

How to comment via email:

1. Members of the public may provide public comment by sending comments to the City Clerk via email at cityhall@scottsvalley.org.
2. Additional materials and emails must be received by 5:30 pm the day of the meeting and will be distributed to agenda recipients prior to the meeting.
3. Emails received after 5:30 pm the day of the meeting will not be included in the record.

ELECTED OFFICIALS	CITY STAFF MEMBERS
Donna Lind, Mayor	Mali LaGoe, City Manager
Jim Reed, Vice Mayor	Casey Estorga, Administrative Services Director
Jack Dilles, Council Member	Kirsten Powell, City Attorney
Randy Johnson, Council Member	Steve Walpole, Chief of Police
Derek Timm, Council Member	Taylor Bateman, Community Development Director
	Chris Lamm, Public Works Director
	Lauren Lambert, Deputy City Clerk

MEETING NOTICE AND AGENDA PACKET MATERIALS

Notice regarding City Council Meetings:
The City Council meets regularly on the 1st and 3rd Wednesday of each month at 6:00 pm.

Agenda and Agenda Packet Materials:
The City Council agenda and the complete agenda packet are available for review by 5:00 pm the Friday before the Wednesday meeting on the Internet at the City's website: http://scottsvalley.org/AgendaCenter. Due to COVID-19, City Hall is closed to the public therefore, the agenda is only available for viewing online.

Televised Meetings:
City Council meetings are cablecast "Live" on Community Television of Santa Cruz County on Comcast Channel 25 and are also available livestream on the Community TV website at the following link: https://communitytv.org/watch/

Zoom Meetings/Webinars:
For those wishing to participate via Zoom you can join from a PC, Mac, iPad, iPhone or Android device by entering or clicking on the following URL:
https://us02web.zoom.us/j/83534216595

CALL TO ORDER 6:00 PM

MOMENT OF SILENCE

ROLL CALL

COMMITTEE REPORTS

Council members are appointed to committees which are either City committees or committees dealing with other jurisdictions. This portion of the agenda allows the committee member to present oral or written reports to the Council regarding their committee assignments. It also allows the Council to make comments and give the committee member direction, as required.

CITY MANAGER REPORT

PUBLIC COMMENT TIME

This is the opportunity for individuals to make and/or submit written or oral comments to the Council on any items within the purview of the Council, which are NOT part of the Agenda. No action on the item may be taken, but the Council may request the matter be placed on a future agenda.

ALTERATIONS TO CONSENT AGENDA

Council can remove or add items to the Consent Agenda.

CONSENT AGENDA

The Consent Agenda is comprised of items which appear to be non-controversial. Persons wishing to speak on any items may do so raising their hand to be recognized by the Mayor.

A. Approve City Council minutes of 1-19-2022

B. Approve check registers dated 12-17-2021, 12-28-2021, 1-07-2022, 1-13-2022, 1-21-2022, 1-28-2022

C. Approve Resolution No. 2007.4 authorizing the continued use of teleconferenced meetings pursuant to Assembly Bill 361

D. Adopt Resolution No. 2009 authorizing the Public Works Director to accept completed Public Works Projects and file notices of completion

E. Adopt Resolution No. 2010 approving the City of Scotts Valley Sewer System Management Plan

ALTERATIONS TO REGULAR AGENDA

Council can remove or add items to the Regular Agenda.

REGULAR AGENDA

Persons wishing to speak on any item may do so by raising their hand to be recognized by the Mayor.

1. Future Council agenda items
   (This portion of the Regular Agenda allows the Council to determine items to be placed on a future agenda and to choose a date, if so desired.)

ADJOURNMENT

ADA NOTICE

The City of Scotts Valley does not discriminate against persons with disabilities. The City Council Chambers is an accessible facility. If you wish to attend a City Council meeting and require assistance such as sign language, a translator, or other special assistance or devices in order to attend and participate at the meeting, please call the City Clerk's office at (831) 440-5602 five to seven days in advance of the meeting to make arrangements for assistance. If you require the agenda of a City Council meeting be available in an alternative format consistent with a specific disability, please call the City Clerk's Office. The California State Relay Service (TTY/VCO/HCO to Voice: English 1-800-735-2929, Spanish 1-800-855-3000; or, Voice to TTY/VCO/HCO: English 1-800-735-2922, Spanish 1-800-855-3000), provides Telecommunications Devices for the Deaf and Disabled and will provide a link between the TDD caller and users of telephone equipment.

PROCEDURAL INFORMATION FOR THE PUBLIC

THE FOLLOWING IS THE PROCEDURE COUNCIL SHOULD TAKE IN APPROVAL OF A RESOLUTION:

1. Move the Resolution number for approval.
2. Second the motion.
3. Vote by body, a roll call vote is not required.

THE FOLLOWING IS THE PROCEDURE COUNCIL SHOULD TAKE IN INTRODUCTION/ADOPTION OF AN ORDINANCE:

1. Move the Ordinance number for introduction (or adoption).
2. Move the Ordinance be introduced by title only and waive the reading of the text.
3. Read the Ordinance title.
4. Second the motion.
5. Vote by body, a roll call vote is not required.

THE FOLLOWING IS THE PROCEDURE COUNCIL SHOULD TAKE IN PUBLIC COMMENT/PUBLIC HEARINGS:

Unless otherwise determined by the presiding officer of the meeting:

1. Three minutes allowed per individual to speak.
2. Five minutes allowed per individual representing a group of three or more.

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M I N U T E S

Meeting of the
Scotts Valley City Council

Date: January 19, 2022
Time: 6:00 PM

CONTACT INFORMATION	MEETING LOCATION	POSTING
City of Scotts Valley 1 Civic Center Drive Scotts Valley, CA 95066 (831) 440-5600	Zoom Videoconference	The agenda was posted 1-14-2022 at City Hall and on the Internet at www.scottsvalley.org.

CALL TO ORDER 6:00 PM

The City Council meeting was called to order at 6:01 PM

MOMENT OF SILENCE

ROLL CALL

ELECTED OFFICIALS PRESENT:	CITY STAFF MEMBERS PRESENT:
Donna Lind, Mayor Jim Reed, Vice Mayor Jack Dilles, Council Member Randy Johnson, Council Member Derek Timm, Council Member	Mali LaGoe, City Manager Kirsten Powell, City Attorney Steve Walpole, Chief of Police Taylor Bateman, Community Development Director Casey Estorga, Administrative Services Director Chris Lamm, Public Works Director/City Engineer Tracy Ferrara, City Clerk Lauren Lambert, Deputy City Clerk

COMMITTEE REPORTS

CM Dilles reported that in December he, along with Public Works Director Chris Lamm, attended a meeting of the Integrated Waste Management Local Task Force. At the meeting they discussed the new rules and requirements around recycling food waste. Food waste should be placed in the green carts along with green waste instead of being placed in the garbage.

CM Dilles reported that he met with Congressman Jimmy Panetta. Congressman Panetta was interested in learning more about our city and any federal issues we have. Currently Congressman Panetta's district does not include the San Lorenzo Valley and Scotts Valley area. However, the congressional area could change at the next election and, if successful, would move San Lorenzo Valley and Scotts Valley under Congressman Panetta's jurisdiction.

CM Dilles attended the meeting of the Santa Cruz County Consolidated Redevelopment Successor Agency Oversight Board, which deals with the winddown of all the redevelopment agencies and reported they receive the property tax dollars to pay off preexisting debt. The Oversight Board will turn in everything to the State on February 1st Included for approval was Scotts Valley's Administration budget and Recognized Obligation Payment Schedule (ROPS).

CM Dilles reported that the Area Agency on Aging Seniors Advisory Council met and discussed the Governors budget as it relates to programs for seniors.

CM Timm reported he attended the Economic Recovery Town Hall for the businesses in town. It was well attended by businesses who were provided information on how to apply for the CBDG Grant from the City.

CM Timm reported the Association of Monterey Bay Area Governments (AMBAG) met last week concerning 2,000 units shifted from Monterey County to Santa Cruz County. With the additional units that have been allocated to Santa Cruz County, Scotts Valley has to plan for 1,220 new units in an eight-year cycle. Capitola and Santa Cruz were hit in a similar way, Capitola has to plan for 1,336 and Santa Cruz City will have to plan for 3,736 units. This is a substantial increase from what they had been working on the past three years. This will now go to the State, who has 30 days to comment on this plan. AMBAG Staff feels this plan will be adopted.

CM Timm reported the Economic Recovery Subcommittee met with the Chamber and wanted to remind the community that nominations are due for Man and Woman of the Year and Community Groups of the Year.

CM Johnson reported he attended the Economic Recovery Town Hall meeting, commented on how well it was attended and saluted the business community for the tough two years they have gone through with the pandemic. CM Johnson thanked Administrative Services Director Casey Estorga for the presentation he put together to go over the grants and the process of applying for them.

Mayor Lind reported that the Ad Hoc Committee for the Santa Cruz Metropolitan Transit Board met for recruitment for the new CEO to replace Alex Clifford whose last day is Friday, January 21, 2022. The Ad Hoc Committee will be reviewing applications at a Special Meeting on Friday, January 21, 2022.

Mayor Lind reported the Santa Cruz Metro Finance and Budget Committee met and discussed revenue, which is higher due to higher sales taxes than had been anticipated, and expenses, which have been lower due to vacant positions that they are having difficult recruiting for. The bus replacement fund did better because of additional Measure D sales tax and ridership is slowly recovering.

CITY MANAGER REPORT

1. **Sales Tax:** Received a presentation from HdL to check on our sales tax figures which are looking cautiously optimistic. They are higher than anticipated but we still recognize there is room to grow. The presentation was helpful and informative.

2. **Health Call:** Mayor Lind and City Manager LaGoe participated in a Public Health Call with the County on Friday to get an update on COVID-19. USPS started a program where any resident can request free at home COVID test kits, up to four tests per home, which will be sent directly to their homes.

3. **Library:** City Manager LaGoe walked through the Library space with our new County Librarian, Yolande Wilburn, and saw the construction progress on the space, however, they are facing some supply chain challenges on needed materials.

4. **Public Works:** Paving work has begun on Whispering Pines and will continue this week. A request for proposals is out right now for maintenance of the Skypark fields to help us keep up with the maintenance.

5. **Community Partners:** Over the next week, City Manager LaGoe is looking forward to continue to meet with community partners and has several more meetings set up with additional community partners.

PUBLIC COMMENT TIME

Piret Harmon, Scotts Valley Water District General Manager, welcomed Ms. LaGoe and is looking forward to working with her.

Mayor Lind announced the Fallen Officer Foundation Ball is being held on February 12, 2022. Tickets can be purchased at www.fallenofficerfoundation.com

ALTERATIONS TO CONSENT AGENDA

M/S: Dilles/Timm
To approve the Consent Agenda.
Carried 5/0 (AYES: Dilles, Johnson, Lind, Reed, Timm)

CONSENT AGENDA

A. Approve City Council minutes of 12-15-2021, 12-15-2021, 1-12-2022, 1-12-2022

B. Approve check registers dated 12-10-2021

C. Approve second reading and adoption of Ordinance No. 199 regarding electronic signatures and extension of emergency order allowing the use of electronic signatures

D. Approve Resolution 1955.19 amending the job description for the City Clerk/ Administrative Manager job classification and introduce a Human Resources Manager job classification and salary schedule

ALTERATIONS TO REGULAR AGENDA

M/S: Dilles/Timm
To approve the Regular Agenda.
Carried 5/0 (AYES: Dilles, Johnson, Lind, Reed, Timm)

REGULAR AGENDA

1. Consider Council appointments to Interjurisdictional Committee and Standing Local Committee

Mayor Lind announced one change for the Interjurisdictional Committee and Standing Local Committee Roster from the 2021 appointments. She replaced CM Timm with CM Dilles as the alternate for the Santa Cruz Regional Transportation Commission.

M/S: Timm/Johnson
To approve the 2022 Interjurisdictional Committee and Standing Local Committee appointments as presented by Mayor Lind, with one change to replace CM Timm with CM Dilles as the alternate to the Santa Cruz County Regional Transportation Commission.
Carried 5/0 (AYES: Dilles, Johnson, Lind, Reed, Timm)

2. Consider adoption of resolutions establishing project specific subcommittees

CM LaGoe presented the written staff report on the four proposed project specific subcommittees for consideration and responded to questions from Council.

M/S: Timm/Reed
To approve Resolution No. 1959.9 Establishing a Temporary Project Specific Council FY 22/23 Budget Subcommittee.
Carried 5/0: (AYES: Dilles, Lind, Johnson, Reed, Timm)

M/S: Dilles/Timm
To approve Resolution No. 1959.10 Establishing a Temporary Project Specific Council Measure S Renovations Subcommittee with the amended date of July 1, 2022.
Carried 5/0: (AYES: Dilles, Lind, Johnson, Reed, Timm)

M/S: Dilles/Johnson
To approve Resolution No. 1959.11 Establishing a Temporary Project Specific Council Economic Recovery Committee.
Carried 5/0: (AYES: Dilles, Lind, Johnson, Reed, Timm)

M/S: Dilles/Johnson
To approve Resolution No. 1960.3 Establishing a Temporary Project Specific Council Town Center Opportunity Committee.
Carried 5/0: (AYES: Dilles, Lind, Johnson, Reed, Timm)

3. Future Council agenda items

CM Timm requested a future agenda item to bring forward a flavored tobacco ordinance.

CA Powell announced that pursuant to Government Code Section 54956.9 the City Council would be holding closed session to confer with legal counsel regarding existing litigation, the cases are Ball v. City of Scotts Valley 21CV01948 and Ball v. City Council of the City of Scotts Valley 21CV01448.

ADJOURNMENT

The meeting adjourned at 6:36 PM.

Approved: _____
Donna Lind, Mayor

Attest: _____
Lauren Lambert, Deputy City Clerk

M I N U T E S

Special Closed Session Meeting of the
Scotts Valley City Council

Date: January 19, 2022
Time: 6:15 PM

CONTACT INFORMATION	MEETING LOCATION	POSTING
City of Scotts Valley 1 Civic Center Drive Scotts Valley, CA 95066 (831) 440-5600	Zoom Videoconference	The agenda was posted 1-14-22 at City Hall and on the Internet at www.scottsvalley.org.

ROLL CALL	
ELECTED OFFICIALS PRESENT: Donna Lind, Mayor Jim Reed, Vice Mayor Jack Dilles, Council Member Randy Johnson, Council Member ABSENT: Derek Timm, Council Member	CITY STAFF MEMBERS PRESENT: Mali LaGoe, City Manager Kirsten Powell, City Attorney Casey Estorga, Administrative Services Director Steve Walpole, Chief of Police

CALL TO ORDER 6:15 PM

The City Council meeting was called to order at 6:40 PM

CONVENE TO CLOSED SESSION

CLOSED SESSION SUBJECT(S)

The City Council convened to closed session at 6:40 PM to discuss the following items:

(1) Pursuant to Government Code Section 54956.9, the City Council met in closed session to confer with the legal counsel regarding existing litigation, the cases are: (1) Ball v. City of Scotts Valley 21CV01948; and (2) Ball v. City Council of the City of Scotts Valley 21CV01448.

RECONVENE TO OPEN SESSION

The City Council reconvened to open session at 7:05 PM.

REPORT ON ACTION TAKE DURING CLOSED SESSION

Mayor Lind announced that there was nothing to report.

ADJOURNMENT

The meeting adjourned at 7:05 PM.

Approved: _____
Donna Lind, Mayor

Attest: _____
Lauren Lambert, Deputy City Clerk

SCOTTS VALLEY ACCOUNTS PAYABLE CITY OF SCOTTS VALLEY
12/17/2021 13:12:08 Check Register GL050S-V08.15 COVERPAGE
GL540R

Report Selection:

RUN GROUP... 121721 COMMENT... 12/17/21 A/P

DATA-JE-ID	DATA COMMENT
W-12172021-541	12/17/21 A/P

Run Instructions:

Jobq	Banner	Copies	Form	Printer	Hold	Space	LPI	Lines	CPI	CP	SP	RT
L		01			Y	S	6	066	10			

BANK	VENDOR	CHECK#	DATE	AMOUNT
BA GENERAL CHECKING ACCOUNT				
001840	A TOOL SHED, INC.	122961	12/17/21	1,148.00
003342	ACCENT CLEAN & SWEEP INC	122962	12/17/21	2,123.00
003597	ADAMS ASHBY GROUP, INC	122963	12/17/21	625.00
001912	ADVANCED FLOW MEASUREMEN	122964	12/17/21	2,000.00
003758	ASCANI, PSY.D./CORIE L.	122965	12/17/21	225.00
001593	BENEDICT DDS/NANETTE	122966	12/17/21	170.00
001786	BEWICK/KENNETH	122967	12/17/21	135.00
001566	BUSINESS WITH PLEASURE	122968	12/17/21	221.82
003088	CALIFORNIA COAST UNIFORM	122969	12/17/21	177.56
003521	CARD SERVICE CENTER	122970	12/17/21	908.05
001553	CARD SHARK INC/THE	122971	12/17/21	6,523.76
002091	COMCAST	122972	12/17/21	320.71
002091	COMCAST	122973	12/17/21	177.61
002091	COMCAST	122974	12/17/21	323.22
003134	CRIME SCENE CLEANERS,INC	122975	12/17/21	100.00
001935	CRITICAL REACH, INC.	122976	12/17/21	275.00
000389	DASSEL'S PETROLEUM INC	122977	12/17/21	418.16
000207	DEPARTMENT OF JUSTICE	122978	12/17/21	66.00
001537	DYNAMIC PRESS	122979	12/17/21	299.62
000202	FEDERAL EXPRESS	122980	12/17/21	117.36
001881	GRAINGER	122981	12/17/21	4,514.92
003980	HUTCHISON/TREVOR	122982	12/17/21	345.00
004024	K & D LANDSCAPING, INC.	122983	12/17/21	1,035.00
000238	KENNEDY-JENKS CONSULTANT	122984	12/17/21	10,190.00
000066	KING'S PAINT & PAPER	122985	12/17/21	41.53
001372	KURATOMI DDS/REED K	122986	12/17/21	200.00
003995	LIPARI/NICOLAS	122987	12/17/21	345.00
000291	MBASIA	122988	12/17/21	455,609.77
001787	MICHAEL WADE PETRINI	122989	12/17/21	125.00
003171	MICHALAK/GENE	122990	12/17/21	125.00
003570	MISSION COMMUNICATIONS,	122991	12/17/21	6,945.00
001418	MONTEREY REGIONAL	122992	12/17/21	5,840.45
000323	NBS GOVERNMENT FINANCE G	122993	12/17/21	1,079.52
000101	PACIFIC GAS & ELECTRIC C	122994	12/17/21	44,654.54
000101	PACIFIC GAS & ELECTRIC C	122995	12/17/21	118.76
000101	PACIFIC GAS & ELECTRIC C	122996	12/17/21	87.17
004052	PATRIOT CONTRACTING, INC	122997	12/17/21	461,719.00
003559	ROBERTS/MEREDITH	122998	12/17/21	214.00
001894	S.V. WATER DISTRICT - BU	122999	12/17/21	10.23
003658	SANTA CRUZ OCCUPATIONAL	123000	12/17/21	471.00
000127	SANTA CRUZ SENTINEL	123001	12/17/21	691.55
000319	SCOTTS VALLEY CAR WASH	123002	12/17/21	74.93
000133	SCOTTS VALLEY SPRINKLER	123003	12/17/21	14.03
002053	STEPFORD	123004	12/17/21	520.00
001844	STERLING WATER TECHNOLOG	123005	12/17/21	1,848.00
004020	STOEBERL/NICHOLAS	123006	12/17/21	32.50
003468	TRI-COUNTY TROPHY & ENGR	123007	12/17/21	142.79
001366	U.S. BANCORP OFFICE	123008	12/17/21	1,300.62

BANK	VENDOR	CHECK#	DATE	AMOUNT	
BA GENERAL CHECKING ACCOUNT					
001106	VERIZON WIRELESS	123009	12/17/21	1,039.17	
000443	WALPOLE/STEVE	123010	12/17/21	152.00	
GENERAL CHECKING ACCOUNT				1,015,841.35	***

BANK	VENDOR	CHECK#	DATE	AMOUNT
REPORT TOTALS:				1,015,841.35

RECORDS PRINTED - 000106

GL540R

FUND RECAP:

FUND	DESCRIPTION	DISBURSEMENTS
001	GENERAL	389,338.52
002	RECYCLING/ENVIRONMENTAL	2,123.00
004	RECREATION	18,414.00
010	WASTEWATER OPERATIONS	125,071.63
011	TERTIARY TREATMENT PLANT	1,179.74
012	WASTEWATER CAPITAL RESERVE	10,190.00
028	SENIOR CENTER	2,493.85
050	PINEWOOD EST LNDSCP MAINT DT	9.58
077	SKYPARK MAINT ASSESS DIST	28.60
088	LIBRARY FACILITIES-MEAS "S"	461,719.00
090	SV DRIVE A REDEMPTION	1,079.52
112	DENTAL INS INTERNAL SERV	522.00
123	COMMUNITY FACILITY CENTER	2,636.91
150	GENERAL CAPITAL IMPROVEMENTS	1,035.00
TOTAL ALL FUNDS		1,015,841.35

BANK RECAP:

BANK	NAME	DISBURSEMENTS
BA	GENERAL CHECKING ACCOUNT	1,015,841.35
TOTAL ALL BANKS		1,015,841.35

Report Selection:

RUN GROUP... 122821 COMMENT... 12/28/21 A/P

DATA-JE-ID	DATA COMMENT
W-12282021-549	12/28/21 A/P

Run Instructions:

Jobq	Banner	Copies	Form	Printer	Hold	Space	LPI	Lines	CPI	CP	SP	RT
L		01			Y	S	6	066	10			

BANK	VENDOR	CHECK#	DATE	AMOUNT
BA GENERAL CHECKING ACCOUNT				
000182	A SIGN ASAP	123011	12/28/21	91.37
003919	ACCO ENGINEERED SYSTEMS	123012	12/28/21	3,797.72
001405	AFLAC-FLEX ONE	123013	12/28/21	1,563.20
001219	ALHAMBRA	123014	12/28/21	188.75
000652	ANDERSON PACIFIC ENG INC	123015	12/28/21	7,340.20
001631	ART CLEANERS	123016	12/28/21	1,130.93
001670	AT &T	123017	12/28/21	479.98
000097	AT&T	123018	12/28/21	159.41
003724	ATLAS BUSINESS SOLUTIONS	123019	12/28/21	583.20
003746	AVENU HOLDINGS, LLC	123020	12/28/21	2,029.09
000614	BATTERIES + BULBS #314	123021	12/28/21	9.99
.15837	BNI BUILDING NEWS	123022	12/28/21	53.60
000021	BOWMAN & WILLIAMS	123023	12/28/21	3,470.00
000437	BRASS KEY LOCKSMITH	123024	12/28/21	6.56
003178	BUTANO GEOTECHNICAL	123025	12/28/21	8,456.25
001017	C.W.E.A.	123026	12/28/21	192.00
003714	CAPITOLA/CITY OF	123027	12/28/21	26,458.29
003521	CARD SERVICE CENTER	123028	12/28/21	1,422.21
004055	CENTRAL COAST DRILLING	123029	12/28/21	3,156.25
001051	COASTAL EVERGREEN CORP	123030	12/28/21	2,535.00
001103	CREATIVE FORMS & CONCEPT	123031	12/28/21	978.30
003043	CSG CONSULTANTS, INC	123032	12/28/21	78,236.57
001896	D & G SANITATION	123033	12/28/21	724.18
000207	DEPARTMENT OF JUSTICE	123034	12/28/21	96.00
004037	FERGUSON ENTERPRISES, LL	123035	12/28/21	80.85
003253	FIRST ALARM	123036	12/28/21	123.15
001881	GRAINGER	123037	12/28/21	195.61
003706	GRANADOS/JUSTIN	123038	12/28/21	170.00
000801	HINDERLITER, DE LLAMAS &	123039	12/28/21	300.00
004023	HOUSEKEYS, INC.	123040	12/28/21	10,000.00
004041	INTERWEST CONSULTING GRO	123041	12/28/21	8,053.75
003292	KIMLEY-HORN & ASSOCIATES	123042	12/28/21	11,838.76
000066	KING'S PAINT & PAPER	123043	12/28/21	647.86
003756	MICHAEL BAKER INTERNATIO	123044	12/28/21	5,759.00
000218	MID VALLEY SUPPLY	123045	12/28/21	274.95
000323	NBS GOVERNMENT FINANCE G	123046	12/28/21	4,516.98
000088	NORTH BAY FORD-LINCOLN-	123047	12/28/21	200.00
004042	PACE ANALYTICAL SERVICES	123048	12/28/21	288.00
000101	PACIFIC GAS & ELECTRIC C	123049	12/28/21	28.92
002063	PATEL-CROSKREY/DARSHANA	123050	12/28/21	180.18
004036	PEREZ/ERIC	123051	12/28/21	1,100.00
001857	PHOENIX GROUP	123052	12/28/21	324.80
000723	PIED PIPER INC./THE	123053	12/28/21	78.50
000102	PITNEY BOWES GLOBAL	123054	12/28/21	550.98
000463	RALEY'S	123055	12/28/21	88.68
003572	REGIONAL GOVERNMENT SERV	123056	12/28/21	17,405.00
001883	S.W.R.C.B.	123057	12/28/21	3,326.00
.15838	SANTA CRUZ BACKFLOW	123058	12/28/21	121.00

BANK	VENDOR	CHECK#	DATE	AMOUNT	
BA GENERAL CHECKING ACCOUNT					
003367	SANTA CRUZ LIVE SCAN, IN	123059	12/28/21	30.00	
004054	ST.FRANCIS ELECTRIC	123060	12/28/21	4,175.00	
002053	STEPFORD	123061	12/28/21	9,306.00	
001085	SYCAL ENGINEERING INC	123062	12/28/21	973.96	
001589	TELECOMMUNICATIONS	123063	12/28/21	11,773.26	
001831	USA BLUE BOOK	123064	12/28/21	821.61	
001106	VERIZON WIRELESS	123065	12/28/21	179.99	
003145	WAGE WORKS	123066	12/28/21	125.00	
000152	WECO INDUSTRIES INC.	123067	12/28/21	400.31	
004053	WILSON, D.D.S., INC/EDWA	123068	12/28/21	915.50	
000154	WINCHESTER AUTO STORES	123069	12/28/21	70.76	
003971	WIZIX TECHNOLOGY GROUP,	123070	12/28/21	300.72	
GENERAL CHECKING ACCOUNT				237,884.13	***

BANK	VENDOR	CHECK#	DATE	AMOUNT
REPORT TOTALS:				237,884.13

RECORDS PRINTED - 000103

GL540R

FUND RECAP:

FUND	DESCRIPTION	DISBURSEMENTS
001	GENERAL	193,129.90
004	RECREATION	75.99
010	WASTEWATER OPERATIONS	8,290.41
011	TERTIARY TREATMENT PLANT	288.00
012	WASTEWATER CAPITAL RESERVE	7,340.20
019	AFFORDABLE HOUSING	10,000.00
025	GENERAL TRUST	11,838.76
028	SENIOR CENTER	309.89
090	SV DRIVE A REDEMPTION	4,516.98
112	DENTAL INS INTERNAL SERV	2,015.50
123	COMMUNITY FACILITY CENTER	78.50
TOTAL ALL FUNDS		237,884.13

BANK RECAP:

BANK	NAME	DISBURSEMENTS
BA	GENERAL CHECKING ACCOUNT	237,884.13
TOTAL ALL BANKS		237,884.13

Report Selection:

RUN GROUP... 010722 COMMENT... 01/07/2022 A/P

DATA-JE-ID	DATA COMMENT
W-01072022-559	01/07/2022 A/P

Run Instructions:

Jobq	Banner	Copies	Form	Printer	Hold	Space	LPI	Lines	CPI	CP	SP	RT
L		01			Y	S	6	066	10			

BANK	VENDOR	CHECK#	DATE	AMOUNT
BA GENERAL CHECKING ACCOUNT				
000041	ACC BUSINESS	123071	01/07/22	1,812.96
001219	ALHAMBRA	123072	01/07/22	59.99
000652	ANDERSON PACIFIC ENG INC	123073	01/07/22	24,859.16
004057	ANDREWS/SELINA	123074	01/07/22	50.00
001009	ARD/KRISTIN	123075	01/07/22	50.00
004029	ARMSTRONG/AMANDA	123076	01/07/22	50.00
000097	AT&T	123077	01/07/22	728.14
004035	BABCOCK/COLTON	123078	01/07/22	50.00
001928	BATEMAN/TAYLOR	123079	01/07/22	50.00
001373	BAY TREE, LLC	123080	01/07/22	3,620.38
001593	BENEDICT DDS/NANETTE	123081	01/07/22	773.30
003170	BOGARD CONSTRUCTION INC	123082	01/07/22	8,562.50
000437	BRASS KEY LOCKSMITH	123083	01/07/22	313.34
003894	BURKE, WILLIAMS & SORENS	123084	01/07/22	16,722.25
000773	CENTRAL COAST LANDSCAPE	123085	01/07/22	383.00
015008	CENTRAL HOME SUPPLY	123086	01/07/22	233.61
003887	CHEUNG/ATHENA	123087	01/07/22	50.00
002091	COMCAST	123088	01/07/22	146.31
003134	CRIME SCENE CLEANERS, IN	123089	01/07/22	100.00
001896	D & G SANITATION	123090	01/07/22	1,016.86
000975	DEAN/MICHAEL R.	123091	01/07/22	50.00
003990	DIBENEDETTO/GUNNAR	123092	01/07/22	50.00
004005	ESTORGA/CASEY	123093	01/07/22	50.00
.15839	FARSHAD KESHAVARZA	123094	01/07/22	218.82
000582	FERRARA/TRACY A.	123095	01/07/22	50.00
004019	FERRO/ARMANDO	123096	01/07/22	76.50
003706	GRANADOS/JUSTIN	123097	01/07/22	50.00
003944	HEBARD/TYLER	123098	01/07/22	50.00
003271	HOME DEPOT CREDIT SERVIC	123099	01/07/22	310.46
003983	INTERNATIONAL BUSINESS I	123100	01/07/22	1,545.00
001903	JONES/KIMARIE	123101	01/07/22	171.55
003993	JORDAN/ZACHARY	123102	01/07/22	50.00
001660	KING/KATI	123103	01/07/22	50.00
000066	KING'S PAINT & PAPER	123104	01/07/22	609.95
003331	KOFFLER ELECTRICAL MECHA	123105	01/07/22	21,102.56
004018	LAMBERT/LAUREN	123106	01/07/22	50.00
004046	LAMM/CHRIS	123107	01/07/22	50.00
003959	LARIOS/EDGAR	123108	01/07/22	68.00
003761	LEDGER/CHASE	123109	01/07/22	50.00
000078	LLOYD'S TIRE SERVICE INC	123110	01/07/22	66.75
003389	LOCKE/CERINA	123111	01/07/22	50.00
000284	LOGAN & POWELL, LLP	123112	01/07/22	21,075.00
003913	LONG/AMANDA	123113	01/07/22	50.00
001591	MARKELL/ROD	123114	01/07/22	1,974.00
001815	MC GRATH/TRISH	123115	01/07/22	50.00
001787	MICHAEL WADE PETRINI	123116	01/07/22	125.00
004044	NATIONAL TRUCK SALES & S	123117	01/07/22	9,382.88
001615	OLIN CORP-CHLOR ALKALI	123118	01/07/22	2,300.92

BANK	VENDOR	CHECK#	DATE	AMOUNT	
BA GENERAL CHECKING ACCOUNT					
002082	ONE WORK PLACE	123119	01/07/22	15,316.47	
003766	ORMONDE/ROBERT	123120	01/07/22	50.00	
004042	PACE ANALYTICAL SERVICES	123121	01/07/22	612.00	
000101	PACIFIC GAS & ELECTRIC C	123122	01/07/22	47,804.59	
001097	PRODESSE PROPERTY GROUP	123123	01/07/22	3,523.52	
003786	RENN/TIMOTHY	123124	01/07/22	68.00	
001118	RUTHERFORD/JAYSON	123125	01/07/22	50.00	
000134	S.V. WATER DISTRICT	123126	01/07/22	13,829.75	
000135	SAN LORENZO VALLEY WATER	123127	01/07/22	45.01	
004056	SANTA CRUZ ENDODONTICS	123128	01/07/22	189.00	
003658	SANTA CRUZ OCCUPATIONAL	123129	01/07/22	1,524.00	
000128	SCARBOROUGH LUMBER	123130	01/07/22	990.98	
003745	SCOTTS VALLEY HOTEL LP	123131	01/07/22	39,808.26	
002065	SOTO/ART	123132	01/07/22	50.00	
004026	STEELE-FREITAS/SETH	123133	01/07/22	50.00	
002053	STEPFORD	123134	01/07/22	311.49	
004020	STOEBERL/NICHOLAS	123135	01/07/22	53.75	
001589	TELECOMMUNICATIONS	123136	01/07/22	6,666.24	
003973	THOMAS/TYLER	123137	01/07/22	50.00	
000153	THOMSON REUTERS-WEST	123138	01/07/22	454.37	
003548	TORO PETROLEUM CORP	123139	01/07/22	4,094.61	
003908	TRANSUNION RISK & ALTERN	123140	01/07/22	78.00	
000098	TROWBRIDGE ENTERPRISES	123141	01/07/22	1,136.72	
004030	U.S. BANK CORPORATE	123142	01/07/22	5,828.28	
003924	VIRTUAL PROJECT MANAGER	123143	01/07/22	1,000.00	
000154	WINCHESTER AUTO STORES	123144	01/07/22	92.14	
GENERAL CHECKING ACCOUNT				263,036.37	***

BANK	VENDOR	CHECK#	DATE	AMOUNT
REPORT TOTALS:				263,036.37

RECORDS PRINTED - 000142

GL540R

FUND RECAP:

FUND	DESCRIPTION	DISBURSEMENTS
001	GENERAL	116,881.99
004	RECREATION	566.48
010	WASTEWATER OPERATIONS	52,717.37
011	TERTIARY TREATMENT PLANT	3,629.77
012	WASTEWATER CAPITAL RESERVE	24,859.16
015	TTP - DISTRICT RESERVE FUND	21,102.56
019	AFFORDABLE HOUSING	1,974.00
023	SVRDA SUCCESSOR AGENCY	7,143.90
028	SENIOR CENTER	1,256.51
050	PINEWOOD EST LNDSCP MAINT DT	393.57
077	SKYPARK MAINT ASSESS DIST	5,650.34
088	LIBRARY FACILITIES-MEAS "S"	23,878.97
112	DENTAL INS INTERNAL SERV	1,050.50
123	COMMUNITY FACILITY CENTER	1,354.76
312	POLICE - BUDGET ACT OF 2016	576.49
TOTAL ALL FUNDS		263,036.37

BANK RECAP:

BANK	NAME	DISBURSEMENTS
BA	GENERAL CHECKING ACCOUNT	263,036.37
TOTAL ALL BANKS		263,036.37

Report Selection:

RUN GROUP... 011322 COMMENT... 01/13/2022 A/P

DATA-JE-ID	DATA COMMENT
W-01132022-562	01/13/2022 A/P

Run Instructions:

Jobq	Banner	Copies	Form	Printer	Hold	Space	LPI	Lines	CPI	CP	SP	RT
L		01			Y	S	6	066	10			

BANK	VENDOR	CHECK#	DATE	AMOUNT	
BA GENERAL CHECKING ACCOUNT					
.15840	ADAMS POOL GROUP	123145	01/13/22	490.00	
000001	AMERICAN PLANNING ASSOCI	123146	01/13/22	398.00	
001670	AT &T	123147	01/13/22	3,641.76	
000097	AT&T	123148	01/13/22	9.48	
003893	BADAWI & ASSOCIATES	123149	01/13/22	8,880.75	
001593	BENEDICT DDS/NANETTE	123150	01/13/22	1,085.50	
003521	CARD SERVICE CENTER	123151	01/13/22	983.30	
003787	CARMEL AREA WASTEWATER D	123152	01/13/22	5,836.00	
002091	COMCAST	123153	01/13/22	323.25	
003134	CRIME SCENE CLEANERS, IN	123154	01/13/22	100.00	
000389	DASSEL'S PETROLEUM INC	123155	01/13/22	5,315.44	
003160	DIXON & SON TIRE	123156	01/13/22	653.73	
001362	DUNCAN AUTO TECH	123157	01/13/22	399.71	
001881	GRAINGER	123158	01/13/22	85.44	
004059	HAROS/JOANNA	123159	01/13/22	72.53	
003944	HEBARD/TYLER	123160	01/13/22	488.80	
001903	JONES/KIMARIE	123161	01/13/22	1,100.00	
003565	MANAGEMENT PARTNERS	123162	01/13/22	1,050.00	
000195	MESITI-MILLER ENGINEERIN	123163	01/13/22	762.00	
000218	MID VALLEY SUPPLY	123164	01/13/22	237.05	
000939	NATIONAL COMTEL NETWORK	123165	01/13/22	17.22	
004058	NETFILE, INC.	123166	01/13/22	1,400.00	
004042	PACE ANALYTICAL SERVICES	123167	01/13/22	22.00	
000820	SANTA CRUZ/COUNTY OF	123168	01/13/22	37.00	
003757	SWEDBERG ELECTRIC INC.	123169	01/13/22	9,640.37	
001085	SYCAL ENGINEERING INC	123170	01/13/22	15,535.14	
000153	THOMSON REUTERS-WEST	123171	01/13/22	355.92	
001366	U.S. BANCORP OFFICE	123172	01/13/22	1,300.62	
001625	YOSHIDA DDS/NOREEN	123173	01/13/22	276.00	
GENERAL CHECKING ACCOUNT				60,497.01	***

BANK	VENDOR	CHECK#	DATE	AMOUNT
REPORT TOTALS:				60,497.01

RECORDS PRINTED - 000058

GL540R

FUND RECAP:

FUND	DESCRIPTION	DISBURSEMENTS
001	GENERAL	23,276.78
004	RECREATION	526.89
010	WASTEWATER OPERATIONS	32,395.82
028	SENIOR CENTER	50.79
088	LIBRARY FACILITIES-MEAS "S"	216.00
112	DENTAL INS INTERNAL SERV	2,950.30
123	COMMUNITY FACILITY CENTER	44.43
150	GENERAL CAPITAL IMPROVEMENTS	490.00
155	TRANSPORTATION FUNDS-MEAS D	546.00
TOTAL ALL FUNDS		60,497.01

BANK RECAP:

BANK	NAME	DISBURSEMENTS
BA	GENERAL CHECKING ACCOUNT	60,497.01
TOTAL ALL BANKS		60,497.01

Report Selection:

RUN GROUP... 012122 COMMENT... 01/21/2022 A/P

DATA-JE-ID	DATA COMMENT
W-01212022-584	01/21/2022 A/P

Run Instructions:

Jobq	Banner	Copies	Form	Printer	Hold	Space	LPI	Lines	CPI	CP	SP	RT
L		01			Y	S	6	066	10			

BANK	VENDOR	CHECK#	DATE	AMOUNT
BA GENERAL CHECKING ACCOUNT				
003342	ACCENT CLEAN & SWEEP INC	123174	01/21/22	2,123.00
003919	ACCO ENGINEERED SYSTEMS	123175	01/21/22	990.00
003597	ADAMS ASHBY GROUP, INC	123176	01/21/22	2,000.00
003497	ALVAREZ INDUSTRIES, INC	123177	01/21/22	256.00
.15842	APPLIED INDUSTRIAL	123178	01/21/22	52.20
001009	ARD/KRISTIN	123179	01/21/22	1,100.00
001969	ASCAP	123180	01/21/22	390.00
001670	AT &T	123181	01/21/22	301.86
000097	AT&T	123182	01/21/22	33.78
001928	BATEMAN/TAYLOR	123183	01/21/22	159.20
003573	BEN'S MOTORCYCLE WORKS	123184	01/21/22	1,320.94
001593	BENEDICT DDS/NANETTE	123185	01/21/22	305.40
001566	BUSINESS WITH PLEASURE	123186	01/21/22	1,515.61
.15841	CALIFORNIA GOVERNOR'S OF	123187	01/21/22	2,000.00
003521	CARD SERVICE CENTER	123188	01/21/22	4,294.86
002091	COMCAST	123189	01/21/22	331.33
002091	COMCAST	123190	01/21/22	169.63
004007	COMMUNITY TREE SERVICE,	123191	01/21/22	8,300.00
000037	CRYSTAL SPRINGS WATER CO	123192	01/21/22	31.35
000037	CRYSTAL SPRINGS WATER CO	123193	01/21/22	33.50
003160	DIXON & SON TIRE	123194	01/21/22	259.50
001597	ENVIRONMENTAL INNOVATION	123195	01/21/22	3,410.00
000202	FEDERAL EXPRESS	123196	01/21/22	122.94
004027	GLADWELL GOVERNMENTAL SV	123197	01/21/22	1,300.00
001881	GRAINGER	123198	01/21/22	1,715.12
004025	GVP VENTURES, INC.	123199	01/21/22	1,287.16
003266	INTERGRITY AUTOMOTIVE	123200	01/21/22	2,593.84
000066	KING'S PAINT & PAPER	123201	01/21/22	279.02
001092	KNOX ROOFING	123202	01/21/22	462.00
001030	LEAGUE OF CA CITIES	123203	01/21/22	150.00
000284	LOGAN & POWELL, LLP	123204	01/21/22	25,525.00
003913	LONG/AMANDA	123205	01/21/22	218.40
003565	MANAGEMENT PARTNERS	123206	01/21/22	262.50
003171	MICHALAK/GENE	123207	01/21/22	125.00
000218	MID VALLEY SUPPLY	123208	01/21/22	601.58
000083	MISSION UNIFORM SERVICE	123209	01/21/22	575.20
001615	OLIN CORP-CHLOR ALKALI	123210	01/21/22	2,527.70
004042	PACE ANALYTICAL SERVICES	123211	01/21/22	442.00
000101	PACIFIC GAS & ELECTRIC C	123212	01/21/22	94.97
000101	PACIFIC GAS & ELECTRIC C	123213	01/21/22	357.01
004036	PEREZ/ERIC	123214	01/21/22	1,100.00
003503	PURETEC INDUSTRIAL WATER	123215	01/21/22	145.59
000134	S.V. WATER DISTRICT	123216	01/21/22	1,950.00
001883	S.W.R.C.B.	123217	01/21/22	11,491.00
001885	SANTA CRUZ BIOTECHNOLOGY	123218	01/21/22	346.70
001823	SANTA CRUZ CO ENVIRONMEN	123219	01/21/22	900.00
001544	SANTA CRUZ COUNTY CONFER	123220	01/21/22	18,712.98
001544	SANTA CRUZ COUNTY CONFER	123221	01/21/22	16,236.20

BANK	VENDOR	CHECK#	DATE	AMOUNT	
BA GENERAL CHECKING ACCOUNT					
000127	SANTA CRUZ SENTINEL	123222	01/21/22	2,220.45	
000319	SCOTTS VALLEY CAR WASH	123223	01/21/22	14.99	
002053	STEPFORD	123224	01/21/22	15,900.95	
000882	SUPERIOR ALARM COMPANY	123225	01/21/22	79.50	
001085	SYCAL ENGINEERING INC	123226	01/21/22	1,840.00	
002064	TRUCK SERVICES	123227	01/21/22	320.00	
001831	USA BLUE BOOK	123228	01/21/22	23.22	
001106	VERIZON WIRELESS	123229	01/21/22	1,035.82	
003971	WIZIX TECHNOLOGY GROUP,	123230	01/21/22	34.50	
003635	3SI SECURITY SYSTEMS, IN	123231	01/21/22	1,210.24	
GENERAL CHECKING ACCOUNT				141,579.74	***

BANK	VENDOR	CHECK#	DATE	AMOUNT
REPORT TOTALS:				141,579.74

RECORDS PRINTED - 000096

GL540R

FUND RECAP:

FUND	DESCRIPTION	DISBURSEMENTS
001	GENERAL	112,336.29
002	RECYCLING/ENVIRONMENTAL	4,873.00
004	RECREATION	110.85
010	WASTEWATER OPERATIONS	18,641.17
011	TERTIARY TREATMENT PLANT	1,818.79
028	SENIOR CENTER	169.63
112	DENTAL INS INTERNAL SERV	2,883.00
123	COMMUNITY FACILITY CENTER	747.01
TOTAL ALL FUNDS		141,579.74

BANK RECAP:

BANK	NAME	DISBURSEMENTS
BA	GENERAL CHECKING ACCOUNT	141,579.74
TOTAL ALL BANKS		141,579.74

Report Selection:

RUN GROUP... 012822 COMMENT... 01/28/2022 A/P

DATA-JE-ID	DATA COMMENT
W-01282022-592	01/28/2022 A/P

Run Instructions:

Jobq	Banner	Copies	Form	Printer	Hold	Space	LPI	Lines	CPI	CP	SP	RT
L		01			Y	S	6	066	10			

BANK	VENDOR	CHECK#	DATE	AMOUNT
BA GENERAL CHECKING ACCOUNT				
001840	A TOOL SHED, INC.	123232	01/28/22	338.92
000041	ACC BUSINESS	123233	01/28/22	1,812.96
001219	ALHAMBRA	123234	01/28/22	108.86
001219	ALHAMBRA	123235	01/28/22	45.83
000652	ANDERSON PACIFIC ENG INC	123236	01/28/22	25,562.12
001670	AT &T	123237	01/28/22	178.12
000097	AT&T	123238	01/28/22	127.39
003746	AVENU HOLDINGS, LLC	123239	01/28/22	2,029.09
000614	BATTERIES + BULBS #314	123240	01/28/22	454.40
001593	BENEDICT DDS/NANETTE	123241	01/28/22	366.40
003899	BIGLER CONSTRUCTION	123242	01/28/22	25,000.00
000021	BOWMAN & WILLIAMS	123243	01/28/22	315.00
004060	BURGEON GROUP LLC	123244	01/28/22	10,173.83
001633	CAL-WEST LIGHTING & SIGN	123245	01/28/22	4,654.58
004063	CAPITOL BARRICADE, INC.	123246	01/28/22	1,775.59
000773	CENTRAL COAST LANDSCAPE	123247	01/28/22	383.00
001051	COASTAL EVERGREEN CORP	123248	01/28/22	1,285.00
001362	DUNCAN AUTO TECH	123249	01/28/22	455.82
.15844	ED POSTON	123250	01/28/22	920.00
004005	ESTORGA/CASEY	123251	01/28/22	266.40
004037	FERGUSON ENTERPRISES, LL	123252	01/28/22	17.27
001881	GRAINGER	123253	01/28/22	716.45
001898	GUARD PRODUCTS INC	123254	01/28/22	1,548.63
000238	KENNEDY-JENKS CONSULTANT	123255	01/28/22	12,300.00
001372	KURATOMI DDS/REED K	123256	01/28/22	125.00
003726	LE DDS/VU	123257	01/28/22	125.00
003761	LEDGER/CHASE	123258	01/28/22	377.76
001926	MICROTECH SCIENTIFIC	123259	01/28/22	213.63
003685	MONTEREY BAY ANALYTICAL	123260	01/28/22	81.00
003487	MONTEREY BAY ECONOMIC	123261	01/28/22	5,000.00
001418	MONTEREY REGIONAL	123262	01/28/22	5,026.82
004042	PACE ANALYTICAL SERVICES	123263	01/28/22	144.00
.15845	PANTHER PROTECTIVE SERVI	123264	01/28/22	300.00
.15843	PHIL ADAMS	123265	01/28/22	1,360.00
001857	PHOENIX GROUP	123266	01/28/22	286.33
004065	REBUILD-IT SERVICES GROU	123267	01/28/22	2,787.06
001479	ROBB DDS/JOSEPH W	123268	01/28/22	369.60
004064	S.C. UNDERGROUND & PAVIN	123269	01/28/22	9,944.33
001894	S.V. WATER DISTRICT - BU	123270	01/28/22	59.33
001364	SANTA CRUZ COUNTY	123271	01/28/22	20,332.40
000128	SCARBOROUGH LUMBER	123272	01/28/22	1,546.37
002053	STEPFORD	123273	01/28/22	627.32
003757	SWEDBERG ELECTRIC INC.	123274	01/28/22	20,074.13
001085	SYCAL ENGINEERING INC	123275	01/28/22	525.00
004062	THE CHRISTMAS LIGHT PROS	123276	01/28/22	5,500.00
001560	TRITON CONSTRUCTION	123277	01/28/22	300.00
001106	VERIZON WIRELESS	123278	01/28/22	178.49
003145	WAGE WORKS	123279	01/28/22	55.00

BANK	VENDOR	CHECK#	DATE	AMOUNT	
BA GENERAL CHECKING ACCOUNT					
003971	WIZIX TECHNOLOGY GROUP,	123280	01/28/22	249.20	
GENERAL CHECKING ACCOUNT				166,423.43	***

BANK	VENDOR	CHECK#	DATE	AMOUNT
REPORT TOTALS:				166,423.43

RECORDS PRINTED - 000077

GL540R

FUND RECAP:

FUND	DESCRIPTION	DISBURSEMENTS
001	GENERAL	50,457.62
004	RECREATION	7,819.85
010	WASTEWATER OPERATIONS	20,620.36
012	WASTEWATER CAPITAL RESERVE	49,723.61
050	PINEWOOD EST LNDSCP MAINT DT	383.00
088	LIBRARY FACILITIES-MEAS "S"	10,173.83
112	DENTAL INS INTERNAL SERV	1,630.16
123	COMMUNITY FACILITY CENTER	300.00
150	GENERAL CAPITAL IMPROVEMENTS	25,315.00
TOTAL ALL FUNDS		166,423.43

BANK RECAP:

BANK	NAME	DISBURSEMENTS
BA	GENERAL CHECKING ACCOUNT	166,423.43
TOTAL ALL BANKS		166,423.43

City of Scotts Valley
CITY COUNCIL STAFF REPORT

DATE: February 2, 2022

TO: Honorable Mayor and City Council

FROM: Kirsten M. Powell, City Attorney

SUBJECT: **CONTINUED VIRTUAL MEETINGS FOR CITY COUNCIL AND APPOINTED BOARDS**

SUMMARY OF ISSUE

On October 26, 2021, the City Council passed Resolution No. 2007 authorizing continued virtual meetings and extended those meetings on November 17, 2021, December 15, 2021 and January 12, 2022 by Resolution Nos. 2007.1, 2007.2 and 2007.3. Pursuant to AB 361, legislative bodies may use teleconferencing to conduct public meetings during a proclaimed State of Emergency, as defined under the California Emergency Services Act, if one of the following circumstances apply: (A) State or local officials have imposed or recommended measures to promote social distancing; (B) The legislative body is meeting to determine whether, as a result of the emergency, meeting in person would present imminent risks to the health or safety of attendees; or (C) The legislative body has determined that, as a result of the emergency, meeting in person would present imminent risks to the health or safety of attendees.

At this point, the State of Emergency the Governor proclaimed on March 4, 2020 is still in effect today and the recommended measures to promote social distancing are still in place. In addition, on November 19, 2021, the County Health Officer issued an order requiring masks in indoor settings. The Omicron variant has been spreading significantly in Santa Cruz County and has been found to be highly contagious. Although the infection rates are beginning to decrease, the threat continues. As a result, holding public meetings of the City Council or other appointed bodies in person continues to present imminent risks to the health and safety of attendees.

FISCAL IMPACT

There is no fiscal impact associated with continuing virtual meetings.

STAFF RECOMMENDATION

Adopt Resolution No. 2007.4 confirming the need for virtual meetings pursuant to AB 361.

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RESOLUTION NO. 2007.4

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF SCOTTS VALLEY AUTHORIZING THE CONTINUED USE OF TELECONFERENCED MEETINGS PURSUANT TO ASSEMBLY BILL 361

WHEREAS, on March 4, 2020, Governor Newsom issued a Proclamation of State of Emergency, pursuant to the Emergency Services Act, in response to the COVID-19 pandemic; and

WHEREAS, on March 17, 2020, Governor Newsom issued Executive Order N-29-20, which suspended certain requirements of Government Code section 54950 *et seq.*, the Ralph M. Brown Act ("Brown Act"), in order to allow local legislative bodies to conduct meetings telephonically or electronically without a physical meeting place; and

WHEREAS, on June 11, 2021, Governor Newsom issued Executive Order N-08-21, providing that the provision suspending the Brown Act requirements in Executive Order N-29-20 would remain in effect through September 30, 2021, at which point the suspension would expire; and

WHEREAS, on September 16, 2021, Governor Newsom signed Assembly Bill 361 ("AB 361"), an urgency measure effective upon adoption, amending the Brown Act to allow legislative bodies to continue teleconferencing during a proclaimed State of Emergency, and either state or local officials have imposed or recommended measures to promote social distancing, or the legislative body determines that meeting in person would present imminent risks to the health or safety of attendees;

WHEREAS, the State of Emergency proclaimed by the Governor on March 4, 2020, remains in effect; and

WHEREAS, state and local officials have imposed and/or recommended measures to promote social distancing, as demonstrated by both the California Department of Public Health's and the Santa Cruz County Health Officer's recommendations that all individuals wear masks indoors; and

WHEREAS, since early August, the highly contagious Delta variant has caused increased community transmission and rates of hospitalizations within the County; and

WHEREAS, the Omicron variant is now spreading throughout the country and has been identified in Santa Cruz County; and

WHEREAS, according to the CDC, community transmission of COVID-19 in Santa Cruz County is now significant due to the unpredictable nature of the virus and potential proliferation of COVID-19 variants; and

WHEREAS, on October 26, 2021, the City Council of the City of Scotts Valley passed Resolution No. 2007 to continue the use of virtual meetings and confirmed the need for virtual meetings on November 17, 2021, with passage of Resolution No. 2007.1, on December 15, 2021, with the passage of Resolution No. 2007.2 and on January 12, 2022, with the passage of Resolution No. 2007.3; and

WHEREAS, the City Council of the City of Scotts Valley hereby finds and determines that the above conditions continue to create an imminent risk to the health and safety of attendees should they be required to attend meetings in person in a shared indoor public meeting space; and

WHEREAS, the City Council wishes to authorize remote meetings as set forth in this Resolution.

NOW THEREFORE, be it resolved by the City Council of the City of Scotts Valley as follows:

A. The City hereby acknowledges the Governor of the State of California's Proclamation of State of Emergency related to the COVID-19 pandemic remains in effect; and

B. The City finds that due to the continued threat of COVID-19 transmission in the community, holding in person meetings for the City Council and other appointed bodies of the City of Scotts Valley would present imminent risks to the health or safety of attendees.

C. The City Council and other appointed bodies of the City of Scotts Valley are hereby authorized and directed to take all actions necessary to carry out the intent and purpose of this Resolution including conducting open and public meetings in accordance with Government Code section 54953(e) and other applicable provisions of the Brown Act.

D. This Resolution shall take effect immediately upon its adoption and shall be effective until the earlier of (i) thirty days from the adoption of this Resolution, or (ii) such time the City Council adopts a subsequent resolution in accordance with Government Code section 54953(e)(3) to extend the time during which the City Council and the appointed bodies of the City of Scotts Valley may continue to teleconference without compliance with paragraph (3) of subdivision (b) of section 54953.

* *

The above and foregoing Resolution was duly and regularly adopted by the City Council of the City of Scotts Valley at a regular meeting held on the 2nd day of February, 2022 by the following vote:

AYES:

NOES

ABSENT:

ABSTAIN:

Approved: _____
Donna Lind, Mayor

Attest: _____
Lauren Lambert, Deputy City Clerk

City of Scotts Valley
CITY COUNCIL STAFF REPORT

DATE: February 2, 2022

TO: Honorable Mayor and City Council

FROM: Chris Lamm, Public Works Director

APPROVED: Mali LaGoe, City Manager

SUBJECT: **NOTICES OF COMPLETION**

SUMMARY OF ISSUE

Construction contracts over the City Manager's purchase signing authority are awarded by the City Council. Once a project is awarded, the contractor is authorized to begin the construction work per the project's plans and specifications. Following the completion of the work, a final inspection is conducted by Public Works staff to ensure the work meets the project's specifications. During this time, the contractor is required to address the following:

- Complete all construction and punch list items
- Complete all change orders
- Resolve any pending claims
- Deliver all operation and maintenance manuals
- Provide all required bonds, guarantees and warranties

Once the contractor has met all of the contractual requirements and the work improvements have been completed within the contract amount, a recommendation is made requesting that the City Council authorize the Public Works Director to accept the work. The request for acceptance requires the preparation of a staff report that is reviewed and published 72 hours before a City Council meeting.

After acceptance, a Notice of Completion is recorded at the Santa Cruz County's Clerk's Office. The recording of completion establishes the beginning of the warranty period (typically one year) and establishes the beginning of a 35-day period for the release of retention held on construction projects. The warranty requires that the contractor guarantee the work performed under the contract and address any defects in workmanship and materials

The proposed action would eliminate the need for staff to request a second City Council action for a construction project by providing the Public Works Director with the ability to accept a project once all of the contract requirements are met. The change would reduce the amount of staff time spent on the writing, reviewing and routing of staff reports and expedites the ability to make final payments to contractors. The procedural change is also consistent with practices followed by other cities and with the Public Contract Code (Public Contract Code Division 2. General Provisions (1100- 22355), Part 1 Administrative Provisions (1100-9203), Chapter 7. Contract Clauses (7100-7203), Section 7107 which notes that the acceptance of the work can be done by the agent of the public agency).. Staff would report out on which projects have been accepted through the annual budget process.

Upon delegation of authority, notices of completion would be filed on the following projects, which have been deemed complete by the Public Works Department:

- Bluebonnet Improvements
- East Glenwood Trail Project
- Glenwood Parking Project
- Glenwood Drive – Street Widening and Improvements
- Skypark Restroom Renovations
- Skypark Field Renovations

FISCAL IMPACT

There is no fiscal impact associated with the adopting of the Resolution authorizing the Public Works Director to accept completed Public Works projects.

STAFF RECOMMENDATION

It is recommended that the City Council adopt Resolution No. 2009, authorizing the Public Works Director to accept completed Public Works projects and file notices of completion.

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RESOLUTION NO. 2009

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF SCOTTS VALLEY AUTHORIZING THE PUBLIC WORKS DIRECTOR TO ACCEPT COMPLETED PUBLIC WORKS PROJECTS

WHEREAS, pursuing practices that improve efficiency saves the City of Scotts Valley valuable resources; and

WHEREAS, currently the City Council of the City of Scotts Valley authorizes the Public Works Director to accept the work performed by a contractor on a project-by-project basis; and

WHEREAS, Public Contract Code Section 7107 allows the public agency or its agent to accept the work of improvement; and

WHEREAS, authorizing the City's Public Works Director to accept construction projects awarded by the City Council once the contractual requirements are met and without the need for further City Council action would improve efficiency, save staff time and have a positive impact on the City's resources

NOW, THEREFORE, BE IT RESOLVED AND ORDERED that the City Council of the City of Scotts Valley hereby finds that public interest and convenience require the City Council to delegate authority to the Public Works Director or his/her designee, as its agent, to accept construction projects awarded by the City Council once the contractual requirements are met and without the need for further action by the City Council.

The above and foregoing resolution was duly and regularly adopted by the City Council of the City of Scotts Valley at a regular meeting held on the 2nd day of February, 2022 by the following vote:

AYES:
NOES:
ABSENT:
ABSTAIN:

Approved: _____
Donna Lind, Mayor

Attest: _____
Lauren Lambert, Deputy City Clerk

City of Scotts Valley
CITY COUNCIL STAFF REPORT

DATE: February 2, 2022

TO: Honorable Mayor and City Council

FROM: Chris Lamm, Public Works Director

APPROVED: Mali LaGoe, City Manager

SUBJECT: **SEWER SYSTEM MANAGEMENT PLAN**

SUMMARY OF ISSUE

In 2006 and 2008, the State Water Resources Control Board (SWRCB) adopted Order No. 2006-0003-DWQ and Order No. 2008-0002-EXEC which requires all public agencies in California to be regulated under the general State Water Resources Control Board General Waste Discharge Requirements (GWDR) and mandated development of a Sewer System Management Plan (SSMP). The SWRCB requires regular SSMP updates and audits as part of the WDR. The City of Scotts Valley last prepared a SSMP in 2009.

In 2013, the SWRCB adopted Order No. 2013-0058-EXEC, amending the Monitoring and Reporting Program (MRP) of the GWDR.

On September 5, 2018 the City Council approved an agreement with Carollo Engineers for a Sewer Master Plan and Sanitary Sewer Management Plan. Originally planned for completion in fall of 2019, staff turnover caused delay in the completion of the report until December 2021

The SSMP describes the procedures the City of Scotts Valley will use to manage its sewage collection system effectively. The plan addresses the requirements for the following elements to effectively manage a wastewater collection system:

1. Introduction
2. Goals
3. Organization
4. Legal Authority
5. Operation and Maintenance Program
6. Design and Performance Provisions

7. Overflow Emergency Response Plan
8. Fats, Oils and Grease (FOG) Control Program
9. System Evaluation and Capacity Assurance Plan
10. Monitoring, Measurement, and Program Modifications
11. SSMP Program Audits
12. Communication Program

Upon adoption, the approving resolution will be incorporated into the SSMP. The SSMP will be uploaded to the City website and submitted to the SWRCB.

FISCAL IMPACT

There is no fiscal impact associated with the adopting of the Resolution approving the SSMP. Costs associated with the implementation of the plan are included in the annual operating and capital improvement program (CIP) budgets for the wastewater division and are funded through the Wastewater Enterprise Fund.

STAFF RECOMMENDATION

It is recommended that the City Council adopt the Resolution No. 2010, approving the City of Scotts Valley Sewer System Management Plan.

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RESOLUTION NO. 2010

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF SCOTTS VALLEY ADTOPTING THE CITY OF SCOTTS VALLEY SEWER SYSTEM MANAGEMENT PLAN

WHEREAS, the State Water Resources Control Board (SWRCB) adopted Order No. 2006-0003-DWQ, Statewide General Waste Discharge Requirements for Sanitary Sewer Systems (GWDR) dated May 2, 2006, and Order No. WQ-2008-0002-EXEC dated February 20, 2008, to regulate all sanitary sewer collection systems greater than one mile in length that discharge to a publicly owned sewage treatment facility, and

WHEREAS, the SWRCB issued Order No. 2013-0058-EXEC, effective September 9, 2013, amending the Monitoring and Reporting Program (MRP) elements of the GWDR, and

WHEREAS, the City of Scotts Valley, as the owner and operator of the City's sanitary sewer collection system, which serves a population of approximately 12,200 across 4.6 square miles and discharges to the City of Scotts Valley Waste Water Treatment Plant, is an enrollee under the GWDR

WHEREAS, the GWDR requires that an enrolled sanitary sewer collection system prepare and implement a Sewer System Management Plan (SSMP) documenting the enrollee's program to properly operate and maintain its sanitary sewer system, and that the governing body approve significant updates to the SSMP, and

WHEREAS, staff have updated the SSMP in conformance with the GWDR and MRP requirements.

NOW, THEREFORE, BE IT RESOLVED AND ORDERED that the City Council of the City of Scotts Valley hereby adopt the City of Scotts Valley 2021 Sewer System Management Plan.

The above and foregoing resolution was duly and regularly adopted by the City Council of the City of Scotts Valley at a special meeting held on the 2nd day of February, 2022 by the following vote:

AYES:
NOES:
ABSENT:
ABSTAIN:

Approved: _____
Donna Lind, Mayor

Attest: _____
Lauren Lambert, Deputy City Clerk



City of Scotts Valley
Sewer System Management Plan

SEWER SYSTEM MANAGEMENT PLAN

FINAL | December 2021

carollo

City of Scotts Valley

SEWER SYSTEM MANAGEMENT PLAN

FINAL | December 2021



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Abbreviations

ACI	American Concrete Institute
ADWF	average dry weather flow
AMBAG	Association of Monterey County Governments
ANSI	American National Standards Institute
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Material
AWWA	American Water Works Association
BMP	Best Management Practices
CAD	Computer-aided Design
Cal OES	California Office of Emergency Services
Cal/OSHA	California Division of Occupational Safety and Health
Carollo	Carollo Engineers, Inc.
CCR	California Code of Regulations
CCTV	closed-circuit television
CIP	Capital Improvement Program
City	City of Scotts Valley
City Engineer	Public Works Director/City Engineer
CIWQS	California Integrated Water Quality System
CMOM	Capacity, management, operation, and maintenance
Council	City Council
County Code	Santa Cruz County Code
CWA	Clean Water Act
CWC	California Water Code
CWEA	California Water Environment Association
DWFs	dry weather flows
FOG	fats, oil, and grease
fps	feet per second
FSE	Food Service Establishments
FWPCA	Federal Water Pollution Control Act
GBP	Monterey Bay Area Green Business Programs
GIS	Geographic Information System
HIS	Hydraulic Institute Standards
hp	horsepower
hydro jet	hydraulic jet
I/I	infiltration and inflow

Lab/Environmental Compliance Manager	Compliance Manager
Lotus Software	maintenance program
LRO	Legally Responsible Official
mgd	million gallons per day
MRP	Statewide General Waste Discharge RequirementsOrder No. WQ 2013-0058
Municipal Code	Scotts Valley Municipal Code
NASSCO	National Association of Sewer Service Companies
NEC	National Electric Code
NPDES	National Pollutant Discharge Elimination System
O&M	operation and maintenance
OERP	Overflow Emergency Response Plan
PACP	Pipeline Assessment Certification Program
PM	Preventive Maintenance
Public Works Director	City Engineer
PWWF	peak wet weather flow
R&R	rehabilitation and replacement (
rodding	root cutting
RWQCB	Regional Water Quality Control Board
SCADA	Supervisory Control and Data Acquisition
SECAP	System Evaluation and Capacity Assurance Plan
SOPs	standard operating procedures
SSMP	Sewer System Management Plan
SSO	Sanitary Sewer Overflow
Standards	Standard Details and Specifications
SVFPD	Scotts Valley Fire Protection District
SWRCB	California State Water Resources Control Board
USEPA	United States Environmental Protection
WDR	State Water Board Order No. 2006-0003-DWQ
WQC	Quality Monitoring Program
WRF	Scotts Valley Water Reclamation Facility
WWF	wet weather flow

Chapter 1

INTRODUCTION

This Sewer System Management Plan (SSMP) has been prepared in compliance with the requirements of the State Water Resources Control Board (SWRCB) Order 2006-0003 (WDR), Statewide General Waste Discharge Requirements for Sanitary Sewer Systems, as well as SWRCB Order No. WQ 2013-0058-EXEC (MRP), Amending Monitoring and Reporting Program for Statewide General Waster Discharge Requirements for Sanitary Sewer Systems. The goal of the WDRs is to provide a consistent statewide approach for reducing sanitary sewer overflows (SSOs). The 2021 SSMP builds upon the SSMP that was prepared by the City of Scotts Valley (City) on December 21, 2009.

1.1 Background

The City is primarily a residential community with a considerable amount of office, warehouse, and research and development in the commercial sector. The City is located in Santa Cruz County within the Central Coast, approximately 30 miles south of downtown San Jose and 6 miles north of the City of Santa Cruz.

1.2 Scope and Authorization

On September 5, 2018 the City approved a professional service agreement with Carollo Engineers, Inc. (Carollo) to prepare this SSMP, which included the following tasks:

- Project Management and Meetings.
- Data Collection and Background Review.
- Temporary Flow Monitoring Program.
- Land Use Analysis.
- Wastewater Flow Projections.
- Hydraulic Model Construction and Calibration.
- Capacity Analysis and Recommended Projects.
- Prioritized CCTV Inspection Plan and Phase 1 Inspection.
- Lift Station Condition Assessment.
- Develop 20-Year Capital Improvement Program (CIP).
- Develop Sewer System Management Plan.

1.3 Sanitary Sewer Service Area

Collectively, the City's wastewater collection and conveyance system includes approximately 47miles of gravity sewers, and seven lift stations. The City's collection system discharges to and is treated at the Scotts Valley Scotts Valley Water Reclamation Facility (WRF).

1.4 Purpose

This SSMP has been prepared by Carollo for the City in order to comply with the SWRCB orders to develop and implement a system-specific SSMP, and monitoring and reporting requirements. The purpose of a SSMP is to provide a plan and schedule to properly manage, operate, and maintain all parts of the sanitary sewer system. An SSMP is intended to facilitate proper funding and management of sanitary sewer systems. This will help reduce and prevent SSOs, as well as mitigate any SSOs that do occur.

1.5 Regulatory Background

This section briefly summarizes the history surrounding the development of the SSMP requirements.

1.5.1 National Regulatory Background

Nationally, SSOs have been in the regulatory spotlight since 1995, when the United States Environmental Protection Agency (USEPA) formed the Sanitary Sewer Overflow Federal Advisory Subcommittee (SSO Subcommittee). The purpose of the SSO Subcommittee is to examine the need for national consistency in permitting and enforcement of SSOs.

From 1995 to 1999, the SSO Subcommittee met 12 times to discuss policy issues associated with SSOs. In 1999, the SSO Subcommittee supported basic principles requiring the following:

- Capacity, management, operation, and maintenance (CMOM) programs for municipal sanitary sewer collection systems.
- A prohibition on SSOs, which includes a closely circumscribed framework for raising a defense for unavoidable discharges.
- Reporting, public notification, and record-keeping requirements for municipal sanitary sewer collection systems and SSOs.
- The recommendations of the SSO Subcommittee were then incorporated into the proposed "SSO Rule," which was published in the Federal Register in January 2001. For a variety of reasons, however, the proposed SSO Rule has yet to be formally adopted by the USEPA on a national level.

1.5.2 California General Waste Discharge Requirements

On May 2, 2006, the SWRCB adopted the WDR, which requires all federal and state agencies, municipalities, counties, districts, and other public entities that own or operate a sanitary sewer system greater than 1 mile in length to comply with the elements of the WDRs. A copy of the WDRs are included in Appendix A for reference. The WDRs serve to provide a unified statewide approach for reporting and tracking SSOs, establishing consistent and uniform requirements for SSMP development and implementation, establishing uniformity in reporting, and facilitating consistent enforcement for violations.

The WDRs include directives for owners and operators of sanitary sewer systems to demonstrate adequate and efficient management, operation, and maintenance of the sanitary sewer system. Generally, the WDRs require that:

1. In the event of an SSO, all feasible steps be taken to control the released volume and prevent untreated wastewater from entering storm drains, creeks, etc.
2. If an SSO occurs, it must be reported to the SWRCB using California Integrated Water Quality System (CIWQS), the online reporting system developed by the SWRCB[1]. The County completed its enrollment into the program and the demographic questionnaire, and electronic reporting commenced in October 2006.
3. An SSMP with all mandatory elements is to be developed and approved by the governing body that owns or is responsible for the operation of the sanitary sewer system. The SSMP must include provisions to provide proper and efficient management, operation, and maintenance of the sanitary sewer system.

Since 2006, the SWRCB adopted Order Number WQ 2013-0058-EXEC on August 6, 2013, amending the MRP included in the WRD, which implemented changes to SSO categories by adding a Category 3 SSO type. A copy of the MRP has been included in Appendix B for reference. The provisions of this amendment are incorporated in this report.

1.6 SSMP Elements and Organization

This SSMP contains 12 chapters. Appendices are provided to support the information provided in the text. A brief description of the chapters follows:

- Chapter 1 - Introduction. This chapter presents a summary of the City's sanitary sewer system service area, the need for the SSMP, and a description of the regulatory history of the SSMP. General information, such as a list of abbreviations and a list of references, is also provided to assist the reader.
- Chapter 2 - Goals. This chapter summarizes goals established for the City's SSMP.
- Chapter 3 - Organization. This chapter identifies the responsible City representative for the implementation of the provisions of this SSMP. It also includes an organizational chart and a chain of communication for reporting SSOs.
- Chapter 4 - Legal Authority. This chapter summarizes the City's authority, through ordinances, services agreements, or other legally binding procedures, to conform to the requirements of the WDRs.
- Chapter 5 - Operation and Maintenance Program. This chapter contains a description of the City's operations and maintenance plan, including mapping, routine and preventative maintenance, rehabilitation, and training.
- Chapter 6 - Design and Performance Provisions. This chapter presents a summary of the relevant design and construction standards, as well as standards for the inspection and testing of new sewers, pumps, and other appurtenances and for rehabilitation projects.
- Chapter 7 - Overflow Emergency Response Plan. This chapter describes the overflow emergency response plan, which provides measures to protect the public health and the environment in the event of an overflow.
- Chapter 8 - FOG Control Program. This chapter summarizes the City's fats, oil, and grease (FOG) control plan, which has been developed to limit the amount of FOG that enters the collection system to the extent feasible.

[1] California Integrated Water Quality System Project

- Chapter 9 - System Evaluation and Capacity Assurance Plan. This chapter provides an evaluation of the City's sanitary sewer system facilities, identifies and proposes improvements for deficiencies, identifies design criteria, and provides a list of capital improvement projects and schedule for improvements.
- Chapter 10 - Monitoring, Measurement, and Program Modifications. This chapter presents a summary of the steps to be taken by the City to evaluate the effectiveness of this SSMP and perform updates to the document should improvements be necessary or desirable.
- Chapter 11 - SSMP Program Audits. This chapter presents a summary of the procedures to be used by the City to perform internal audits.
- Chapter 12 - Communication Program. This chapter presents a summary of the steps to be taken by the City to communicate with the public on the development, implementation, and performance of the SSMP. This chapter also contains the final certification of this SSMP.

The report organization shown above was developed based on the mandatory elements of the SSMP, as documents in Section D.13 of the WDRs. The minimum requirements of each required SSMP element, which are copied from the WDRs are shown in blue-shaded boxes in the beginning of each chapter of this SSMP, as shown in the example below.

Regulatory Requirement (Example):

D.13. (xi) Communication Program. The Enrollee shall communicate on a regular basis with the public on the development, implementation, and performance of its SSMP. The communication system shall provide the public the opportunity to provide input to the Enrollee as the program is developed and implemented.

The Enrollee shall also create a plan of communication with systems that are tributary and/or satellite to the Enrollee's sanitary sewer system.

Additional supporting information for the SSMP elements is included in appendices to the SSMP, as applicable. Generally, information expected to require relatively frequent updates that can be modified without formal action is included in appendices.

Chapter 2

GOALS

The following sections include a summary of the City of Scott Valley's (City's) goals that reflect its commitment to continue its effort to provide effective and efficient management, operation, and maintenance of the sanitary sewer system.

2.1 Regulatory Requirements

The Statewide General Waster Discharge Requirements for Sanitary Sewer Systems Order No. 2006-0003-DWQ (WDR) specify the following with respect to the goals element of the Sanitary Sewer Management Plan (SSMP):

> **D.13.(i) Goals:** The goal of the SSMP is to provide a plan and schedule to properly manage, operate, and maintain all parts of the sanitary sewer system. This will help reduce and prevent SSOs, as well as mitigate any SSOs that do occur.

Establishing goals to properly manage, operate, and maintain all parts of its sanitary sewer system allows the City to achieve its objective of reducing and preventing sanitary sewer overflows (SSOs) and properly mitigating any SSOs that may occur. Typically, high-level statements regarding the overall management of a system include a vision and mission statement, as well as a statement of short- and long-term goals.

2.2 Goals

The City has established several goals for complying with the WDRs and developing strategies and procedures to achieve successful overall management and maintenance of the sanitary sewer system. The goals of this SSMP are to:

- To properly manage, operate and maintain all portions of the City's sanitary sewer collection system.
- To provide adequate capacity to convey the peak wastewater flows.
- To minimize the frequency of SSOs.
- To mitigate the adverse impacts that are associated with any SSO that may occur.
- To meet all applicable regulatory notification and reporting requirements.

Chapter 3

ORGANIZATION

This chapter identifies the City of Scotts Valley's (City's) the authorized representative for the implementation of this Sewer System Management Plan (SSMP). It also includes an organizational chart and a chain of communication for reporting sanitary sewer overflows (SSOs).

3.1 Regulatory Requirements

It is required that the City's SSMP clearly identify the staff responsible for implementing measures outlined in this SSMP. The Statewide General Waste Discharge Requirements for Sanitary Sewer Systems Order No. 2006-0003-DWQ (WDR) requires that the City identify the following:

D.13. (ii) Organization. The SSMP must identify:

a. The name of the responsible or authorized representative as described in Section J of this Order.

b. The names and telephone numbers for management, administrative, and maintenance positions responsible for implementing specific measures in the SSMP program. The SSMP must identify lines of authority through an organization chart or similar document with a narrative explanation; and

c. The chain of communication for reporting SSOs, from receipt of a complaint or other information, including the person responsible for reporting SSOs to the State and Regional Water Board and other agencies if applicable (such as County Health Officer, County Environmental Health Agency, Regional Water Board, and/or State OES).

The WDRs were amended in 2013 by Statewide General Waste Discharge Requirements Order No. WQ 2013-0058-EXEC (MRP). The changes that are relevant to the Organization element relate to the Legally Responsible Official (LRO), which is also referred to as the responsible or authorized representative, as described below:

- An Enrollee may/should have more than one LRO.
- Any LRO shall be registered with the SWRCB; link to CIWQS User Registration (LROs and Data Submitters) at https://ciwqs.waterboards.ca.gov/ciwqs/newUser.jsp.
- The Enrollee shall maintain continuous coverage by an LRO. Any change of a registered LRO, including deactivation or a change to the LRO's contact information, shall be submitted by the Enrollee to the SWRCB within 30 days of the change by calling 866-79-CIWQS (24977) or by email at ciwqshelp@waterboards.ca.gov.

3.2 Authorized Representatives

The Wastewater Division Manager is the authorized representative, also known as the LRO, and is responsible for execution of compliance actions required under the WDR and MRP. This includes, but is not limited to, signing and certification of all reports and correspondence as required under the order.

The LRO is authorized to submit electronic spill reports to the State Water Resources Control Board (SWRCB) California Integrated Water Quality System (CIWQS). The LRO is also authorized to report applicable SSOs to other applicable agencies:

- California Office of Emergency Services (Cal OES).
- State Water Resources Control Board (SWRCB).
- Regional Water Quality Control Board (RWQCB).
- County of Santa Cruz Environmental Health Services.

In the event that the LRO is unavailable, the City has established two alternates to handle the duties of the LROs. The alternative LROs are as follows:

1. Art Soto
2. Tyler Hebard

The alternative LROs can act as data entry designees on the CIWQS.

3.3 Organization Overview

The City's sanitary sewer collection system is primarily managed by the City's Wastewater Division, which falls under the Public Works Department. However, some of the SSMP responsibilities are carried out by other City departments and divisions. The organization chart, shown on Figure 3.1, shows the organizational structure and relations of the City's legislative, administrative, management, and field positions.

Additionally, the general responsibilities of the personnel, as they relate to the development and implementation of the SSMP, are described in this section. In order to make the update of this document more user-friendly, the lines of authority on Figure 3.1 reference job titles only. Appendix C provides the names and contact information for the individuals referenced in the organizational chart at the time of certification.

The following sections summarize the rules and responsibilities of each of the positions identified on Figure 3.1 as applicable to the SSMP.

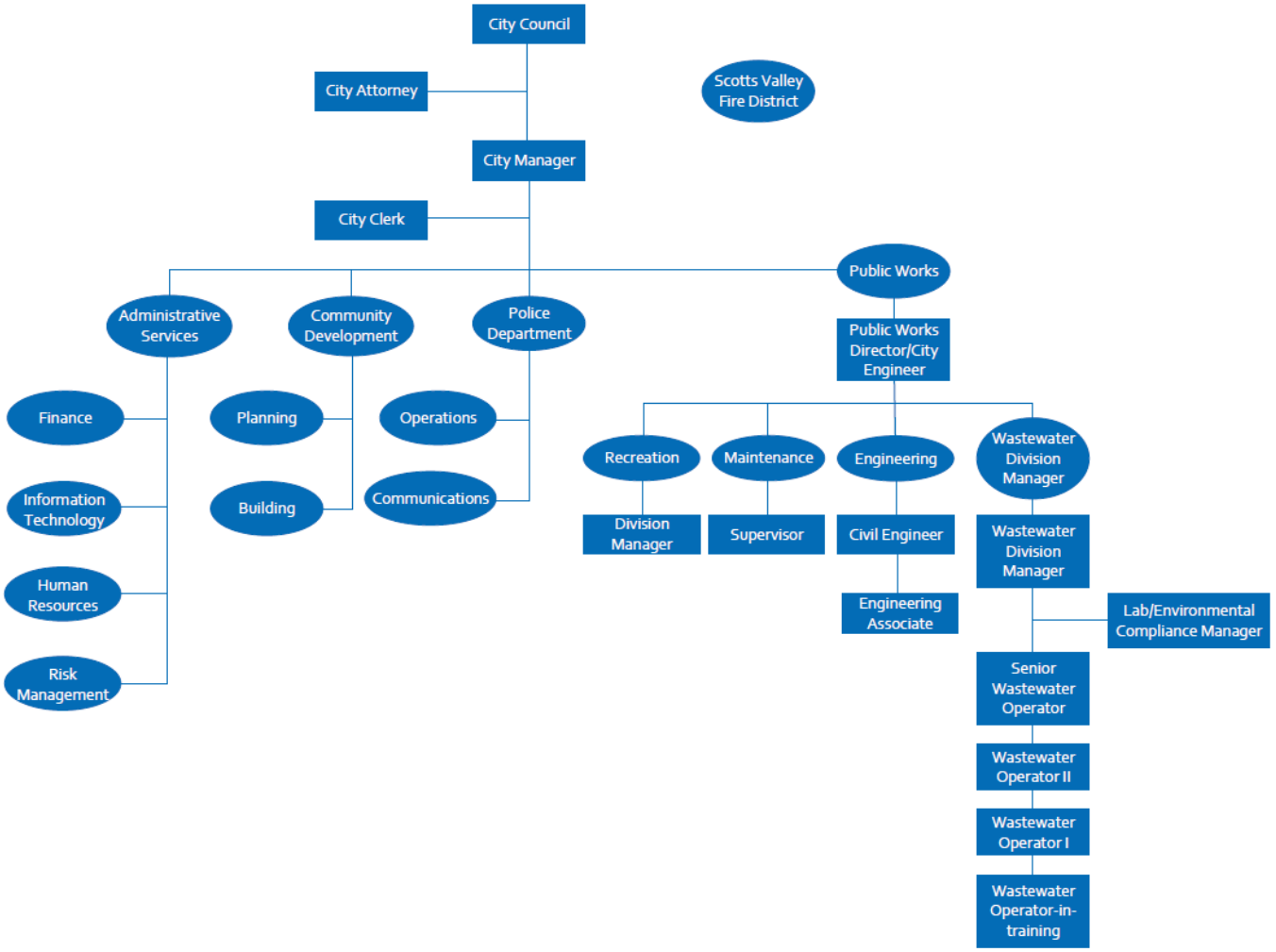


Figure 3.1 Organizational Chart

3.4 Governance

This section summarizes the City's elected governing body and appointed positions. These governing bodies are responsible for adopting legislation, setting policy, adjudicating issues, and establishing the budget of the City. The following sections describe these positions/roles in more detail.

3.4.1 City Council

The City's elected governing body is composed of a City Council (Council) comprised of five council members, all of whom are directly elected by the people. The Mayor and Vice-Mayor are appointed annually by the Council, and the Council Members serve four-year staggered terms. The purpose of the Council is to establish local laws, to set policy, to reject or to approve programs, to allocate funds and provide direction, through the City Manager, to City staff to implement its policy. The Council can also appoint members to various local and regional committees, commissions, and other boards.

Since the City is a General Law City, its Council must act within the framework of limitations and procedures established by State Law. Local laws are established by ordinance and are compiled in a book called the Municipal Code. These laws are enforceable by the City, and violations thereof constitute an infraction. Other directives and policies of the City Council are recorded in Council resolutions and Council minutes.

3.4.2 City Manager

In accordance with ordinances, the City Council appoints a City Manager to serve as the City's chief administrative officer. The City Manager falls under the City Administration Department which is responsible for the overall administration of the City.

The City Manager is responsible for implementing policies passed by City Council. The City Manager provides administrative direction and leadership to all City departments. The City Manager's Office is responsible for a wide variety of activities including general administration, personnel and labor relations, and the redevelopment program.

3.4.3 City Clerk

In accordance with ordinances, the City Manager appoints a City Clerk that serves as liaison between the Council and the community. The City Clerk falls under the City Administration Department which sources as a custodian of official records. The City Clerk is responsible for maintain the City's Municipal Code.

3.4.4 City Attorney

The City Attorney is responsible for the administration of all legal affairs of the City. In addition, the City Attorney serves as Agency Counsel of the Redevelopment Agency. The City Attorney advises the City Council and staff on all matters of general and municipal law.

3.5 Public Works Department

The Public Works Department oversees planning, design, construction, maintenance, repairs, and operations services for City's infrastructure. The department is comprised of four divisions that represent different disciplines. Three of the four divisions' complete functions related to the SSMP.

- Wastewater Division. This division operates and maintains sanitary sewer pipelines, seven lift stations, a laboratory, the 1.5 million gallon per day Scotts Valley Water Reclamation Facility (WRF) and monitors the Source Control Program.
- Engineering Division. This division oversees and supports the planning, design, construction and inspection of improvements for all public works infrastructure projects including streets, storm facilities, curbs, gutters, sidewalks, landscaping, lighting and traffic control systems constructed within the City as part of the capital improvement program (CIP) or new development.
- Maintenance Division. This division is responsible for public streets, parking lots, storm drain systems, sidewalks, signage, striping, and street sweeping services. Maintaining and renovating public buildings, and performs all par maintenance and operations activities.

The following sections describe the roles and responsibilities of Public Works Department staff as they relate to the SSMP.

3.5.1 Public Works Director/City Engineer

The Public Works Director/City Engineer (Public Works Director) manages the Public Works Department and the respective division, assists with reviewing and analyzing operations to achieve effective and efficient operations, and performs long term planning for all activities of the Public Works Department. The Public Works Director reports to the City Manager.

3.5.2 Wastewater Division Manager

The Wastewater Division Manager plans, assigns and supervises the work of personnel engaged in WRF and related facilities to maintain compliance with a regulations and standards. The Wastewater Division Manager reports to the Public Works Director. The Wastewater Division Manager's essential duties include the following:

- Review work of subordinates to insure conformance with standards.
- Assists in selection and training of wastewater operations employees.
- Prepares administrative and technical reports, including monthly and annual reports to the RWQCB.
- Analyzes operations and suggests and/or implements improvements.
- Makes recommendations on the types and kinds of equipment needed for wastewater maintenance and repair.
- Recommends policy or procedural changes and provides input to long-range goals and plans for the division to the Public Works Director.
- Approves plant alterations and changes in operating procedures.
- Directs and assists or coordinates consulting engineering on wastewater projects.
- Prepares and monitors the division budget, maintaining control of expenses in accordance with appropriations.
- Interacts with vendors to obtain cost-effective supplies, materials and equipment.
- Calculates sewer permit and user fees in accordance with the budget.
- Monitors existing businesses and industries for source control and compliance with pre-treatment discharge regulations.

- Reviews industrial hook-up permits that are to be granted and approves or suggests changes to assure that the discharge would be in compliance with pretreatment regulations.
- Remains up-to-date on laws and regulations affecting the wastewater operations by reviewing appropriate laws, codes, regulations and current literature.
- Establishes and maintains a computer data base on all divisional records.

3.5.3 Senior Wastewater Operator

The Senior Wastewater Operator provides day-to-day supervision as working leader at the WRF, and monitor and adjust equipment, perform laboratory tests, maintain WRF and lift station facilities. The Senior Wastewater Operator reports to the Wastewater Division Manager. The Senior Wastewater Operator's essential duties that relate to the implementation of the SSMP include the following:

- Establishes and leads a preventative maintenance program for the WRF, lift stations and collection system.
- Inspects and makes mechanical repairs to plant and pumping station equipment.
- Keeps records of plant operations and laboratory tests.

3.5.4 Wastewater Operators

The Wastewater Operators are responsible for performing assigned operation and maintenance (O&M) tasks related to the Scotts Valley WRF and collection system. Under supervision, these tasks consists of monitor and adjust equipment, perform laboratory tests, maintain pumping station facilities and grounds, and to do related work as required. The Wastewater Operators report to the Senior Wastewater Operator. The Wastewater Operators consists of three levels depending on certification:

- Wastewater Plant Operator-in-Training.
- Wastewater Plant Operator I.
- Wastewater Plant Operator II.

3.5.5 Lab/Environmental Compliance Manager

The Lab/Environmental Compliance Manager (Compliance Manger) plans and coordinated activities related to the WRF laboratory, and Environmental Compliance Programs that includes pretreatment and storm water programs to ensure compliance with City, State, and Federal Regulations.

The Compliance Manger oversees and directs all lab activities, including day-to-day operations including short and long-range planning. Responsibilities include coordinating the activities of the lab with those of other jurisdictions and departments while managing and accomplishing the complex and varied functions of the laboratory. The incumbent is accountable for accomplishing mandatory state testing protocols and reporting while furthering City goals and objectives within general policy guidelines.

3.5.6 Civil Engineer

The Civil Engineer performs professional civil and traffic engineering work in the field and office under the direction of the City Engineer. The Civil Engineer coordinates the Public Works Department portion of the CIP. In addition, the Civil Engineers monitors various sources of the Public Works Department funding. Coordinates the preparation of documents related to contract administration, monitors public works construction projects to assure quality of construction and conformance with contract requirements. The Civil Engineer is in charge of coordinating all maps updates.

3.5.7 Engineering Associate

An Engineering Associate performs office and field engineering tasks related to design, construction plan reviews, and inspect City construction projects. An Engineering Associate works under the direction of the Civil Engineer.

3.5.8 Source Control Inspector

The City's current source control inspector regularly inspects restaurants, automobile and industrial businesses within the City. Those inspections currently include storm water education and inspection of any best management practices (BMPs) that are currently in place. All problems are noted and discussed by the inspector with the business for correction. Recent enforcement includes prohibiting an RV sales business from discharging wash water from RV washing into the storm drain and prohibition of a crane business discharging wash water from their vehicle washing in to the storm drain

3.6 Other Key Personnel

Other divisions or departments within the City are currently and will continue to be responsible for carrying out some of the compliance actions called for by the WDRs for the City. The key support units and their responsibilities are described in this section.

3.6.1 Administrative Services Department

The Administrative Services Department consist of four divisions that provide their respective functions under the direction of an Administrative Services Director. The following summarizes two of the divisions that support administering the SSMP:

3.6.1.1 *Flow Depth Criteria for New*

- Finance Division. The Finance Division is part of the Administrative Services Department. The Finance Division is responsible processing sewer service fees, and for preparing all financial reports for operating departments. The division helps prepare the annual budget by making recommendations to the City Council under the direction of the City Manager.
- Information Technology Division. The Information Technology Division is part of the Administrative Services Department. The division provides strategic direction and implementation of the City's use of information technology tools. As well as, manages the contracts related to technology support vendor for help desk support and network, telecommunications, server and systems administration.

3.6.2 Community Development Department

The Community Development Department is made up of three divisions that impact the future development in the City.

- Planning Division. The Planning Division makes policy recommendations to the City Manager, and City Council. The division develops guiding policies in the City's General Plan and reviews new construction through zoning, subdivision regulations, community design guidelines and review of building permits and code enforcement issues.
- Building Division. The Building Division is responsible for overseeing all construction activities including compliance with the Building, Electrical and Plumbing Codes. The Building Division reviews proposed construction plans for conformance to code requirements and monitors construction activities on a continuing basis to ensure structural integrity and safety. The Division identifies violations and necessitates corrections. Generating reports and providing data to various agencies is also an important function of the Building Division.

3.6.3 Scotts Valley Fire Protection District

The Scotts Valley Fire Protection District (SVFPD) will act as lead in the case that a spill contains hazardous material.

3.7 Chain of Communication for Reporting SSOs

The chain of communication for responding and reporting an SSO, from receipt of a complaint to reporting to appropriate agencies, are shown on Figure 7.1 and Figure 7.2 from Chapter 7 of the SSMP. Figure 7.1 outlines the notification of an SSO and the City's response procedures. Figure 7.2 outlines the City's SSO reporting procedures. Table 7.1 from Chapter 7 of the SSMP lists the notification, monitoring, and reporting requirements when an SSO occurs. The City's Overflow Emergency Response Plan (OERP) is discussed in more detail in Chapter 7 of the SSMP.

The City's OERP contains the procedures that should be utilized by the City to notify primary SSO response crews and the appropriate regulatory agencies.

Chapter 4

LEGAL AUTHORITY

This chapter of the Sanitary Sewer Management Plan (SSMP) includes a discussion of the City of Scotts Valley's (City's) current legal authority for the collection and conveyance of wastewater within its jurisdiction.

4.1 Regulatory Requirements

The State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Board (RWQCB) regulate the management, operation, and maintenance of the sanitary sewer systems. The Statewide General Waste Discharge Requirements for Sanitary Sewer Systems Order No. 2006-0003-DWQ (WDR) specifies that the legal authority element of the SSMP must:

> **D.13. (iii) Legal Authority.** Each Enrollee must demonstrate, through sanitary sewer system use ordinances, service agreements, or other legally binding procedures, that it possesses the necessary legal authority to:
>
> (a) Prevent illicit discharges into its sanitary sewer system (examples may include I/I, stormwater, chemical dumping, unauthorized debris and cut roots, etc.);
>
> (b) Require that sewers and connections be properly designed and constructed;
>
> (c) Ensure access for maintenance, inspection, or repairs for portions of the lateral owned or maintained by the Public Agency;
>
> (d) Limit the discharge of FOG and other debris that may cause blockages, and
>
> (e) Enforce any violation of its sewer ordinances.

The basis of all authority to manage, operate, and maintain an agency's infrastructure is derived from documents adopted by its elected board or council. In order to ensure the City has the proper legal authority established to implement and enforce all programs required by the WDRs, the City must first establish necessary legal authority to do so.

4.2 Background for Legal Authority

The California Water Code (CWC) of the California Code of Regulations (CCR), the Federal Clean Water Act (CWA) of the United States Code, and the California WDR grant the City the authority to establish codes, agreements, policies, and procedures for the construction, operation, and maintenance of a wastewater collection system, and the ability to enforce the necessary requirements. The following sections discuss the relevant sections granting the City this authority.

4.2.1 California Water Code Section 13271, California Code of Regulations

Section 13271 of the CWC, Title 23 of the CCR, prohibits the discharge of sewage and hazardous material into the waters of the state of California and requires the proper notification of authorized agencies in the event of a sanitary sewer overflow (SSO). Entities which do not properly follow the requirements of this section may be found guilty of a misdemeanor and punished by fine, imprisonment, or both.

4.2.2 CWA, Section 1251 of Chapter 33 of the United States Code

In 1972, the federal Congress enacted the Federal Water Pollution Control Act, commonly known as the CWA. The CWA prohibits the discharge of pollutants, including sewage, into public waters of the United States. The federal government has the authority to enforce compliance with the CWA via specific permits, such as National Pollutant Discharge Elimination System (NPDES) permits, as well as court actions such as administrative orders and consent decrees.

4.2.3 Code of Federal Regulations, Title 40, Protection of the Environment

The United States Environmental Protection Agency (USEPA), in its general pretreatment regulations (40 CFR Part 403) prohibits any user from discharging solid or viscous pollutants, such as fats, oil, and grease (FOG) waste, in amounts which will cause obstructions (blockages) to the flow in the wastewater system and interfere with the operation of the wastewater system.

4.2.4 California Waste Discharge Requirements

On May 2, 2006, the SWRCB adopted the Statewide General WDR for Sanitary Sewer Systems, Order No. 2006-0003. The WDRs are applicable to all federal and state agencies, municipalities, counties, districts, and other public entities that own or operate sanitary sewer systems greater than 1 mile in length that collect and/or convey untreated or partially treated wastewater to publicly owned treatment facilities in the state of California. Specifically, the WDRs require all affected agencies, municipalities, counties, districts, and other public entities to take a proactive approach to confirm a system-wide operation, maintenance, and management plan is established to effectively reduce the potential, quantity, and frequency of SSOs that may occur and impact surface or ground waters, threaten public health, adversely affect aquatic life, and impair the recreational use and aesthetic enjoyment of surface waters.

4.3 Statutory Authority

The City's legal authority and powers pertaining to the City's wastewater collection system originate from the powers granted by the State and Federal governments and are codified in the Scotts Valley Municipal Code (Municipal Code). The City may access the Municipal Code through the City's published codes website[1]. In addition, the City is also governed through the Santa Cruz County Code (County Code), one can access the County Code through the County's published code website[2].

[1] City Municipal Code
[2] County Code

Through the City's Municipal Code, the City establishes the authority to confirm the proper and efficient operation, management, and maintenance of the City's wastewater collection system. These controls include, but are not limited to, limiting the types of substances allowed to be discharged into the City's wastewater collection system; establishing requirements for the proper design, construction, and connections to the City's collection system; ensuring access to City sewer pipelines for inspecting, monitoring, and enforcing activities; limiting the discharge of FOG and other types of debris that cause blockages; and enforcing violations of its sewer-related ordinances, codes, and laws. Additional codes and policies that are applicable may be included at a later date.

The City Council, as the local legislative body, may, by ordinances and resolutions, make and enforce all rules and regulations necessary for the administration of the City's wastewater collection system. Table 4.1 is a legal authority checklist demonstrate that the required authorities exist within the City's Municipal Code. Table 4 2 summaries additional Municipal Codes not required but relate to the items and abilities cited in the WDR.

Table 4.1 Legal Authority Checklist – Required

Requirement	Reference
Public Sewers	
Ability to prevent illicit discharges into the wastewater collection system.	Municipal Code • 13.04.020 - General prohibitions. • 13.04.025 - Storm drainage and groundwater • 13.04.030 - Unpolluted water • 13.04.035 - Garbage grinders • 13.04.040 - Point of discharge • 13.04.045 - Holding tank waste • 13.04.050 - Radioactive wastes • 13.04.055 - Grease interceptors • 13.04.060 - General discharge limitations • 13.04.070 - Vehicle radiator wastewater and sludge's • 13.04.075 - Discharge into storm drain prohibited • 13.04.080 - Water softening wastes • 13.04.085 - Evolving federal and/or state discharge standards • 16.32.070 - Sanitary waste considerations.
Ability to require that sewers and connections be properly designed and constructed.	Municipal Code • 13.04.040 - Point of discharge. • 13.04.240 - Owner responsible for hook-ups. • 13.04.300 - Conflict with plumbing code. • 13.08.010 - Intent and purpose. • 13.08.090 - Existing systems—Building alterations—General. • 13.08.100 - Additions, alterations and repair—Cost more than fifty percent of building value. • 13.08.110 - Additions, alterations and repairs—Cost less than fifty percent of building value. • 15.04.060 - Adoption of Codes.
Laterals	
Ensure access for maintenance, inspection, or repairs for portions of the service lateral owned or maintained by the Enrollee.	Municipal Cod • 13.04.245 - Easement required for hook-ups. • 13.04.175 - Power to inspect. • 13.08.190 - Sewage nuisance—Investigation—When. • 3.08.200 - Sewage nuisance—Determination—Abatement.
FOG Source Control	
Ability to limit the discharge of FOG and other debris that may cause blockages.	Municipal Code • 13.04.020 - General prohibitions. • 13.04.055 - Grease interceptors. • 13.04.060 - General discharge limitations.
Enforcement	
Ability to enforce any violation of the Enrollee's sewer ordinances.	Municipal Code • 13.04.175 - Power to inspect. • 13.04.180 - Administrative enforcement procedures. • 13.04.185 - Revocation of permits. • 13.04.190 - Judicial remedies—Civil and criminal.

Table 4.2 Legal Authority Checklist – Referenced but not required

Requirement	Reference
Public Sewers	
Ability to require proper installation, testing, and inspection of new and rehabilitated sewers	Municipal Code • 13.04.280 - Required connection. • 16.50.020 - Access for inspection. • 16.50.030 - Notification—Required inspections.
Laterals	
Provide clear delineation of Enrollee responsibility (e.g., mains and lower laterals) and policies (e.g., courtesy cleaning, repair, cleanout installation)	Municipal Code • 13.04.255 - Ownership and maintenance of lines.
Define lateral ownership and maintenance responsibility	Municipal Code: • 13.04.255 - Ownership and maintenance of lines. • 13.08.120 - Maintenance.
Prohibit vandalism (tampering)	Municipal Code • 13.04.065 – Protection from Damage
Ability to deal effectively with private lateral problems (e.g., force property owner to correct failed/plugged private building sewer).	Municipal Code • 13.08.190 - Sewage nuisance—Investigation—When. • 13.08.200 - Sewage nuisance—Determination—Abatement.
FOG Source Control	
Requirements for the installation of grinders.	Municipal Code • 13.04.035 - Garbage grinders.
Ability to set design standards for grinders.	Municipal Code • 13.04.035 - Garbage grinders.
Ability to set maintenance requirements for grinders.	Municipal Code • 13.04.035 - Garbage grinders.
Ability to require application of BMPs	Municipal Code • 12.14.130 - Mandatory best management practices. • 12.14.140 - Best management practices for construction activity. • 12.14.150 - Best management practices for industrial/ commercial activities. • 12.14.160 - Best management practices for business not covered by state permit.
Authority to inspect grease producing facilities.	Municipal Code • 13.04.055 - Grease interceptors.
Enforcement	
Prescribe prohibited actions (e.g., illicit connections, discharges)	Municipal Code • 13.04.175 - Power to inspect.

Requirement	Reference
Provide notice of alleged violations to sewer user	Municipal Code • 13.04.180 - Administrative enforcement procedures.
Industrial Users	
Require that industrial users obtain a wastewater discharge permit.	Municipal Code • 13.04.100 - Industrial wastewater monitoring and reporting. • 13.04.105 - Wastewater discharge permit. • 13.04.135 - Permit conditions.
Prescribe monitoring and reporting requirements.	Municipal Code • 13.04.140 - Monitoring facilities.
Require pretreatment for industrial wastewater discharge users.	Municipal Code • 13.04.145 - Pretreatment.

Chapter 5

OPERATION AND MAINTENANCE PROGRAM

This chapter of the Sanitary Sewer Management Plan (SSMP) describes how the City of Scotts Valley (City) will operate and maintain the sanitary sewer system within its jurisdiction. It will involve the development and implementation of several major programs and activities including the production of maps, maintenance and cleaning schedules, and a comprehensive rehabilitation and replacement (R&R) plan.

5.1 Regulatory Requirements

The State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Board (RWQCB) to help agencies with the operation and maintenance of the sanitary sewer systems. The Statewide General Waste Discharge Requirements for Sanitary Sewer Systems Order No. 2006-0003-DWQ (WDR) specifies that the SSMP must identify the following for the Operation and Maintenance Program element:

D.13. (iv) Operation and Maintenance Program. The SSMP must include those elements listed below that are appropriate and applicable to the Enrollee's system:

(a) Maintain an up-to-date map of the sanitary sewer system, showing all gravity line segments and manholes, pumping facilities, pressure pipes and valves, and applicable stormwater conveyance facilities;

(b) Describe routine preventative operation and maintenance activities by staff and contractors, including a system for scheduling regular maintenance and cleaning of the sanitary sewer system with more cleaning and maintenance targeted at known problem areas. The Preventative Maintenance (PM) program should have a system to document scheduled and conducted activities, such as work orders;

(c) Develop a rehabilitation and replacement plan to identify and prioritize system deficiencies and implement short-term and long-term rehabilitation actions to address each deficiency. The program should include regular visual and TV inspections of manholes and sewer pipes, and a system for ranking the condition of sewer pipes and scheduling rehabilitation. Rehabilitation and replacement should focus on sewer pipes that are at risk of collapse or prone to more frequent blockages due to pipe defects. Finally, the rehabilitation and replacement plan should include a capital improvement plan that addresses proper management and protection of the infrastructure assets. The plan shall include a time schedule for implementing the short- and long-term plans plus a schedule for developing the funds needed for the capital improvement plan;

(d) Provide training on a regular basis for staff in sanitary sewer system O&M and require contractors to be appropriately trained; and

(e) Provide equipment and replacement part inventories, including identification of critical replacement parts.

The WDR was amended by Amending Monitoring and Reporting Program for Statewide General Waste Discharge Requirements for Sanitary Sewer Systems Order No. WQ 2013-0058-EXEC (MRP), effective September 9, 2013. The MRP requires a new technical report for SSOs greater than 50,000 gallons. The following summarizes the MRP's technical report requirements that relate to the SSMP's Operation and Maintenance Program element:

- The MRP does not directly impact map requirements. However, the MRP's Technical Report requires for SSOs greater than or equal to 50,000 gallons must include a detailed location map illustrating all water quality sampling points.
- The report must describe the response to an SSO that includes final corrective actions completed and planned to be completed with a schedule for action not yet completed. Changes to the Preventive Maintenance (PM) schedule should be part of a corrective action plan. R&R corrective action(s) taken or planned should be documents.
- Development of a Water Quality Monitoring Program (WQC) Program to understand the impacts of all SSOs greater than or equal to 50,000 gallons that reach surface water. The WQCP must be initiated within 48-hours of the City becoming aware of an SSO. A WQCP was developed as part of this program.

5.2 Collection System Description

The City-owned sewer collection system consists of roughly 46 miles of gravity sewers ranging in size from 4 inches to 24 inches in diameter, and seven lift stations. The City's collection system is treated at the Scotts Valley Water Reclamation Facility (WRF).

5.3 Collection System Map

The City's collection system map was developed using a Computer-aided Design (CAD) software. The Engineering Division is charged with maintaining and updating the system map. The Engineering Division does not fall under the Wastewater Division. The City used as-built plans of sewer facilities to construct the CAD map. The Engineering Division maintain and stores hard copies of as-built plans in the at Public Works Dept. 701 Lundy Lane, Scotts Valley. The Wastewater Division updates system maps by submitting maps with hand drawn edits to the Engineering Division. The Wastewater Division updates the collection map on an as needed basis.

It is recommended that the Wastewater Division Manager assign the responsibilities for submitting system map updates to the Engineering Division and develop a system for tracking submittals to a personnel. In addition, it is recommended that the City develop a digital file storage for as-built plans.

5.4 Inspection Program

Regular and systematic inspection and assessment of sanitary sewer system facilities provide the means to monitor the condition of the facilities and the effectiveness of the maintenance operations and provides a basis for identifying and scheduling capital improvements. In addition, the overall assessment can be used to determine the funding required to repair, rehabilitate, and replace an aging collection system and to prioritize the allocation of funds and optimize the preventative maintenance and efforts to operate a sewer collection system.

The inspection programs are managed by Wastewater Division Manager. The inspection efforts are performed by a combination of wastewater plant operators and outside contractors. All data is entered into a proprietary software program. Information from inspections is incorporated into the maintenance software for scheduled maintenance and capital improvement. This information is also used to modify the preventative maintenance and repair projects as needed.

It is recommended that the Wastewater Division work with the Information Technology Division to pick a software program that can store inspection records and integrate with the City's maintenance program software.

5.4.1 Gravity Sewer Inspections

The Wastewater Division Manager is charged with scheduling inspection work and managing inspection data, while outside contractors are responsible for carrying out the field inspections. The City employs closed-circuit television (CCTV) technology for the inspection of its pipelines. The City contracts this work out.

The City is currently completing a gravity sewer inspection program as part of this SSMP update in 2021. The inspection program consists of inspecting of the collection system, and making recommendations. The inspection work is prioritized to focus on sewers that have the greatest consequence and risk of failure. The inspection work is prioritized to focus on sewers that have the greatest consequence and risk of failure. The program also inspected other areas of the system that were underrepresented to get a distribution of the system. Findings from this inspection program can be found in Appendix D.

Moving forward the City has a gravity sewer inspection goal of approximately 2.4 miles (five percent of the system) of their gravity sewer annually, with problem areas to be inspected more frequently. In addition, maintenance history, past overflows records, materials, inspection records, age, and anticipated street rehabilitation are factors used to prioritize the inspection work schedule.

All newly constructed sewer lines are required to be CCTV inspected by the contractor or developer to verify as-built drawings and ensure the line has no construction defects. Additionally, all new pipes and manholes are required to be pressured tested to ensure tightness and prevent release of sewer odors and future infiltration of storm water. This inspection and testing process must be completed prior to backfilling and before the City will accept the infrastructure from the construction contractor.

5.4.2 Manhole Inspection

The inspection of manholes, interior and lid area, are performed at the same time as the gravity sewer inspections to identify any structural defects, sewage flow conditions, signs of surcharge, presence of vermin or rodents, deleterious industrial waste, odors, and any signs of unusual settlement around the manholes and along sewer alignments.

5.4.3 Lift Station Inspections

The City's Senior Wastewater Operator is responsible for completing routine lift station inspection and report the findings to the Wastewater Division Manager. The routine inspections consisted of are visually inspecting the pumps and motors are visually inspected each week.

Carollo Engineers, Inc. (Carollo) conducted condition assessment of the City's seven existing lift stations in 2019 year. A copy of the Lift Station Condition Assessment Technical Memorandum is included in Appendix E.

The condition assessment team was tasked with identifying current deficiencies and condition issues related to concrete structures, pipes, valves, gates, pumps, motors, electrical equipment, station configuration, and station appurtenances based on visual observations and input from City staff. The assessment was performed only on station components which were readily visible at the time of the assessment. The assessment was intended as a high-level screening for significant issues, not a comprehensive condition evaluation of all facility components and maintenance needs.

The findings from the condition assessment are included in the 20-year capital improvement program (CIP) that combines capacity and condition related improvements required to provide adequate sewer system service to existing and future City customers through buildout of the City's general plan.

5.5 Preventative Maintenance Programs

The City's sanitary sewer system does preventive maintenance to minimize and prevent system blockages and extend the useful life of the sanitary sewer system, the City's Preventive Maintenance Program has focused on cleaning of the collection system. The City's Senior Wastewater Operator is responsible for establishing and leading the Preventive Maintenance Programs, under the supervision of Wastewater Division Manager. The City preventive maintenance equipment is located at the WRF. From here maintenance crews is equipped with the equipment and City standard communication devices.

5.5.1 Cleaning Program

The City's sewer lines are cleaned by maintenance crews via hydraulic jet (hydro jet). Known problem areas are labeled as "hot spots" and require a higher frequency of cleaning. These "hot spots" are caused by an accumulation of fats, oil, and grease (FOG); garbage grinds; or other grit, or have root intrusions. A list of these hotspot locations are included in Appendix F. Most of the City's cleaning efforts focus on "hot spot" areas and/or call-outs on reported complaints.

The City does not have a formal plan for cleaning non-hot spot areas. Maintenance crews will spend as much time that is available to clean non-hot spot areas. It is recommended that the City adopt a goal of cleaning the entire system every ten years. Changes in cleaning schedules should be updated based on inspection records and/or call-outs on reported complaints.

Each line segment cleaned is identified by an upstream and downstream manhole number. A log is submitted for each day of work completed. The Senior Wastewater Operator is charged with entering these records into a proprietary maintenance program (Lotus Software) unless work is designated to another staff member. The City may also use outside contractors for cleaning and repairs, and for emergencies during non-business hours.

5.5.2 Root Control Program

The Wastewater Division Manager, of the Wastewater Division, is charged with managing the City's Root Control Program. The City currently hires sub-contractors to handle all root control field work. The methods used consist of mechanical root cutting (rodding) or chemical applications to control roots. The frequency of root control is based on known problem areas. The City currently completes approximately 8,700 feet of root control every year. Changes in root control schedules are considered in order to be more effective in performing regular needed maintenance. The root control "hot spots" that undergo cleaning are included in Appendix F.

5.5.3 Lift Station Preventative Maintenance Program

The City's maintenance crews currently preform preventative maintenance based on the weekly inspection discussed in Section 5.4.3.

5.6 Repair and Rehabilitation Plan

The City's Wastewater Division is responsible for performing various types of wastewater facility repairs and rehabilitation improvements. Repair and rehabilitation work performed by crews may include point repairs at cracks, joints, and service interfaces; repairing collapsing or broken sewer pipe; removing obstructions in the sewers that hinder cleaning operations; manhole rehabilitation; video inspection; and other related work. The Wastewater Division Manager is responsible for scheduling repair and rehabilitation work orders based on the Inspection Program. Repairs that require resources beyond those available within the Wastewater Division or require further prioritization and planning are coordinated and scheduled with the Public Works Director.

The City's sewer discharge fees help fund both urgent and scheduled repair projects. The scheduled inspections and evaluation activity is the basis of scheduling future rehabilitation projects.

5.7 Equipment and Replacement Part Inventories

The City maintains an inventory of spare pump parts, pipes, and other parts needed to perform emergency repair work on the sewer system. A list of equipment and spare parts that are currently available is stored at the WRF and managed by the Senior Plant Operator. Appendix G includes a list of major equipment and replacement part inventories at the time of certification of the SSMP. The equipment is regularly checked, adjusted, repaired, or replaced, as necessary. However, major fixed assets are replaced when they meet or exceed the City's established fixed assets replacement criteria based on equipment age, mileage, hours of use, repair history, safety, etc. Replacement of or additions to major assets are done through the City's annual budget process. Any changes to the equipment and replacement part inventors must be reported to the Senior Plant Operator.

5.8 Staff Training

The City currently does not have a formal training program. The training for Wastewater Division staff is provided through a combination of informal/on-the-job training approaches. The City's informal training consists of weekly quality control meetings and in-house training.

Structured training educates staff of the latest requirements, methods, and equipment available in the industry on how to carry out their tasks safely and efficiently. The selection of structured training opportunities shall be at the sole discretion of the Public Works Director and City Manager that are consistent with City policies. City employees are encouraged to join and attend meetings and conferences of the appropriate organizations related to their field of work. Recommended structured training may consist of classes or seminars hosted by other agencies that consist of, but are not limited to:

- California Division of Occupational Safety and Health (Cal/OSHA).
- California Water Environment Association (CWEA).
- National Association of Sewer Service Companies (NASSCO).

Other as-needed private company service providers and/or construction firm employees must be well trained and experienced to be considered for emergency SSO mitigation or sewer construction and rehabilitation work.

To aid in compliance with the WDRs, it is recommended that the City begin to offer its maintenance workers periodic "refresher courses" on City Standard Operating Procedures (SOPs) and maintenance activities for the collection system. In addition, it is recommended that these training sessions include training with regard to the new programs or policies that will be implemented as part of the SSMP and the new WDRs. This is particularly important with respect to the reporting requirements for SSOs in the City. It is essential that all staff is aware of the WDRs and know who needs to be informed should an SSO occur.

Chapter 6

DESIGN AND PERFORMANCE PROVISIONS

This chapter presents the City of Scotts Valley's (City's) relevant design and construction standards, as well as standards for the inspection and testing of new sewers, pumps, and other appurtenances and for rehabilitation projects as required by the Sewer System Management Plan (SSMP).

6.1 Regulatory Requirements

The State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Board (RWQCB) regulate the management, operation, and maintenance of the sanitary sewer systems. The Statewide General Waste Discharge Requirements for Sanitary Sewer Systems Order No. 2006-0003-DWQ (WDR) specifies that the City's SSMP must include design and performance provisions that includes, at minimum, the following:

D.13. (v) Design and Performance Provisions:

(a) Design and construction standards and specifications for the installation of new sanitary sewer systems, pump stations and other appurtenances; and for the R&R of existing sanitary sewer systems; and

(b) Procedures and standards for inspecting and testing the installation of new sewers, pumps and other appurtenances and for R&R projects.

6.2 Design and Construction Standards and Specifications

The City's "Standard Details and Specifications" (Standards) provide certain minimum standards for the design, construction, repair and alteration for sanitary sewers, and all appurtenances. The Standards were developed and maintained by the City's Department of Public Works, Engineering Division. A copy of the City's Standards can be found on City's website[1]. The City's Standards were last updated in December 2017, since the approval of this SSMP. Any items not included in the City Standards shall be designed in accordance with the State Highway Design Manual, State Traffic Manual, Subdivision Ordinance or Zoning Ordinance, the General Plan, Master Plans, and any applicable Specific Plan of the City, generally accepted engineering practice, or as directed by the Public Works Director/City Engineer (City Engineer). This section summarizes the City's Standards that relate to a sanitary sewer collection system.

[1] Standard Details and Specifications

6.2.1 Gravity Sewers

The City's standards for gravity sewers are as follows:

- *Material (Section I-5):* All pipe shall be PVC SDR-35 or approved equal as approved by the Public Works Director/City Engineer.
- *Minimum Diameter (Section IV-1):* New sanitary sewers must have a minimum diameter of 6-inches. Side sewers with a diameter of 8-inches or larger must be connect by or at a manhole.
- *Clearance (Sections IV-2 and IV-4):* All sanitary sewers must comply with California Department of Public Health and outlined in Section 64572, Title 22, of the California Administrative Code. In cases where a sanitary sewer crosses over the top of a water line or the horizontal separation between the sanitary sewer and water line is less than 10-feet, special requirements shall apply for the type of pipe used and the location of joints. Sanitary sewers shall be laid with a minimum of 12-inches vertical cleared from water lines and 6-inches from all other improvements (utilities).
- *Minimum Cover (Section IV-4):* Sanitary sewer mains and trunks must have a minimum pipe cover of six feet. If minimum cover is not available, then special approval is required and will require special pipe, bedding and/or backfill as directed by the Public Works Director/City Engineer.
- *Responsibilities (Section IV-5):* The City maintained sewers must lie in a right-of-way or dedicated public easement.

6.2.2 Manholes

The City's standards for manholes are as follows:

- *Spacing (Section IV-6):* Section a maximum manhole spacing of 350 feet, under normal conditions. Sewers on curved alignment with a radius of less than 400 feet shall have a maximum manhole spacing of 300 feet. Manholes must be constructed at the termination of all sewers which may be extended in the future. This sections requires permanent means for safe and convenient access shall be provided to all sewer manholes.
- *Lids (Section I-5):* Sanitary manhole covers shall have enclosed pick holes. Sanitary sewer manholes, subject to surface or storm drain, shall have water-tight lids.

6.2.3 Lateral Sewers

The City's standards for lateral sewers are as follows:

- *Minimum Diameter (Section IV-1):* of the standards establish required minimum lateral diameters for various user types and conditions. In addition, connecting houses with a finished floor elevation 1-foot or less above the highest elevation of the nearest upstream structure must install approved backflow prevention device next to and immediately upstream of the cleanout.
- *Minimum Cover (Section I-5):* A minimum cover of 3 feet from the top of the pipe to the top of the curb is the required cover for laterals.
  - Section I-V of the Laterals are to be constructed with top of pipe three feet below top of curb grade unless otherwise noted.

- *Responsibilities (Section IV-5):* It is the owner's responsibility for the installation, maintenance, and repair of lateral sewers. Installation of lateral sewer for each existing individual house or other buildings during the construction of a sanitary sewer. Individual single-family residential building shall be serviced by a separate lateral to the sewer main.

6.2.4 Lift Stations

The City does not currently have a specific set of design standards for lift stations. Thus, Section IV-7 (Unusual Design) of the City's Standards governs lift station designs. It is recommended that the City develop a formal set of design standards, or adopt another agencies standards for lift stations.

6.2.5 Miscellaneous Structures

The City's standards for miscellaneous structures are as follows:

- *Wyes (Section I-5):* Wyes must be constructed with 1 pipe length of station shown on the plans and all laterals laid 90 degrees to main except in cul-de-sacs where laterals shall be laid either at 90 degrees or 45 degrees to the main line.

6.2.6 Rehabilitation

The City does not currently have design standards that relate to rehabilitation projects. It is anticipated that the City's ongoing inspection program may identify some rehabilitation projects. To maintain consistency it is recommended that the City adopt rehabilitation design standards.

6.2.7 Right-of-Way Policy

Section IV-3 of the City' Design Standard requires all public sewers be in easements or right-of-ways granted or dedicated for sewers and/or public use. The section also defines a width criteria that sanitary sewer easements must meet.

6.2.8 Updating Design Standards

As mentioned earlier, the City's Engineering Division are charged with maintain and updating the Standards. The City's Wastewater Division Manager shall provide input on design standards that relate to sanitary sewer. Additional design standard updates not identified in this SSMP will be included in SSMP audits by the Wastewater Division's leadership as needs are identified.

6.2.9 Design Standard Recommendations

The following design standard updates should be recommended to the Engineering Division during the next update. Include the adoption of industry design of sanitary sewers facilities shall conform to standard accepted engineering practice. In addition, it is recommended that the City include a list of industry accepted standards for facility design and construction requirements incorporate, but not limited to:

- American Society of Mechanical Engineers (ASME) Standards.
- American National Standards Institute (ANSI) Standards.
- American Society for Testing and Material (ASTM) Standards.
- American Water Works Association (AWWA) Standards.
- American Society of Civil Engineers (ASCE) Standards.

- Hydraulic Institute Standards (HIS).
- American Concrete Institute (ACI) Standards.
- National Electric Code (NEC).
- Standard Specifications of the State of California Department of Transportation.
- State of California Industrial Safety Orders.
- All applicable state and federal regulations.

6.3 Inspection and Testing Standards

The City inspects all new infrastructure facilities to ensure conformance with the City's design and construction standards. In the case of sanitary sewer facilities, this includes air and mandrel testing of new lines and CCTV inspection prior to acceptance.

- ***Trench Compaction Testing (Section I-5):*** Trench compaction shall be in accordance with City's provisions for trench compaction. The contractor shall employ a certified soils firm to take soils tests at locations directed by the City. Soils tests shall be submitted to the City.
- ***Air Testing (Section I-5):*** All new sewer pipe shall be air pressure tested at 5 pounds pressure for 15 minutes, televised and one electronic format copy delivered to the City of Scotts Valley.
- **Lateral Inspection (Section I-5):** For proposed construction to existing sanitary sewer laterals, the applicant shall inspect and record existing laterals and submit a video recording to the Public Works Department for review and approval.

It is recommended that the City's standards reference specific testing criteria.

6.4 Performance Standards

Section 16.32.070 of the Municipal Code[2], requires the council to determine whether the discharge of waste from the proposed subdivision into an existing community sewer system would result in violation of existing requirements prescribed by the RWQCB. If the findings show that the proposed waste discharge would violate requirements of the RWQCB, it may reject the tentative proposed subdivision.

Chapter 9, System Evaluation and Capacity Assurance Plan, of the SSMP developed system performance criteria used to help identify existing sewers with capacity deficiencies. These existing deficiencies are flagged for improvements. See Chapter 9, for more details.

[2] Municipal Code

Chapter 7

OVERFLOW EMERGENCY RESPONSE PLAN

This chapter presents the City of Scotts Valley's (City's) Overflow Emergency Response Plan (OERP) as required by the Sewer System Management Plan (SSMP). The OERP provides measures to protect the public health and the environment in the event of a sanitary sewer overflow (SSO).

7.1 Regulatory Requirements

The State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Board (RWQCB) regulate the management, operation, and maintenance of the sanitary sewer systems. The Statewide General Waster Discharge Requirements for Sanitary Sewer Systems Order No. 2006-0003-DWQ (WDR) specifies that the City's Sanitary Sewer Management Plan must include an Overflow Emergency Response Plan that includes, at a minimum, the following elements:

D.13. (vi) Overflow Emergency Response Plan. Each Enrollee shall develop and implement an overflow emergency response plan that identifies measures to protect public health and the environment. At a minimum, this plan must include the following:

(a) Proper notification procedures so that the primary responders and regulatory agencies are informed of all SSOs in a timely manner;

(b) A program to ensure an appropriate response to all overflows;

(c) Procedures to ensure prompt notification to appropriate regulatory agencies and other potentially affected entities (e.g. health agencies, Regional Water Boards, water suppliers, etc.) of all SSOs that potentially affect public health or reach the waters of the State in accordance with the MRP. All SSOs shall be reported in accordance with this MRP, the CWC, other State Law, and other applicable Regional Water Board WDRs or NPDES permit requirements. The SSMP should identify the officials who will receive immediate notification;

(d) Procedures to ensure that appropriate staff and contractor personnel are aware of and follow the Emergency Response Plan and are appropriately trained;

(e) Procedures to address emergency operations, such as traffic and crowd control and other necessary response activities; and

(f) A program to ensure that all reasonable steps are taken to contain and prevent the discharge of untreated and partially treated wastewater to waters of the United States and to minimize or correct any adverse impact on the environment resulting from the SSOs, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the discharge.

The WDR was amended by Amending Monitoring and Reporting Program for Statewide General Waste Discharge Requirements for Sanitary Sewer Systems Order No. WQ 2013-0058-EXEC (MRP), effective September 9, 2013. The MRP impacted on the WDR by:

- Time sensitive requirements depending on the overflow category
- Complete a Technical Report requirement for SSOs ≥ 50,000 gallons does require a "Detailed location map illustrating all water quality sampling points."
- Implement a Water Quality Monitoring Program to assess impacts of all SSOs greater than 50,000 gallons reaching surface waters

7.2 Overflow Emergency Response Plan

An OERP) has been developed for the City in order to comply with the requirements of Order No. 2006-0003-DWQ. This plan is intended to be updated and modified by the City as necessary to more closely reflect operating conditions and changes that may occur in overflow response procedures.

An OERP has been developed for the City in order to comply with the requirements of the WDR, which is included in Appendix H. This plan is intended to be updated and modified by the City as necessary to more closely reflect operating conditions and changes that may occur in overflow response procedures. The following sections summarizes the major aspects of the OERP as relevant to the specific WDR, MRP, and RWQCB requirements.

7.3 Receipt of Information Regarding an SSO

An overflow may be detected by the general public, departments, through routine maintenance activities, or by others. The City's lift station are equipped with supervisory control and data acquisition (SCADA). These systems send early warnings of potential backups caused by power outages or high-level conditions. Calls from the general public regarding potential overflows within the City limits are generally received through the Public Works Department 831-438-5854 during normal business hours or the Police Dispatch at 911 during non-business hours. The dispatcher begins an SSO Field Report (included in Appendix H, Attachment 1) that documents all relevant information regarding the potential spill from the caller.

7.4 Overflow Response Procedures

Section 3.2 of the City's OERP contains the emergency response procedures that should be followed by response crews. These include provisions for dispatching, crew instruction, requests for additional resources, assessing property damage, field supervision and inspection, hazard materials, and crowd control, traffic diversion, and other emergency operations.

The OERP emphases timely placement of containment barriers to minimize the SSO volume of reaching storm drains or drainage channels that discharge into the Waters of the United States. Section 3.3 of the OERP contains the overflow correction, containment and clean-up procedures that should be followed by response crews. These include responsibilities of response crew upon arrival, containment, initial estimate of spill volume (included in Appendix H, Attachment 2), clean up, and if necessary water quality sampling. The notification and response procedure flow chart is shown in Figure 7.1.

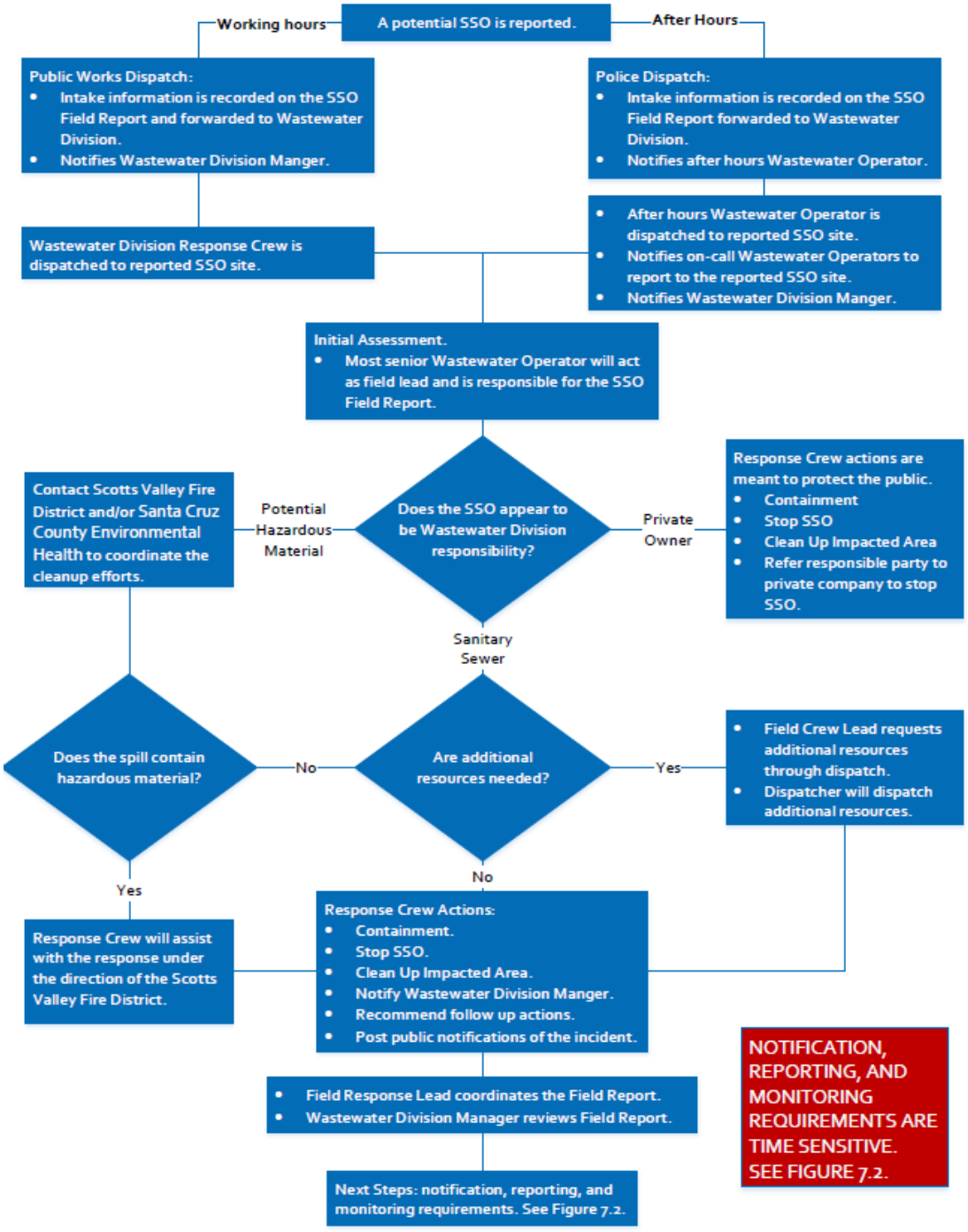


Figure 7.1 SSO Notification and Response Flow Chart

7.5 Regulatory Agency Notification Plan

Various regulatory agencies must be notified if an SSO occurs depending on the type as defined by the MRP (Section 1.2 of the OERP). Likewise, the time frame in which the appropriate agencies must be notified depends on the type of discharge. Table 7.1 summarizes the notification, reporting, water quality monitoring, and record keeping time frames that are required by the MRP. Likewise, the time frame in which the appropriate agencies must be notified depends on the type of discharge. Section 5 of the OERP provides a summary of the information required for reports under what conditions.

A flow chart identifying the required notification, reporting, and monitoring Figure 7.2.

Table 7.1 Notification, Reporting, Monitoring, and Record Keeping Requirements

Element	Requirements	Method
Notification7.1	• Within two (2) hours of becoming aware of any Category 1 SSO greater than or equal to 1,000 gallons discharged to surface water or spilled in a location where it probably will be discharged to surface water, notify the Cal OES and obtain a notification control number. • If Cal OES notification is not required then within two (2) hours of becoming aware of any spills notify Santa Cruz County Environmental Health Services. • If Cal OES notification is not required then within two (2) hours of becoming aware of any spills notify RWQCB. • If sewer spill reaches waterbody notify CA Department of Fish and Game.	• Call Cal OES at: (800) 852-7550 • Call County Health: (831) 454-2022 Call RWQCB: (805) 542-4649 • Call CA Department of Fish and Game: (831) 649-2870
Reporting	• Category 1 SSO: Submit draft report within three (3) business days of becoming aware of the SSO and certify within 15 calendar days of SSO end date. • Category 2 SSO: Submit draft report within three (3) business days of becoming aware of the SSO and certify within 15 calendar days of the SSO end date. • Category 3 SSO: Submit certified report within 30 calendar days of the end of month in which SSO the occurred. • SSO Technical Report: Submit within 45 calendar days after the end date of any Category 1 SSO in which 50,000 gallons or greater are spilled to surface waters. • "No Spill" Certification: Certify that no SSOs occurred within 30 calendar days of the end of the month or, if reporting quarterly, the quarter in which no SSOs occurred. • Collection System Questionnaire: Update and certify every 12 months.	Enter data into the CIWQS Online SSO Database, certified by enrollee's Legally Responsible Official(s).
Water Quality Monitoring	Conduct water quality sampling within 48 hours after initial SSO notification for Category 1 SSOs in which 50,000 gallons or greater are spilled to surface waters.	Water quality results are required to be uploaded into CIWQS for Category 1 SSOs in which 50,000 gallons or greater are spilled to surface waters.
Record Keeping	• SSO event records. • Records documenting SSMP implementation and changes/updates to the SSMP. • Records to document Water Quality Monitoring for SSOs of 50,000 gallons or greater spilled to surface waters. • Collection system telemetry records if relied upon to document and/or estimate SSO Volume.	Self-maintained records shall be available during inspections or upon request.

Notes:
(1) Source: State of California, Water Resources Control Board Order No. WQ 2013-0058-EXEC.

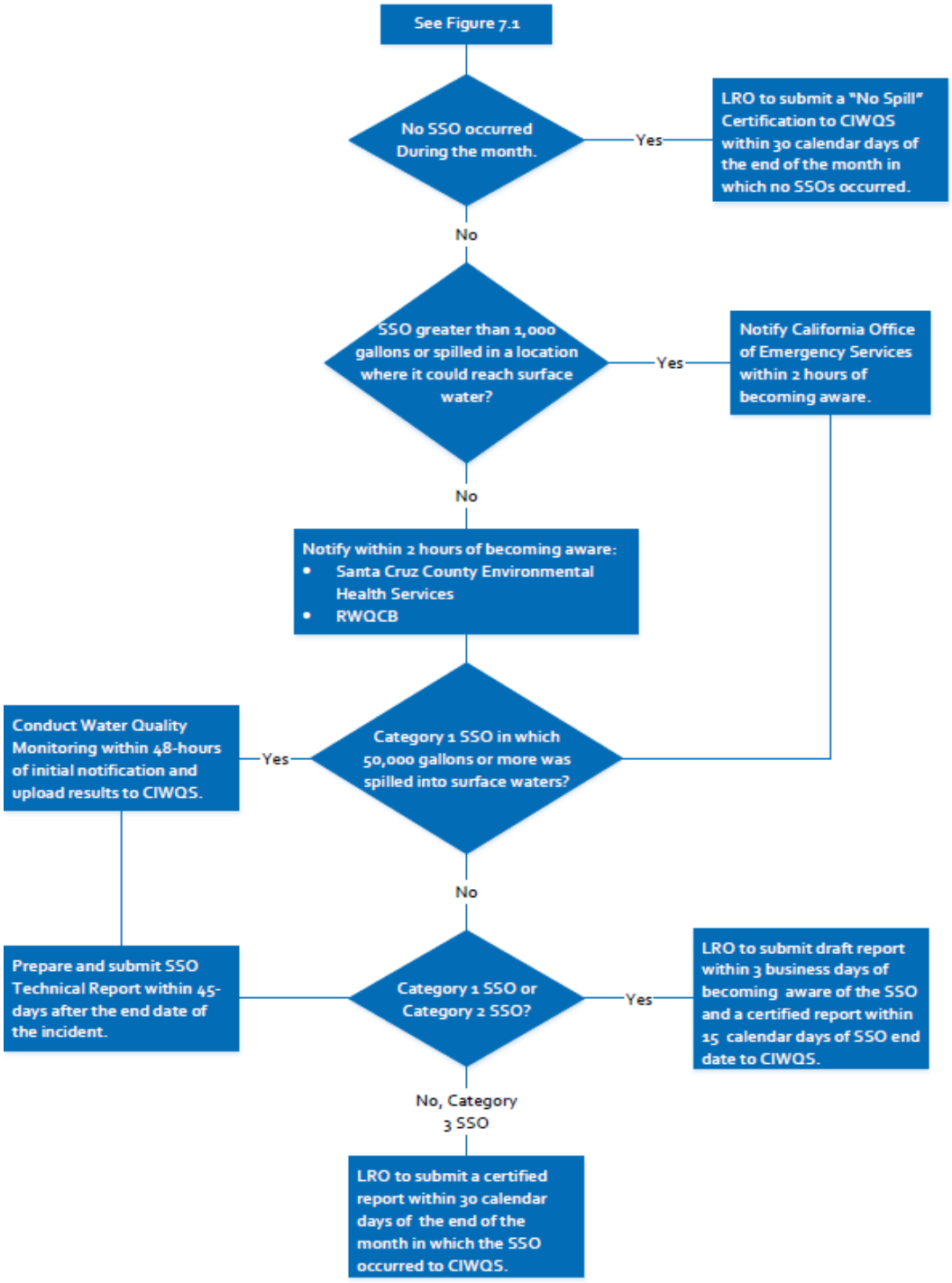


Figure 7.2 Notification, Reporting, and Monitoring Requirements Flow Chart

7.5.1 Emergency Response Plan Awareness and Training

Section 7 of the OERP contains provisions concerning the distribution, maintenance, and awareness of the provisions presented in that document. The City's OERP contains provisions cornering the training of City personnel in the goals and procedures of the OERP. The training and experience of the response team members and the inclusion of contractors (if needed), plays an important part in the selection process. In addition to the response procedures, the overflow emergency response team is trained in traffic and crowd control. It is recommended that the City develop training and education for other City departments that assist with the overflow emergency response. Ensure that dispatchers are trained with starting a SSO Field Report.

The City is ultimately responsible for keeping the OERP up to date. The OERP should be reviewed at a predefined time interval for outdated material and should be updated are required. The City's OERP contains provisions covering the maintenance of the OERP. The

The OERP is available to key personnel who are responsible for managing or responding to SSOs. The OERP includes important forms that are available to field crews and engineers who manage or prepare SSO Reports for regulatory agencies.

Chapter 8

FOG CONTROL PROGRAM

This chapter summarizes the City of Scotts Valley (City) fats, oil, and grease (FOG) control program, which has been developed to limit the amount of FOG that enters the collection system to the extent feasible.

8.1 Regulatory Requirements

The State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Board (RWQCB) regulate the management, operation, and maintenance of the sanitary sewer systems. The Statewide General Waste Discharge Requirements for Sanitary Sewer Systems Order No. 2006-0003-DWQ (WDR) specifies that the City's Sewer System Management Plan (SSMP) must include an evaluation of the City service area to determine whether a FOG control program is needed. If no FOG program is needed, justification for why it is not needed must be provided. If FOG is considered to be a problem, a FOG source control plan must be prepared and implemented, including the following as appropriate:

D.13. (vii) FOG Control Program. Each Enrollee shall evaluate its service area to determine whether a FOG control program is needed. If an Enrollee determines that a FOG program is not needed, the Enrollee must provide justification for why it is not needed. If FOG is found to be a problem, the enrollee must prepare and implement a FOG source control program to reduce the amount of these substances discharged to the sanitary sewer system. The plan shall include the following as appropriate:

(a) An implementation plan and schedule for a public education outreach program that promotes proper disposal of FOG;
(b) A plan and schedule for the disposal of FOG generated within the sanitary sewer system service area. This may include a list of acceptable disposal facilities and/or additional facilities needed to adequately dispose of FOG generated within a sanitary sewer system service area;
(c) The legal authority to prohibit discharges to the system and identify measures to prevent SSOs and blockages caused by FOG;
(d) Requirements to install grease removal devices (such as traps or interceptors), design standards for the removal devices, maintenance requirements, BMP requirements, record keeping and reporting requirements;
(e) Authority to inspect grease producing facilities, enforcement authorities, and whether the Enrollee has sufficient staff to inspect and enforce the FOG ordinance;
(f) An identification of sanitary sewer system sections subject to FOG blockages and establishment of a cleaning maintenance schedule for each section; and
(g) Development and implementation of source control measures for all sources of FOG discharged to the sanitary sewer system for each section identified in (f) above.

8.2 FOG Control Program

FOG is generated in most types of restaurants during food preparation, food service, and kitchen clean up. If flushed down the drain, FOG can build up in pipes, pumps, and equipment causing significant problems in the sanitary sewer system, including line blockages. Blockages can lead to a sanitary sewer overflow (SSO), which poses environmental and public health hazards. Understanding and controlling discharges of FOG will greatly reduce potential liability of SSOs and efforts required to keep lines clean.

The key to reducing FOG in the sanitary sewer system includes both a good source control program, as well as preventative maintenance to ensure FOG that does build up within the system is cleaned before significant buildup can occur. Additionally, understanding your collection system and the type of discharges within the service area is paramount to the strategic implementation of a FOG program. The City's FOG Control Program is administered by the Environmental Compliance which falls under the Wastewater Division.

8.3 Legal Authority

Section 13.04.055 of the Municipal Code grants the City the legal authority to prohibit discharges to the system and identify measures to prevent SSOs and blockages caused by FOG.

8.4 Inspection and Enforcement Procedures

The City's Municipal Code has provisions for the inspection of FOG-producing facilities and the enforcement actions that should be taken by the City in the event of a violation of the provisions of the plan. The following sections of the City's Municipal Codes grants the City the authority to inspect and enforce:

- 13.04.175 - Power to inspect.
- 13.04.180 - Administrative enforcement procedures.
- 13.04.185 - Revocation of permits.
- 13.04.190 - Judicial remedies—Civil and criminal.

8.4.1 Inspection

Inspection actions are defined in Section 13.04.175 of the City's Municipal Code. Due to COVID-19 restrictions, in-person inspections were not conducted in 2020, but remote inspection via phone interview, photos, and documentation that is verified by grease hauler was conducted. During fiscal year 2019-20, the City inspected 110 business for wastewater and storm water compliance. The inspections are usually unannounced and some facilities may have received several inspections if corrective actions are required.

8.4.2 Enforcement Actions

Enforcement actions for non-compliance are defined in Section 13.04.180 - Administrative enforcement procedures, of the City's Municipal Code. If there is a FOG-related problem associated with FOG, the City will take enforcement action against the permittee in accordance with Municipal Code. The City has the authority to monitor and enforce the terms of the Plumbing Code and the Public Health Code. This includes all domestic waste disposal into the sanitary sewer system.

8.5 Best Management Practices

Environmental Compliance and inspectors review Best Management Practices (BMPs) and brochures for reducing FOG and other solids in the sewer lines.

The City's existing BMPs details the appropriate ways to reduce FOG in sewer laterals, and municipal sewer lines from Food Service Establishments (FSE). The BMPs also summarize proper custodial cleaning methods, and the differences between interior and exterior crease interceptors and their maintenance requirements. The following list the current City BMP:

- Food Service Facilities[1].
- Property Management and Custodial Services[2].
- Protect Creeks from Pollution[3].

In addition, Section 13.04.055 of the City's Municipal Code gives the City the authority to request proof of pumping or cleaning. In the case of interceptors pumped by a licensed grease pumper, such proof shall consist of a signed and dated invoice or manifest. For self-cleaned interior grease traps, a bound written log shall be kept, and a dated, signed notation shall be made each time the trap is cleaned.

8.6 FOG Disposal

In general, the WDR requires the City to have a plan and schedule for the disposal of FOG generated within the sanitary sewer service area. The City operates an acceptable disposal sites for grease. The City's Municipal Code define the provisions for the proper disposal and scheduled cleaning of grease removal devices. Section 13.04.055 of the City's Municipal Code requires businesses to use a licensed commercial grease pumper and the schedule that grease removal devices must be cleaned. The City's Food Service Faculties BMP describes in more detail the maintenance, record-keeping, and reporting requirements.

8.7 Public Outreach

The City's 8.3 is in charge of making and coordinating the distributing public outreach materials for controlling FOG discharges into the sanitary sewers. The outreach materials target both business and residential customers. The outreach materials provide BMPs for proper disposal of FOG as well as information on grease traps, backwater valves, and sewer lateral maintenance. The outreach materials consist of, but are not limited to, various publications such as brochures and newsletter. These outreach materials are typically distributed to businesses during inspection. While residents receive FOG Outreach material twice annual through the Waterline newsletter that Green Waste Recover sends to its customers. A copy of the Fall 2020 newsletter can be found in Appendix I.

The City continues to support the Monterey Bay Area Green Business Programs (GBP). The goals of GBP include promoting pollution prevention, waste minimization and implementing best management practices that go beyond the regulatory standards. A significant portion of the program is dedicated to minimizing discharges of FOG into sanitary sewers.

[1] BMP - Food Service Facilities
[2] BMP - Property Management and Custodial Services
[3] BMP - Protect Creeks from Pollution

8.8 FOG related "Hot Spots"

The City has stated that several years of inspection of local food service facilities have proven to be highly effective, as most facilities operate in compliance with the FOG Program and local ordinances. The City updated the City ordinances so that coffee shops are no longer exempt from FOG control devices. It was believed that the amount of grease discharged from a coffee show was negligible, but that has proven to not be the case. Since then the City six of the seven coffee shops have install a grease interceptor.

Chapter 9

SYSTEM EVALUATION AND CAPACITY ASSURANCE PLAN

This element of the City of Scotts Valley's (City's) Sewer System Management Plan (SSMP) includes several major programs and activities regarding development of a Capital Improvement Program (CIP) and hydraulic analysis. Most of the requirements are satisfied by a recent collection system master plan.

9.1 Regulatory Requirements

The State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Board (RWQCB) regulate the management, operation, and maintenance of the sanitary sewer systems. The Statewide General Waste Discharge Requirements for Sanitary Sewer Systems Order No. 2006-0003-DWQ (WDR) requires that the City prepare and implement a CIP that will provide hydraulic capacity for peak dry weather flows (DWFs) as well as the appropriate design storm or wet weather event. The SSMP must address, at a minimum, the following:

D.13. (viii) System Evaluation and Capacity Assurance Plan: The Enrollee shall prepare and implement a capital improvement plan (CIP) that will provide hydraulic capacity of key sanitary sewer system elements for dry weather peak flow conditions, as well as the appropriate design storm or wet weather event. At a minimum, the plan must include:

(a) Evaluation: Actions needed to evaluate those portions of the sanitary sewer system that are experiencing or contributing to an SSO discharge caused by hydraulic deficiency. The evaluation must provide estimates of peak flows (including flows from SSOs that escape from the system) associated with conditions similar to those causing overflow events, estimates of the capacity of key system components, hydraulic deficiencies (including components of the system with limiting capacity) and the major sources that contribute to the peak flows associated with overflow events;

(b) Design Criteria: Where design criteria do not exist or are deficient, undertake the evaluation identified in (a) above to establish appropriate design criteria; and

(c) Capacity Enhancement Measures: The steps needed to establish a short- and long-term CIP to address identified hydraulic deficiencies, including prioritization, alternatives analysis, and schedules. The CIP may include increases in pipe size, I/I reduction programs, increases and redundancy in pumping capacity, and storage facilities. The CIP shall include an implementation schedule and shall identify sources of funding.

(d) Schedule: The Enrollee shall develop a schedule of completion dates for all portions of the CIP developed in (a)-(c) above. This schedule shall be reviewed and updated consistent with the SSMP review and update requirements as described in Section D. 14.

9.2 System Evaluation and Capacity Assurance Plan

As part of this project, a System Evaluation and Capacity Assurance Plan (SECAP) has been developed, which is included in Appendix J for reference. The purpose of the SECAP is to identify capacity deficiencies in the wastewater collection system, develop feasible alternatives to correct these deficiencies, and to develop a funding plan and schedule to implement these improvements. The following sections summarizes the major aspects of the SECAP as relevant to the specific WDRs.

9.3 Evaluation Criteria

Capacity analysis of the wastewater collection system was performed in accordance with the criteria established in the SECAP. This section summarizes the most important planning criteria that were used in the SECAP.

9.3.1 Gravity Sewer Criteria

Sewer pipe capacities are dependent on many factors, including roughness of the pipe, and the maximum allowable depth of flow. Relevant criteria are summarized below:

- Manning Coefficent (n). The manning coefficient 'n' is a friction coefficient and varies with respect to pipe material, size of pipe, depth of flow, smoothness of pipe and joints, and extent of root intrusion. For sewer pipes, the Manning coefficient typically ranges between 0.011 and 0.017, with 0.013 being a representative value used for sewer system planning.
- Flow Depth Criteria for Existing Sewers: Maximum flow depth criteria for existing sanitary sewers are established based on a number of factors, including the acceptable risk tolerance of the utility and local standards and codes. Using a conservative flow depth criteria when evaluating existing sewers may lead to unnecessary replacement of existing pipelines. Conversely, lenient flow depth criteria could increase the risk of sanitary sewer overflows (SSOs). Ultimately, the maximum allowable flow depth criteria should be established to be as cost-effective as possible while at the same time reducing the risk of SSOs to the greatest extent possible. For the City, existing pipelines were flagged if the pipe surcharged within five (5) feet within the manhole rim.

  System bottlenecks raise the hydraulic grade line of upstream sewers, leading to backwater conditions. The greater the capacity deficiency, the higher water levels will surcharge upstream of the bottleneck pipeline (or pipelines). The hydraulic model is used to identify "backwater" pipelines in order to isolate which specific pipelines are the actual root causes of the capacity deficiency. Capital projects are proposed to provide greater flow capacity for the deficient sewers, which eliminates the backwater conditions that cause surcharging.
- Flow Depth Criteria for New Sewers: When sizing new sewer pipelines, it is common practice to adopt different flow depth criteria for various pipe sizes. Design d/D ratios typically range from 0.5 to 0.92, with the lower values typically used for smaller pipes, which may experience flow peaks greater than design flow or blockages from debris, paper, or rags. A maximum allowable d/D ratio of 0.92 for all new sewers.
- Small Diameter Pipe: The recommended minimum sewer main diameter is 8 inches. When a small diameter pipe needs to be replaced, it is recommended that it be upsized to at least 8 inches in diameter.

9.3.2 Lift Station and Force Main Criteria

Industry standard practice is to require that sewage lift stations have sufficient capacity to pump peak flows with the largest pump out of service (firm capacity). Force main piping should be sized to provide a minimum velocity of 3 feet per second (fps) at the design flow rate of the lift station and no more than 8 fps. For the determination of head loss, the Hazen-Williams equation is used with a C-factor of 110, which is typical for sewer system master planning purposes.

9.4 Flow Monitoring Program

As part of the SSMP development process, a temporary flow monitoring program was conducted in 2019 to assist in the development of design flow criteria and to correlate actual sewer system flows to the hydraulic model predicted flows. Flow monitoring data are used to calibrate the wastewater collection system hydraulic model for DWF and wet weather flow (WWF).

The primary purpose of flow monitoring is to measure flow contributions from different areas of the collection system. The flow monitoring period was conducted from January 31, 2019 to May 2, 2019, at 8 monitoring sites, at locations selected by Carollo. The meter sites were selected to best model the sewer areas and multiple sub-areas within the sewer system.

More information regarding the flow monitoring programs, including the flow monitoring results, is provided in Appendix J.

9.5 Estimated Wastewater Flows

Wastewater flow rates were estimated for years 2020 and 2040 which represent existing and future conditions, respectively. Table 9.1 presents a summary of the estimated existing and future average dry weather flow (ADWF) and peak wet weather flow (PWWF). As shown in Table 9.1, the City's ADWF is projected to increase from 0.72 mgd to 0.86 mgd by 2040, whereas the PWWF is projected to increase from 5.40 mgd to about 5.78 mgd by 2040. Therefore, the City's PWWF to ADWF peaking factor is projected to decrease from roughly 7.5 to 6.7. This is typical, as newer sewers tend to have less RDII response than older areas of the system, primarily due to better construction methods. Furthermore, flow attenuation also tends to dampen out flow peaks as collection systems expand. See Appendix J for details on how wastewater flows were developed.

Table 9.1 Existing and Future Wastewater Flows

Year	Estimated ADWF (mgd)	Estimated PWWF (mgd)	Peaking Factor
2020 (Existing)	0.72	5.40	7.5
2040 (Future)	0.86	5.78	6.7
Change	0.14	0.38	--

9.6 Analysis Methods

A wastewater collection system model is a simplified representation of the real sewer system. Sewer system models can assess the conveyance capacity for a collection system. Also, sewer system models can perform "what if" scenarios to assess the impacts of additional flows or modifications to the collection system.

The City's hydraulic model combines information on the physical and operational characteristics of the wastewater system, and performs calculations to solve a series of mathematical equations to simulate flows in pipes. The hydraulic model was developed based on available data collected from the City's GIS Databases, utility atlas, and appropriate assumptions.

Model calibration is a crucial component of the hydraulic modeling effort. Calibrating the model to match data collected during the flow-monitoring program ensures the most accurate results possible. The calibration process consists of calibrating to both dry and wet weather conditions. For this project, both DWF and WWF monitoring were conducted. DWF calibration ensures an accurate depiction of base wastewater flow generated within the study area. The WWF calibration consists of calibrating the hydraulic model to a specific storm event to quantify the peak and volume of infiltration and inflow (I/I) into the sewer system. The amount of I/I is essentially the difference between the WWF and DWF components.

A detailed summary of the model calibration process, including the results of the model calibration, is included in Appendix J for reference.

9.7 Capacity Evaluation

Following the DWF and WWF calibrations, a capacity analysis of the City's collection system was performed. The capacity analysis entailed identifying areas in the sewer system where flow restrictions occur or where pipe capacity is insufficient to convey design flows. Sewers that lack sufficient capacity to convey design flows could produce backwater effects in the collection system and potentially cause SSOs. The sewer system was evaluated based on planning criteria presented in Section 9.3 and Appendix J.

For existing conditions, the capacity analysis consisted of applying the 10-year, 24-hour design storm to the existing ADWF to simulate the peak wet weather, or design, flow condition. This is the maximum hourly flow that is expected to occur in the collection system. Sewers with flows exceeding the flow depth under design flow conditions were identified and improvement projects to mitigate existing capacity deficiencies were developed.

There is an appreciable I/I response throughout the City's wastewater collection system, which leads to design flow peaking factors greater than the industry standard in most locations. In general, though, the majority of sewers in the City are currently sized with sufficient capacity to convey existing PWWF.

The analysis of the future system was performed in a manner similar to the existing system analysis. The purpose of the future system evaluation is to verify that the existing system improvements were appropriately sized to convey future PWWFs, and to identify the locations of sewers that are adequately sized to convey existing PWWFs, but cannot convey future 2040 PWWFs.

Future 2040, the City's wastewater flows are expected to increase by 0.38 mgd, under PWWF conditions. As such, there were no additional areas in the existing collection system were identified as being capacity deficient under 2040 PWWF conditions.

The capacity evaluation found that the lift stations and force mains have sufficient capacity to meet the evaluation criteria. Results of the capacity evaluations are included in Appendix J for reference.

9.8 Recommended Projects

This section discusses the proposed projects that correct capacity deficiencies as well as rehabilitation recommendations.

9.8.1 Capacity Projects

The majority of the City sewers contain sufficient capacity to accommodate existing and future design flows without exceeding the established capacity criteria. There are a few exceptions where existing sewers will need to be replaced by larger diameter sewers. The decision as to whether a particular sewer should be replaced or a parallel sewer constructed should be made during the preliminary design phase. This study assumes that deficient sewers will be replaced.

Figure 9.1 illustrates the proposed sewer improvements required to correct existing deficiencies. The project ID in Figure 9.1**Error! Reference source not found.** correlate with the capacity improvement project descriptions below.

- Old El Pueblo Road (Project GM-1). This project includes replacing approximately 580 feet of 6-inch diameter gravity sewer along Old El Pueblo Road. The flow within the gravity sewer along Navarra Drive and Green Hills Road could cause manholes to overflow under PWWF conditions. It is recommended that the existing pipeline be replaced with a 10-inch diameter pipeline. By upsizing the gravity sewer along Old El Pueblo Road the downstream system is able mitigate a bottleneck and increase capacity along the flow split.
- Scotts Valley Drive Diversion with Study (Project GM-2). This project includes constructing a diversion structure and approximately 60 feet of 10-inch diameter of new gravity sewer along Scotts Valley Drive. The flow within the 10-inch diameter gravity sewer along Scotts Valley Drive causes upstream manholes to overflow under PWWF conditions. It is recommended that the City construct a diversion structure that diverts flow from the 10-inch diameter gravity sewer to the parallel 18-inch diameter gravity sewer. An additional study is recommended to determine the optimal location for this project.
- East of Highway 17 (Project GM-3A). This project includes constructing approximately 1,220 feet of 10-inch diameter gravity sewer east of Highway 17 between Navarra Drive and Meadow Way. The flow along the 10-inch diameter gravity sewer causes upstream manholes to surcharge within three feet of the manhole rim. It is recommended that the existing pipeline be replaced and upsized with a 12-inch diameter pipeline.
- East of Highway 17 - Creek Crossing (Project GM-3B). This project includes constructing approximately 300 feet of 10-inch diameter gravity sewer that crosses Carbonera Creek east of Highway 17. The flow along the 10-inch diameter gravity sewer causes upstream manholes to surcharge within three feet of the manhole rim. It is recommended that the existing pipeline be replaced with a 12-inch diameter pipeline.
- Glenwood Drive (Project GM-4). This project includes constructing approximately 730 feet of 10-inch diameter gravity sewer along Glenwood Drive between Vine Hill School Road and Scotts Valley Drive. The flow within the 10-inch diameter sewer cause upstream manholes to surcharge within three feet if the manhole rim under PWWF conditions. It is recommended that the existing pipeline be replaced with a 12-inch diameter pipeline.

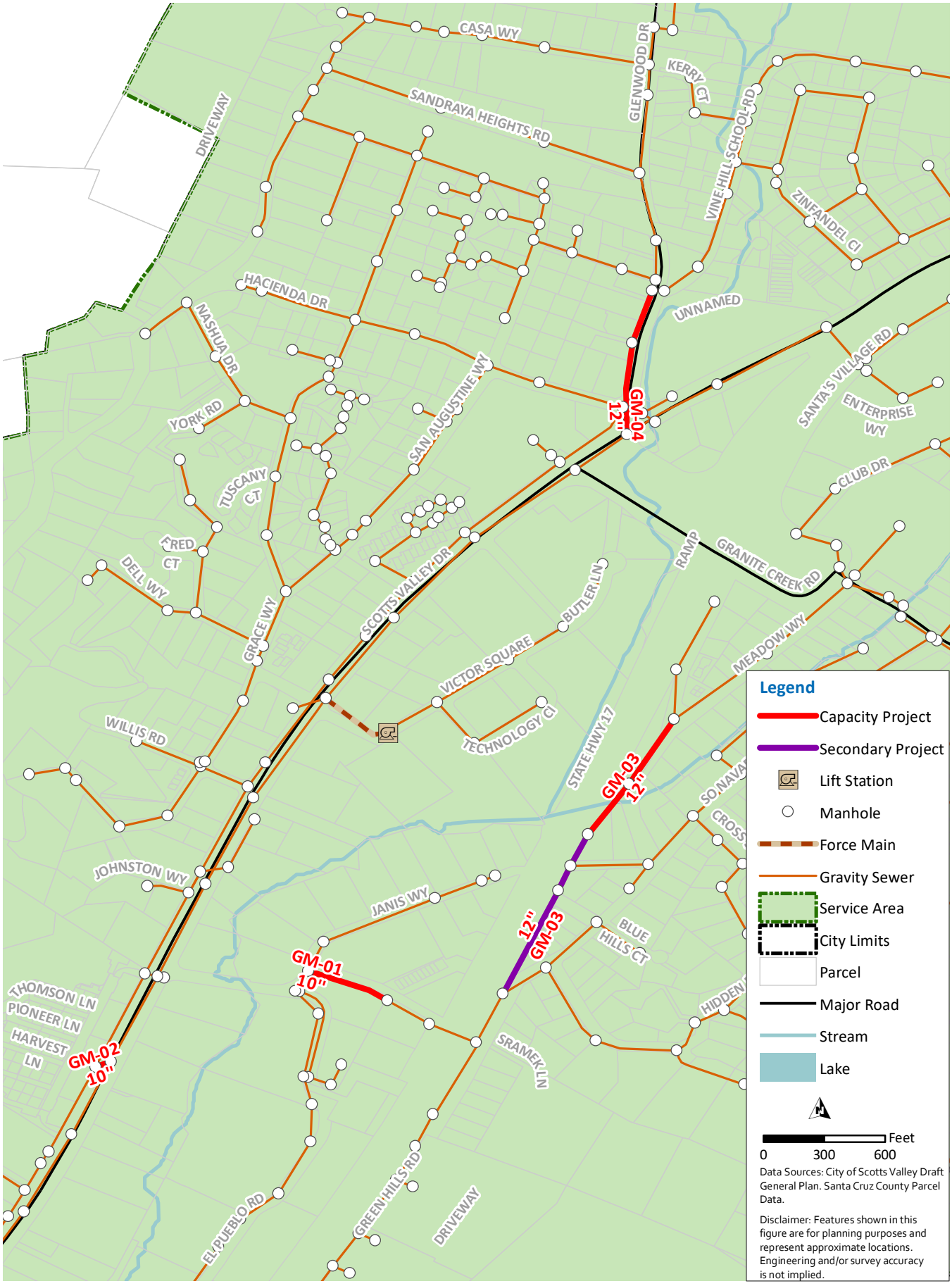


Figure 9.1 Proposed Capacity Improvements

9.8.2 Rehabilitation Projects

The following summarizes rehabilitation and replacement related programs developed based on existing and future condition assessments:

- Gravity Sewer Renewal Program (Project RR-1). This program consists of annual rehabilitation and replacement of gravity sewers necessary to maintain proper operation of existing facilities. The exact projects are unknown at this time and will be identified using inspection data collected from the ongoing and future inspection programs (Project PR-1). For planning purposes the City should make the goal of completing approximately 0.4 miles (0.8 percent of the system) renewal projects annually.
- Lift Station Renewal Projects (Projects RR-2 through RR-8). These projects consist of rehabilitation and replacement of lift station assets based on the condition of that asset developed during the 2019 Lift Station Condition Assessment. The lift station asset projects were grouped into three priorities (one being the highest priority). It was assumed that Priority one and two projects will occur in Phase 1 of the CIP, while priority three projects will occur during Phase 2 of the CIP. See Attachment 4 for more details in regard to the lift station renewal projects for each priority for each lift station.
  - Bethany Lift Station Renewal (Project RR-2).
  - Glen Canyon Lift Station Renewal (Project RR-3).
  - Granite Creek Lift Station Renewal (Project RR-4).
  - Montevalle Lift Station Renewal (Project RR-5).
  - Sunset Terrace Lift Station Renewal (Project RR-6).
  - Suzanne Lane Lift Station Renewal (Project RR-7).
  - Carbonero Lift Station Renewal (Project RR-8).

9.8.3 Programs

The following summarizes programs that helps the City meet requirements established by the SSMP and make informed decisions necessary to make decisions maintain proper operation of existing facilities.

- Inspection Program (Project PR-1). This inspection program consists of CCTV inspection of the collection system. The City should use the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment Certification Program (PACP) rating system to score each pipeline. These inspections and conditions will be used to decide the method and prioritize the annual pipeline renewal pipeline projects (RR-1). The City is currently implementing the first stages of this program as part of the development of this SSMP, and will continue to implement the program in the future as part of an ongoing CCTV inspection program.
- Flow Monitoring Program (Project PR-2). This program consists of a flow monitoring program that should be completed for the prior to the SSMP Update (Project PR-3) for the SECAP.
- SSMP Update (Project PR-3). This program consists of updating the SSMP every five years as required by WDR.

9.9 Capital Improvement Plan

The improvement projects outlined in the SECAP are prioritized based on their urgency to mitigate existing deficiencies and to correct pipeline or lift station condition problems. It is recommended that improvements to mitigate existing deficiencies be constructed as soon as possible.

The implementation of projects are separated into four phases that are in five year increments starting in year 2022 and continues through year 2041. Table 9.2 summarizes the project costs by phase for the proposed projects discussed in Section 9.8. The CIP identified approximately $16.96 million worth of projects which averages to approximately $0.85 million annually over the 20 year planning period.

A detailed summary of the cost estimate process, including the contingencies, is included in Appendix J for reference.

Table 9.2 Capital Improvement Program Summary

Project ID	Project Name	Total Project Cost[1][2][3][4] ($, million)	CIP Cost by Phase[1][2][3][4] ($,million)			
			Phase 1 (2022-26)	Phase 2 (2027-21)	Phase 3 (2032-36)	Phase 4 (2037-41)
GM-1	Old El Pueblo Road	$0.19	$0.19	$0.00	$0.00	$0.00
GM-2	Scotts Valley Drive Diversion with Study	$0.05	$0.05	$0.00	$0.00	$0.00
GM-3A	East of Highway 17	$0.42	$0.42	$0.00	$0.00	$0.00
GM-3B	East of Highway 17 - Creek Crossing	$0.28	$0.28	$0.00	$0.00	$0.00
GM-4	Glenwood Drive	$0.25	$0.25	$0.00	$0.00	$0.00
RR-1	Gravity Sewer Renewal Program	$12.00	$2.10	$3.30	$3.30	$3.30
RR-2	Bethany Lift Station Renewal	$0.32	$0.29	$0.03	$0.00	$0.00
RR-3	Glen Canyon Lift Station Renewal	$0.42	$0.41	$0.00	$0.00	$0.00
RR-4	Granite Creek Lift Station Renewal	$0.16	$0.16	$0.00	$0.00	$0.00
RR-5	Montevalle Lift Station Renewal	$0.52	$0.52	$0.00	$0.00	$0.00
RR-6	Sunset Terrace Lift Station Renewal	$0.12	$0.12	$0.00	$0.00	$0.00
RR-7	Suzanne Lane Lift Station Renewal	$0.12	$0.11	$0.01	$0.00	$0.00
RR-8	Carbonero Lift Station Renewal	$0.02	$0.02	$0.01	$0.00	$0.00
PR-1	Inspection Program	$0.60	$0.15	$0.15	$0.15	$0.15
PR-2	Flow Monitoring Program	$0.28	$0.07	$0.07	$0.07	$0.07
PR-3	SSMP Update	$1.20	$0.30	$0.30	$0.30	$0.30
	Total	$16.96	$5.44	$3.88	$3.82	$3.82
	Annual	$0.85	$1.09	$0.78	$0.76	$0.76

Notes:
(1) ENR San Francisco Construction Cost Index for February 2021 is 13,110.
(2) Estimated Construction Cost includes a 30% contingency of the baseline construction cost.
(3) Total project costs includes a 10% markup for engineering, a 10% markup for construction management and a 7.5% markup for project administration of the estimated construction cost.
(4) Total Mark-Up is 65.8% of the baseline construction costs.

Chapter 10

MONITORING, MEASUREMENT, AND PROGRAM MODIFICATIONS

This chapter presents a summary of the steps to be taken by the City of Scotts Valley (City) to evaluate the effectiveness of the Sewer System Management Plan (SSMP) and update it should improvements be necessary or desirable.

10.1 Regulatory Requirements

The State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Board (RWQCB) regulate the management, operation, and maintenance of the sanitary sewer systems. The Statewide General Waster Discharge Requirements for Sanitary Sewer Systems Order No. 2006-0003-DWQ (WDR) specifies that the City's SSMP specifies that the City shall:

D.13. (ix) Monitoring, Measurement, and Program Modifications: The Enrollee shall:

a. Maintain relevant information that can be used to establish and prioritize appropriate SSMP activities;

b. Monitor the implementation and, where appropriate, measure the effectiveness of each element of the SSMP;

c. Assess the success of the preventative maintenance program;

d. Update program elements, as appropriate, based on monitoring or performance evaluations; and

e. Identify and illustrate SSO trends, including: frequency, location, and volume.

The WDR was amended by Amending Monitoring and Reporting Program for Statewide General Waste Discharge Requirements for Sanitary Sewer Systems Order No. WQ 2013-0058-EXEC (MRP), effective September 9, 2013. The MRP impacted on the WDR by:

Records documenting all changes made to the SSMP since its last certification indicating when a subsection(s) of the SSMP was changed and/or updated and who authorized the changes or update. These Changes shall be attached to the SSMP.

10.2 Monitoring, Measurement, and Program Modification Overview

As part of the WDRs, the City is required to perform periodic SSMP program audits, as outlined in Chapter 11. The monitoring, measurement, and program modification element of the SSMP is closely paired with the program audits element, in that the information collected as part of the monitoring, measurement, and program modification element (such as sanitary sewer overflow (SSO) trends, etc.) will be used while performing the SSMP program audits.

10.3 SSMP Information Maintenance Program

In order to streamline SSMP audits (performed at least once every two years) and updates (at least once every five years), it is necessary to store and maintain relevant information related to individual SSMP elements so that they can be easily located and accessed in the future.

Recommendations for the maintenance of data related to the SSMP are provided below:

- **Notes Related to the SSMP.** City staff, during the course of their day to day routine, will likely encounter elements of the SSMP that will need to be updated (e.g., personnel changes, changes in operational conditions, new equipment acquired, etc.) or areas in which the SSMP could be improved. Because SSMP program audits are performed only once every two years, important changes that need to be included in the SSMP may be lost or forgotten. To account for this, Appendix K has been provided in this document as a blank placeholder. The intent of Appendix K is that when City staff identify an important change related to the SSMP, they can place their notes or other relevant documents in the appendix for easy reference at a later date. The notes must identify who authorized the SSMP change or update.
- **Capital Improvement Projects Implementation/Expenditures.** When the City performs program audits, the auditor should work with Wastewater Division to obtain summaries of capital improvement projects and other sanitary sewer facility expenditures during the audit period. Additionally, projects identified in the City's capital improvement program (CIP) should be reviewed to determine which have been implemented as scheduled.
- **Hydraulic Model Maintenance.** As noted in Chapter 9, a hydraulic computer model of the City collection system was created as part of the SSMP development. As changes are made to the collection system, the City should update its hydraulic model accordingly. These changes could include new sewer facilities, changes in flow rates, etc.
- **SSO Data.** The overall purpose and intent of the WDRs is to reduce the amount and severity of SSOs. It is critical that the City have available detailed information regarding SSOs that occur within the City in order to establish whether or not the SSMP is effective in meeting the intent of the WDRs. Appendix L also provides a table that can be used by the City to maintain relevant information pertaining to each SSO as it occurs.

10.4 Program Monitoring

To accurately gauge the progress of the SSMP and its successes or failures in preventing SSOs, the City should establish a key staff member, or a group of staff members, to periodically monitor (biannually or annually) the implementation and effectiveness of the SSMP elements to determine which SSMP elements are being implemented or not implemented, and their general performance to date. This information will be useful in the preparation of SSMP program audits (See Chapter 11) to establish overall trends. Notes or records of the monitoring activities should be kept on file, and can be placed in Appendix K.

10.5 Program Evaluation

The City will assess the success of the SSMP periodically similar to the procedure outlined in this report. Appropriate staff members will be designated to perform an evaluation of the City's program periodically. The City's designees should evaluate where the City's program can be improved in order to maximize the efficiency of the system. The conclusions of these evaluations will be kept on record and used for program updates and audits.

10.6 Program Modifications

Updates to the City's SSMP programs will be performed based on the results of the two-year program audits discussed in Chapter 11 of this report or whenever there are major changes to the SSMP. All program updates and modifications should be approved by the City's legally responsible official (LRO) and incorporated into the SSMP report, when necessary. If there are major changes to the SSMP, it needs to be re-certified by the City's LRO on the California Integrated Water Quality System (CIWQS). At a minimum, the City shall update and recertify the SSMP once every five years. The City should budget for the costs associated with the SSMP updates.

10.7 SSO Trends

In order to optimize the performance of the City's sanitary sewer collection system, it is necessary to identify any SSO trends that may exist. Through the identification of such trends, the City may find capacity deficiencies, areas of the system in need of increased maintenance, SSO or fats, oil, and grease (FOG) "Hot Spots." Some key performance indicators that should be considered for tracking by the City are:

- Number of service calls, blockages, and SSOs over a one-year period.
- SSO events by cause.
- SSOs by type (e.g., Category 1 to Surface Water, Category 1 not to Surface Water, Category 2, etc.).
- Volume of SSOs and volume contained.
- SSO events by location.

More detailed information regarding SSO trends is presented in Appendix L of this report. In addition, the City should keep copies of the CIWQS SSO reports on file for use by the City in the identification of SSO trends, as these reports contain very detailed information on specific spills that is not practical to maintain on other databases.

Chapter 11

SSMP PROGRAM AUDITS

This chapter presents a summary of the procedures to be used by the City of Scotts Valley (City) to perform internal audits on their Sanitary Sewer Management Plan (SSMP).

11.1 Regulatory Requirements

The State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Board (RWQCB) regulate the management, operation, and maintenance of the sanitary sewer systems. The Statewide General Waster Discharge Requirements for Sanitary Sewer Systems Order No. 2006-0003-DWQ (WDR) specifies the following, in relation to audits, must be included in the Sanitary Sewer Management Plan (SSMP):

> **D.13. (x) SSMP Program Audits** - As part of the SSMP, the Enrollee shall conduct periodic internal audits, appropriate to the size of the system and the number of SSOs. At a minimum, these audits must occur every two years and a report must be prepared and kept on file. This audit shall focus on evaluating the effectiveness of the SSMP and the Enrollee's compliance with the SSMP requirements identified in this subsection (D.13), including identification of any deficiencies in the SSMP and steps to correct them.

The WDR was amended by Amending Monitoring and Reporting Program for Statewide General Waste Discharge Requirements for Sanitary Sewer Systems Order No. WQ 2013-0058-EXEC (MRP), effective September 9, 2013. Section E of the MRP requires audit reports be kept on file for a minimum of five years and be made to SWRCB or RWQCB staff upon request.

11.2 Purpose

Audit programs are intended to provide controls for ensuring that all programs associated with the SSMP are being implemented as planned and managed appropriately. Audit outcomes should provide information about challenges and successes in implementing the SSMP by evaluating work practices and operations, documentation, procedures records and staff for implementation effectiveness and consistency. The audit will identify any program or policy changes that may be needed to continually improve effective implementation. Information collected as part of an audit should be used in to plan program or procedure revisions necessary to improve program performance.

11.3 Responsible Party for the Program Audit

The City's legally responsible official (LRO), the Wastewater Division Manager, will oversee the performance of the SSMP program audit. They may also designate certain key City staff that are knowledgeable in the City's sanitary sewer collection facilities to assist in the audits. The final audit report shall be reviewed and approved by the Public Works Director, City Manager, and City Council. A copy of the audits be kept on file with the City Clerk.

11.4 Audit Procedures

The recommended program audit procedures are broken up into three major categories: data compilation/summary, operation, and engineering/capital improvement program (CIP). The City's LRO will likely be responsible for coordinating the major aspects of the program audit, including relevant interviews and data collection. The following sections summarize the main aspects of the proposed audit approach. As is true with the SSMP in general, the audit procedures should be updated and modified, as necessary, to improve efficiency or reflect changing operating conditions.

11.4.1 Data Compilation/Summary

The data compilation/summary audit focuses primarily on the following aspects, and is initiated by the LRO:

- **Data Gathering:**
  - SSO Reports. The LRO should obtain copies of all SSO reports and data since the previous program audit. Data that should be collected include SSO cause, location and receiving waters (if any portion of the spill reached a surface water), spill volume, volume of spill contained, and rainfall (if infiltration and inflow (I/I) is the suspected cause) as discussed in Chapter 10 of this report.
  - Maintenance Records. The LRO should compile all relevant data concerning the maintenance of the system (e.g., number of service calls, number of blockages, lift station failures/maintenance activities, miles of pipe cleaned, etc.). Maintenance work performed during the audit period should be broken down between preventative and corrective actions and by the need for the maintenance action (e.g., fats, oil, and grease (FOG) blockage; electrical problem; etc.).
  - Interviews/Miscellaneous Data Gathering. The LRO should seek feedback from relevant personnel as to which SSMP elements work well and which could be improved upon. The LRO should also gather relevant information necessary to audit the various elements of the SSMP to determine which items are outdated. Examples may include updated names/contact information for the organization chart, recent improvement plans, maps of recently abandoned sewer lines, etc. The LRO should also gather copies of notes from City staff that have been stored in Appendix K of the various SSMP report copies.
- **Data Analysis:**
  - SSO Summary. One of the most important aspects of the program audits is to summarize the data collected from the SSO reports in order to establish trends. A simple way to track SSO trends is to develop Microsoft® Excel-based tables and charts to summarize the data available in the SSO reports. More sophisticated tracking methods, such as geographic information system (GIS) mapping, could also be utilized as desired.
  - Maintenance Activity Summary. In order to gauge the effectiveness of the SSMP in reducing SSOs, the SSMP program audits should include a summary of maintenance activities performed during the audit year. Correlations between maintenance activities and SSO trends or blockages can then be identified.

- Summarizing Utilities Management Audit. The LRO, upon completion of the data gathering and data analysis/summary phases, should develop report summarizing the results of the utilities management audit, including the following:
  - Discussion of SSO trends during the audit period compared to historical trends.
  - A summary of maintenance activities during the audit period, including any apparent correlations to SSOs (did an increase/decrease in maintenance of a sewer facility correlate to increase/decreases in SSOs?).
  - A list of changes to be made to the SSMP to reflect changes to reflect current operational conditions or to improve the effectiveness of the SSMP.

11.4.2 Operations Audit

The operations audit focuses primarily on the following aspects, and is initiated by the LRO:

- Operations Interviews. The LRO should conduct interviews with relevant parties to determine how effective the SSMP has been in helping the crews respond to and mitigate the effects of SSOs. Questions that could be helpful in conducting these interviews include:
  - Is the Overflow Emergency Response Plan (OERP) being fully implemented and is it working as envisioned?
  - Are there any procedures that should be added to the OERP?
  - Are there any procedures in the OERP that are unnecessary or need to be removed?
  - Which components of the SSMP are working well? Why?
  - Which components of the SSMP need improvement? Why?
  - Is there a need to purchase additional equipment or add staff?
  - Are there any equipment maintenance needs?
  - Is there a need for additional training to field crews on SSMP/City operating procedures?
  - What additional resources are needed to help respond to SSOs?
  - Are there any operational changes that have occurred since the previous program audit (e.g., new equipment/spare parts, changes to cleaning/maintenance activities, new "hot spots" identified, etc.)?
- Summarizing Operations Audit. The LRO, upon completion of the operations interviews, should develop a report summarizing the results of the operations audit, including the following:
  - Discussion of SSMP components that are working well.
  - A summary of SSMP components that need to be improved, enhanced, or removed.
  - A list of changes to be made to the SSMP to reflect changes to reflect current operational conditions or to improve the effectiveness of the SSMP.
  - A list of recommendations for additional training, equipment, staffing levels, etc.

11.4.3 Engineering/CIP Audit

The engineering/CIP audit focuses primarily on the following aspects, and is initiated by the LRO:

- Element Review. The LRO should coordinate a meeting with all appropriate divisions related to CIP projects and expenditures in order to review specific elements of the SSMP as they pertain to the Engineering Division, including, but not necessarily limited to, the following:

  - System Evaluation and Capacity Assurance Plan. It is recommended that the Wastewater Division and Engineering Division review the System Evaluation and Capacity Assurance Plan (SECAP) during each program audit to determine whether updates or amendments are necessary. When an update or amendment to the SECAP is required, it should be prepared by a licensed engineer.
  - CIP. The program audit should also include a review of the CIP to determine which projects have been implemented as scheduled, which projects have not been implemented as scheduled and why, and to determine the adequacy of the budget allocation for each program or project.
  - Design, Inspection, and Construction Standards. The Public Works Department should review their design, inspection, and construction standards during each program audit to determine if changes or modifications are needed.
  - Mapping, Etc. The Engineering Division should also review their collection system map/hydraulic model to verify that its contents are up to date and accurate.
- Summarizing Engineering/CIP Audit. The LRO, upon completion of the engineering/CIP review, should develop a report summarizing the results of the engineering audit, including the following:
  - A summary of SSMP components that need to be improved, modified, enhanced, or removed.
  - A list of changes to be made to the SSMP to reflect changes or to improve the effectiveness of the SSMP.

11.5 Program Audit Report

Following the utilities management, operations, and engineering audits, the LRO should use the material summarized in the utilities management, operations, and engineering reports to develop a draft SSMP program audit report.

This draft report should include supporting material, such as tables, figures, and maps that support the conclusions of the report. Information presented in the audit report may include the following:

- An evaluation of each element of the SSMP report, including the City's sewer ordinances, design standards, operations and maintenance (O&M) program, overflow emergency response plan, FOG control plan, system evaluation and capacity assurance plan, and communications program.
- Progress made on the development of SSMP elements. Justification should be provided if progress has not been made on the development of certain elements of this SSMP.
- A description of the new SSMP program elements since the last program audit.
- The effectiveness of implementing SSMP elements.
- A description of the additions and improvements to the sanitary sewer collection system facilities since the previous program audit.
- A description of the additions and improvements to the sanitary sewer collection system facilities planned for the next year.

The draft report should then be distributed to all interested City staff members for review and approval.

All appropriate City staff comments should then be incorporated into a final SSMP program audit report. Copies of the program audit should be kept on file should the SWRCB request a copy.

11.6 Schedule for Program Audits

At a minimum, the City's program audits must occur every two years. Therefore, the City will perform its initial program audit within two years of adoption of this SSMP report, and every two years subsequently. Should City staff determine, based on the results of the interim program evaluations described in Chapter 10, that more frequent audits are desirable, a shorter time interval, such as annually, may be chosen. A copy of the audits be kept on file in the WRF. Copies of program audits must be logged and attached to Appendix K of the SSMP.

Chapter 12

COMMUNICATION PROGRAM

This chapter presents a summary of the steps to be taken by the City of Scotts Valley (City) to communicate with the public on the development, implementation, and performance of the Sewer System Management Plan (SSMP). This chapter also contains the final certification of this SSMP.

12.1 Regulatory Requirements

The State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Board (RWQCB) regulate the management, operation, and maintenance of the sanitary sewer systems. The Statewide General Waste Discharge Requirements for Sanitary Sewer Systems Order No. 2006-0003-DWQ (WDR) specifies the City's SSMP Communication Program requirements as follows:

> **D.13. (xi) Communication Program** - The Enrollee shall communicate on a regular basis with the public on the development, implementation, and performance of its SSMP. The communication system shall provide the public the opportunity to provide input to the Enrollee as the program is developed and implemented.
>
> The Enrollee shall also create a plan of communication with systems that are tributary and/or satellite to the Enrollee's sanitary sewer system.

12.2 Purpose

Communication programs are often underrated and overlooked. However, an effective communication program may end up being the key element that keeps your organization from missing critical SSMP deadlines. Involving the public early and at appropriate times will help your organization avoid last minute comments that delay approval of your SSMP by your governing body. A quality communication program with satellite agencies will help to minimize negative operational impacts on your plant or collection system.

It is important to identify an individual who will be responsible for development of your communication program. Larger agencies will typically have Communications and Media Officers or Public Information Officers who are appropriate to lead the development of the communication program. Smaller agencies who don't have these staff in-house should look to those within the agency who have exhibited strong writing skills, public speaking skills, experience with customer interface, or have successfully completed controversial projects. A self-assessment and rough timeline follow to help you on your way to a successful communication program.

12.3 Communication Program and Adoption

In accordance with the WDRs, the City held a public hearing to formally approve and adopt the final SSMP. A copy of the resolution to formally approve and adopt the SSMP is included in Appendix M.

To provide the public with the chance to review the SSMP, an electronic copy is available upon request. Additionally, an electronic copy of the report is available at Scotts Valley's website for review by the public prior to and following final approval.

12.4 Final Certification

The City's Legally Responsible Official (LRO) is required to certify that all sections of this report comply with the applicable WDRs requirements. This was accomplished by completing the certification portion in the Online SSO Database Questionnaire and sending the appropriate signed form to the SWRCB. A copy of the SWRCB certification is included in Appendix N of this report.

The City shall update and re-certify the SSMP when significant changes are made. At a minimum, the City will update and re-certify this report every five years. All changes to the SSMP must be documents in the SSMP Change Log which is included in Appendix O. The SSMP Change Log is different from the SSMP Notes Log (Appendix K). The SSMP Change Log is an official record of changes made to the SSMP while the Notes Log acts as a depository of notes, programs, and audits that anyone can submit to ensure important information is not lost.

Appendix A

STATE WATER BOARD ORDER NO. 2006-003-DWQ

STATE WATER RESOURCES CONTROL BOARD
ORDER NO. 2006-0003-DWQ

STATEWIDE GENERAL WASTE DISCHARGE REQUIREMENTS FOR SANITARY SEWER SYSTEMS

The State Water Resources Control Board, hereinafter referred to as "State Water Board", finds that:

1. All federal and state agencies, municipalities, counties, districts, and other public entities that own or operate sanitary sewer systems greater than one mile in length that collect and/or convey untreated or partially treated wastewater to a publicly owned treatment facility in the State of California are required to comply with the terms of this Order. Such entities are hereinafter referred to as "Enrollees".

2. Sanitary sewer overflows (SSOs) are overflows from sanitary sewer systems of domestic wastewater, as well as industrial and commercial wastewater, depending on the pattern of land uses in the area served by the sanitary sewer system. SSOs often contain high levels of suspended solids, pathogenic organisms, toxic pollutants, nutrients, oxygen-demanding organic compounds, oil and grease and other pollutants. SSOs may cause a public nuisance, particularly when raw untreated wastewater is discharged to areas with high public exposure, such as streets or surface waters used for drinking, fishing, or body contact recreation. SSOs may pollute surface or ground waters, threaten public health, adversely affect aquatic life, and impair the recreational use and aesthetic enjoyment of surface waters.

3. Sanitary sewer systems experience periodic failures resulting in discharges that may affect waters of the state. There are many factors (including factors related to geology, design, construction methods and materials, age of the system, population growth, and system operation and maintenance), which affect the likelihood of an SSO. A proactive approach that requires Enrollees to ensure a system-wide operation, maintenance, and management plan is in place will reduce the number and frequency of SSOs within the state. This approach will in turn decrease the risk to human health and the environment caused by SSOs.

4. Major causes of SSOs include: grease blockages, root blockages, sewer line flood damage, manhole structure failures, vandalism, pump station mechanical failures, power outages, excessive storm or ground water inflow/infiltration, debris blockages, sanitary sewer system age and construction material failures, lack of proper operation and maintenance, insufficient capacity and contractor-caused damages. Many SSOs are preventable with adequate and appropriate facilities, source control measures and operation and maintenance of the sanitary sewer system.

SEWER SYSTEM MANAGEMENT PLANS

5. To facilitate proper funding and management of sanitary sewer systems, each Enrollee must develop and implement a system-specific Sewer System Management Plan (SSMP). To be effective, SSMPs must include provisions to provide proper and efficient management, operation, and maintenance of sanitary sewer systems, while taking into consideration risk management and cost benefit analysis. Additionally, an SSMP must contain a spill response plan that establishes standard procedures for immediate response to an SSO in a manner designed to minimize water quality impacts and potential nuisance conditions.

6. Many local public agencies in California have already developed SSMPs and implemented measures to reduce SSOs. These entities can build upon their existing efforts to establish a comprehensive SSMP consistent with this Order. Others, however, still require technical assistance and, in some cases, funding to improve sanitary sewer system operation and maintenance in order to reduce SSOs.

7. SSMP certification by technically qualified and experienced persons can provide a useful and cost-effective means for ensuring that SSMPs are developed and implemented appropriately.

8. It is the State Water Board's intent to gather additional information on the causes and sources of SSOs to augment existing information and to determine the full extent of SSOs and consequent public health and/or environmental impacts occurring in the State.

9. Both uniform SSO reporting and a centralized statewide electronic database are needed to collect information to allow the State Water Board and Regional Water Quality Control Boards (Regional Water Boards) to effectively analyze the extent of SSOs statewide and their potential impacts on beneficial uses and public health. The monitoring and reporting program required by this Order and the attached Monitoring and Reporting Program No. 2006-0003-DWQ, are necessary to assure compliance with these waste discharge requirements (WDRs).

10. Information regarding SSOs must be provided to Regional Water Boards and other regulatory agencies in a timely manner and be made available to the public in a complete, concise, and timely fashion.

11. Some Regional Water Boards have issued WDRs or WDRs that serve as National Pollution Discharge Elimination System (NPDES) permits to sanitary sewer system owners/operators within their jurisdictions. This Order establishes minimum requirements to prevent SSOs. Although it is the State Water Board's intent that this Order be the primary regulatory mechanism for sanitary sewer systems statewide, Regional Water Boards may issue more stringent or more

prescriptive WDRs for sanitary sewer systems. Upon issuance or reissuance of a Regional Water Board's WDRs for a system subject to this Order, the Regional Water Board shall coordinate its requirements with stated requirements within this Order, to identify requirements that are more stringent, to remove requirements that are less stringent than this Order, and to provide consistency in reporting.

REGULATORY CONSIDERATIONS

12. California Water Code section 13263 provides that the State Water Board may prescribe general WDRs for a category of discharges if the State Water Board finds or determines that:

    - The discharges are produced by the same or similar operations;
    - The discharges involve the same or similar types of waste;
    - The discharges require the same or similar treatment standards; and
    - The discharges are more appropriately regulated under general discharge requirements than individual discharge requirements.

    This Order establishes requirements for a class of operations, facilities, and discharges that are similar throughout the state.

13. The issuance of general WDRs to the Enrollees will:
    a) Reduce the administrative burden of issuing individual WDRs to each Enrollee;
    b) Provide for a unified statewide approach for the reporting and database tracking of SSOs;
    c) Establish consistent and uniform requirements for SSMP development and implementation;
    d) Provide statewide consistency in reporting; and
    e) Facilitate consistent enforcement for violations.

14. The beneficial uses of surface waters that can be impaired by SSOs include, but are not limited to, aquatic life, drinking water supply, body contact and non-contact recreation, and aesthetics. The beneficial uses of ground water that can be impaired include, but are not limited to, drinking water and agricultural supply. Surface and ground waters throughout the state support these uses to varying degrees.

15. The implementation of requirements set forth in this Order will ensure the reasonable protection of past, present, and probable future beneficial uses of water and the prevention of nuisance. The requirements implement the water quality control plans (Basin Plans) for each region and take into account the environmental characteristics of hydrographic units within the state. Additionally, the State Water Board has considered water quality conditions that could reasonably be achieved through the coordinated control of all factors that affect

water quality in the area, costs associated with compliance with these requirements, the need for developing housing within California, and the need to develop and use recycled water.

16. The Federal Clean Water Act largely prohibits any discharge of pollutants from a point source to waters of the United States except as authorized under an NPDES permit. In general, any point source discharge of sewage effluent to waters of the United States must comply with technology-based, secondary treatment standards, at a minimum, and any more stringent requirements necessary to meet applicable water quality standards and other requirements. Hence, the unpermitted discharge of wastewater from a sanitary sewer system to waters of the United States is illegal under the Clean Water Act. In addition, many Basin Plans adopted by the Regional Water Boards contain discharge prohibitions that apply to the discharge of untreated or partially treated wastewater. Finally, the California Water Code generally prohibits the discharge of waste to land prior to the filing of any required report of waste discharge and the subsequent issuance of either WDRs or a waiver of WDRs.

17. California Water Code section 13263 requires a water board to, after any necessary hearing, prescribe requirements as to the nature of any proposed discharge, existing discharge, or material change in an existing discharge. The requirements shall, among other things, take into consideration the need to prevent nuisance.

18. California Water Code section 13050, subdivision (m), defines nuisance as anything which meets all of the following requirements:
    a. Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property.
    b. Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal.
    c. Occurs during, or as a result of, the treatment or disposal of wastes.

19. This Order is consistent with State Water Board Resolution No. 68-16 (Statement of Policy with Respect to Maintaining High Quality of Waters in California) in that the Order imposes conditions to prevent impacts to water quality, does not allow the degradation of water quality, will not unreasonably affect beneficial uses of water, and will not result in water quality less than prescribed in State Water Board or Regional Water Board plans and policies.

20. The action to adopt this General Order is exempt from the California Environmental Quality Act (Public Resources Code §21000 et seq.) because it is an action taken by a regulatory agency to assure the protection of the environment and the regulatory process involves procedures for protection of the environment. (Cal. Code Regs., tit. 14, §15308). In addition, the action to adopt

this Order is exempt from CEQA pursuant to Cal.Code Regs., title 14, §15301 to the extent that it applies to existing sanitary sewer collection systems that constitute "existing facilities" as that term is used in Section 15301, and §15302, to the extent that it results in the repair or replacement of existing systems involving negligible or no expansion of capacity.

21. The Fact Sheet, which is incorporated by reference in the Order, contains supplemental information that was also considered in establishing these requirements.

22. The State Water Board has notified all affected public agencies and all known interested persons of the intent to prescribe general WDRs that require Enrollees to develop SSMPs and to report all SSOs.

23. The State Water Board conducted a public hearing on February 8, 2006, to receive oral and written comments on the draft order. The State Water Board received and considered, at its May 2, 2006, meeting, additional public comments on substantial changes made to the proposed general WDRs following the February 8, 2006, public hearing. The State Water Board has considered all comments pertaining to the proposed general WDRs.

IT IS HEREBY ORDERED, that pursuant to California Water Code section 13263, the Enrollees, their agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted hereunder, shall comply with the following:

A. DEFINITIONS

1. **Sanitary sewer overflow (SSO)** - Any overflow, spill, release, discharge or diversion of untreated or partially treated wastewater from a sanitary sewer system. SSOs include:
   (i) Overflows or releases of untreated or partially treated wastewater that reach waters of the United States;
   (ii) Overflows or releases of untreated or partially treated wastewater that do not reach waters of the United States; and
   (iii) Wastewater backups into buildings and on private property that are caused by blockages or flow conditions within the publicly owned portion of a sanitary sewer system.

2. **Sanitary sewer system** – Any system of pipes, pump stations, sewer lines, or other conveyances, upstream of a wastewater treatment plant headworks used to collect and convey wastewater to the publicly owned treatment facility. Temporary storage and conveyance facilities (such as vaults, temporary piping, construction trenches, wet wells, impoundments, tanks, etc.) are considered to be part of the sanitary sewer system, and discharges into these temporary storage facilities are not considered to be SSOs.

For purposes of this Order, sanitary sewer systems include only those systems owned by public agencies that are comprised of more than one mile of pipes or sewer lines.

3. **Enrollee** - A federal or state agency, municipality, county, district, and other public entity that owns or operates a sanitary sewer system, as defined in the general WDRs, and that has submitted a complete and approved application for coverage under this Order.

4. **SSO Reporting System** – Online spill reporting system that is hosted, controlled, and maintained by the State Water Board. The web address for this site is http://ciwqs.waterboards.ca.gov. This online database is maintained on a secure site and is controlled by unique usernames and passwords.

5. **Untreated or partially treated wastewater** – Any volume of waste discharged from the sanitary sewer system upstream of a wastewater treatment plant headworks.

6. **Satellite collection system** – The portion, if any, of a sanitary sewer system owned or operated by a different public agency than the agency that owns and operates the wastewater treatment facility to which the sanitary sewer system is tributary.

7. **Nuisance** - California Water Code section 13050, subdivision (m), defines nuisance as anything which meets all of the following requirements:
    a. Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property.
    b. Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal.
    c. Occurs during, or as a result of, the treatment or disposal of wastes.

B. APPLICATION REQUIREMENTS

1. Deadlines for Application – All public agencies that currently own or operate sanitary sewer systems within the State of California must apply for coverage under the general WDRs within six (6) months of the date of adoption of the general WDRs. Additionally, public agencies that acquire or assume responsibility for operating sanitary sewer systems after the date of adoption of this Order must apply for coverage under the general WDRs at least three (3) months prior to operation of those facilities.

2. Applications under the general WDRs – In order to apply for coverage pursuant to the general WDRs, a legally authorized representative for each agency must submit a complete application package. Within sixty (60) days of adoption of the general WDRs, State Water Board staff will send specific instructions on how to

apply for coverage under the general WDRs to all known public agencies that own sanitary sewer systems. Agencies that do not receive notice may obtain applications and instructions online on the Water Board's website.

3. Coverage under the general WDRs – Permit coverage will be in effect once a complete application package has been submitted and approved by the State Water Board's Division of Water Quality.

C. PROHIBITIONS

1. Any SSO that results in a discharge of untreated or partially treated wastewater to waters of the United States is prohibited.

2. Any SSO that results in a discharge of untreated or partially treated wastewater that creates a nuisance as defined in California Water Code Section 13050(m) is prohibited.

D. PROVISIONS

1. The Enrollee must comply with all conditions of this Order. Any noncompliance with this Order constitutes a violation of the California Water Code and is grounds for enforcement action.

2. It is the intent of the State Water Board that sanitary sewer systems be regulated in a manner consistent with the general WDRs. Nothing in the general WDRs shall be:

   (i) Interpreted or applied in a manner inconsistent with the Federal Clean Water Act, or supersede a more specific or more stringent state or federal requirement in an existing permit, regulation, or administrative/judicial order or Consent Decree;
   (ii) Interpreted or applied to authorize an SSO that is illegal under either the Clean Water Act, an applicable Basin Plan prohibition or water quality standard, or the California Water Code;
   (iii) Interpreted or applied to prohibit a Regional Water Board from issuing an individual NPDES permit or WDR, superseding this general WDR, for a sanitary sewer system, authorized under the Clean Water Act or California Water Code; or
   (iv) Interpreted or applied to supersede any more specific or more stringent WDRs or enforcement order issued by a Regional Water Board.

3. The Enrollee shall take all feasible steps to eliminate SSOs. In the event that an SSO does occur, the Enrollee shall take all feasible steps to contain and mitigate the impacts of an SSO.

4. In the event of an SSO, the Enrollee shall take all feasible steps to prevent untreated or partially treated wastewater from discharging from storm drains into

flood control channels or waters of the United States by blocking the storm drainage system and by removing the wastewater from the storm drains.

5. All SSOs must be reported in accordance with Section G of the general WDRs.

6. In any enforcement action, the State and/or Regional Water Boards will consider the appropriate factors under the duly adopted State Water Board Enforcement Policy. And, consistent with the Enforcement Policy, the State and/or Regional Water Boards must consider the Enrollee's efforts to contain, control, and mitigate SSOs when considering the California Water Code Section 13327 factors. In assessing these factors, the State and/or Regional Water Boards will also consider whether:

   (i) The Enrollee has complied with the requirements of this Order, including requirements for reporting and developing and implementing a SSMP;

   (ii) The Enrollee can identify the cause or likely cause of the discharge event;

   (iii) There were no feasible alternatives to the discharge, such as temporary storage or retention of untreated wastewater, reduction of inflow and infiltration, use of adequate backup equipment, collecting and hauling of untreated wastewater to a treatment facility, or an increase in the capacity of the system as necessary to contain the design storm event identified in the SSMP. It is inappropriate to consider the lack of feasible alternatives, if the Enrollee does not implement a periodic or continuing process to identify and correct problems.

   (iv) The discharge was exceptional, unintentional, temporary, and caused by factors beyond the reasonable control of the Enrollee;

   (v) The discharge could have been prevented by the exercise of reasonable control described in a certified SSMP for:
   - Proper management, operation and maintenance;
   - Adequate treatment facilities, sanitary sewer system facilities, and/or components with an appropriate design capacity, to reasonably prevent SSOs (e.g., adequately enlarging treatment or collection facilities to accommodate growth, infiltration and inflow (I/I), etc.);
   - Preventive maintenance (including cleaning and fats, oils, and grease (FOG) control);
   - Installation of adequate backup equipment; and
   - Inflow and infiltration prevention and control to the extent practicable.

   (vi) The sanitary sewer system design capacity is appropriate to reasonably prevent SSOs.

(vii) The Enrollee took all reasonable steps to stop and mitigate the impact of the discharge as soon as possible.

7. When a sanitary sewer overflow occurs, the Enrollee shall take all feasible steps and necessary remedial actions to 1) control or limit the volume of untreated or partially treated wastewater discharged, 2) terminate the discharge, and 3) recover as much of the wastewater discharged as possible for proper disposal, including any wash down water.

   The Enrollee shall implement all remedial actions to the extent they may be applicable to the discharge and not inconsistent with an emergency response plan, including the following:

   (i) Interception and rerouting of untreated or partially treated wastewater flows around the wastewater line failure;
   (ii) Vacuum truck recovery of sanitary sewer overflows and wash down water;
   (iii) Cleanup of debris at the overflow site;
   (iv) System modifications to prevent another SSO at the same location;
   (v) Adequate sampling to determine the nature and impact of the release; and
   (vi) Adequate public notification to protect the public from exposure to the SSO.

8. The Enrollee shall properly, manage, operate, and maintain all parts of the sanitary sewer system owned or operated by the Enrollee, and shall ensure that the system operators (including employees, contractors, or other agents) are adequately trained and possess adequate knowledge, skills, and abilities.

9. The Enrollee shall allocate adequate resources for the operation, maintenance, and repair of its sanitary sewer system, by establishing a proper rate structure, accounting mechanisms, and auditing procedures to ensure an adequate measure of revenues and expenditures. These procedures must be in compliance with applicable laws and regulations and comply with generally acceptable accounting practices.

10. The Enrollee shall provide adequate capacity to convey base flows and peak flows, including flows related to wet weather events. Capacity shall meet or exceed the design criteria as defined in the Enrollee's System Evaluation and Capacity Assurance Plan for all parts of the sanitary sewer system owned or operated by the Enrollee.

11. The Enrollee shall develop and implement a written Sewer System Management Plan (SSMP) and make it available to the State and/or Regional Water Board upon request. A copy of this document must be publicly available at the Enrollee's office and/or available on the Internet. This SSMP must be approved by the Enrollee's governing board at a public meeting.

12. In accordance with the California Business and Professions Code sections 6735, 7835, and 7835.1, all engineering and geologic evaluations and judgments shall be performed by or under the direction of registered professionals competent and proficient in the fields pertinent to the required activities. Specific elements of the SSMP that require professional evaluation and judgments shall be prepared by or under the direction of appropriately qualified professionals, and shall bear the professional(s)' signature and stamp.

13. The mandatory elements of the SSMP are specified below. However, if the Enrollee believes that any element of this section is not appropriate or applicable to the Enrollee's sanitary sewer system, the SSMP program does not need to address that element. The Enrollee must justify why that element is not applicable. The SSMP must be approved by the deadlines listed in the SSMP Time Schedule below.

Sewer System Management Plan (SSMP)

(i) **Goal**: The goal of the SSMP is to provide a plan and schedule to properly manage, operate, and maintain all parts of the sanitary sewer system. This will help reduce and prevent SSOs, as well as mitigate any SSOs that do occur.

(ii) **Organization**: The SSMP must identify:

(a) The name of the responsible or authorized representative as described in Section J of this Order.

(b) The names and telephone numbers for management, administrative, and maintenance positions responsible for implementing specific measures in the SSMP program. The SSMP must identify lines of authority through an organization chart or similar document with a narrative explanation; and

(c) The chain of communication for reporting SSOs, from receipt of a complaint or other information, including the person responsible for reporting SSOs to the State and Regional Water Board and other agencies if applicable (such as County Health Officer, County Environmental Health Agency, Regional Water Board, and/or State Office of Emergency Services (OES)).

(iii) **Legal Authority:** Each Enrollee must demonstrate, through sanitary sewer system use ordinances, service agreements, or other legally binding procedures, that it possesses the necessary legal authority to:

(a) Prevent illicit discharges into its sanitary sewer system (examples may include I/I, stormwater, chemical dumping, unauthorized debris and cut roots, etc.);

(b) Require that sewers and connections be properly designed and constructed;

(c) Ensure access for maintenance, inspection, or repairs for portions of the lateral owned or maintained by the Public Agency;

(d) Limit the discharge of fats, oils, and grease and other debris that may cause blockages, and

(e) Enforce any violation of its sewer ordinances.

(iv) **Operation and Maintenance Program**. The SSMP must include those elements listed below that are appropriate and applicable to the Enrollee's system:

(a) Maintain an up-to-date map of the sanitary sewer system, showing all gravity line segments and manholes, pumping facilities, pressure pipes and valves, and applicable stormwater conveyance facilities;

(b) Describe routine preventive operation and maintenance activities by staff and contractors, including a system for scheduling regular maintenance and cleaning of the sanitary sewer system with more frequent cleaning and maintenance targeted at known problem areas. The Preventative Maintenance (PM) program should have a system to document scheduled and conducted activities, such as work orders;

(c) Develop a rehabilitation and replacement plan to identify and prioritize system deficiencies and implement short-term and long-term rehabilitation actions to address each deficiency. The program should include regular visual and TV inspections of manholes and sewer pipes, and a system for ranking the condition of sewer pipes and scheduling rehabilitation. Rehabilitation and replacement should focus on sewer pipes that are at risk of collapse or prone to more frequent blockages due to pipe defects. Finally, the rehabilitation and replacement plan should include a capital improvement plan that addresses proper management and protection of the infrastructure assets. The plan shall include a time schedule for implementing the short- and long-term plans plus a schedule for developing the funds needed for the capital improvement plan;

(d) Provide training on a regular basis for staff in sanitary sewer system operations and maintenance, and require contractors to be appropriately trained; and

(e) Provide equipment and replacement part inventories, including identification of critical replacement parts.

(v) **Design and Performance Provisions**:

(a) Design and construction standards and specifications for the installation of new sanitary sewer systems, pump stations and other appurtenances; and for the rehabilitation and repair of existing sanitary sewer systems; and

(b) Procedures and standards for inspecting and testing the installation of new sewers, pumps, and other appurtenances and for rehabilitation and repair projects.

(vi) **Overflow Emergency Response Plan -** Each Enrollee shall develop and implement an overflow emergency response plan that identifies measures to protect public health and the environment. At a minimum, this plan must include the following:

(a) Proper notification procedures so that the primary responders and regulatory agencies are informed of all SSOs in a timely manner;

(b) A program to ensure an appropriate response to all overflows;

(c) Procedures to ensure prompt notification to appropriate regulatory agencies and other potentially affected entities (e.g. health agencies, Regional Water Boards, water suppliers, etc.) of all SSOs that potentially affect public health or reach the waters of the State in accordance with the MRP. All SSOs shall be reported in accordance with this MRP, the California Water Code, other State Law, and other applicable Regional Water Board WDRs or NPDES permit requirements. The SSMP should identify the officials who will receive immediate notification;

(d) Procedures to ensure that appropriate staff and contractor personnel are aware of and follow the Emergency Response Plan and are appropriately trained;

(e) Procedures to address emergency operations, such as traffic and crowd control and other necessary response activities; and

(f) A program to ensure that all reasonable steps are taken to contain and prevent the discharge of untreated and partially treated wastewater to waters of the United States and to minimize or correct any adverse impact on the environment resulting from the SSOs, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the discharge.

(vii) **FOG Control Program:** Each Enrollee shall evaluate its service area to determine whether a FOG control program is needed. If an Enrollee determines that a FOG program is not needed, the Enrollee must provide justification for why it is not needed. If FOG is found to be a problem, the Enrollee must prepare and implement a FOG source control program to reduce the amount of these substances discharged to the sanitary sewer system. This plan shall include the following as appropriate:

(a) An implementation plan and schedule for a public education outreach program that promotes proper disposal of FOG;

(b) A plan and schedule for the disposal of FOG generated within the sanitary sewer system service area. This may include a list of acceptable disposal facilities and/or additional facilities needed to adequately dispose of FOG generated within a sanitary sewer system service area;

(c) The legal authority to prohibit discharges to the system and identify measures to prevent SSOs and blockages caused by FOG;

(d) Requirements to install grease removal devices (such as traps or interceptors), design standards for the removal devices, maintenance requirements, BMP requirements, record keeping and reporting requirements;

(e) Authority to inspect grease producing facilities, enforcement authorities, and whether the Enrollee has sufficient staff to inspect and enforce the FOG ordinance;

(f) An identification of sanitary sewer system sections subject to FOG blockages and establishment of a cleaning maintenance schedule for each section; and

(g) Development and implementation of source control measures for all sources of FOG discharged to the sanitary sewer system for each section identified in (f) above.

(viii) **System Evaluation and Capacity Assurance Plan**: The Enrollee shall prepare and implement a capital improvement plan (CIP) that will provide hydraulic capacity of key sanitary sewer system elements for dry weather peak flow conditions, as well as the appropriate design storm or wet weather event. At a minimum, the plan must include:

(a) **Evaluation**: Actions needed to evaluate those portions of the sanitary sewer system that are experiencing or contributing to an SSO discharge caused by hydraulic deficiency. The evaluation must provide estimates of peak flows (including flows from SSOs

that escape from the system) associated with conditions similar to those causing overflow events, estimates of the capacity of key system components, hydraulic deficiencies (including components of the system with limiting capacity) and the major sources that contribute to the peak flows associated with overflow events;

(b) **Design Criteria:** Where design criteria do not exist or are deficient, undertake the evaluation identified in (a) above to establish appropriate design criteria; and

(c) **Capacity Enhancement Measures:** The steps needed to establish a short- and long-term CIP to address identified hydraulic deficiencies, including prioritization, alternatives analysis, and schedules. The CIP may include increases in pipe size, I/I reduction programs, increases and redundancy in pumping capacity, and storage facilities. The CIP shall include an implementation schedule and shall identify sources of funding.

(d) **Schedule:** The Enrollee shall develop a schedule of completion dates for all portions of the capital improvement program developed in (a)-(c) above. This schedule shall be reviewed and updated consistent with the SSMP review and update requirements as described in Section D. 14.

(ix) **Monitoring, Measurement, and Program Modifications:** The Enrollee shall:

(a) Maintain relevant information that can be used to establish and prioritize appropriate SSMP activities;

(b) Monitor the implementation and, where appropriate, measure the effectiveness of each element of the SSMP;

(c) Assess the success of the preventative maintenance program;

(d) Update program elements, as appropriate, based on monitoring or performance evaluations; and

(e) Identify and illustrate SSO trends, including: frequency, location, and volume.

(x) **SSMP Program Audits** - As part of the SSMP, the Enrollee shall conduct periodic internal audits, appropriate to the size of the system and the number of SSOs. At a minimum, these audits must occur every two years and a report must be prepared and kept on file. This audit shall focus on evaluating the effectiveness of the SSMP and the

Enrollee's compliance with the SSMP requirements identified in this subsection (D.13), including identification of any deficiencies in the SSMP and steps to correct them.

(xi) **Communication Program** – The Enrollee shall communicate on a regular basis with the public on the development, implementation, and performance of its SSMP. The communication system shall provide the public the opportunity to provide input to the Enrollee as the program is developed and implemented.

The Enrollee shall also create a plan of communication with systems that are tributary and/or satellite to the Enrollee's sanitary sewer system.

14. Both the SSMP and the Enrollee's program to implement the SSMP must be certified by the Enrollee to be in compliance with the requirements set forth above and must be presented to the Enrollee's governing board for approval at a public meeting. The Enrollee shall certify that the SSMP, and subparts thereof, are in compliance with the general WDRs within the time frames identified in the time schedule provided in subsection D.15, below.

    In order to complete this certification, the Enrollee's authorized representative must complete the certification portion in the Online SSO Database Questionnaire by checking the appropriate milestone box, printing and signing the automated form, and sending the form to:

    State Water Resources Control Board
    Division of Water Quality
    Attn: SSO Program Manager
    P.O. Box 100
    Sacramento, CA 95812

    The SSMP must be updated every five (5) years, and must include any significant program changes. Re-certification by the governing board of the Enrollee is required in accordance with D.14 when significant updates to the SSMP are made. To complete the re-certification process, the Enrollee shall enter the data in the Online SSO Database and mail the form to the State Water Board, as described above.

15. The Enrollee shall comply with these requirements according to the following schedule. This time schedule does not supersede existing requirements or time schedules associated with other permits or regulatory requirements.

Sewer System Management Plan Time Schedule

Task and Associated Section	**Completion Date**			
	Population > 100,000	Population between 100,000 and 10,000	Population between 10,000 and 2,500	Population < 2,500
Application for Permit Coverage ***Section C***	6 months after WDRs Adoption			
Reporting Program ***Section G***	6 months after WDRs Adoption[1]			
SSMP Development Plan and Schedule ***No specific Section***	9 months after WDRs Adoption[2]	12 months after WDRs Adoption[2]	15 months after WDRs Adoption[2]	18 months after WDRs Adoption[2]
Goals and Organization Structure ***Section D 13 (i) & (ii)***	12 months after WDRs Adoption[2]		18 months after WDRs Adoption[2]	
Overflow Emergency Response Program ***Section D 13 (vi)***	24 months after WDRs Adoption[2]	30 months after WDRs Adoption[2]	36 months after WDRs Adoption[2]	39 months after WDRs Adoption[2]
Legal Authority ***Section D 13 (iii)***				
Operation and Maintenance Program ***Section D 13 (iv)***				
Grease Control Program ***Section D 13 (vii)***				
Design and Performance ***Section D 13 (v)***	36 months after WDRs Adoption	39 months after WDRs Adoption	48 months after WDRs Adoption	51 months after WDRs Adoption
System Evaluation and Capacity Assurance Plan ***Section D 13 (viii)***				
Final SSMP, incorporating all of the SSMP requirements ***Section D 13***				

1. In the event that by July 1, 2006 the Executive Director is able to execute a memorandum of agreement (MOA) with the California Water Environment Association (CWEA) or discharger representatives outlining a strategy and time schedule for CWEA or another entity to provide statewide training on the adopted monitoring program, SSO database electronic reporting, and SSMP development, consistent with this Order, then the schedule of Reporting Program Section G shall be replaced with the following schedule:

Reporting Program ***Section G***	
Regional Boards 4, 8, and 9	8 months after WDRs Adoption
Regional Boards 1, 2, and 3	12 months after WDRs Adoption
Regional Boards 5, 6, and 7	16 months after WDRs Adoption

If this MOU is not executed by July 1, 2006, the reporting program time schedule will remain six (6) months for all regions and agency size categories.

2. In the event that the Executive Director executes the MOA identified in note 1 by July 1, 2006, then the deadline for this task shall be extended by six (6) months. The time schedule identified in the MOA must be consistent with the extended time schedule provided by this note. If the MOA is not executed by July 1, 2006, the six (6) month time extension will not be granted.

E. WDRs and SSMP AVAILABILITY

1. A copy of the general WDRs and the certified SSMP shall be maintained at appropriate locations (such as the Enrollee's offices, facilities, and/or Internet homepage) and shall be available to sanitary sewer system operating and maintenance personnel at all times.

F. ENTRY AND INSPECTION

1. The Enrollee shall allow the State or Regional Water Boards or their authorized representative, upon presentation of credentials and other documents as may be required by law, to:

    a. Enter upon the Enrollee's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this Order;

    b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order;

c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order; and

d. Sample or monitor at reasonable times, for the purposes of assuring compliance with this Order or as otherwise authorized by the California Water Code, any substances or parameters at any location.

G. GENERAL MONITORING AND REPORTING REQUIREMENTS

1. The Enrollee shall furnish to the State or Regional Water Board, within a reasonable time, any information that the State or Regional Water Board may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order. The Enrollee shall also furnish to the Executive Director of the State Water Board or Executive Officer of the applicable Regional Water Board, upon request, copies of records required to be kept by this Order.

2. The Enrollee shall comply with the attached Monitoring and Reporting Program No. 2006-0003 and future revisions thereto, as specified by the Executive Director. Monitoring results shall be reported at the intervals specified in Monitoring and Reporting Program No. 2006-0003. Unless superseded by a specific enforcement Order for a specific Enrollee, these reporting requirements are intended to replace other mandatory routine written reports associated with SSOs.

3. All Enrollees must obtain SSO Database accounts and receive a “Username” and “Password” by registering through the California Integrated Water Quality System (CIWQS). These accounts will allow controlled and secure entry into the SSO Database. Additionally, within 30days of receiving an account and prior to recording spills into the SSO Database, all Enrollees must complete the “Collection System Questionnaire”, which collects pertinent information regarding a Enrollee’s collection system. The “Collection System Questionnaire” must be updated at least every 12 months.

4. Pursuant to Health and Safety Code section 5411.5, any person who, without regard to intent or negligence, causes or permits any untreated wastewater or other waste to be discharged in or on any waters of the State, or discharged in or deposited where it is, or probably will be, discharged in or on any surface waters of the State, as soon as that person has knowledge of the discharge, shall immediately notify the local health officer of the discharge. Discharges of untreated or partially treated wastewater to storm drains and drainage channels, whether man-made or natural or concrete-lined, shall be reported as required above.

   Any SSO greater than 1,000 gallons discharged in or on any waters of the State, or discharged in or deposited where it is, or probably will be, discharged in or on any surface waters of the State shall also be reported to the Office of Emergency Services pursuant to California Water Code section 13271.

H. CHANGE IN OWNERSHIP

1. This Order is not transferable to any person or party, except after notice to the Executive Director. The Enrollee shall submit this notice in writing at least 30 days in advance of any proposed transfer. The notice must include a written agreement between the existing and new Enrollee containing a specific date for the transfer of this Order's responsibility and coverage between the existing Enrollee and the new Enrollee. This agreement shall include an acknowledgement that the existing Enrollee is liable for violations up to the transfer date and that the new Enrollee is liable from the transfer date forward.

I. INCOMPLETE REPORTS

1. If an Enrollee becomes aware that it failed to submit any relevant facts in any report required under this Order, the Enrollee shall promptly submit such facts or information by formally amending the report in the Online SSO Database.

J. REPORT DECLARATION

1. All applications, reports, or information shall be signed and certified as follows:

    (i) All reports required by this Order and other information required by the State or Regional Water Board shall be signed and certified by a person designated, for a municipality, state, federal or other public agency, as either a principal executive officer or ranking elected official, or by a duly authorized representative of that person, as described in paragraph (ii) of this provision. (For purposes of electronic reporting, an electronic signature and accompanying certification, which is in compliance with the Online SSO database procedures, meet this certification requirement.)

    (ii) An individual is a duly authorized representative only if:

        (a) The authorization is made in writing by a person described in paragraph (i) of this provision; and

        (b) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity.

K. CIVIL MONETARY REMEDIES FOR DISCHARGE VIOLATIONS

1. The California Water Code provides various enforcement options, including civil monetary remedies, for violations of this Order.

2. The California Water Code also provides that any person failing or refusing to furnish technical or monitoring program reports, as required under this Order, or

falsifying any information provided in the technical or monitoring reports is subject to civil monetary penalties.

L. SEVERABILITY

1. The provisions of this Order are severable, and if any provision of this Order, or the application of any provision of this Order to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this Order, shall not be affected thereby.

2. This order does not convey any property rights of any sort or any exclusive privileges. The requirements prescribed herein do not authorize the commission of any act causing injury to persons or property, nor protect the Enrollee from liability under federal, state or local laws, nor create a vested right for the Enrollee to continue the waste discharge.

CERTIFICATION

The undersigned Clerk to the State Water Board does hereby certify that the foregoing is a full, true, and correct copy of general WDRs duly and regularly adopted at a meeting of the State Water Resources Control Board held on May 2, 2006.

AYE: Tam M. Doduc
Gerald D. Secundy

NO: Arthur G. Baggett

ABSENT: None

ABSTAIN: None



Song Her
Clerk to the Board

Appendix B

STATE WATER BOARD ORDER NO.WQ 2013-0058-EXEC

STATE OF CALIFORNIA
WATER RESOURCES CONTROL BOARD
ORDER NO. WQ 2013-0058-EXEC

AMENDING MONITORING AND REPORTING PROGRAM FOR STATEWIDE GENERAL WASTE DISCHARGE REQUIREMENTS FOR SANITARY SEWER SYSTEMS

The State of California, Water Resources Control Board (hereafter State Water Board) finds:

1. The State Water Board is authorized to prescribe statewide general Waste Discharge Requirements (WDRs) for categories of discharges that involve the same or similar operations and the same or similar types of waste pursuant to Water Code section 13263(i).
2. Water Code section 13193 et seq. requires the Regional Water Quality Control Boards (Regional Water Boards) and the State Water Board (collectively, the Water Boards) to gather Sanitary Sewer Overflow (SSO) information and make this information available to the public, including but not limited to, SSO cause, estimated volume, location, date, time, duration, whether or not the SSO reached or may have reached waters of the state, response and corrective action taken, and an enrollee's contact information for each SSO event. An enrollee is defined as the public entity having legal authority over the operation and maintenance of, or capital improvements to, a sanitary sewer system greater than one mile in length.
3. Water Code section 13271, *et seq.* requires notification to the California Office of Emergency Services (Cal OES), formerly the California Emergency Management Agency, for certain unauthorized discharges, including SSOs.
4. On May 2, 2006, the State Water Board adopted Order 2006-0003-DWQ, "Statewide Waste Discharge Requirements for Sanitary Sewer Systems"[1] (hereafter SSS WDRs) to comply with Water Code section 13193 and to establish the framework for the statewide SSO Reduction Program.
5. Subsection G.2 of the SSS WDRs and the Monitoring and Reporting Program (MRP) provide that the Executive Director may modify the terms of the MRP at any time.
6. On February 20, 2008, the State Water Board Executive Director adopted a revised MRP for the SSS WDRs to rectify early notification deficiencies and ensure that first responders are notified in a timely manner of SSOs discharged into waters of the state.
7. When notified of an SSO that reaches a drainage channel or surface water of the state, Cal OES, pursuant to Water Code section 13271(a)(3), forwards the SSO notification information[2] to local government agencies and first responders including local public health officials and the applicable Regional Water Board. Receipt of notifications for a single SSO event from both the SSO reporter and Cal OES is duplicative. To address this, the SSO notification requirements added by the February 20, 2008 MRP revision are being removed in this MRP revision.

[1] Available for download at:
http://www.waterboards.ca.gov/board decisions/adopted orders/water quality/2006/wgo/wgo2006 0003.pdf

[2] Cal OES Hazardous Materials Spill Reports available Online at:
http://w3.calema.ca.gov/operational/malhaz.nsf/$defaultview and
http://w3.calema.ca.gov/operational/malhaz.nsf

8. In the February 28, 2008 Memorandum of Agreement between the State Water Board and the California Water and Environment Association (CWEA), the State Water Board committed to re- designing the CIWQS[3] Online SSO Database to allow "event" based SSO reporting versus the original "location" based reporting. Revisions to this MRP and accompanying changes to the CIWQS Online SSO Database will implement this change by allowing for multiple SSO appearance points to be associated with each SSO event caused by a single asset failure.
9. Based on stakeholder input and Water Board staff experience implementing the SSO Reduction Program, SSO categories have been revised in this MRP. In the prior version of the MRP, SSOs have been categorized as Category 1 or Category 2. This MRP implements changes to SSO categories by adding a Category 3 SSO type. This change will improve data management to further assist Water Board staff with evaluation of high threat and low threat SSOs by placing them in unique categories (i.e., Category 1 and Category 3, respectively). This change will also assist enrollees in identifying SSOs that require Cal OES notification.
10. Based on over six years of implementation of the SSS WDRs, the State Water Board concludes that the February 20, 2008 MRP must be updated to better advance the SSO Reduction Program[4] objectives, assess compliance, and enforce the requirements of the SSS WDRs.

IT IS HEREBY ORDERED THAT:

Pursuant to the authority delegated by Water Code section 13267(f), Resolution 2002-0104, and Order 2006-0003-DWQ, the MRP for the SSS WDRs (Order 2006-0003-DWQ) is hereby amended as shown in Attachment A and shall be effective on September 9, 2013.

8/6/13
Date

Thomas Howard
Executive Director

[3] California Integrated Water Quality System (CIWQS) publicly available at http://www.waterboards .ca.gov/ciwqs/publicreports.shtml

[4] Statewide Sanitary Sewer Overflow Reduction Program information is available at: http://www.waterboards.ca.gov/water issues/programs/sso/

ATTACHMENT A

STATE WATER RESOURCES CONTROL BOARD
ORDER NO. WQ 2013-0058-EXEC

AMENDING MONITORING AND REPORTING PROGRAM
FOR
STATEWIDE GENERAL WASTE DISCHARGE REQUIREMENTS FOR
SANITARY SEWER SYSTEMS

This Monitoring and Reporting Program (MRP) establishes monitoring, record keeping, reporting and public notification requirements for Order 2006-0003-DWQ, "Statewide General Waste Discharge Requirements for Sanitary Sewer Systems" (SSS WDRs). This MRP shall be effective from September 9, 2013 until it is rescinded. The Executive Director may make revisions to this MRP at any time. These revisions may include a reduction or increase in the monitoring and reporting requirements. All site specific records and data developed pursuant to the SSS WDRs and this MRP shall be complete, accurate, and justified by evidence maintained by the enrollee. Failure to comply with this MRP may subject an enrollee to civil liabilities of up to $5,000 a day per violation pursuant to Water Code section 13350; up to $1,000 a day per violation pursuant to Water Code section 13268; or referral to the Attorney General for judicial civil enforcement. The State Water Resources Control Board (State Water Board) reserves the right to take any further enforcement action authorized by law.

A. SUMMARY OF MRP REQUIREMENTS

Table 1 – Spill Categories and Definitions

CATEGORIES	**DEFINITIONS** [see Section A on page 5 of Order 2006-0003-DWQ, for Sewer Overflow (SSO) definition]
CATEGORY 1	Discharges of untreated or partially treated wastewater of **any volume** resulting from an enrollee's sanitary sewer system failure or flow condition that: • Reach surface water and/or reach a drainage channel tributary to a surface water; or • Reach a Municipal Separate Storm Sewer System (MS4) and are not fully captured and returned to the sanitary sewer system or not otherwise captured and disposed of properly. Any volume of wastewater not recovered from the MS4 is considered to have reached surface water unless the storm drain system discharges to a dedicated storm water or groundwater infiltration basin (e.g., infiltration pit, percolation pond).
CATEGORY 2	Discharges of untreated or partially treated wastewater of **1,000 gallons or greater** resulting from an enrollee's sanitary sewer system failure or flow condition that **do not** reach surface water, a drainage channel, or a MS4 unless the entire SSO discharged to the storm drain system is fully recovered and disposed of properly.
CATEGORY 3	All other discharges of untreated or partially treated wastewater resulting from an enrollee's sanitary sewer system failure or flow condition.

CATEGORIES	**DEFINITIONS** [see Section A on page 5 of Order 2006-0003-DWQ, for Sewer Overflow (SSO) definition]
PRIVATE LATERAL SEWAGE DISCHARGE (PLSD)	Discharges of untreated or partially treated wastewater resulting from blockages or other problems **within a privately owned sewer lateral** connected to the enrollee's sanitary sewer system or from other private sewer assets. PLSDs that the enrollee becomes aware of may be voluntarily reported to the California Integrated Water Quality System (CIWQS) Online SSO Database.

Table 2 – Notification, Reporting, Monitoring, and Record Keeping Requirements

ELEMENT	REQUIREMENT	METHOD
NOTIFICATION (see section B of MRP)	• Within two hours of becoming aware of any Category 1 SSO **greater than or equal to 1,000 gallons discharged to surface water or spilled in a location where it probably will be discharged to surface water**, notify the California Office of Emergency Services (Cal OES) and obtain a notification control number.	Call Cal OES at: **(800) 852-7550**
REPORTING (see section C of MRP)	• Category 1 SSO: Submit draft report within three business days of becoming aware of the SSO and certify within 15 calendar days of SSO end date. • Category 2 SSO: Submit draft report within 3 business days of becoming aware of the SSO and certify within 15 calendar days of the SSO end date. • Category 3 SSO: Submit certified report within 30 calendar days of the end of month in which SSO the occurred. • SSO Technical Report: Submit within 45 calendar days after the end date of any Category 1 SSO in which 50,000 gallons or greater are spilled to surface waters. • "No Spill" Certification: Certify that no SSOs occurred within 30 calendar days of the end of the month or, if reporting quarterly, the quarter in which no SSOs occurred. • Collection System Questionnaire: Update and certify every 12 months.	Enter data into the CIWQS Online SSO Database (http://ciwqs.waterboards.ca.gov/), certified by enrollee's Legally Responsible Official(s).
WATER QUALITY MONITORING (see section D of MRP)	• Conduct water quality sampling **within 48 hours** after initial SSO notification for Category 1 SSOs in which 50,000 gallons or greater are spilled to surface waters.	Water quality results are required to be uploaded into CIWQS for Category 1 SSOs in which 50,000 gallons or greater are spilled to surface waters.

RECORD KEEPING (see section E of MRP)	• SSO event records. • Records documenting Sanitary Sewer Management Plan (SSMP) implementation and changes/updates to the SSMP. • Records to document Water Quality Monitoring for SSOs of 50,000 gallons or greater spilled to surface waters. • Collection system telemetry records if relied upon to document and/or estimate SSO Volume.	Self-maintained records shall be available during inspections or upon request.

B. NOTIFICATION REQUIREMENTS

Although Regional Water Quality Control Boards (Regional Water Boards) and the State Water Board (collectively, the Water Boards) staff do not have duties as first responders, this MRP is an appropriate mechanism to ensure that the agencies that have first responder duties are notified in a timely manner in order to protect public health and beneficial uses.

1. For any Category 1 SSO greater than or equal to 1,000 gallons that results in a discharge to a surface water or spilled in a location where it probably will be discharged to surface water, either directly or by way of a drainage channel or MS4, the enrollee shall, as soon as possible, but not later than two (2) hours after (A) the enrollee has knowledge of the discharge, (B) notification is possible, and (C) notification can be provided without substantially impeding cleanup or other emergency measures, notify the Cal OES and obtain a notification control number.
2. To satisfy notification requirements for each applicable SSO, the enrollee shall provide the information requested by Cal OES before receiving a control number. Spill information requested by Cal OES may include:
   i. Name of person notifying Cal OES and direct return phone number.
   ii. Estimated SSO volume discharged (gallons).
   iii. If ongoing, estimated SSO discharge rate (gallons per minute).
   iv. SSO Incident Description:
      a. Brief narrative.
      b. On-scene point of contact for additional information (name and cell phone number).
      c. Date and time enrollee became aware of the SSO.
      d. Name of sanitary sewer system agency causing the SSO.
      e. SSO cause (if known).
   v. Indication of whether the SSO has been contained.
   vi. Indication of whether surface water is impacted.
   vii. Name of surface water impacted by the SSO, if applicable.
   viii. Indication of whether a drinking water supply is or may be impacted by the SSO.
   ix. Any other known SSO impacts.
   x. SSO incident location (address, city, state, and zip code).
3. Following the initial notification to Cal OES and until such time that an enrollee certifies the SSO report in the CIWQS Online SSO Database, the enrollee shall provide updates to Cal OES regarding substantial changes to the estimated volume of untreated or partially treated sewage discharged and any substantial change(s) to known impact(s).

4. PLSDs: The enrollee is strongly encouraged to notify Cal OES of discharges greater than or equal to 1,000 gallons of untreated or partially treated wastewater that result or may result in a discharge to surface water resulting from failures or flow conditions within a privately owned sewer lateral or from other private sewer asset(s) if the enrollee becomes aware of the PLSD.

C. REPORTING REQUIREMENTS

1. **CIWQS Online SSO Database Account:** All enrollees shall obtain a CIWQS Online SSO Database account and receive a "Username" and "Password" by registering through CIWQS. These accounts allow controlled and secure entry into the CIWQS Online SSO Database.
2. **SSO Mandatory Reporting Information:** For reporting purposes, if one SSO event results in multiple appearance points in a sewer system asset, the enrollee shall complete one SSO report in the CIWQS Online SSO Database which includes the GPS coordinates for the location of the SSO appearance point closest to the failure point, blockage or location of the flow condition that caused the SSO, and provide descriptions of the locations of all other discharge points associated with the SSO event.
3. **SSO Categories**

   i. **Category 1** – Discharges of untreated or partially treated wastewater of any volume resulting from an enrollee's sanitary sewer system failure or flow condition that:

      a. Reach surface water and/or reach a drainage channel tributary to a surface water; or

      b. Reach a MS4 and are not fully captured and returned to the sanitary sewer system or not otherwise captured and disposed of properly. Any volume of wastewater not recovered from the MS4 is considered to have reached surface water unless the storm drain system discharges to a dedicated storm water or groundwater infiltration basin (e.g., infiltration pit, percolation pond).

   ii. **Category 2** – Discharges of untreated or partially treated wastewater greater than or equal to 1,000 gallons resulting from an enrollee's sanitary sewer system failure or flow condition that does not reach a surface water, a drainage channel, or the MS4 unless the entire SSO volume discharged to the storm drain system is fully recovered and disposed of properly.

   iii. **Category 3 –** All other discharges of untreated or partially treated wastewater resulting from an enrollee's sanitary sewer system failure or flow condition.

4. **Sanitary Sewer Overflow Reporting to CIWQS - Timeframes**

   i. **Category 1 and Category 2 SSOs** – All SSOs that meet the above criteria for Category 1 or Category 2 SSOs shall be reported to the CIWQS Online SSO Database:

      a. Draft reports for Category 1 and Category 2 SSOs shall be submitted to the CIWQS Online SSO Database within three (3) business days of the enrollee becoming aware of the SSO. Minimum information that shall be reported in a draft Category 1 SSO report shall include all information identified in section 8.i.a. below. Minimum information that shall be reported in a Category 2 SSO draft report shall include all information identified in section 8.i.c below.

b. A final Category 1 or Category 2 SSO report shall be certified through the CIWQS Online SSO Database within 15 calendar days of the end date of the SSO. Minimum information that shall be certified in the final Category 1 SSO report shall include all information identified in section 8.i.b below. Minimum information that shall be certified in a final Category 2 SSO report shall include all information identified in section 8.i.d below.

ii. **Category 3 SSOs** – All SSOs that meet the above criteria for Category 3 SSOs shall be reported to the CIWQS Online SSO Database and certified within 30 calendar days after the end of the calendar month in which the SSO occurs (e.g., all Category 3 SSOs occurring in the month of February shall be entered into the database and certified by March 30). Minimum information that shall be certified in a final Category 3 SSO report shall include all information identified in section 8.i.e below.

iii. **"No Spill" Certification** – If there are no SSOs during the calendar month, the enrollee shall either 1) certify, within 30 calendar days after the end of each calendar month, a "No Spill" certification statement in the CIWQS Online SSO Database certifying that there were no SSOs for the designated month, or 2) certify, quarterly within 30 calendar days after the end of each quarter, "No Spill" certification statements in the CIWQS Online SSO Database certifying that there were no SSOs for each month in the quarter being reported on. For quarterly reporting, the quarters are Q1 - January/ February/ March, Q2 - April/May/June, Q3 - July/August/September, and Q4 - October/November/December.

If there are no SSOs during a calendar month but the enrollee reported a PLSD, the enrollee shall still certify a "No Spill" certification statement for that month.

iv. **Amended SSO Reports** – The enrollee may update or add additional information to a certified SSO report within 120 calendar days after the SSO end date by amending the report or by adding an attachment to the SSO report in the CIWQS Online SSO Database. SSO reports certified in the CIWQS Online SSO Database prior to the adoption date of this MRP may only be amended up to 120 days after the effective date of this MRP. After 120 days, the enrollee may contact the SSO Program Manager to request to amend an SSO report if the enrollee also submits justification for why the additional information was not available prior to the end of the 120 days.

5. **SSO Technical Report**

The enrollee shall submit an SSO Technical Report in the CIWQS Online SSO Database within 45 calendar days of the SSO end date for any SSO in which 50,000 gallons or greater are spilled to surface waters. This report, which does not preclude the Water Boards from requiring more detailed analyses if requested, shall include at a minimum, the following:

i. **Causes and Circumstances of the SSO:**

a. Complete and detailed explanation of how and when the SSO was discovered.

b. Diagram showing the SSO failure point, appearance point(s), and final destination(s).

c. Detailed description of the methodology employed and available data used to calculate the volume of the SSO and, if applicable, the SSO volume recovered.

d. Detailed description of the cause(s) of the SSO.

e. Copies of original field crew records used to document the SSO.

f. Historical maintenance records for the failure location.

ii. **Enrollee's Response to SSO:**

a. Chronological narrative description of all actions taken by enrollee to terminate the spill.

b. Explanation of how the SSMP Overflow Emergency Response plan was implemented to respond to and mitigate the SSO.

c. Final corrective action(s) completed and/or planned to be completed, including a schedule for actions not yet completed.

iii. **Water Quality Monitoring:**

a. Description of all water quality sampling activities conducted including analytical results and evaluation of the results.

b. Detailed location map illustrating all water quality sampling points.

6. **PLSDs**

Discharges of untreated or partially treated wastewater resulting from blockages or other problems within a privately owned sewer lateral connected to the enrollee's sanitary sewer system or from other private sanitary sewer system assets may be voluntarily reported to the CIWQS Online SSO Database.

i. The enrollee is also encouraged to provide notification to Cal OES per section B above when a PLSD greater than or equal to 1,000 gallons has or may result in a discharge to surface water. For any PLSD greater than or equal to 1,000 gallons regardless of the spill destination, the enrollee is also encouraged to file a spill report as required by Health and Safety Code section 5410 et. seq. and Water Code section 13271, or notify the responsible party that notification and reporting should be completed as specified above and required by State law.

ii. If a PLSD is recorded in the CIWQS Online SSO Database, the enrollee must identify the sewage discharge as occurring and caused by a private sanitary sewer system asset and should identify a responsible party (other than the enrollee), if known. Certification of PLSD reports by enrollees is not required.

7. **CIWQS Online SSO Database Unavailability**

In the event that the CIWQS Online SSO Database is not available, the enrollee must fax or e-mail all required information to the appropriate Regional Water Board office in accordance with the time schedules identified herein. In such event, the enrollee must also enter all required information into the CIWQS Online SSO Database when the database becomes available.

8. **Mandatory Information to be Included in CIWQS Online SSO Reporting**

All enrollees shall obtain a CIWQS Online SSO Database account and receive a "Username" and "Password" by registering through CIWQS which can be reached at CIWQS@waterboards.ca.gov or by calling (866) 792-4977, M-F, 8 A.M. to 5 P.M. These accounts will allow controlled and secure entry into the CIWQS Online SSO Database. Additionally, within thirty (30) days of initial enrollment and prior to recording SSOs into the CIWQS Online SSO Database, all enrollees must complete a Collection System Questionnaire (Questionnaire). The Questionnaire shall be updated at least once every 12 months.

i. **SSO Reports**

At a minimum, the following mandatory information shall be reported prior to finalizing and certifying an SSO report for each category of SSO:

a. **Draft Category 1 SSOs**: At a minimum, the following mandatory information shall be reported for a draft Category 1 SSO report:

1. SSO Contact Information: Name and telephone number of enrollee contact person who can answer specific questions about the SSO being reported.
2. SSO Location Name.
3. Location of the overflow event (SSO) by entering GPS coordinates. If a single overflow event results in multiple appearance points, provide GPS coordinates for the appearance point closest to the failure point and describe each additional appearance point in the SSO appearance point explanation field.
4. Whether or not the SSO reached surface water, a drainage channel, or entered and was discharged from a drainage structure.
5. Whether or not the SSO reached a municipal separate storm drain system.
6. Whether or not the total SSO volume that reached a municipal separate storm drain system was fully recovered.
7. Estimate of the SSO volume, inclusive of all discharge point(s).
8. Estimate of the SSO volume that reached surface water, a drainage channel, or was not recovered from a storm drain.
9. Estimate of the SSO volume recovered (if applicable).
10. Number of SSO appearance point(s).
11. Description and location of SSO appearance point(s). If a single sanitary sewer system failure results in multiple SSO appearance points, each appearance point must be described.
12. SSO start date and time.
13. Date and time the enrollee was notified of, or self-discovered, the SSO.
14. Estimated operator arrival time.
15. For spills greater than or equal to 1,000 gallons, the date and time Cal OES was called.

16. For spills greater than or equal to 1,000 gallons, the Cal OES control number.

b. **Certified Category 1 SSOs:** At a minimum, the following mandatory information shall be reported for a certified Category 1 SSO report, in addition to all fields in section 8.i.a:

1. Description of SSO destination(s).
2. SSO end date and time.
3. SSO causes (mainline blockage, roots, etc.).
4. SSO failure point (main, lateral, etc.).
5. Whether or not the spill was associated with a storm event.
6. Description of spill corrective action, including steps planned or taken to reduce, eliminate, and prevent reoccurrence of the overflow; and a schedule of major milestones for those steps.
7. Description of spill response activities.
8. Spill response completion date.
9. Whether or not there is an ongoing investigation, the reasons for the investigation and the expected date of completion.
10. Whether or not a beach closure occurred or may have occurred as a result of the SSO.
11. Whether or not health warnings were posted as a result of the SSO.
12. Name of beach(es) closed and/or impacted. If no beach was impacted, NA shall be selected.
13. Name of surface water(s) impacted.
14. If water quality samples were collected, identify parameters the water quality samples were analyzed for. If no samples were taken, NA shall be selected.
15. If water quality samples were taken, identify which regulatory agencies received sample results (if applicable). If no samples were taken, NA shall be selected.
16. Description of methodology(ies) and type of data relied upon for estimations of the SSO volume discharged and recovered.
17. SSO Certification: Upon SSO Certification, the CIWQS Online SSO Database will issue a final SSO identification (ID) number.

c. **Draft Category 2 SSOs:** At a minimum, the following mandatory information shall be reported for a draft Category 2 SSO report:

1. Items 1-14 in section 8.i.a above for Draft Category 1 SSO.

d. **Certified Category 2 SSOs:** At a minimum, the following mandatory information shall be reported for a certified Category 2 SSO report:

1. Items 1-14 in section 8.i.a above for Draft Category 1 SSO and Items 1-9, and 17 in section 8.i.b above for Certified Category 1 SSO.

e. **Certified Category 3 SSOs:** At a minimum, the following mandatory information shall be reported for a certified Category 3 SSO report:

1. Items 1-14 in section 8.i.a above for Draft Category 1 SSO and Items 1-5, and 17 in section 8.i.b above for Certified Category 1 SSO.

ii. **Reporting SSOs to Other Regulatory Agencies**

These reporting requirements do not preclude an enrollee from reporting SSOs to other regulatory agencies pursuant to state law. In addition, these reporting requirements do not replace other Regional Water Board notification and reporting requirements for SSOs.

iii. **Collection System Questionnaire**

The required Questionnaire (see subsection G of the SSS WDRs) provides the Water Boards with site-specific information related to the enrollee's sanitary sewer system. The enrollee shall complete and certify the Questionnaire at least every 12 months to facilitate program implementation, compliance assessment, and enforcement response.

iv. **SSMP Availability**

The enrollee shall provide the publicly available internet web site address to the CIWQS Online SSO Database where a downloadable copy of the enrollee's approved SSMP, critical supporting documents referenced in the SSMP, and proof of local governing board approval of the SSMP is posted. If all of the SSMP documentation listed in this subsection is not publicly available on the Internet, the enrollee shall comply with the following procedure:

a. Submit an **electronic** copy of the enrollee's approved SSMP, critical supporting documents referenced in the SSMP, and proof of local governing board approval of the SSMP to the State Water Board, within 30 days of that approval and within 30 days of any subsequent SSMP re-certifications, to the following mailing address:

State Water Resources Control Board
Division of Water Quality
Attn: SSO Program Manager
1001 I Street, 15th Floor, Sacramento, CA 95814

D. WATER QUALITY MONITORING REQUIREMENTS:

To comply with subsection D.7(v) of the SSS WDRs, the enrollee shall develop and implement an SSO Water Quality Monitoring Program to assess impacts from SSOs to surface waters in which 50,000 gallons or greater are spilled to surface waters. The SSO Water Quality Monitoring Program, shall, at a minimum:

1. Contain protocols for water quality monitoring.
2. Account for spill travel time in the surface water and scenarios where monitoring may not be possible (e.g. safety, access restrictions, etc.).
3. Require water quality analyses for ammonia and bacterial indicators to be performed by an accredited or certified laboratory.
4. Require monitoring instruments and devices used to implement the SSO Water Quality Monitoring Program to be properly maintained and calibrated, including any records to document maintenance and calibration, as necessary, to ensure their continued accuracy.
5. Within 48 hours of the enrollee becoming aware of the SSO, require water quality sampling for, at a minimum, the following constituents:
    i. Ammonia
    ii. Appropriate Bacterial indicator(s) per the applicable Basin Plan water quality objective or Regional Board direction which may include total and fecal coliform, enterococcus, and e-coli.

E. RECORD KEEPING REQUIREMENTS:

The following records shall be maintained by the enrollee for a minimum of five (5) years and shall be made available for review by the Water Boards during an onsite inspection or through an information request:

1. General Records: The enrollee shall maintain records to document compliance with all provisions of the SSS WDRs and this MRP for each sanitary sewer system owned including any required records generated by an enrollee's sanitary sewer system contractor(s).
2. SSO Records: The enrollee shall maintain records for each SSO event, including but not limited to:

    i. Complaint records documenting how the enrollee responded to all notifications of possible or actual SSOs, both during and after business hours, including complaints that do not result in SSOs. Each complaint record shall, at a minimum, include the following information:

        a. Date, time, and method of notification.
        b. Date and time the complainant or informant first noticed the SSO.
        c. Narrative description of the complaint, including any information the caller can provide regarding whether or not the complainant or informant reporting the potential SSO knows if the SSO has reached surface waters, drainage channels or storm drains.
        d. Follow-up return contact information for complainant or informant for each complaint received, if not reported anonymously.
        e. Final resolution of the complaint.

ii. Records documenting steps and/or remedial actions undertaken by enrollee, using all available information, to comply with section D.7 of the SSS WDRs.

iii. Records documenting how all estimate(s) of volume(s) discharged and, if applicable, volume(s) recovered were calculated.

3. Records documenting all changes made to the SSMP since its last certification indicating when a subsection(s) of the SSMP was changed and/or updated and who authorized the change or update. These records shall be attached to the SSMP.

4. Electronic monitoring records relied upon for documenting SSO events and/or estimating the SSO volume discharged, including, but not limited to records from:

i. Supervisory Control and Data Acquisition (SCADA) systems

ii. Alarm system(s)

iii. Flow monitoring device(s) or other instrument(s) used to estimate wastewater levels, flow rates and/or volumes.

F. CERTIFICATION

1. All information required to be reported into the CIWQS Online SSO Database shall be certified by a person designated as described in subsection J of the SSS WDRs. This designated person is also known as a Legally Responsible Official (LRO). An enrollee may have more than one LRO.
2. Any designated person (i.e. an LRO) shall be registered with the State Water Board to certify reports in accordance with the CIWQS protocols for reporting.
3. Data Submitter (DS): Any enrollee employee or contractor may enter draft data into the CIWQS Online SSO Database on behalf of the enrollee if authorized by the LRO and registered with the State Water Board. However, only LROs may certify reports in CIWQS.
4. The enrollee shall maintain continuous coverage by an LRO. Any change of a registered LRO or DS (e.g., retired staff), including deactivation or a change to the LRO's or DS's contact information, shall be submitted by the enrollee to the State Water Board within 30 days of the change by calling (866) 792-4977 or e-mailing help@ciwqs.waterboards.ca.gov.
5. A registered designated person (i.e., an LRO) shall certify all required reports under penalty of perjury laws of the state as stated in the CIWQS Online SSO Database at the time of certification.

CERTIFICATION

The undersigned Clerk to the Board does hereby certify that the foregoing is a full, true, and correct copy of an order amended by the Executive Director of the State Water Resources Control Board.

7/30/13
Date

Jeanine Townsend
Clerk to the Board

Appendix C

CONTACT INFORMATION

Table C.1 Contact Information

Position	Name	Phone	Email
Public Works Director / City Engineer	Chris Lamm	831-438-5854	clamm@scottsvalley.org
Wastewater Division Manager	Kati King	831-438-0732	kking@scottsvalley.org
Senior Wastewater Operator	Are Soto	831-438-0732	asoto@scottsvalley.org
Wastewater Operator	Gunnar Dibenedetto	831-438-0732	
Wastewater Operator Grade I	Tyler Hebard	831-438-0732	thebard@scottsvalley.org
Wastewater Operator Grade I	Justin Granados	831-438-0732	jgranados@scottsvalley.org
Source Control Inspector	Josephine Fleming	831-706-7384	jo.fleming@envirocentives.com
Environmental Compliance Inspector	Sheila Peck	--	speck@environmentalin.com
Civil Engineer	Chris Lamm	831-438-5854	clamm@scottsvalley.org
Engineering Associate	Kimarie Jones	831-438-5854	kjones@scottsvalley.org
Engineering Associate	Athena Cheung	831-438-5854	acheung@scottsvalley.org

Appendix D

2021 INSPECTION PROGRAM

Appendix E

LIFT STATION CONDITION ASSESSMENT



City of Scotts Valley
SSMP and Sewer Master Plan

Technical Memorandum 1
LIFT STATION CONDITION ASSESSMENT

DRAFT | February 2020

carollo

City of Scotts Valley
SSMP and Sewer Master Plan

Technical Memorandum 1
LIFT STATION CONDITION ASSESSMENT

DRAFT | February 2020

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Abbreviations

ATS	automatic transfer switch
Carollo	Carollo Engineers, Inc.
CIP	capital improvement project
City	City of Scotts Valley
SSMP	Sewer System Management Plan
SSO	sewer overflow
TM	Technical Memorandum
VFDs	frequency drives

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Technical Memorandum 1

LIFT STATION CONDITION ASSESSMENT

This technical memorandum (TM) presents a summary of the visual condition assessment of the City's sewer lift stations for the City of Scotts Valley (City) Sewer System Management Plan (SSMP) and Sewer Master Plan project. This TM is the basis for the improvement recommendations presented in the City's SSMP report.

1.1 Introduction

Carollo conducted a visual condition assessment of the City's seven existing lift stations to supplement the hydraulic and capacity evaluations of the sewer system. The condition assessment of the lift stations had two primary objectives:

- Assess the physical condition of the equipment and structures of each station and identify any potential code violations.
- Develop condition-related improvement projects for the existing lift stations.

The findings from the condition assessment are included in the 20-year capital improvement program (CIP) that combines capacity and condition related improvements required to provide adequate sewer system service to existing and future City customers through buildout of the City's general plan.

1.2 Condition Assessment Overview

The condition assessment team was tasked with identifying current deficiencies and condition issues related to concrete structures, pipes, valves, gates, pumps, motors, electrical equipment, station configuration, and station appurtenances based on visual observations and input from City staff. The assessment was performed only on station components which were readily visible at the time of the assessment. Therefore, the City's force mains were not included in the assessment. The focus of the condition assessment was to identify capital improvement projects and develop the general funding requirement over the 20-year planning period. The assessment was intended as a high-level screening for significant issues, not a comprehensive condition evaluation of all facility components and maintenance needs.

1.2.1 Assessed Stations

The visual condition assessment was conducted on January 30 and 31, 2019. Assessments were performed on the following seven lift stations:

- Bethany.
- Carbonera.
- Glen Canyon.
- Granite Creek.
- Montevalle.
- Sunset Terrace.
- Susan Lane.

Figure 1.1 is a map of the assessed lift stations.

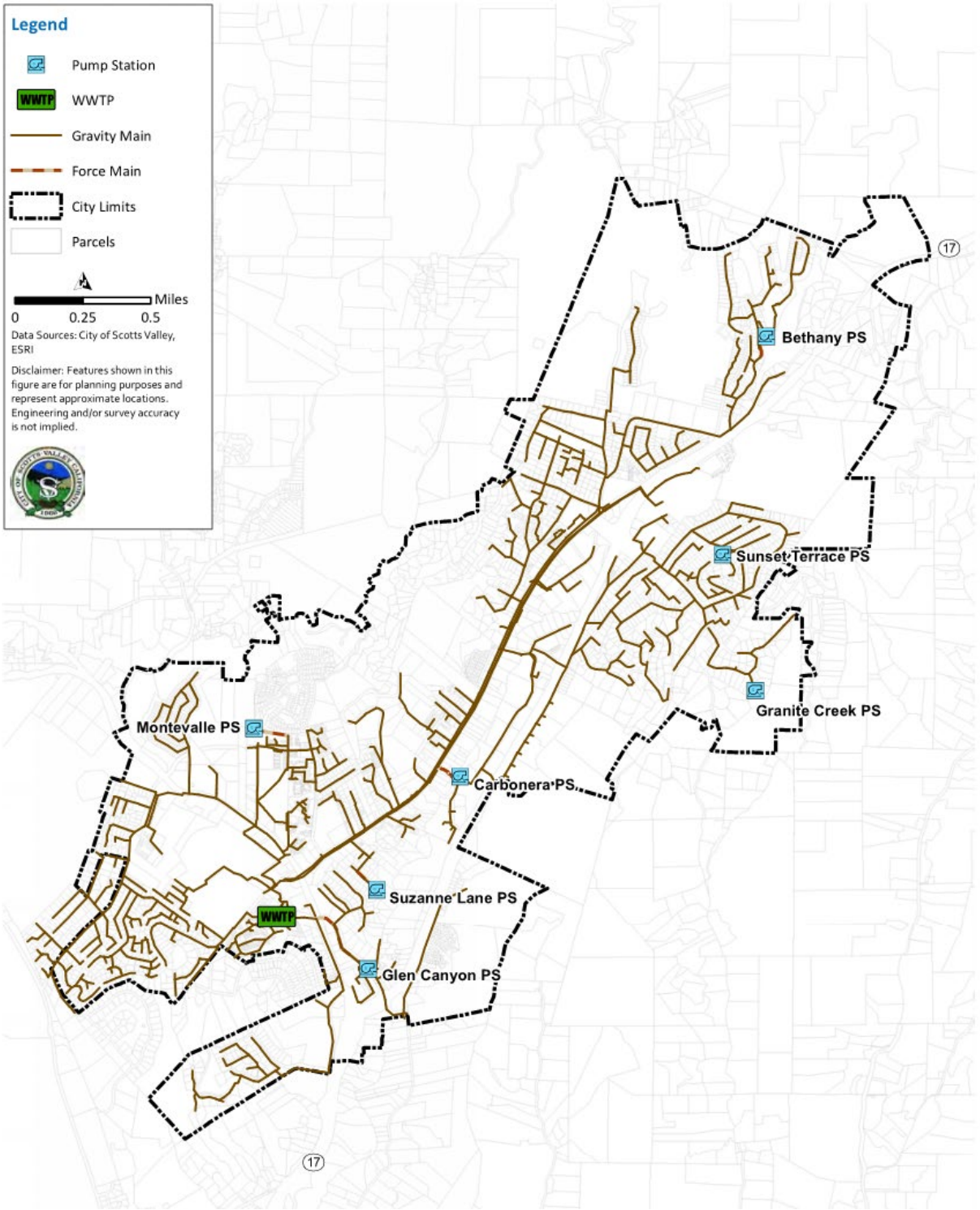


Figure 1.1 Lift Station Map

1.2.2 Assessment Team

The assessment was conducted by Carollo Engineers, Inc.'s (Carollo) condition assessment lead, David Baranowski, and civil engineer specializing in water and wastewater, Eric McGrath. The team was accompanied by the City's former Superintendent of Wastewater Operations, Jason Daniels, and other members of the City's operations staff.

1.2.3 Available Information

Background information about each station was provided by City staff. Prior to visiting the stations, the Carollo team met with City staff to learn the background of each station and to learn about any problems or deficiencies at each station from an operational perspective.

Additional information provided included:

- Photographs of available station as-built drawings.
- Photographs of pump nameplates.
- Copies of purchase orders.
- Handwritten notes from City staff of pump specs.

No list of assets was available prior to the assessment. The Carollo team documented the major assets while at each site. A list of assets is included with the findings for each station.

1.2.4 Assessment Procedure

The assessment team separated their assessment findings and recommendations into three aspects of the station.

- Condition and operation of equipment
  - This includes any pumps, motors, piping, valves, flow meters, electrical equipment, instrumentation and controls, backup generators, and other miscellaneous equipment at the station.
- Condition of structures and buildings
  - This includes any wet wells, dry well valve and meter vaults, buildings, roofs, and hatches.
- Condition of the site and grounds
  - This includes any pavement or concrete, perimeter fencing or walls, and security features. This also includes findings related to safety of the City staff and public, potential code violations, and concerns of flooding.

The assessment team applied the following 1 to 5 scoring system to rate each of these aspects for each lift station.

- **1 (Excellent)** – New or like new condition, no past or present issues, no improvements expected to be needed in the next 20 years.
- **2 (Good)** – Good condition, relatively new installation or construction, no current issues, no improvements needed for the next 10 years.
- **3 (Fair)** - Acceptable condition, past issues have been addressed, improvements expected in next 10 years.
- **4 (Below Average)** – Undesired condition, noteworthy past or present issues, needs improvements in near future, at or beyond its expected life but still operational.

- **5 (Poor)** – Unacceptable condition, severe past or present issues, needs immediate replacement or rehabilitation.

The condition scoring system is based on the judgement of the assessment team and relative to other wastewater facilities both within and outside of the City.

1.3 Assessment Observations and Findings

This section contains the key observations and condition findings for each lift station. Table 1.1 summarizes the basic information for each station.

Table 1.1 Lift Stations Overview

Lift Station Name	Pump Information	Approximate Construction Year
Bethany	2 submersibles (10 hp)	1972 (2001 upgrade)
Carbonera	3 submersibles (10 hp)	1984 (2006 upgrade)
Glen Canyon	2 submersibles (7.5 hp)	1984
Granite Creek	2 submersibles (23 hp)	1971
Montevalle	2 submersibles (15 hp)	1998
Sunset Terrace	2 submersibles (5 hp)	2004
Suzanne Lane	2 submersibles (5 hp)	Unknown

Notes:
(1) Based on discussions with City staff and information provided by the City.

1.3.1 General Findings

Some findings applied to all or most lift stations. Rather than repeat these findings for each station, they are listed here.

- All of the lift stations are near a stream, creek, or waterway. If a sanitary sewer overflow (SSO) ever occurred at any of the lift stations, the overflow would spill into the waterway very quickly. No stations have a containment berm or other means to contain or divert flow. However, the operators report there has not been an SSO at a lift station in the last 10 years. The stations do not appear to be vulnerable to flooding.
- There are no inlet manholes at the lift stations, with the exception of the Carbonera Lift Station. Without an inlet manhole, it is very difficult to set up temporary bypass pumping for maintenance work or for constructing wet well improvements.
- The lift stations are lacking flow meters on the discharge pipe (except Carbonera) and pressure gauges. These devices provide useful information such as recording flow and evaluating pump performance.
- There are no provisions at any of the lift station to combat rags and other materials that get into the wet well. A grinder unit might be beneficial for those lift station that experience rags or debris buildup in the wet well. Staff use a chopper pump on occasion at specific stations that sometimes experience clogging.
- Site lighting needs to be improved at the lift stations. Many stations have no lighting, and a few have minimal lighting. Operators report that evening or night callouts require the use of the lights of their trucks in order to see while performing work.

- None of the lift stations have wash-down water. Wash down water is useful for cleaning up the site and cleaning the pumps prior to bringing them back to the shop for servicing.

Additional findings about each station are included in the following sections.

1.3.2 Bethany

The Bethany Lift Station is located in a relatively remote area south of the parking lot for the Baymonte Early Childhood Learning Center on Bethany Drive. The station is located adjacent to Carbonera Creek in the northern portion of the service area. An aerial image of the station is shown in Photo 1.1.



Photo 1.1 - Bethany Lift Station Aerial

The station was originally constructed in 1972 (per the date on the record drawings) and a repair and upgrade project was completed in 2001 (per the date on the record drawings). The recent construction of a new facility affected the station flows and the adjacent hillside.

Table 1.2 lists the major assets at the lift station. Photo 1.2 to Figure 1.8 are photos of the lift station.

Table 1.2 Bethany Lift Stations Asset List

Lift Station Areas	Major Assets
Site/Grounds	• Chain-link perimeter fence. • Light pole.
Structures	• Wet well (with hatch and safety grating).
Mechanical Equipment	• Submersible pump 1. • Submersible pump 2. • Discharge piping with check valves and air release valve. • Wet well exhaust fan.
Electrical Equipment	• Control panel (with portable generator hookup). • Standby generator.

The findings from the condition assessment are included in the following sections.

1.3.2.1 Site and Structures

- The site suffers from drainage issues leading to sand and leaves entering the site under the fence. The recent construction left the adjacent hillside bare, which has resulted in sand and dirt washing onto the site. Staff have put sandbags along parts of the fence to keep out some of the debris, but more is needed. A berm or curb is needed to eliminate the drainage problem.
- There is yard lighting on the site, but it is not known if it works. The light may be an alarm light. Better lighting is needed at this station because it is relatively isolated.
- Staff noted that there was an odor complaint for this station. The complaint came from a resident near the force main discharge manhole. Prior to this, there hadn't been an

odor complaint in years, and staff believe this may be due to increased flows from a new discharger upstream of the lift station. The addition of chemical odor control may be necessary if this persists.

- The wet well was coated with an elastomeric coating in 2001. The lining is bubbling throughout the wet well. The lining likely needs to be repaired to ensure it is providing the needed protection.
- The safety grating in the wet well has corrosion. The paint is peeling off in some areas and the corrosion is visible under the pain in other areas. Repair or replace the grating.

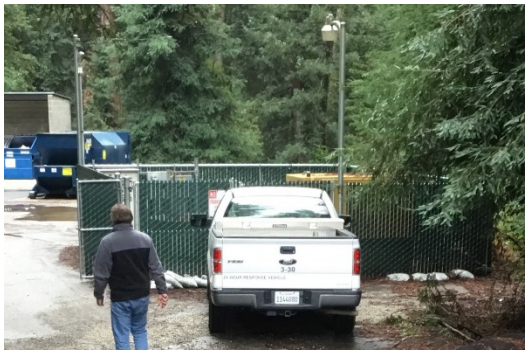


Photo 1.2 - Entrance and Perimeter Fence



Photo 1.3 - Wet Well Interior



Photo 1.4 - Safety Grate Corrosion



Photo 1.5 - Perimeter Sandbags

1.3.2.2 Mechanical and Electrical Equipment

- The pumps, appurtenances, and discharge piping are in good condition. Most of the pump hardware was replaced in 2001.
- The wet well has an exhaust fan to draw out air. This is the only station that has this exhaust fan. This fan is not shown on the 2001 drawings, but a vent pipe is shown on the drawings that does not exist on the top of the wet well. This exhaust fan was either added after 2001 or was a change from the drawings to replace the vent pipe. Based on the corrosion of the safety grating, it isn't providing the necessary airflow to vent the wet well. Replace the fan with a larger unit.
- This lift station has had the pump discharge check valves changed out with the Val-Matic Surge Buster check valves.

- This lift station has an air release valve on the pump discharge (the only lift station with one).
- There is a knife gate valve on the pump discharge that has provided operational challenges in the past.

1.3.2.3 Electrical Equipment

- There is a hookup for a trailer mounted generator for use if the on-site engine generator is not operational.
- The engine generator shows evidence of rodents chewing on the insulation.
- There is no automatic transfer switch (ATS) at this lift station but needs one because it is the farthest lift station from the City's headquarters at the WWTP and therefore the response time to this station is higher than at the other lift stations.



Photo 1.6 - Wet Well and Discharge Piping



Photo 1.7 - Control Panel



Photo 1.8 - Exhaust Fan

1.3.2.4 Recommended Improvements

The following improvements are recommended for this station based on the observations noted above.

- Repair or replace safety grating.
- Repair or reapply wet well liner.
- Install site lighting.
- Install site perimeter curb or berm to prevent spills from leaving the site.
- Replace vent fan.
- Replace or rehabilitate standby generator and install automatic transfer switch.
- Install flow meter and pressure gauges.

1.3.3 Carbonera

The Carbonera Lift Station is located in a business park at the end of El Pueblo Road. The station is in between a commercial building, the Santa Cruz Ranch RV Resort, and Carbonera Creek. An image of the station is shown in Photo 1.9.



Photo 1.9 - Carbonera Lift Station

The station was originally constructed in 1978 (per the date on the record drawings for the El Pueblo pump station). However, a major upgrade in 2006 replaced most of the equipment (per the date on the record drawings). This is the only lift station with three pumps.

Table 1.3 lists the major assets at the lift station. Figure 1.11 to Figure 1.20 are photos of the lift station.

Table 1.3 Carbonera Lift Stations Asset List

Lift Station Areas	Major Assets
Site/Grounds	• Chain-link perimeter fence. • Light pole.
Structures	• Wet well (with hatch and safety grating).
Mechanical Equipment	• Submersible pump 1. • Submersible pump 2. • Submersible pump 3. • Discharge piping with check valves and air release valve.
Electrical Equipment	• Control panel (with portable generator hookup and automatic transfer switch). • Standby generator. • Flow meter.

The findings from the condition assessment are included in the following sections.

1.3.3.1 Site and Structures

- The site and structures were upgraded in 2006. They are all in good condition.
- The wet well is T-LOCK® lined and in good condition. It has a double leaf wet well access hatch system with fall protection grating. The paint on the safety grating is peeling and is covered in deposits.
- The station's location makes it prone to odor complaints. There is no odor control system at the site. However, staff were not aware of any odor complaints. The vent pipe coming out of the wet well is blind flanged. This may be trapping the odors in the wet well but is also exposing the equipment to potentially corrosive environment. The paint on the safety grating is peeling off and corrosion has started to form.
- This site has a single light pole over the control panel. This light likely does not provide enough light to see inside the wet well.
- The site suffers from leaf deposition within the fenced area due to the number of trees surrounding the area. Staff noted that the building's landscapers inadvertently blow leaves onto the site. The leaves also fall onto the site. A cover over the station and a curb around the perimeter should alleviate the problem. Staff currently don't have enough time to clean up the leaves.



Photo 1.10 - Site Fencing and Light



Photo 1.11 - Blind Flange on Vent Pipe



Photo 1.12 - Grating Peeling Paint



Photo 1.13 - Wet Well Interior

1.3.3.2 Mechanical Equipment

- The pumps were replaced in 2006 and are in good condition. No issues were noted by staff. This is the only station with three pumps.
- The site is adjacent to an RV park and is prone to rags. If ragging becomes a consistent issue, replacing one or more pumps with a chopper would address the issue.
- The discharge piping, check valves, and isolation vales were also replaced in 2006 and are in good condition. The discharge piping has connections to allow for bypassing pumping.



Photo 1.14 - Discharge Piping



Photo 1.15 - Flow Meter and Bypass Connection

1.3.3.3 Electrical Equipment

- The installation year of the control panels is not known. They do not appear to be from the 2006 station upgrade. The control panels are in fair condition.
- The control panels contain Mission Control equipped for remote monitoring and control. This is the only station with this equipment. If it proves beneficial, this system will be rolled out to the rest of the stations.
- The station has a standby generator. The generator was installed in 2006 and includes an automatic transfer switch. The station also includes a hookup for a trailer mounted generator.
- During the site visit, the pumps cycled on/off frequently. The pumps are not equipped with variable frequency drives (VFDs). VFDs would allow the pumps to cycle less frequently, which should extend the life of the pumps.
- The station has a flow meter.



Photo 1.16 - Control Panels



Photo 1.17 - Mission Control System



Photo 1.18 - Standby Generator

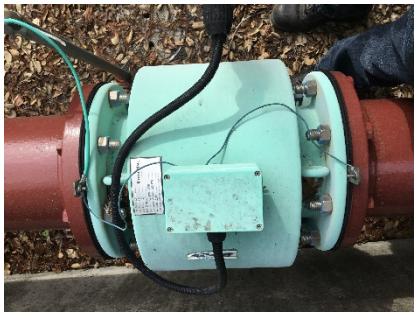


Photo 1.19 - Flow Meter

1.3.3.4 Recommended Improvements

The following improvements are recommended for this station based on the observations noted above.

- Install containment around site to prevent spill from leaving the site and leave from entering the site.
- Fix wet well ventilation pipe.
- Repair wet well safety grating and recoat.
- Install more site lighting.
- Replace the control panel.

1.3.4 Glen Canyon

The Glen Canyon Lift Station is located along Glen Canyon Road, across the street from the Camp Evers Fishing Park. There are no residents located near this lift station. An image of the station is shown in Photo 1.20.

The station was originally constructed around 1984 (per the date on the record drawings). Table 1.4 lists the major assets at the lift station. Photo 1.21 to Photo 1.25 are photos of the lift station



Photo 1.20 - Glen Canyon Lift Station

Table 1.4 Glen Canyon Stations Asset List

Lift Station Areas	Major Assets
Site/Grounds	• Chain-link perimeter fence.
Structures	• Wet well (with hatch).
Mechanical Equipment	• Submersible pump 1. • Submersible pump 2.
Electrical Equipment	• Control panel (with portable generator hookup). • Standby generator.

The findings from the condition assessment are included in the following sections.

1.3.4.1 Site and Structures

- The site is adjacent to the property line of a residents and about 100 feet from a house. Across the street is Carbonera Creek. The site has no containment and a spill could have multiple impacts.
- The wet well is unlined and in fair condition but starting to degrade. Some concrete aggregate was observed in the interior walls of the wet well. Resurfacing and recoating is likely needed in the next few years.
- The wet well has no ventilation system. There is a relatively large fall from the inlet pipe to the water surface elevation, which is likely to cause the release of sewer gases.
- The site has a single light, mounted to the control panel. This would only provide light on the panel, nowhere else on site. More lighting is needed.
- There are existing power and telephone lines directly over the lift station. Staff indicated that these do not hinder pump removal and reinstallation. However, this may need to be verified against current safety regulations to ensure staff are not working in dangerous conditions.



Photo 1.21 - Lift Station Site



Photo 1.22 - Wet Well

1.3.4.2 Mechanical Equipment

- The station has two submersible pumps. The pumps are likely original (Staff were not aware of any pump replacements). These pumps were submerged during the visit and their condition was not observed. However, based on their age, they likely need to be replaced. The guide rails had moderate corrosion.
- Staff indicated that this lift station suffers from rags and FOG more than the other stations. Chopper pumps should be considered when the pumps are replaced.
- The discharge piping and valves are located in the wet well and are not easily accessible. The discharge piping is buried outside of the wet well with no means to bypass or connect temporary pumping.



Photo 1.23 - Pump Guide Rails

1.3.4.3 Electrical Equipment

- The control panel is original to the site but parts have been upgraded, such as the Mission Control system. The panel is in fair to poor condition and likely need to be replaced based on its age.
- The generator is also original (1989 date of manufacture). The generator appeared in to be in fair condition. Staff did not have input on the operation of the generator or when it was last tested. Based on its age, the generator likely needs to be replaced in the coming years.

- The generator is activated with a manual transfer switch (there is no automatic transfer switch [ATS]). And there is a hookup for a trailer mounted engine generator to power the lift station.
- There is no flow meter or pressure gauges on the discharge piping.



Photo 1.24 - Control Panel



Photo 1.25 - Generator

1.3.4.4 Recommended Improvements

The following improvements are recommended for this station based on the observations noted above:

- Replace the pumps, rails, and discharge piping. Move the piping above ground and install a bypass connection, flow meter, and pressure gauges.
- Resurface and coat the interior of the wet well. Install a ventilation system and safety grating.
- Install better site lighting.
- Replace the control panel.
- Replace or rehabilitate standby generator and install automatic transfer switch.
- Install containment around site to prevent spill from leaving the site.

1.3.5 Granite Creek

The Granite Creek lift station is located at the end of Traci Court. The station is located between two homes on a cul-de-sac. An image of the station is shown in Photo 1.26.

The station was originally constructed around 1971 (per the date on the record drawings). Some upgrades have been made to the station since, but no additional drawings were found.

Table 1.5 lists the major assets at the lift station. Photo 1.26 to Photo 1.33 are photos of the lift station



Photo 1.26 - Granite Creek Lift Station

Table 1.5 Granite Creek Stations Asset List

Lift Station Areas	Major Assets
Site/Grounds	• Perimeter fence.
Structures	• Wet well (with hatch). • Valve vault.
Mechanical Equipment	• Submersible pump 1. • Submersible pump 2. • Chemical dosing system (pump and tank) for odor control.
Electrical Equipment	• Control panel (with portable generator hookup). • Standby generator.

The findings from the condition assessment are included in the following sections.

1.3.5.1 Site and Structures

- The station is located in between two residential homes. There is very limited parking in front of the station. It is the only station with odor control facilities which was installed in response to a complaint for the adjacent residence. Behind the station is a heavily wooded area that includes a creek. A spill at this site would likely flow toward the creek.
- The wet well appeared in good condition. The uncoated concrete didn't have any spalling or surface deterioration. The wet well hatch appeared in good condition as well. Roots have entered through pipe penetrations.
- The wet well opening is at grade (not raised) and has no fall protection around it.
- The wet well does not have a vent. However, the valve vault drains into the wet well, which may act like a vent. The corrosion was much more noticeable in the valve vault. The valve vault concrete appeared in good condition.
- The site does not have any lighting.
- The site is very crowded. There is no room for additional equipment. Access to the generator and control panels is limited.



Photo 1.27 - Wet Well



Photo 1.28 - Wet Well (Alternate View)

1.3.5.2 Mechanical Equipment

- The station has two submersible pumps. The pumps might be original (Staff were not aware of any pump replacements). These pumps were submerged during the visit and

their condition was not observed. The guiderails looked as if they were replaced, which likely means the pumps are not original.

- Staff indicated that FOG accumulation is an issue. The station sees very limited flow. Installing a chopper pump may resolve this issue.
- The discharge piping passes through a valve vault that includes two check valves and isolation valves. The piping includes a bypass connection. The piping in the vault appeared in below average condition. It is likely original equipment and replacement should be considered. The vault drains to the wet well and likely accumulates gases from the wet well, which is causing the pipes and valves to corrode.
- A Sul-Free chemical injections system is used for odor control. The system only operates during summer. Staff believe it was installed about ten years ago. The system was in good condition and no operational issues were reported by staff.

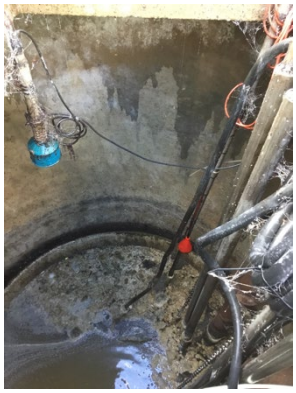


Photo 1.29 – Pump Guide Rails



Photo 1.30 - Discharge Piping/Valve Vault



Photo 1.31 - Chemical Injection System

1.3.5.3 Electrical Equipment

- The control panel is original and in below average condition. The Hand/Off/Auto switch for pump 2 is broken. The entire panel should be replaced.
- This lift station is scheduled to get the Mission Control system installed.

- The standby generator appeared in good condition. No issues were noted. The installation year of the generator was not found. Opening of the generator panels is limited by the perimeter fence.



Photo 1.32 - Control Panel



Photo 1.33 - Generator

1.3.5.4 Recommended Improvements

The following improvements are recommended for this station based on the observations noted above.

- Add wet well ventilation system and install safety grating.
- Cut roots in wet well.
- Install site lighting.
- Replace discharge piping and valves.
- Install a flow meter and pressure gauges.
- Install automatic transfer switch for the standby generator.
- Install containment around site to prevent spill from leaving the site.
- Replace control panel.

1.3.6 Montevalle

The Montevalle lift station is in the Montevalle community. The lift station is down a maintenance road, in a wooded area behind the homes. An image of the station is shown in Photo 1.34.

The station was originally constructed in 1998 (per the date on the record drawings). Table 1.6 lists the major assets at the lift station. Photo 1.35 to Photo 1.42 are photos of the lift station



Photo 1.34 - Montevalle Lift Station

Table 1.6 Montevalle Stations Asset List

Lift Station Areas	Major Assets
Site/Grounds	• Chain-link perimeter fence.
Structures	• Wet well (with hatch). • Valve vault.
Mechanical Equipment	• Submersible pump 1. • Submersible pump 2.
Electrical Equipment	• Control panel (with portable generator hookup). • Standby generator.

The findings from the condition assessment are included in the following sections.

1.3.6.1 Site and Structures

- This lift station is very close to a creek and is very vulnerable to spilling into the creek if a sanitary sewer overflow occurred at the lift station.
- The wet well is in poor condition. The concrete is cracked around the hatch and the interior concrete surface is deteriorating. The wet well lacks safety grating or fall protection.
- The wet well lacks a ventilation system.
- The valve vault has steel plates for a lid and lack a locking mechanism. The vault doesn't have a drain and was noticeably wet during the visit. This likely is contributing to the corrosion of metal in the vault.
- The site has a single pole with a light, but staff believe the light is for alarms, not for working at the site. The area the station is in is poorly lit and more adequate lighting is needed for working at this station.



Photo 1.35 - Perimeter Fence



Photo 1.36 - Wet Well



Photo 1.37 - Wet Well Hatch

1.3.6.2 Mechanical Equipment

- One of the submersible pumps was replaced last year. The installation date of the other pump is unknown, but likely original. The pumps were submerged during the visit and their condition was not observed. Based on age, the second pump is likely in need of replacement.
- Staff noted that this lift station occasionally suffers from rag problems. A chopper pump might solve this problem.
- The valves in the valve vault are heavily corroded. However, the check valves are scheduled to be replaced with Surge Buster valves because the force main is steeply sloped.
- The inlet piping includes a gravity line and a force main line (from a private lift station) in a casing pipe suspended over a creek. This is configuration is very vulnerable to a break or leak from external factors like falling rocks or trees, which would cause a sewer spill. The City should work with the private lift station owners to identify possible solutions to reduce the risk of an overflow at this location.



Photo 1.38 - Inlet Piping Suspended Over Creek



Photo 1.39 - Valve Vault



Photo 1.40 - Wet Well Guide Rails

1.3.6.3 Electrical Equipment

- The control panel is original. It appears in fair to below average condition. It will likely need to be replaced in the next few years.
- The Mission Control system has been installed in this lift station.
- The standby generator appears to be in below average condition. The age is unknown, but it is likely original. Plan to replace the generator in the next few years.



Photo 1.41 - Control Panel



Photo 1.42 - Standby Generator

1.3.6.4 Recommended Improvements

The following improvements are recommended for this station based on the observations noted above.

- Replace valve vault lid and install a vault drain.
- Repair wet well interior surface and coat.
- Install a wet well ventilation system and safety grating.
- Install site lighting.
- Replace one submersible pump with a chopper submersible pump.
- Work with the private lift station landowners to identify potential solutions to replace or reconfigure the inlet piping off the suspended pipe over the creek to reduce the risk of an overflow.
- Replace or rehabilitate standby generator and install automatic transfer switch.
- Replace control panel.
- Install containment around site to prevent spill from leaving the site.
- Install a flow meter and pressure gauges.

1.3.7 Sunset Terrace

The Sunset Terrace lift station is located alongside Sunset Terrace. The station does not have a dedicated site, it is blocked from traffic by a few bollards. The station serves a few homes in the area and, according to staff, could be bypassed by a gravity main if a neighboring resident would allow an easement through their property. An image of the station is shown in Photo 1.43.



Photo 1.43 - Sunset Terrace Lift Station

The station was originally constructed in 2004 (per the date on the record drawings). Table 1.7 lists the major assets at the lift station. Photo 1.43 to Photo 1.48 are photos of the lift station.

Table 1.7 Sunset Terrace Lift Station Asset List

Lift Station Areas	Major Assets
Site/Grounds	• Bollards.
Structures	• Wet well (with hatch and safety grating). • Valve vault.
Mechanical Equipment	• Submersible pump 1. • Submersible pump 2.
Electrical Equipment	• Control panel (with portable generator hookup).

The findings from the condition assessment are included in the following sections.

1.3.7.1 Site and Structures

- This lift station could be abandoned if the City could get an easement from the adjacent property owner for a gravity line. However, about 40 feet section of the gravity pipeline would have to be double contained and suspended over a creek or culvert. According to

staff, at the time of construction, the City tried to secure the necessary easement from the landowner for a gravity line but were unsuccessful. The landowner has since deceased, and the City could try again to request from the people who inherited the property an easement for the gravity line.

- This station is located adjacent to a culvert and is located within a drainage channel.
- The station has no perimeter fence, site lighting, or parking for work trucks. Although the road is not heavily trafficked, this presents the potential for unsafe working conditions for staff. There are limited or no options to improve this, given the location of the station.
- The wet well is coated and is in good condition. The hatch includes a safety grating.
- The valve vault is in good condition.



Photo 1.44 - Lift Station Site



Photo 1.45 - Wet Well



Photo 1.46 - Valve Vault

1.3.7.2 Mechanical Equipment

- The station has two submersible pumps, original to the station. The pumps were submerged during the visit and their condition was not observed. The guiderails appeared in good condition.
- The check valves and discharge piping appeared in good condition. The pipes may be made of stainless steel.



Photo 1.47 - Guard Rails

1.3.7.3 Electrical Equipment

- The control panel is in fair condition. No issues were noted by staff. The telecommunication line is unreliable due to rodents. The Mission Control system will soon be installed at this station, according to staff.
- There is no engine generator on site or portable generator hookup. There is no way to power this station during an outage. However, staff noted that this station didn't run for three days during a recent power outage. Due to the low flows, the station didn't spill.



Photo 1.48 - Control Panel

1.3.7.4 Recommended Improvements

The following improvements are recommended for this station based on the observations noted above.

- Further investigate the ability to bypass this station with a gravity main.

- Install site lighting.
- Install portable generator hookup.
- Install containment around site to prevent spill from leaving the site.
- Install a flow meter and pressure gauges.

1.3.8 Suzanne Lane

The Suzanne Lane lift station is located in a cul-de-sac at the end of Suzanne Lane. The station is behind a hedge of shrubs, in between two residential driveways. The station serves a few residences in this neighborhood. An image of the station is shown in Photo 1.49.

Record drawings could not be found for this station. The installation year is unknown, but it is likely in the 1980s or 1990s. Table 1.8 lists the major assets at the lift station. Photo 1.49 to Photo 1.54 are photos of the lift station.



Photo 1.49 - Suzanne Lane Lift Station

Table 1.8 Suzanne Lane Lift Station Asset List

Lift Station Areas	Major Assets
Site/Grounds	• n/a
Structures	• Wet well (with hatch).
Mechanical Equipment	• Submersible pump 1. • Submersible pump 2. • Discharge piping with check valves and air release valve. • Wet well exhaust fan.
Electrical Equipment	• Control panel (with portable generator hookup). • Standby generator.

The findings from the condition assessment are included in the following sections.

1.3.8.1 Site and Structures

- The station has no perimeter fence. Hedges block the station from view from the street.
- Staff noted they found rocks in the wet well and they believe it is from kids throwing rocks down the vent pipe. The site needs some kind of barrier to prevent vandalism.
- The wet well interior concrete is in good condition. The wet well lacks fall protection.
- The wet well is vented by a PVC goose neck sticking out of the top. The pipe is damaged and needs to be fixed or replaced.
- The access hatch to the wet well is sticky, is hard to open, and has a poor lock mechanism. The hatch should be replaced.
- The only lighting at the site is from a streetlamp. Dedicated site lighting is needed.



Photo 1.50 - Lift Station Site



Photo 1.51 - Wet Well



Photo 1.52 - Wet Well Vent

1.3.8.2 Mechanical Equipment

- The station has two submersible pumps, believed to be original to the station. The pumps were submerged during the visit and their condition was not observed. The guiderails appeared in fair condition with minor corrosion at the top. Staff indicated that the pumps work well and they don't know of any issues with them.
- The discharge piping and valves are located in the wet well. These appeared to be in fair to below average condition. These are difficult to access and would be better to be in an adjacent vault or above ground.



Photo 1.53 - Pumps and Guard Rails

1.3.8.3 Electrical Equipment

- The control panel appears to be original to the site. The panel is in fair condition and no issues were noted by staff. The lift station is scheduled to receive Mission Control system soon.
- There is no on-site engine generator, but there is a hookup for a portable generator.



Photo 1.54 – Control Panel

1.3.8.4 Recommended Improvements

The following improvements are recommended for this station based on the observations noted above.

- Install a perimeter fence or block wall to prevent vandalism.
- Replace wet well hatch, install safety grating, and replace or fix vent pipe.
- Relocate the discharge valves from the wet well into a separate vault and provide a connect for bypass pumping.

- Install a flow meter and pressure gauges.
- Install site lighting.

1.4 Summary and Next Steps

Table 1.9 summarizes the overall condition of each station based on the recommended improvements from the previous section. Overall, the Montevalle Lift Station showed the most significant improvements needs of the seven lift stations that were assessed. The overall condition of this lift station was rated as a 5 (poor). Improvements at this lift station should be implemented as soon as possible. The Bethany and Glen Canyon lift stations were rated 4 (below average). The City should consider implementing improvements at these lift stations in the near term as well. The remaining lift stations were rated to be in fair condition (3) and projects for these stations could be prioritized after the implementation of improvement projects at Montevalle, Bethany, and Glen Canyon.

Table 1.9 Lift Stations Condition Summary and Cost Estimates

Lift Station Name	Overall Condition Score	Recommended Improvement Implementation Timeline
Bethany	4 (Below Average)	Near Term
Carbonera	3 (Fair)	Intermediate Term
Glen Canyon	4 (Below Average)	Near Term
Granite Creek	3 (Fair)	Intermediate Term
Montevalle	5 (Poor)	Immediate
Sunset Terrace	3 (Fair)	Intermediate Term
Suzanne Lane	3 (Fair)	Intermediate Term

Notes:
(1) Condition scores per 3.2.4

It should be noted that not all of the recommendations for a particular lift station need to be implemented as part of a single project. As part of the capital improvement plan (CIP) task, Carollo will work with the City to break up/bundle the project recommendations at each lift station into individual CIP projects, which can be phased according to the availability of City funding.

Appendix F

HOT SPOTS

CITY OF SCOTTS VALLEY
Collection System Hot Spots
for
Sewer Master Plan Study and
Sewer System Management Plan

STREET	MANHOLE NUMBER
208 Southwood	E6-016
215-221 Southwood - 290'	E8-058…059
25 Sunset Terrace - street and driveway 325'/140'	F8-022…E8-023 & F8-022…E8-021
123 Sunset Terrace	F8-050…049…048…046
Bay Photo	C6-014
Butler Lane - 360' behind Scotts Valley Market	E7-073…074
Cabernet Court	F7-052
Cristal Oaks	C7-078
Hidden Oaks - 590'	C7-016…C7-021…C6-016…C6-000
North Navarra at Sucinto - 550'	F8-004…011…012
Oak Tree Villa - 400'	C5-006…007…not on map
Scott Court/Club Drive - 170'/550'	F7-005…007 & F7-004…005…006
South Navarra at Buttermilk - 550'	E7-023…024…025
Willis & Grace - 475'	E7-041…043…044…049
Willow Pond - 220'/325'/175'	C5-003…006 & C5-002…003 & C6-009…C5-001…002
Bethany Loop 225'	G7-056…059…060
Dollar Store 111'	C6-081…080
San Augustine & Maeve Court	N/A

Appendix G

EQUIPMENT AND REPLACEMENT PART INVENTORY

Table G.1 Equipment Inventory

Equipment	Quantity	Notes
Vacuum/hydro-jet truck	1	
Trailer Mounted generator	1	Compatible with electrical hook-ups at lift stations

Appendix H

OVERFLOW EMERGENCY RESPONSE PLAN



City of Scotts Valley
Sewer System Management Plan

OVERFLOW EMERGENCY RESPONSE PLAN

FINAL | December 2021

City of Scotts Valley
Sewer System Management Plan

OVERFLOW EMERGENCY RESPONSE PLAN

FINAL | December 2021



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Abbreviations

Cal OES	California Office of Emergency Services
CCTV	closed circuit television
City	City of Scotts Valley
CIWQS	California Integrated Water Quality System
County Health	Santa Cruz Environmental Health Services
LRO	Legally Responsible Official
MRP	Sanitary Sewer Systems Order No. WQ 2013-0058-EXEC
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination Program
OERP	Overflow Emergency Response Plan
PLSD	Private Lateral Sewage Discharge
Questionnaire	Collection System Questionnaire
RWQCB	Regional Water Quality Control Board
SCADA	supervisory control and data acquisitions
SCHMIT	Santa Cruz Hazardous Materials Incident Team
SSMP	Sewer System Management Plan
SSOs	Sanitary Sewer Overflows
SVFD	Scotts Valley Fire District
SWRCB	State Water Resources Control Board
WDRs	State General Waste Discharge Requirements

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Section 1

INTRODUCTION

1.1 Background

Sanitary Sewer Overflows (SSOs) are overflows from sanitary sewer systems of domestic, commercial, or industrial wastewater. SSOs often cause a public nuisance, particularly when raw untreated wastewater is discharged to areas with high public exposure, such as streets or surface waters used for drinking, fishing, or body contact recreation. SSOs may pollute surface or ground waters, threaten public health, adversely affect aquatic life, and impair the recreational use and aesthetic enjoyment of surface waters.

In an effort to reduce SSOs in the State of California, the State Water Resources Control Board (SWRCB), as part of State General Waste Discharge Requirements (WDRs) Order No. 2006 0003, has established that all municipalities and districts with over one mile of sanitary sewer pipelines develop a Sewer System Management Plan (SSMP). The WDR was amended by Amending Monitoring and Reporting Program for Statewide General Waste Discharge Requirements for Sanitary Sewer Systems Order No. WQ 2013-0058-EXEC (MRP). As part of the requirements for the completion of an SSMP, the SWRCB has required that municipalities and districts develop a site-specific Overflow Emergency Response Plan (OERP).

1.2 Technical Definitions of an SSO

An SSO is defined as any overflow, release, discharge, or diversion of untreated or partially treated wastewater from a sanitary sewer system. There are four categories of SSOs as established by the WDR and MRP:

- **Category 1:** Discharges of untreated or partially treated wastewater of any volume resulting from an enrollee's sanitary sewer system failure or flow condition that:
  - Reach surface water and/or reach a drainage channel tributary to a surface water; or
  - Reach a Municipal Separate Storm Sewer System (MS4) and are not fully captured and returned to the sanitary sewer system or not otherwise captured and disposed of properly. Any volume of wastewater not recovered from the MS4 is considered to have reached surface water unless the storm drain system discharges to a dedicated storm water or groundwater infiltration basin (e.g., infiltration pit, percolation pond).
- **Category 2:** Discharges of untreated or partially treated wastewater of 1,000 gallons or greater resulting from an enrollee's sanitary sewer system failure or flow condition that do not reach surface water, a drainage channel, or a MS4 unless the entire SSO discharged to the storm drain system is fully recovered and disposed of properly.
- **Category 3:** All other discharges of untreated or partially treated wastewater resulting from an enrollee's sanitary sewer system failure or flow condition.

- **Private Lateral Sewage Discharge (PLSD):** Discharges of untreated or partially treated wastewater resulting from blockages or other problems within a privately owned sewer lateral connected to the enrollee's sanitary sewer system or from other private sewer assets. PLSDs that the enrollee becomes aware of may be voluntarily reported to the California Integrated Water Quality System (CIWQS) Online SSO Database.

1.3 Objectives

This report is intended to serve as a City of Scotts Valley (City) specific OERP. The primary objectives of the OERP are to protect public health and the environment and to establish procedures to streamline and optimize the City's SSO response activities. Additional objectives of the OERP are as follows:

- Establish a formalized SSO reporting procedure for City staff to follow in the event of any SSO, regardless of its size.
- Provide appropriate customer service.
- Protect collection system personnel.
- Minimize the risk of enforcement actions against the City.
- Protect the collection system and all appurtenances.
- Protect private and public property beyond the collection system.

This plan should be updated and modified as necessary to more closely reflect operating conditions and changes that may occur in SSO response and remediation procedures.

Additionally, this plan has been developed to meet the WDRs and SWQCB requirements. This plan shall not supersede existing standard operating procedures, unless otherwise specified by the City's Legally Responsible Official (LRO) or designated representative.

1.4 Key Personnel

The report contains references to specific City personnel as applicable to overflow response procedures. References are made to job titles, rather than individual names. The purpose of this is to simplify the process of updating the document as staff changes occur. Appendix C of the SSMP contains a list of the key personnel identified in the OERP and their contact information. This list should be updated as necessary.

1.5 Safety Provisions

When responding to the reported location of a potential SSO, City staff may encounter emergency situations requiring immediate action. Specific actions to be taken will vary greatly depending on the type of overflow and its underlying cause (e.g., main blockage, lift station failure, etc.). While swift action may be required to mitigate the negative impacts associated with an overflow, it is important to perform these actions in a safe and competent manner that is consistent with existing standard operating procedures.

1.6 Organization

The key elements of the OERP are addressed individually as follows:

- Section 1: Introduction.
- Section 2: Regulatory Requirements.
- Section 3: Overflow Response Procedure.
- Section 4: Regulatory Agency Notification Plan.
- Section 5: Report Requirements.
- Section 6: Public Notification.
- Section 7: Distribution and Maintenance of OERP.

Section 2
REGULATORY REQUIREMENTS

The WDRs specify that an OERP include, at a minimum, the following:

1. Proper notification procedures so that the primary responders and regulatory agencies are informed of all SSO in a timely manner.
2. A program to ensure an appropriate response to all overflows.
3. Procedures to ensure prompt notification to appropriate regulatory agencies and other potentially affected entities (e.g., health agencies, Regional Water Boards, water suppliers, etc.) of all SSOs that potentially affect public health or reach the waters of the State in accordance with the monitoring reporting program, the California Water Code, other State Law, and other applicable Regional Water Board WDR or National Pollutant Discharge Elimination Program (NPDES) permit requirements. The SSMP should identify the officials who will receive immediate notification.
4. Procedures to ensure that appropriate staff and contractor personnel are aware of and follow the Emergency Response Plan and are appropriately trained.
5. Procedures to address emergency operations, such as traffic and crowd control and other necessary response activities.
6. A program to ensure that all reasonable steps are taken to contain and prevent discharge of untreated or partially treated wastewater to waters of the United States and to minimize or correct any adverse impact of the environment resulting from the SSOs, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the discharge.

The MRP amended the WDR that impact the OERP the by:

1. Time sensitive requirements depending on the overflow category.
2. Complete a Technical Report requirement for SSOs ≥ 50,000 gallons does require a "Detailed location map illustrating all water quality sampling points."
3. Implement a Water Quality Monitoring Program to assess impacts of all SSOs greater than 50,000 gallons reaching surface waters.

Section 3

OVERFLOW RESPONSE PROCEDURES

This section presents a strategy for City staff to mobilize labor, materials, tools, and equipment to mitigate any condition, which may cause or contribute to an SSO. The plan considers a wide range of potential system failures that could create an overflow to surface waters, land, or buildings.

3.1 Receipt of Information Regarding an SSO

An overflow may be detected by the general public, departments, through routine maintenance activities, or by others. This section summarizes the various ways in which City staff may become aware of a potential SSO, and how the information is documented and transferred to the appropriate City personnel.

Calls from the general public regarding potential overflows within the City limits are generally received through the Public Works Department 831-438-5854 during normal business hours or the Police Dispatch at 911 during non-business hours. To effectively respond to calls regarding potential SSOs, the dispatchers should begin a SSO Field Report (see Attachment 1) to document all relevant information regarding the potential spill from the caller. This includes in general, the following:

- Time and date call was received.
- Specific location (street address, cross street).
- Description of problem.
- Time possible overflow was noticed by the caller.
- Caller's name and phone number.
- Observations of the caller (e.g., odor, duration, back, or front of property).
- Other relevant information that will enable the responding investigator and crews, if required, to quickly locate, assess, and stop the overflow.

Until verified by response crew the report of a possible spill should not be referred to as a "sanitary sewer overflow."

In addition to receiving notifications through calls, the City's lift station are equipped with supervisory control and data acquisition (SCADA). These systems send early warnings of potential backups caused by power outages or high-level conditions.

3.2 Dispatch of Response Crews to Site of Sanitary Sewer Overflow

Failure of any element within the City's sewer system that threatens to cause or causes a SSO will trigger an immediate response to isolate and correct the problem. Crews and equipment shall be available to respond to any SSO location and be dispatched to the site of a reported SSO immediately. Also, additional maintenance and contract personnel shall be "on call" should extra crews be needed. The notification and response procedure flow chart is shown in Figure 1.

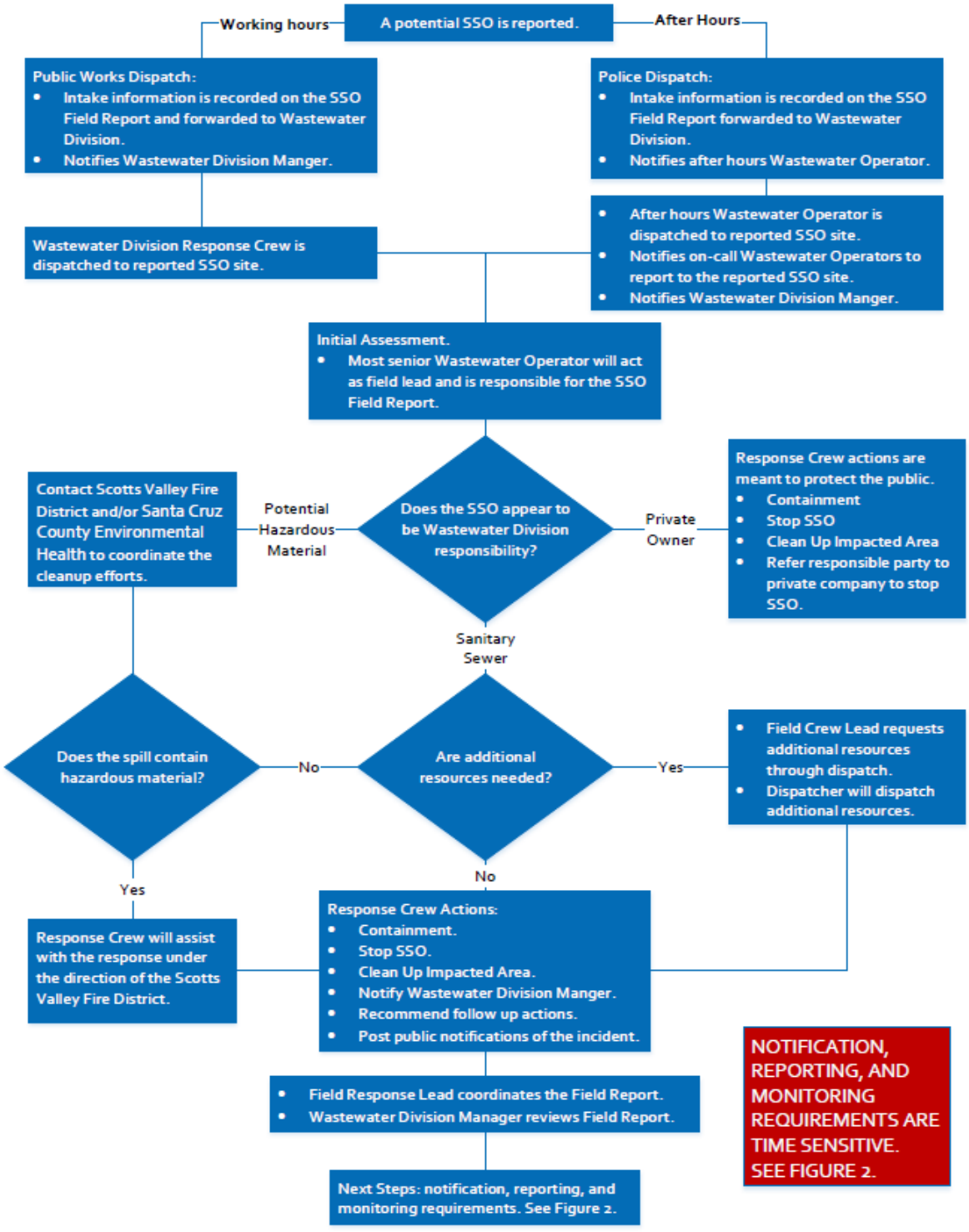


Figure 1 SSO Notification and Response Flow Chart

3.2.1 Dispatching Duties

Dispatchers should receive notification of SSOs as outlined in Section 3.1 and dispatch the appropriate crews and resources as required. Dispatching duties are normally performed by either the Public Works Department during normal work hours, or the Police Department during any hours.

3.2.2 Crew Instructions and Work Orders

Response crews should receive notification from the designated dispatcher noted in Section 3.2.1. The dispatcher will inform the Wastewater Division of all pertinent information regarding the spill. Response crews should receive instructions regarding appropriate materials, supplies, and equipment needed by the most senior Wastewater Division employee when notification is received. A response crew will consist of all available wastewater operators. The most senior operator that responses to the potential SSO will be acting response lead. In the event that additional assistance is needed, the Maintenance Division personnel may be dispatched through the designated dispatcher.

All employees being dispatched to the site of a SSO shall proceed immediately to the site of the overflow. Any delays or conflicts in assignments must be immediately reported to the dispatcher for resolution.

Response crews should report their findings, including possible damage to private and public property, to the dispatcher immediately upon making their investigation. If the Senior Wastewater Operator has not received findings from the field crew within a reasonable amount of time, he shall contact the response crew to determine the status of the investigation. The Senior Wastewater Operator shall also refer all pertinent information to the next shift, including any details of the problems described by customers.

3.2.3 Preliminary Assessment of Damage to Private and Public Property

The focus of the field response is to resolve the problem in an efficient manner and to protect the public health and welfare. The response crews should use discretion in assisting individual tenants/property owners as reasonably as they can for SSOs in sewers not owned or maintained by the City. The City should be aware that it could face increased liability for any further damages inflicted to private property during such assistance. Appropriate still photographs and video footage, if possible, should be taken of the outdoor area of the SSO and impacted area in order to thoroughly document the nature and extent of impacts. Available photographs are to be forwarded to the appropriate department below for filing with the SSO Field Report.

3.2.4 Field Supervision and Inspection

The response lead will act as superior to spill response, if necessary, to verify that the provisions of this overflow response plan and other directives are met. The Senior Wastewater Operator is responsible for confirming that the SSO Field Report is completed and that the available information is forwarded to the Wastewater Division Manager for review and eventual reporting to the SWRCB and other applicable regulatory as established in the WDR. The Wastewater Division Manager is also responsible for coordinating with the Public Works Director, and other necessary parties to certify all SSO reports submitted to the SWRCB.

3.2.5 Coordination with Hazardous Material Response

In the event that the spill may contain hazardous material or is unknown the dispatcher or response crew must contact the Scotts Valley Fire District (SVFD) and/or Santa Cruz County Environmental Health Services (County Health) since these agencies act as the primary responders in the case of hazardous material spills. The Santa Cruz Hazardous Materials Incident Team (SCHMIT) will in the assist in the identification of the substance. Hazardous waste disposal companies are notified by SCHMIT as needed to assist in the recovery of the spilled material.

Upon arrival of SCHMIT, the response crew will take direction from the person with the lead authority of that team and from the Response Lead. Only when that authority determines it is safe and appropriate for the response crew to proceed or assist with SSO response actions can they then proceed with containment (as needed), clean-up activities, and correction. These actions, however, may be performed by a hazardous material contractor, depending on the size and nature of the event.

3.2.6 Crowd Control, Traffic Diversion, and Other Emergency Operations

Should an SSO be of such a size or at such a location as to cause major disruptions to the flow of traffic at any point in the City, the responding crew shall notify the dispatcher as soon as possible. The dispatcher will then coordinate with the appropriate staff to set up a traffic diversion to move motorists away from the SSO location.

Steps should be taken to barricade off the site of an SSO to eliminate the potential of large crowds to inhibit the response crew's ability to effectively work. If necessary, additional assistance may be required (from the City's Police Department).

3.3 Overflow Correction, Containment, and Clean-Up

SSOs of various volumes occur from time to time, in spite of concerted prevention efforts. Spills may result from blocked sewers, pipe failures, or mechanical malfunctions, among other natural or man-made causes. The City should be ready to respond upon notification and confirmation of an overflow. This section describes specific actions to be performed by the crews during an SSO.

The objectives of these actions are:

- To protect public health, environment, and property from sewage overflows and restore surrounding area back to normal as soon as possible.
- To establish perimeters and control zones with appropriate traffic cones and barricades, vehicles or use of natural topography (e.g., hills, berms).
- To promptly notify appropriate regulatory agencies.
- To contain the SSO to the maximum extent possible including preventing the discharge of sewage into surface waters.
- To minimize the City's exposure to any regulatory agency penalties and fines.

An important issue with respect to an emergency response is to make sure that the temporary actions necessary to divert flows and repair the problem do not produce a problem elsewhere in the system. For example, repair of a force main could require the temporary shutdown of the pump station and diversion of the flow at an upstream location. If the closure is not handled properly, sewage system back-ups may create other overflows.

Although the City is staffed with individuals capable of responding efficiently to overflows, the City does not currently own the equipment necessary to fully mitigate large SSOs that occur. For this reason, the SCHMIT typically contracts with a Hazardous Material Contractor when conditions warrant such assistance.

3.3.1 Responsibilities of Response Crew upon Arrival

It is the responsibility of the first personnel who arrive at the site of an SSO to protect the health and safety of the public by mitigating the impact of the overflow to the extent possible. Should the overflow not be the responsibility of the City, but there is imminent danger to public health, public or private property, or to the quality of waters of the United States, then prudent emergency action should be taken until the responsible party assumes responsibility and provides actions. Upon arrival at an SSO, the response crew should do the following:

- Isolate and secure all sources of spill materials to mitigate the spill volume, such as securing any bathrooms that may be added to the spill.
- Determine the cause of the overflow, e.g., sewer line blockage, pump station mechanical or electrical failure, sewer line break, etc.
- Identify and request, if necessary, assistance or additional resources to correct the overflow or to assist in the determination of its cause.
- Determine if private property is impacted.
- Take immediate steps to stop the overflow if possible (e.g., relieve pipeline blockage, manually operate pump station controls, repair pipe, etc.). Extraordinary steps may be considered where overflows from private property threaten public health and safety (e.g., an overflow running off of private property into the public right-of-way).
- Notify the response team for guidance on how to proceed.
- Request additional personnel, materials, supplies, or equipment that will expedite and minimize the impact of the overflow.

3.3.2 Initial Measures for Containment

The response crew shall initiate measures to contain the overflowing sewage and recover sewage that has already been discharged. An SSO spill volume estimate packet is included in Attachment 2. Appropriate steps should be taken to minimize the impact to public health or the environment, including the following:

- Determine the immediate destination of the overflow (e.g., storm drain, street curb gutter, body of water, creek bed, etc.).
- Identify and request the necessary materials and equipment to contain or isolate the overflow, if not readily available.
- Take immediate steps to contain the overflow (e.g., block or bag storm drains, divert into downstream manhole, etc.).

3.3.3 Additional Measures Under Potentially Prolonged Overflow Conditions

In the event of a prolonged sewer line blockage or a sewer line collapse, a determination should be made to set up a portable by-pass pumping operation around the obstruction. This may require the City to seek assistance from an outside contractor.

- Appropriate measures shall be taken to determine the proper size and number of pumps required to effectively handle the sewage flow.
- Continuous or periodic monitoring of the by-pass pumping operation shall be implemented as required.
- Regulatory agency issues shall be addressed in conjunction with emergency repairs.

3.3.4 Cleanup

Sewer overflow sites are to be thoroughly cleaned after an overflow. No readily identified residue (e.g., sewage solids, papers, rags, plastics, rubber products) is to remain. Appropriate cleanup actions that shall be addressed, as applicable. In some cases, the City may utilize the services of an outside contractor for cleanup and disinfection. Actions that could be performed during cleanup:

- Where practical, the area is to be thoroughly flushed and cleaned of any sewage or wash-down water. Solids and debris are to be flushed, swept, raked, picked-up, and transported for proper disposal.
- Where appropriate, the overflow site is to be disinfected and deodorized.
- Where sewage has resulted in ponding, the pond should be pumped dry and the residue disposed of in accordance with applicable regulations and policies.
- If a pond area contains sewage, which cannot be pumped dry, it may be treated with bleach. If sewage has discharged into a body of water that may contain fish or other aquatic life, bleach or other appropriate disinfectant should not be applied and the California Department of Fish and Game should be contacted for specific instructions.
- Use of portable aerators may be required where complete recovery of sewage is not practical and where severe oxygen depletion in existing surface water is expected.
- The overflow site is to be secured to prevent contact by members of the public until the site has been thoroughly cleaned. Posting, if required, should also be undertaken.

3.3.5 Water Quality Sampling

In the event of a Category 1 SSO in which 50,000 gallons or more sewage is reaches surface water the City is required to complete an SSO Technical Report. One of the major components of this report is water quality monitoring. The MRP requires that the agency to conduct a water quality sampling within 48-hours after the initial SSO notification.

Even when not required by the MRP, when possible the City recommends that first responders collect samples of the spilled. If the overflow reaches surface waters samples should be taken on the receiving waters to evaluate the potential impact on water quality. Samples are collected from the location(s) most likely to be impact by the overflow and from the receiving waters. When samples are taken, the responsible staff will coordinate with a certified laboratory to analyze the collected samples and will facilitate the sample delivery. The delivered samples are analyzed for total coliform, fecal coliform, and enterococcus and other constituents if applicable. It is City policy that a second round of samples are collected within 24-hours of the first sample collection or the overflow is contained. If the second round of samples indicate elevated levels of sewage constituents in the receiving waters, then the City will continue to sample the receiving waters every 24-hours until it returns back to normal levels.

3.4 Follow-up Activities

Once the clean-up is completed, the incident is reviewed and any appropriate measures to prevent recurrence must be implemented. The following summarizes some of the follow-up activities that the City might perform:

- If the SSO was caused by a blockage, the City will schedule a closed circuit television (CCTV) Inspection of the sewer to verify that the blockage was removed.
- If the SSO was avoidable by preventive maintenance, the City may adjust the maintenance activities for that sewer. For instance, the City may increase the cleaning frequency for a sewer that are susceptible to grease build-up.
- If the SSO was caused by factors outside the City's control, such as vandalism, steps are still taken to minimize recurrence by strengthen security. For instance, lock down manhole covers, increase surveillance, and/or request neighborhood assistance in reporting vandalism or unauthorized dumping.

The City actively updates policies and procedures as appropriate to prevent recurrence of accidental spills are due to procedural errors by City's staff or contractors.

3.5 Overflow Report

An SSO Field Report shall be completed by response crews and designated staff. The Senior Wastewater Operator and response lead (if applicable) are charged with preparing the SSO Field Report. The Senior Wastewater Operator is responsible for confirming that the SSO Field Report is completed and that the available information is forwarded to the Wastewater Division Manager where it is used to complete the SSO Report for the eventual reporting to the SWRCB and other applicable regulatory as established in the WDR. The Wastewater Division Manager is also responsible for coordinating with the Public Works Director, and other necessary parties to certify all SSO reports submitted to the SWRCB. Information regarding the SSO that is required in the SSO Report discussed in Section 5.

Section 4

REGULATORY AGENCY NOTIFICATION PLAN

This section summarizes the procedures that City staff shall follow to provide formal notice to the appropriate regulatory agencies as necessary in the event of an SSO. Agency notifications shall be performed in parallel with other internal notifications. The procedures for providing notification of an SSO to the media are presented in a later Section. Internal notification and mobilization of personnel are detailed in Section 3.0.

The regulatory agency that must be notified if an SSO occurs varies depending on the type of discharge. Likewise, the time frame in which the appropriate agencies must be notified depends on the type of discharge. The MRP defines three types of SSOs, as summarized in Section 1.2 of this OERP. Table 1 summarizes the notification, reporting, water quality monitoring, and record keeping time frames that are required by the MRP. The MRP changed the call notification requirement for California Office of Emergency Services (Cal OES) as described in Table 1.

When Cal OES is notified the City does not have to notify the Regional Water Quality Control Board (RWQCB) and Santa Cruz County Environmental Health Services since Cal OES already notifies these agencies when a spill notification is received. Until a certified SSO Report is submitted to CIWQS, the City shall update Cal OES regrading substantial changes to the estimated volume of untreated or partially treated sewage and any substantial changes to known impacts.

Table 1 Notification, Reporting, Monitoring, and Record Keeping Requirements

Element	Requirements	Method
Notification	• Within two (2) hours of becoming aware of any Category 1 SSO greater than or equal to 1,000 gallons discharged to surface water or spilled in a location where it probably will be discharged to surface water, notify the Cal OES and obtain a notification control number. • If Cal OES notification is not required then within two (2) hours of becoming aware of any spills notify Santa Cruz County Environmental Health Services. • If Cal OES notification is not required then within two (2) hours of becoming aware of any spills notify RWQCB. • If sewer spill reaches waterbody notify CA Department of Fish and Game	• Call Cal OES at: – (800) 852-7550 • Call County Health: – (831) 454-2022 • Call RWQCB: – (805) 542-4649 • Call CA Department of Fish and Game: – (831) 649-2870
Reporting	• Category 1 SSO: Submit draft report within three (3) business days of becoming aware of the SSO and certify within 15 calendar days of SSO end date. • Category 2 SSO: Submit draft report within three (3) business days of becoming aware of the SSO and certify within 15 calendar days of the SSO end date. • Category 3 SSO: Submit certified report within 30 calendar days of the end of month in which SSO the occurred. • SSO Technical Report: Submit within 45 calendar days after the end date of any Category 1 SSO in which 50,000 gallons or greater are spilled to surface waters. • "No Spill" Certification: Certify that no SSOs occurred within 30 calendar days of the end of the month or, if reporting quarterly, the quarter in which no SSOs occurred. • Collection System Questionnaire: Update and certify every 12 months.	• Enter data into the CIWQS Online SSO Database, certified by enrollee's Legally Responsible Official(s).

Water Quality Monitoring	Conduct water quality sampling within 48 hours after initial SSO notification for Category 1 SSOs in which 50,000 gallons or greater are spilled to surface waters.	Water quality results are required to be uploaded into CIWQS for Category 1 SSOs in which 50,000 gallons or greater are spilled to surface waters.
Record Keeping	• SSO event records. • Records documenting SSMP implementation and changes/updates to the SSMP. • Records to document Water Quality Monitoring for SSOs of 50,000 gallons or greater spilled to surface waters. • Collection system telemetry records if relied upon to document and/or estimate SSO Volume.	• Self-maintained records shall be available during inspections or upon request.

Notes:
(1) Source: State of California, Water Resources Control Board Order No. WQ 2013-0058-EXEC.

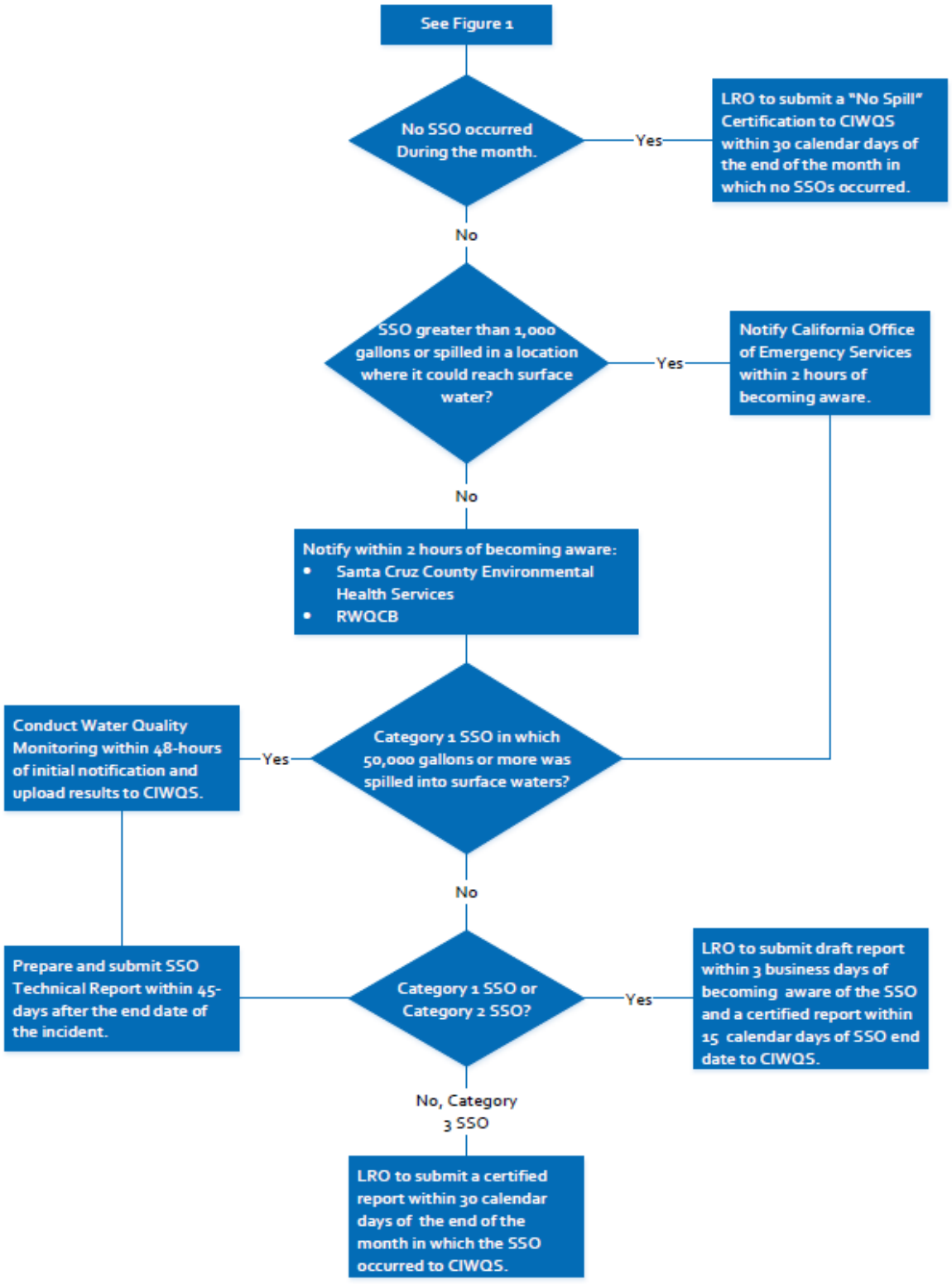


Figure 2 Notification, Reporting, and Monitoring Requirements Flow Chart

Section 5

REPORTING REQUIREMENTS

The City is responsible for preparing and submitting various types of reports in order to maintain compliance. The time frame and receiving agency in which the appropriate report is discussed in Section 4 of the OERP. The required report and mandatory information will vary depending on the type of discharge. These reports should be prepared by the dispatcher, response crews, and designated City staff. The reports are submitted and certified (if required) by the LRO.

5.1 Initial Reporting

During a Category 1 SSO where 1,000 or more gallons of sewage reach surface waters or has the potential to reach surface water. The City is required to call Cal OES within two (2) hours of the incident to get issued a notification control number. Before being issued a notification control number the City might be asked to provide information on the spill.

To prevent delays in the process the following spill information should be collected:

1. Name of person notifying Cal OES and direct return phone number.
2. Name of the agency causing the SSO.
3. Provide the on-scene point of contact and their contact information so they can be reached in the field.
4. Provide the date and time when the City became aware of the SSO.
5. SSO incident location (address, city, state, and zip code).
6. Is the SSO contained or ongoing?
    a. If contained, the estimated SSO volume discharged.
    b. If ongoing, the estimated SSO discharge rate.
7. Description of the incident. If known, include causes of the SSO.
8. Are there known impacts of the SSO.
    a. Surface water, if applicable, name of the impacted surface water.
    b. Drinking water supply was impacted or may be impacted.
    c. Are there any other known impacts?

5.2 SSO Reports

In the event of an SSO the City must prepare and submit SSO Report(s) to CIWQS Online SSO Database. The required time frames and mandatory information for an SSO Report depends on the SSO Category as defined in Section 1.2. The number of submittals and the mandatory information for each submittal varies depending on the Category of SSO. Table 2 summarizes the mandatory information for SSO Report submittals depending on the Category of SSO. The City may submit one SSO Report if one SSO event results in multiple appearance point in a sewer system.

The City may amend a certified SSO Report within 120 calendar days after the SSO end date by amending the report or by adding an attachment to the certified SSO Report in the CIWQS Online SSO Database. After 120 days, in order to amend a certified SSO Report the City must submit a request to the SSO Program Manager. The request must include justification for why the additional information was not available prior to the end of the 120 days.

Table 2 SSO Report – Summary

Information to Report	Category 1 – Draft	Category 1 – Certified	Category 2 – Draft	Category 2 – Certified	Category 3 – Certified
SSO Contact Information: Name and telephone number of enrollee contact person who can answer specific questions about the SSO being reported.	✓	✓	✓	✓	✓
SSO Location Name.	✓	✓	✓	✓	✓
Location of the overflow event (SSO) by entering GPS coordinates. If a single overflow event results in multiple appearance points, provide GPS coordinates for the appearance point closest to the failure point and describe each additional appearance point in the SSO appearance point explanation field.	✓	✓	✓	✓	✓
Whether or not the SSO reached surface water, a drainage channel, or entered and was discharged from a drainage structure.	✓	✓	✓	✓	✓
Whether or not the SSO reached a municipal separate storm drain system.	✓	✓	✓	✓	✓
Whether or not the total SSO volume that reached a municipal separate storm drain system was fully recovered.	✓	✓	✓	✓	✓
Estimate of the SSO volume, inclusive of all discharge point(s).	✓	✓	✓	✓	✓
Estimate of the SSO volume that reached surface water, a drainage channel, or was not recovered from a storm drain.	✓	✓	✓	✓	✓
Estimate of the SSO volume recovered (if applicable).	✓	✓	✓	✓	✓
Number of SSO appearance point(s).	✓	✓	✓	✓	✓
Description and location of SSO appearance point(s). If a single sanitary sewer system failure results in multiple SSO appearance points, each appearance point must be described.	✓	✓	✓	✓	✓
SSO start date and time.	✓	✓	✓	✓	✓
Date and time the City was notified of, or self-discovered, the SSO.	✓	✓	✓	✓	✓
Estimated operator arrival time.	✓	✓	✓	✓	✓
For spills greater than or equal to 1,000 gallons, the date and time Cal OES was called.	✓	✓			

Information to Report	Category 1 – Draft	Category 1 – Certified	Category 2 – Draft	Category 2 – Certified	Category 3 – Certified
For spills greater than or equal to 1,000 gallons, the Cal OES control number.	✓	✓			
Description of SSO destination(s).		✓		✓	✓
SSO end date and time.		✓		✓	✓
SSO causes (mainline blockage, roots, etc.).		✓		✓	✓
SSO failure point (main, lateral, etc.).		✓		✓	✓
Whether or not the spill was associated with a storm event.		✓		✓	✓
Description of spill corrective action, including steps planned or taken to reduce, eliminate, and prevent reoccurrence of the overflow; and a schedule of major milestones for those steps.		✓		✓	
Description of spill response activities.		✓		✓	
Spill response completion date.		✓		✓	
Whether or not there is an ongoing investigation, the reasons for the investigation and the expected date of completion.		✓		✓	
Whether or not a beach closure occurred or may have occurred as a result of the SSO.		✓			
Whether or not health warnings were posted as a result of the SSO.		✓			
Name of beach(es) closed and/or impacted. If no beach was impacted, NA shall be selected.		✓			
Name of surface water(s) impacted.		✓			
If water quality samples were collected, identify parameters the water quality samples were analyzed for. If no samples were taken, NA shall be selected.		✓			
If water quality samples were taken, identify which regulatory agencies received sample results (if applicable). If no samples were taken, NA shall be selected.		✓			
Description of methodology(ies) and type of data relied upon for estimations of the SSO volume discharged and recovered.		✓			
SSO Certification: Upon SSO Certification, the CIWQS Online SSO Database will issue a final SSO identification (ID) number.		✓		✓	✓

5.3 No-Spill Certification

If there are no SSOs during a calendar month, the City must certify a "No-Spill" certification statement to CIWQS Online SSO Database. The "No Spill" certification statement must be submitted within 30 calendar days of the month with no spill by the LRO. If there is a reported PLSD the City may certify a "No-Spill" certification for that month.

5.4 Collection System Questionnaire

The MRP requires all enrollees must complete a Collection System Questionnaire (Questionnaire), which provides the SWRCB with system specific information related to the City's collection system. The enrollee shall complete and certify the Questionnaire at least every 12 months to facilitate program implementation, compliance assessment, and enforcement response. The Questionnaire is available on CIWQS Online SSO Database.

5.5 SSO Technical Report

In the event of a Category 1 SSO in which 50,000 gallons or more sewage is reaches surface water the City is required to complete an SSO Technical Report. One of the major components of this report is water quality monitoring. The MRP requires that the agency to conduct a water quality sampling within 48-hours after the initial SSO notification. The City must submit the SSO Technical Report to CIWQS within 45 calendar dates of the SSO end date. At a minimum, an SSO Technical Report shall include the following:

1. Causes and Circumstances:
    a. Explanation of how and when the SSO was discovered.
    b. Diagram showing the SSO failure point, appearance point(s), and final destination(s).
    c. State the methodology and available data used to calculate the approximate sewage volume and, if applicable, the approximate sewage volume recovered.
    d. Description of the cause(s) of the SSO.
    e. Copies of original response crew records used to document the SSO.
    f. Historical maintenance records for the failure location.
2. Response:
    a. Narrative of all actions taken by the City to eliminate the spill in chronological order.
    b. Explanation of how the OERP was implemented during the response respond.
    c. List the final corrective action(s) completed and, if applicable, the planned actions to be completed with a schedule.
3. Water Quality Monitoring:
    a. Description of all water quality sampling activities conducted including analytical results and evaluation of the results.
    b. Detailed location map illustrating all water quality sampling points.

Section 6

PUBLIC NOTIFICATION

When an overflow has been confirmed and is a threat to public health, actions should be taken, if necessary, to notify the public in accordance with this section. For confirmed overflows in the sewer system requiring notification:

- Notify the residents in close proximity to the spill or impacted areas with door hangers.
- If applicable, post signs along impacted surface water.

Section 7

DISTRIBUTION AND MAINTENANCE OF OERP

This plan was prepared in conjunction with and is an important element of the City's SSMP. As such, the OERP should be periodically reviewed and modified as necessary to reflect operational and policy changes. Audits of the plan should also be performed in conjunction with the larger SSMP program audits, as outlined in Chapter 11 of the SSMP.

7.1 Submittal and Availability of OERP

Copies of the OERP and any amendments should be distributed to all of the departments, divisions, and personnel that are heavily involved with the SSMP or OERP programs. All other personnel who may become incidentally involved in responding to overflows should be familiar with the OERP. A program to train such personnel on the provisions of this plan should also be established by the City.

7.2 Review and Update of OERP

The City is ultimately responsible for keeping the OERP up to date. The OERP should be reviewed at a predefined time interval for outdated material and should be updated whenever:

- Specified by the LRO or their designated representative.
- The SSMP plan audit indicates that material needs to be revised or added.
- Responsibilities of personnel involved in SSO response, mitigation or reporting change for various reasons.
- Governing laws, rules or regulations change.

Appendix C

CONTACT INFORMATION

Table C.3 Contact Information

Position	Name	Phone	Email
Public Works Director / City Engineer	Chris Lamm	831-438-5854	clamm@scottsvalley.org
Wastewater Division Manager	Kati King	831-438-0732	kking@scottsvalley.org
Senior Wastewater Operator	Are Soto	831-438-0732	asoto@scottsvalley.org
Wastewater Operator	Gunnar Dibenedetto	831-438-0732	
Wastewater Operator Grade I	Tyler Hebard	831-438-0732	thebard@scottsvalley.org
Wastewater Operator Grade I	Justin Granados	831-438-0732	jgranados@scottsvalley.org
Source Control Inspector	Josephine Fleming	831-706-7384	jo.fleming@envirocentives.com
Environmental Compliance Inspector	Sheila Peck	--	speck@environmentalin.com
Civil Engineer	Chris Lamm	831-438-5854	clamm@scottsvalley.org
Engineering Associate	Kimarie Jones	831-438-5854	kjones@scottsvalley.org
Engineering Associate	Athena Cheung	831-438-5854	acheung@scottsvalley.org

Attachment 1

SANITARY SEWER OVERFLOW FIELD REPORT

SANITARY SEWER OVERFLOW FIELD REPORT

FOR OFFICIAL USE:

DATE: _____ CALL RECEIVED: _____ AM/PM

RECEIVED BY: _____ CALLER'S NAME: _____

CALLER'S PHONE NUMBER: _____

CALLER'S ADDRESS: _____

SSO APPEARANCE POINT(S): _____

LOCATION OF OVERFLOW: _____ CROSS ST: _____

GPS COORDINATE(S):

TIME DISPATCHED: WORK ORDER NO.:

CREW FIELD LEAD: _____

NAMES OF CREW MEMBERS DISPATCHED: _____

DESCRIPTION OF COMPLAINT: _____

FIELD REPORT (FOR RESPONSE CREW USE):

TIME ARRIVED AT SITE: _____ CREW: _____

TIME OVERFLOW STARTED: _____ TIME OVERFLOW STOPPED: _____

OVERFLOW DURATION: _____ MIN. OVERFLOW FLOW: _____ GAL/MIN

UPSTREAM MH#: _____ DOWNSTREAM MH#: _____

SIZE OF LINE: _____ LENGTH OF LINE: _____

FINDINGS:

COMPLETE REMAINDER OF FORM IF AN OVERFLOW HAS OCCURRED:

DESCRIBE CAUSE OF OVERFLOW:

DESCRIBE CLEANUP METHOD AND HOW OVERFLOW VOLUME WAS DETERMINED:

REACHED SURFACE WATER: YES ☐ NO ☐

NAME OF SURFACE WATER(S) IMPACTED: _____

ESTIMATED TOTAL SSO VOLUME: _____ GALLONS

ESTIMATED SSO VOLUME RECOVERED: _____ GALLONS

ESTIMATED SSO VOLUME REACHED SURFACE WATER: _____ GALLONS

NOTE: IF THE ESTIMATED SSO VOLUME REACHED SURFACE WATER IS GREATER THAN 50,000 GALLONS A TECHNICAL REPORT AND WATER QUAILITY MONITORTING IS REQUIRED.

TYPE OF PROBLEM: _____

PICTURES TAKEN: YES ☐ NO ☐

SAMPLES TAKEN: YES ☐ NO ☐ IF YES SEE [INSERT]

DESCRIBE PROPERTY DAMAGE AND AFFECTED AREA:

SIGN POSTED: YES ☐ NO ☐ BARRICADED: YES ☐ NO ☐

NEIGHBORS NOTIFIED: YES ☐ NO ☐

REGULATORY AGENCIES NOTIFIED:

OES	YES ☐	NO ☐	DATE/TIME	SPILL #	
RWQCB	YES ☐	NO ☐	DATE/TIME		
COUNTY HEALTH	YES ☐	NO ☐	DATE/TIME		
OTHER	YES ☐	NO ☐	DATE/TIME		

CONTACTS/DETAILS:

FOLLOWUP MEASURES:

WORK ORDER NO: _____

FREQUENCY OF EXISTING PM PROGRAM: _____

LAST DATE PM WAS PERFORMED: _____

RECOMENDATIONS ON HOW TO PREVENT FUTURE PROBLEMS:

REPORT COMPLETED BY: _____ DATE: _____

WATER QUAILITY SAMPELING:

DESCRIPTION OF SAMPLING ACTIVITES CONDUCTED:

SAMPLE LOG NO:

SAMPLES TAKEN BY:

SAMPLE LOCATION(S):

PARAMETERS TESTED:

SAMPLES TESTED BY:

SAMPLES SEND DATE: SAMPLES SENT BY:

SAMPLE RESULTS RECEIVE DATE:

REGULATORY AGENCIES THAT RECEIVED SAMPLE RESULTS:

SKETCH OF AREA: (Include manholes, intersections, location of stoppage, etc.)

ATTACH MAP: (Include manholes, intersections, location of stoppage, etc.)

ATTACH PHOTOS AS AVAILABLE

Attachment 2

SANITARY SEWER OVERFLOW FIELD REPORT

METHODS FOR ESTIMATING SPILL VOLUME

A variety of approaches exist for estimating the volume of a sanitary sewer spill. This attachment documents the three methods that are most often employed. The person preparing the estimate should use the method most appropriate to the sewer overflow in question and use the best information available.

Method 1 : Eyeball Estimate

The volume of small spills can be estimated using an "eyeball estimate". To use this method imagine the amount of water that would spill from a bucket or a barrel. A bucket contains 5 gallons and a barrel contains 50 gallons. If the spill is larger than 50 gallons, try to break the standing water into barrels and then multiply by 50 gallons. This method is useful for contained spills up to approximately 200 gallons.

Method 2 : Measured Volume

The volume of most small spills that have been contained can be estimated using this method. The shape, dimensions, and the depth of the contained wastewater are needed. The shape and dimensions are used to calculate the area of the spills and the depth is used to calculate the volume.

Step 1 Sketch the shape of the contained sewage (see Figure 1).

Step 2 Measure or pace off the dimensions.

Step 3 Measure the depth at several locations and select an average.

Step 4 Convert the dimensions, including depth, to feet.

Step 5 Calculate the area in square feet using the following formulas:

Rectangle: Area = length (feet) x width (feet)

Circle: Area = diameter (feet) x diameter (feet) x 3.14

Triangle: Area = base (feet) x height (feet) x 0.5

Step 6 Multiply the area (square feet) times the depth (in feet) to obtain the volume in cubic feet.

Step 7 Multiply the volume in cubic feet by 7.5 to convert it to gallons

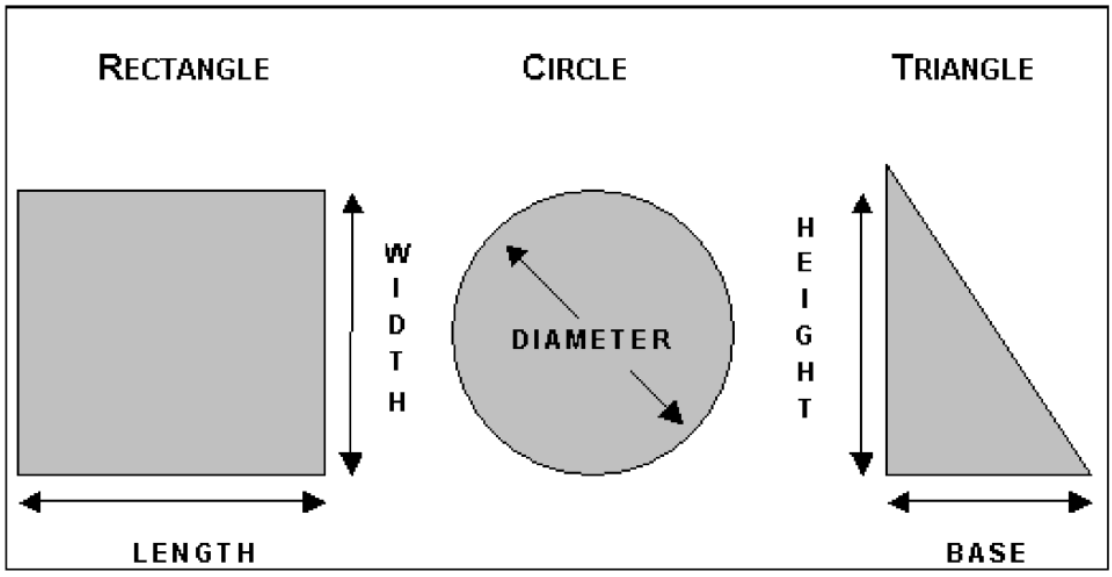


Figure 1 Common Shapes and Dimensions

Method 3 : Duration and Flowrate

Calculating the volume of larger spills, where it is difficult or impossible to measure the area and depth, requires a different approach. In this method, the separate estimates are made of the duration of the spill and the flowrate. The methods of estimating duration and flowrate are:

Duration: The duration is the elapsed time from the time the spill started to the time that the flow was restored.

Start time: The start time is sometimes difficult to establish. Here are some approaches:

- Local residents can be used to establish start time. Inquire as to their observations. Spills that occur in rights-of-way are usually observed and reported promptly. Spills that occur out of the public view can go on longer. Sometimes observations like odors or sounds (e.g. water running in a normally dry creek bed) can be used to estimate the start time.
- Changes in flow on a downstream flowmeter can be used to establish the start time. Typically, the daily flow peaks are "cut off" or flattened by the loss of flow. This can be identified by comparing hourly flow data during the spill event with flow data from prior days.
- Conditions at the spill site change over time. Initially there will be limited deposits of toilet paper and other sewage solids. After a few days to a week, the sewage solids form a light-colored residue. After a few weeks to a month, the sewage solids turn dark. The quantity of toilet paper and other materials of sewage origin increase over time. These observations can be used to estimate the start time in the absence of other information. Taking photographs to document the observations can be helpful if questions arise later in the process.

- It is important to remember that spills may not be continuous. Blockages are not usually complete (some flow continues). In this case, the spill would occur during the peak flow periods (typically 10:00 to 12:00 and 13:00 to 16:00 each day). Spills that occur due to peak flows in excess of capacity will occur only during, and for a short period after, heavy rainfall.

End time: The end time is usually much easier to establish. Field crews on-site observe the "blow down" that occurs when the blockage has been removed. The "blow down" can also be observed in downstream flowmeters.

Flow Rate: The flowrate is the average flow that left the sewer system during the time of the spill. There are three common ways to estimate the flowrate:

- The San Diego Manhole Flowrate Chart: This chart, included as Figure 2, shows sewage flowing from manhole covers at a variety of flowrates. The observations of the field crew can be used to select the appropriate flowrate from the chart. If possible, photographs are useful in documenting basis for the flowrate estimate.
- Flowmeter: Changes in flows in downstream flowmeters can be used to estimate the flowrate during the spill.
- Counting Connections: Once the location of the spill is known, the number of upstream connections can be determined from the sewer maps. Multiply the number of connections by 200 to 250 gallons per day per connection or 8 to 10 gallons per hour per connection.

For example: 22 upstream connections x 9 gallons per hour per connection

= 198 gallons per hour / 60 minutes per hour

= 3.3 gallons per minute

Spill Volume: Once duration and flowrate have been estimated, the volume of the spill is the product of the duration in hours or days and the flowrate in gallons per hour or gallons per day.

For example:

Spill start time = 11:00

Spill end time = 14:00

Spill duration = 3 hours

3.3 gallons per minute X 3 hours X 60 minutes per hour

= 594 gallons

City of San Diego
Metropolitan Wastewater Department

Reference Sheet for Estimating Sewer Spills from Overflowing Sewer Manholes

All estimates are calculated in gallons per minute (gpm)

Wastewater Collection Division
(619) 654-4160


5 gpm


25 gpm


50 gpm

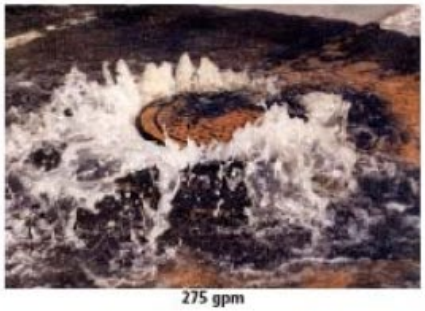

100 gpm


150 gpm


200 gpm


225 gpm


250 gpm


275 gpm

All photos were taken during a demonstration using metered water from a hydrant in cooperation with the City of San Diego's Water Department.

rev. 4/99

Appendix I

EXAMPLE FOG OUTREACH MATERIAL

City of Scotts Valley GreenWaste Recovery

WASTELINE

A Publication for GreenWaste Recovery Customers in the City of Scotts Valley

Fall 2021



Residential Organics Recycling is Coming in 2022

Organic waste emits 20% of the state's methane, a climate super-pollutant 84 times more potent than carbon dioxide. Organics like food scraps, yard trimmings, paper, and cardboard make up half of what California's dump in landfills making organics the third largest source of methane in California. Through a new residential organics recycling program, food scraps and yard trimmings organic material will be diverted from the landfill and processed into mulch and fertilizer.

The City of Scotts Valley and GreenWaste Recovery are working hard to develop this new organics recycling program. When a start date is determined, more information will be sent out to you with program guidelines and how to participate. Look for information coming to your mailbox soon.

Recycle Household Batteries

To recycle small batteries, simply seal the batteries in a clear Ziploc bag and place the items on top (not inside) of your recycling bin.



greenwaste
a brighter shade of green

Remittance Address:
GreenWaste Recovery, P.O. Box 11089, San Jose, CA 95103-1089

We at GreenWaste “Think Differently” and appreciate your suggestions and comments. Please call us today and let us know how we are doing at (800) 665-2209 or (831) 768-9505, or visit us on the web at www.greenwaste.com



Fats, Oils & Grease (FOG) Clog Sewers: Scrape It, Can It,Trash It

Cooking fats, oils, and grease (FOG) are the leading causes of sewer pipe clogs. When poured down sinks, drains, or toilets, FOGs eventually cool, harden, and build up on the inner walls of sewer lines. As sewage flow is restricted, it can back up in your home, on your property, or even in the street.

Protect your pipes and your home. Don't let items like these down your drains:

- Cooking oils (includes deep frying oils)
- Olive oil
- Butter, margarine
- Shortening
- Lard
- Salad dressings
- Sauces, gravies
- Meat fats
- Milk, cream, ice cream
- Marinades
- Sandwich spreads

What You Can Do: *Scrape It, Can It, Trash It*

After cooking, let your fats, oils, and grease cool. For small amounts of FOG, scrape or wipe the pan. For larger amounts, scrape it into a covered disposable container. Either way, throw the by-product into your trash and never down the drain.

Bulky Item Pickup

Large items such as refrigerators and furniture can be picked up at your curb for a small fee. Contact Customer Service at **(831) 768-9505** or **santacruzcs@greenwaste.com** to schedule an appointment.





Recycle Holiday Trees

GreenWaste will pick up your undecorated holiday tree on your regular collection day from January 3-21, 2022. You do not need to call to schedule a pickup.

Please remove the stand, cut the tree to approximately 6-foot lengths, and place curbside before 7 AM on your regular collection day. Flocked trees (fake snow) are NOT accepted.

Holiday Pickup Schedule

Collection does NOT occur on New Year's Day (Jan. 1), Thanksgiving Day (4th Thursday in Nov.) or Christmas Day (December 25). If an observed holiday falls on a regular collection day, collection for the remainder of the week will be delayed by one day.

Thursday, November 25th we will be closed and the collection will be delayed one day for the remaining route days.

Christmas Day and New Year's Day fall on Saturday, which does not cause a service disruption this year.

NOVEMBER

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
21	22	23	24	25	26	27

DECEMBER

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
19	20	21	22	23	24	25

JANUARY

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
26	27	28	29	30	31	1

Printed on 55% recycled 30% post-consumer waste paper.

Appendix J

SYSTEM EVALUATION AND CAPACITY ASSURANCE PLAN



City of Scotts Valley
Sewer System Management Plan

SYSTEM EVALUATION AND CAPACITY ASSURANCE

FINAL | December 2021

carollo

Sewer System Management Plan

SYSTEM EVALUATION AND CAPACITY ASSURANCE PLAN

FINAL | December 2021



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Abbreviations

AACE	The Association for the Advancement of Cost Engineering
AAF	average annual flow
ac	acre
ADWF	average dry weather flow
AMBAG	Association of Monterey County Government
BWF	base wastewater flow
CAD	computer-aided drawing
Carollo	Carollo Engineers, Inc.
CIP	Capital Improvement Plan
City	City of Scotts Valley
DU	dwelling units
DWF	dry weather flow
ENR CCI	Engineering News Record Construction Cost Index
fps	feet per second
General Plan	General Plan Update
GIS	geographic information system
gpcd	gallons per capita per day
gpd/AC	gallons per day per acre
GWI	groundwater infiltration
HGL	hydraulic grade line
I/I	infiltration/inflow
LAFCO	Local Agency Formation Commission
Mg	million gallons
mgd	million gallons per day
NASSCO	National Association of Sewer Service Companies
NOAA	National Oceanic and Atmospheric Administration
NRCS	The Natural Resources Conservation Service
PACP	Pipeline Assessment Certification Program
PWWFs	peak wet weather flows
RDII	Rain Derived Infiltration and Inflow
RWQCB	Regional Water Quality Control Board
SEACAP	System Evaluation and Capacity Assurance Plan
SSMP	Sewer System Management Plan
SSOs	sanitary sewer overflows
SWMM	Storm Water Management Model
SWRCB	State Water Resources Control Board

USEPAs	United State Environmental Protection Agency's
V&A	V&A Consulting Engineers, Inc.
WaPUG	Wastewater Planning Users Group
WDR	Order No. 2006-0003-DWQ
WRF	Water Reclamation Facility
WWF	wet weather flow

Section 1

INTRODUCTION

1.1 Background

The City of Scotts Valley (City) is primarily a residential community with a considerable amount of office, warehouse, and research and development in the commercial sector. The City covers roughly 4.6 square miles within Santa Cruz County, approximately 30 miles south of downtown San Jose and six miles north of the City of Santa Cruz. The City's population is estimated to be 12,145 in 2020.

The City provides sewer services to customers within the city limits, as shown on Figure 1. Collectively, the City's wastewater collection and conveyance system includes approximately 47 miles of gravity sewers, and seven lift stations. The City's collection system discharges to and is treated at the Scotts Valley Water Reclamation Facility (WRF).

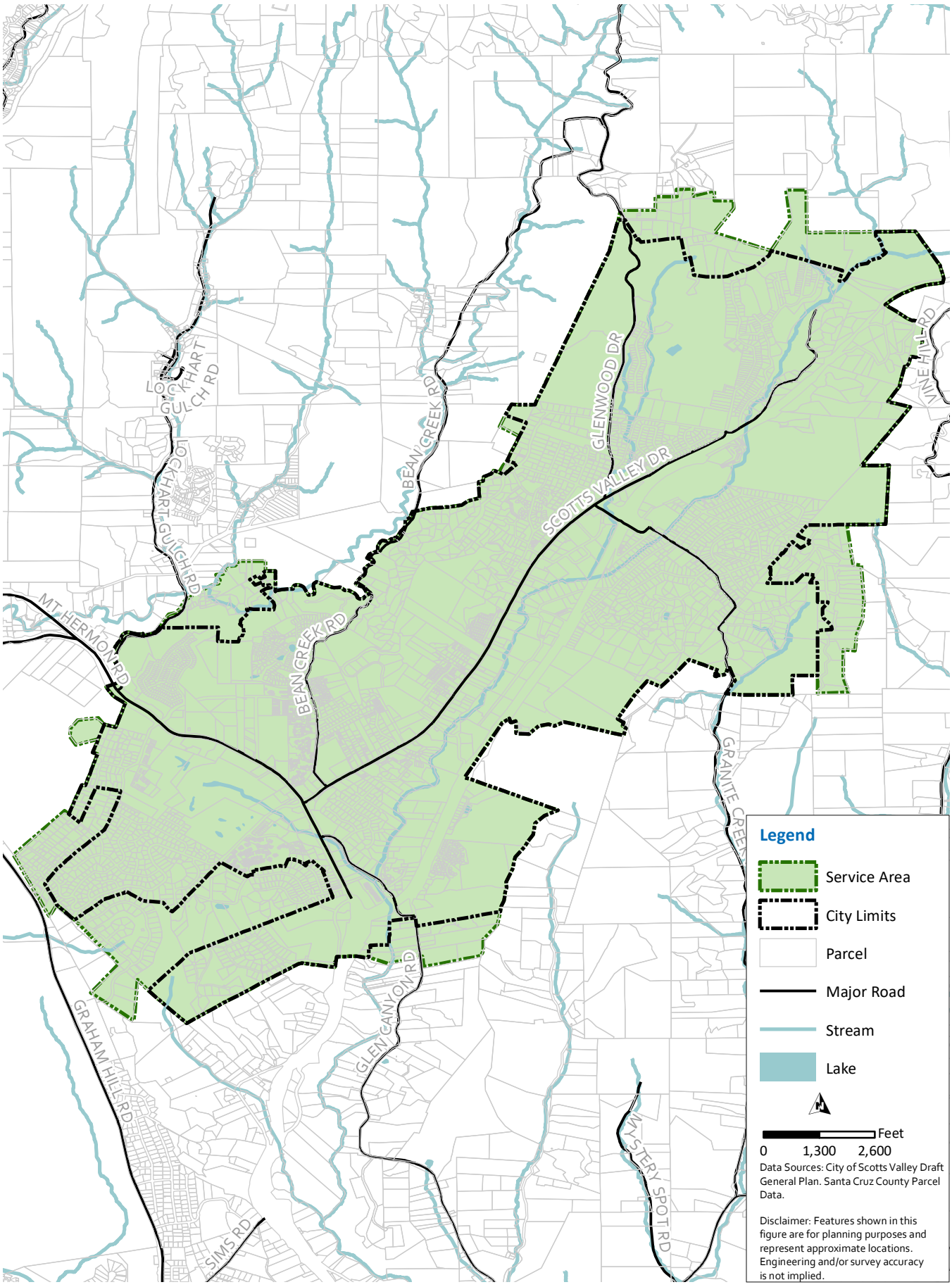


Figure 1 Sanitary Sewer Service Area

1.2 Scope and Authorization

On September 5, 2018 the City approved a professional service agreement with Carollo Engineers, Inc. (Carollo) to prepare this Sewer System Management Plan (SSMP), which included the following main tasks:

- Project Management and Meetings.
- Data Collection and Background Review.
- Temporary Flow Monitoring Program.
- Land Use Analysis.
- Wastewater Flow Projections.
- Hydraulic Model Construction and Calibration.
- Capacity Analysis and Recommended Projects.
- Prioritized CCTV Inspection Plan and Phase 1 Inspection.
- Lift Station Condition Assessment.
- Develop 20-Year Capital Improvement Program (CIP).
- Develop Sewer System Management Plan.

1.3 Regulatory Requirements

The State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Board (RWQCB) regulate the management, operation, and maintenance of the sanitary sewer systems. The Statewide General Waste Discharge Requirements for Sanitary Sewer Systems Order No. 2006-0003-DWQ (WDR) requires that the City prepare and implement a CIP) that will provide hydraulic capacity for peak dry weather flows (DWFs) as well as the appropriate design storm or wet weather event. The SSMP must address, at the minimum, the following:

D.13. (viii) System Evaluation and Capacity Assurance Plan: The Enrollee shall prepare and implement a capital improvement plan that will provide hydraulic capacity of key sanitary sewer system elements for dry weather peak flow conditions, as well as the appropriate design storm or wet weather event. At a minimum, the plan must include:

(a) Evaluation: Actions needed to evaluate those portions of the sanitary sewer system that are experiencing or contributing to an SSO discharge caused by hydraulic deficiency. The evaluation must provide estimates of peak flows (including flows from SSOs that escape from the system) associated with conditions similar to those causing overflow events, estimates of the capacity of key system components, hydraulic deficiencies (including components of the system with limiting capacity) and the major sources that contribute to the peak flows associated with overflow events;

(b) Design Criteria: Where design criteria do not exist or are deficient, undertake the evaluation identified in (a) above to establish appropriate design criteria; and

(c) Capacity Enhancement Measures: The steps needed to establish a short- and long-term CIP to address identified hydraulic deficiencies, including prioritization, alternatives analysis, and schedules. The CIP may include increases in pipe size, I/I reduction programs, increases and redundancy in pumping capacity, and storage facilities. The CIP shall include an implementation schedule and shall identify sources of funding.

(d) Schedule: The Enrollee shall develop a schedule of completion dates for all portions of the CIP developed in (a)-(c) above. This schedule shall be reviewed and updated consistent with the SSMP review and update requirements as described in Section D. 14.

1.4 Purpose

The City recognizes the importance of preventing sewage spills to protect surface waters and to safeguard public health and safety. This System Evaluation and Capacity Assurance Plan (SECAP) was developed to achieve this purpose and conforms to the requirements of the WDRs, as well as other applicable regulations. Specific activities and procedures to implement the various programs related to the sanitary sewer system by City staff are described, which were developed to properly manage, operate, and maintain the collection system and reduce and/or eliminate sanitary sewer overflows (SSOs) to the extent possible.

1.5 Report Organization

This SECAP report contains seven sections, followed by appendices that provide supporting documentation for the information presented in the report. The sections are organized as follows:

- Section 1 - Introduction.
- Section 2 - Planning Area.
- Section 3 - Evaluation Criteria.
- Section 4 - Wastewater Flows.
- Section 5 - Collection System Facilities and Hydraulic Model.
- Section 6 - Capacity Evaluation.
- Section 7 - Recommended Projects.
- Section 8 - Capital Improvement Program.

Section 2

SERVICE AREA, LAND USE, AND POPULATION

This section presents a discussion of the City's service area characteristics, land use classifications, and historical and projected population trends.

2.1 Service Area

The City's existing General Plan was last updated in 1994. Many changes have occurred in the City over since the development of the 1994 General Plan[1]. The City is in the process of updating General Plan Update[2] (General Plan) with a 2040 planning horizon. The Draft General Plan's planning area encompasses approximately 8.3 square miles that consist of area within the City limits and the unincorporated lands that may be annexed to the City. A sphere of influence study was commissioned by the Santa Cruz County Local Agency Formation Commission (LAFCO) for

[1] 1994 General Plan
[2] Final Draft General Plan

the City. A sphere of influence differs from a planning area because it is the probable ultimate physical boundary and service area of the City's jurisdiction. Figure 1 illustrates the City's sanitary sewer service area.

2.2 Planning Period

This SECAP is intended to serve as a guiding document for the planning and implementation of sanitary sewer system improvements to accommodate future growth within the study area through the year 2040. The planning horizon is consistent with the City's Draft General Plan. The population and land use projections included in the Draft General Plan are summarized in later sections and set the foundation for the wastewater flow projections.

2.3 Land Use

Land use information is an integral component in defining the amount of wastewater generated within the service area. Therefore, adequately estimating wastewater flows from various land use types is important in sizing and maintaining the wastewater system facilities. An important tool for determining land use projections is the City's Draft General Plan Land Use[3]. The land use assumptions provided in Draft General Plan were used for the purpose of this SECAP. The Draft General Plan identifies 16 land use categories. Figure 2 shows the land use according to the City's Draft General Plan. As shown in Table 1, there are approximately 1,759 acres connected to the sewer collection system service area connected to the existing collection system.

Table 1 Land Use

Land Use Type	Connected Area (ac)	Unconnected Area (ac)	Total Area (ac)
Mountain Residential	0	1,022	1,022
Rural Residential	156	1,065	1,220
Estate Residential	198	291	489
Low Density Residential	244	59	303
Medium Density Residential	401	22	423
Medium High Density Residential	175	3	177
High Density Residential	86	1	88
Very High Density Residential	25	2	26
Light Industrial	116	20	136
Heavy Industrial	0	180	180
Research and Development	24	7	31
Professional Commercial	13	7	20
Service Commercial	118	27	145
Shopping Center	34	0	34
Public/Quasi Public	170	44	213
Open Space	0	777	777
Total	1,759	3,526	5,285

Notes:
(1) Source: City of Scotts Valley Draft General Plan.
(2) Source: City of Scotts Valley GIS Data.

[3] General Plan Land Use

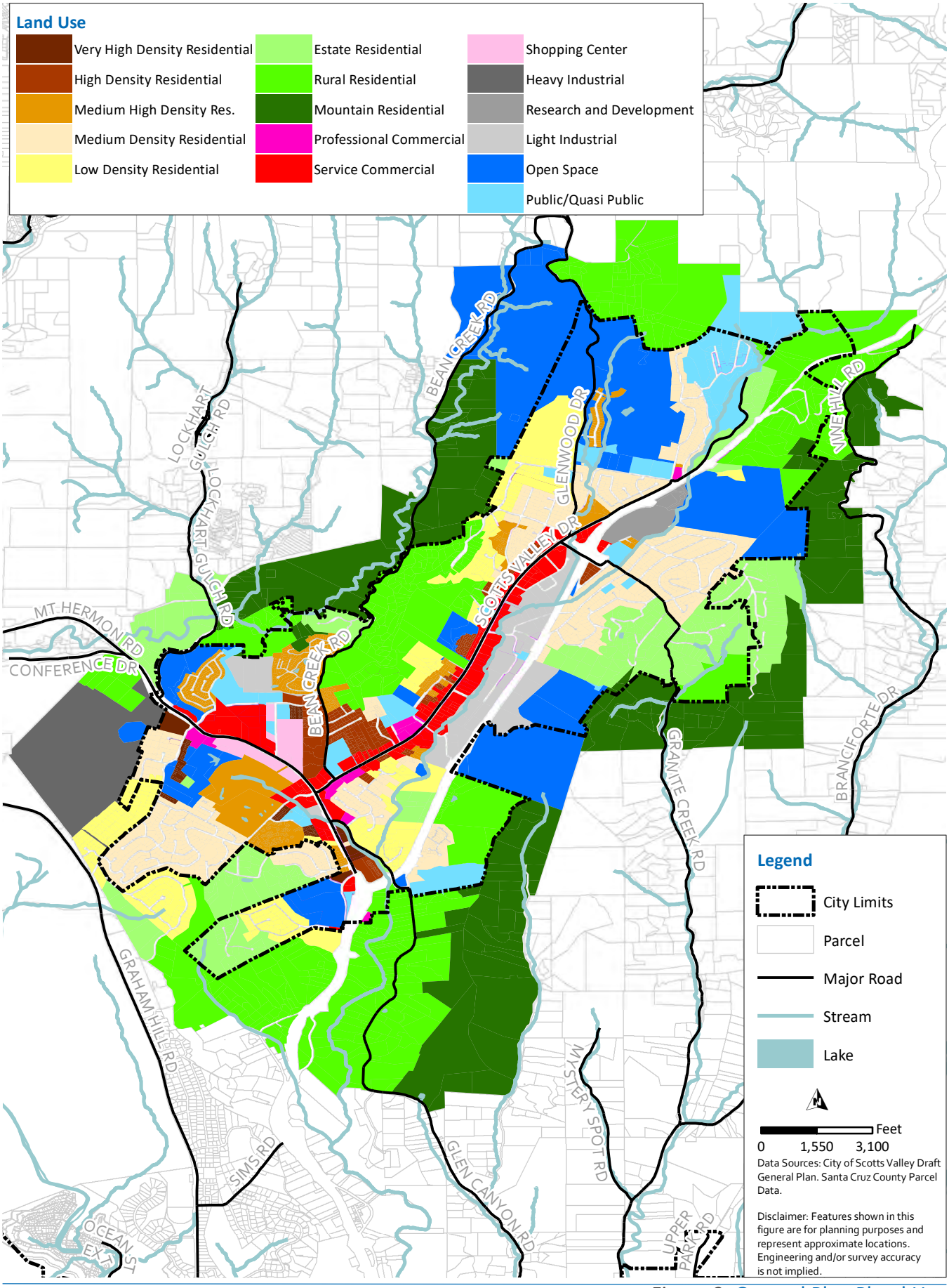


Figure 2 General Plan Pland Use

2.4 Future Connections

Future connections consist of known information provided by the City of potential future developments/customers that could connect to the sanitary sewer collection system by 2040. Potential future connections consist of underutilized parcels, vacant parcels, and planned developments. It was assumed that developed parcels within the service area not currently connected to the sewer system (i.e., septic parcels) would not be connected in the future. Areas currently served by septic systems are located in remote areas that cannot be cost effectively served by the sanitary sewer system. The City's Draft General Plan identified approximately 44 acres of underutilized parcels and 24 acres of vacant parcels within the service area, Table 8 provides details on the acreage by land use type. In addition, the City identified future development plans within the service area that consisted of approximately 149 acres of residential land use and 42 acres of non-residential land use, details on these developments is provided in Table 9. Figure 3 shows the locations of future connections within the service area.

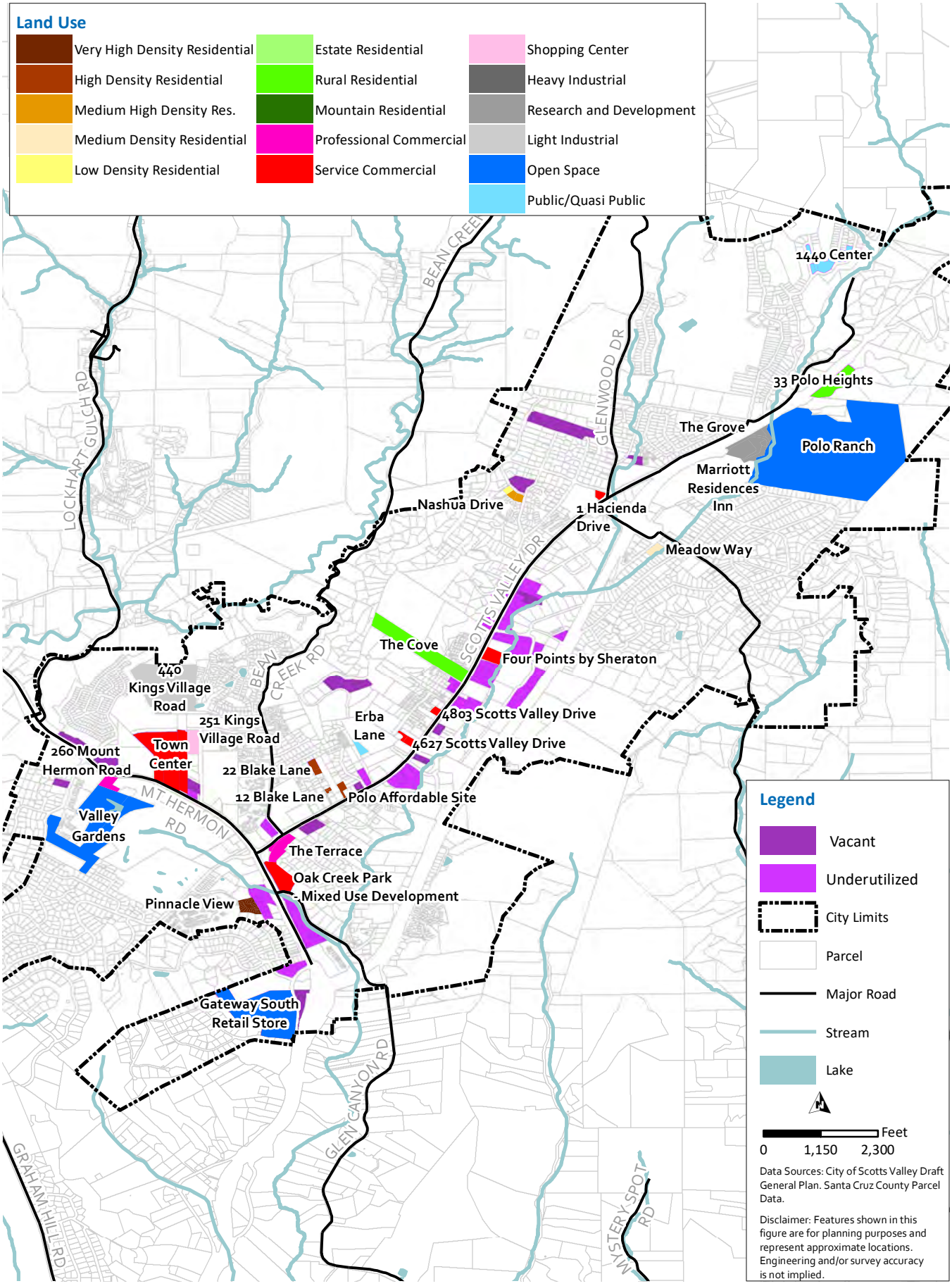


Figure 3 Future Connections

2.5 Population

This section summarizes the City's historic and projected population within the system's service area. Table 2 summarizes the City's historical population from 2010 to 2019. As shown in Table 2, the City's population has fluctuated, but had an overall increase of approximately four percent. Historic population estimates for the City's service area were developed using the 2010 US Census Data for 2010, as well as the California Department of Finance for the years 2011 through 2019. Figure 4 shows the historic and projected population.

Future growth in the City was estimated using the Draft General Plan which cites the 2018 Regional Growth Forecast estimates Scotts Valley study (Regional Growth Forecast) by Association of Monterey County Governments (AMBAG). This SECAP assumes that the City's population will grow based on AMBAG's Regional Growth Forecast, as summarized in Table 2. The projected population is estimated to increase by 336 residents within the planning period (by year 2040).

Table 2 Service Area Population Summary

Year	Population[(1)(2)]
2010	11,580
2011	11,655
2012	11,745
2013	11,846
2014	11,972
2015	12,136
2016	12,189
2017	12,199
2018	12,162
2019	12,082
2020	12,145
2025	12,214
2030	12,282
2035	12,348
2040	12,418

Notes:
(1) Source: California Department of Finance - Population and Housing Estimates for Cities, Counties, and the State, 2011-2019 with 2010 Census Benchmark.
(2) Source: AMBAG 2018 Regional Growth Forecast estimates Scotts Valley.

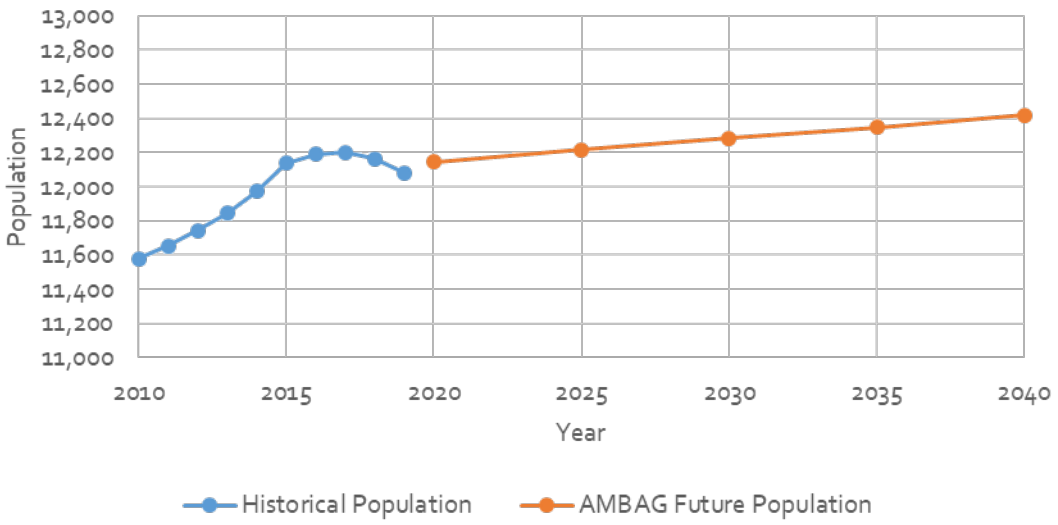


Figure 4 Service Area Population

Section 3

EVALUATION CRITERIA

Capacity analysis of the wastewater collection system was performed in accordance with the criteria established in this section. These criteria are consistent with industry best practices.

3.1 Design Storm

Design storms are rainfall events used to analyze the performance of a collection system under extreme wet weather events. The City's design storm was routed through the collection system model to determine peak wet weather flows (PWWFs), as described in Section 6. The first step in the development of the design storm is to define its recurrence interval and rainfall duration. The recurrence interval is based on the probability that a given rainfall event will occur or be exceeded in any given year. For example, a "100-year storm" means there is a 1-in-100 chance that a storm as large as or larger than this event will occur at a specific location in any year.

Duration is the length of time in which the rainfall occurs. It is industry standard in California to use the 10-year, 24-hour design storm for analyzing wastewater collection system performance during PWWF conditions. The 10-year, 24-hour design storm volume is 7.72 inches as documented on National Oceanic and Atmospheric Administration (NOAA) Atlas 14.

Once the design storm recurrence interval, duration, and associated rainfall volume have been determined, the next step in defining the design storm is to distribute the total rainfall over duration of the storm. The Natural Resources Conservation Service (NRCS) Type 1 rainfall distribution was used. Figure 5 shows the 10-year, 24-hour design storm.

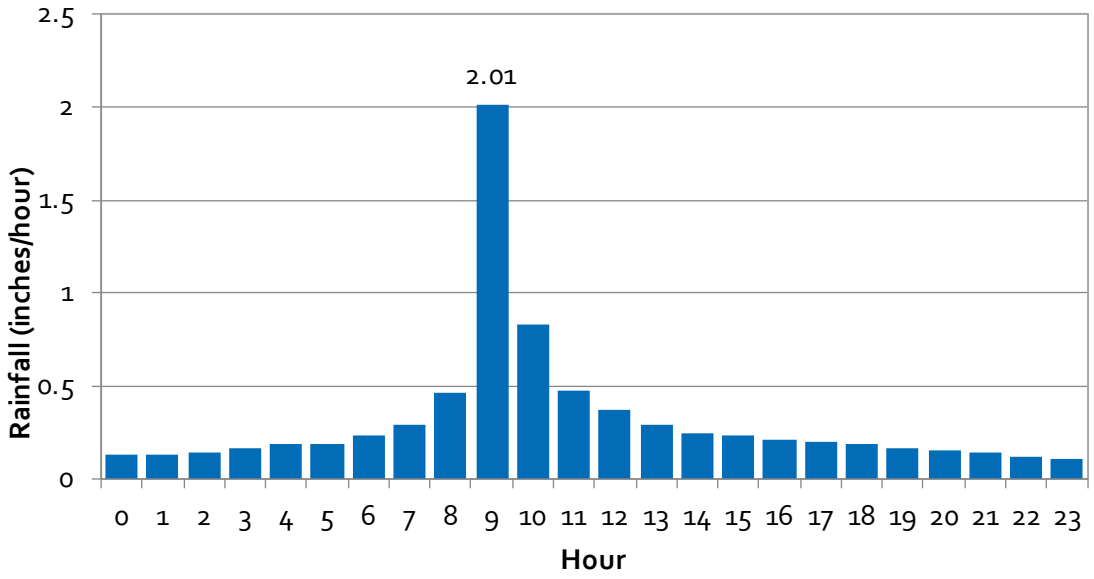


Figure 5 Design Storm Pattern – 10-Year, 24-Hour

3.2 Gravity Sewer Criteria

Sewer pipe capacities are dependent on many factors, including roughness of the pipe, the maximum allowable depth of flow, and minimum velocity.

3.2.1 Manning Coefficient (n)

The Manning coefficient 'n' is a friction coefficient and varies with respect to pipe material, size of pipe, depth of flow, smoothness of pipe and joints. For sewer pipes, the Manning coefficient typically ranges between 0.011 and 0.017, with 0.013 being a typical value used for sewer system planning.

3.2.2 Peak Flow Depth Criteria

The primary criterion used to identify pipeline capacity deficiencies or to size new sewer improvements is the peak flow depth criteria. Based on Carollo's experience, City staff input, and industry standards.

- Flow Depth Criteria for Existing Sewers: Maximum flow depth criteria for existing sanitary sewers are established based on a number of factors, including the acceptable risk tolerance of the utility and local standards and codes. Using a conservative flow depth criteria when evaluating existing sewers may lead to unnecessary replacement of existing pipelines. Conversely, lenient flow depth criteria could increase the risk of SSOs. Ultimately, the maximum allowable flow depth criteria should be established to be as cost-effective as possible while at the same time reducing the risk of SSOs to the greatest extent possible. For the City, existing pipelines were flagged if the pipe surcharged within five (5) feet within the manhole rim.

System bottlenecks raise the hydraulic grade line of upstream sewers, leading to backwater conditions. The greater the capacity deficiency, the higher water levels will surcharge upstream of the bottleneck pipeline (or pipelines). The hydraulic model is used to identify "backwater" pipelines in order to isolate which specific pipelines are the actual root causes of the capacity deficiency. Capital projects are proposed to provide greater flow capacity for the deficient sewers, which eliminates the backwater conditions that cause surcharging.

- Flow Depth Criteria for New Sewers: When sizing new sewer pipelines, it is common practice to adopt different flow depth criteria for various pipe sizes. Design d/D ratios typically range from 0.5 to 0.92, with the lower values typically used for smaller pipes, which may experience flow peaks greater than design flow or blockages from debris, paper, or rags. A maximum allowable d/D ratio of 0.92 for all new sewers.
- Small Diameter Pipe: The recommended minimum sewer main diameter is 8 inches. When a small diameter pipe needs to be replaced, it is recommended that it be upsized to at least 8 inches in diameter.

3.2.3 Design Velocities and Minimum Slopes

To minimize the settlement of sewage solids, it is industry standard to specify a minimum velocity of 2 fps be maintained. At this velocity, the sewer flow will provide self-cleaning of the pipe.

3.3 Lift Station and Force Main Criteria

Industry standard practice is to require that sewage lift stations have sufficient capacity to pump peak flows with the largest pump out of service (firm capacity). Force main piping should be sized to provide a minimum velocity of 3 feet per second (fps) at the design flow rate of the lift station and no more than 8 fps. For the determination of head loss, the Hazen-Williams equation is used with a C-factor of 110, which is typical for sewer system master planning purposes.

Section 4
WASTEWATER FLOWS

This section describes and provides definitions of commonly used terminology in the wastewater collection system analysis and evaluations conducted as part of this project. Wastewater flows vary according to the season. DWF or base flow is flow generated by routine water usage in the residential, commercial, and industrial sectors of the collection system.

Another component of DWF is the contribution of dry weather groundwater infiltration (GWI) into the collection system. Dry weather GWI will enter the sewer system when the relative depth of the groundwater table is higher than the depth of the pipeline and when the susceptibility of the sanitary sewer pipe allows infiltration through defects such as cracks, misaligned joints, and broken pipelines. Figure 6 illustrates the various flow components of wastewater in general, which are described in detail in the following sections.

Wet weather flow (WWF) includes storm water inflow, trench infiltration, and GWI. The storm water inflow and trench infiltration comprise the WWF component termed infiltration/inflow (I/I). The response in the sewer system to rainfall is seen immediately (as with inflow) or within hours after the storm (as with infiltration).

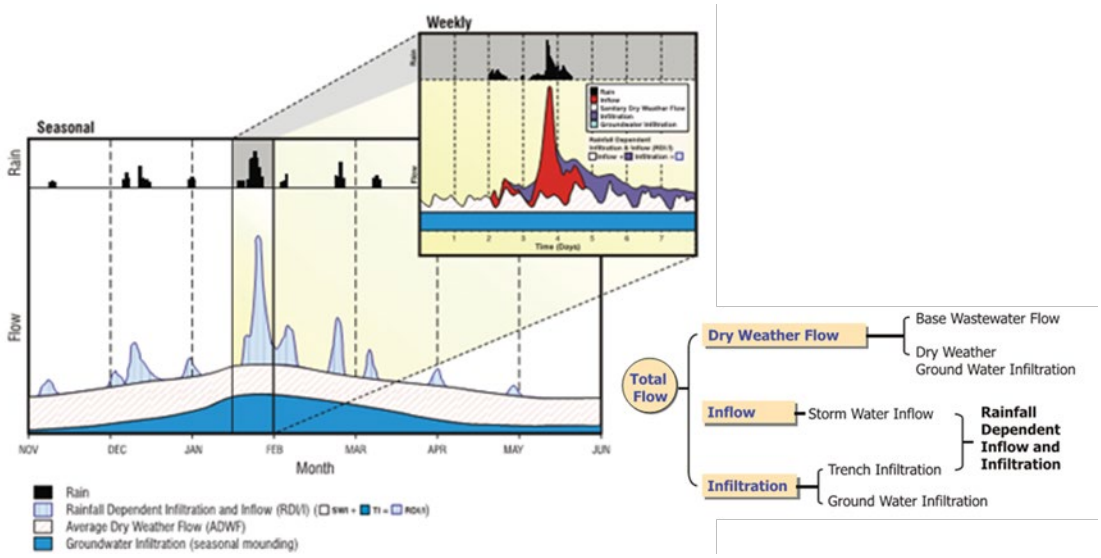


Figure 6 Typical Wastewater Flow Components

- Base Wastewater Flow. The base wastewater flow (BWF) is the flow generated by the City's customers independent of wet weather influences. BWF is estimated by measuring flows during dry weather conditions. The flow has a diurnal pattern that varies depending on the type of use. Commercial and industrial patterns, though they vary depending on the type of use, typically have more consistent higher flows during business hours and lower flows at night. Furthermore, the diurnal flow pattern experienced during a weekend may vary from the diurnal flow experienced during a weekday.
- Average Annual Flow. The average annual flow (AAF) is the average flow that occurs on a daily basis throughout the year, including both periods of dry and wet weather conditions.
- Average Dry Weather Flow. The average dry weather flow (ADWF) is the average flow that occurs on a daily basis during the dry weather season. The ADWF includes the BWF generated by the City's residential, commercial, and industrial users, plus the dry weather GWI component.
- Peak Wet Weather Flow. PWWF is the highest observed flow that occurs following a design storm event. Wet weather I/I cause flows in the collection system to increase. PWWF is typically used for designing sewers, lift stations, and some unit processes in a treatment plant. Therefore, the PWWF and the "Design Flow" are synonymous and will be used interchangeably throughout this report.

- Groundwater Infiltration. GWI is the result of extraneous water entering the sewer system through defects in pipes and manholes. GWI is related to the condition of the sewer pipes, manholes, and groundwater levels. GWI may occur throughout the year, although rates are typically higher in the late winter and early spring. Dry weather GWI (or base infiltration) cannot easily be separated from BWF by flow measurement techniques. Therefore, dry weather GWI is typically grouped with BWF.
- Rain Derived Infiltration and Inflow (RDII). Infiltration is defined as storm water flows that enter the sewer system by percolating through the soil and then through defects in pipelines, manholes, and joints. Examples of infiltration entry points are cracks in pipelines, misaligned joints, and root penetration. Inflow is defined as storm water that enters the sewer system via storm drain cross connections, leaky manhole covers, or cleanouts. Examples of inflow entry points are roof drain and downspout connections, leaky manhole covers, and illegal storm drain connections. Some of the most common sources of RDII are shown on Figure 7. The adverse effects of RDII entering the sewer system are that it increases both the flow volume and peak flows, as illustrated on Figure 8.

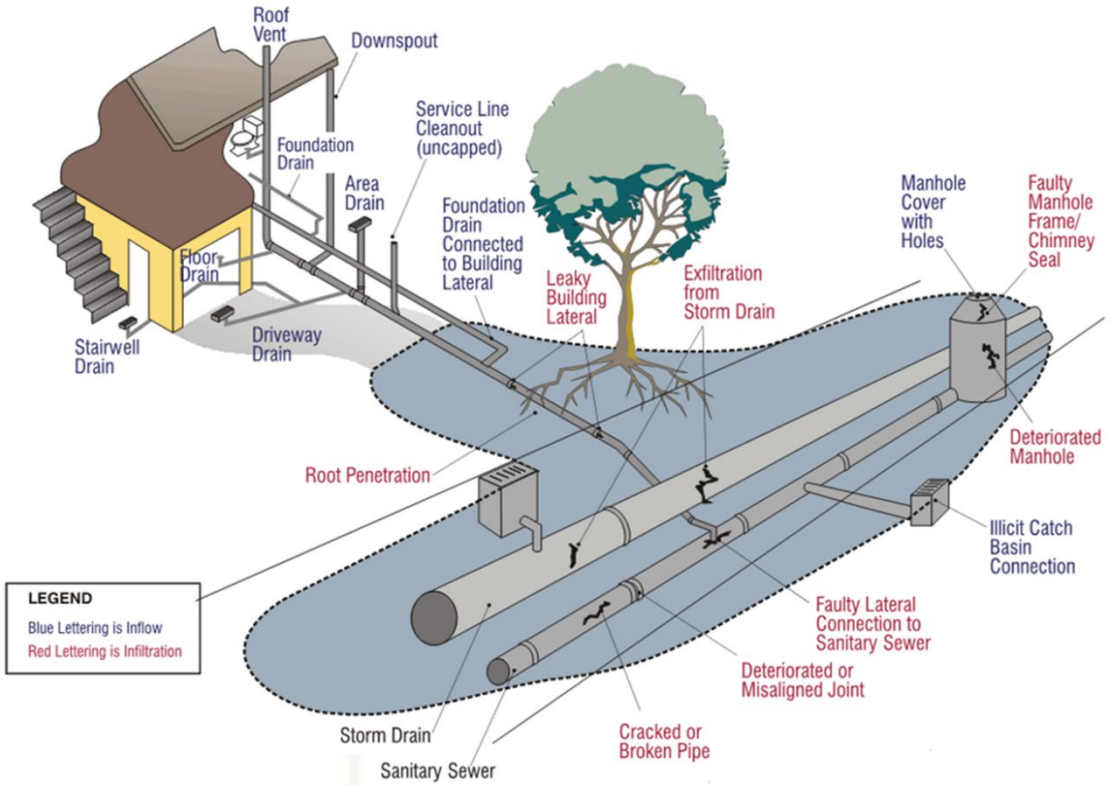


Figure 7 Typical Sources of Infiltration and Inflow

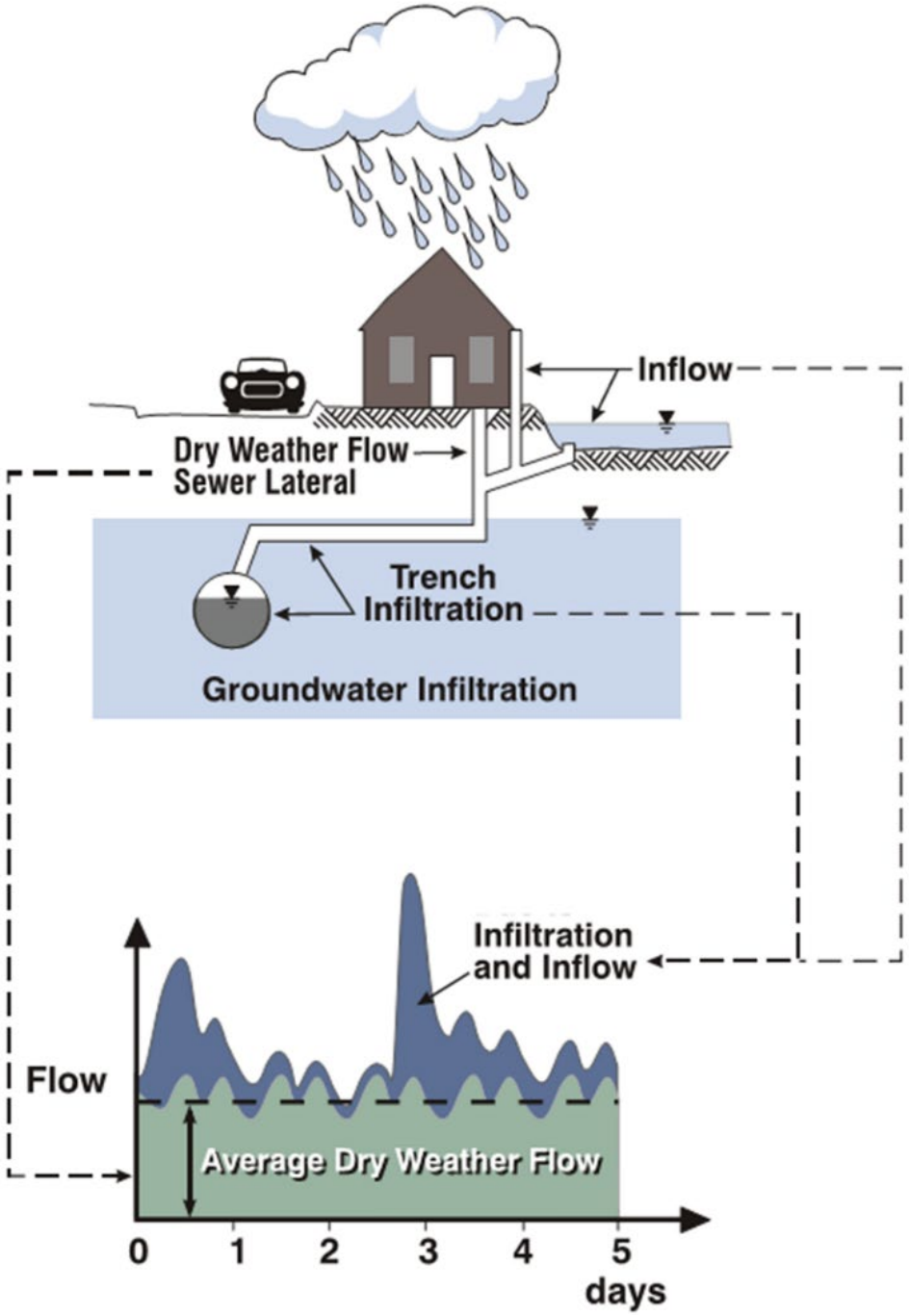


Figure 8 Typical Effects of Infiltration and Inflow

4.1 Historical Wastewater Flows

Before discussing existing and future flows that were developed for this SECAP, it is important to first take a look at historical flows and trends over the last several years. The City provided historical WRF flow data at for years 2014, 2015, 2017, and 2018. The data provided included daily influent and effluent flow data from the WRF. For the purpose of this SECAP, historical ADWF is based on the measured effluent flow data because the influent flow data includes a return flow stream from the WRF. In addition ADWF was calculated using June, July, and August WRF effluent flow data.

Table 3 summarizes the historical ADWF and population for the City which was used to calculate historical per capita wastewater generation within the City service area. The City's per capita wastewater flow has varied, from 56.9 gallons per capita per day (gpcd) to 61.5 gpcd. The historical per capita wastewater flows are consistent over this period.

For planning purposes, it was assumed that a per capita flow of 59.0 gpcd would be used for existing and future flow projections. The per capita flow was calculated using the average per capita flow for years 2014, 2017, and 2018. The 2015 per capita flow was not included in this because the WRF flow data was incomplete.

Table 3 Historical Average Dry Weather Flow

Year	Population[1]	ADWF[2][3] (mgd)	Per Capita Flow (gpcd)
2014	11,972	0.736	61.5
2015	12,136	0.691[4]	56.9
2017	12,199	0.701	57.5
2018	12,162	0.707	58.1
Average			59.0[5]

Notes:
(1) Source: California Department of Finance - Population and Housing Estimates for Cities, Counties, and the State, 2011-2019 with 2010 Census Benchmark.
(2) Source:
(3) ADWF calculated using June, July, and August WRF effluent flow data.
(4) 2015 flow data missing starting August through December.
(5) 2015 not included in the average per capita flow calculation because the WRF flow data incomplete.

4.2 Temporary Flow Monitoring Program

As part of the SSMP development process, a temporary flow monitoring program was conducted by V&A Consulting Engineers, Inc. (V&A) to assist in the development of design flow criteria, and to correlate actual sewer system flows to the hydraulic model predicted flows. Flow monitoring data are used to calibrate the wastewater collection system hydraulic model for DWF and WWF. The Sanitary Sewer Flow Monitoring and Inflow/Infiltration Study is included in Attachment 1 for reference.

The primary purpose of flow monitoring is establish baseline flows, peak flow conditions during rainfall events, and quantify to I/I. The 2019 flow monitoring period was conducted from January 31, 2019 to May 2, 2019 at eight monitoring sites selected by Carollo. Figure 9 illustrates the flowmeter locations and grouped basins. The meter sites were selected to best model the sewer areas and multiple sub-areas within the sewer system. The City meter basins were grouped to multiple flow splits in the interceptor system. Figure 10 is a schematic representation of the flowmeter sites.

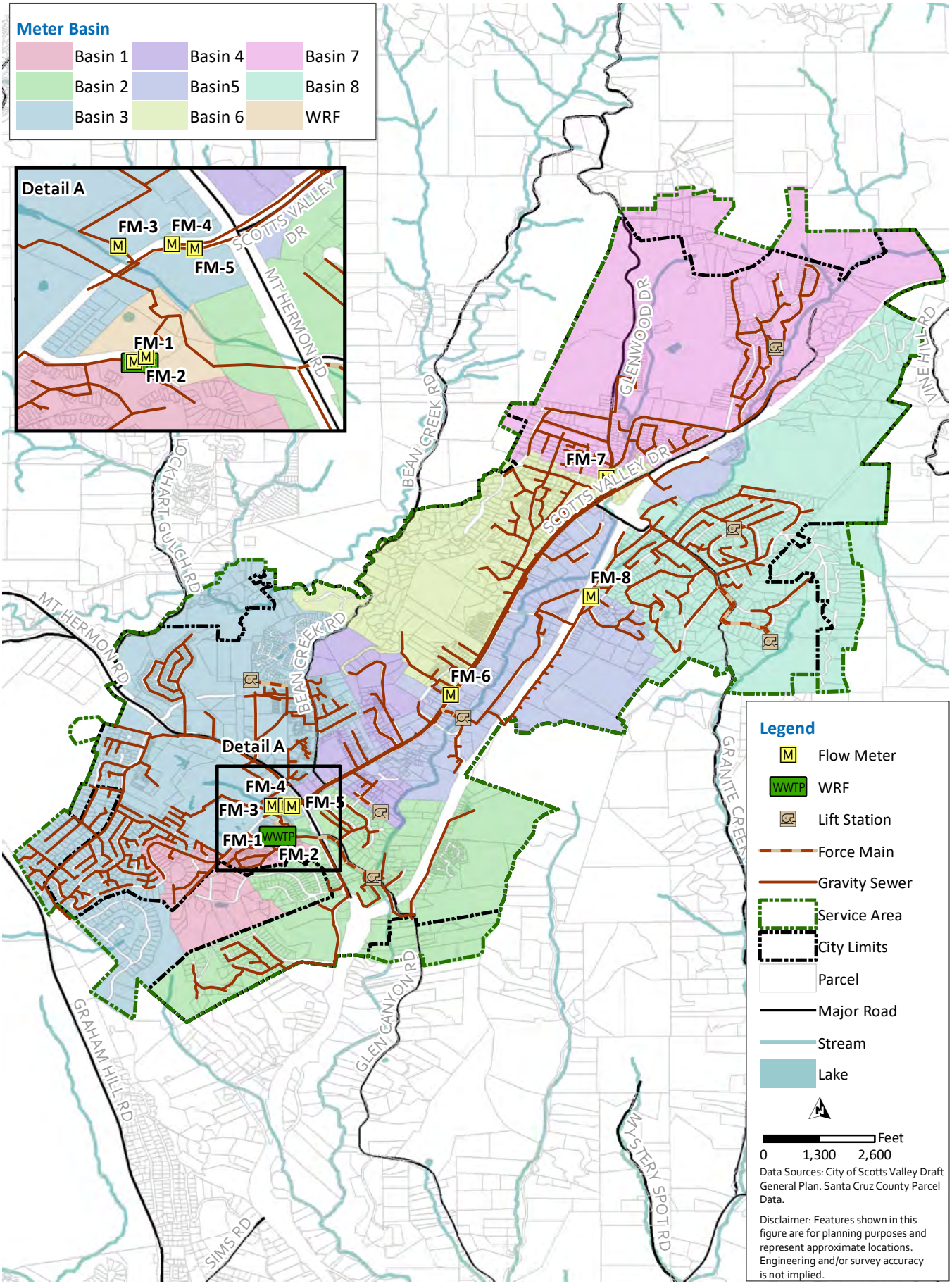


Figure 9 Flow Meter Locations and Meter Basins

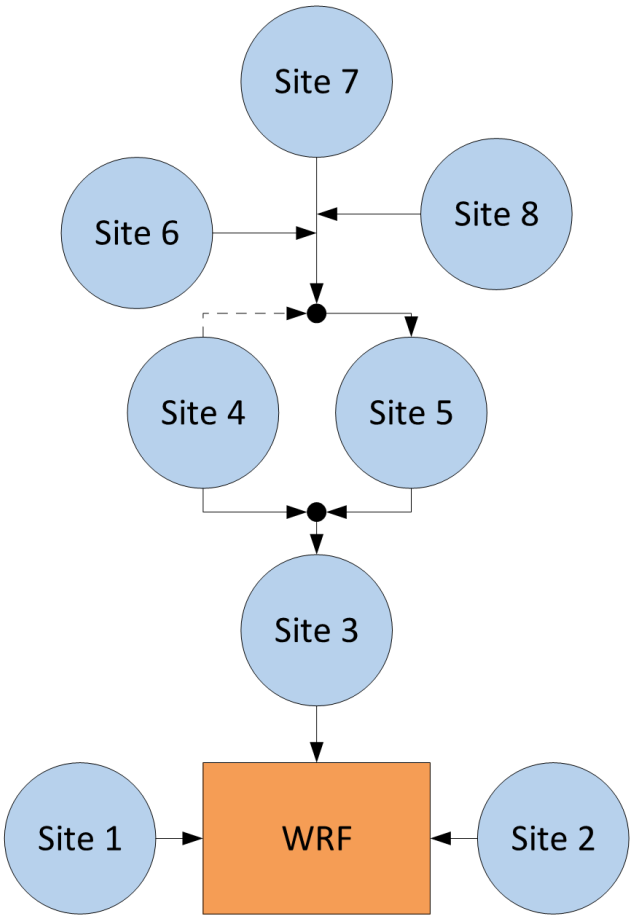


Figure 10 Flowmeter Schematic

4.2.1 Dry Weather Flow Data

The flow monitoring period, depth and velocity data were collected at each meter at 15-minute intervals. Characteristic dry weather 24-hour diurnal flow patterns for each site were developed based on the hourly data. This hourly flow data was then used to calibrate the hydraulic model for ADWF. A summary of the ADWF, calculated by V&A, for each flow monitoring site is presented in Table 4. The flow data indicated that the average weekday flows were generally similar to the average weekend flows; however, the diurnal patterns occasionally differed. For this study, the weekday and weekend flow averages and diurnal patterns were used for calibration and analysis.

The total ADWF for the City was estimated to be 0.76 million gallons per day (mgd) using the flow monitoring data and removing the influent flows.

Table 4 Average Dry Weather Flow Summary in MGD

Basin	Mon.-Thur.	Fri.	Sat.	Sun.	Overall
Basin 1	0.017	0.017	0.018	0.018	0.017
Basin 2	0.075	0.076	0.078	0.078	0.076
Basin 3	0.662	0.676	0.661	0.686	0.667
Basin 4	0.05	0.048	0.061	0.063	0.053
Basin 5	0.42	0.422	0.393	0.397	0.413
Basin 6	0.103	0.102	0.105	0.111	0.104
Basin 7	0.053	0.055	0.054	0.056	0.054
Basin 8	0.109	0.11	0.113	0.12	0.111
System	**0.754**	**0.769**	**0.757**	**0.782**	**0.761**

Notes:
(1) Source: Sanitary Sewer Flow Monitoring and Inflow/Infiltration Study (July 2019).

4.2.2 Rainfall Data

Two gauges within the City were used during the 2019 flow monitoring period. The cumulative rainfall during the 2019 flow monitoring period averaged 24.7 inches. There were three significant rainfall events that were captured. Figure 11 illustrates the average rainfall data for all the rain gauges. In general, the average of rain gauges of the City measured higher rainfall totals.

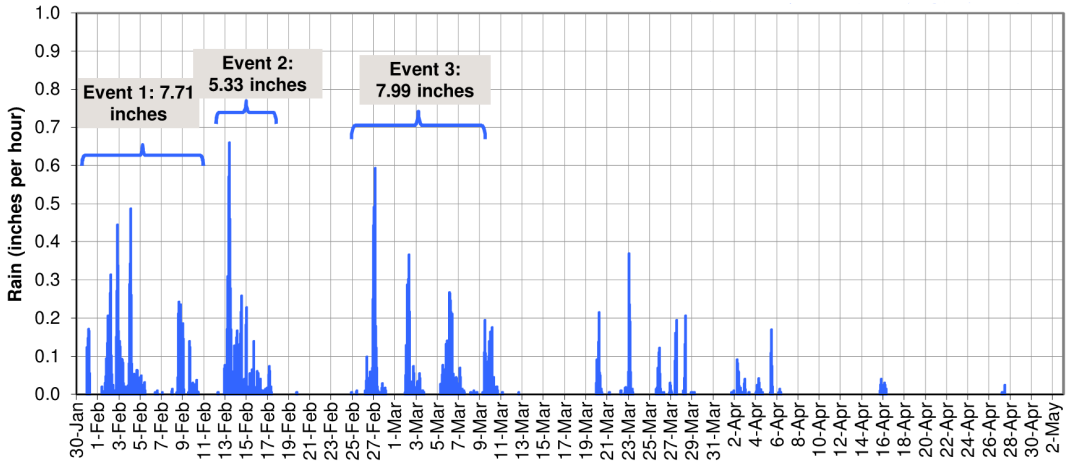


Figure 11 Rainfall Monitoring – Average of Rain Gauges

4.2.3 Wet Weather Flow Data

Flow monitoring data was also evaluated to determine how the collection system responds to wet weather events. As mentioned above, two wet weather events were captured during the flow monitoring period. These events caused a sufficient I/I response to be used for I/I analysis. Table 5 provides a summary of the I/I measured from 2019 flow monitoring period for the monitoring basin.

Table 5 Wet Weather Flow Data Summary

Basin	ADWF (mgd)	Total I/I (MG)	Total I/I per ADWF per inch of Rain
Basin 1	0.017	0.190	0.45
Basin 2	0.076	1.889	1.02
Basin 3	0.201	1.707	0.35
Basin 4/5	0.251	2.809	0.45
Basin 6	0.05	1.596	1.27
Basin 7	0.054	5.567	4.13
Basin 8	0.111	5.580	2.01
System	0.761	19.338	1.03

Notes:
(1) Source: Sanitary Sewer Flow Monitoring and Inflow/Infiltration Study (July 2019).

Table 6 Wet Weather Flow Data Summary

Basin	ADWF (mgd)	Peak Measured Flow (mgd)	Peaking Factor
Basin 1	0.017	0.14	8.24
Basin 2	0.076	0.41	5.39
Basin 3	0.667	2.41	3.61
Basin 4	0.053	0.19	3.58
Basin 5	0.413	1.62	3.92
Basin 6	0.104	0.79	7.60
Basin 7	0.054	0.45	8.33
Basin 8	0.111	0.57	5.14
System	0.761	2.96	3.89

Notes:
(1) Source: Sanitary Sewer Flow Monitoring and Inflow/Infiltration Study (July 2019).

4.3 Estimated Wastewater Flows

Wastewater flow rates can be expressed in several ways. Typically, wastewater flow rates are expressed in terms average flow per capita, an average flow rate per dwelling unit, or average flow rate per gross or net land use area. For planning purposes, years 2020 and 2040 where chosen to represent existing and future conditions, respectively. The following sections will discuss how these wastewater flows were developed.

4.3.1 Existing Wastewater Flows

The existing ADWF was estimated using a population based method because little development has occurred between 2018 and 2020 the service area. Thus the existing ADWF was estimated using a per capita flow of 59 gpcd and the estimated population of 12,145. This equates to an estimated existing ADWF of 0.72 mgd. The existing PWWF was derived throughout the system based on the hydraulic modeling results. This was accomplished by routing the 10-year, 24-hour design storm through the hydraulic model, which was calibrated to both dry weather and wet weather conditions. The estimated existing PWWF is 5.40 mgd.

4.3.2 Wastewater Flow Factors

The existing wastewater flows and connected parcels were used to develop wastewater flow factors. Wastewater flow rates were developed in terms of the average flow per area by land use type, in the units of gallons per day per acre (gpd/ac). Table 7 summarizes the average flow per area for each of the land use.

Table 7 Wastewater Flow Factor by Land Use

Land Use	Connected Parcels Area (ac)	Underutilized Parcels Area (ac)	Average Wastewater Flow Factor (gpd/ac)	ADWF (mgd)
Rural Residential	156	0	20	0.003
Estate Residential	198	0	70	0.014
Low Density Residential	244	0	130	0.032
Medium Density Residential	399	1	400	0.160
Medium High Density Residential	174	0	750	0.130
High Density Residential	86	0	1,100	0.095
Very High Density Residential	17	7	1,500	0.031
Light Industrial	106	10	600	0.066
Research and Development	24	0	450	0.011
Professional Commercial	13	0	500	0.007
Service Commercial	89	27	500	0.051
Shopping Center	34	0	500	0.017
Public/Quasi Public	166	0	600	0.100
Total	**1,706**	**44**		**0.717**

4.3.3 Future Wastewater Flows

The AMBAG growth estimates show minimal population growth through 2040. Applying the population based method yields a future ADWF of 0.73 mgd. However, for the purpose of the SECAP the future ADWF estimated using a combination of average flow rate per gross or net land use area, and average flow rate per dwelling units.

As discussed in Section 2, the City's Draft General Plan identified vacant and underutilized parcels. Using the wastewater flow rates developed in Table 7, future ADWF from vacant and underutilized parcels and is summarized in Table 8. The development of all vacant and underutilized land would increase system-wide ADWF by 0.02 mgd. The analysis assumed that developed parcels not currently connected to the sewer system (i.e., septic parcels) would not be connected in the future. In addition, underutilized parcel's future flows are half of the typical wastewater flow rate.

In addition, the City's Draft General Plan and website identified planned projects that could connect to the system in the near future. Commercial and residential plans where the number dwelling units (DU) was not identified in the plan used the same method as vacant and underutilized parcels to calculate future ADWF. If a residential development plans contained proposed DU, then the number of dwelling units was multiplied by 155 gpd-DU to estimate future ADWF. Table 9 summarizes known projects ADWF. The development of all planned projects would increase system-wide ADWF by 0.12 mgd.

The land based methodology yields a future ADWF of 0.84 mgd. The land use based methodology yields a more conservative planning assumption than the population method for future ADWF, thus the land use method was used.

Table 8 Vacant and Underutilized Parcels - ADWF

Land Use	Vacant Area[1] (ac)	Underutilized Area[1] (ac)	Wastewater Flow Factor (gpd/ac)	ADWF[2] (gpd)
Rural Residential	4	0	20	70
Low Density Residential	6	0	130	760
Medium Density Residential	1	1	400	410
Medium High Density Residential	3	0	750	1,990
Very High Density Residential	0	7	1,500	5470
Light Industrial	1	10	600	3,550
Professional Commercial	2	0	500	770
Service Commercial	7	27	500	10,250
Public/Quasi Public	2	0	600	910
Total	**24**	**44**		**24,180**

Notes:
(1) Source: City of Scotts Valley Draft General Plan
(2) ADWF = (Vacant Area x Wastewater Flow Factor) + (Underutilized Area x Wastewater Flow / 2)

Table 9 Planned Projects ADWF

Development	Dwelling Units (DU)	Area (ac)	ADWF Rate (gpd/unit)	Unit	ADWF (gpd)
Residential					
33 Polo Heights	2	1.71	155	gpd/DU	310
Erba Lane	13	1.03	155	gpd/DU	2,020
Polo Ranch	40	83.44	155	gpd/DU	6,200
Town Center Residential	254	17.00	155	gpd/DU	39,370
Valley Gardens		7.19	400	gpd/ac	2,880
251 Kings Village Road		2.03	400	gpd/ac	810
Nashua Drive	3	0.336	155	gpd/DU	470
Various Sites	10		155	gpd/DU	1,550
12 Blake Lane	3		155	gpd/DU	470
22 Blake Lane	4	0.42	155	gpd/DU	620
440 Kings Village Road	84	20.90	155	gpd/DU	13,020
4803 Scotts Valley Drive	6	0.58	155	gpd/DU	930
4627 Scotts Valley Drive	19	0.93	155	gpd/DU	2,950
The Grove	50	4.31	155	gpd/DU	7,750
Oak Creek Park Apartments	52	1.03	155	gpd/DU	8,060
Pinnacle View	20	1.91	155	gpd/DU	3,100
The Cove Townhome	25	2.35	155	gpd/DU	3,880
The Terrace Residential	20	2.49	155	gpd/DU	3,100
Meadow Way	4	1.039	155	gpd/DU	620
Non-Residential					
1 Hacienda Drive		0.48	500	gpd/ac	240
4803 Scotts Valley Drive		0.40	500	gpd/ac	200
Four Points by Sheraton		1.62	500	gpd/ac	810
Gateway South Retail Store		17.62	500	gpd/ac	8,810
Marriott Residences Inn		2.48	500	gpd/ac	1,240
Oak Creek Park Commercial		2.52	500	gpd/ac	1,260
1440 Center		0.68	600	gpd/ac	410
Town Center Commercial		13.83	500	gpd/ac	6,910
The Cove Commercial		0.54	500	gpd/ac	270
260 Mount Hermon Road		1.52	500	gpd/ac	760
Total	609	190.38			119,020

Similar to the existing PWWF, the future PWWFs were derived by routing a 10-year, 24 hour design storm through the hydraulic model. Peak I/I rates for future growth within the existing City service area were developed based on a peak RDII rate of 1,000 gpd/ac. The estimated future PWWF is projected to be 5.78 mgd.

4.3.4 Existing and Future Flow Summary

Table 10 presents a summary of the estimated existing and future ADWF and PWWF. As shown in Table 10, the City's ADWF is projected to increase from 0.72 mgd to 0.86 mgd by 2040, whereas the PWWF is projected to increase from 5.40 mgd to about 5.78 mgd by 2040. Therefore, the City's PWWF to ADWF peaking factor is projected to decrease from roughly 7.5 to 6.7. This is typical, as newer sewers tend to have less RDII response than older areas of the system, primarily due to better construction methods. Furthermore, flow attenuation also tends to dampen out flow peaks as collection systems expand.

Table 10 Existing and Future Wastewater Flows

Year	Estimated ADWF (mgd)	Estimated PWWF (mgd)	Peaking Factor (PWWF/ADWF)
2020 (Existing)	0.72	5.40	7.5
2040 (Future)	0.86	5.78(1)	6.7
Change	0.14	0.38	--

Notes:
(1) PWWF was estimated using a peak RDII of 1,000 gpd/ac.

Section 5

COLLECTION SYSTEM FACILITIES AND HYDRAULIC MODEL

This section describes the development and calibration of the City's wastewater collection system hydraulic model. This model was used to identify the sewer system's capacity deficiencies and to develop improvements to correct those deficiencies.

5.1 Wastewater Collection System Overview

The City-owned collection system consists of approximately 47 miles of gravity sewers, and seven lift stations according to the geographic information system (GIS) database developed for the purpose of the SSMP. The GIS database is based on the City's computer-aided-drawing (CAD) database. Figure 12 presents the City's existing collection system.

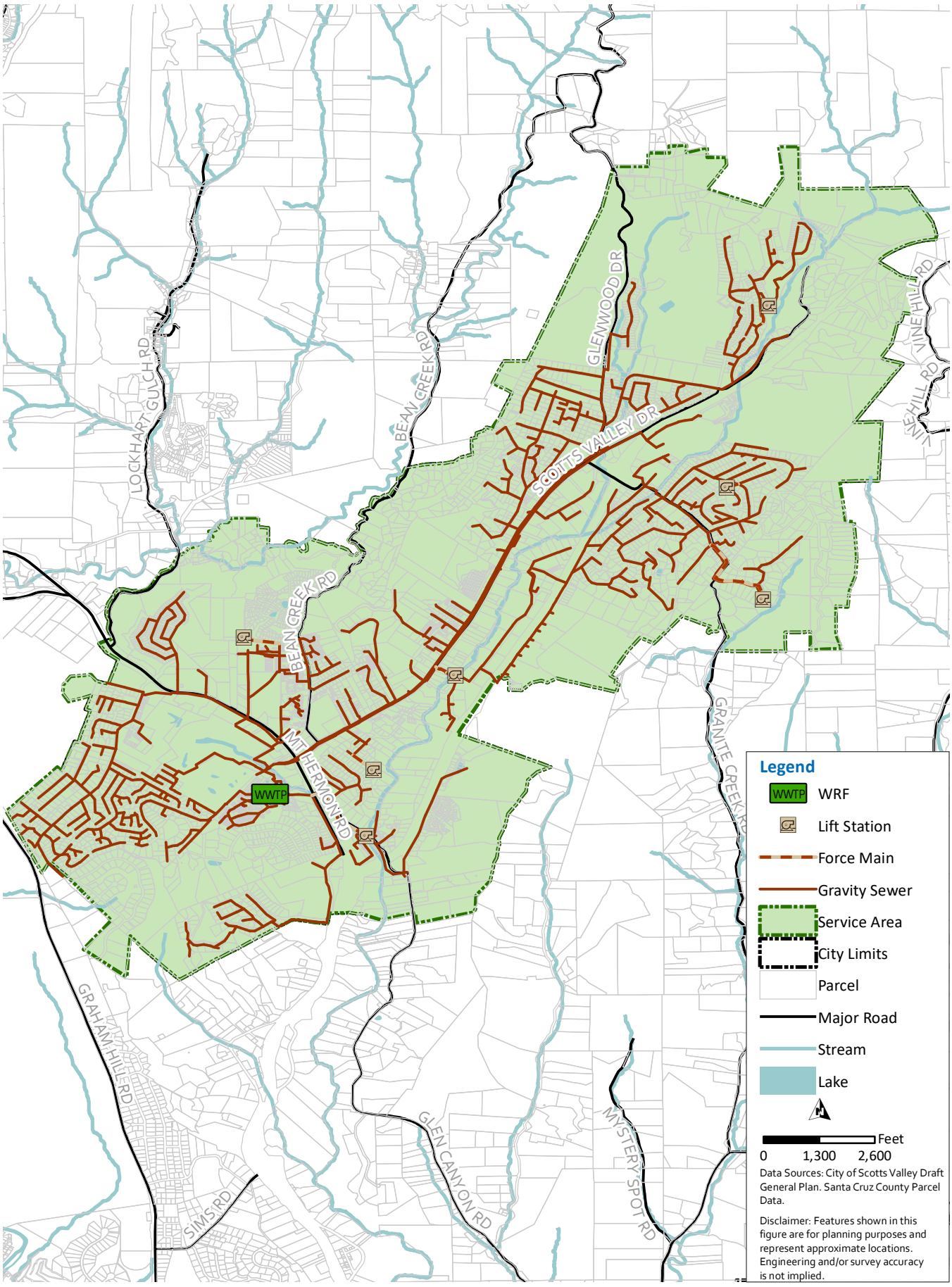


Figure 12 Existing Wastewater Collection System

5.2 Hydraulic Model Development

A wastewater collection system model is a simplified representation of the real sewer system. Sewer system models can assess the conveyance capacity for a collection system. Also, sewer system models can perform "what if" scenarios to assess the impacts of additional flows or modifications to the collection system.

5.2.1 Selected Hydraulic Modeling Software

It was agreed that InfoSWMM, by Innovyze, would be used to assemble the City's hydraulic model. InfoSWMM is a fully dynamic, geospatial wastewater and stormwater modeling and management software application, which is built to run within the ESRI ArcGIS software platform. The hydraulic modeling engine for the InfoSWMM software package uses the United State Environmental Protection Agency's (USEPA's) Storm Water Management Model (SWMM), which is widely used throughout the world for planning, analysis, and design related to stormwater runoff, combined sewers, sanitary sewers, and other drainage systems. InfoSWMM routes flows through the model using the Dynamic Wave method, which solves the complete Saint Venant, one dimensional equations of fluid flow.

5.2.2 Elements of a Hydraulic Model

The following provides an overview of the elements of a hydraulic wastewater model and the required input parameters associated with each:

- Junctions: Sewer manholes, cleanouts, as well as other locations where pipe sizes change or where pipelines intersect are represented by junctions in the hydraulic model. Required inputs for junctions include rim elevation, invert elevation, and surcharge depth (used to represent pressurized systems). Junctions are also used to represent locations where flows are split or diverted between two or more downstream links.
- Pipes: Gravity sewers and force mains are represented as pipes in the hydraulic model. Input parameters for pipes include length, friction factor (e.g., Manning's n for gravity mains, Hazen Williams C for force mains), invert elevations, diameter, and whether or not the pipe is a force main.
- Storage Nodes: For sewer system modeling, storage nodes typically are used to represent lift station wet wells (although other storage basins, etc. can be modeled as storage nodes). Input parameters for storage nodes include invert elevation, wet well depth, and wet well cross section.
- Pumps: Pumps are included in the hydraulic model as links. Input parameters for pumps include pump curves and operational controls.
- Outfalls: Outfalls represent areas where flow leaves the system. For sewer system modeling, an outfall typically represents the connection to the influent pump station or headworks of a wastewater treatment plant.
- Rain Gauges: Rain gauges are input into the hydraulic model to simulate historical or theoretical hourly rainfall events.
- Inflows: The following are the three types of wastewater flow sources that can be injected into individual model junctions (and storage nodes):

- External: External inflows can represent any number of flows into the collection system, such as metered flow data or groundwater inflow. External inflows are applied to a specific model junction by applying a baseline flow value and a pattern that varies the flow by hour, day, or month of the year.
- Dry Weather: Dry weather inflows simulate base sanitary wastewater flows and represent the average flow. The DWFs can be multiplied by up to four patterns that vary the flow by month, day, hour, and day of the week (e.g., weekday or weekend). The dry weather diurnal patterns are adjusted during the dry weather calibration process.
- Rainfall Derived Infiltration and Inflow: RDII flows are applied in the model by assigning a unit hydrograph and a corresponding tributary area to a given junction. The unit hydrographs consists of several parameters that are used to adjust the volume of RDII that enters the system at a given location. These parameters are adjusted during the wet weather calibration process.

5.2.3 Hydraulic Model Construction

The City's hydraulic model combines information on the physical and operational characteristics of the wastewater system, and performs calculations to solve a series of mathematical equations to simulate flows in pipes. The hydraulic model was developed based on available data collected from the City's available data and appropriate assumptions.

Computer modeling requires gathering information of the sewer system, such as pipe diameters, lengths; invert elevations at the upstream and downstream manholes, pipe slope, manhole rim elevations, and wet well dimensions.

To construct the model, the wastewater collection system pipes, manholes, and lift stations were digitized in a GIS format. The GIS platform allows physical attribute data for each pipeline and manhole to be stored in a database file that integrates with the hydraulic modeling software. Known pipe, manhole, and lift station characteristics were input into the GIS database and imported into the hydraulic model.

5.2.4 Wastewater Load Allocation

Adequately estimating the volume of wastewater for a particular area or building is an important process in maintaining and sizing sewer system facilities, both for present and future conditions. For the City, dry weather wastewater loads were calculated for each parcel and then assigned to the appropriate model node. The loads were calculated in the GIS software program by multiplying the appropriate flow coefficient in Table 7 by the parcel's area. The hydraulic model's load allocation feature assigned the calculated ADWF to the appropriate node in the sewer system model.

5.3 Model Calibration

Hydraulic model calibration is a crucial component of the hydraulic modeling effort. Calibrating the model to match data collected during the flow monitoring program ensures the most accurate results possible. The calibration process consists of calibrating to both dry and wet weather conditions.

The calibration process consists of calibrating to both dry and wet weather conditions. For this project, both DWF and WWF monitoring were conducted. DWF calibration ensures an accurate depiction of BWF generated within the study area. The WWF calibration consists of calibrating the hydraulic model to a specific storm event to quantify the peak and volume of I/I into the sewer system. The amount of I/I is essentially the difference between the WWF and DWF components.

5.3.1 Calibration Standards

The hydraulic model was calibrated in accordance with international modeling standards. The Wastewater Planning Users Group (WaPUG), a section of the Chartered Institution of Water and Environmental Management, has established generally agreed upon principles for model verification. The dry weather and wet weather calibration focused on meeting the recommendations on model verification contained in the "Code of Practice for the Hydraulic Modeling of Sewer Systems," published by the WaPUG (WaPUG 2002), as summarized below:

- Dry Weather Calibration Standards: Dry weather calibration should be carried out for two dry weather days and the modeled flows and depths should be compared to the field measured flows and depths. Both the modeled and field measured flow hydrographs should closely follow each other in both shape and magnitude.
  In addition to the shape, the flow hydrographs should also meet the following criteria as a general guide:
  - The timing of flow peaks and troughs should be within one hour.
  - The peak flow rate should be within the range of ±10 percent.
  - The volume of flow (or the average rate of flow) should be within the range of ±10 percent. If applicable, care should be taken to exclude periods of missing or inaccurate data.
- Wet Weather Calibration Standards: The model simulated flows should be compared to the field measured flows. The flow hydrographs for both events should closely follow each other in both shape and magnitude, until the flow has substantially returned to DWF rates. In addition to the shape, the flow hydrographs should also meet the following criteria as a general guide:
  - The timing of the peaks and troughs should be similar with regard to the duration of the events.
  - The peak flow rates at significant peaks should be in the range of +25 percent to -15 percent and should be generally similar throughout.
  - The volume of flow (or the average flow rate) should be within the range of +20 percent to -10 percent.

5.3.2 Dry Weather Calibration

The DWF calibration consists of several elements: 1) dividing the sewer system into areas tributary to each of the flowmeter stations; 2) defining the flow volumes within each area; and 3) creating diurnal patterns to match the temporal distribution of flow. The diurnal curve is the variation of flow throughout the day.

The first step in the calibration process was to divide the City service area into flowmeter tributary areas. Eight tributary areas were created, as summarized in Section 4.2. The next step was to define the flow volumes within each area, which was accomplished in the flow-loading step. Diurnal curves based on the flow monitoring data were created for nodes tributary to a specific flowmeter. Figure 13 displays the weekday and weekend diurnal curves for Basin 7. Similar diurnal curves were developed for each of the meters and its tributary area. These additional curves are available in Attachment 2.

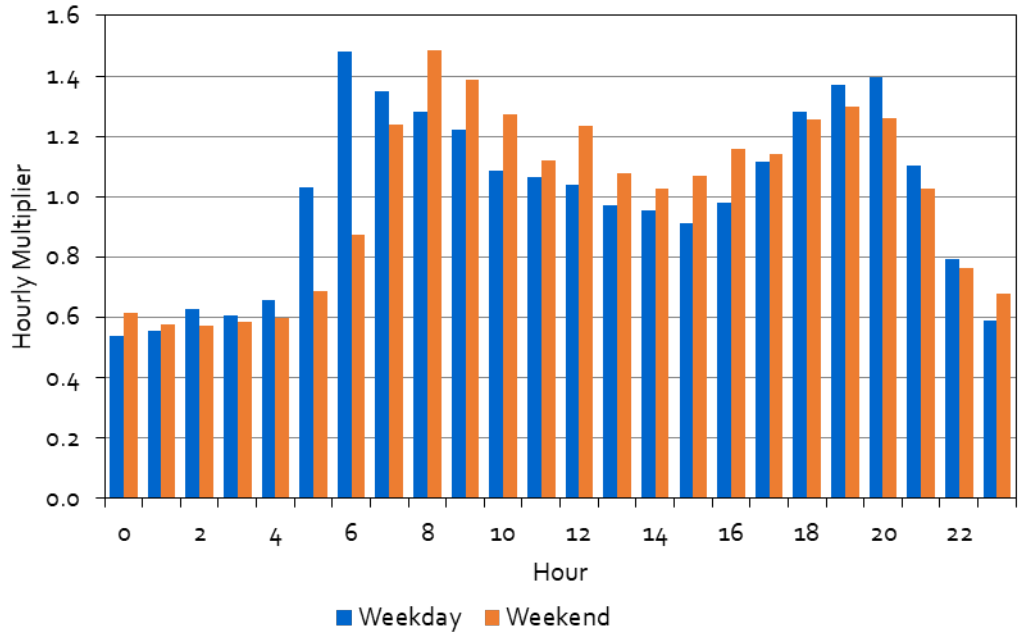


Figure 13 Sample Diurnal Pattern – Basin 7

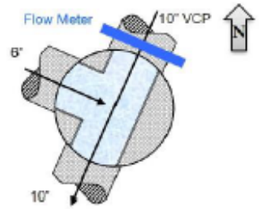
The calibration process compared the meter data with the model output. Comparisons were made using calibration sheets. A sample calibration sheet of the DWF calibration for Basin 7 is presented in Figure 14. This figure shows the measured flow at the meter versus the model predicted flows over a 24-hour period. The remaining DWF calibration plots are provided in Attachment 2. As shown in Attachment 2, the correlation between the modeled and the measured results is good.

Flow Monitoring Site 7, Dry Weather Flow Calibration
Location: Glenwood Drive, North of Hacienda Drive
Pipeline Diameter: 10"
City Manhole ID: F7-013
Model Pipe ID: P-587

Flow Monitor Location











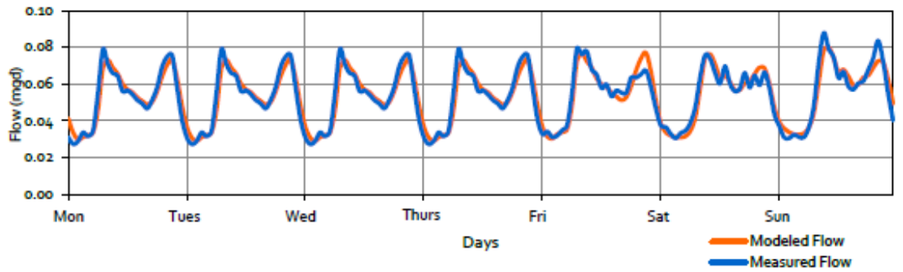


Model Calibration Summary

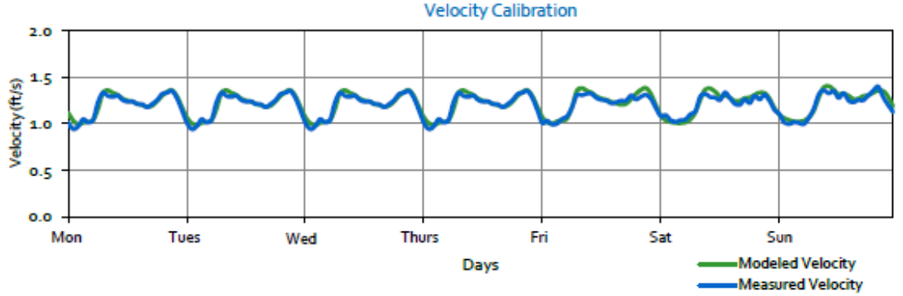
Day	Measured Data[1,2] Avg. Flow (mgd)	Peak Flow[1,2] (mgd)	Avg. Level (in)	Avg. Vel. (ft/s)	Modeled Data Avg. Flow (mgd)	Peak Flow[1,2] (mgd)	Avg. Level (in)	Avg. Vel. (ft/s)	Percent Error[1,3] Avg. Flow (%)	Peak Flow (%)	Avg. Level (%)	Avg. Vel. (%)
Mon.	0.05	0.08	1.8	1.19	0.05	0.07	1.8	1.20	0.2%	-7.0%	0.1%	0.7%
Tues.	0.05	0.08	1.8	1.19	0.05	0.07	1.8	1.20	0.2%	-7.0%	0.1%	0.7%
Wed.	0.05	0.08	1.8	1.19	0.05	0.07	1.8	1.20	0.2%	-7.0%	0.1%	0.7%
Thur.	0.05	0.08	1.8	1.19	0.05	0.07	1.8	1.20	0.2%	-7.0%	0.1%	0.7%
Fri.	0.06	0.08	1.9	1.20	0.06	0.08	1.8	1.22	0.2%	-2.9%	-1.0%	1.5%
Sat.	0.05	0.08	1.8	1.20	0.05	0.08	1.8	1.21	-0.2%	0.4%	-1.0%	0.9%
Sun.	0.06	0.09	1.9	1.20	0.06	0.08	1.8	1.23	0.1%	-8.9%	-0.6%	1.9%
Summary												
Weekday	0.05	--	1.8	1.19	0.05	--	1.8	1.20	0.2%	--	-0.1%	0.9%
Weekend	0.06	--	1.8	1.20	0.06	--	1.8	1.22	0.0%	--	-0.8%	1.4%
ADWF[4]	0.05	--	1.8	1.20	0.05	--	1.8	1.21	0.1%	--	-0.3%	1.0%

Notes:
(1) Source: V&A Temporary Flow Monitoring Program (January 31, 2019 through May 2, 2019)
(2) Peak flow is the hourly average hourly peak flow, which was derived based on the 15-minute flow data from V&A.
(3) Percent Error = (Modeled - Measured) /Measured x 100
(4) ADWF = (5xWeekday Average + 2xWeekend Average)/7

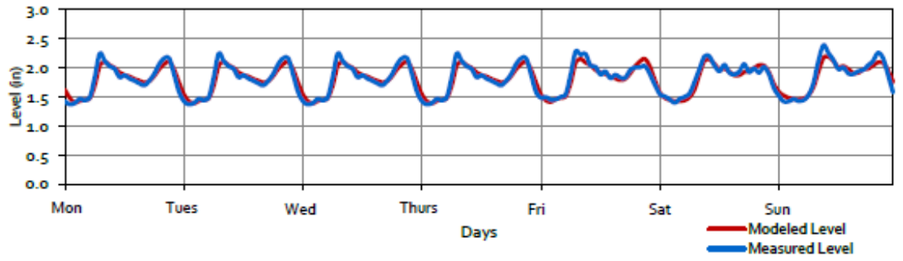
Flow Calibration



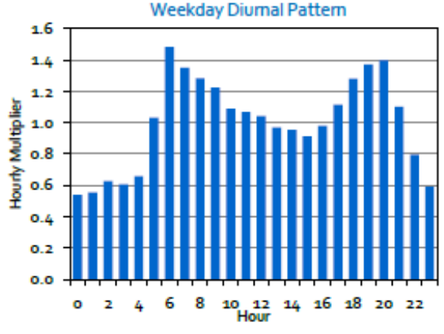
Velocity Calibration



Level Calibration



Weekday Diurnal Pattern



Weekend Diurnal Pattern

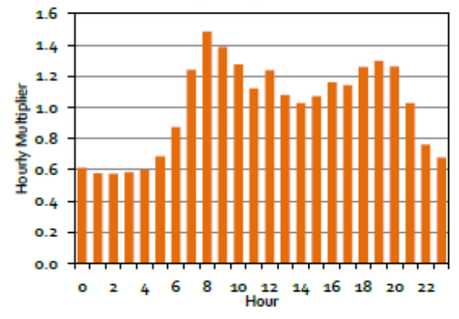


Figure 14 Sample DWF Calibration Sheet – Basin 7

5.3.3 Wet Weather Calibration

The WWF calibration enables the hydraulic model to accurately measure I/I entering a sewer system during a large storm. WWF calibration consists of two steps: 1) determining a rainfall event that characterizes the most significant impact on the sewer system facilities, preferably during wet antecedent soil moisture conditions; and 2) creating a database of I/I parameters for this rainfall event. The 2019 February and March rainfall events, were used to characterize the system's response to wet weather events. The hydraulic model was calibrated to these series of rainfall events.

The wet weather calibration process involves creating custom unit hydrographs for each flowmeter tributary. The hydrographs utilize the R-Values (percent of rainfall that enters collection system) to simulate I/I. The R-Values are input into the model and the parameters are adjusted until the peak I/I rate measured during the flow monitoring program are simulated for each of the series of rainfall events. Figure 15 illustrates the results for the wet weather calibration for Basin 8. The remaining WWF calibration plots are provided in Attachment 3. As shown in Attachment 3, the correlation between the modeled and the measured results is good.

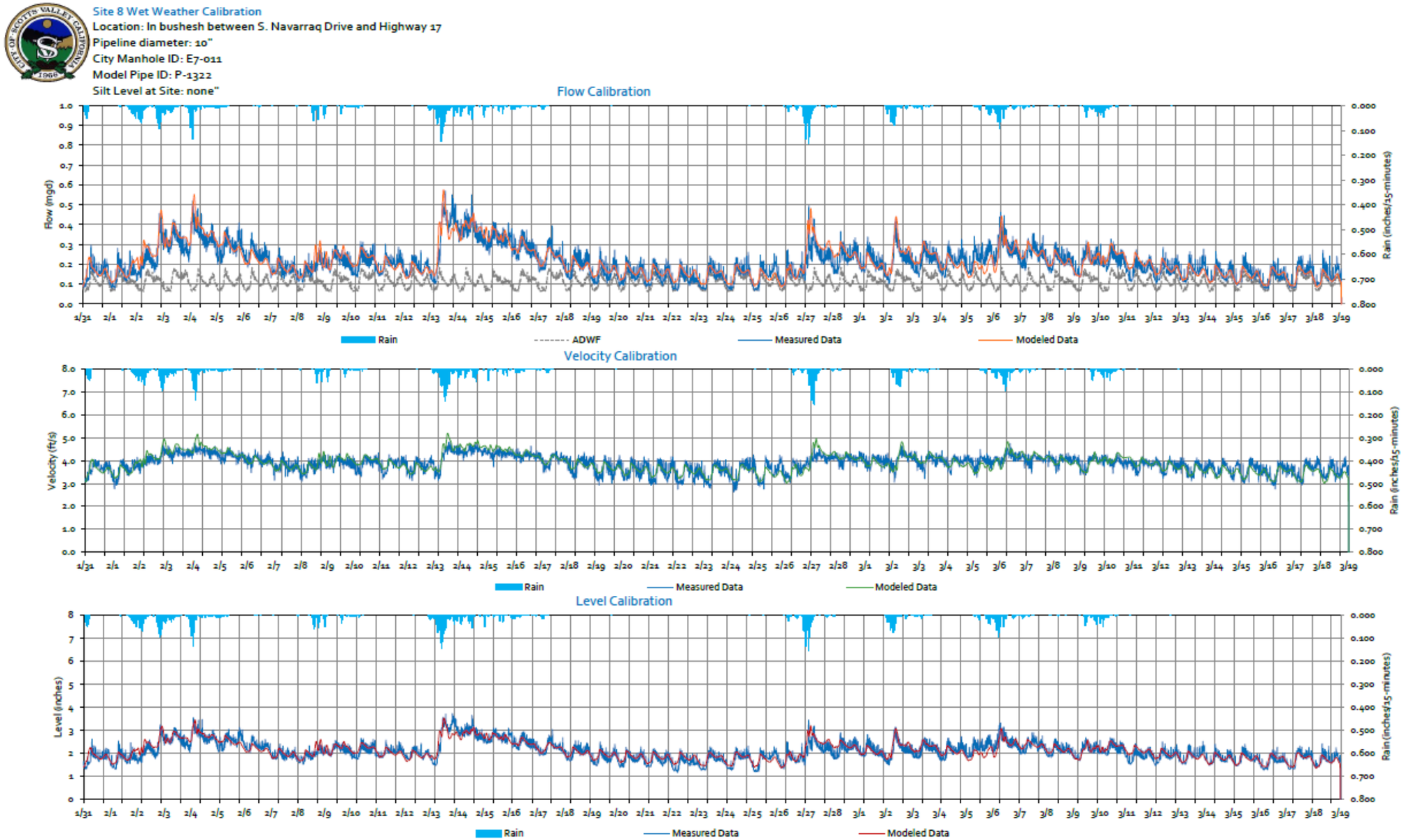


Figure 15 Sample WWF Calibration Sheet – Basin 8

5.3.4 Calibration Summary

The calibration results indicate the model predicts conditions similar to those observed in the field. Within a few isolated areas of the model, there are some discrepancies, but the overall collection system is very well represented in the model.

Section 6

CAPACITY EVALUATION

This section discusses the hydraulic evaluation of the wastewater collection system and the proposed projects that correct capacity deficiencies.

Following the DWF and WWF calibration, a capacity analysis of the City's collection system was performed. For the existing sewer collection system, a 10-year, 24-hour design storm was routed through the hydraulic model to simulate PWWF conditions, or design flow. In accordance with the established flow depth criteria for existing sewers, manholes where the maximum hydraulic grade line (HGL) is within five feet of the manhole rim. Sewers that lack sufficient capacity to convey design flows could produce backwater effects in the collection system and potentially cause SSOs.

Note that the pipelines that surcharge within five feet of the manhole rim are not necessarily deficient. In some cases, a surcharged condition within a given pipeline is due to backwater effects created by a downstream bottleneck (i.e. upstream surcharging is caused by downstream pipeline deficiencies). An illustration of backwater effects is shown on Figure 16. For this reason, the hydraulic model was used to identify the pipeline segments that are capacity deficient (i.e., not subject to backwater conditions).

In general, the City's collection system has sufficient capacity to convey current PWWFs without exceeding the established flow depth criterion. However, there were areas of the collection system that surcharged within five feet of the manhole rim. These are shown on Figure 17 in red. Replacing a capacity limited (bottleneck) sewer will allow for higher peak flows to be carried to downstream sewers. In some cases, this increase in peak flow overwhelms the downstream sewers, which creates additional deficiencies. This process was then repeated for following improvement projects to ensure new capacity deficiencies, if any, were developed.

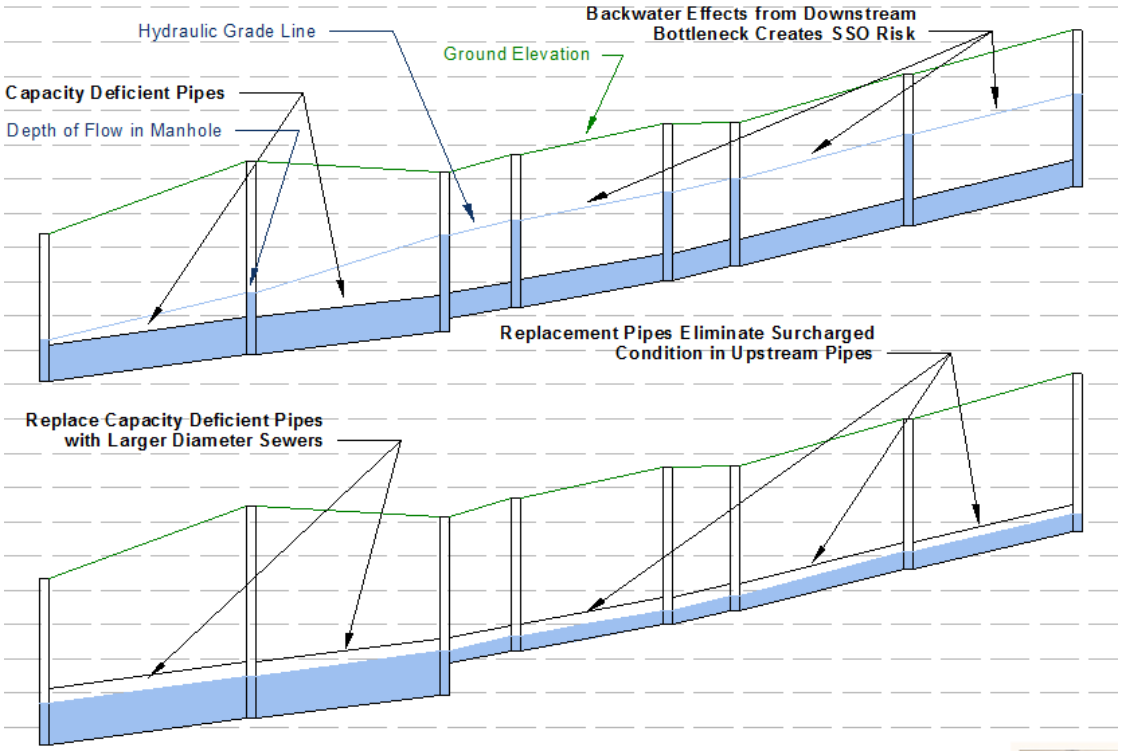


Figure 16 Sample Illustration of Backwater Effects in a Sewer

Following the completion of the existing system analysis, improvement projects and alternatives were identified in order to mitigate existing system pipeline capacity deficiencies. The recommended improvement projects are discussed in greater detail in Section 7.1. In accordance with the established planning criteria, new sewer pipelines were sized such that the maximum d/D does not exceed the new pipe design criteria summarized in Section 3 under future 2040 PWWF conditions.

The analysis of the future system was performed in a manner similar to the existing system analysis. The purpose of the future system evaluation is to verify that the existing system improvements were appropriately sized to convey future PWWFs, and to identify the locations of sewers that are adequately sized to convey existing PWWFs, but cannot convey future 2040 PWWFs.

Future 2040, the City's wastewater flows are expected to increase by 0.38 mgd, under PWWF conditions. As such, there were no additional areas in the existing collection system that were identified as being capacity deficient under 2040 PWWF conditions.

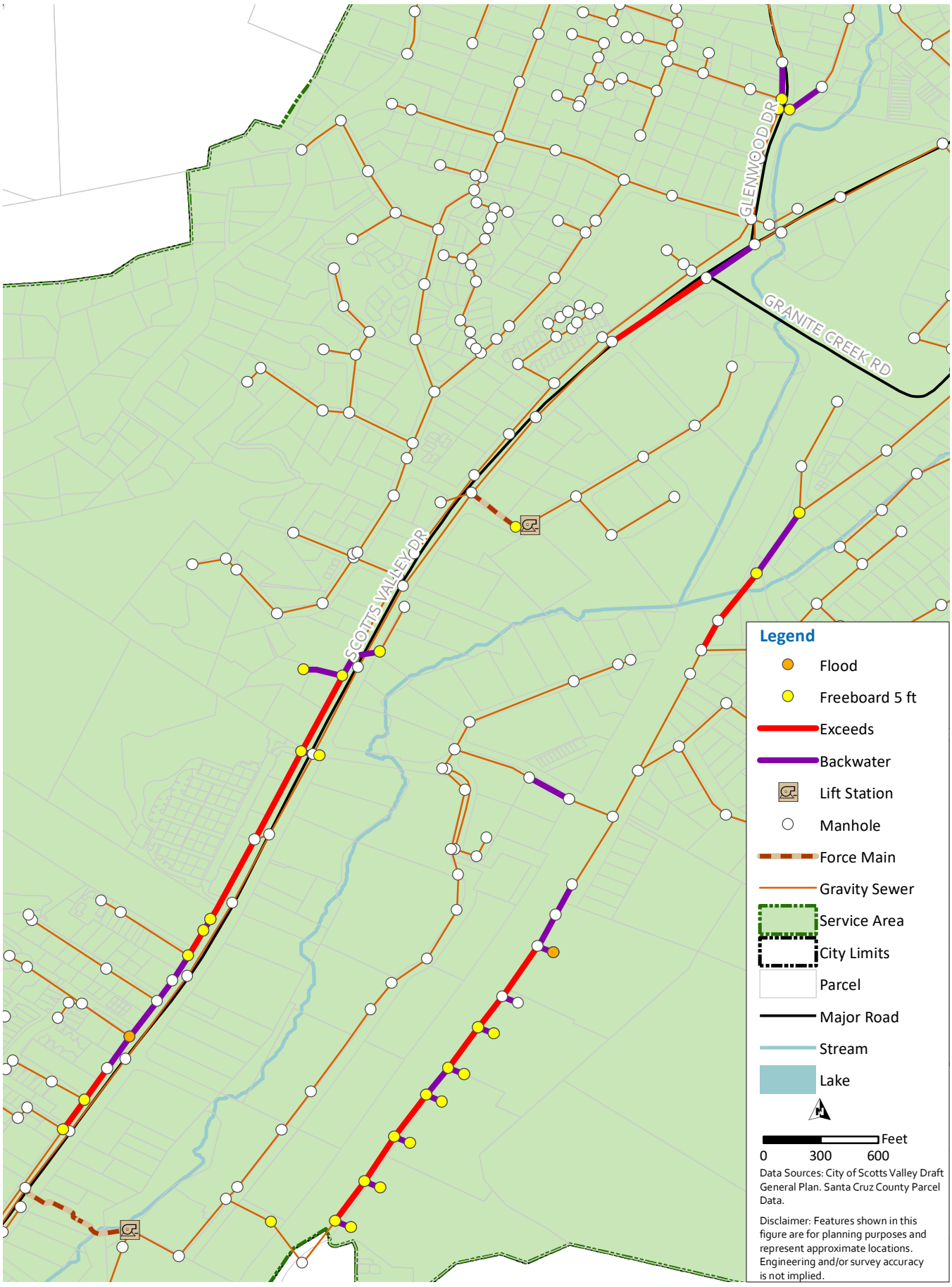


Figure 17 Existing Capacity Deficiencies

Section 7

RECOMMENDED PROJECTS

This section discusses the proposed projects that correct capacity deficiencies as well as rehabilitation recommendations.

7.1 Capacity Projects

Figure 18 illustrates the proposed capacity improvements required to correct existing deficiencies caused by deficiencies within the City's system. The proposed pipeline diameter is also shown on the figures with a project ID. The project ID in Figure 18 correlate with the capacity improvement project descriptions below.

- Old El Pueblo Road (Project GM-1). This project includes replacing approximately 580 feet of 6-inch diameter gravity sewer along Old El Pueblo Road. The flow within the gravity sewer along Navarra Drive and Green Hills Road could cause manholes to overflow under PWWF conditions. It is recommended that the existing pipeline be replaced with a 10-inch diameter pipeline. By upsizing the gravity sewer along Old El Pueblo Road the downstream system is able mitigate a bottleneck and increase capacity along the flow split.
- Scotts Valley Drive Diversion with Study (Project GM-2). This project includes constructing a diversion structure and approximately 60 feet of 10-inch diameter of new gravity sewer along Scotts Valley Drive. The flow within the 10-inch diameter gravity sewer along Scotts Valley Drive causes upstream manholes to overflow under PWWF conditions. It is recommended that the City construct a diversion structure that diverts flow from the 10-inch diameter gravity sewer to the parallel 18-inch diameter gravity sewer. An additional study is recommended to determine the optimal location for this project.
- East of Highway 17 (Project GM-3A). This project includes constructing approximately 1,220 feet of 10-inch diameter gravity sewer east of Highway 17 between Navarra Drive and Meadow Way. The flow along the 10-inch diameter gravity sewer causes upstream manholes to surcharge within three feet of the manhole rim. It is recommended that the existing pipeline be replaced and upsized with a 12-inch diameter pipeline.
- East of Highway 17 - Creek Crossing (Project GM-3B). This project includes constructing approximately 300 feet of 10-inch diameter gravity sewer that crosses Carbonera Creek east of Highway 17. The flow along the 10-inch diameter gravity sewer causes upstream manholes to surcharge within three feet of the manhole rim. It is recommended that the existing pipeline be replaced with a 12-inch diameter pipeline.

- Glenwood Drive (Project GM-4). This project includes constructing approximately 730 feet of 10-inch diameter gravity sewer along Glenwood Drive between Vine Hill School Road and Scotts Valley Drive. The flow within the 10-inch diameter sewer cause upstream manholes to surcharge within three feet if the manhole rim under PWWF conditions. It is recommended that the existing pipeline be replaced with a 12-inch diameter pipeline.

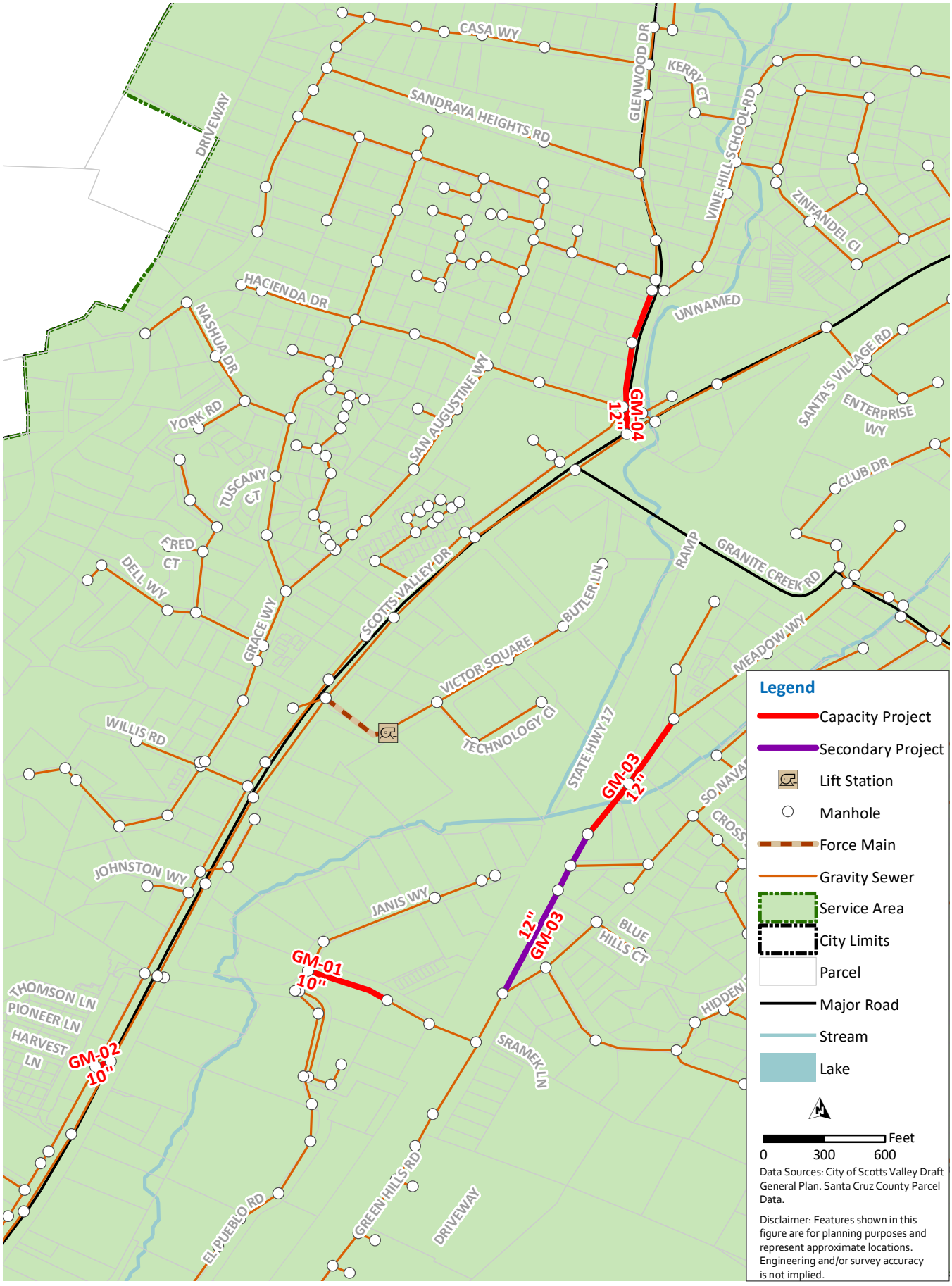


Figure 18 Proposed Capacity Improvements

7.2 Rehabilitation Projects

The following summarizes rehabilitation and replacement related programs developed based on existing and future condition assessments:

- Gravity Sewer Renewal Program (Project RR-1). This program consists of annual rehabilitation and replacement of gravity sewers necessary to maintain proper operation of existing facilities. The exact projects are unknown at this time and will be identified using inspection data collected from the ongoing and future inspection programs (Project PR-1). For planning purposes the City should make the goal of completing approximately 0.4 miles (0.8 percent of the system) renewal projects annually.
- Lift Station Renewal Projects (Projects RR-2 through RR-8). These projects consist of rehabilitation and replacement of lift station assets based on the condition of that asset developed during the 2019 Lift Station Condition Assessment. The lift station asset projects were grouped into three priorities (one being the highest priority). It was assumed that Priority one and two projects will occur in Phase 1 of the CIP, while priority three projects will occur during Phase 2 of the CIP. See Attachment 4 for more details in regards to the lift station renewal projects for each priority for each lift station.
  - Bethany Lift Station Renewal (Project RR-2).
  - Glen Canyon Lift Station Renewal (Project RR-3).
  - Granite Creek Lift Station Renewal (Project RR-4).
  - Montevalle Lift Station Renewal (Project RR-5).
  - Sunset Terrace Lift Station Renewal (Project RR-6).
  - Suzanne Lane Lift Station Renewal (Project RR-7).
  - Carbonero Lift Station Renewal (Project RR-8).

7.3 Programs

The following summarizes programs that helps the City meet requirements established by the SSMP and make informed decisions necessary to make decisions maintain proper operation of existing facilities.

- Inspection Program (Project PR-1). This inspection program consists of CCTV inspection of the collection system. The City should use the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment Certification Program (PACP) rating system to score each pipeline. These inspections and conditions will be used to decide the method and prioritize the annual pipeline renewal pipeline projects (RR-1). The City is currently implementing the first stages of this program as part of the development of this SSMP, and will continue to implement the program in the future as part of an ongoing CCTV inspection program.
- Flow Monitoring Program (Project PR-2). This program consists of a flow monitoring program that should be completed for the prior to the SSMP Update (Project PR-4) for the SECAP.
- SSMP Update (Project PR-3). This program consists of updating the SSMP every five years as required by WDR.

7.4 Project Prioritization

The improvement projects outlined in this report are prioritized based on their urgency to mitigate existing deficiencies. It is recommended that improvements to mitigate existing deficiencies be constructed as soon as possible. The implementation phases are separated into four phases that are in five year increments for the CIP starting in year 2022 through year 2041.

Section 8

CAPITAL IMPROVEMENT PROGRAM

This section presents the recommended CIP for the City sewer system, a summary of the capital costs, and a basic assessment of the possible financial impacts on the City. The CIP is based on the evaluation of the City's sewer system, as detailed in the recommended projects described in the previous Section 7.

The capacity upgrades and projects to accommodate future growth set the foundation for the City's sewer system CIP. The cost estimates presented in this study are opinions developed from bid tabulations, cost curves, information obtained from previous studies, and Carollo experience on other projects. The costs are based on an Engineering News Record Construction Cost Index (ENR CCI) for San Francisco of 13,110 (February 2021).

8.1 Cost Estimating Accuracy

The cost estimates presented in the CIP have been prepared for general planning purposes and for guidance in project evaluation and implementation. Final costs of a project will depend on actual labor and material costs, competitive market conditions, final project scope, implementation schedule, and other variable factors such as: preliminary alignment generation, investigation of alternative routings, and detailed utility and topography surveys.

The Association for the Advancement of Cost Engineering (AACE) defines an Order of Magnitude Estimate, deemed appropriate for master plan studies, as an approximate estimate made without detailed engineering data. It is normally expected that an estimate of this type would be accurate within plus 50 percent to minus 30 percent. This section presents the assumptions used in developing order of magnitude cost estimates for recommended facilities.

8.2 Baseline Construction Unit Costs

The construction costs are representative of sewer system facilities under normal construction conditions and schedules. Costs have been estimated for public works construction, either as new construction in existing developed areas. Pipeline unit costs are listed in Table 11. The construction cost estimates are based upon these unit costs. The unit costs are for "typical" field conditions with construction in stable soil at a depth ranging between 10 to 15 feet.

Table 11 Gravity Sewer Baseline Construction Unit Costs

Diameter (inches)	Unit Cost[1] ($/foot)
8	195
10	200
12	210
15	230
18	245
21	310
24	340

Notes:
(1) Source: ENR CCI of 13,110 for San Francisco February 2021.

8.3 Project Costs and Contingencies

Project cost estimates are calculated based on elements, such as the project location, size, length, and other factors. Allowances for project contingencies consistent with an "Order of Magnitude" estimate are also included in the project costs prepared as part of this study, as outlined in this section.

8.3.1 Baseline Construction Cost

This is the total estimated construction cost, in dollars, of the proposed improvement. Pipeline and lift station Baseline Construction Costs were developed using the following criteria:

- Pipeline: Calculated by multiplying the estimated length by the unit cost.
- Lift Stations: Calculated by using the total capacity in the cost curve equation.

8.3.2 Estimated Construction Cost

Contingency costs must be reviewed on a case-by-case basis because they will vary considerably with each project. Consequently, it is appropriate to allow for uncertainties associated with the preliminary layout of a project. Such factors as unexpected construction conditions, the need for unforeseen mechanical items, and variations in final quantities are a few of the items that can increase project costs for which it is wise to make allowances in preliminary estimates. To assist the Port in making financial decisions for these future construction projects, contingency costs will be added to the planning budget as percentages of the total construction cost, divided into two categories: Estimated Construction Cost and Capital Improvement Cost.

Since knowledge about site-specific conditions of each proposed project is limited at the planning stage, a 30 percent contingency was applied to the Baseline Construction Cost to account for unforeseen events and unknown conditions. A 30 percent contingency to account for unknown site conditions such as poor soils, unforeseen conditions, environmental mitigations, and other unknowns is typical for planning projects. The Estimated Construction Cost for the proposed sewer system improvement consists of the Baseline Construction Cost plus the 30 percent construction contingency.

8.3.3 Capital Improvement Cost

Other project construction contingency costs are divided into three subcategories, totaling 27.5 percent: 10 percent engineering, 10 construction management, and 7.5 percent project administration. Engineering services associated with new facilities include preliminary investigations and reports, ROW acquisition, foundation explorations, preparation of drawings and specifications during construction, surveying and staking, sampling of testing material, and start-up services. For this study, engineering costs are assumed to equal 10 percent of the Estimated Construction Cost.

Construction phase professional services covers such items as construction management, engineering services, materials testing, and inspection during construction. The cost of these items can also vary, but for the purpose of this study, it is assumed that construction phase professional services expenses will equal approximately 10 percent of the Estimated Construction Cost.

Finally, there are project administration costs, which cover such items as legal fees, environmental/CEQA compliance requirements, financing expenses, administrative costs, and interest during construction. The cost of these items can also vary, but for the purpose of this Master Plan, it is assumed that project administration costs will equal 7.5 percent of the Estimated Construction Cost.

The Capital Improvement Cost is the total of the Estimated Construction Cost (including contingency) plus the other costs discussed in the previous paragraphs. As shown in the following sample calculation of the Capital Improvement Cost, the total cost of all project construction contingencies (construction, engineering services, construction management, and project administration) is 65.75 percent of the Baseline Construction Cost. Note that contingencies were not applied to land acquisition costs. Calculation of the 65.75 percent is the overall mark-up on the baseline construction cost to arrive at the capital improvement cost. It is not an additional contingency.

Example:

Baseline Construction Cost	**$1,000,000**
Construction Contingency (30%)	$300,000
Estimated Construction Cost	**$1,300,000**
Engineering Cost (10%)	$130,000
Construction Management (10%)	$130,000
Project Administration (7.5%)	$97,500
Capital Improvement Cost	**$1,657,500**

8.4 Capital Improvement Implementation

As discussed in Section 7, the CIPs are prioritized based on their urgency to mitigate existing deficiencies and for servicing anticipated growth. It is recommended that improvements to mitigate existing deficiencies be constructed as soon as possible.

The implementation of projects are separated into four phases that are in five year increments.

Table 12 summarizes the project costs by phase for the proposed projects discussed in Section 7. A detailed CIP Table is included in Attachment 5.

Table 12 Capital Improvement Program Summary

Project ID	Project Name	Total Project Cost[1][2][3][4] ($, million)	CIP Cost by Phase[1][2][3][4] ($,million) Phase 1 (2022-26)	Phase 2 (2027-21)	Phase 3 (2032-36)	Phase 4 (2037-41)
GM-1	Old El Pueblo Road	$0.19	$0.19	$0.00	$0.00	$0.00
GM-2	Scotts Valley Drive Diversion with Study	$0.05	$0.05	$0.00	$0.00	$0.00
GM-3A	East of Highway 17	$0.42	$0.42	$0.00	$0.00	$0.00
GM-3B	East of Highway 17 - Creek Crossing	$0.28	$0.28	$0.00	$0.00	$0.00
GM-4	Glenwood Drive	$0.25	$0.25	$0.00	$0.00	$0.00
RR-1	Gravity Sewer Renewal Program	$12.00	$2.10	$3.30	$3.30	$3.30
RR-2	Bethany Lift Station Renewal	$0.32	$0.29	$0.03	$0.00	$0.00
RR-3	Glen Canyon Lift Station Renewal	$0.42	$0.41	$0.00	$0.00	$0.00
RR-4	Granite Creek Lift Station Renewal	$0.16	$0.16	$0.00	$0.00	$0.00
RR-5	Montevalle Lift Station Renewal	$0.52	$0.52	$0.00	$0.00	$0.00
RR-6	Sunset Terrace Lift Station Renewal	$0.12	$0.12	$0.00	$0.00	$0.00
RR-7	Suzanne Lane Lift Station Renewal	$0.12	$0.11	$0.01	$0.00	$0.00
RR-8	Carbonero Lift Station Renewal	$0.02	$0.02	$0.01	$0.00	$0.00
PR-1	Inspection Program	$0.60	$0.15	$0.15	$0.15	$0.15
PR-2	Flow Monitoring Program	$0.28	$0.07	$0.07	$0.07	$0.07
PR-3	SSMP Update	$1.20	$0.30	$0.30	$0.30	$0.30
	Total	**$16.96**	**$5.44**	**$3.88**	**$3.82**	**$3.82**
	Annual	**$0.85**	**$1.09**	**$0.78**	**$0.76**	**$0.76**

Notes:
(1) ENR San Francisco Construction Cost Index for February 2021 is 13,110.
(2) Estimated Construction Cost includes a 30% contingency of the baseline construction cost.
(3) Total project costs includes a 10% markup for engineering, a 10% markup for construction management and a 7.5% markup for project administration of the estimated construction cost.
(4) Total Mark-Up is 65.8% of the baseline construction costs.

Attachment 1

SANITARY SEWER FLOW MONITORING AND INFLOW/INFILTRATION

City of Scotts Valley

Sewer Flow Monitoring and Inflow/Infiltration Study



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Draft Report Date:

July 2019

Prepared by:

V&A consulting engineers

V&A Project No. 18-0162

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Abbreviations and Acronyms

Abbreviations/Acronyms	Definition
ADWF	Average Dry Weather Flow
AVG	Average
CCTV	Closed-Circuit Television
CDEC	California Data Exchange Center
CIP	Capital Improvement Plan
CO	Carbon Monoxide
CWOP	Citizen Weather Observing Program
DIA.	Diameter
d/D	Depth/Diameter Ratio
FT.	Feet
FM	Flow Monitor
GPD	Gallons per Day
GPM	Gallons per Minute
GWI	Groundwater Infiltration
H2S	Hydrogen Sulfide
IN.	Inch
I/I	Inflow and Infiltration
IDM	Inch-Diameter Mile
IDW	Inverse Distance Weighting
LEL	Lower Explosive Limit
MAX.	Maximum
MGD	Million Gallons per Day
MIN.	Minimum
NOAA	National Oceanic and Atmospheric Administration
N/A	Not applicable
PF	Peaking Factor
PS	Pump Station
Q	Flow Rate
RDI	Rainfall-Dependent Infiltration
RG	Rain Gauge
SSO	Sanitary Sewer Overflow
V&A	V&A Consulting Engineers, Inc.
WEF	Water Environment Federation
WRCC	Western Regional Climate Center

Terms and Definitions

Term	Definition
Average dry weather flow (ADWF)	Average flow rate or pattern from days without noticeable inflow or infiltration response. ADWF usage patterns for weekdays and weekends differ and must be computed separately. ADWF is expressed as a numeric average and may include the influence of normal groundwater infiltration (not related to a rain event).
Basin	Sanitary sewer collection system upstream of a given location (often a flow meter), including all pipelines, inlets, and appurtenances. Also refers to the ground surface area near and enclosed by pipelines. A basin may refer to the entire collection system upstream from a flow meter or exclude separately monitored basins upstream.
Depth/diameter (*d/D*) ratio	Depth of water in a pipe as a fraction of the pipe's diameter. A measure of fullness of the pipe used in capacity analysis.
Design storm	A theoretical storm event of a given duration and intensity that aligns with historical frequency records of rainfall events. For example, a 10-year, 24-hour design storm is a storm event wherein the volume of rain that falls in a 24-hour period would historically occur once every 10 years. Design storm events are used to predict I/I response and are useful for modeling how a collection system will react to a given set of storm event scenarios.
Infiltration and inflow	**Infiltration and inflow (I/I)** rates are calculated by subtracting the ADWF flow curve from the instantaneous flow measurements taken during and after a storm event. Flow in excess of the baseline consists of inflow, rainfall-responsive infiltration, and rainfall-dependent infiltration. **Total I/I** is the total sum in gallons of additional flow attributable to a storm event.
Infiltration, groundwater	**Groundwater infiltration (GWI)** is groundwater that enters the collection system through pipe defects. GWI depends on the depth of the groundwater table above the pipelines as well as the percentage of the system that is submerged. The variation of groundwater levels and subsequent groundwater infiltration rates is seasonal by nature. On a day-to-day basis, groundwater infiltration rates are relatively steady and will not fluctuate greatly.
Infiltration, rainfall-dependent	**Rainfall-dependent infiltration (RDI)** is similar to groundwater infiltration but occurs as a result of storm water. The storm water percolates into the soil, submerges more of the pipe system, and enters through pipe defects. RDI is the slowest component of storm-related infiltration and inflow, beginning gradually and often lasting 24 hours or longer. The response time depends on the soil permeability and saturation levels.
Inflow	Inflow is defined as water discharged into the sewer system, including private sewer laterals, from direct connections such as downspouts, yard and area drains, holes in manhole covers, cross-connections from storm drains, or catch basins. Inflow creates a peak flow problem in the sewer system and often dictates the required capacity of downstream pipes and transport facilities to carry these peak instantaneous flows. Overflows are often attributable to high inflow rates.
Peak Wet Weather Flow	The highest daily flow during and immediately after a significant storm event. Includes sanitary flow, infiltration and inflow.
Peaking factor (PF)	PF is the ratio of peak measured flow to average dry weather flow. This ratio expresses the degree of fluctuation in flow rate over the monitoring period and is used in capacity analysis.
Surcharge	When the flow level is higher than the crown of the pipe, then the pipeline is said to be in a **surcharged** condition. The pipeline is surcharged when the *d/D* ratio is greater than 1.0.
Synthetic hydrograph	A set of algorithms has been developed to approximate the actual I/I hydrograph. The synthetic hydrograph is developed strictly using rainfall data and response parameters representing response time, recession coefficient and soil saturation.

Executive Summary

Scope and Purpose

V&A Consulting Engineers (V&A) has completed sanitary sewer flow monitoring and rainfall monitoring with I/I analysis within the City of Scotts Valley (City) collection system. Flow and rainfall monitoring was performed over a period of over 3 months from January 31, 2019 to May 2, 2019. Open-channel flow monitoring was performed at 8 sites. There were three general purposes of this study.

1. Establish the baseline sanitary sewer flows at the flow monitoring sites
2. Establish the peak flow condition during the rainfall events and estimate available sewer capacity.
3. Quantify inflow/ infiltration (I/I) at the applicable flow monitoring sites.

Monitoring Sites

The flow monitoring site locations were selected and approved by the City and are listed in Table ES-1 and shown in Figure ES-1 and Figure ES-2.

Table ES-1. List of Monitoring Sites

Monitoring Site	Monitored Pipe	Pipe Diameter (in)	Location
Site 1	Southwest Inlet	10	In Treatment Plant, inside gate
Site 2	East Inlet	10	In Treatment Plant, behind parked car
Site 3	Northwest Inlet	17/18*	In Integrity Automotive parking lot, behind gate
Site 4	East Inlet	10	Sidewalk near Bubbles Laundromat
Site 5	East Inlet	18	Whispering Pines Drive, west of Mt Hermon Road
Site 6	Northeast Inlet	10	Scotts Valley Drive, south of Ball Drive
Site 7	North Inlet	10	Glenwood Drive, north of Hacienda Drive
Site 8	North Inlet	10	In bushes between S Navarraq Drive and Highway 17

* Pipe measured 17" diameter above water line due to pipe corrosion and surface mortar expansion. Underneath the water line the pipe measured 18". The 18" diameter value (typically wetted) was used for the flow calculations. The 17" diameter value (worst case) was used for capacity analysis.

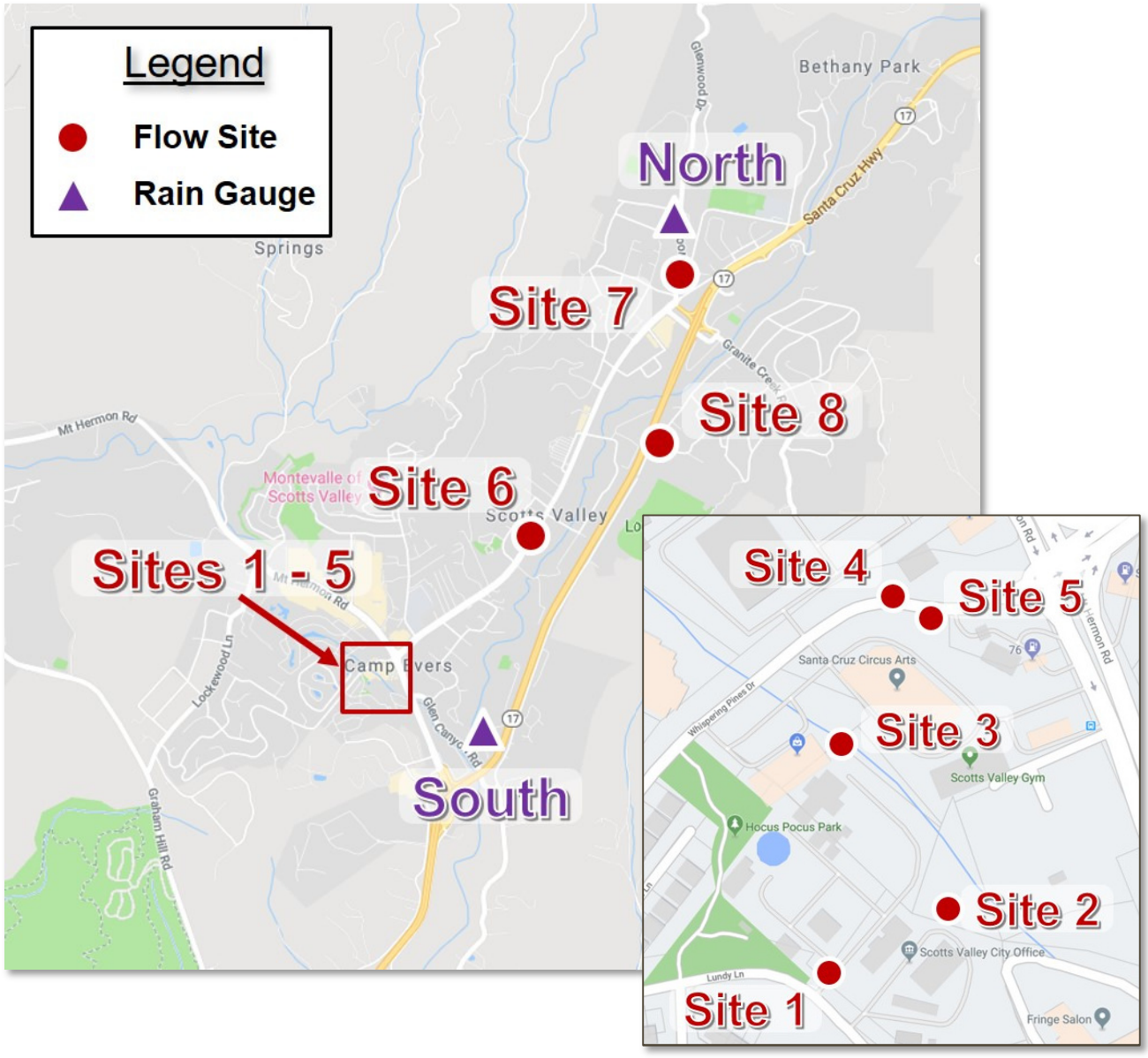


Figure ES-1. Map of Flow Monitoring Sites – Overall

Rainfall Monitoring

The cumulative precipitation for the rain gauges was approximately 15% greater than the historical precipitation for the duration of the flow monitoring. There were several rainfall events during the monitoring period. The three largest rainfall events were defined as shown in Figure ES-2, noting the following items:

- Event 2 was classified as the strongest rainfall event during the season and was classified as a 1-year, 8-hour rainfall event at the South Rain Gauge

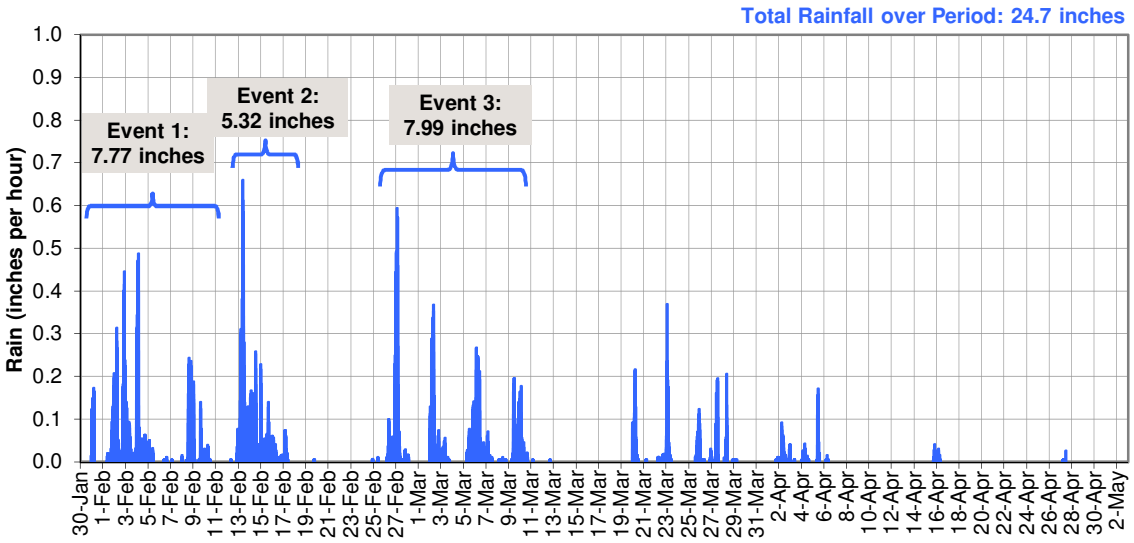


Figure ES-2. Rainfall Over Monitoring Period, Average of 2 Rain Gauges

The following items are noted relevant to the storm events used for I/I analyses:

- All three rainfall events elicited strong I/I responses and were evaluated for I/I analysis in this study.
- **Inflow**: Events 2 and 3 had the highest intensity rainfall that fell at the start of each event; peak I/I rates could be evaluated as inflow with minimal RDI interference.
- **RDI**: RDI is typically taken as the average I/I flow rate measured at a project-specific time, typically 24 hours, after the rainfall event has concluded. There were three opportune times after Events 1, 2 and 3 RDI measurements:
  - February 7, 19 and March 12, 2019 were all days 24-hour clear of, but following the strong rainfall events of Events 1, 2 and 3, respectively.
- **Combined I/I**: To attribute full capture of totalized volume of RDI/I to a storm event, it is necessary for flows to return to baseline flow levels. For Scotts Valley, this only occurs at the end of the flow study. The most accurate determination of combined I/I for this study was to measure total I/I not per storm event, but across the entirety of the study.

Site Flow Monitoring and Capacity Results

Peak measured flows and the hydraulic grade line data (flow depths) are important to understand the capacity limitations of a collection system. The following capacity analyses terms are defined as follows:

- **Peaking Factor**: Peaking factor is defined as the peak measured flow divided by the average dry weather flow (ADWF). Peaking factors are influenced by many factors including size and topography of tributary area, flow attenuation, flow restrictions, characteristics of I/I entering the collection system, and hydraulic features such as pump stations.

  For this report, peaking factors are reported and PF > 5 are highlighted in RED[1]; however, the City should refer to City standards when evaluating peaking factors. Peaking factor data should be used at the discretion of the City Engineer.

- **d/D Ratio**: The d/D ratio is the peak measured depth of flow (d) divided by the pipe diameter (D). The d/D ratio for each site was computed based on the maximum depth of flow for the study. Standards for d/D ratio vary from agency to agency, but typically range between d/D ≤ 0.5 and d/D ≤ 0.75.

  For this report, d/D ratios > 1.0 (surcharged) are highlighted in RED; however, the City should refer to City standards when evaluating d/D ratios, to be used at the discretion of the City Engineer.

Table ES-2 summarizes the peak recorded flows, levels, d/D ratios, and peaking factors per site during the flow monitoring period. Capacity analysis data is presented on a site-by-site basis and represents the hydraulic conditions only at the site locations; hydraulic conditions in other areas of the collection system will differ.

Table ES-2. Capacity Analysis Summary

Monitoring Site	ADWF (MGD)	Peak Measured Flow (MGD)	Peaking Factor	Pipe Diameter, *D* (IN)	Peak Measured Depth (IN)	*Max d/D* Ratio	Surcharge above pipe crown(FT)
Site 1	0.017	0.14	8.2	10	4.26	0.43	n/a
Site 2	0.076	0.41	5.4	10	4.01	0.40	n/a
Site 3	0.667	2.41	3.6	17*	18.65	1.10	0.14
Site 4	0.053	0.19	3.5	10	2.01	0.20	n/a
Site 5	0.413	1.62	3.9	18	4.05	0.23	n/a
Site 6	0.104	0.79	7.5	10	7.29	0.73	n/a
Site 7	0.054	0.45	8.4	10	6.59	0.66	n/a
Site 8	0.111	0.57	5.1	10	3.71	0.37	n/a
System	*0.761*	*2.96*	*3.9*	-	-	-	-

* Pipe measured 17" diameter above water line due to pipe corrosion and surface mortar expansion. Underneath the water line the pipe measured 18". The 18" diameter value (typically wetted) was used for the flow calculations. The 17" diameter value (worst case) was used for capacity analysis.

[1] WEF Manual of Practice FD-6 and ASCE Manual No. 62 suggests typical peaking factor ratios range between 3 and 4, with higher values possibly indicative of pronounced I/I flows.

The following capacity analysis results are noted:

- **Peaking Factors**
  - Sites 3, 4, and 5 had peaking factors below 5.
  - Sites 2 and 8 had peaking factors between 5 and 7.
  - Sites 1, 6 and 7 had peaking factors above 7.
- **d/D Ratio:**
  - Only Site 3 reached a surcharge condition. This condition was reached during a temporary backflow condition reached during the February 13, 2019 peak-intensity rain event, but did not occur during the other rainfall events.

Figure ES-3 shows a schematic diagram of the peak measured flows with peak flow levels.

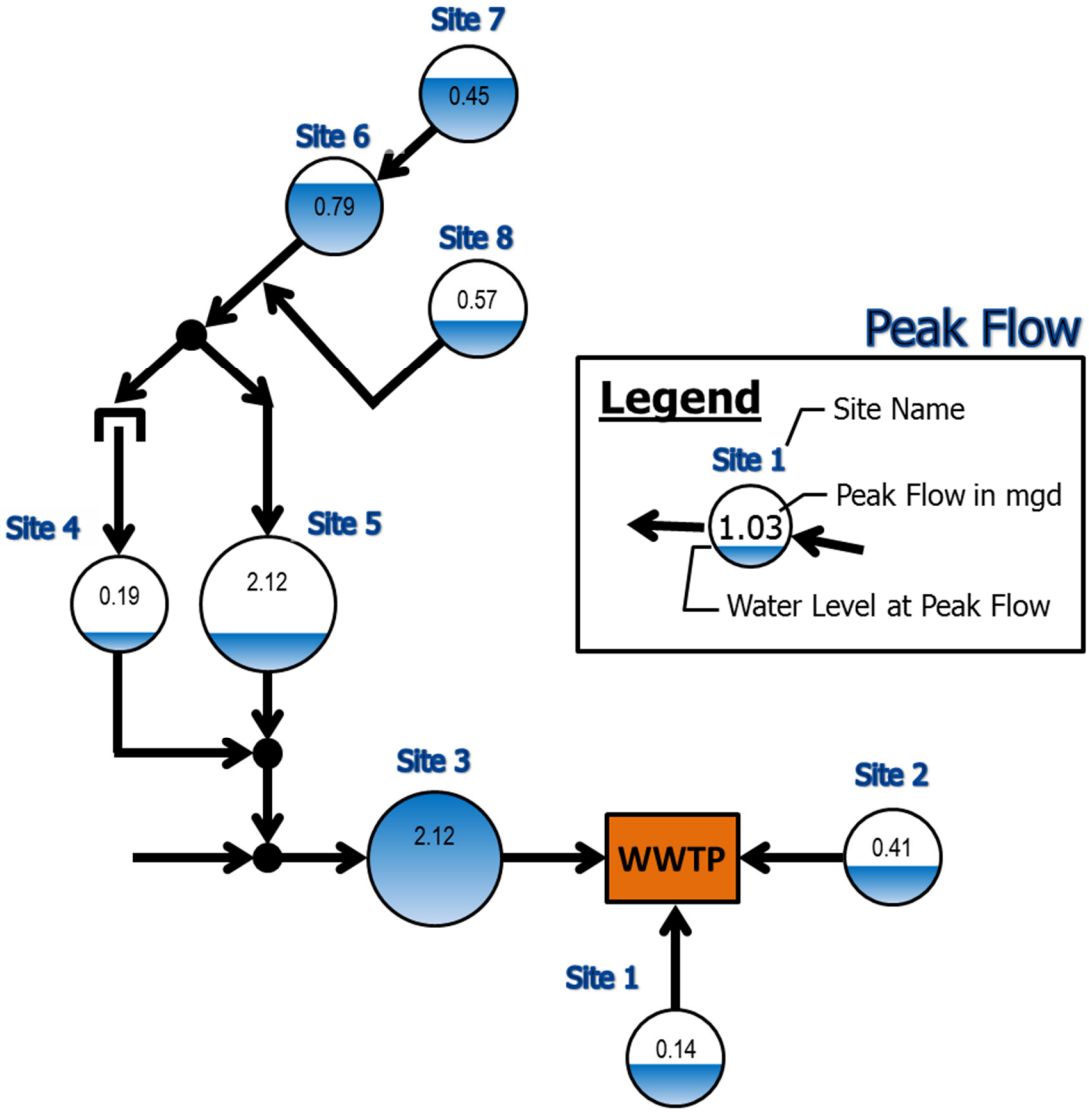


Figure ES-3. Peak Measured Flow Schematic

Infiltration and Inflow Analysis

Flow monitoring basins are localized areas of a sanitary sewer collection system upstream of a given location (often a flow meter), including all pipelines, inlets, and appurtenances. The basin refers to the ground surface area near and enclosed by the pipelines. A basin may refer to the entire collection system upstream from a flow meter or may exclude separately monitored basins upstream. I/I analysis in this report will be conducted on a basin-by-basin basis.

For this study subtraction of flows was required to isolate the drainage areas of some flow monitoring basins. Basin 4/5 is the addition of the flows of Sites 4 and 5 as the upstream flows (from Sites 6 and 8) can go to either Site 4 or Site 5. With no way to isolate these basins, the flows are combined and treated as one basin for the purposes of the I/I analysis.

I/I results were taken from all three rainfall events and across the entirety of the study. Table ES-3 summarizes the I/I results for this study. The "Top 3" basins for each category have been shaded in RED. Please refer to the I/I Methods section for more information on inflow and infiltration analysis methods and ranking methods.

Table ES-3. I/I Analysis Summary

Basin	ADWF (mgd)	Inflow Rate [a] (mgd)	RDI Rate [b] (mgd)	Combined I/I [c] (gallons)	R-Value	Overall Inflow Rank	Overall RDI Rank	Combined I/I Rank	Excessive GWI?
Basin 1	0.017	0.009	0.001	190,000	0.37%	7	6	6	No
Basin 2	0.076	0.082	0.022	1,889,000	1.07%	6	5	4	No
Basin 3	0.201	1.063	0.009	1,707,000	0.48%	2	7	7	No
Basin 4/5	0.251	0.517	0.082	2,809,000	1.01%	5	4	5	No
Basin 6	0.050	0.351	0.028	1,596,000	1.35%	1	2	3	Yes
Basin 7	0.054	0.243	0.079	5,567,000	2.39%	3	1	1	Yes
Basin 8	0.111	0.294	0.059	5,580,000	2.53%	4	3	2	Yes
System	*0.761*	*1.507*	*0.001*	*19,338,000*	*1.35%*	-	-	-	-

[a] Average from Events 2 and 3. [b] Average from Events 1, 2 and 3. [c] Total I/I over entirety of flow monitoring period.

The following inflow/infiltration analysis results are noted:

- **Inflow**: Basins 3, 6, and 7 ranked highest for normalized inflow contribution.
- **Rainfall-Dependent Infiltration**: Basins 6, 7, and 8 ranked highest for normalized RDI contribution. The RDI rates measured for this study may be even higher than reported due to high groundwater calculated in these three basins.
- **Combined I/I**: Basins 6, 7, and 8 ranked highest for normalized combined I/I contribution.
- **Groundwater Infiltration**: Sites 6, 7, and 8 had GWI rates considerably higher than other sites and typical standards. Since the GWI rates were measured at the end of the flow monitoring study, possibly before flows had receded to true ADWF levels, it is possible that the reported ADWF rates are inflated due to this excessive GWI component. This also may indicate that the

RDI rates reported for these three basins are higher than reported due to the elevated ADWF values used within the RDI calculation.

Figure ES-4 illustrates a temperature map summary of the normalized combined I/I results. Additional temperature maps can be found in Section 3.3.

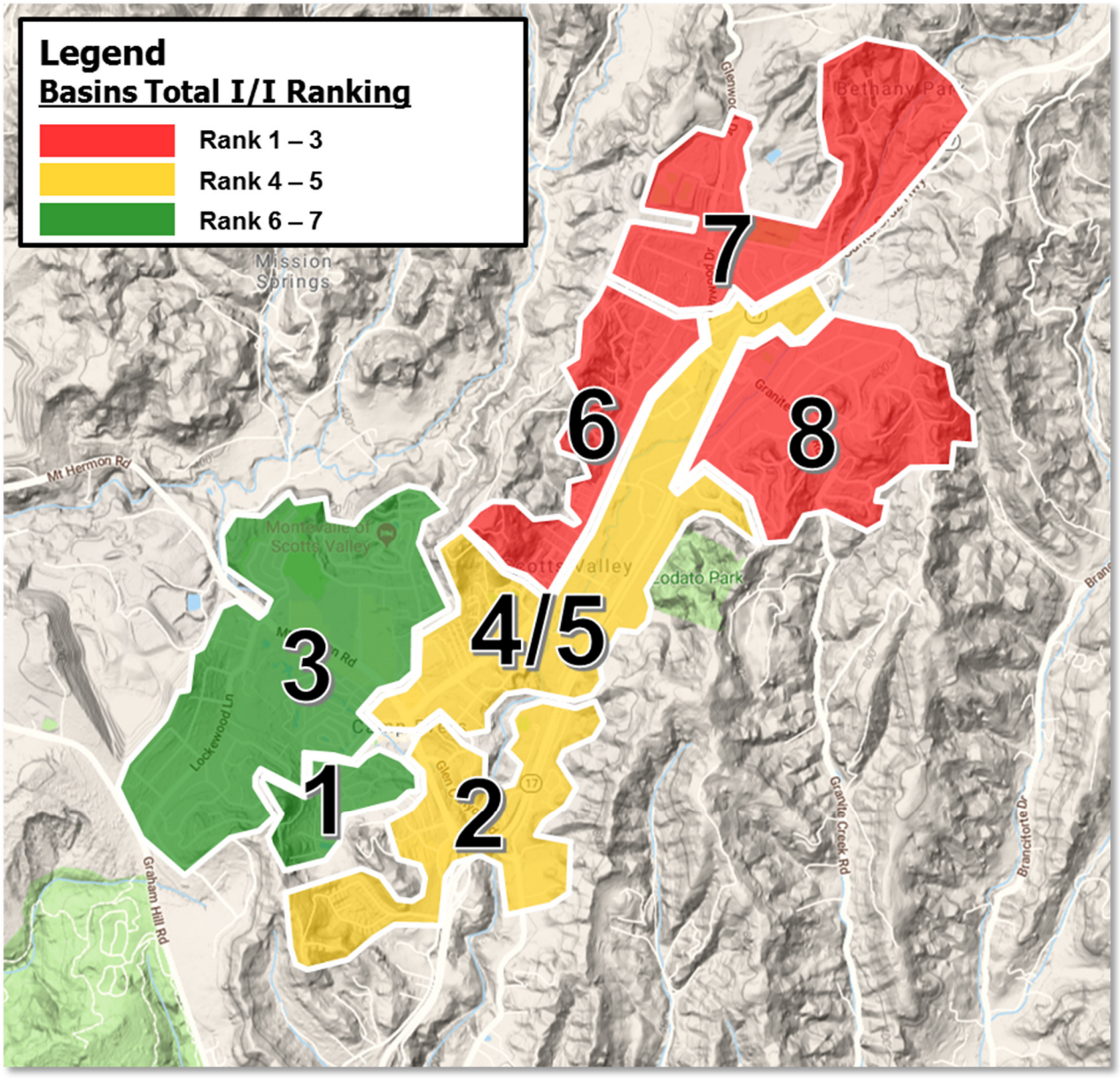


Figure ES-4. Combined I/I Results Temperature Map Summary

Recommendations

V&A advises that future I/I reduction plans consider the following recommendations:

1. **Master Plan and Model Implementation**: This study focuses on inflow and infiltration generation; however, the capacity deficiencies of the collection system may be of greater concern relative to I/I response during peak wet weather events. The City may wish to have a model designed and/or a master plan study conducted to determine the overall needs of the City relative to I/I. Or simply, the study results can be used to update the master plan and compare with previous model assumptions and flow monitoring results.
2. **Determine I/I Reduction Program**: The City should examine its I/I reduction needs to determine their needs and goals for a future I/I reduction program.
    a. If peak flows, sanitary sewer overflows, and pipeline capacity issues are of greater concern, then priority can be given to investigate and reduce sources of inflow within the basins with the greatest inflow problems. The highest inflow occurs in Basins 3, 6, and 7.
    b. If total infiltration and general pipeline deterioration are of greater concern, then the program can be weighted to investigate and reduce sources of infiltration within the basins with the greatest infiltration problems. The highest combined I/I, highest RDI and elevated GWI occurs in Basins 6, 7, and 8.
3. **I/I Investigation Methods**: Potential I/I investigation methods include the following:
    a. Smoke testing can be effective for locating sources of inflow. Smoke testing can be considered for Basins 3, 6 and 7 which had the highest normalized inflow rates.
    b. Mini-basin or sub-basin flow monitoring can be used to better determine the distribution of I/I within a particular sub-basin. Basins 6, 7, and 8 may be good candidates mini-basin flow monitoring to better locate the distribution of inflow and infiltration within these basins.
    c. Night-time I/I reconnaissance can be conducted within basins with high RDI rates to better determine on a pipe reach by pipe reach basis where the RDI is occurring within particular sub-basin. This method may be utilized to determine candidate neighborhoods for potential CIP projects to mitigate and reduce I/I within the collection system. Night-time I/I reconnaissance could be considered for Basins 6, 7, and 8.
4. **I/I Reduction Cost Effective Analysis**: The City should conduct a study to determine which is more cost-effective: (1) locating the sources of inflow/infiltration and systematically rehabilitating or replacing the faulty pipelines; or (2) continued treatment of the additional rainfall dependent I/I flow.

1 Introduction

1.1 Scope and Purpose

V&A Consulting Engineers (V&A) was retained by Carollo Engineers (Carollo) to perform sanitary sewer flow monitoring and rainfall monitoring with I/I analysis within the City of Scotts Valley (City) collection system. Flow and rainfall monitoring was performed over a period of over 3 months from January 31, 2019 to May 2, 2019. Open-channel flow monitoring was performed at 8 sites. There were three general purposes of this study.

1. Establish the baseline sanitary sewer flows at the flow monitoring sites
2. Establish the peak flow condition during the rainfall events and estimate available sewer capacity.
3. Quantify inflow/ infiltration (I/I) at the applicable flow monitoring basins.

1.2 Flow Monitoring Sites and Sewerage Basins

Flow monitoring sites are identified as the manholes where the flow monitors were secured and the pipelines wherein the flow sensors were placed. Capacity analysis and flow rate information is presented on a site-by-site basis.

The flow monitoring site locations were selected by Carollo and approved by the City. Information regarding the flow monitoring locations are listed in Table 1-1 and illustrated in Figure 1-1. Detailed descriptions of the individual flow monitoring sites, including photographs, are included in *Appendix A*.

Table 1-1. List of Monitoring Locations

Monitoring Site	Monitored Pipe	Pipe Diameter (in)	Location
Site 1	Southwest Inlet	10	In Treatment Plant, inside gate
Site 2	East Inlet	10	In Treatment Plant, behind parked car
Site 3	Northwest Inlet	17/18*	In Integrity Automotive parking lot, behind gate
Site 4	East Inlet	10	Sidewalk near Bubbles Laundromat
Site 5	East Inlet	18	Whispering Pines Drive, west of Mt Hermon Road
Site 6	Northeast Inlet	10	Scotts Valley Drive, south of Ball Drive
Site 7	North Inlet	10	Glenwood Drive, north of Hacienda Drive
Site 8	North Inlet	10	In bushes between S Navarraq Drive and Highway 17

* Pipe measured 17" diameter above water line due to pipe corrosion and surface mortar expansion. Underneath the water line the pipe measured 18". The 18" diameter value (typically wetted) was used for the flow calculations. The 17" diameter value (worst case) was used for capacity analysis.

Flow monitoring site data may include the flows of one or many drainage basins. Flow monitoring basins are localized areas of a sanitary sewer collection system upstream of a given location (often a flow meter), including all pipelines, inlets, and appurtenances. The basin refers to the ground surface area near and enclosed by the pipelines. A basin may refer to the entire collection system upstream from a flow meter or may exclude separately monitored basins upstream, requiring basin isolation (subtraction of upstream flows). The I/I analysis results will be presented on an isolated basin basis. The basins, basin attributes and basin isolation equations are listed in Table 1-2 and shown in Figure 1-2.

- **Basin 4/5**: Basin 4/5 is the addition of the flows of Sites 4 and 5 as the upstream flows (from Sites 6 and 8) can go to either Site 4 or Site 5. With no way to isolate these basins, the flows are combined and treated as one basin for the purposes of the I/I analysis.
- **System**: System flows and analyses were conducted to provide an overall reference for the City collection system as a whole. System flows were determined as the sum of Sites 1, 2, and 3.

Table 1-2. Isolated Flow Monitoring Basin Characteristics

Isolated Basin	Flow Isolation Calculation	Area (Acres)
Basin 1	= Q_1	77
Basin 2	= Q_2	267
Basin 3	= $Q_3 - (Q_4 + Q_5)$	533
Basin 4/5	= $(Q_4 + Q_5) - (Q_6 + Q_8)$	416
Basin 6	= $Q_6 - Q_7$	174
Basin 7	= Q_7	342
Basin 8	= Q_8	325
System	= $Q_1 + Q_2 + Q_3$	2,134

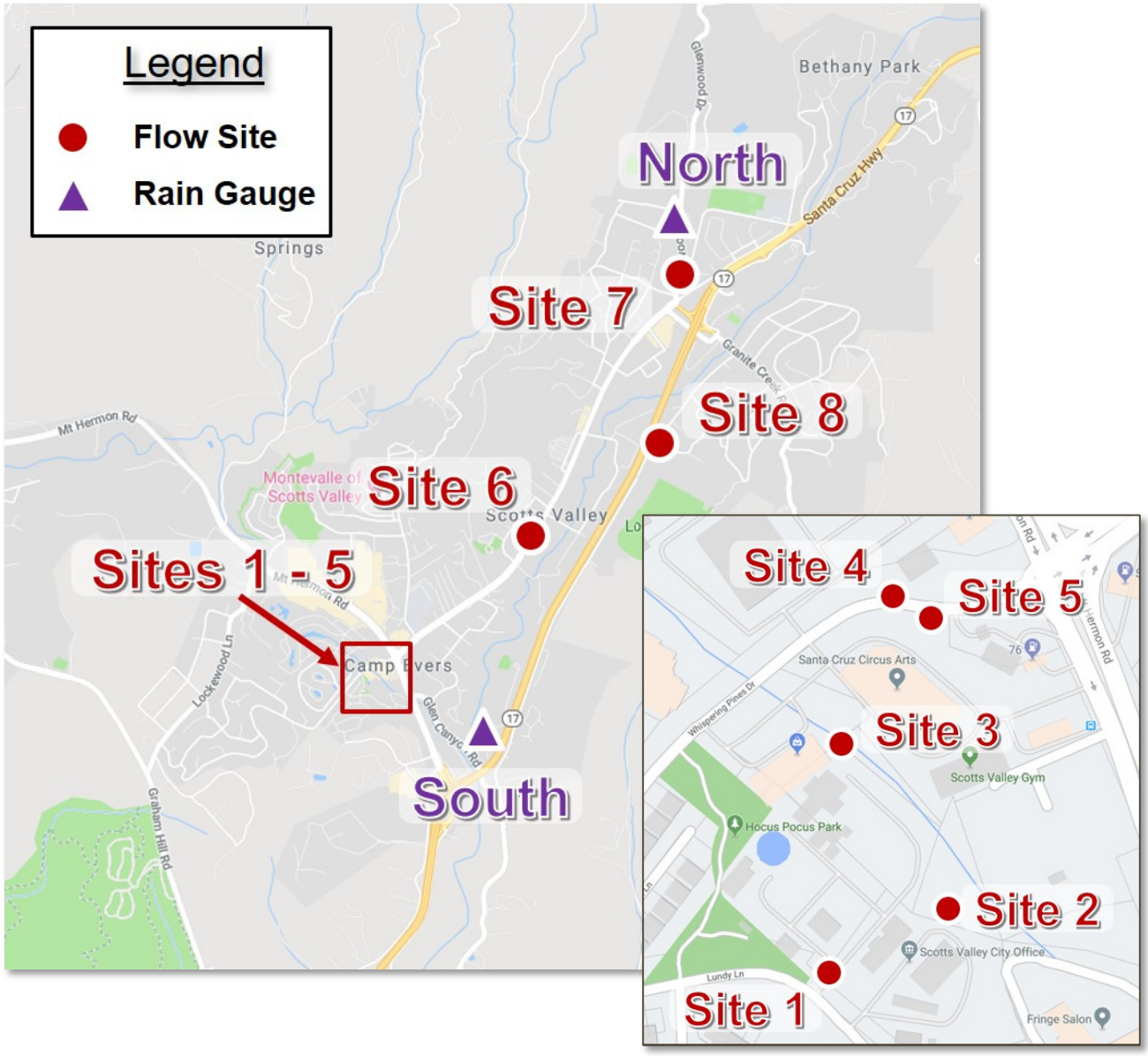


Figure 1-1. Map of Flow Monitoring Sites – Overall

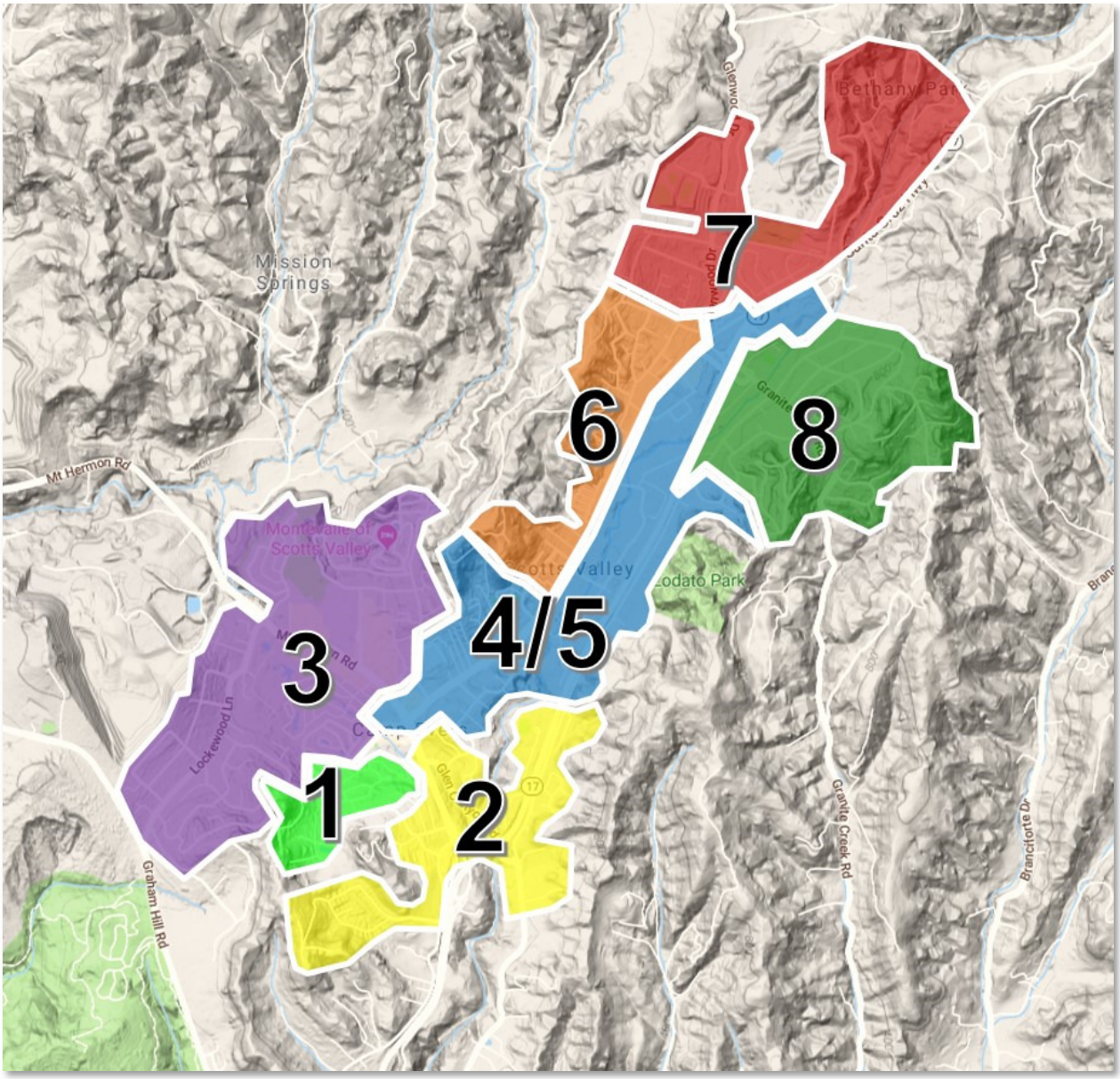


Figure 1-2. Map of Flow Monitoring Basins

2 Methods and Procedures

2.1 Confined Space Entry

A confined space (Photo 2-1) is defined as any space that is large enough and so configured that a person can bodily enter and perform assigned work, has limited or restricted means for entry or exit and is not designed for continuous employee occupancy. In general, the atmosphere must be constantly monitored for sufficient levels of oxygen (19.5% to 23.5%), and the presence of hydrogen sulfide (H_2S) gas, carbon monoxide (CO) gas, and lower explosive limit (LEL) levels. A typical confined space entry crew has members with OSHA-defined responsibilities of Entrant, Attendant and Supervisor. The Entrant is the individual performing the work. He or she is equipped with the necessary personal protective equipment needed to perform the job safely, including a personal four-gas monitor (Photo 2-2). If it is not possible to maintain line-of-sight with the Entrant, then more Entrants are required until line-of-sight can be maintained. The Attendant is responsible for maintaining contact with the Entrants to monitor the atmosphere using another four-gas monitor and maintaining records of all Entrants, if there is more than one. The Supervisor is responsible for developing the safe work plan for the job at hand prior to entering.



Photo 2-1. Confined Space Entry



Photo 2-2. Typical Personal Four-Gas Monitor

2.2 Flow Meter Installation

V&A installed 8 Teledyne ISCO area-velocity flow meters for temporary metering within the collection system. ISCO 2150 meters use submerged sensors with a pressure transducer to collect depth readings and an ultrasonic Doppler sensor to determine the average fluid velocity. The ultrasonic sensor emits high-frequency sound waves, which are reflected by air bubbles and suspended particles in the flow. The sensor receives the reflected signal and determines the Doppler frequency shift, which indicates the estimated average flow velocity. The sensor is typically mounted at a manhole inlet to take advantage of smoother upstream flow conditions. The sensor may be offset to one side to lessen the chances of fouling and sedimentation where these problems are expected to occur. Manual level and velocity measurements were taken during installation of the flow meters and again when they were removed and compared to simultaneous level and velocity readings from the flow meters to ensure proper calibration and accuracy. Figure 2-1 shows a typical installation for a flow meter with a submerged sensor.

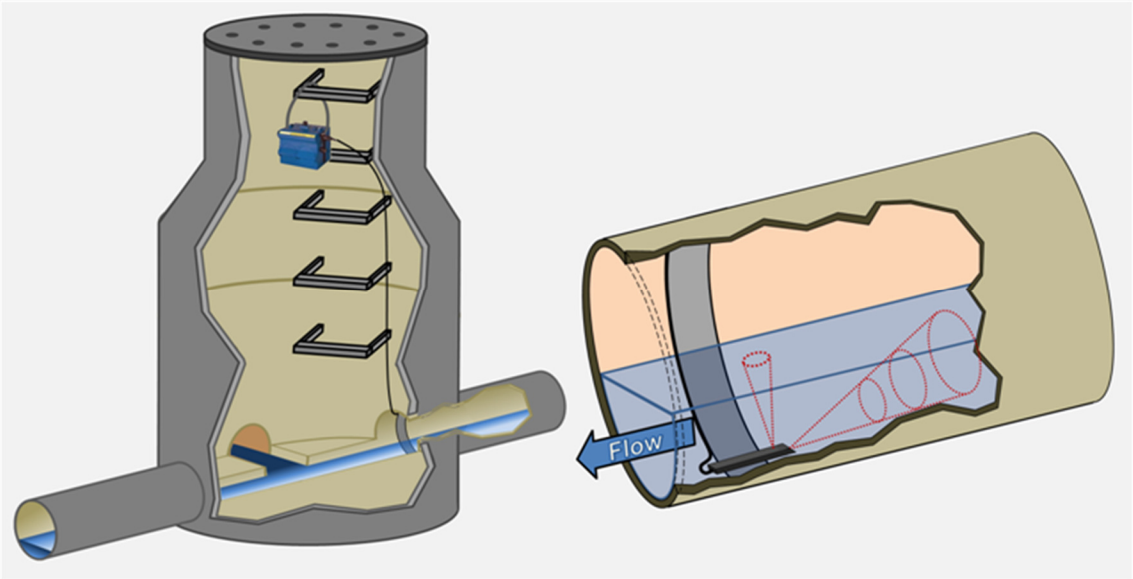


Figure 2-1. Typical Installation for ISCO 2150 Flow Meter with Submerged Sensor

2.3 Flow Calculation

Data retrieved from the flow meters was placed into a spreadsheet program for analysis. Data analysis includes data comparison to field calibration measurements, as well as necessary geometric adjustments as required for sediment (sediment reduces the pipe's wetted cross-sectional area available to carry flow). Area-velocity flow metering uses the continuity equation,

$$Q = v \cdot A = v \cdot (A_T - A_S)$$

where Q : volume flow rate

v: average velocity as determined by the ultrasonic sensor

A: cross-sectional area available to carry flow

A_T: total cross-sectional area with both wastewater and sediment

A_S: cross-sectional area of sediment.

For circular pipe,

$$A_T = \left[\frac{D^2}{4} \cos^{-1}\left(1 - \frac{2d_W}{D} \right) \right] - \left[\left(\frac{D}{2} - d_W \right) \left(\frac{D}{2} \right) \sin\left(\cos^{-1}\left(1 - \frac{2d_W}{D} \right) \right) \right]$$

$$A_S = \left[\frac{D^2}{4} \cos^{-1}\left(1 - \frac{2d_S}{D} \right) \right] - \left[\left(\frac{D}{2} - d_S \right) \left(\frac{D}{2} \right) \sin\left(\cos^{-1}\left(1 - \frac{2d_S}{D} \right) \right) \right]$$

where d_W: distance between wastewater level and pipe invert

d_S: depth of sediment

D: pipe diameter

2.4 Measurement Error and Uncertainty

For traditional engineering applications, measurement "error" is explained as a difference between a computed, estimated, or measured value and the generally accepted true or theoretically correct value. It can also be thought of as a difference between the desired and the actual performance of equipment. For equipment, error is usually expressed as a percentage relative to accuracy (i.e., "…the velocity sensor has an accuracy of ±2% of the reading…").

However, for this study and flow monitoring applications, the cause of the measurement difference is important, and a distinction will be made between the equipment not performing to industry standards ("error") and expected inaccuracies ("uncertainty") associated with monitoring technology limitations.

Gauging **"error"** occurs when the equipment is not performing to industry standards. This can occur as a result of the following common categories of conditions that can be encountered at a wastewater monitoring site.

- Malfunctioning equipment (i.e. a sensor is damaged, battery life ends, or a desiccant canister becomes saturated)
- Improper equipment choice or maintenance (i.e. the selected gauging equipment technologies are incompatible with hydraulic conditions within the sewer, or excessive gravel deposits are allowed to accumulate around the sensors without being removed)
- Improper equipment calibration (i.e. depth and/or velocity measurements are incorrectly taken within the sewer, or equipment is allowed to drift out of calibration)
- Field conditions within the sewer, (i.e. foaming at the water surface that "blinds" an ultrasonic depth sensor, or toilet paper catching and accumulating on a combination sensor, blinding the acoustic Doppler velocity meter)

For flow monitoring applications, gauging **"uncertainty"** is used to describe and quantify the expected inaccuracies that result from the limitations of the technologies that utilize indirect measurements to quantify wastewater flow.

It is important to try and install flow meters in "ideal" flow conditions. Ideal flow conditions are generally defined by as laminar flow in a straight-through, constant-slope pipeline with no disturbances (elbows, tees, hydraulic shifts, etc.) 10 diameters upstream and 5 diameters downstream from the flow monitoring location. If ideal flow conditions are met, then an expected uncertainty of final flow calculation from an open-channel flow meter may be approximately ±5%. For many situations, ideal flow conditions cannot be met, and uncertainties increase.

2.4.1 Flow Addition versus Flow Subtraction

Due to the uncertainties involved in subtracting flows of similar magnitudes, the addition of flows at multiple monitoring sites is usually preferred over subtraction of flows. Subtraction becomes an issue especially when the flow difference from the subtraction falls within the measurement uncertainty range of the two larger flow data sets (i.e. subtracting a large flow from another large flow to obtain a small difference).

This concept is best demonstrated per the following example:

1. Meter A measures 2.00 MGD of flow and has an expected uncertainty of ±5%, thus the uncertainty range of the flow measurement is ±0.10 MGD.

2. Meter B measures 2.50 MGD of flow and has an expected uncertainty of ±6%, thus the uncertainty range of the flow measurement is ±0.15 MGD.
3. Meter C measures 0.50 MGD of flow and has an expected uncertainty of ±8%, thus the uncertainty range of the flow measurement is ±0.04 MGD.

Scenario 1 – Flow Addition

- Meter A + Meter B = 2.00 MGD (±0.10) + 2.50 MGD (±0.15) = 4.50 MGD (±0.25)
- Overall uncertainty = ±0.25 / 4.50 = ±5.6%
- For flow addition, the final uncertainty is essentially a weighted average of the component uncertainties.

Scenario 2 – Flow Subtraction, Large Flow less Small Flow

- Meter B - Meter C = 2.50 MGD (±0.15) - 0.50 MGD (±0.04) = 2.00 MGD (±0.19)
- Overall uncertainty = ±0.19 / 2.00 = ±9.5%
- For flow subtraction, the final uncertainty will always be greater than the component uncertainties.
- When subtracting a small flow from a large flow, the resulting uncertainties can still be manageable.

Scenario 3 – Flow Subtraction, Large Flow less a similarly Large Flow

- Meter B - Meter A = 2.50 MGD (±0.15) – 2.00 MGD (±0.10) = 0.50 MGD (±0.25)
- Overall uncertainty = ±0.25 / 0.50 = ±50%
- When subtracting a similarly sized flow rates, the resulting uncertainties may not be manageable. In this example, an uncertainty of ±50% may be considered unacceptable for confident analyses.

Scenario 3 is a very "real-world" situation. The uncertainties for Meter A and Meter B are extremely reasonable (indeed, most flow monitoring service providers would be extremely pleased with true meter uncertainties of ±5% to ±6%). However, the reality of the math is clear, and the above example demonstrates the concept of flow subtraction and compounding or inflating uncertainty ranges.

The following points are emphasized in relation to the items of this section:

- For subtraction of flows, the overall uncertainty can be an inflated value that far exceeds the component uncertainties.
- The smaller the resultant flow from the subtraction equation, the larger the percentage uncertainty.
- Whenever possible, basins flows should be directly measured, rather than calculated as a subtraction of two or more flow meters.
- If flow subtraction cannot be avoided, it is better to have the magnitudes of the component flows be as dissimilar as possible.

2.5 Average Dry Weather Flow Determination

For this study, four distinct average dry weather flow curves were established for each site location:

- Mondays – Thursdays
- Fridays
- Saturdays
- Sundays

Flows for many sites differ on Friday evenings compared to Mondays through Thursdays. Starting around 7 pm, the flows are often decreased (compared to Monday through Thursday). Similarly, flow patterns for Saturday and Sunday were also separated due to their unique evening flow pattern. This type of differentiation can be important when determining I/I response, especially if a rain event occurs on a Friday, Saturday or Sunday evening.

Figure 2-2 illustrates a sample of varying flow patterns within a typical dry week[2].

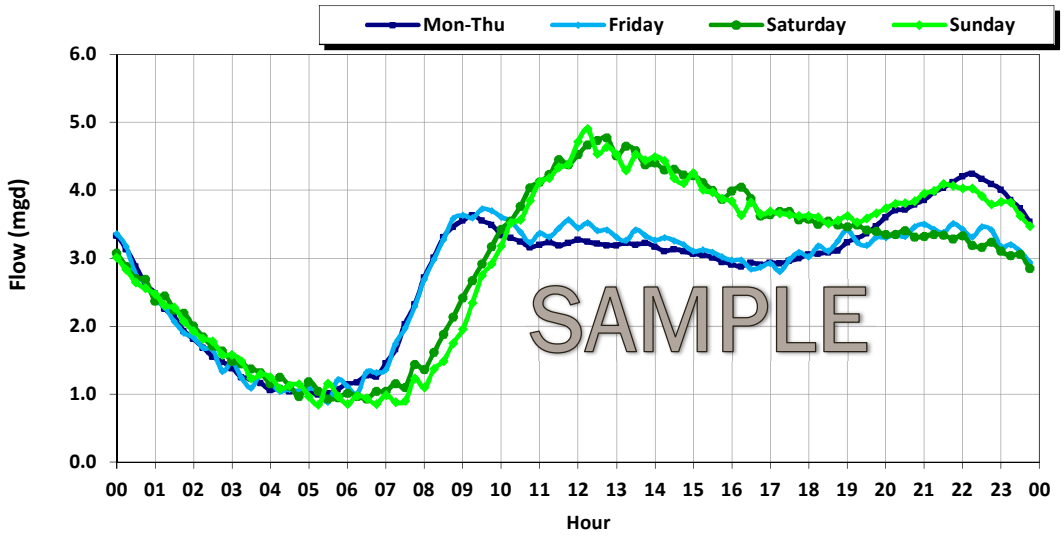


Figure 2-2. Sample ADWF Diurnal Flow Patterns

ADWF curves are taken from "Dry Days", when RDI had the least impact on the baseline flow. The overall average dry weather flow (ADWF) was calculated per the following equation:

$$ADWF = \left(ADWF_{Mon-Thu} \times \frac{4}{7} \right) + \left(ADWF_{Fri} \times \frac{1}{7} \right) + \left(ADWF_{Sat} \times \frac{1}{7} \right) + \left(ADWF_{Sun} \times \frac{1}{7} \right),$$

[2] Holiday flows can be extremely variable. Christmas flows are different from Thanksgiving flows and different from MLK Day flows. V&A does not establish ADWF curves for holidays unless required for I/I analysis, which was not the case for this project. A "typical" holiday (Monday holidays like MLK Day, Presidents' Day, Memorial Day and Labor Day) can be roughly estimated as a weighted average of 80% Sunday flow and 20% Mon-Thu Flow.

2.6 Flow Attenuation

Flow attenuation in a sewer collection system is the natural process of the reduction of the peak flow rate through redistribution of the same volume of flow over a longer period of time. This occurs as a result of friction (resistance), internal storage and diffusion along the sewer pipes. Fluids are constantly working towards equilibrium. For example, a volume of fluid poured into a static vessel with no outside turbulence will eventually stabilize to a static state, with a smooth fluid surface without peaks and valleys. Attenuation within a sanitary sewer collection system is based upon this concept. A flow profile with a strong peak will tend to stabilize towards equilibrium, as shown in Figure 2-3.

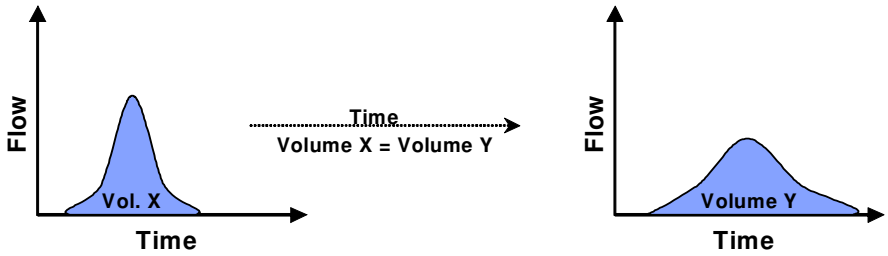


Figure 2-3. Attenuation Illustration

Within a sanitary sewer collection system, each individual basin will have a specific flow profile. As the flows from the basins combine within the trunk sewer lines, the peaks from each basin will (a) not necessarily coincide at the same time, and (b) due to the length and time of travel through the trunk sewers, peak flows will attenuate prior to reaching the treatment facility. The sum of the peak flows of the individual basins within a collection system will usually be greater than the peak flows observed at the treatment facility.

2.7 Inflow / Infiltration Analysis: Definitions and Identification

Inflow and infiltration (I/I) consists of storm water and groundwater that enter the sewer system through pipe defects and improper storm drainage connections and is defined as follows:

2.7.1 Inflow / Infiltration Analysis: Definitions and Identification

- **Inflow**: Storm water inflow is defined as water discharged into the sewer system, including private sewer laterals, from direct connections such as downspouts, yard and area drains, holes in manhole covers, cross-connections from storm drains, or catch basins.
- **Infiltration**: Infiltration is defined as water entering the sanitary sewer system through defects in pipes, pipe joints, and manhole walls, which may include cracks, offset joints, root intrusion points, and broken pipes.

Figure 2-4 illustrates the possible sources and components of I/I.

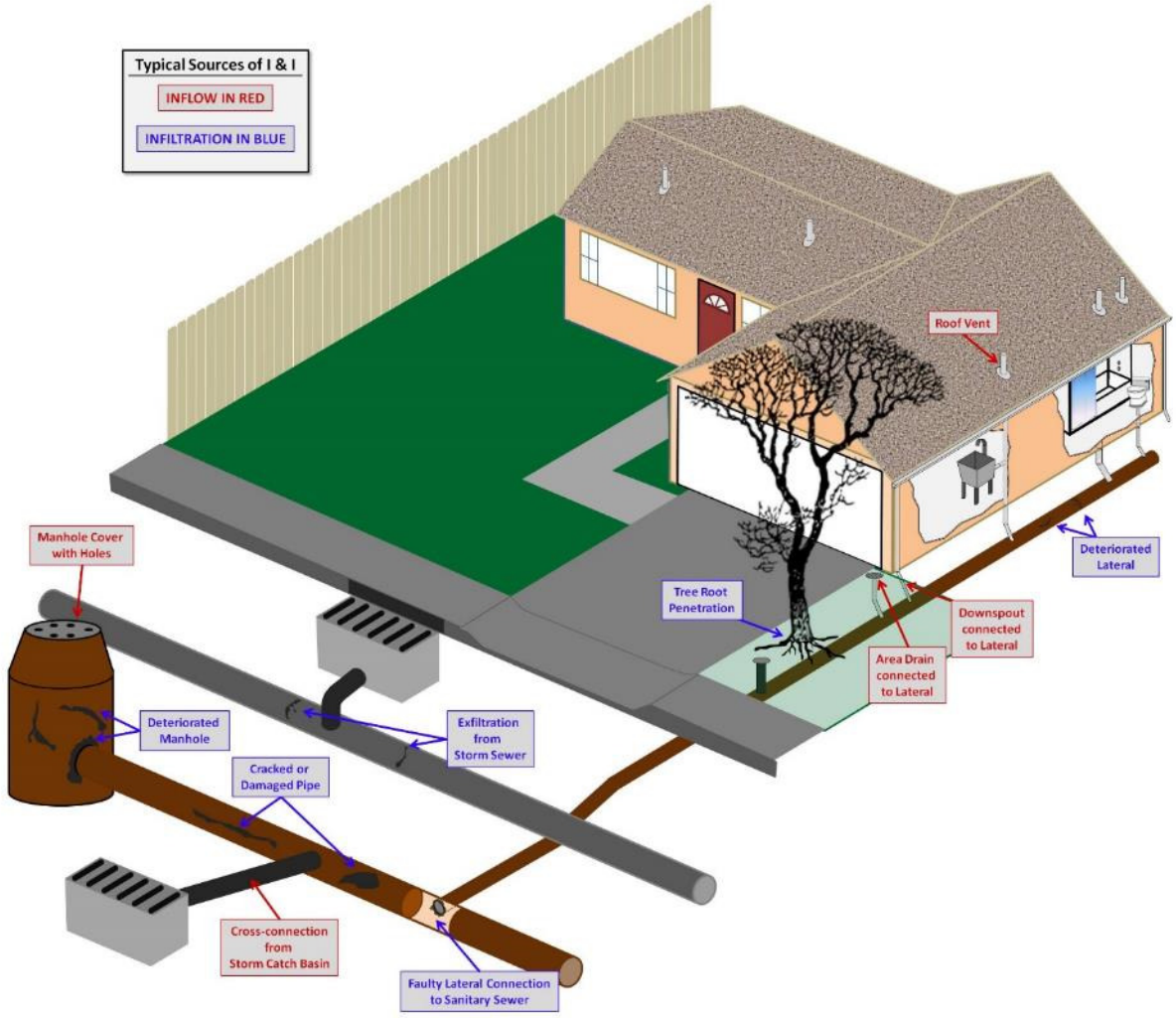


Figure 2-4. Typical Sources of Infiltration and Inflow

2.7.2 Infiltration Components

Infiltration can be further subdivided into components as follows:

- **Groundwater Infiltration**: Groundwater infiltration depends on the depth of the groundwater table above the pipelines as well as the percentage of the system submerged. The variation of groundwater levels and subsequent groundwater infiltration rates is seasonal by nature. On a day-to-day basis, groundwater infiltration rates are relatively steady and will not fluctuate greatly.
- **Rainfall-Dependent Infiltration**: This component occurs as a result of storm water and enters the sewer system through pipe defects, as with groundwater infiltration. The storm water first percolates directly into the soil and then migrates to an infiltration point. Typically, the time of concentration for rainfall-related infiltration may be 24 hours or longer, but this depends on the soil permeability and saturation levels.
- **Rainfall-Responsive Infiltration** is storm water which enters the collection system indirectly through pipe defects, but normally in sewers constructed close to the ground surface such as private laterals. Rainfall-responsive infiltration is independent of the groundwater table and reaches defective sewers via the pipe trench in which the sewer is constructed, particularly if the pipe is placed in impermeable soil and bedded and backfilled with a granular material. In this case, the pipe trench serves as a conduit similar to a French drain, conveying storm drainage to defective joints and other openings in the system. This type of infiltration can have a quick response and graphically can look very similar to inflow.

2.7.3 Impact and Cost of Source Detection and Removal

- **Inflow**:
  - Impact: This component of I/I creates a peak flow problem in the sewer system and often dictates the required capacity of downstream pipes and transport facilities to carry these peak instantaneous flows. Because the response and magnitude of inflow is tied closely to the intensity of the storm event, the short-term peak instantaneous flows may result in surcharging and overflows within a collection system. Severe inflow may result in sewage dilution, resulting in upsetting the biological treatment (secondary treatment) at the treatment facility.
  - Cost of Source Identification and Removal: Inflow locations are usually less difficult to find and less expensive to correct. These sources include direct and indirect cross-connections with storm drainage systems, roof downspouts, and various types of surface drains. Generally, the costs to identify and remove sources of inflow are low compared to potential benefits to public health and safety or the costs of building new facilities to convey and treat the resulting peak flows.
- **Infiltration:**
  - Impact: Infiltration typically creates long-term annual volumetric problems. The major impact is the cost of pumping and treating the additional volume of water, and of paying for treatment (for municipalities that are billed strictly on flow volume).
  - Cost of Source Detection and Removal: Infiltration sources are usually harder to find and more expensive to correct than inflow sources. Infiltration sources include defects in deteriorated sewer pipes or manholes that may be widespread throughout a sanitary sewer system.

2.7.4 Graphical Identification of I/I

Inflow is usually recognized graphically by large-magnitude, short-duration spikes immediately following a rain event. Infiltration is often recognized graphically by a gradual increase in flow after a wet-weather event. The increased flow typically sustains for a period after rainfall has stopped and then gradually drops off as soils become less saturated and as groundwater levels recede to normal levels. Realtime flows were plotted against ADWF to analyze the I/I response to rainfall events. Figure 2-5 illustrates a sample of how this analysis is conducted and some of the measurements that are used to distinguish infiltration and inflow. Similar graphs were generated for the individual flow monitoring sites and can be found in Appendix A.

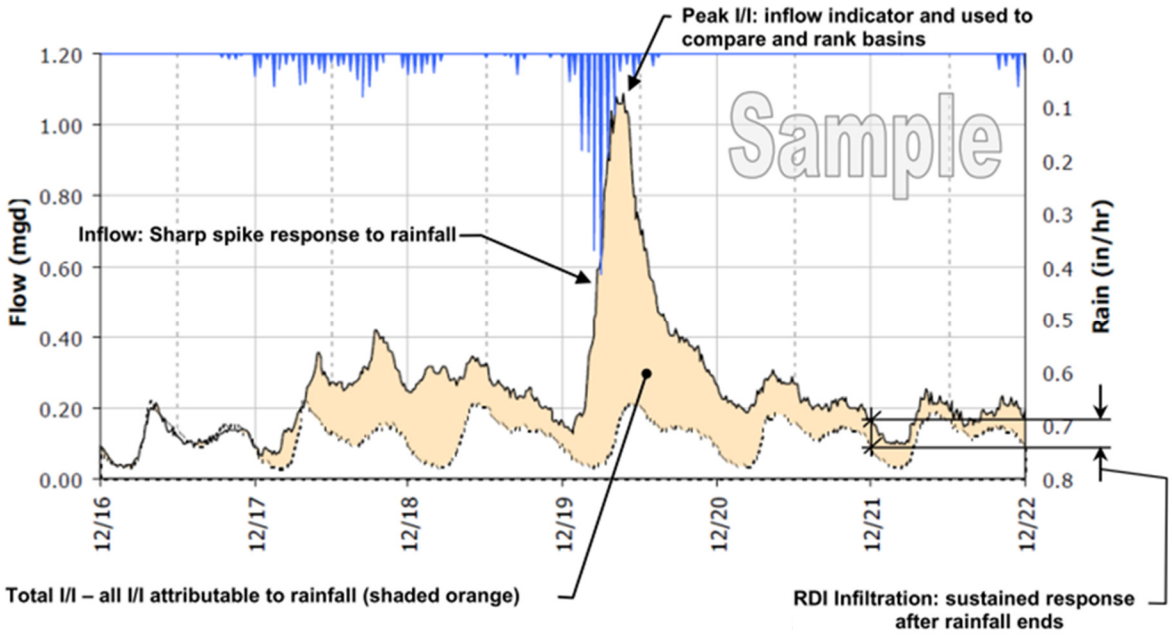


Figure 2-5. Sample Infiltration and Inflow Isolation Graph

2.7.5 Analysis Metrics

After differentiating I/I flows from ADWF flows, various calculations can be made to determine which I/I component (inflow or infiltration) is more prevalent at a particular site and to compare the relative magnitudes of the I/I components between drainage basins and between storm events:

- **Inflow – Peak I/I Flow Rate:** Inflow is characterized by sharp, direct spikes occurring during a rainfall event. Peak I/I rates are used for inflow analysis. [3]
- **Groundwater Infiltration (GWI):** GWI analysis is conducted by looking at minimum dry weather flow to average dry weather flow ratios and comparing them to established standards to quantify the rate of excess groundwater infiltration.
- **Rainfall-Dependent Infiltration (RDI):** RDI Analysis is conducted by looking at the infiltration rates at set periods after the conclusion of a storm event. Depending on the particular

[3] I/I flow rate is the real time flow less the estimated average dry weather flow rate. It is an estimate of flows attributable to rainfall. By using peak measured flow rates (inclusive of ADWF), the I/I flow rate would be skewed higher or lower depending on whether the storm event I/I response occurs during low-flow or high-flow hours.

collection system and the time required for flows to return to ADWF levels, different periods may be examined to determine the basins with the greatest or most sustained rainfall-dependent infiltration rates.

- **Combined I/I:** The combined inflow and infiltration is measured in gallons per site and per storm event. Because it is based on combined I/I volume, it is used to identify the overall volumetric influence of I/I within the monitoring basin.

2.7.6 Normalization Methods

There are three ways to *normalize* the I/I analysis metrics for an "apples-to-apples" comparison amongst the different drainage basins:

- **per-ADWF:** The metric is divided by the established average dry weather flow rate and typically expressed as a ratio. *Peaking Factors* are examples of using ADWF to normalize data from different sites.
- **per-IDM:** The metric is divided by length of pipe (IDM [inch-diameter mile]) contained within the upstream basin. Final units typically are gallons per day (gpd) per IDM.
- **per-ACRE:** The metric is divided by the acreage of the upstream basin. Final units typically are gallons per day (gpd) per ACRE.

The infiltration and inflow indicators were normalized by the per-ADWF and per-ACRE methods in this report and these results will be shown in the following I/I analysis results sections. IDM information was not available for this project. For the purposes of basin rankings, the following weighting decisions are given:

- **per-ADWF:** The majority of the flow monitoring sites had consistent ADWF curves and the sites were well distributed throughout the system. Per-ADWF metrics will be assigned 51% weighting towards final rankings.
- **per-ACRE:** The metering basin boundaries are clearly defined and basin acreages are known. Due to varying topography, the per-ACRE analysis values will be assigned 49% weighting towards final rankings.

3 Results and Analysis

3.1 Rainfall Monitoring

3.1.1 Rain Gauge Locations

V&A analyzed rainfall data from two National Oceanic and Atmospheric Administration (NOAA) Citizen Weather Observer Program (CWOP) rain gauges[4], allowing for solid coverage over the collection system. The locations and labeling convention used for the three rain gauges can be seen in Figure 1-1.

3.1.2 Flow Study Rainfall Data

There were numerous main rainfall events that elicited solid I/I responses over the flow monitoring period, illustrated in Figure 3-1. The three largest rainfall events were evaluated for I/I analysis.

Table 3-1 shows the duration and precipitation of each rainfall event for each rain gauge. Figure 3-2 shows the rain accumulation plot of the period rainfall, as well as the historical average rainfall[5] in the City during this project duration. The cumulative precipitation for the rain gauges was approximately 15% greater than the historical precipitation for the duration of the flow monitoring.

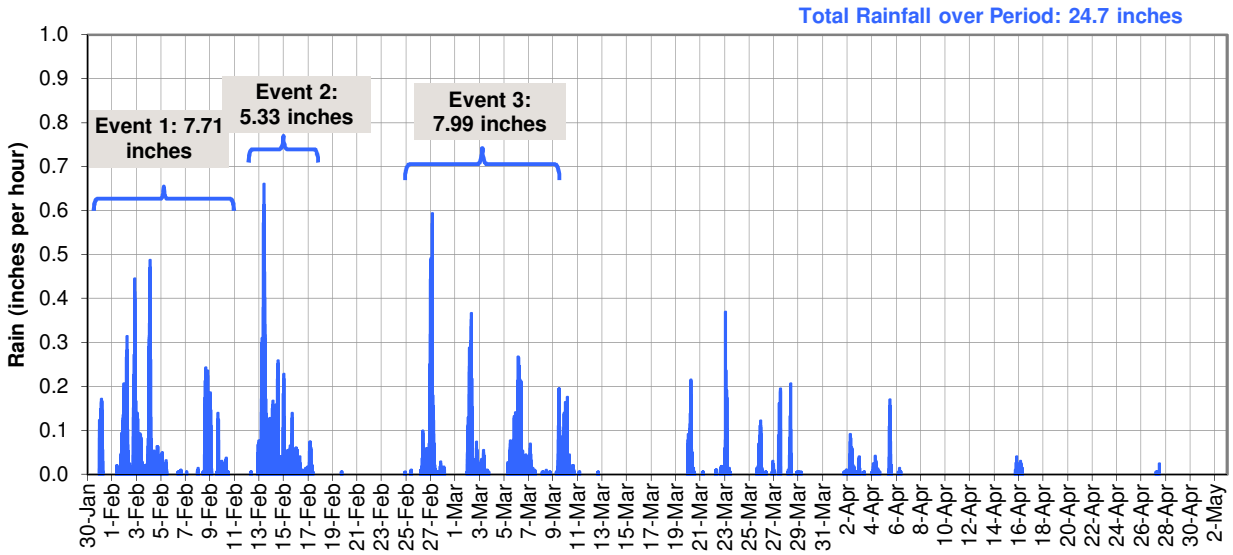


Figure 3-1. Rainfall Monitoring – Average of Rain Gauges

[4] The NOAA CWOP members send data from their private weather stations to the NOAA MADIS server; the data undergoes QAQC and then is distributed. While V&A has no direct control over these gauges, V&A performed additional QAQC on the data before using it for analysis.

[5] Historical data taken from the WRCC (Station 40673 in Ben Lomond): http://www.wrcc.dri.edu/summary/climsmnca.html

Table 3-1. Summary of Rainfall Data

Rain Gauge	Rain Event 1 Jan 30 – Feb 10, 2019 (in)	Rain Event 2 February 12 – 17, 2019 (in)	Rain Event 3 Feb 26 – March 10, 2019 (in)	Season Total (in)
North	7.67	5.30	8.40	*25.06*
South	7.75	5.35	7.58	*24.33*
Average:	***7.71***	***5.33***	***7.99***	***24.70***

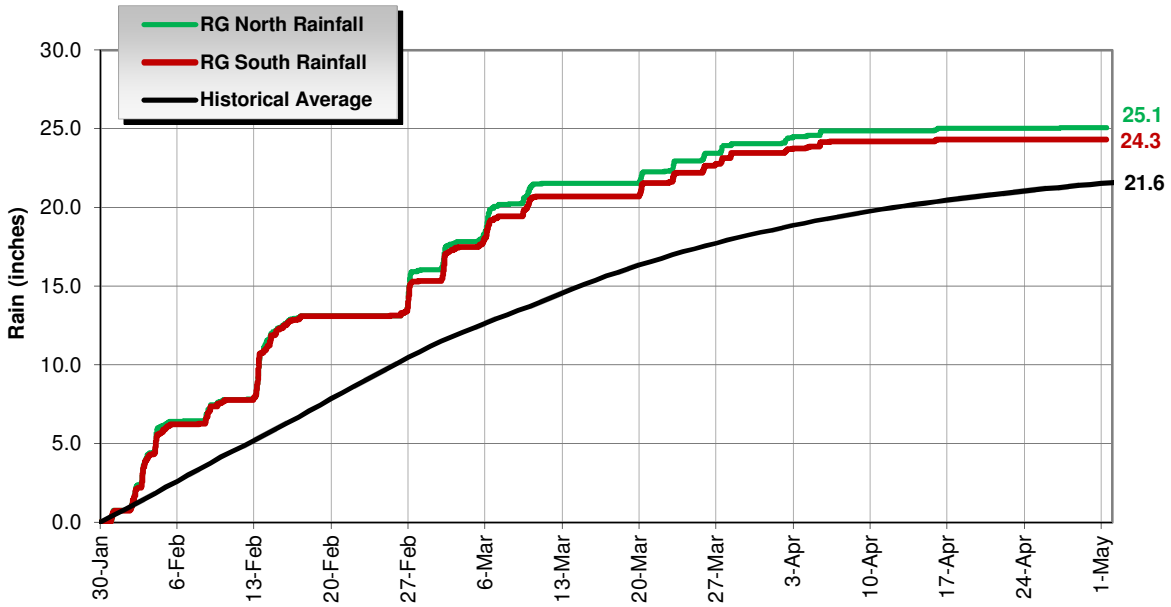


Figure 3-2. Rainfall Accumulation Plot

3.1.3 Regional Rainfall Event Classification

It is important to classify the relative size of a major storm event that occurs over the course of a flow monitoring period[6]. Rainfall events are classified by intensity and duration. Based on historical data, frequency contour maps for storm events of given intensity and duration have been developed by the NOAA for all areas within the continental United States (Figure 3-3).

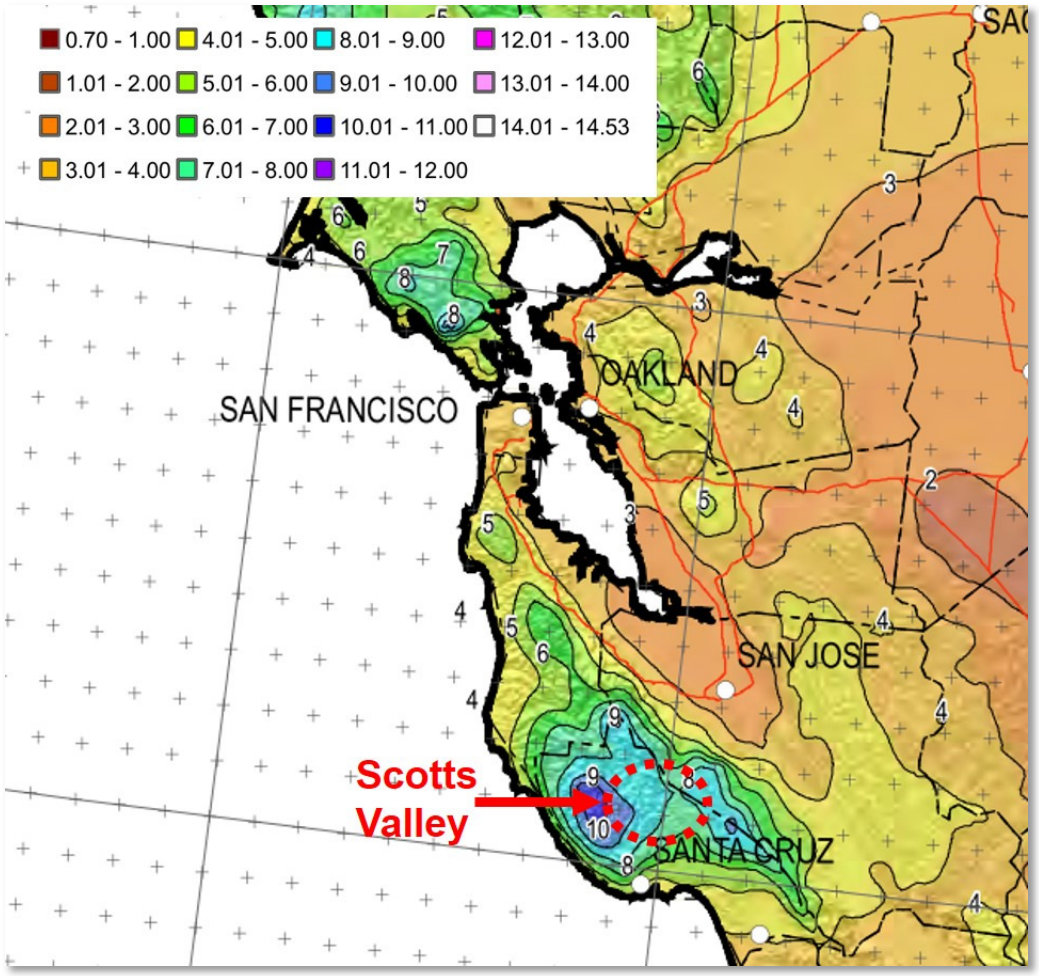


Figure 3-3. NOAA Northern California Rainfall Frequency Map

For example, the NOAA Rainfall Frequency Atlas[7] classifies a 10-year, 24-hour storm event at the North rain gauge location as **7.75** inches. This means that in any given year, at this specific location, there is a 10% chance that 7.75 inches of rain will fall in any 24-hour period.

From the NOAA frequency maps, for a specific latitude and longitude, the rainfall densities for period durations ranging from 1 hour to 20 days are known for rain events ranging from 1-year to 10-year intensities. These are plotted to develop a rain event frequency map specific to each rainfall monitoring site. Superimposing the peak measured densities for the rainfall events on the rain event frequency plot determines the classification of the rainfall event. Table 3-2 shows the peak classifications for

[6] Sanitary sewers are often designed to withstand I/I contribution to sanitary flows for specific-sized "design" storm events.

[7] NOAA Western U.S. Precipitation Frequency Maps Atlas 14, Volume 6, 2011: ftp://hdsc.nws.noaa.gov/pub/hdsc/data/sw/ca10y24h.pdf

each rain event at each rain gauge location. Figure 3-4 through Figure 3-7 illustrate the rain event classification plots per each rain gauge location. The following items are noted:

- Event 2 was the highest classified rainfall event during this study, as a 1-year, 8-hour storm event at the South rain gauge.
- Event 2 was classified as a less than 1-year, 4-day storm event despite sustained rainfall that lasted for several days.
- Event 1, which was used primarily for inflow analysis, was classified as a less than 1-year, 24-hour storm event.
- Since Event 1, 2, and 3 occurred close to each other, the whole monitoring period was classified as a 1.8-year, 60-day storm event at the South rain gauge.

Table 3-2. Rainfall Event Classification

Rain Event	Duration	RG North	RG South
Rain Event 1 January 30 – February 10, 2019	Peak (12 – 24 Hour)	<1-yr, 24-hr	<1-yr, 24-hr
	4 - Day	<1-yr, 4-day	<1-yr, 4-day
Rain Event 2 February 12 – 17, 2019	Peak (12 – 24 Hour)	<1-yr, 24-hr	1-yr, 8-hr
	4 - Day	<1-yr, 4-day	<1-yr, 4-day
Rain Event 3 February 26 – March 10, 2019	Peak (12 – 24 Hour)	<1-yr, 24-hr	<1-yr, 24-hr
	4 - Day	<1-yr, 4-day	<1-yr, 4-day
Flow Monitoring Period January 30, 2019 – May 2, 2019	60-Day	1.5-yr, 60-day	1.8-yr, 60-day

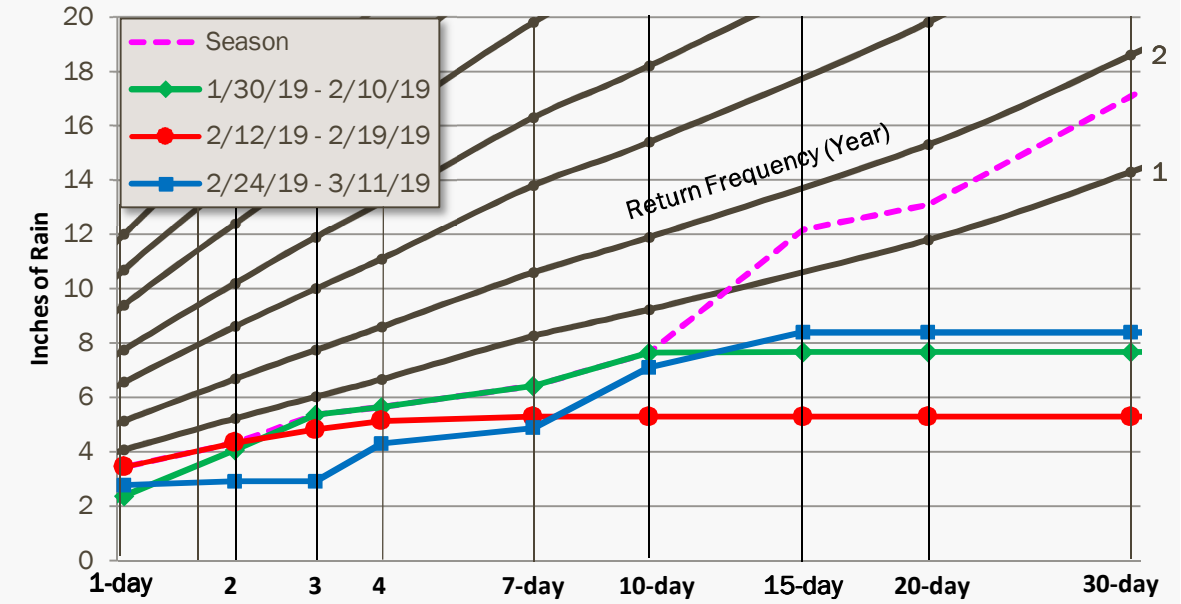


Figure 3-4. Rainfall Event Classification – 30-Day Period (North RG)

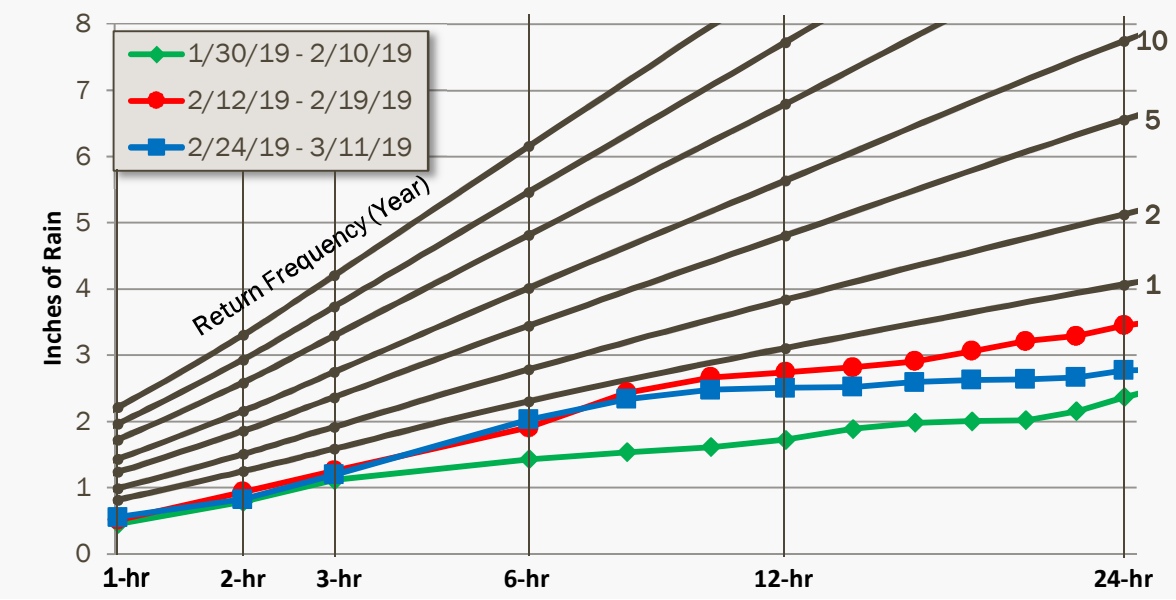


Figure 3-5. Rainfall Event Classification – 1-Day Period (North RG)

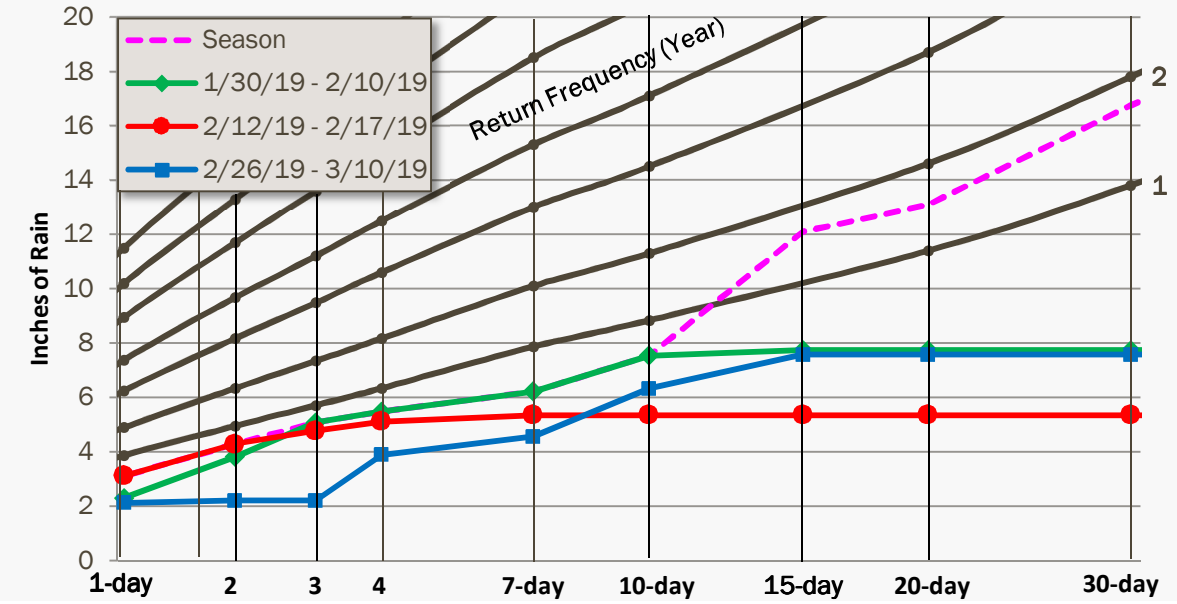


Figure 3-6. Rainfall Event Classification – 30-Day Period (South RG)

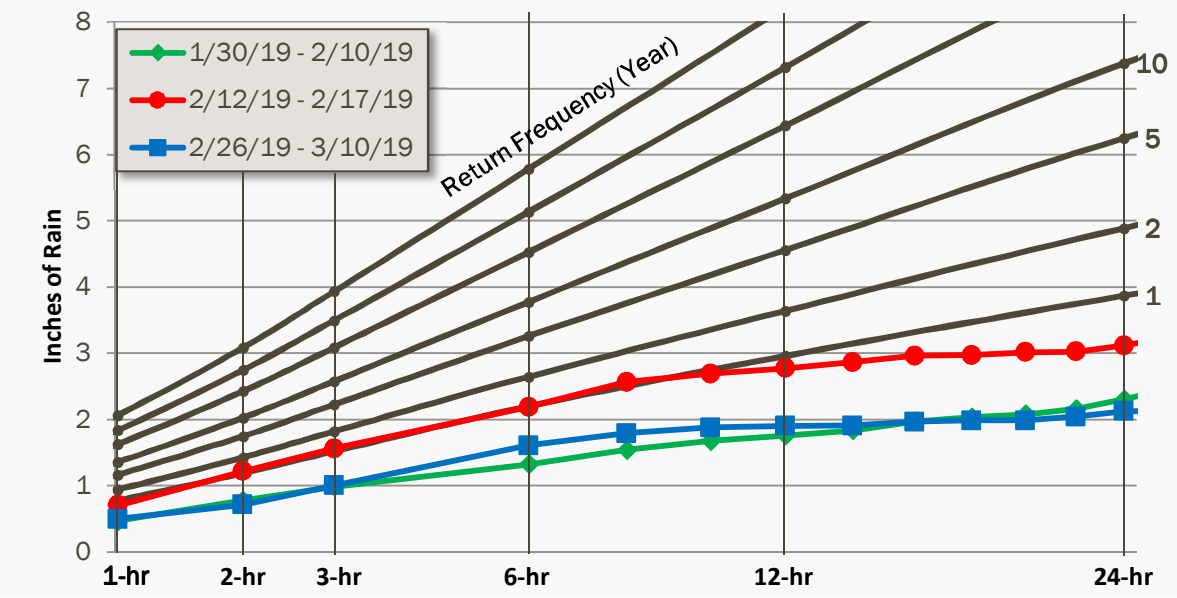


Figure 3-7. Rainfall Event Classification – 1-Day Period (South RG)

3.1.4 Rain Gauge Triangulation Distribution

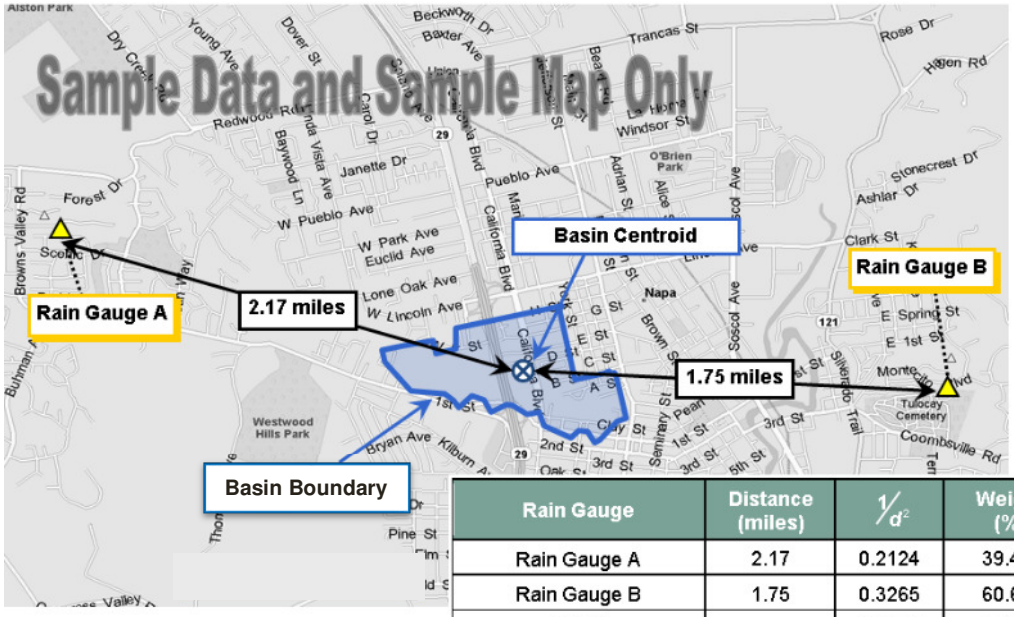
The rainfall affecting the sanitary sewer collection system basins must be calculated based on the proximity to the rain gauge locations. The mean precipitation for each sites' upstream basin was calculated by taking data from the rain gauges and using the inverse distance weighting (IDW) method. IDW is an interpolation method that assumes the influence of each rain gauge location diminishes with distance. The center of an upstream basin[8] is identified, and a weighted triangulated average is taken of the precipitation data from nearby rain gauge locations.

The IDW function is as follows:

$$weight(d) = \frac{1/d^{p}}{\sum 1/d^{p}}, \quad \text{where:} \quad d = \text{distance} \quad p = \text{power } (p > 0)$$

The value of p is user defined. The most common choice for hydrological studies of watershed areas is $p = 2$.

Figure 3-8 illustrates the IDW method with sample data. The rain gauge distribution as calculated for each flow monitoring basin is shown in Table 3-3.



Rain Gauge	Distance (miles)	$1/d^2$	Weight (%)
Rain Gauge A	2.17	0.2124	39.4%
Rain Gauge B	1.75	0.3265	60.6%
Totals		**0.5389**	**100%**

Figure 3-8. Rainfall Inverse Distance Weighting Method

[8] Note that the full basin upstream of the site was used instead of the isolated basins as the rain data will be compared to the flow at each site

Table 3-3. Rain Gauge Distribution per Monitoring Site

Monitoring Site	RG North	RG South
Site 1	6.5%	93.5%
Site 2	0.5%	99.5%
Site 3	58.6%	41.4%
Site 4	50.0%	50.0%
Site 5	77.3%	22.7%
Site 6	93.4%	6.6%
Site 7	97.0%	3.0%
Site 8	86.6%	13.4%

3.2 Flow Monitoring

3.2.1 Average Flow Analysis

Average dry weather flow (ADWF) curves were established during dry days when I/I had the least impact on the baseline flow. Table 3-4 summarizes the dry weather flow data measured for this study. ADWF curves for each site can be found in *Appendix A*. Figure 3-9 shows a flow schematic of the average daily flows and levels.

Table 3-4. Dry Weather Flow

Monitoring Site	Mon-Thu ADWF (MGD)	Friday ADWF (MGD)	Saturday ADWF (MGD)	Sunday ADWF (MGD)	Overall ADWF (MGD)
Site 1	0.017	0.017	0.018	0.018	0.017
Site 2	0.075	0.076	0.078	0.078	0.076
Site 3	0.662	0.676	0.661	0.686	0.667
Site 4	0.050	0.048	0.061	0.063	0.053
Site 5	0.420	0.422	0.393	0.397	0.413
Site 6	0.103	0.102	0.105	0.111	0.104
Site 7	0.053	0.055	0.054	0.056	0.054
Site 8	0.109	0.110	0.113	0.120	0.111
System	0.754	0.769	0.757	0.782	0.761

The following ADWF analysis results are noted (refer to Figure 3-9 on the following page):

- All sites were less than 50% full (less than 0.5 d/D) during ADWF conditions.
- None of the flow monitoring sites had sediment during the site visits.

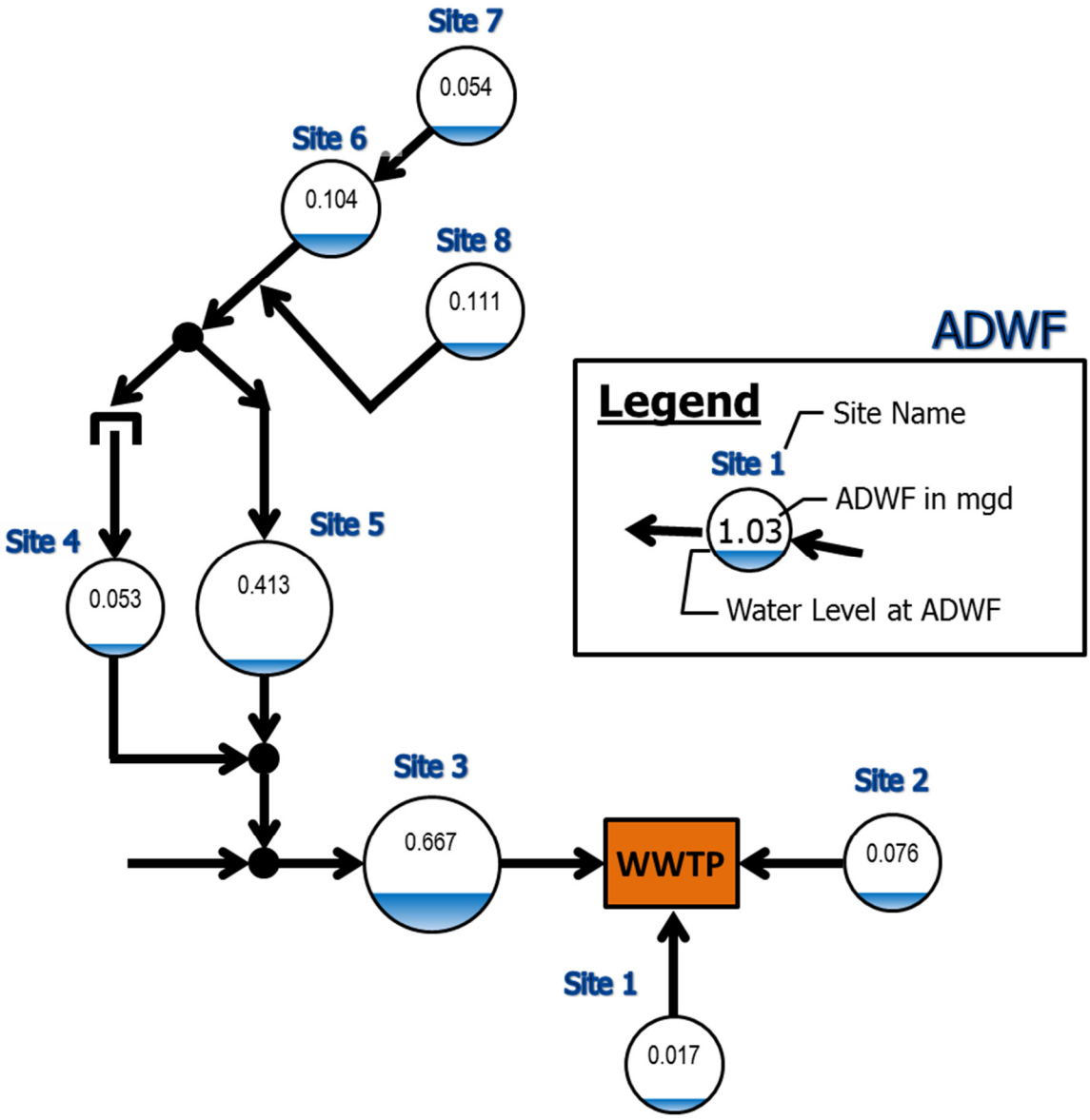


Figure 3-9. Average Dry Weather Flow Schematic

3.2.2 Peak Measured Flows and Pipeline Capacity Analysis

Peak measured flows and the hydraulic grade line data (flow depths) are important to understand the capacity limitations of a collection system. The peak flows and flow levels reported are from the peak measurements as taken across the entirety of the flow monitoring period. Peak flows and levels may not correspond to a rainfall event or occur at the same time.

The following capacity analysis terms are defined as follows:

- **Peaking Factor**: Peaking factor is defined as the peak measured flow divided by the average dry weather flow (ADWF). Peaking factors are influenced by many factors including size and topography of tributary area, flow attenuation, flow restrictions, characteristics of I/I entering the collection system, and hydraulic features such as pump stations.

  For this report, peaking factors are reported and PF > 5 are highlighted in RED[9]; however, the City should refer to City standards when evaluating peaking factors. Peaking factor data should be used at the discretion of the City Engineer.

- **d/D Ratio**: The d/D ratio is the peak measured depth of flow (d) divided by the pipe diameter (D). The d/D ratio for each site was computed based on the maximum depth of flow for the study. Standards for d/D ratio vary from agency to agency, but typically range between d/D ≤ 0.5 and d/D ≤ 0.75.

  For this report, d/D ratios > 1.0 are highlighted in RED; however, the City should refer to City standards when evaluating d/D ratios, to be used at the discretion of the City Engineer.

Table 3-5 summarizes the peak recorded flows, levels, *d/D* ratios, and peaking factors per site during the flow monitoring period. Results of note have been shaded in RED. Capacity analysis data are presented on a site-by-site basis and represents the hydraulic conditions only at the site locations; hydraulic conditions in other areas of the collection system will differ.

Table 3-5. Capacity Analysis Summary

Monitoring Site	ADWF (MGD)	Peak Measured Flow (MGD)	Peaking Factor	Pipe Diameter, *D* (IN)	Peak Measured Depth (IN)	*Max d/D* Ratio	Surcharge above pipe crown(FT)
Site 1	0.017	0.14	8.2	10	4.26	0.43	n/a
Site 2	0.076	0.41	5.4	10	4.01	0.40	n/a
Site 3	0.667	2.41	3.6	17*	18.65	1.10	0.14
Site 4	0.053	0.19	3.5	10	2.01	0.20	n/a
Site 5	0.413	1.62	3.9	18	4.05	0.23	n/a
Site 6	0.104	0.79	7.5	10	7.29	0.73	n/a
Site 7	0.054	0.45	8.4	10	6.59	0.66	n/a
Site 8	0.111	0.57	5.1	10	3.71	0.37	n/a
System	*0.761*	*2.96*	*3.9*	-	-	-	-

* Pipe measured 17" diameter above water line due to pipe corrosion and surface mortar expansion. Underneath the water line the pipe measured 18". The 18" diameter value (typically wetted) was used for the flow calculations. The 17" diameter value (worst case) was used for capacity analysis.

[9] WEF Manual of Practice FD-6 and ASCE Manual No. 62 suggests typical peaking factor ratios range between 3 and 4, with higher values possibly indicative of pronounced I/I flows.

The following capacity analysis results are noted:

- **Peaking Factors**
  - Sites 3, 4, and 5 had peaking factors below 5.
  - Sites 2 and 8 had peaking factors between 5 and 7.
  - Sites 1, 6 and 7 had peaking factors above 7.
- **d/D Ratio:**
  - Only Site 3 reached a surcharge condition. This condition was reached during a temporary backflow condition reached during the February 13, 2019 peak-intensity rain event, but did not occur during the other rainfall events.

Figure 3-10 and Figure 3-11 show bar graph summaries of the peaking factors and d/D ratios, respectively. Figure 3-12 shows the schematic diagram of the peak measured flows in each section with peak flow levels.

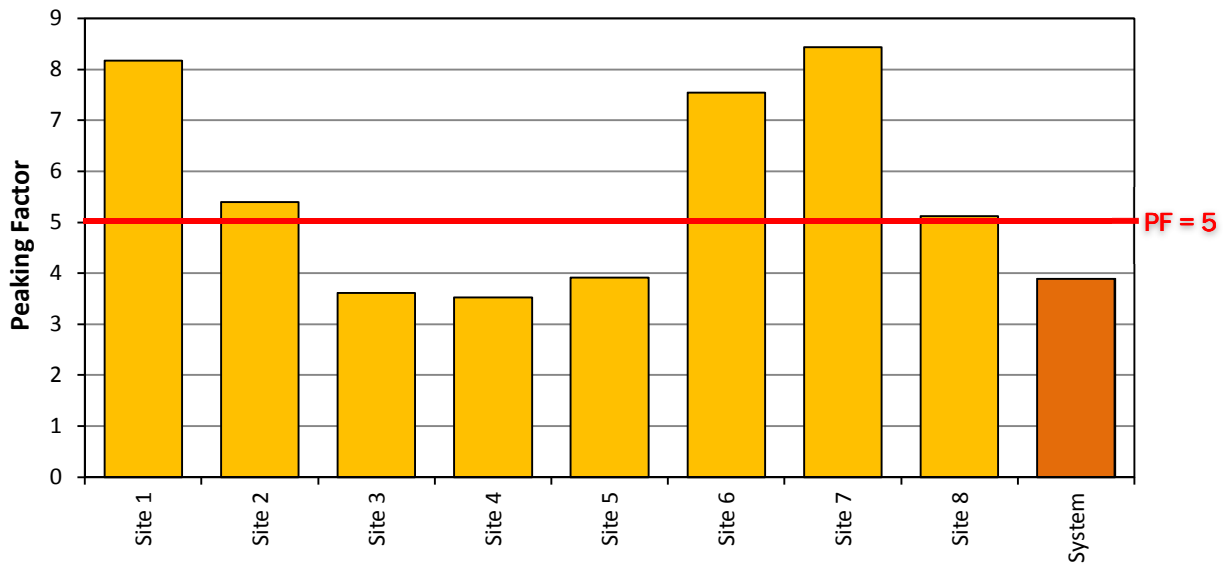


Figure 3-10. Peaking Factors

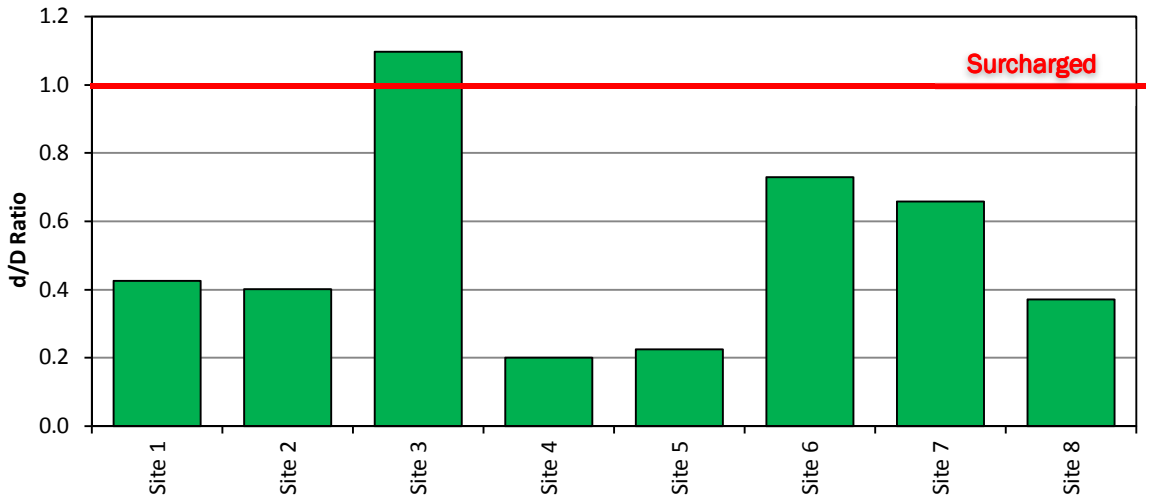


Figure 3-11. Capacity Summary: Max d/D Ratios

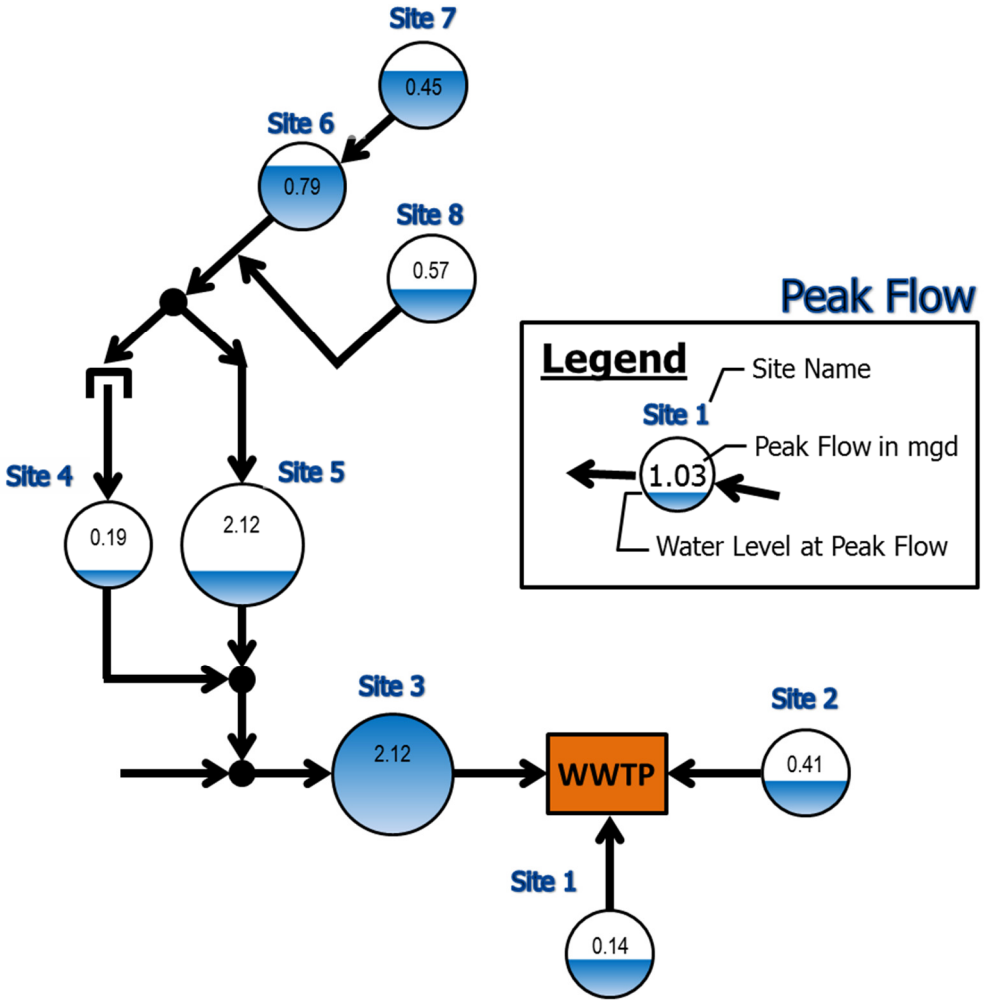


Figure 3-12. Peak Measured Flow Schematic

3.3 Inflow and Infiltration: Results

3.3.1 Preface

Every collection system is different; it can be helpful to review the overall flow monitoring data from an overall, system-wide perspective so as to determine the proper course of action for inflow and infiltration analyses.

Flow meters were installed after a series of rain events in January 2019 (measuring approximately 7.29 inches[10]), when soil saturation levels were generally high and rain dependent infiltration had not fully cleared the system. Referring to Figure 3-13, system-wide flows were approximately at 114% of ADWF levels when the flow meters were installed. Additionally, it is observed that the rain events of February and March kept flow levels and I/I rates high. Full recession to baseline flows did not occur until the very end of the flow monitoring period in early May.

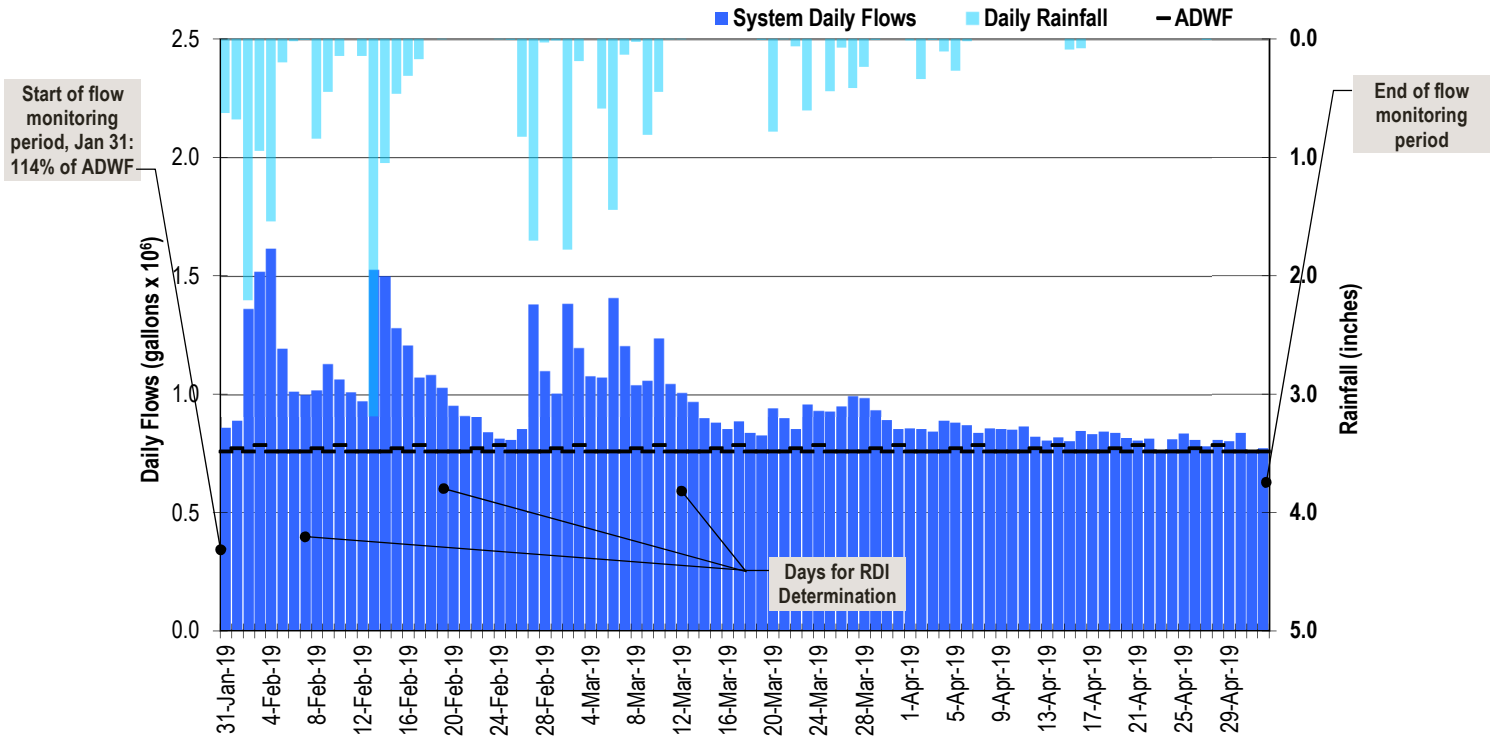


Figure 3-13. Collection System Daily Flows Bar Graph

Based on this overall system view, a plan for properly analyzing the different components of infiltration and inflow can be properly developed.

[10] Per www.accuweather.com

3.3.2 RDI/I Analysis Plan (RDI and Combined I/I)

I/I analyses are presented on a basin-by-basin basis. Items relevant to the analysis in this study are noted below and referenced in Figure 3-14 below in regards to RDI and Combined I/I. The Inflow Analysis plan is addressed in the following section:

- **I/I Isolation**: I/I isolation curves are developed for various storm events by which various metrics are analyzed and normalized for I/I analysis. The I/I flow rate is the real-time flow less the estimated average dry weather flow rate (shown below as the RED line).
- **RDI**: RDI is typically taken as the average I/I flow rate measured at a project-specific time, typically 24 hours, after the rainfall event has concluded. There were three opportune times over the flow monitoring period to take RDI measurements: February 7, 19 and March 12, 2019, were all days 24-hour clear of, but following strong rainfall events (refer to Figure 3-13 and Figure 3-14).
- **Combined I/I**: The totalized volume (in gallons) of both inflow and RDI over the course of a rainfall event (shown in Figure 3-14 as the orange area). To attribute full capture of totalized volume of RDI/I to a storm event, it is necessary for flows to return to baseline flow levels. For Scotts Valley, this only occurs at the end of the flow study. The most accurate determination of combined I/I for this study is to measure total I/I not per storm event, but across the entirety of the study.

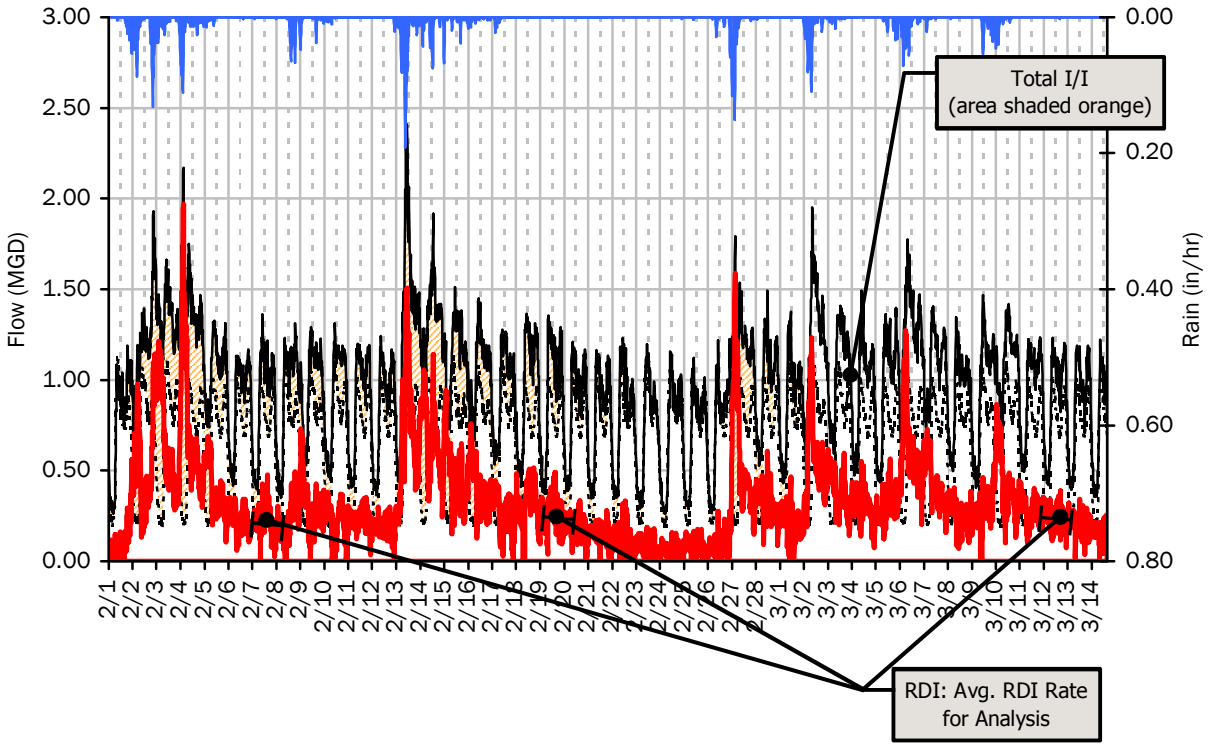


Figure 3-14. I/I Isolation (Feb 1 – Mar 15), Site 3

3.3.3 RDI/I Analysis Plan (Inflow)

Items relevant to the inflow analysis in this study are noted below:

- **Inflow**: Inflow is usually recognized graphically by large-magnitude, short-duration spikes immediately following a rain event. The peak inflow rate is the highest spike in the isolated I/I hydrograph immediately following the evaluated rainfall event.
- **Preferred Scenario**: To most appropriately isolate inflow from RDI, the most preferable scenario is for strong intensity rainfall to occur at the beginning of a storm event before the influence and interference of RDI. For example at Site 3, even though Event 1 caused the highest peak RDI/I rate, this peak rate was not suitable for inflow analysis due to a heavy RDI influence. In contrast, for Events 2 and 3, high intensity rainfall fell at the start of each event, and peak inflow could be evaluated with minimal RDI interference (Figure 3-15). Seasonal GWI rates entering the storm event are also adjusted to better isolate inflow from infiltration interference.

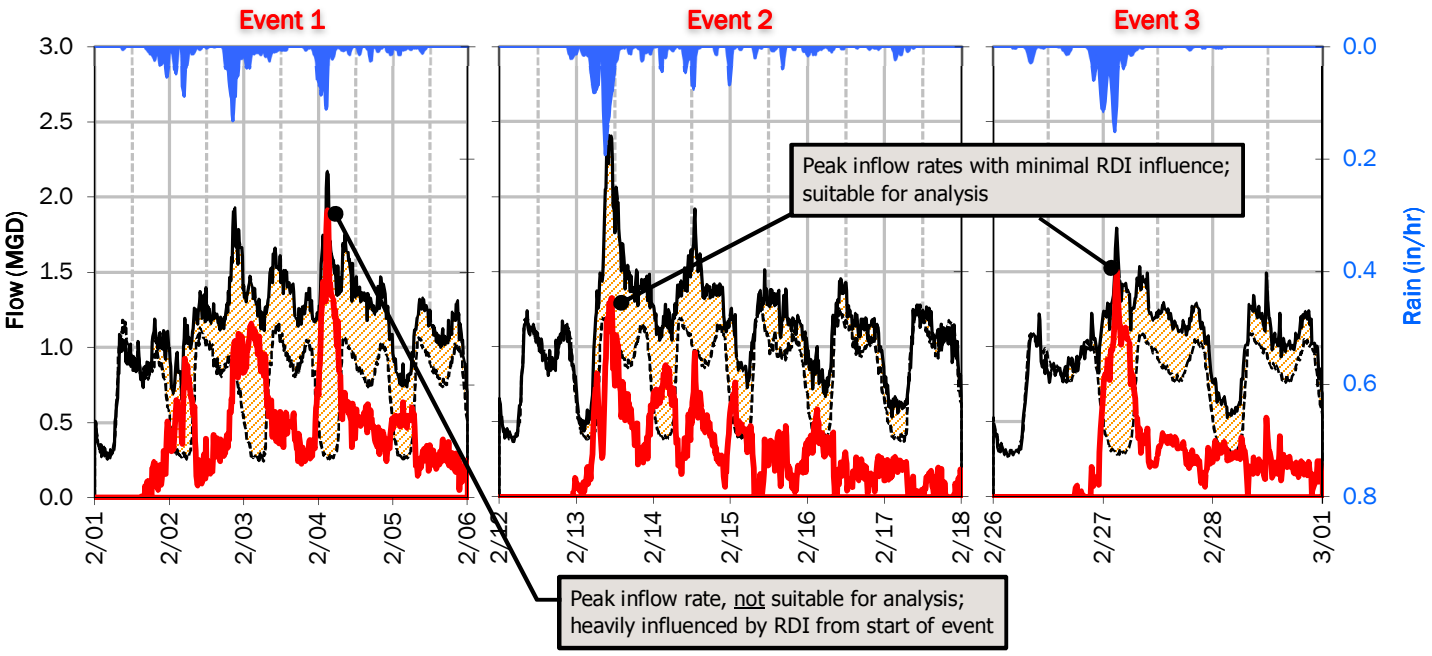


Figure 3-15. I/I Isolations for Inflow, Site 3

- **Pump Stations**: Sites 1, 2, 4, and 8 were influenced by upstream or downstream pump station operations. Measuring rates of inflow of flow monitoring sites that are in the immediate proximity of pump stations can present several problems. RDI and Total I/I analyses are valid as they consider I/I rates over time. Peak inflow being an instantaneous point measurement is more difficult to determine.

  If the upstream flows consist primarily of a single pump station, the peak rate of flow may not necessarily increase as flows are largely dictated by pumping capacity. However, the frequency of pumping cycles may increase, indicating I/I into the pump station

  Best practices are to examine the data on a more microscopic level and make appropriate engineering judgments. Figure 3-16 illustrates a more detailed look at inflow for Site 2 during Event 2.

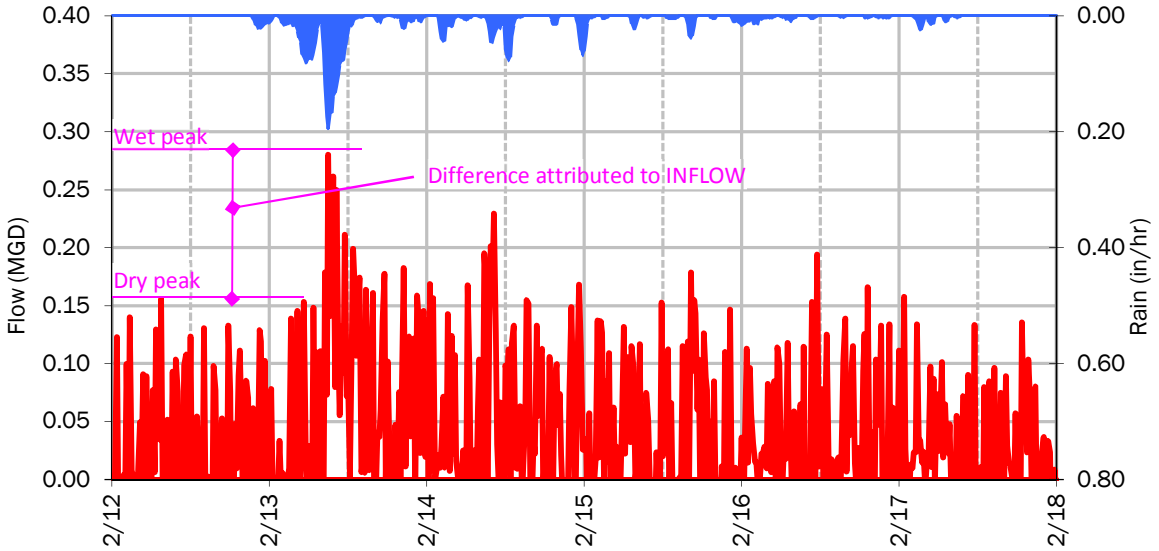


Figure 3-16. I/I Hydrograph, Site 2, Storm Event 2

Using the traditional method, the wet peak I/I response is not differentiated from typical peak flow "noise" that is present for flows measured in close proximity to a pump station. To account for this regularly occurring pump station noise, inflow is calculated as the difference between the peak I/I rates measured during the storm event less the difference of the typical dry-weather peaks caused by pump station operations.

These differing pump station metrics are examined on a site-by-site, storm-by-storm basis. Outliers could exist due to pumping operations and are eliminated. V&A carefully regarded specific inflow idiosyncrasies when performing the inflow analyses for these sites; however, the reviewing Engineer should utilize inflow results at his/her discretion.

3.3.4 Inflow Results Summary

Inflow is storm water discharged into the sewer system through direct connections such as downspouts, area drains, cross-connections to catch basins, etc. These sources transport rain water directly into the sewer system and the corresponding flow rates are tied closely to the intensity of the storm. This component of I/I often causes a peak flow problem in the sewer system and often dictates the required capacity of downstream pipes and transport facilities to carry these peak instantaneous flows.

Per the RDI/I analysis plan, inflow results were taken from Rainfall Events 2 and 3. Table 3-6 and Figure 3-17 summarize the peak measured inflow and inflow analysis results for the relevant flow monitoring basins. Figure 3-18 shows a temperature map summary of the inflow analysis results per basin. The "Top 3" basins for each category have been shaded in **RED**. The following inflow results are noted:

- Basins 3, 6, and 7 had the highest normalized peak I/I rates, an indicator of high inflow upstream from the flow monitoring basin.

Table 3-6. Results and Rankings of Inflow Analysis

Basin	ADWF (mgd)	AREA (acres)	Inflow Rate (mgd)			Inflow per ADWF (ratio) [Event Ranking]	Inflow per ACRE (gpd/acre) [Event Ranking]	Final Inflow Ranking
			Event 2	Event 3	Avg.			
Basin 1	0.017	77	0.011	0.006	0.009	0.50 [7]	113 [7]	7
Basin 2	0.076	267	0.124	0.040	0.082	1.08 [6]	307 [6]	6
Basin 3	0.201	533	0.620	1.507	1.063	5.30 [2]	1,995 [2]	2
Basin 4/5	0.251	416	0.000	1.034	0.517	2.06 [5]	1,243 [3]	5
Basin 6	0.050	174	0.257	0.446	0.351	6.99 [1]	2,020 [1]	1
Basin 7	0.054	342	0.254	0.233	0.243	4.52 [3]	711 [5]	3
Basin 8	0.111	325	0.290	0.297	0.294	2.64 [4]	903 [4]	4
System	*0.761*	*2,134*	*1.461*	*1.553*	*1.507*	*1.98*	*706*	

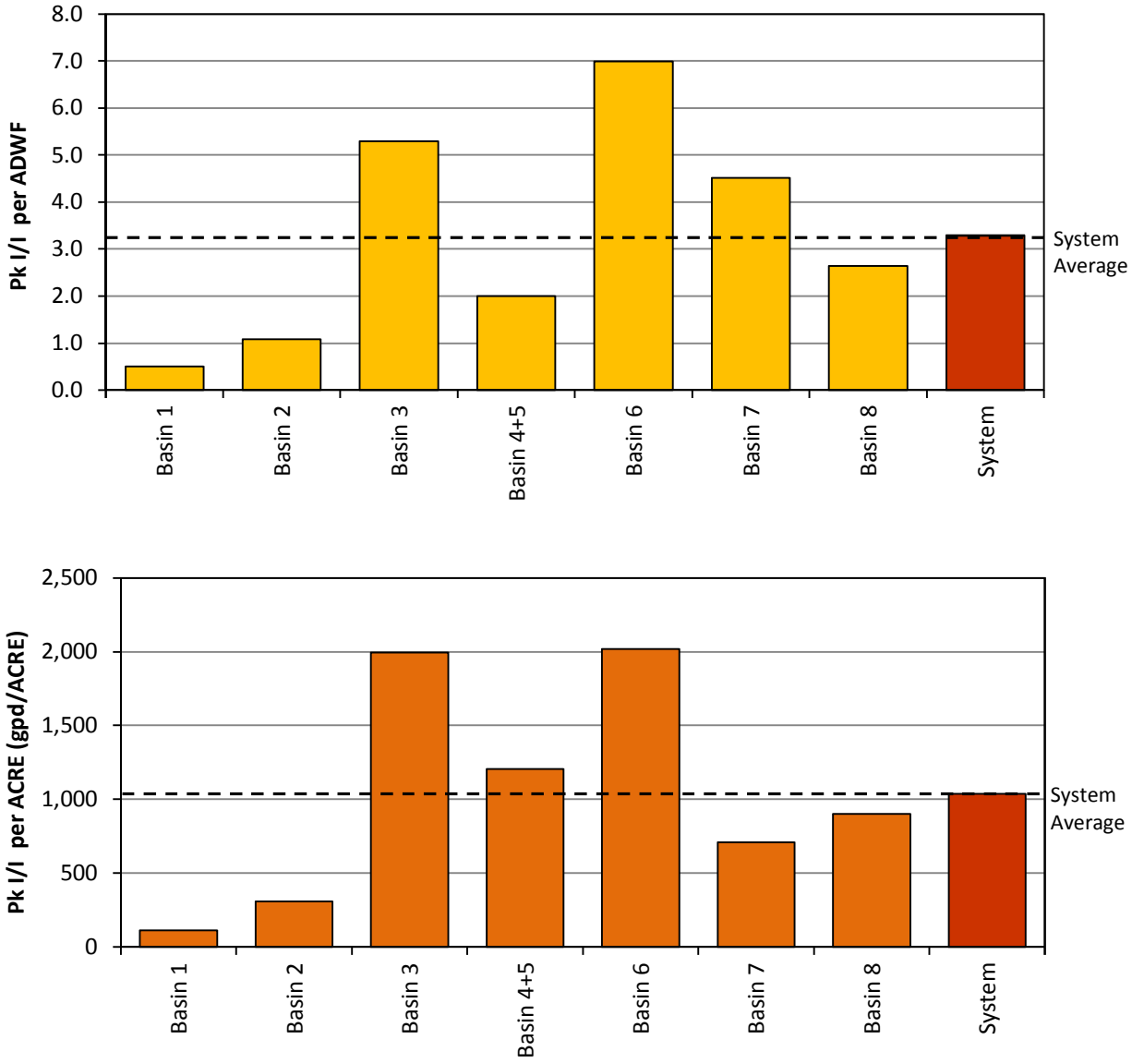


Figure 3-17. Bar Graphs: Inflow Analysis Summary

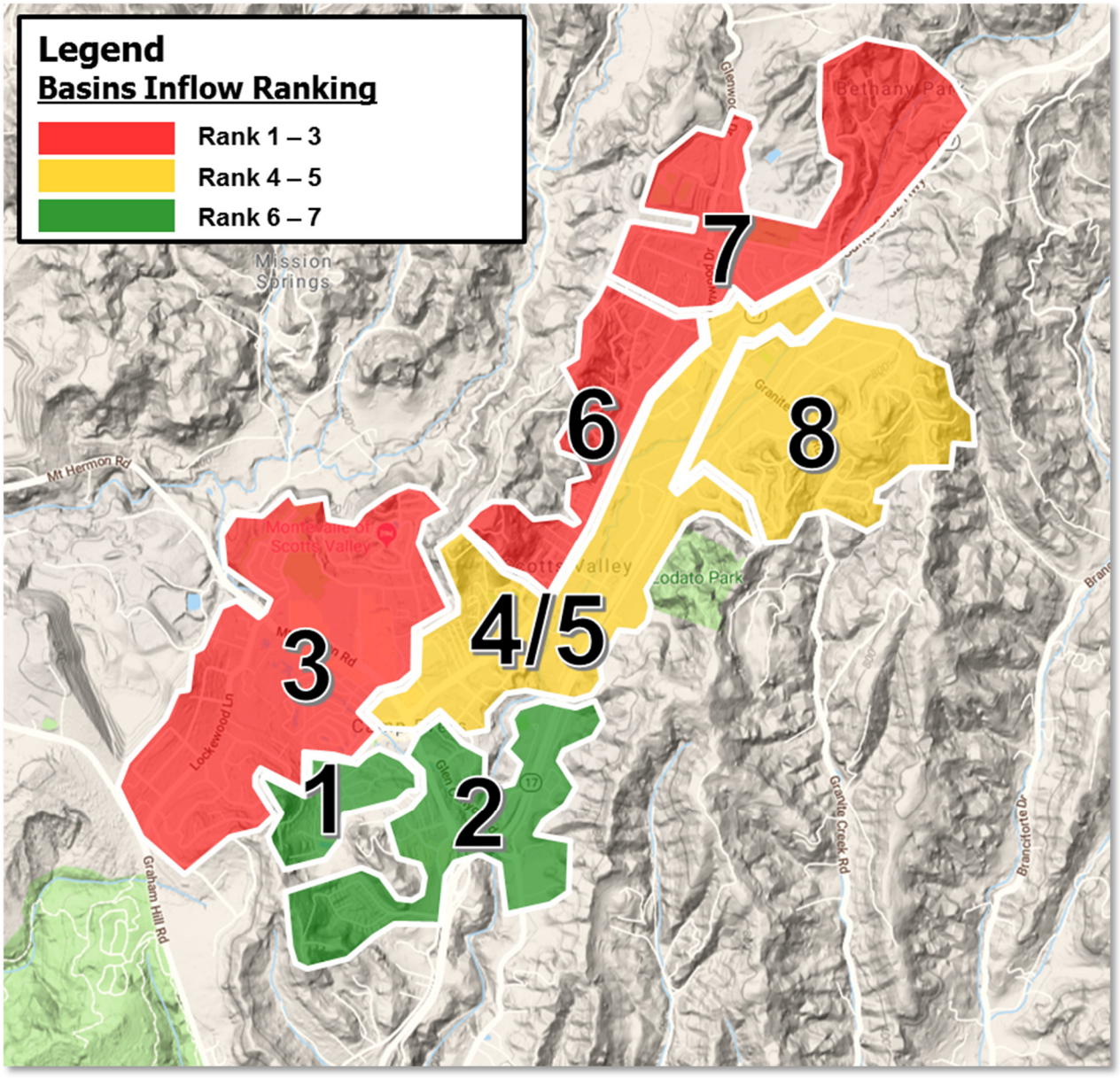


Figure 3-18. Temperature Map: Inflow Final Basin Rankings

3.3.5 Rainfall Dependent Infiltration Results Summary

Infiltration is defined as water entering the sanitary sewer system through defects in pipes, pipe joints, and manhole walls, which may include cracks, offset joints, root intrusion points, and broken pipes. Increased flows into the sanitary sewer system are usually tied to groundwater levels and soil saturation levels. Infiltration sources transport rain water into the system indirectly; flow levels in the sanitary system increase gradually, are typically sustained for a period after rainfall has stopped, and then gradually decrease as soils become less saturated and as groundwater levels recede to normal.

Infiltration typically creates long-term annual volumetric problems. The major impact is the cost of pumping and treating the additional volume of water, and of paying for treatment (for municipalities that are billed strictly on flow volume).

Per the RDI/I analysis plan, the RDI rate used for comparative analysis was measured as the average I/I rate from three different time periods immediately following strong rainfall events (February 7, 19 and March 12, 2019).

Table 3-7 and Figure 3-19 summarize the captured RDI flow rates. Figure 3-20 shows a temperature map. The "Top 3" basins for each category have been shaded in **RED**. The following RDI results are noted:

- Basins 6, 7, and 8 had the highest normalized RDI rates, an indicator of high RDI upstream from the flow monitoring basin.

Table 3-7. Results and Rankings of RDI Analysis

Basin	ADWF (mgd)	AREA (acres)	RDI Rate (mgd)				Inflow per ADWF (ratio) [Event Ranking]	Inflow per ACRE (gpd/acre) [Event Ranking]	Final RDI Ranking
			Event 1	Event 2	Event 3	Avg.			
Basin 1	0.017	77	0.000	0.002	0.001	0.001	0.07 [6]	16 [7]	6
Basin 2	0.076	267	0.030	0.015	0.019	0.022	0.28 [5]	81 [5]	5
Basin 3	0.201	533	0.000	0.027	0.000	0.009	0.05 [7]	17 [6]	7
Basin 4/5	0.251	416	0.078	0.069	0.099	0.082	0.33 [4]	197 [2]	4
Basin 6	0.050	174	0.060	0.025	0.000	0.028	0.56 [2]	163 [4]	2
Basin 7	0.054	342	0.078	0.088	0.071	0.079	1.47 [1]	231 [1]	1
Basin 8	0.111	325	0.066	0.050	0.061	0.059	0.53 [3]	181 [3]	3
System	*0.761*	*2,134*	*0.246*	*0.277*	*0.253*	*0.001*	*0.34*	*121*	

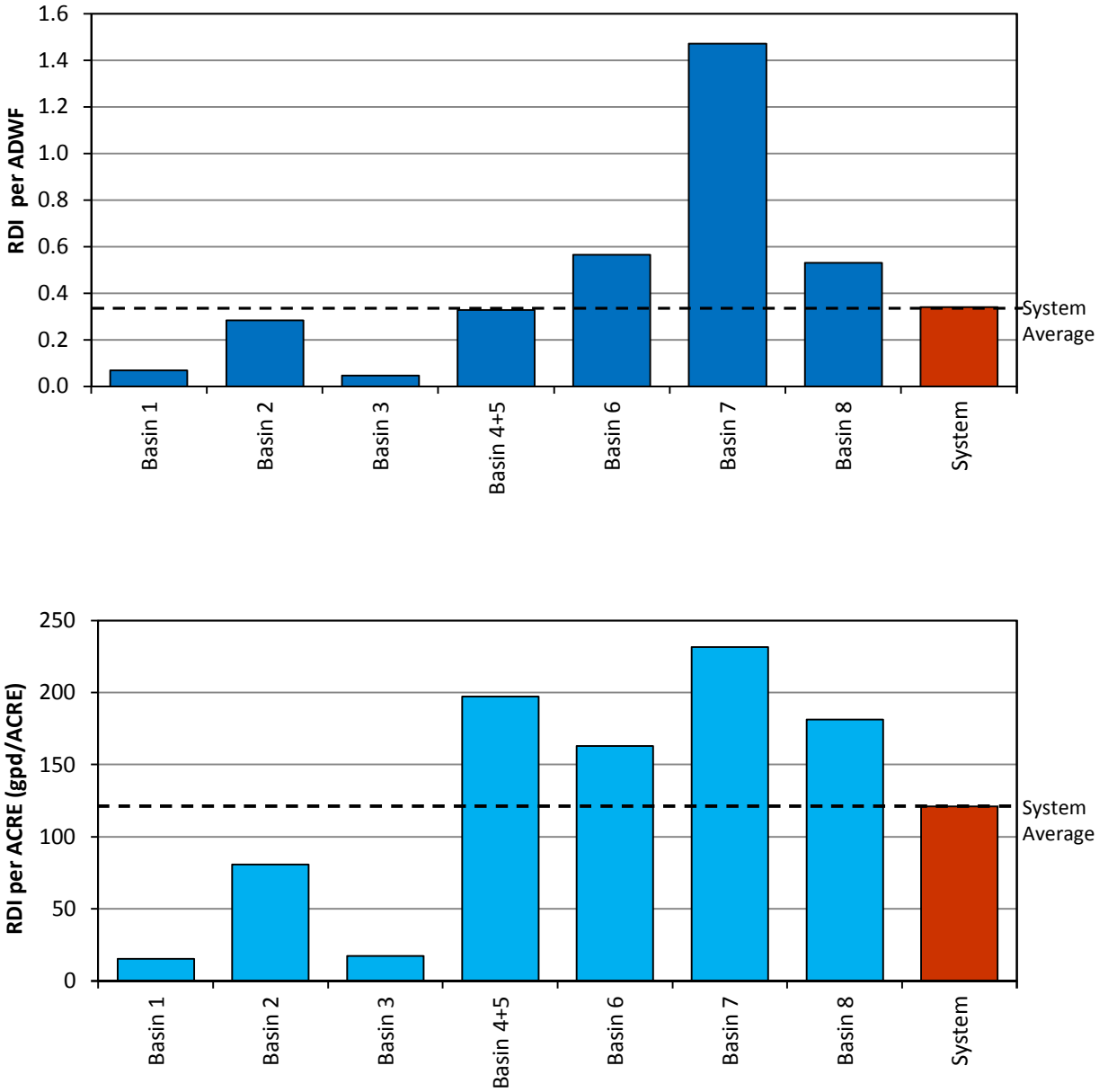


Figure 3-19. Bar Graphs: RDI Analysis Summary

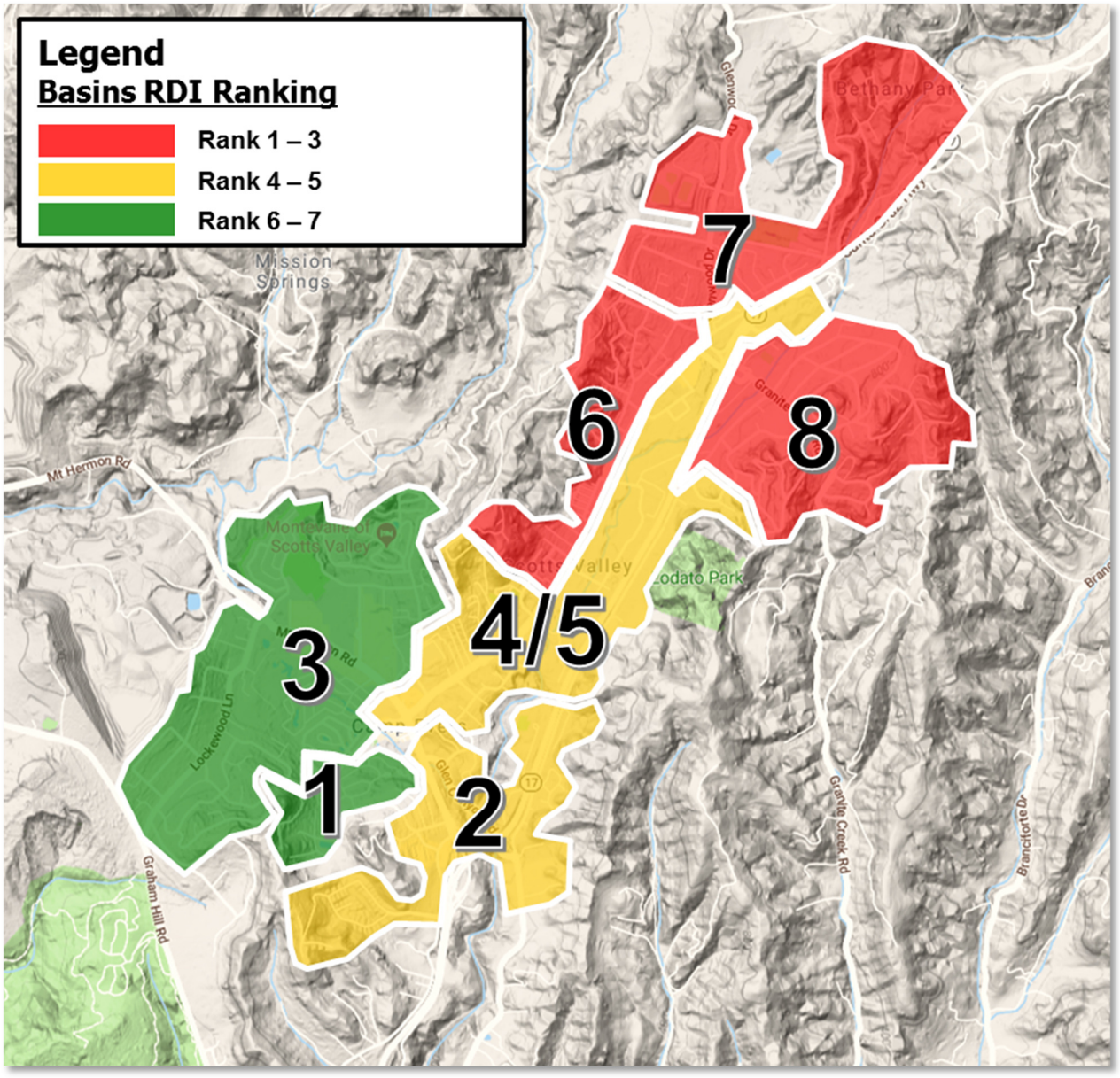


Figure 3-20. Temperature Map: RDI Final Basin Rankings

3.3.6 Combined I/I Results

Combined I/I analysis considers the totalized volume (in gallons) of both inflow and rainfall-dependent infiltration over the course of a storm event. Per the RDI/I analysis plan, given that flows did not recess to baseline flows until the very end of the flow study, combined I/I analysis for this study measured total I/I across the entirety of the study.

Table 3-8 summarizes the combined I/I flow results. The "Top 3" overall rankings for this analysis have been shaded in RED. Figure 3-21 shows the bar graph results of the per Basin total I/I analysis. A temperature map is shown in Figure 3-22.

The following total I/I results are noted:

- Basin 6, 7, and 8 had the highest normalized total I/I rates, an indicator of high inflow and rain-dependent infiltration upstream from the flow monitoring basin.

Table 3-8. Combined I/I Analysis Summary

Basin	ADWF (mgd)	AREA (acres)	Total I/I (gallons)	Total I/I per ADWF per inch -rain [Event Ranking]	R-Value (% of I/I in collection system, per ACRE) [Event Ranking]	Final Total I/I Ranking
Basin 1	0.017	77	190,000	0.45 [6]	0.37% [7]	6
Basin 2	0.076	267	1,889,000	1.02 [4]	1.07% [4]	4
Basin 3	0.201	533	1,707,000	0.35 [7]	0.48% [6]	7
Basin 4/5	0.251	416	2,809,000	0.45 [5]	1.01% [5]	5
Basin 6	0.050	174	1,596,000	1.27 [3]	1.35% [3]	3
Basin 7	0.054	342	5,567,000	4.13 [1]	2.39% [2]	1
Basin 8	0.111	325	5,580,000	2.01 [2]	2.53% [1]	2
System	*0.761*	*2,134*	*19,338,000*	*1.03*	*1.35%*	

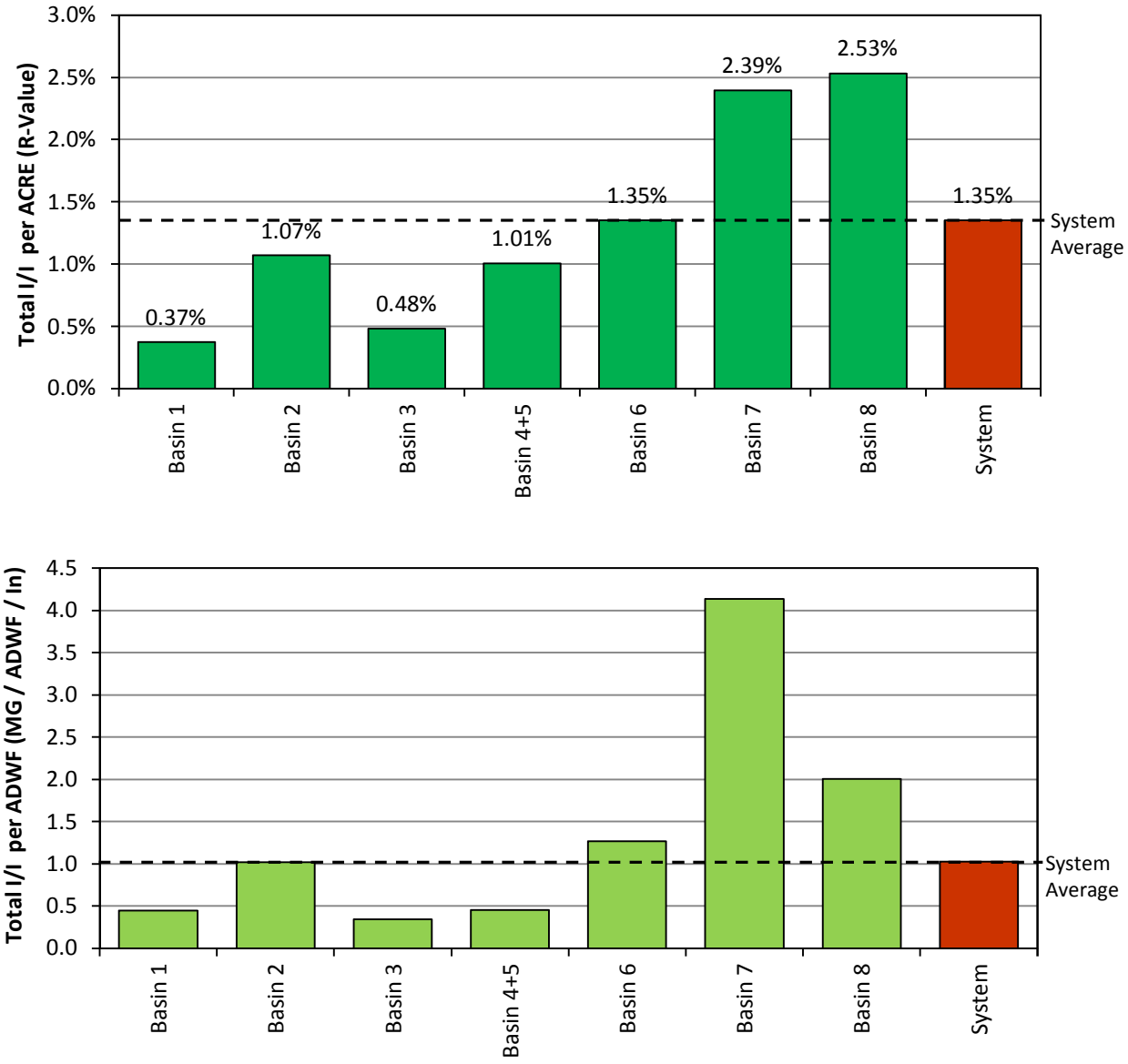


Figure 3-21. Bar Graphs: Total I/I Analysis Summary

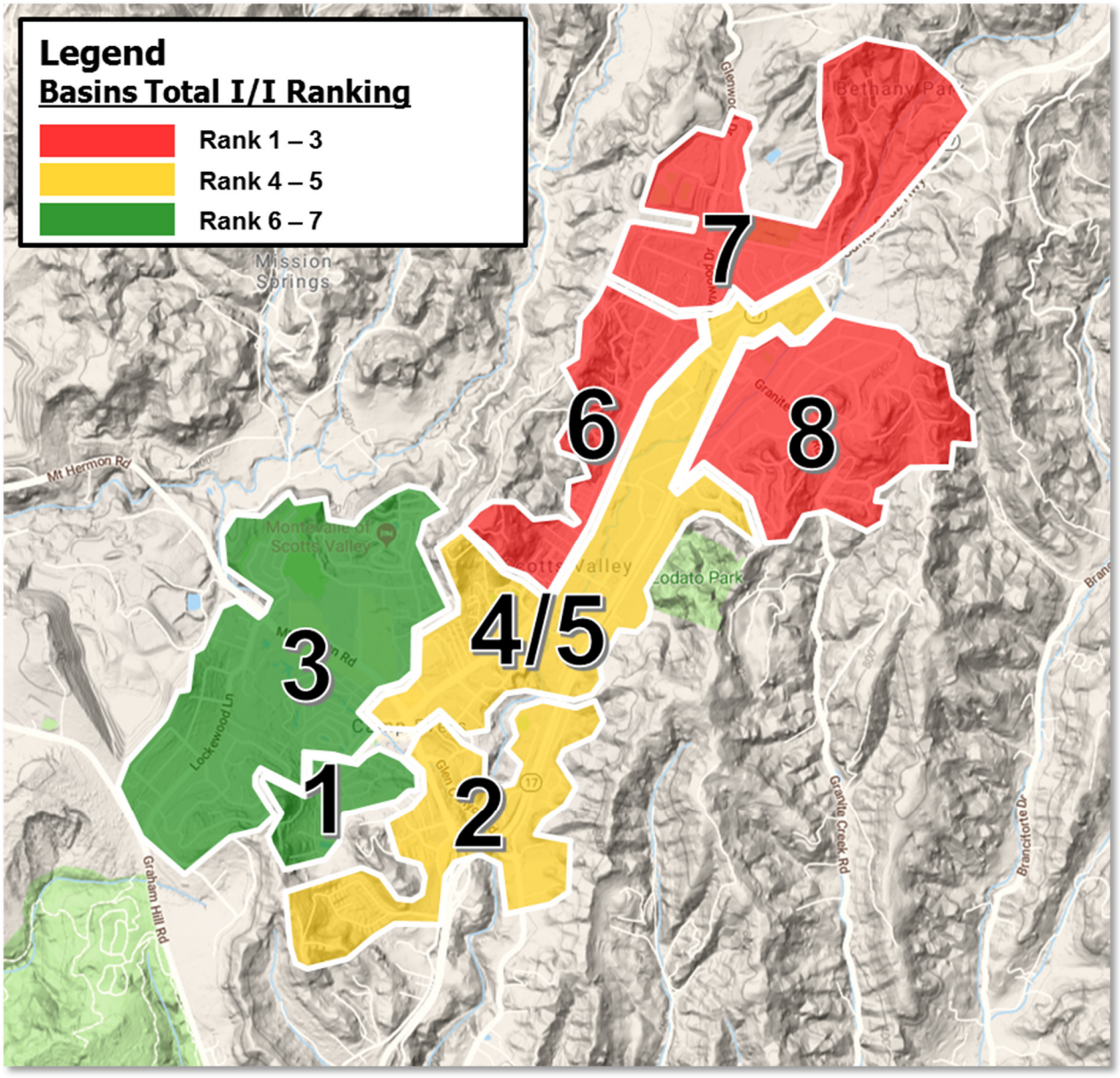


Figure 3-22. Temperature Map: Combined I/I Final Basin Rankings

3.3.7 Groundwater Infiltration Results Summary

Dry weather (ADWF) flow can be expected to have a predictable diurnal flow pattern. While each site is unique, experience has shown that, given a reasonable volume of flow and typical loading conditions, the daily flows fall into a predictable range when compared to the daily average flow. If a site has a large percentage of groundwater infiltration occurring during the periods of dry weather flow measurement, the amplitudes of the peak and low flows will be dampened[11]. Figure 3-23 shows a sample of two flow monitoring sites, both with nearly the same average daily flow, but with considerably different peak and low flows. In this *sample* case, Site B1 may have a considerable volume of groundwater infiltration.

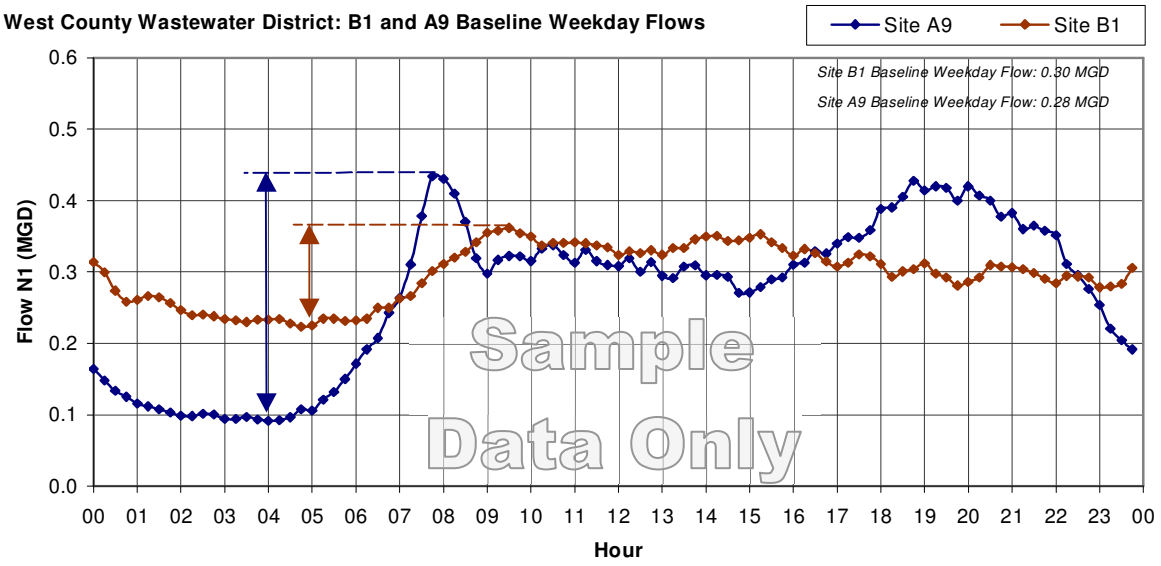


Figure 3-23. Groundwater Infiltration Sample Figure

It can be useful to compare the low-to-ADWF flow ratios for the flow metering sites. A site with abnormal ratios, and with no other reasons to suspect abnormal flow patterns (such as proximity to a pump station, treatment facilities, etc.), has a possibility of higher levels of groundwater infiltration in comparison to the rest of the collection system.

Figure 3-24 plots the low-to-ADWF flow ratios[12] against the ADWF flows for the relevant flow monitoring sites. The brown dashed line shows “typical” low-to-ADWF ratios per the Water Environment Federation (WEF). Figure 3-25 shows a color-coded map of the basins with rates of groundwater infiltration considerably above typical groundwater infiltration standards (as set forth by WEF).

[11] In an extreme case, perhaps 0.2 mgd of ADWF flow and 2.0 mgd of groundwater infiltration, the peaks and lows would be barely recognizable; the ADWF flow would be nearly a straight line.

[12] The Minimum to Average flow ratio is calculated by taking the minimum flow and dividing by the ADWF value (using the Mon-Thu ADWF curve).

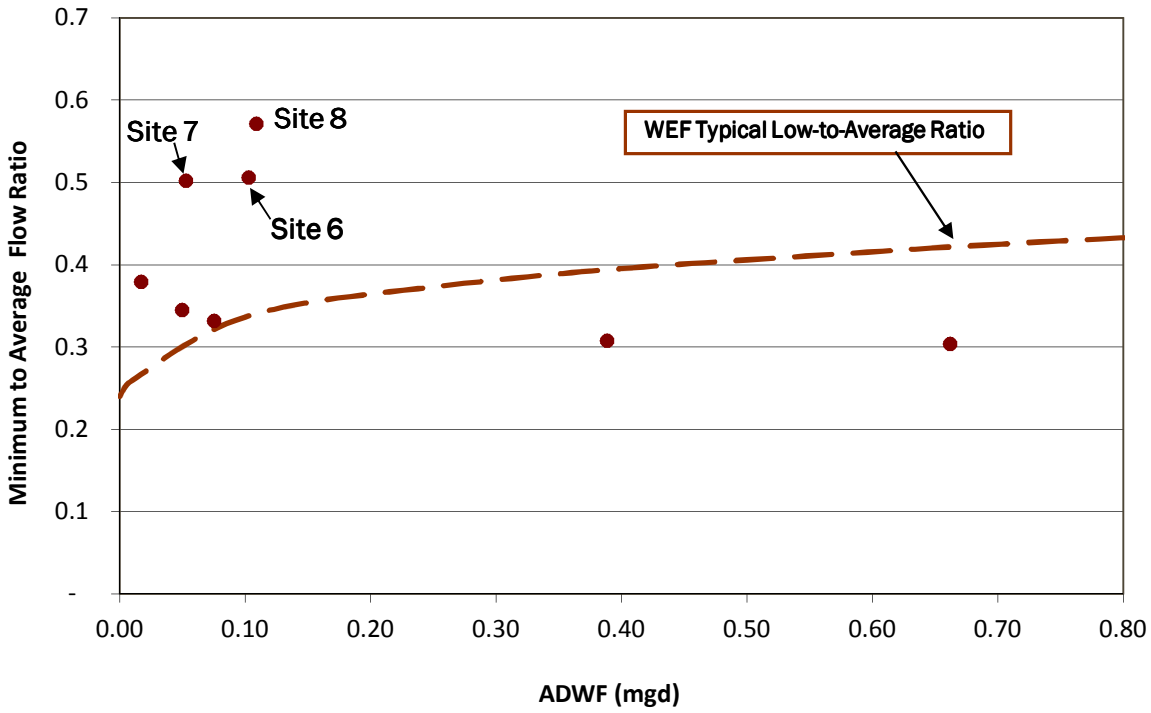


Figure 3-24. Minimum Flow Ratios vs ADWF[13]

The following GWI results are noted:

- The following sites had GWI rates higher-than typical standards:
  - Sites 6, 7, and 8 had GWI rates considerably higher than other sites and typical standards.

[13] Due to attenuation, it should be expected that sites with larger flow volumes should not have quite the peak-to-average and low-to-average flow ratios as sites with lesser flow volumes. This is why the WEF typical trend line's slope is closer to 1.0 as the ADWF increases, as shown in the figure.

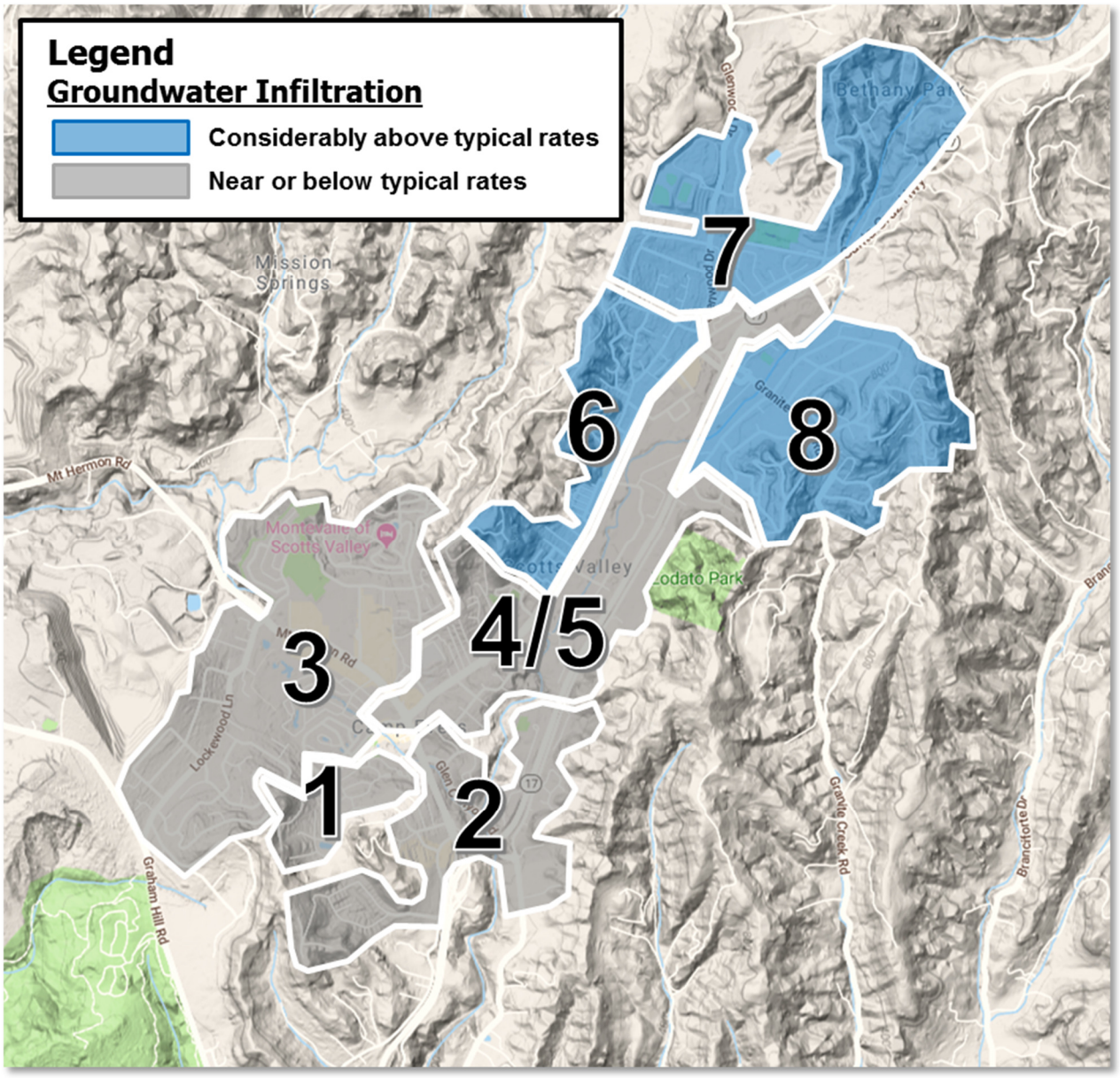


Figure 3-25. Basins with Groundwater Infiltration

4 Recommendations

V&A advises that future I/I reduction plans consider the following recommendations:

1. **Master Plan and Model Implementation**: This study focuses on inflow and infiltration generation; however, the capacity deficiencies of the collection system may be of greater concern relative to I/I response during peak wet weather events. The City may wish to have a model designed and/or a master plan study conducted to determine the overall needs of the City relative to I/I. Or simply, the study results can be used to update the master plan and compare with previous model assumptions and flow monitoring results.
2. **Determine I/I Reduction Program**: The City should examine its I/I reduction needs to determine their needs and goals for a future I/I reduction program.
    a. If peak flows, sanitary sewer overflows, and pipeline capacity issues are of greater concern, then priority can be given to investigate and reduce sources of inflow within the basins with the greatest inflow problems. The highest inflow occurs in Basins 3, 6, and 7.
    b. If total infiltration and general pipeline deterioration are of greater concern, then the program can be weighted to investigate and reduce sources of infiltration within the basins with the greatest infiltration problems. The highest combined I/I, highest RDI and elevated GWI occurs in Basins 6, 7, and 8.
3. **I/I Investigation Methods**: Potential I/I investigation methods include the following:
    a. Smoke testing can be effective for locating sources of inflow. Smoke testing can be considered for Basins 3, 6 and 7 which had the highest normalized inflow rates.
    b. Mini-basin or sub-basin flow monitoring can be used to better determine the distribution of I/I within a particular sub-basin. Basins 6, 7, and 8 may be good candidates mini-basin flow monitoring to better locate the distribution of inflow and infiltration within these basins.
    c. Night-time I/I reconnaissance can be conducted within basins with high RDI rates to better determine on a pipe reach by pipe reach basis where the RDI is occurring within particular sub-basin. This method may be utilized to determine candidate neighborhoods for potential CIP projects to mitigate and reduce I/I within the collection system. Night-time I/I reconnaissance could be considered for Basins 6, 7, and 8.
4. **I/I Reduction Cost Effective Analysis**: The City should conduct a study to determine which is more cost-effective: (1) locating the sources of inflow/infiltration and systematically rehabilitating or replacing the faulty pipelines; or (2) continued treatment of the additional rainfall dependent I/I flow.

Appendix A
Flow Monitoring Sites: Data, Graphs, Information

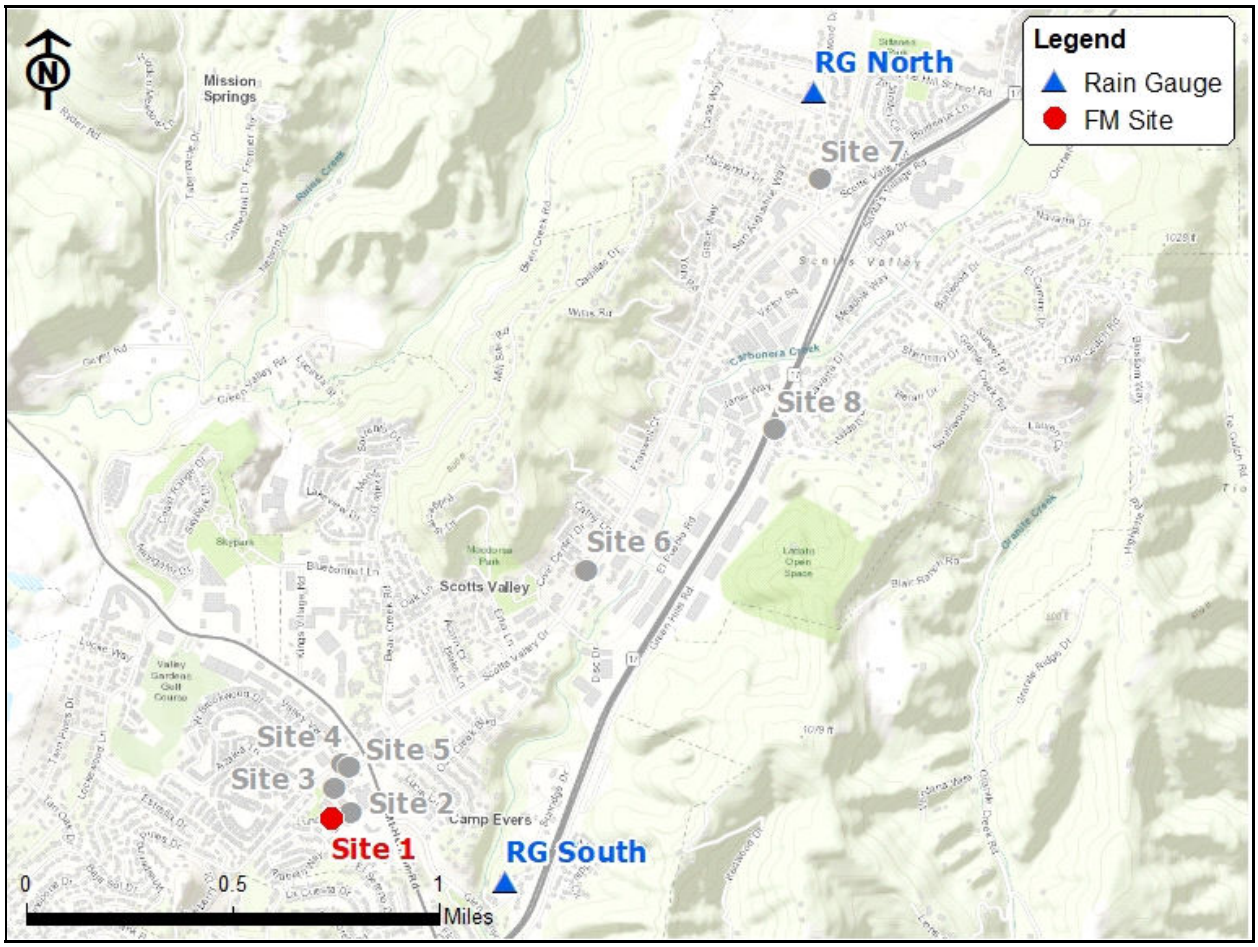
Carollo | Scotts Valley, California

Sanitary Sewer Flow Monitoring
January 30 - May 03, 2019

Monitoring Site: Site 1

Location: In Treatment Plant, inside gate

Data Summary Report



Vicinity Map: Site 1

SITE 1

Site Information

Location: In Treatment Plant, inside gate

Coordinates: 122.0267° W, 37.0411° N

Rim Elevation (Earth): 505 feet

Expected Pipe Diameter: 10 inches

Measured Pipe Diameter: 10 inches

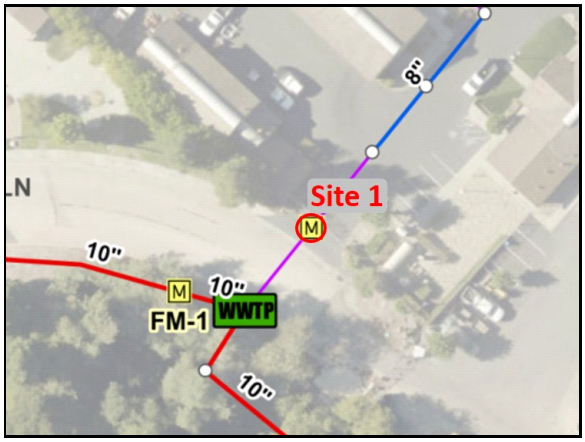
ADWF: 0.017 mgd

Peak Measured Flow: 0.143 mgd

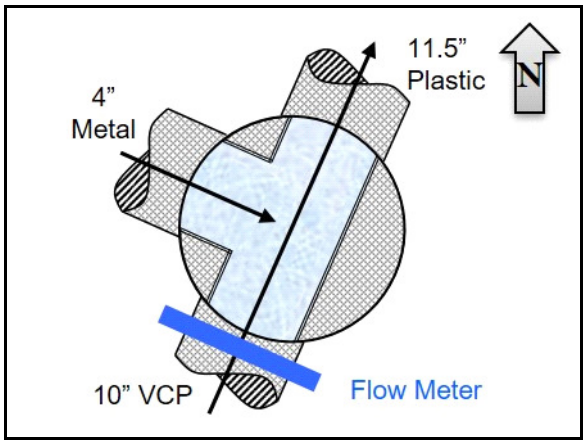
Sediment: None



Satellite Map



Sewer Map



Flow Sketch



Street View

SITE 1

Additional Site Photos

Effluent Pipe



Monitored South Influent Pipe



SITE 1

Additional Site Photos

West Influent Pipe

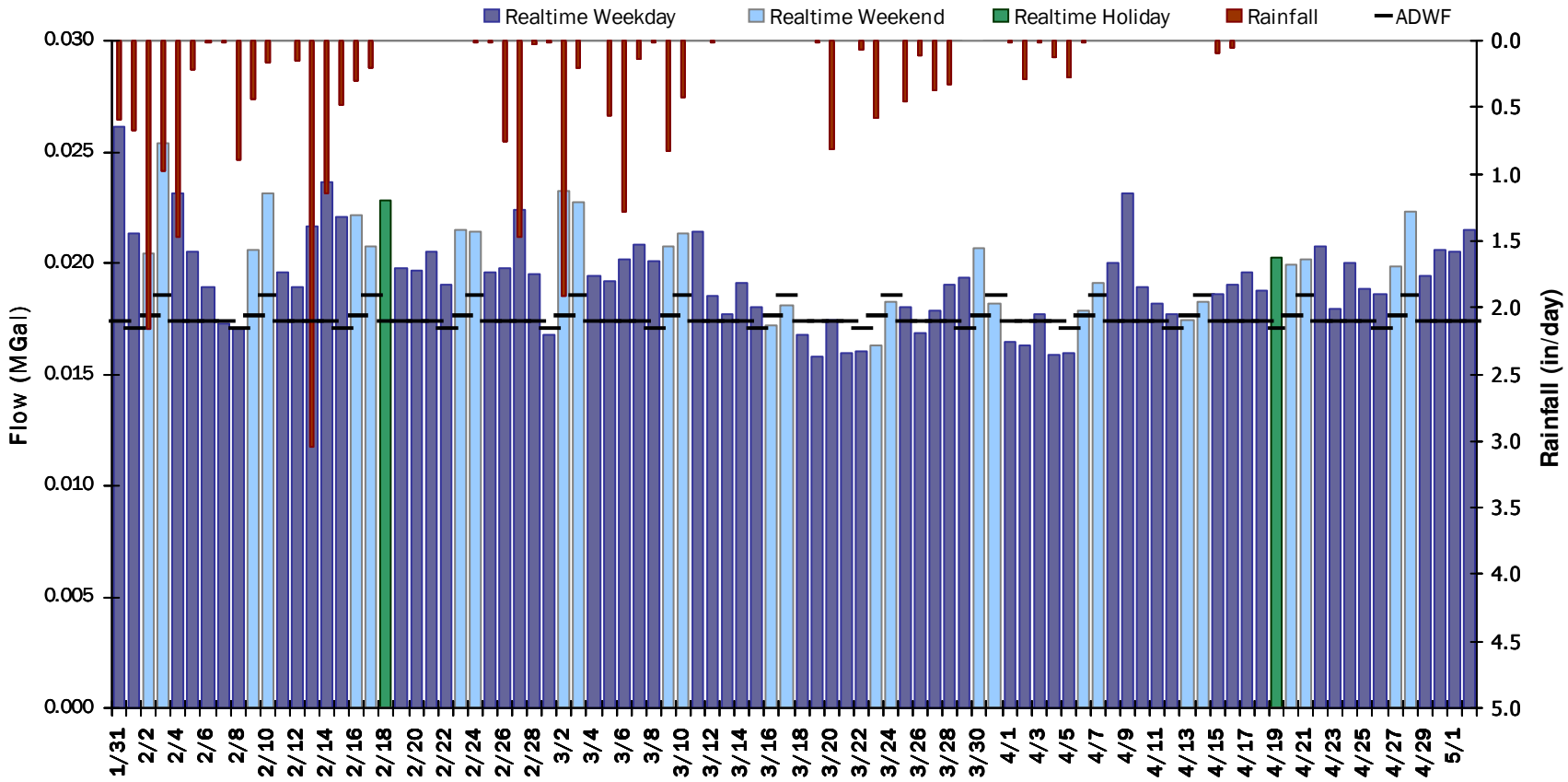


SITE 1

Period Flow Summary: Daily Flow Totals

Avg Daily Flow: 0.020 MGal Peak Daily Flow: 0.026 MGal Min Daily Flow: 0.016 MGal

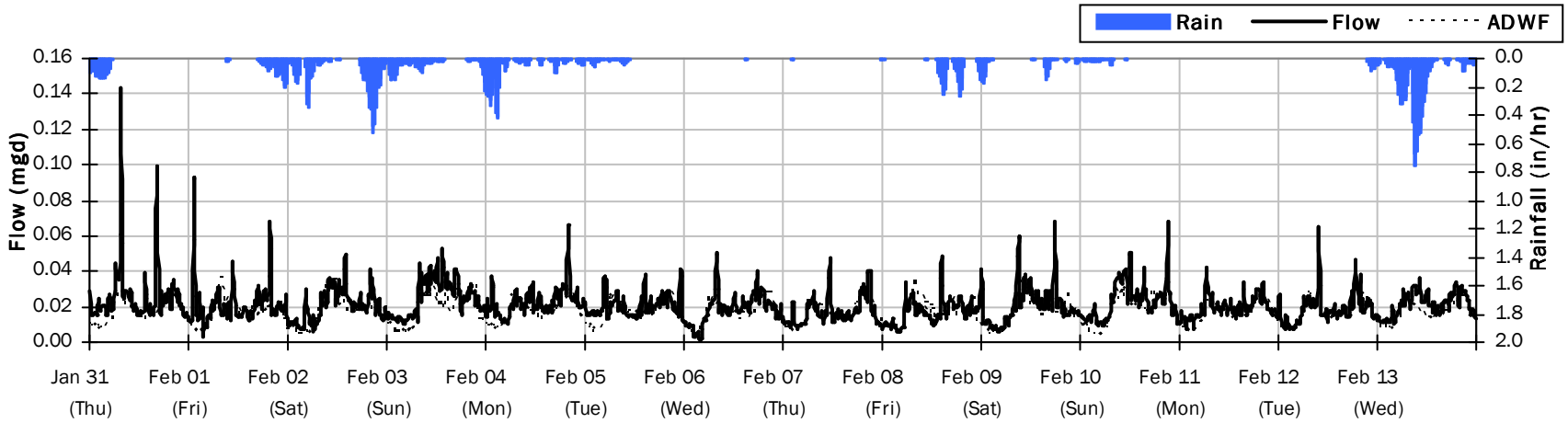
Total Rainfall: 24.26 inches

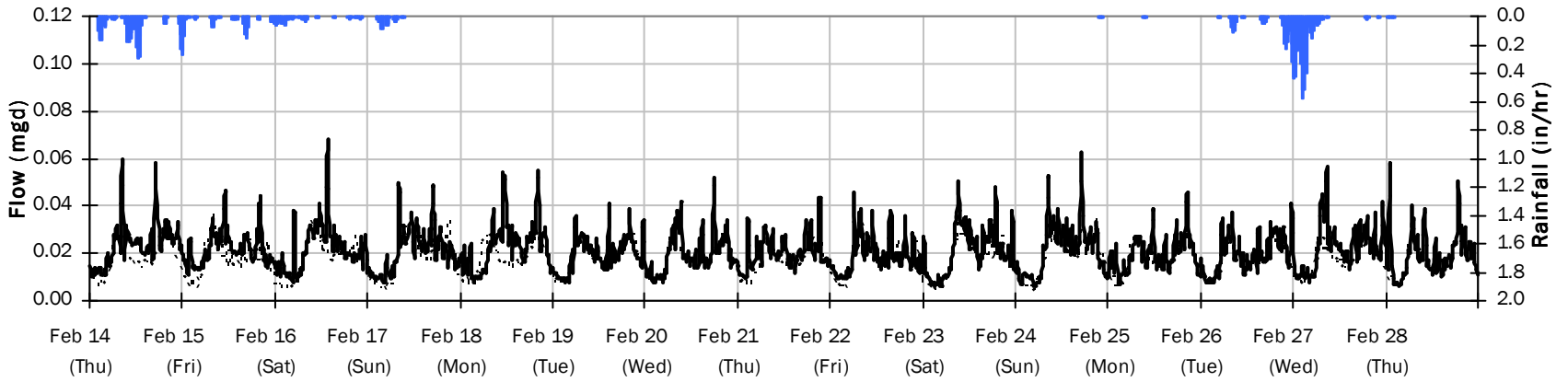


SITE 1

Flow Summary: 1/31/2019 to 2/28/2019

Period Rainfall: 15.21 inches Period Avg Flow: 0.021 mgd Period Peak Flow: 0.143 mgd Period Min Flow

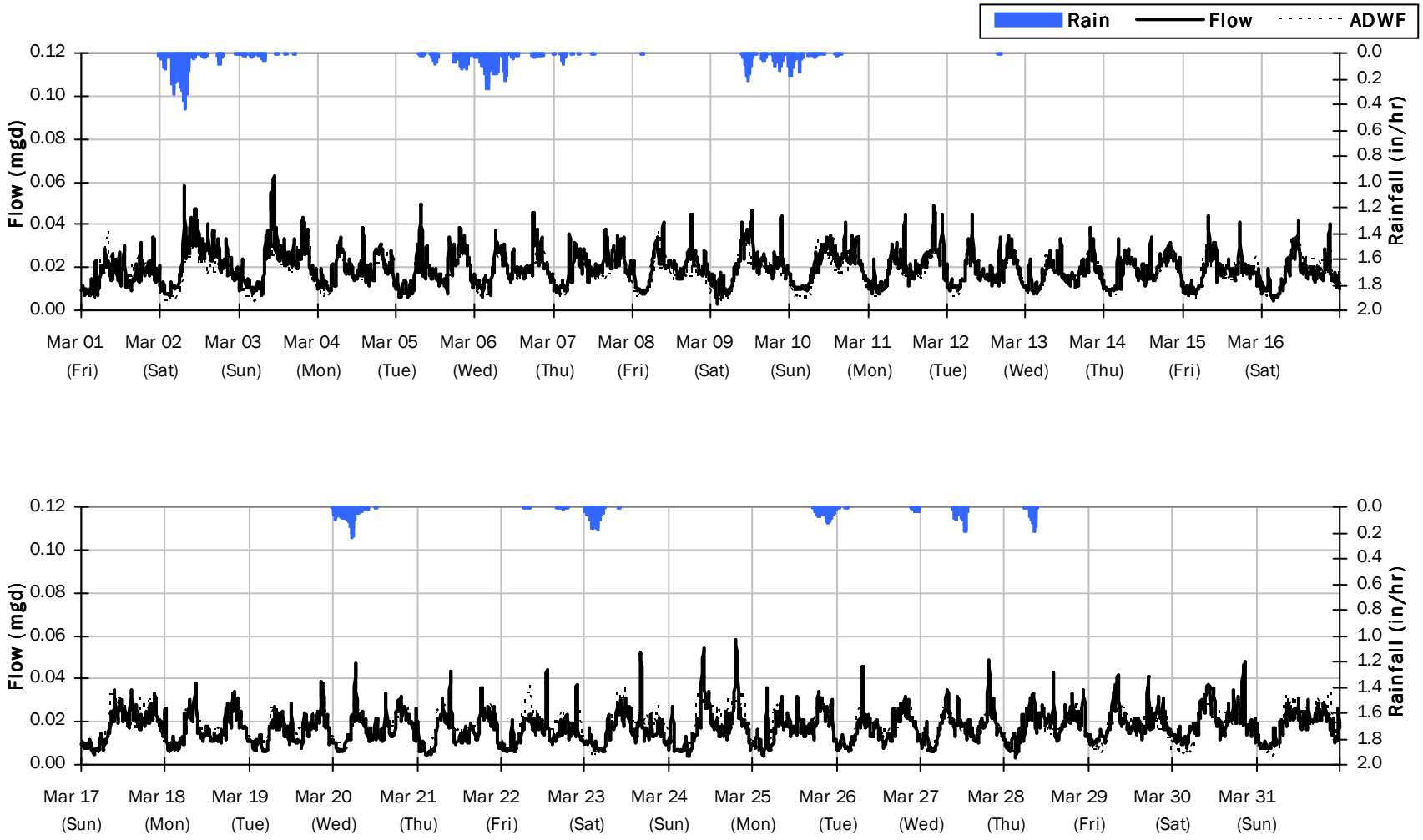




SITE 1

Flow Summary: 3/1/2019 to 3/31/2019

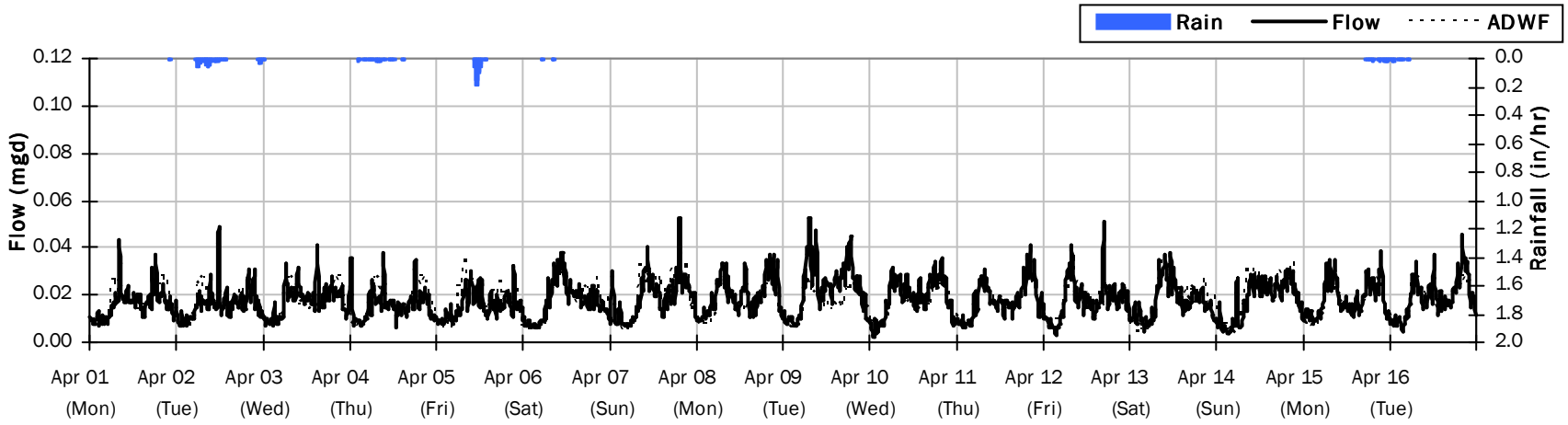
Period Rainfall: 8.15 inches Period Avg Flow: 0.019 mgd Period Peak Flow: 0.062 mgd Period Min Flow

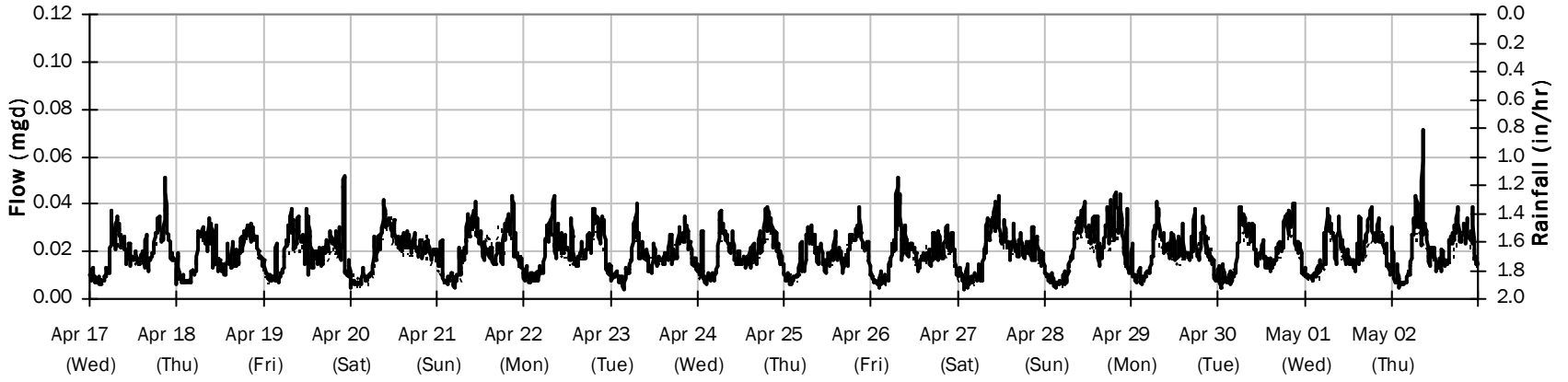


SITE 1

Flow Summary: 4/1/2019 to 5/2/2019

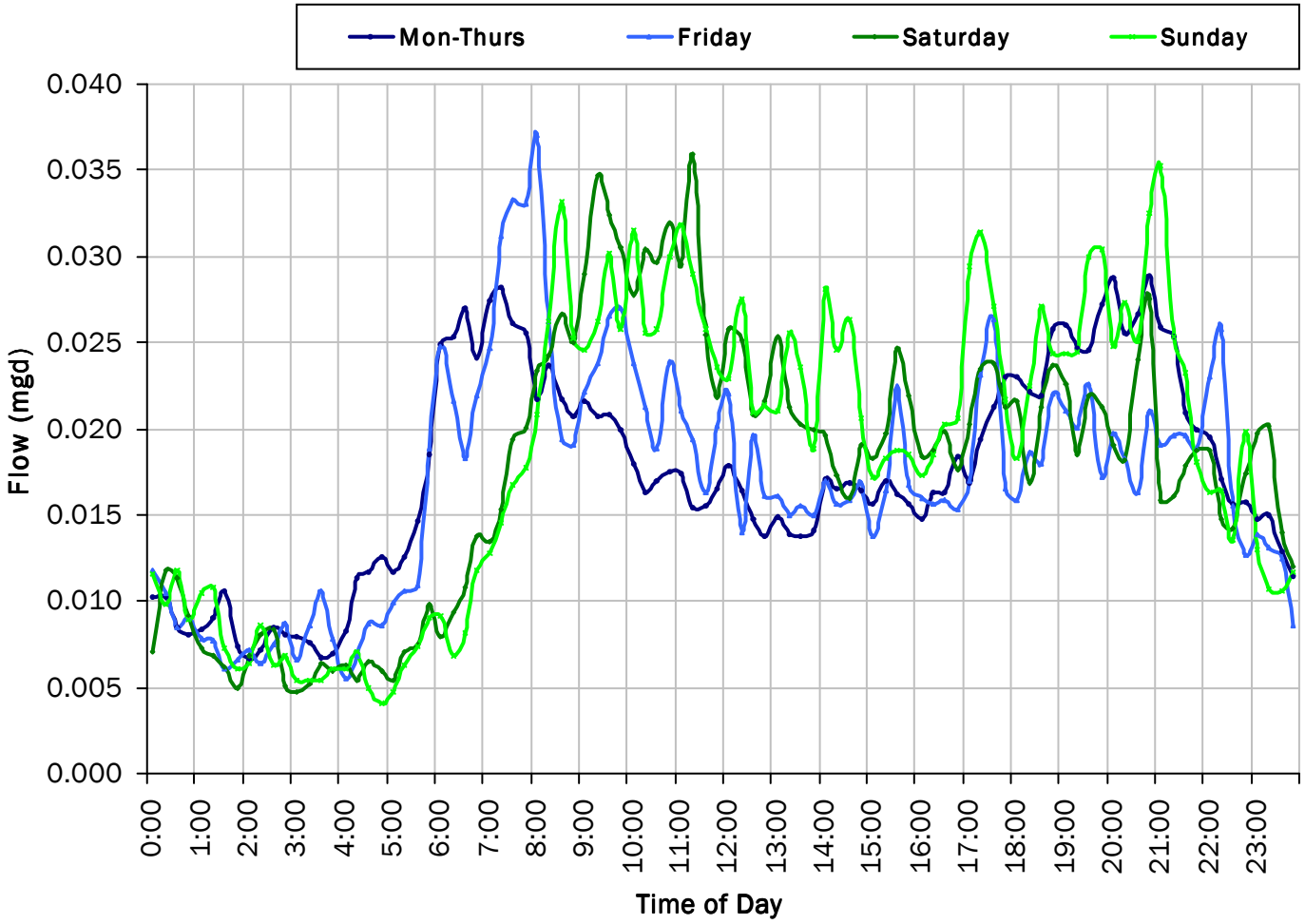
Period Rainfall: 0.89 inches Period Avg Flow: 0.019 mgd Period Peak Flow: 0.071 mgd Period Min Flow





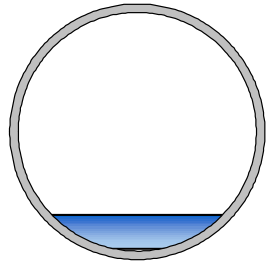
SITE 1

Average Dry Weather Flow Hydrographs



ADWF:

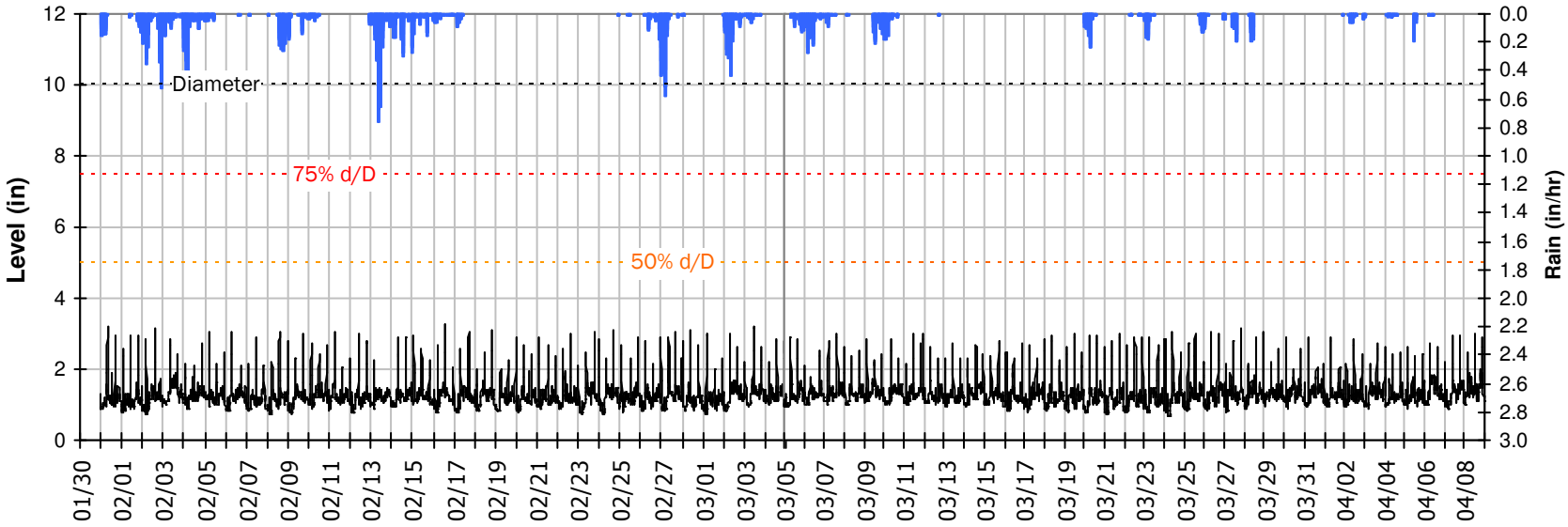
0.017 *mgd*

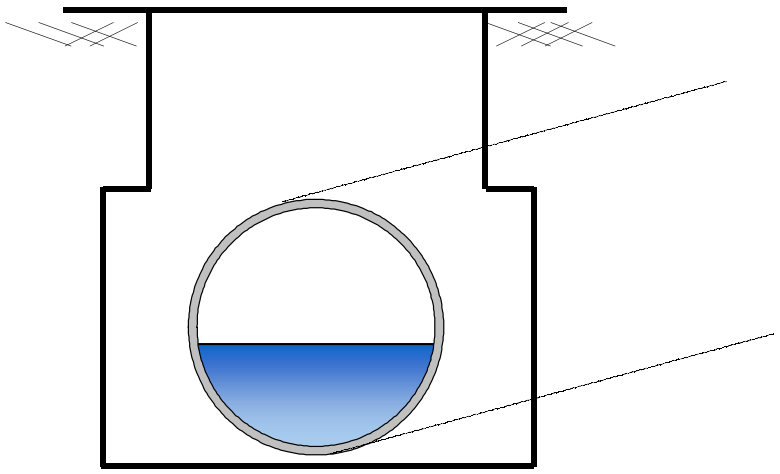


SITE 1

Site Capacity and Surcharge Summary

Realtime Flow Levels with Rainfall Data over Peak Level Period

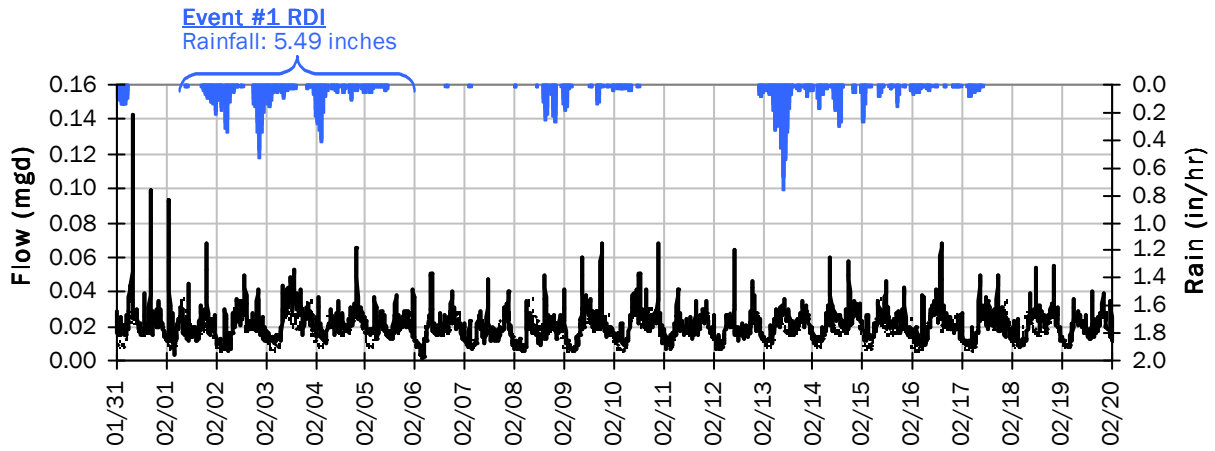




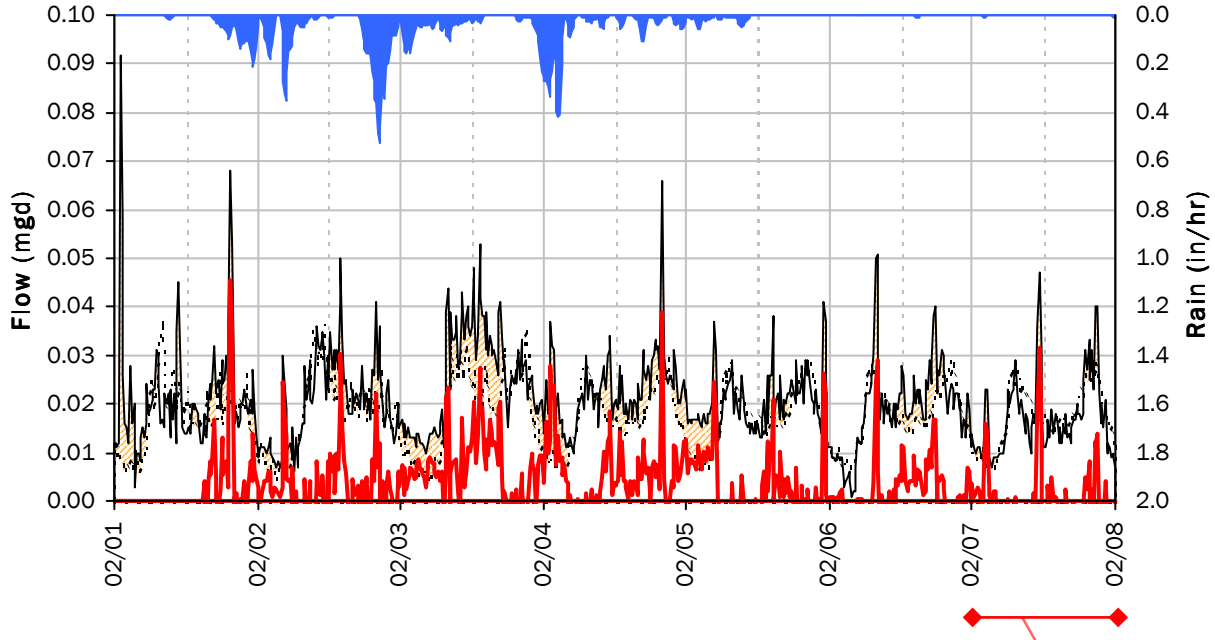
Pipe Diameter:	10	*inches*
Peak Measured Level:	4.26	*inches*
Peak d/D Ratio:	0.43	

SITE 1
I/I Summary: Event #1 RDI

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #1 RDI Detail Graph

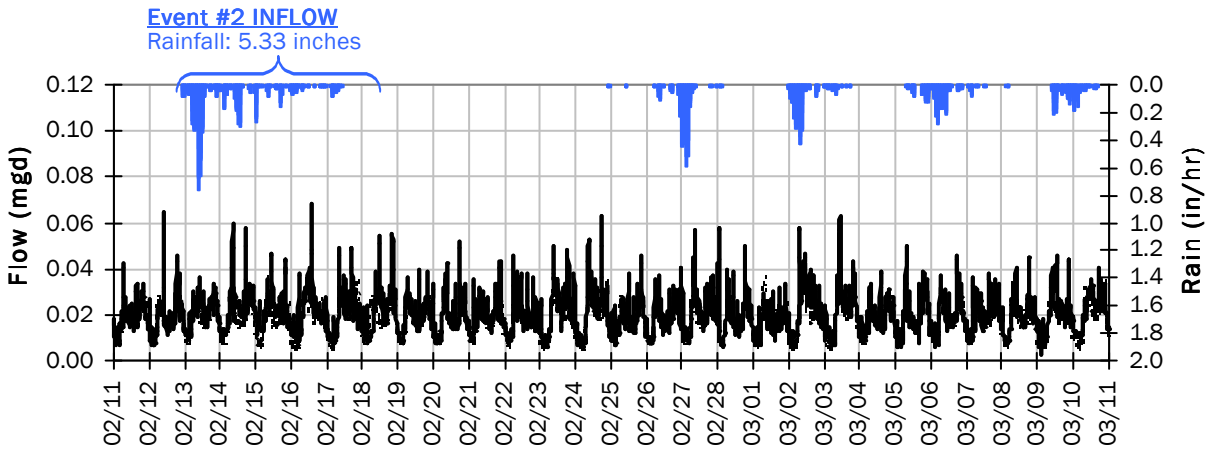


Storm Event I/I Analysis (Rain = 5.49 inches)

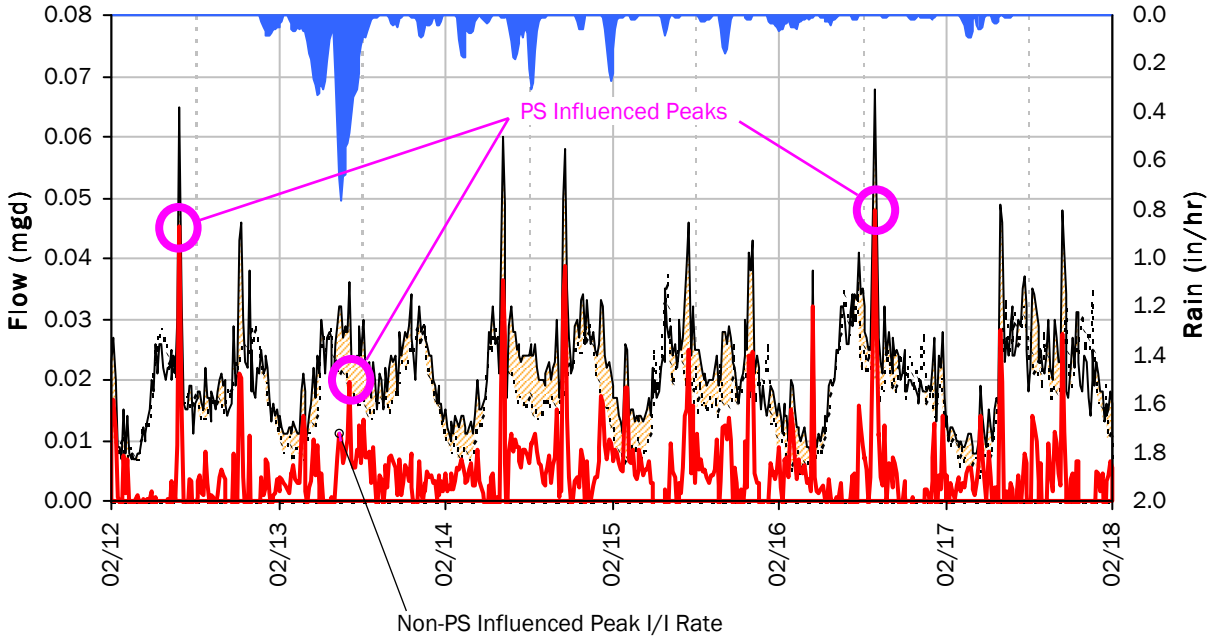
Capacity		Inflow / Infiltration	
Peak Flow:	0.092 *mgd*	**RDI:**	0.000 *mgd*
PF:	5.26		
Peak Level:	3.15 *in*		
d/D Ratio:	0.32		

SITE 1
I/I Summary: Event #2 INFLOW

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #2 INFLOW Detail Graph

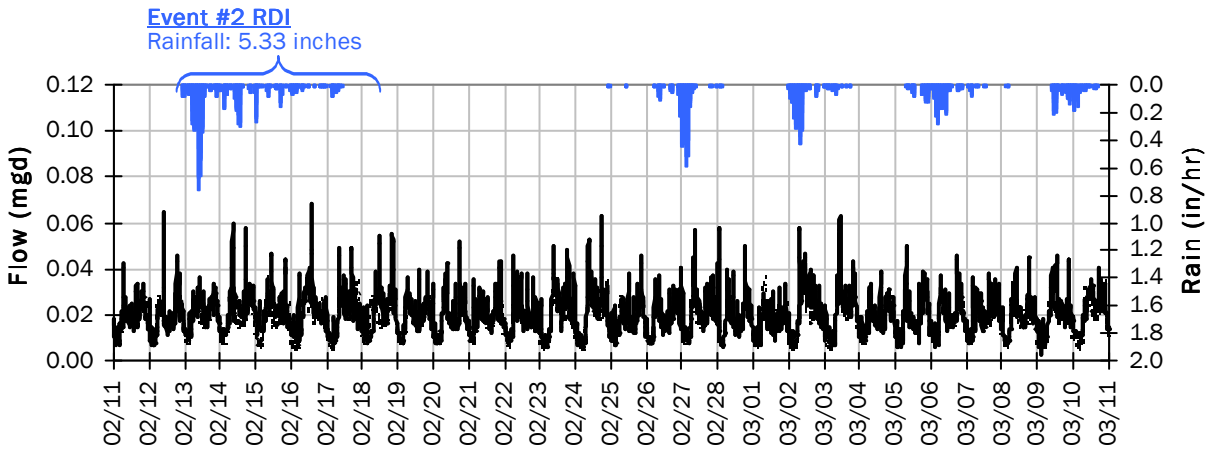


Storm Event I/I Analysis (Rain = 5.33 inches)

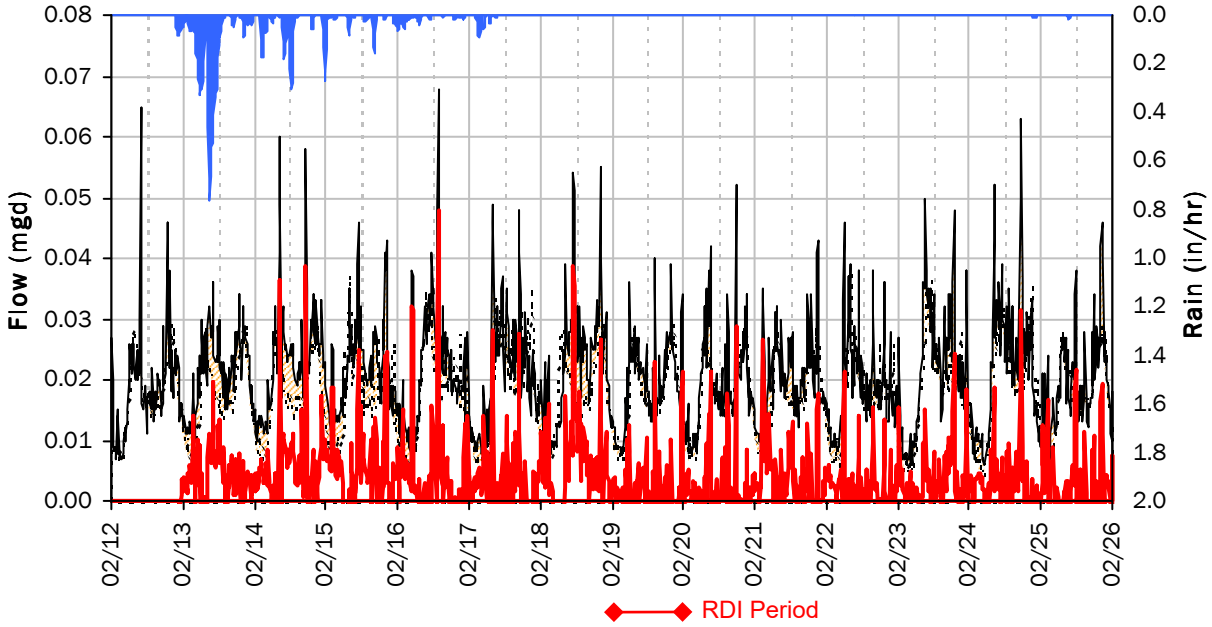
Capacity		Inflow / Infiltration	
Peak Flow:	0.068 *mgd*	**Peak I/I Rate:**	0.0113 *mgd*
PF:	3.89		
Peak Level:	3.25 *in*		
d/D Ratio:	0.33		

SITE 1
I/I Summary: Event #2 RDI

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #2 RDI Detail Graph

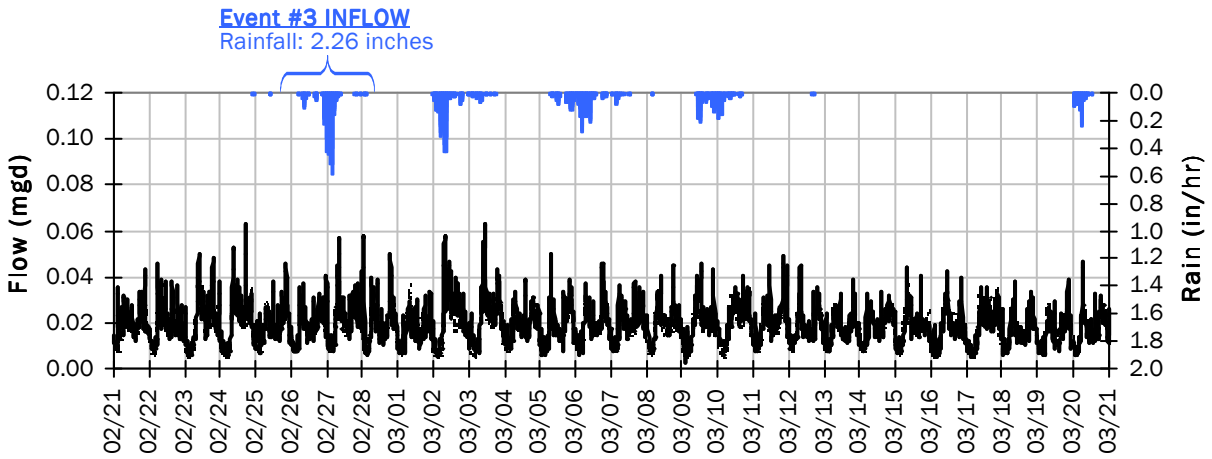


Storm Event I/I Analysis (Rain = 5.33 inches)

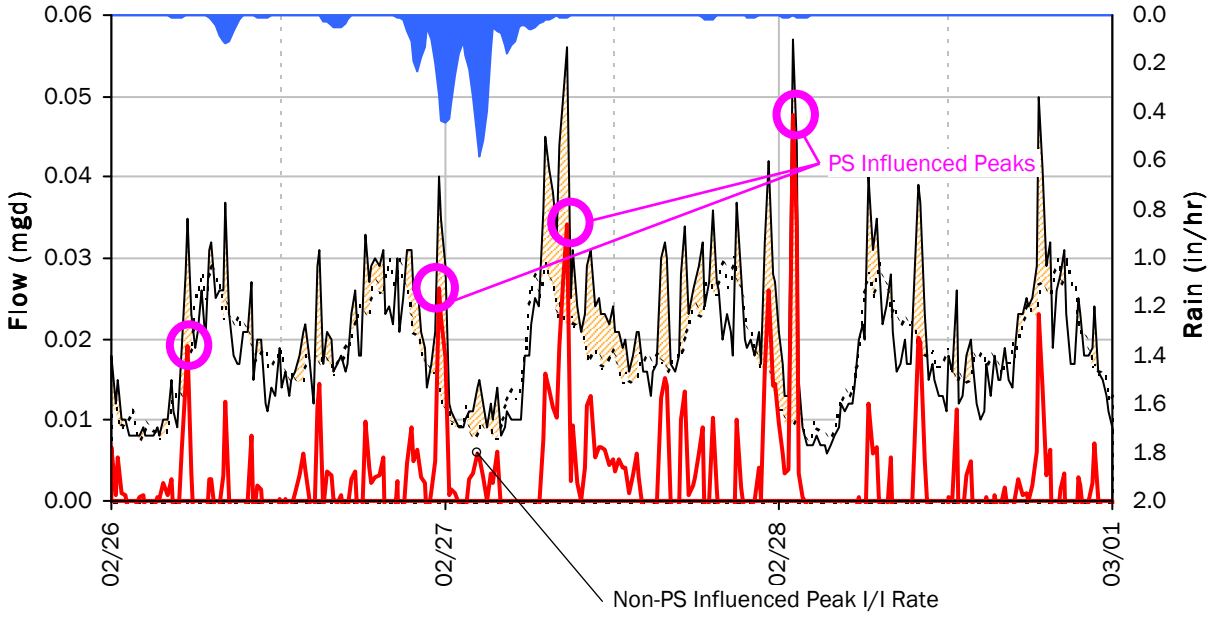
Capacity		Inflow / Infiltration	
Peak Flow:	0.068 *mgd*	**RDI:**	0.002 *mgd*
PF:	3.89		
Peak Level:	3.25 *in*		
d/D Ratio:	0.33		

SITE 1
I/I Summary: Event #3 INFLOW

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #3 INFLOW Detail Graph

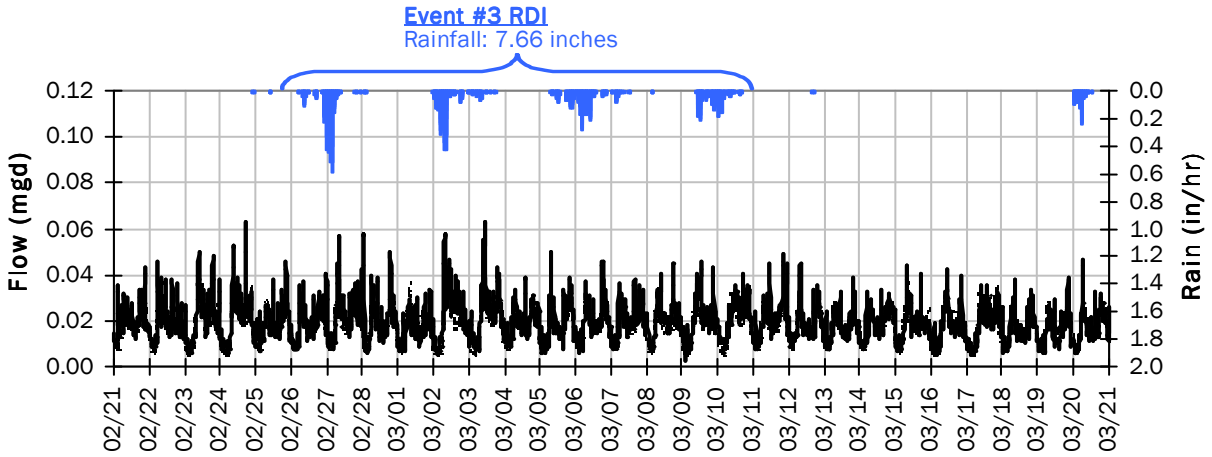


Storm Event I/I Analysis (Rain = 2.26 inches)

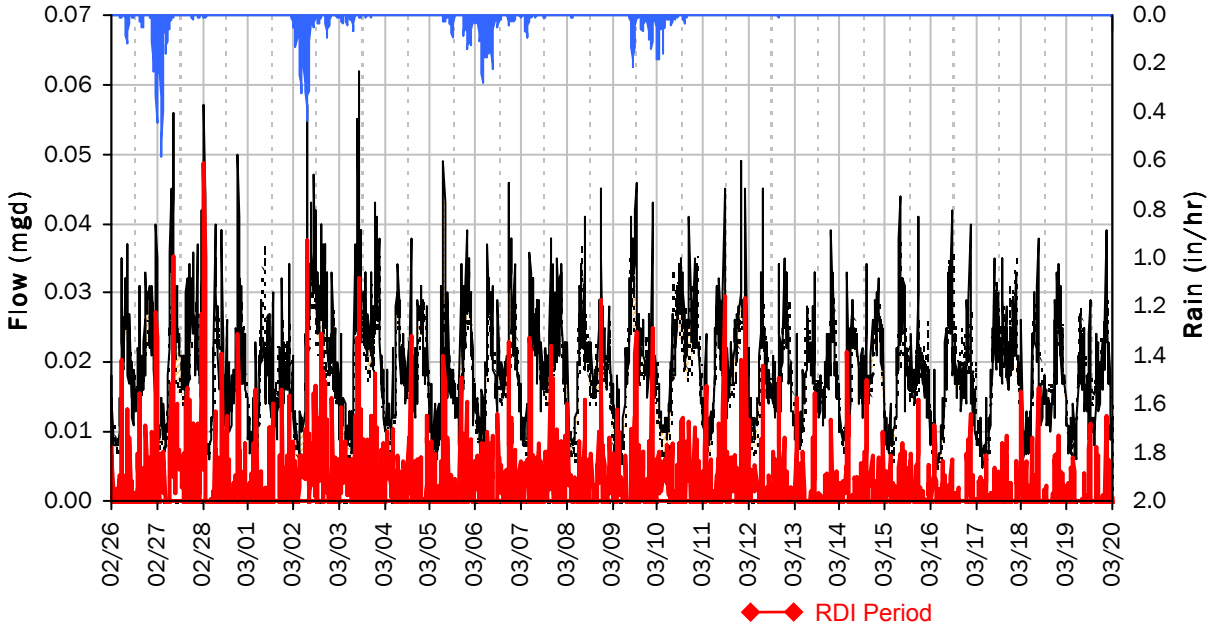
Capacity		Inflow / Infiltration	
Peak Flow:	0.06 *mgd*	**Peak I/I Rate:**	0.0061 *mgd*
PF:	3.26		
Peak Level:	3.09 *in*		
d/D Ratio:	0.31		

SITE 1
I/I Summary: Event #3 RDI

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #3 RDI Detail Graph



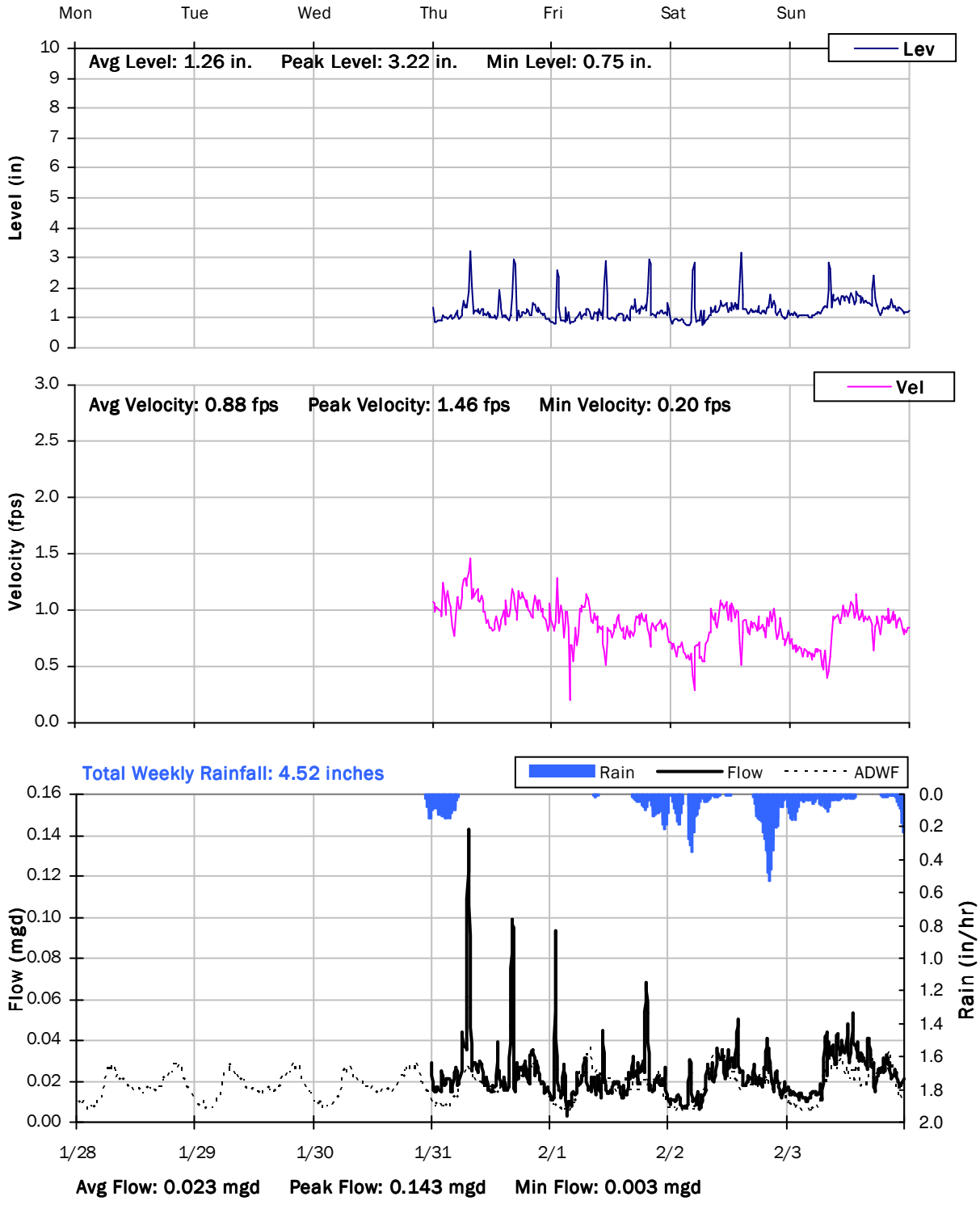
Storm Event I/I Analysis (Rain = 7.66 inches)

Capacity		Inflow / Infiltration	
Peak Flow:	0.06 *mgd*	**RDI:**	0.001 *mgd*
PF:	3.54		
Peak Level:	3.14 *in*		
d/D Ratio:	0.31		

SITE 1

Weekly Level, Velocity and Flow Hydrographs

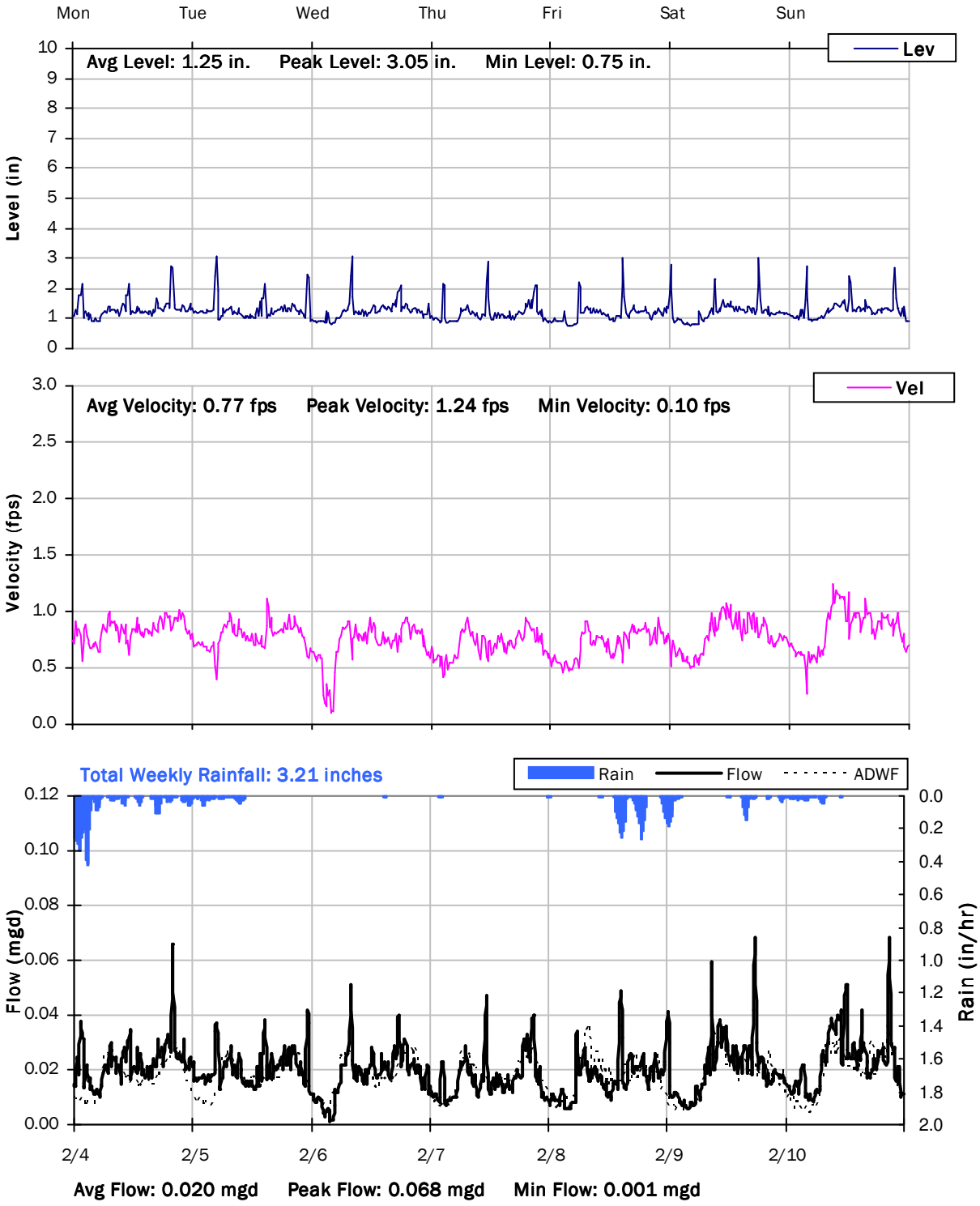
1/28/2019 to 2/4/2019



SITE 1

Weekly Level, Velocity and Flow Hydrographs

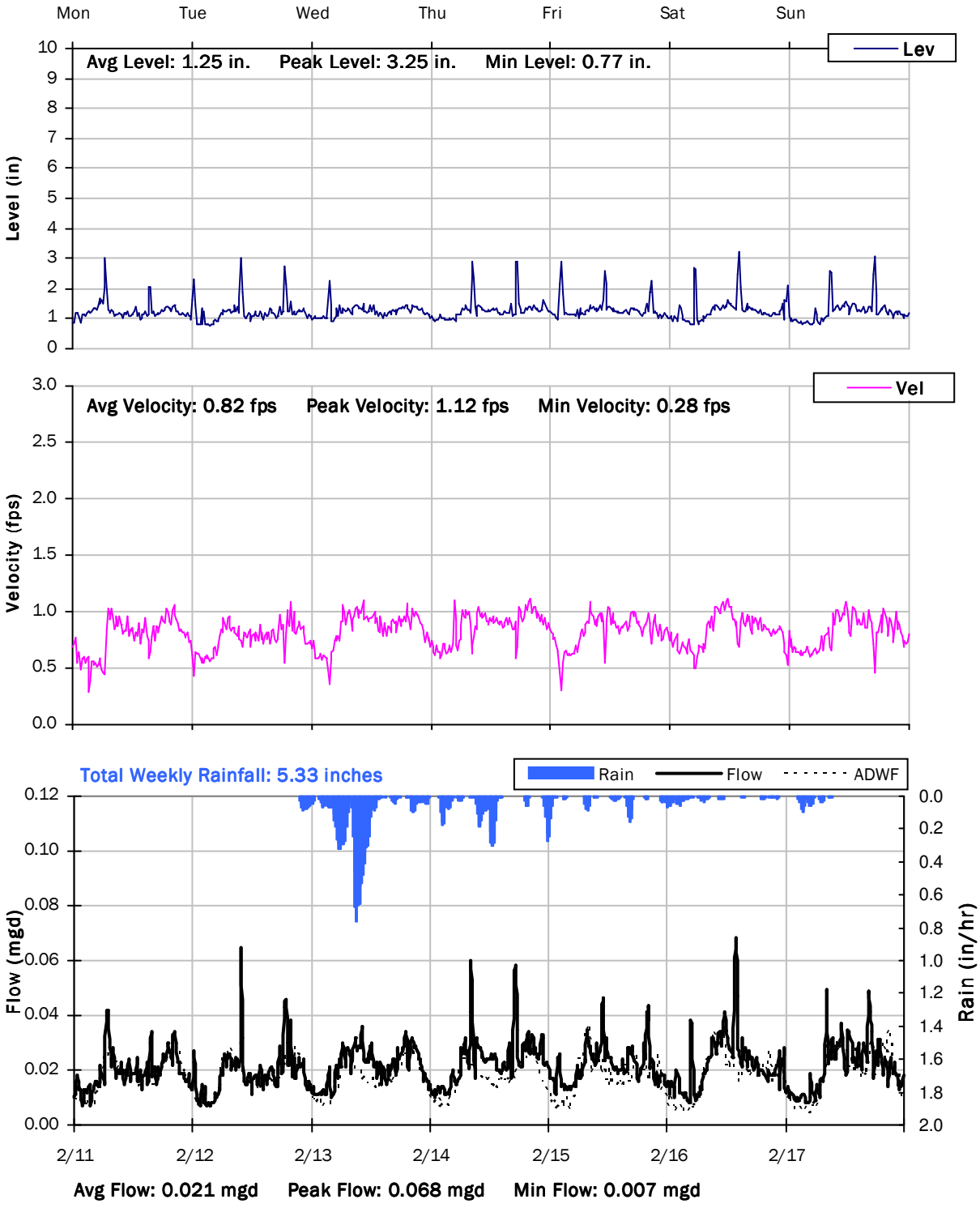
2/4/2019 to 2/11/2019



SITE 1

Weekly Level, Velocity and Flow Hydrographs

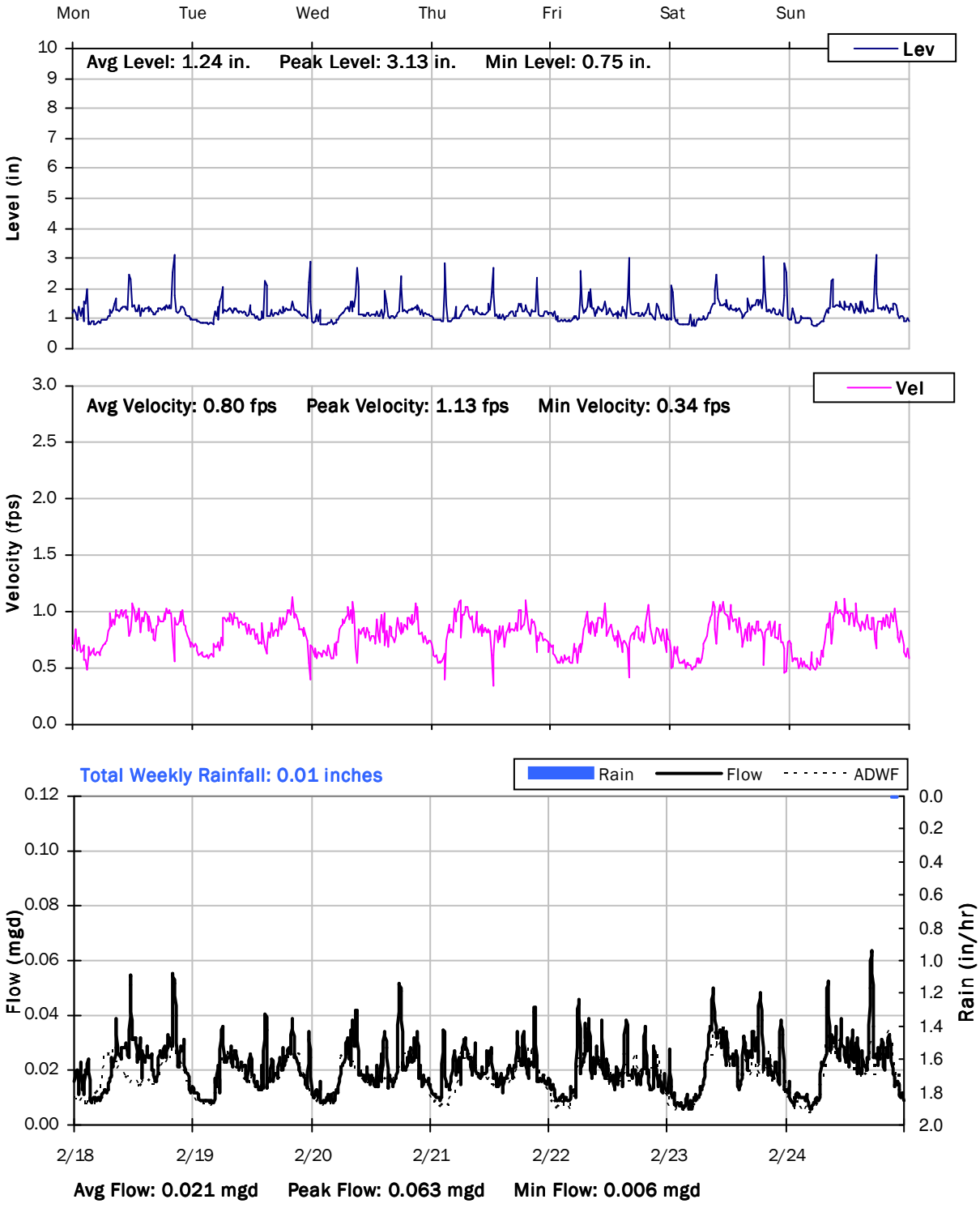
2/11/2019 to 2/18/2019



SITE 1

Weekly Level, Velocity and Flow Hydrographs

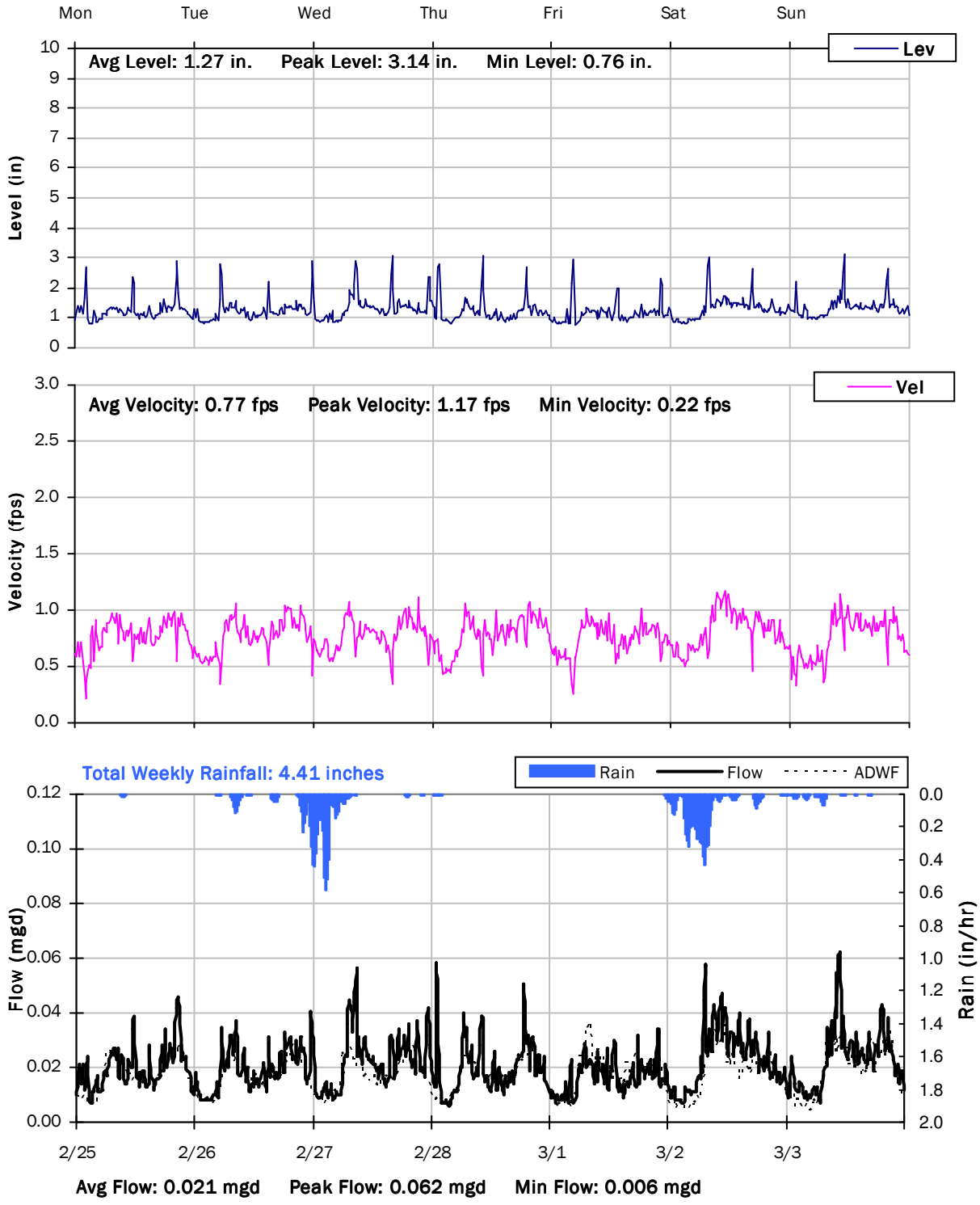
2/18/2019 to 2/25/2019



SITE 1

Weekly Level, Velocity and Flow Hydrographs

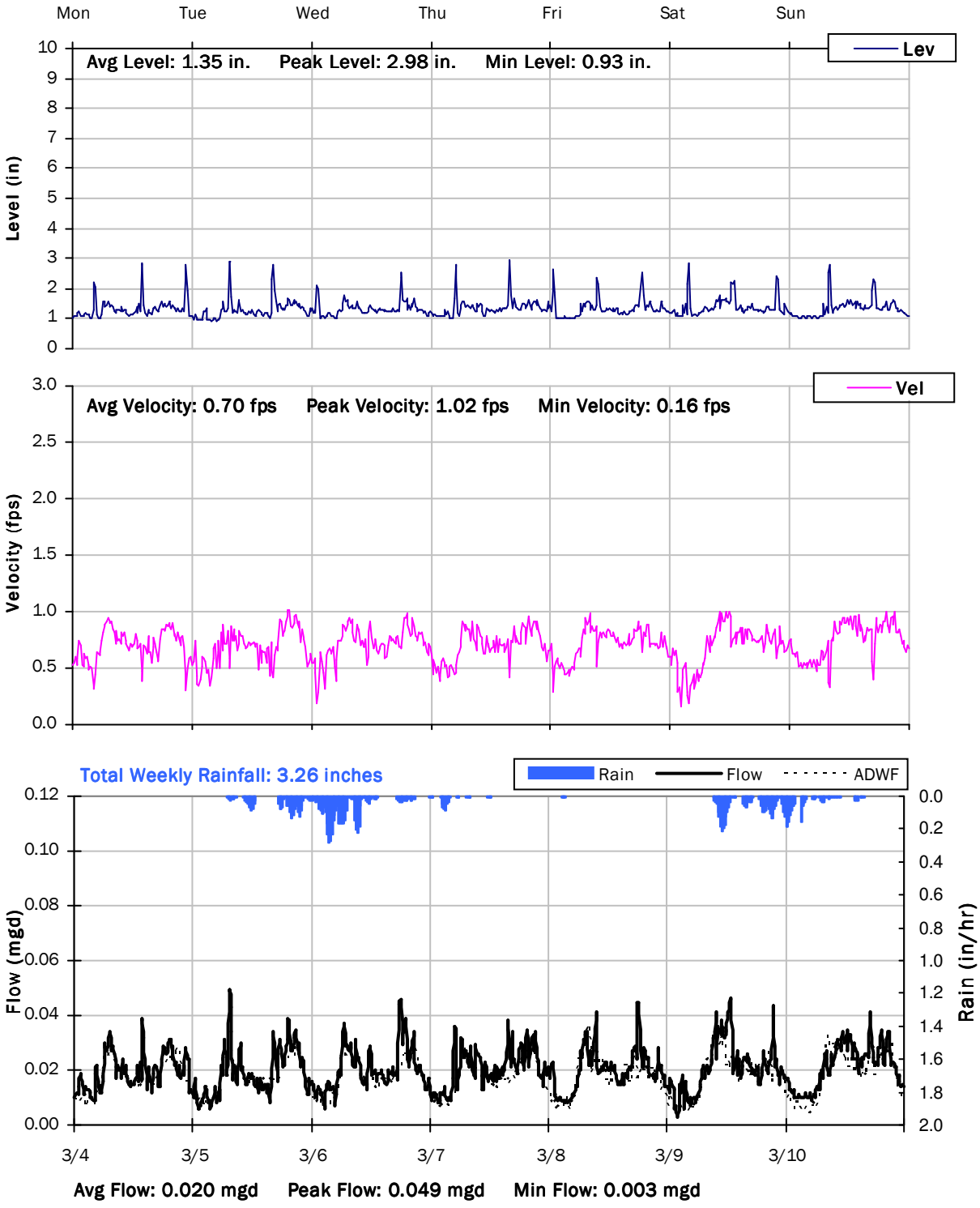
2/25/2019 to 3/4/2019



SITE 1

Weekly Level, Velocity and Flow Hydrographs

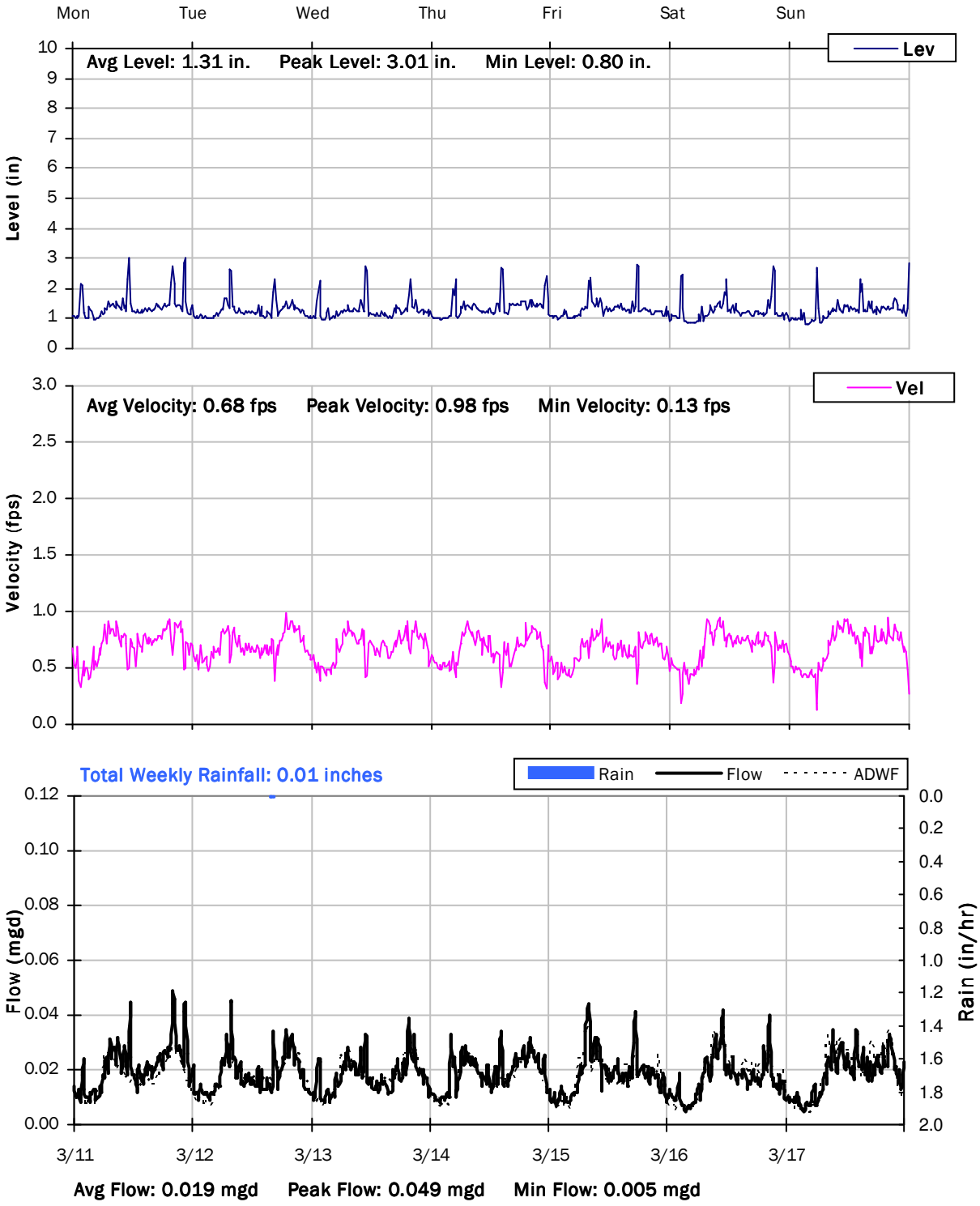
3/4/2019 to 3/11/2019



SITE 1

Weekly Level, Velocity and Flow Hydrographs

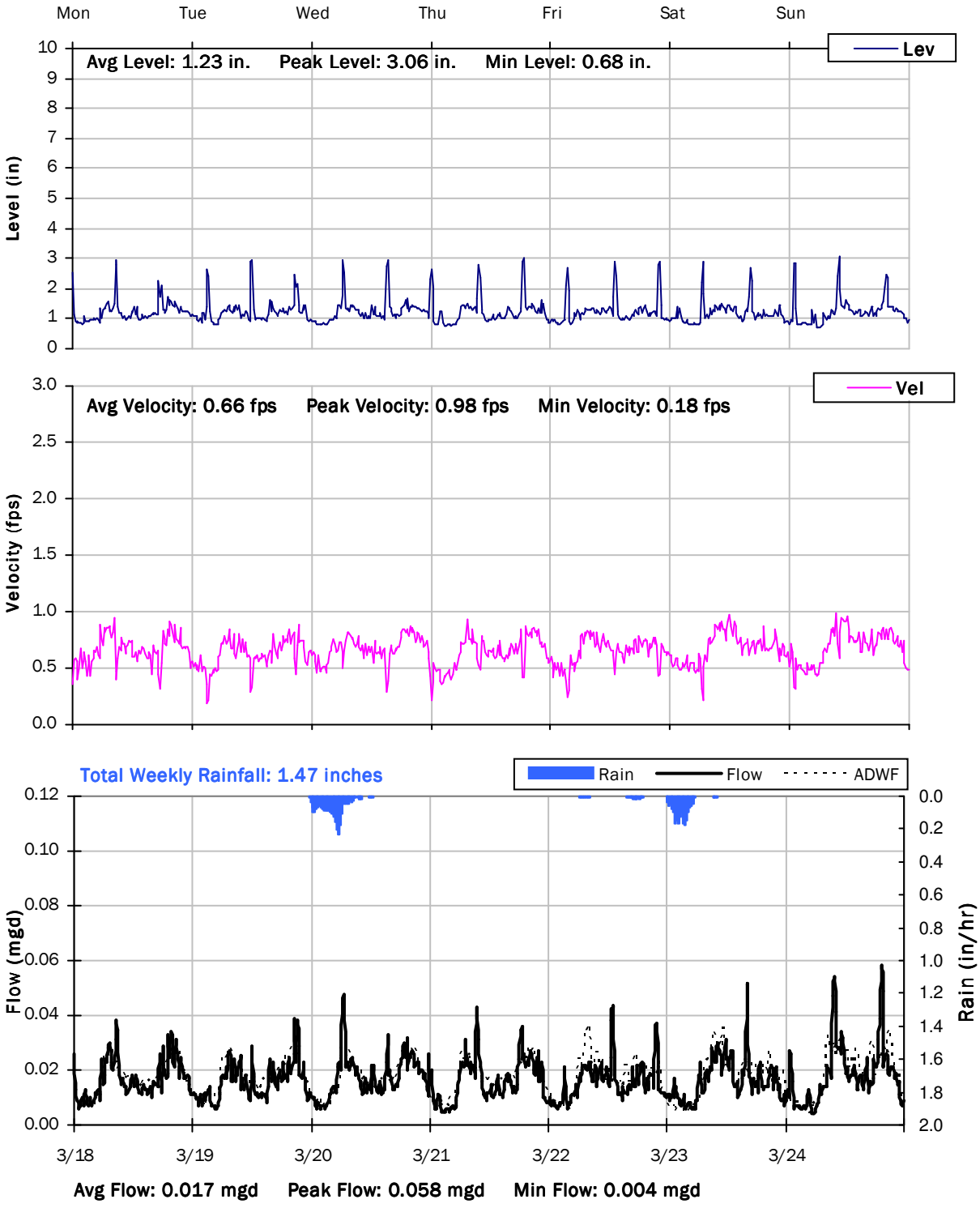
3/11/2019 to 3/18/2019



SITE 1

Weekly Level, Velocity and Flow Hydrographs

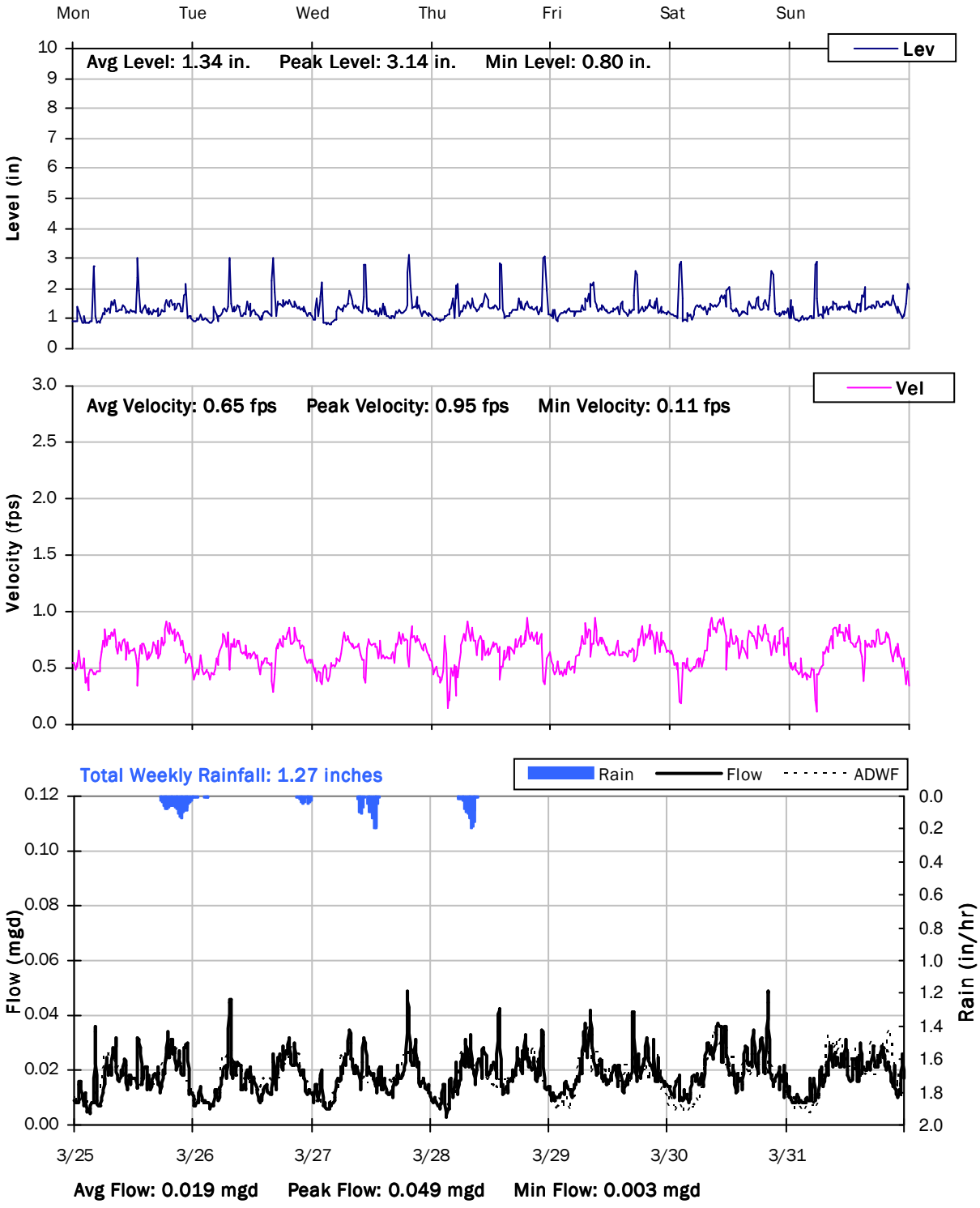
3/18/2019 to 3/25/2019



SITE 1

Weekly Level, Velocity and Flow Hydrographs

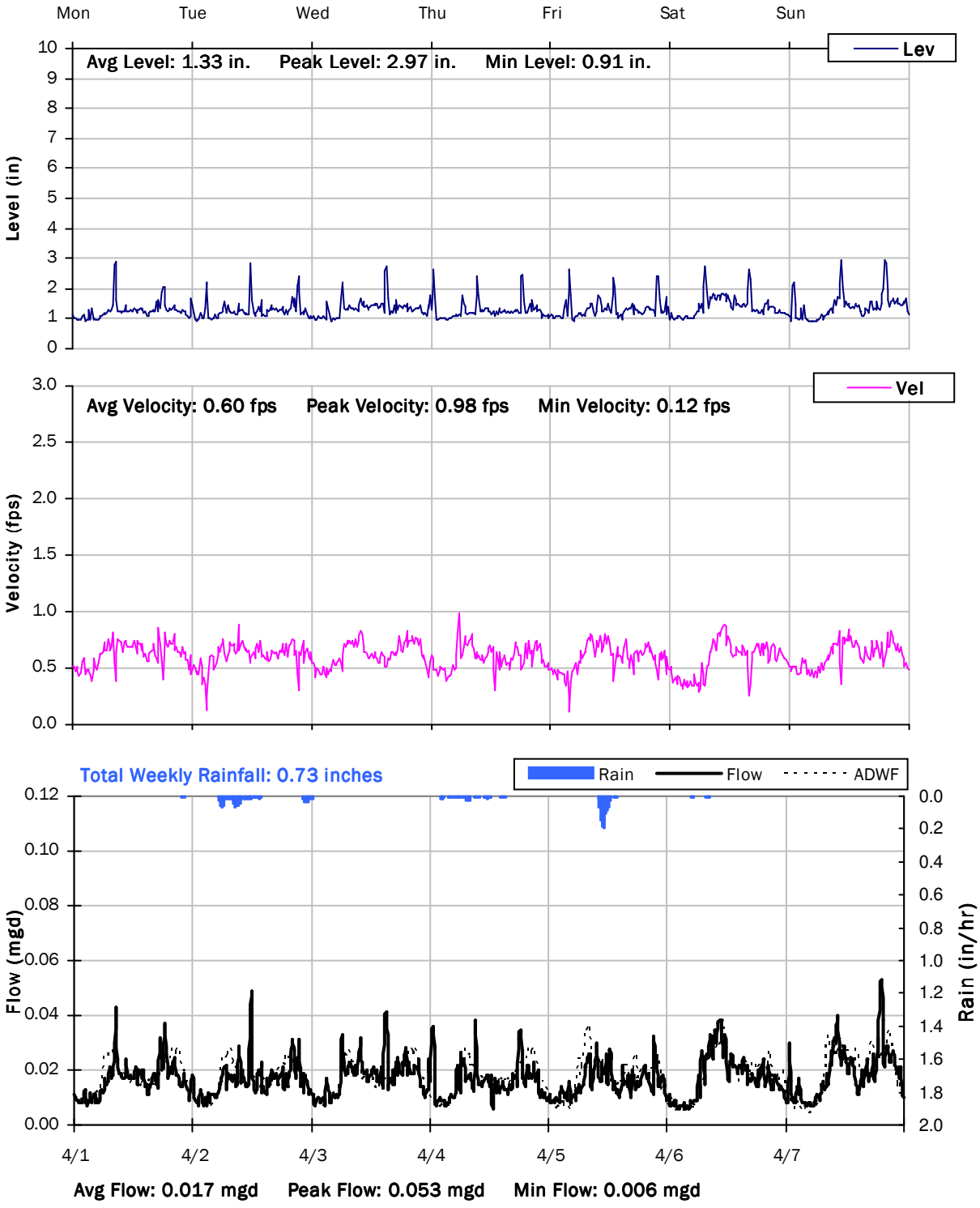
3/25/2019 to 4/1/2019



SITE 1

Weekly Level, Velocity and Flow Hydrographs

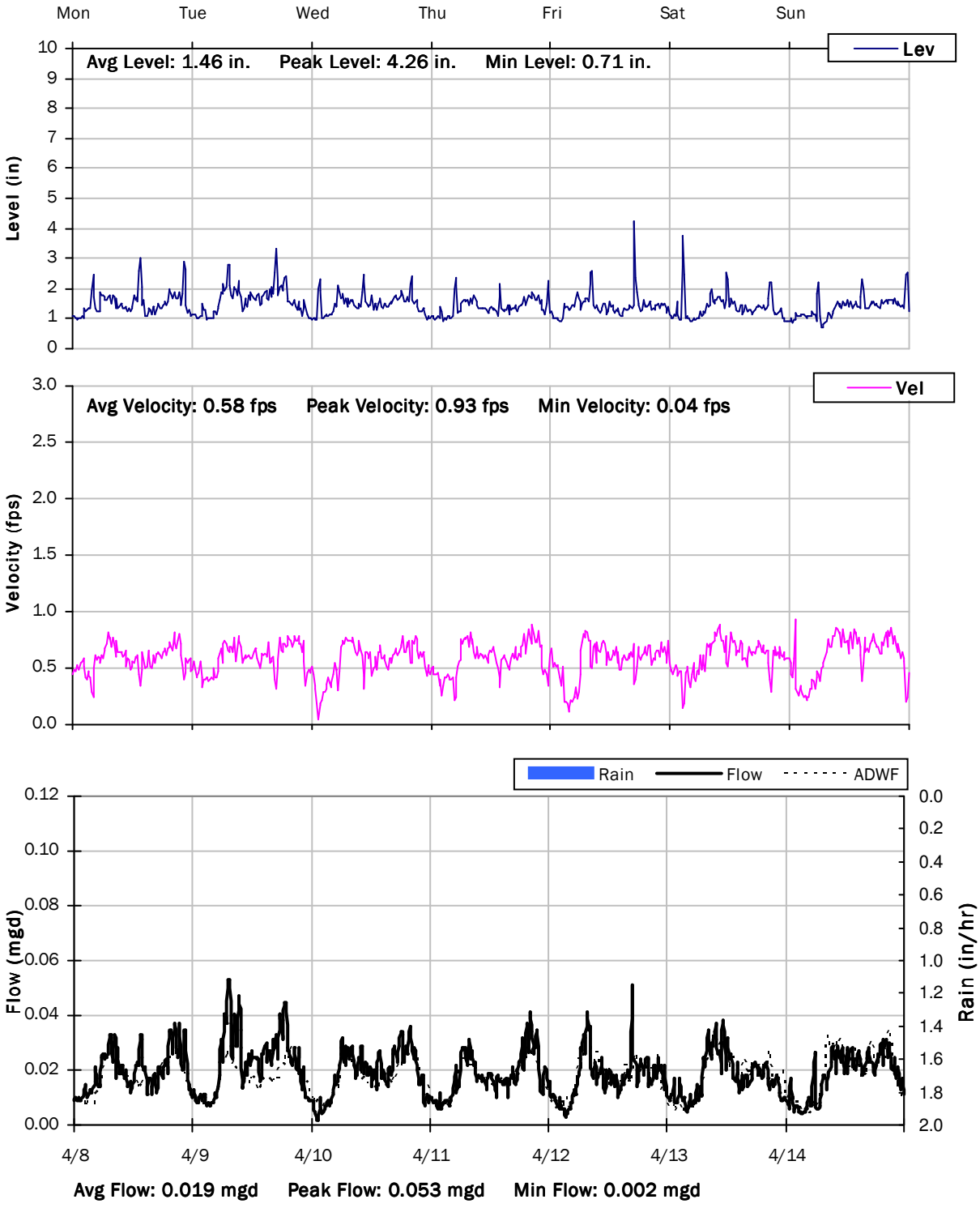
4/1/2019 to 4/8/2019



SITE 1

Weekly Level, Velocity and Flow Hydrographs

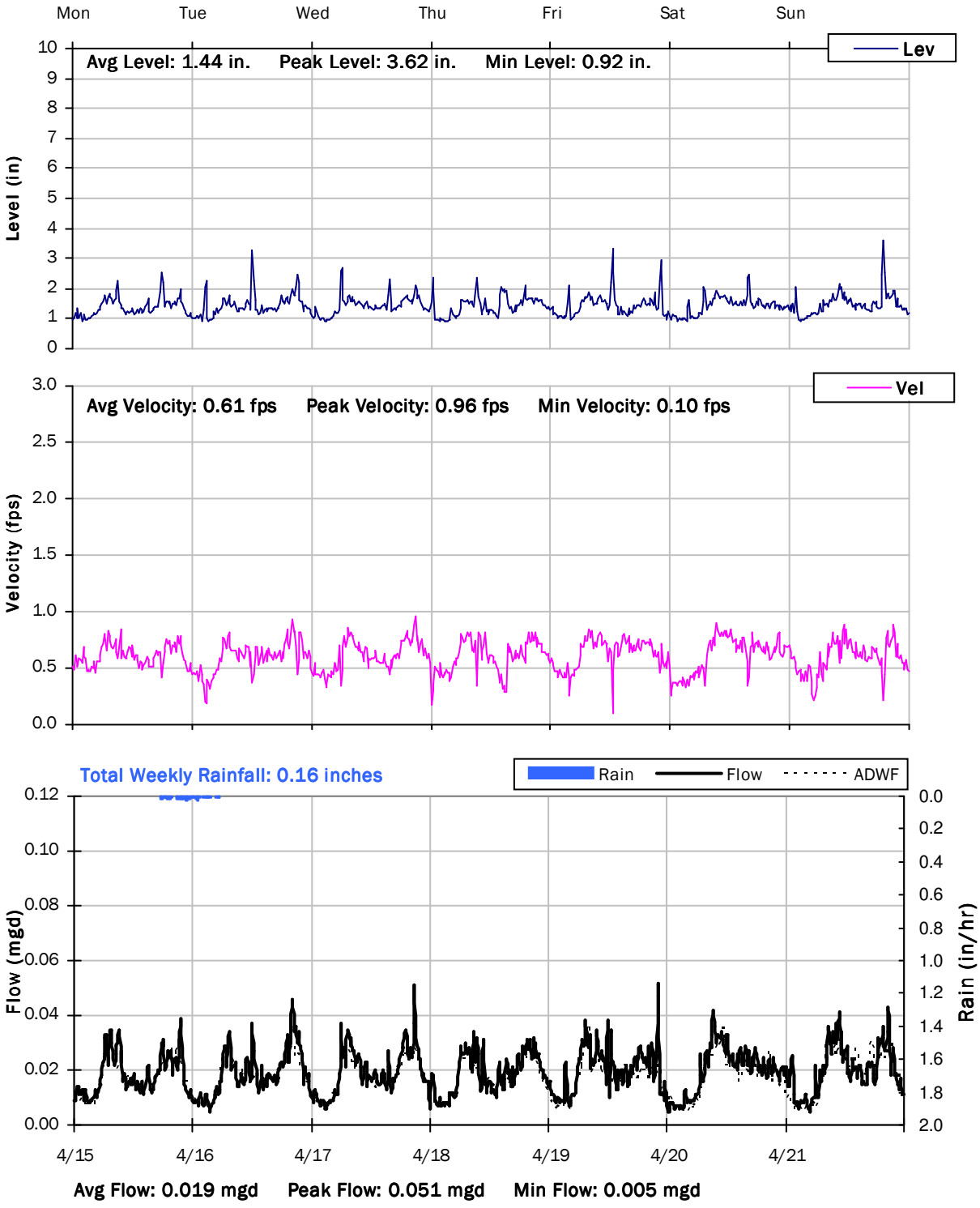
4/8/2019 to 4/15/2019



SITE 1

Weekly Level, Velocity and Flow Hydrographs

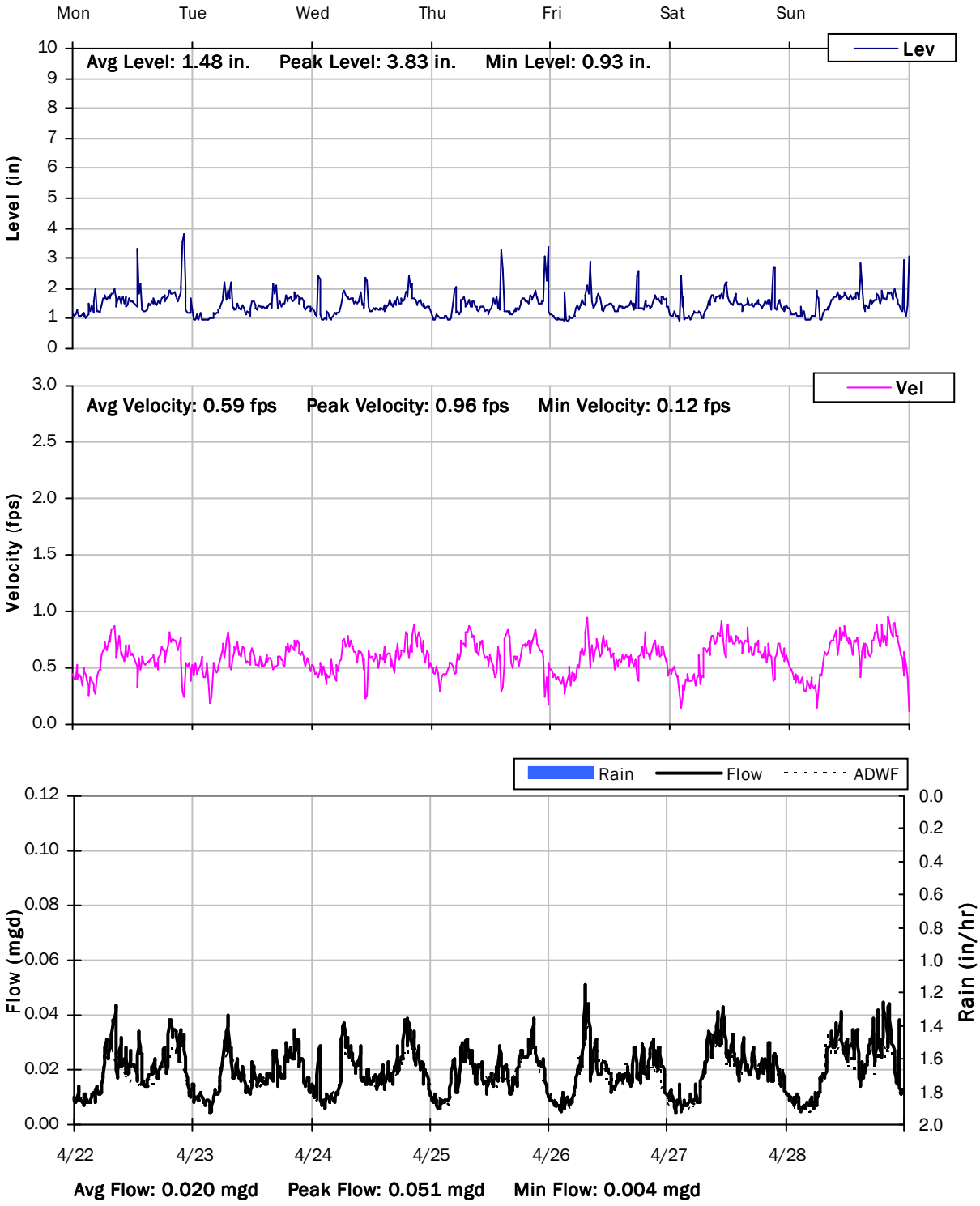
4/15/2019 to 4/22/2019



SITE 1

Weekly Level, Velocity and Flow Hydrographs

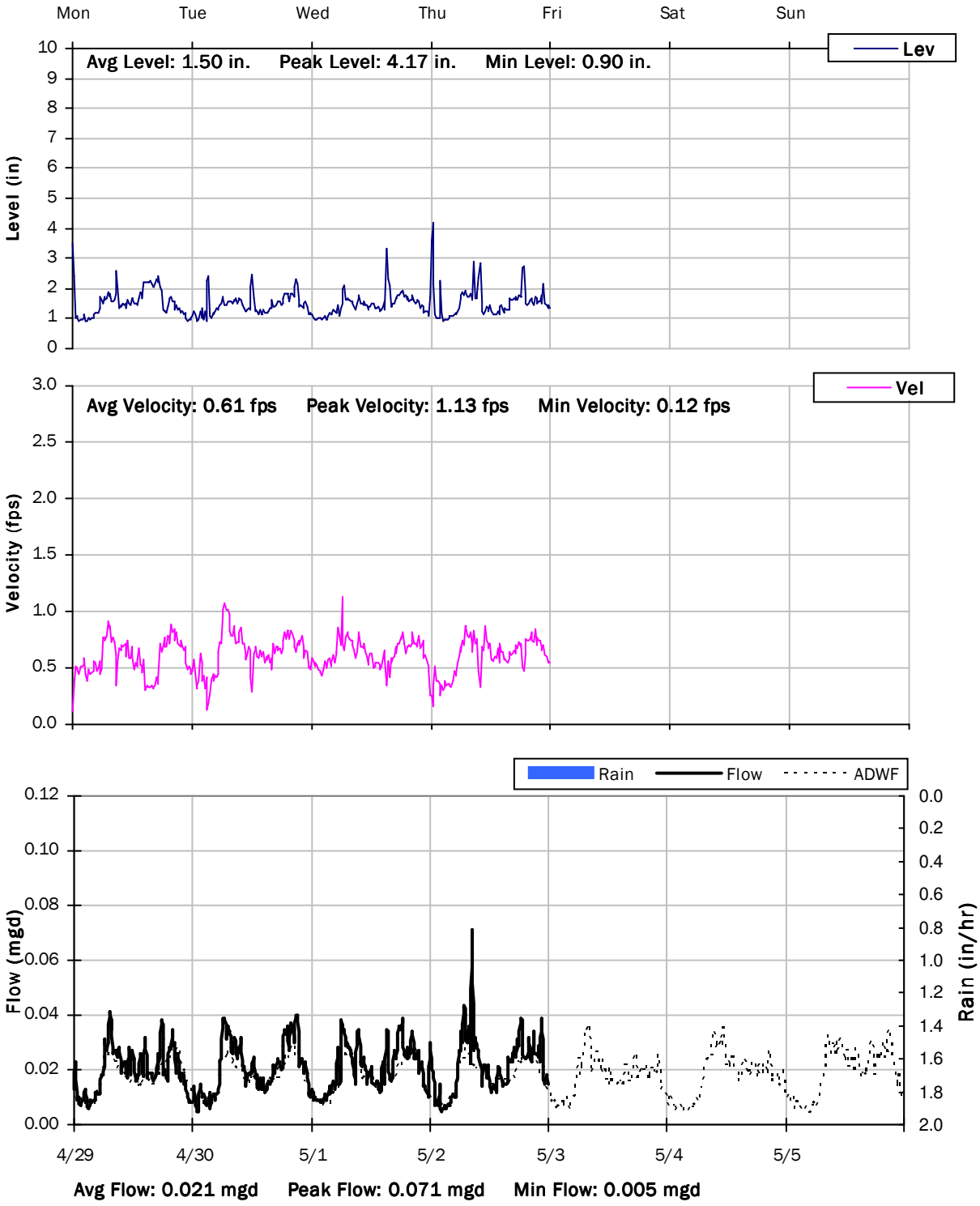
4/22/2019 to 4/29/2019



SITE 1

Weekly Level, Velocity and Flow Hydrographs

4/29/2019 to 5/6/2019



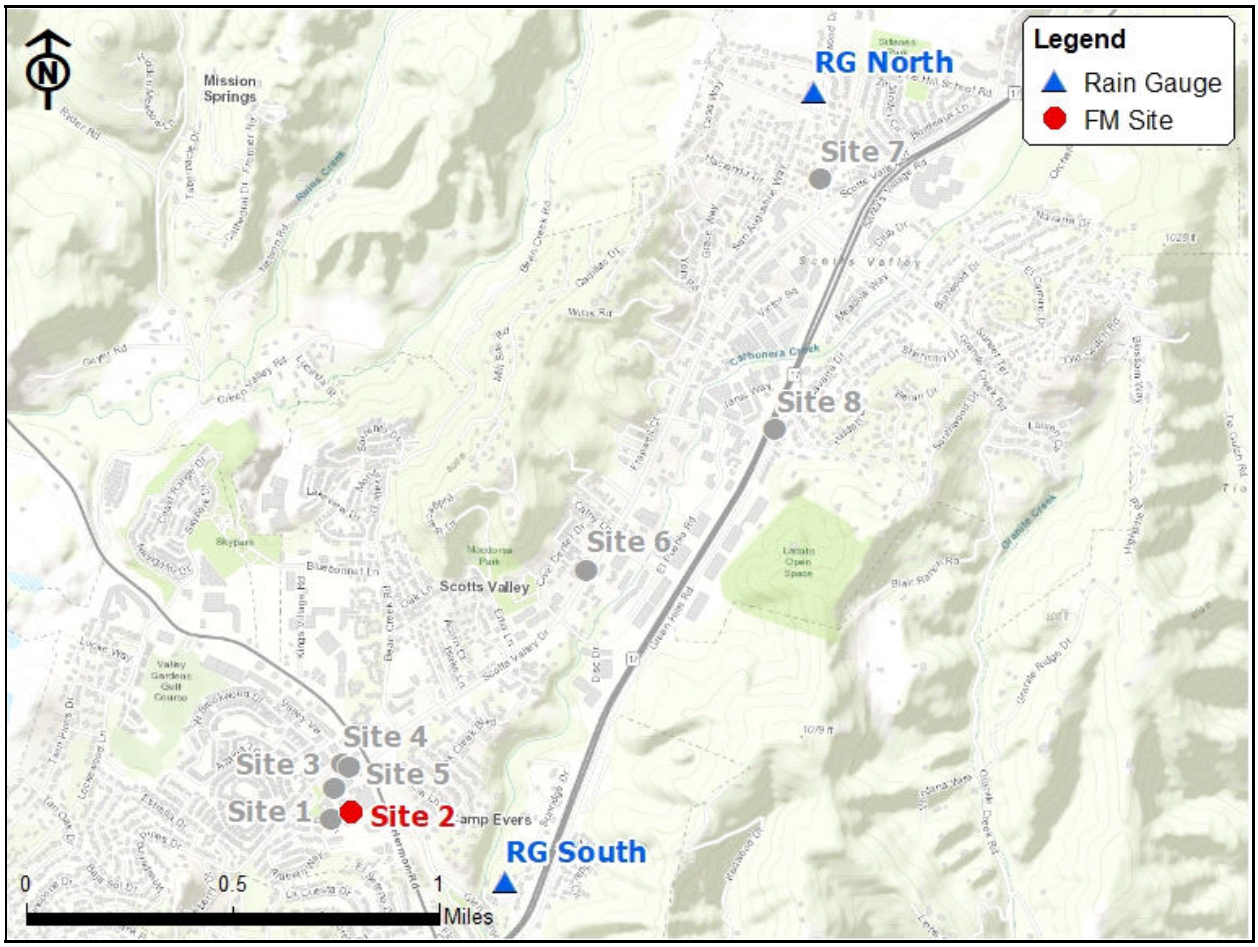
Carollo | Scotts Valley, California

Sanitary Sewer Flow Monitoring
January 30 - May 03, 2019

Monitoring Site: Site 2

Location: In Treatment Plant, behind parked car

Data Summary Report



Vicinity Map: Site 2

SITE 2

Site Information

Location: In Treatment Plant, behind parked car

Coordinates: 122.0256° W, 37.0410° N

Rim Elevation (Earth): 505 feet

Expected Pipe Diameter: 10 inches

Measured Pipe Diameter: 10 inches

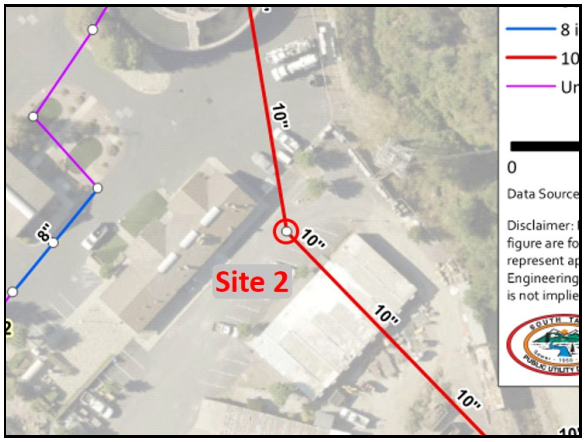
ADWF: 0.076 mgd

Peak Measured Flow: 0.411 mgd

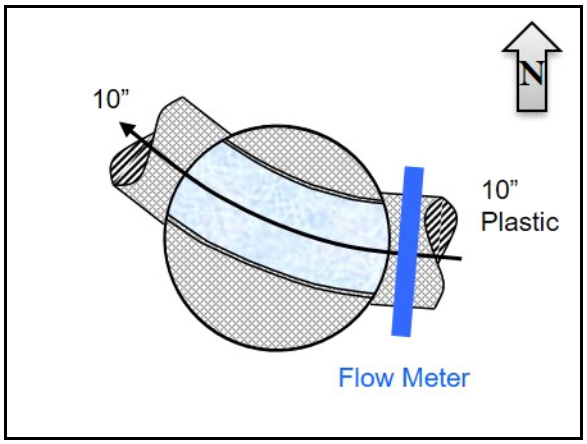
Sediment: None



Satellite Map



Sewer Map



Flow Sketch



Street View



Plan View

SITE 2

Additional Site Photos

Effluent Pipe



Monitored Influent Pipe

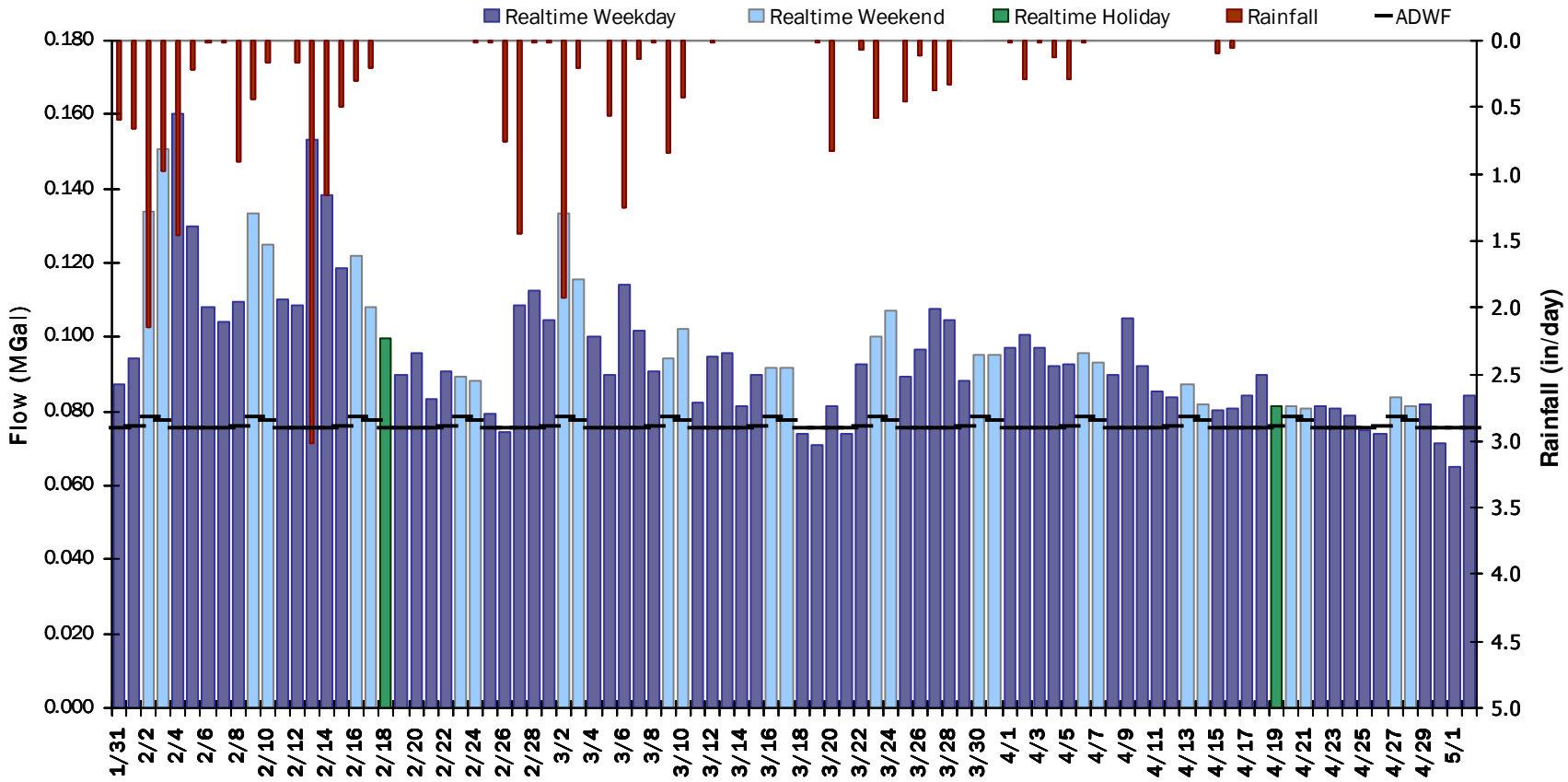


SITE 2

Period Flow Summary: Daily Flow Totals

Avg Daily Flow: 0.097 MGal Peak Daily Flow: 0.160 MGal Min Daily Flow: 0.065 MGal

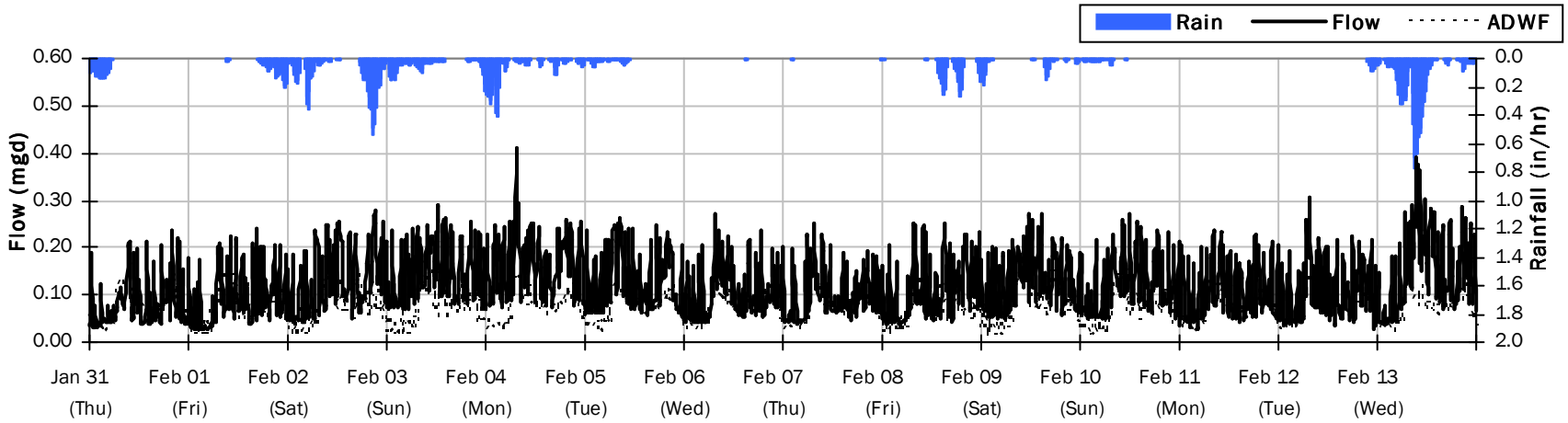
Total Rainfall: 24.20 inches

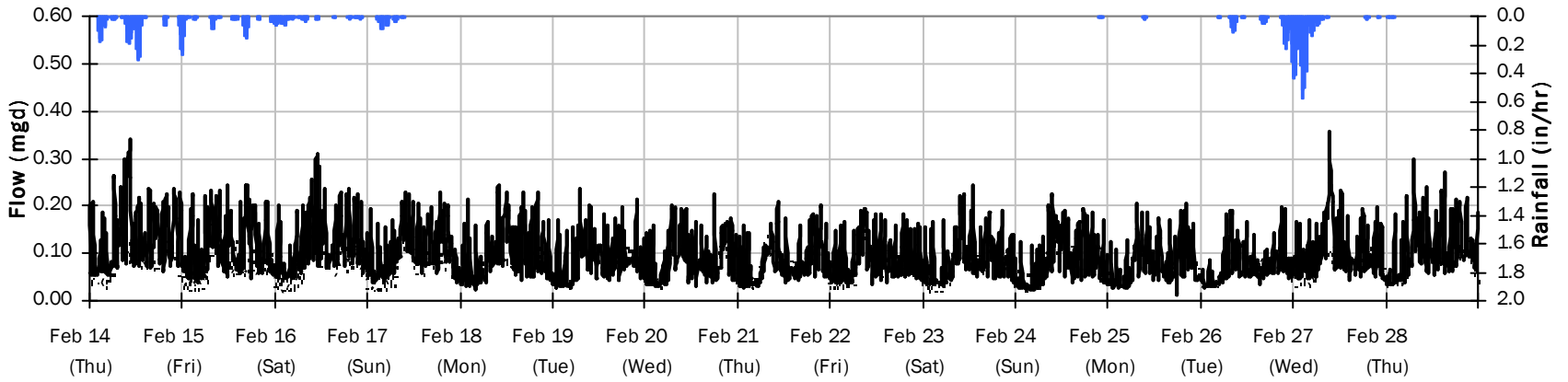


SITE 2

Flow Summary: 1/31/2019 to 2/28/2019

Period Rainfall: 15.16 inches Period Avg Flow: 0.111 mgd Period Peak Flow: 0.411 mgd Period Min Flow

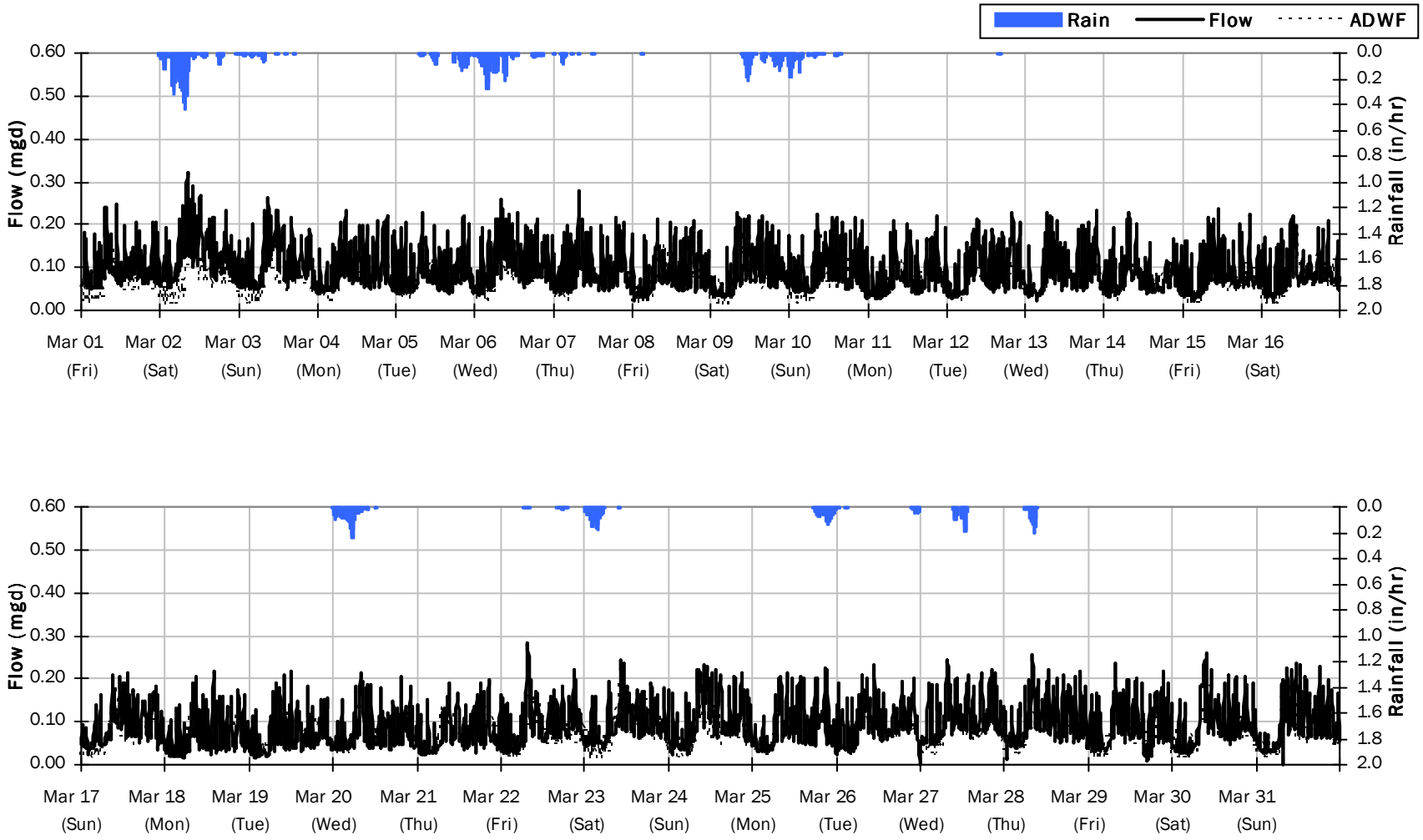




SITE 2

Flow Summary: 3/1/2019 to 3/31/2019

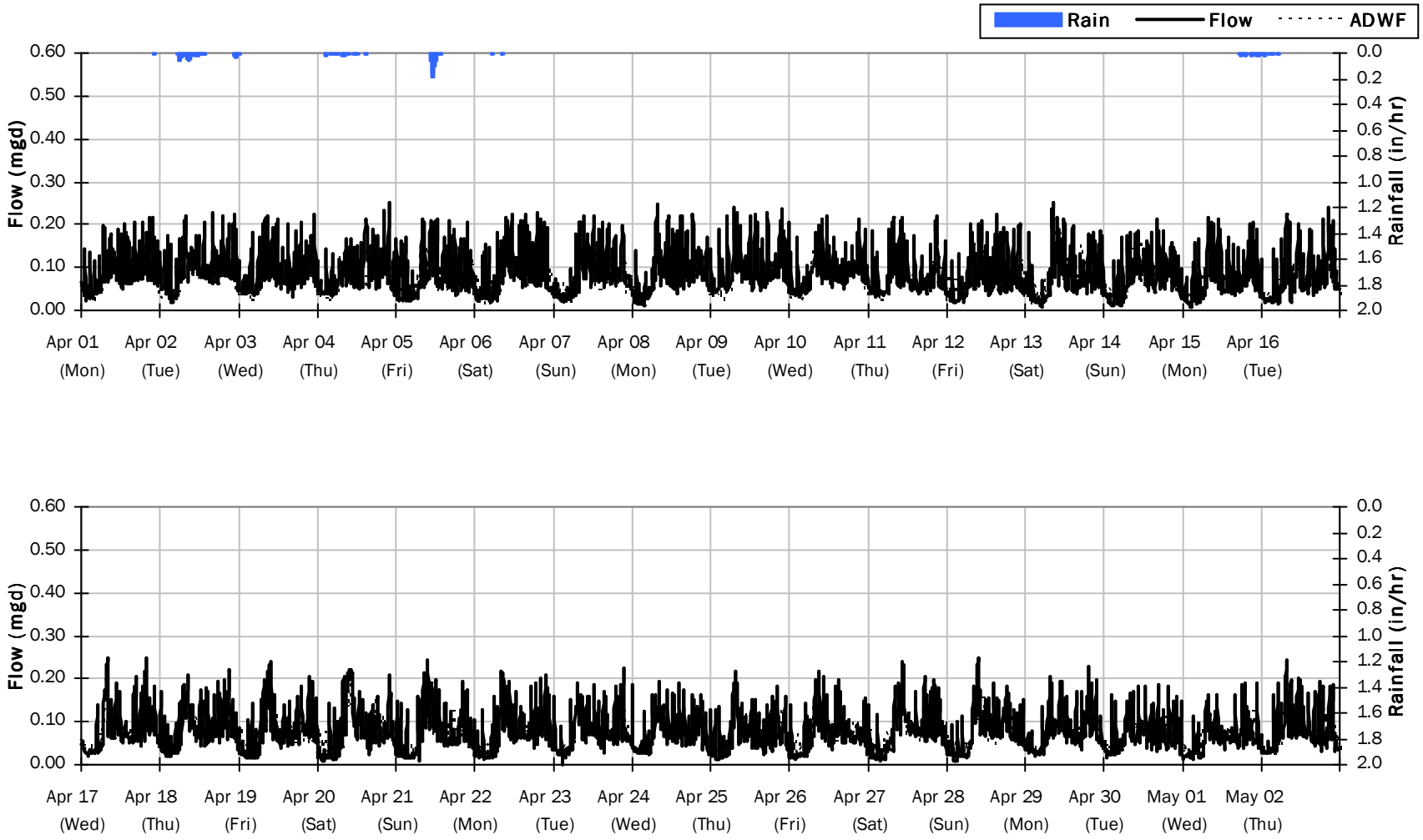
Period Rainfall: 8.15 inches Period Avg Flow: 0.095 mgd Period Peak Flow: 0.319 mgd Period Min Flow



SITE 2

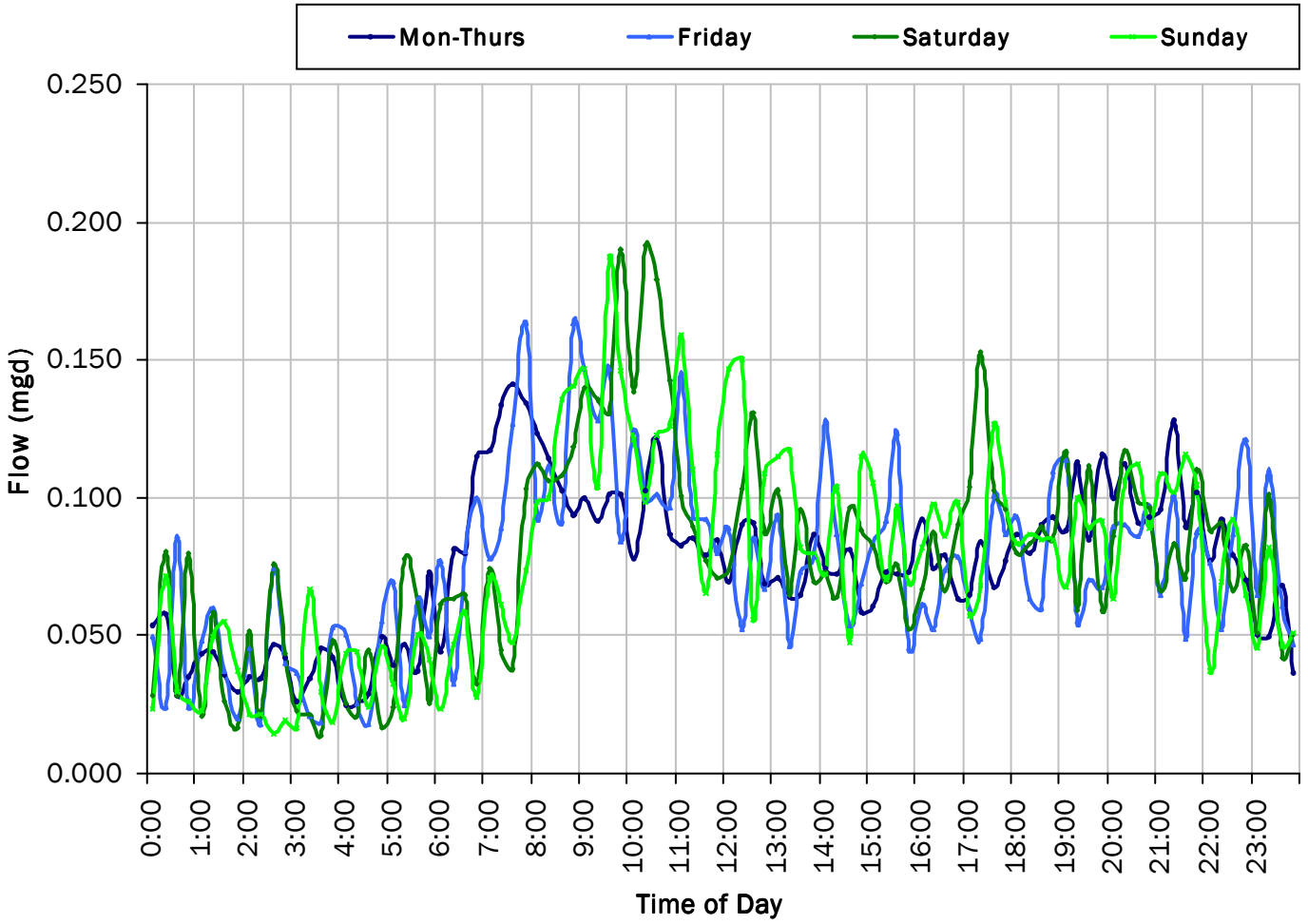
Flow Summary: 4/1/2019 to 5/2/2019

Period Rainfall: 0.88 inches Period Avg Flow: 0.085 mgd Period Peak Flow: 0.253 mgd Period Min Flow



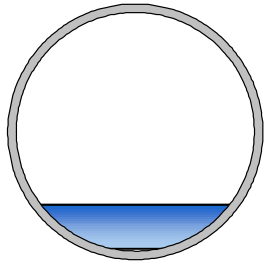
SITE 2

Average Dry Weather Flow Hydrographs



ADWF:

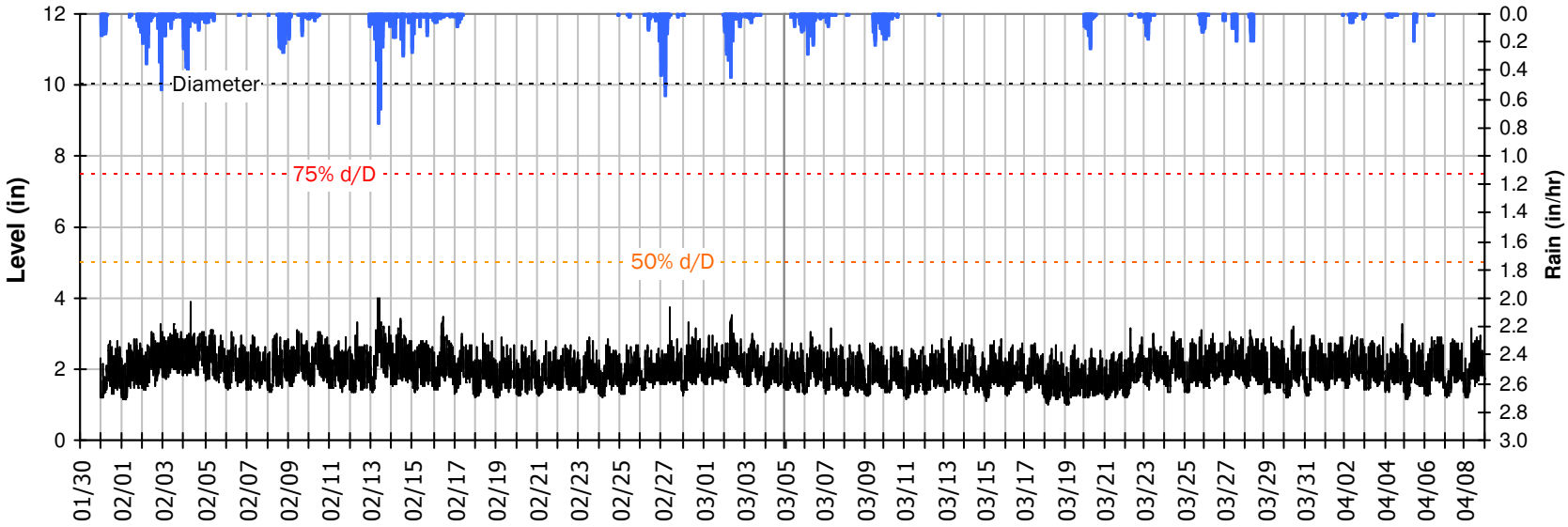
0.076 *mgd*

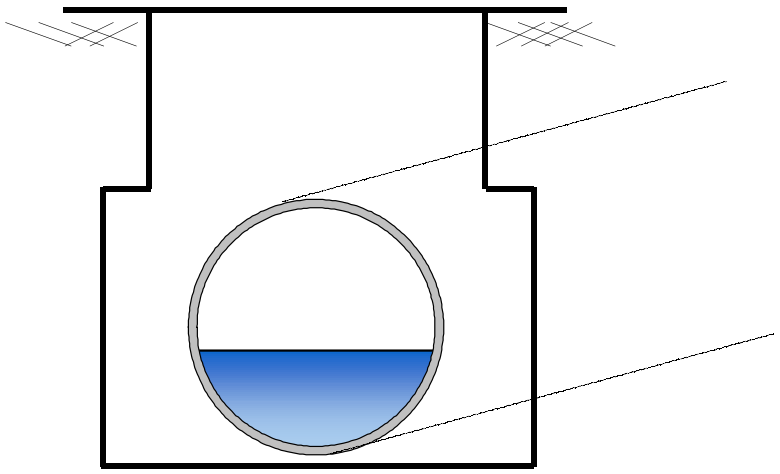


SITE 2

Site Capacity and Surcharge Summary

Realtime Flow Levels with Rainfall Data over Peak Level Period

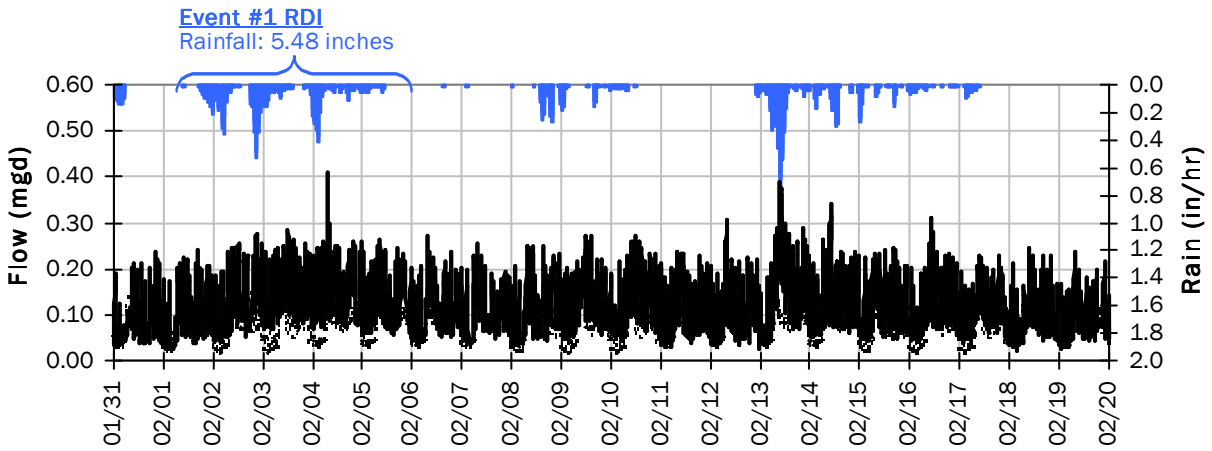




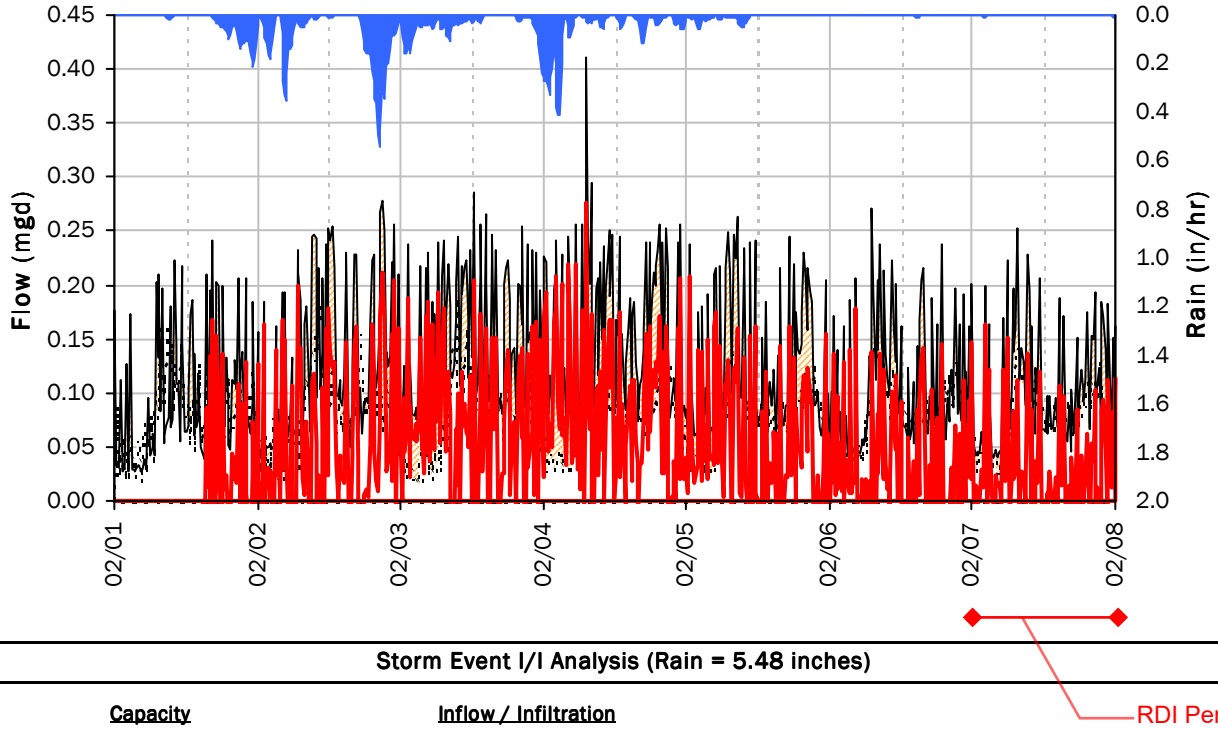
Pipe Diameter:	10	*inches*
Peak Measured Level:	4.01	*inches*
Peak d/D Ratio:	0.40	

SITE 2
I/I Summary: Event #1 RDI

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #1 RDI Detail Graph

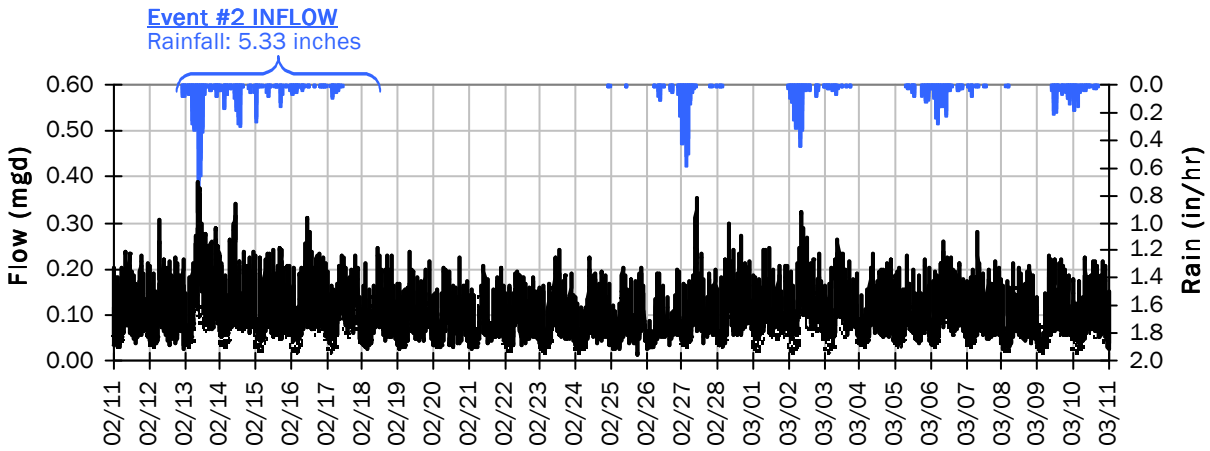


Storm Event I/I Analysis (Rain = 5.48 inches)

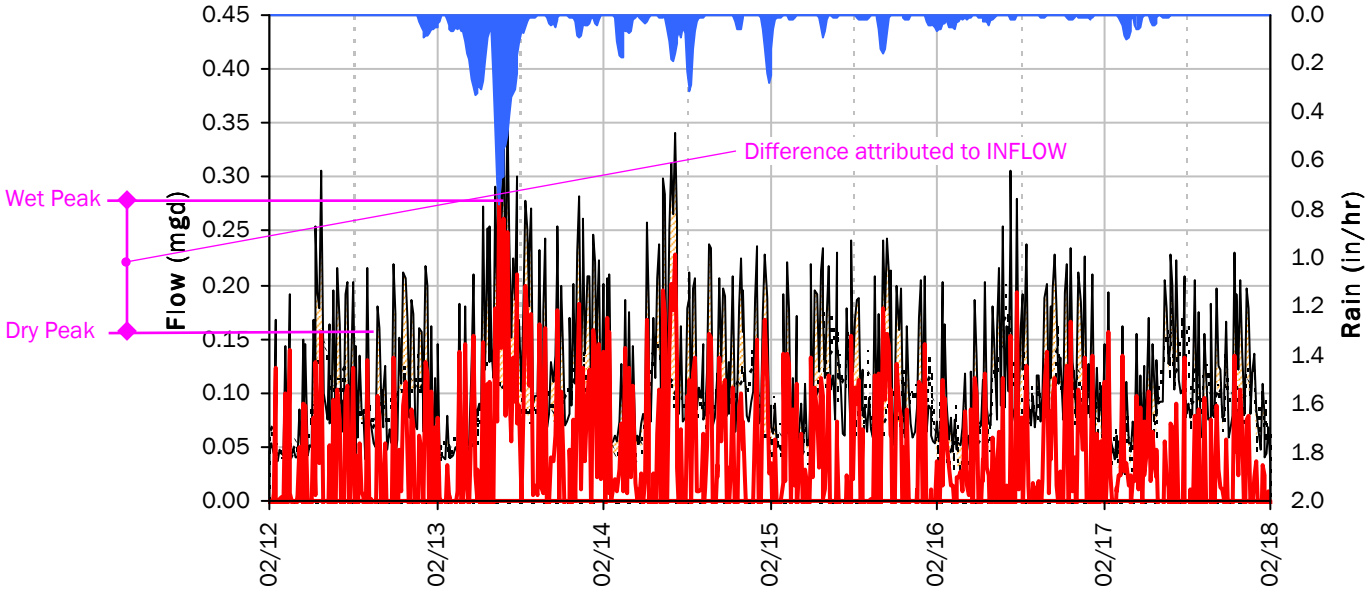
Capacity		Inflow / Infiltration	
Peak Flow:	0.411 *mgd*	**RDI:**	0.030 *mgd*
PF:	5.40		
Peak Level:	3.92 *in*		
d/D Ratio:	0.39		

SITE 2
I/I Summary: Event #2 INFLOW

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #2 INFLOW Detail Graph

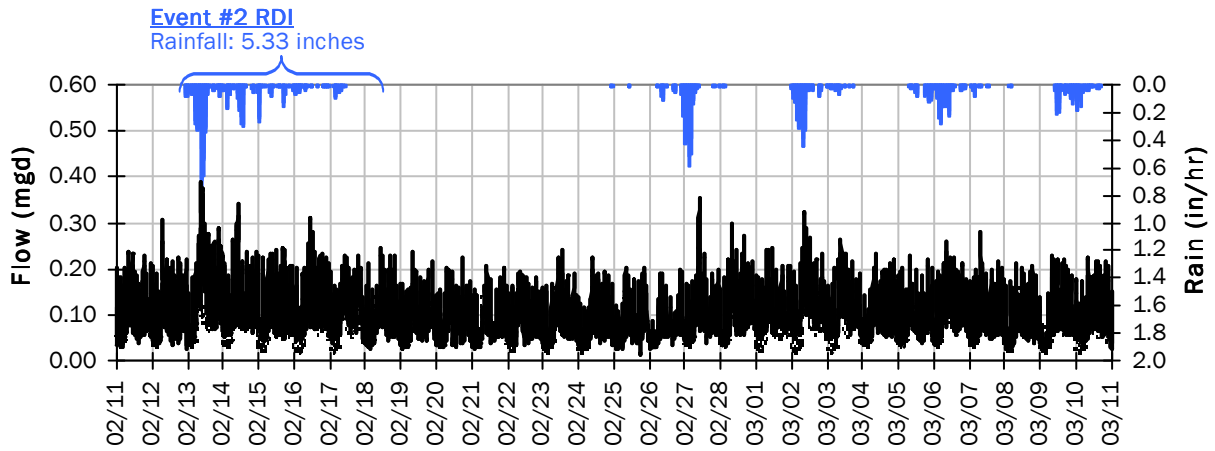


Storm Event I/I Analysis (Rain = 5.33 inches)

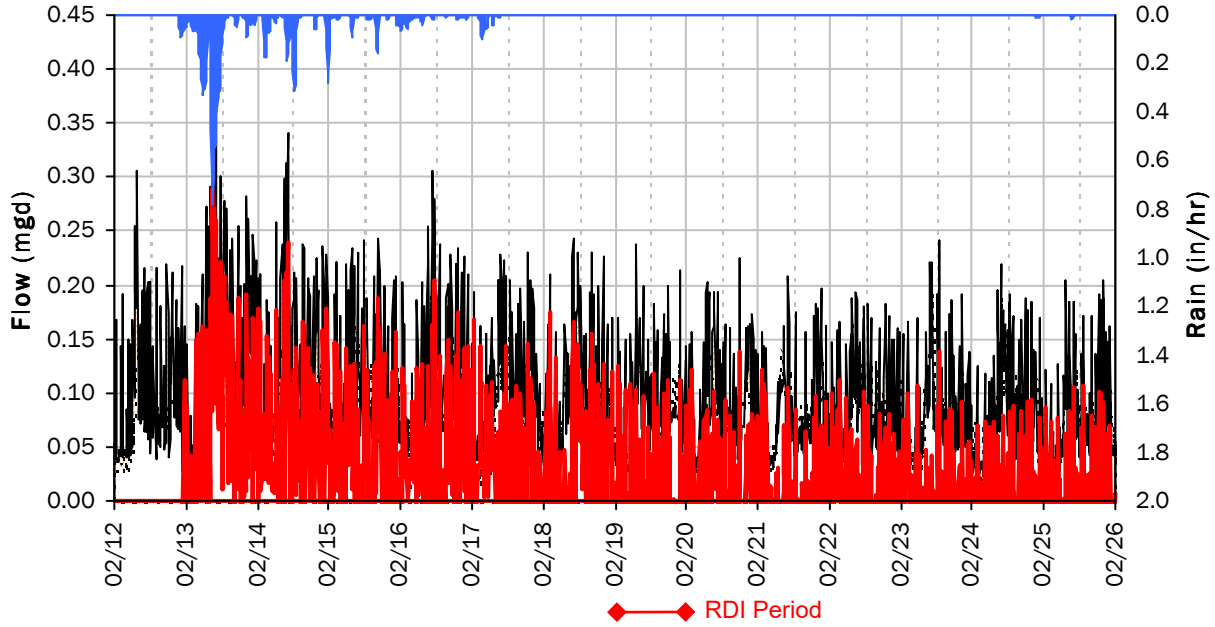
Capacity		Inflow / Infiltration	
Peak Flow:	0.390 *mgd*	**Peak I/I Rate:**	0.124 *mgd*
PF:	5.13		
Peak Level:	4.01 *in*		
d/D Ratio:	0.40		

SITE 2
I/I Summary: Event #2 RDI

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #2 RDI Detail Graph

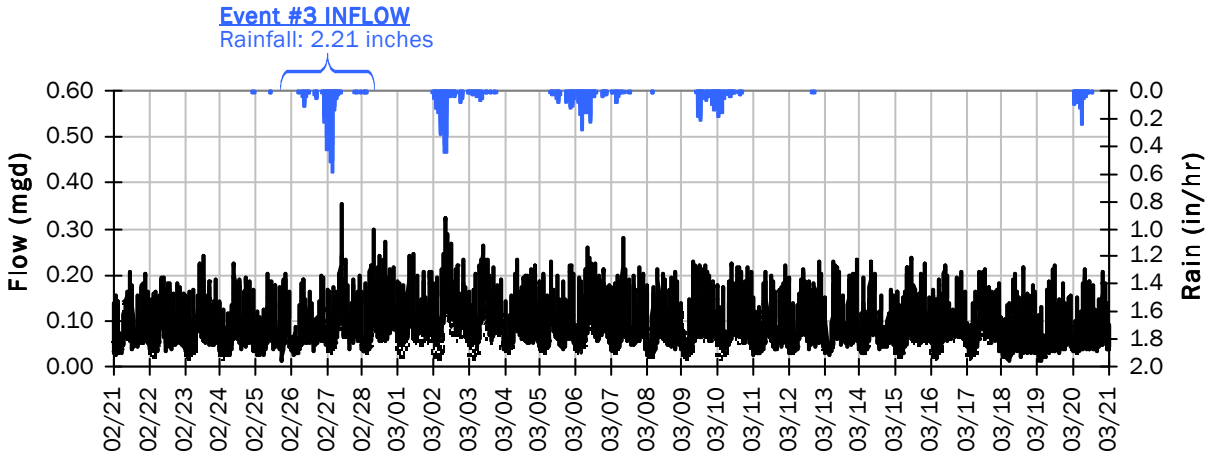


Storm Event I/I Analysis (Rain = 5.33 inches)

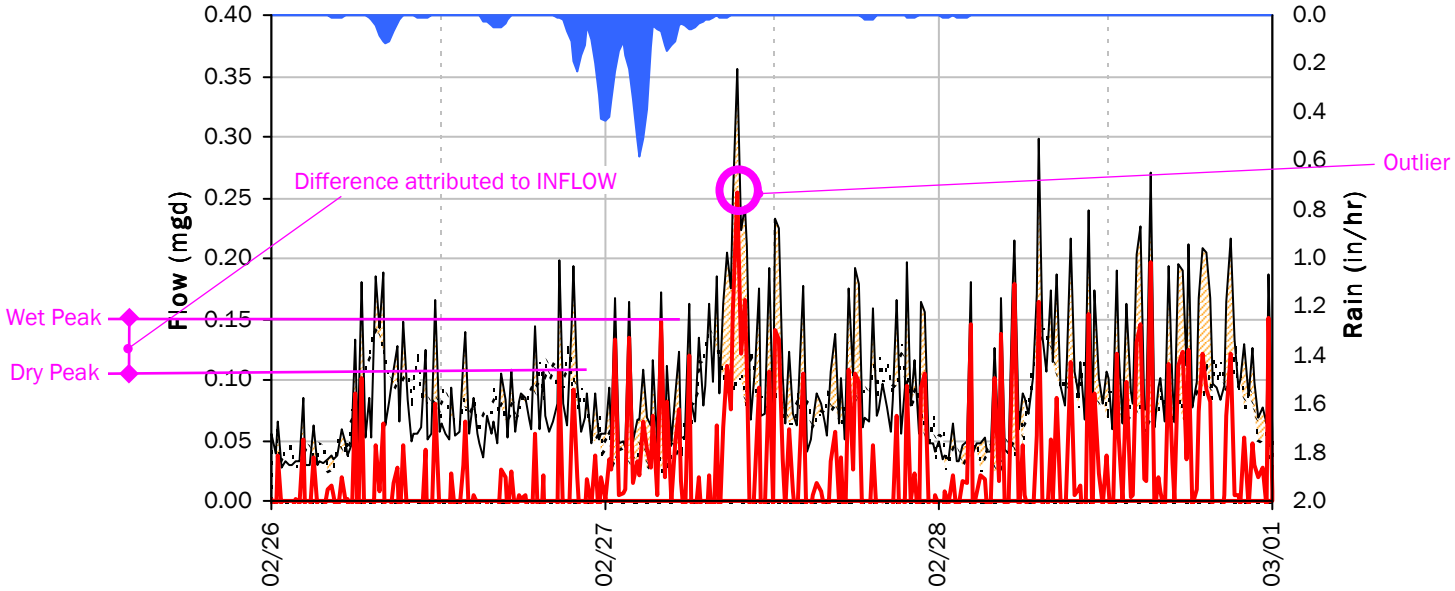
Capacity		Inflow / Infiltration	
Peak Flow:	0.390 *mgd*	**RDI:**	0.015 *mgd*
PF:	5.13		
Peak Level:	4.01 *in*		
d/D Ratio:	0.40		

SITE 2
I/I Summary: Event #3 INFLOW

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #3 INFLOW Detail Graph

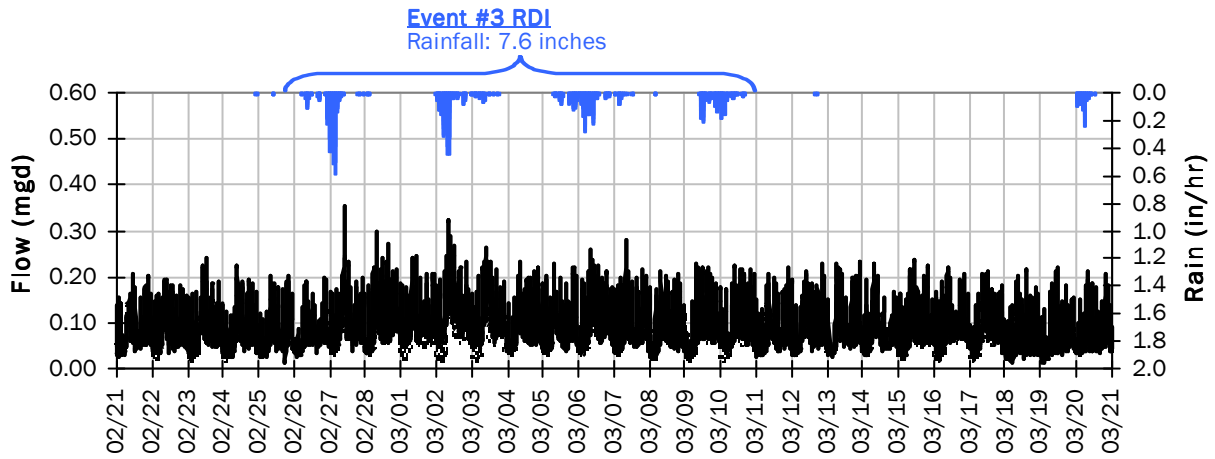


Storm Event I/I Analysis (Rain = 2.21 inches)

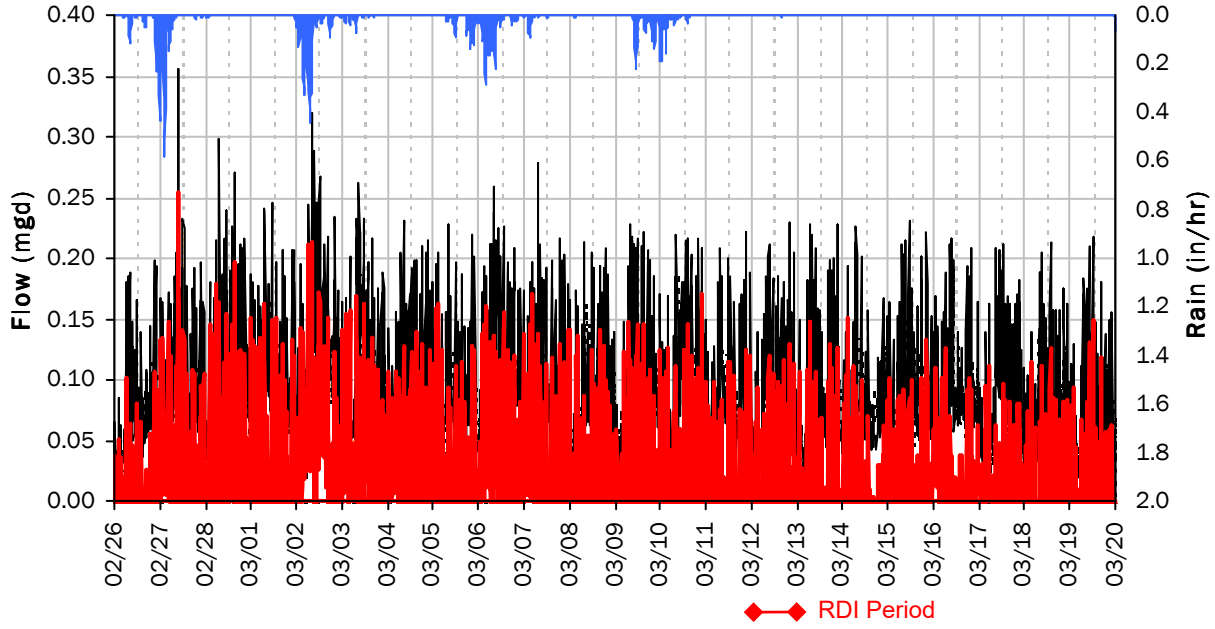
Capacity		Inflow / Infiltration	
Peak Flow:	0.36 *mgd*	**Peak I/I Rate:**	0.040 *mgd*
PF:	4.68		
Peak Level:	3.76 *in*		
d/D Ratio:	0.38		

SITE 2
I/I Summary: Event #3 RDI

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #3 RDI Detail Graph



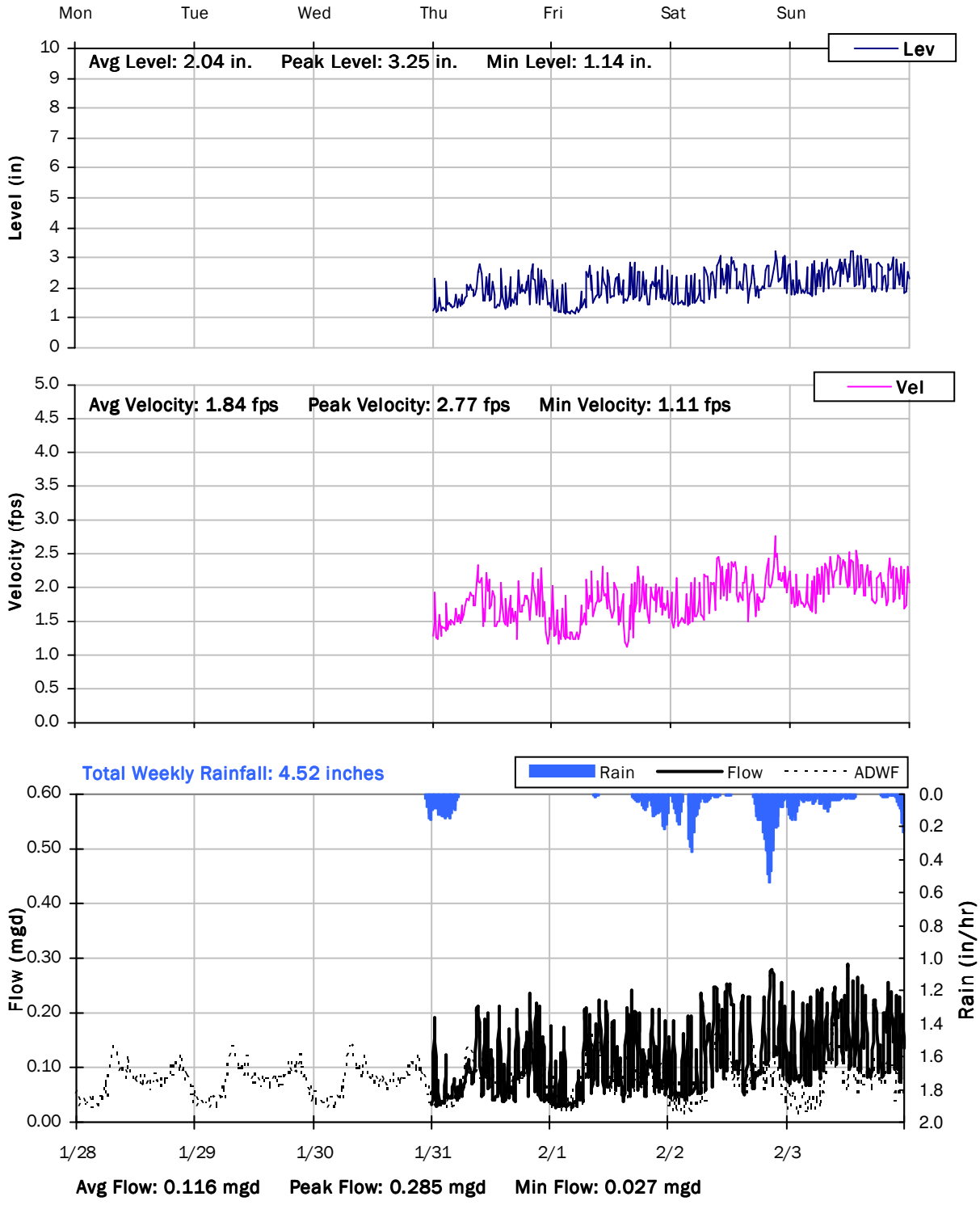
Storm Event I/I Analysis (Rain = 7.60 inches)

Capacity		Inflow / Infiltration	
Peak Flow:	0.36 *mgd*	**RDI:**	0.019 *mgd*
PF:	4.68		
Peak Level:	3.76 *in*		
d/D Ratio:	0.38		

SITE 2

Weekly Level, Velocity and Flow Hydrographs

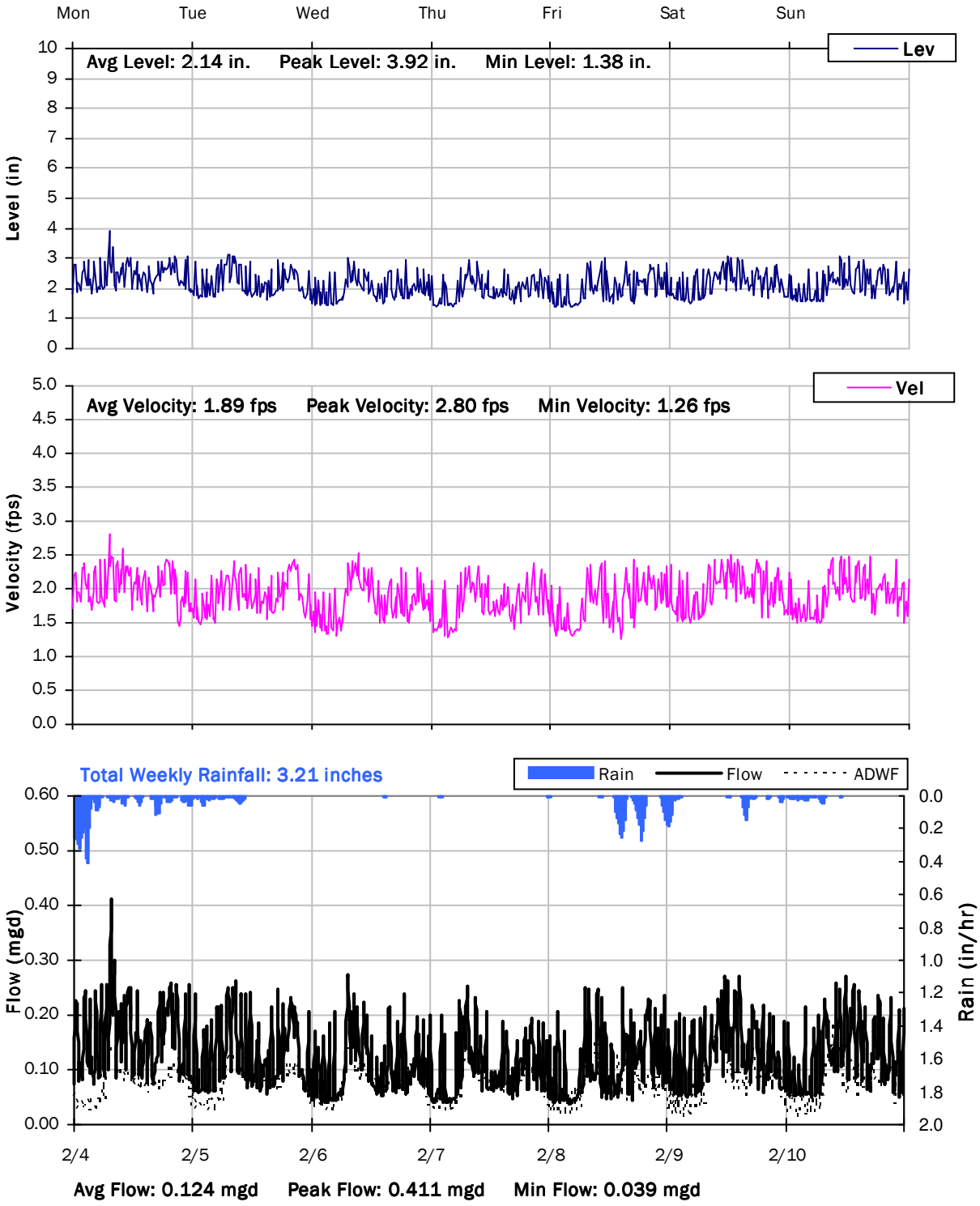
1/28/2019 to 2/4/2019



SITE 2

Weekly Level, Velocity and Flow Hydrographs

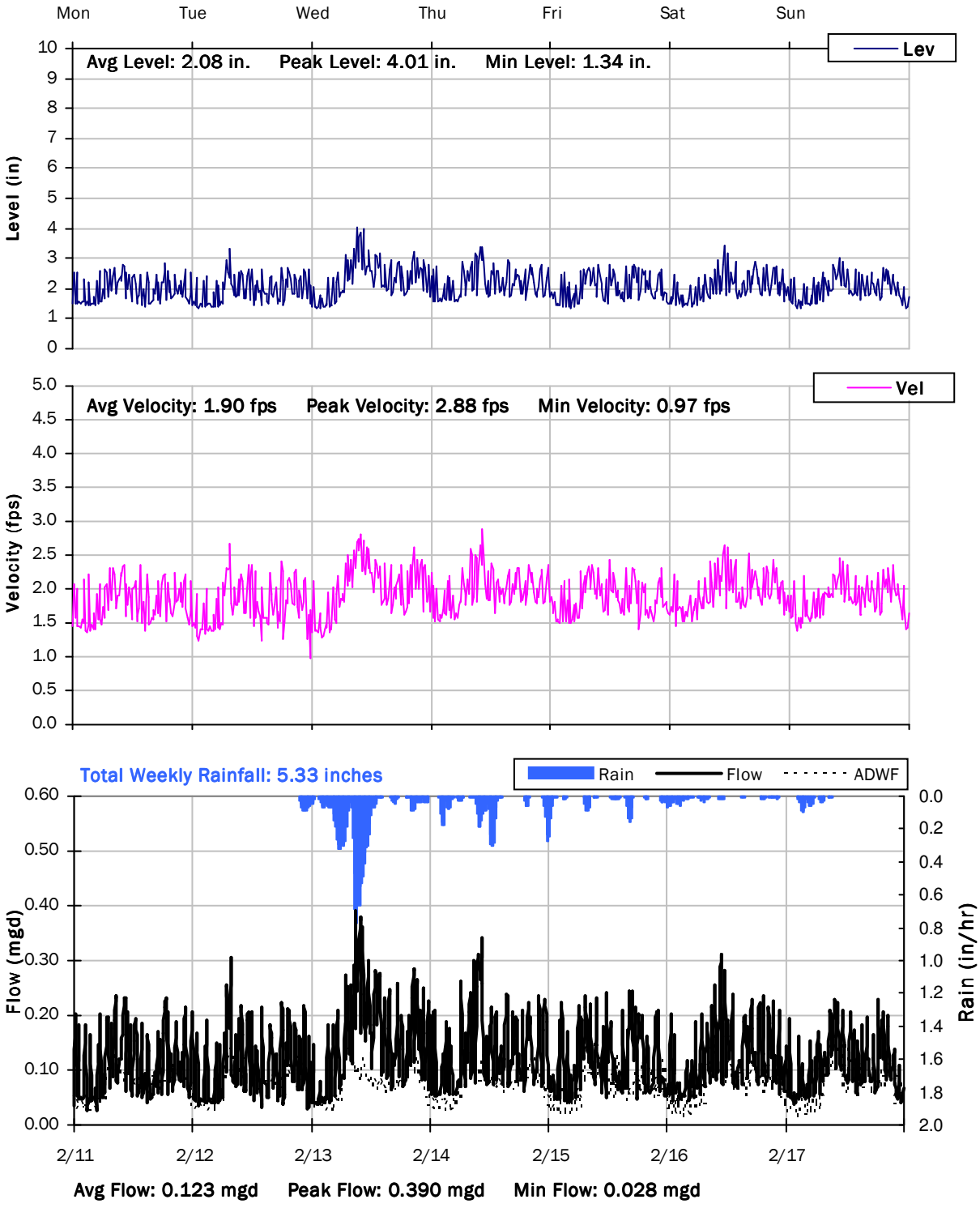
2/4/2019 to 2/11/2019



SITE 2

Weekly Level, Velocity and Flow Hydrographs

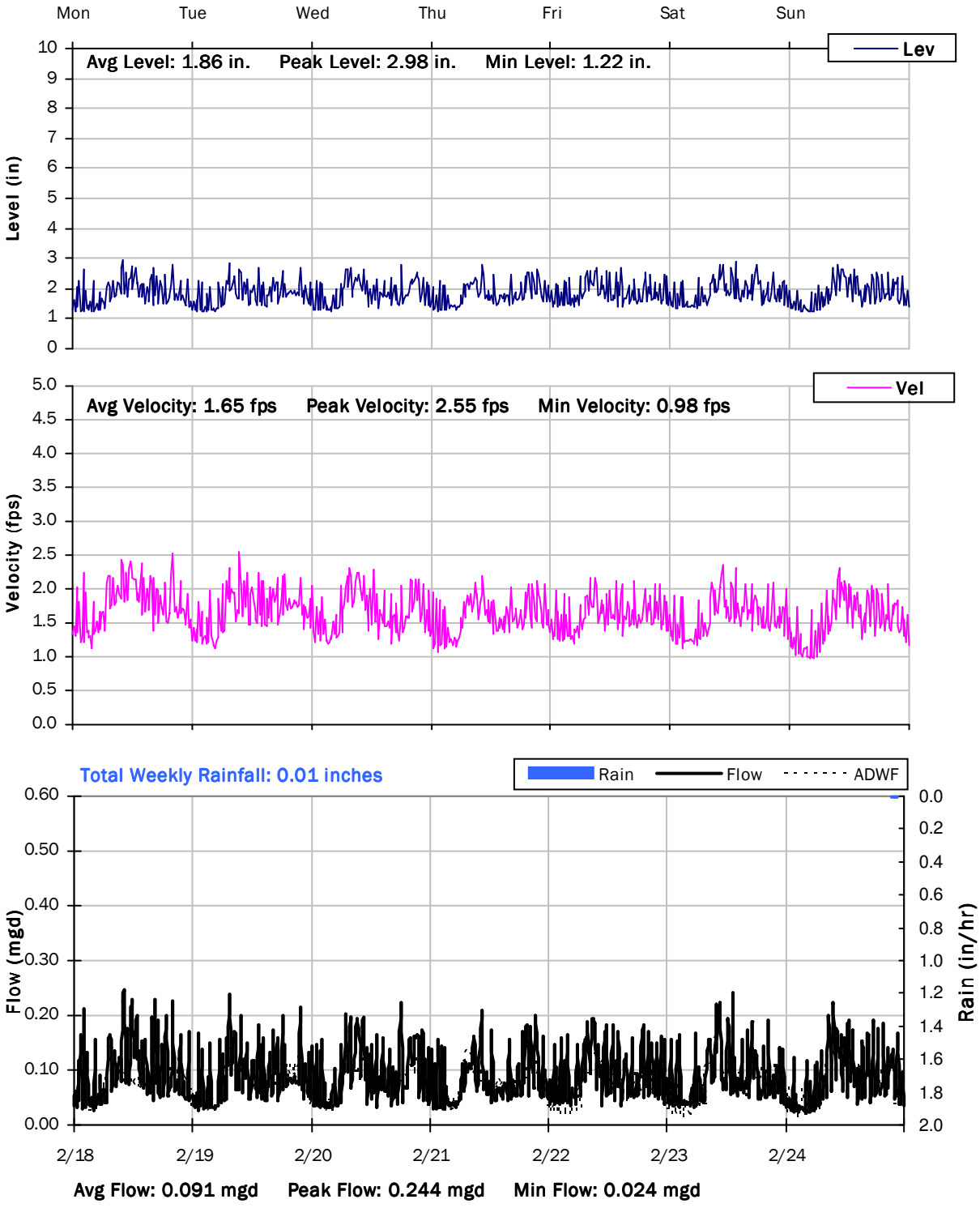
2/11/2019 to 2/18/2019



SITE 2

Weekly Level, Velocity and Flow Hydrographs

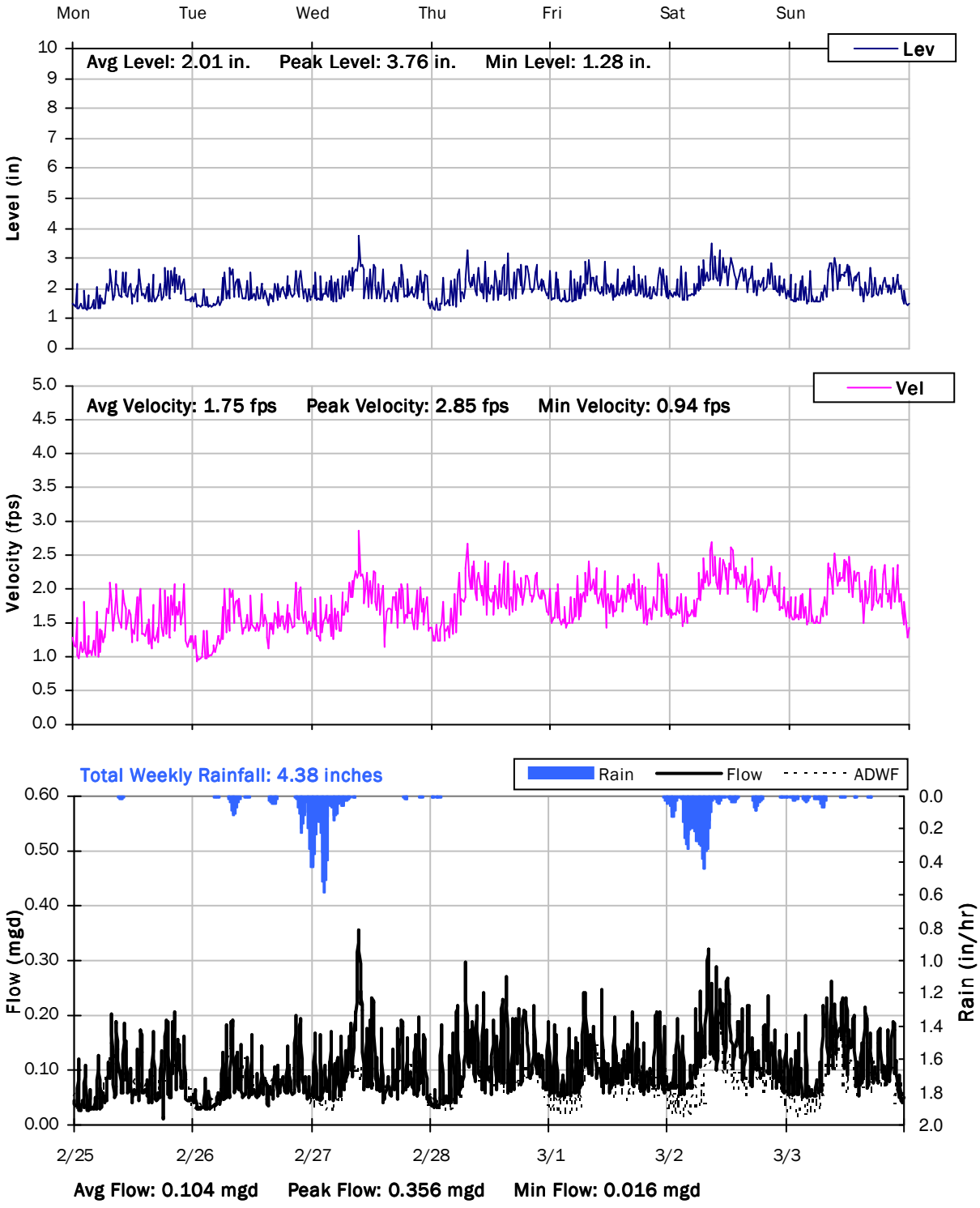
2/18/2019 to 2/25/2019



SITE 2

Weekly Level, Velocity and Flow Hydrographs

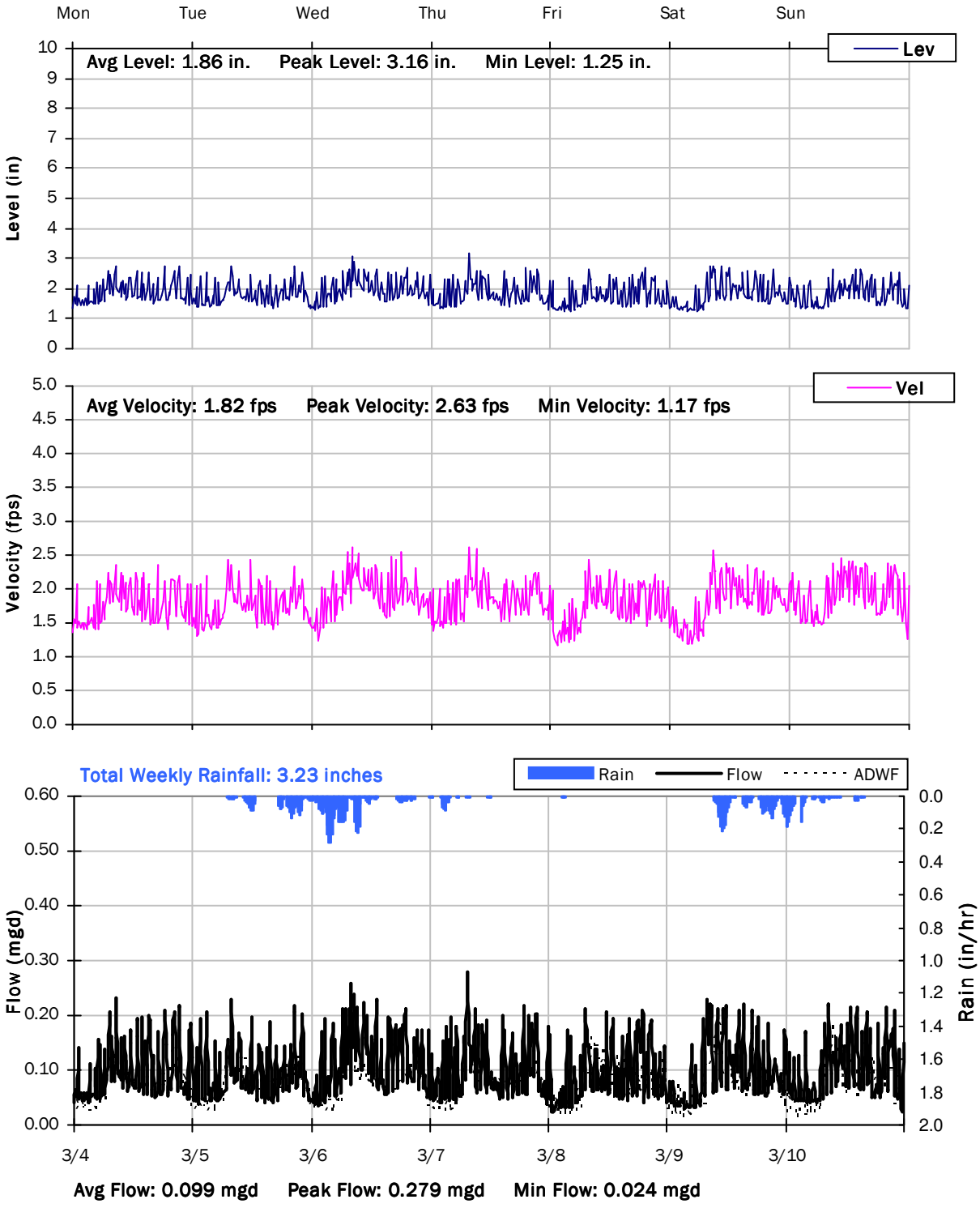
2/25/2019 to 3/4/2019



SITE 2

Weekly Level, Velocity and Flow Hydrographs

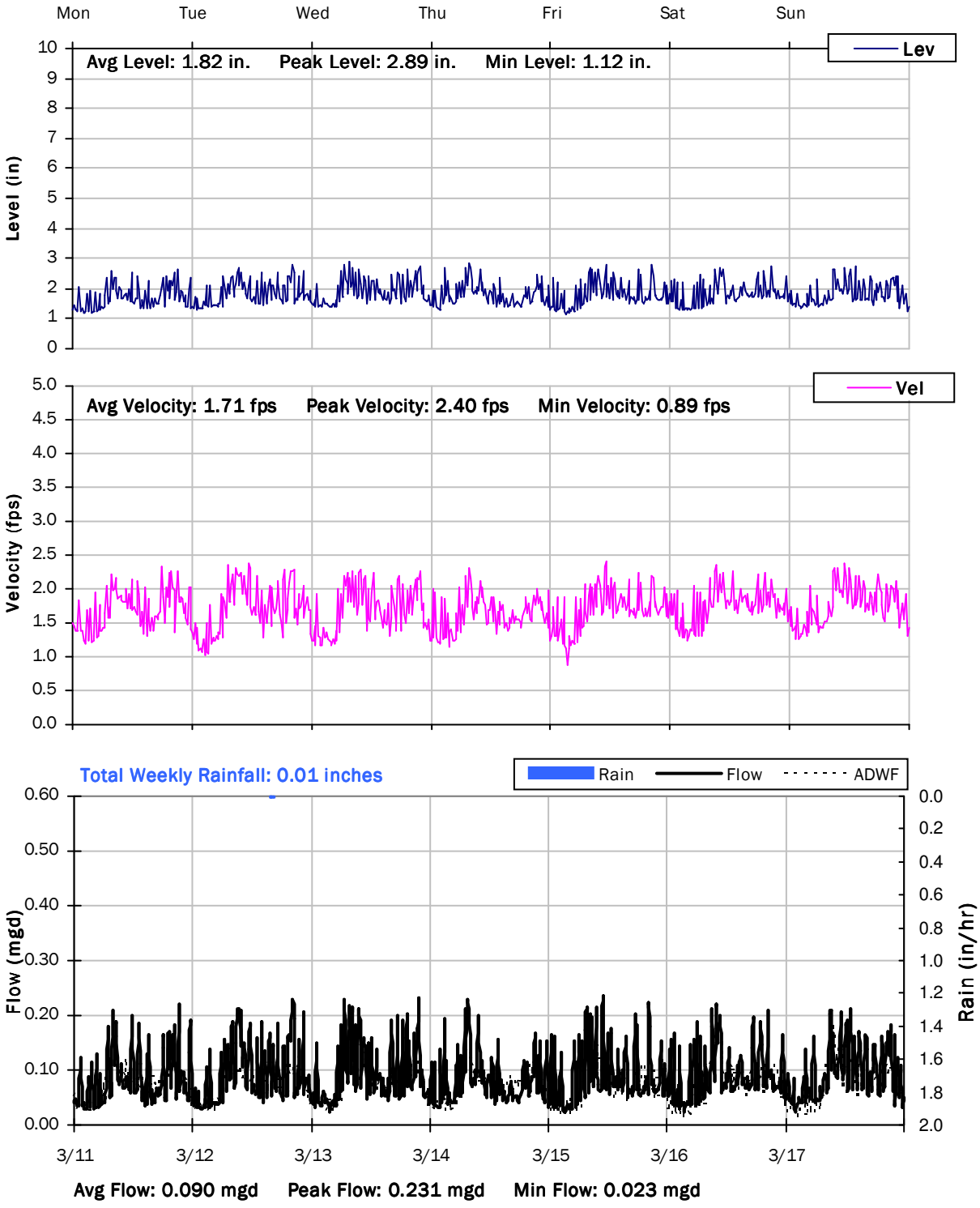
3/4/2019 to 3/11/2019



SITE 2

Weekly Level, Velocity and Flow Hydrographs

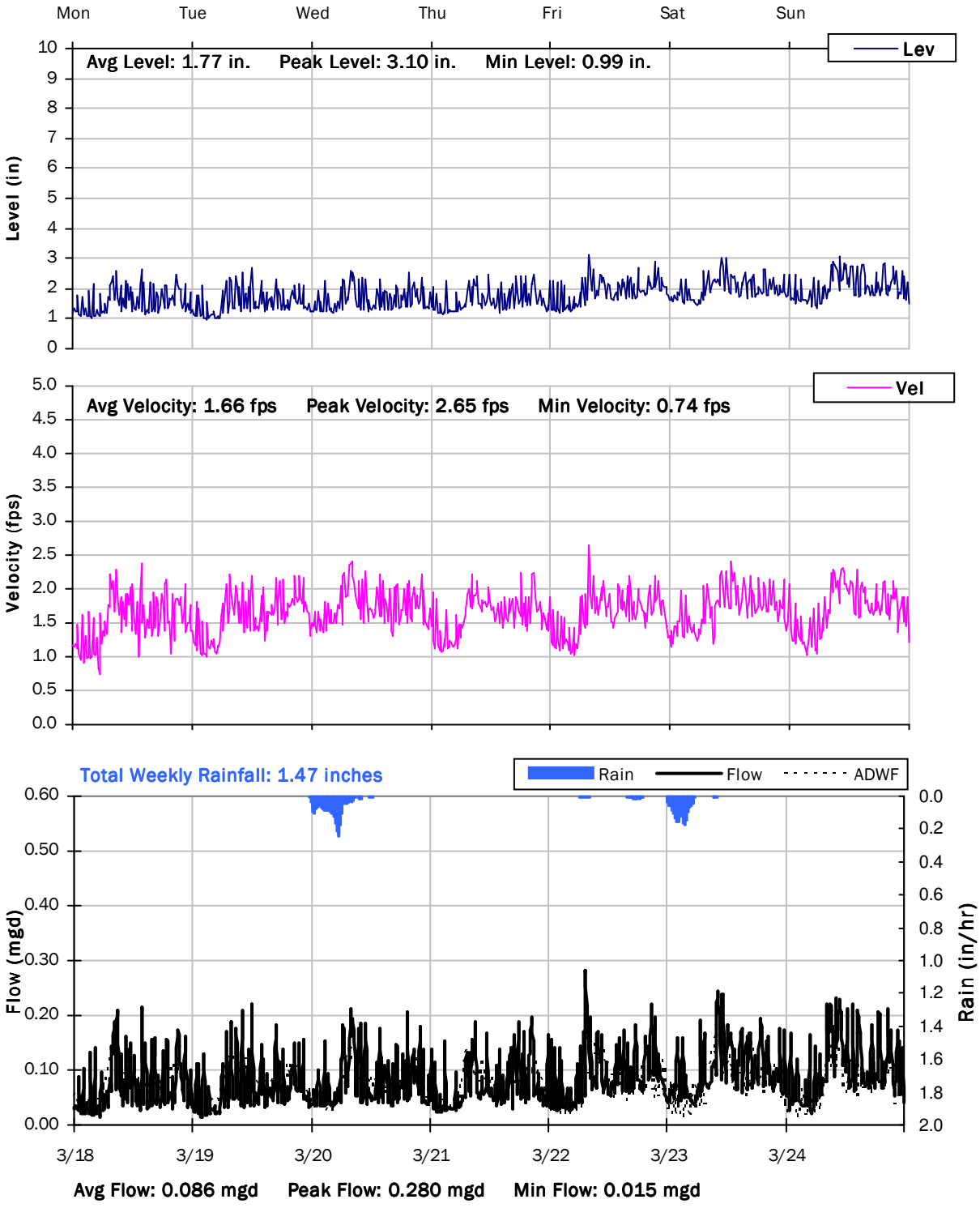
3/11/2019 to 3/18/2019



SITE 2

Weekly Level, Velocity and Flow Hydrographs

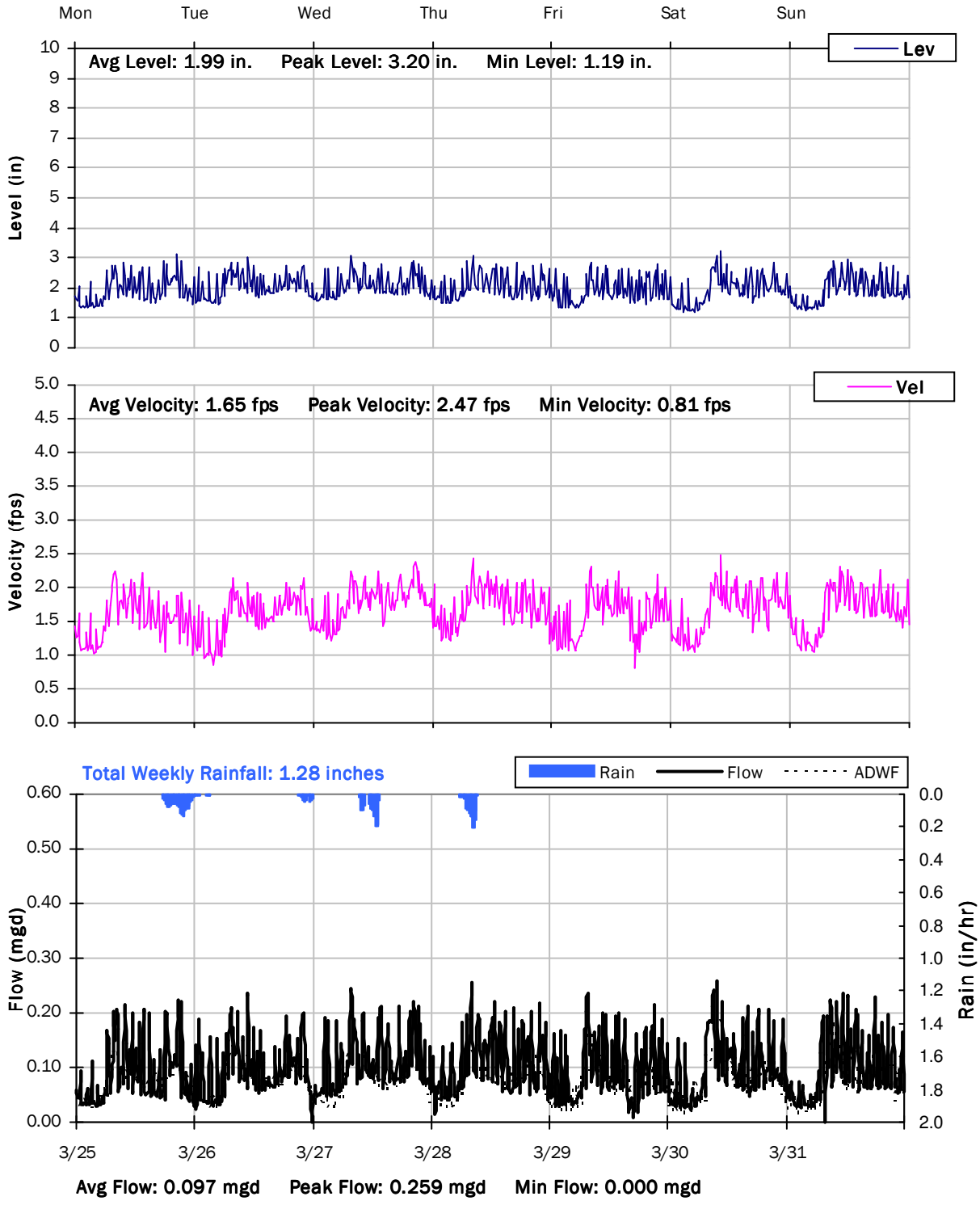
3/18/2019 to 3/25/2019



SITE 2

Weekly Level, Velocity and Flow Hydrographs

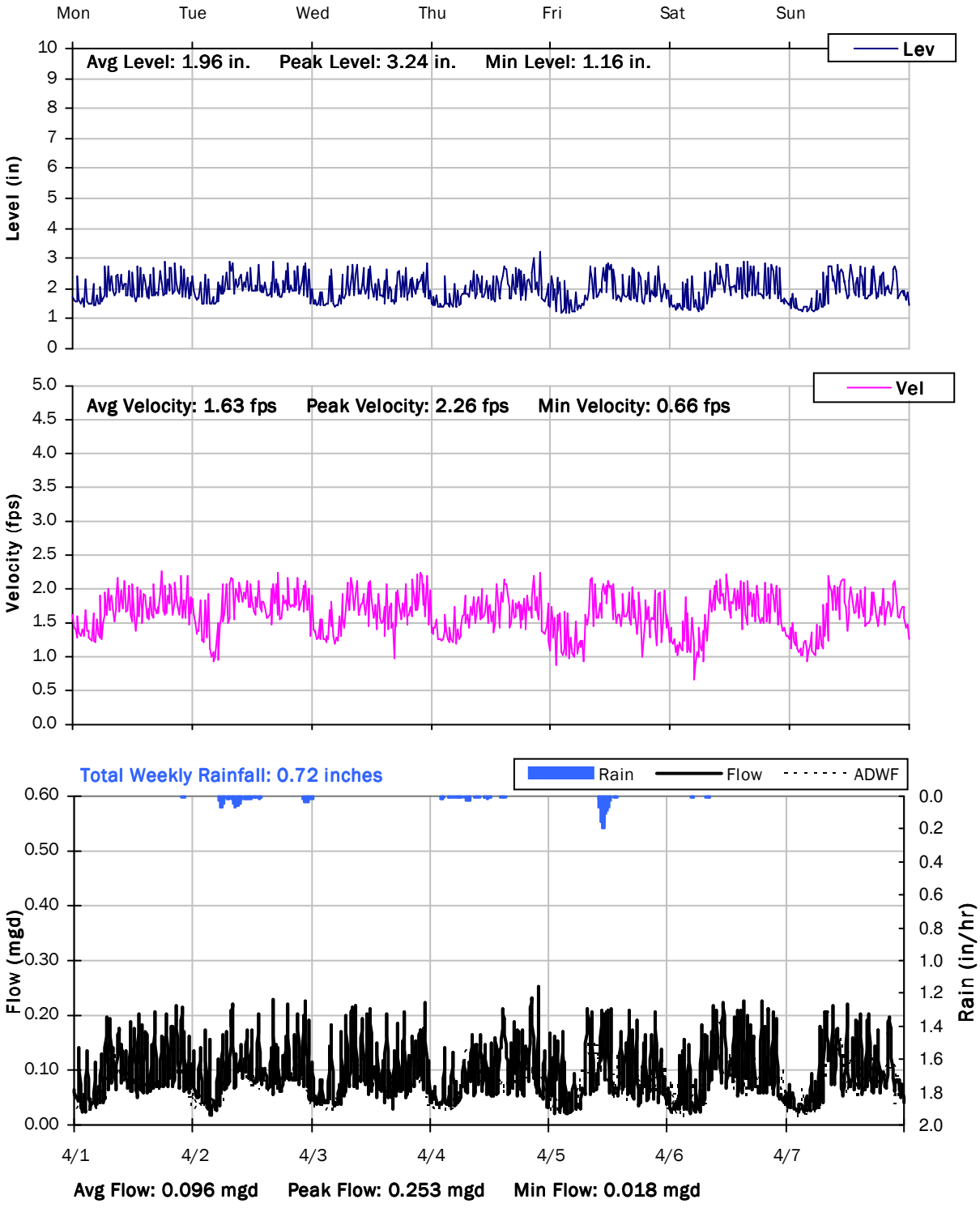
3/25/2019 to 4/1/2019



SITE 2

Weekly Level, Velocity and Flow Hydrographs

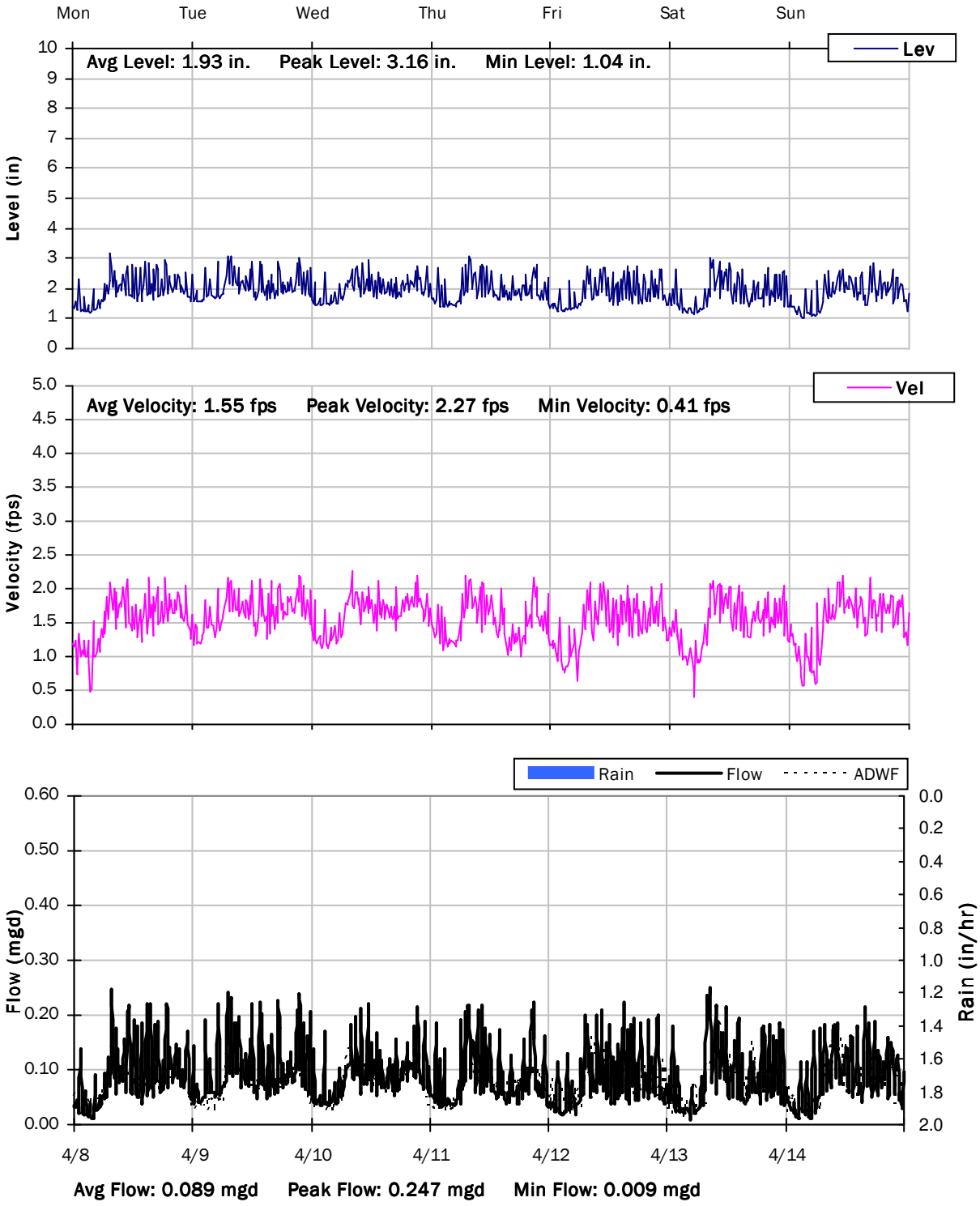
4/1/2019 to 4/8/2019



SITE 2

Weekly Level, Velocity and Flow Hydrographs

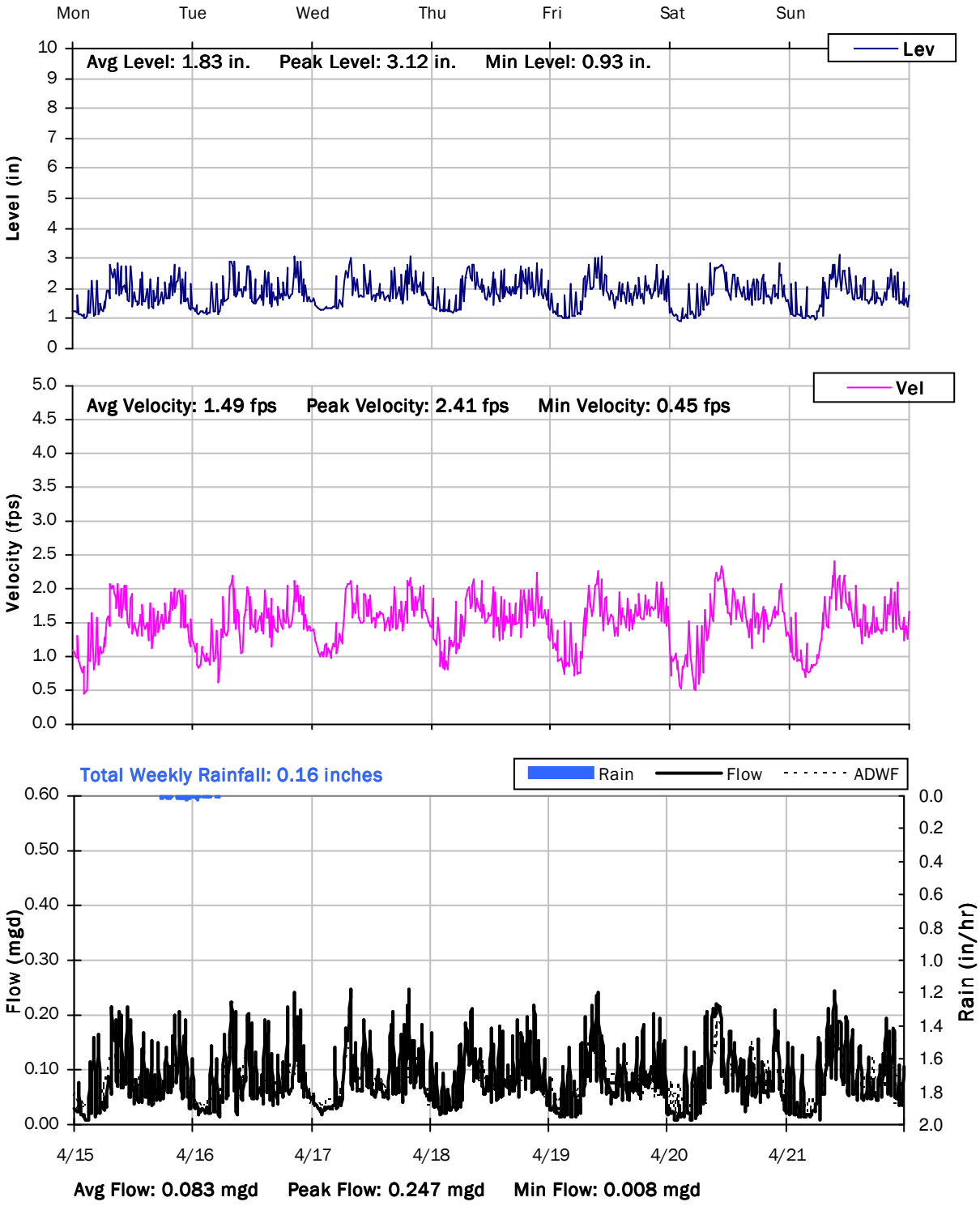
4/8/2019 to 4/15/2019



SITE 2

Weekly Level, Velocity and Flow Hydrographs

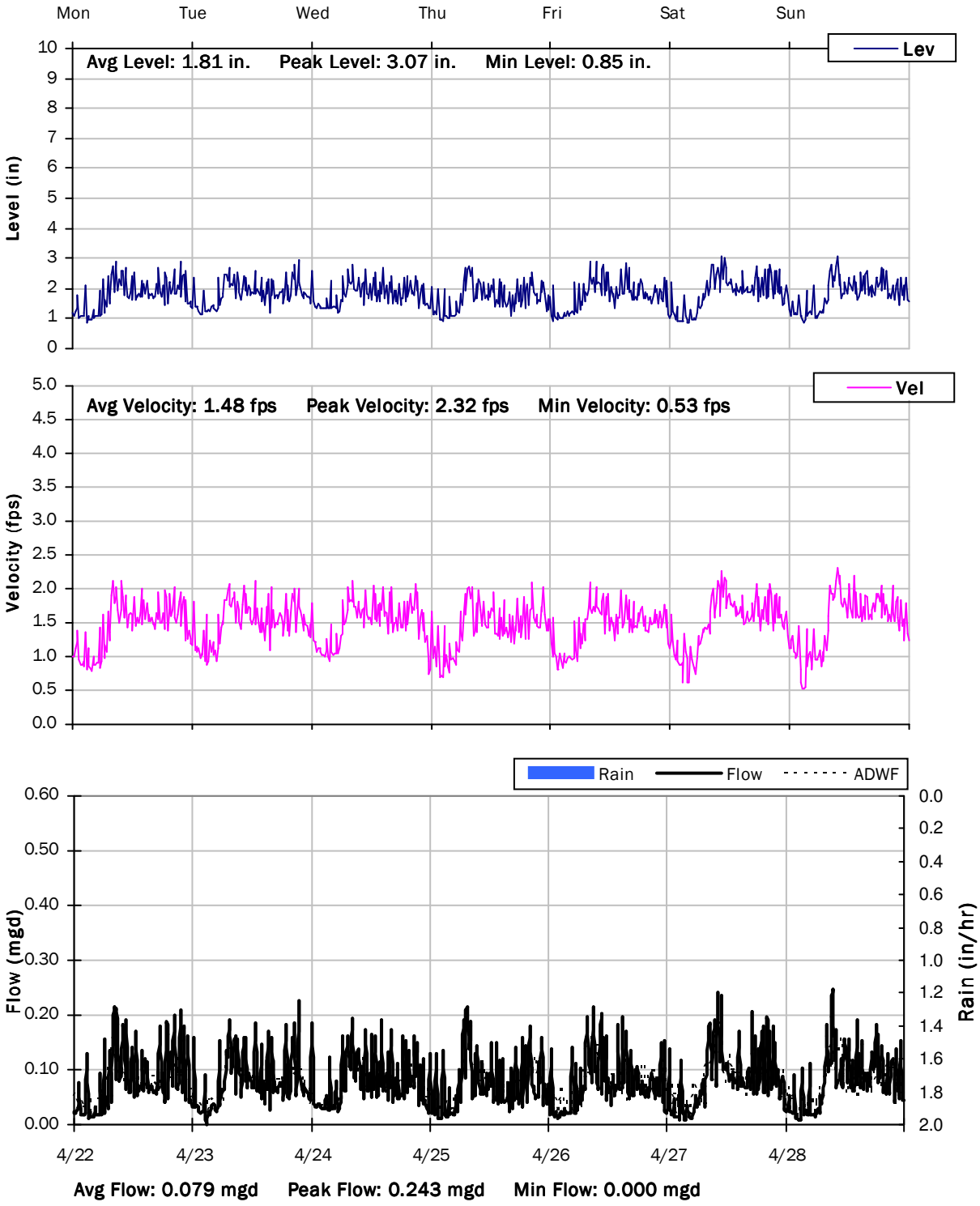
4/15/2019 to 4/22/2019



SITE 2

Weekly Level, Velocity and Flow Hydrographs

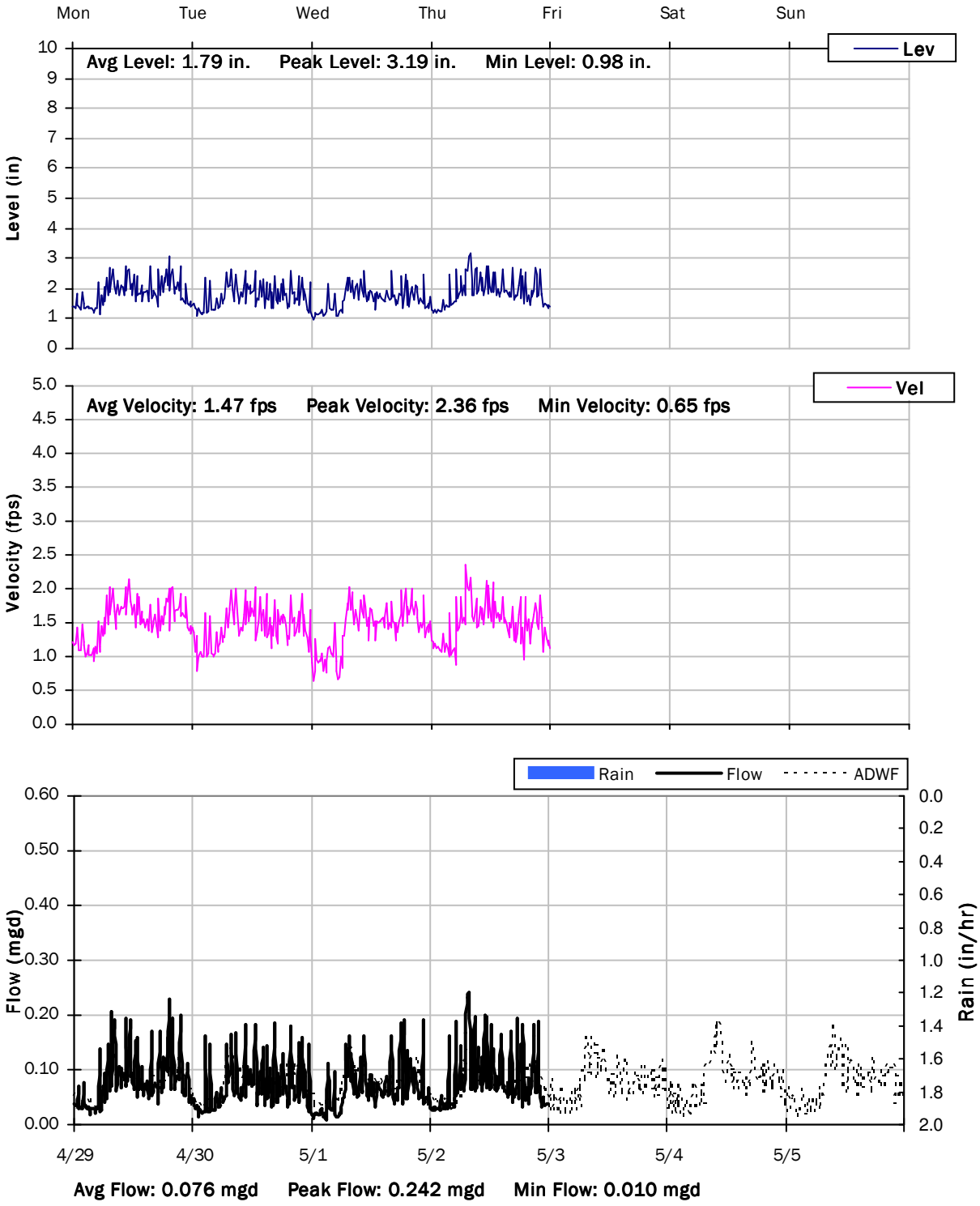
4/22/2019 to 4/29/2019



SITE 2

Weekly Level, Velocity and Flow Hydrographs

4/29/2019 to 5/6/2019



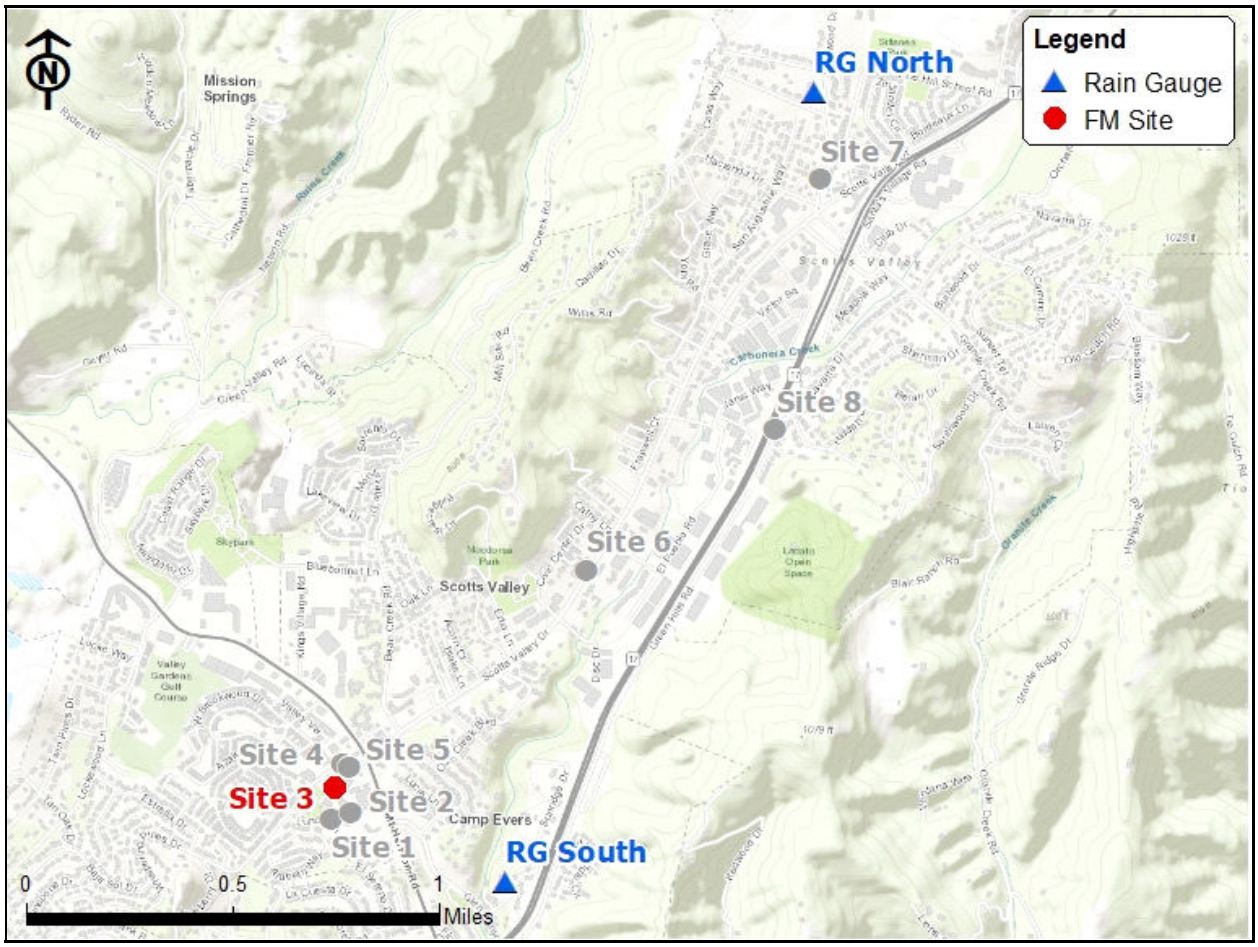
Carollo | Scotts Valley, California

Sanitary Sewer Flow Monitoring
January 30 - May 03, 2019

Monitoring Site: Site 3

Location: In Treatment Plant, behind gate

Data Summary Report



Vicinity Map: Site 3

SITE 3

Site Information

Location: In Treatment Plant, behind gate

Coordinates: 122.0266° W, 37.0423° N

Rim Elevation (Earth): 505 feet

Expected Pipe Diameter: 18 inches

Measured Pipe Diameter: 17 inches*

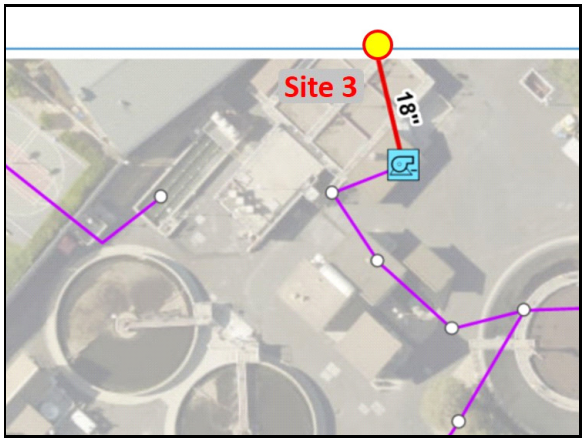
ADWF: 0.667 mgd

Peak Measured Flow: 2.408 mgd

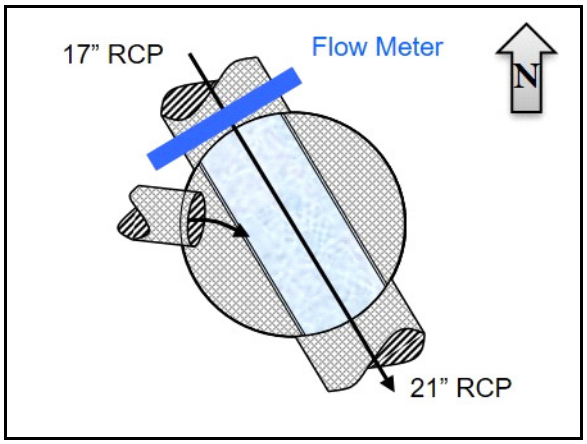
Sediment: None



Satellite Map



Sewer Map



Flow Sketch



Street View



Plan View

* Pipe measured 17" diameter above water line due to pipe corrosion and surface mortar expansion. Underneath the water line the pipe measured 18". The 18" diameter value (typically wetted) was used for the flow calculations. The 17" diameter value (worst case) was used for capacity analysis.

SITE 3

Additional Site Photos

Effluent Pipe



Monitored Northwest Influent Pipe



SITE 3

Additional Site Photos

West Influent Pipe

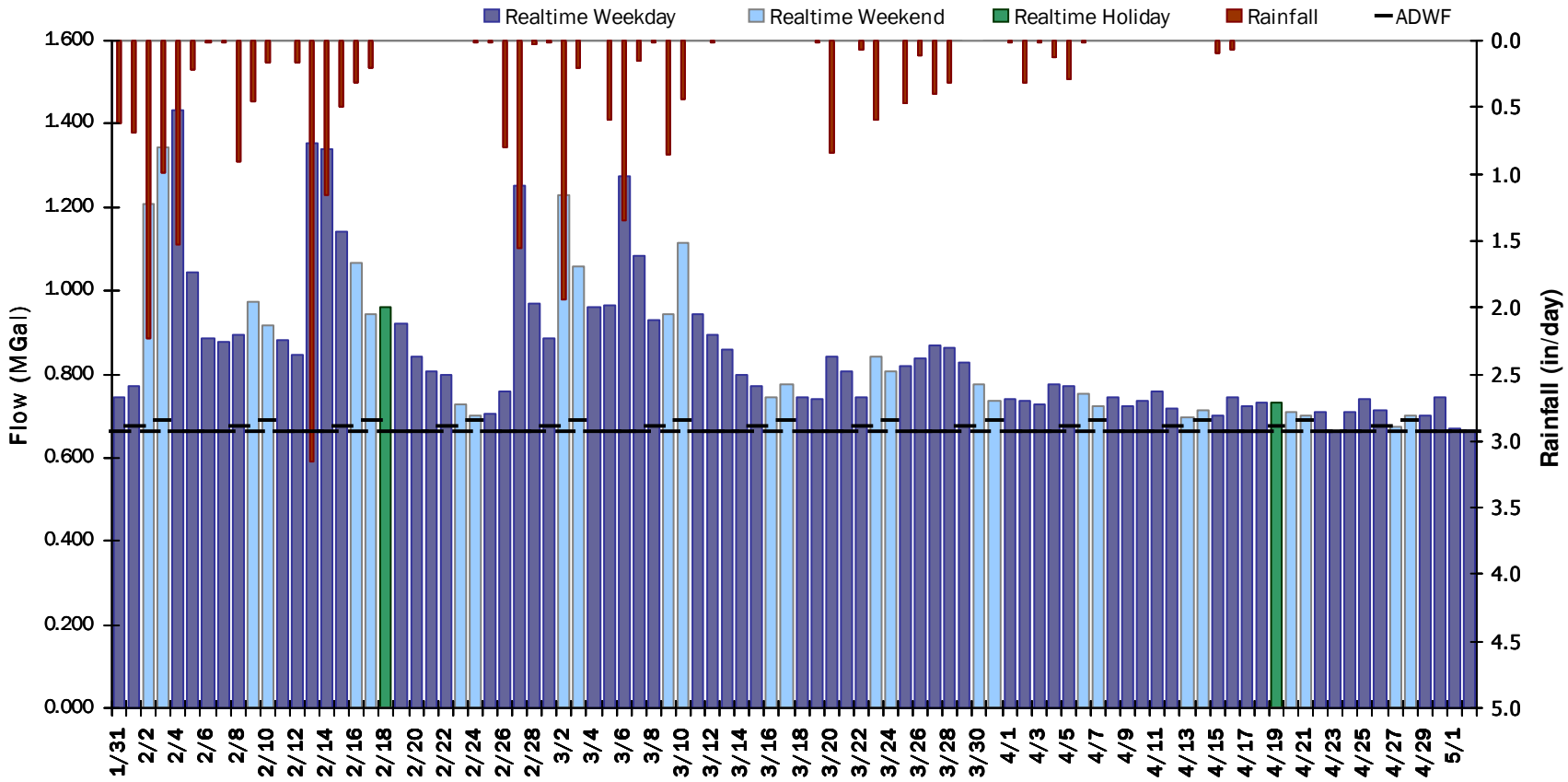


SITE 3

Period Flow Summary: Daily Flow Totals

Avg Daily Flow: 0.855 MGal Peak Daily Flow: 1.434 MGal Min Daily Flow: 0.662 MGal

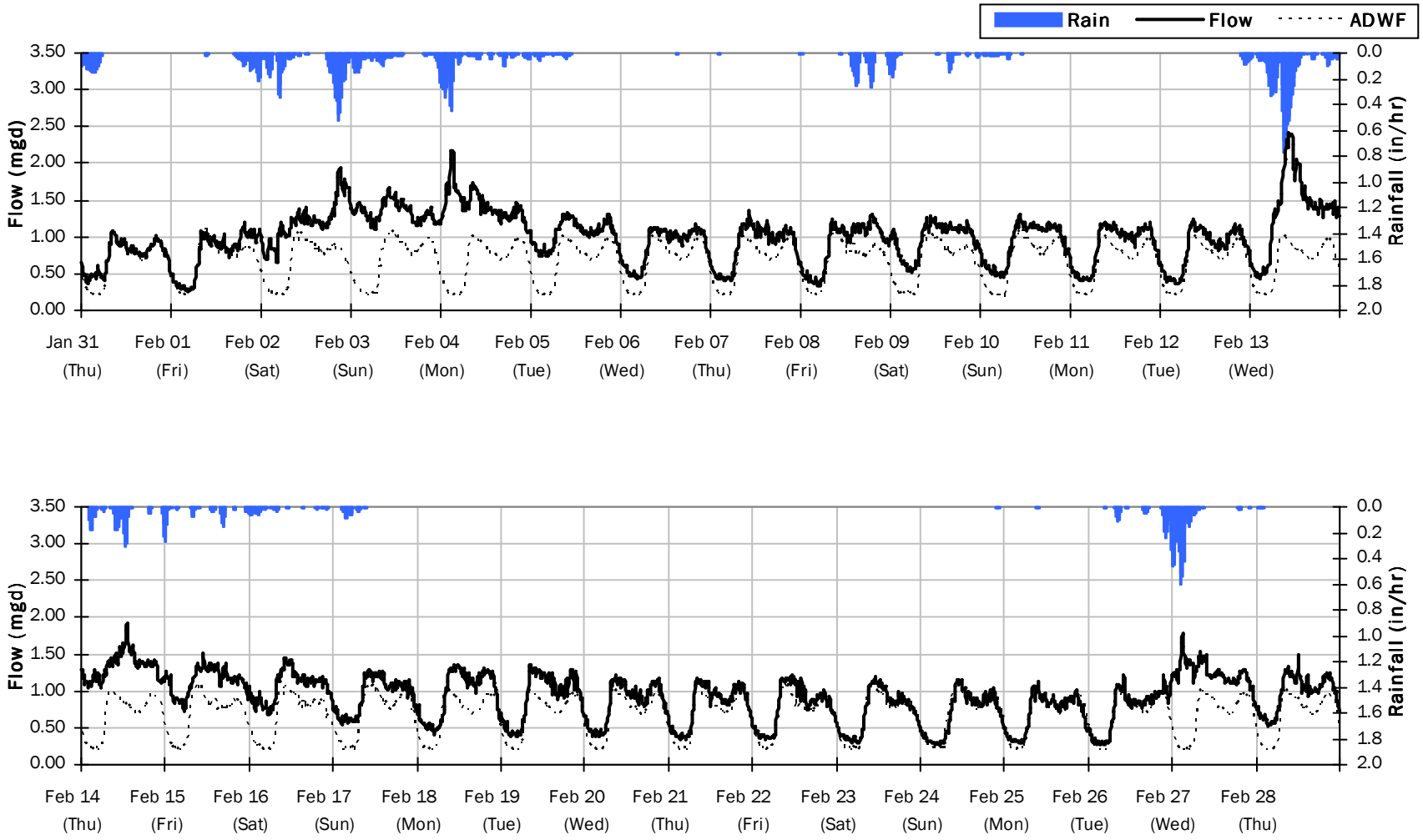
Total Rainfall: 25.06 inches



SITE 3

Flow Summary: 1/31/2019 to 2/28/2019

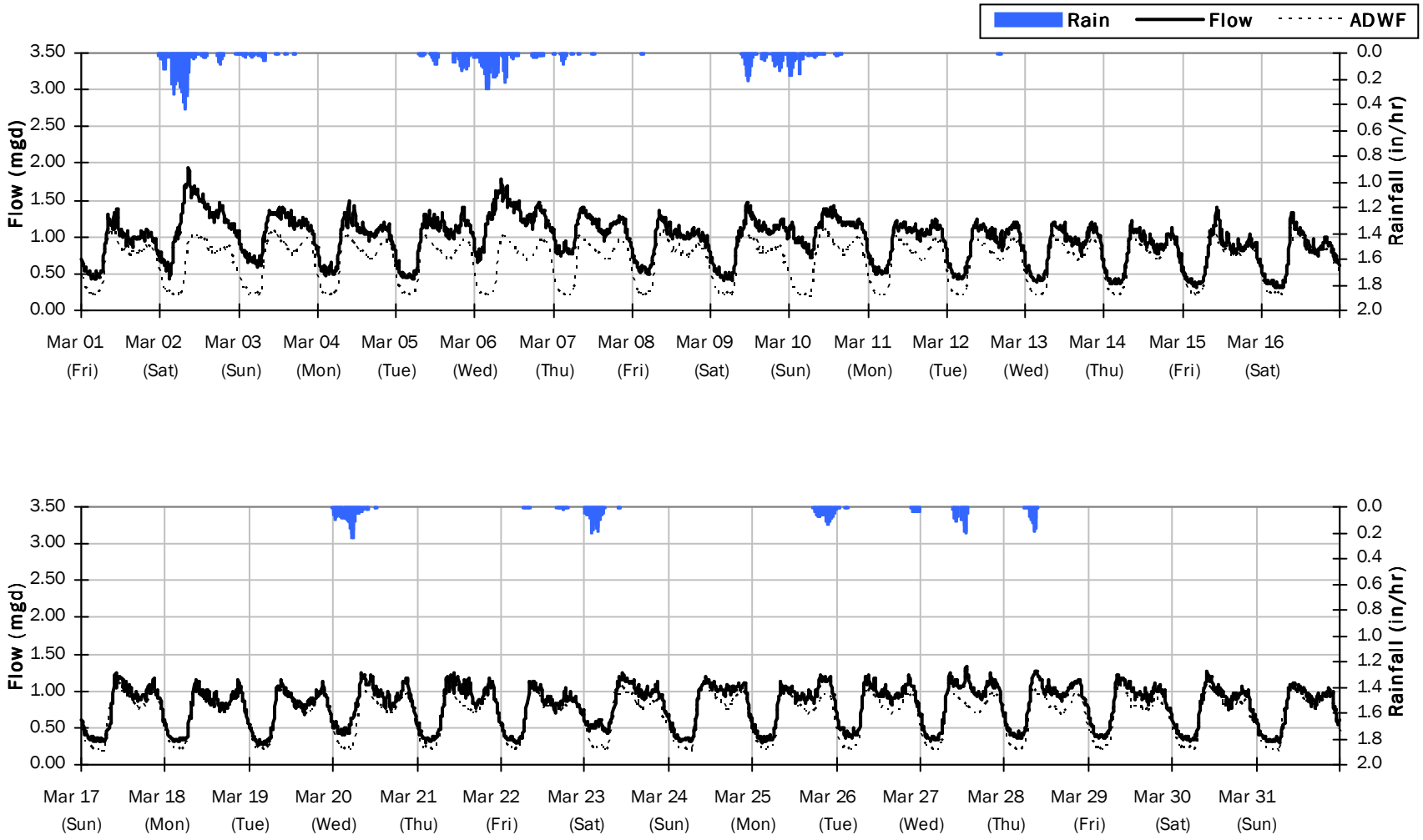
Period Rainfall: 15.73 inches Period Avg Flow: 0.969 mgd Period Peak Flow: 2.408 mgd Period Min Flow



SITE 3

Flow Summary: 3/1/2019 to 3/31/2019

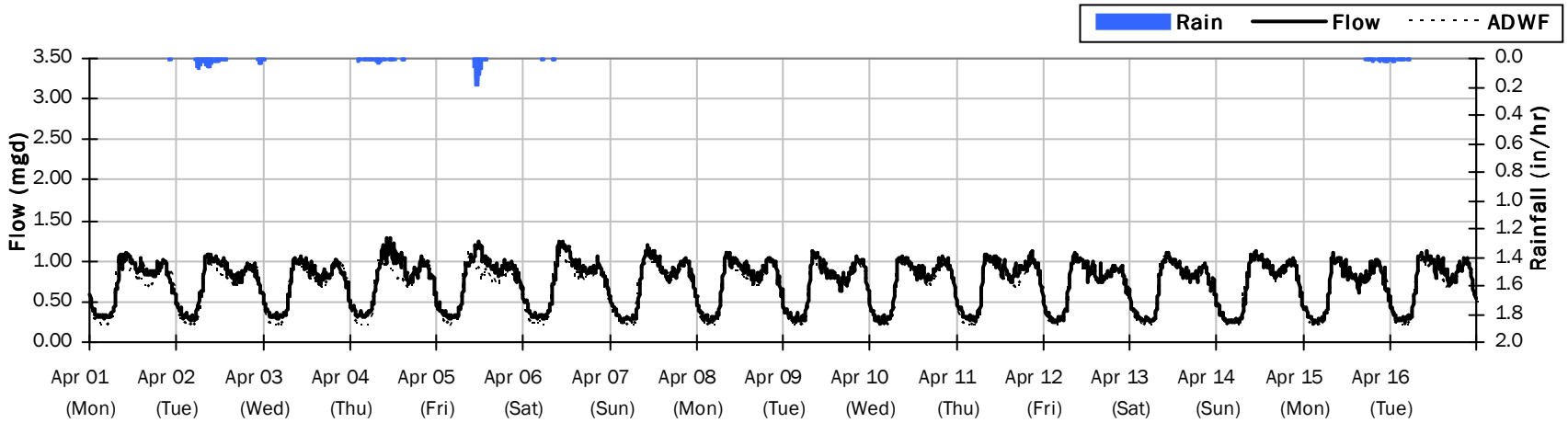
Period Rainfall: 8.40 inches Period Avg Flow: 0.886 mgd Period Peak Flow: 1.950 mgd Period Min Flow

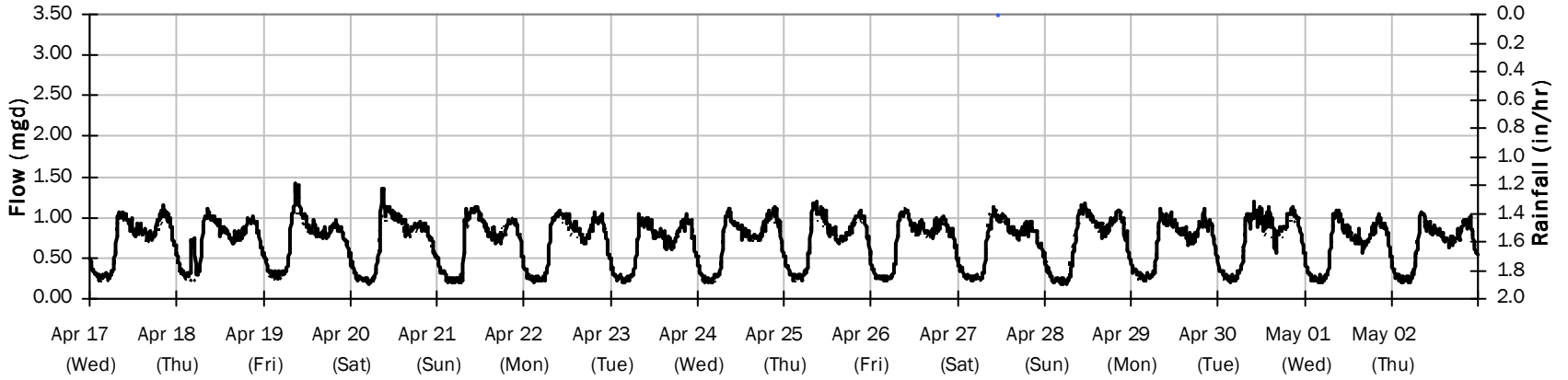


SITE 3

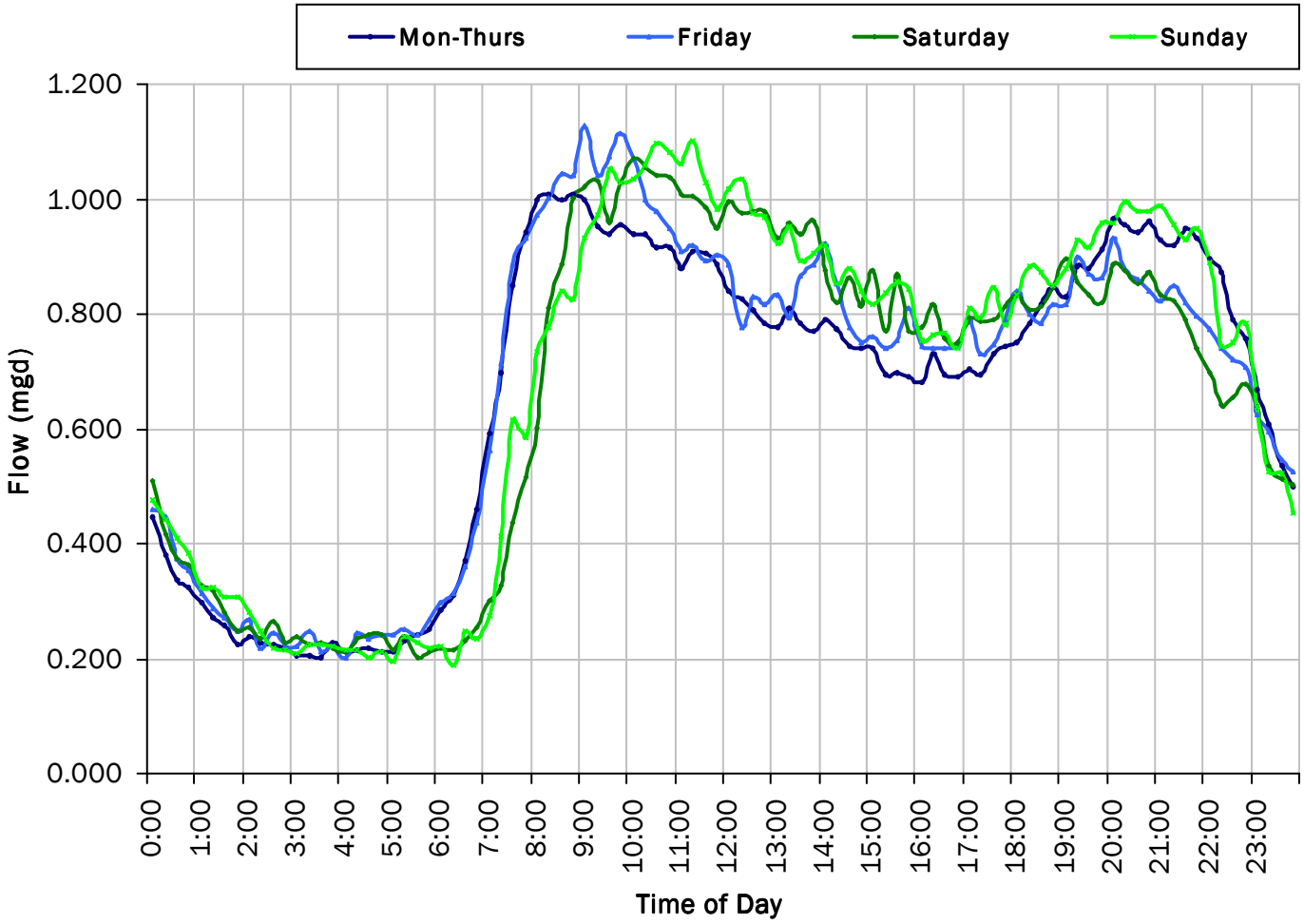
Flow Summary: 4/1/2019 to 5/2/2019

Period Rainfall: 0.93 inches Period Avg Flow: 0.720 mgd Period Peak Flow: 1.420 mgd Period Min Flow



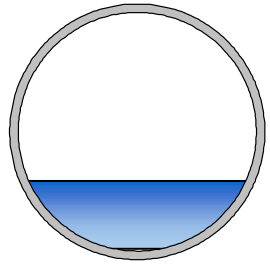


SITE 3
Average Dry Weather Flow Hydrographs



ADWF:

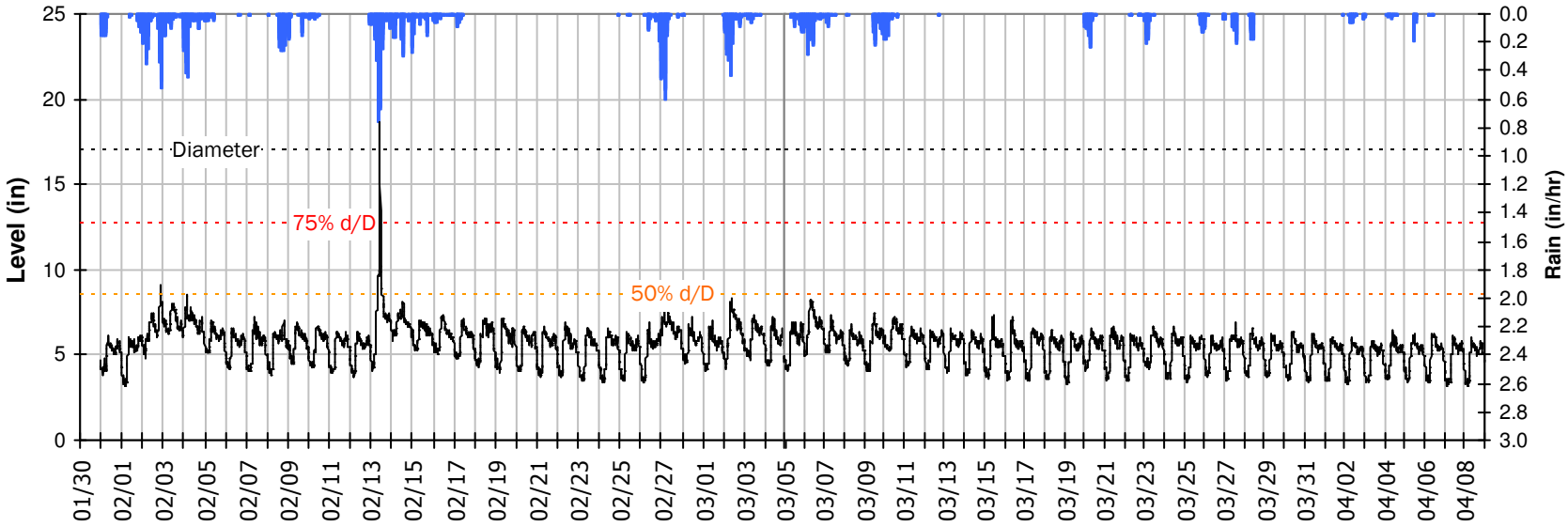
0.667 *mgd*

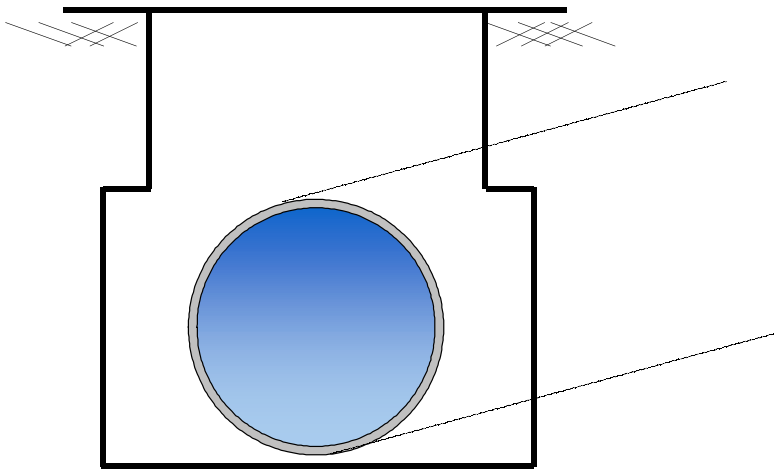


SITE 3

Site Capacity and Surcharge Summary

Realtime Flow Levels with Rainfall Data over Peak Level Period



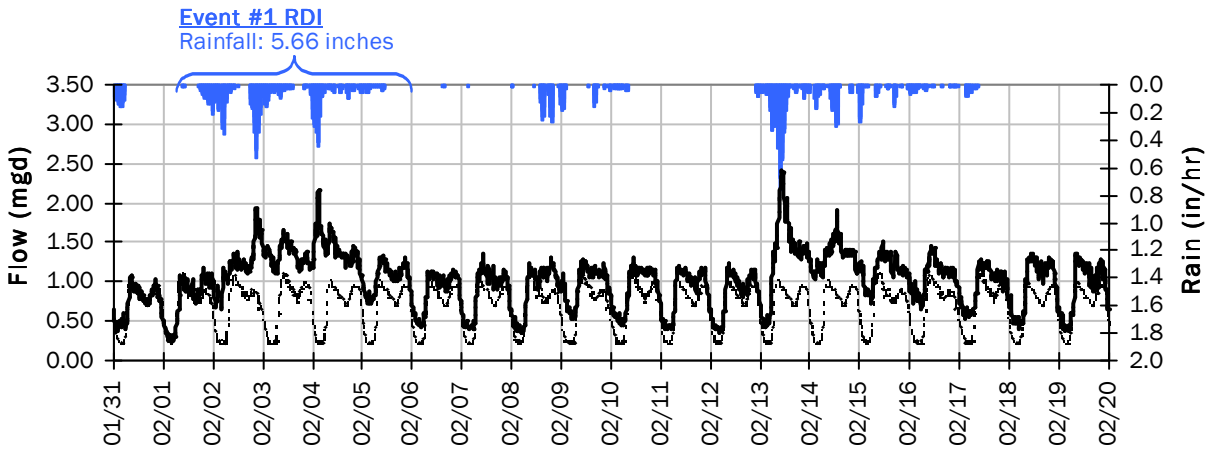


Pipe Diameter:	17	*inches*
Peak Measured Level:	18.7	*inches*
Peak d/D Ratio:	1.10	

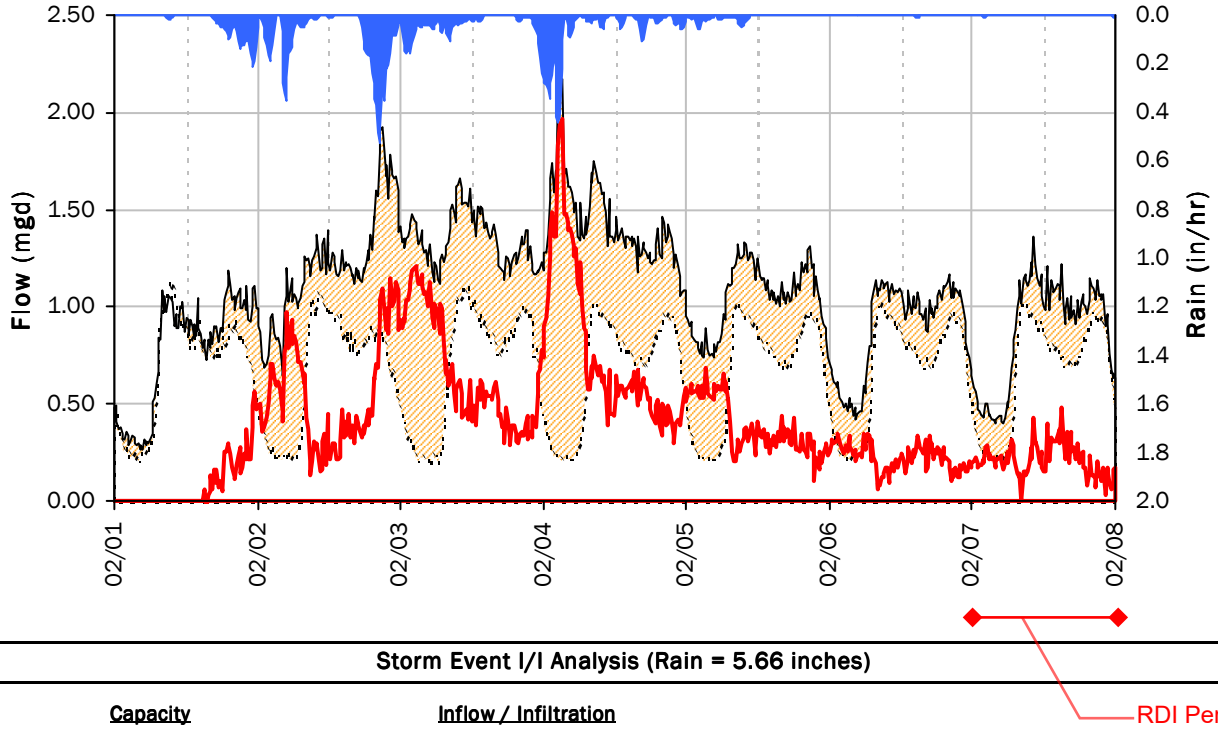
Surcharged 1.7 inches over crown

SITE 3
I/I Summary: Event #1 RDI

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #1 RDI Detail Graph

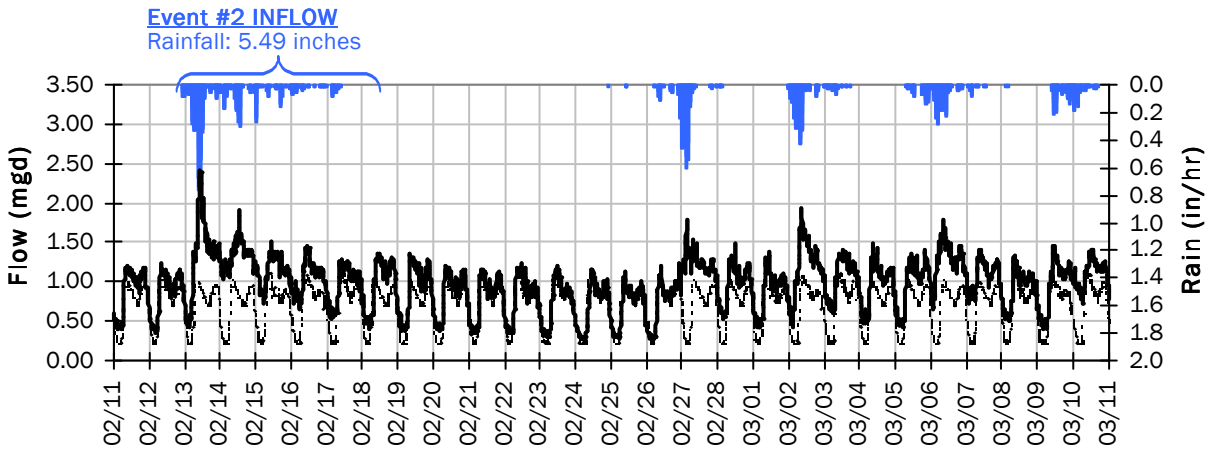


Storm Event I/I Analysis (Rain = 5.66 inches)

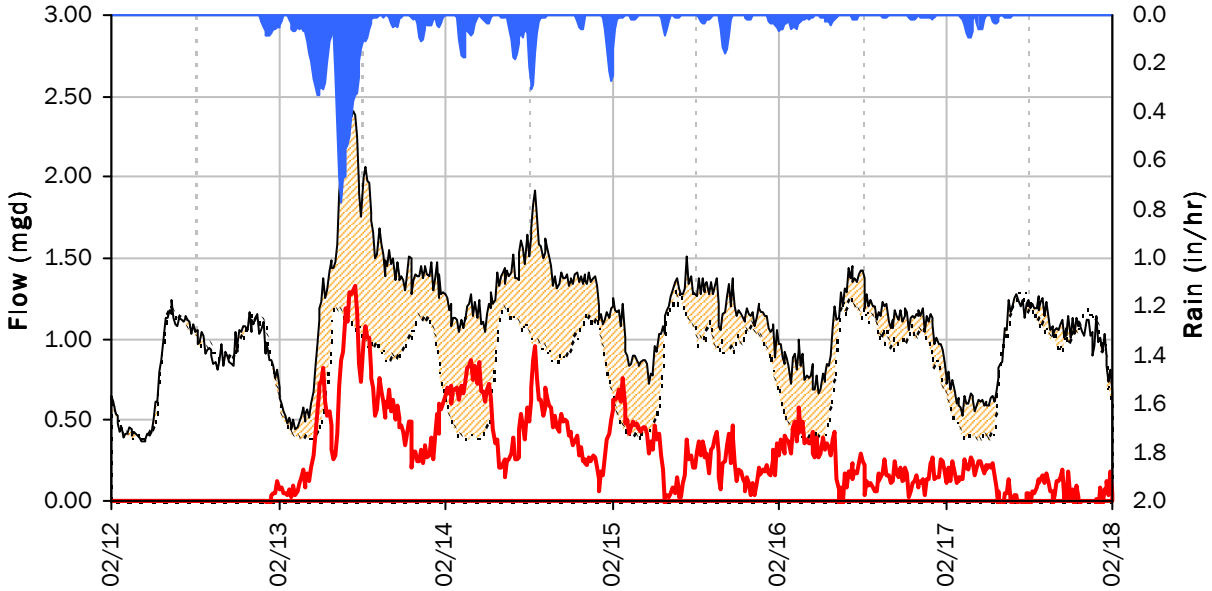
Capacity		Inflow / Infiltration	
Peak Flow:	2.172 *mgd*	**RDI:**	0.216 *mgd*
PF:	3.26		
Peak Level:	9.13 *in*		
d/D Ratio:	0.54		

SITE 3
I/I Summary: Event #2 INFLOW

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #2 INFLOW Detail Graph

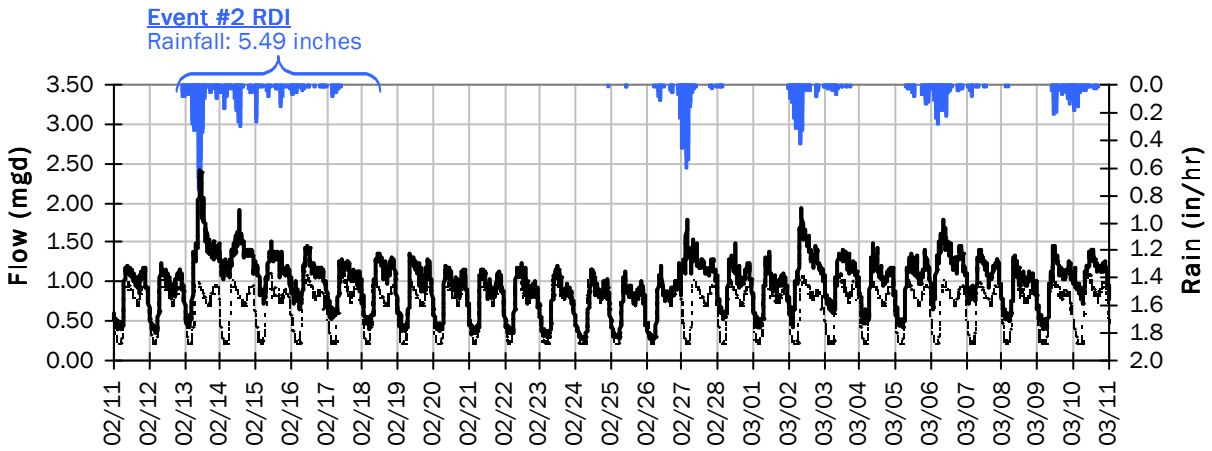


Storm Event I/I Analysis (Rain = 5.49 inches)

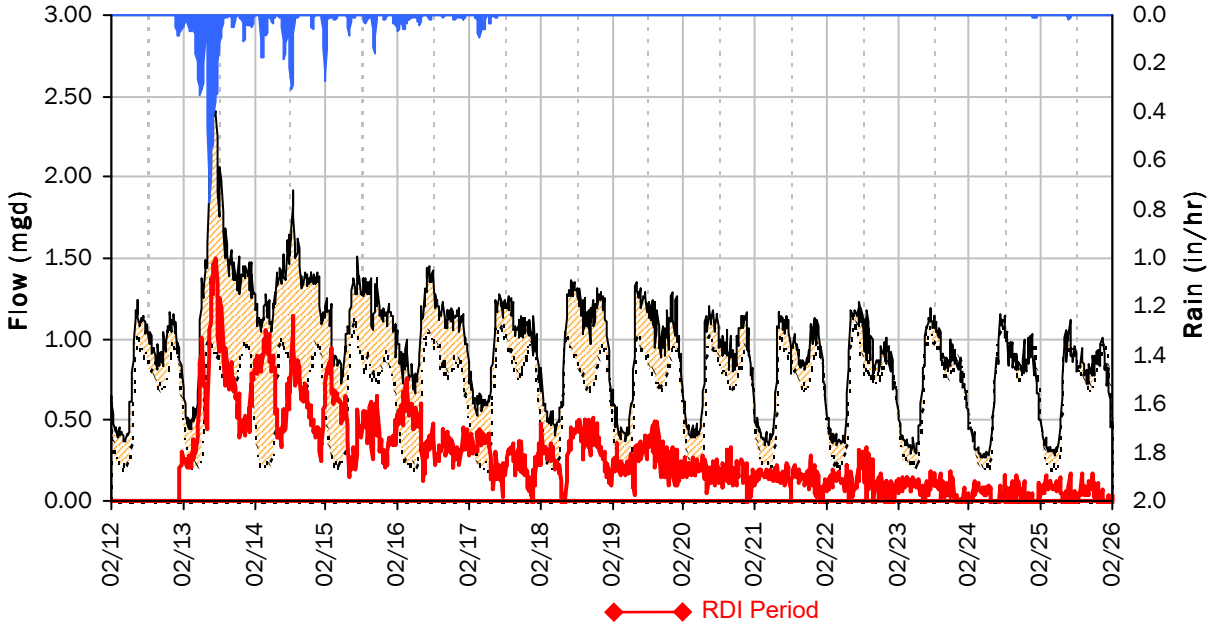
Capacity		Inflow / Infiltration	
Peak Flow:	2.408 *mgd*	**Peak I/I Rate:**	1.326 *mgd*
PF:	3.61		
Peak Level:	18.65 *in*		
d/D Ratio:	1.10		

SITE 3
I/I Summary: Event #2 RDI

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #2 RDI Detail Graph

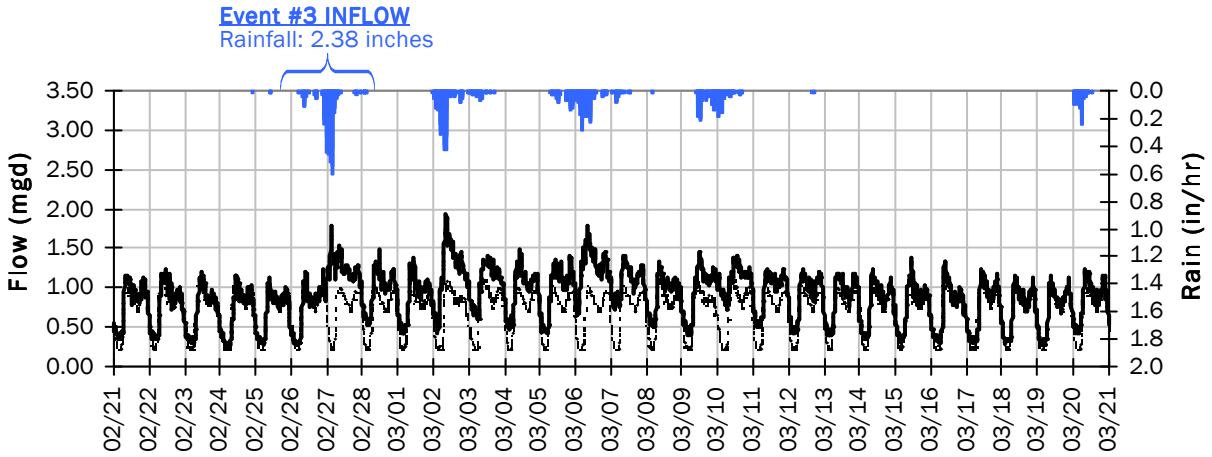


Storm Event I/I Analysis (Rain = 5.49 inches)

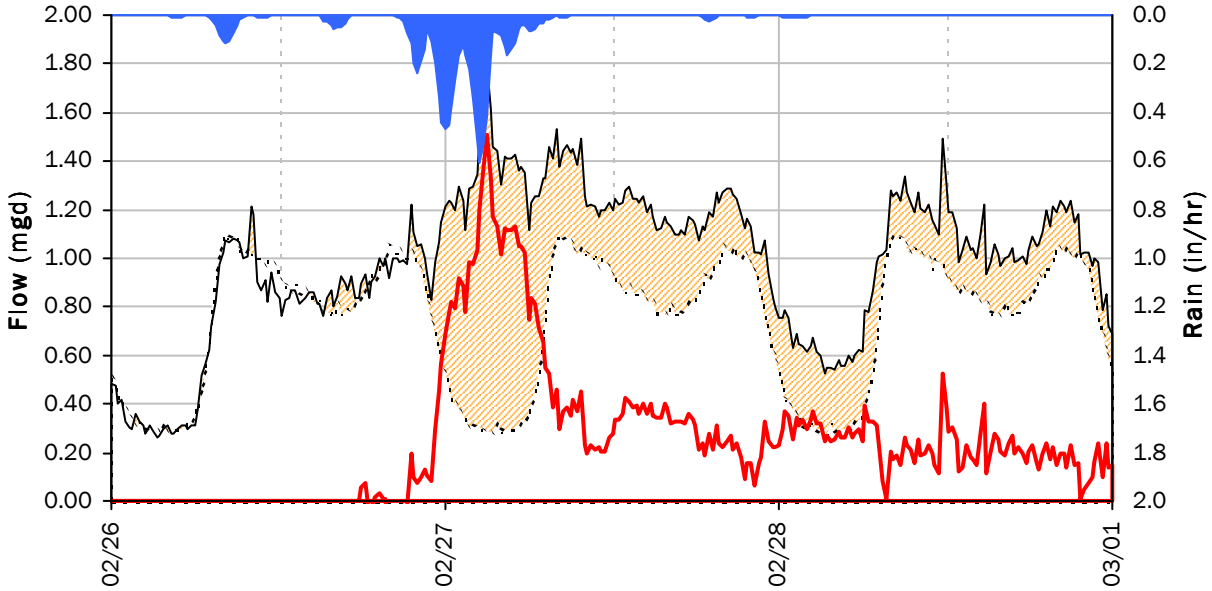
Capacity		Inflow / Infiltration	
Peak Flow:	2.408 *mgd*	**RDI:**	0.259 *mgd*
PF:	3.61		
Peak Level:	18.65 *in*		
d/D Ratio:	1.10		

SITE 3
I/I Summary: Event #3 INFLOW

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #3 INFLOW Detail Graph

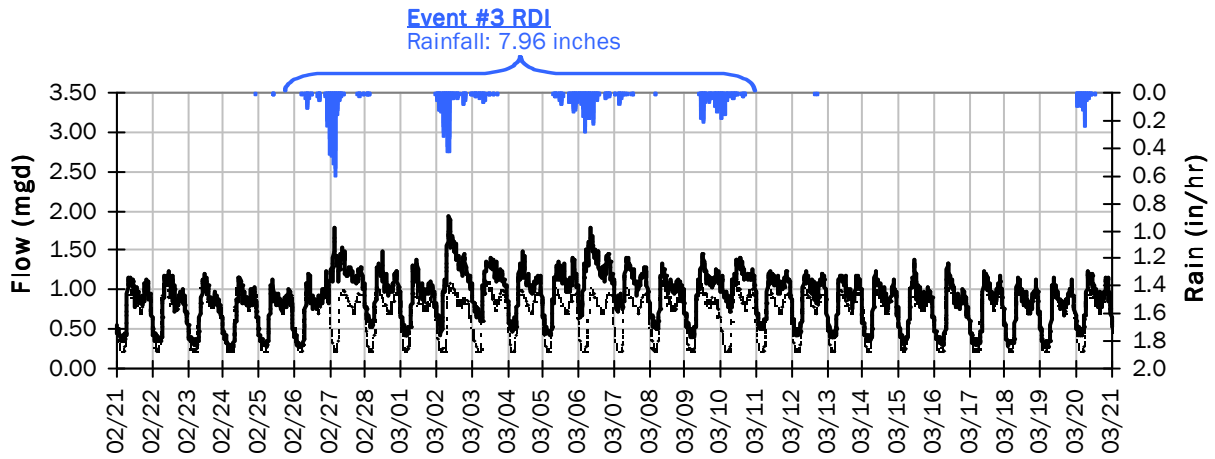


Storm Event I/I Analysis (Rain = 2.38 inches)

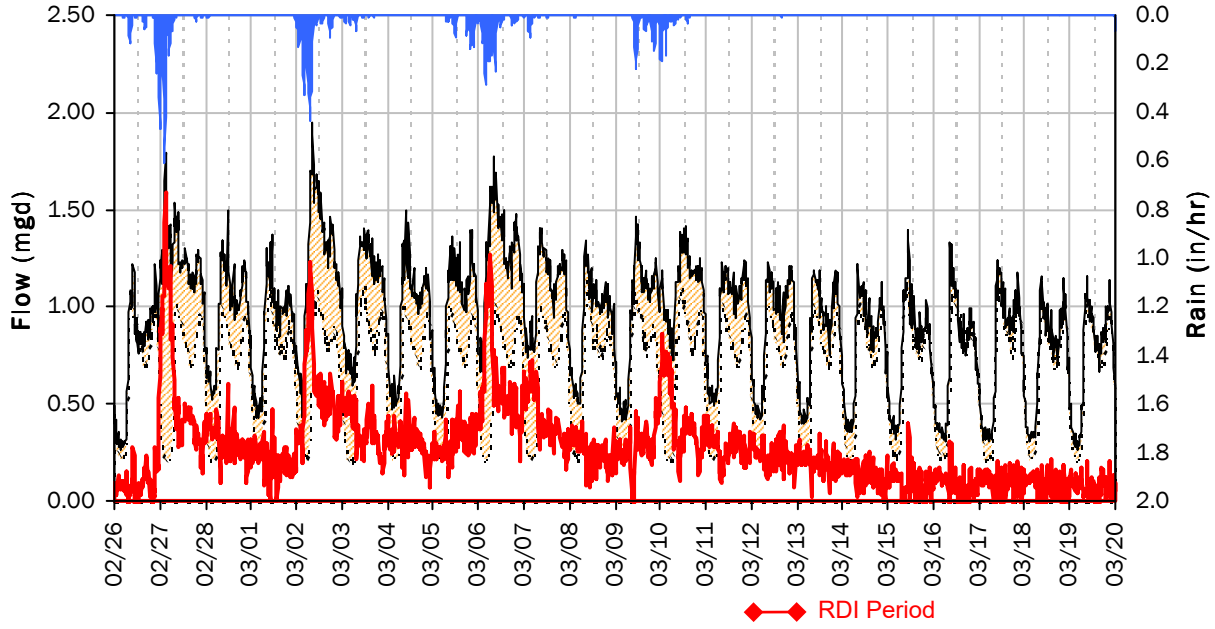
Capacity		Inflow / Infiltration	
Peak Flow:	1.79 *mgd*	**Peak I/I Rate:**	1.507 *mgd*
PF:	2.69		
Peak Level:	8.40 *in*		
d/D Ratio:	0.49		

SITE 3
I/I Summary: Event #3 RDI

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #3 RDI Detail Graph



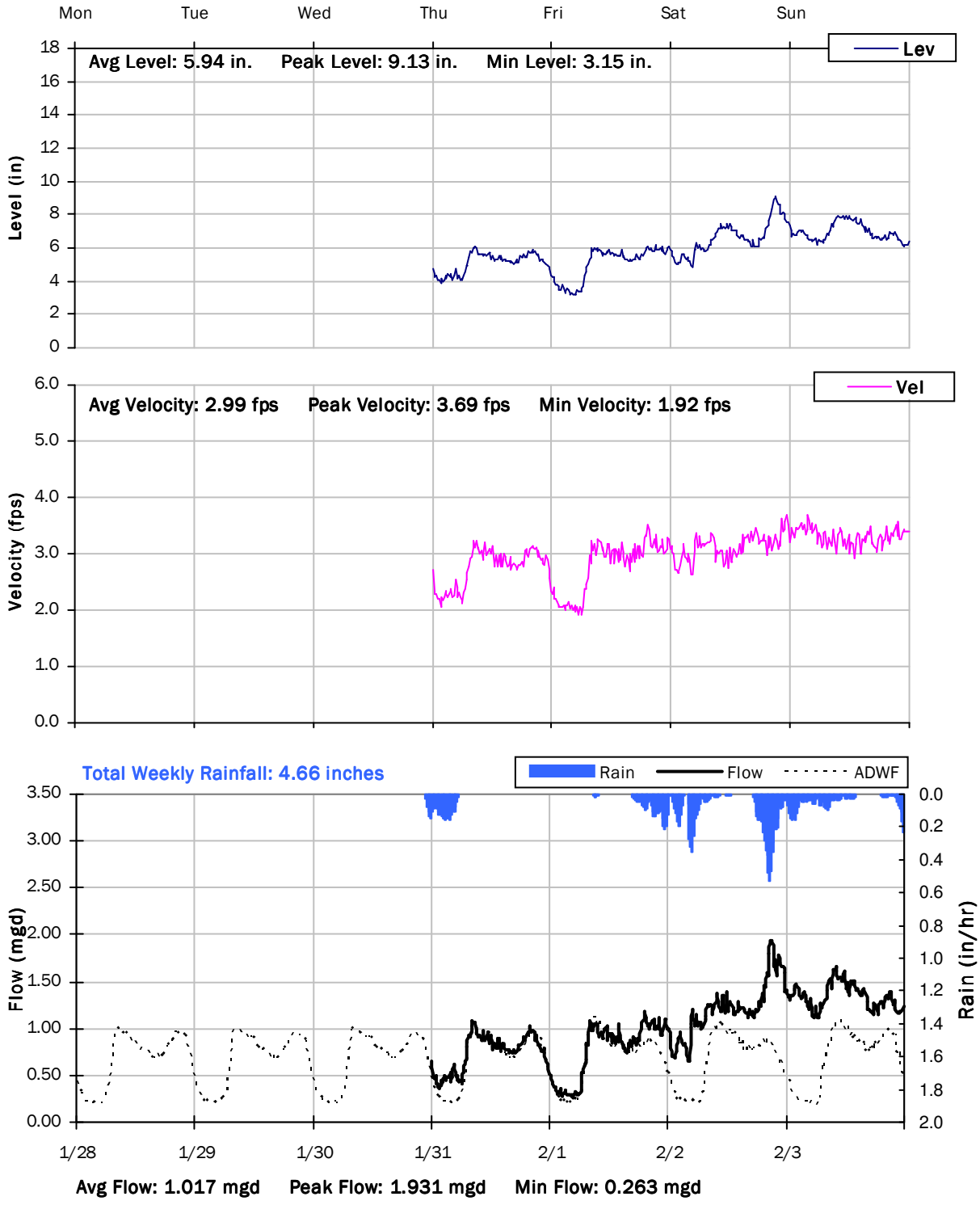
Storm Event I/I Analysis (Rain = 7.96 inches)

Capacity		Inflow / Infiltration	
Peak Flow:	1.95 *mgd*	**RDI:**	0.233 *mgd*
PF:	2.92		
Peak Level:	8.40 *in*		
d/D Ratio:	0.49		

SITE 3

Weekly Level, Velocity and Flow Hydrographs

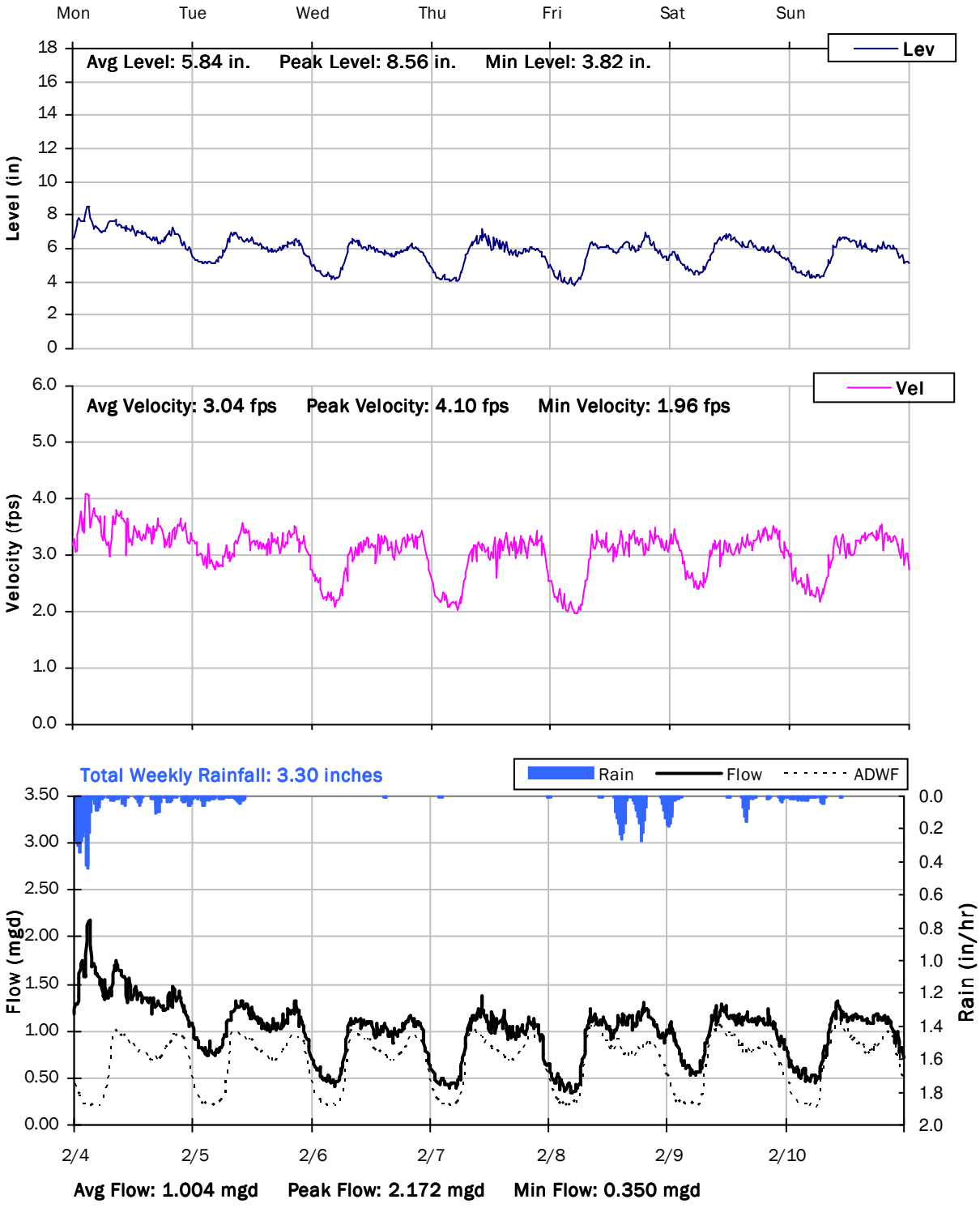
1/28/2019 to 2/4/2019



SITE 3

Weekly Level, Velocity and Flow Hydrographs

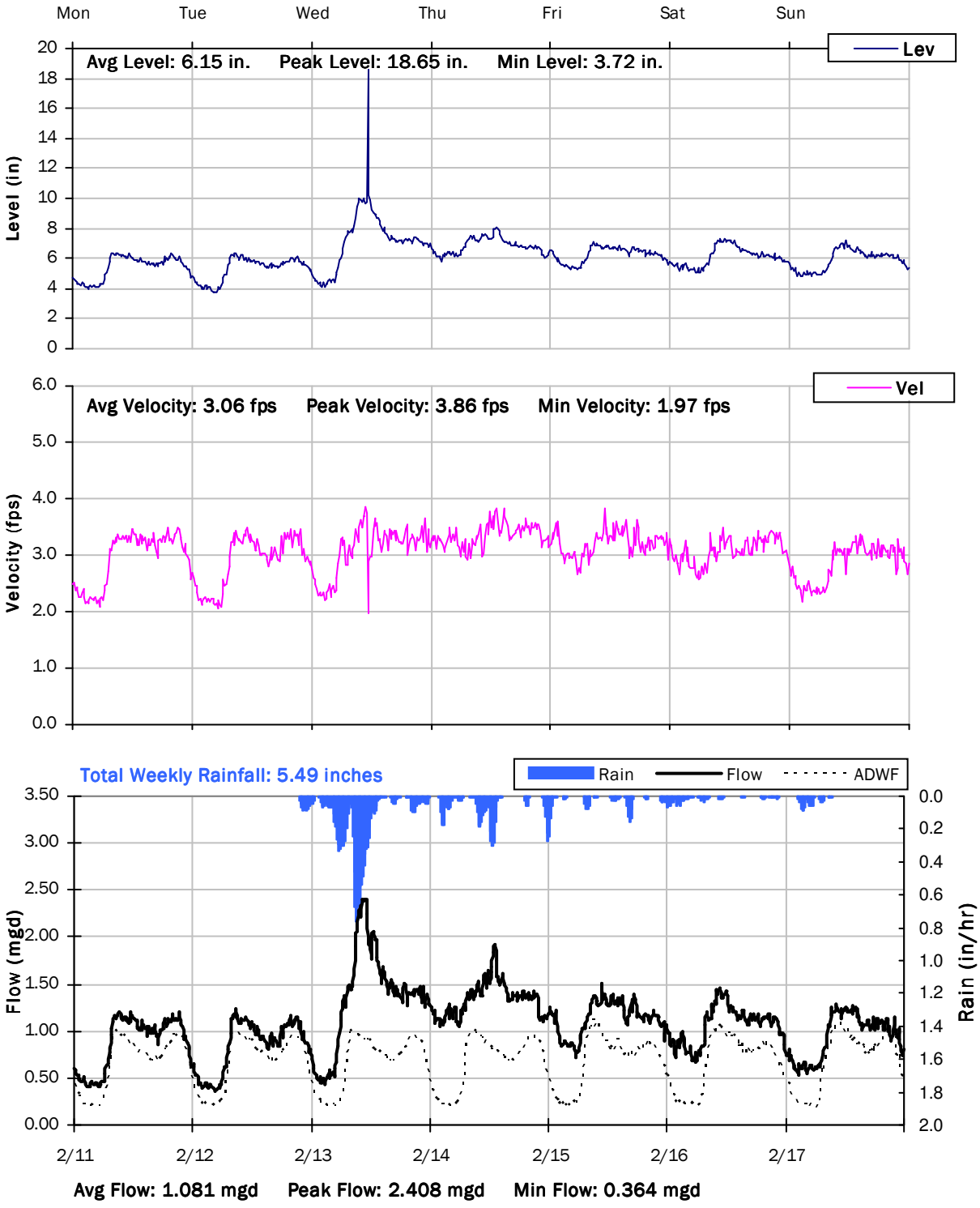
2/4/2019 to 2/11/2019



SITE 3

Weekly Level, Velocity and Flow Hydrographs

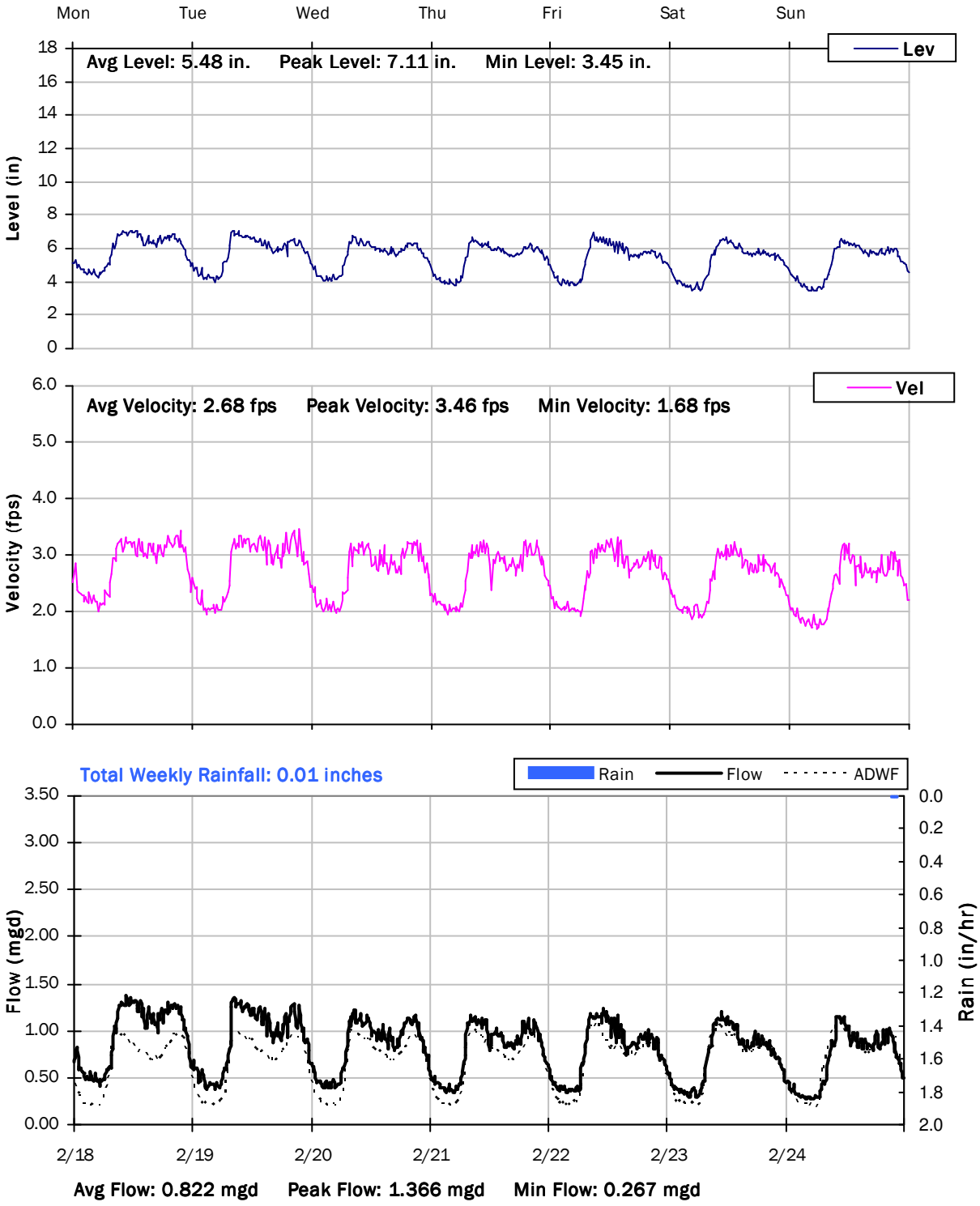
2/11/2019 to 2/18/2019



SITE 3

Weekly Level, Velocity and Flow Hydrographs

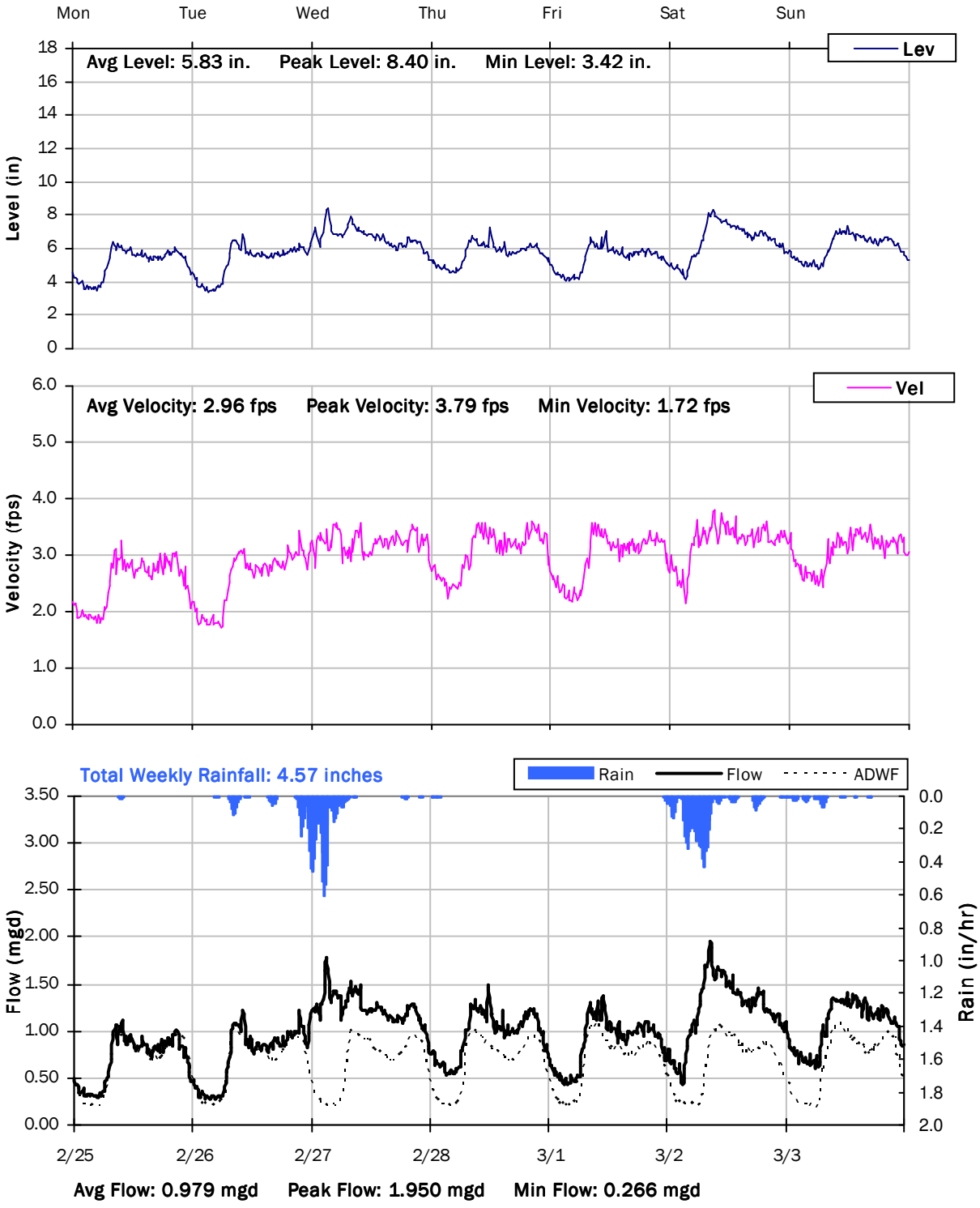
2/18/2019 to 2/25/2019



SITE 3

Weekly Level, Velocity and Flow Hydrographs

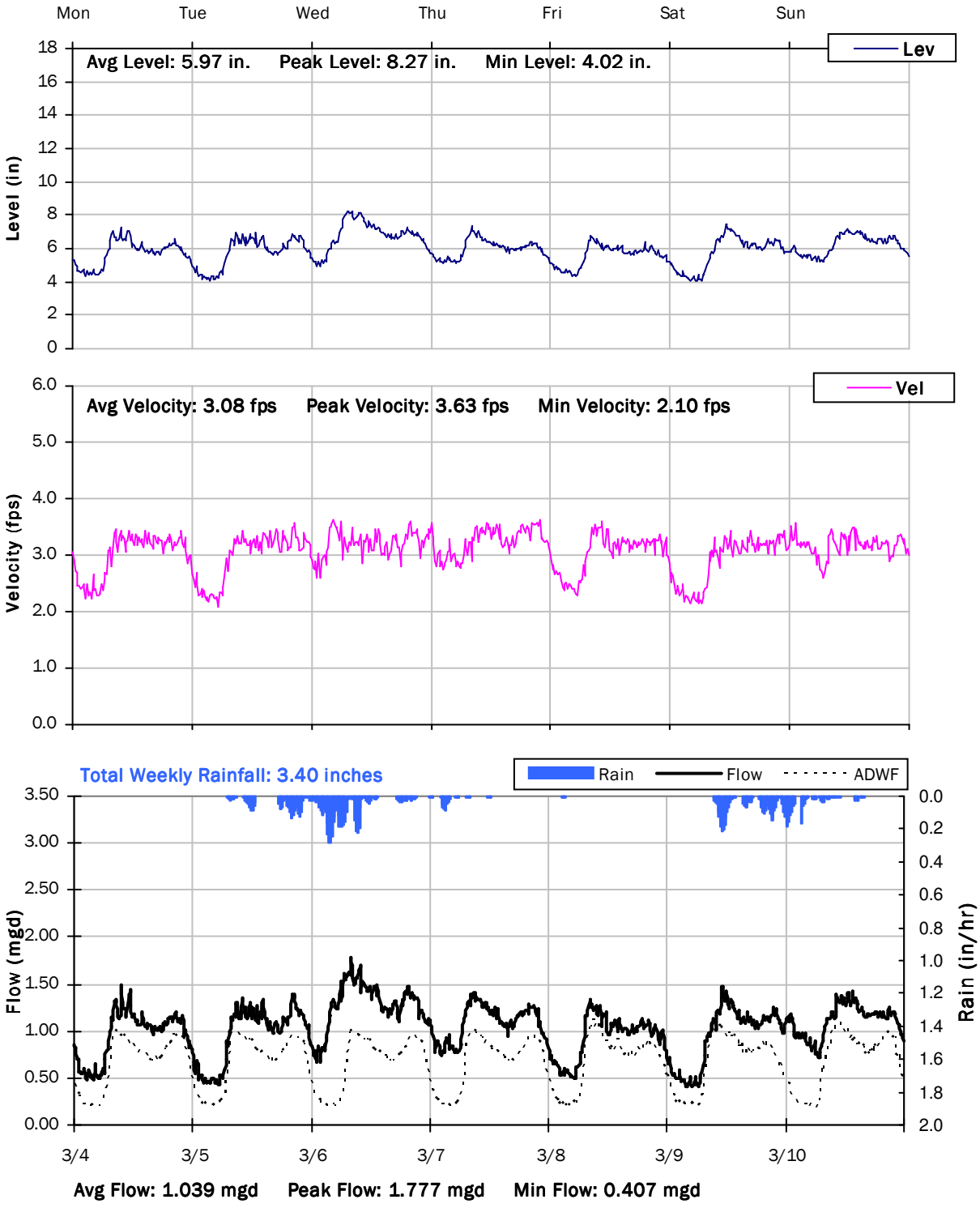
2/25/2019 to 3/4/2019



SITE 3

Weekly Level, Velocity and Flow Hydrographs

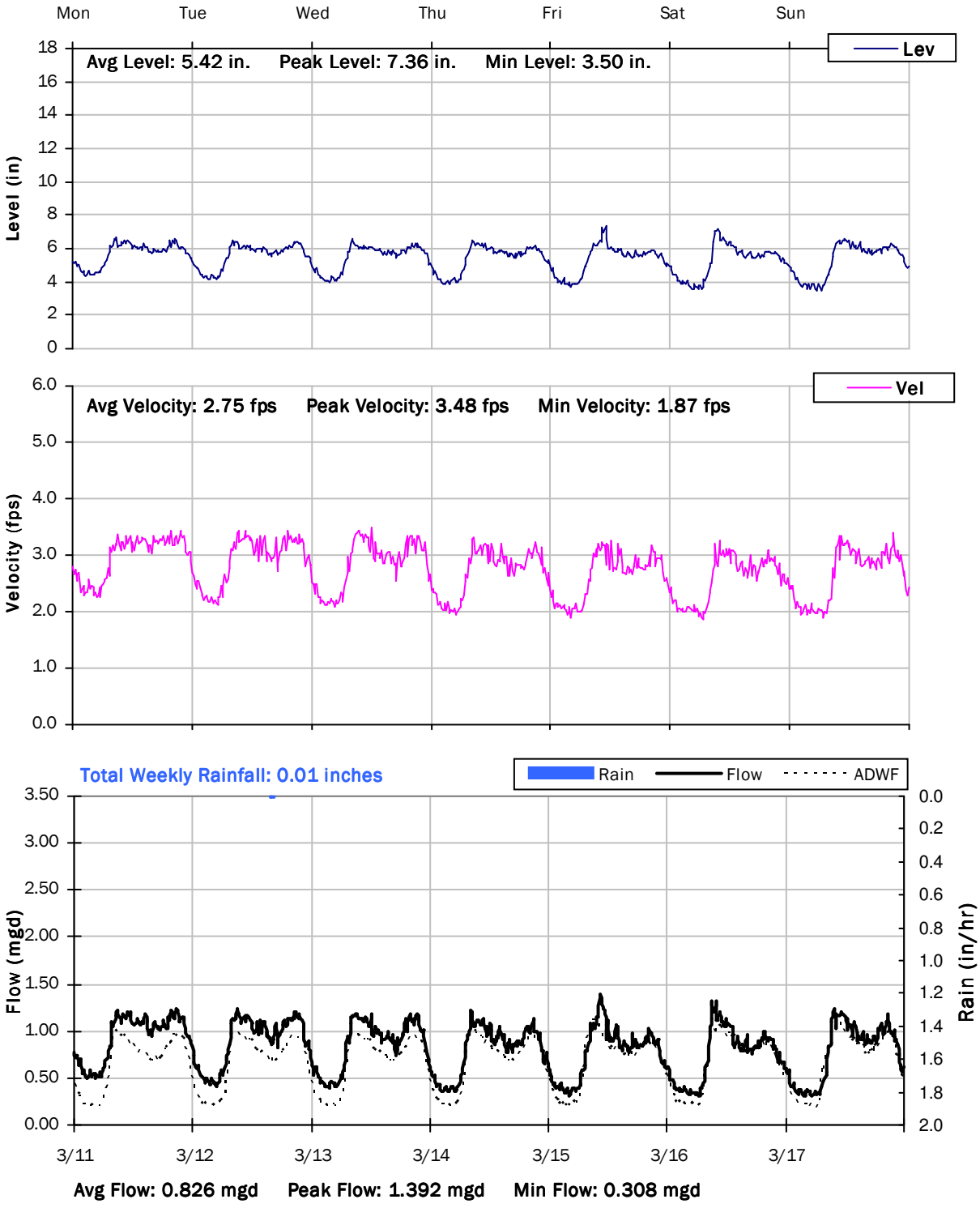
3/4/2019 to 3/11/2019



SITE 3

Weekly Level, Velocity and Flow Hydrographs

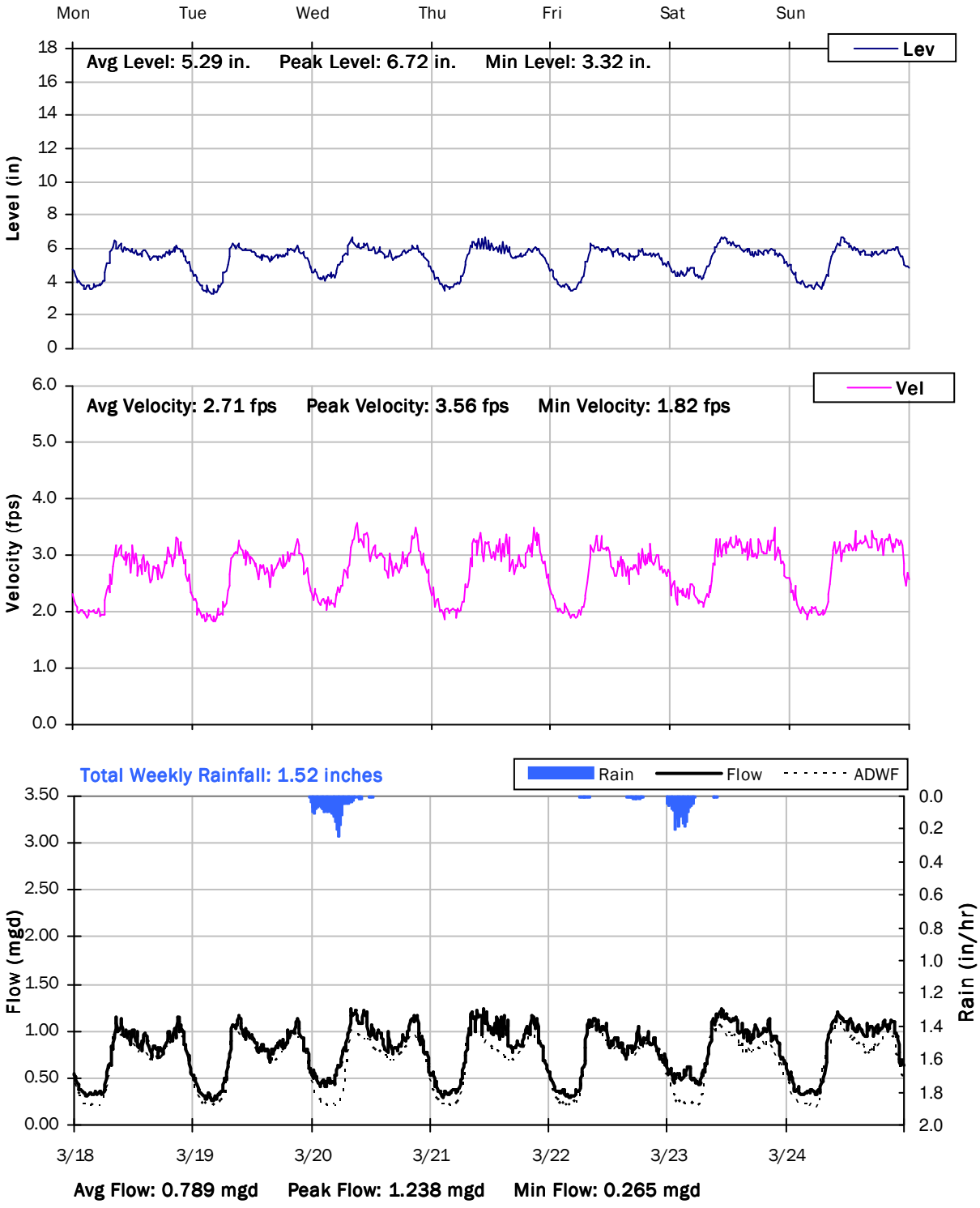
3/11/2019 to 3/18/2019



SITE 3

Weekly Level, Velocity and Flow Hydrographs

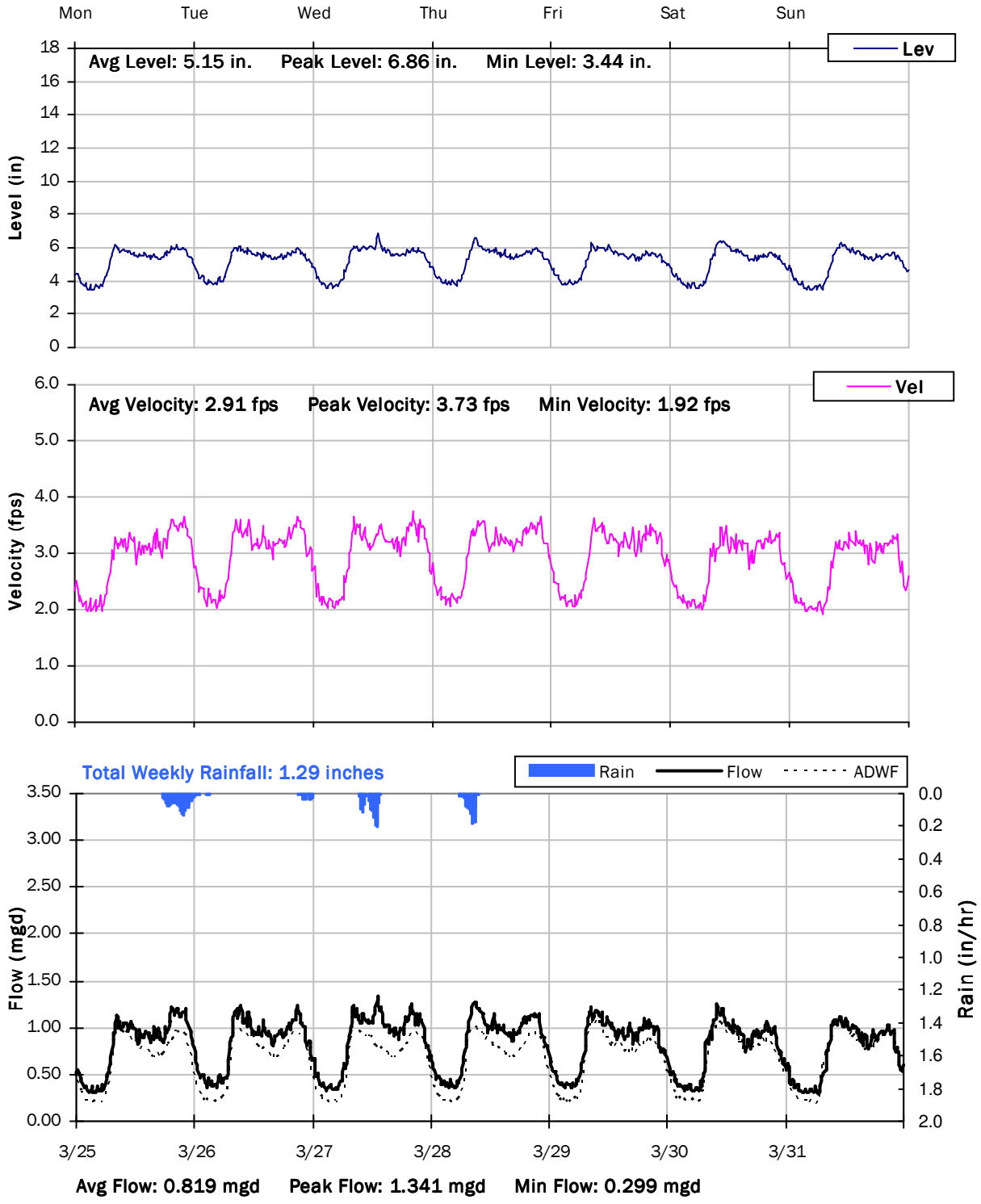
3/18/2019 to 3/25/2019



SITE 3

Weekly Level, Velocity and Flow Hydrographs

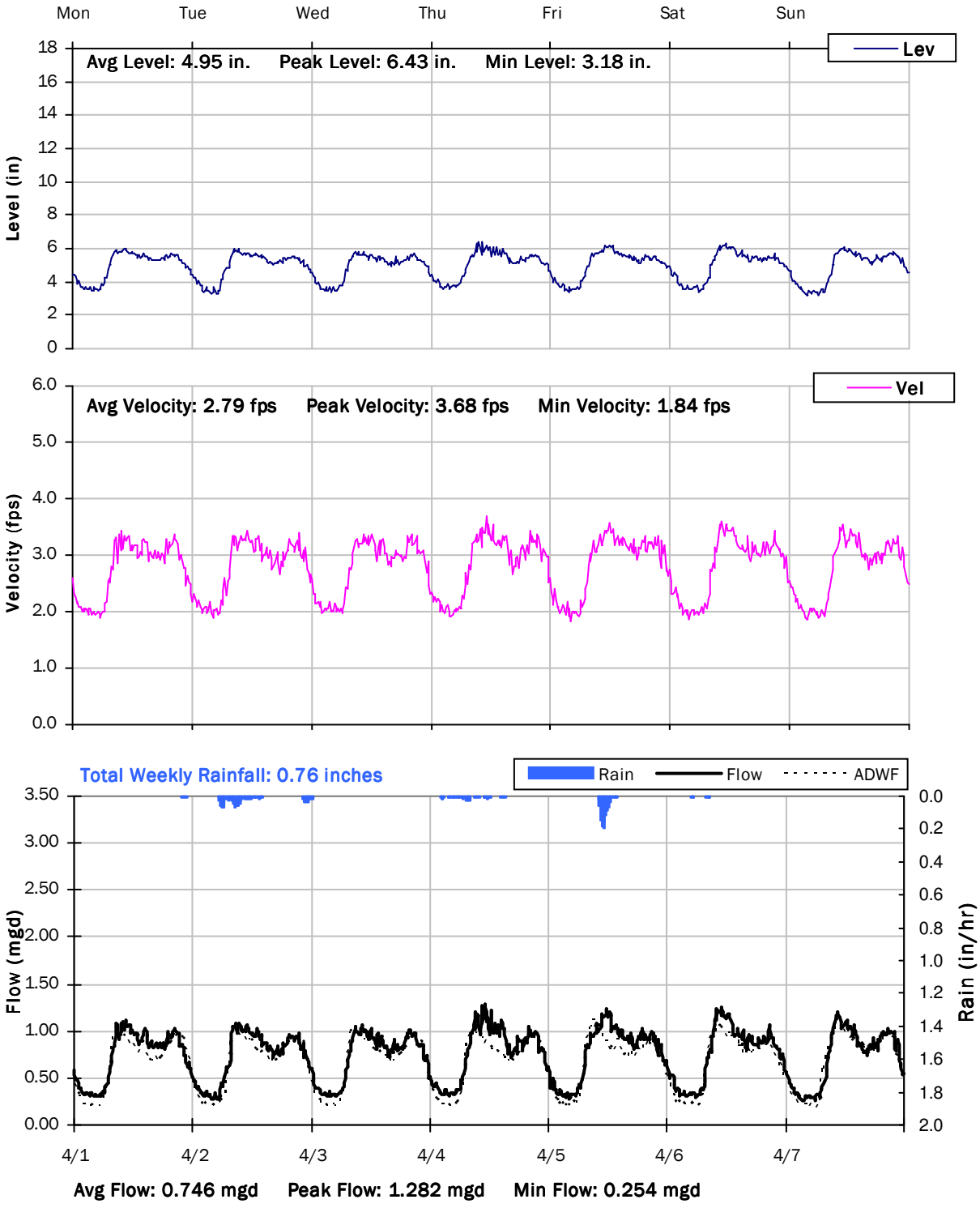
3/25/2019 to 4/1/2019



SITE 3

Weekly Level, Velocity and Flow Hydrographs

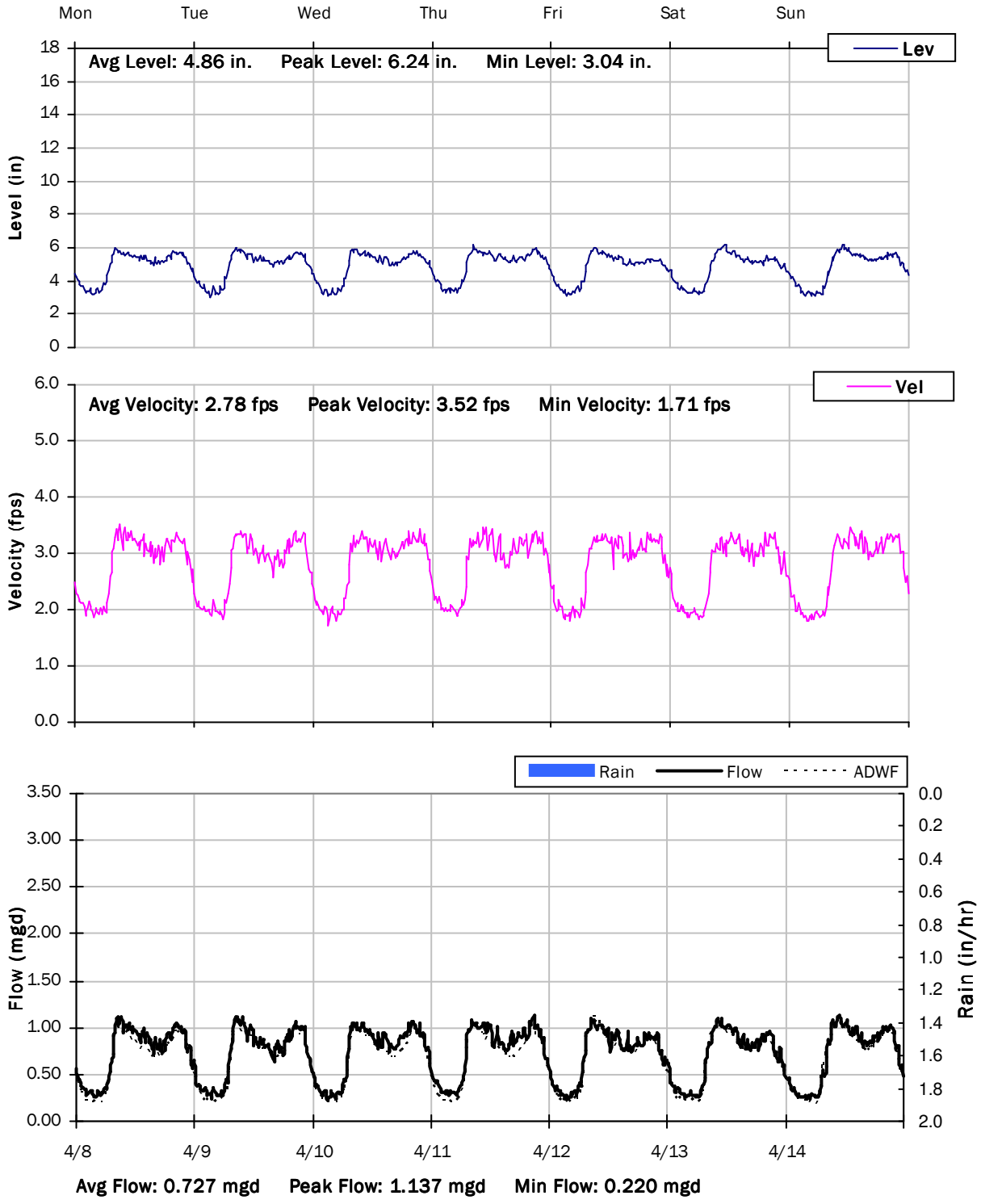
4/1/2019 to 4/8/2019



SITE 3

Weekly Level, Velocity and Flow Hydrographs

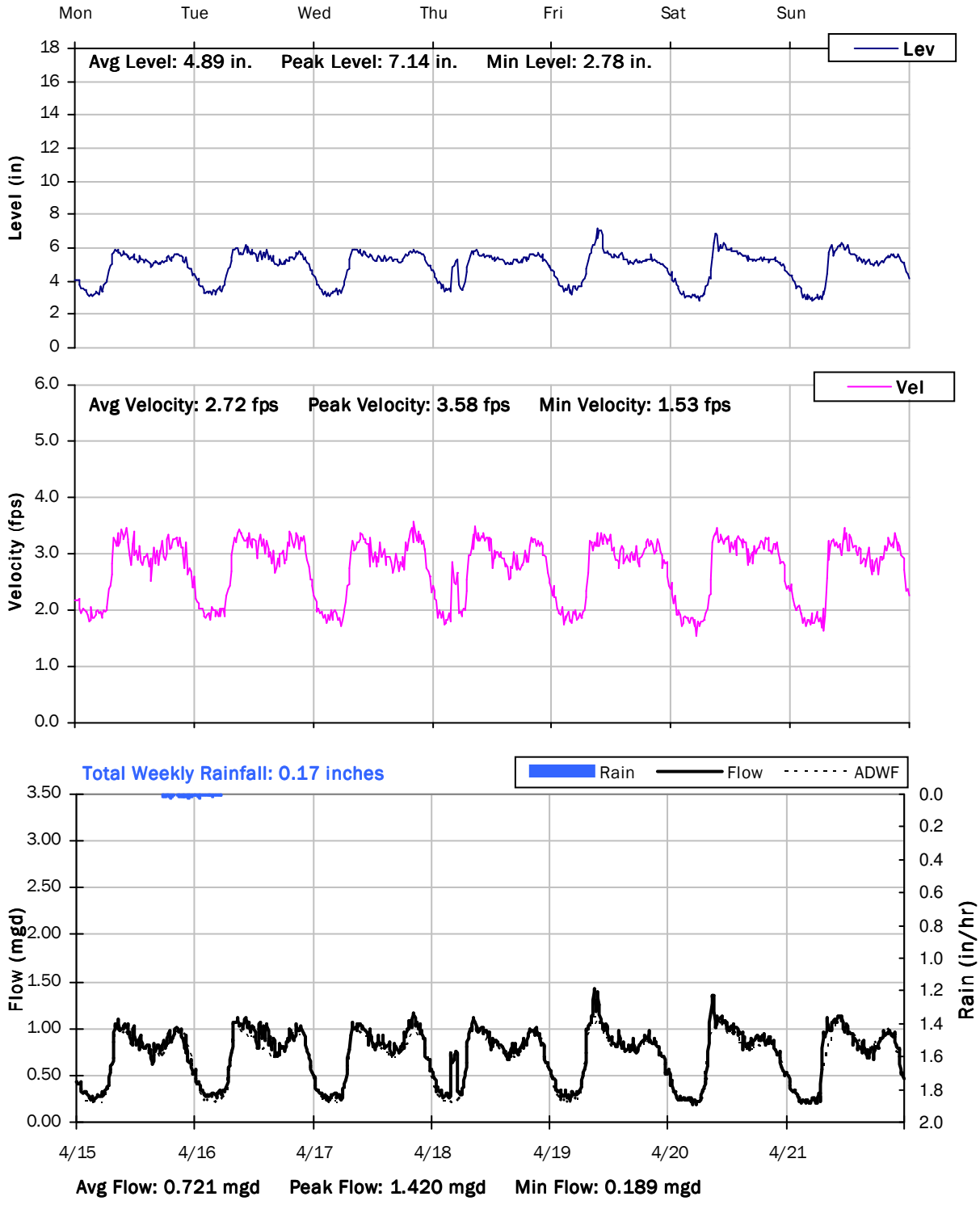
4/8/2019 to 4/15/2019



SITE 3

Weekly Level, Velocity and Flow Hydrographs

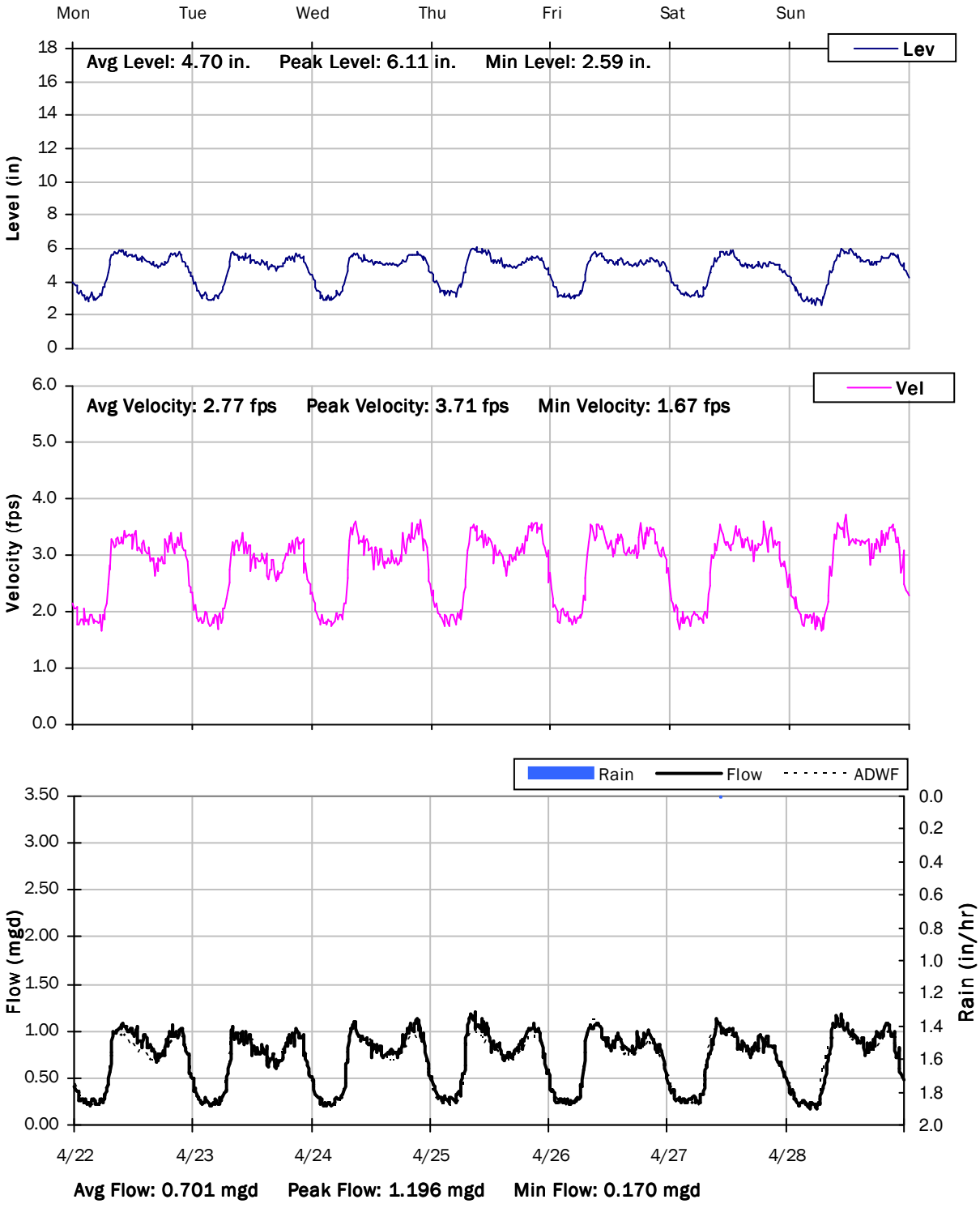
4/15/2019 to 4/22/2019



SITE 3

Weekly Level, Velocity and Flow Hydrographs

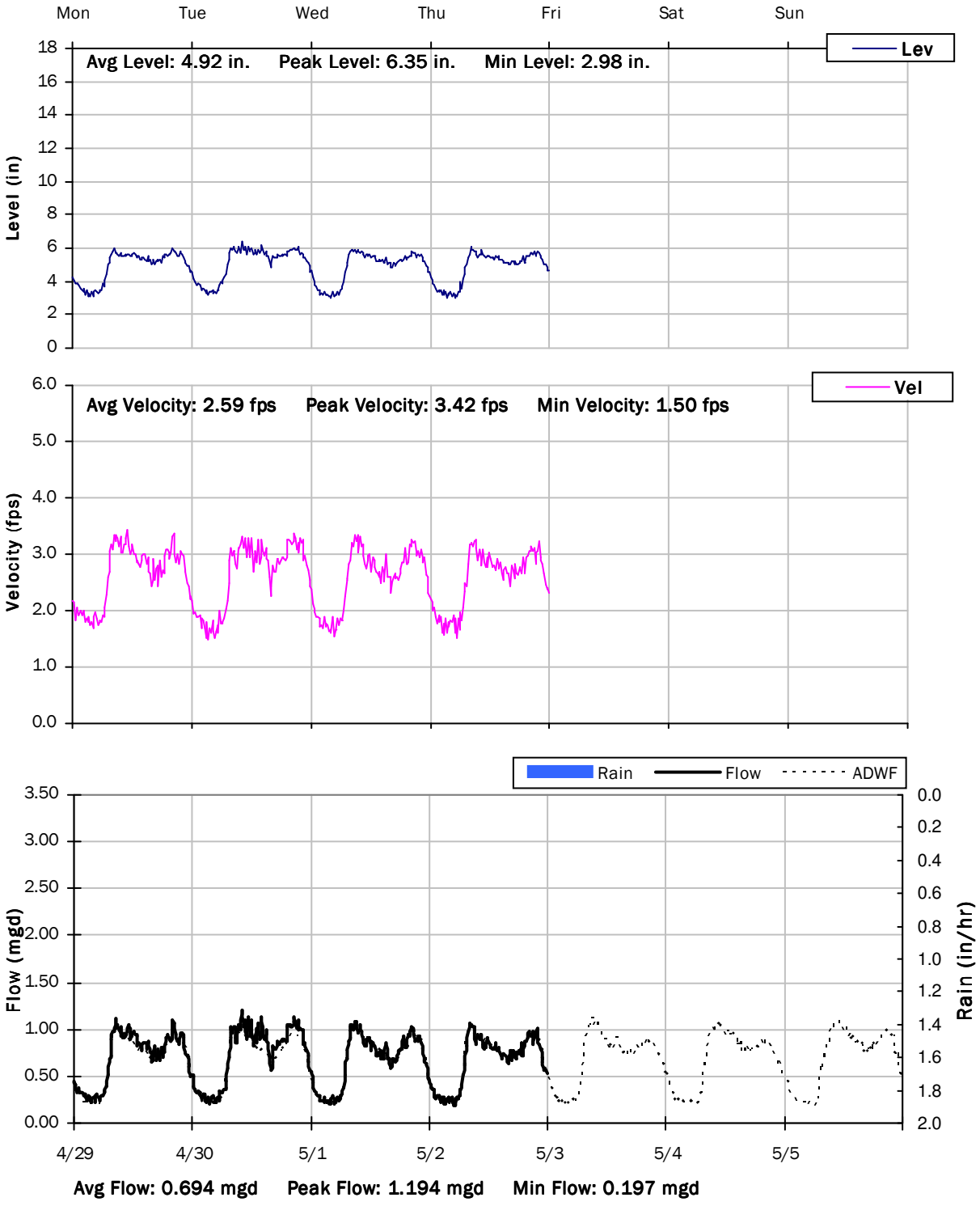
4/22/2019 to 4/29/2019



SITE 3

Weekly Level, Velocity and Flow Hydrographs

4/29/2019 to 5/6/2019



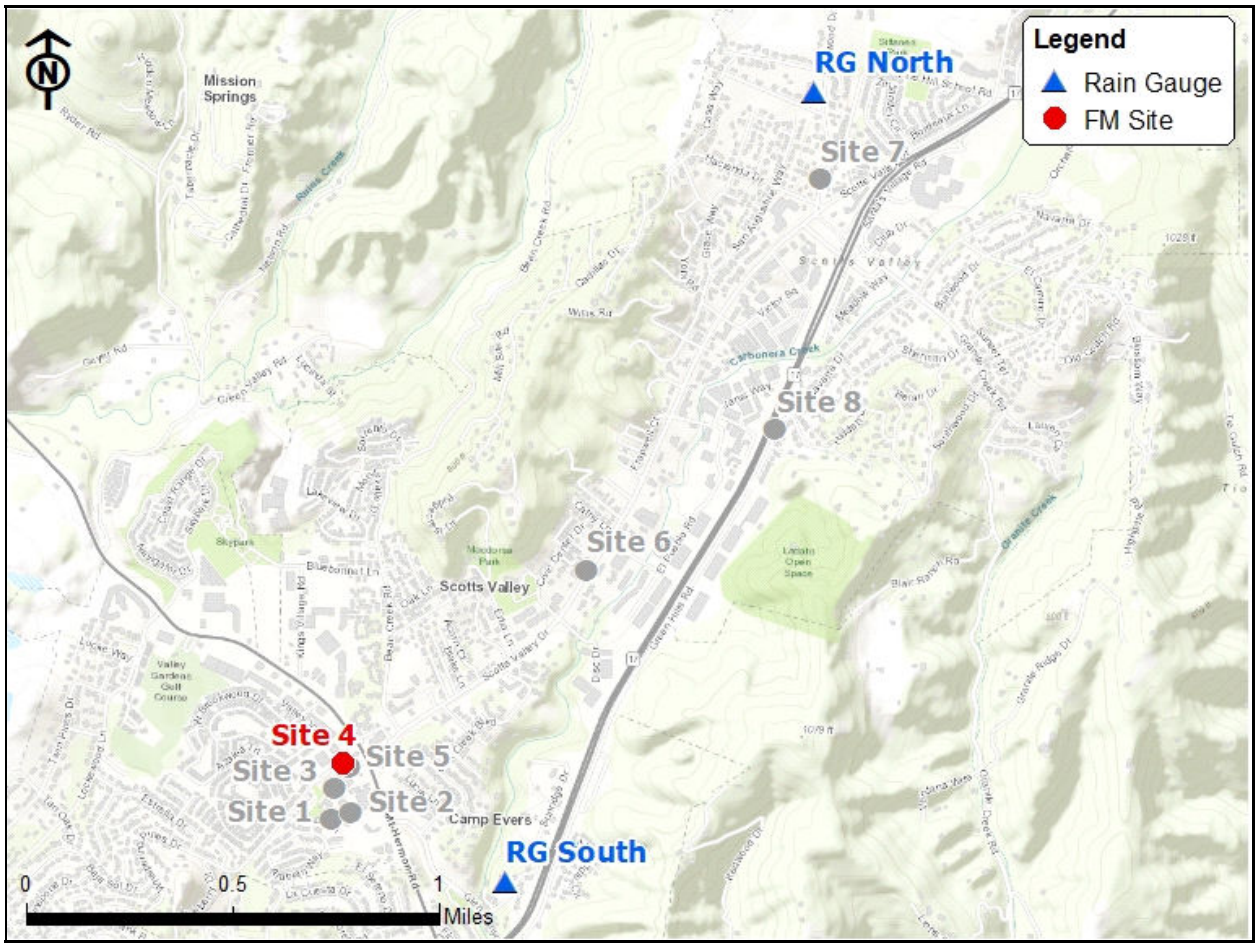
Carollo | Scotts Valley, California

Sanitary Sewer Flow Monitoring
January 30 - May 03, 2019

Monitoring Site: Site 4

Location: Sidewalk near Bubbles Laundromat

Data Summary Report



Vicinity Map: Site 4

SITE 4

Site Information

Location: Sidewalk near Bubbles Laundromat

Coordinates: 122.0262° W, 37.0431° N

Rim Elevation (Earth): 510 feet

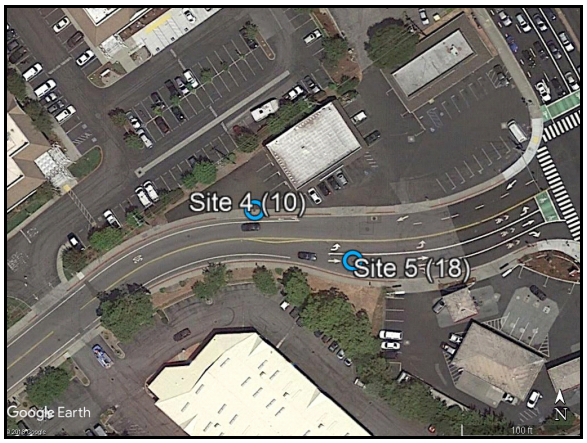
Expected Pipe Diameter: 10 inches

Measured Pipe Diameter: 10 inches

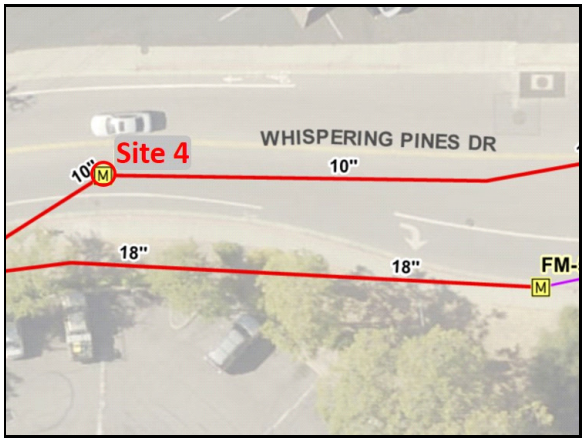
ADWF: 0.053 mgd

Peak Measured Flow: 0.187 mgd

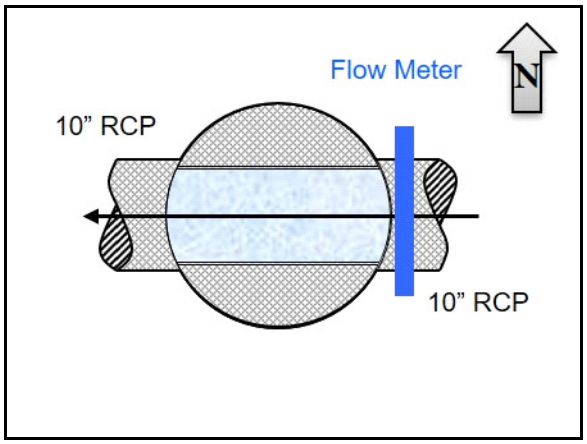
Sediment: None



Satellite Map



Sewer Map



Flow Sketch



Street View



Plan View

SITE 4

Additional Site Photos

Effluent Pipe



Monitored Influent Pipe

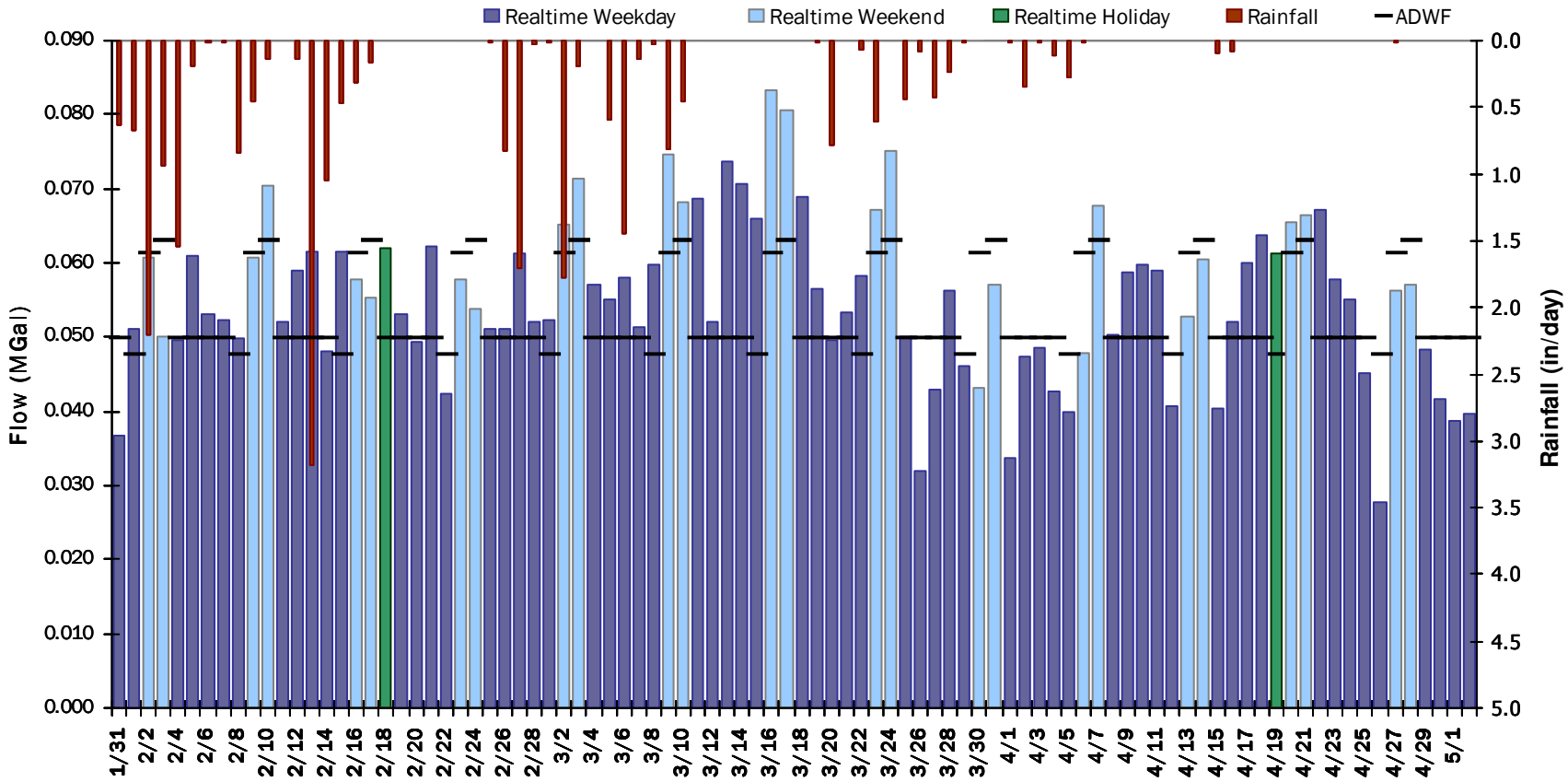


SITE 4

Period Flow Summary: Daily Flow Totals

Avg Daily Flow: 0.055 MGal **Peak Daily Flow: 0.083 MGal** **Min Daily Flow: 0.028 MGal**

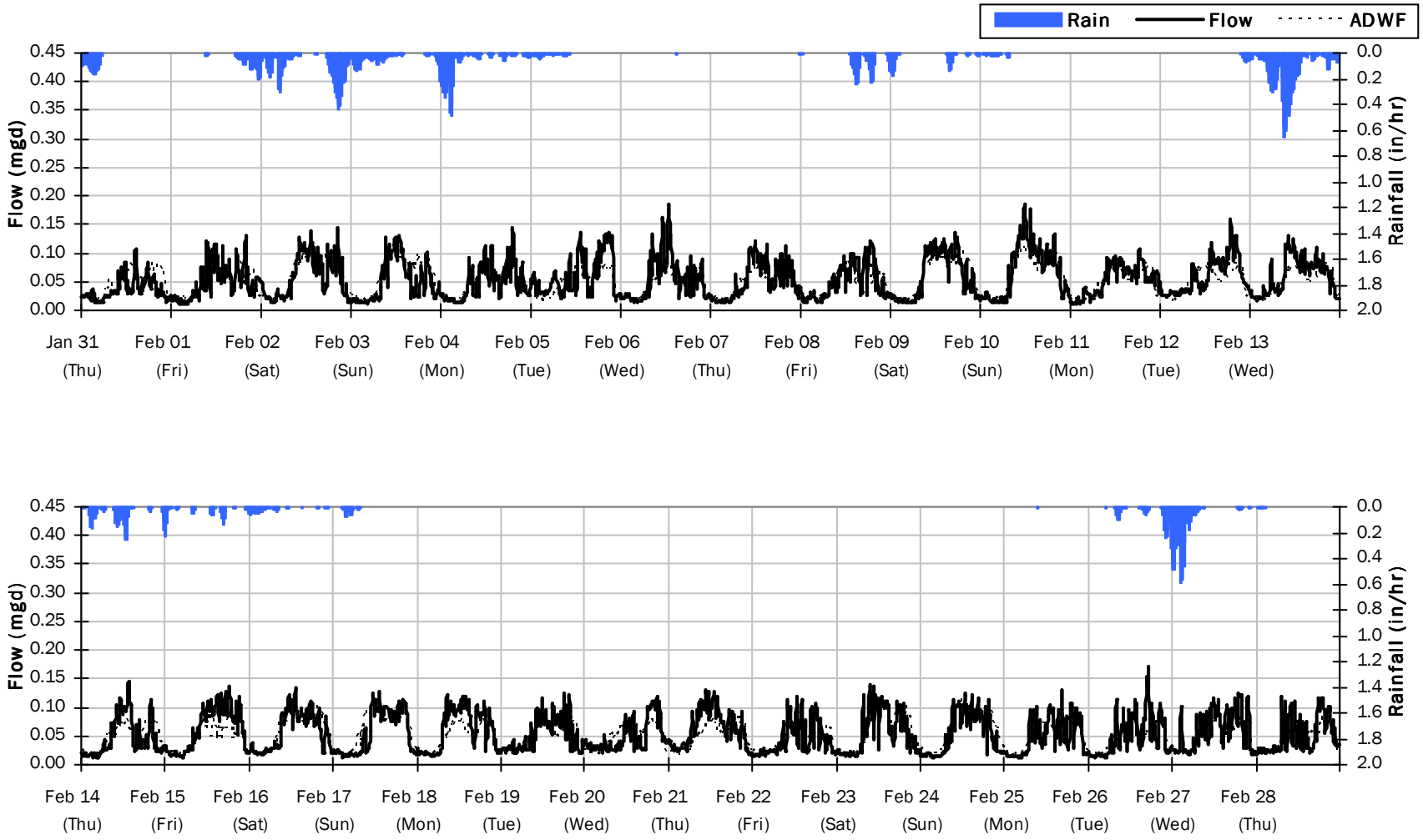
Total Rainfall: 24.66 inches



SITE 4

Flow Summary: 1/31/2019 to 2/28/2019

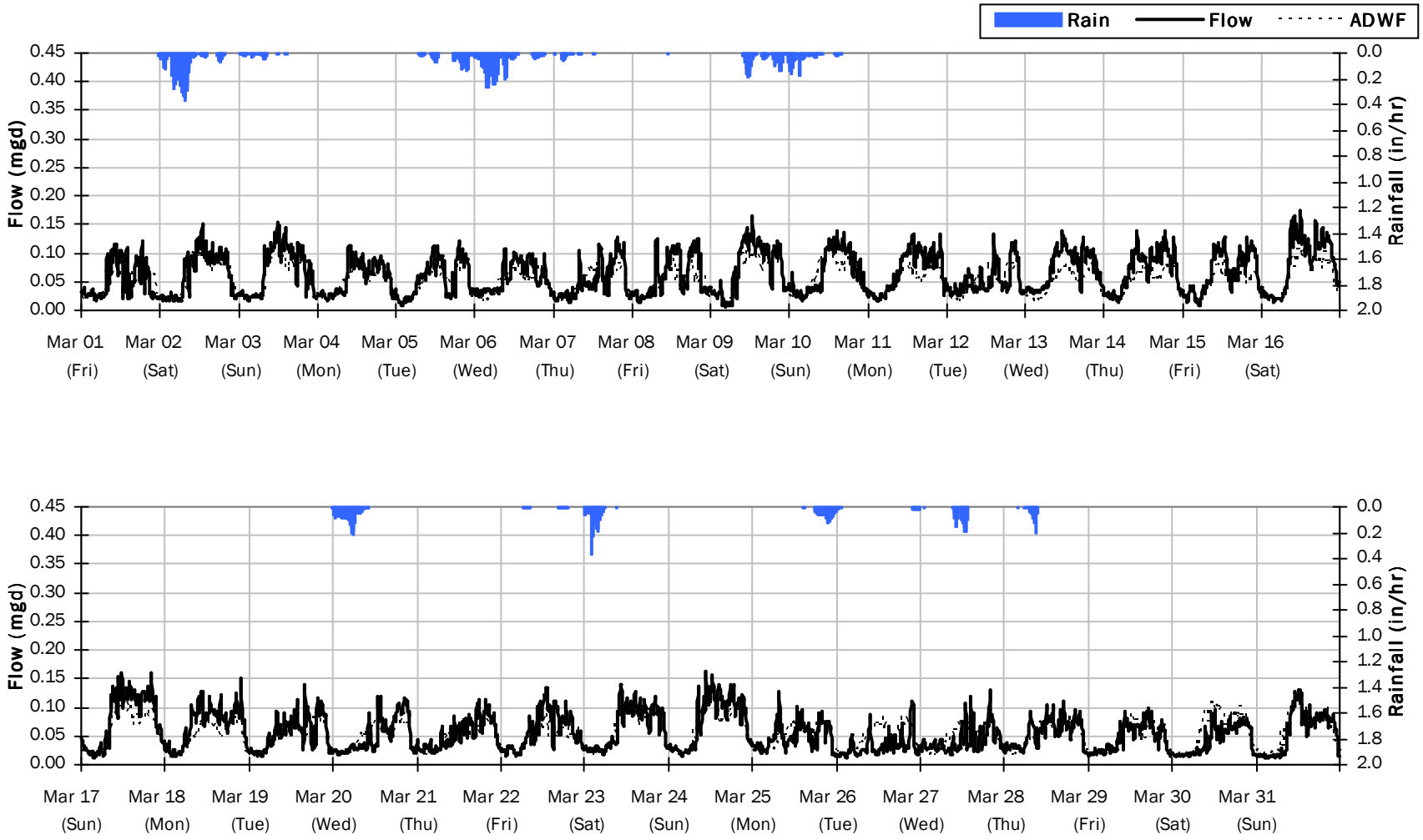
Period Rainfall: 15.55 inches Period Avg Flow: 0.055 mgd Period Peak Flow: 0.187 mgd Period Min Flow



SITE 4

Flow Summary: 3/1/2019 to 3/31/2019

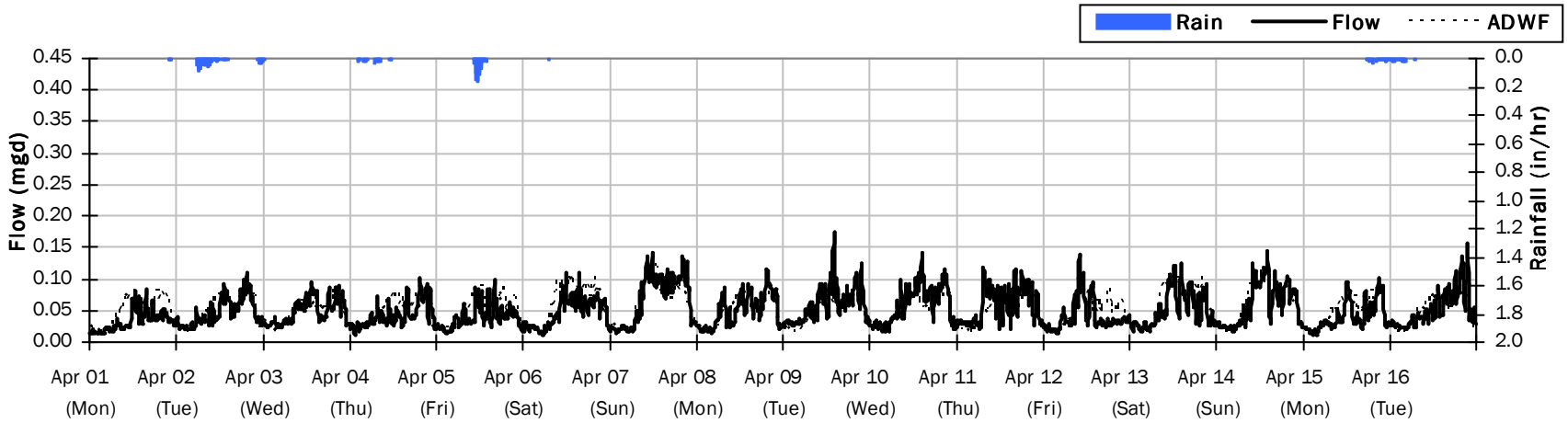
Period Rainfall: 8.15 inches Period Avg Flow: 0.060 mgd Period Peak Flow: 0.175 mgd Period Min Flow

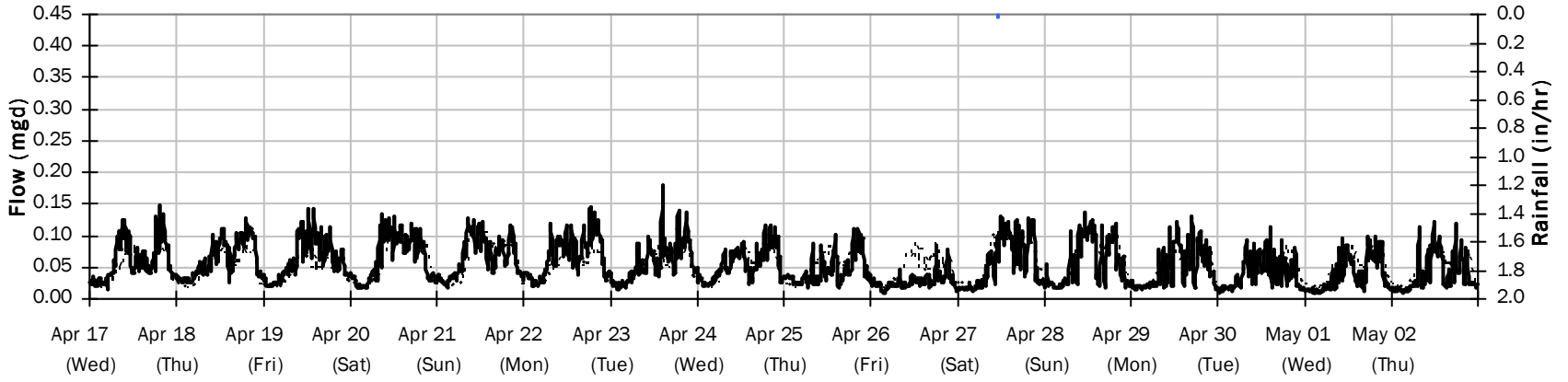


SITE 4

Flow Summary: 4/1/2019 to 5/2/2019

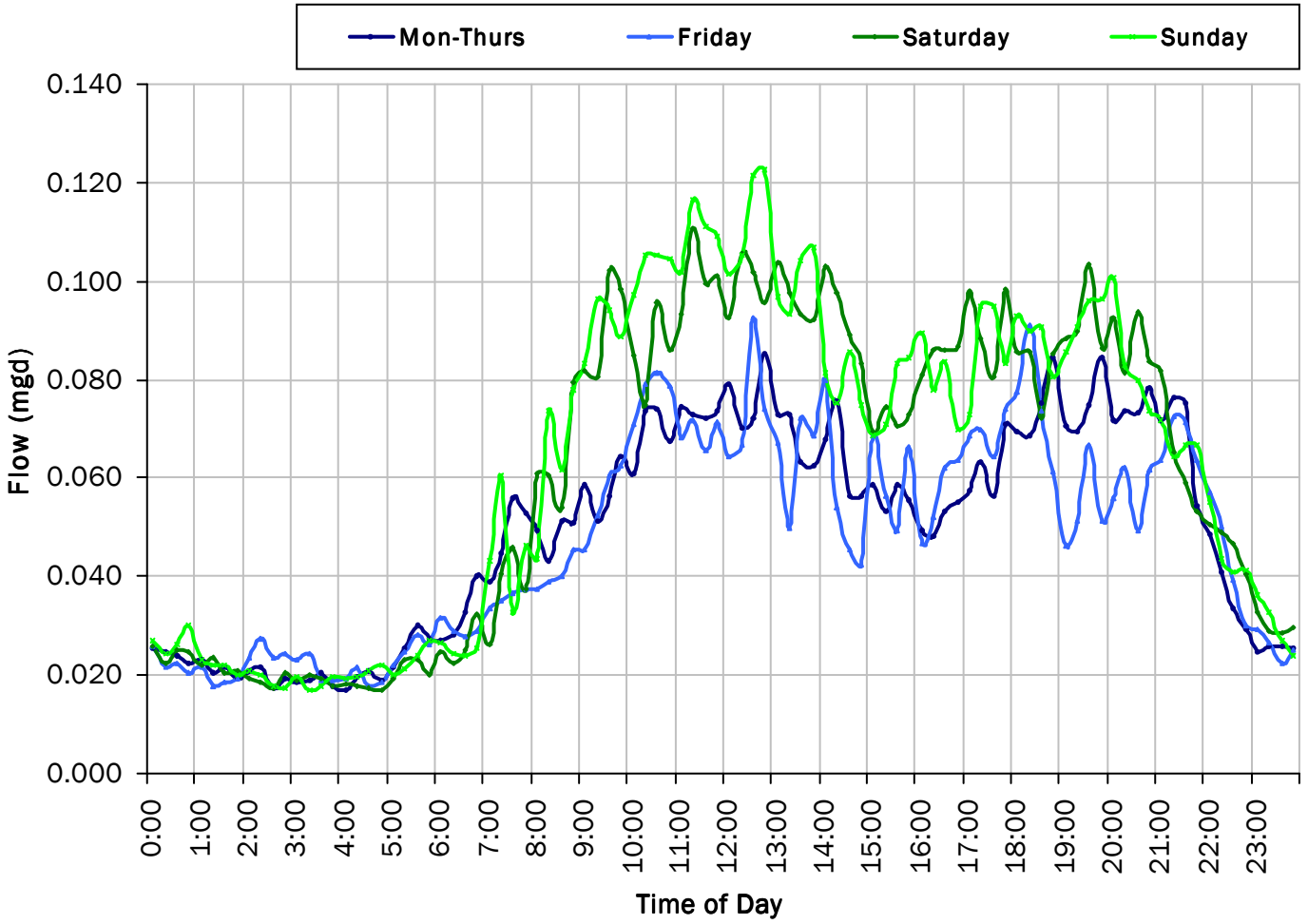
Period Rainfall: 0.96 inches Period Avg Flow: 0.052 mgd Period Peak Flow: 0.181 mgd Period Min Flow





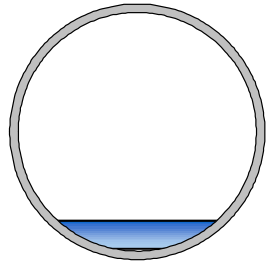
SITE 4

Average Dry Weather Flow Hydrographs



ADWF:

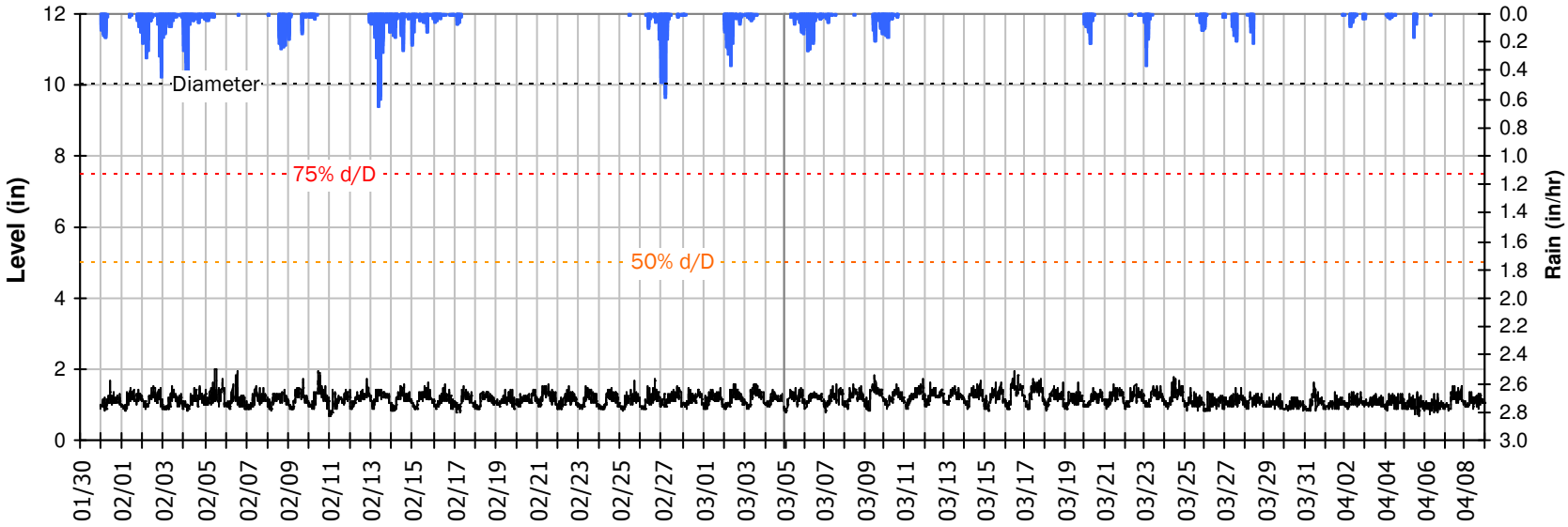
0.053 *mgd*

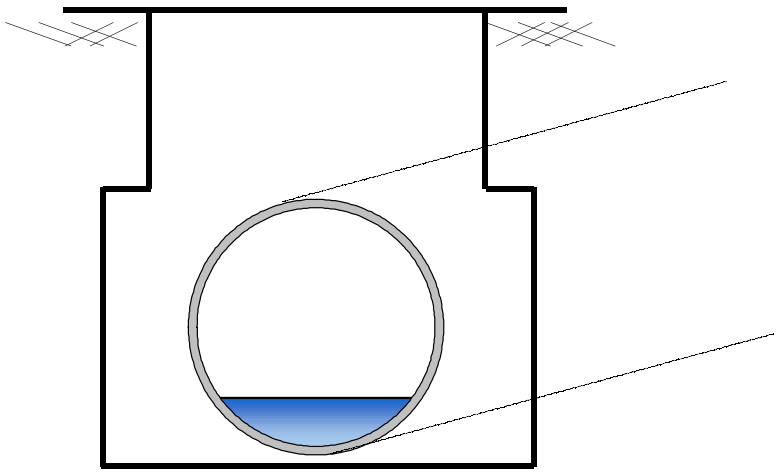


SITE 4

Site Capacity and Surcharge Summary

Realtime Flow Levels with Rainfall Data over Peak Level Period

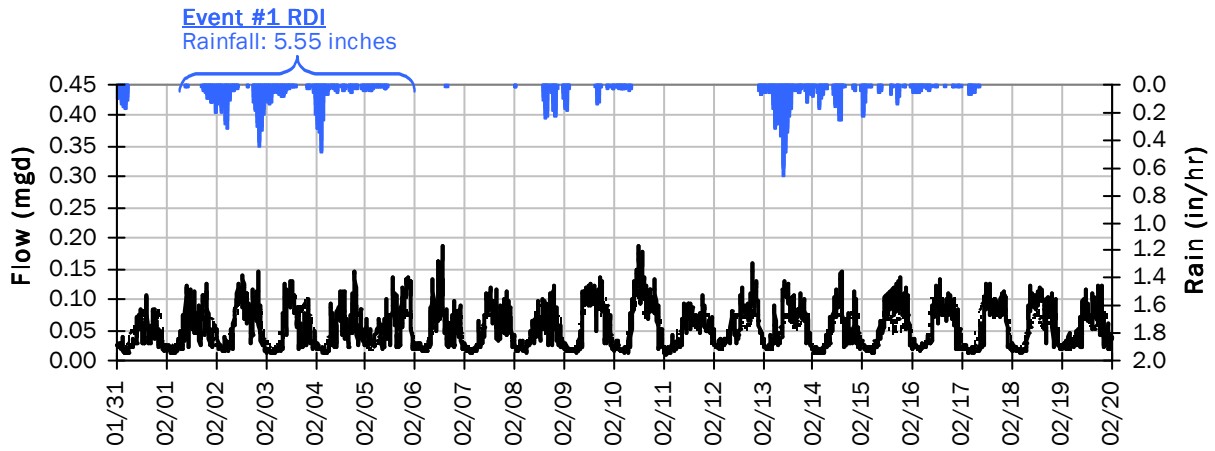




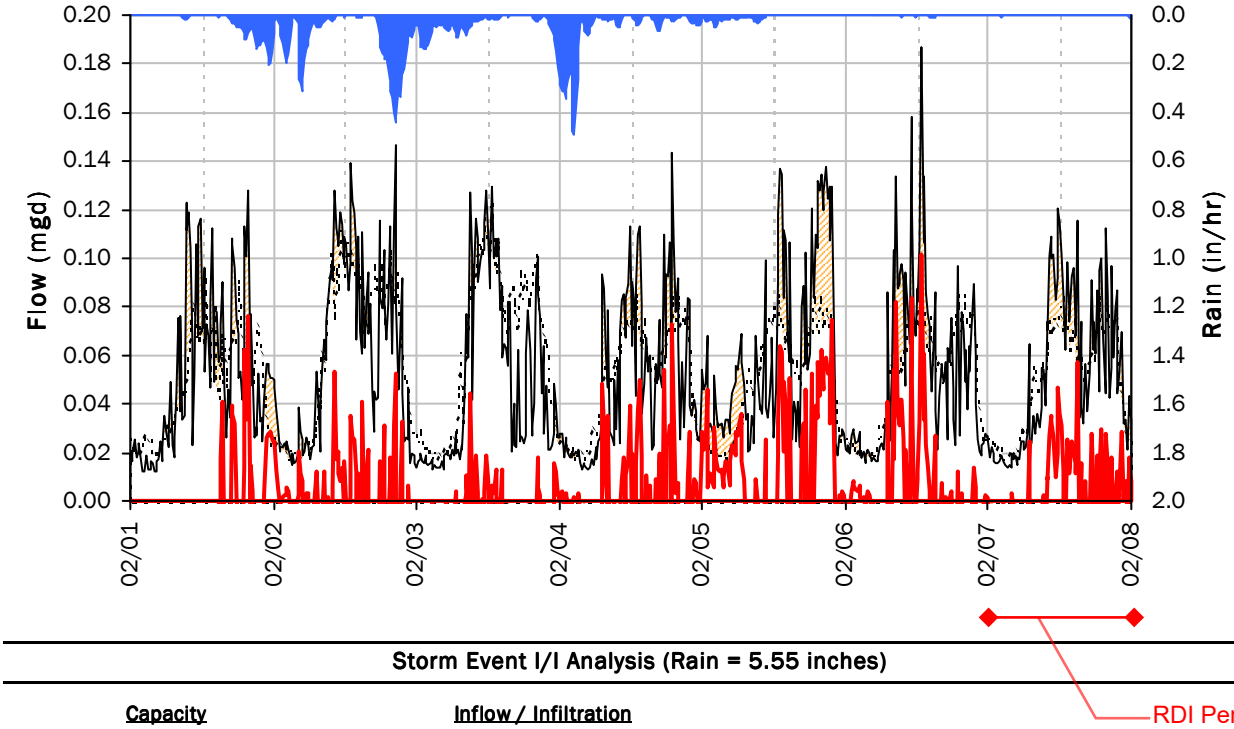
Pipe Diameter:	10	*inches*
Peak Measured Level:	2.01	*inches*
Peak d/D Ratio:	0.20	

SITE 4
I/I Summary: Event #1 RDI

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #1 RDI Detail Graph

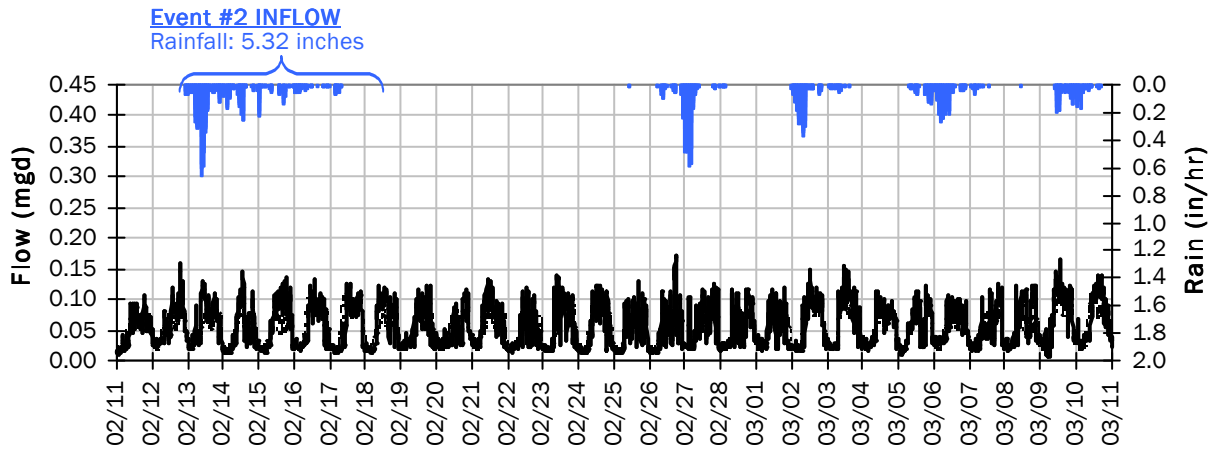


Storm Event I/I Analysis (Rain = 5.55 inches)

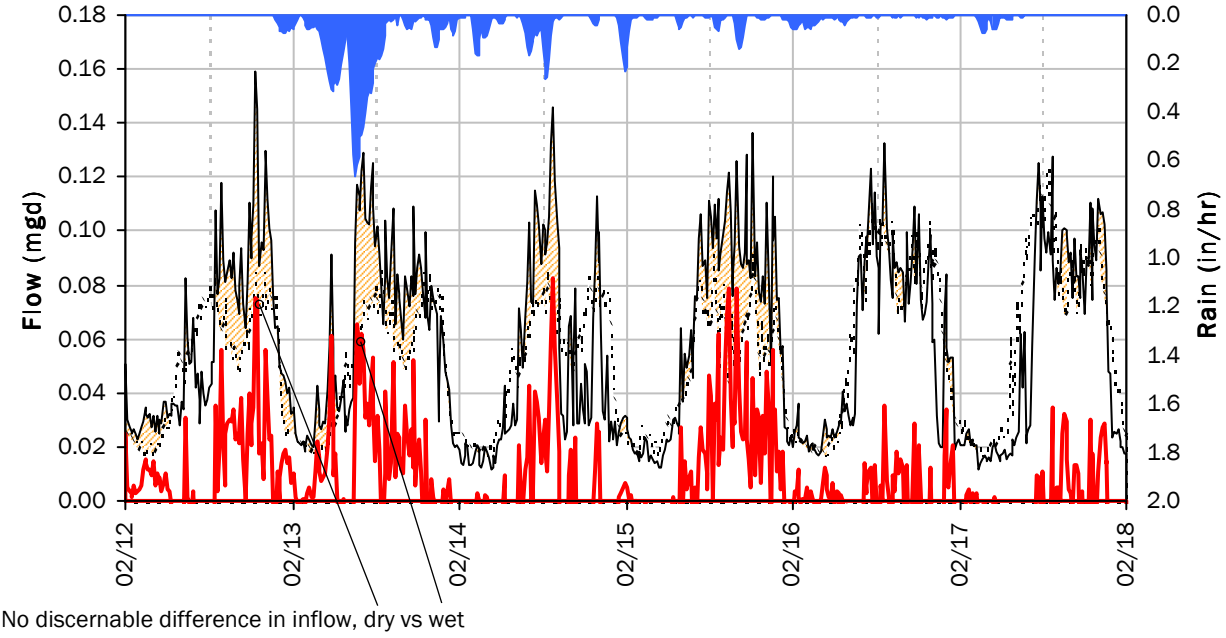
Capacity		Inflow / Infiltration	
Peak Flow:	0.187 *mgd*	**RDI:**	0.003 *mgd*
PF:	3.53		
Peak Level:	2.01 *in*		
d/D Ratio:	0.20		

SITE 4
I/I Summary: Event #2 INFLOW

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #2 INFLOW Detail Graph



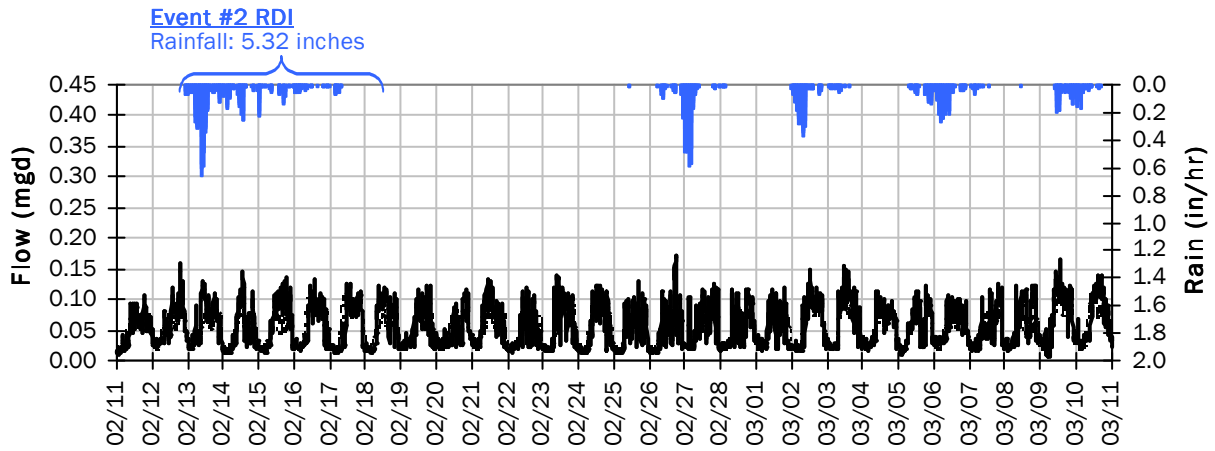
No discernable difference in inflow, dry vs wet

Storm Event I/I Analysis (Rain = 5.32 inches)

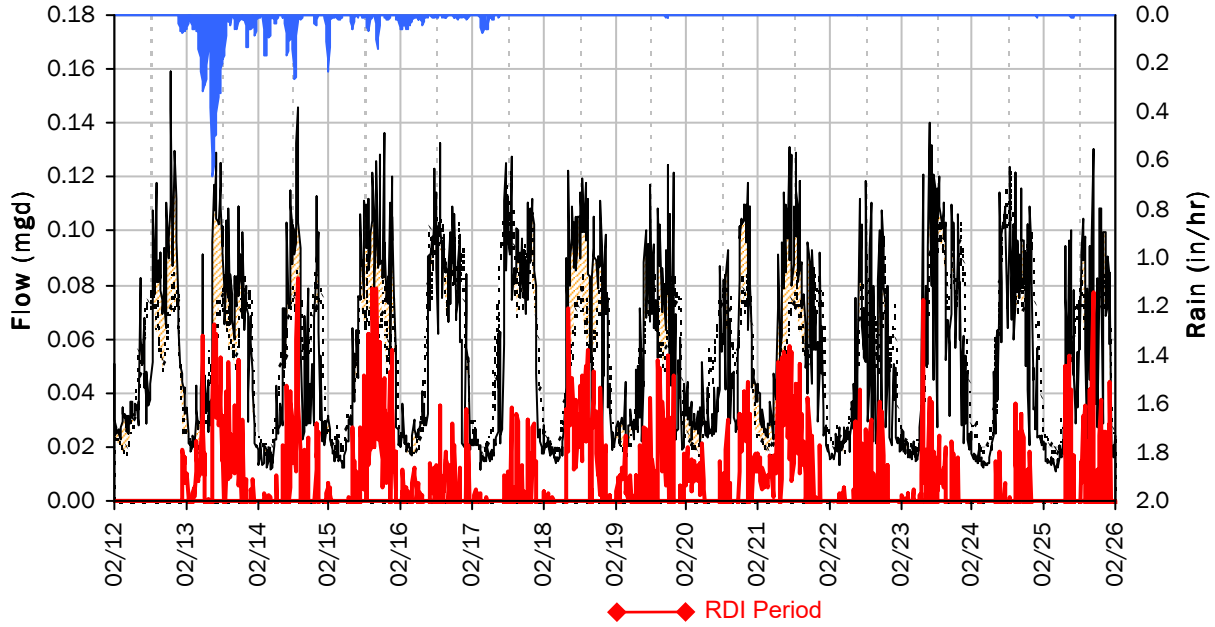
Capacity		Inflow / Infiltration	
Peak Flow:	0.160 *mgd*	**Peak I/I Rate:**	0.000 *mgd*
PF:	3.01		
Peak Level:	1.74 *in*		
d/D Ratio:	0.17		

SITE 4
I/I Summary: Event #2 RDI

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #2 RDI Detail Graph

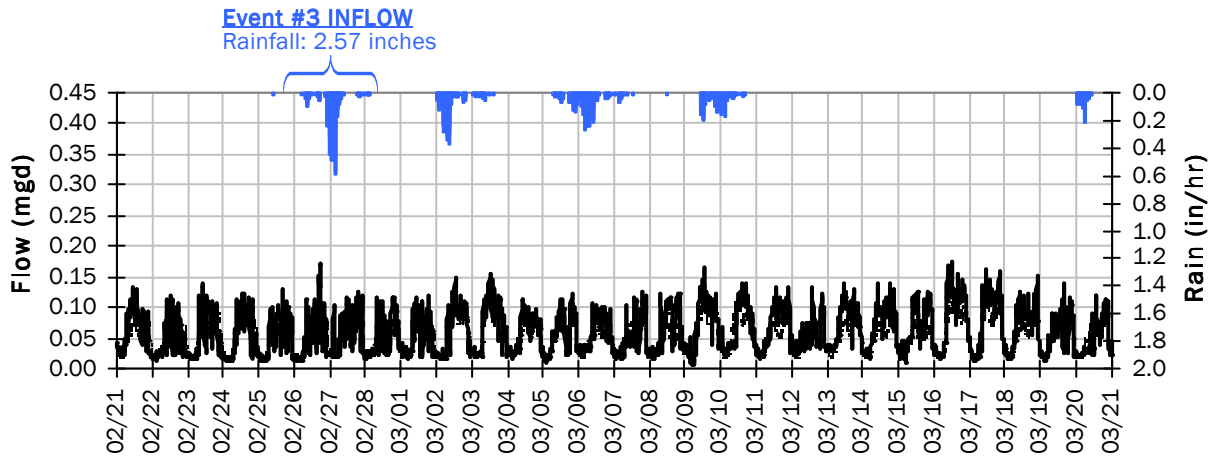


Storm Event I/I Analysis (Rain = 5.32 inches)

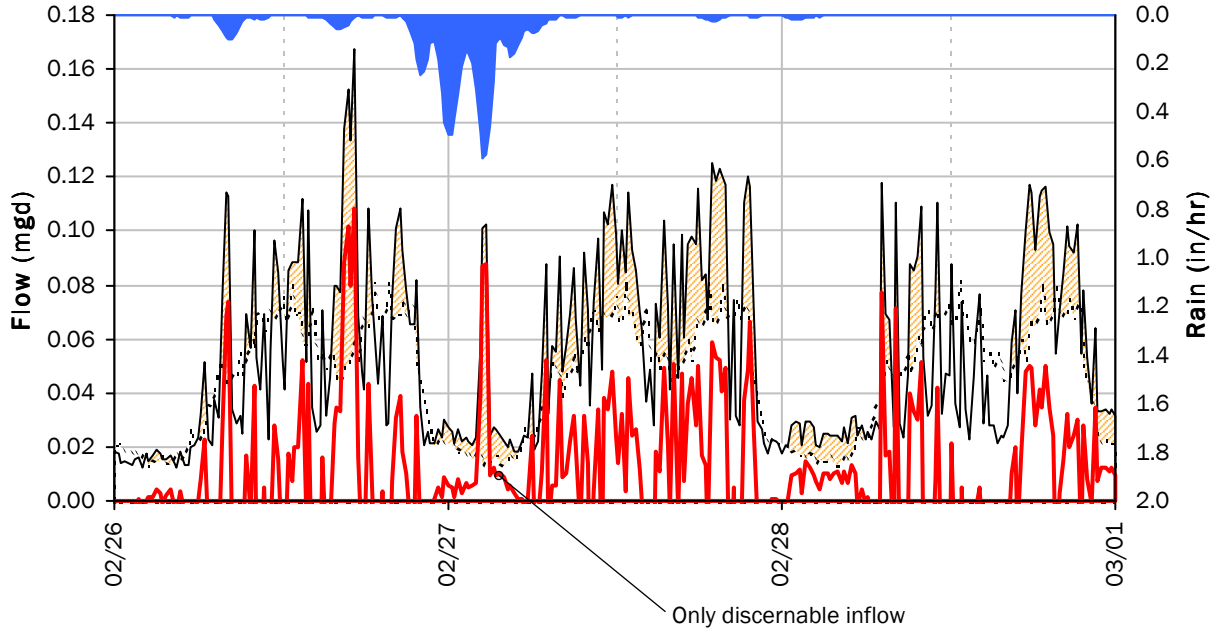
Capacity		Inflow / Infiltration	
Peak Flow:	0.160 *mgd*	**RDI:**	0.003 *mgd*
PF:	3.01		
Peak Level:	1.74 *in*		
d/D Ratio:	0.17		

SITE 4
I/I Summary: Event #3 INFLOW

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #3 INFLOW Detail Graph

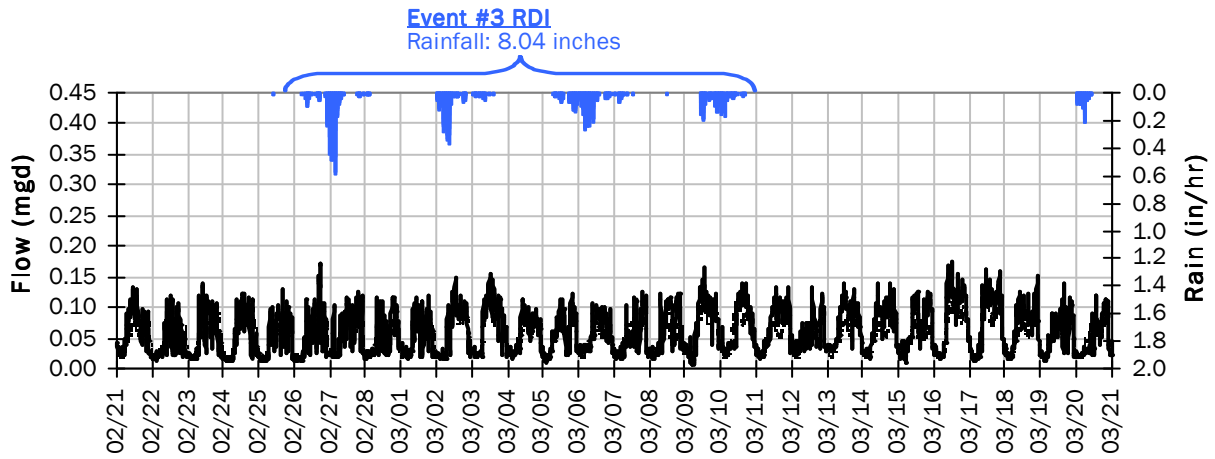


Storm Event I/I Analysis (Rain = 2.57 inches)

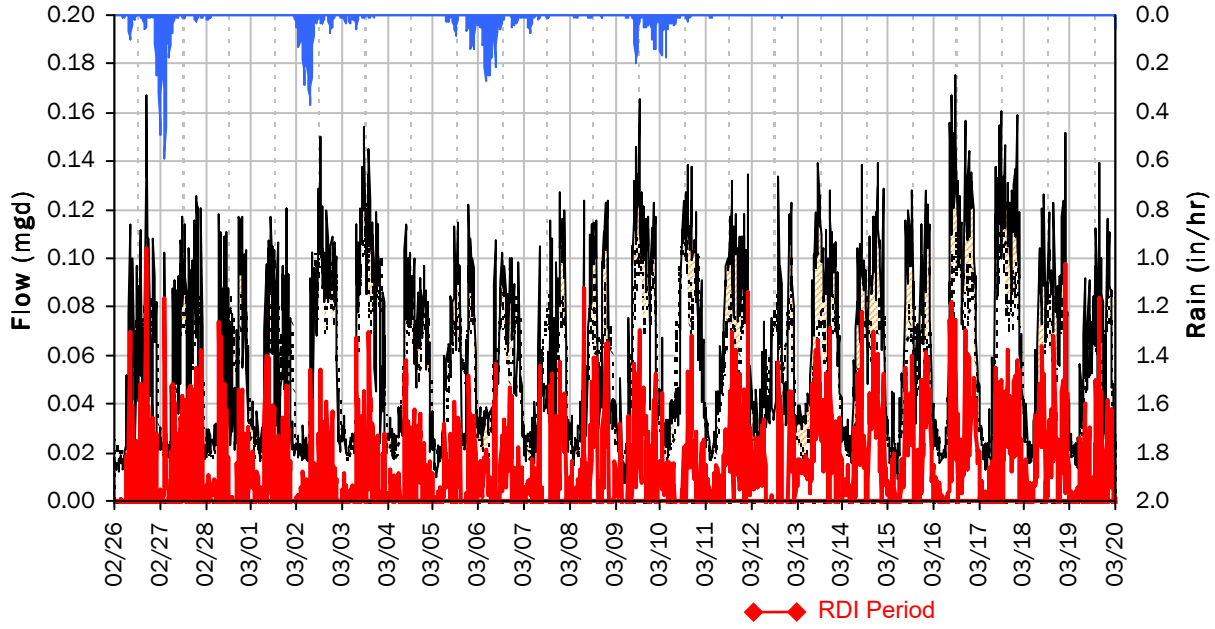
Capacity		Inflow / Infiltration	
Peak Flow:	0.17 *mgd*	**Peak I/I Rate:**	0.0128 *mgd*
PF:	3.16		
Peak Level:	1.72 *in*		
d/D Ratio:	0.17		

SITE 4
I/I Summary: Event #3 RDI

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #3 RDI Detail Graph



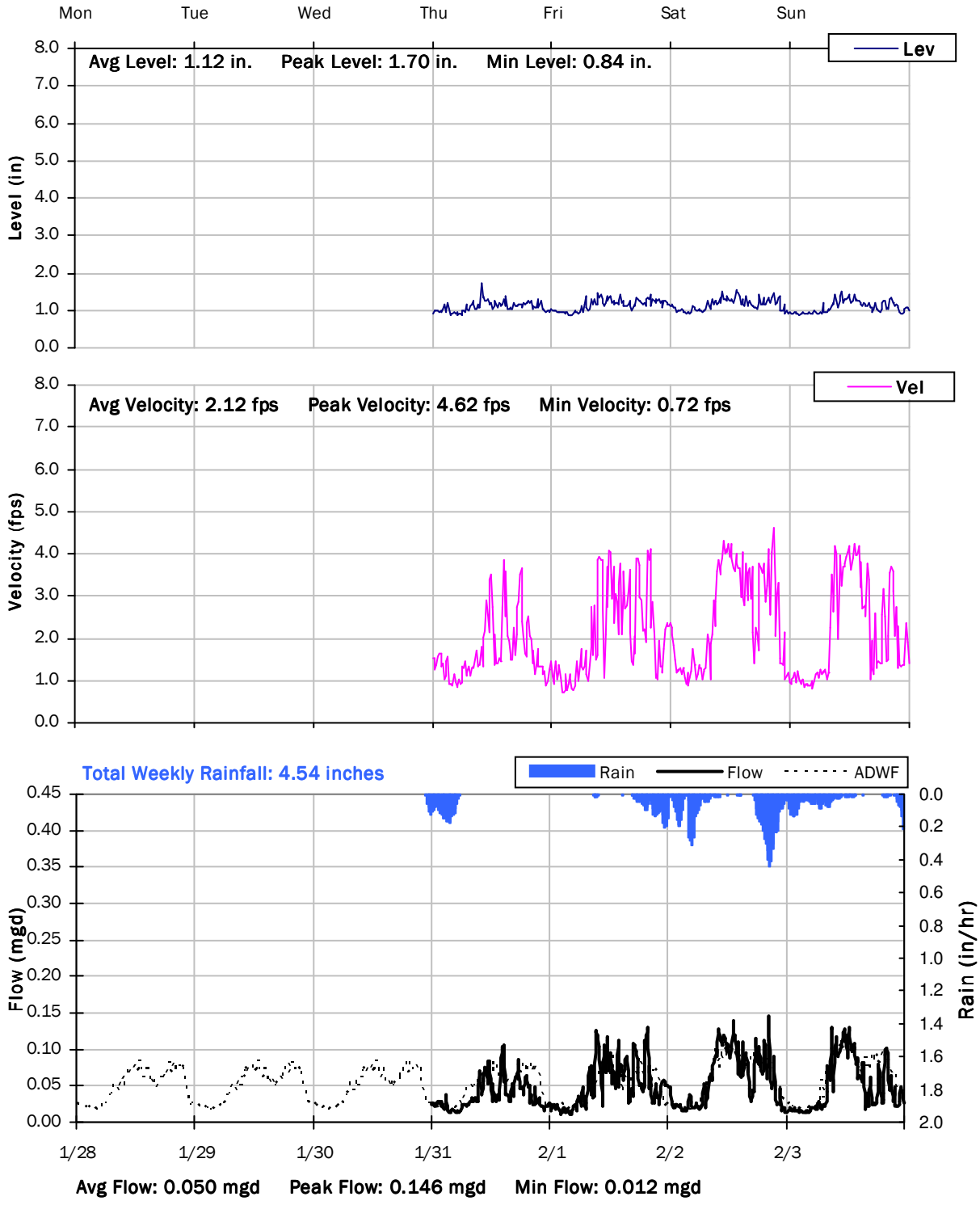
Storm Event I/I Analysis (Rain = 8.04 inches)

Capacity		Inflow / Infiltration	
Peak Flow:	0.18 *mgd*	**RDI:**	0.002 *mgd*
PF:	3.31		
Peak Level:	1.96 *in*		
d/D Ratio:	0.20		

SITE 4

Weekly Level, Velocity and Flow Hydrographs

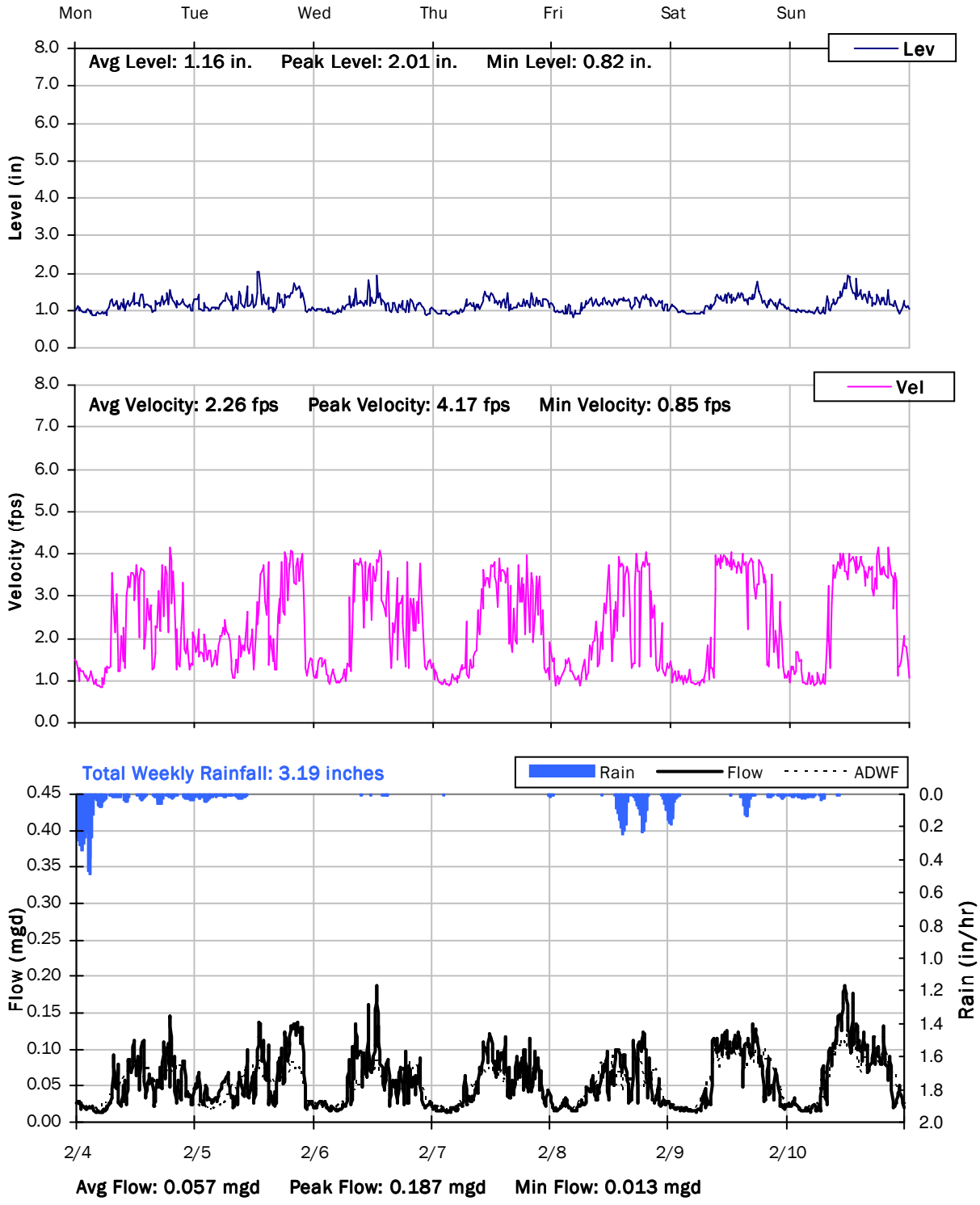
1/28/2019 to 2/4/2019



SITE 4

Weekly Level, Velocity and Flow Hydrographs

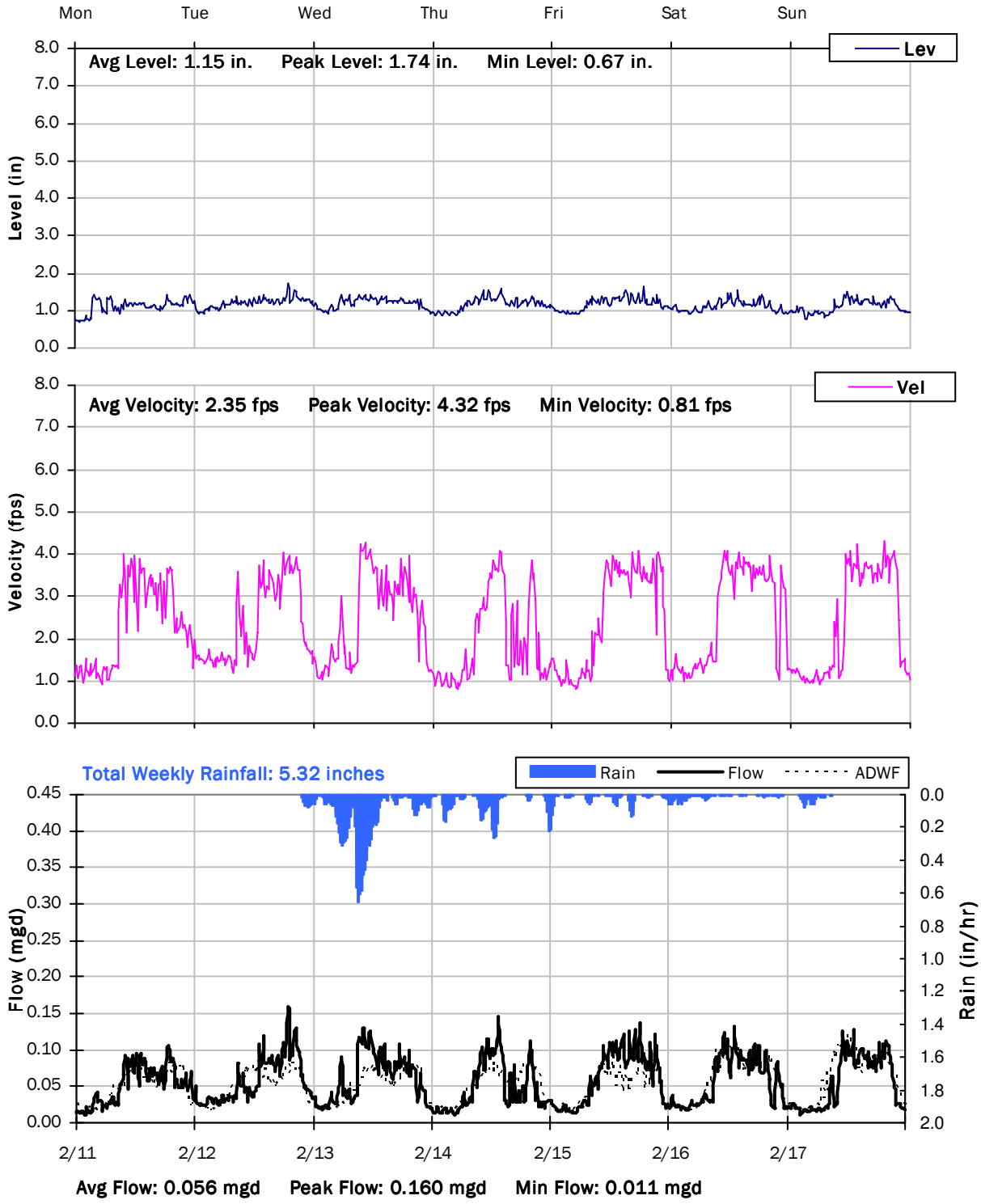
2/4/2019 to 2/11/2019



SITE 4

Weekly Level, Velocity and Flow Hydrographs

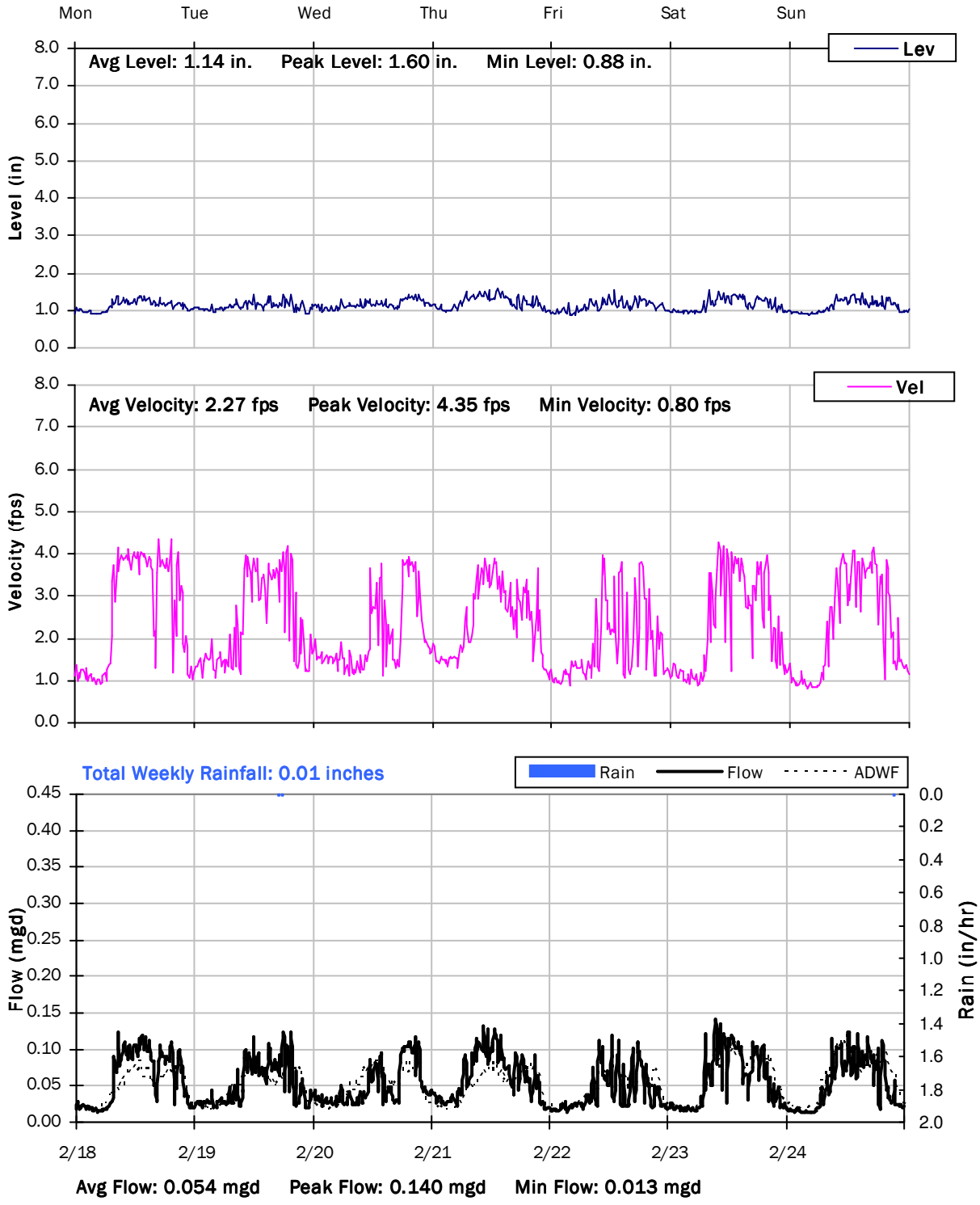
2/11/2019 to 2/18/2019



SITE 4

Weekly Level, Velocity and Flow Hydrographs

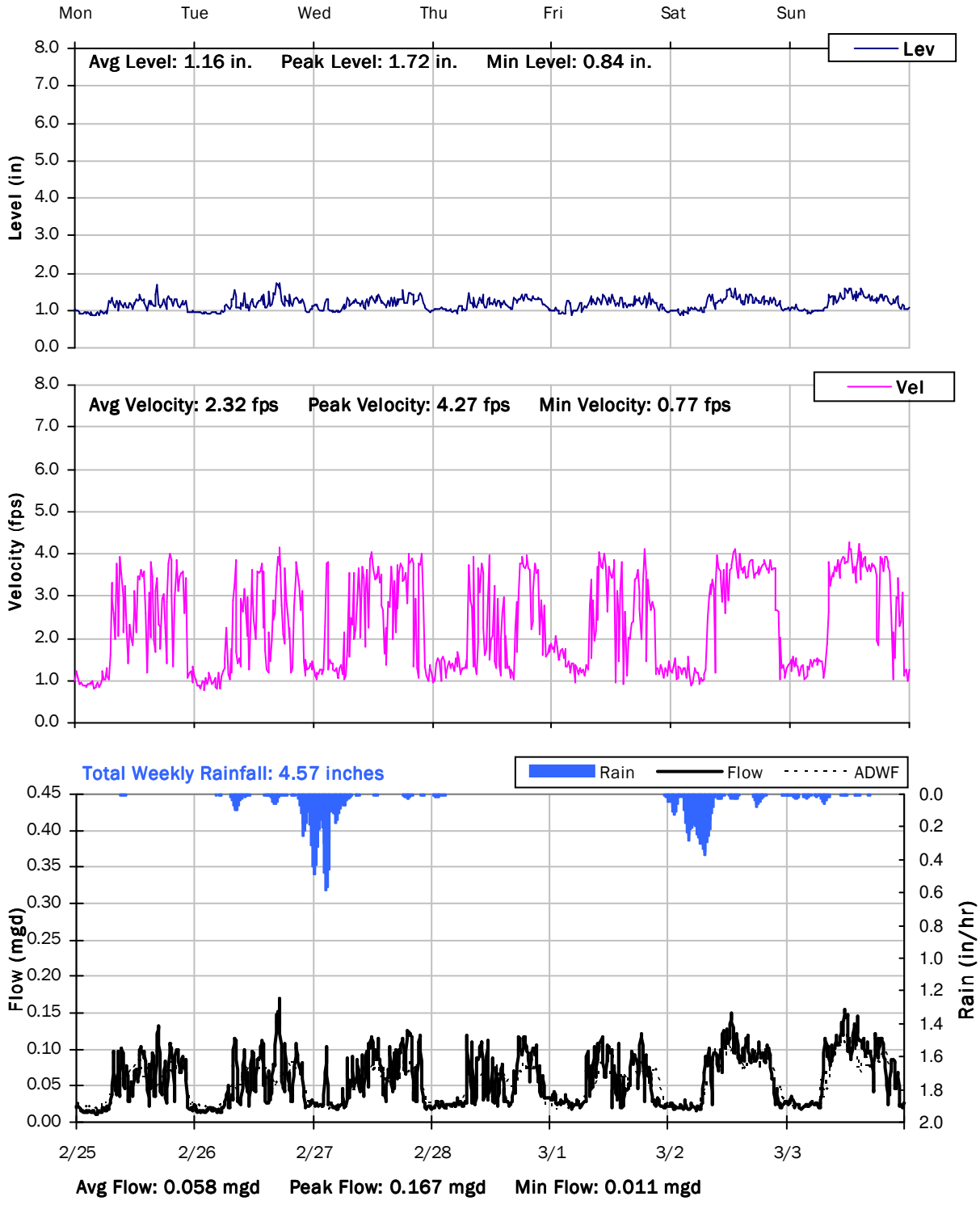
2/18/2019 to 2/25/2019



SITE 4

Weekly Level, Velocity and Flow Hydrographs

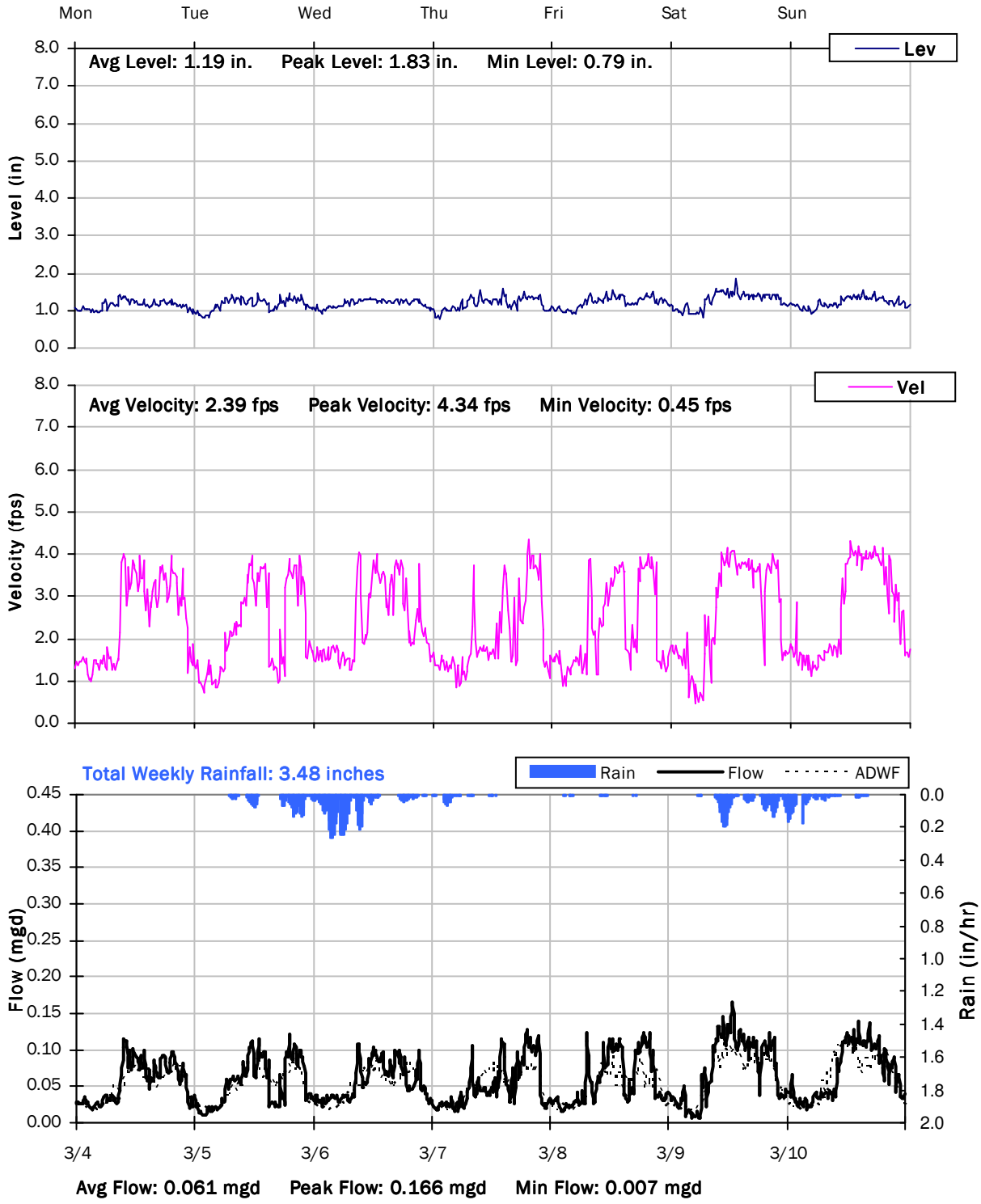
2/25/2019 to 3/4/2019



SITE 4

Weekly Level, Velocity and Flow Hydrographs

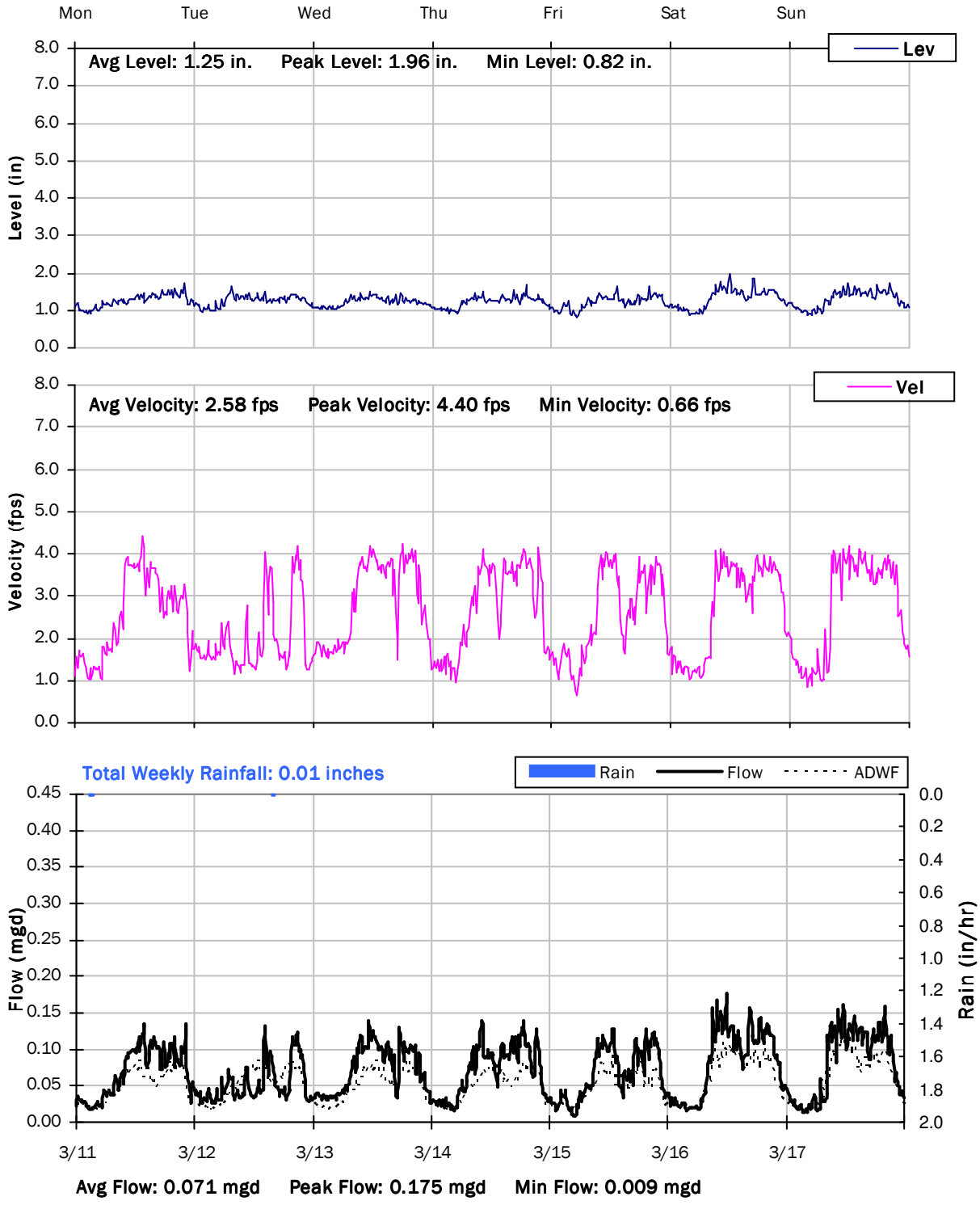
3/4/2019 to 3/11/2019



SITE 4

Weekly Level, Velocity and Flow Hydrographs

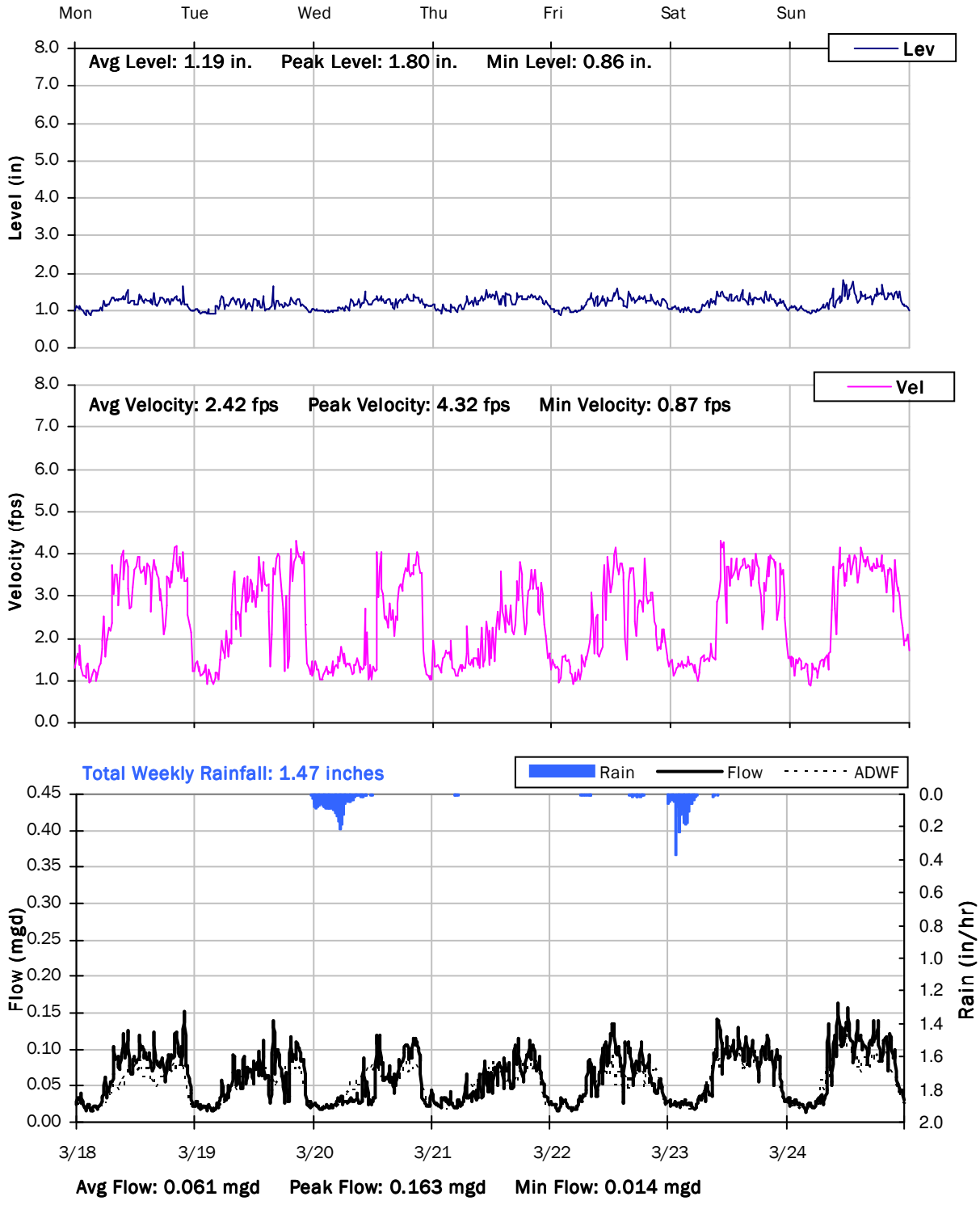
3/11/2019 to 3/18/2019



SITE 4

Weekly Level, Velocity and Flow Hydrographs

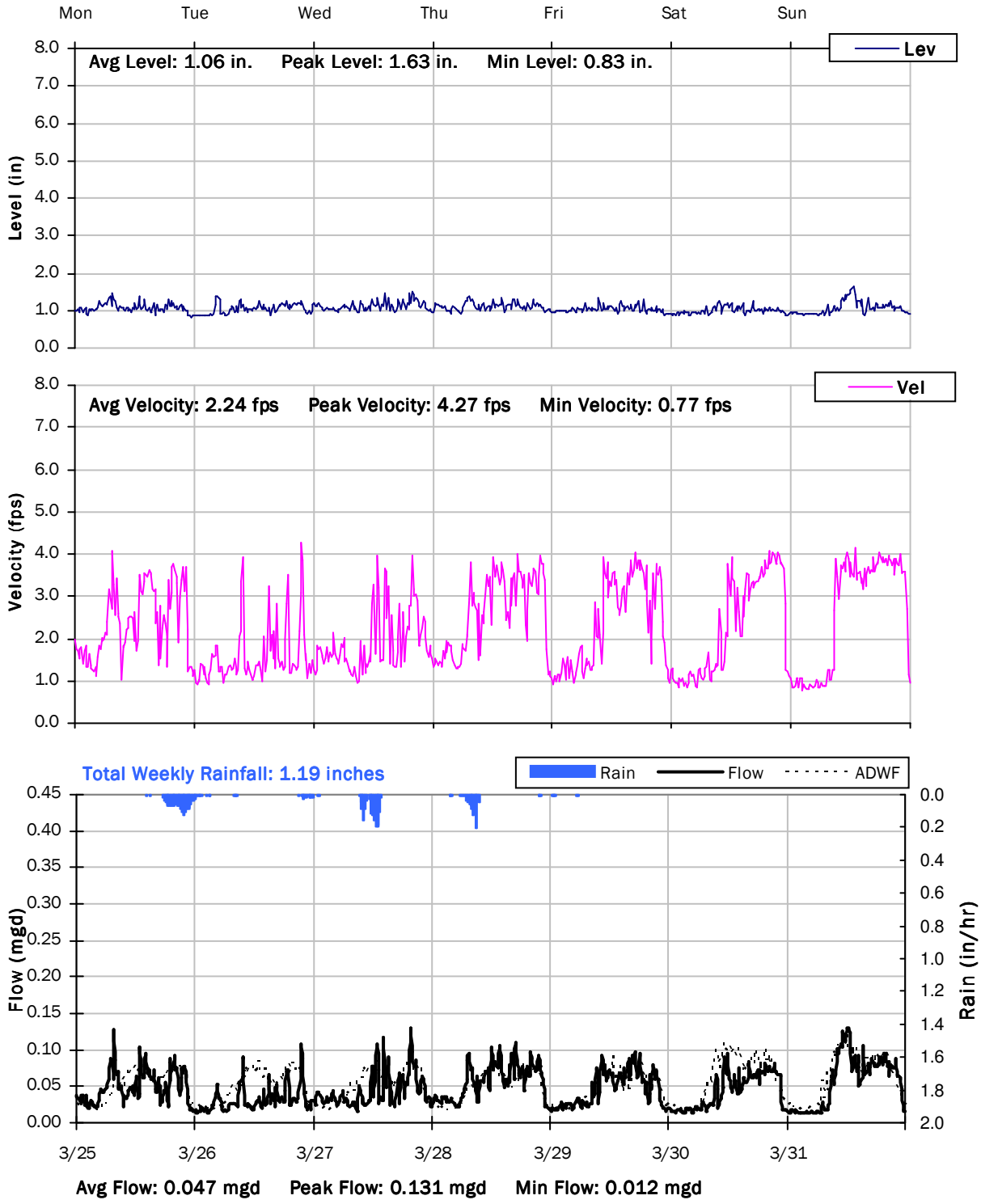
3/18/2019 to 3/25/2019



SITE 4

Weekly Level, Velocity and Flow Hydrographs

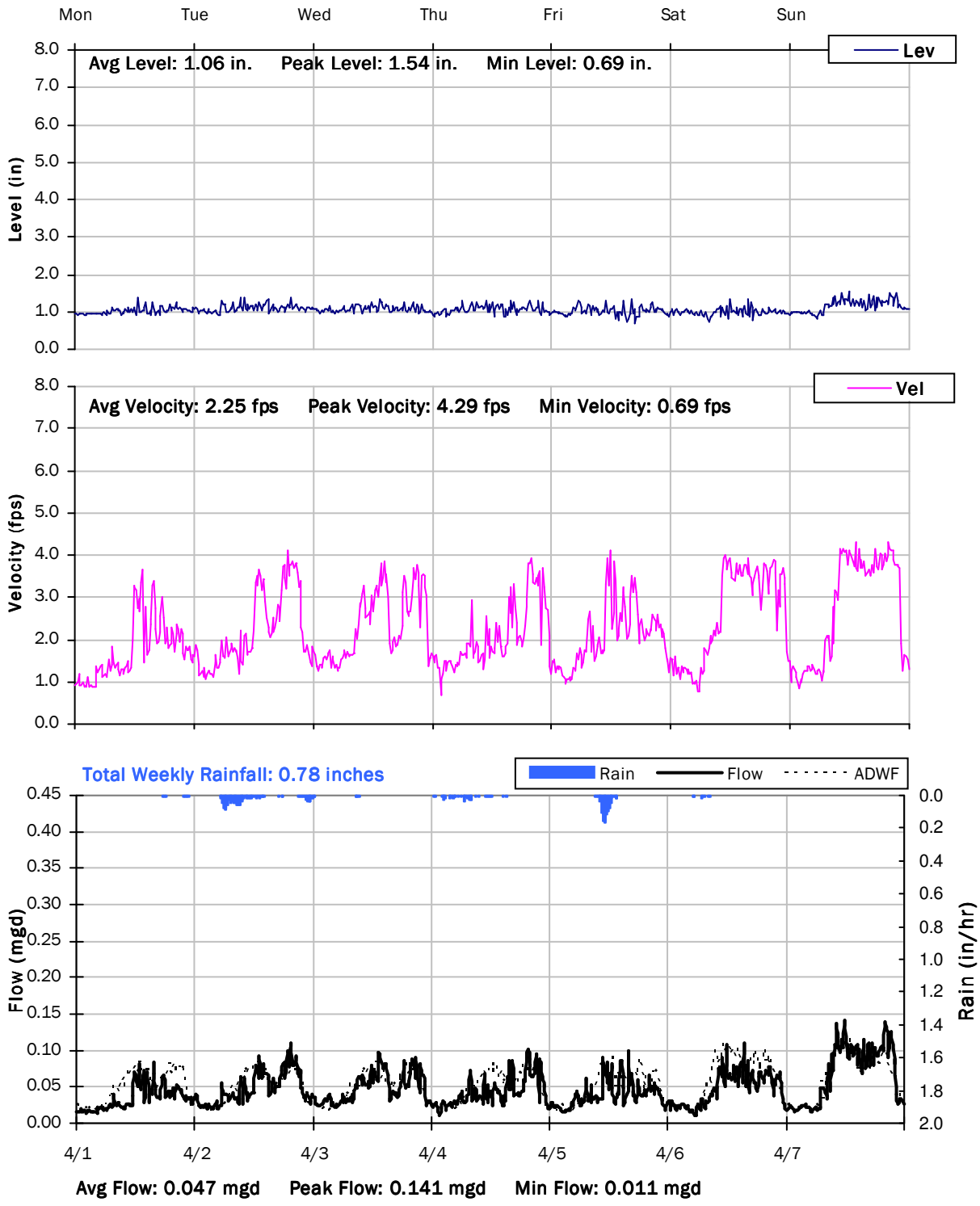
3/25/2019 to 4/1/2019



SITE 4

Weekly Level, Velocity and Flow Hydrographs

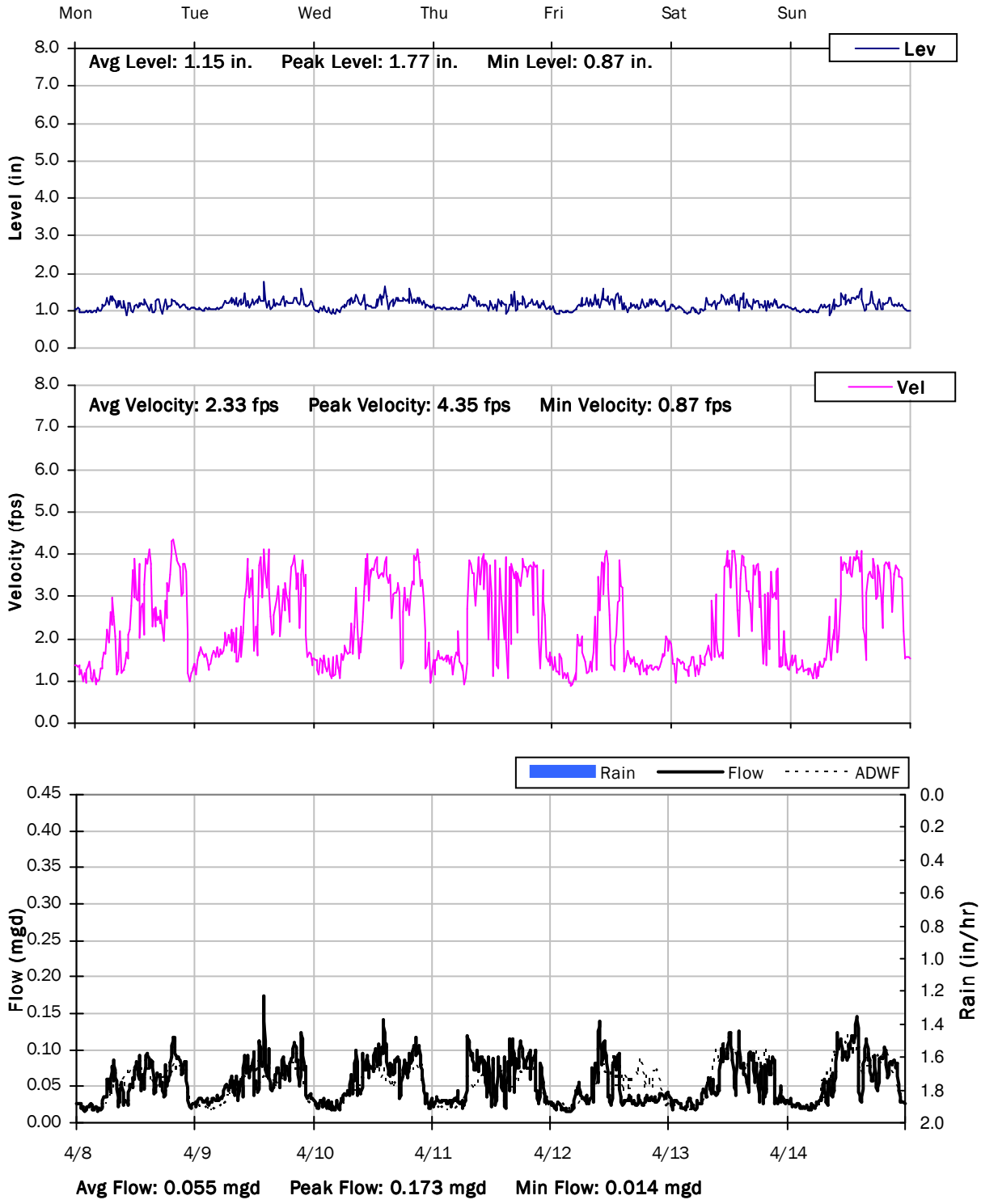
4/1/2019 to 4/8/2019



SITE 4

Weekly Level, Velocity and Flow Hydrographs

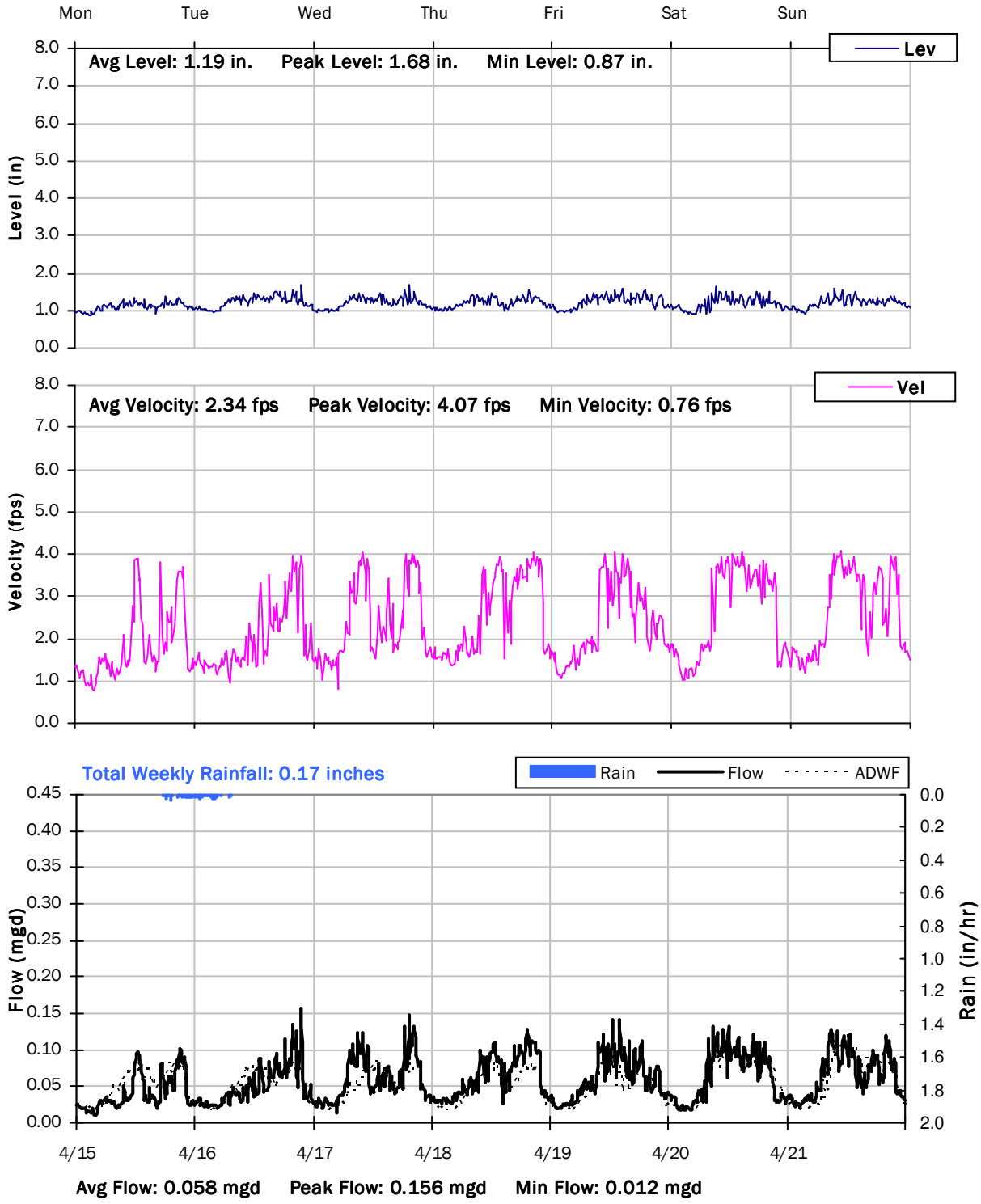
4/8/2019 to 4/15/2019



SITE 4

Weekly Level, Velocity and Flow Hydrographs

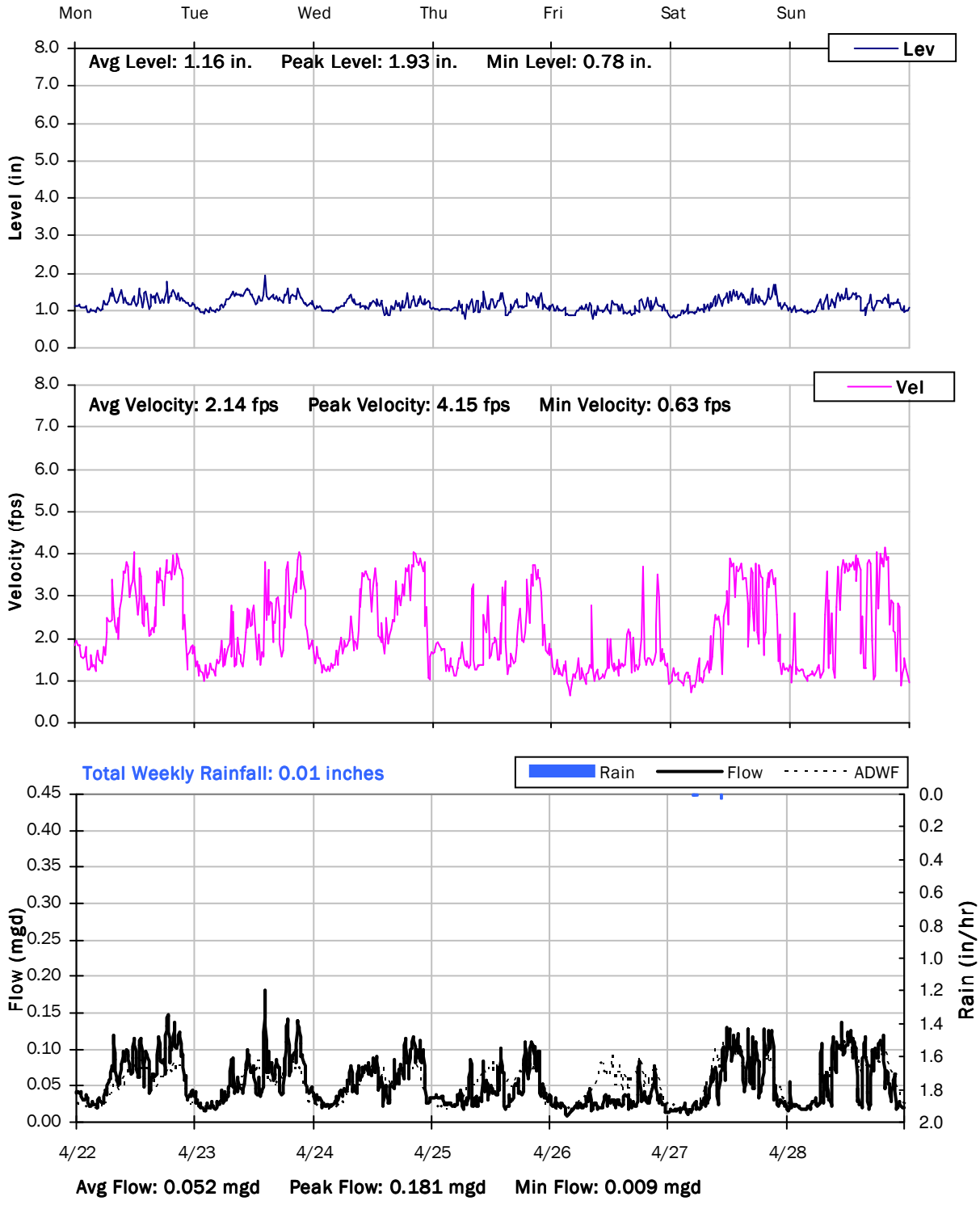
4/15/2019 to 4/22/2019



SITE 4

Weekly Level, Velocity and Flow Hydrographs

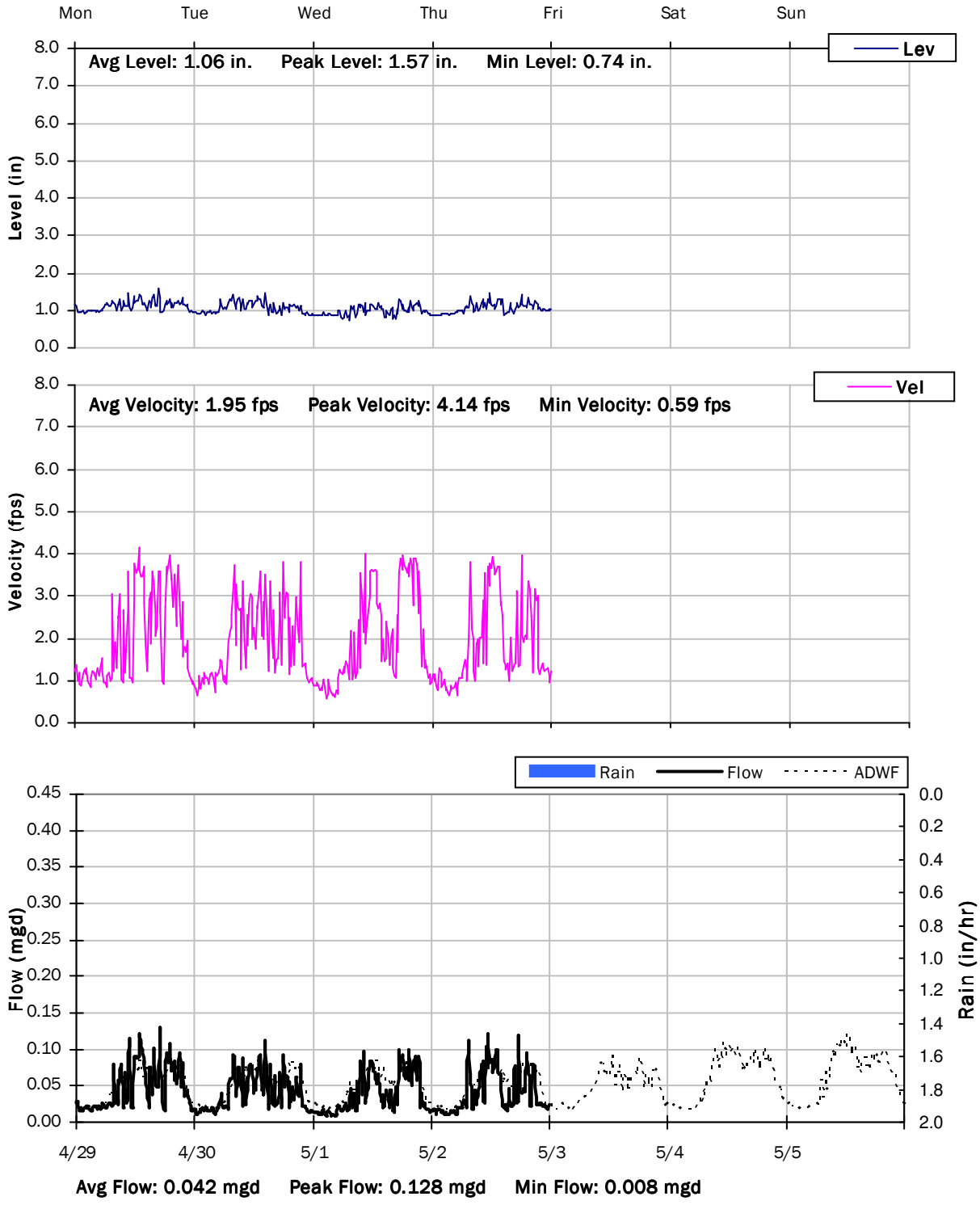
4/22/2019 to 4/29/2019



SITE 4

Weekly Level, Velocity and Flow Hydrographs

4/29/2019 to 5/6/2019



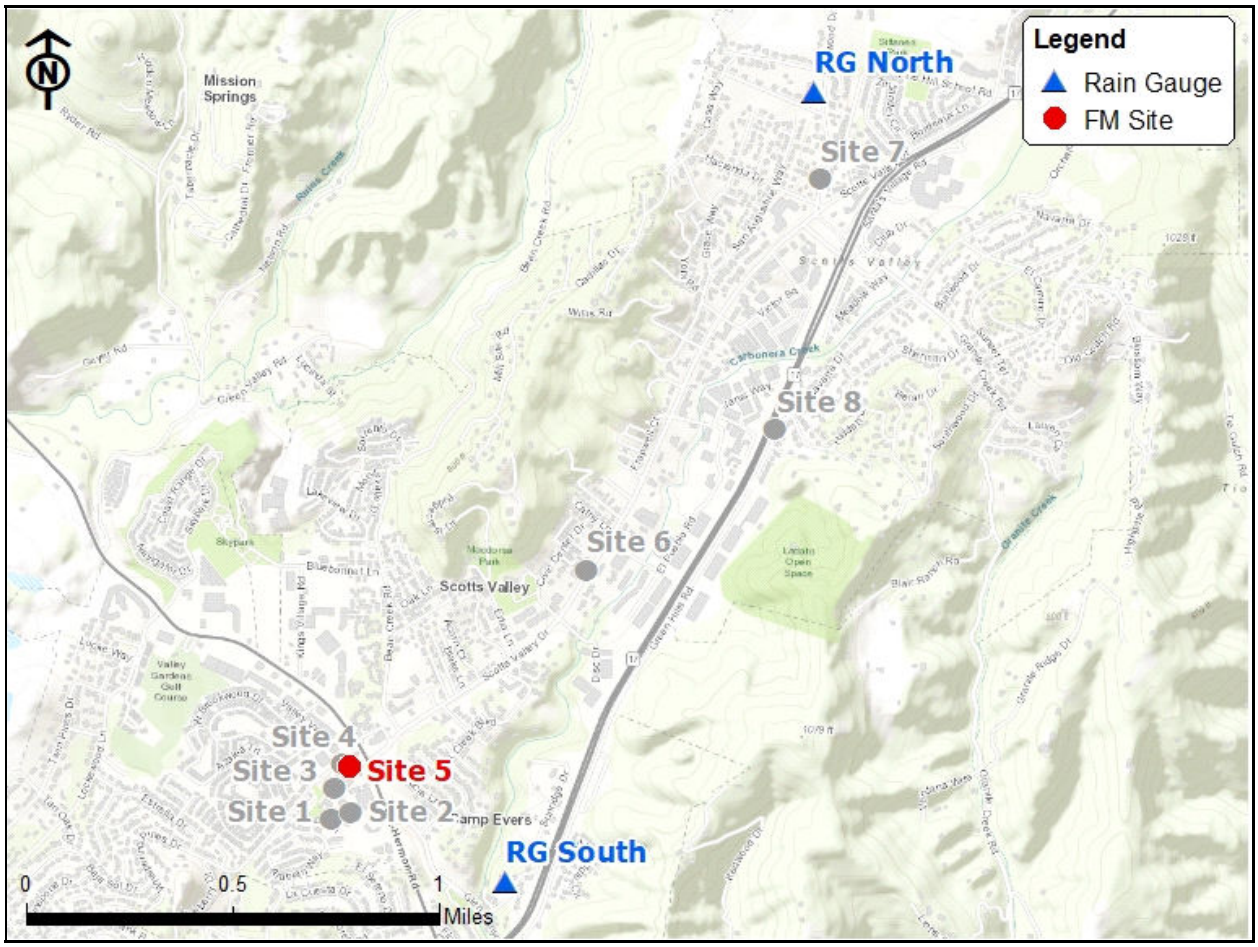
Carollo | Scotts Valley, California

Sanitary Sewer Flow Monitoring
January 30 - May 03, 2019

Monitoring Site: Site 5

Location: Whispering Pines Drive, west of Mt Hermon Road

Data Summary Report



Vicinity Map: Site 5

SITE 5

Site Information

Location: Whispering Pines Drive, west of Mt Hermon Road

Coordinates: 122.0259° W, 37.0430° N

Rim Elevation (Earth): 511 feet

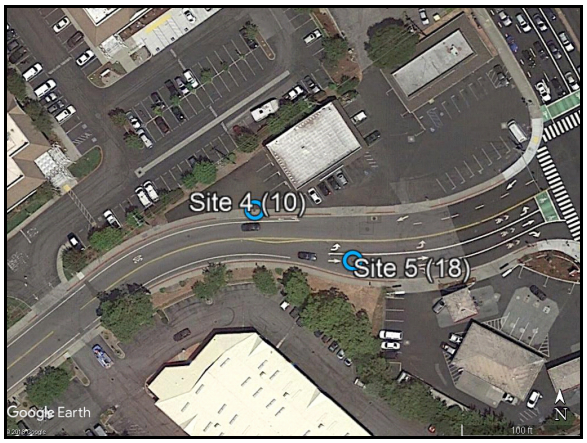
Expected Pipe Diameter: 18 inches

Measured Pipe Diameter: 18 inches

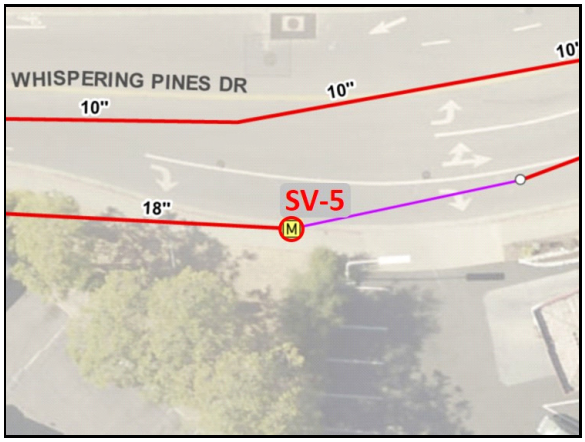
ADWF: 0.413 mgd

Peak Measured Flow: 1.620 mgd

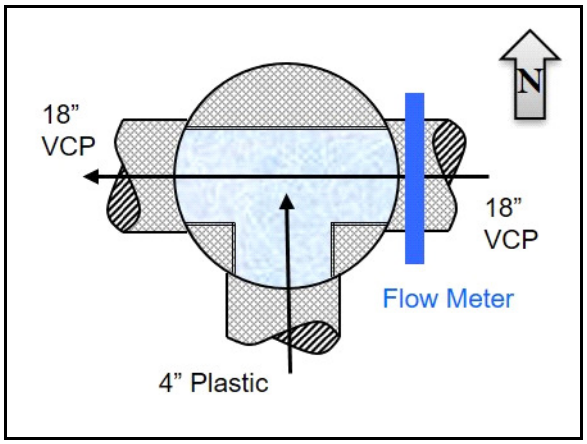
Sediment: None



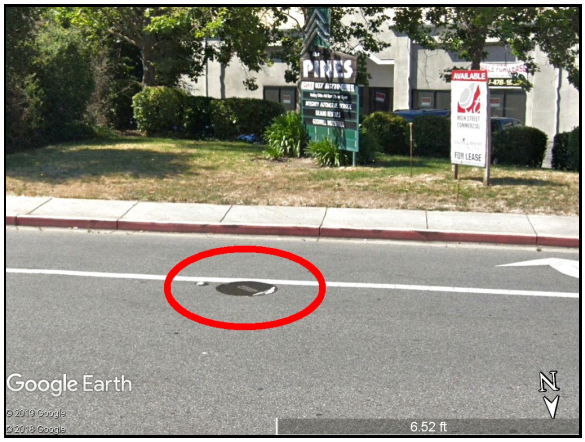
Satellite Map



Sewer Map



Flow Sketch



Street View



Plan View

SITE 5

Additional Site Photos

Effluent Pipe



Monitored East Influent Pipe



SITE 5

Additional Site Photos

South Influent Pipe

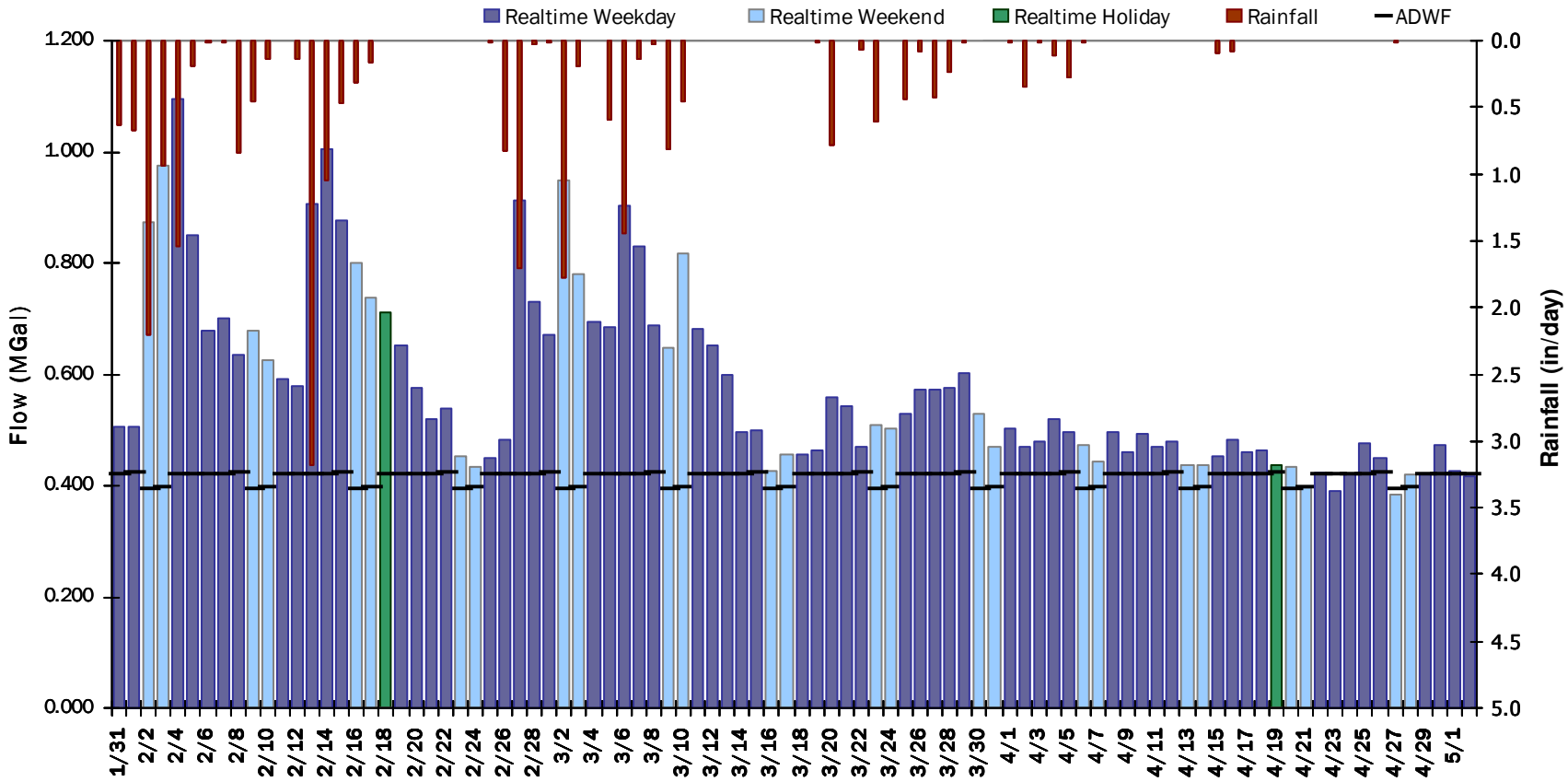


SITE 5

Period Flow Summary: Daily Flow Totals

Avg Daily Flow: 0.580 MGal Peak Daily Flow: 1.095 MGal Min Daily Flow: 0.384 MGal

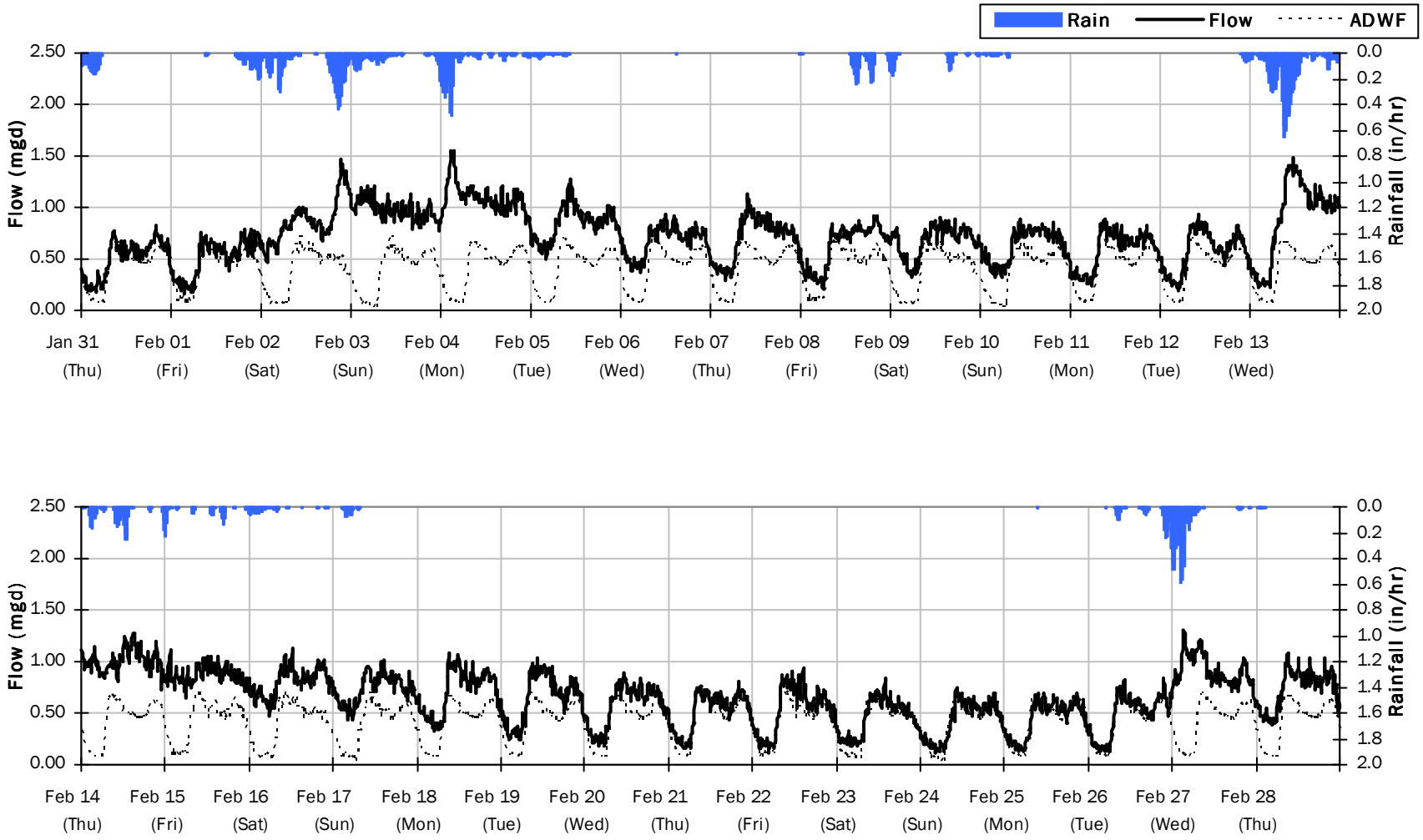
Total Rainfall: 24.66 inches



SITE 5

Flow Summary: 1/31/2019 to 2/28/2019

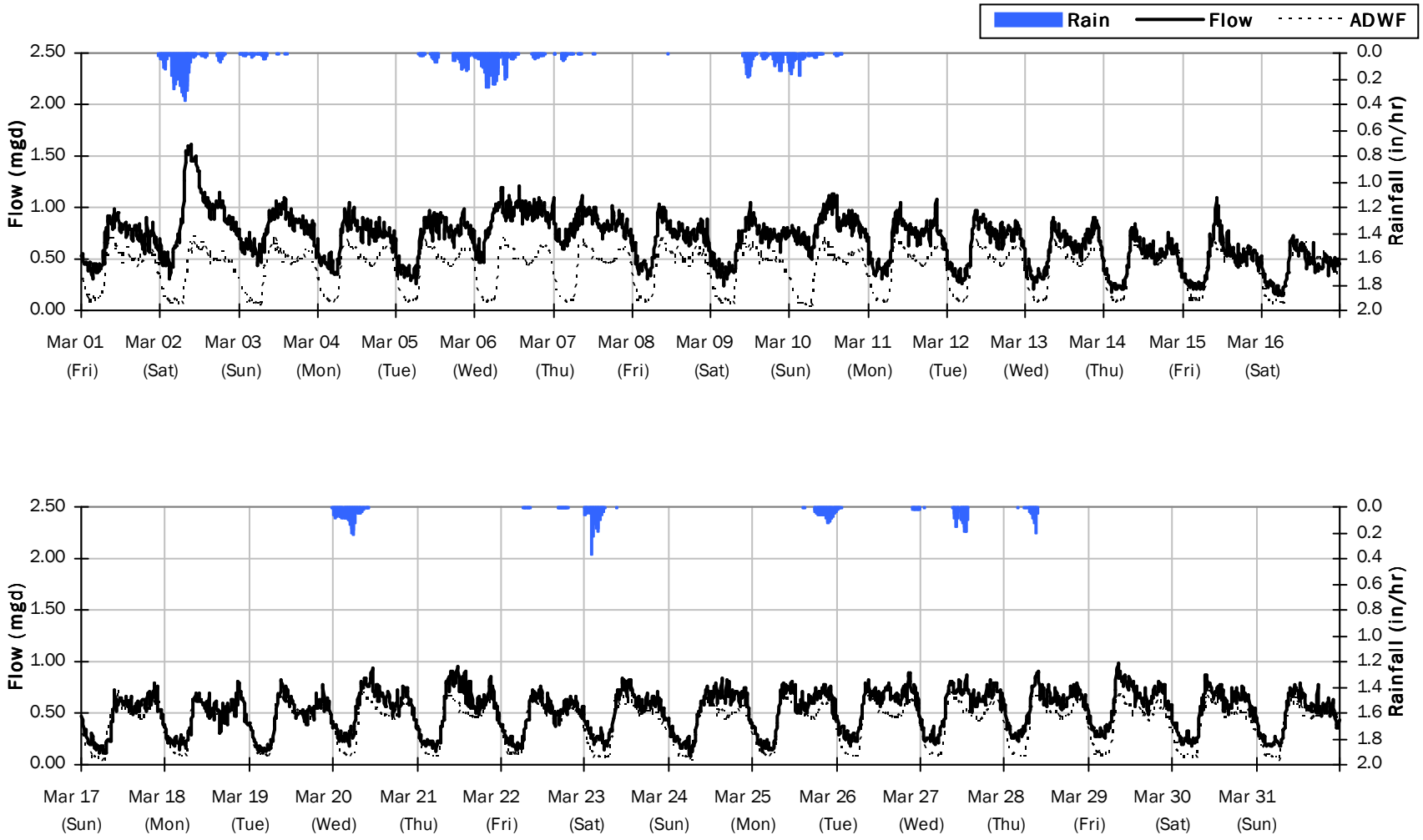
Period Rainfall: 15.55 inches Period Avg Flow: 0.692 mgd Period Peak Flow: 1.543 mgd Period Min Flow



SITE 5

Flow Summary: 3/1/2019 to 3/31/2019

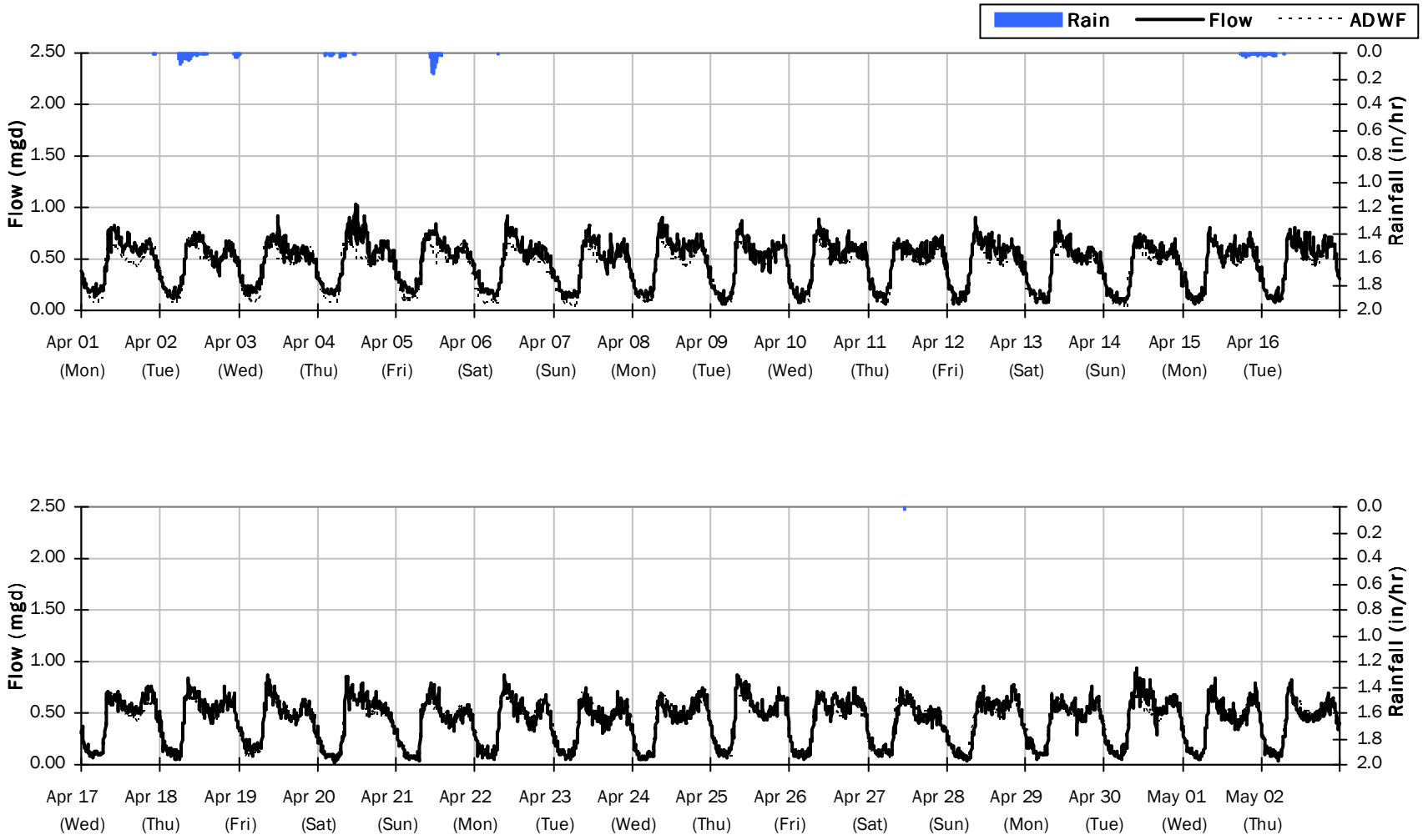
Period Rainfall: 8.15 inches Period Avg Flow: 0.607 mgd Period Peak Flow: 1.620 mgd Period Min Flow



SITE 5

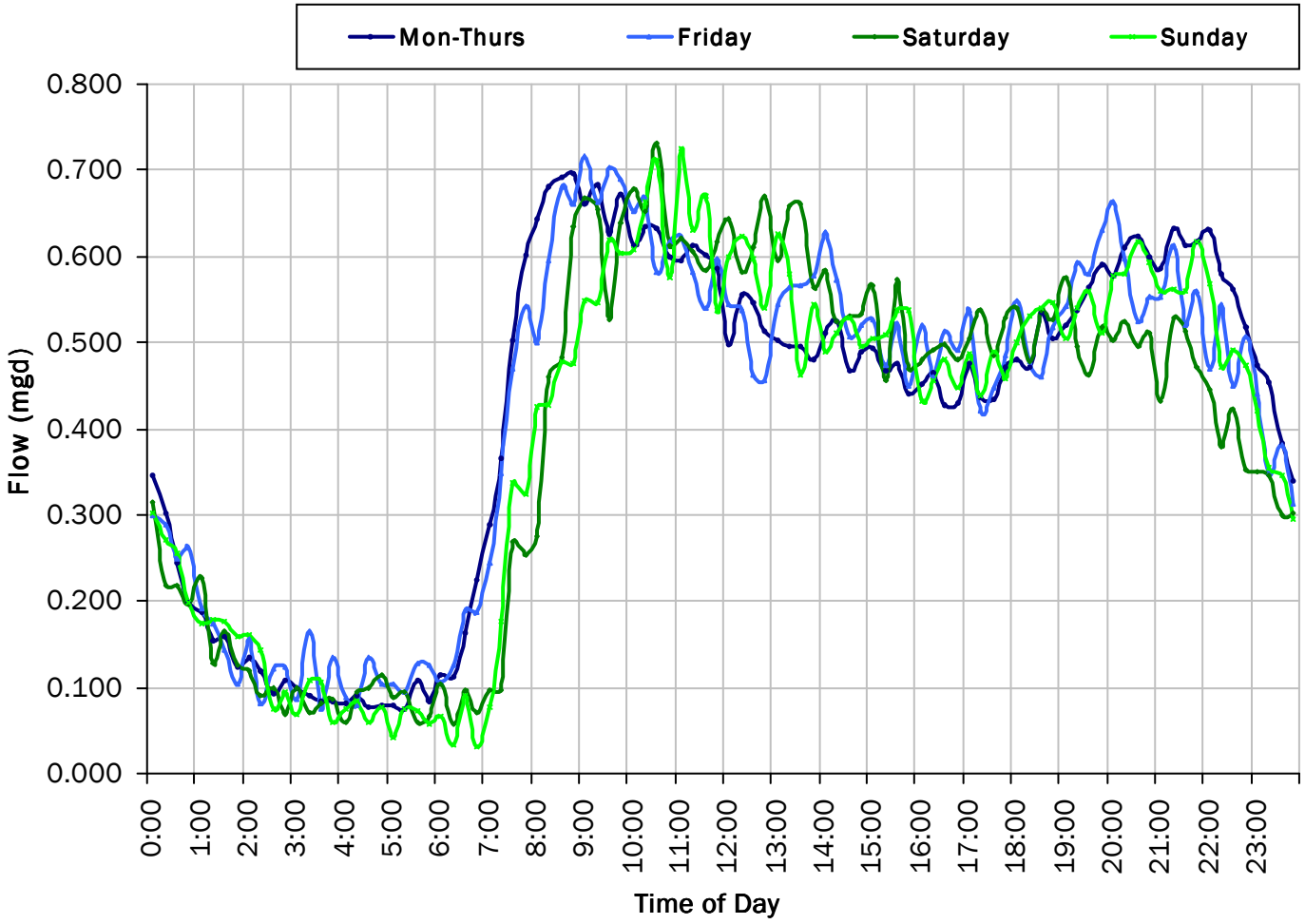
Flow Summary: 4/1/2019 to 5/2/2019

Period Rainfall: 0.96 inches Period Avg Flow: 0.452 mgd Period Peak Flow: 1.032 mgd Period Min Flow



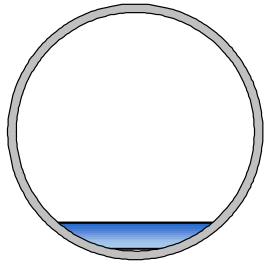
SITE 5

Average Dry Weather Flow Hydrographs



ADWF:

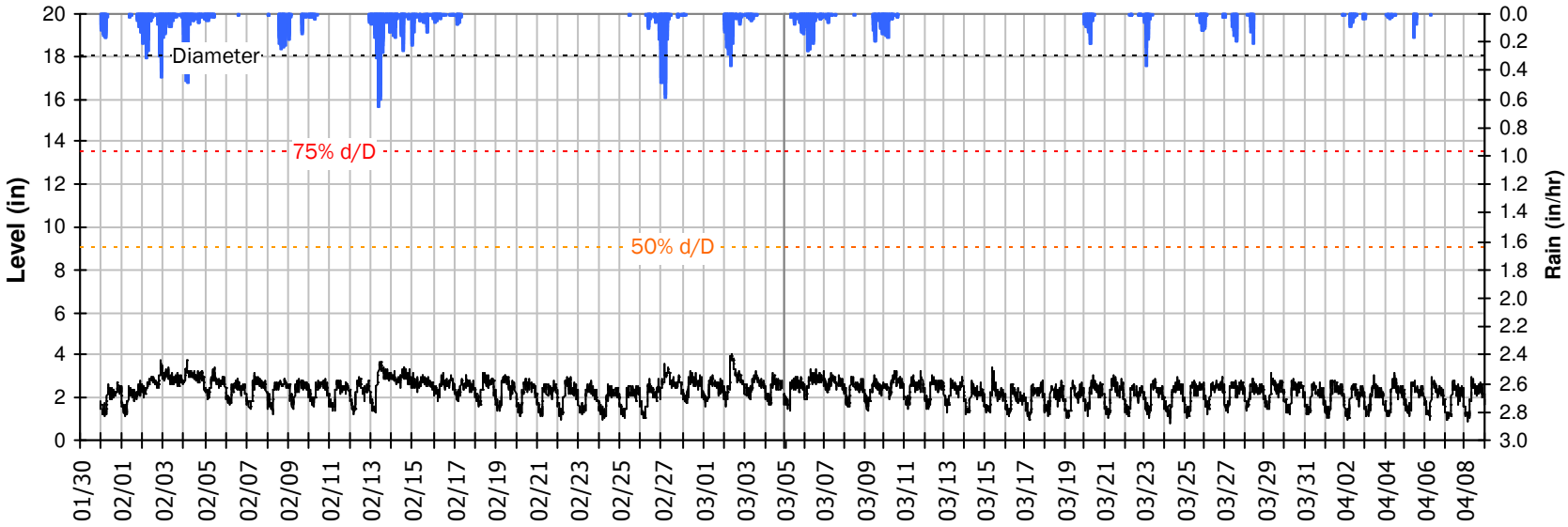
0.413 *mgd*

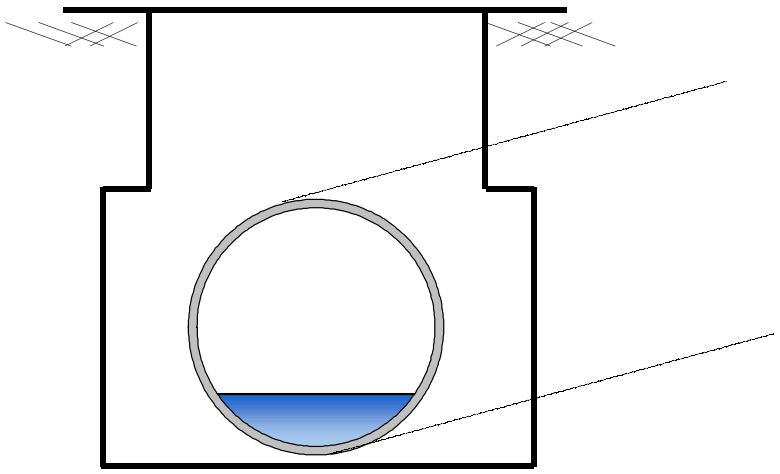


SITE 5

Site Capacity and Surcharge Summary

Realtime Flow Levels with Rainfall Data over Peak Level Period

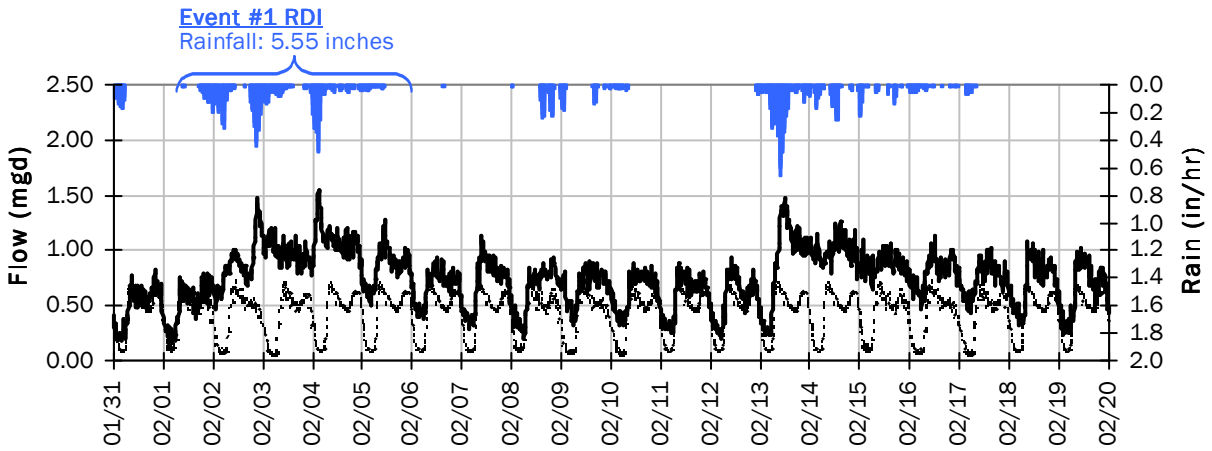




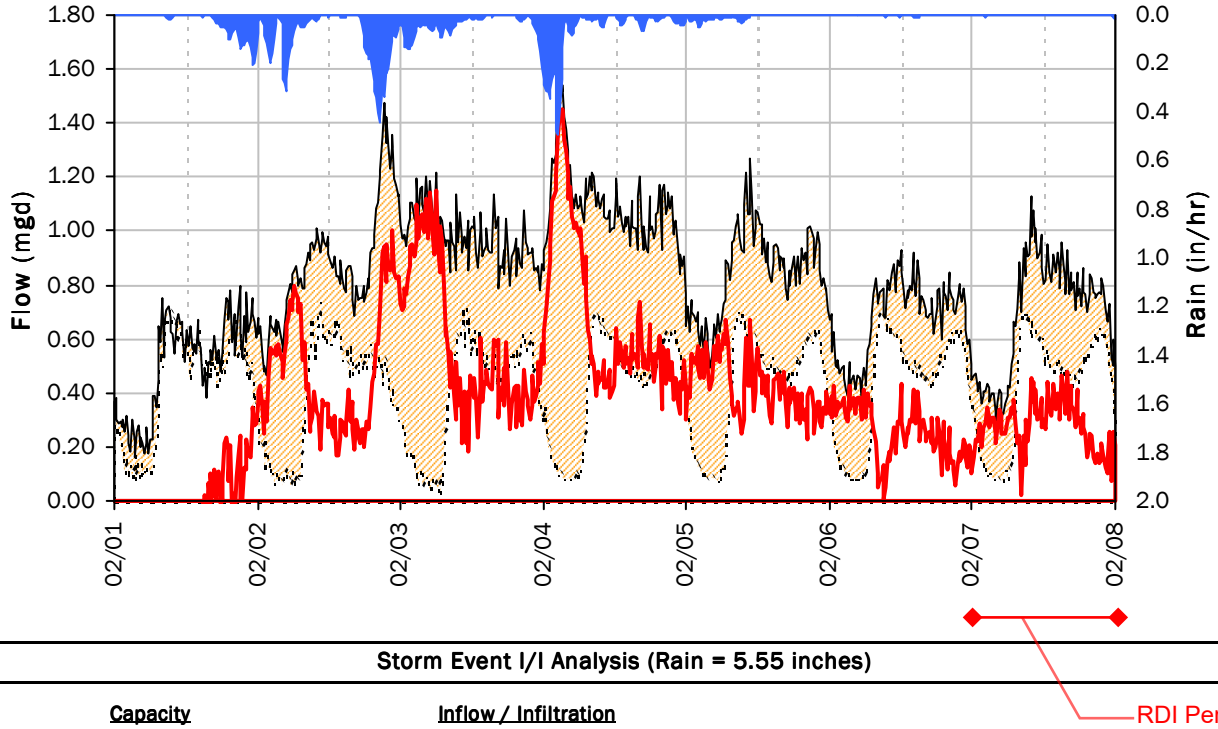
Pipe Diameter:	18	*inches*
Peak Measured Level:	4.05	*inches*
Peak d/D Ratio:	0.23	

SITE 5
I/I Summary: Event #1 RDI

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #1 RDI Detail Graph

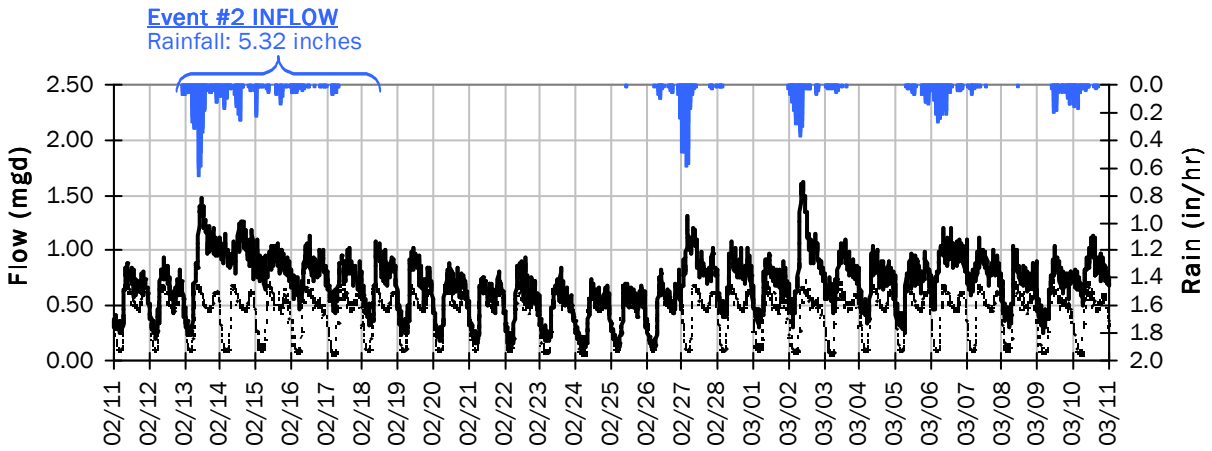


Storm Event I/I Analysis (Rain = 5.55 inches)

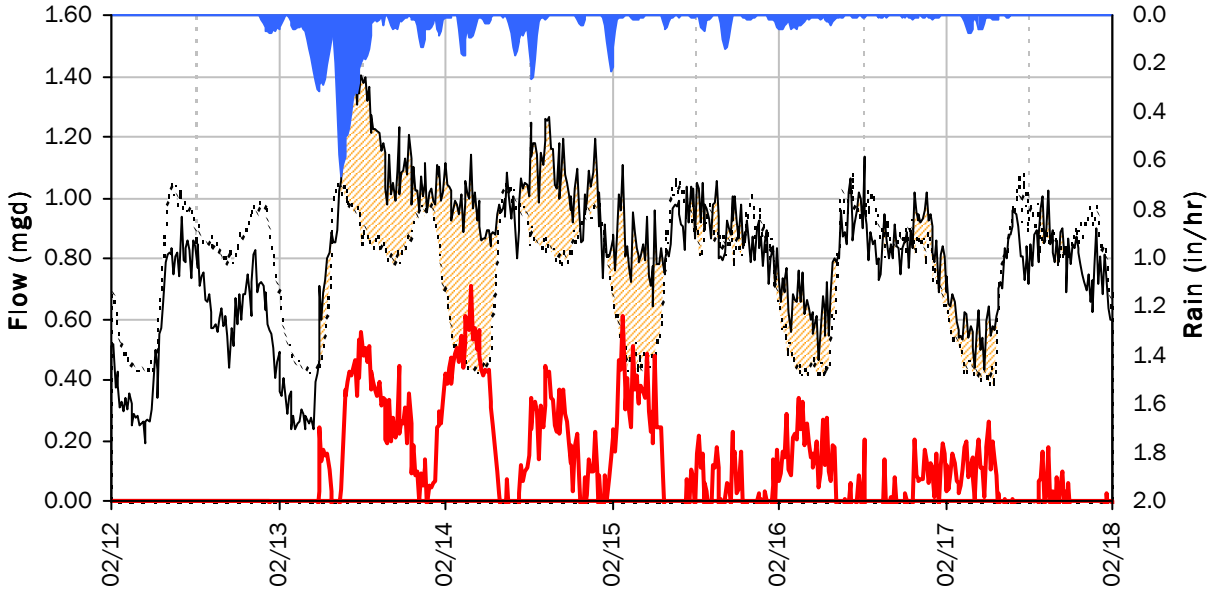
Capacity		Inflow / Infiltration	
Peak Flow:	1.544 *mgd*	**RDI:**	0.279 *mgd*
PF:	3.73		
Peak Level:	3.75 *in*		
d/D Ratio:	0.21		

SITE 5
I/I Summary: Event #2 INFLOW

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #2 INFLOW Detail Graph

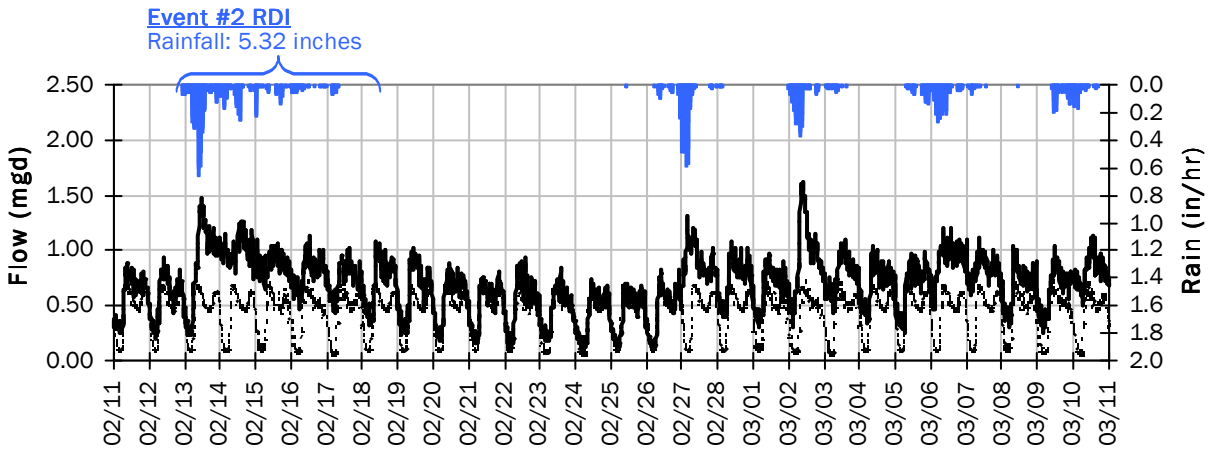


Storm Event I/I Analysis (Rain = 5.32 inches)

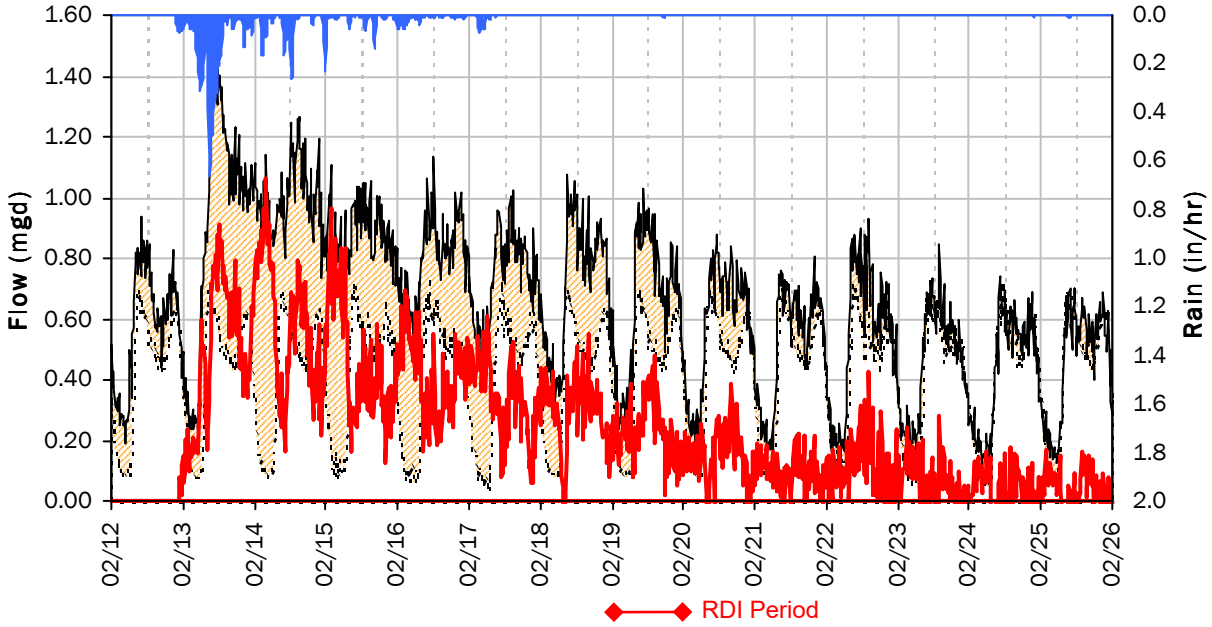
Capacity		Inflow / Infiltration	
Peak Flow:	1.481 *mgd*	**Peak I/I Rate:**	0.710 *mgd*
PF:	3.58		
Peak Level:	3.72 *in*		
d/D Ratio:	0.21		

SITE 5
I/I Summary: Event #2 RDI

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #2 RDI Detail Graph

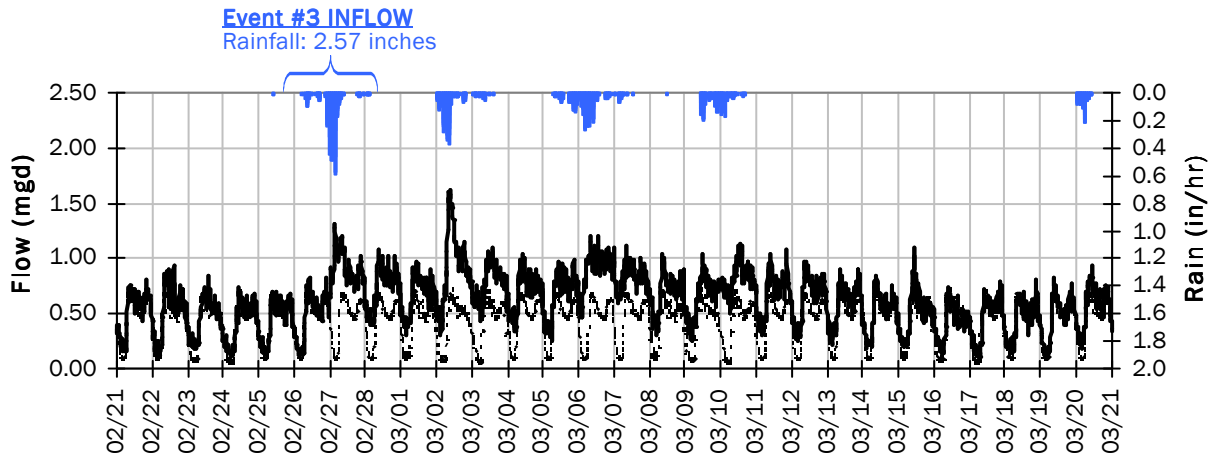


Storm Event I/I Analysis (Rain = 5.32 inches)

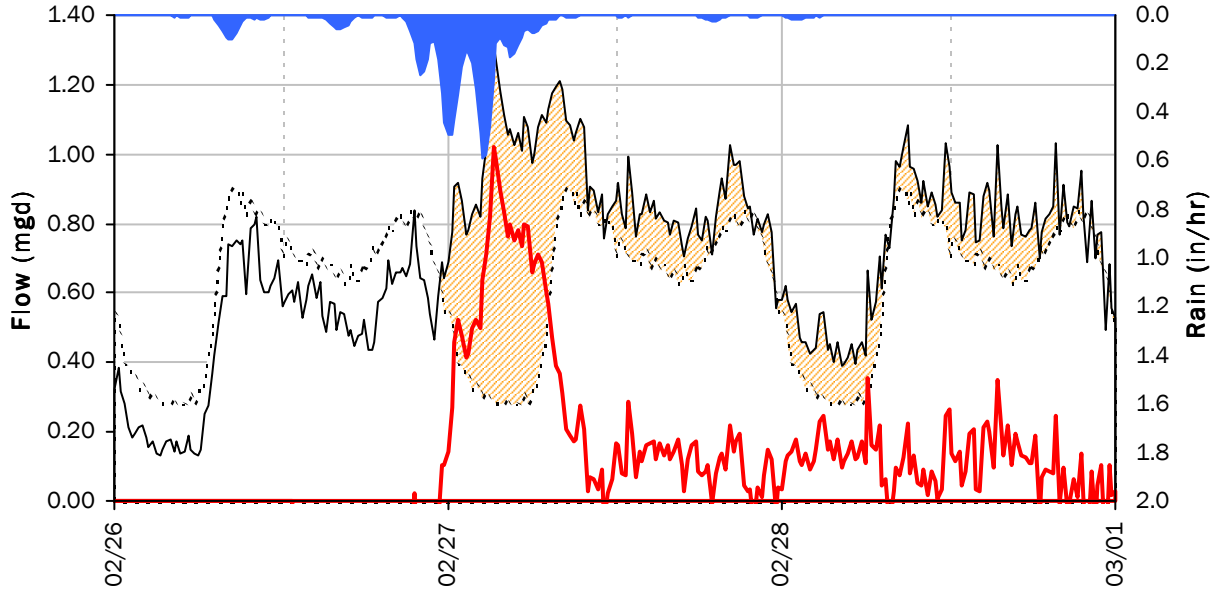
Capacity		Inflow / Infiltration	
Peak Flow:	1.481 *mgd*	**RDI:**	0.228 *mgd*
PF:	3.58		
Peak Level:	3.72 *in*		
d/D Ratio:	0.21		

SITE 5
I/I Summary: Event #3 INFLOW

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #3 INFLOW Detail Graph

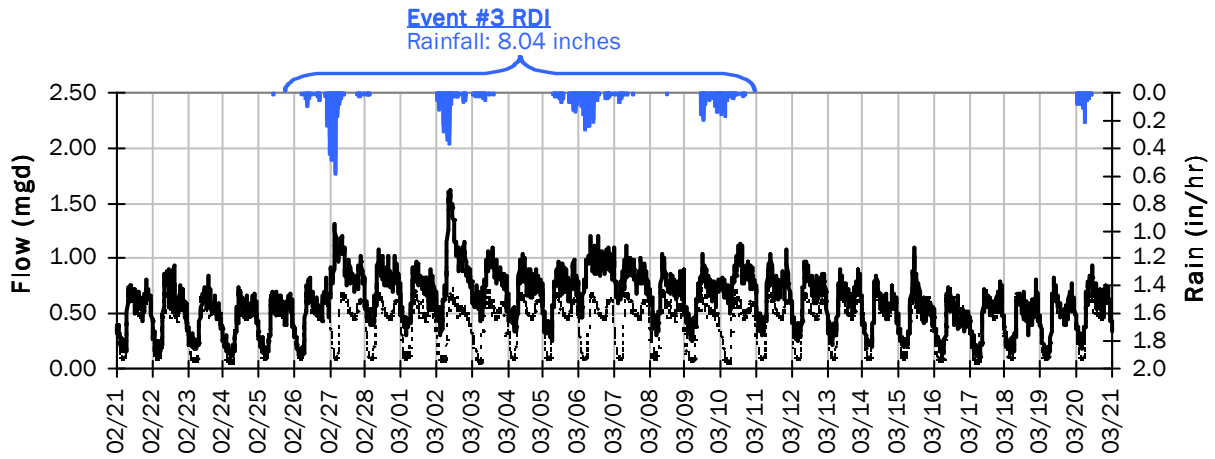


Storm Event I/I Analysis (Rain = 2.57 inches)

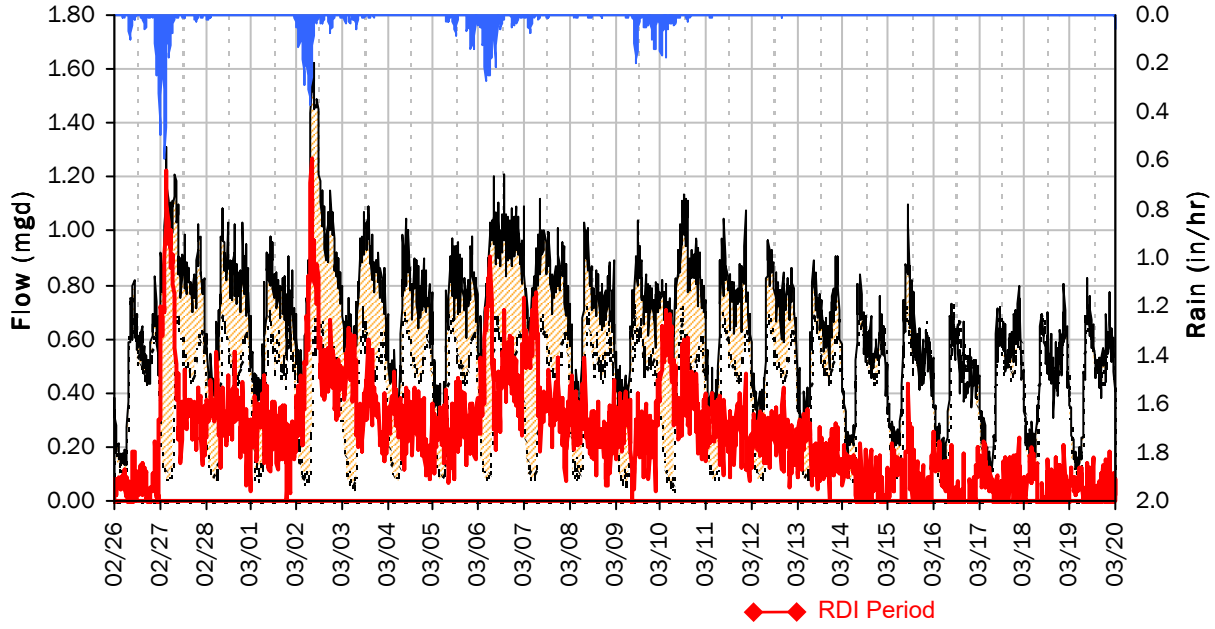
Capacity		Inflow / Infiltration	
Peak Flow:	1.31 *mgd*	**Peak I/I Rate:**	1.021 *mgd*
PF:	3.17		
Peak Level:	3.59 *in*		
d/D Ratio:	0.20		

SITE 5
I/I Summary: Event #3 RDI

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #3 RDI Detail Graph



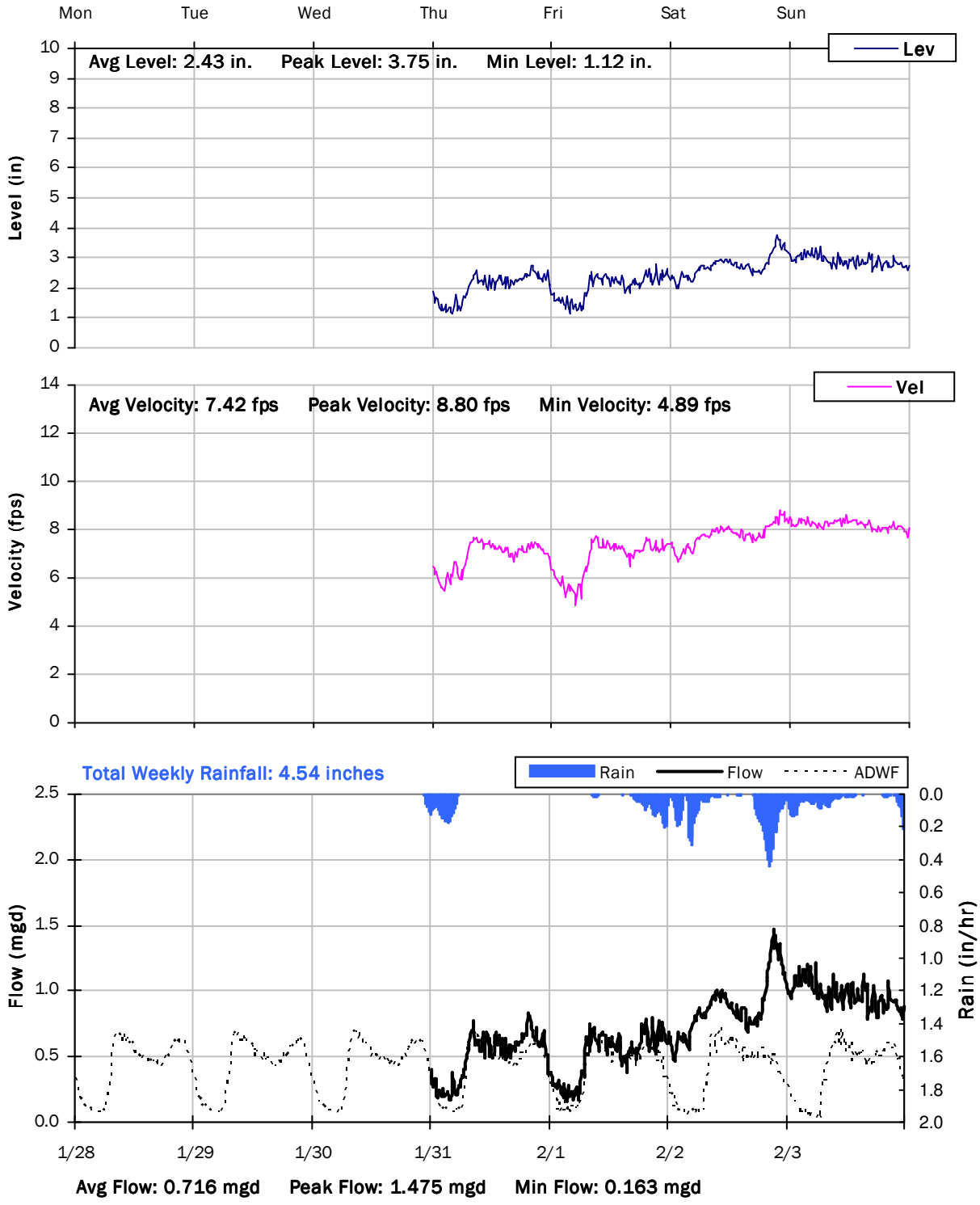
Storm Event I/I Analysis (Rain = 8.04 inches)

Capacity		Inflow / Infiltration	
Peak Flow:	1.62 *mgd*	**RDI:**	0.230 *mgd*
PF:	3.92		
Peak Level:	4.05 *in*		
d/D Ratio:	0.23		

SITE 5

Weekly Level, Velocity and Flow Hydrographs

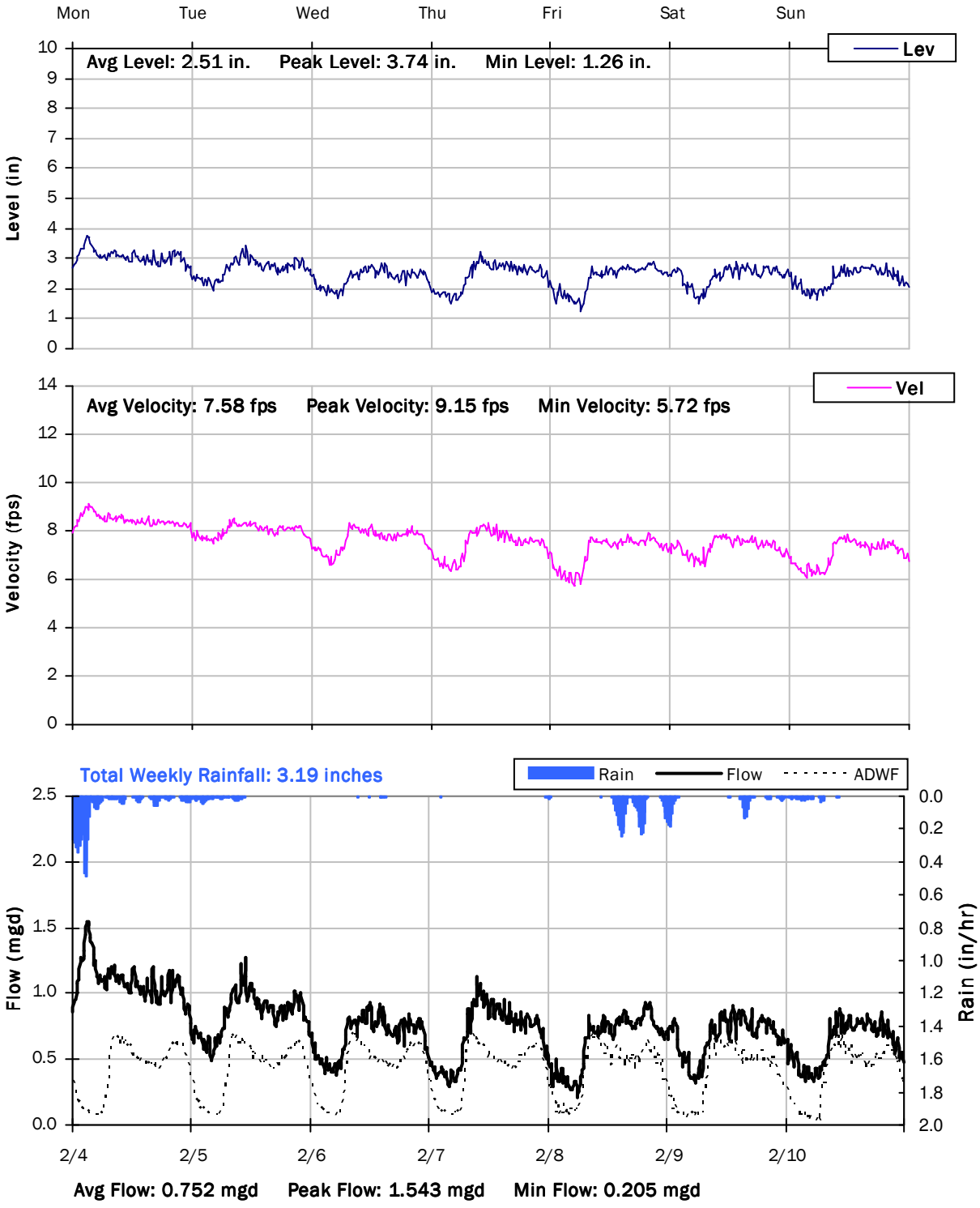
1/28/2019 to 2/4/2019



SITE 5

Weekly Level, Velocity and Flow Hydrographs

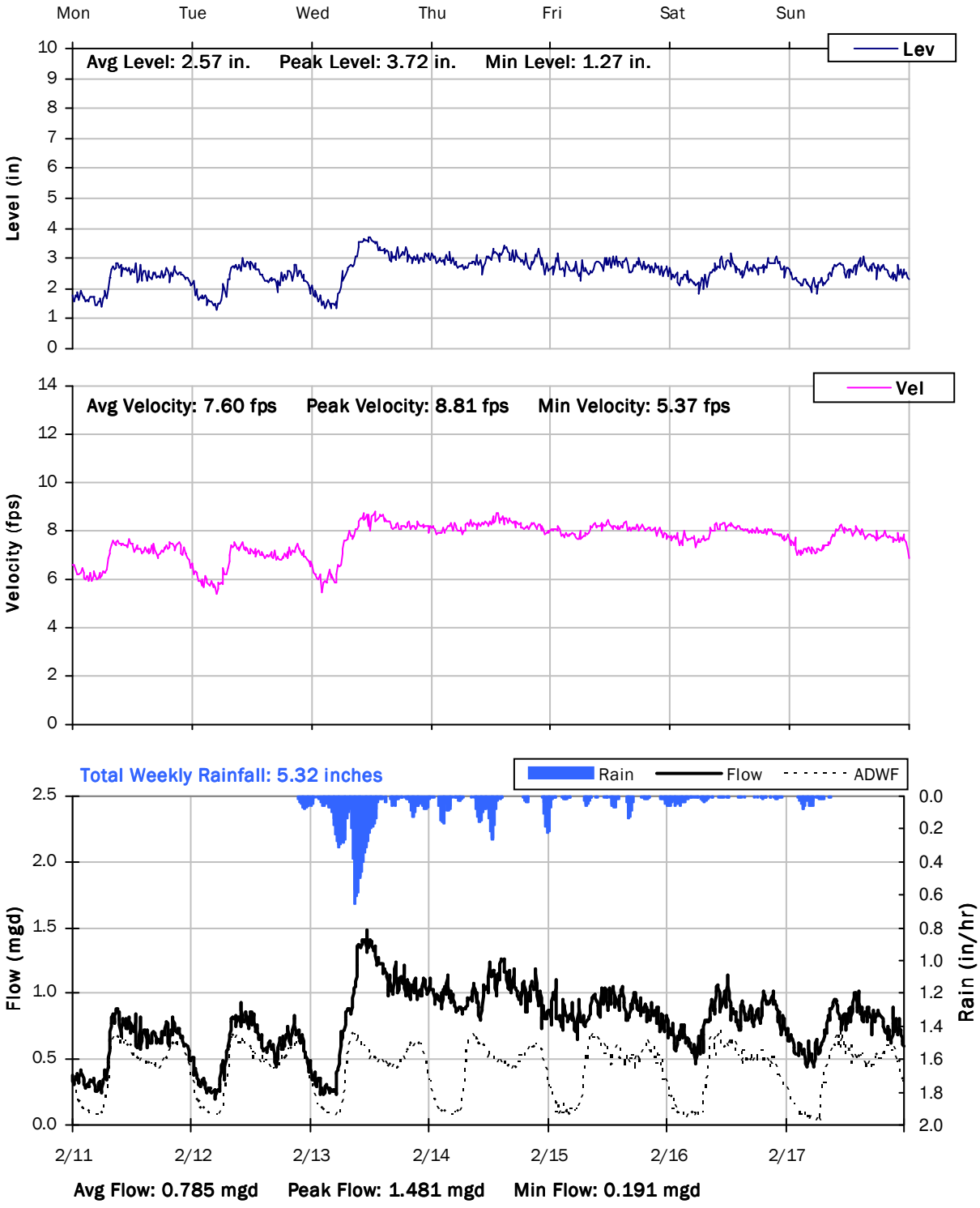
2/4/2019 to 2/11/2019



SITE 5

Weekly Level, Velocity and Flow Hydrographs

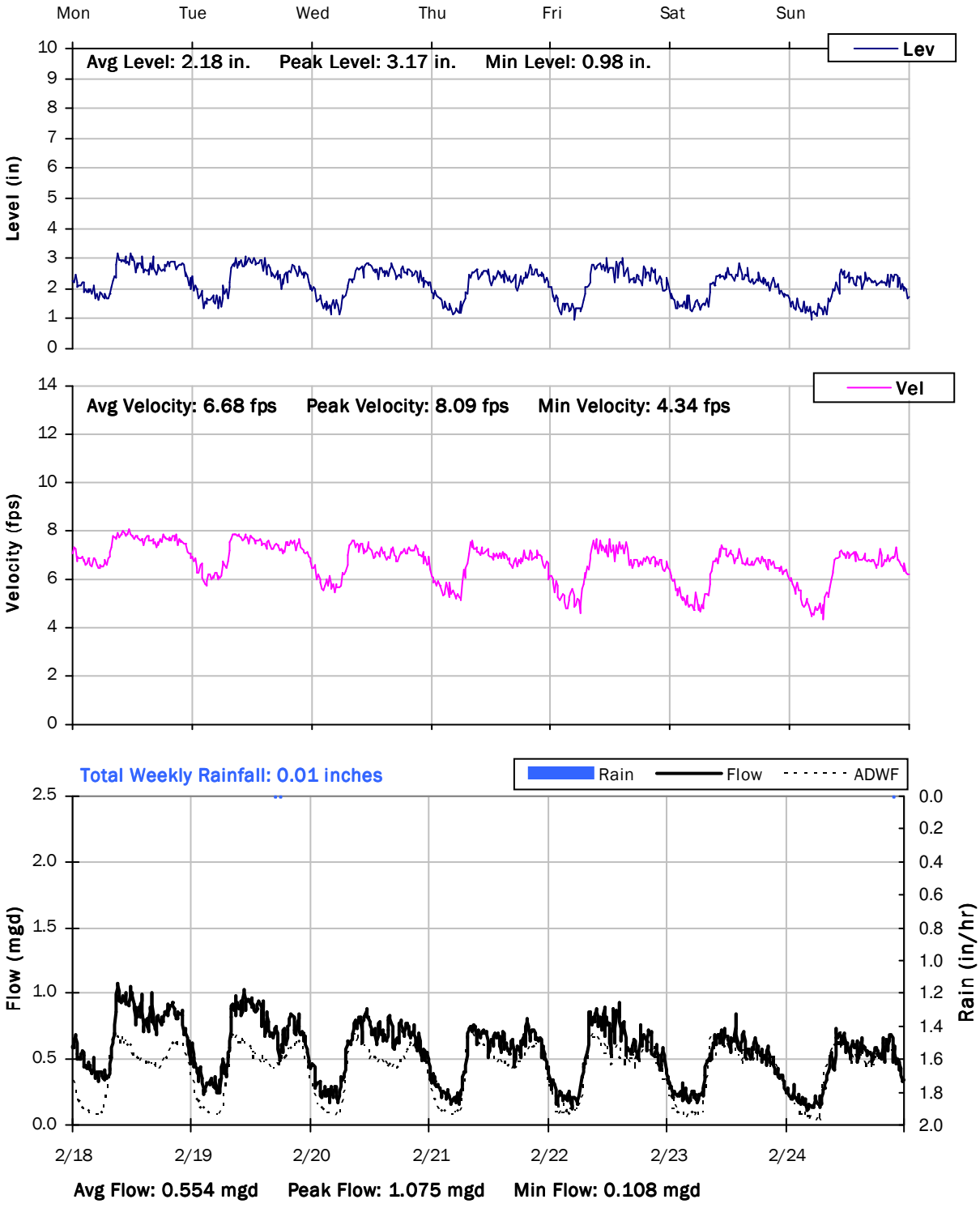
2/11/2019 to 2/18/2019



SITE 5

Weekly Level, Velocity and Flow Hydrographs

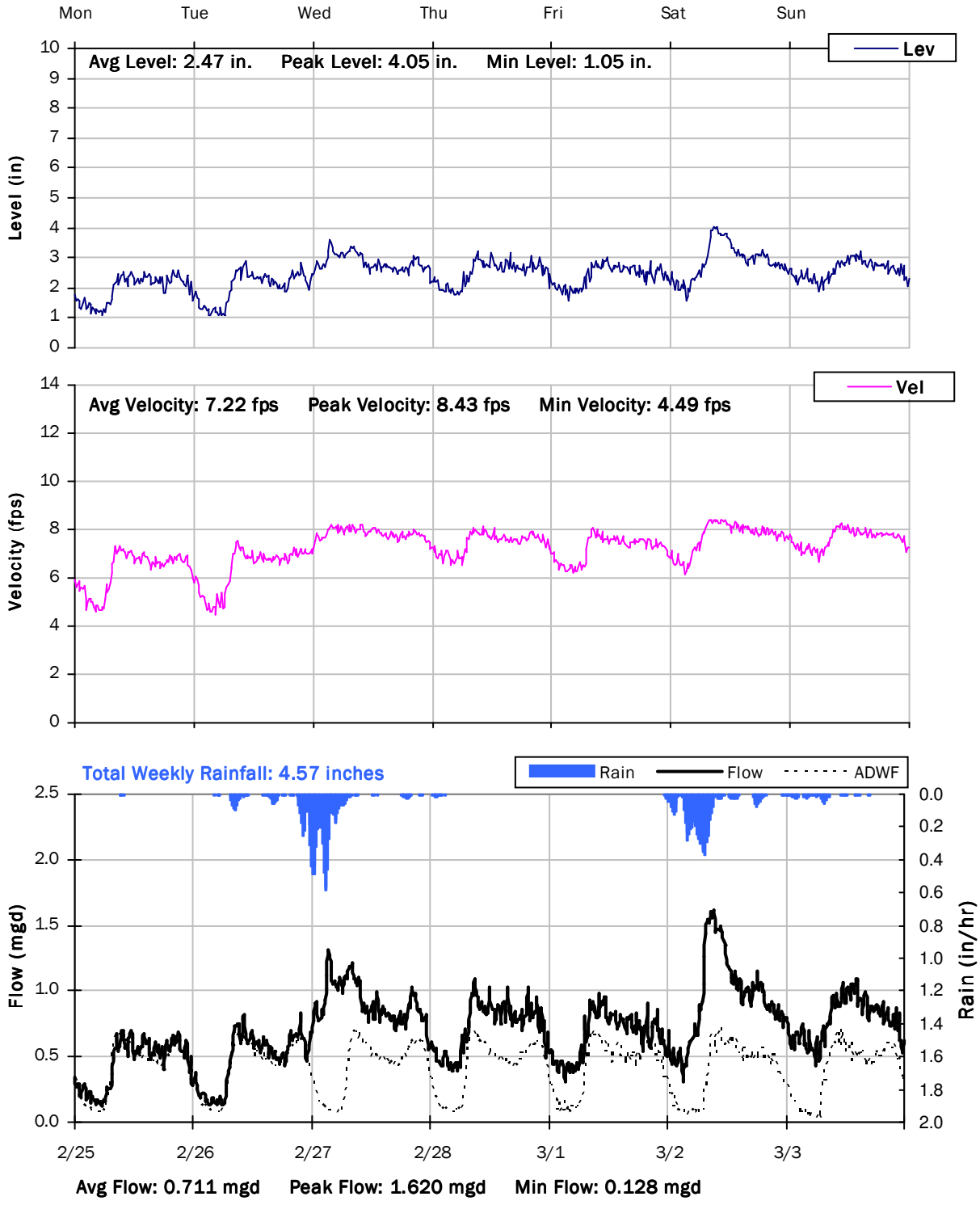
2/18/2019 to 2/25/2019



SITE 5

Weekly Level, Velocity and Flow Hydrographs

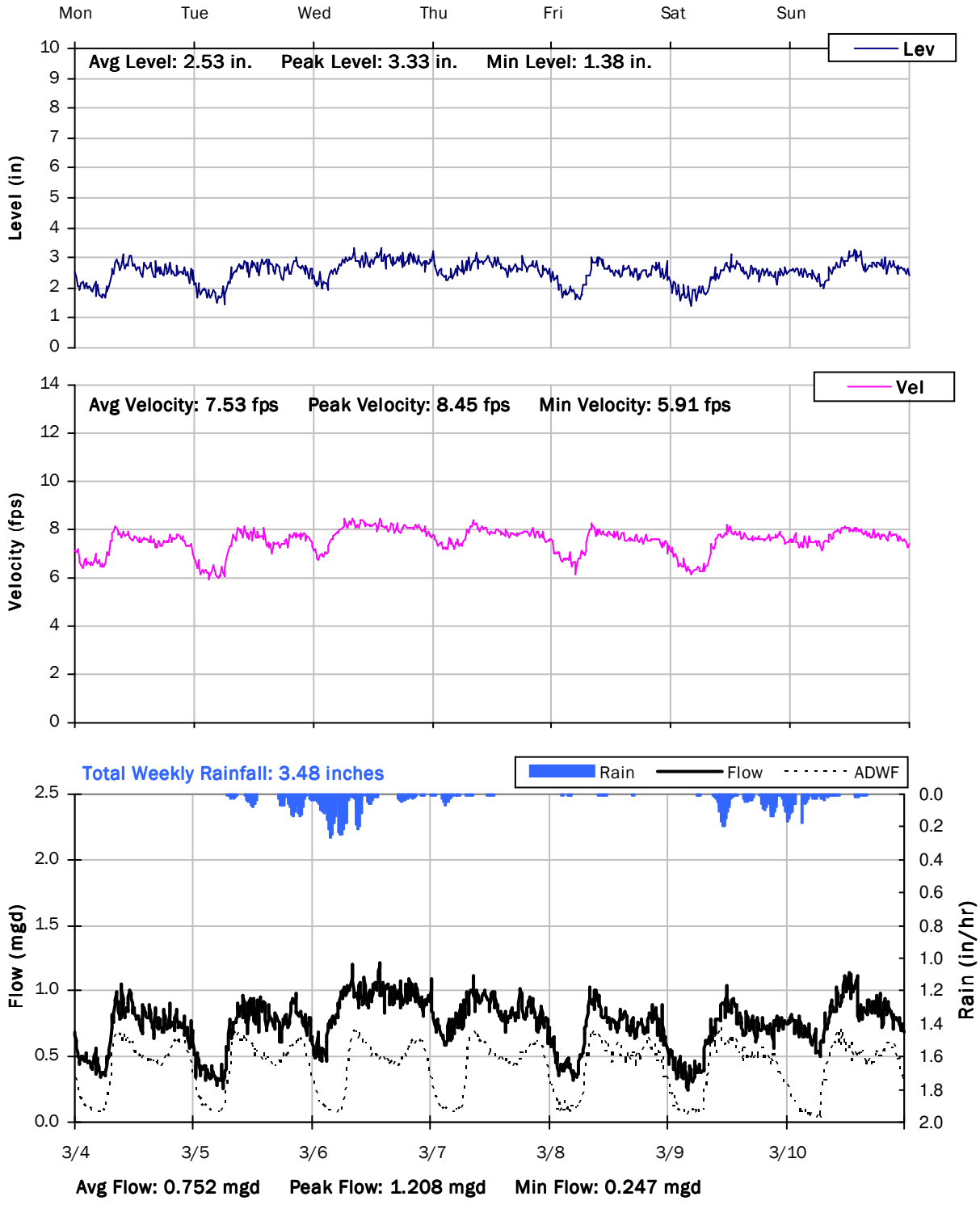
2/25/2019 to 3/4/2019



SITE 5

Weekly Level, Velocity and Flow Hydrographs

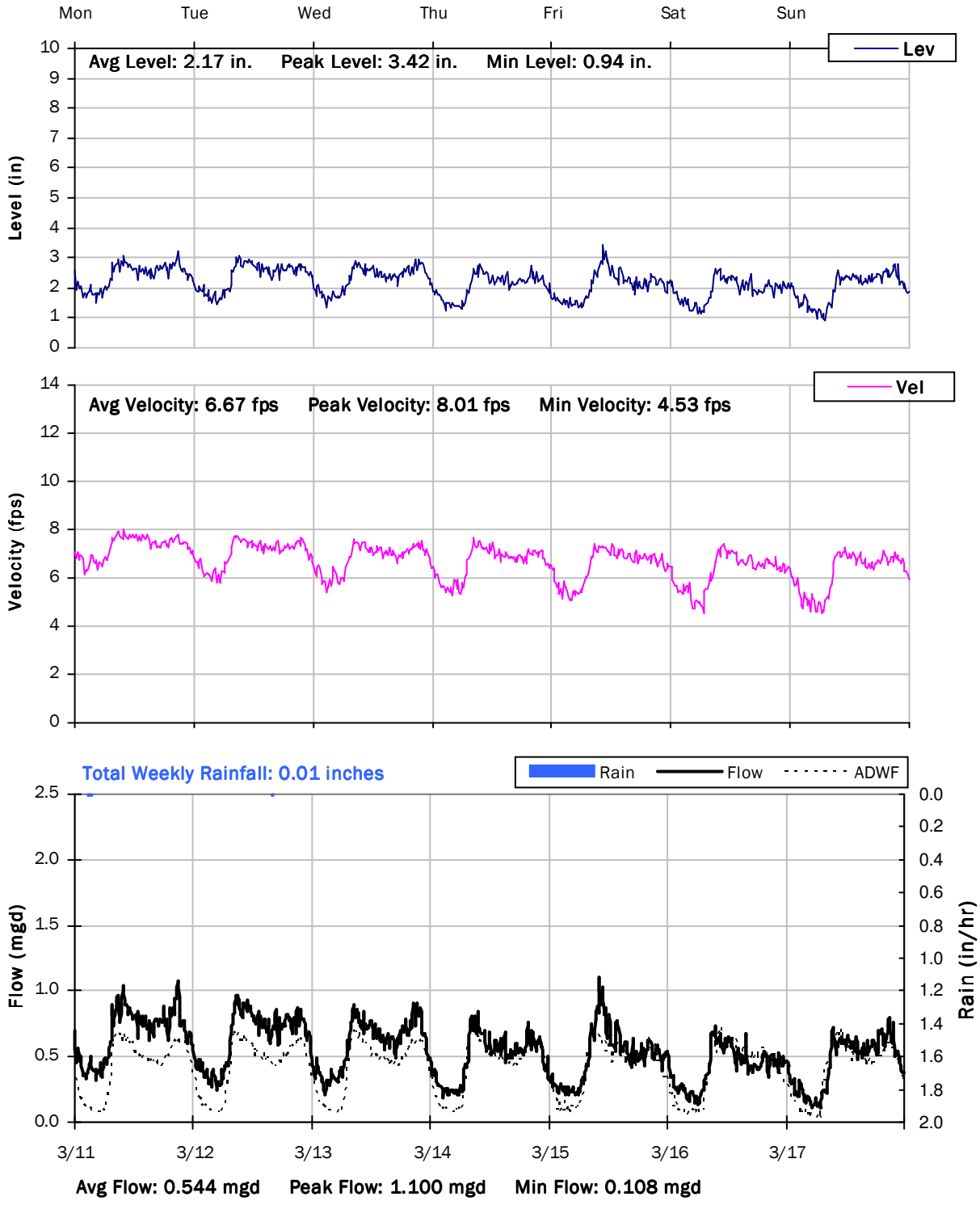
3/4/2019 to 3/11/2019



SITE 5

Weekly Level, Velocity and Flow Hydrographs

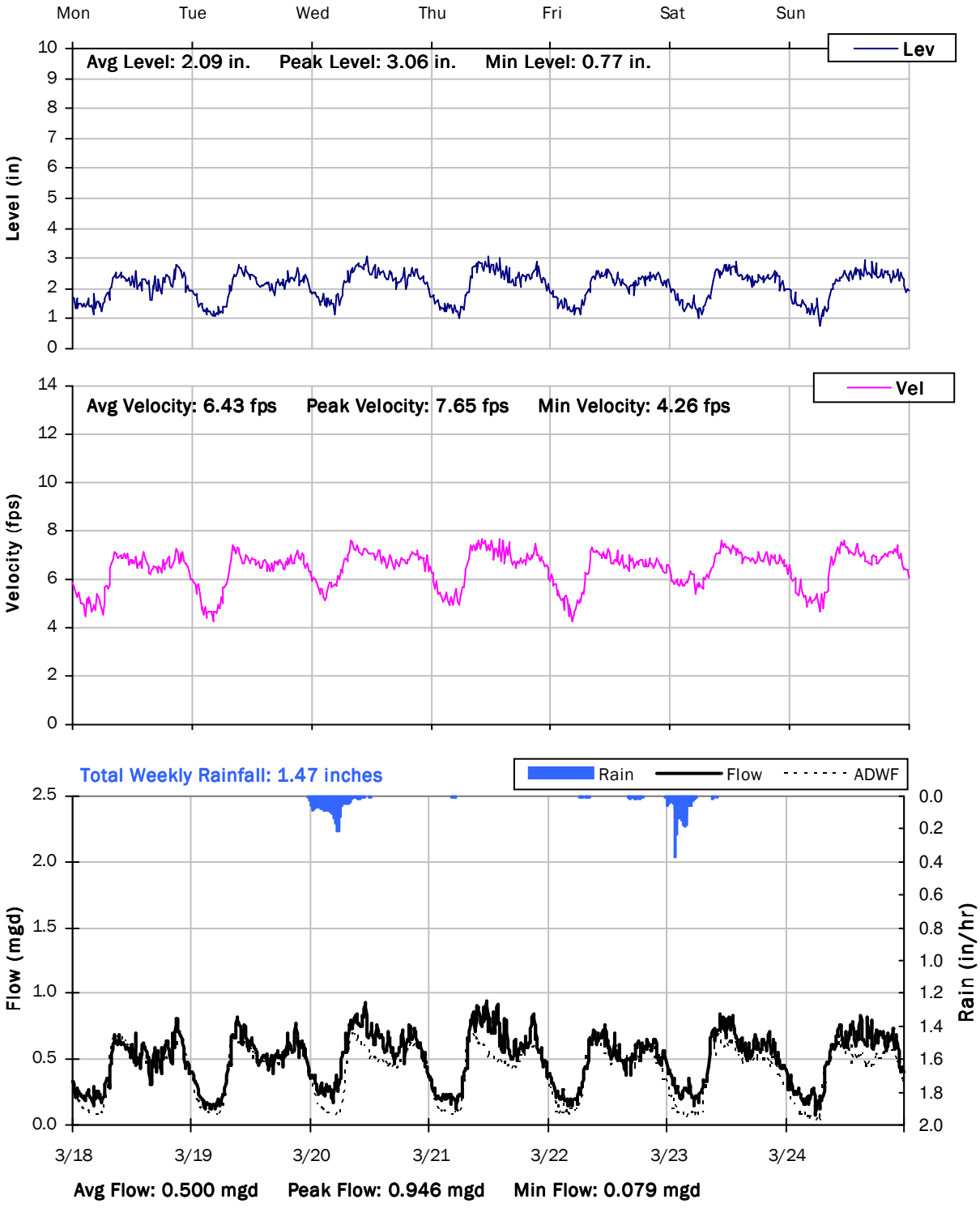
3/11/2019 to 3/18/2019



SITE 5

Weekly Level, Velocity and Flow Hydrographs

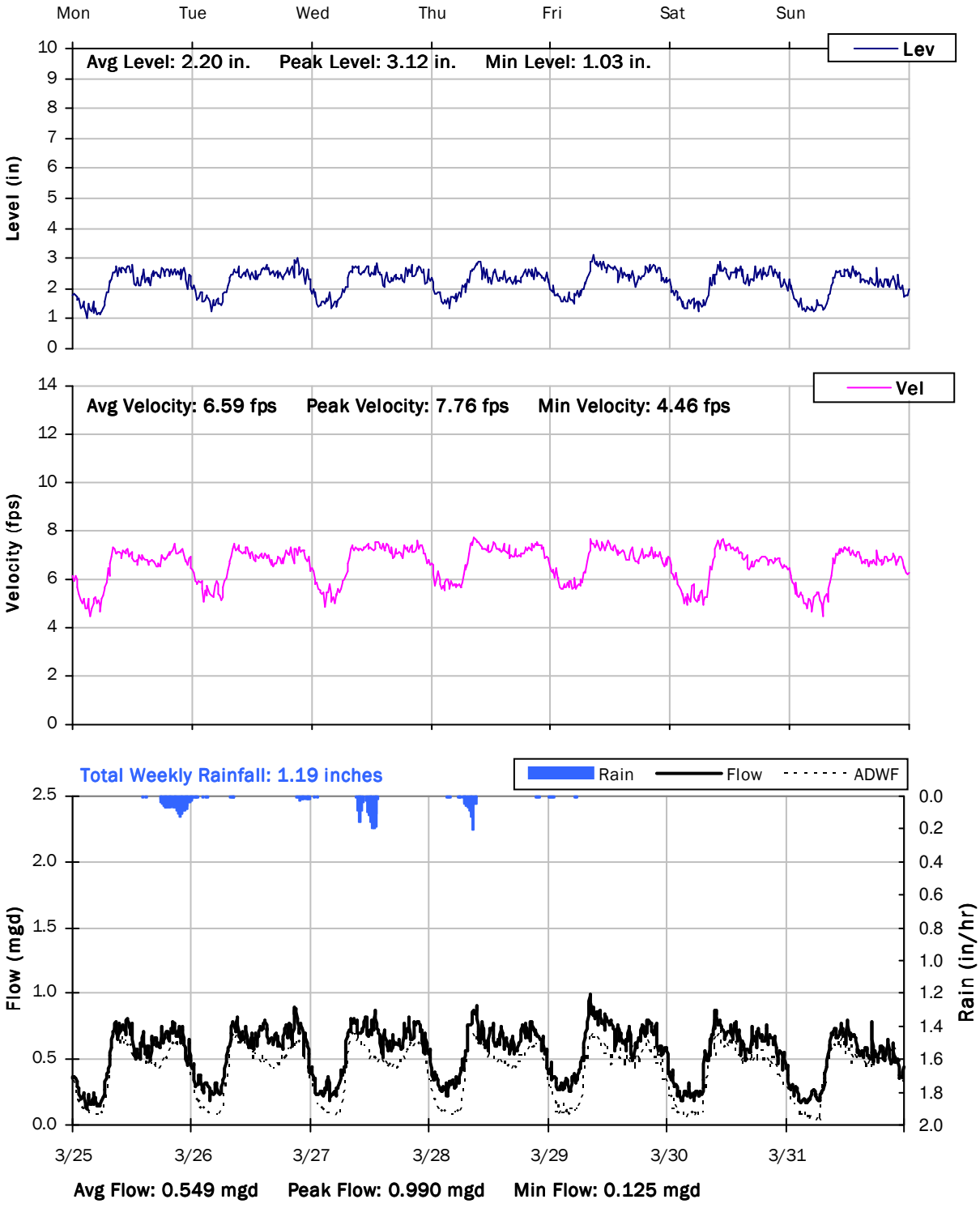
3/18/2019 to 3/25/2019



SITE 5

Weekly Level, Velocity and Flow Hydrographs

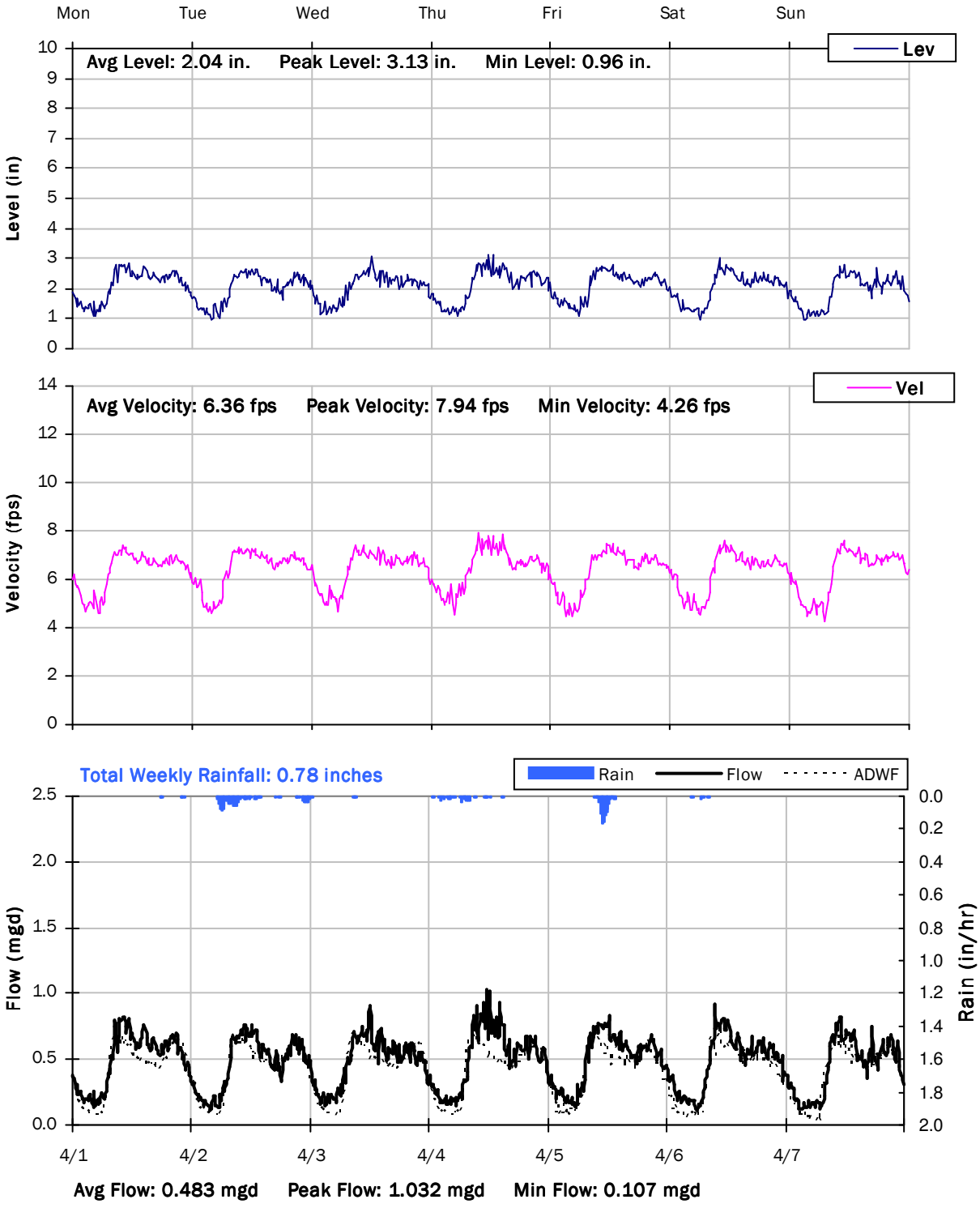
3/25/2019 to 4/1/2019



SITE 5

Weekly Level, Velocity and Flow Hydrographs

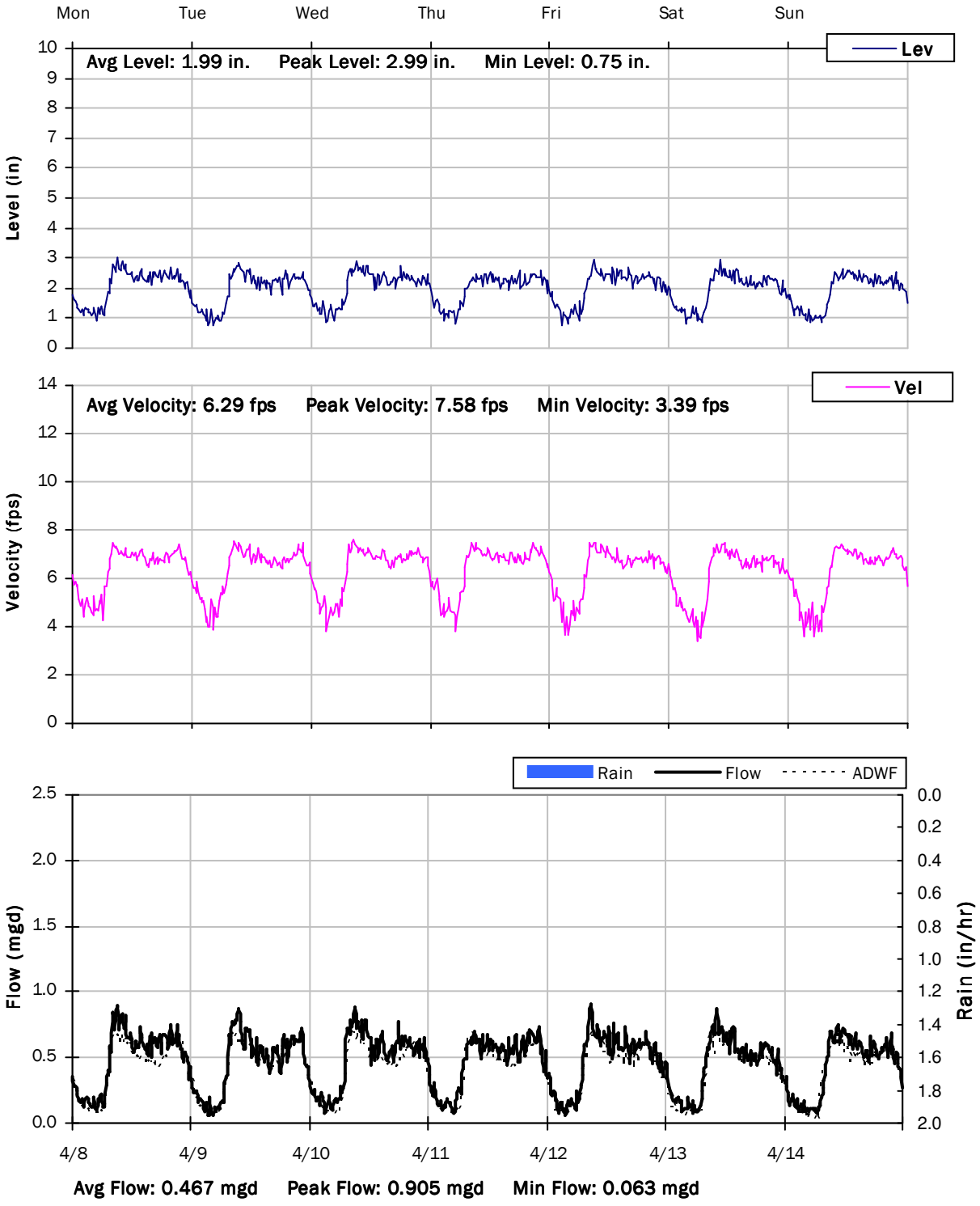
4/1/2019 to 4/8/2019



SITE 5

Weekly Level, Velocity and Flow Hydrographs

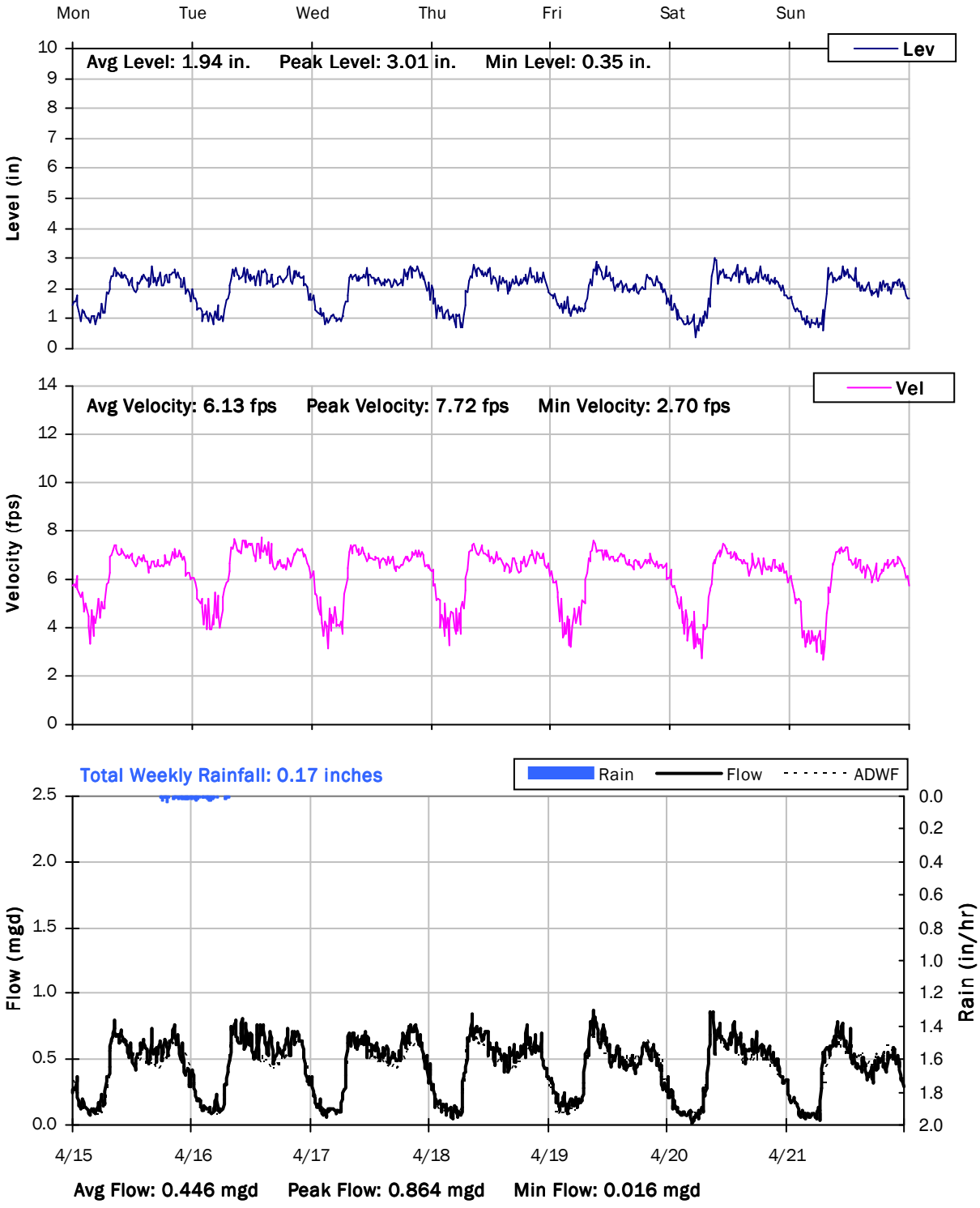
4/8/2019 to 4/15/2019



SITE 5

Weekly Level, Velocity and Flow Hydrographs

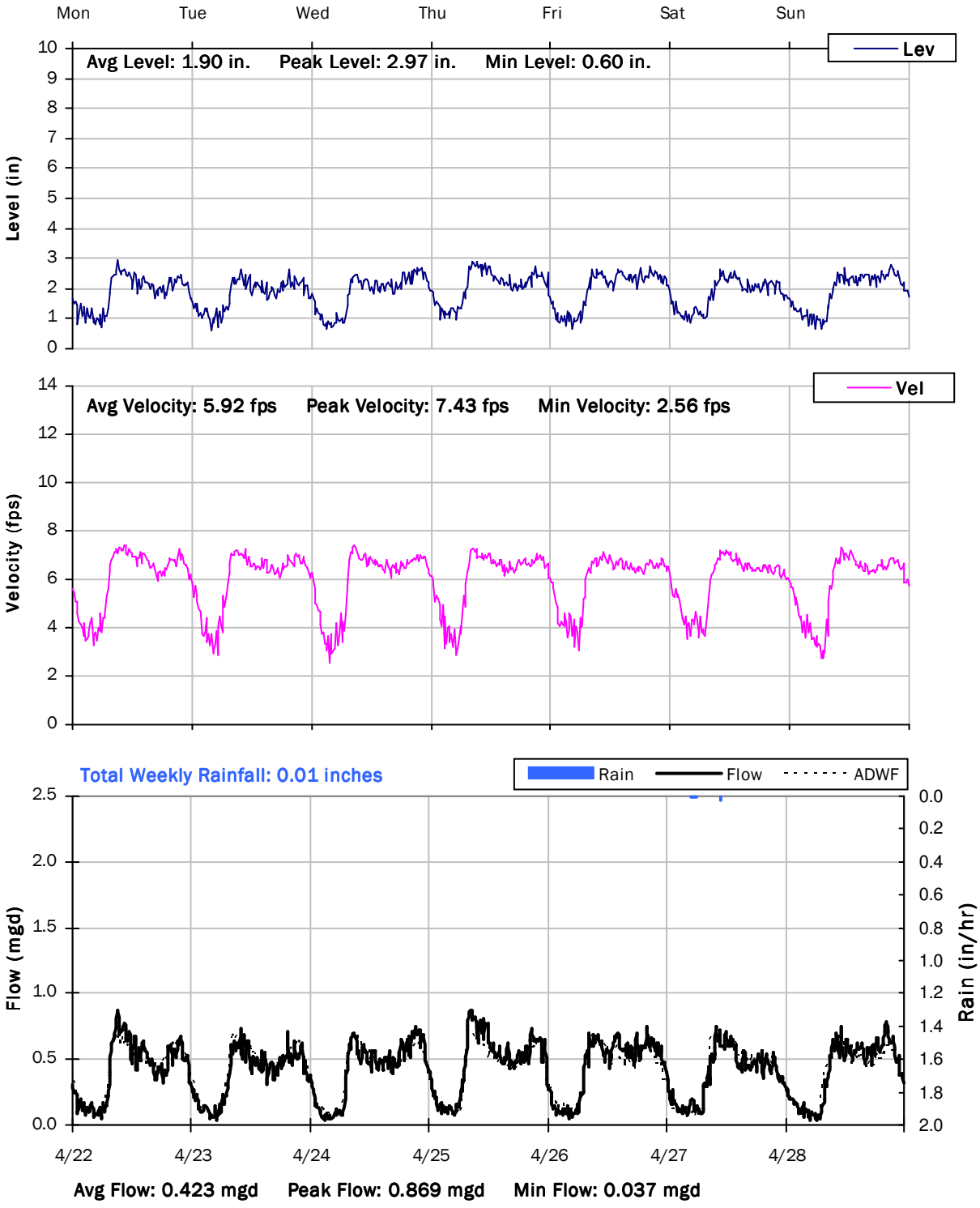
4/15/2019 to 4/22/2019



SITE 5

Weekly Level, Velocity and Flow Hydrographs

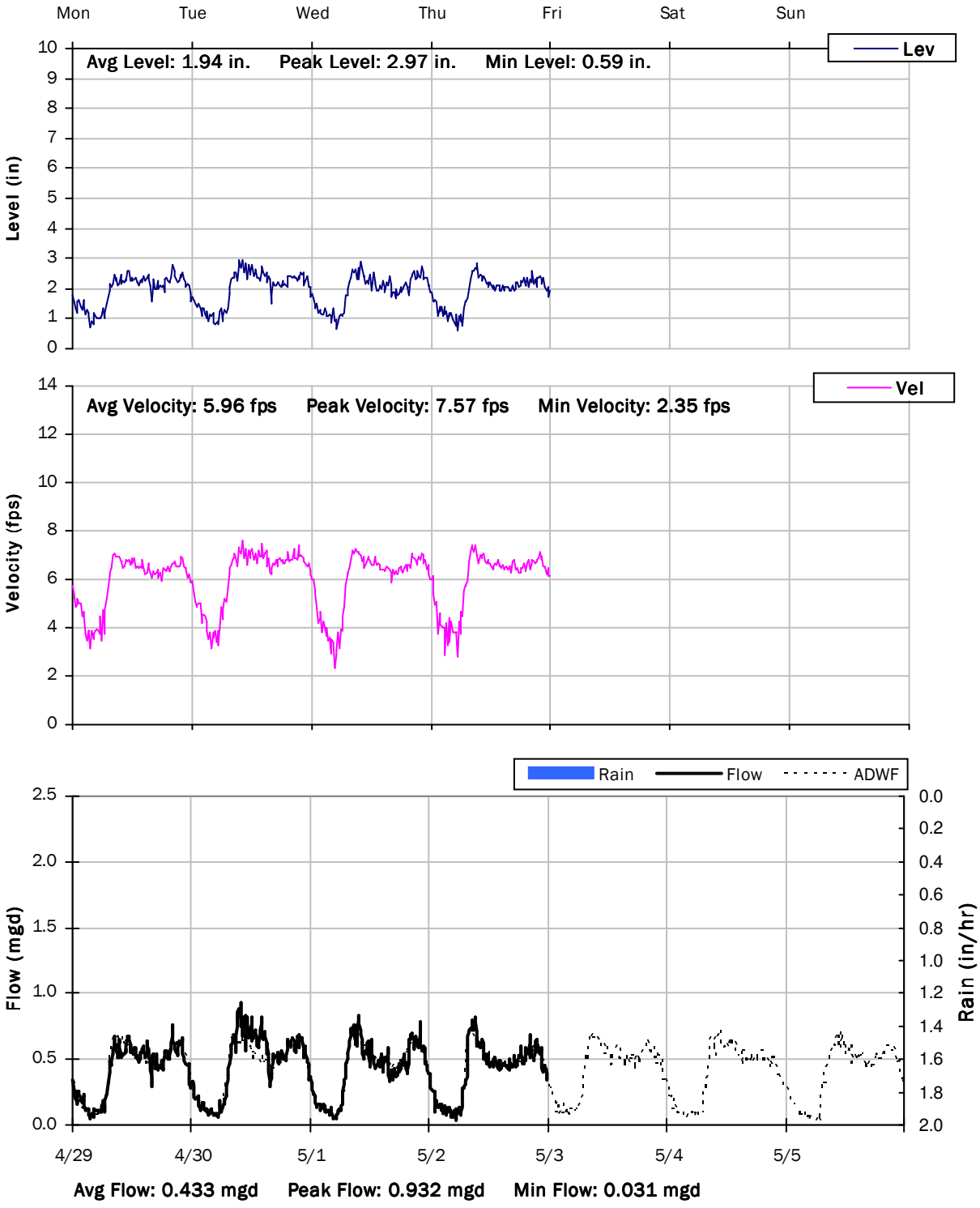
4/22/2019 to 4/29/2019



SITE 5

Weekly Level, Velocity and Flow Hydrographs

4/29/2019 to 5/6/2019



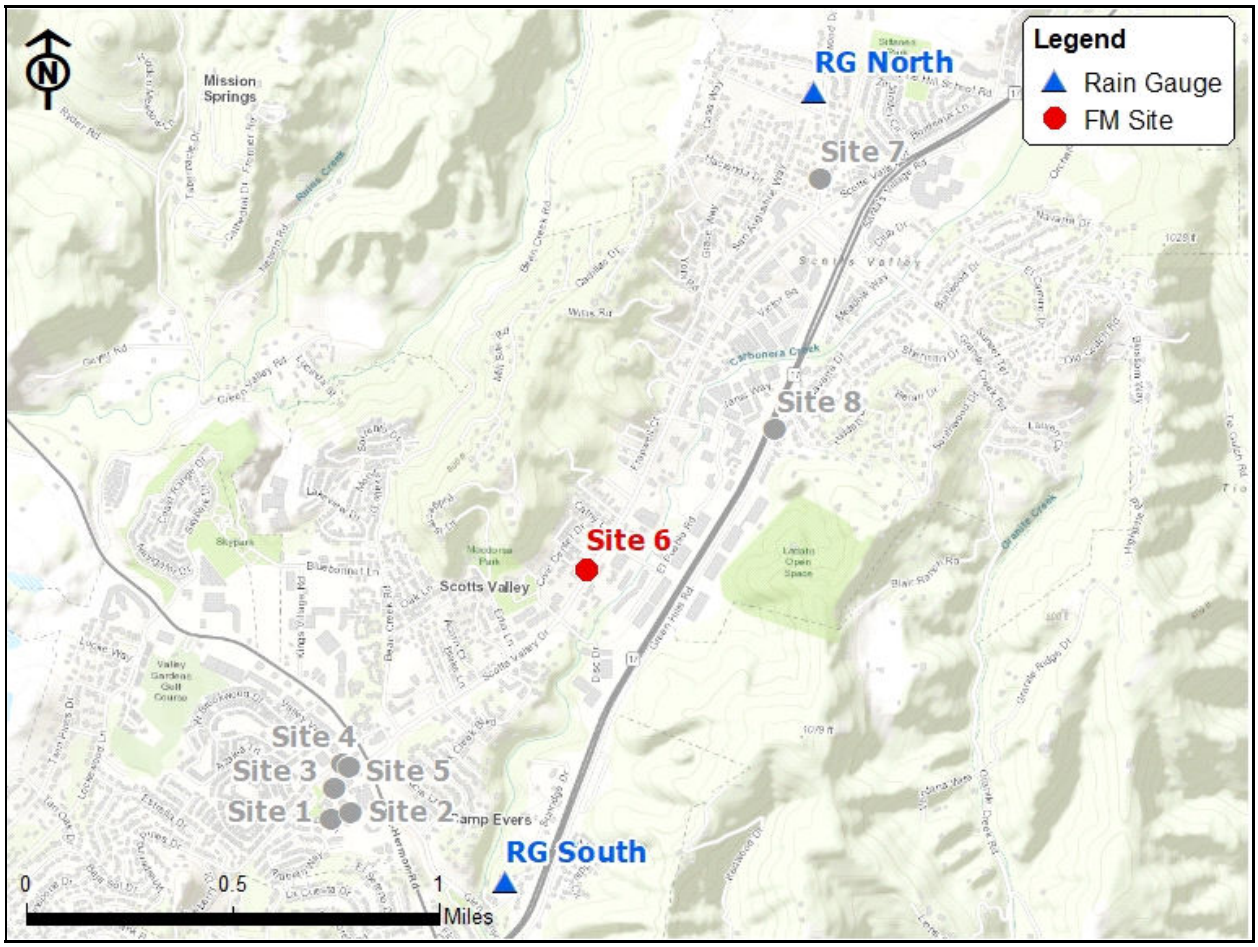
Carollo | Scotts Valley, California

Sanitary Sewer Flow Monitoring
January 30 - May 03, 2019

Monitoring Site: Site 6

Location: Scotts Valley Drive, south of Ball Drive

Data Summary Report



Vicinity Map: Site 6

SITE 6

Site Information

Location: Scotts Valley Drive, south of Ball Drive

Coordinates: 122.0156° W, 37.0500° N

Rim Elevation (Earth): 560 feet

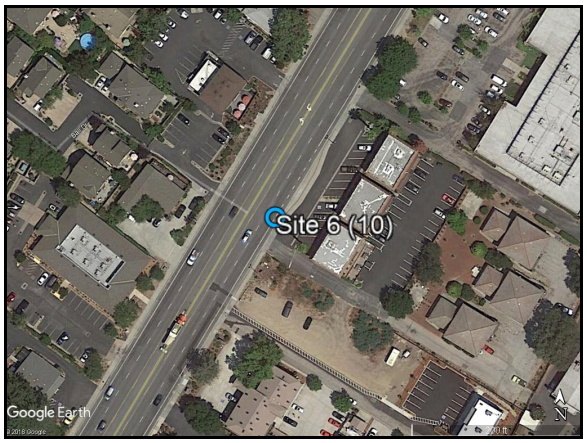
Expected Pipe Diameter: 10 inches

Measured Pipe Diameter: 10 inches

ADWF: 0.104 mgd

Peak Measured Flow: 0.785 mgd

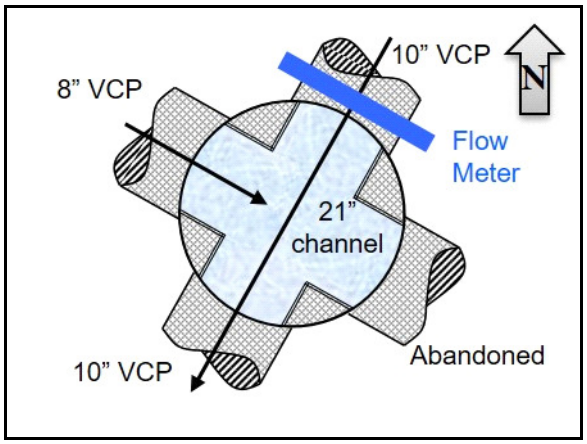
Sediment: None



Satellite Map



Sewer Map



Flow Sketch



Street View



Plan View

SITE 6

Additional Site Photos

Effluent Pipe



Monitored Northeast Influent Pipe



SITE 6

Additional Site Photos

Northwest Influent Pipe



Southeast Abandoned Pipe

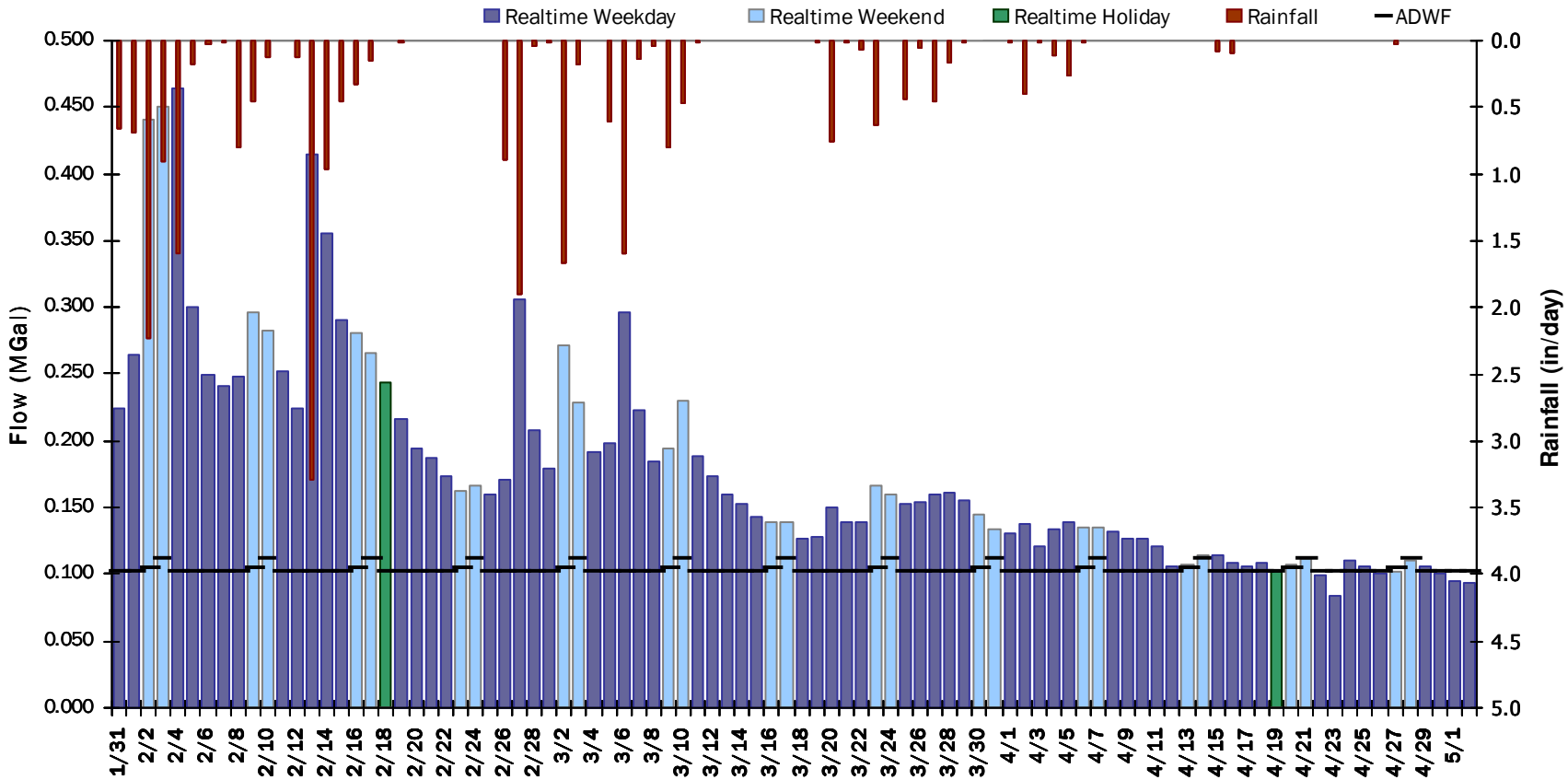


SITE 6

Period Flow Summary: Daily Flow Totals

Avg Daily Flow: 0.182 MGal Peak Daily Flow: 0.465 MGal Min Daily Flow: 0.084 MGal

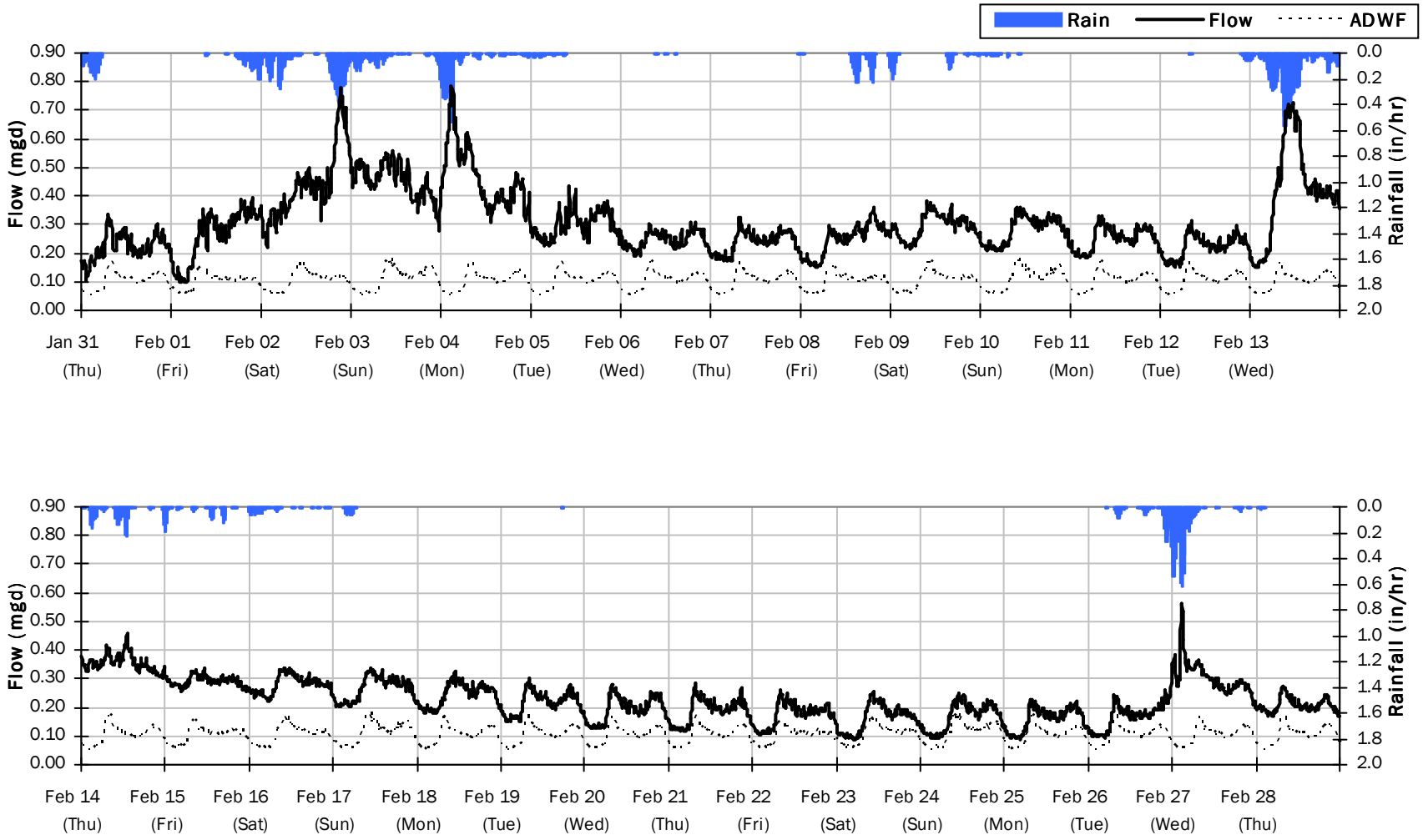
Total Rainfall: 25.00 inches



SITE 6

Flow Summary: 1/31/2019 to 2/28/2019

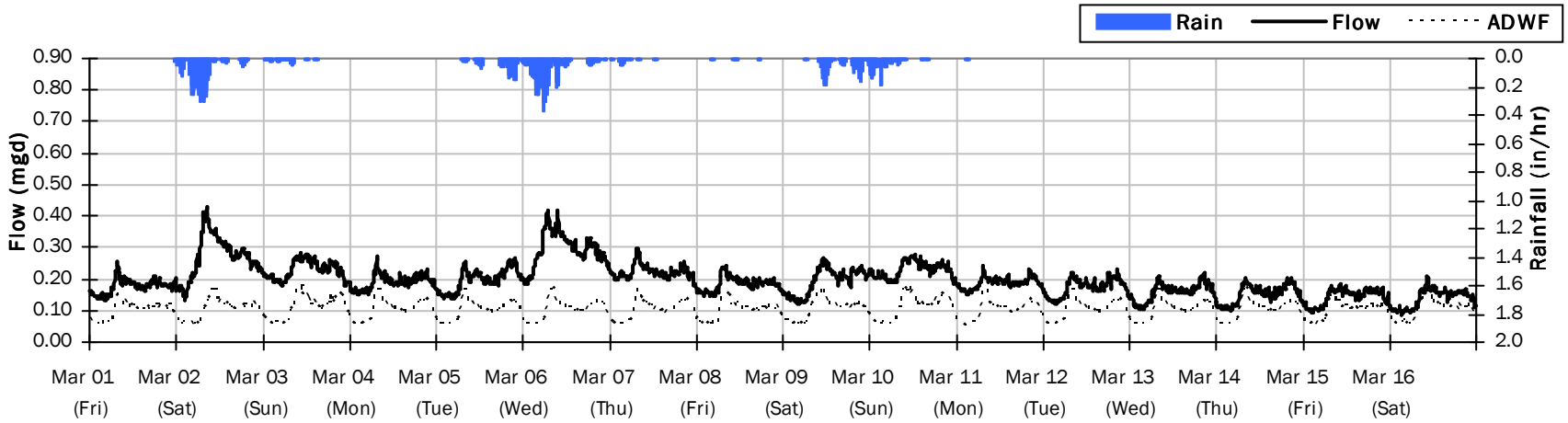
Period Rainfall: 15.84 inches Period Avg Flow: 0.267 mgd Period Peak Flow: 0.785 mgd Period Min Flow

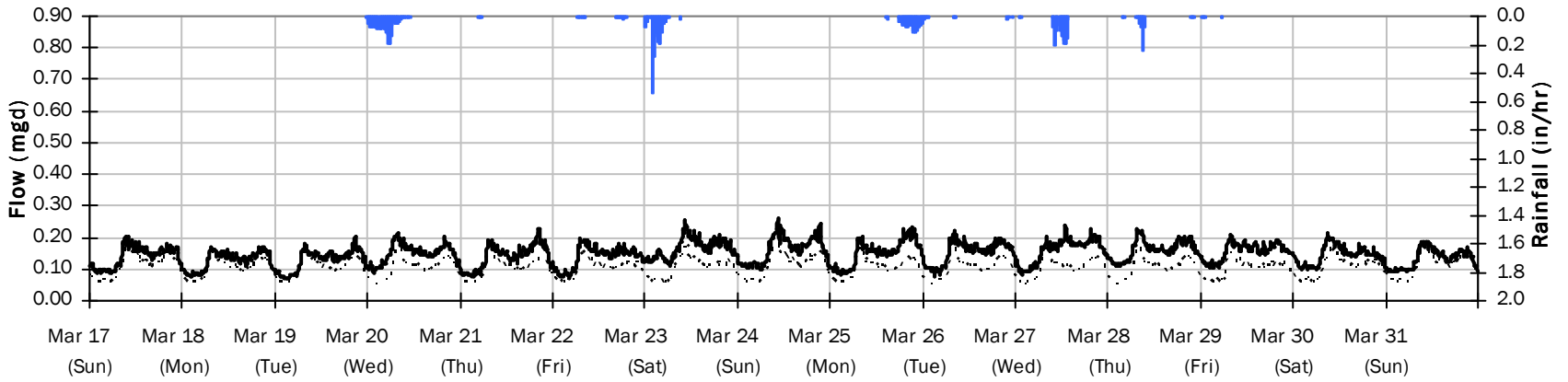


SITE 6

Flow Summary: 3/1/2019 to 3/31/2019

Period Rainfall: 8.15 inches Period Avg Flow: 0.173 mgd Period Peak Flow: 0.430 mgd Period Min Flow

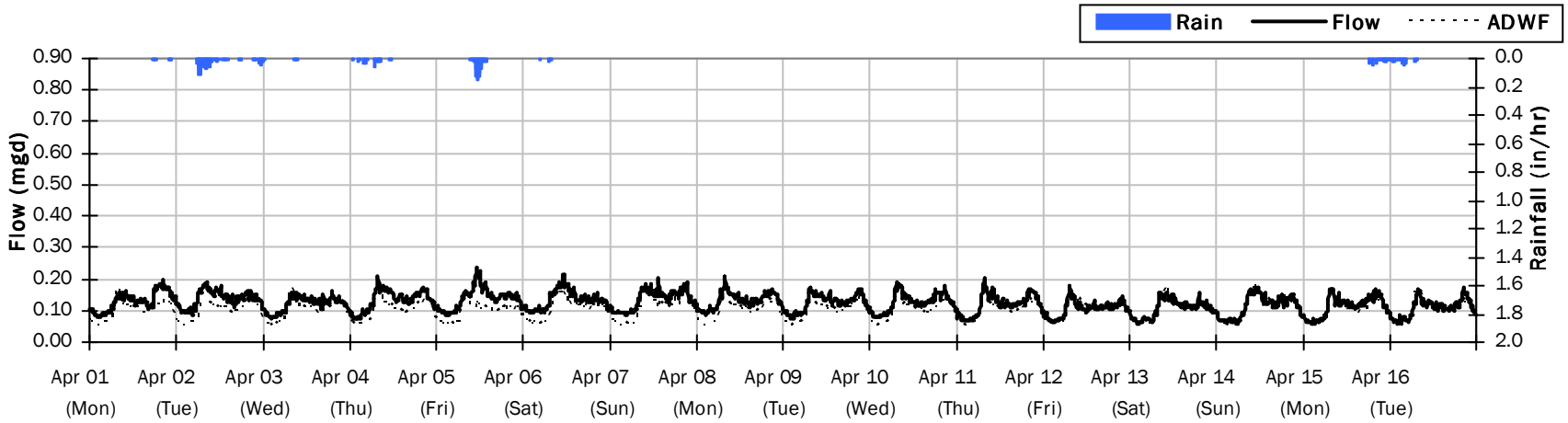


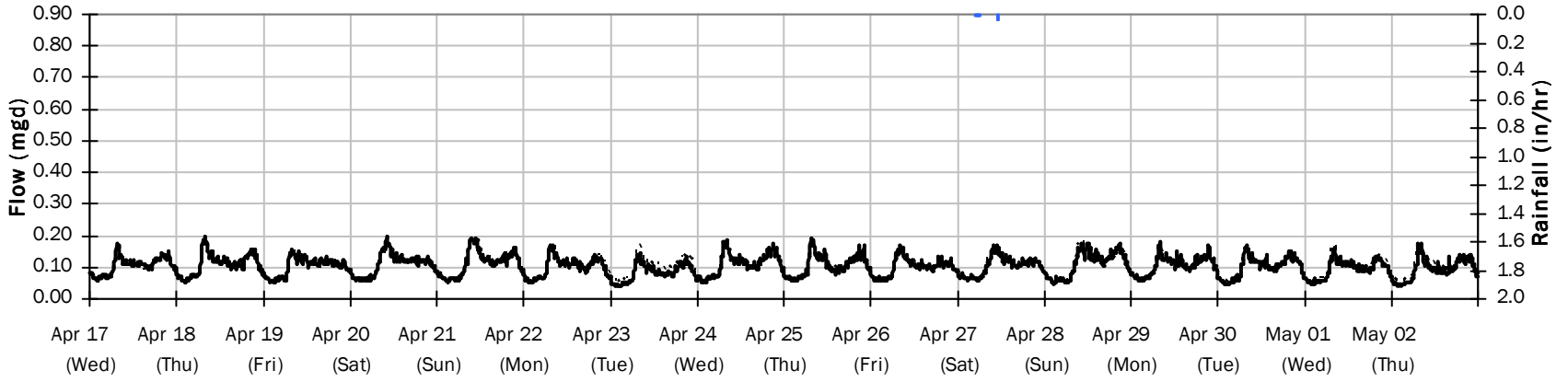


SITE 6

Flow Summary: 4/1/2019 to 5/2/2019

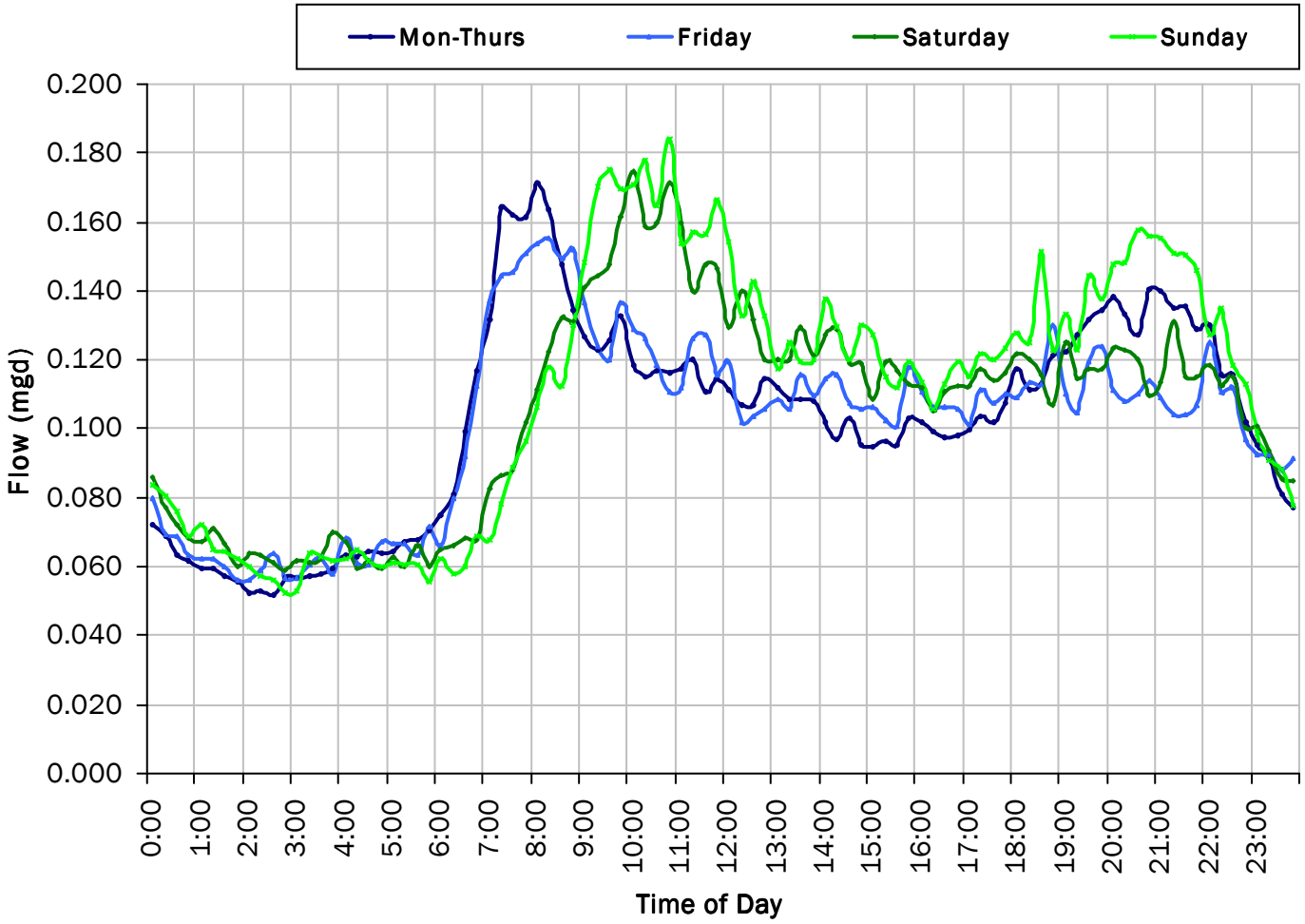
Period Rainfall: 1.02 inches Period Avg Flow: 0.114 mgd Period Peak Flow: 0.236 mgd Period Min Flow





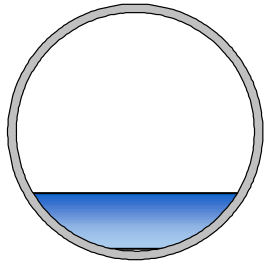
SITE 6

Average Dry Weather Flow Hydrographs



ADWF:

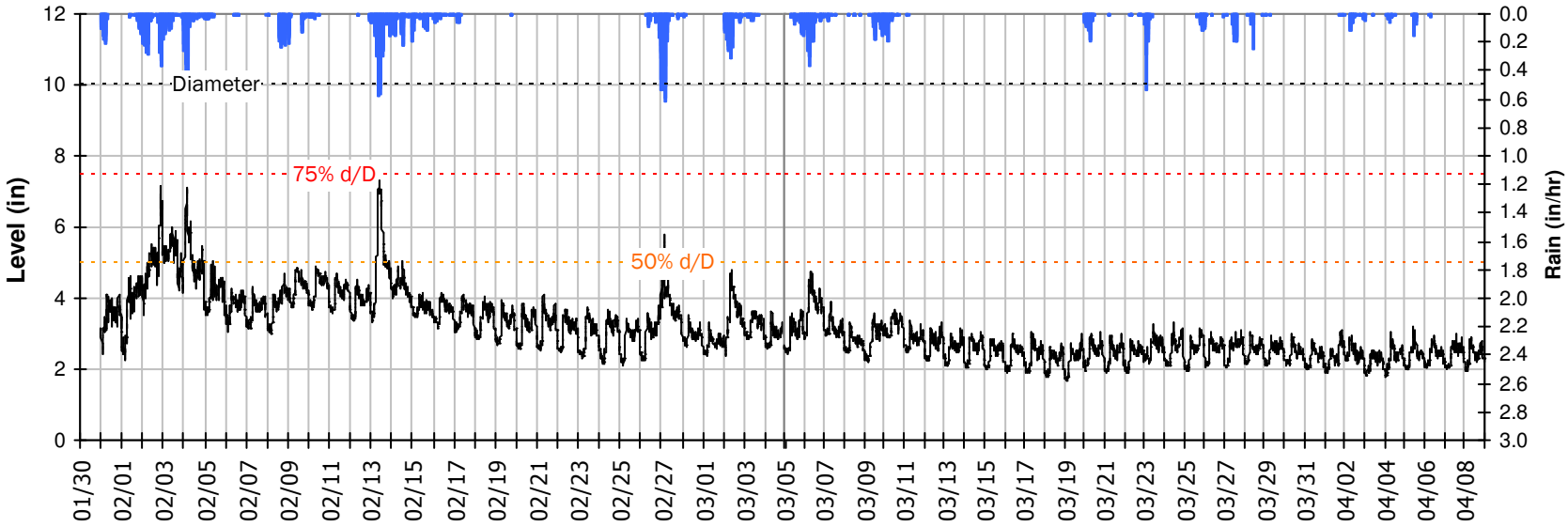
0.104 *mgd*

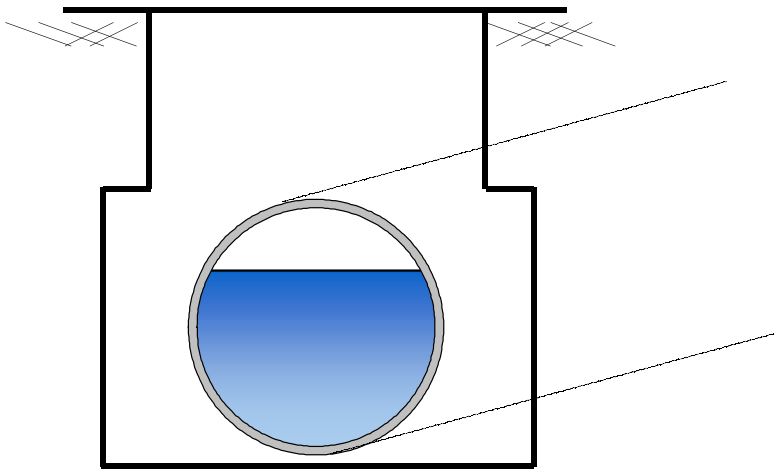


SITE 6

Site Capacity and Surcharge Summary

Realtime Flow Levels with Rainfall Data over Peak Level Period

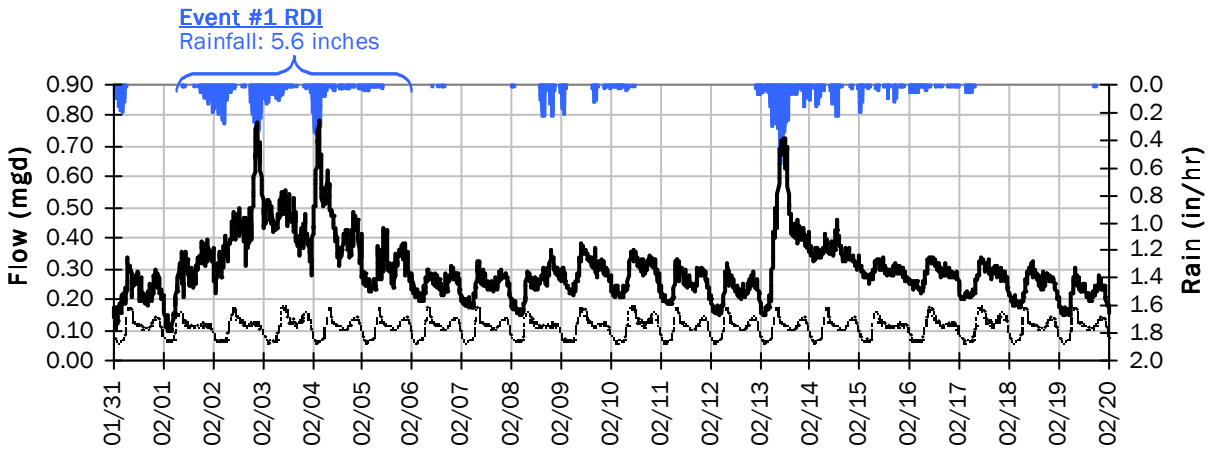




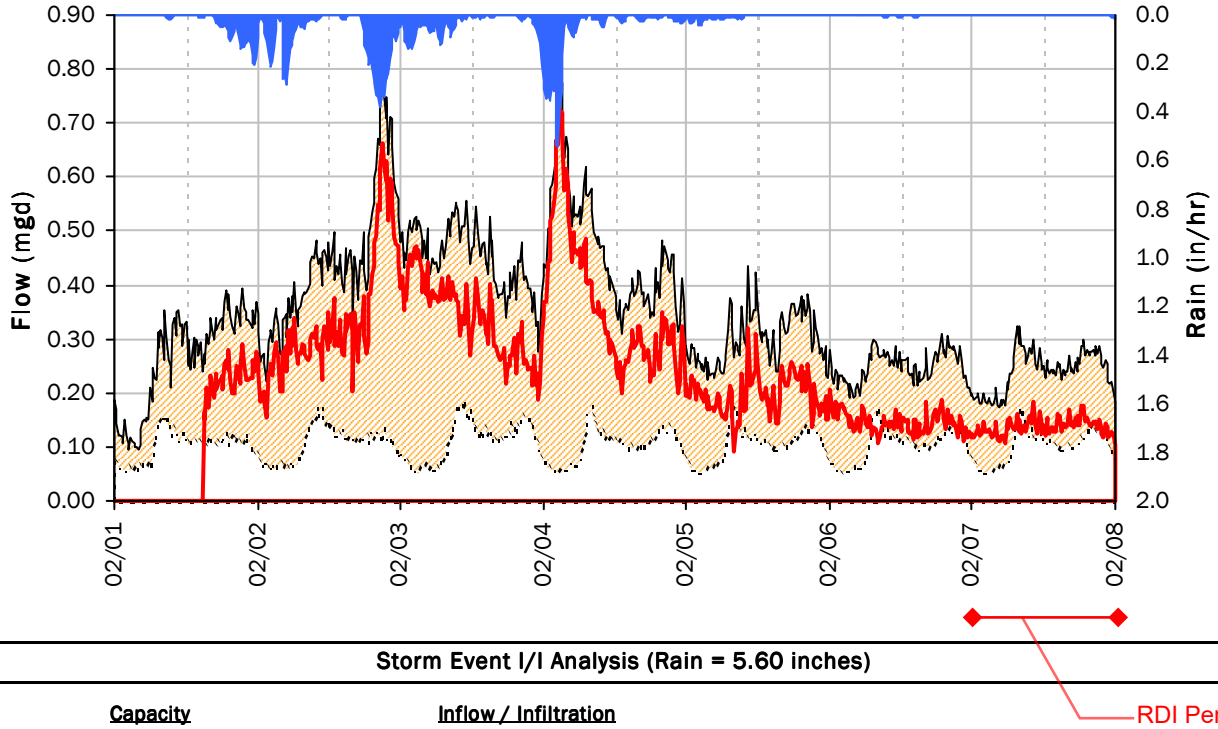
Pipe Diameter:	10	*inches*
Peak Measured Level:	7.29	*inches*
Peak d/D Ratio:	0.73	

SITE 6
I/I Summary: Event #1 RDI

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #1 RDI Detail Graph

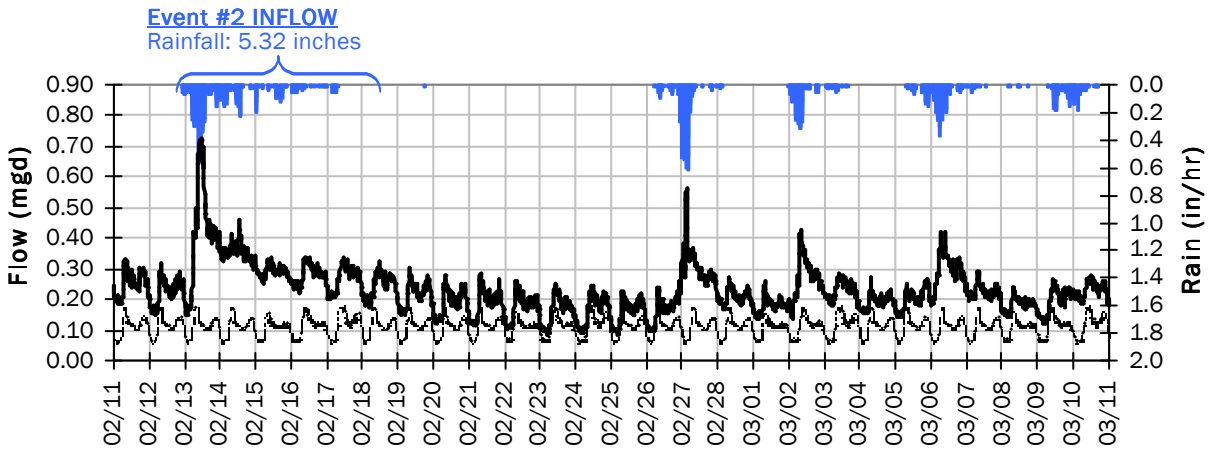


Storm Event I/I Analysis (Rain = 5.60 inches)

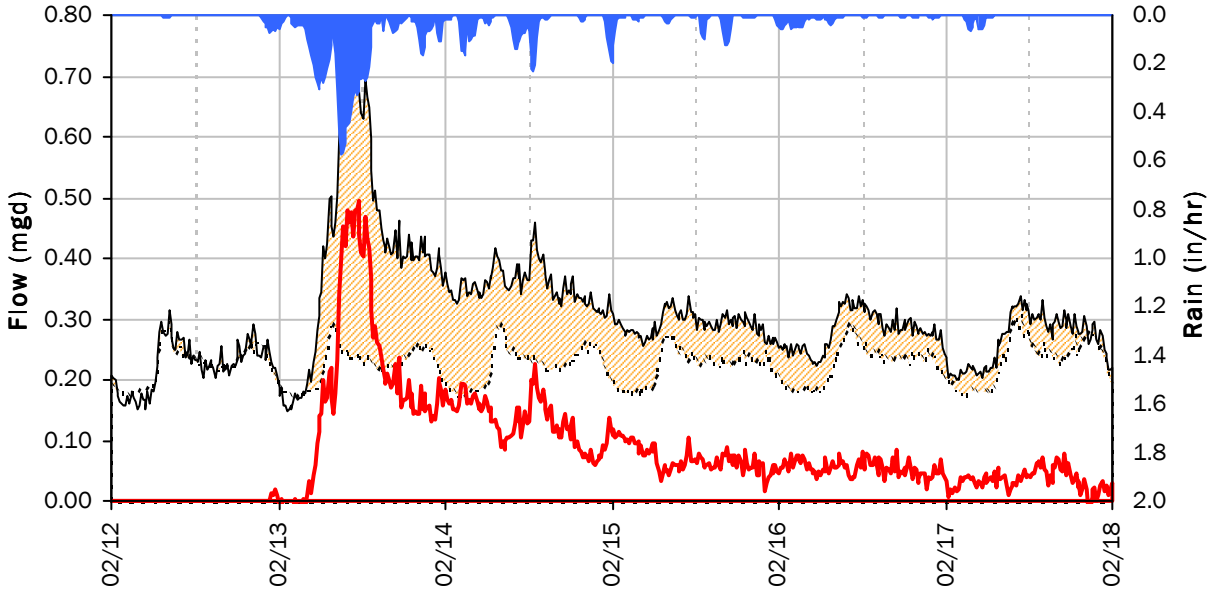
Capacity		Inflow / Infiltration	
Peak Flow:	0.785 *mgd*	**RDI:**	0.138 *mgd*
PF:	7.55		
Peak Level:	7.15 *in*		
d/D Ratio:	0.72		

SITE 6
I/I Summary: Event #2 INFLOW

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #2 INFLOW Detail Graph

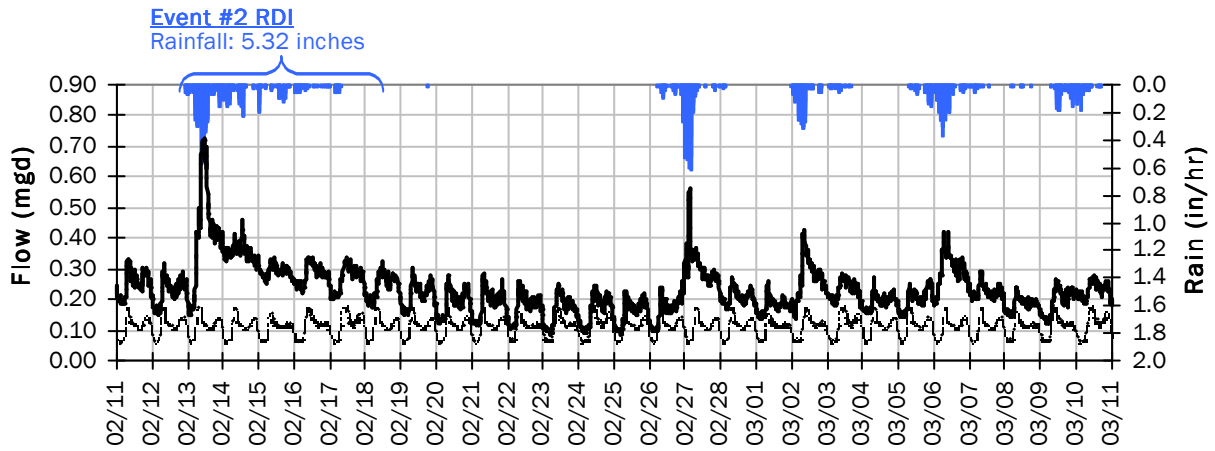


Storm Event I/I Analysis (Rain = 5.32 inches)

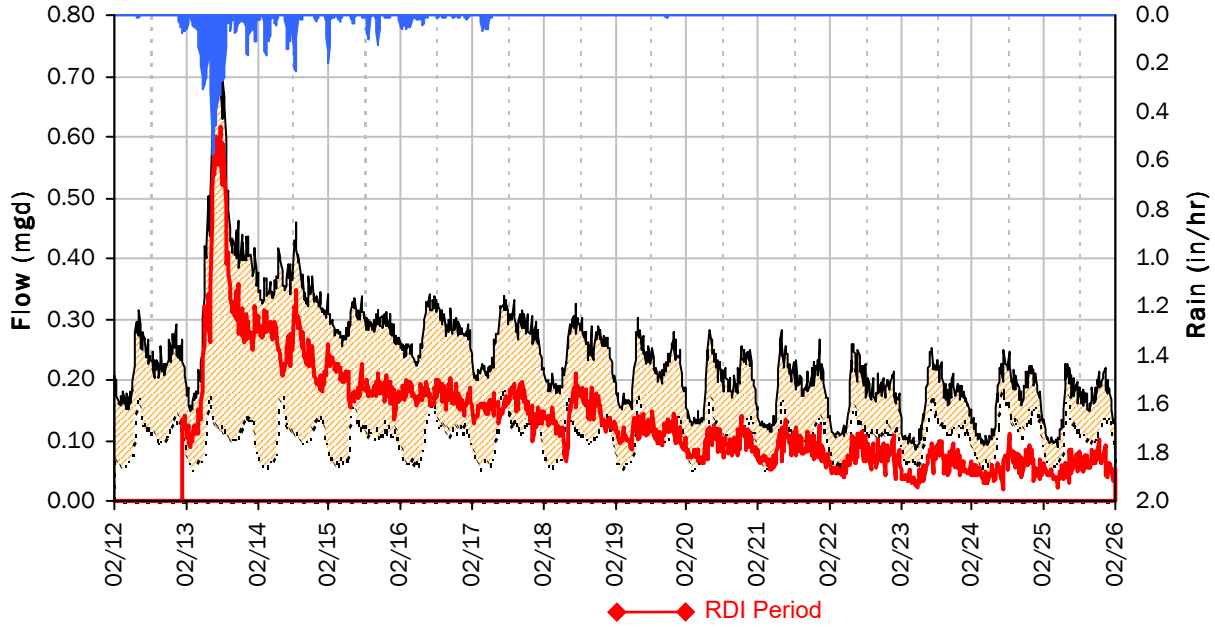
Capacity		Inflow / Infiltration	
Peak Flow:	0.726 *mgd*	**Peak I/I Rate:**	0.495 *mgd*
PF:	6.97		
Peak Level:	7.29 *in*		
d/D Ratio:	0.73		

SITE 6
I/I Summary: Event #2 RDI

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #2 RDI Detail Graph

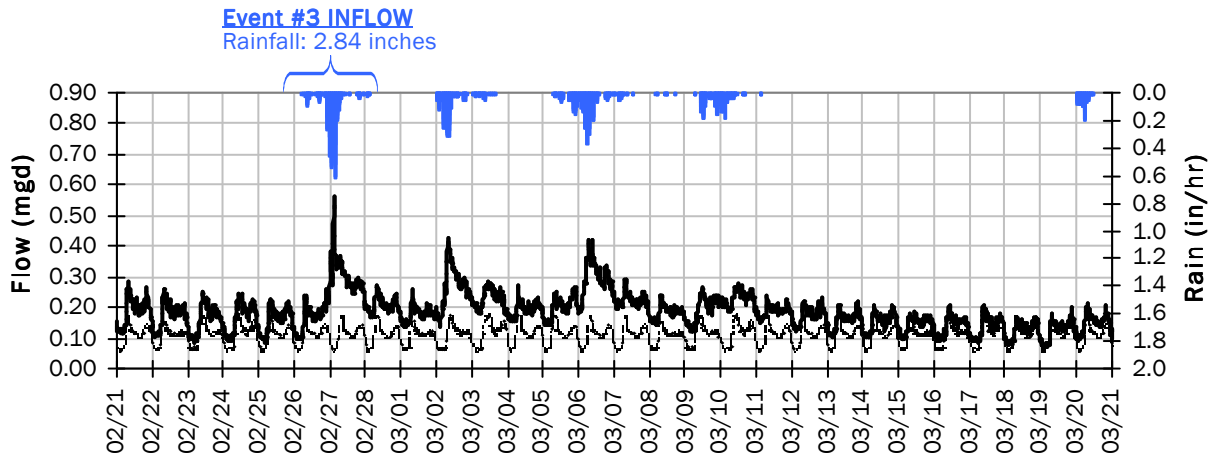


Storm Event I/I Analysis (Rain = 5.32 inches)

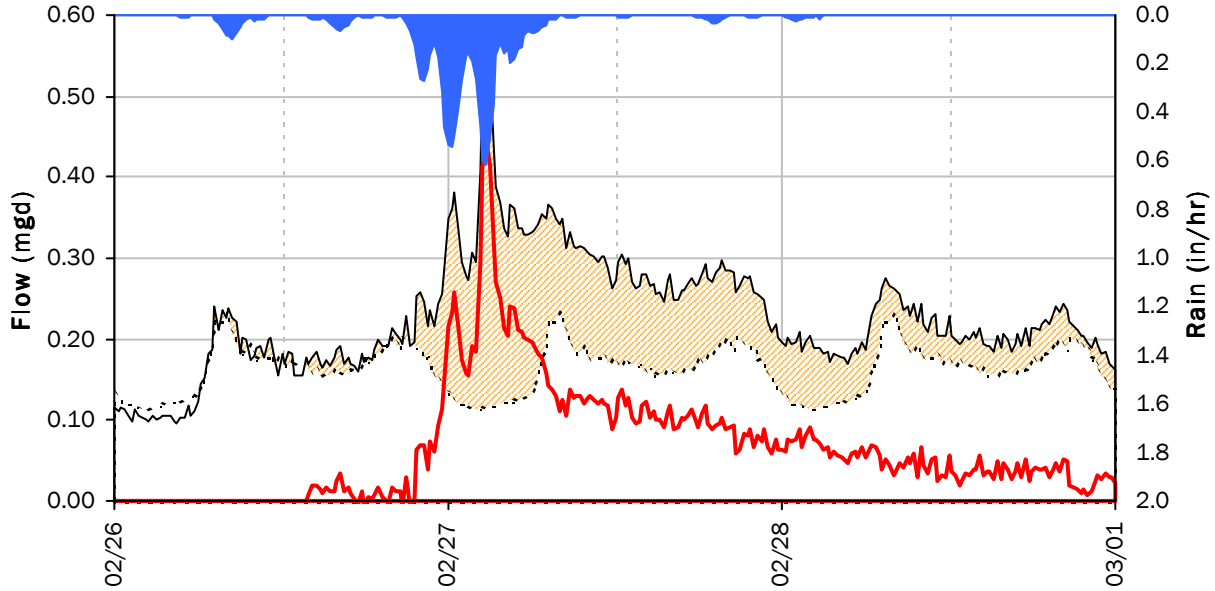
Capacity		Inflow / Infiltration	
Peak Flow:	0.726 *mgd*	**RDI:**	0.113 *mgd*
PF:	6.97		
Peak Level:	7.29 *in*		
d/D Ratio:	0.73		

SITE 6
I/I Summary: Event #3 INFLOW

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #3 INFLOW Detail Graph

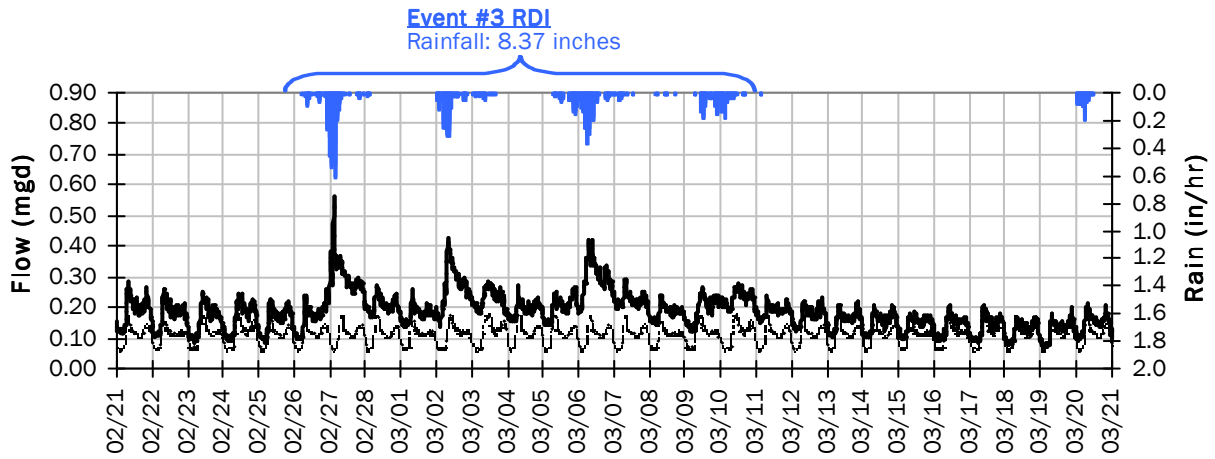


Storm Event I/I Analysis (Rain = 2.84 inches)

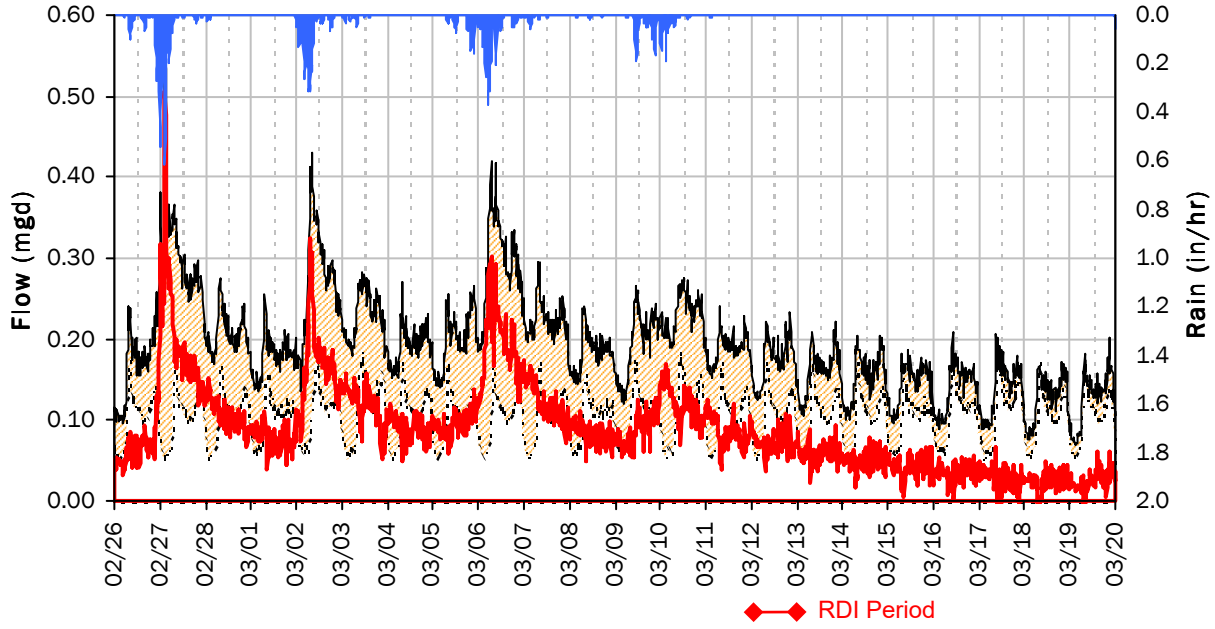
Capacity		Inflow / Infiltration	
Peak Flow:	0.56 *mgd*	**Peak I/I Rate:**	0.446 *mgd*
PF:	5.41		
Peak Level:	5.77 *in*		
d/D Ratio:	0.58		

SITE 6
I/I Summary: Event #3 RDI

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #3 RDI Detail Graph



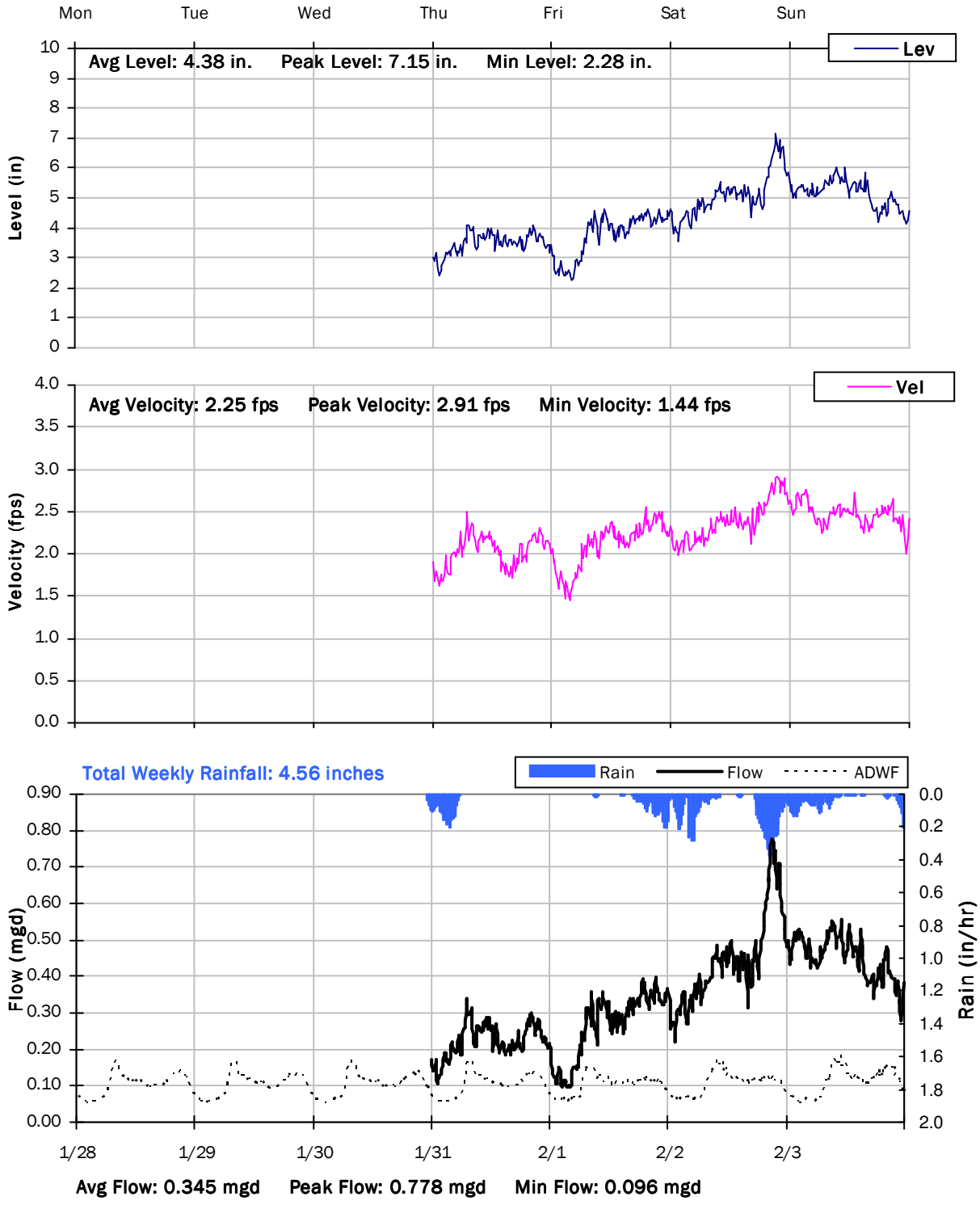
Storm Event I/I Analysis (Rain = 8.37 inches)

Capacity		Inflow / Infiltration	
Peak Flow:	0.56 *mgd*	**RDI:**	0.071 *mgd*
PF:	5.41		
Peak Level:	5.77 *in*		
d/D Ratio:	0.58		

SITE 6

Weekly Level, Velocity and Flow Hydrographs

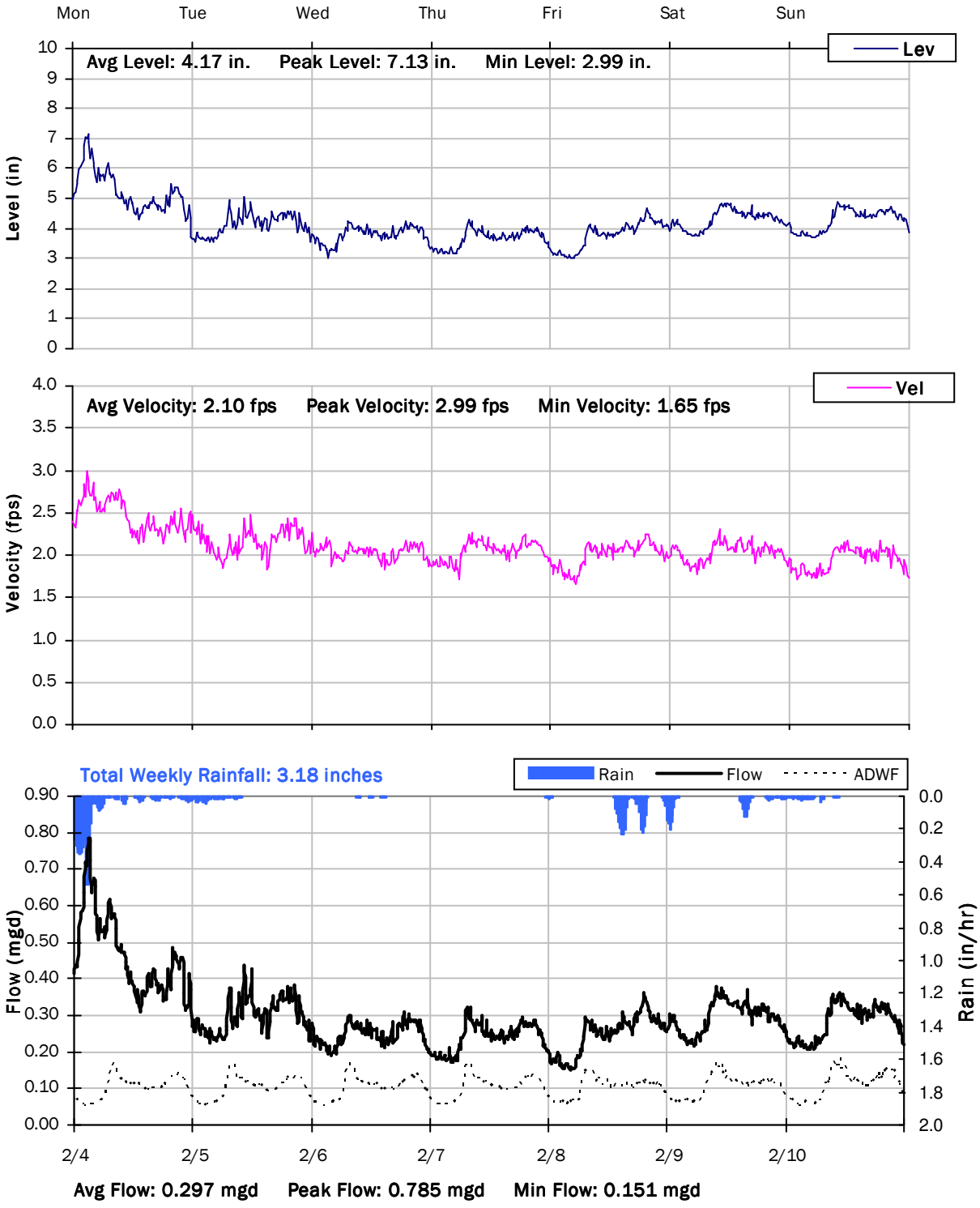
1/28/2019 to 2/4/2019



SITE 6

Weekly Level, Velocity and Flow Hydrographs

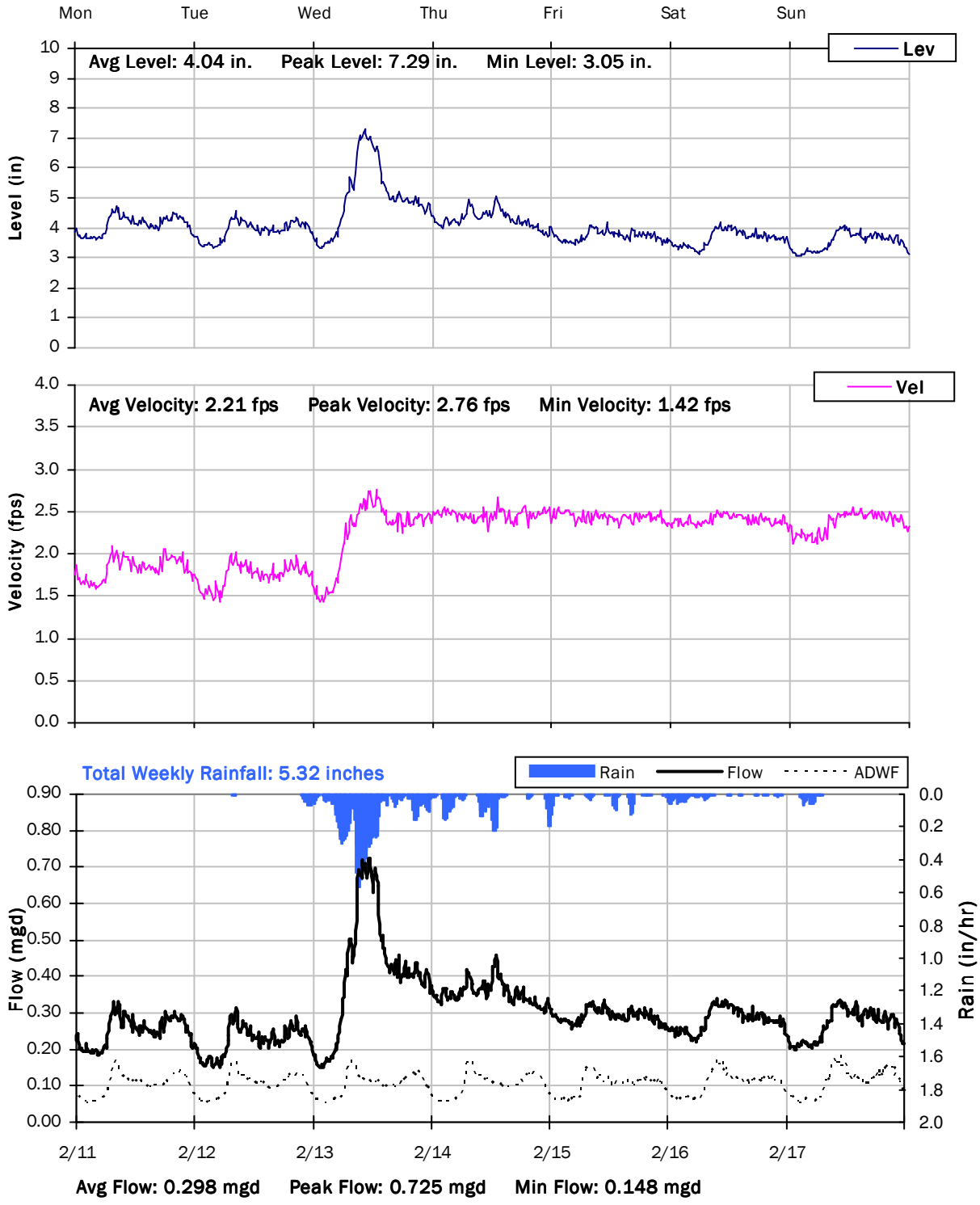
2/4/2019 to 2/11/2019



SITE 6

Weekly Level, Velocity and Flow Hydrographs

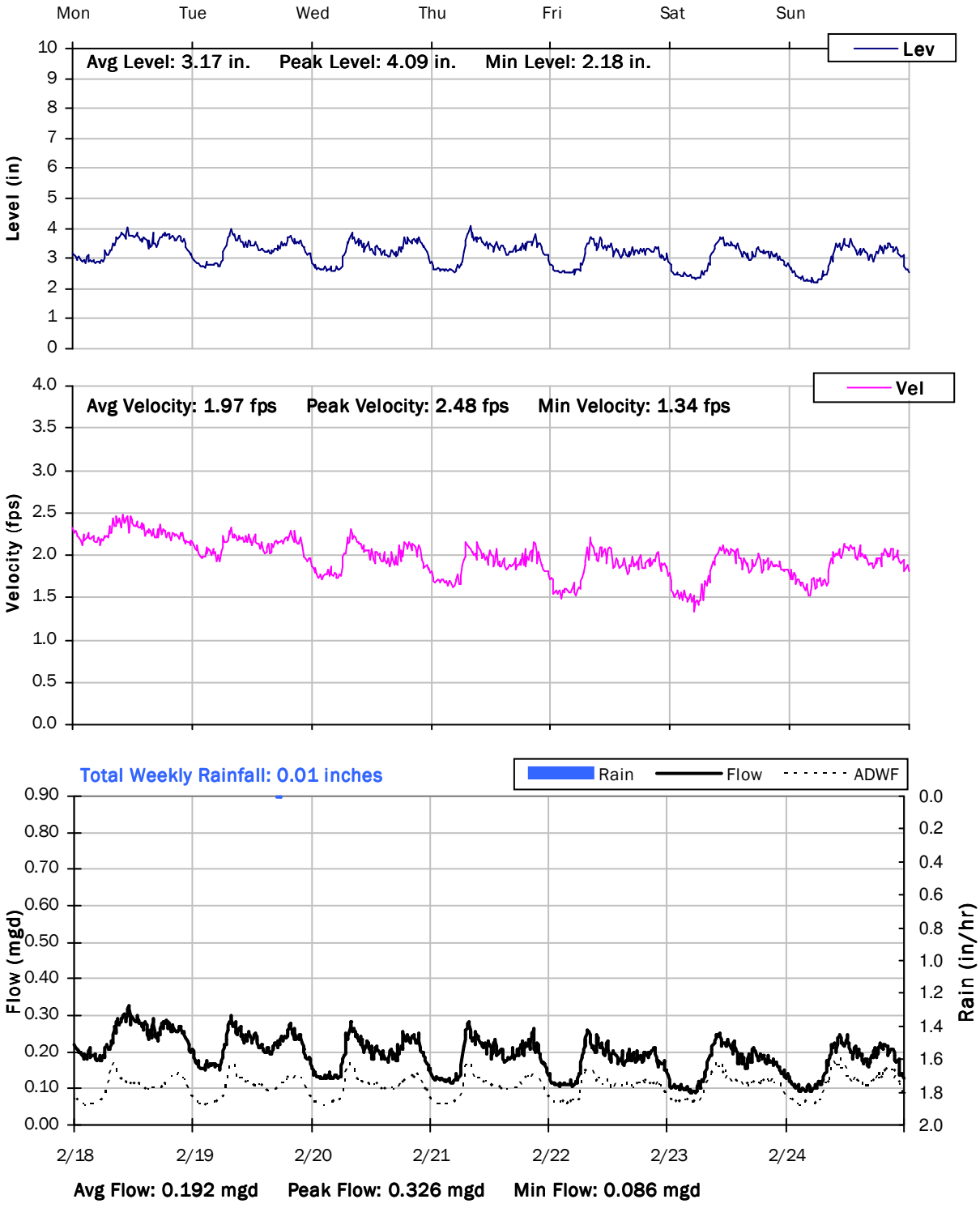
2/11/2019 to 2/18/2019



SITE 6

Weekly Level, Velocity and Flow Hydrographs

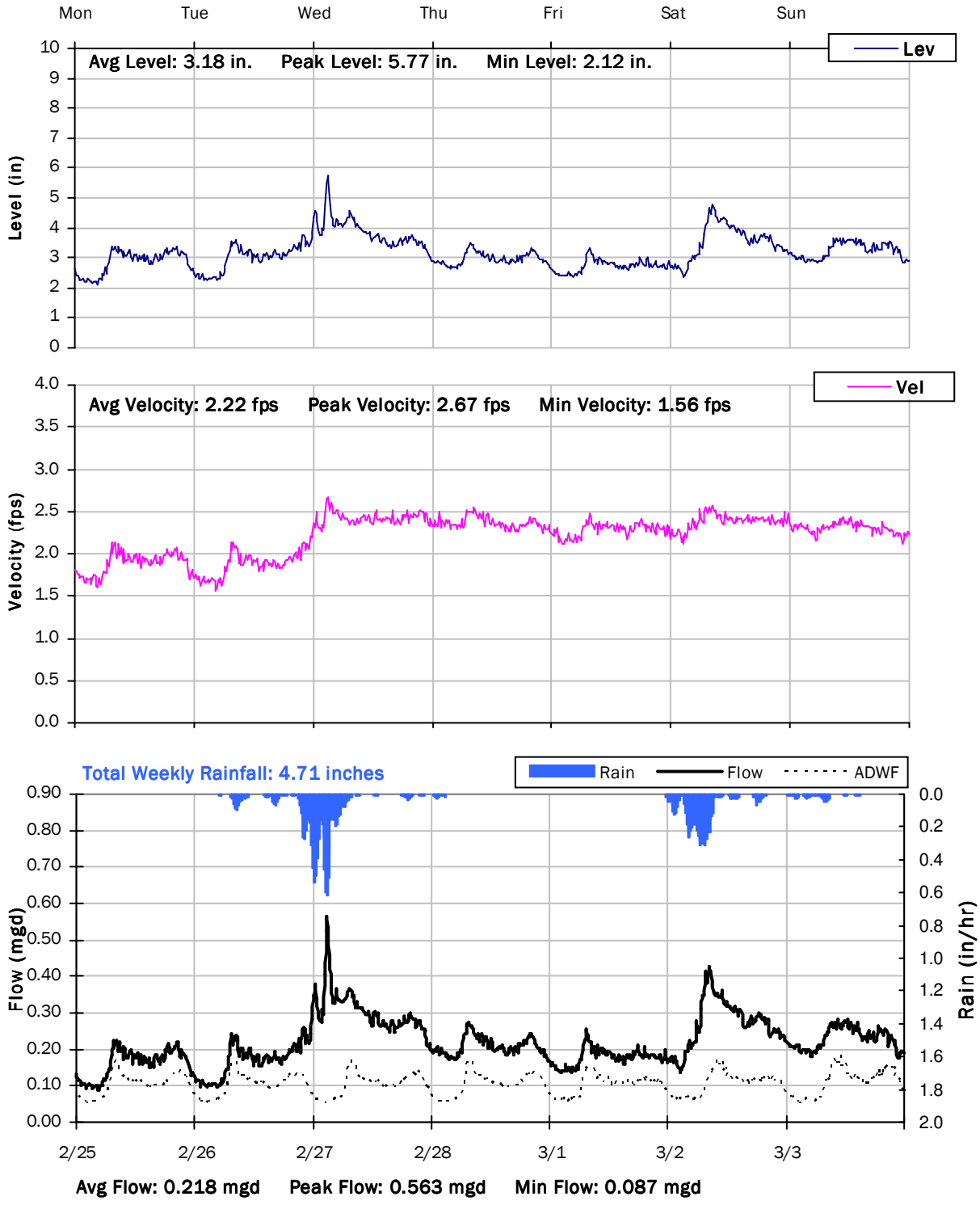
2/18/2019 to 2/25/2019



SITE 6

Weekly Level, Velocity and Flow Hydrographs

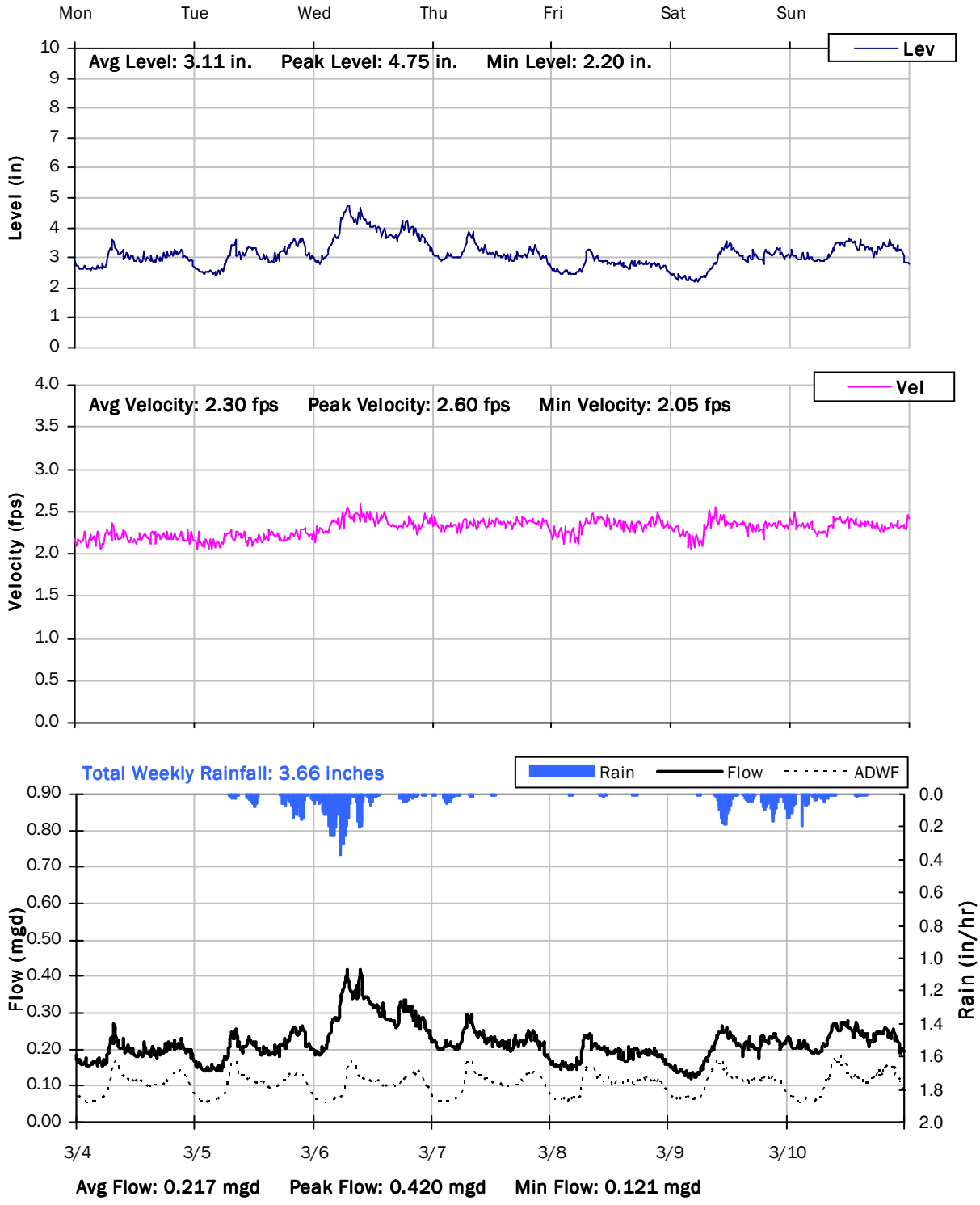
2/25/2019 to 3/4/2019



SITE 6

Weekly Level, Velocity and Flow Hydrographs

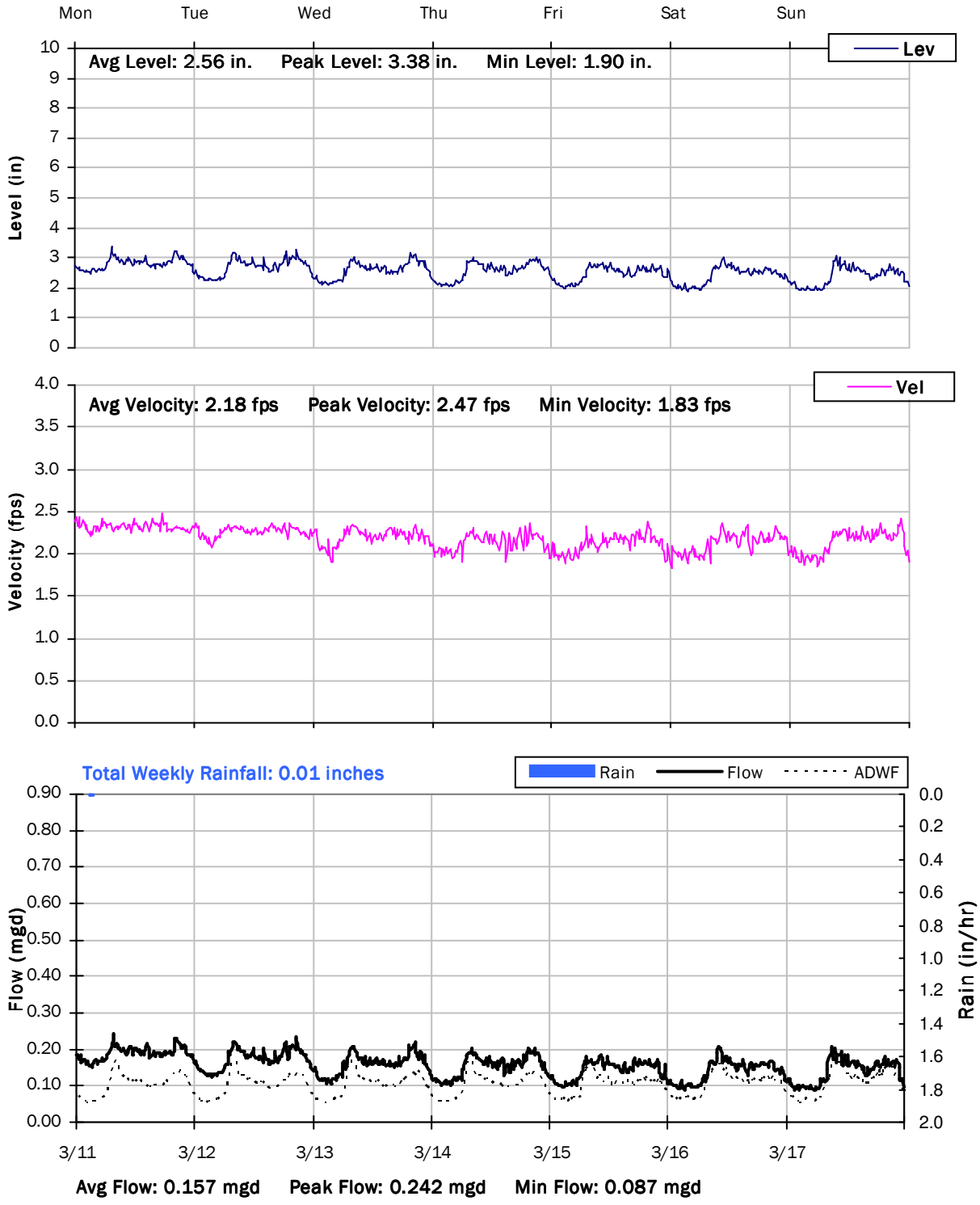
3/4/2019 to 3/11/2019



SITE 6

Weekly Level, Velocity and Flow Hydrographs

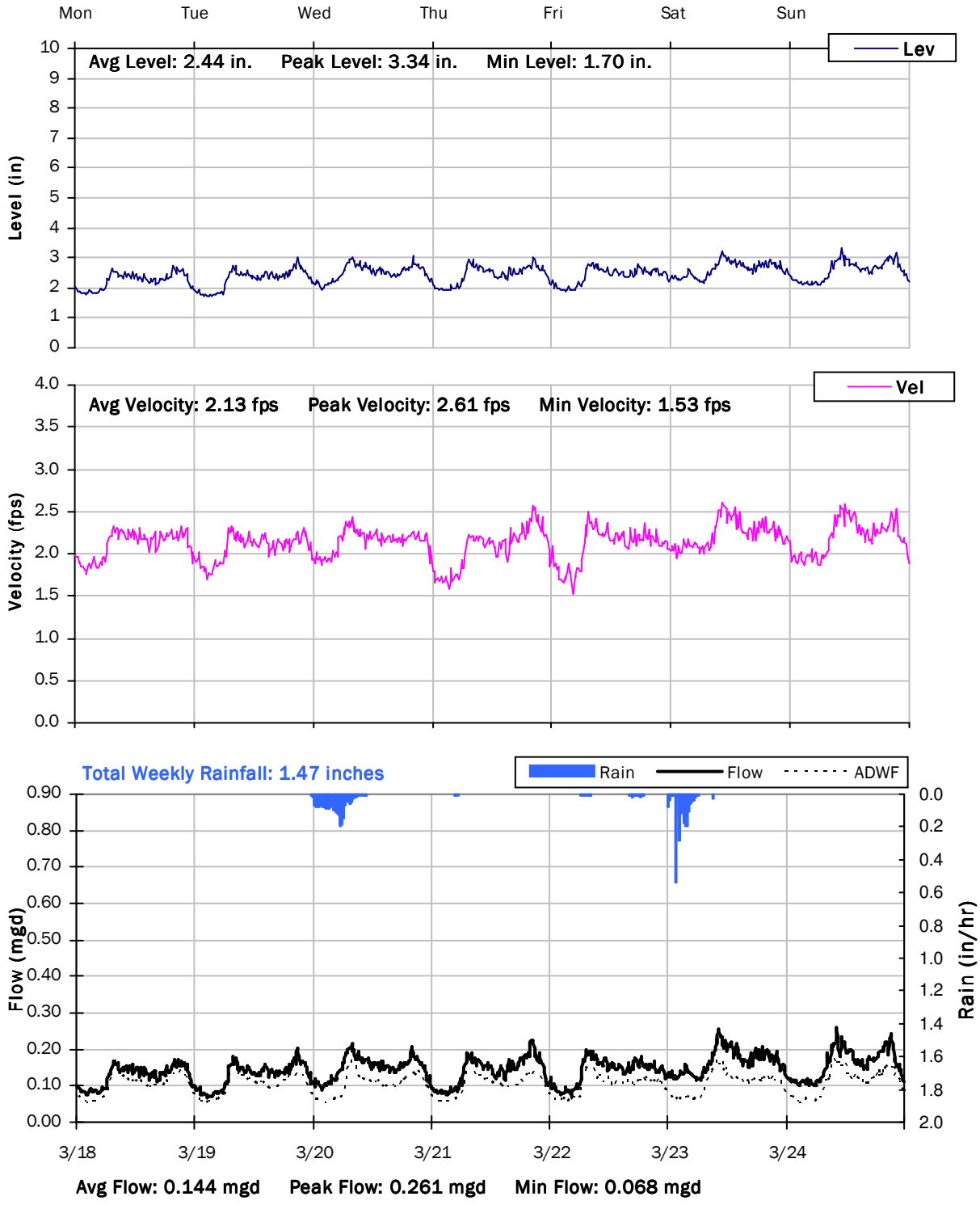
3/11/2019 to 3/18/2019



SITE 6

Weekly Level, Velocity and Flow Hydrographs

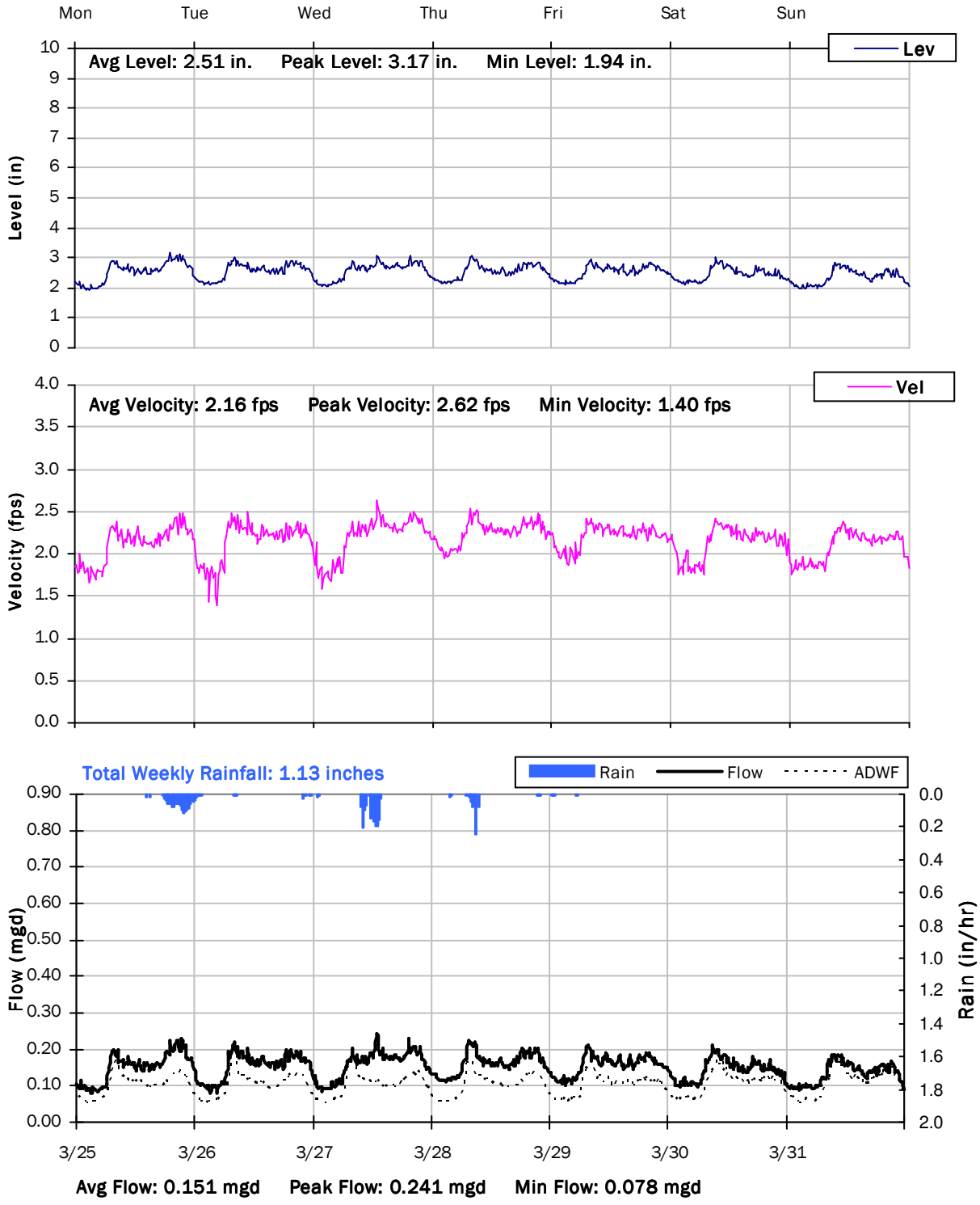
3/18/2019 to 3/25/2019



SITE 6

Weekly Level, Velocity and Flow Hydrographs

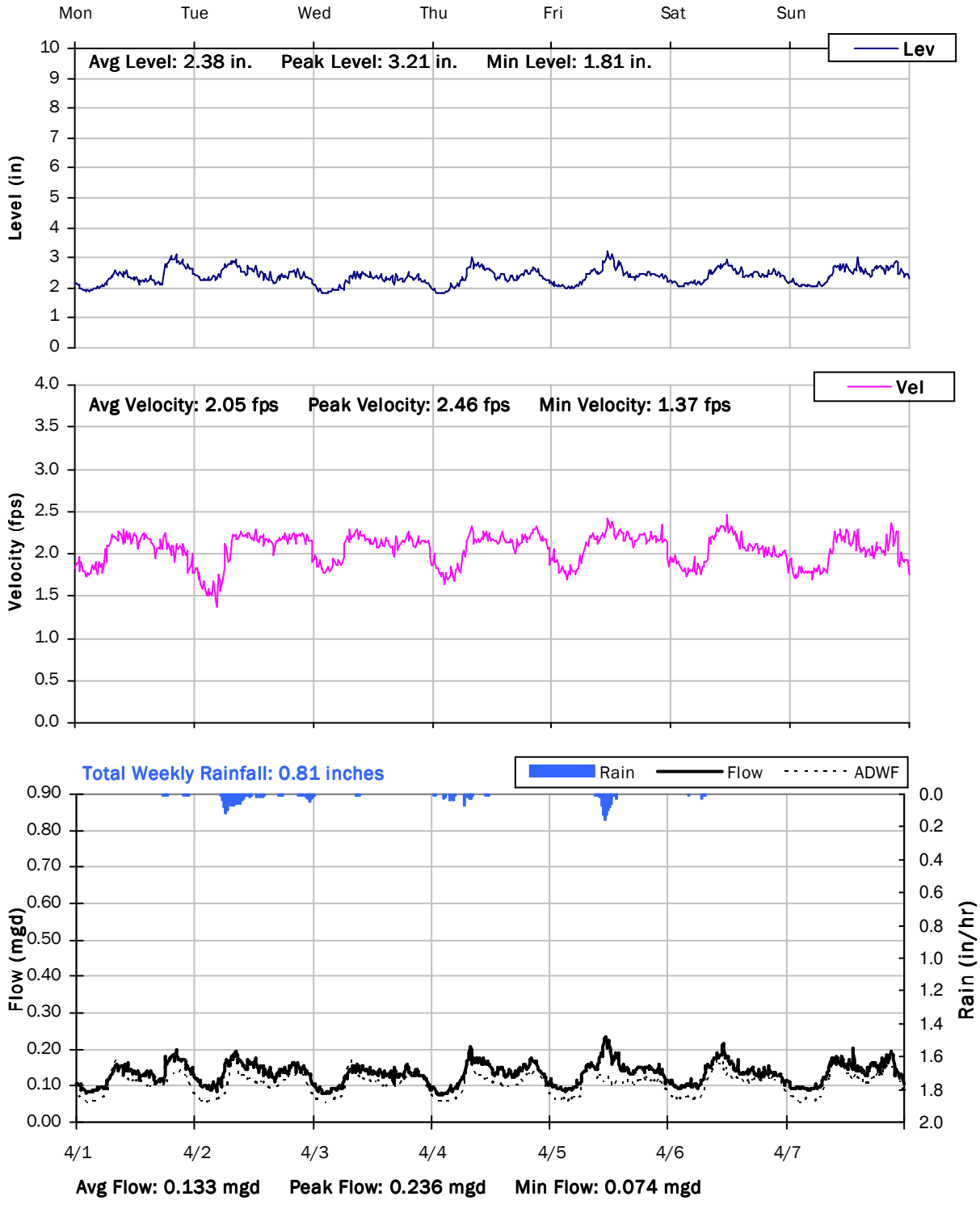
3/25/2019 to 4/1/2019



SITE 6

Weekly Level, Velocity and Flow Hydrographs

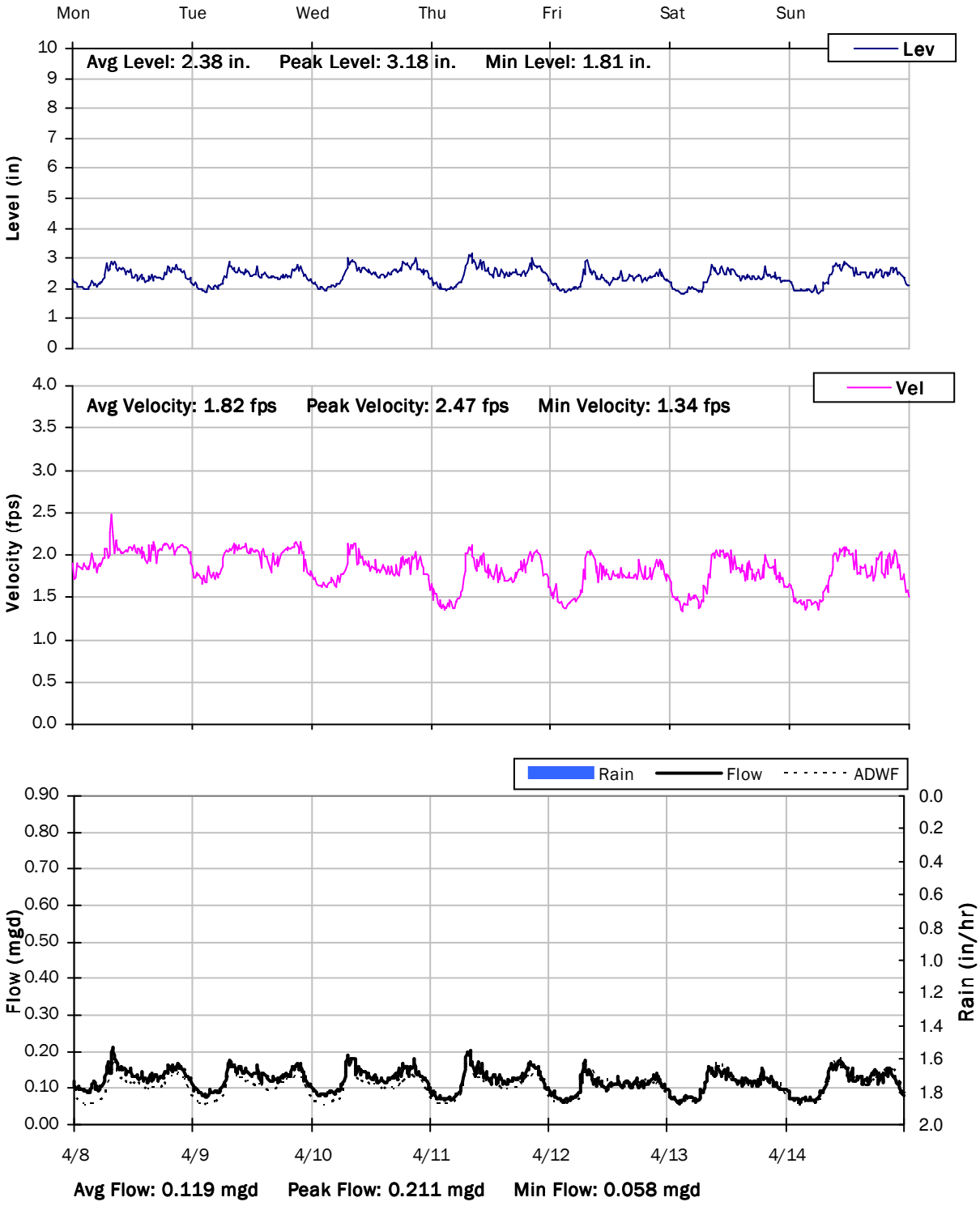
4/1/2019 to 4/8/2019



SITE 6

Weekly Level, Velocity and Flow Hydrographs

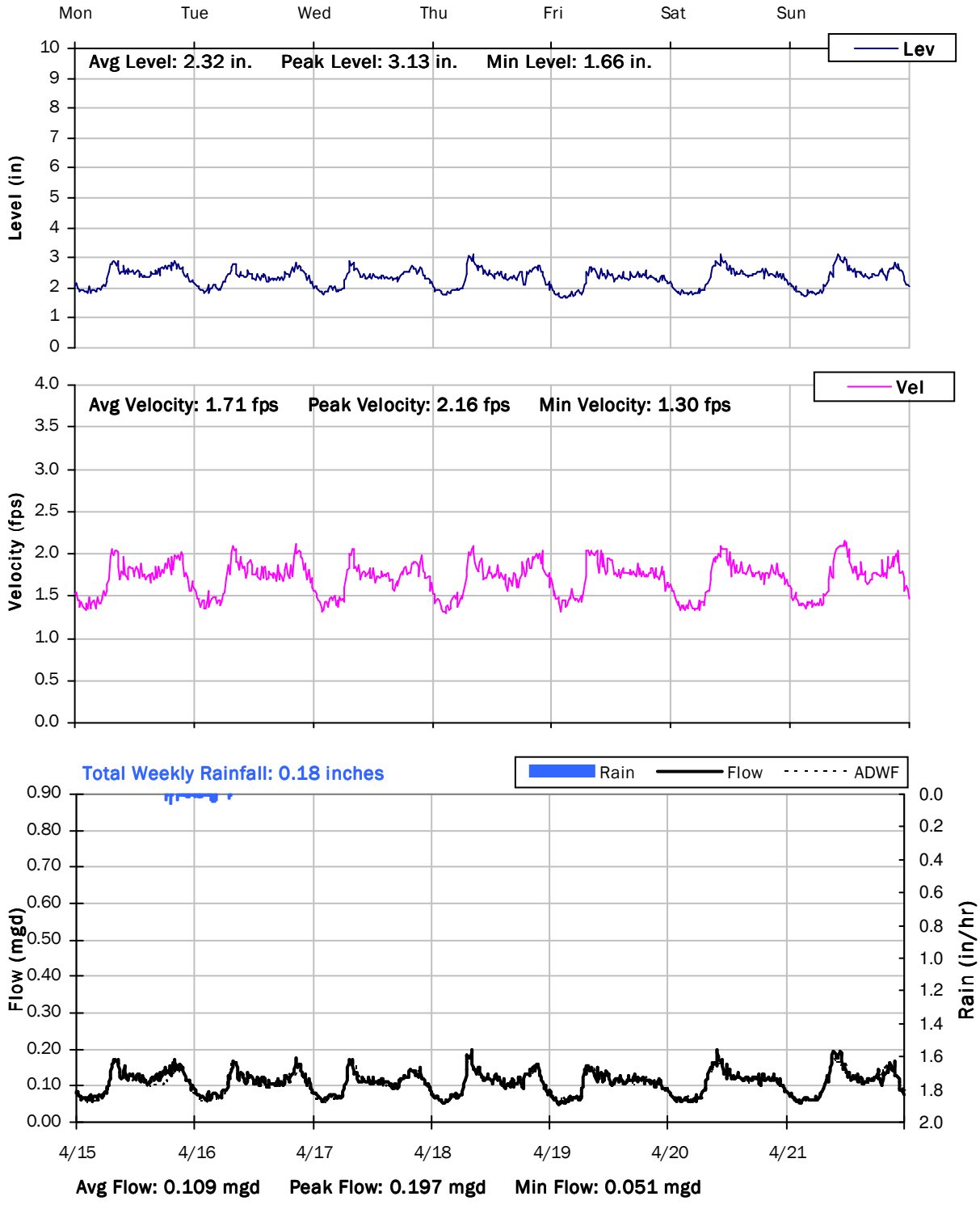
4/8/2019 to 4/15/2019



SITE 6

Weekly Level, Velocity and Flow Hydrographs

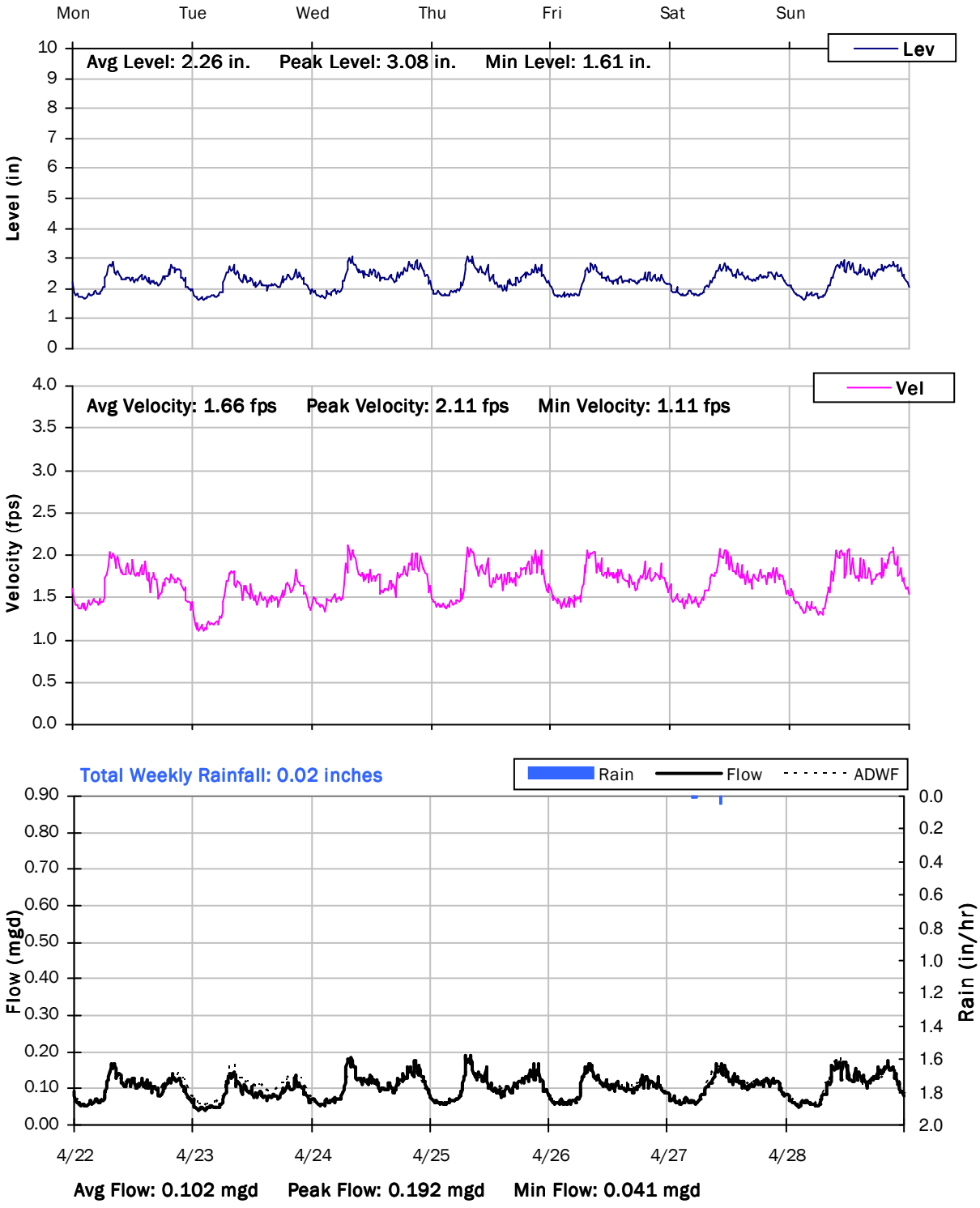
4/15/2019 to 4/22/2019



SITE 6

Weekly Level, Velocity and Flow Hydrographs

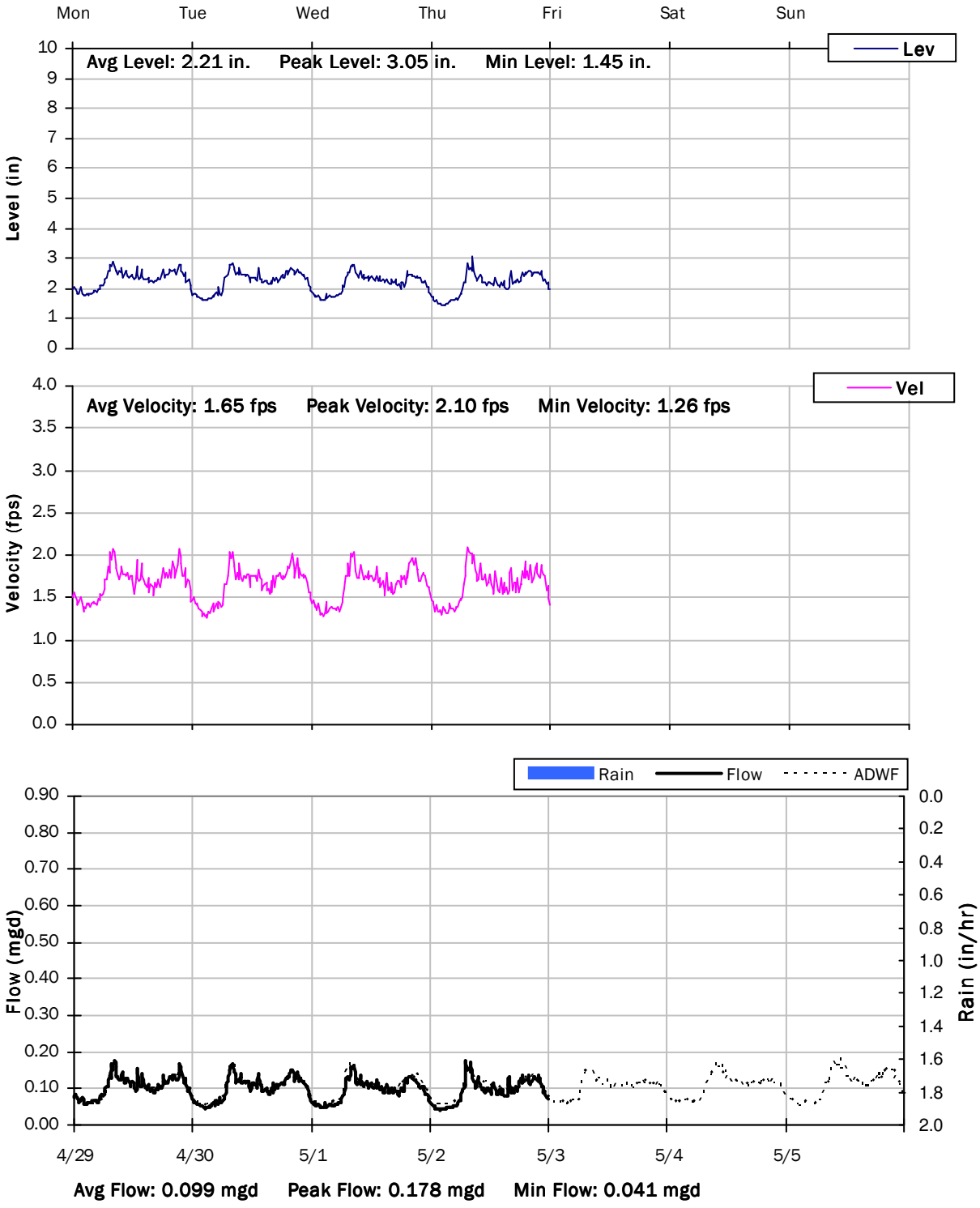
4/22/2019 to 4/29/2019



SITE 6

Weekly Level, Velocity and Flow Hydrographs

4/29/2019 to 5/6/2019



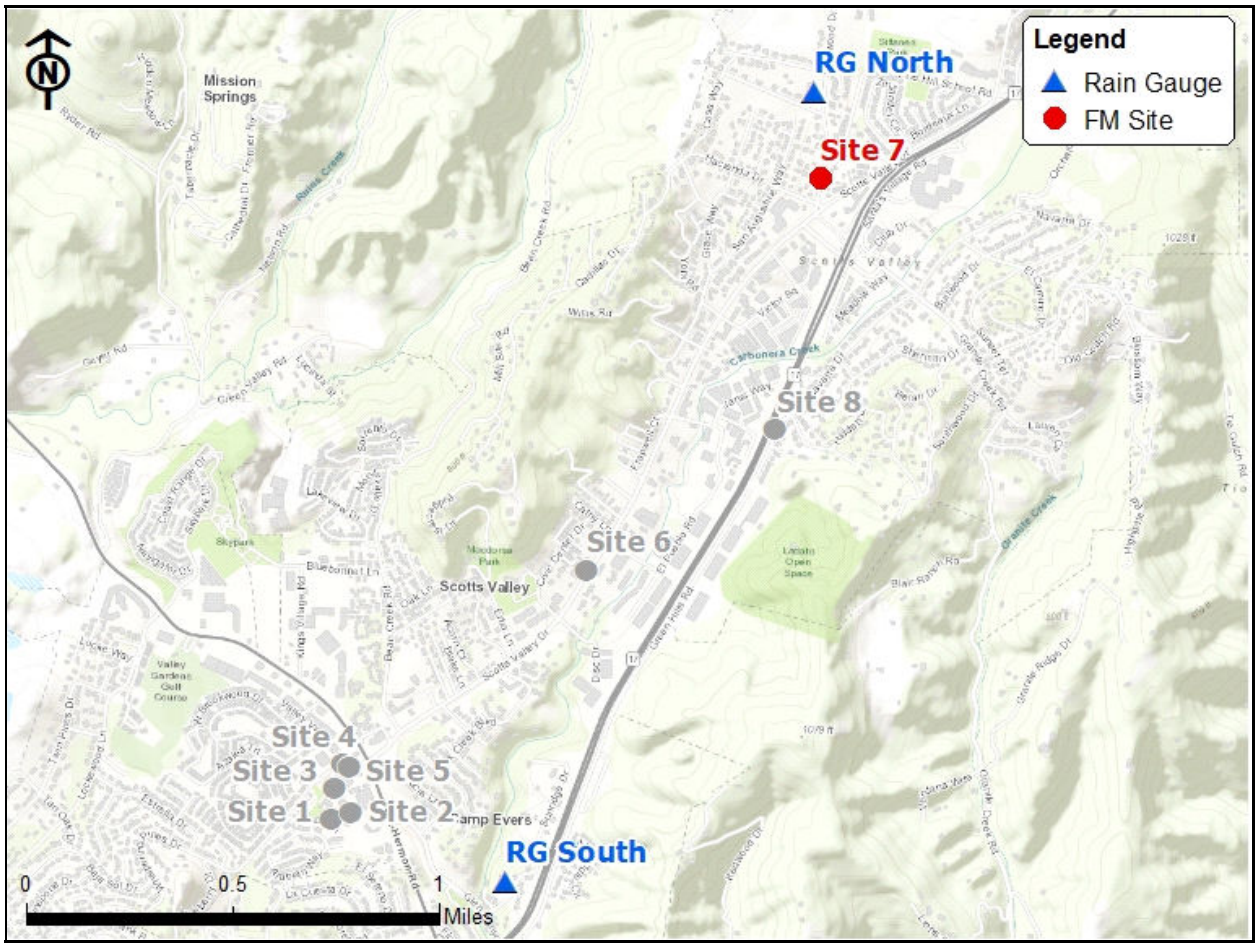
Carollo | Scotts Valley, California

Sanitary Sewer Flow Monitoring
January 30 - May 03, 2019

Monitoring Site: Site 7

Location: Glenwood Drive, north of Hacienda Drive

Data Summary Report



Vicinity Map: Site 7

SITE 7

Site Information

Location: Glenwood Drive, north of Hacienda Drive

Coordinates: 122.0056° W, 37.0640° N

Rim Elevation (Earth): 624 feet

Expected Pipe Diameter: 10 inches

Measured Pipe Diameter: 10 inches

ADWF: 0.054 mgd

Peak Measured Flow: 0.454 mgd

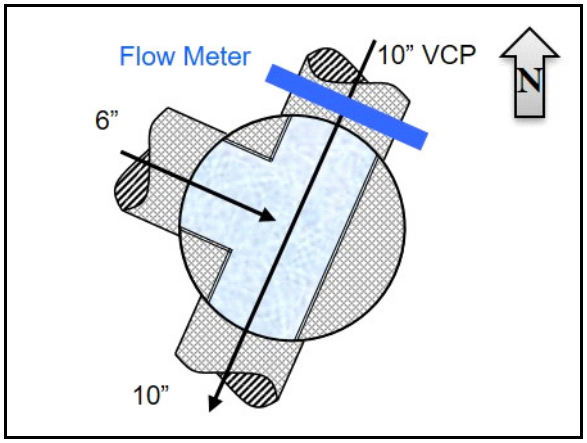
Sediment: None



Satellite Map



Sewer Map



Flow Sketch



Street View



Plan View

SITE 7

Additional Site Photos

Effluent Pipe



Monitored North Influent Pipe



SITE 7

Additional Site Photos

West Influent Pipe

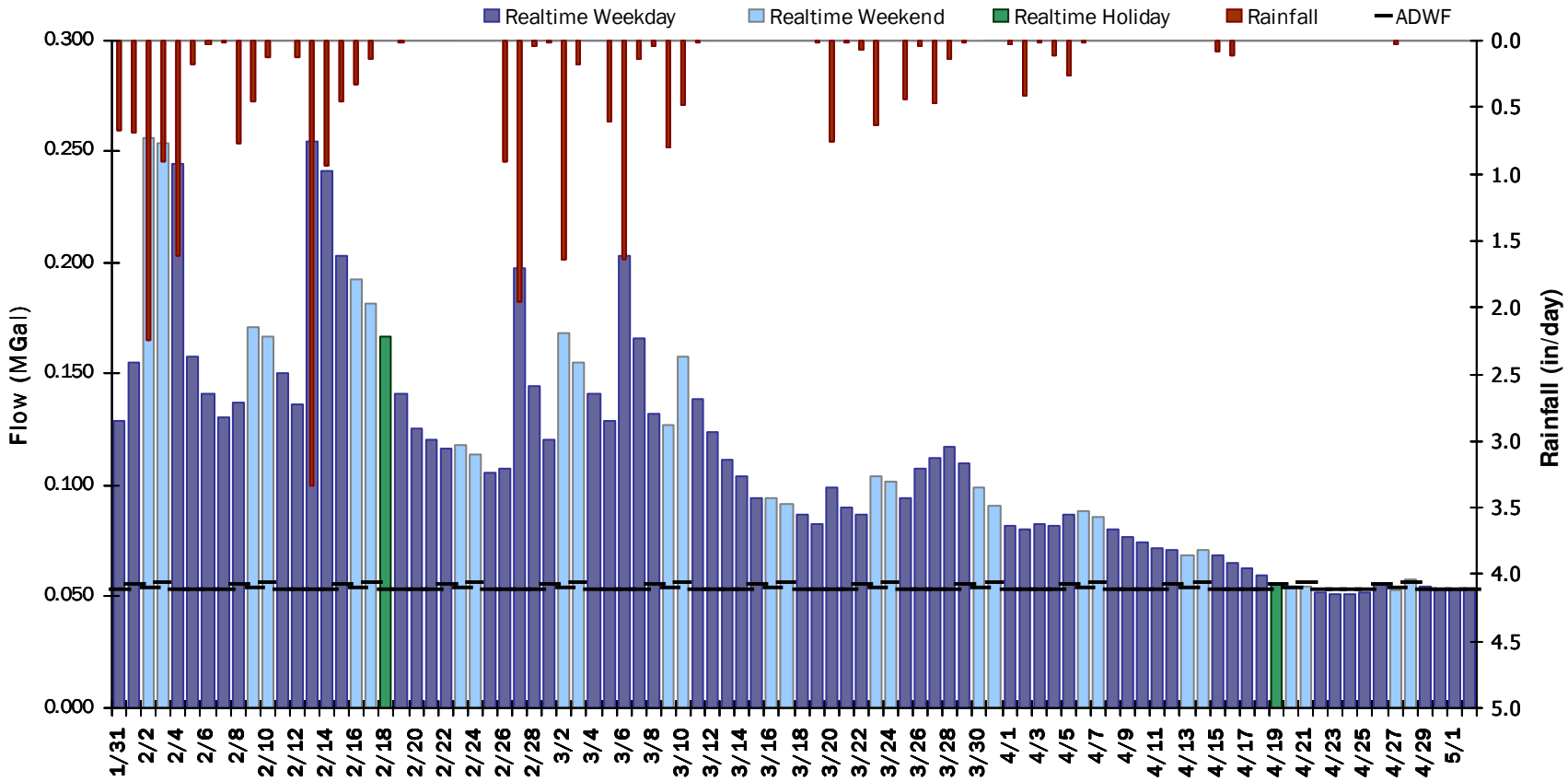


SITE 7

Period Flow Summary: Daily Flow Totals

Avg Daily Flow: 0.114 MGal Peak Daily Flow: 0.256 MGal Min Daily Flow: 0.051 MGal

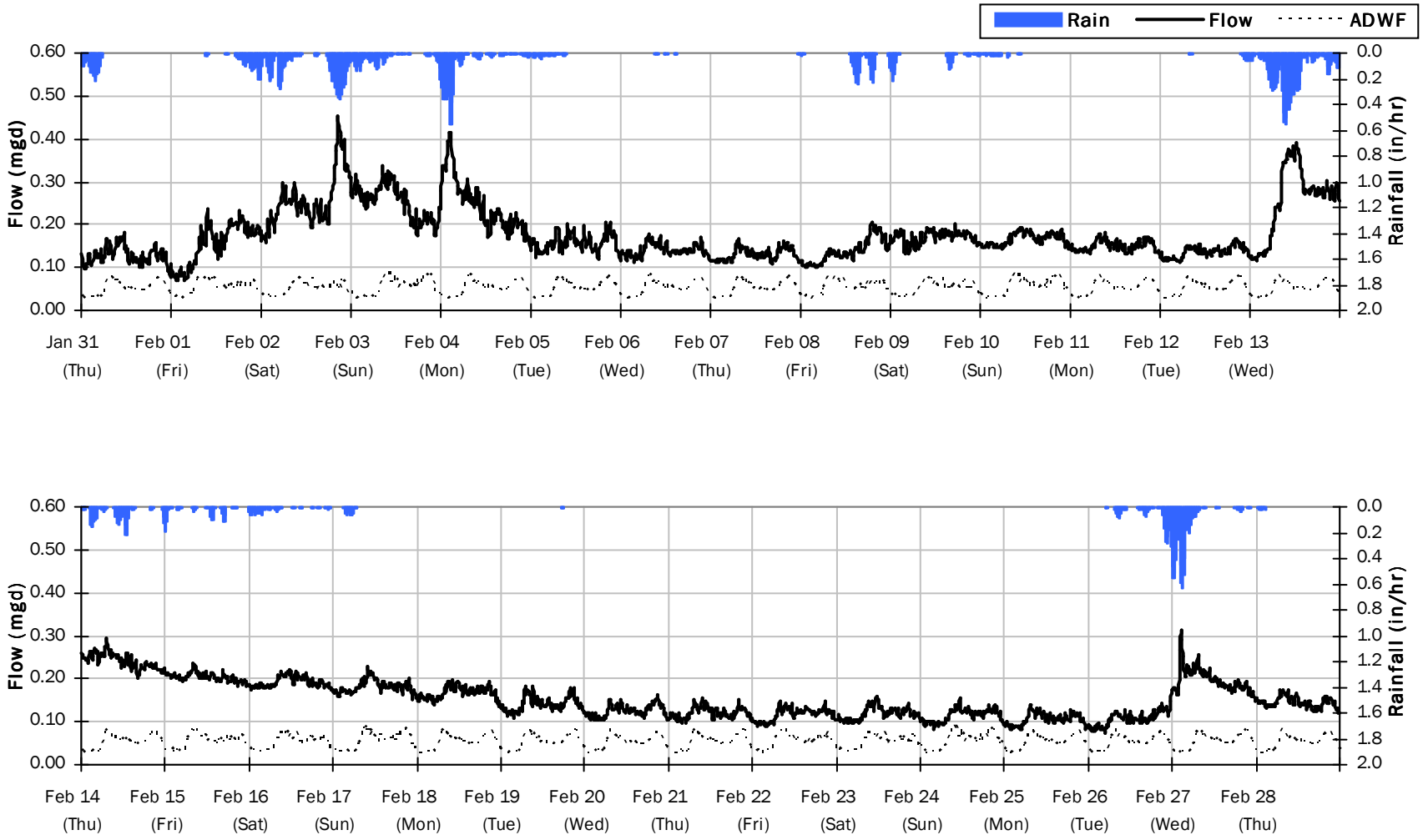
Total Rainfall: 25.10 inches



SITE 7

Flow Summary: 1/31/2019 to 2/28/2019

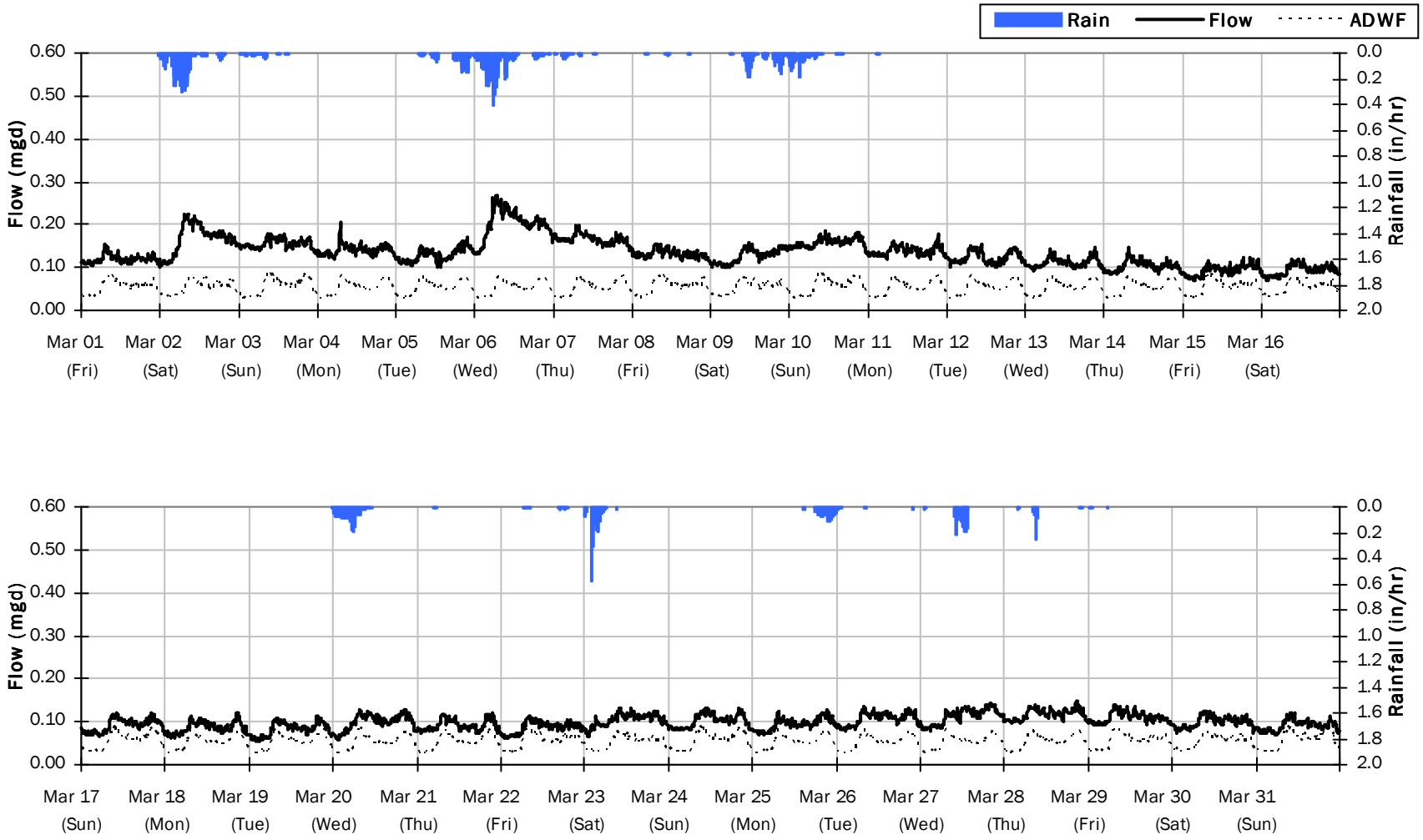
Period Rainfall: 15.92 inches Period Avg Flow: 0.164 mgd Period Peak Flow: 0.454 mgd Period Min Flow



SITE 7

Flow Summary: 3/1/2019 to 3/31/2019

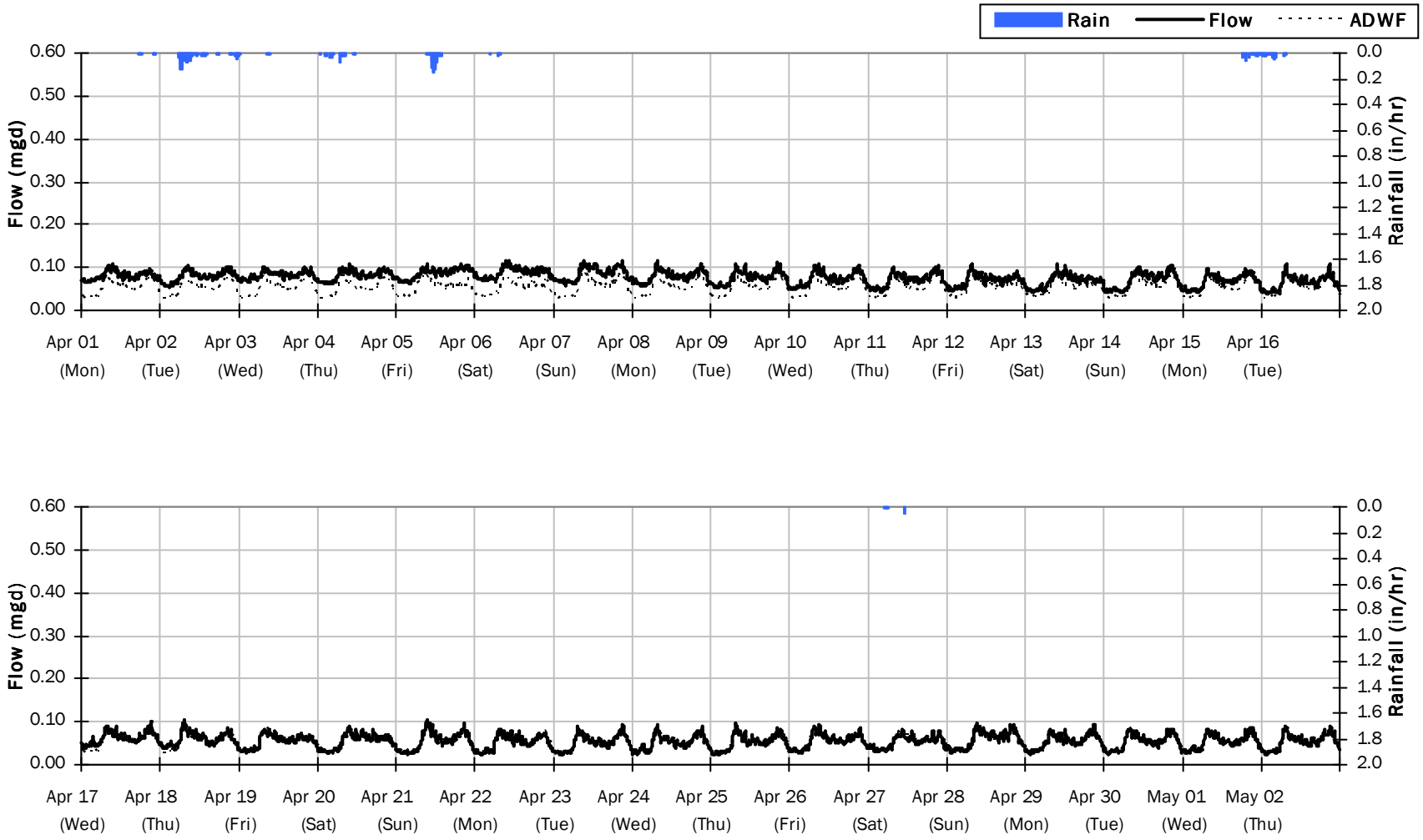
Period Rainfall: 8.14 inches Period Avg Flow: 0.117 mgd Period Peak Flow: 0.269 mgd Period Min Flow



SITE 7

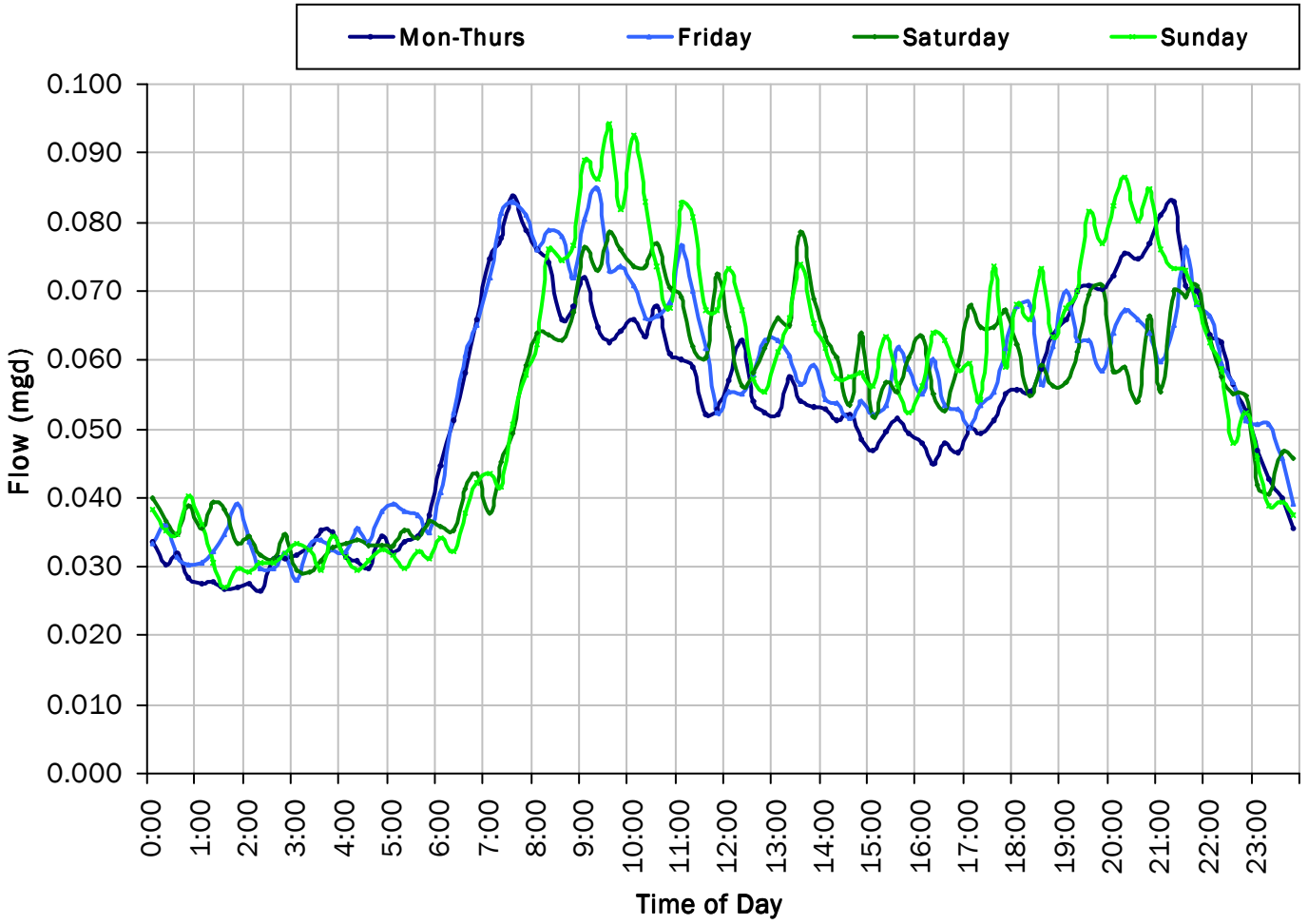
Flow Summary: 4/1/2019 to 5/2/2019

Period Rainfall: 1.04 inches Period Avg Flow: 0.066 mgd Period Peak Flow: 0.117 mgd Period Min Flow



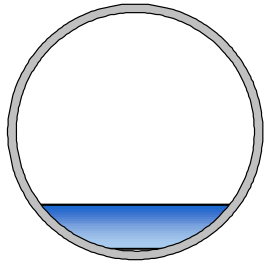
SITE 7

Average Dry Weather Flow Hydrographs



ADWF:

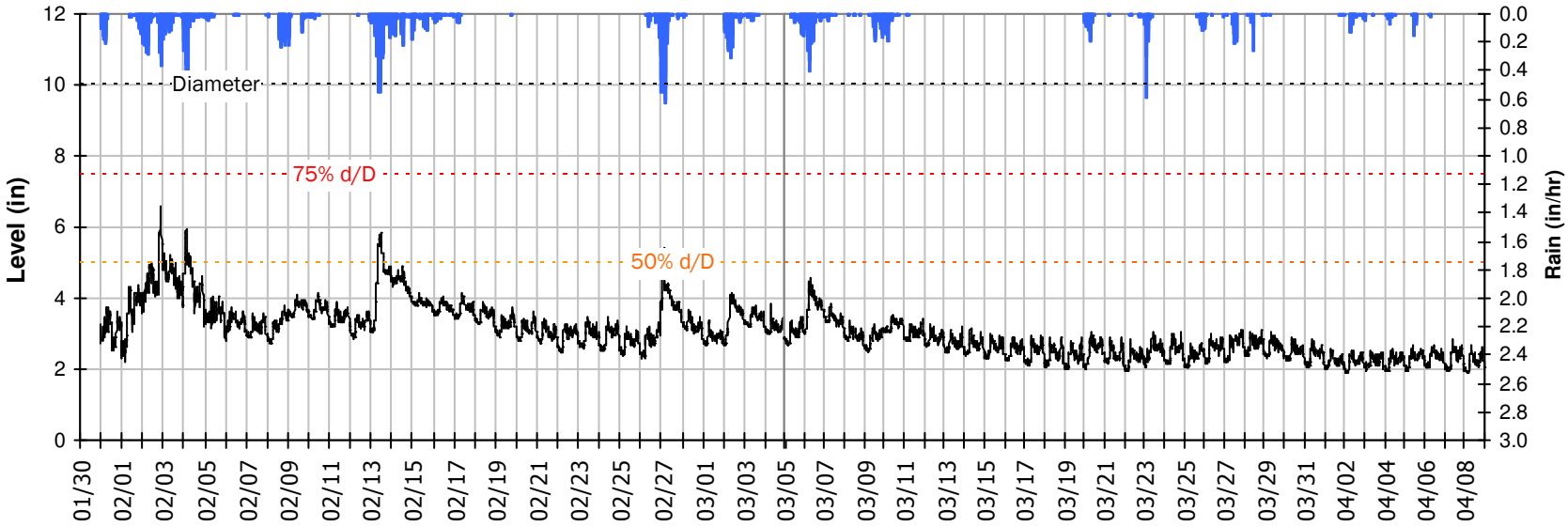
0.054 *mgd*

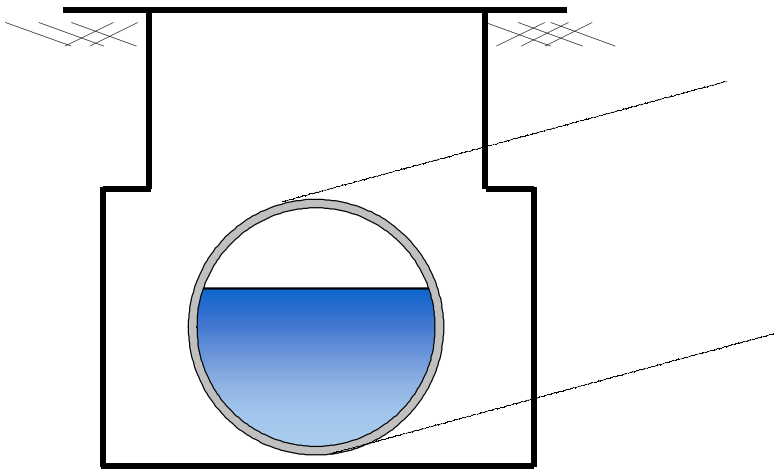


SITE 7

Site Capacity and Surcharge Summary

Realtime Flow Levels with Rainfall Data over Peak Level Period

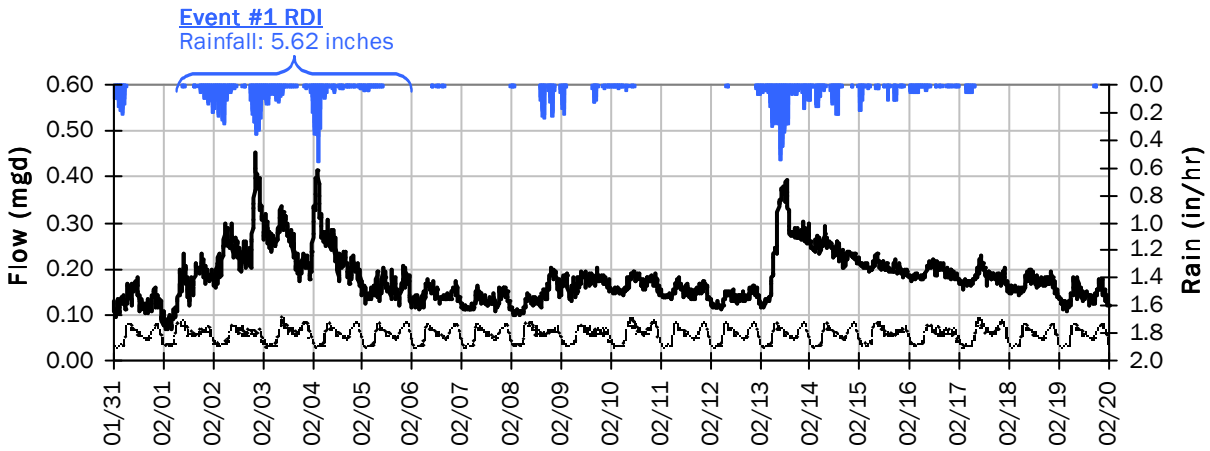




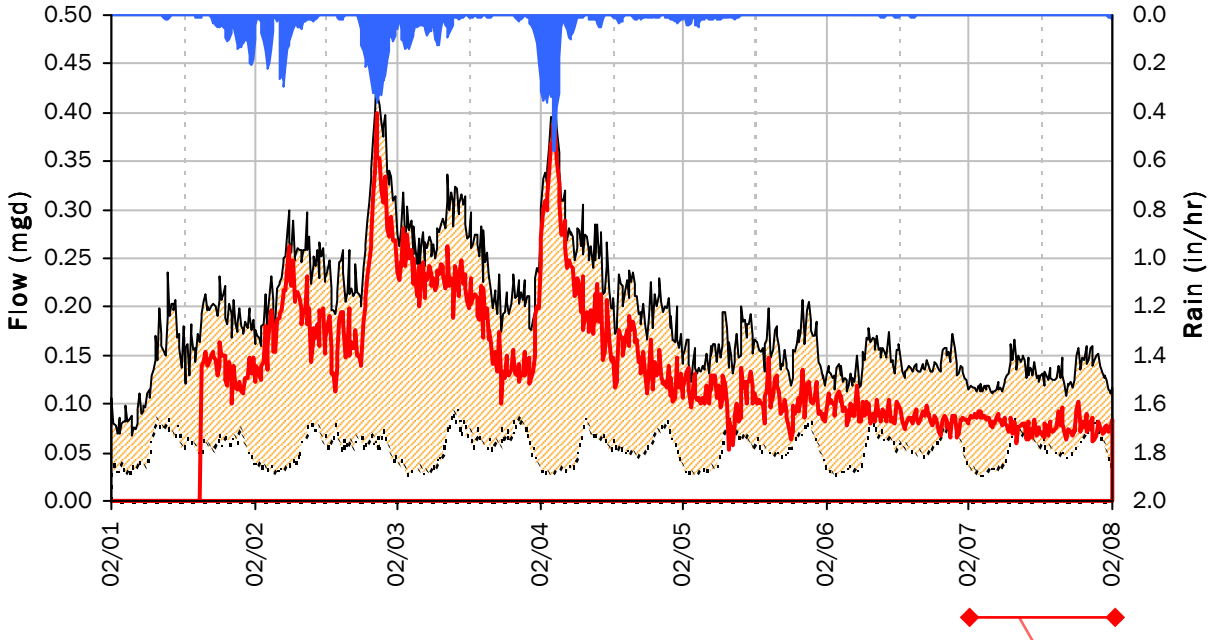
Pipe Diameter:	10	*inches*
Peak Measured Level:	6.59	*inches*
Peak d/D Ratio:	0.66	

SITE 7
I/I Summary: Event #1 RDI

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #1 RDI Detail Graph

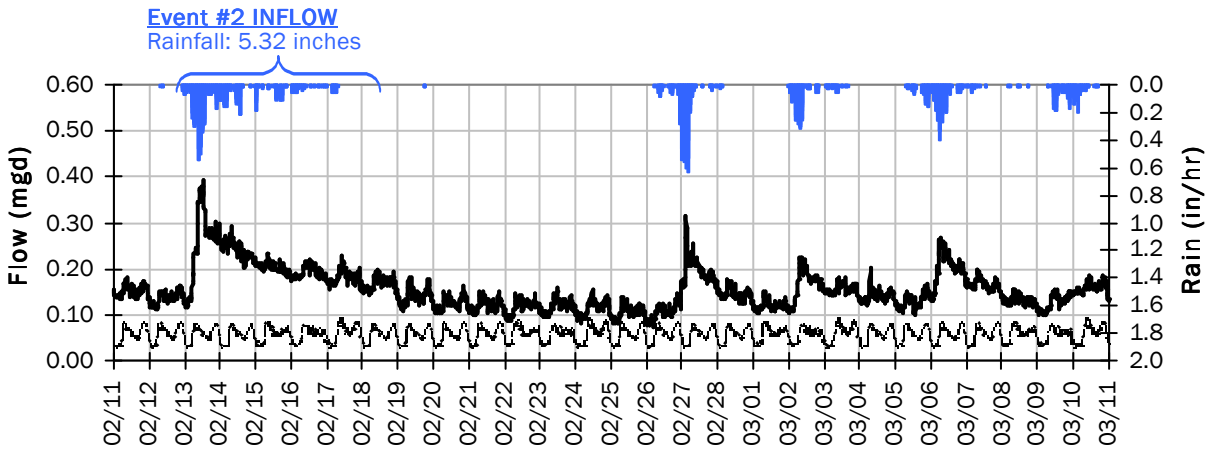


Storm Event I/I Analysis (Rain = 5.62 inches)

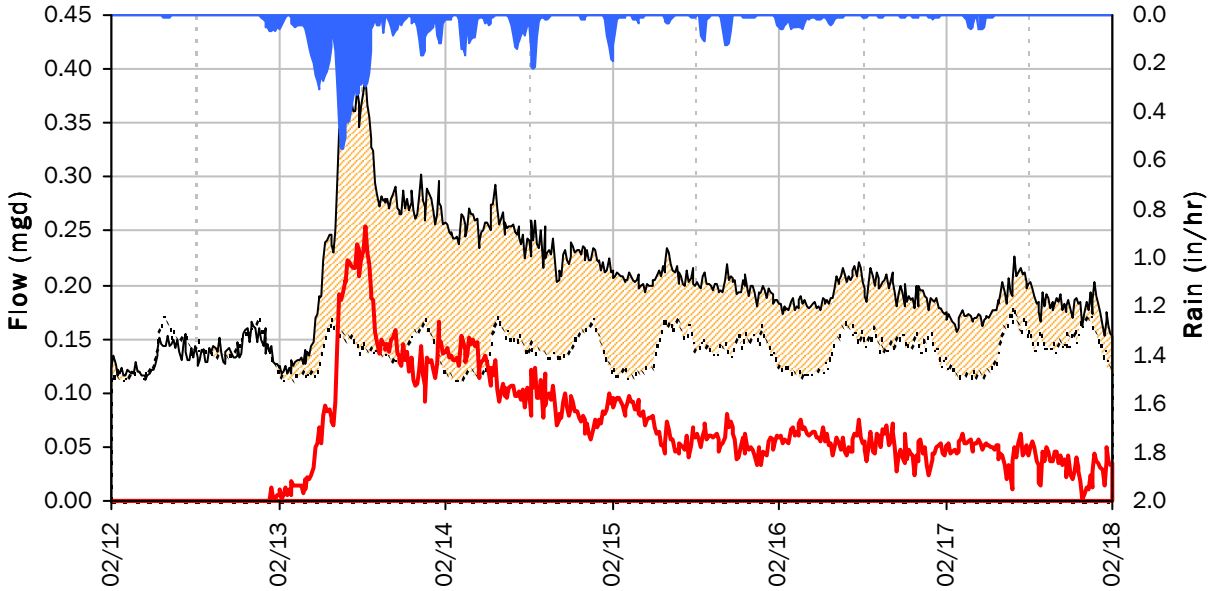
Capacity		Inflow / Infiltration	
Peak Flow:	0.454 *mgd*	**RDI:**	0.078 *mgd*
PF:	8.44		
Peak Level:	6.59 *in*		
d/D Ratio:	0.66		

SITE 7
I/I Summary: Event #2 INFLOW

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #2 INFLOW Detail Graph

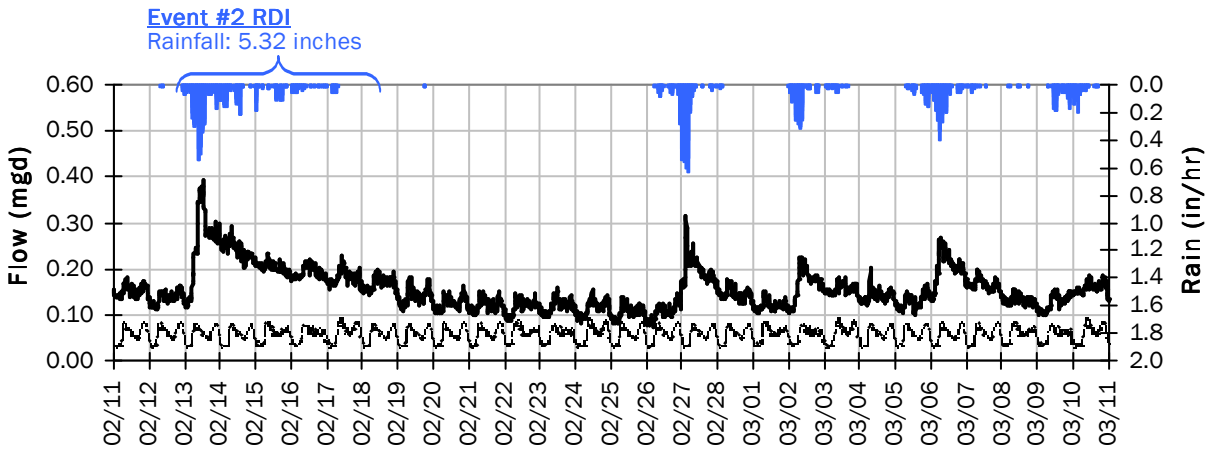


Storm Event I/I Analysis (Rain = 5.32 inches)

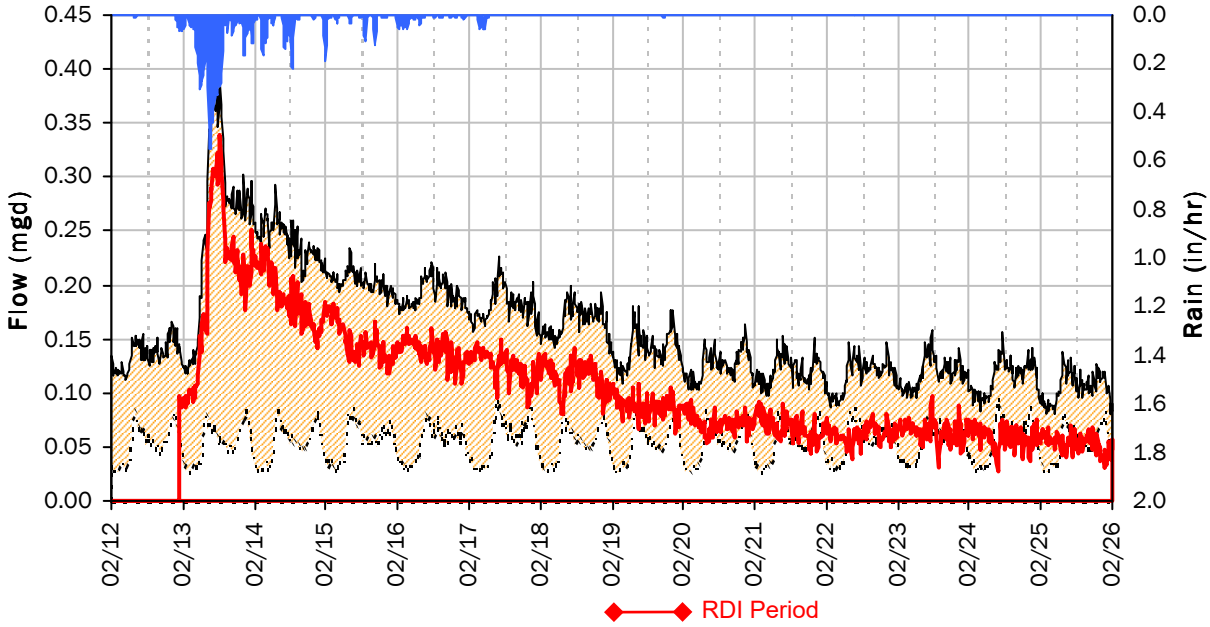
Capacity		Inflow / Infiltration	
Peak Flow:	0.393 *mgd*	**Peak I/I Rate:**	0.254 *mgd*
PF:	7.30		
Peak Level:	5.84 *in*		
d/D Ratio:	0.58		

SITE 7
I/I Summary: Event #2 RDI

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #2 RDI Detail Graph

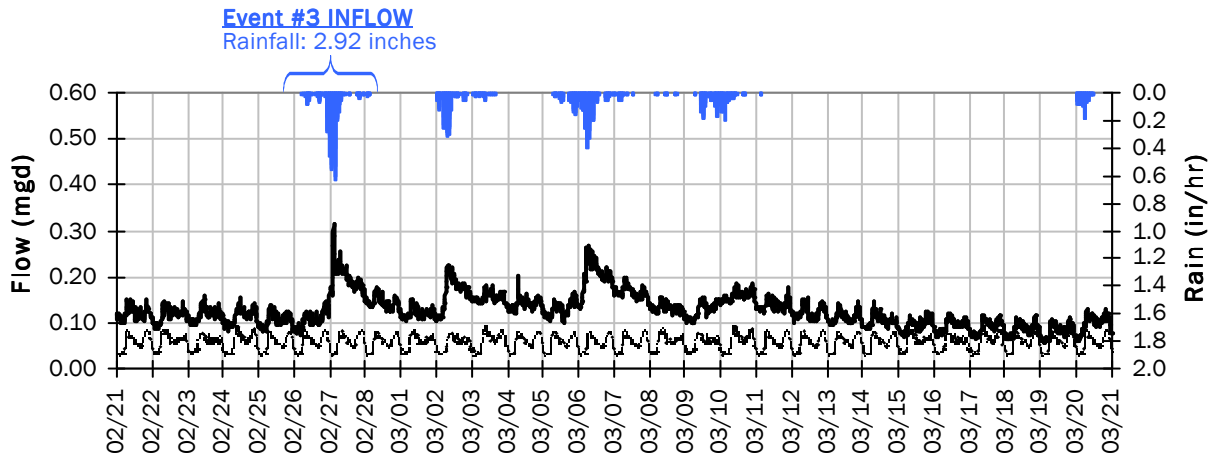


Storm Event I/I Analysis (Rain = 5.32 inches)

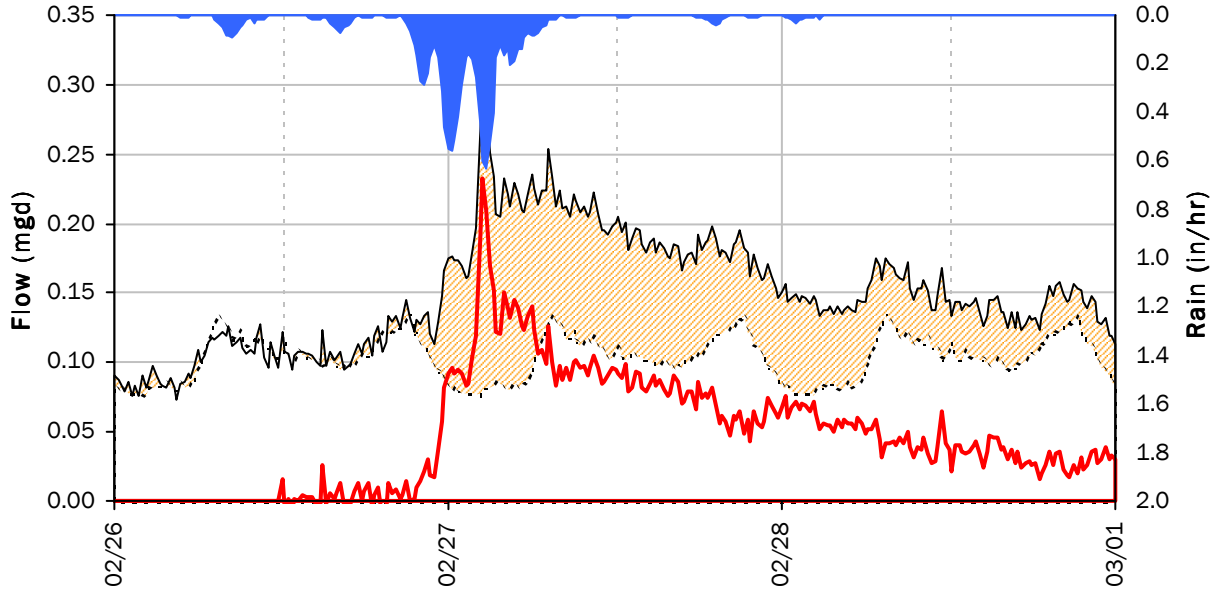
Capacity		Inflow / Infiltration	
Peak Flow:	0.393 *mgd*	**RDI:**	0.088 *mgd*
PF:	7.30		
Peak Level:	5.84 *in*		
d/D Ratio:	0.58		

SITE 7
I/I Summary: Event #3 INFLOW

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #3 INFLOW Detail Graph

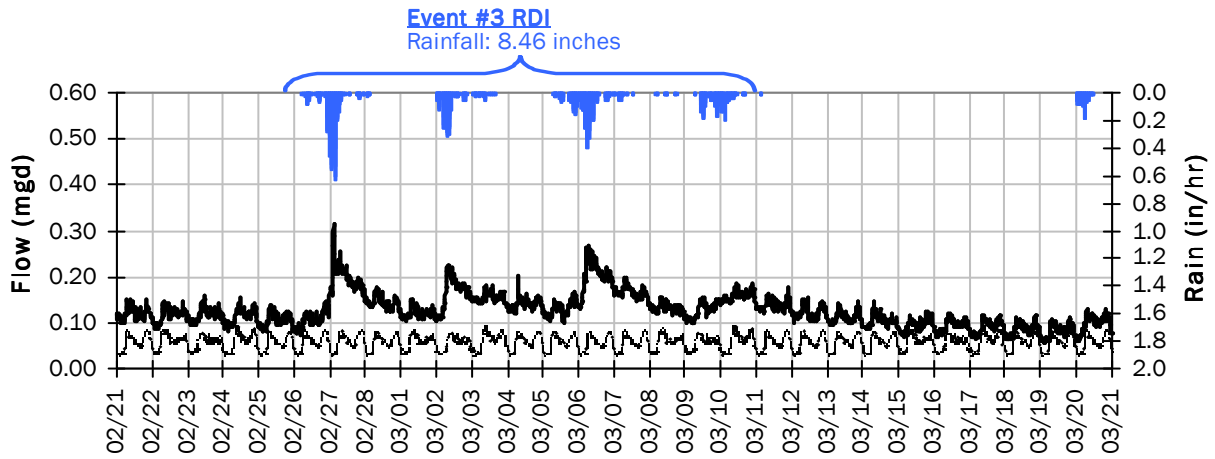


Storm Event I/I Analysis (Rain = 2.92 inches)

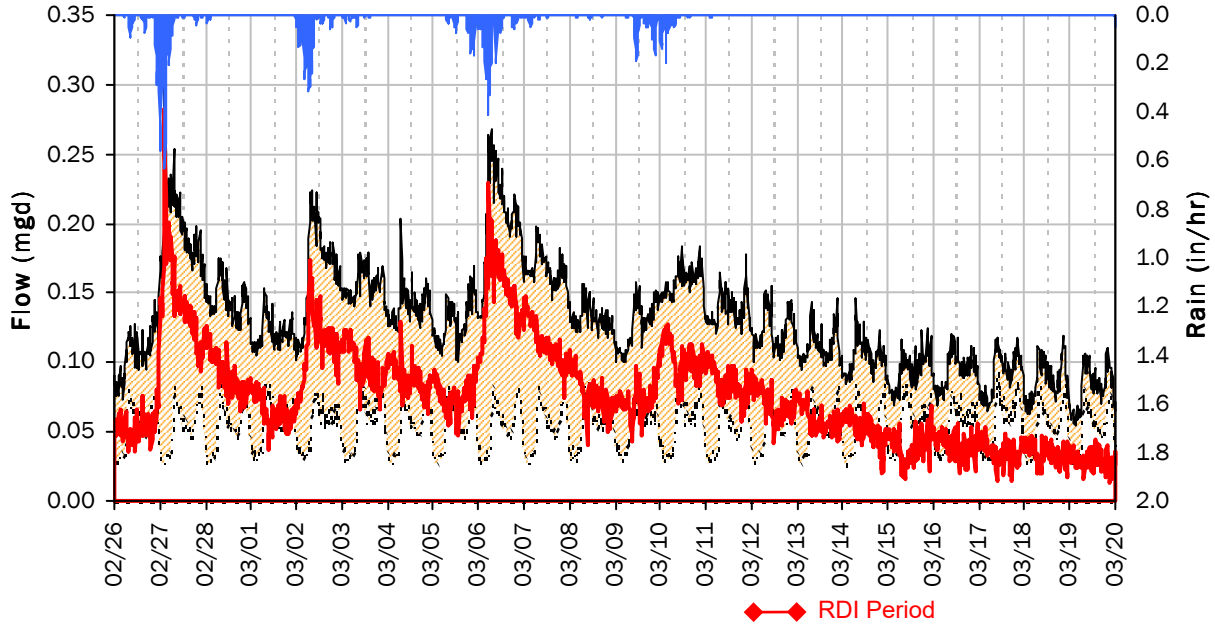
Capacity		Inflow / Infiltration	
Peak Flow:	0.31 *mgd*	**Peak I/I Rate:**	0.233 *mgd*
PF:	5.83		
Peak Level:	5.40 *in*		
d/D Ratio:	0.54		

SITE 7
I/I Summary: Event #3 RDI

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #3 RDI Detail Graph



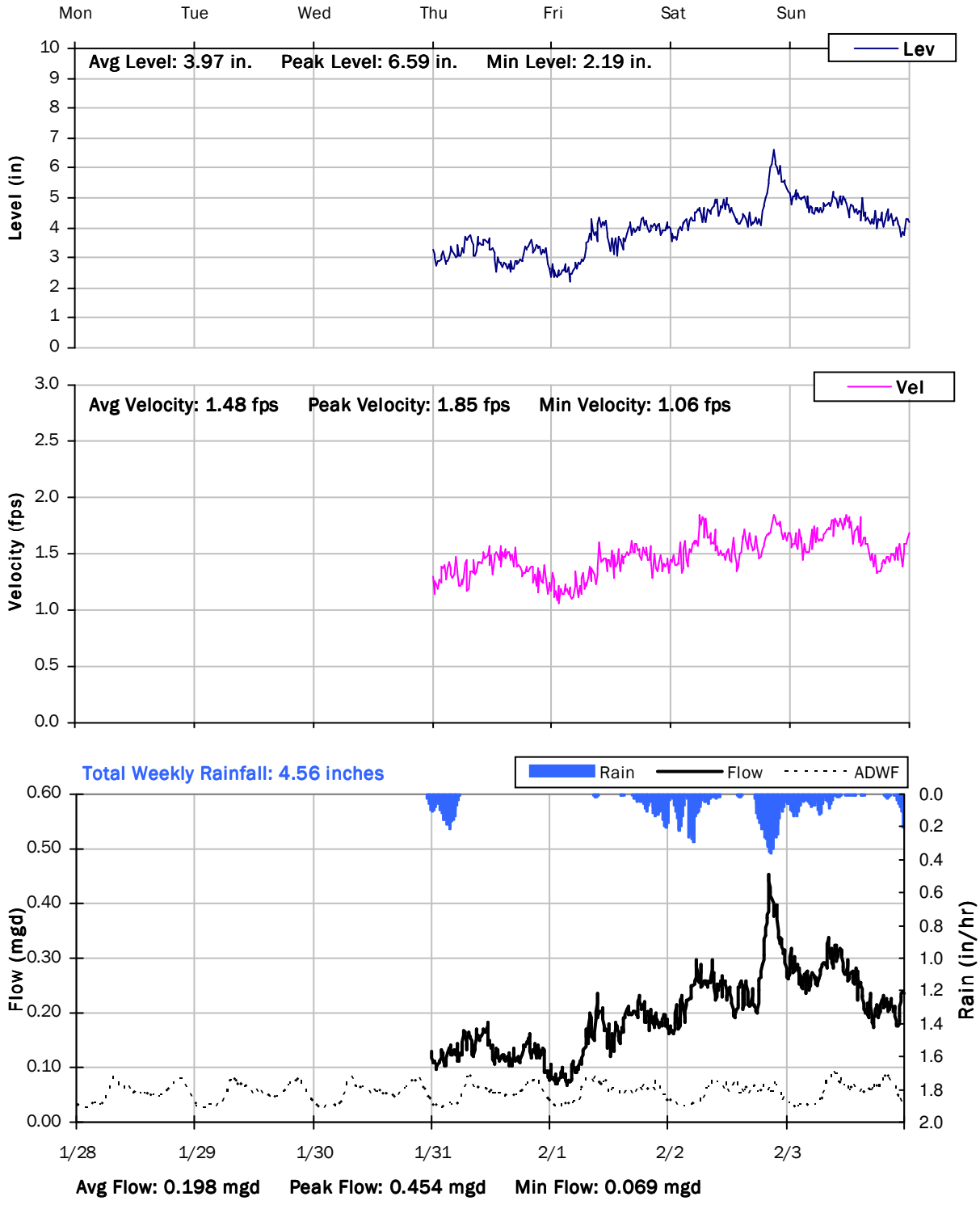
Storm Event I/I Analysis (Rain = 8.46 inches)

Capacity		Inflow / Infiltration	
Peak Flow:	0.31 *mgd*	**RDI:**	0.071 *mgd*
PF:	5.83		
Peak Level:	5.40 *in*		
d/D Ratio:	0.54		

SITE 7

Weekly Level, Velocity and Flow Hydrographs

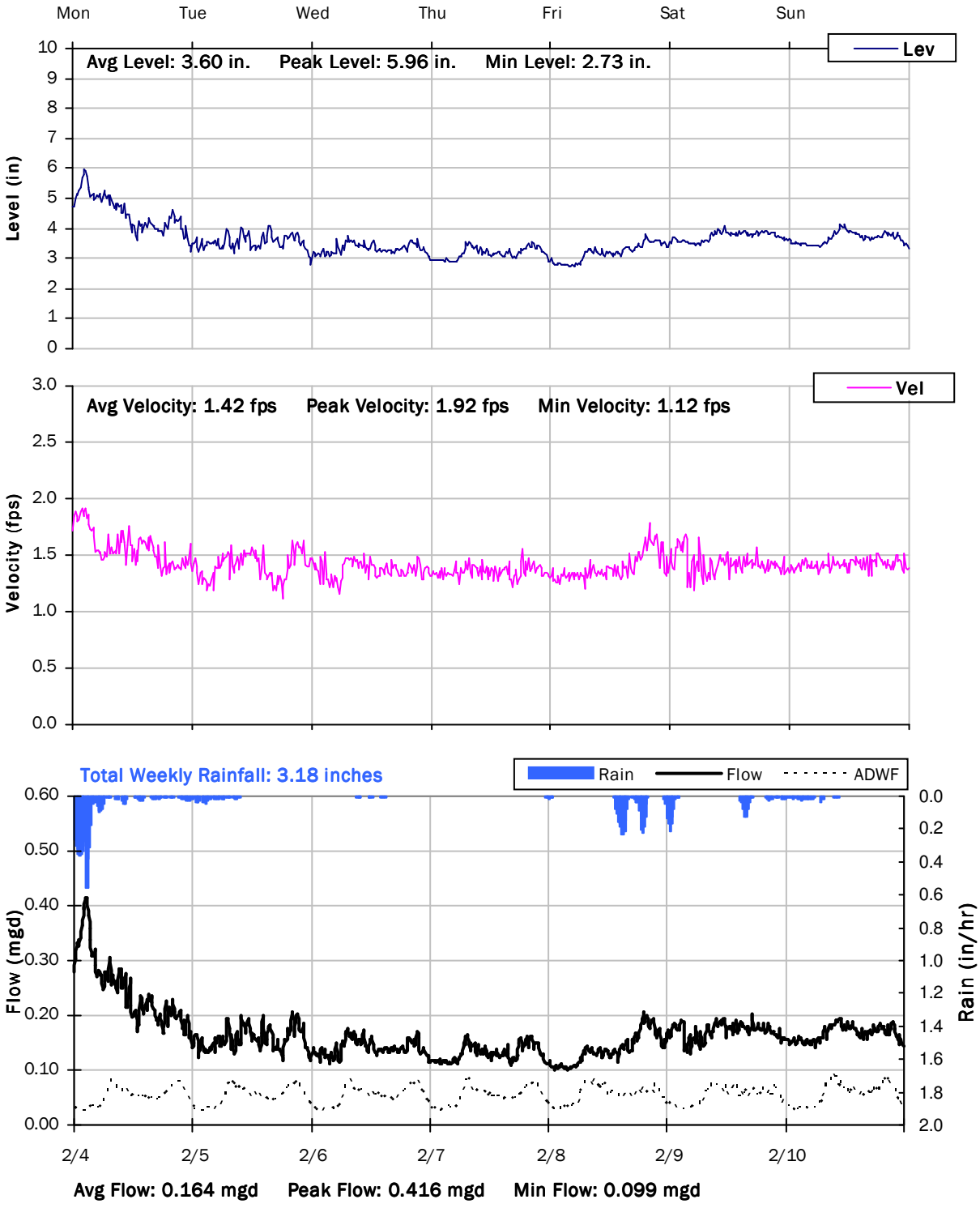
1/28/2019 to 2/4/2019



SITE 7

Weekly Level, Velocity and Flow Hydrographs

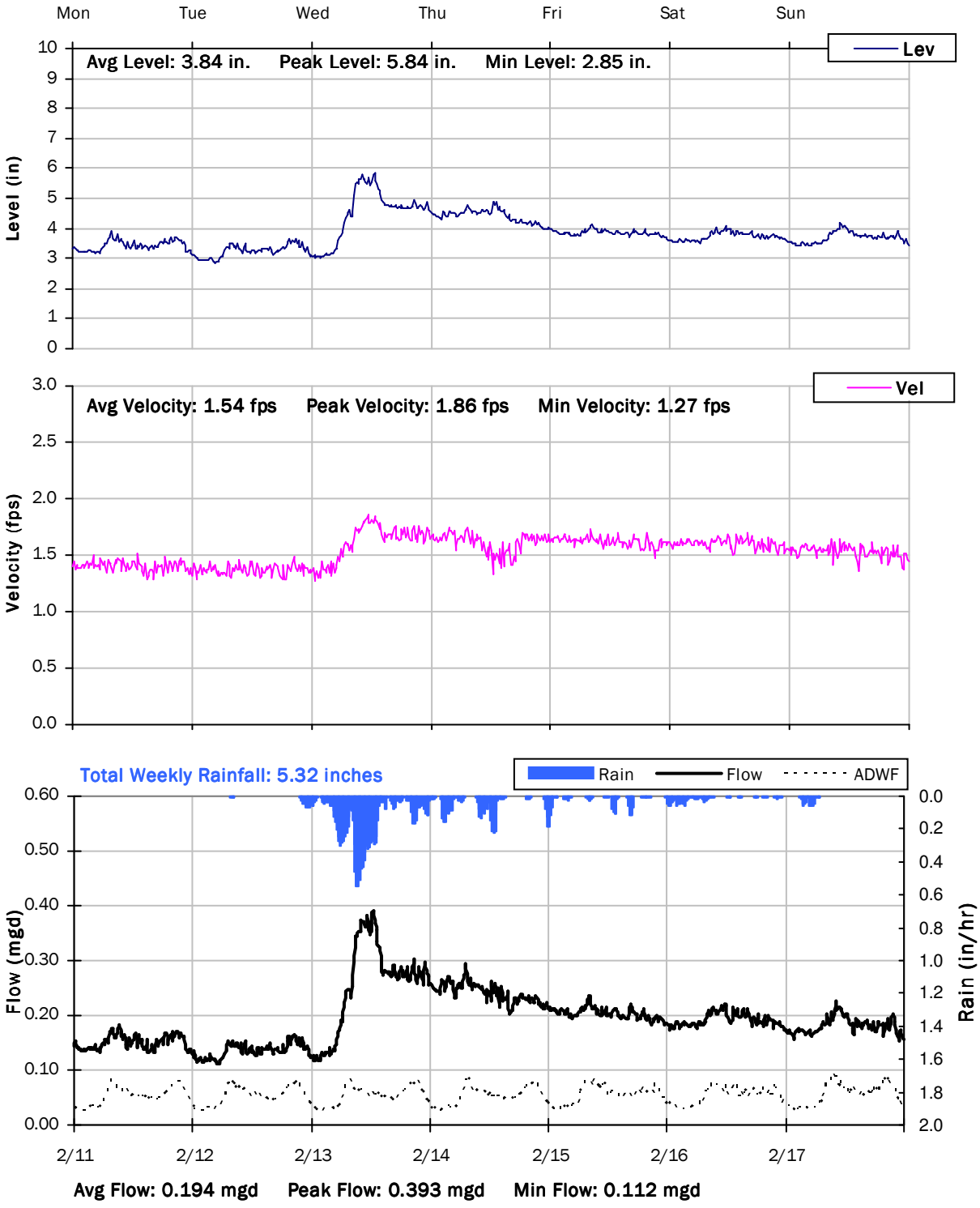
2/4/2019 to 2/11/2019



SITE 7

Weekly Level, Velocity and Flow Hydrographs

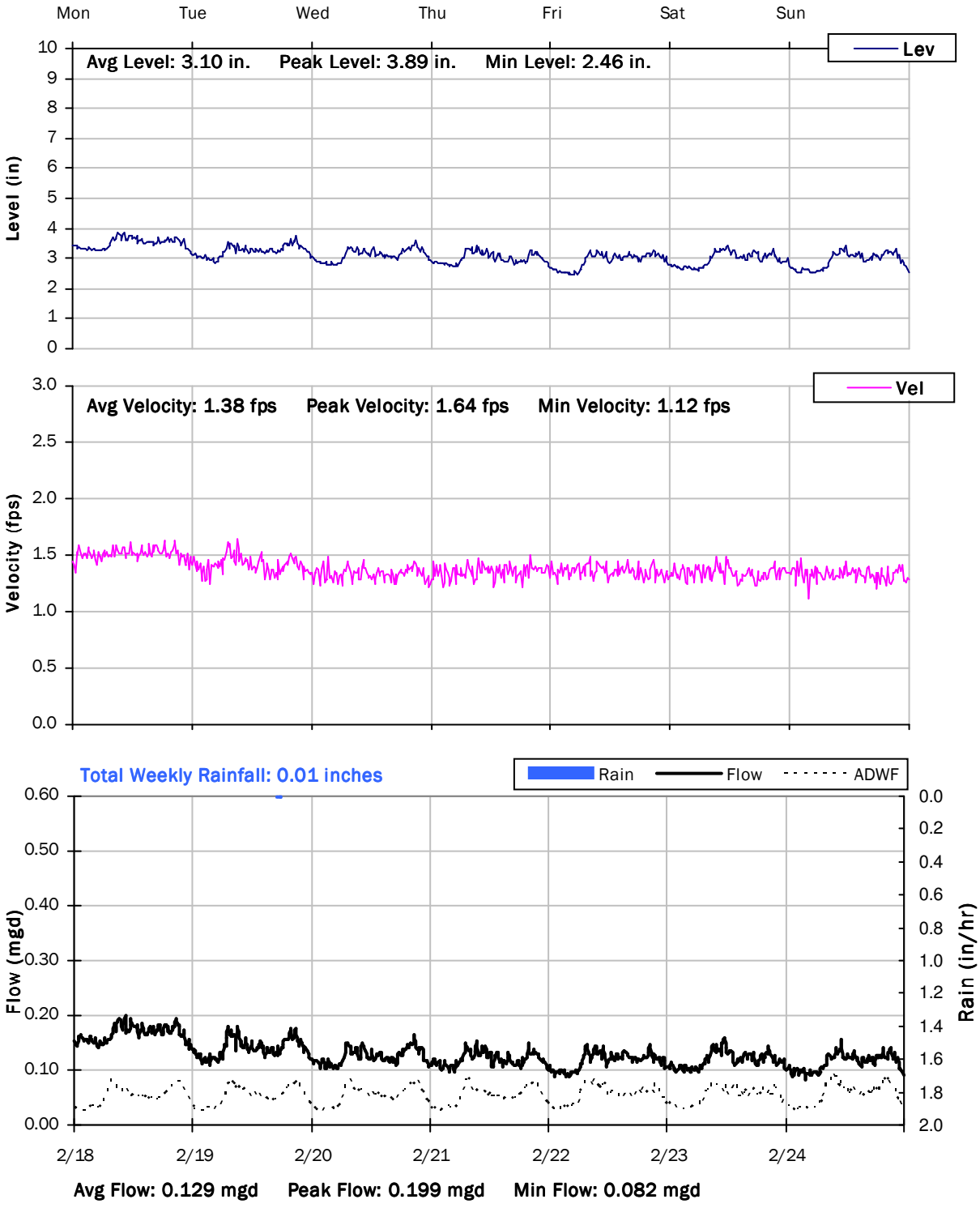
2/11/2019 to 2/18/2019



SITE 7

Weekly Level, Velocity and Flow Hydrographs

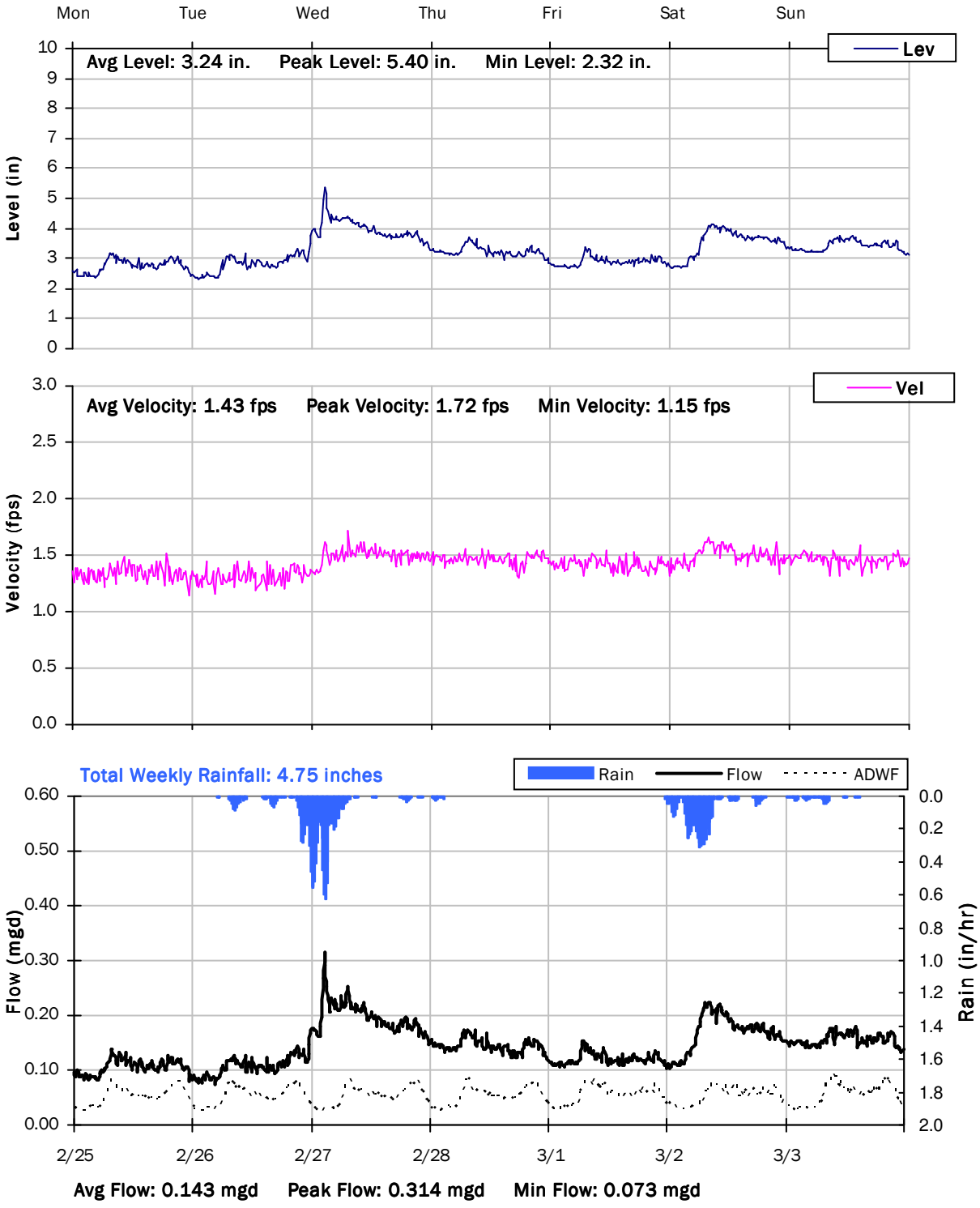
2/18/2019 to 2/25/2019



SITE 7

Weekly Level, Velocity and Flow Hydrographs

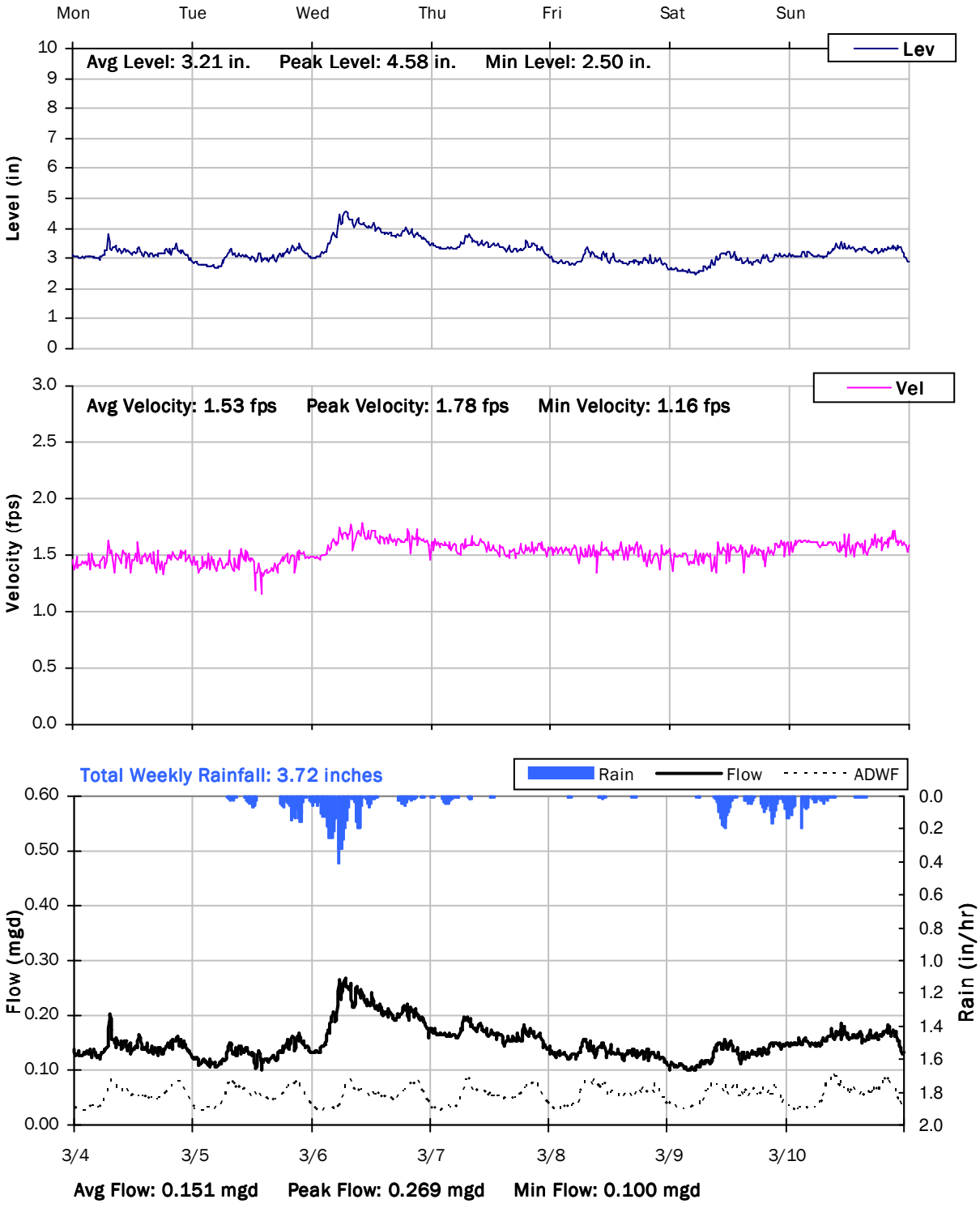
2/25/2019 to 3/4/2019



SITE 7

Weekly Level, Velocity and Flow Hydrographs

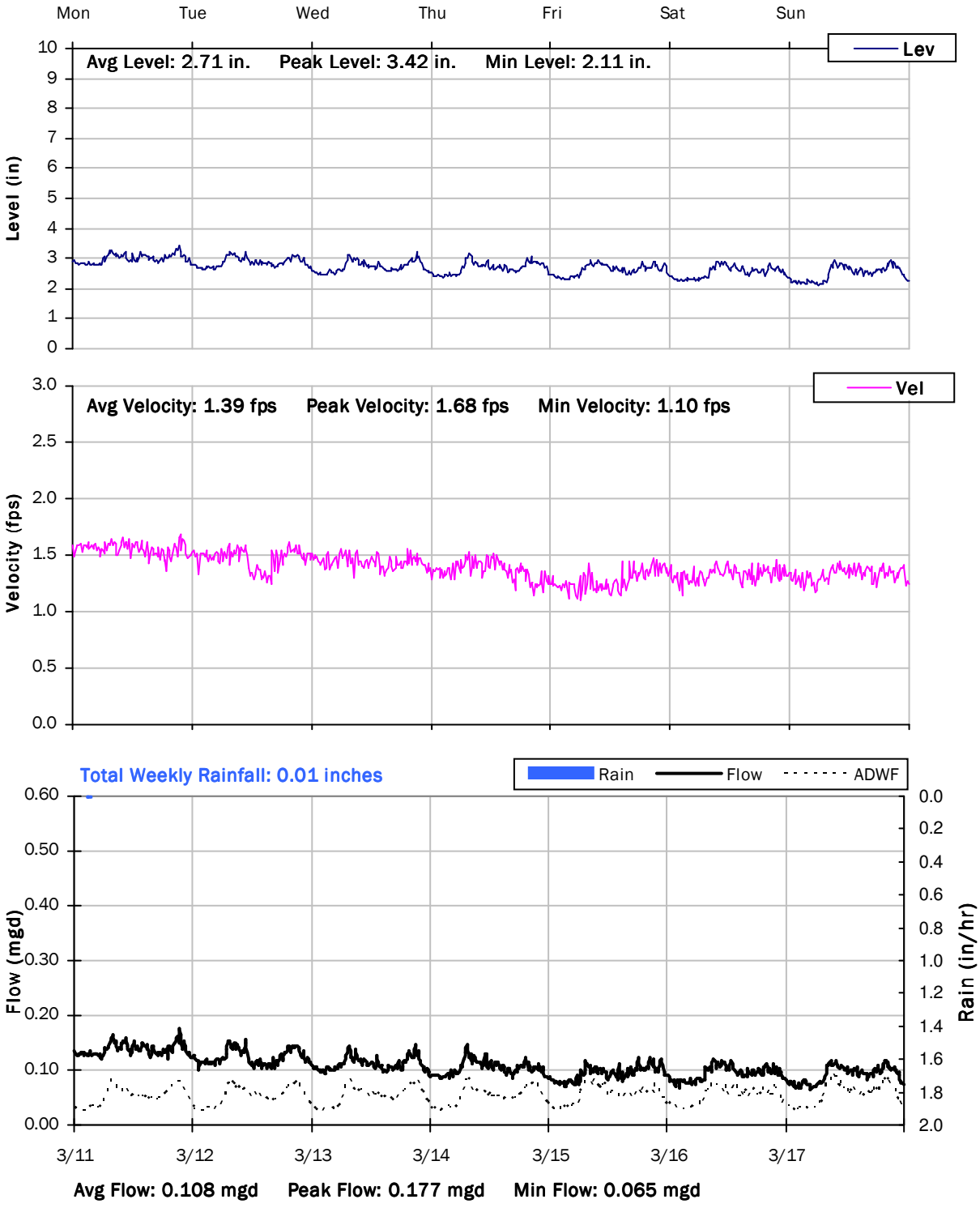
3/4/2019 to 3/11/2019



SITE 7

Weekly Level, Velocity and Flow Hydrographs

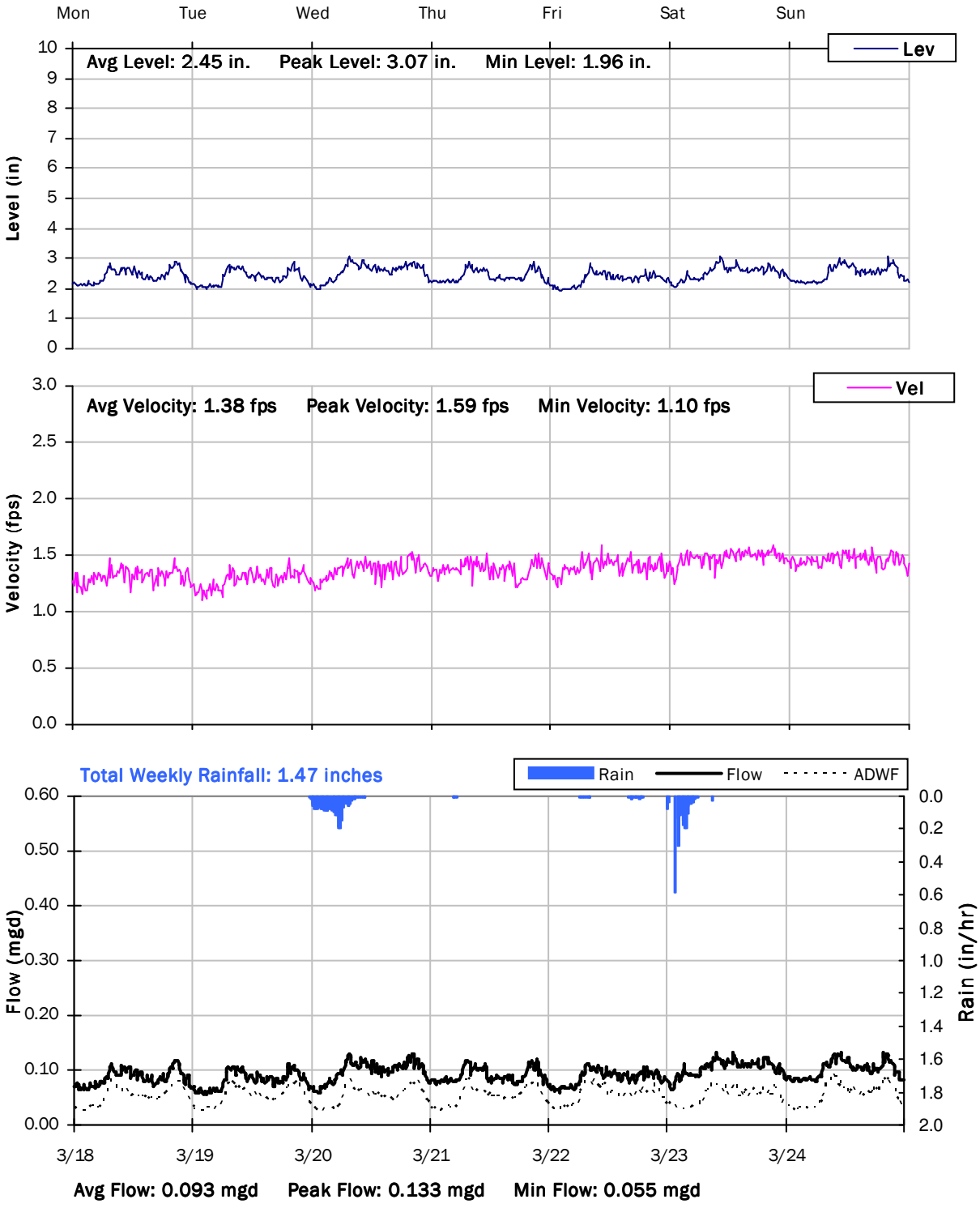
3/11/2019 to 3/18/2019



SITE 7

Weekly Level, Velocity and Flow Hydrographs

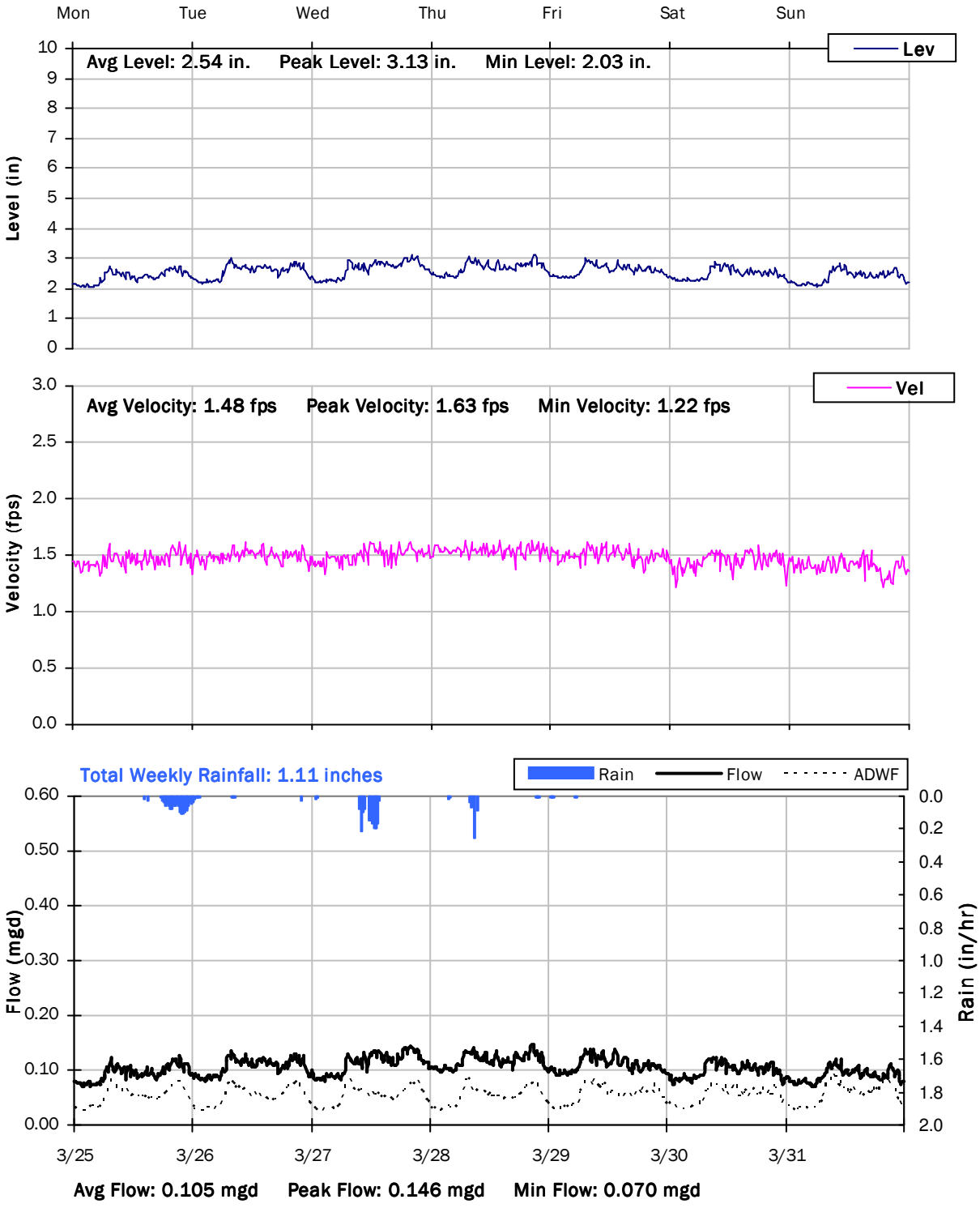
3/18/2019 to 3/25/2019



SITE 7

Weekly Level, Velocity and Flow Hydrographs

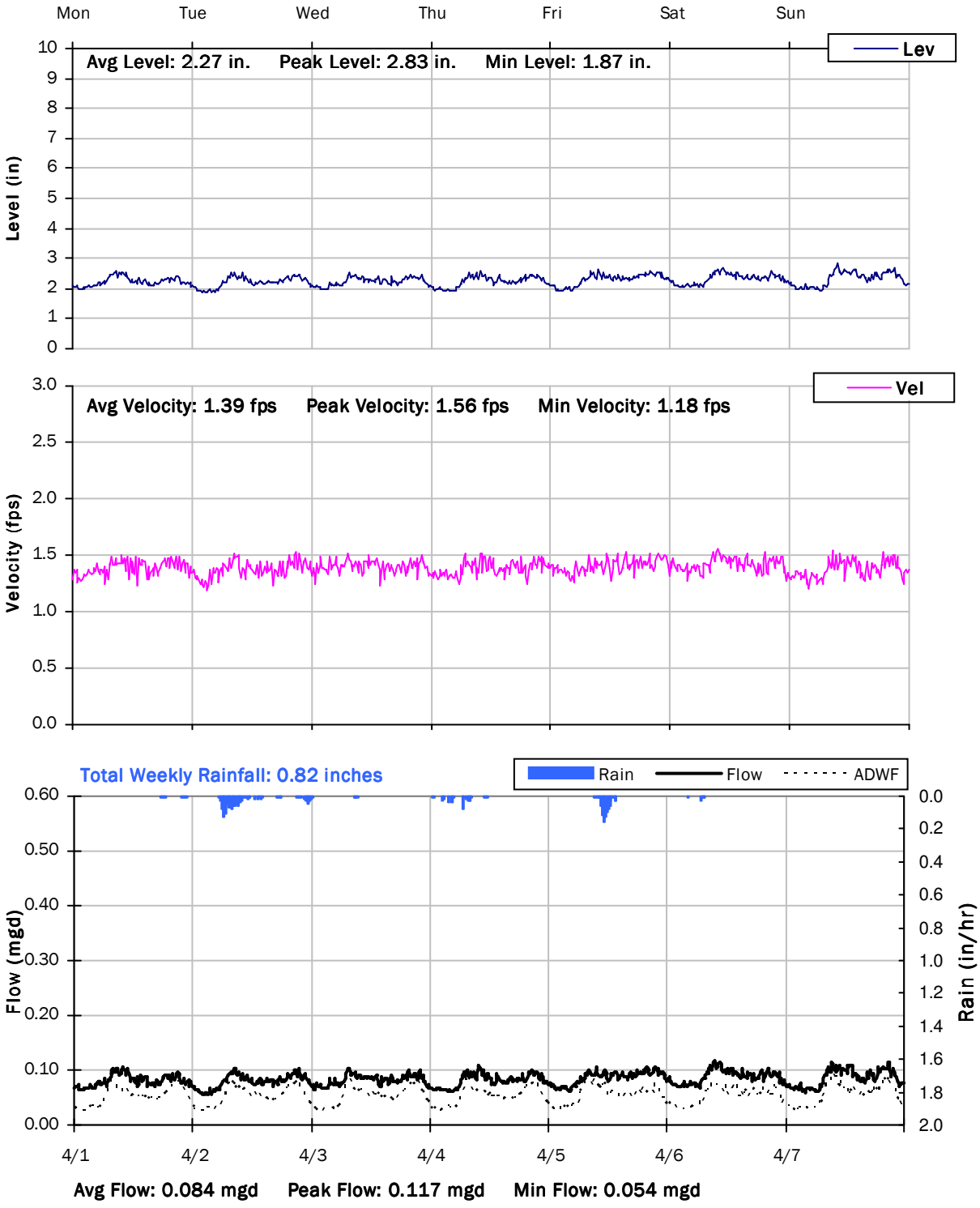
3/25/2019 to 4/1/2019



SITE 7

Weekly Level, Velocity and Flow Hydrographs

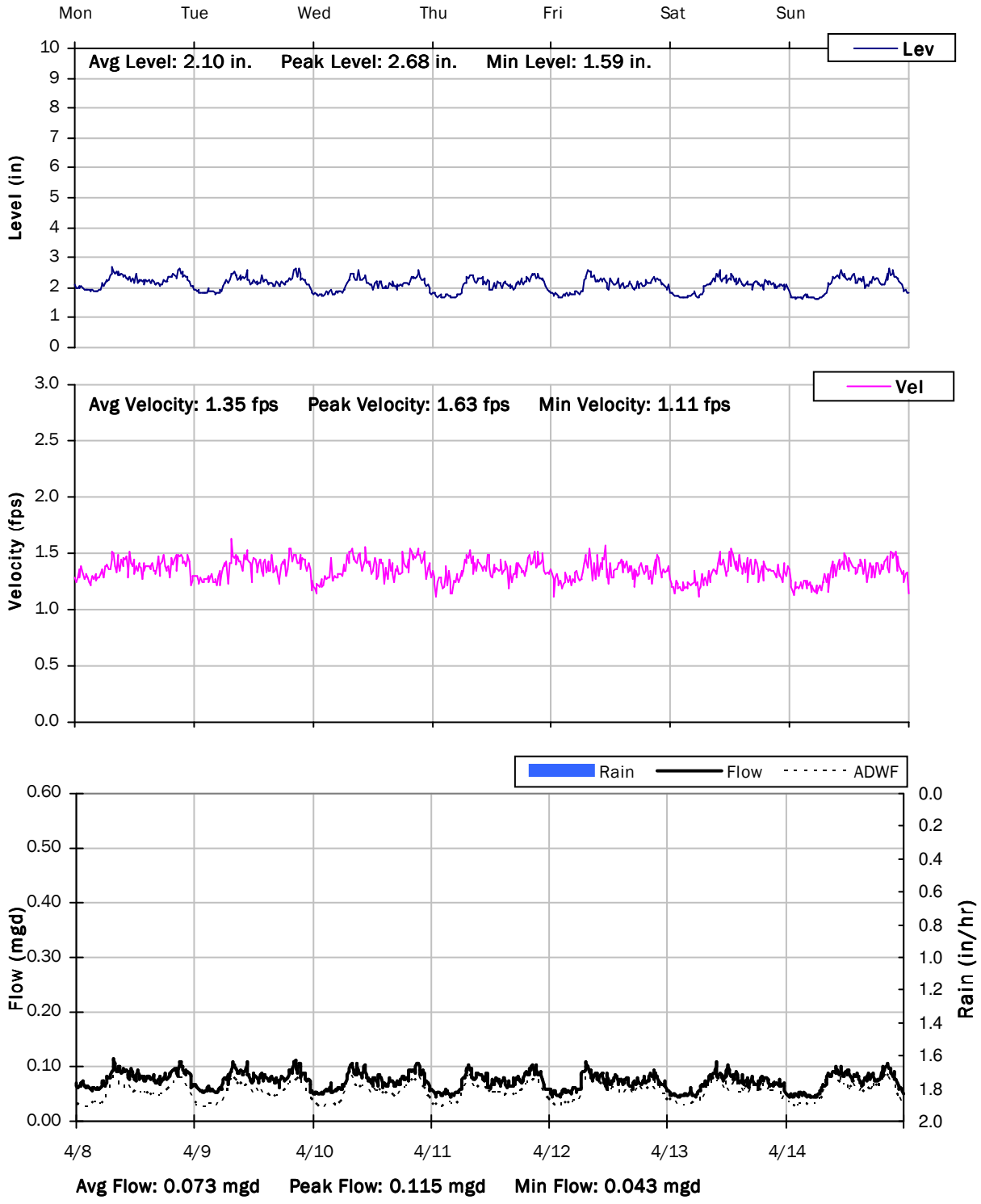
4/1/2019 to 4/8/2019



SITE 7

Weekly Level, Velocity and Flow Hydrographs

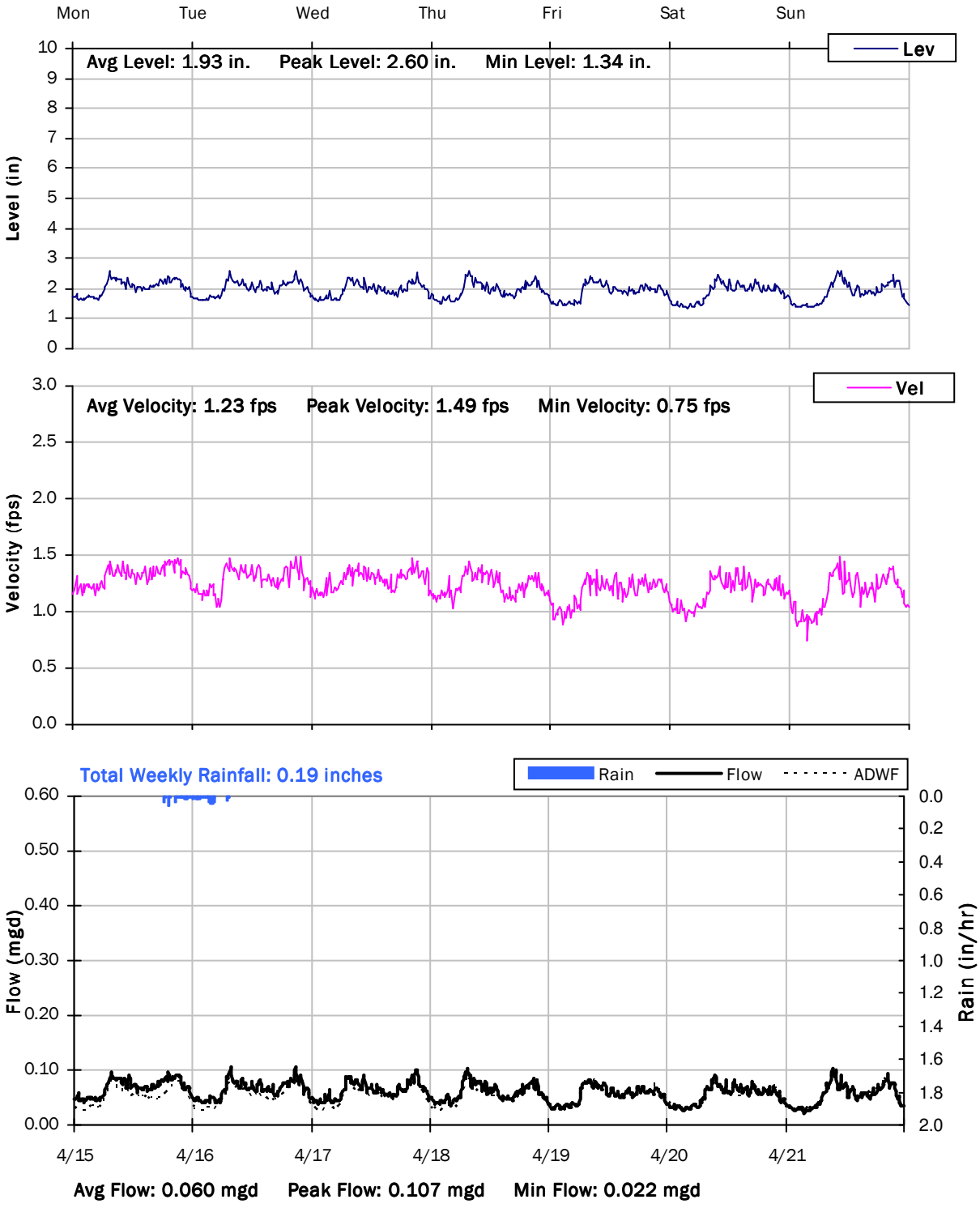
4/8/2019 to 4/15/2019



SITE 7

Weekly Level, Velocity and Flow Hydrographs

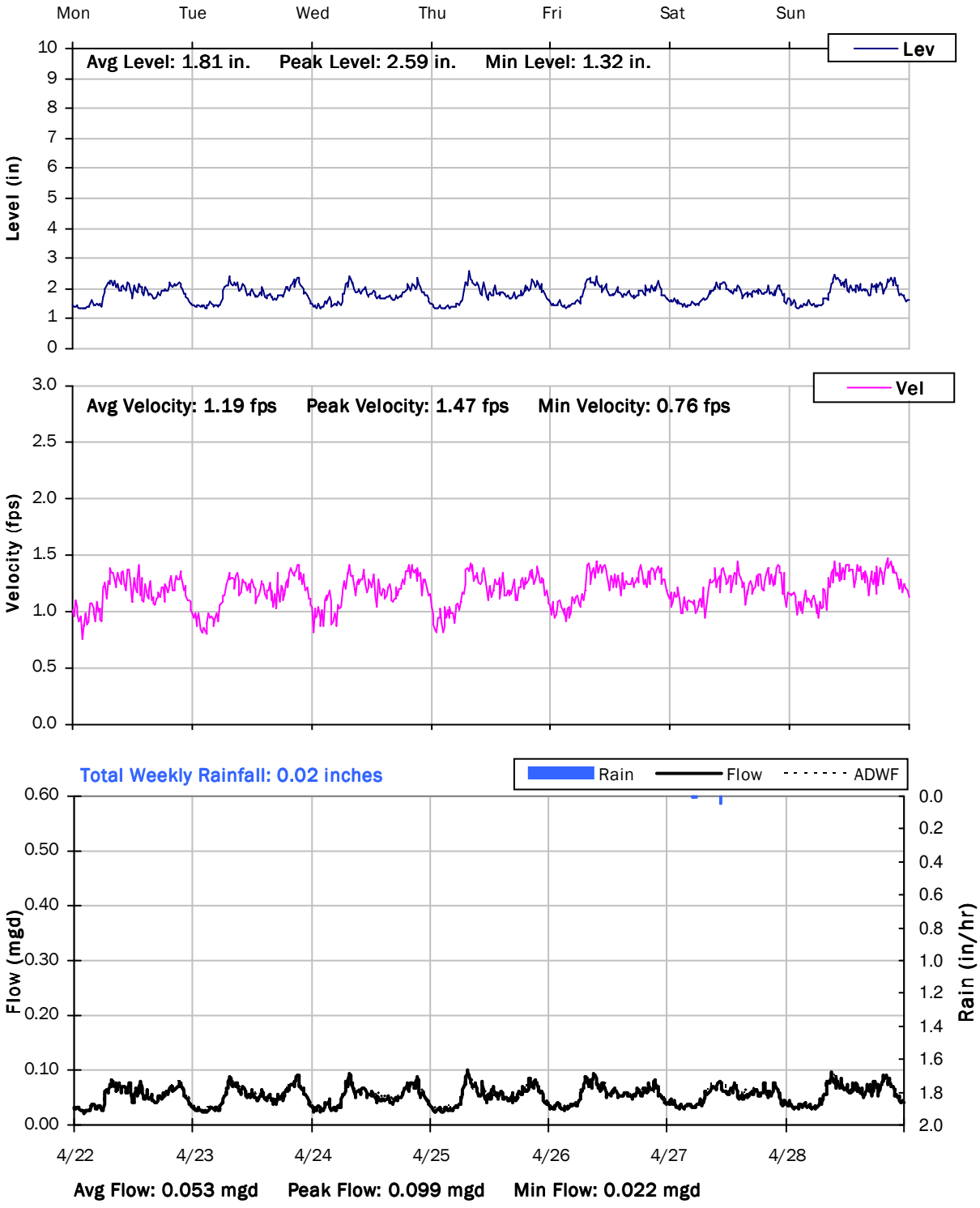
4/15/2019 to 4/22/2019



SITE 7

Weekly Level, Velocity and Flow Hydrographs

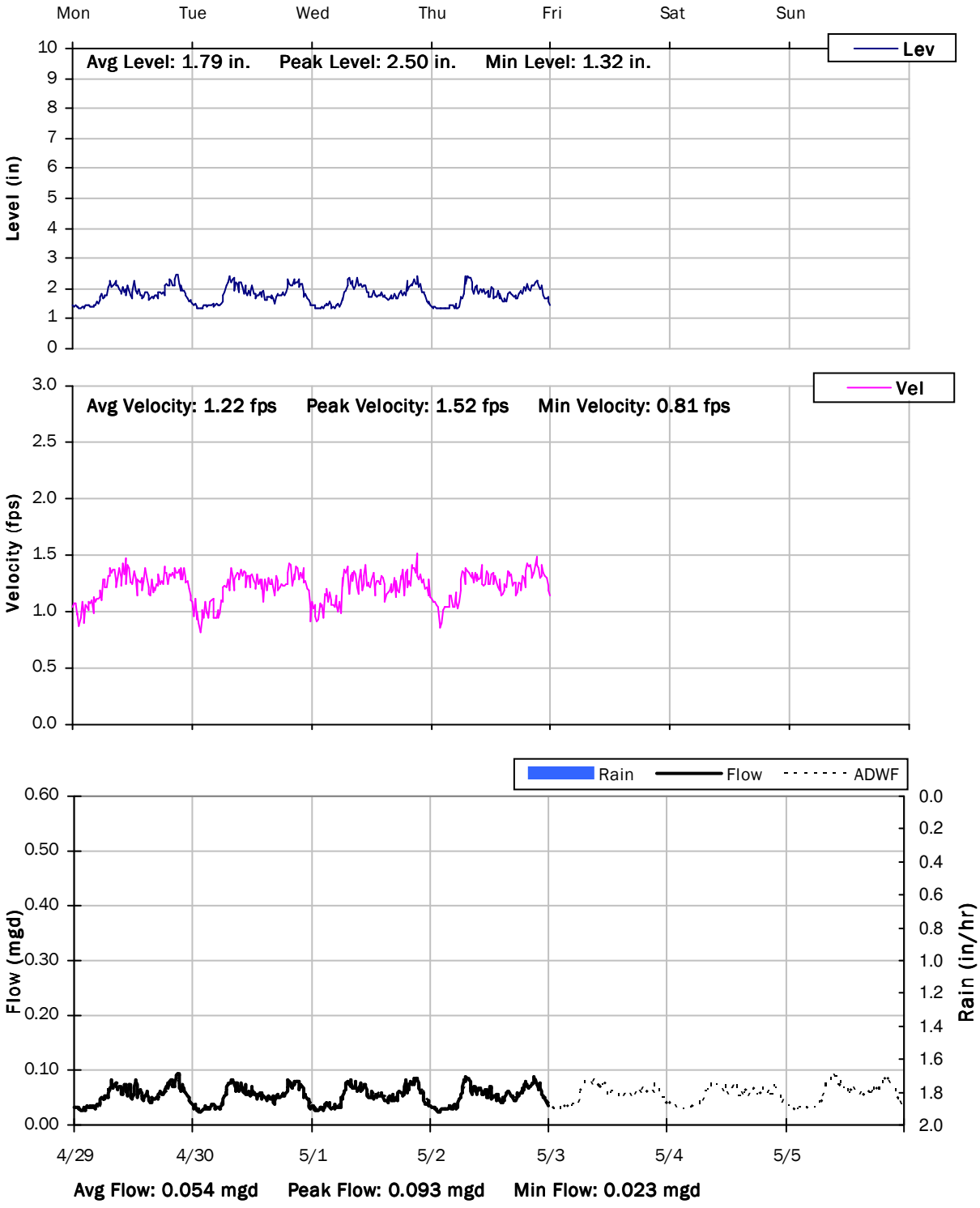
4/22/2019 to 4/29/2019



SITE 7

Weekly Level, Velocity and Flow Hydrographs

4/29/2019 to 5/6/2019



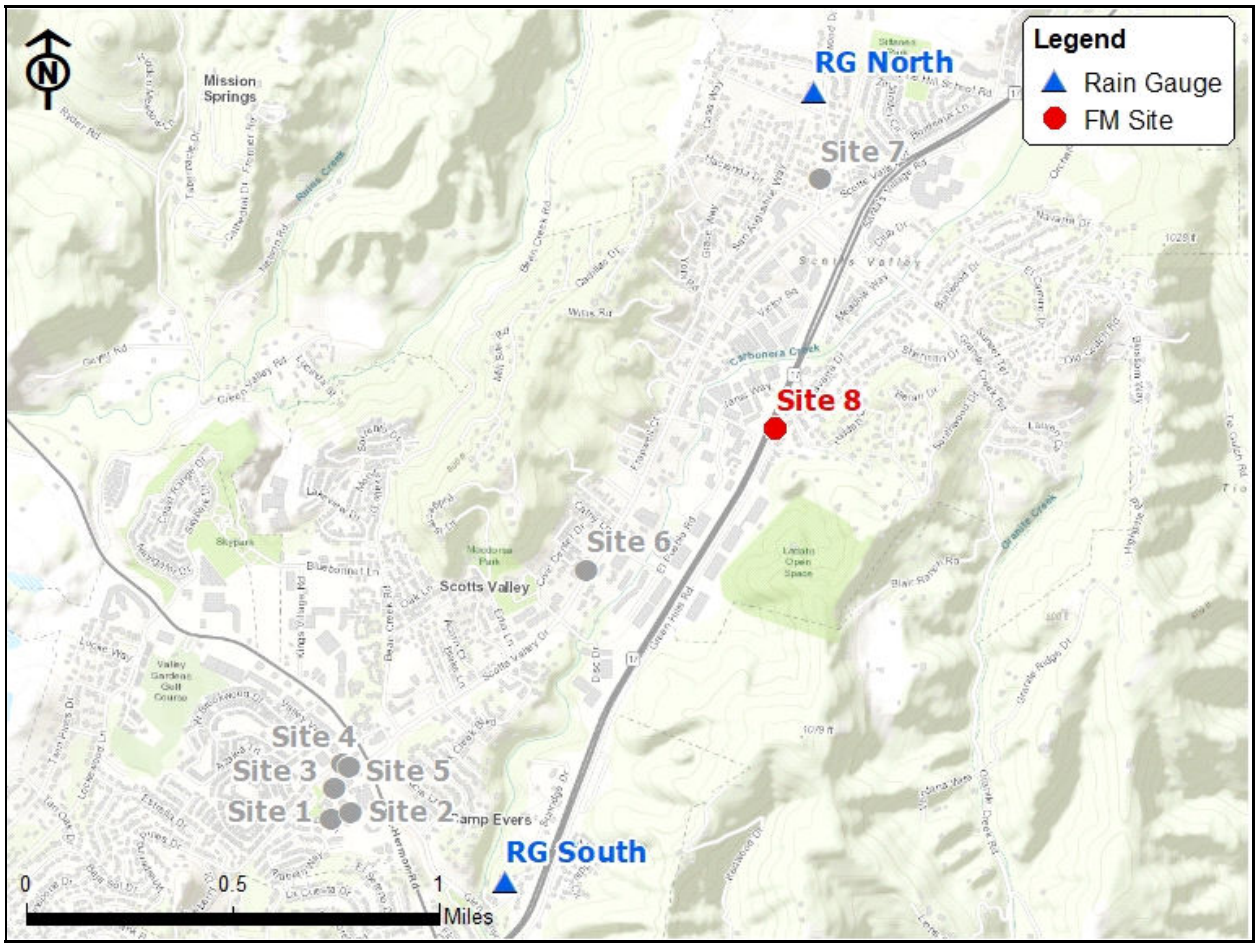
Carollo | Scotts Valley, California

Sanitary Sewer Flow Monitoring
January 30 - May 03, 2019

Monitoring Site: Site 8

Location: In Bushes between S Navarraq Drive and Highway 17

Data Summary Report



Vicinity Map: Site 8

SITE 8

Site Information

Location: In Bushes between S Navarraq Drive and Highway 17

Coordinates: 122.0074° W, 37.0551° N

Rim Elevation (Earth): 595 feet

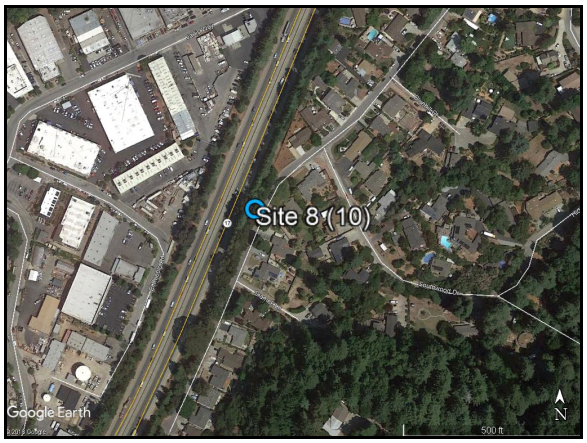
Expected Pipe Diameter: 10 inches

Measured Pipe Diameter: 10 inches

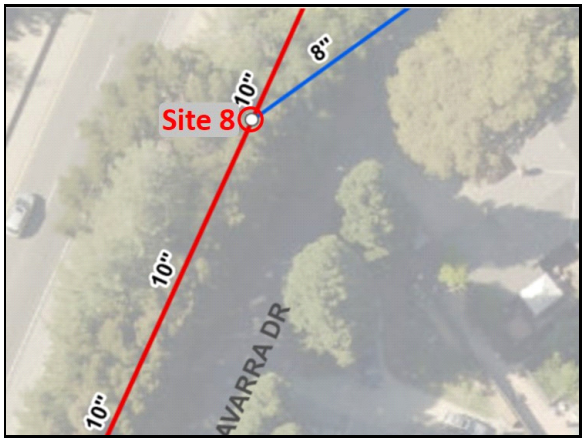
ADWF: 0.111 mgd

Peak Measured Flow: 0.569 mgd

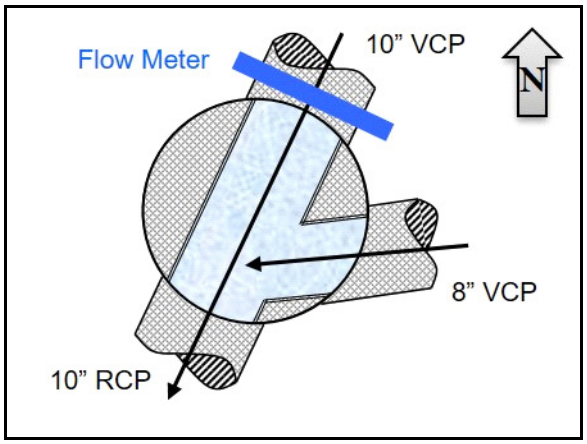
Sediment: None



Satellite Map



Sewer Map



Flow Sketch



Street View



Plan View

SITE 8

Additional Site Photos

Effluent Pipe



Monitored North Influent Pipe



SITE 8

Additional Site Photos

Northeast Influent Pipe

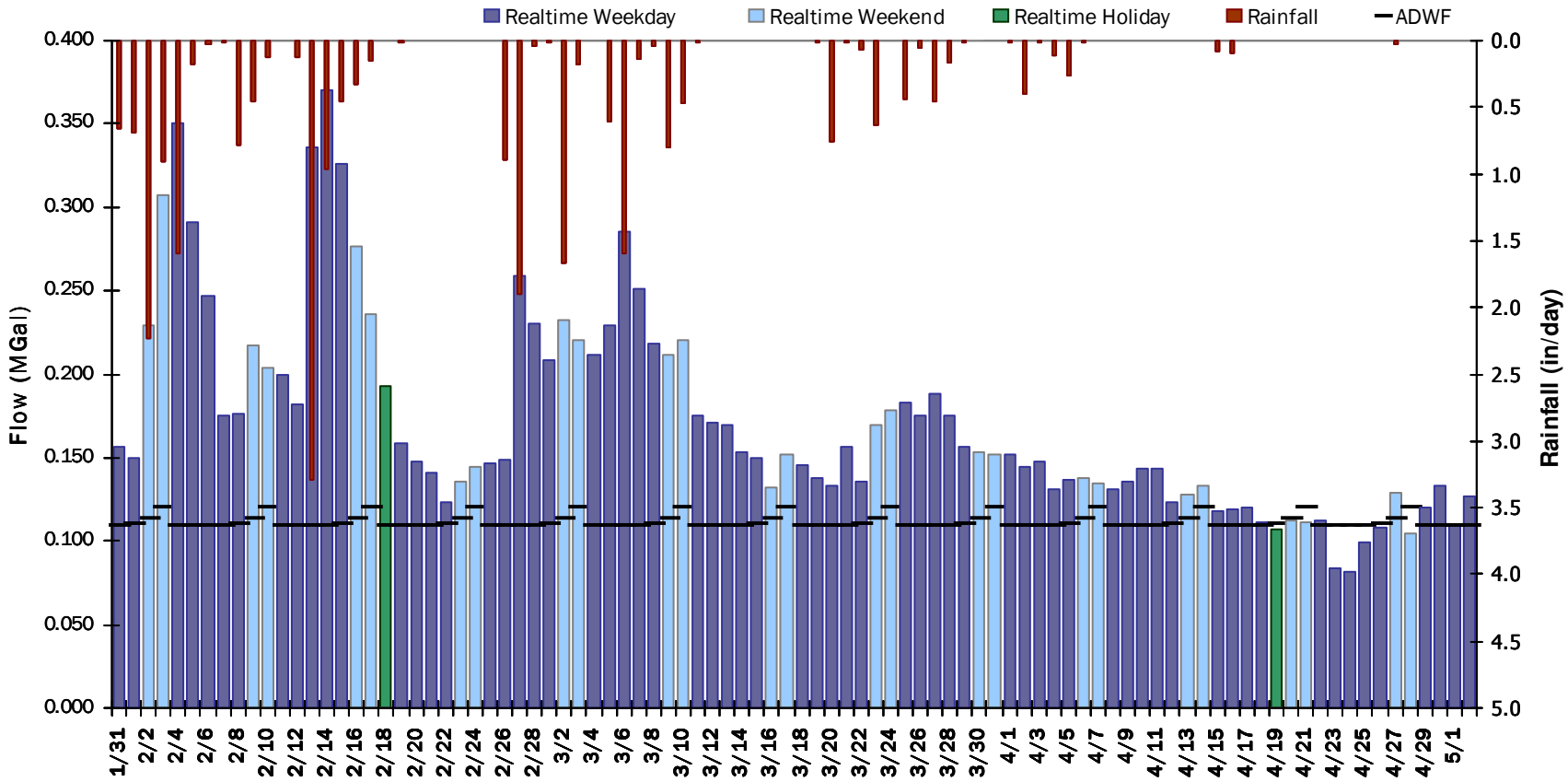


SITE 8

Period Flow Summary: Daily Flow Totals

Avg Daily Flow: 0.172 MGal Peak Daily Flow: 0.370 MGal Min Daily Flow: 0.081 MGal

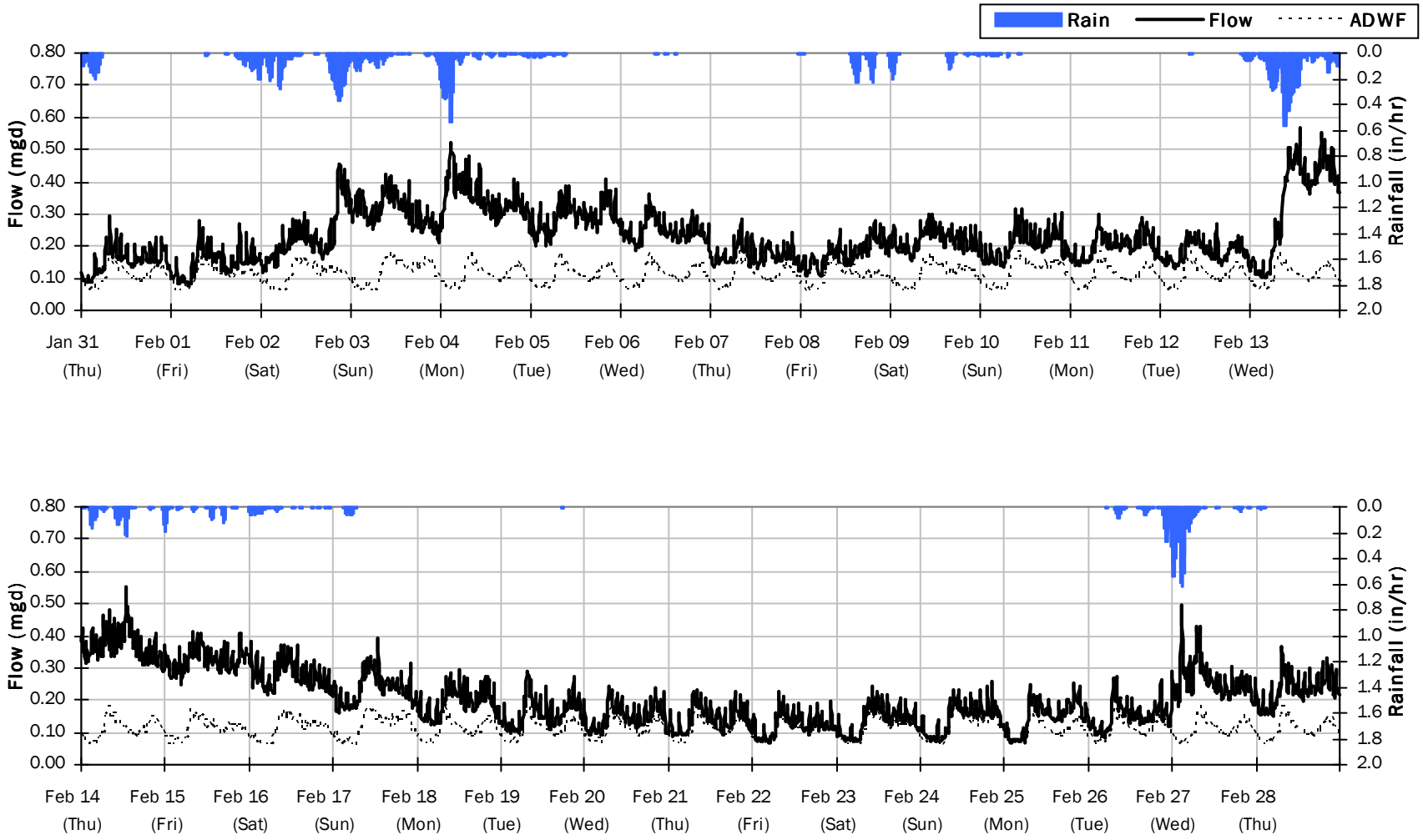
Total Rainfall: 25.01 inches



SITE 8

Flow Summary: 1/31/2019 to 2/28/2019

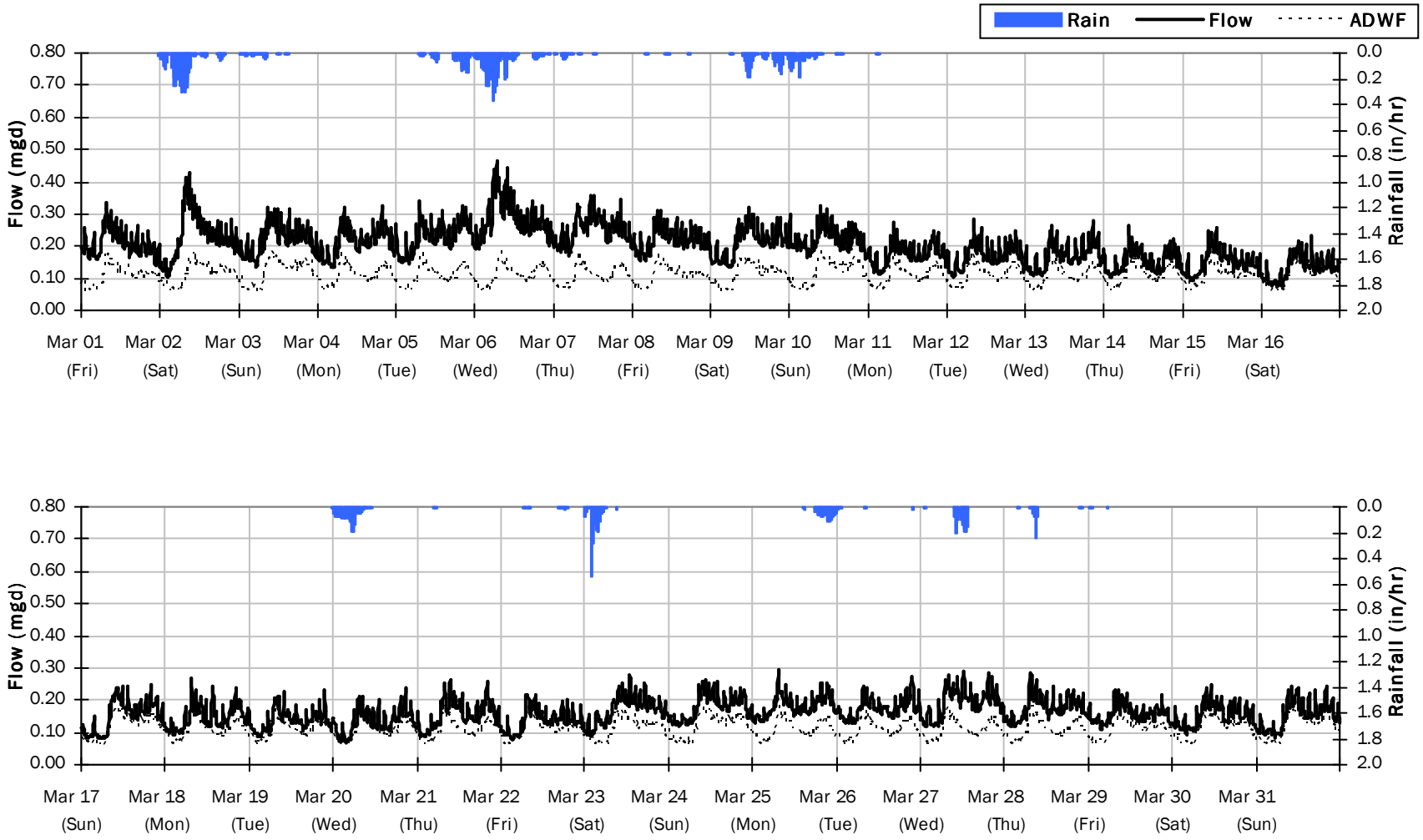
Period Rainfall: 15.84 inches Period Avg Flow: 0.216 mgd Period Peak Flow: 0.569 mgd Period Min Flow



SITE 8

Flow Summary: 3/1/2019 to 3/31/2019

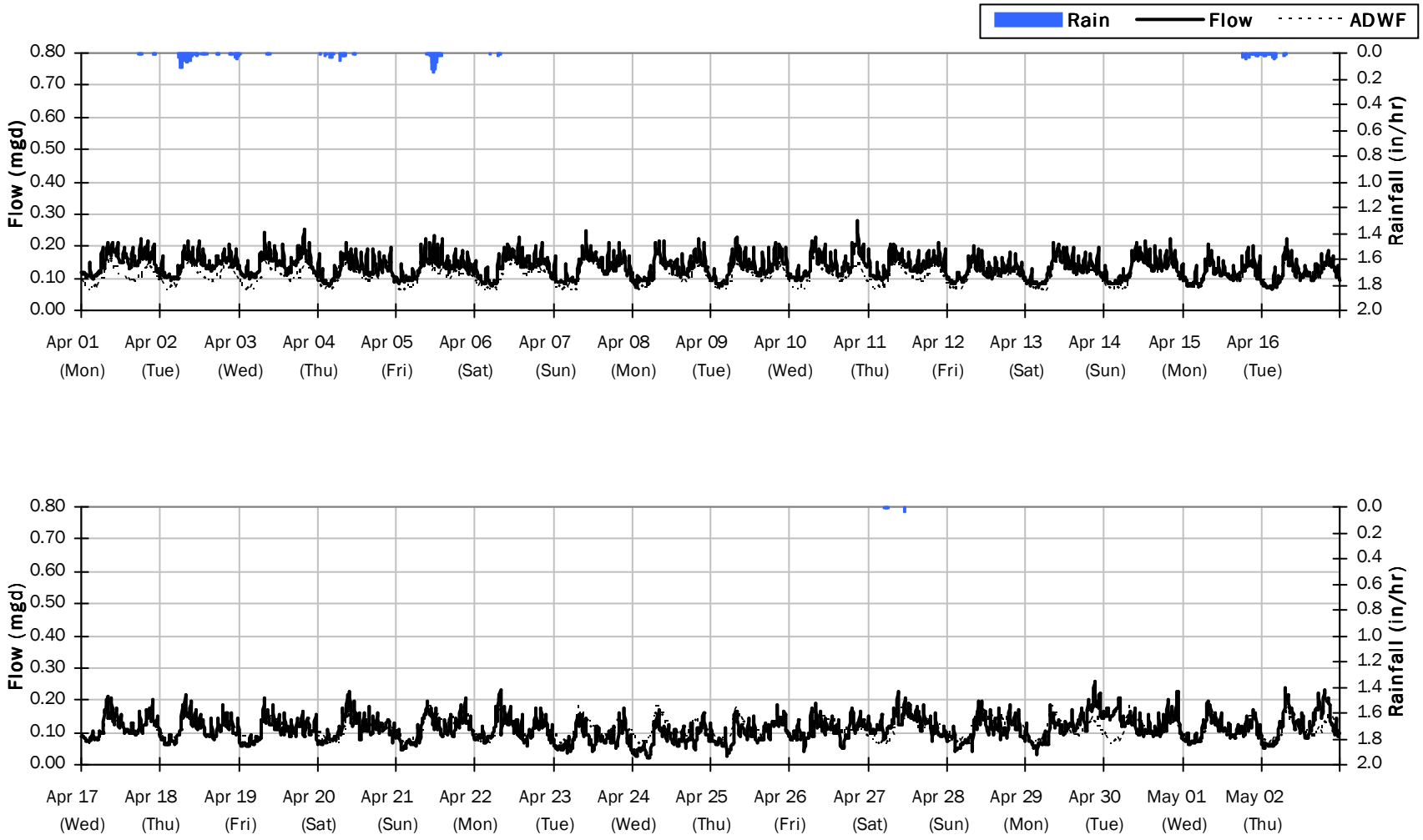
Period Rainfall: 8.15 inches Period Avg Flow: 0.182 mgd Period Peak Flow: 0.463 mgd Period Min Flow



SITE 8

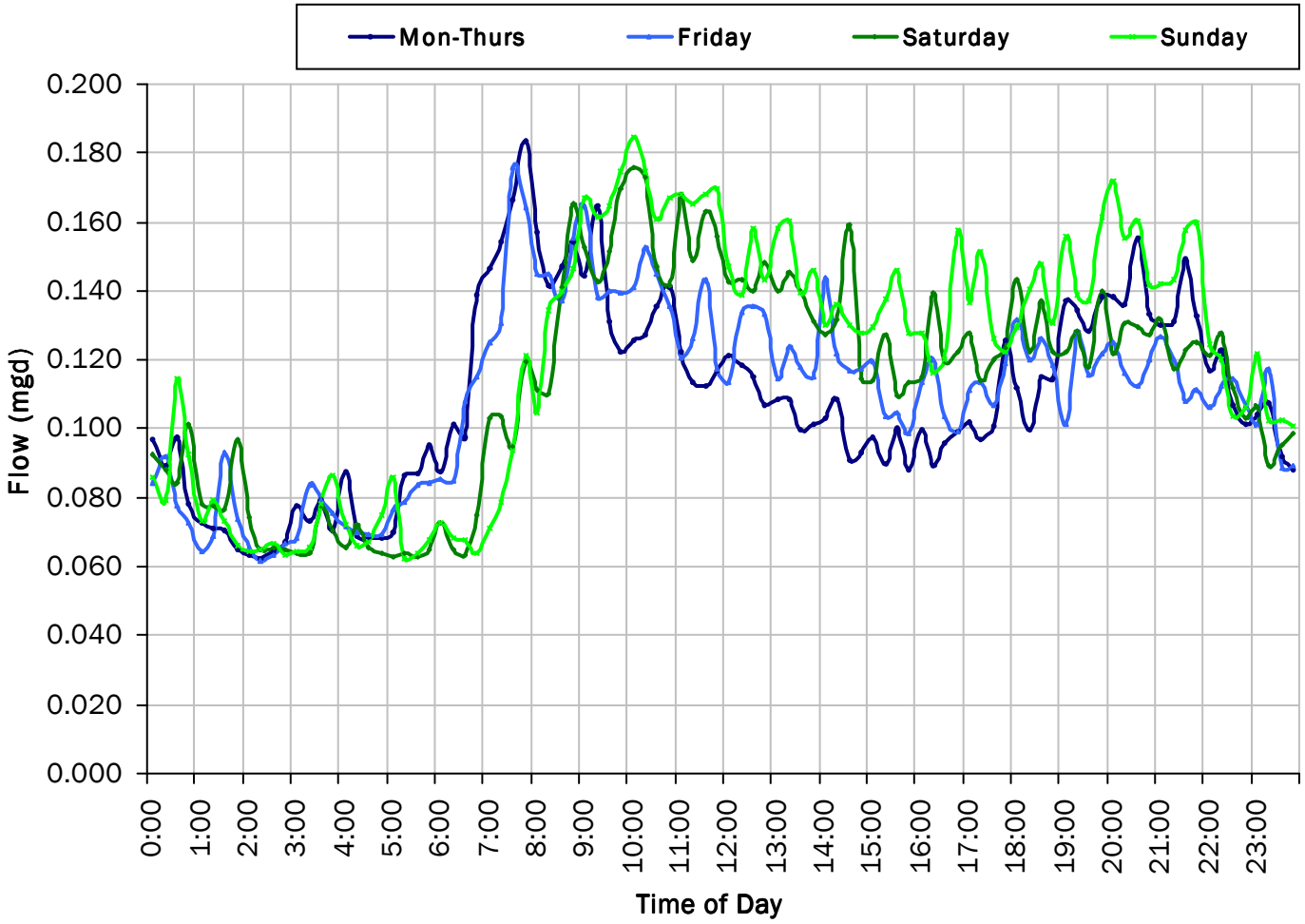
Flow Summary: 4/1/2019 to 5/2/2019

Period Rainfall: 1.02 inches Period Avg Flow: 0.123 mgd Period Peak Flow: 0.280 mgd Period Min Flow



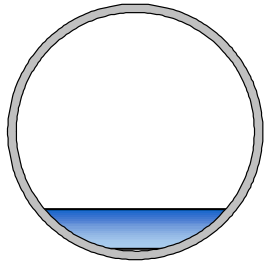
SITE 8

Average Dry Weather Flow Hydrographs



ADWF:

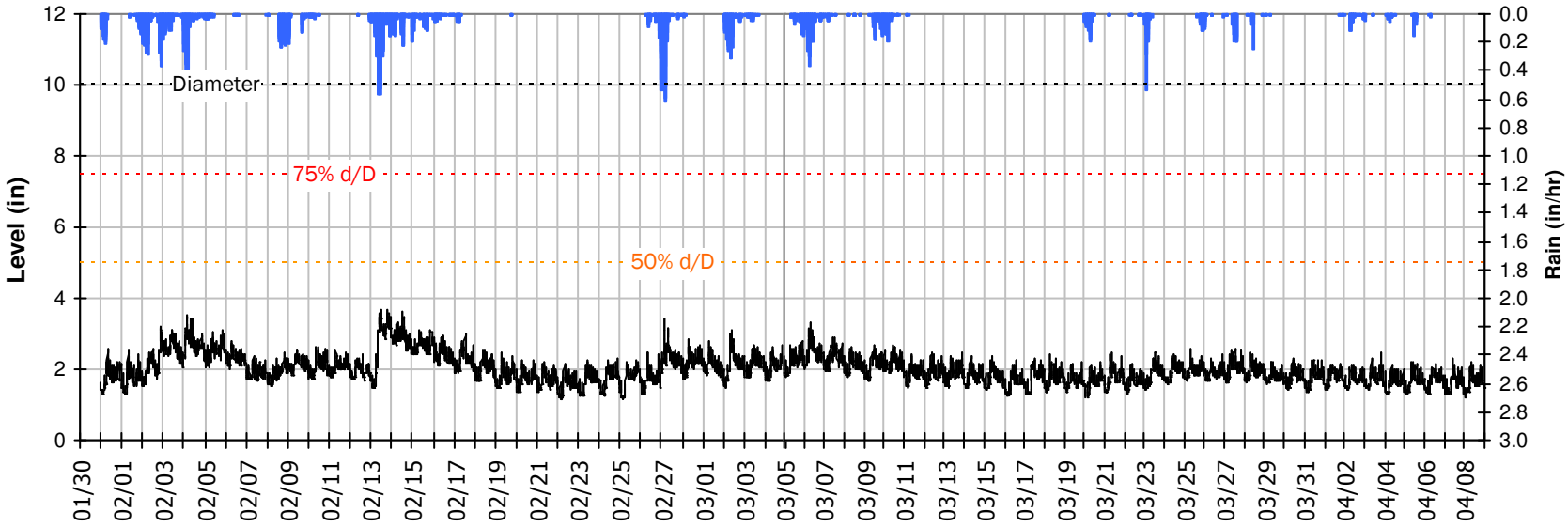
0.111 *mgd*

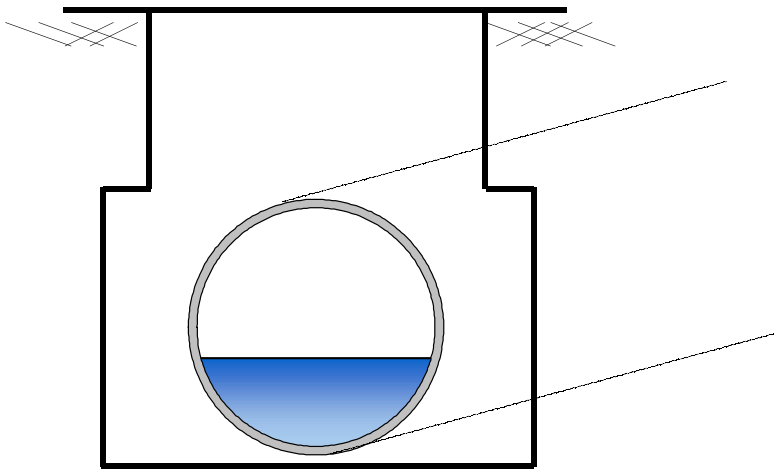


SITE 8

Site Capacity and Surcharge Summary

Realtime Flow Levels with Rainfall Data over Peak Level Period

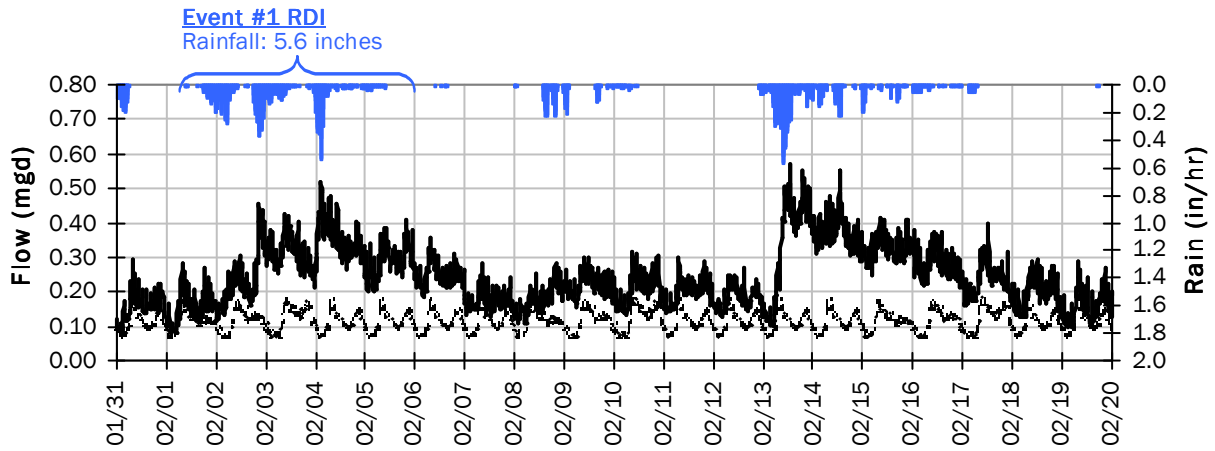




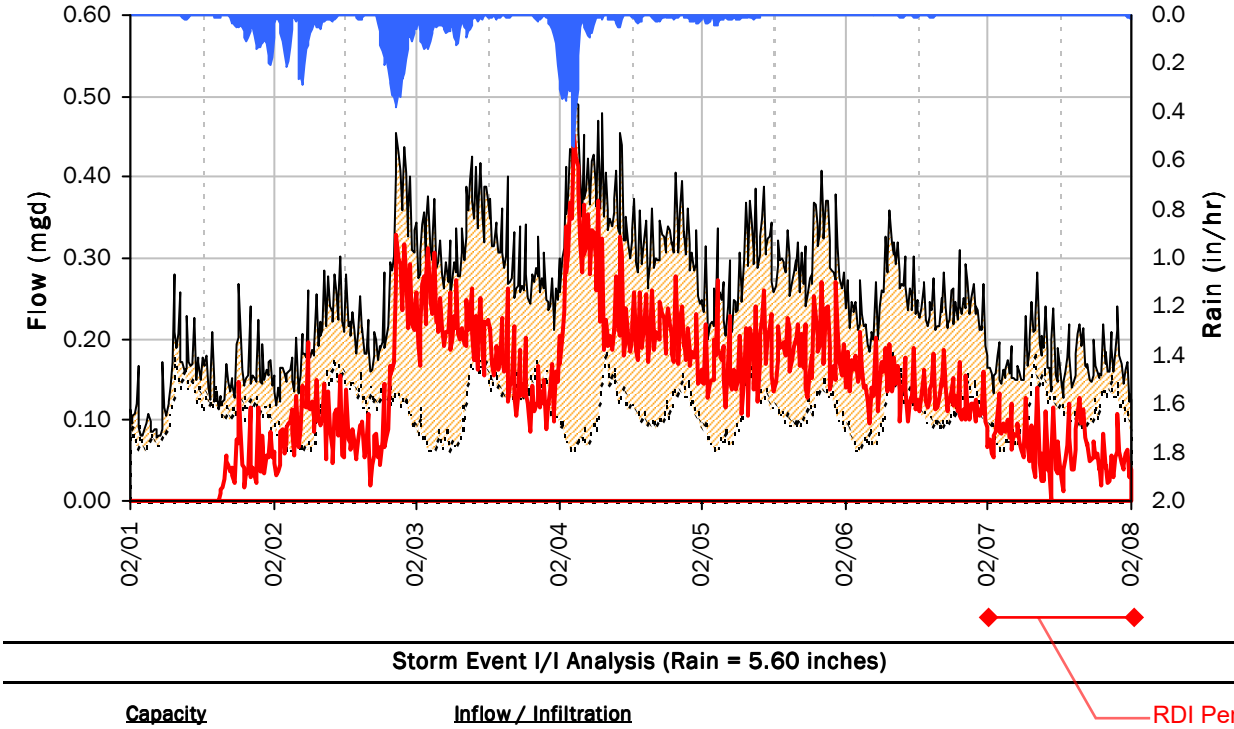
Pipe Diameter:	10	*inches*
Peak Measured Level:	3.71	*inches*
Peak d/D Ratio:	0.37	

SITE 8
I/I Summary: Event #1 RDI

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #1 RDI Detail Graph

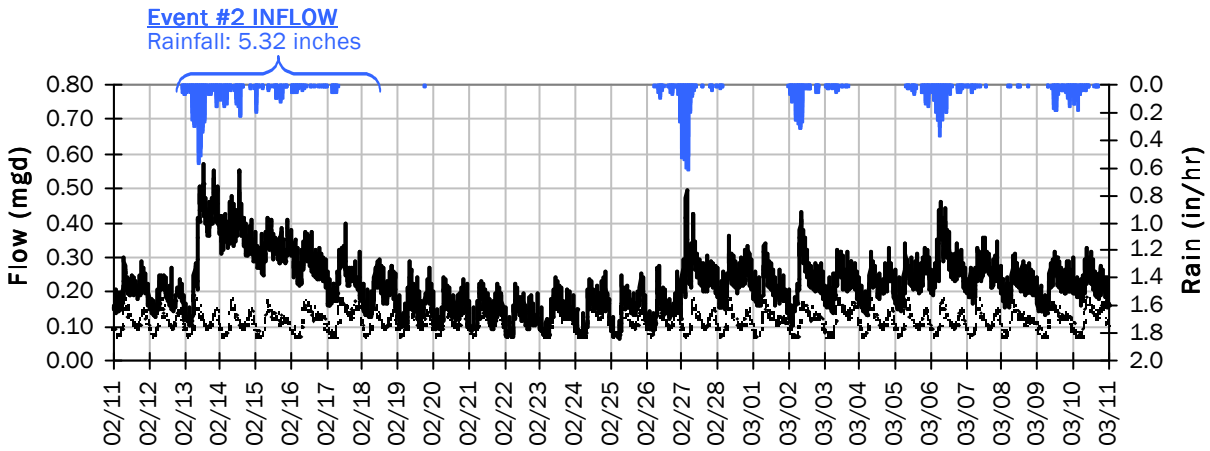


Storm Event I/I Analysis (Rain = 5.60 inches)

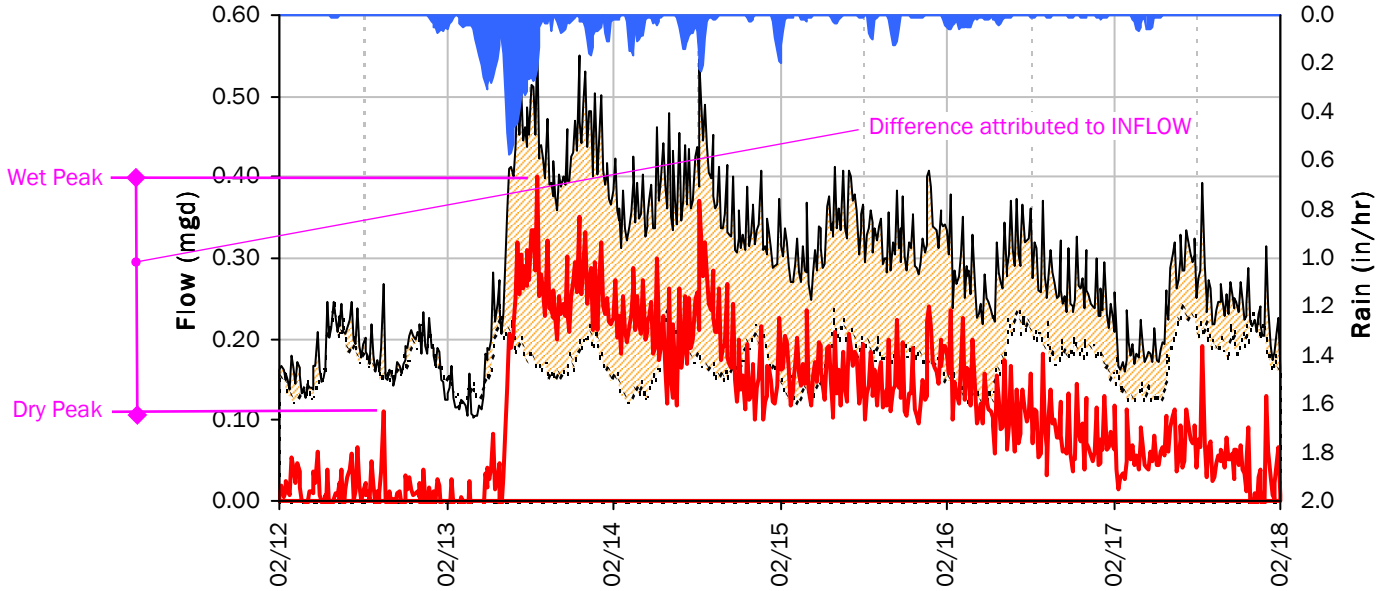
Capacity		Inflow / Infiltration	
Peak Flow:	0.517 *mgd*	**RDI:**	0.066 *mgd*
PF:	4.65		
Peak Level:	3.53 *in*		
d/D Ratio:	0.35		

SITE 8
I/I Summary: Event #2 INFLOW

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #2 INFLOW Detail Graph

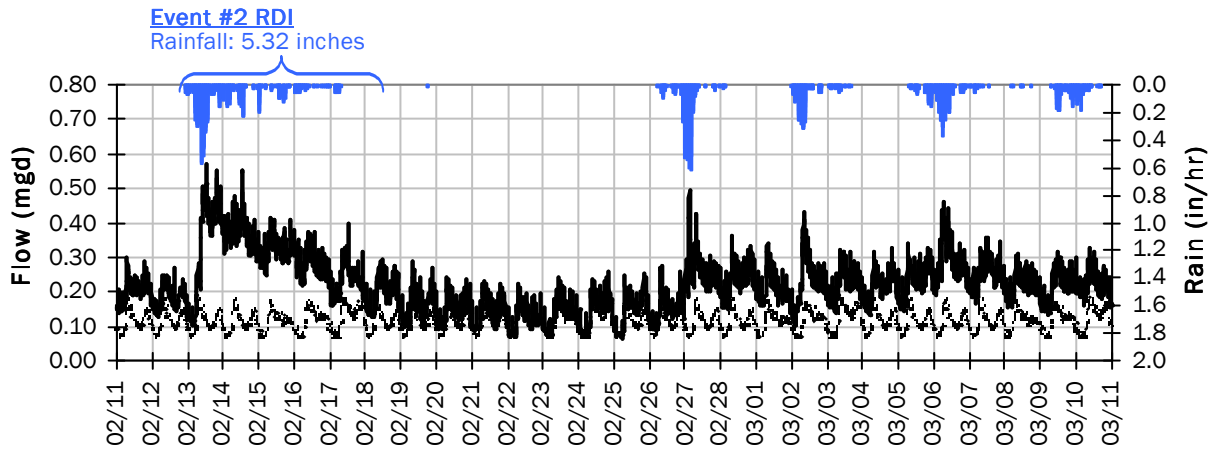


Storm Event I/I Analysis (Rain = 5.32 inches)

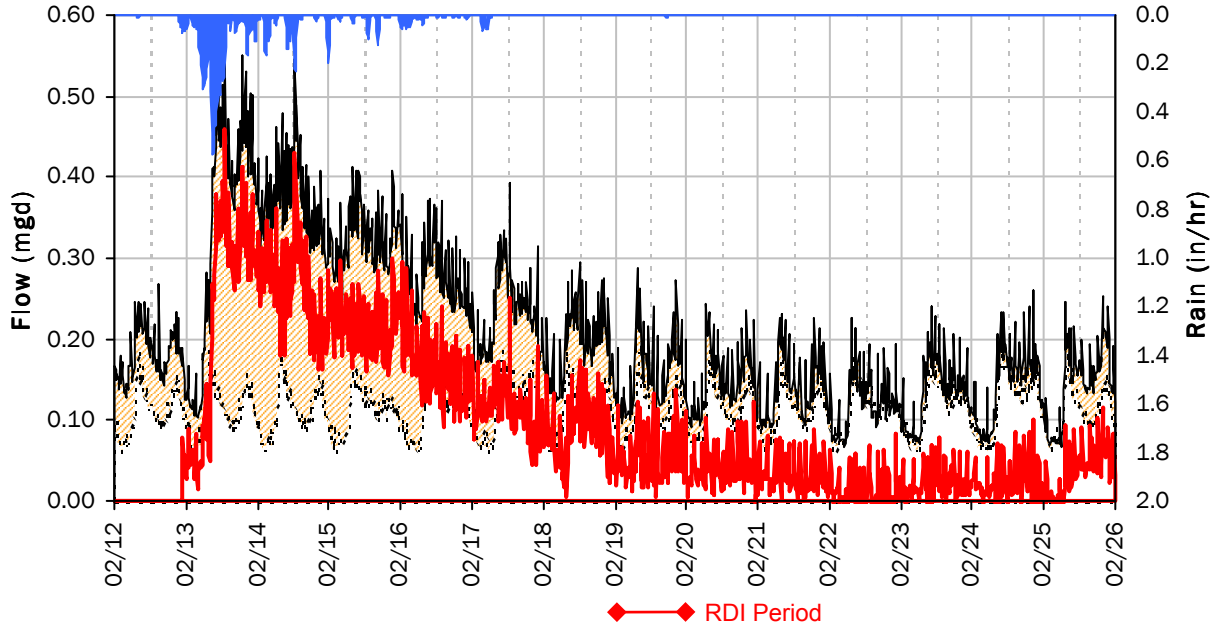
Capacity		Inflow / Infiltration	
Peak Flow:	0.569 *mgd*	**Peak I/I Rate:**	0.290 *mgd*
PF:	5.12		
Peak Level:	3.71 *in*		
d/D Ratio:	0.37		

SITE 8
I/I Summary: Event #2 RDI

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #2 RDI Detail Graph

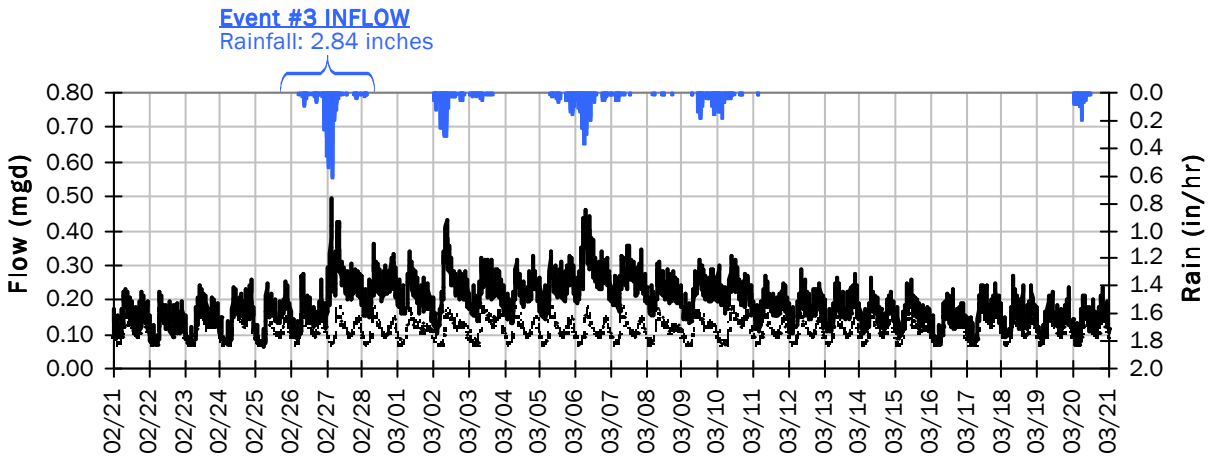


Storm Event I/I Analysis (Rain = 5.32 inches)

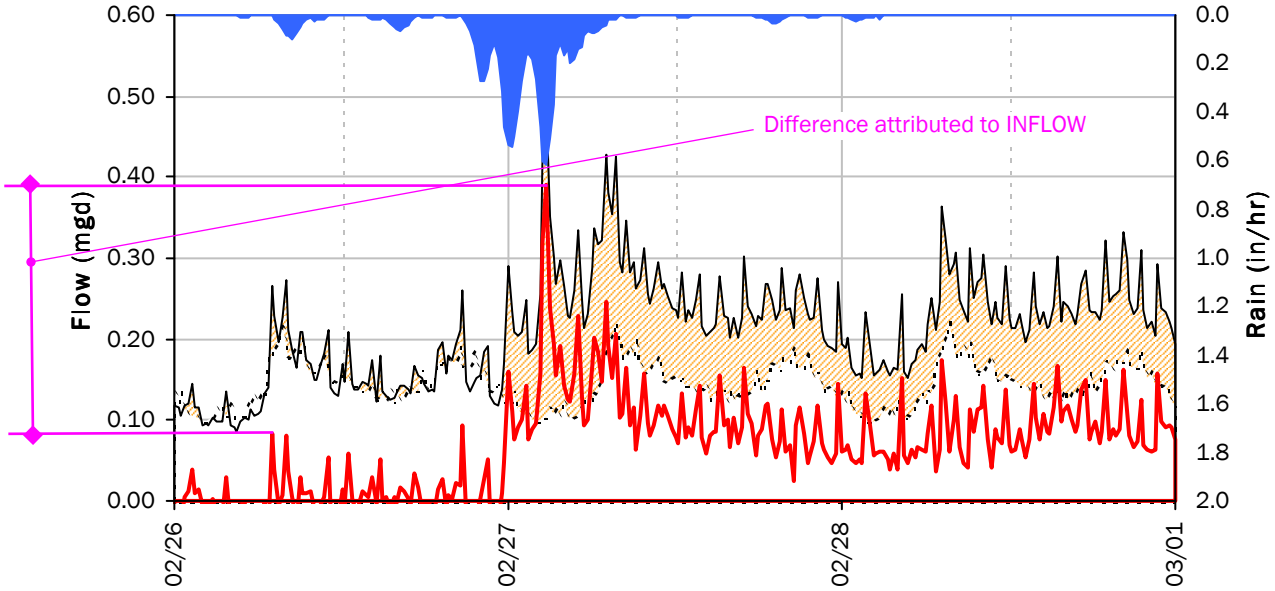
Capacity		Inflow / Infiltration	
Peak Flow:	0.569 *mgd*	**RDI:**	0.050 *mgd*
PF:	5.12		
Peak Level:	3.71 *in*		
d/D Ratio:	0.37		

SITE 8
I/I Summary: Event #3 INFLOW

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #3 INFLOW Detail Graph

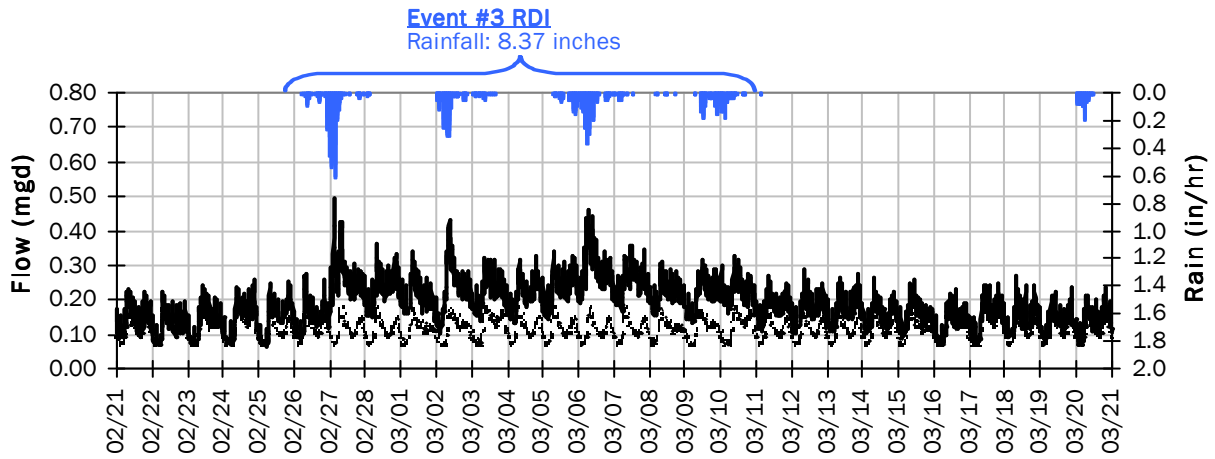


Storm Event I/I Analysis (Rain = 2.84 inches)

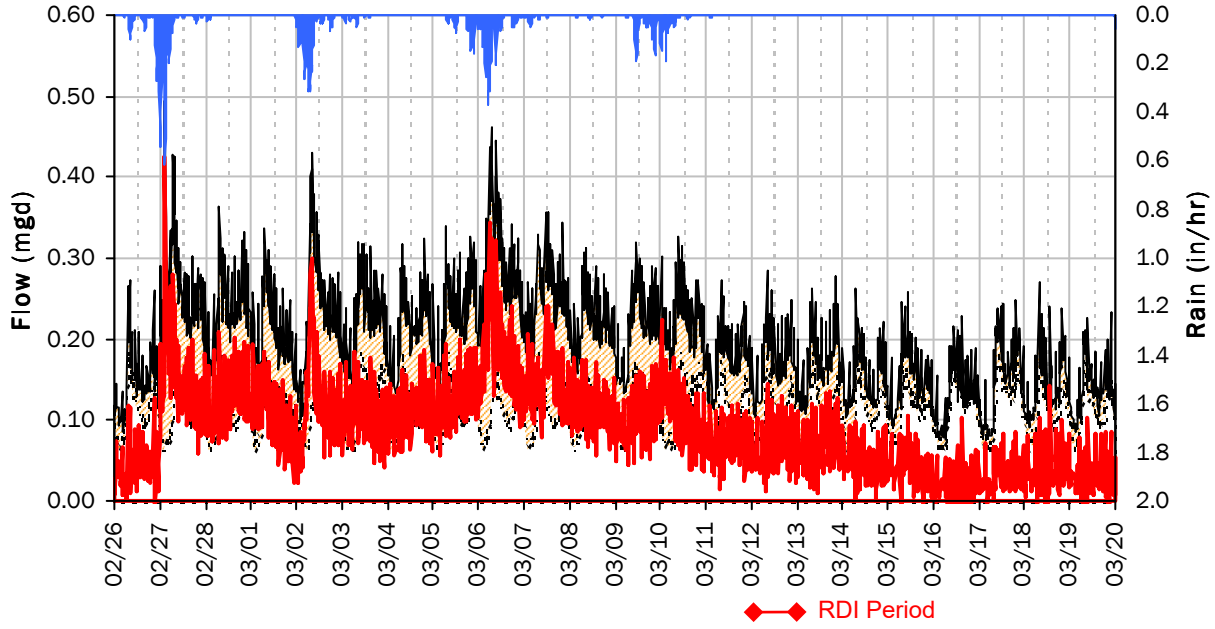
Capacity		Inflow / Infiltration	
Peak Flow:	0.49 *mgd*	**Peak I/I Rate:**	0.297 *mgd*
PF:	4.43		
Peak Level:	3.43 *in*		
d/D Ratio:	0.34		

SITE 8
I/I Summary: Event #3 RDI

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event #3 RDI Detail Graph



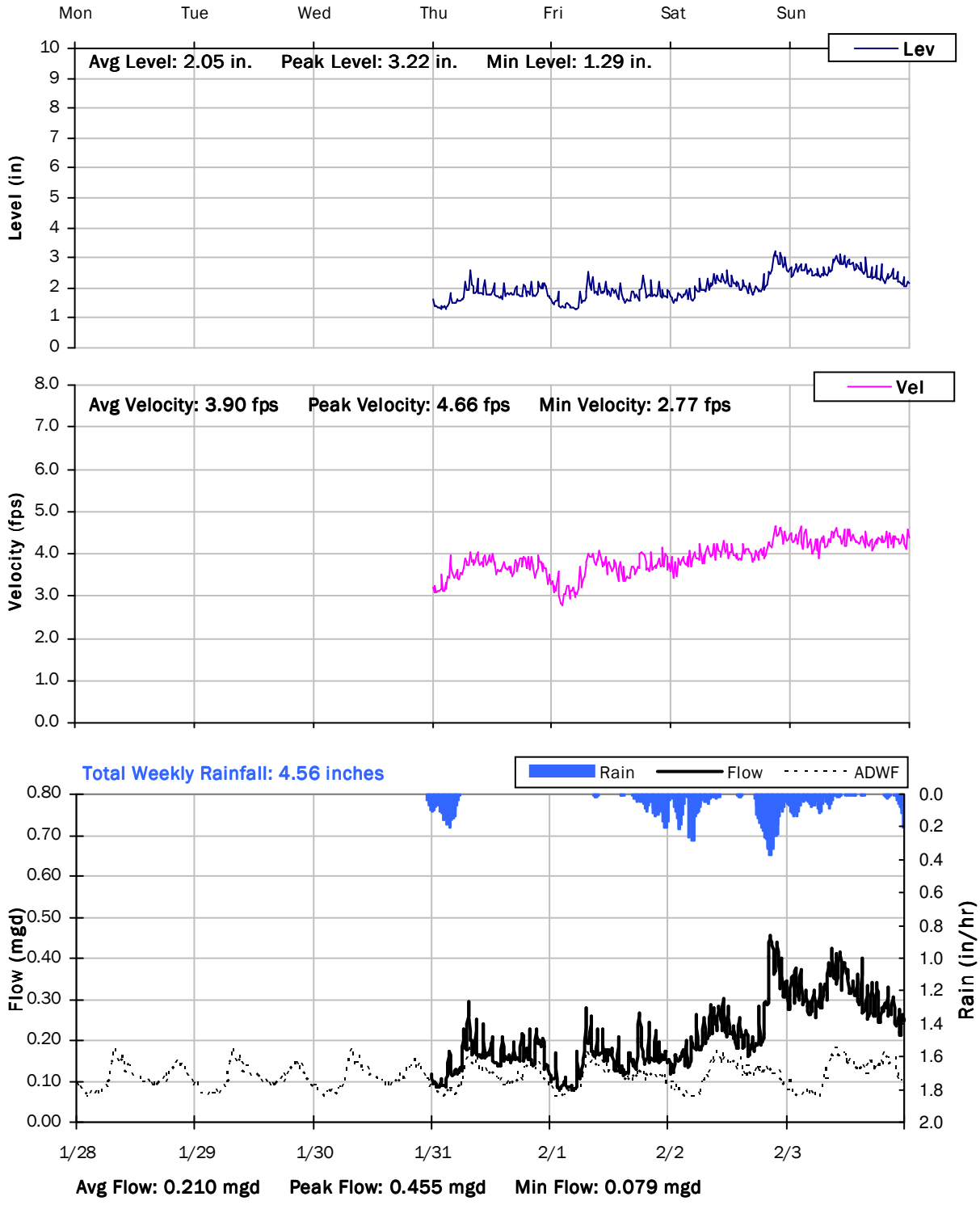
Storm Event I/I Analysis (Rain = 8.37 inches)

Capacity		Inflow / Infiltration	
Peak Flow:	0.49 *mgd*	**RDI:**	0.061 *mgd*
PF:	4.43		
Peak Level:	3.43 *in*		
d/D Ratio:	0.34		

SITE 8

Weekly Level, Velocity and Flow Hydrographs

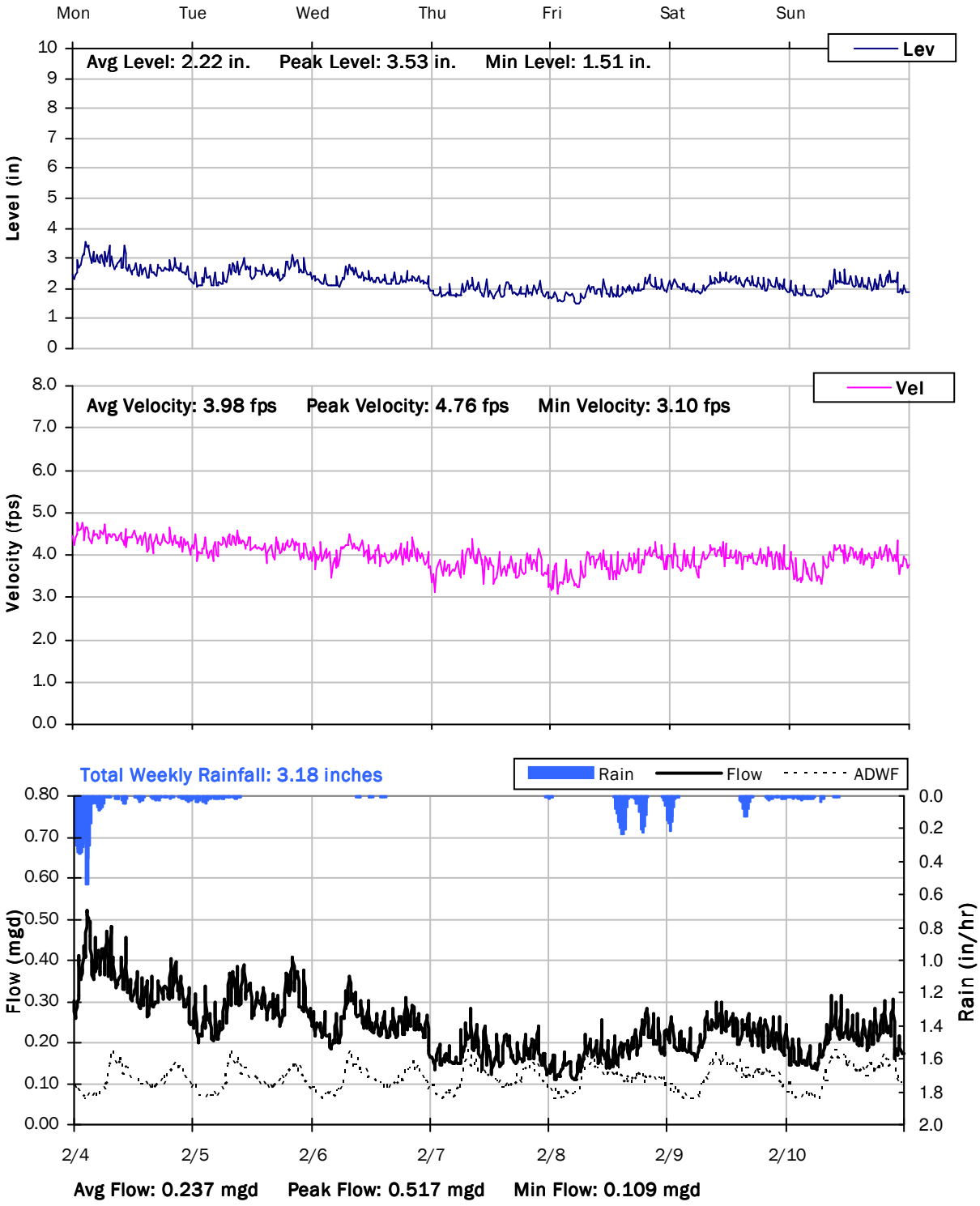
1/28/2019 to 2/4/2019



SITE 8

Weekly Level, Velocity and Flow Hydrographs

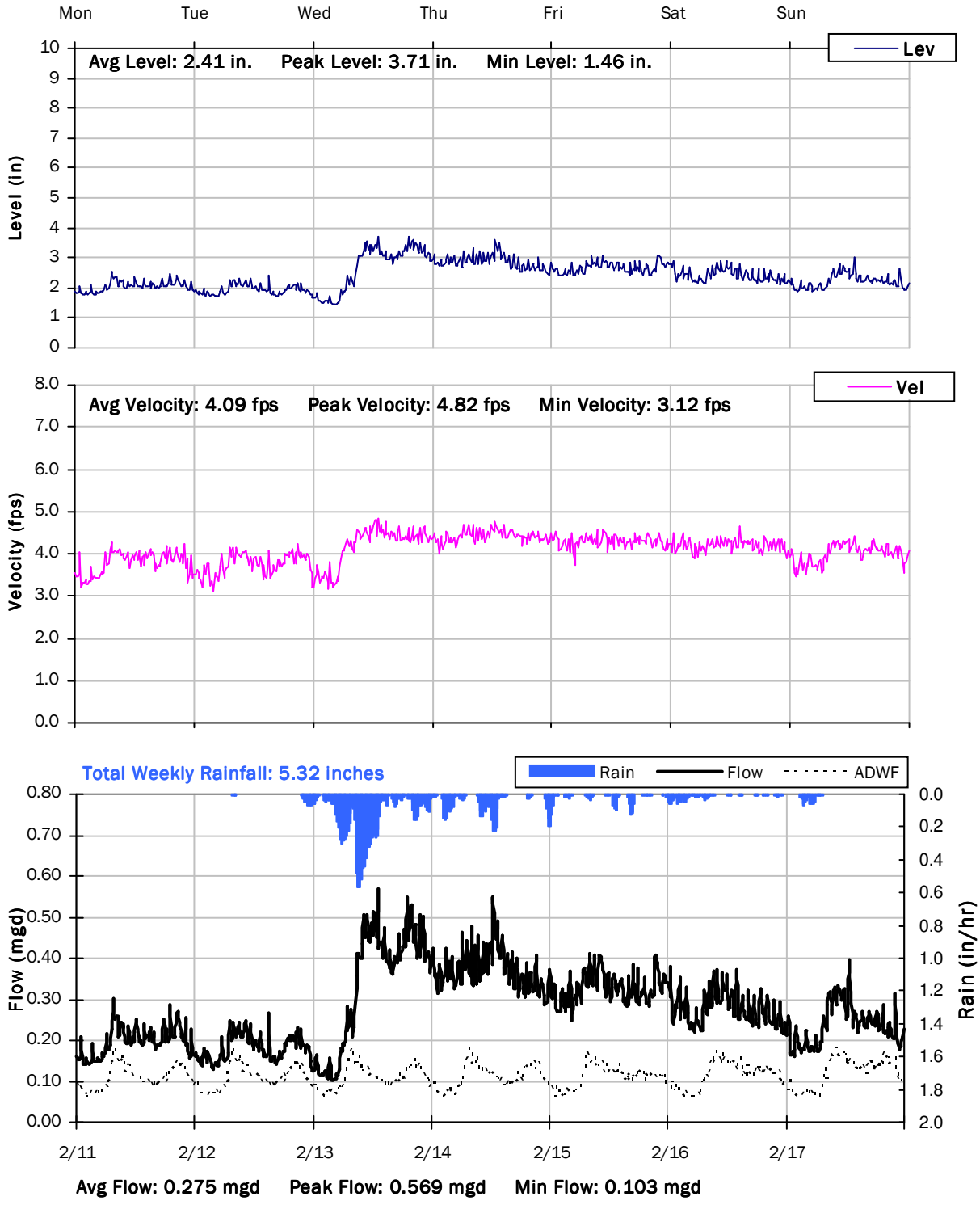
2/4/2019 to 2/11/2019



SITE 8

Weekly Level, Velocity and Flow Hydrographs

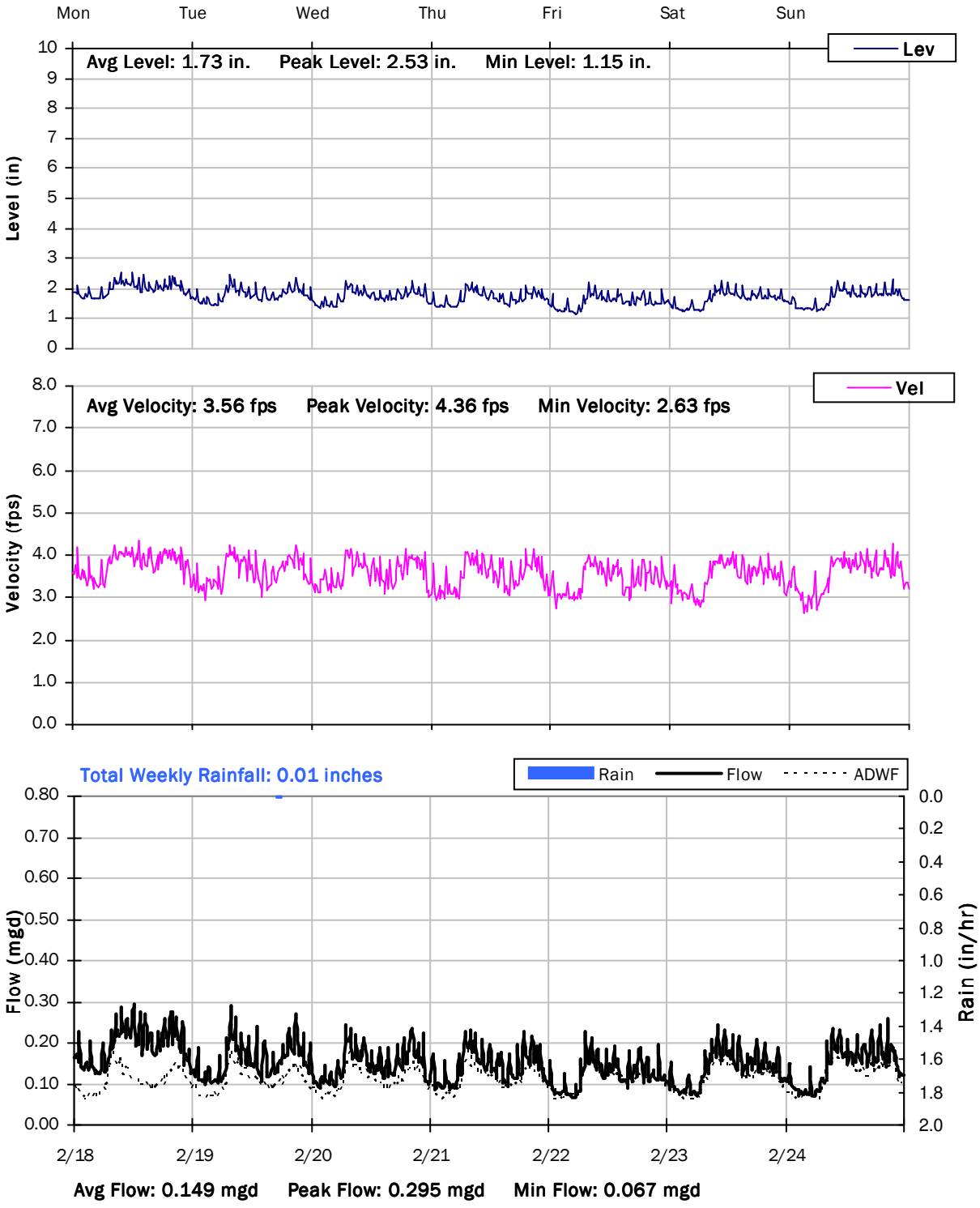
2/11/2019 to 2/18/2019



SITE 8

Weekly Level, Velocity and Flow Hydrographs

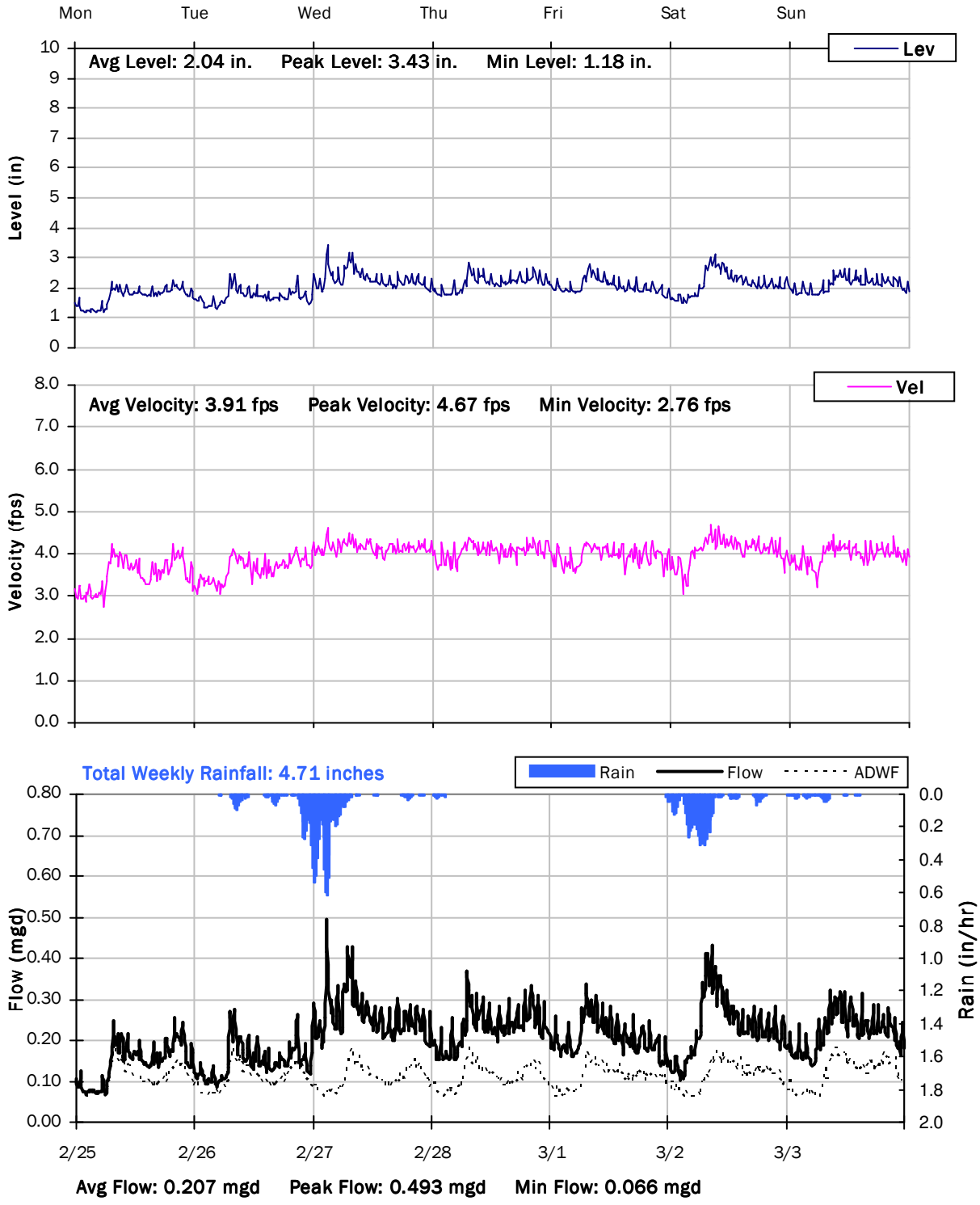
2/18/2019 to 2/25/2019



SITE 8

Weekly Level, Velocity and Flow Hydrographs

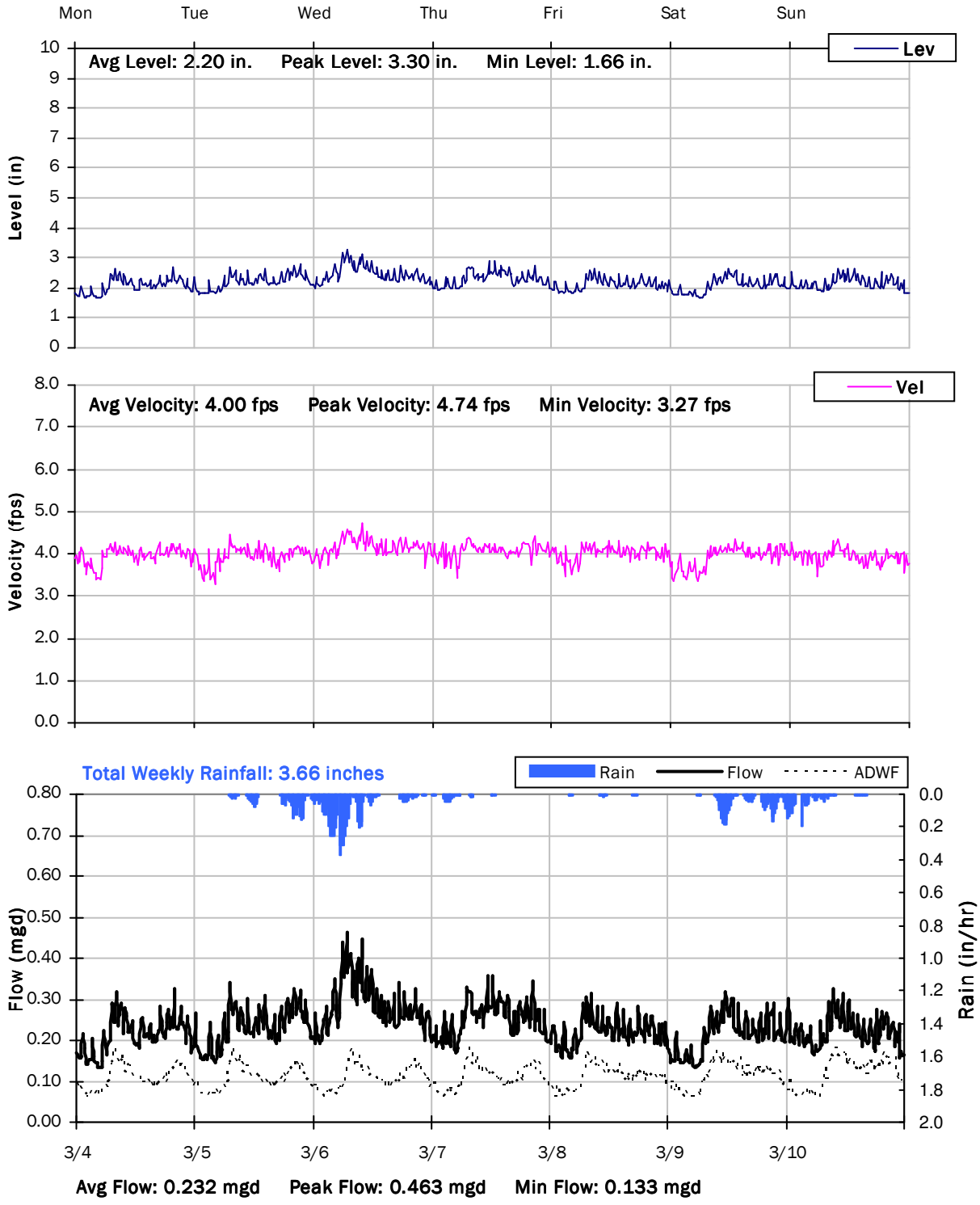
2/25/2019 to 3/4/2019



SITE 8

Weekly Level, Velocity and Flow Hydrographs

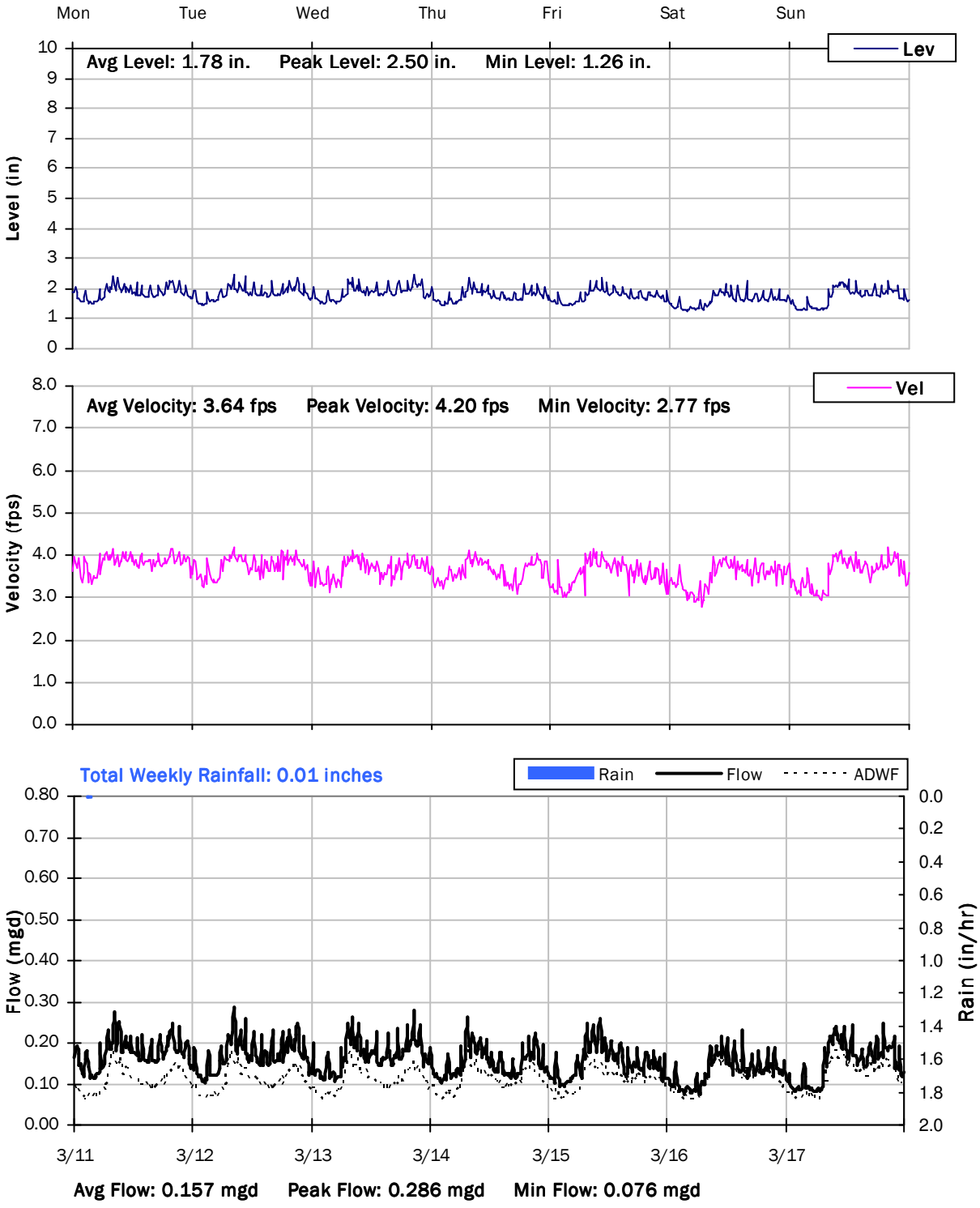
3/4/2019 to 3/11/2019



SITE 8

Weekly Level, Velocity and Flow Hydrographs

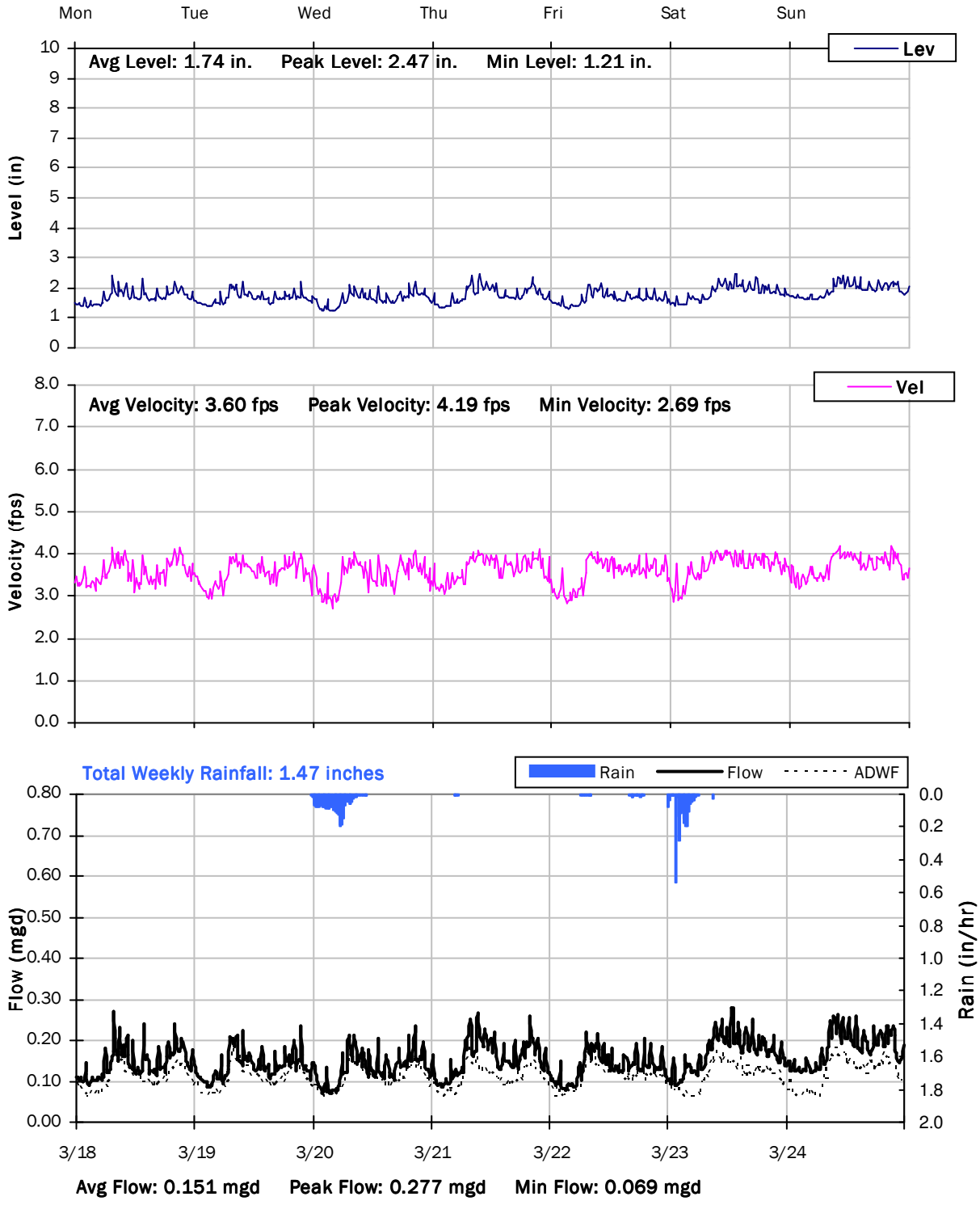
3/11/2019 to 3/18/2019



SITE 8

Weekly Level, Velocity and Flow Hydrographs

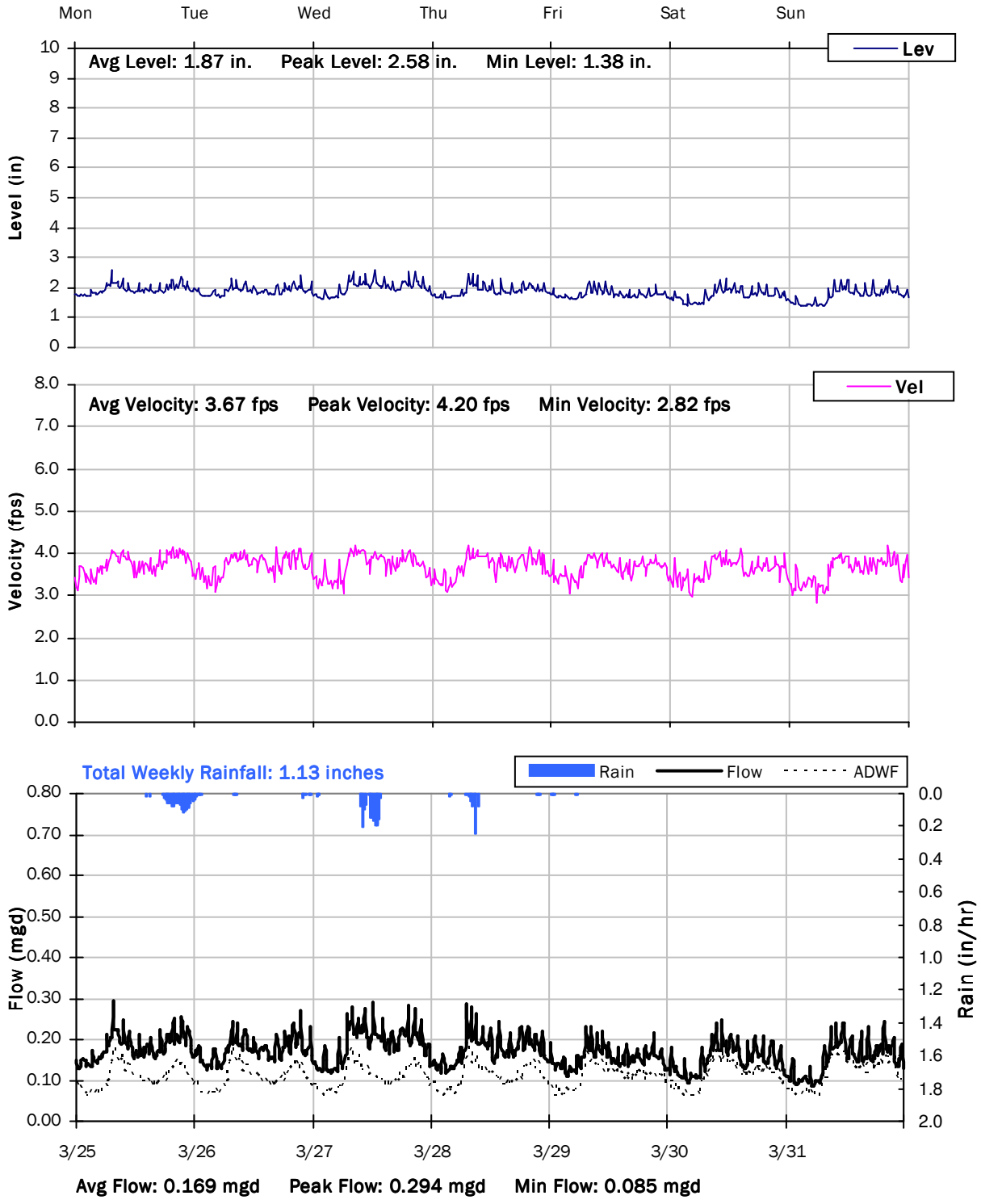
3/18/2019 to 3/25/2019



SITE 8

Weekly Level, Velocity and Flow Hydrographs

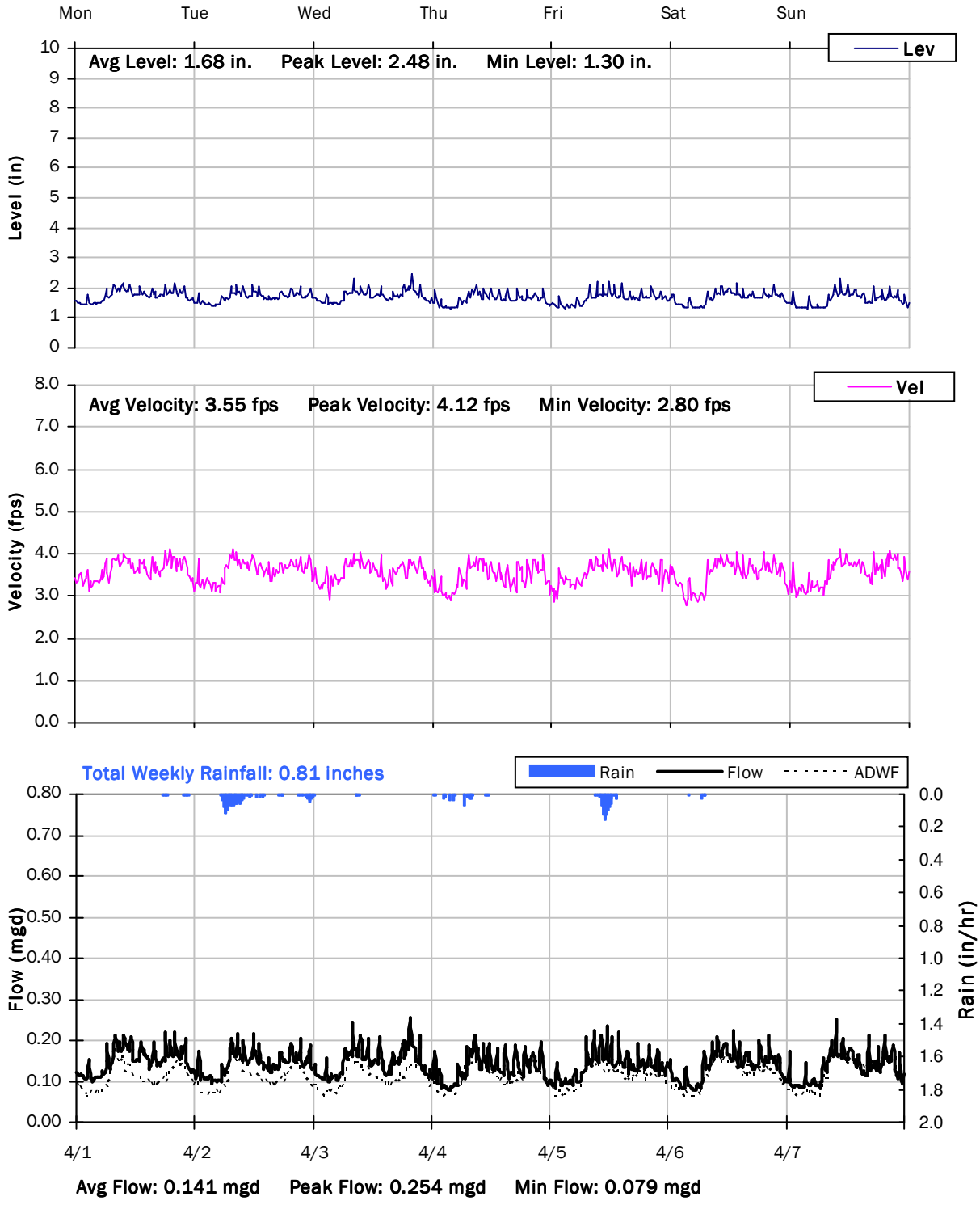
3/25/2019 to 4/1/2019



SITE 8

Weekly Level, Velocity and Flow Hydrographs

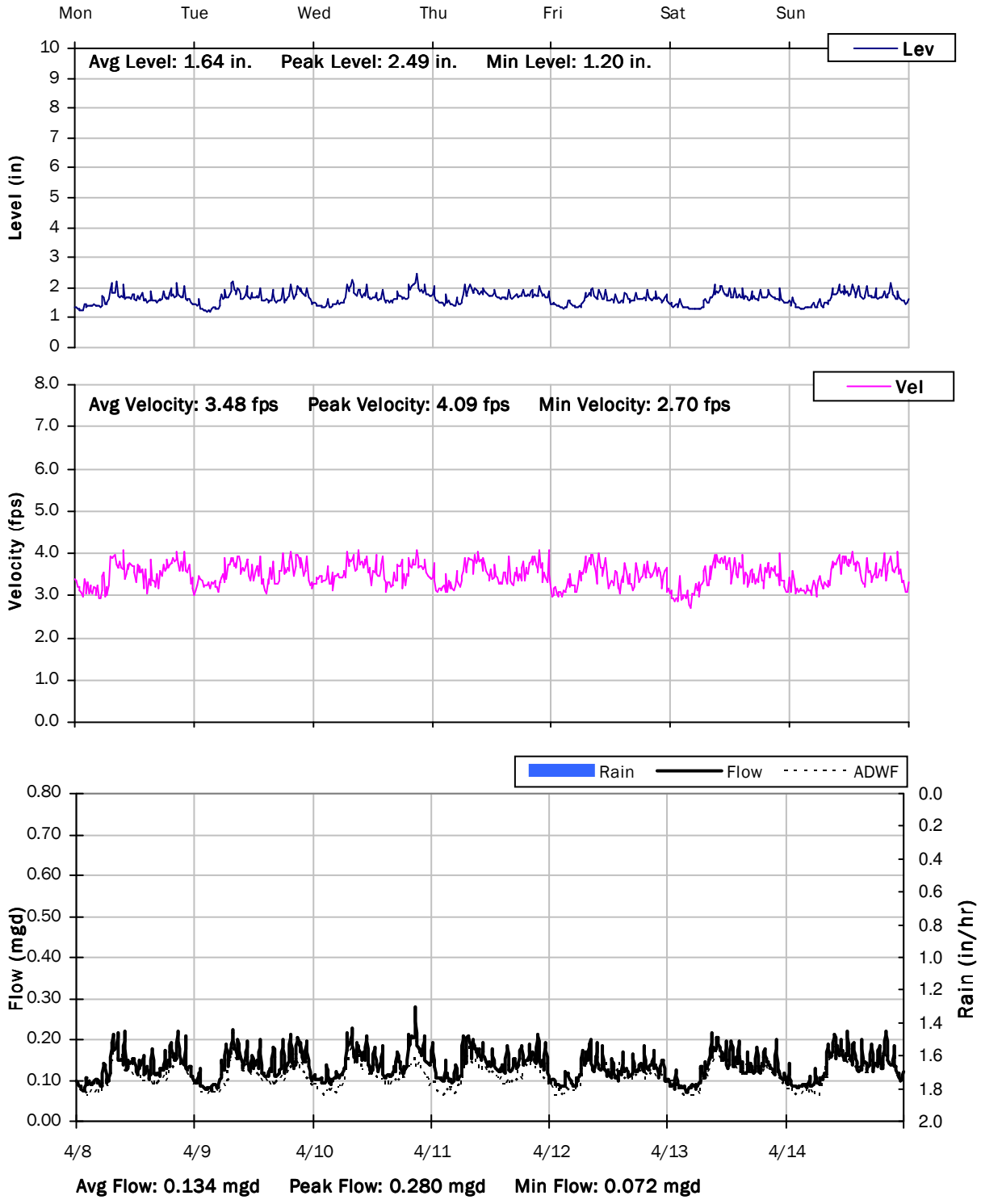
4/1/2019 to 4/8/2019



SITE 8

Weekly Level, Velocity and Flow Hydrographs

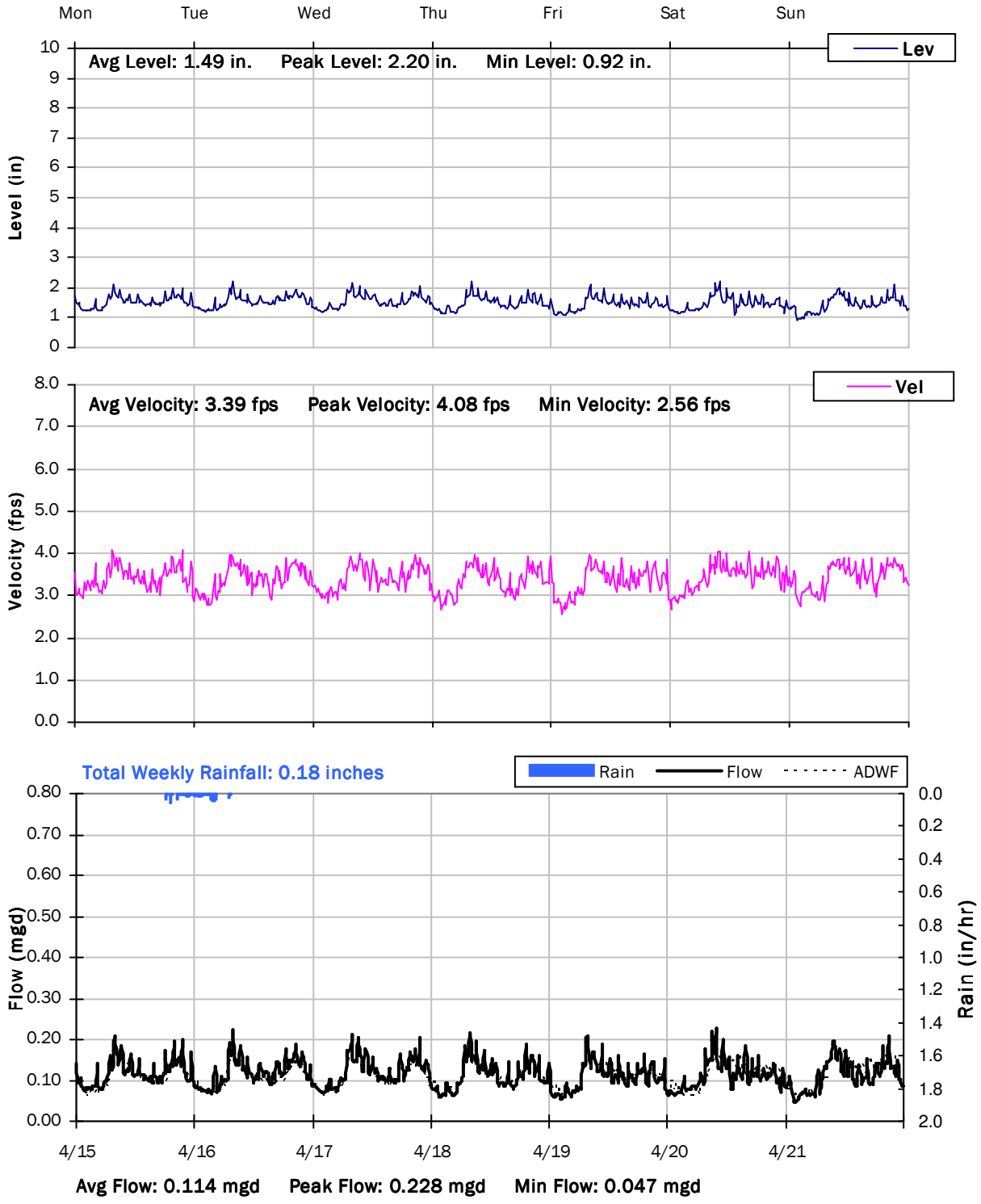
4/8/2019 to 4/15/2019



SITE 8

Weekly Level, Velocity and Flow Hydrographs

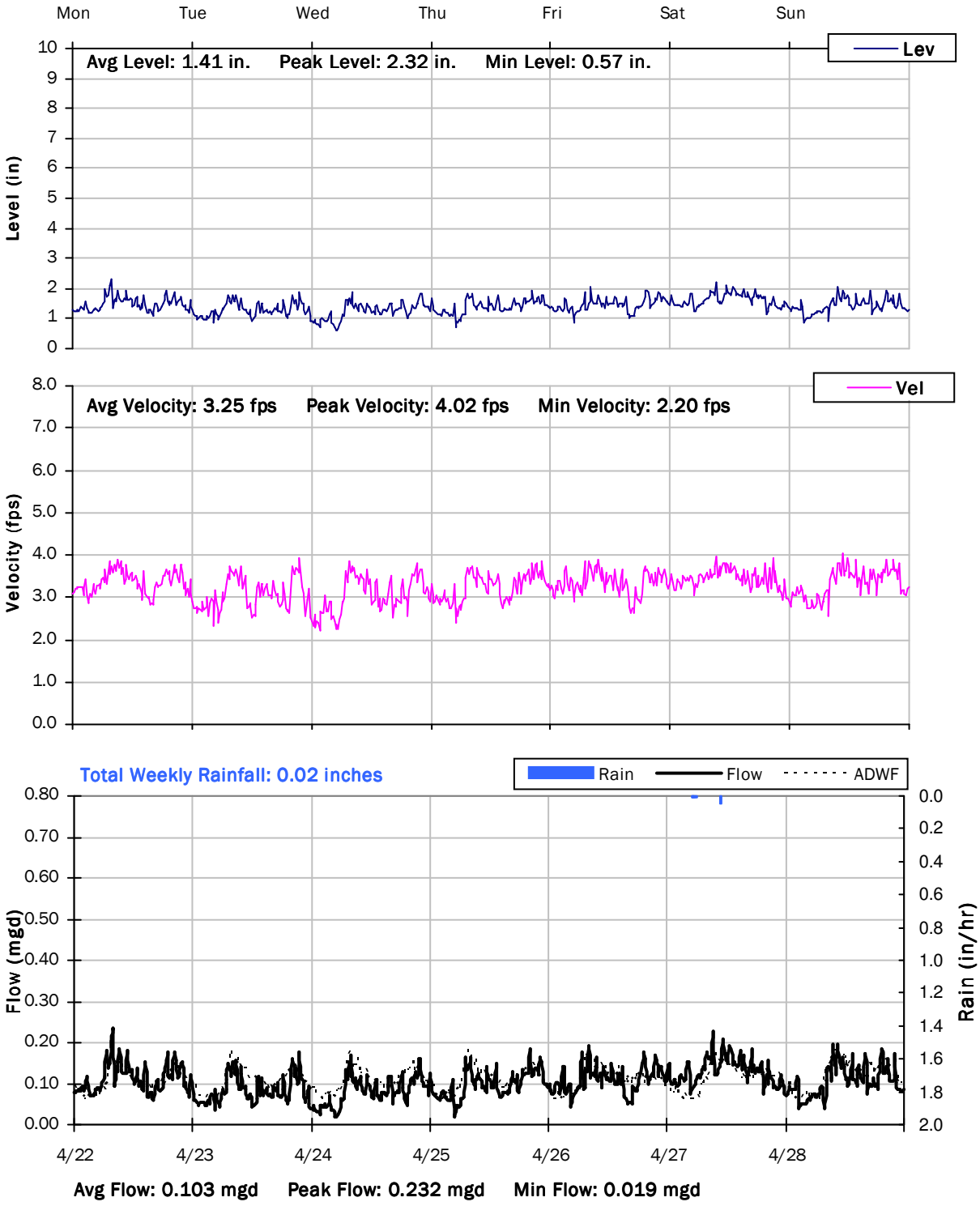
4/15/2019 to 4/22/2019



SITE 8

Weekly Level, Velocity and Flow Hydrographs

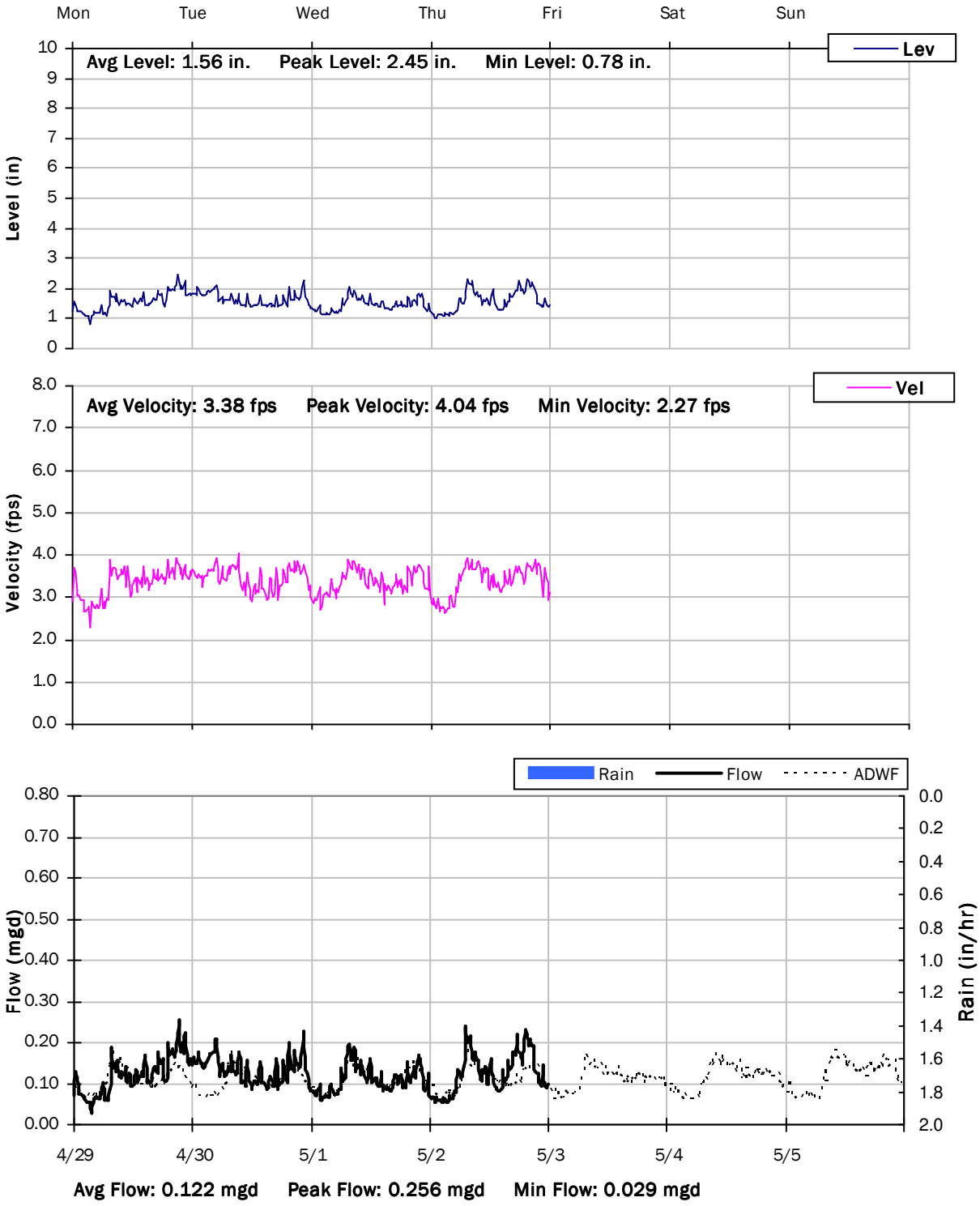
4/22/2019 to 4/29/2019



SITE 8

Weekly Level, Velocity and Flow Hydrographs

4/29/2019 to 5/6/2019



<V&A Project No. 18-0162>







V&A consulting engineers
1000 Broadway
Suite 320
Oakland, CA 94607
510.903.6600
510.903.6601, Fax

Attachment 2

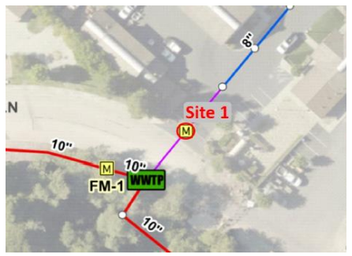
DRY WEATNER FLOW CALIBRATION

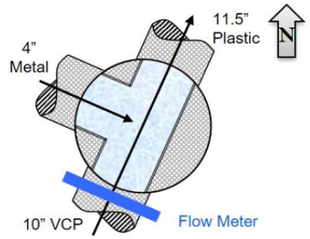
Flow Monitoring Site 1, Dry Weather Flow Calibration

Location: In Treatment Plant, inside gate
Pipeline Diameter: 10"
City Manhole ID: none
Model Pipe ID: P-354

Flow Monitor Location













Model Calibration Summary

	Measured Data[1]				Modeled Data				Percent Error[3]			
Day	Avg. Flow (mgd)	Peak Flow[2] (mgd)	Avg. Level (in)	Avg. Vel. (ft/s)	Avg. Flow (mgd)	Peak Flow[2] (mgd)	Avg. Level (in)	Avg. Vel. (ft/s)	Avg. Flow (%)	Peak Flow (%)	Avg. Level (%)	Avg. Vel. (%)
Mon.	0.02	0.03	1.4	0.66	0.02	0.03	0.8	1.25	0.0%	-2.6%	-41.3%	90.5%
Tues.	0.02	0.03	1.4	0.66	0.02	0.03	0.8	1.25	0.0%	-2.6%	-41.3%	90.5%
Wed.	0.02	0.03	1.4	0.66	0.02	0.03	0.8	1.25	0.0%	-2.6%	-41.3%	90.5%
Thur.	0.02	0.03	1.4	0.66	0.02	0.03	0.8	1.25	0.0%	-2.6%	-41.3%	90.5%
Fri.	0.02	0.03	1.4	0.65	0.02	0.03	0.8	1.24	-0.2%	-14.3%	-41.1%	90.7%
Sat.	0.02	0.03	1.4	0.66	0.02	0.03	0.8	1.24	0.1%	-10.2%	-40.8%	87.1%
Sun.	0.02	0.03	1.4	0.67	0.02	0.03	0.8	1.26	0.2%	5.8%	-40.9%	89.1%
Summary												
Weekday	0.02	--	1.4	0.66	0.02	--	0.8	1.25	-0.1%	--	-41.3%	90.5%
Weekend	0.02	--	1.4	0.67	0.02	--	0.8	1.25	0.1%	--	-40.9%	88.1%
ADWF[4]	0.02	--	1.4	0.66	0.02	--	0.8	1.25	0.0%	--	-41.2%	89.8%

Notes:

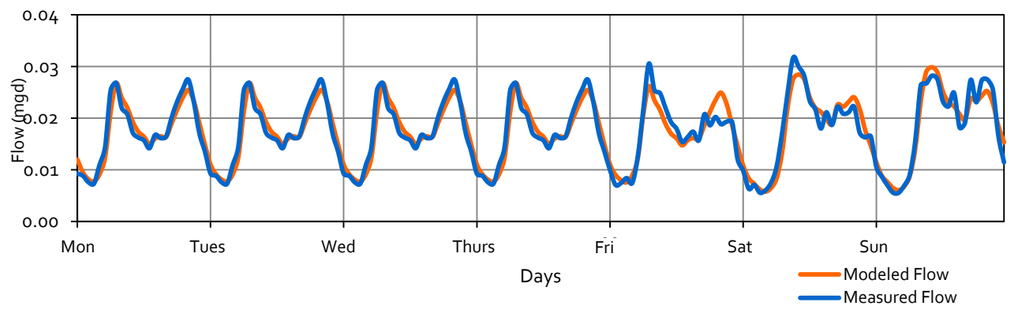
(1) Source: V&A Temporary Flow Monitoring Program (January 31, 2019 through May 2, 2019)

(2) Peak flow is the hourly average hourly peak flow, which was derived based on the 15-minute flow data from V&A.

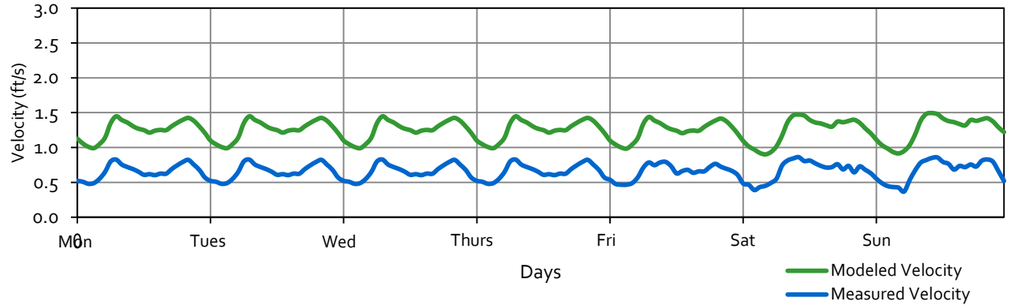
(3) Percent Error = (Modeled - Measured) /Measured x 100

(4) ADWF = (5xWeekday Average + 2xWeekend Average)/7

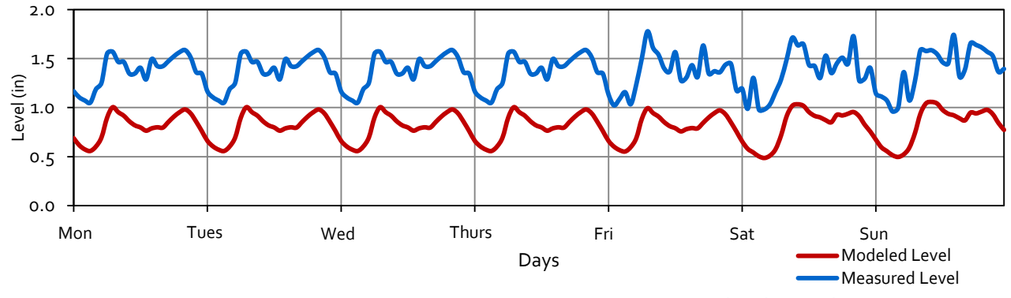
Flow Calibration



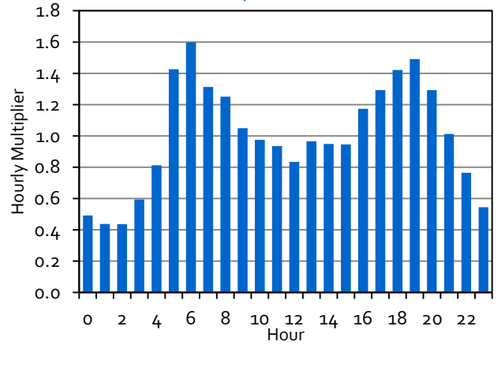
Velocity Calibration



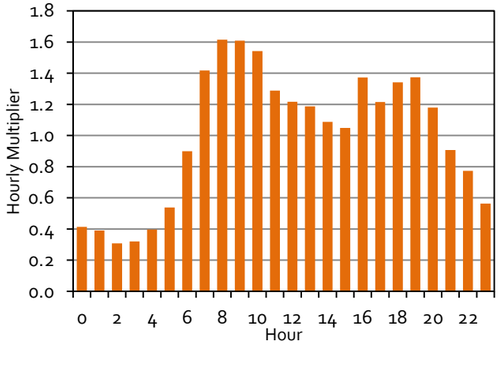
Level Calibration



Weekday Diurnal Pattern



Weekend Diurnal Pattern

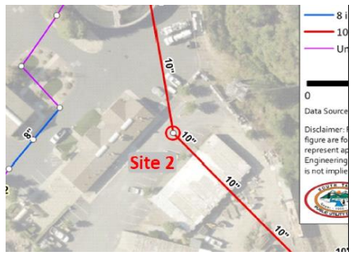


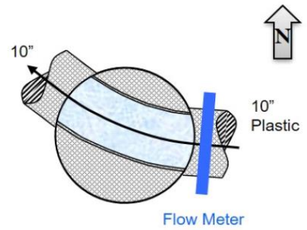
Flow Monitoring Site 2, Dry Weather Flow Calibration

Location: In Treatment Plant, behind parked car
Pipeline Diameter: 10"
City Manhole ID: none
Model Pipe ID: P-379

Flow Monitor Location













Model Calibration Summary

	Measured Data[1]				Modeled Data				Percent Error[3]			
Day	Avg. Flow (mgd)	Peak Flow[2] (mgd)	Avg. Level (in)	Avg. Vel. (ft/s)	Avg. Flow (mgd)	Peak Flow[2] (mgd)	Avg. Level (in)	Avg. Vel. (ft/s)	Avg. Flow (%)	Peak Flow (%)	Avg. Level (%)	Avg. Vel. (%)
Mon.	0.08	0.13	1.8	1.56	0.08	0.12	2.0	1.49	0.3%	-9.3%	7.9%	-4.5%
Tues.	0.08	0.13	1.8	1.56	0.08	0.12	2.0	1.49	0.3%	-9.3%	7.9%	-4.5%
Wed.	0.08	0.13	1.8	1.56	0.08	0.12	2.0	1.49	0.3%	-9.3%	7.9%	-4.5%
Thur.	0.08	0.13	1.8	1.56	0.08	0.12	2.0	1.49	0.3%	-9.3%	7.9%	-4.5%
Fri.	0.08	0.13	1.8	1.57	0.08	0.12	2.0	1.49	0.1%	-4.6%	8.7%	-4.7%
Sat.	0.08	0.16	1.8	1.58	0.08	0.14	2.0	1.50	-0.1%	-12.8%	8.2%	-5.3%
Sun.	0.08	0.15	1.8	1.57	0.08	0.14	2.0	1.49	0.2%	-3.6%	9.2%	-5.1%
Summary												
Weekday	0.08	--	1.8	1.56	0.08	--	2.0	1.49	0.3%	--	8.0%	-4.5%
Weekend	0.08	--	1.8	1.58	0.08	--	2.0	1.49	0.1%	--	8.7%	-5.2%
ADWF[4]	0.08	--	1.8	1.57	0.08	--	2.0	1.49	0.2%	--	8.2%	-4.7%

Notes:

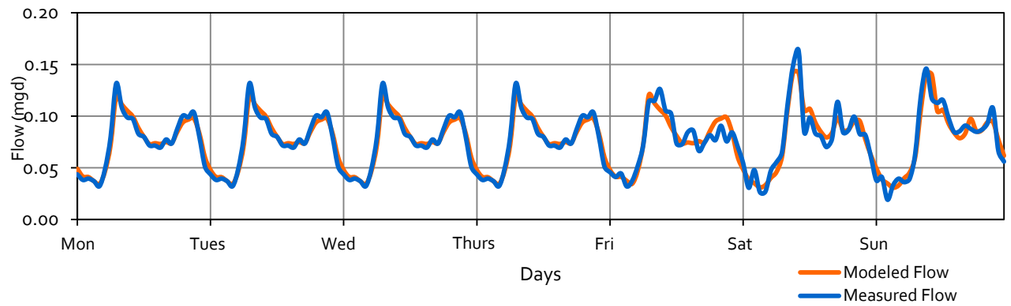
(1) Source: V&A Temporary Flow Monitoring Program (January 31, 2019 through May 2, 2019)

(2) Peak flow is the hourly average hourly peak flow, which was derived based on the 15-minute flow data from V&A.

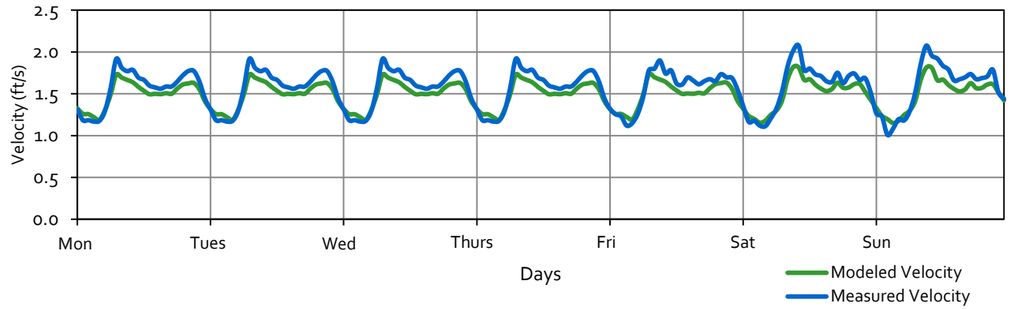
(3) Percent Error = (Modeled - Measured) /Measured x 100

(4) ADWF = (5xWeekday Average + 2xWeekend Average)/7

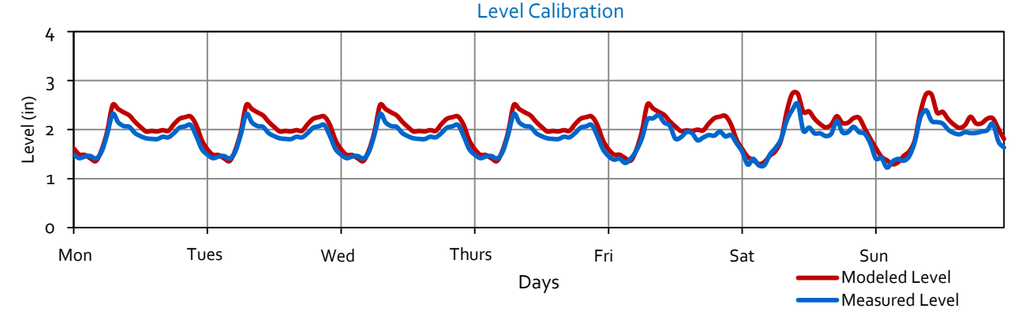
Flow Calibration



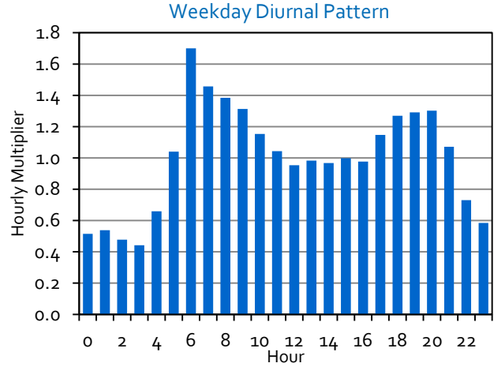
Velocity Calibration



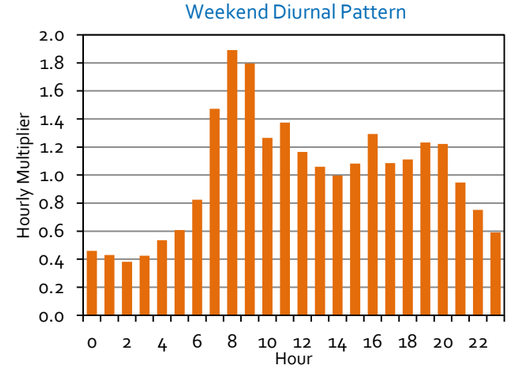
Level Calibration



Weekday Diurnal Pattern



Weekend Diurnal Pattern

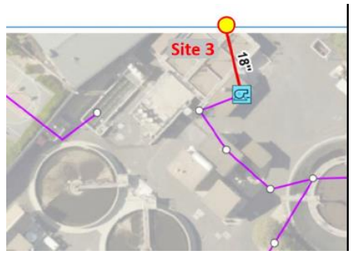


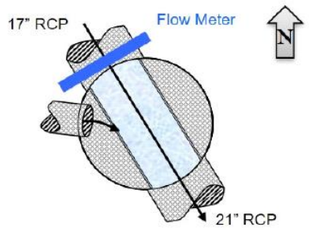
Flow Monitoring Site 3, Dry Weather Flow Calibration

Location: In Treatment Plant, behind gate
Pipeline Diameter: 18"
City Manhole ID: C7-002
Model Pipe ID: P-85

Flow Monitor Location













Model Calibration Summary

Day	Measured Data[1] Avg. Flow (mgd)	Peak Flow[2] (mgd)	Avg. Level (in)	Avg. Vel. (ft/s)	Modeled Data Avg. Flow (mgd)	Peak Flow[2] (mgd)	Avg. Level (in)	Avg. Vel. (ft/s)	Percent Error[3] Avg. Flow (%)	Peak Flow (%)	Avg. Level (%)	Avg. Vel. (%)
Mon.	0.66	1.00	4.8	2.71	0.66	1.01	4.8	2.68	0.2%	0.8%	-1.4%	-1.1%
Tues.	0.66	1.00	4.8	2.71	0.66	1.01	4.8	2.68	0.2%	0.8%	-1.4%	-1.1%
Wed.	0.66	1.00	4.8	2.71	0.66	1.01	4.8	2.68	0.2%	0.8%	-1.4%	-1.1%
Thur.	0.66	1.00	4.8	2.71	0.66	1.01	4.8	2.68	0.2%	0.8%	-1.4%	-1.1%
Fri.	0.68	1.09	4.8	2.79	0.68	1.03	4.8	2.69	0.1%	-5.2%	-0.2%	-3.3%
Sat.	0.66	1.05	4.7	2.73	0.66	1.06	4.7	2.66	-0.3%	0.3%	0.1%	-2.5%
Sun.	0.69	1.07	4.7	2.74	0.69	1.10	4.8	2.70	0.0%	2.6%	1.5%	-1.4%
Summary												
Weekday	0.66	--	4.8	2.72	0.67	--	4.8	2.68	0.2%	--	-1.2%	-1.6%
Weekend	0.67	--	4.7	2.73	0.67	--	4.8	2.68	-0.1%	--	0.8%	-2.0%
ADWF[4]	0.67	--	4.8	2.73	0.67	--	4.8	2.68	0.1%	--	-0.6%	-1.7%

Notes:

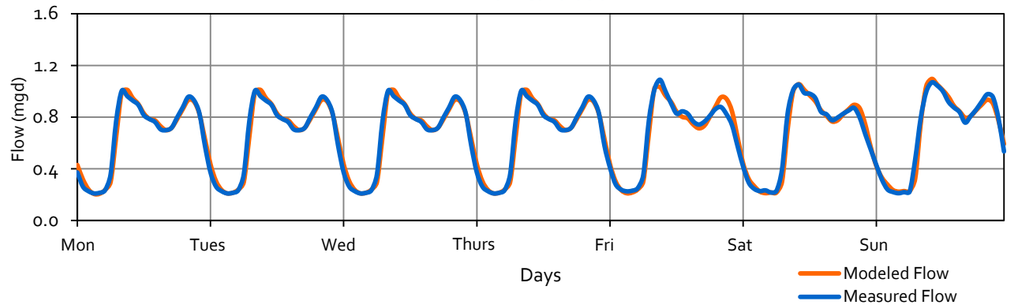
(1) Source: V&A Temporary Flow Monitoring Program (January 31, 2019 through May 2, 2019)

(2) Peak flow is the hourly average hourly peak flow, which was derived based on the 15-minute flow data from V&A.

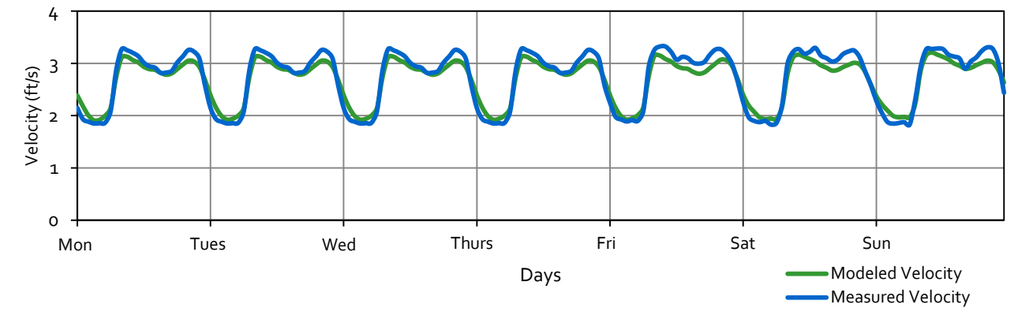
(3) Percent Error = (Modeled - Measured) /Measured x 100

(4) ADWF = (5xWeekday Average + 2xWeekend Average)/7

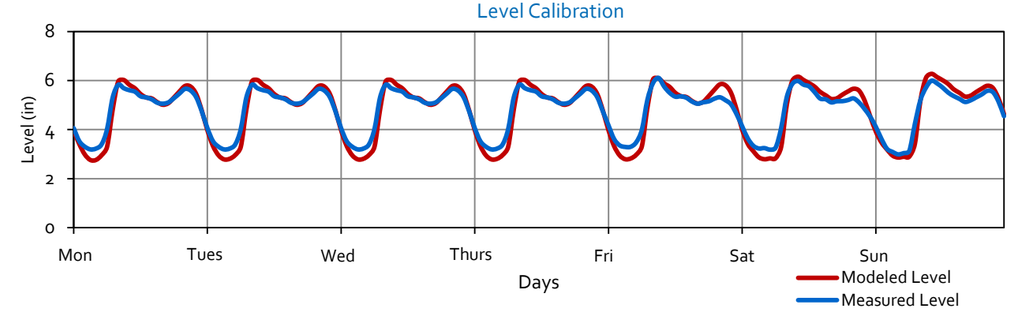
Flow Calibration



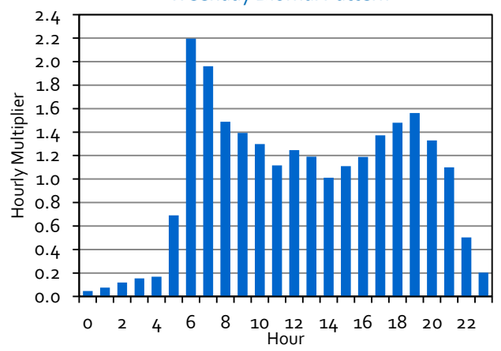
Velocity Calibration



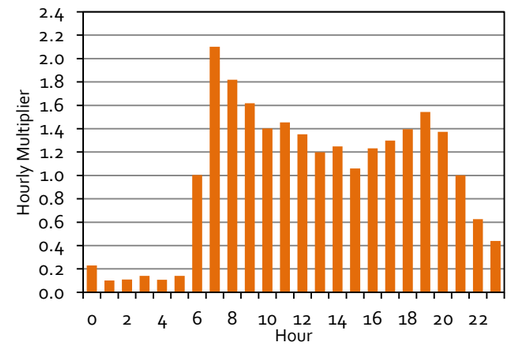
Level Calibration



Weekday Diurnal Pattern



Weekend Diurnal Pattern

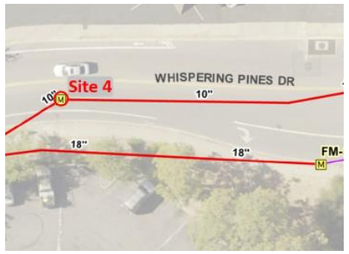


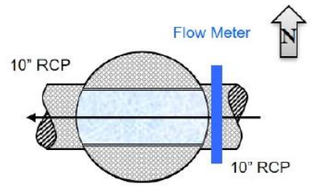
Flow Monitoring Site 4, Dry Weather Flow Calibration

Location: Sidewalk near Bubbles Laundromat
Pipeline Diameter: 10"
City Manhole ID: C7-032
Model Pipe ID: P-913

Flow Monitor Location













Model Calibration Summary

Day	Measured Data[1] Avg. Flow (mgd)	Measured Data[1] Peak Flow[2] (mgd)	Measured Data[1] Avg. Level (in)	Measured Data[1] Avg. Vel. (ft/s)	Modeled Data Avg. Flow (mgd)	Modeled Data Peak Flow[2] (mgd)	Modeled Data Avg. Level (in)	Modeled Data Avg. Vel. (ft/s)	Percent Error[3] Avg. Flow (%)	Percent Error[3] Peak Flow (%)	Percent Error[3] Avg. Level (%)	Percent Error[3] Avg. Vel. (%)
Mon.	0.05	0.08	1.2	2.24	0.05	0.08	1.1	2.18	0.2%	0.0%	-2.9%	-2.7%
Tues.	0.05	0.08	1.2	2.24	0.05	0.08	1.1	2.18	0.2%	0.0%	-2.9%	-2.7%
Wed.	0.05	0.08	1.2	2.24	0.05	0.08	1.1	2.18	0.2%	0.0%	-2.9%	-2.7%
Thur.	0.05	0.08	1.2	2.24	0.05	0.08	1.1	2.18	0.2%	0.0%	-2.9%	-2.7%
Fri.	0.05	0.08	1.1	2.10	0.05	0.07	1.1	2.15	0.0%	-5.5%	-2.4%	2.3%
Sat.	0.06	0.10	1.2	2.42	0.06	0.10	1.2	2.28	0.3%	3.2%	4.3%	-5.7%
Sun.	0.06	0.11	1.2	2.51	0.06	0.11	1.2	2.30	0.1%	-5.0%	5.8%	-8.2%
Summary												
Weekday	0.05	--	1.1	2.21	0.05	--	1.1	2.17	0.2%	--	-2.8%	-1.7%
Weekend	0.06	--	1.2	2.47	0.06	--	1.2	2.29	0.2%	--	5.0%	-7.0%
ADWF[4]	0.05	--	1.2	2.28	0.05	--	1.1	2.20	0.2%	--	-0.5%	-3.4%

Notes:

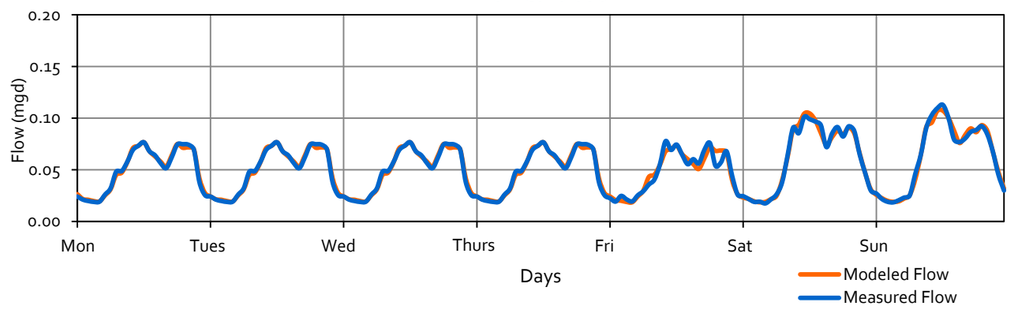
(1) Source: V&A Temporary Flow Monitoring Program (January 31, 2019 through May 2, 2019)

(2) Peak flow is the hourly average hourly peak flow, which was derived based on the 15-minute flow data from V&A.

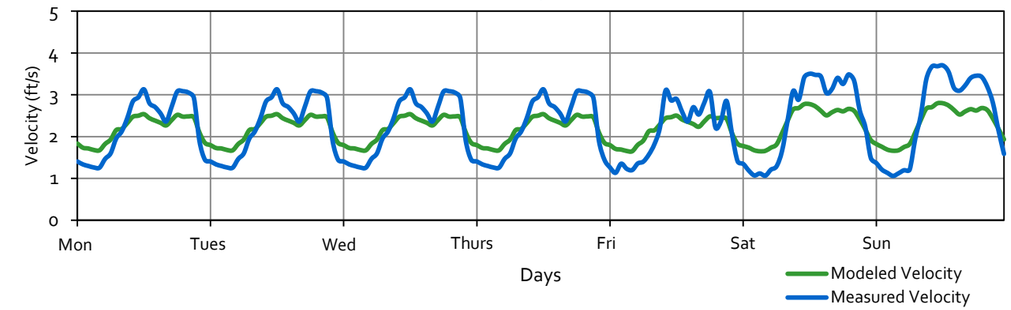
(3) Percent Error = (Modeled - Measured) /Measured x 100

(4) ADWF = (5xWeekday Average + 2xWeekend Average)/7

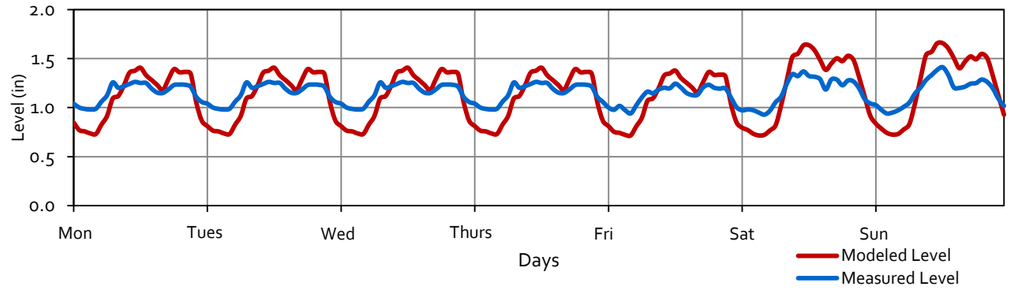
Flow Calibration



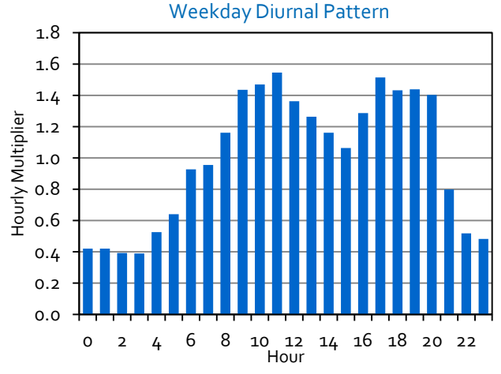
Velocity Calibration



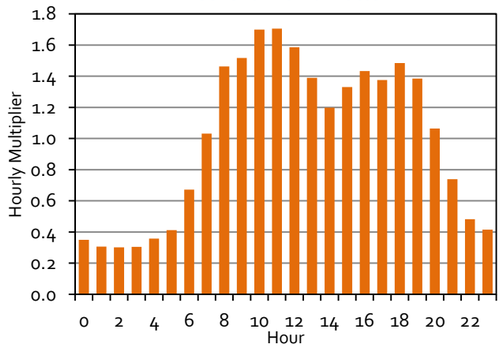
Level Calibration



Weekday Diurnal Pattern



Weekend Diurnal Pattern

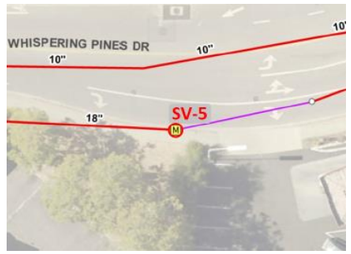


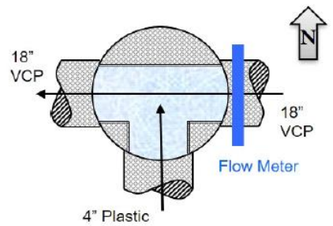
Flow Monitoring Site 5, Dry Weather Flow Calibration

Location: Whispering Pines Drive, West of Mt. Hermon Road
Pipeline Diameter: 18"
City Manhole ID: C7-028
Model Pipe ID: P-893

Flow Monitor Location













Model Calibration Summary

Day	Measured Data[1] Avg. Flow (mgd)	Measured Data[1] Peak Flow[2] (mgd)	Measured Data[1] Avg. Level (in)	Measured Data[1] Avg. Vel. (ft/s)	Modeled Data Avg. Flow (mgd)	Modeled Data Peak Flow[2] (mgd)	Modeled Data Avg. Level (in)	Modeled Data Avg. Vel. (ft/s)	Percent Error[3] Avg. Flow (%)	Percent Error[3] Peak Flow (%)	Percent Error[3] Avg. Level (%)	Percent Error[3] Avg. Vel. (%)
Mon.	0.42	0.68	1.9	6.00	0.42	0.63	2.1	5.48	0.0%	-7.1%	8.0%	-8.7%
Tues.	0.42	0.68	1.9	6.00	0.42	0.63	2.1	5.48	0.0%	-7.1%	8.0%	-8.7%
Wed.	0.42	0.68	1.9	6.00	0.42	0.63	2.1	5.48	0.0%	-7.1%	8.0%	-8.7%
Thur.	0.42	0.68	1.9	6.00	0.42	0.63	2.1	5.48	0.0%	-7.1%	8.0%	-8.7%
Fri.	0.42	0.69	2.0	6.06	0.42	0.63	2.1	5.49	0.2%	-8.7%	6.4%	-9.5%
Sat.	0.39	0.67	1.9	5.90	0.40	0.62	2.0	5.36	0.7%	-7.3%	8.4%	-9.1%
Sun.	0.40	0.64	1.9	5.77	0.40	0.62	2.0	5.38	0.1%	-2.8%	7.8%	-6.8%
Summary												
Weekday	0.42	--	1.9	6.01	0.42	--	2.1	5.48	0.0%	--	7.7%	-8.9%
Weekend	0.40	--	1.9	5.84	0.40	--	2.0	5.37	0.4%	--	8.1%	-8.0%
ADWF[4]	0.41	--	1.9	5.96	0.41	--	2.1	5.45	0.1%	--	7.8%	-8.6%

Notes:

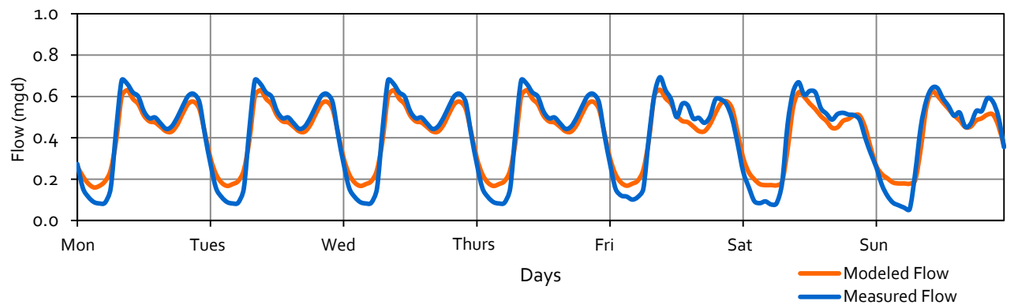
(1) Source: V&A Temporary Flow Monitoring Program (January 31, 2019 through May 2, 2019)

(2) Peak flow is the hourly average hourly peak flow, which was derived based on the 15-minute flow data from V&A.

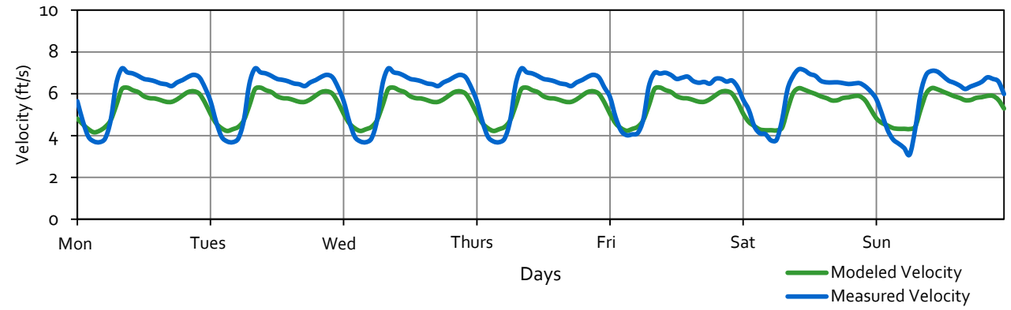
(3) Percent Error = (Modeled - Measured) /Measured x 100

(4) ADWF = (5xWeekday Average + 2xWeekend Average)/7

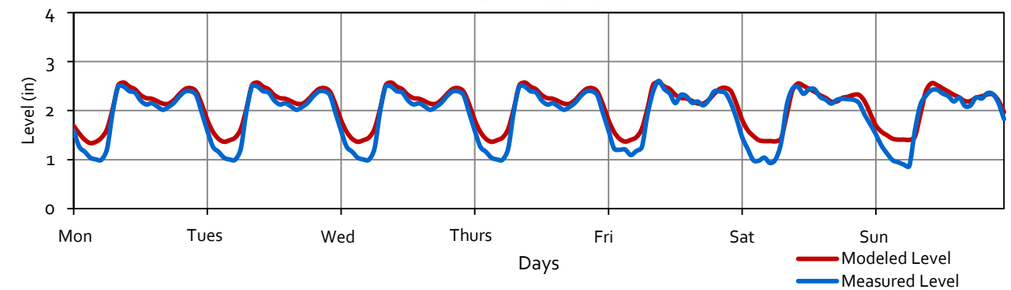
Flow Calibration



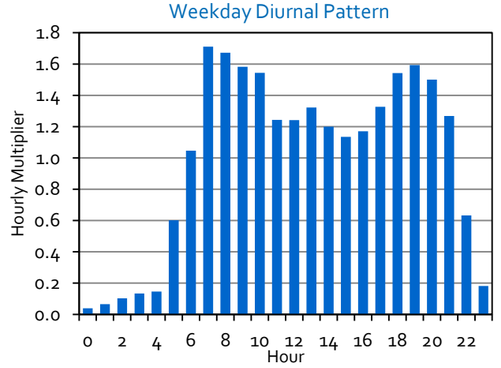
Velocity Calibration



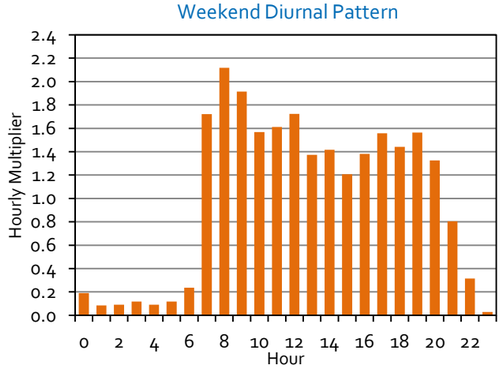
Level Calibration



Weekday Diurnal Pattern



Weekend Diurnal Pattern



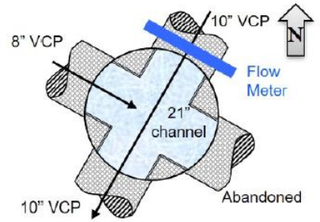
Flow Monitoring Site 6, Dry Weather Flow Calibration

Location: Scotts Valley Drive, South of Ball Drive
Pipeline Diameter: 10"
City Manhole ID: none
Model Pipe ID: P-1509

Flow Monitor Location













Model Calibration Summary

Day	Measured Data[1] Avg. Flow (mgd)	Measured Data[1] Peak Flow[2] (mgd)	Measured Data[1] Avg. Level (in)	Measured Data[1] Avg. Vel. (ft/s)	Modeled Data Avg. Flow (mgd)	Modeled Data Peak Flow[2] (mgd)	Modeled Data Avg. Level (in)	Modeled Data Avg. Vel. (ft/s)	Percent Error[3] Avg. Flow (%)	Percent Error[3] Peak Flow (%)	Percent Error[3] Avg. Level (%)	Percent Error[3] Avg. Vel. (%)
Mon.	0.10	0.15	2.3	1.67	0.10	0.15	2.3	1.66	0.5%	-0.7%	1.5%	-0.9%
Tues.	0.10	0.15	2.3	1.67	0.10	0.15	2.3	1.66	0.5%	-0.7%	1.5%	-0.9%
Wed.	0.10	0.15	2.3	1.67	0.10	0.15	2.3	1.66	0.5%	-0.7%	1.5%	-0.9%
Thur.	0.10	0.15	2.3	1.67	0.10	0.15	2.3	1.66	0.5%	-0.7%	1.5%	-0.9%
Fri.	0.10	0.15	2.2	1.70	0.10	0.15	2.3	1.65	0.5%	-0.2%	2.7%	-3.2%
Sat.	0.11	0.17	2.3	1.69	0.10	0.16	2.3	1.66	-0.5%	-2.2%	0.6%	-1.6%
Sun.	0.11	0.17	2.3	1.70	0.11	0.17	2.4	1.69	0.0%	-1.2%	1.1%	-0.6%
Summary												
Weekday	0.10	--	2.3	1.68	0.10	--	2.3	1.66	0.5%	--	1.8%	-1.4%
Weekend	0.11	--	2.3	1.69	0.11	--	2.3	1.68	-0.3%	--	0.9%	-1.1%
ADWF[4]	0.10	--	2.3	1.68	0.10	--	2.3	1.66	0.3%	--	1.5%	-1.3%

Notes:

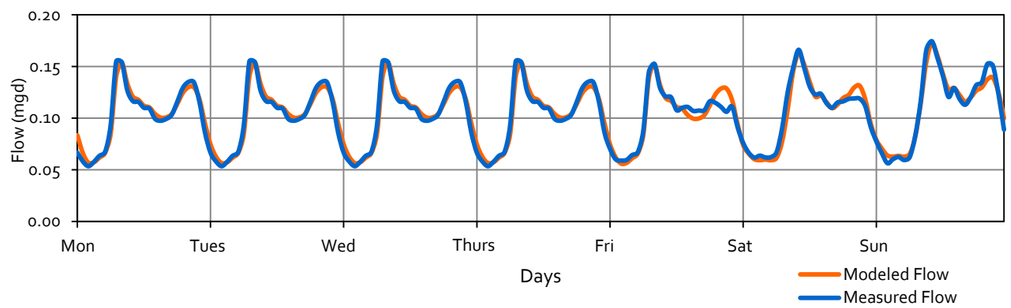
(1) Source: V&A Temporary Flow Monitoring Program (January 31, 2019 through May 2, 2019)

(2) Peak flow is the hourly average hourly peak flow, which was derived based on the 15-minute flow data from V&A.

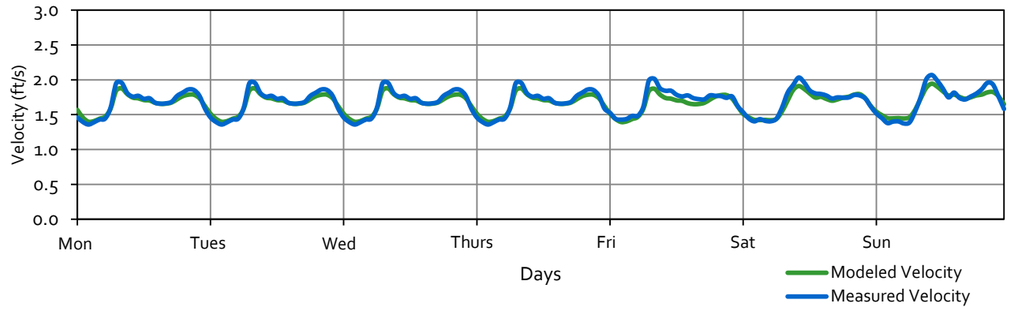
(3) Percent Error = (Modeled - Measured) /Measured x 100

(4) ADWF = (5xWeekday Average + 2xWeekend Average)/7

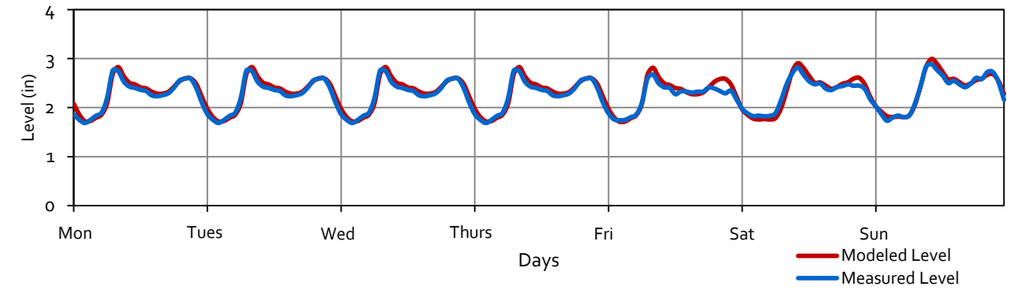
Flow Calibration



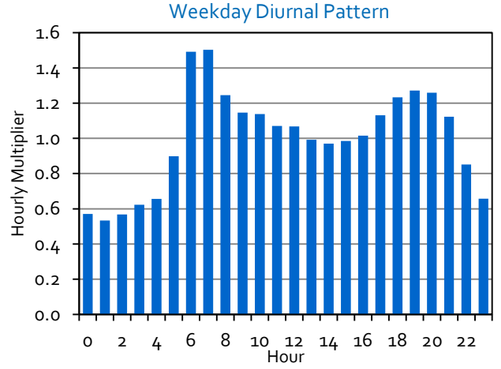
Velocity Calibration



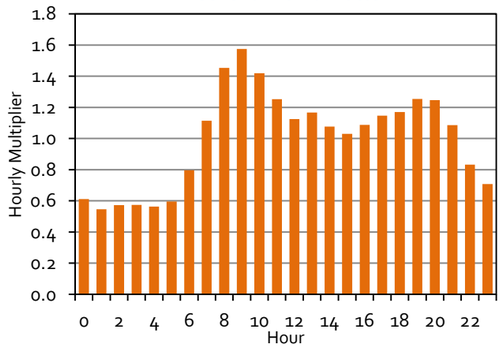
Level Calibration



Weekday Diurnal Pattern



Weekend Diurnal Pattern



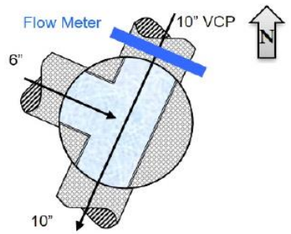
Flow Monitoring Site 7, Dry Weather Flow Calibration

Location: Glenwood Drive, North of Hacienda Drive
Pipeline Diameter: 10"
City Manhole ID: F7-013
Model Pipe ID: P-587

Flow Monitor Location













Model Calibration Summary

Day	Measured Data[1] Avg. Flow (mgd)	Peak Flow[2] (mgd)	Avg. Level (in)	Avg. Vel. (ft/s)	Modeled Data Avg. Flow (mgd)	Peak Flow[2] (mgd)	Avg. Level (in)	Avg. Vel. (ft/s)	Percent Error[3] Avg. Flow (%)	Peak Flow (%)	Avg. Level (%)	Avg. Vel. (%)
Mon.	0.05	0.08	1.8	1.19	0.05	0.07	1.8	1.20	0.2%	-7.0%	0.1%	0.7%
Tues.	0.05	0.08	1.8	1.19	0.05	0.07	1.8	1.20	0.2%	-7.0%	0.1%	0.7%
Wed.	0.05	0.08	1.8	1.19	0.05	0.07	1.8	1.20	0.2%	-7.0%	0.1%	0.7%
Thur.	0.05	0.08	1.8	1.19	0.05	0.07	1.8	1.20	0.2%	-7.0%	0.1%	0.7%
Fri.	0.06	0.08	1.9	1.20	0.06	0.08	1.8	1.22	0.2%	-2.9%	-1.0%	1.5%
Sat.	0.05	0.08	1.8	1.20	0.05	0.08	1.8	1.21	-0.2%	0.4%	-1.0%	0.9%
Sun.	0.06	0.09	1.9	1.20	0.06	0.08	1.8	1.23	0.1%	-8.9%	-0.6%	1.9%
Summary												
Weekday	0.05	--	1.8	1.19	0.05	--	1.8	1.20	0.2%	--	-0.1%	0.9%
Weekend	0.06	--	1.8	1.20	0.06	--	1.8	1.22	0.0%	--	-0.8%	1.4%
ADWF[4]	0.05	--	1.8	1.20	0.05	--	1.8	1.21	0.1%	--	-0.3%	1.0%

Notes:

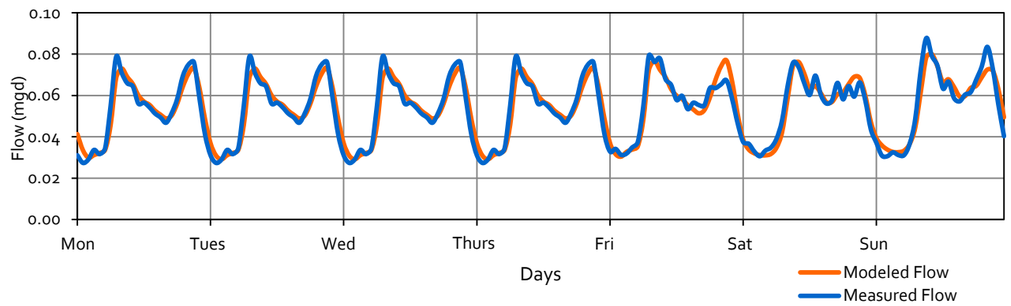
(1) Source: V&A Temporary Flow Monitoring Program (January 31, 2019 through May 2, 2019)

(2) Peak flow is the hourly average hourly peak flow, which was derived based on the 15-minute flow data from V&A.

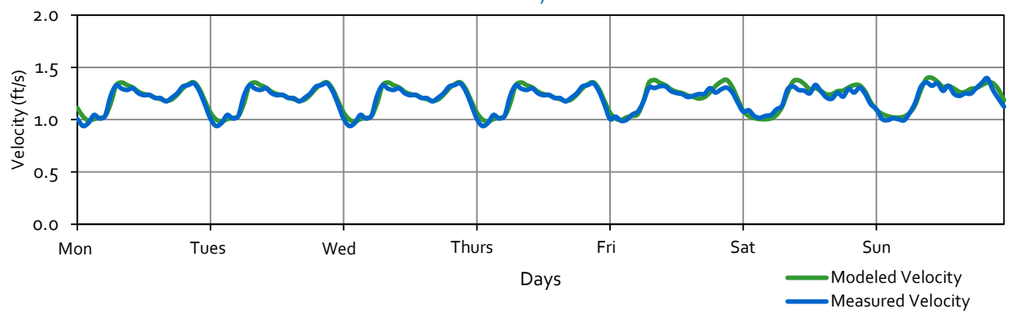
(3) Percent Error = (Modeled - Measured) /Measured x 100

(4) ADWF = (5xWeekday Average + 2xWeekend Average)/7

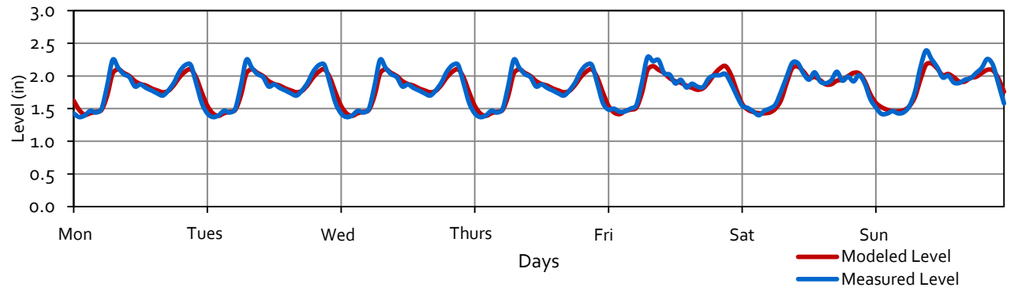
Flow Calibration



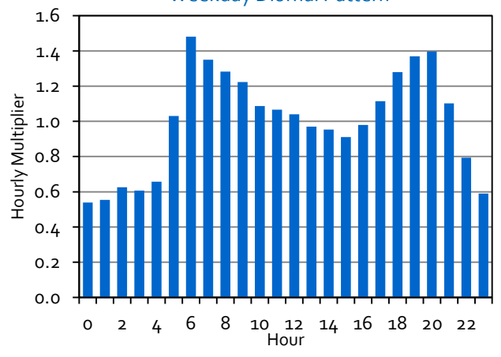
Velocity Calibration



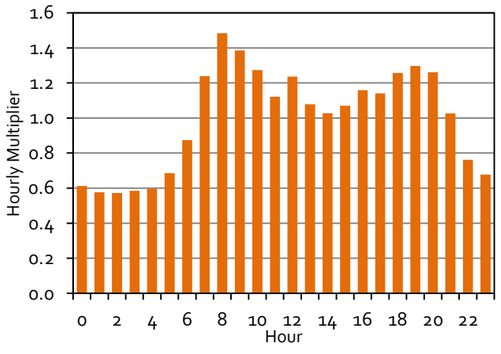
Level Calibration



Weekday Diurnal Pattern



Weekend Diurnal Pattern

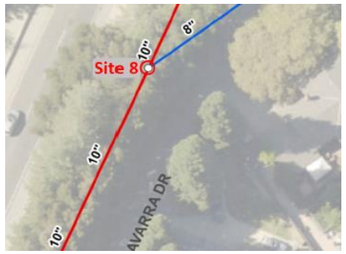


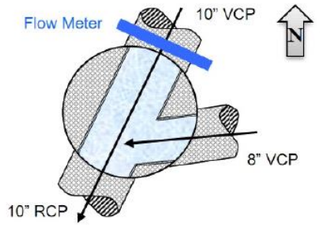
Flow Monitoring Site 8, Dry Weather Flow Calibration

Location: In bushesh between S. Navarraq Drive and Highway 17
Pipeline Diameter: 10"
City Manhole ID: E7-011
Model Pipe ID: P-1322

Flow Monitor Location













Model Calibration Summary

Day	Measured Data[1] Avg. Flow (mgd)	Peak Flow[2] (mgd)	Avg. Level (in)	Avg. Vel. (ft/s)	Modeled Data Avg. Flow (mgd)	Peak Flow[2] (mgd)	Avg. Level (in)	Avg. Vel. (ft/s)	Percent Error[3] Avg. Flow (%)	Peak Flow (%)	Avg. Level (%)	Avg. Vel. (%)
Mon.	0.11	0.16	1.6	3.45	0.11	0.15	1.5	3.18	0.0%	-7.1%	-5.1%	-7.8%
Tues.	0.11	0.16	1.6	3.45	0.11	0.15	1.5	3.18	0.0%	-7.1%	-5.1%	-7.8%
Wed.	0.11	0.16	1.6	3.45	0.11	0.15	1.5	3.18	0.0%	-7.1%	-5.1%	-7.8%
Thur.	0.11	0.16	1.6	3.45	0.11	0.15	1.5	3.18	0.0%	-7.1%	-5.1%	-7.8%
Fri.	0.11	0.15	1.6	3.46	0.11	0.15	1.5	3.19	0.1%	2.4%	-4.5%	-7.6%
Sat.	0.11	0.16	1.7	3.50	0.11	0.16	1.5	3.22	0.2%	0.6%	-7.3%	-8.0%
Sun.	0.12	0.17	1.7	3.55	0.12	0.17	1.6	3.28	-0.2%	-1.1%	-6.6%	-7.6%
Summary												
Weekday	0.11	--	1.6	3.45	0.11	--	1.5	3.18	0.0%	--	-5.0%	-7.7%
Weekend	0.12	--	1.7	3.52	0.12	--	1.6	3.25	0.0%	--	-6.9%	-7.8%
ADWF[4]	0.11	--	1.6	3.47	0.11	--	1.5	3.20	0.0%	--	-5.5%	-7.8%

Notes:

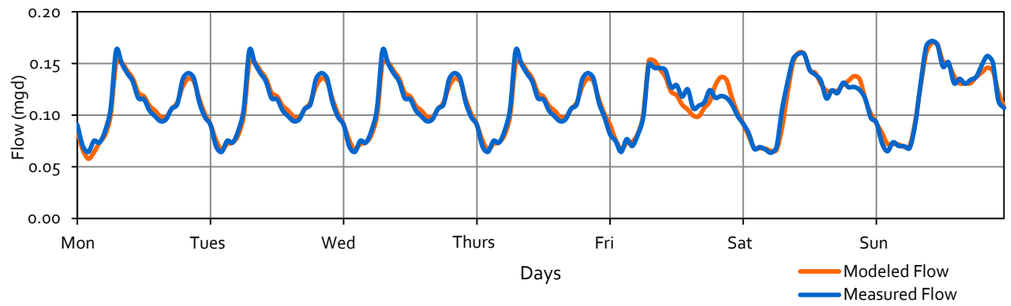
(1) Source: V&A Temporary Flow Monitoring Program (January 31, 2019 through May 2, 2019)

(2) Peak flow is the hourly average hourly peak flow, which was derived based on the 15-minute flow data from V&A.

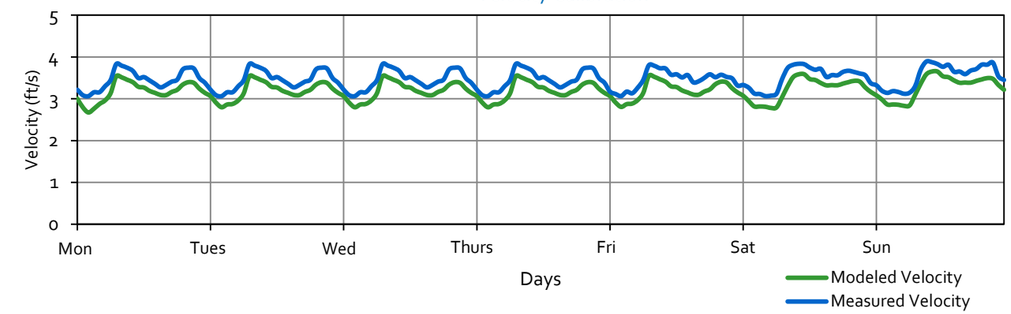
(3) Percent Error = (Modeled - Measured) /Measured x 100

(4) ADWF = (5xWeekday Average + 2xWeekend Average)/7

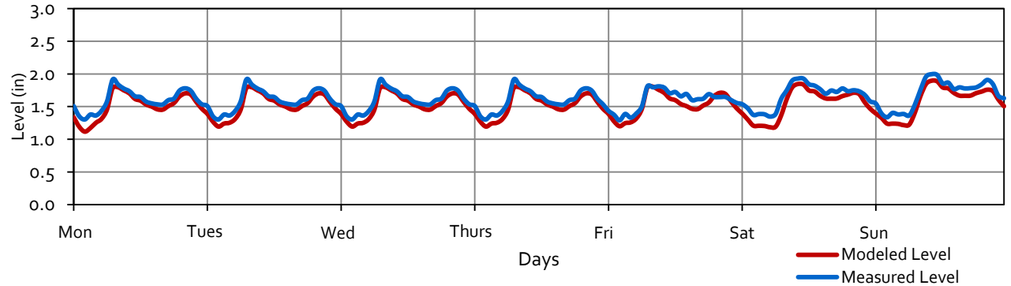
Flow Calibration



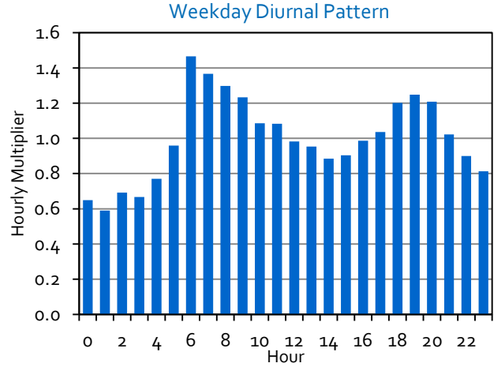
Velocity Calibration



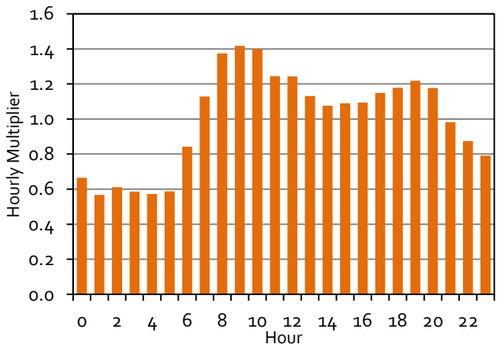
Level Calibration



Weekday Diurnal Pattern



Weekend Diurnal Pattern



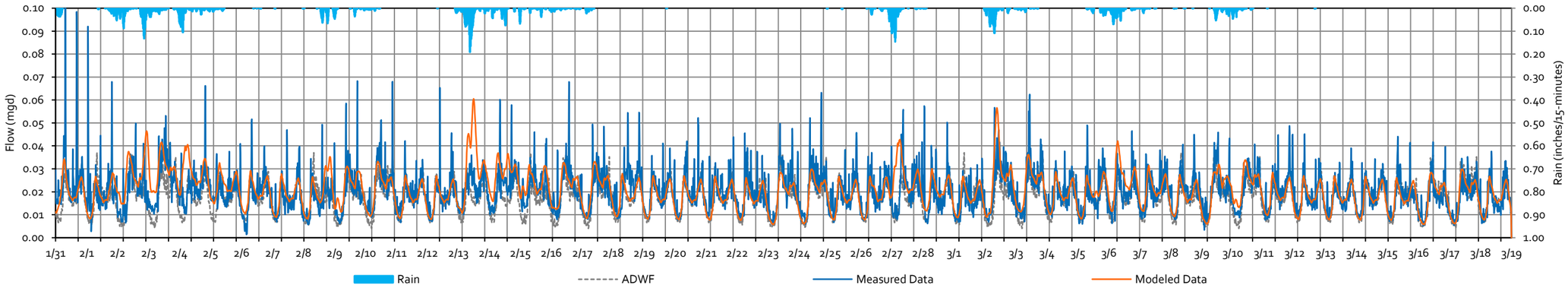
Attachment 3

WET WEATHER FLOW CALIBRATION

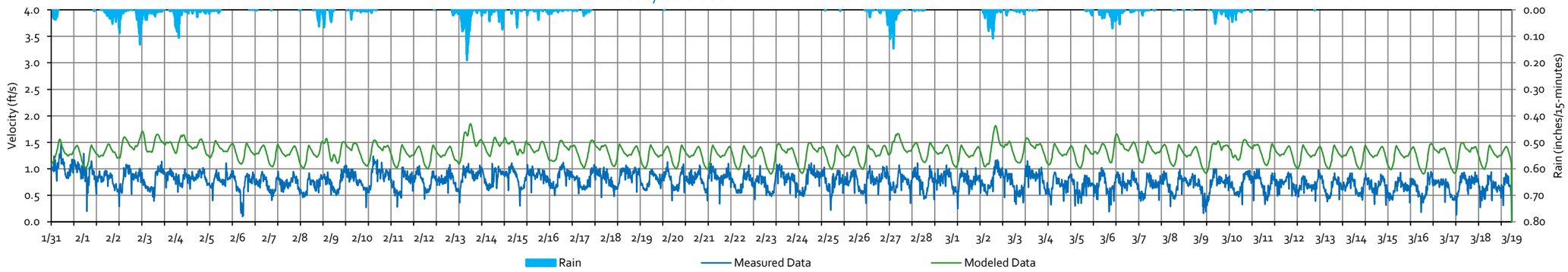
Site 1 Wet Weather Calibration

Location: In Treatment Plant, inside gate
Pipeline diameter: 10"
City Manhole ID: none
Model Pipe ID: P-354
Silt Level at Site: none"

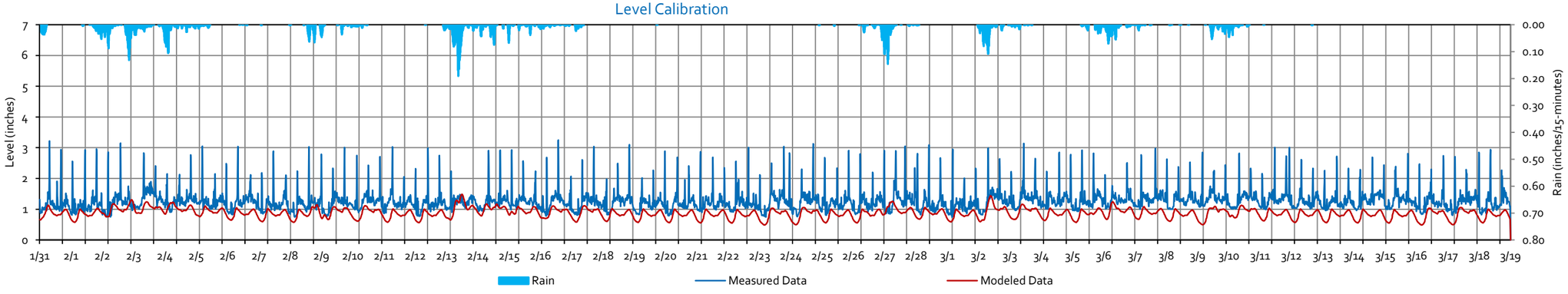
Flow Calibration



Velocity Calibration



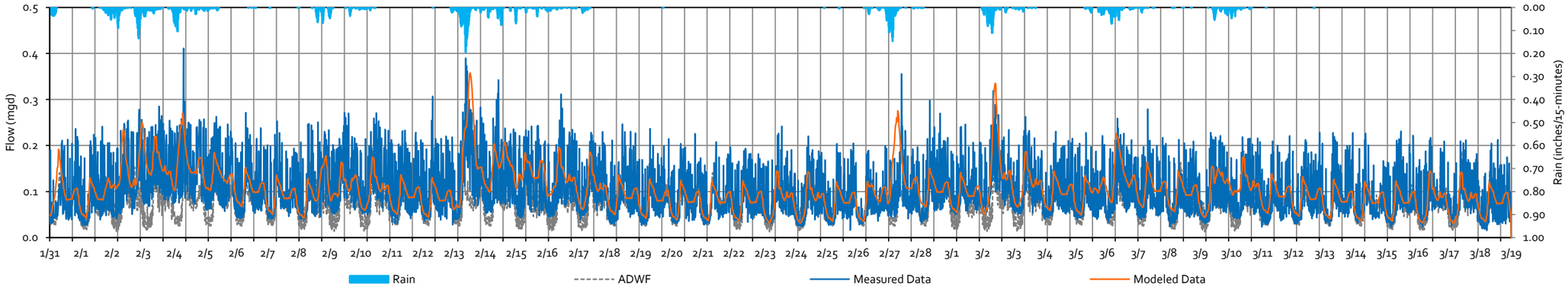
Level Calibration



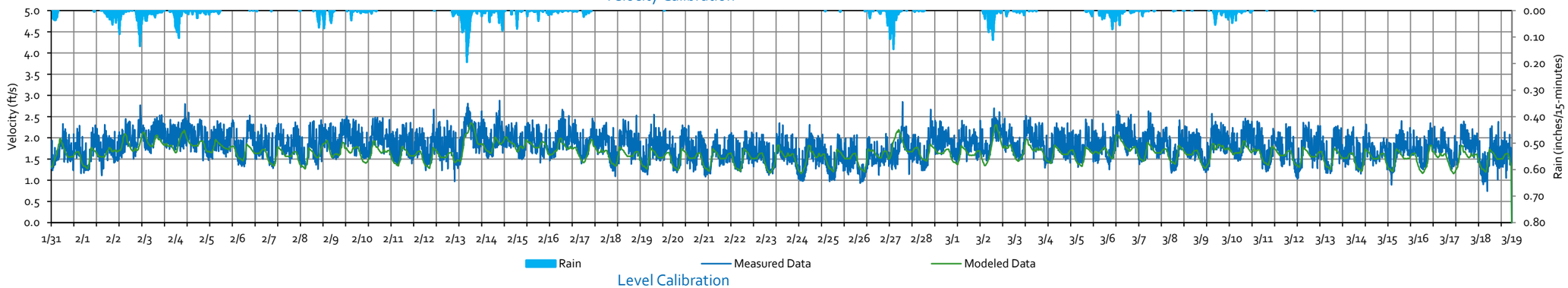
Site 2 Wet Weather Calibration

Location: In Treatment Plant, behind parked car
Pipeline diameter: 10"
City Manhole ID: none
Model Pipe ID: P-379
Silt Level at Site: none"

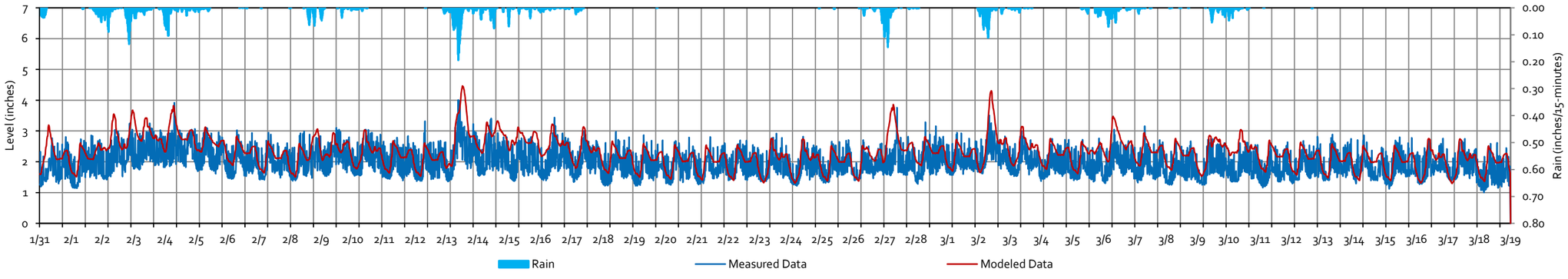
Flow Calibration



Velocity Calibration



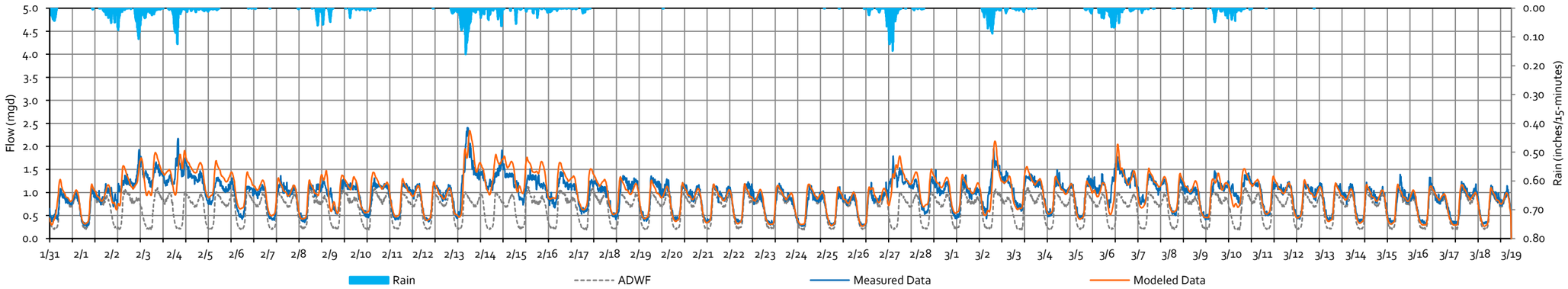
Level Calibration



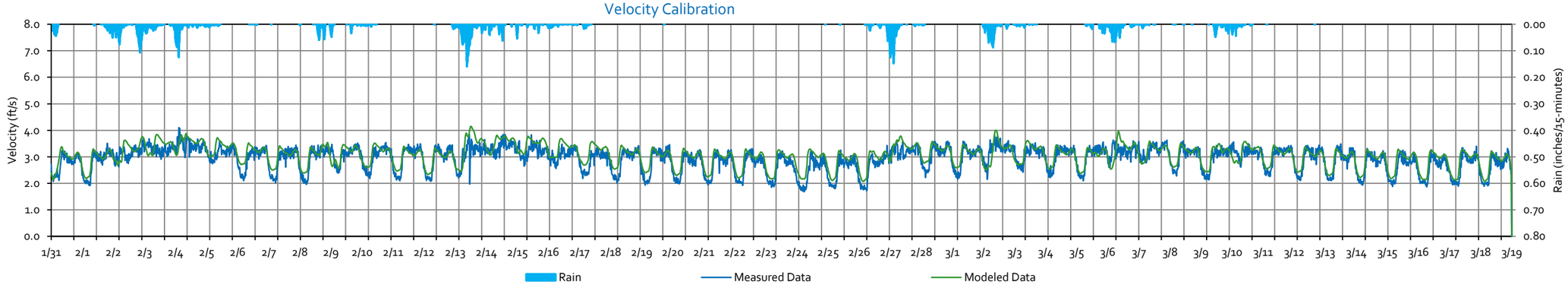
Site 3 Wet Weather Calibration

Location: In Treatment Plant, behind gate
Pipeline diameter: 18"
City Manhole ID: C7-002
Model Pipe ID: P-85
Silt Level at Site: none"

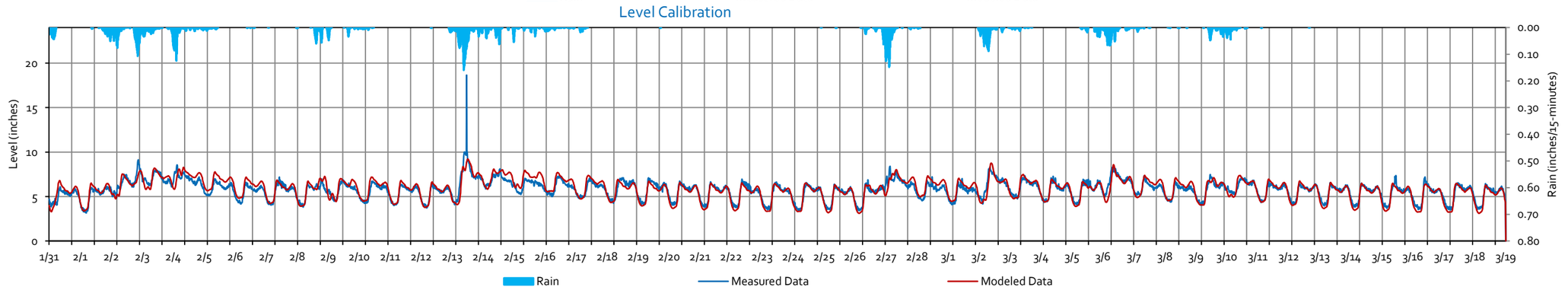
Flow Calibration



Velocity Calibration



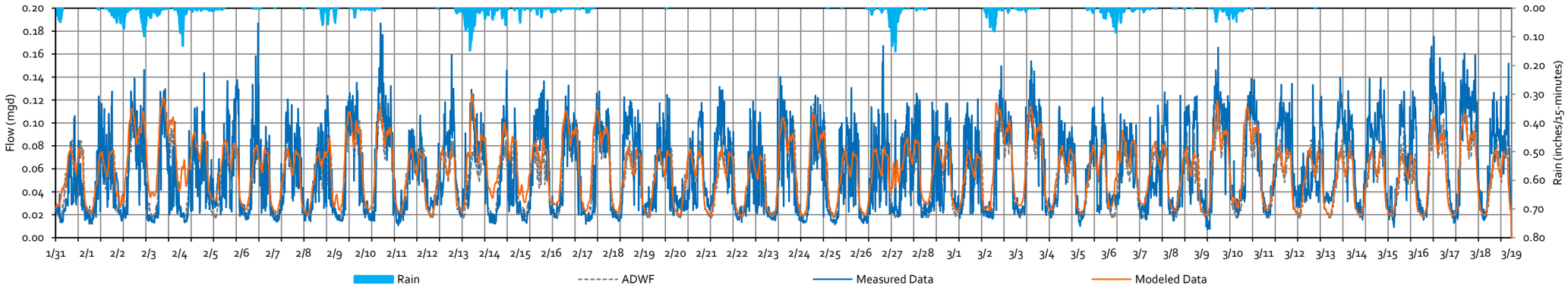
Level Calibration



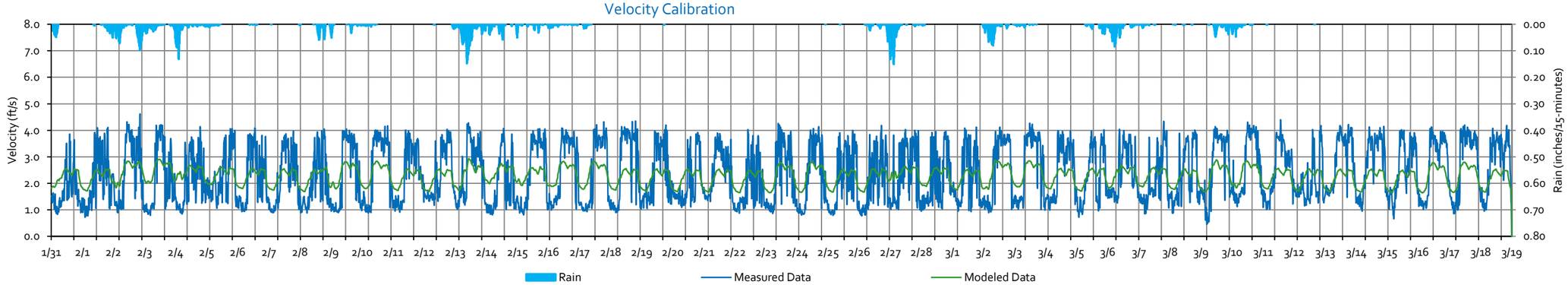
Site 4 Wet Weather Calibration

Location: Sidewalk near Bubbles Laundromat
Pipeline diameter: 10"
City Manhole ID: C7-032
Model Pipe ID: P-913
Silt Level at Site: none"

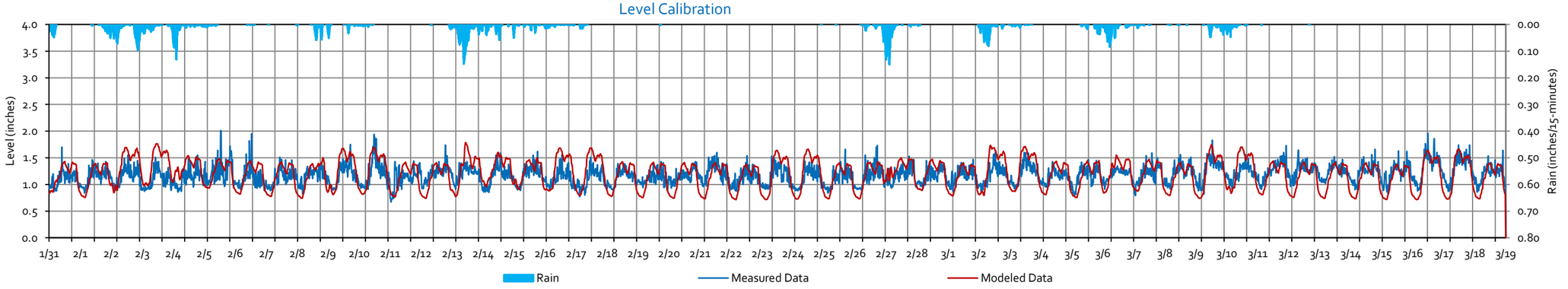
Flow Calibration



Velocity Calibration



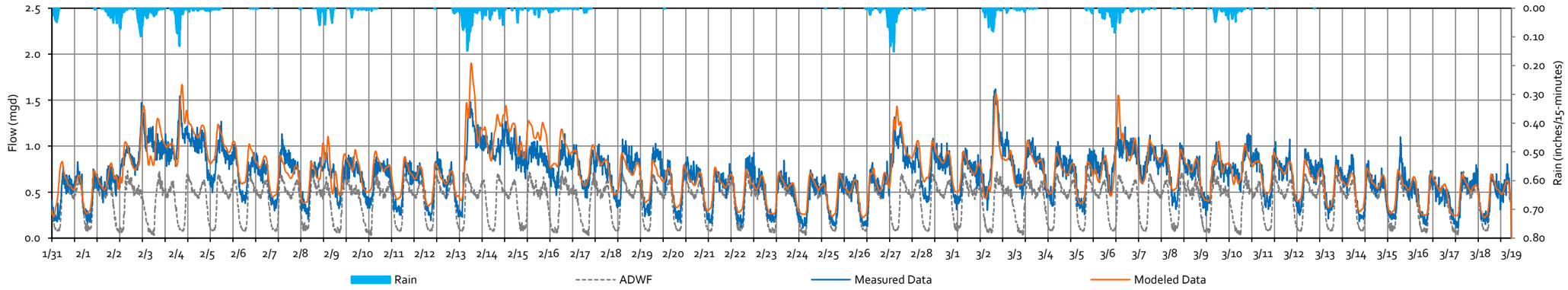
Level Calibration



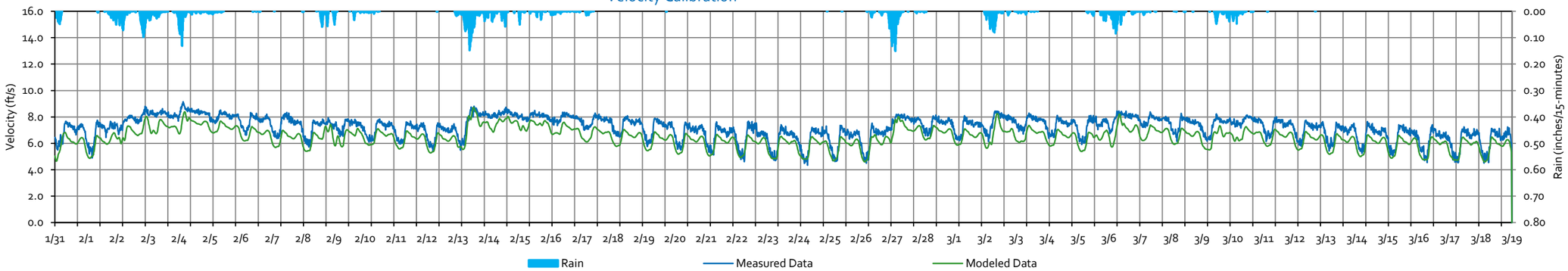
Site 5 Wet Weather Calibration

Location: Whispering Pines Drive, West of Mt. Hermon Road
Pipeline diameter: 18"
City Manhole ID: C7-028
Model Pipe ID: P-893
Silt Level at Site: none"

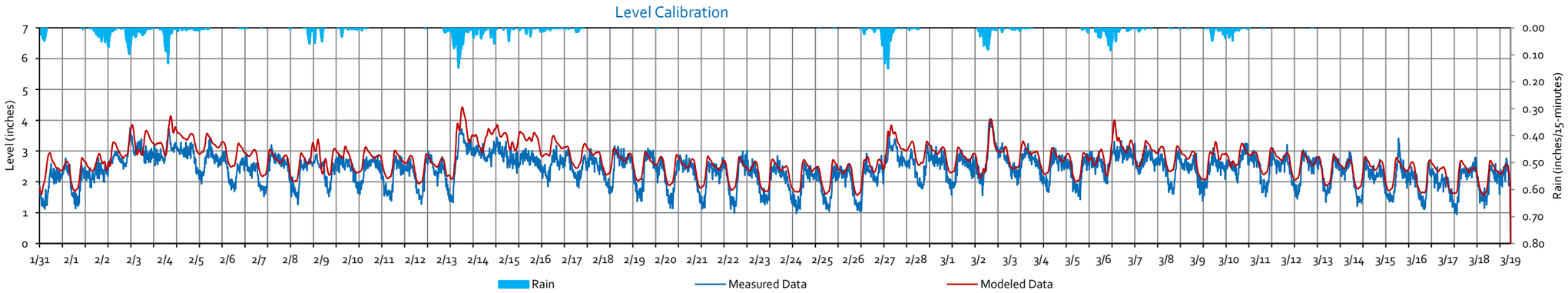
Flow Calibration



Velocity Calibration



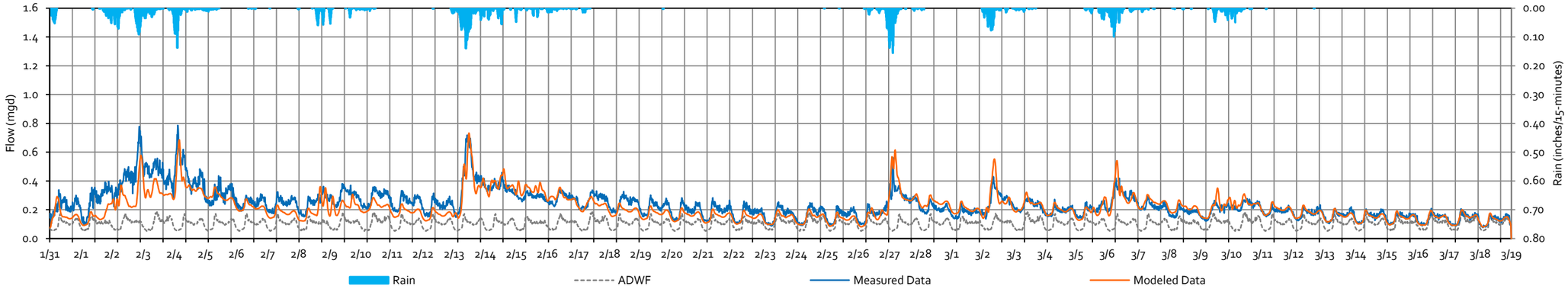
Level Calibration



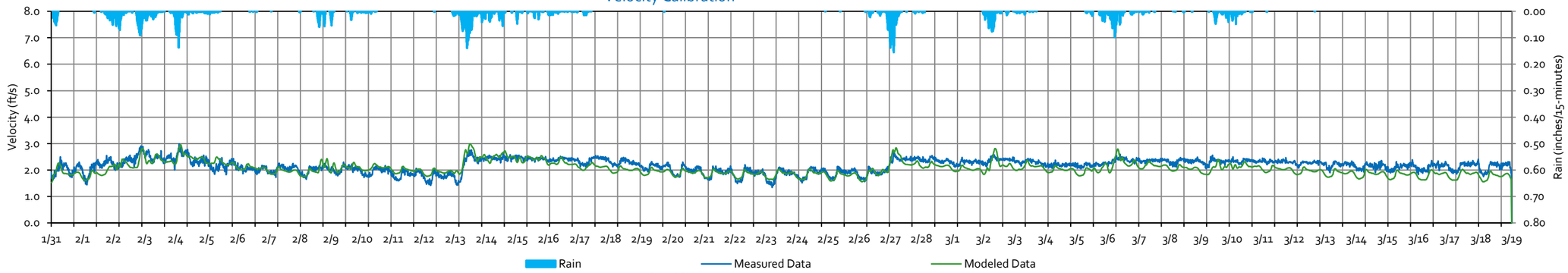
Site 6 Wet Weather Calibration

Location: Scotts Valley Drive, South of Ball Drive
Pipeline diameter: 10"
City Manhole ID: none
Model Pipe ID: P-1509
Silt Level at Site: none"

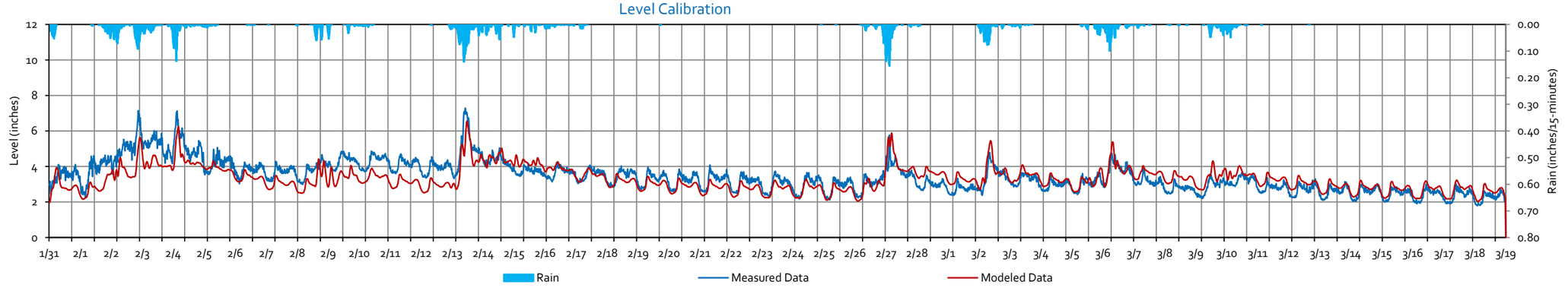
Flow Calibration



Velocity Calibration



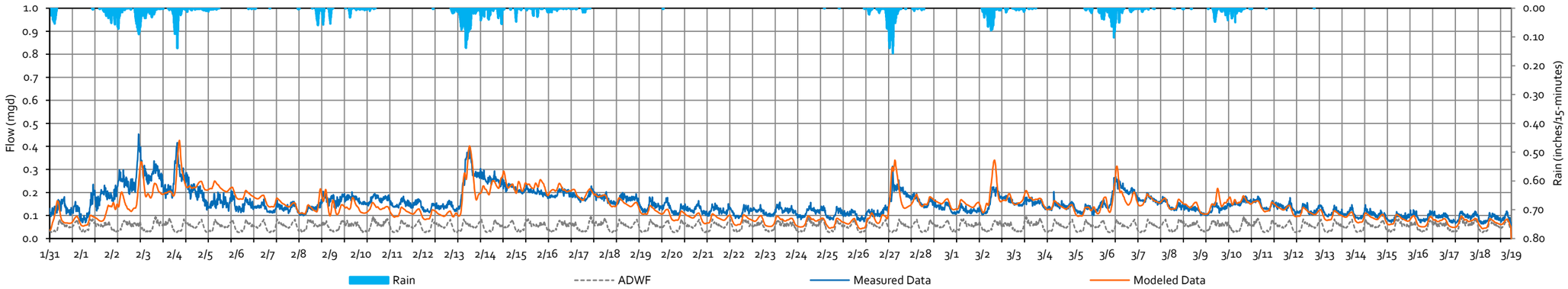
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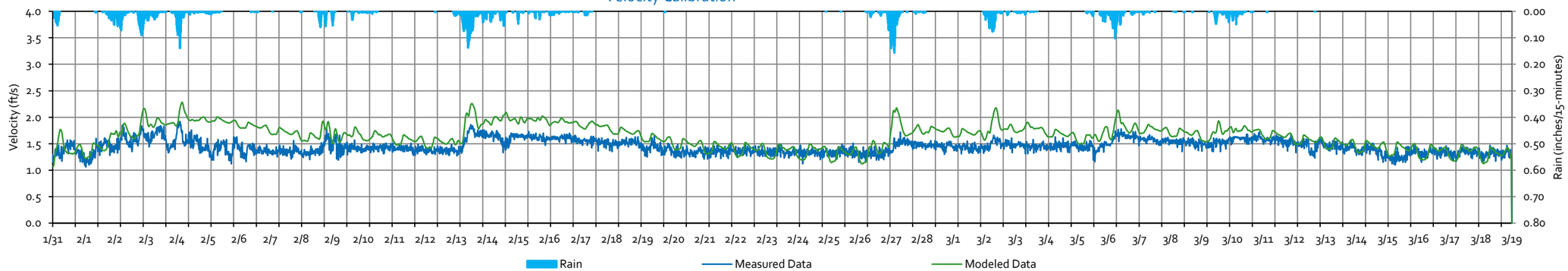
Site 7 Wet Weather Calibration

Location: Glenwood Drive, North of Hacienda Drive
Pipeline diameter: 10"
City Manhole ID: F7-013
Model Pipe ID: P-587
Silt Level at Site: none"

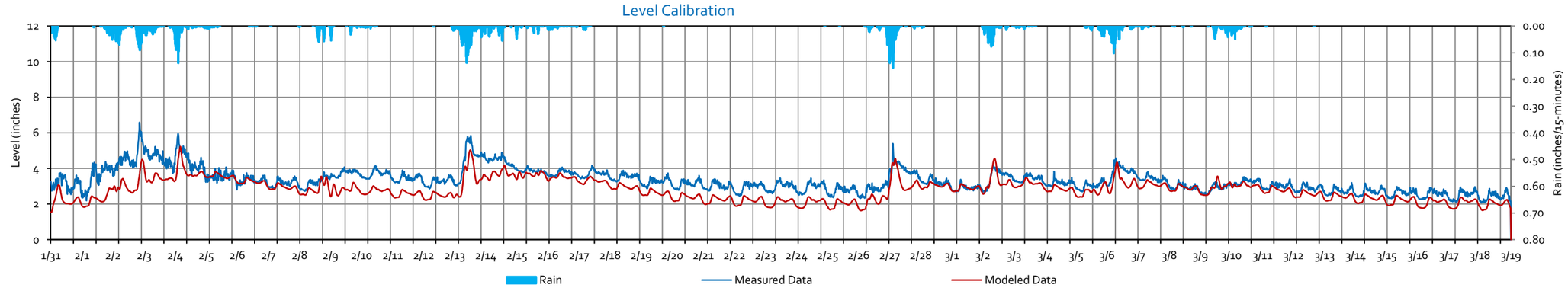
Flow Calibration



Velocity Calibration

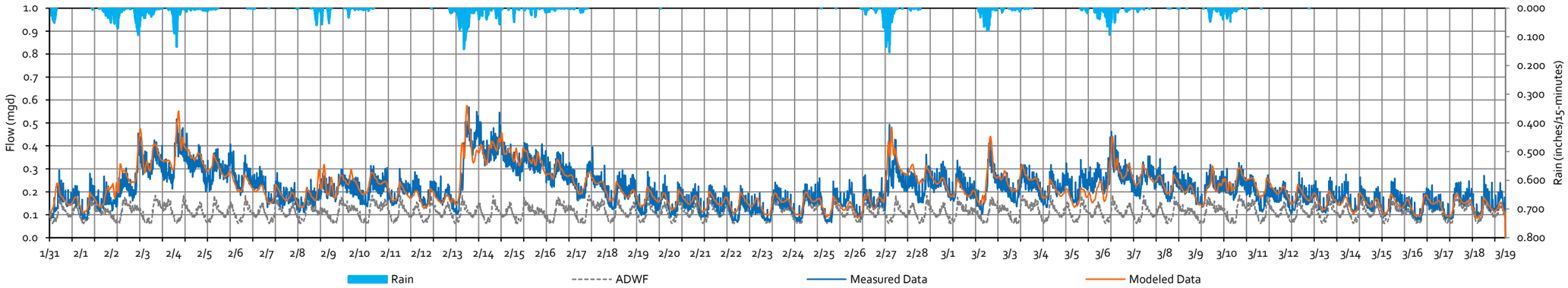


Level Calibration

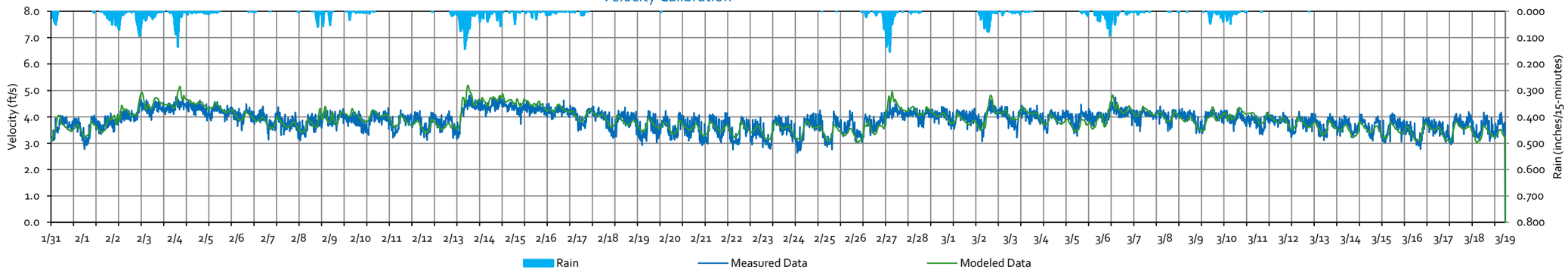


Site 8 Wet Weather Calibration
Location: In bushesh between S. Navarraq Drive and Highway 17
Pipeline diameter: 10"
City Manhole ID: E7-011
Model Pipe ID: P-1322
Silt Level at Site: none"

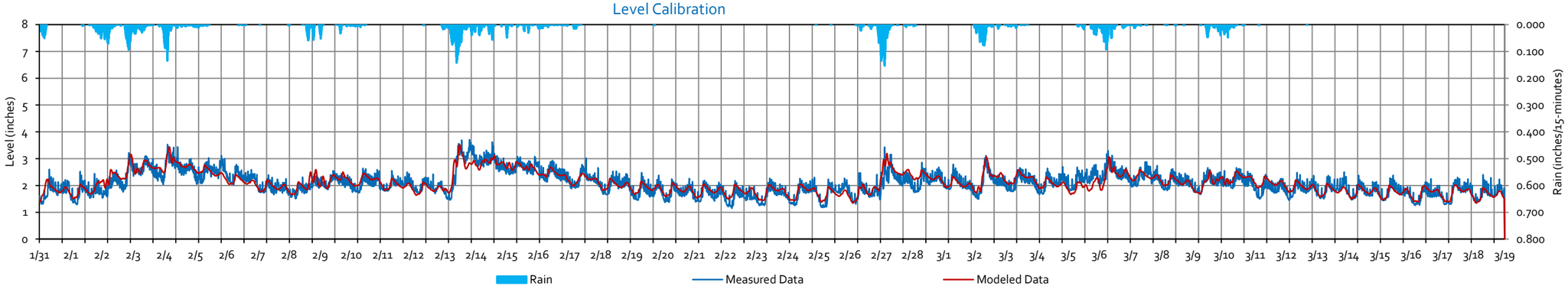
Flow Calibration



Velocity Calibration



Level Calibration



Attachment 4

LIFT STATION CAPITAL IMPROVEMENTS COST

Lift Station	Recommendation	Priority
All		
	SSO containment berm or means of catchment	1
	Inlet Manholes, except carbonera	1
	Discharge flowmeters/Pressure Gauges, except carbonera	1
	Influent Grinders	3
	Site lighting	2
	Wash down water infrastructure	3
Bethany		
	Replace safety grating	3
	Remove and Replace Wetwell Liner	1
	Install site perimeter curb to prevent SSO leaving site	3
	Replace vent fan	3
	Generator and electric equipment upgrades	2
	Flowmeter and pressure gauge install	1
	Inlet Manholes are approximatley 9 to 10 feet deep x 2 for bot	1
	Site clearing and grubbing (leaves/dirt)	3
Carbonero		
	Containment curb around site, approximatley 100'	3
	Fix wet well ventilation pipe	2
	Repair wet well safety grating and recoat	2
	Site lighting	2
	Replace the control panel, they're in "fair" condition	2
	Site clearing and grubbing (leaves/dirt)	3
Glen Canyon		
	Replace the pumps (with chopper pumps)	1
	Replace discharge piping (move it to above ground)	1
	Add flowmeter and pressure gauges	1
	Install liner on wet well	1
	Install ventilization system	2
	Site lighting	2
	Replace control panel	2
	Replace standby generator and add auto transfer switch	2
	Containment curb	3
	Inlet Manholes, invert is approx 5 feet deep	1
Granite Creek		
	Wet well ventiliation system	2
	Install safety grating	3
	Cut roots in wet well	1
	Epoxy Line	1
	Install site lighting	2
	Replace discharge piping and valves	1
	Install Auto Transfer switch	2
	containment curb	3
	Replace and isntall new control panel	2
	Inlet Manholes, invert assume 6 feet	1

Lift Station	Recommendation	Priority
Montevalle		
	Replace valve vault lid and isntall a vault drain	3
	Repair wet well interior surface, coat with epoxy liner	1
	Install wet well ventilization system and safety grating	2
	Install site lighting	2
	Replace one submersible pump with chopper sub pump	2
	Reconfigure the inlet piping suspended over creek	1
	Replace or rehab standby generator	2
	Install Auto Transfer switch	2
	Replace control panel	2
	containment curb	3
	Install flow meter and pressure gauge	1
	Inlet manhole, invert assume 6 feet	1
Sunset Terrace		
	Install Site LIghting	2
	Install Portable generator hookup	2
	Containment curb, approximately 75'	3
	Flowmeter and pressure gauges	1
	Inlet manhole, invert assume 8 feet x 2 for both influent pipes	1
Suzanne Lane		
	Install permiter fence	3
	replace wet well hatch	3
	install safety grating	3
	replace/repair vent pipe	2
	relocate discharge valves from wet well into sepreate vault	1
	Provide a connection for bypass pumping	1
	Install flow meter and pressure gauge	1
	Site lighting	2
	Inlet manhole, invert assume 6 feet (no records)	1

Attachment 5

SEWER SYSTEM CAPITAL IMPROVEMENT PROGRAM

SEWER SYSTEM CAPITAL IMPROVEMENT PROGRAM

Project ID	Project Name	Existing Size/Type	Proposed Size/Type	Proposed Amount	CIP Cost Estimate[1][2][3][4] ($)	CIP Cost by Phase ($)			
						Phase 1 (2022-2026)	Phase 2 (2027-2031)	Phase 3 (2032-2036)	Phase 4 (2037-2041)
GM-1	Old El Pueblo Road	6-in	10-in	580-ft	$ 192,000	$ 192,000	$ -	$ -	$ -
GM-2	Scotts Valley Drive Diversion with Study	--	10-in	60-ft	$ 45,000	$ 45,000	$ -	$ -	$ -
GM-3A	East of Highway 17	10-in	12-in	1220-ft	$ 424,000	$ 424,000	$ -	$ -	$ -
GM-3B	East of Highway 17 - Creek Crossing	10-in	12/24-in	300-ft	$ 282,000	$ 282,000	$ -	$ -	$ -
GM-4	Glenwood Drive	10-in	12-in	730-ft	$ 254,000	$ 254,000	$ -	$ -	$ -
RR-1	Gravity Sewer Renewal Program	Varies	Varies	7.6 miles	$ 12,003,000	$ 2,103,000	$ 3,300,000	$ 3,300,000	$ 3,300,000
RR-2	Bethany Lift Station Renewal	--	--	--	$ 323,000	$ 293,000	$ 30,000	$ -	$ -
RR-3	Glen Canyon Lift Station Renewal	--	--	--	$ 415,000	$ 413,000	$ 2,000	$ -	$ -
RR-4	Granite Creek Lift Station Renewal	--	--	--	$ 160,000	$ 157,000	$ 3,000	$ -	$ -
RR-5	Montevalle Lift Station Renewal	--	--	--	$ 523,000	$ 520,000	$ 3,000	$ -	$ -
RR-6	Sunset Terrace Lift Station Renewal	--	--	--	$ 117,000	$ 115,000	$ 2,000	$ -	$ -
RR-7	Suzanne Lane Lift Station Renewal	--	--	--	$ 118,000	$ 105,000	$ 13,000	$ -	$ -
RR-8	Carbonero Lift Station Renewal	--	--	--	$ 23,000	$ 18,000	$ 5,000	$ -	$ -
PR-1	Inspection Program	--	--	46 miles	$ 600,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000
PR-2	Flow Monitoring Program	--	--	--	$ 280,000	$ 70,000	$ 70,000	$ 70,000	$ 70,000
PR-3	SSMP Update	--	--	--	$ 1,200,000	$ 300,000	$ 300,000	$ 300,000	$ 300,000
CIP Total					$16,959,000	$5,441,000	$3,878,000	$3,820,000	$3,820,000

Notes:

(1) ENR San Francisco Construction Cost Index for February 2021 is 13,110.

(2) Estimated Construction Cost includes a 30% contingency of the baseline construction cost.

(3) Total project costs includes a 10% markup for engineering, a 10% markup for construction management and a 7.5% markup for project administration of the estimated construction cost.

(4) Total Mark-Up is 65.8% of the baseline construction costs.

Appendix K

SSMP NOTES LOG

Table K.1 SSMP Notes Log

Date	SSMP Element and Section	Description of Change/Revision Made	Submitted By

Notes:
(1) Additional documents can be attached following the SSMP Notes Log table.

Appendix L

PERFORMANCE INDICATORS

Table L.1 Sanitary Sewer Overflow (SSO) Events by Cause

Year	Roots	Debris	FOG	Capacity Related	Pipe Failure	Other	Total
2014	1	1	1	1	0	0	**4**
2015	1	1	0	0	0	0	**2**
2016	1	1	0	0	0	0	**2**
2017	0	0	0	0	1	2	**3**
2018	2	0	0	0	1	0	**3**
2019	0	0	2	1	0	1	**4**
2020	0	0	0	0	0	0	**0**
Total	**5**	**3**	**3**	**2**	**2**	**3**	**18**

Note:
Abbreviation: fats, oil, and grease (FOG)

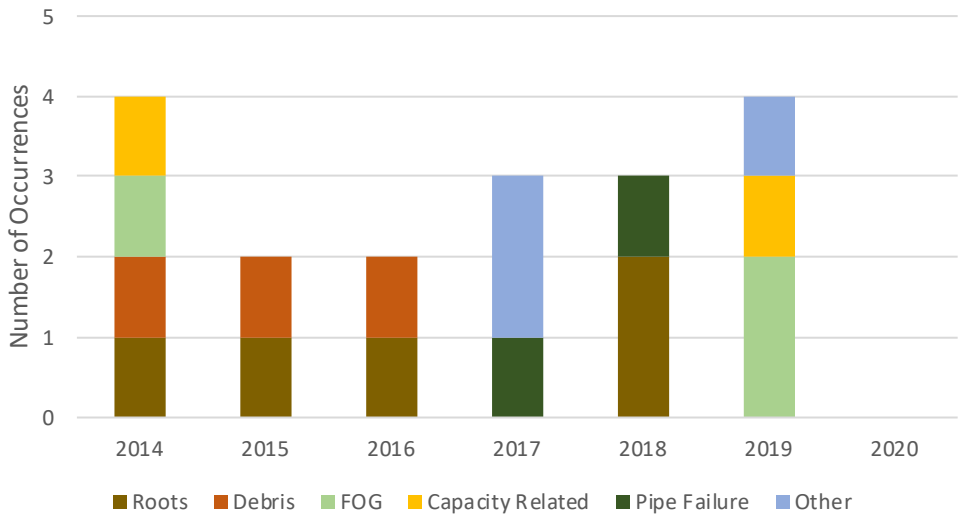


Figure L.1 Sanitary Sewer Overflow Events (SSO) Events by Cause

Table L.2 Sanitary Sewer Overflow (SSO) Events by Size

Year	< 100 gallons	100 - 500 gallons	501 - 1,000 gallons	>1,000 gallons	Total Spills
2014	3	1	0	0	**4**
2015	1	1	0	0	**2**
2016	0	2	0	0	**2**
2017	0	2	0	1	**3**
2018	1	2	0	0	**3**
2019	2	0	0	2	**4**
2020	0	0	0	0	**0**
Total	**7**	**8**	**0**	**3**	**18**

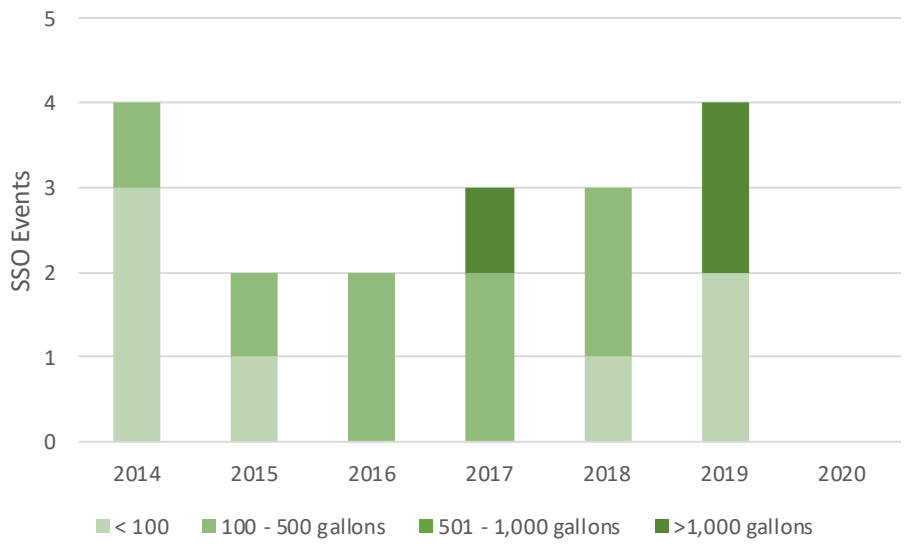


Figure L.2 Sanitary Sewer Overflow (SSO) Events by Size

Table L.3 Sanitary Sewer Overflow (SSO) Volume by Year

Year	Volume Spilled onto Land (gallons)	Volume Spilled into Surface Water (gallons)	**Total Spill Volume (gallons)**
2014	50	530	**580**
2015	155	0	**155**
2016	150	50	**200**
2017	21,750	350	**22,100**
2018	50	600	**650**
2019	2,050	2,205	**4,255**
2020	0	0	**0**
Total	**24,205**	**3,735**	**27,940**

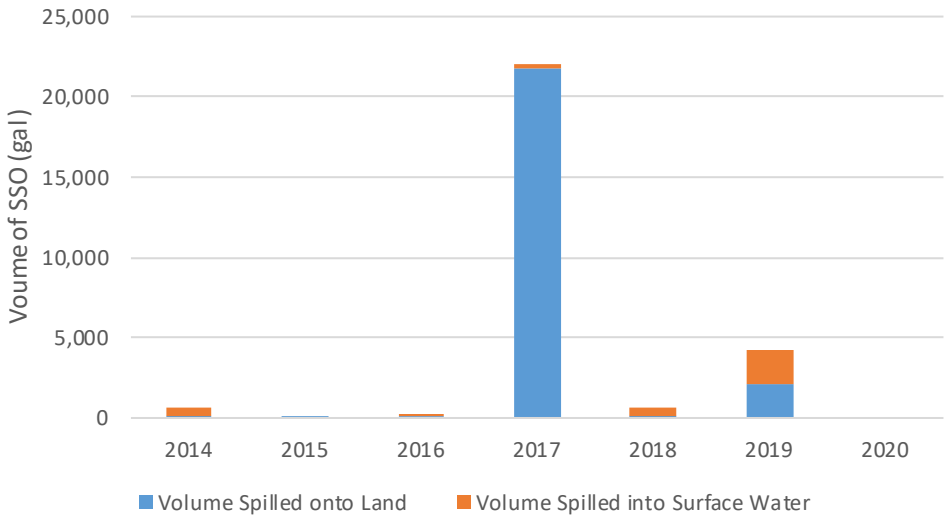


Figure L.3 Sanitary Sewer Overflow (SSO) Volume by Year

Table L.4 Sanitary Sewer Overflow (SSO) Event by Type

Year	Type 1	Type 2	Type 3	Total SSOs
2014	3	0	1	**4**
2015	0	0	2	**2**
2016	1	0	1	**2**
2017	2	1	0	**3**
2018	2	0	1	**3**
2019	2	1	1	**4**
2020	0	0	0	**0**
Total	**10**	**2**	**6**	**18**

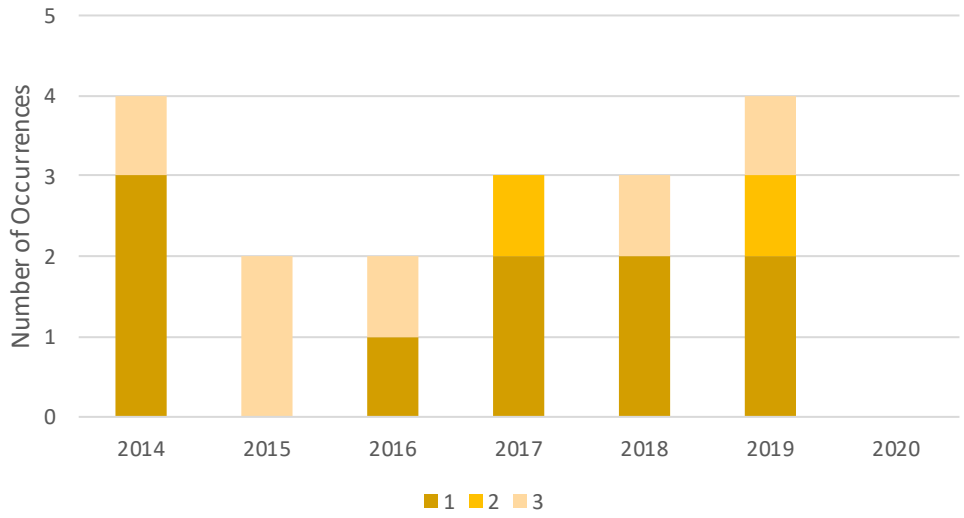


Figure L.4 Sanitary Sewer Overflow (SSO) Event by Type

Appendix M

RESOLUTION APPROVAL SSMP

Appendix N

CERTIFICATION

Appendix O

SSMP CHANGE LOG

Table O.1 SSMP Change Log

Date	SSMP Element and Section	Description of Change/Revision Made	Change Authorized By

Notes:
(1) Additional documents can be attached following the SSMP Change Log table.