

City of Dubuque Comprehensive Sanitary Sewer Master Plan

City of Dubuque, Dubuque County
Iowa

MSA Project No. 4920601

May 29, 2008

Prepared by:

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PROFESSIONAL SERVICES

TRANSPORTATION • MUNICIPAL
DEVELOPMENT • ENVIRONMENTAL

MEMO

To: City of Dubuque
From: Eric Thompson, P.E. & Katrina Feltes
Subject: City of Dubuque Sanitary Sewer Analysis
Date: May 29, 2008

Between September, 2006 and July, 2007 eleven meters were installed within the City of Dubuque to collect flow data in the sanitary system. Four precipitation gauges collected rainfall data in 15-minute intervals between January and August, 2007; however, there are no flow meters located near the JFK precipitation gauge, therefore, data from this gauge is not included. This binder contains the following diagrams to display the results of the data analyzed:

- Precipitation Gauge Results
- Depth versus Velocity Graphs
- Dry Weather Flow (DWF)
- Wet Weather Flow (WWF)

A map displaying the location of the flow meters and the precipitation gauges is also enclosed.

Each event is labeled as either

- 1.) Small Depth Storm
- 2.) Short-Duration, High Intensity Storm
- 3.) Long-Duration, Low Intensity Storm
- 4.) Long-Duration, High Intensity Storm

The small depth storms typically have less than 0.5 inches of rain over a short time period (~3 hours). Short-duration, high intensity storms are defined by having an average intensity of 0.5 in/hr over approximately 4 hours. Long-duration, low intensity storms are defined by having an average intensity less than 0.3 in/hr over a longer time period than 4 hours. One storm (July 17-18) was labeled as long-duration, high intensity as the intensity was ~0.5 in/hr lasting approximately 7.25 hrs.

Offices in Illinois, Iowa, Minnesota, and Wisconsin

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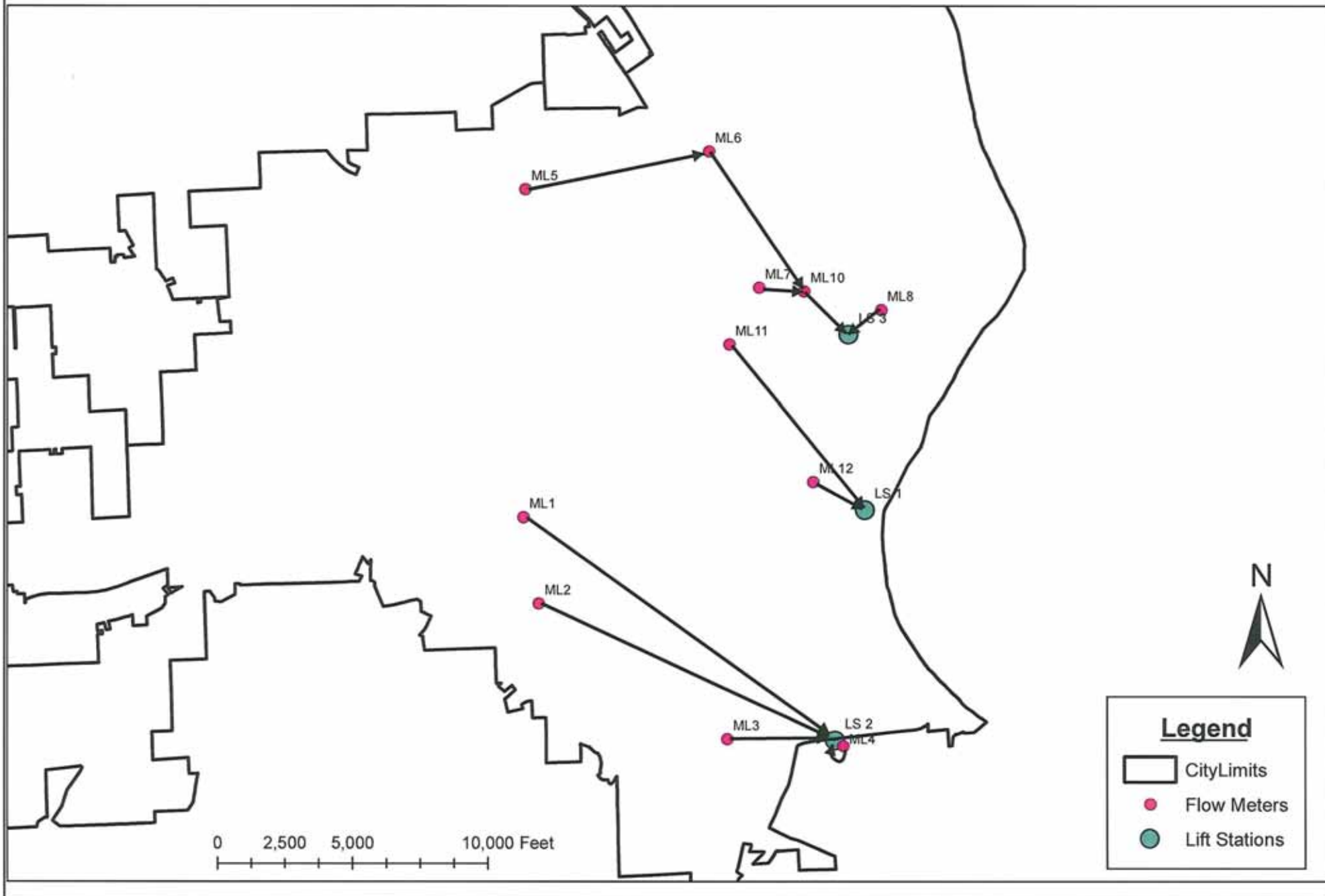
G:\projects\490s\492\4920601\KMF\Flow Data\Revised Flow Summary.doc

METER INSTALLATION SUMMARY

Duration of Flow Meter and Precipitation Gauge Installations

	2006				2007							
Meter	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
1	19						14					
2	19						15					
3	19						1					
4	18										24	
5	19										24	
6	19						14					
7	19										24	
8	19			28		8-19						
10							15				24	
11										8-22		
12							29				24	
Precip Gauge												
32nd St					16							3
University					16						27	
JFK							23					3
Wastewater					26						28	

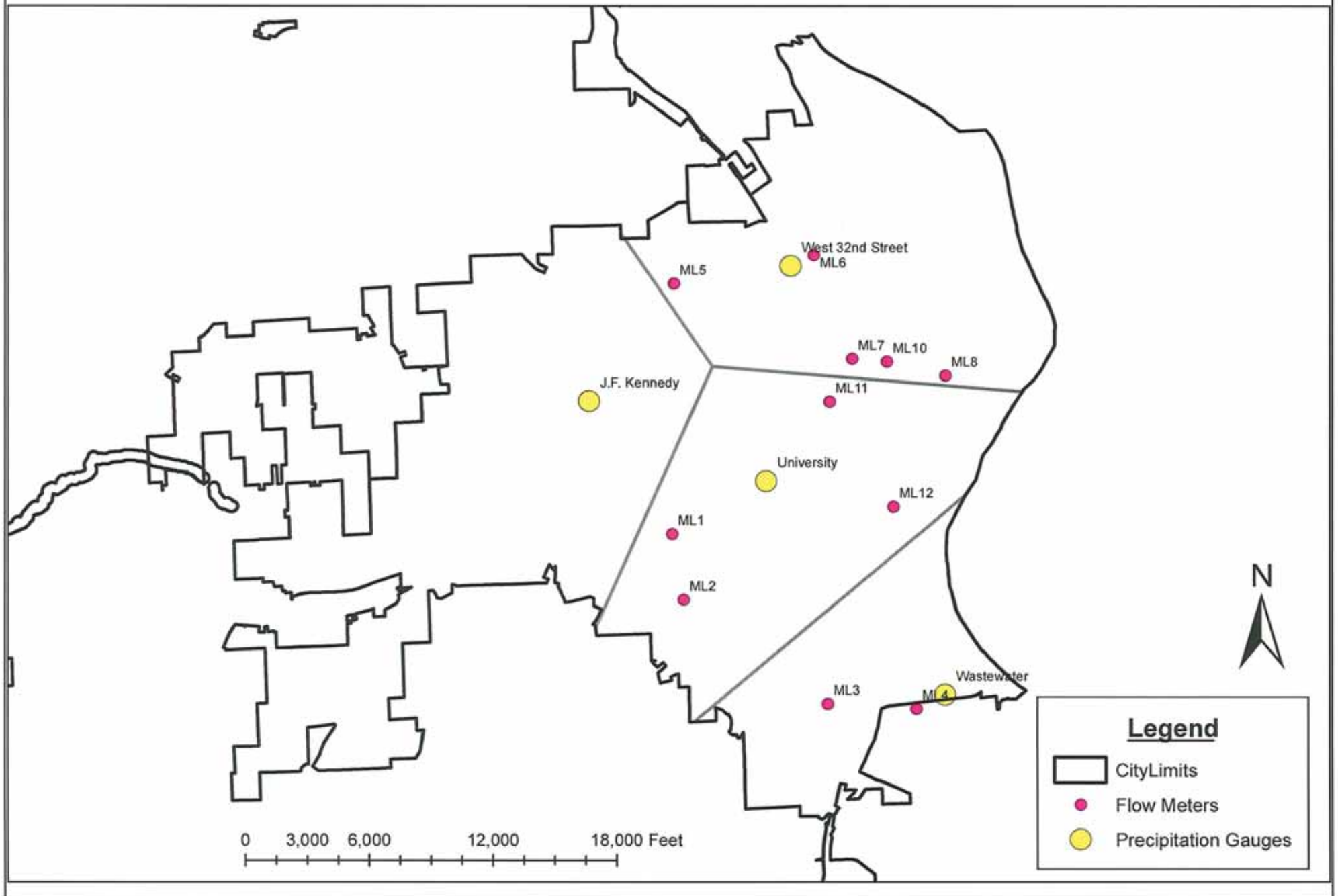
City of Dubuque Sanitary Sewer Analysis Sequence of Flow Meters



PRECIPITATION DATA

City of Dubuque Sanitary Sewer Analysis

Flow Meter Locations Relative to Precipitation Gauge Locations

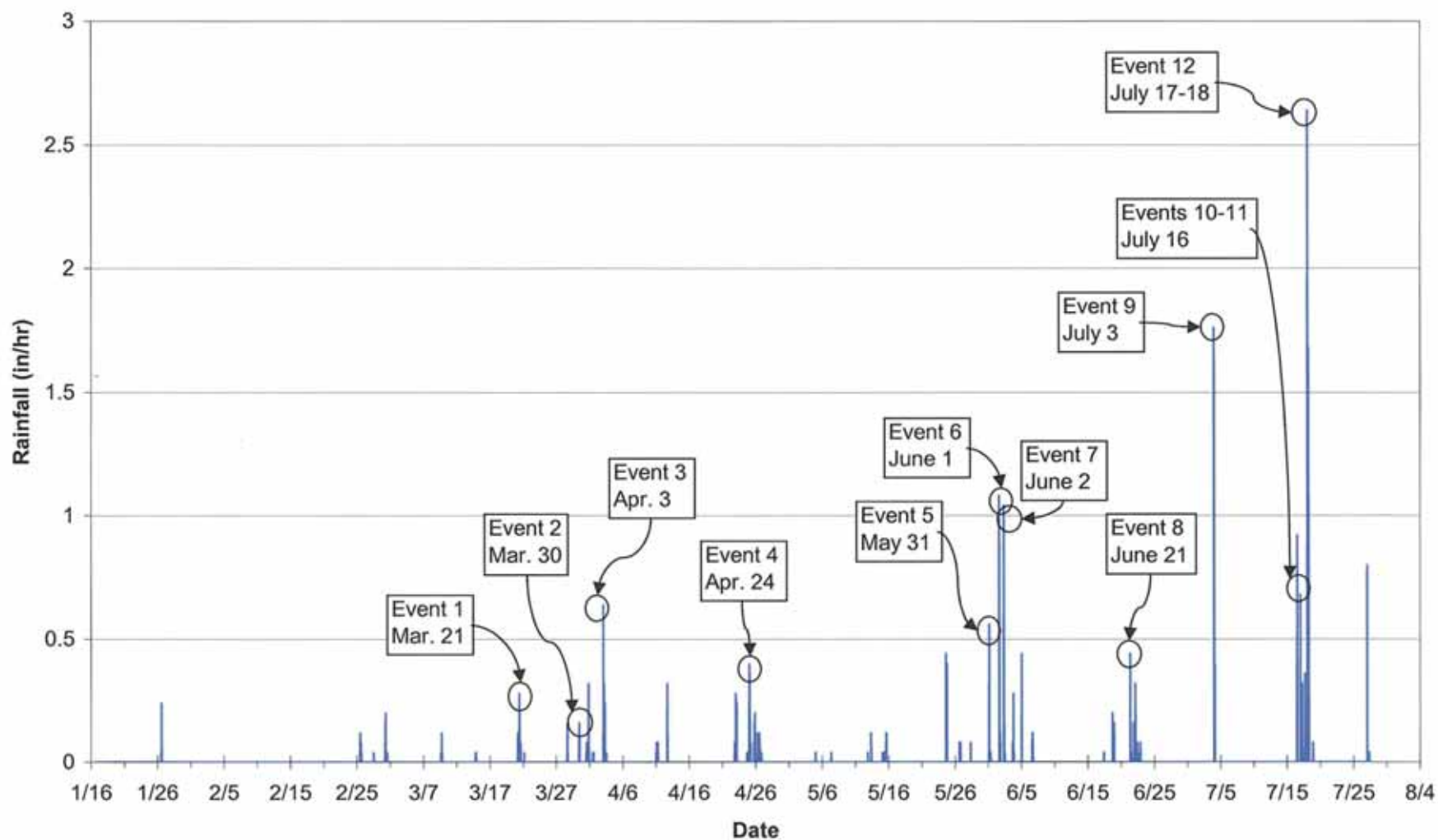


City of Dubuque Precipitation Gauge Data

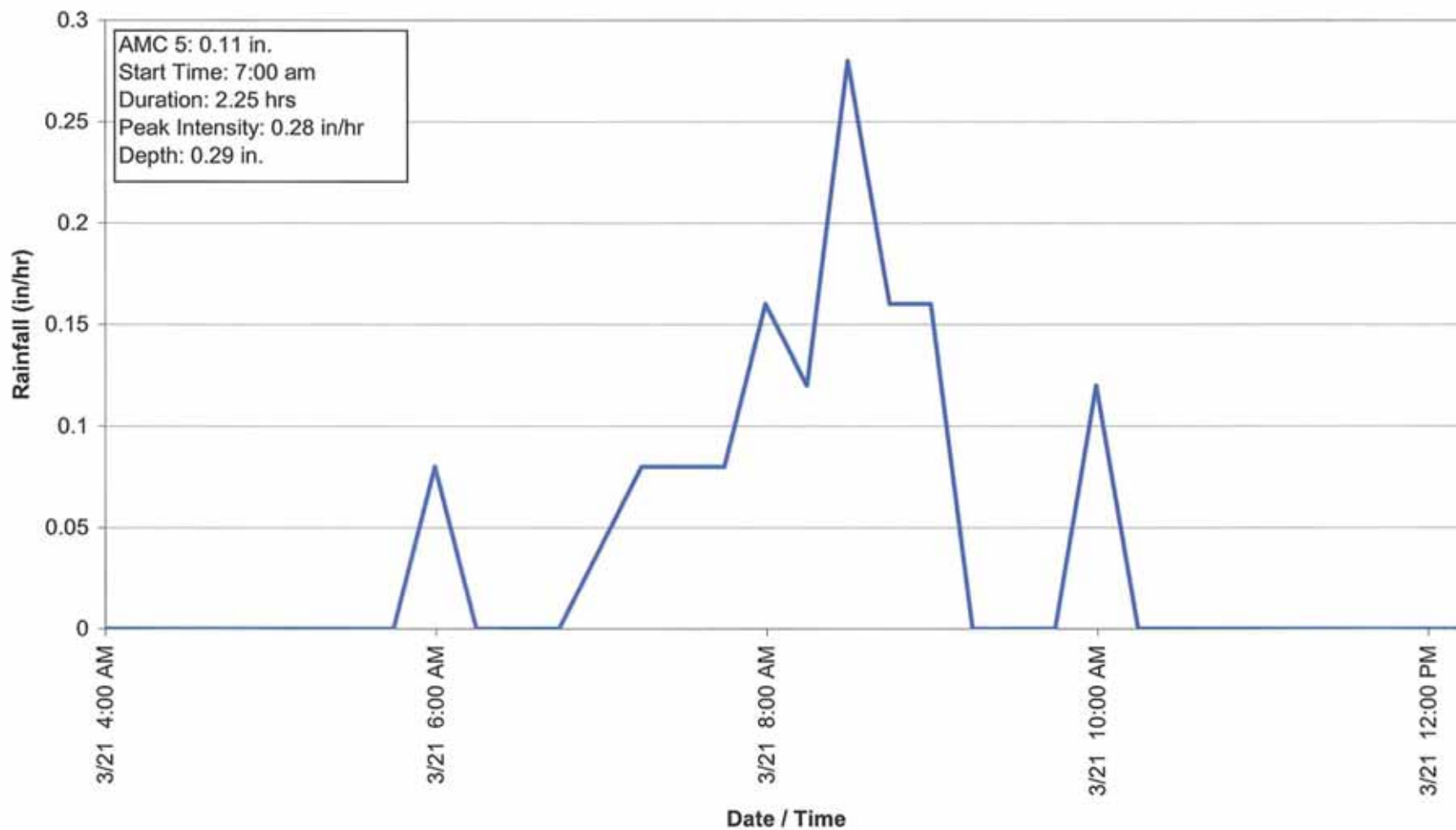
UNIVERSITY PRECIPITATION GAUGE

	Date	Depth (in)	Duration (hr)	Average Intensity (in/hr)	Event
Small-Depth	Mar 21st	0.29	2.25	0.13	1
	Mar 30th	0.23	2.5	0.09	2
	May 31st	0.28	2.5	0.11	5
	June 21st	0.25	1.5	0.17	8
	July 16th	0.35	1.5	0.23	11
Long-Duration, Low Intensity	Apr 3rd	1.2	7.75	0.15	3
	Apr 24th	1.01	6.5	0.16	4
Short-Duration, High Intensity	June 1st	0.5	1.25	0.40	6
	June 2nd	0.49	1.25	0.39	7
	July 3rd	2.2	3.25	0.68	9
	July 16th	0.53	2.25	0.24	10
Long-Duration, High Intensity	July 17-18th	4.41	7	0.63	12

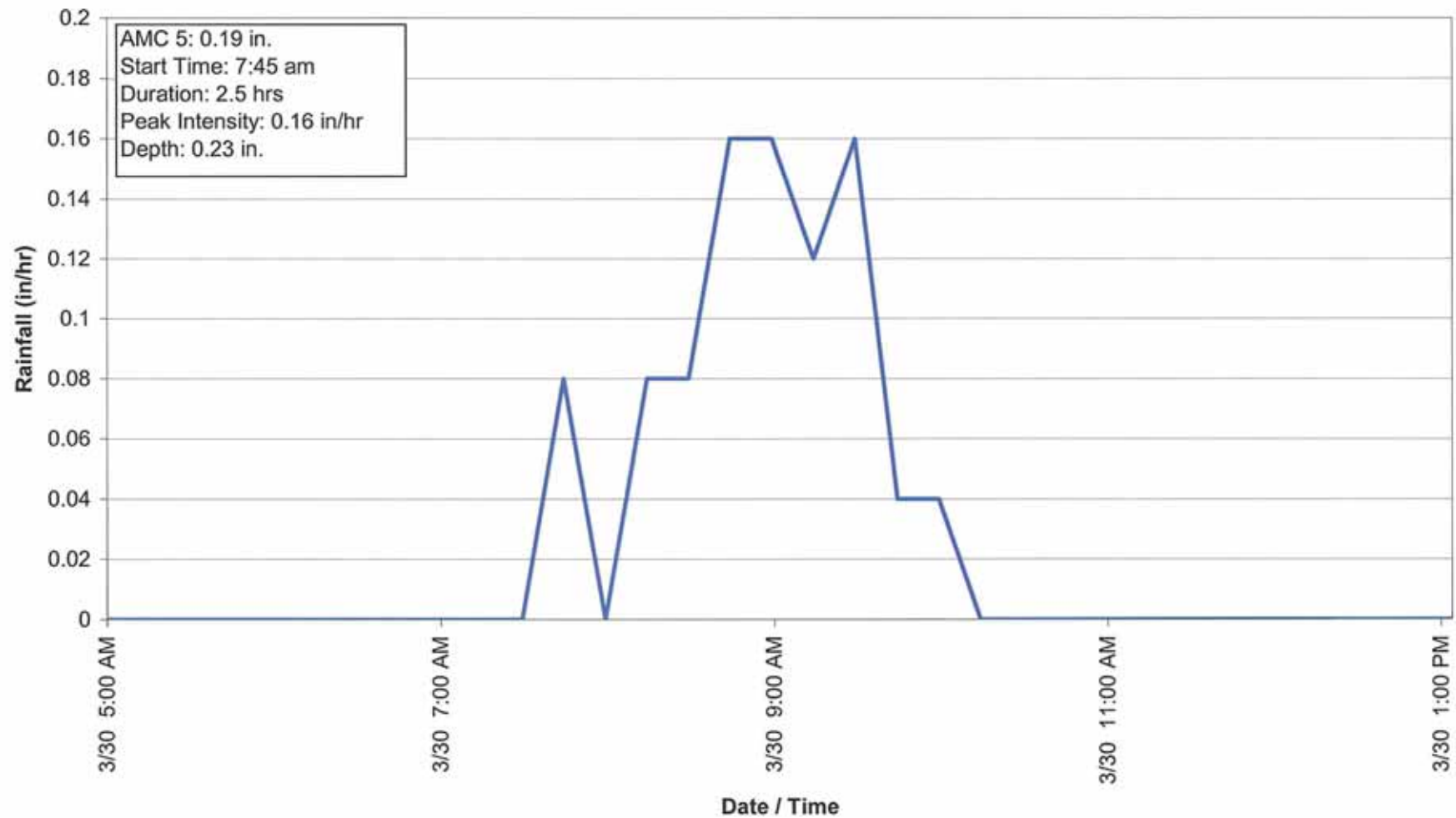
University Precipitation Gauge
January 16 - August 3, 2007



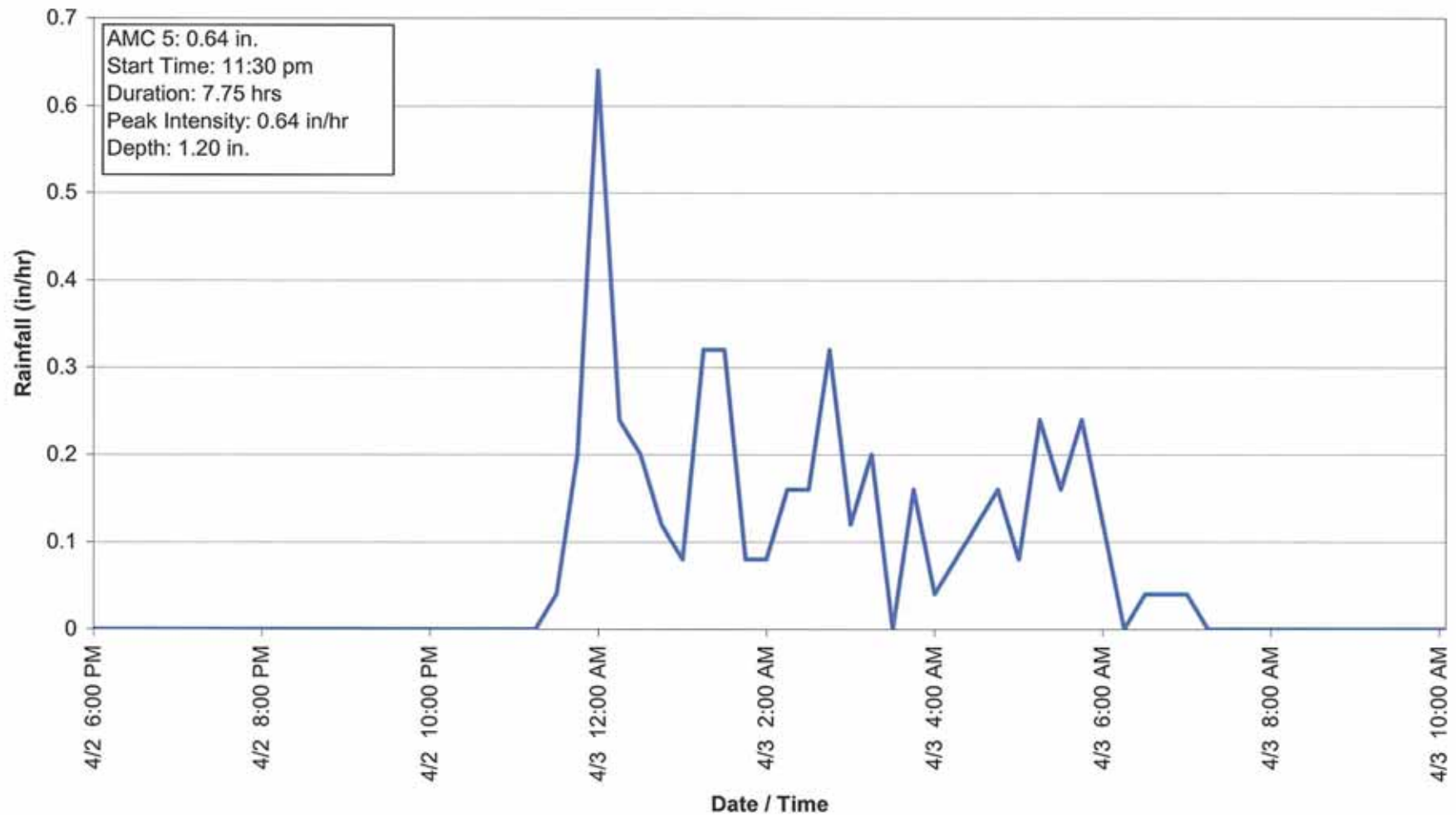
**University Precipitation Gauge
Event 1: March 21
Small Depth Storm**



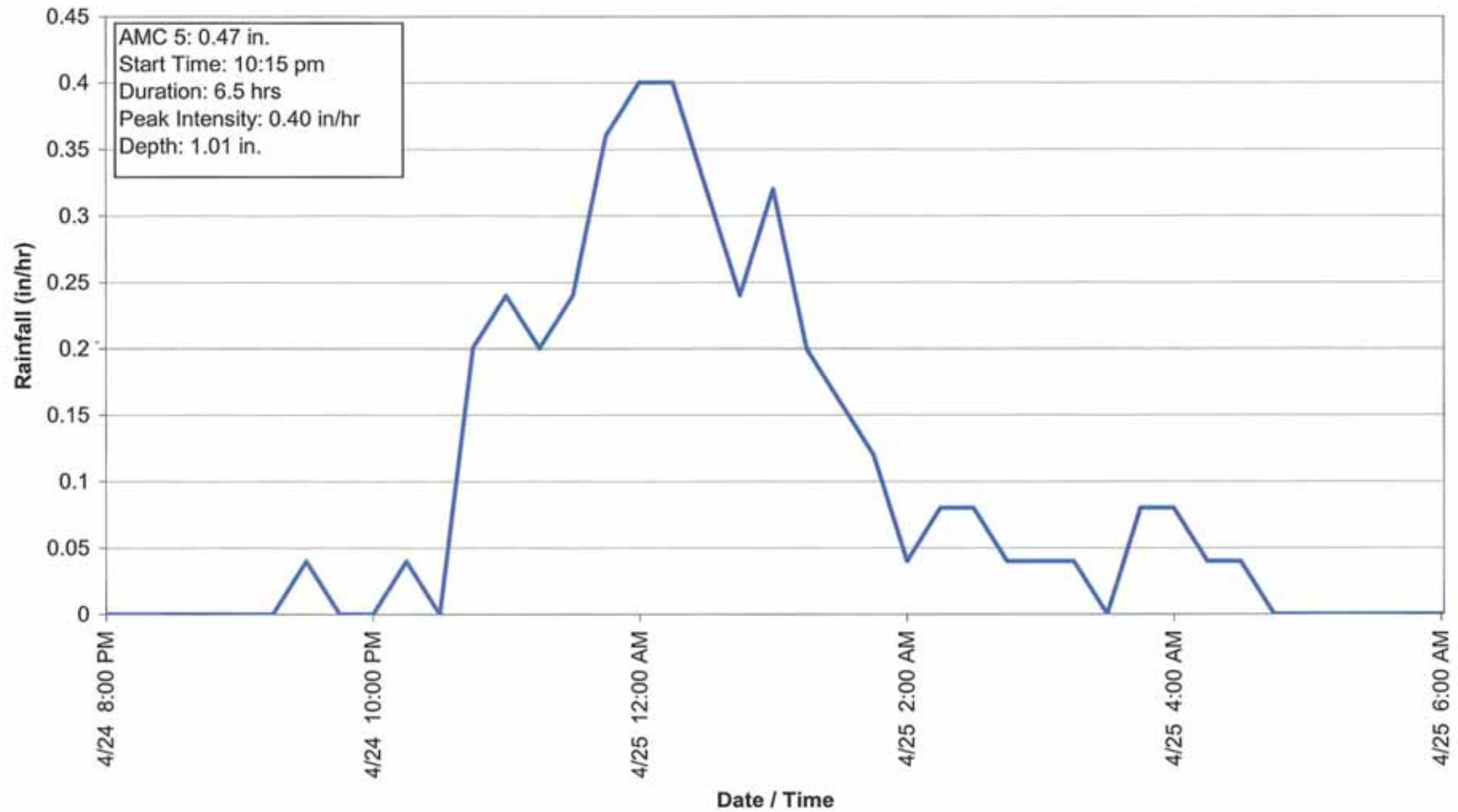
University Precipitation Gauge
Event 2: March 30
Small Depth Storm



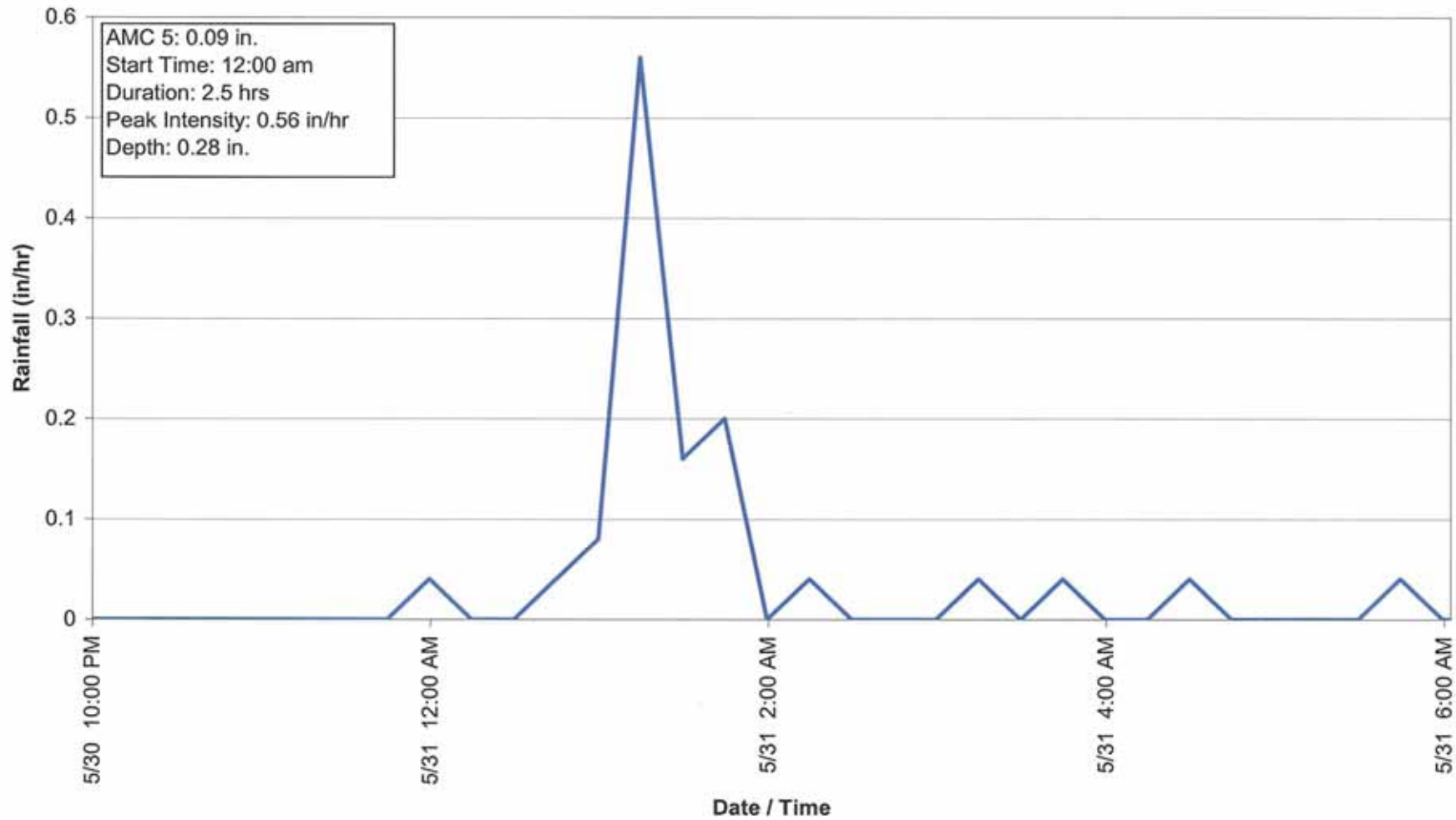
University Precipitation Gauge
Event 3: April 2 - 3
Long-Duration, Low Intensity Storm



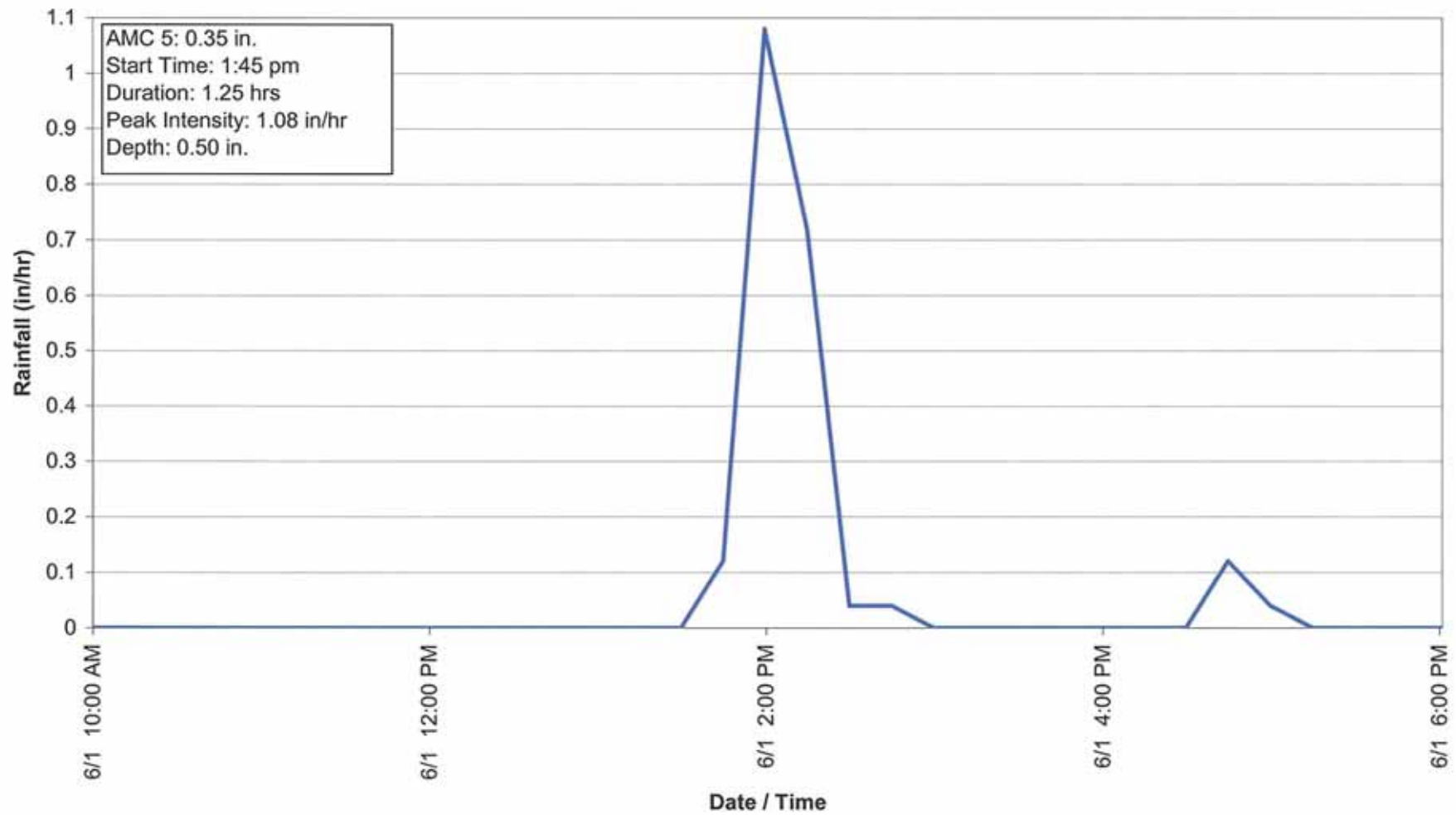
University Precipitation Gauge
Event 4: April 24 - 25
Long-Duration, Low Intensity Storm



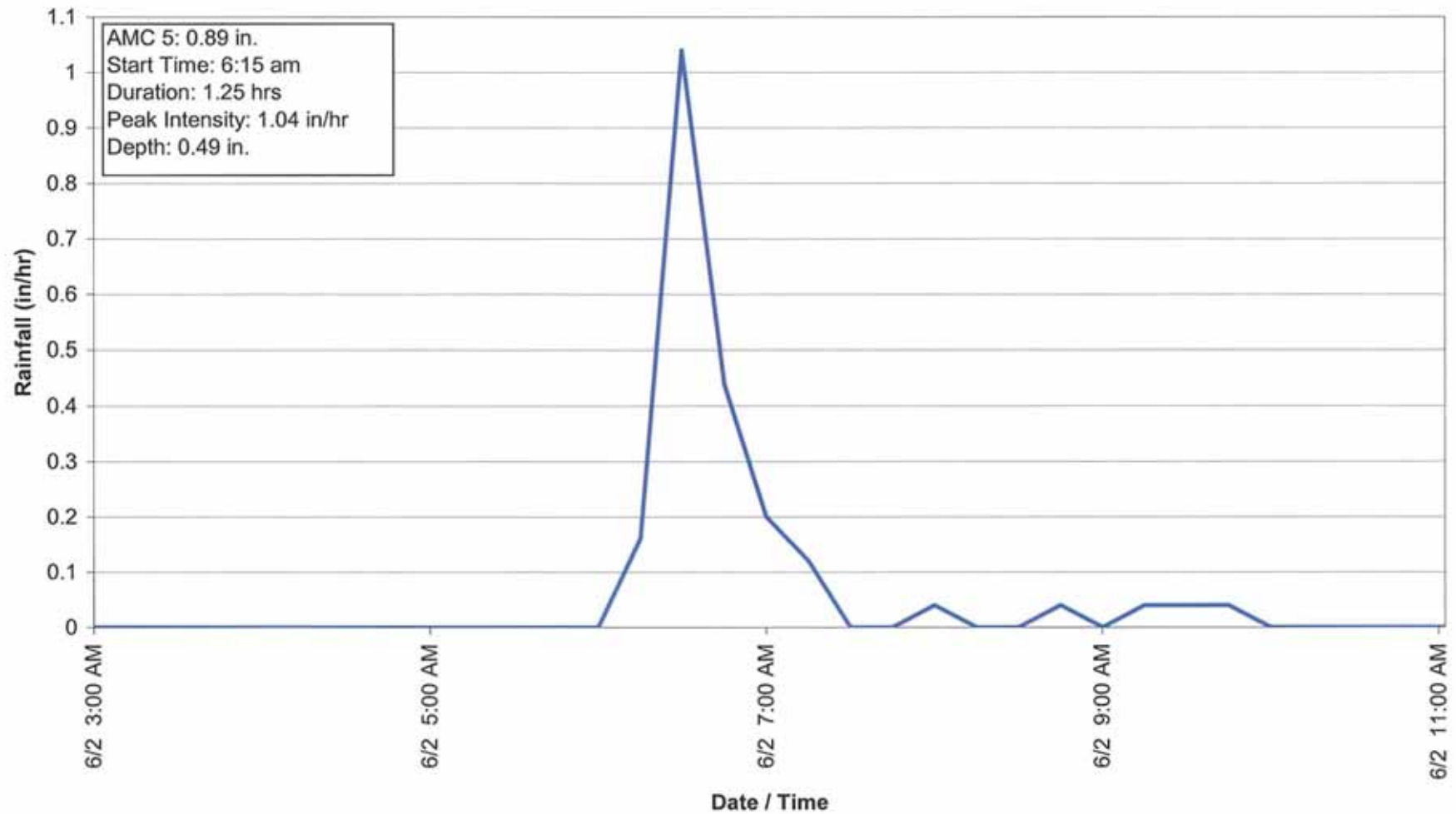
University Precipitation Gauge
Event 5: May 31
Small Depth Storm



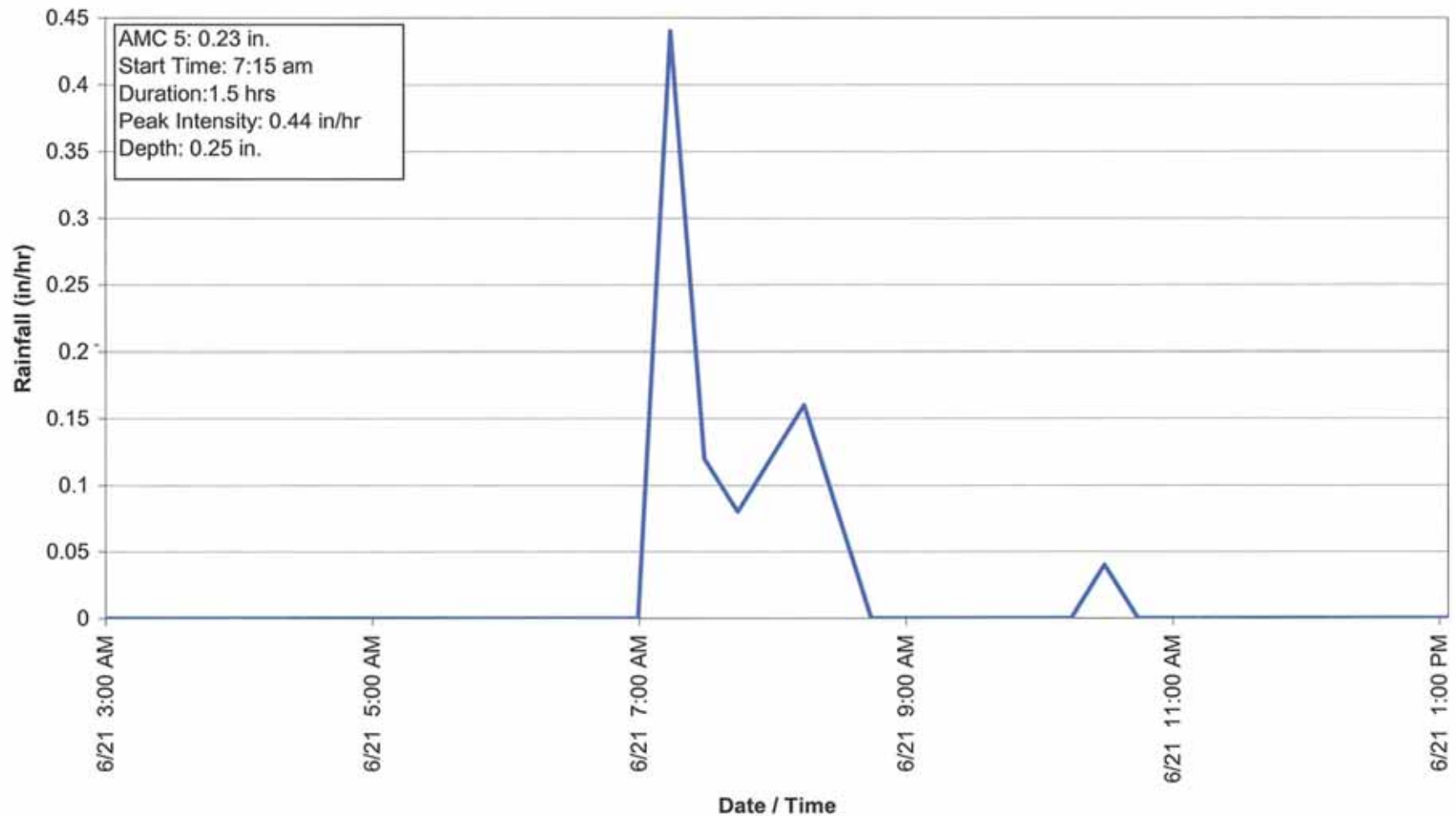
University Precipitation Gauge
Event 6: June 1
Short-Duration, High Intensity Storm



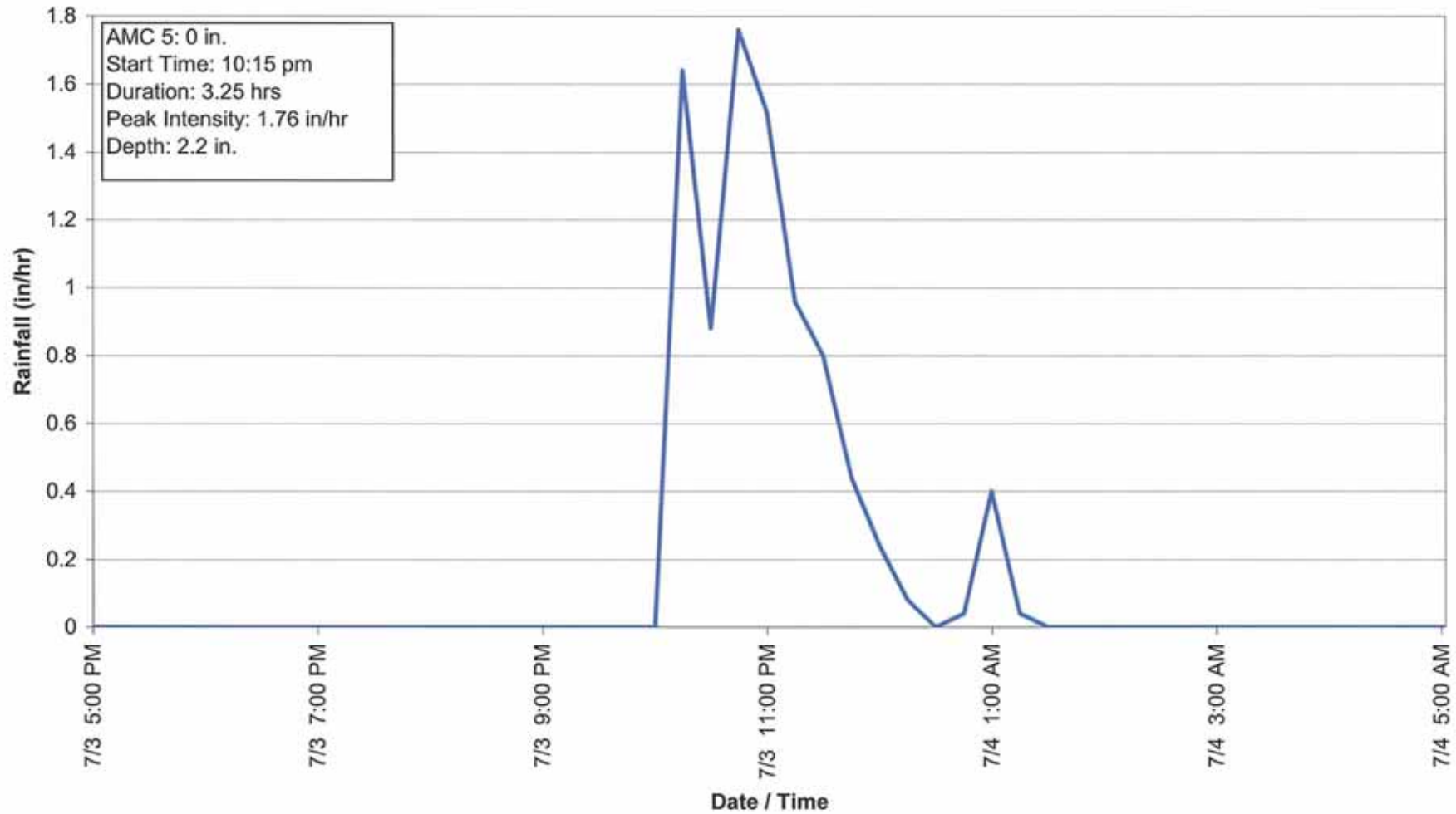
University Precipitation Gauge
Event 7: June 2
Short-Duration, High Intensity Storm



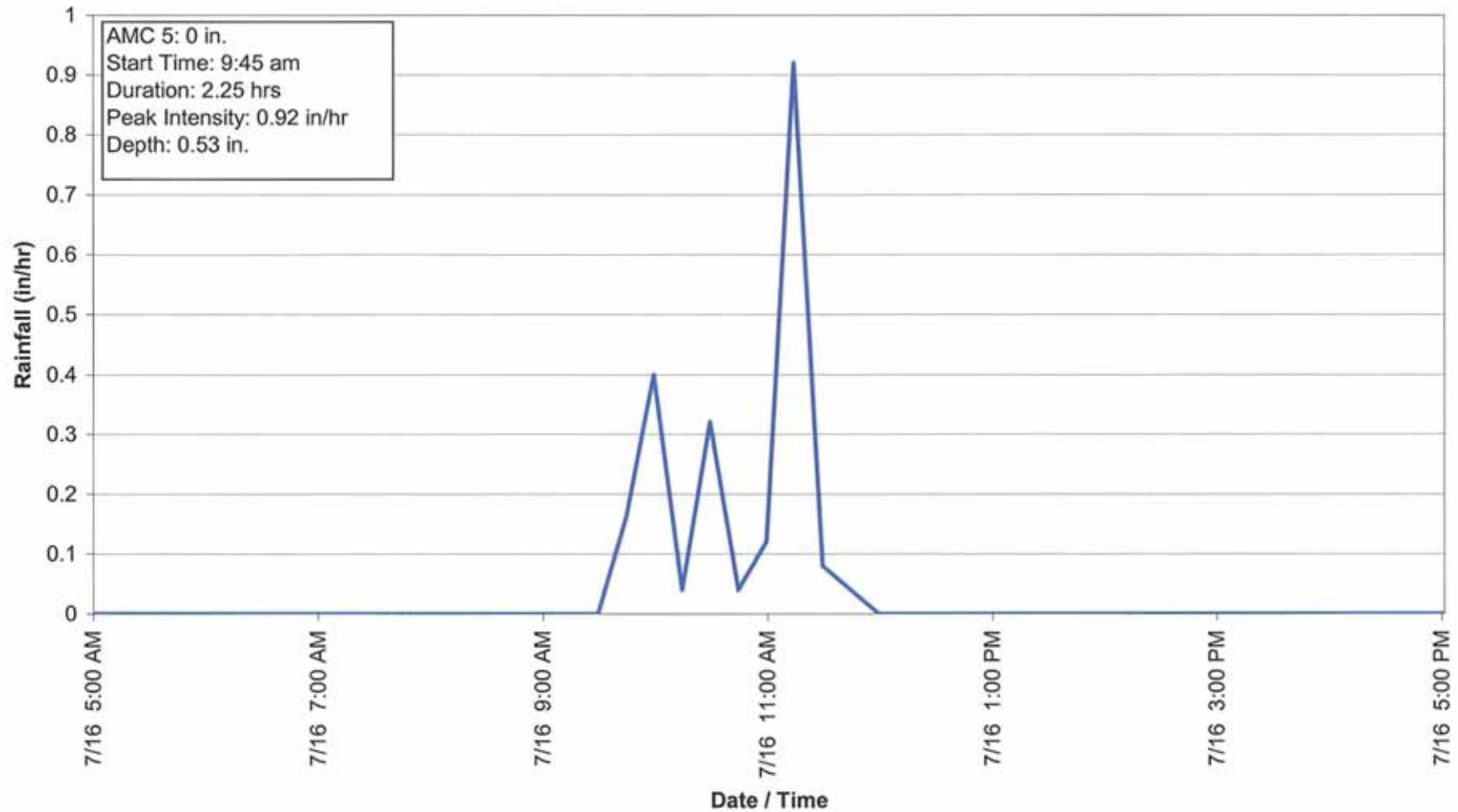
University Precipitation Gauge
Event 8: June 21
Small Depth Storm



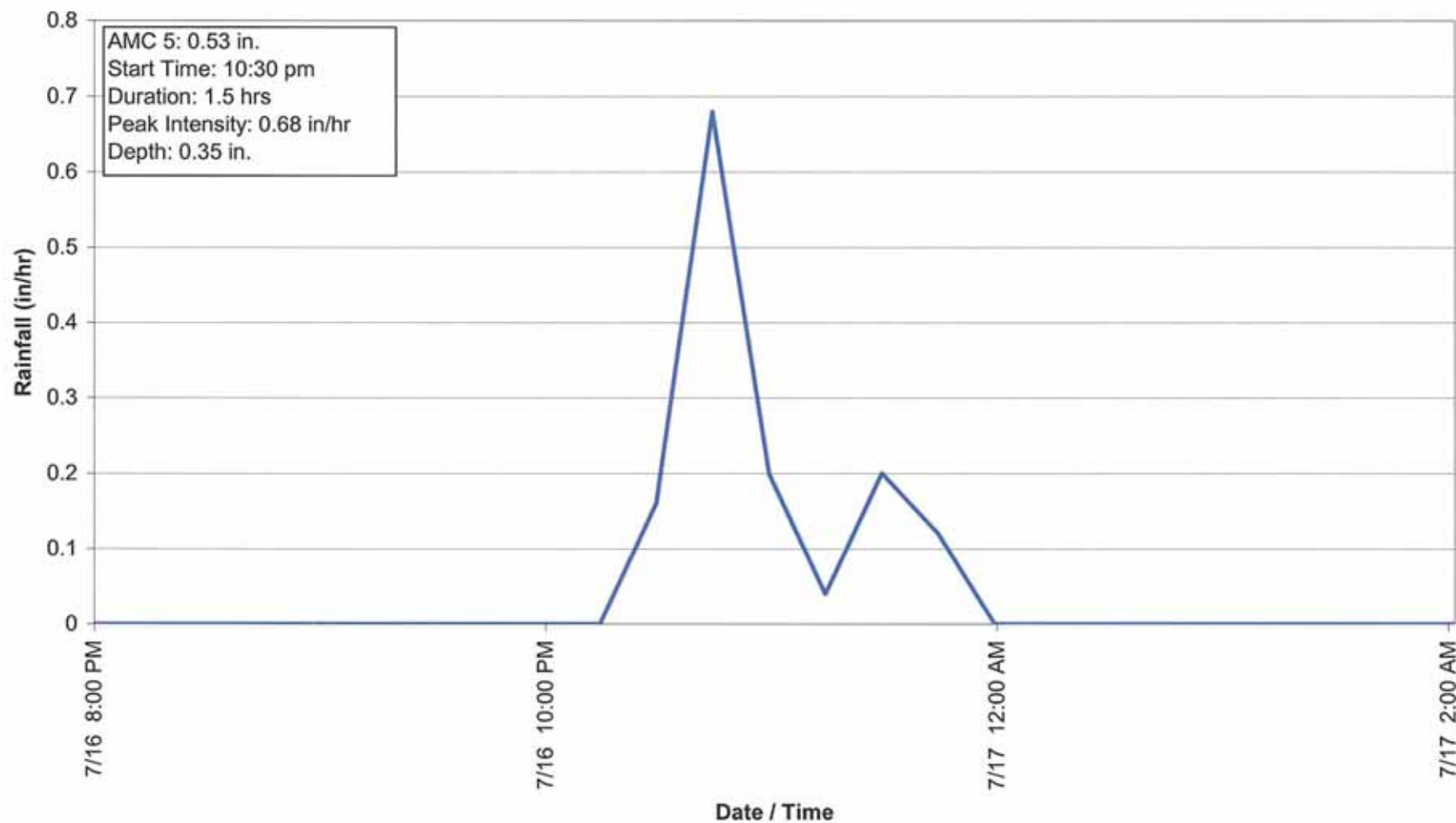
University Precipitation Gauge
Event 9: July 3 - 4
Short-Duration, High Intensity Storm



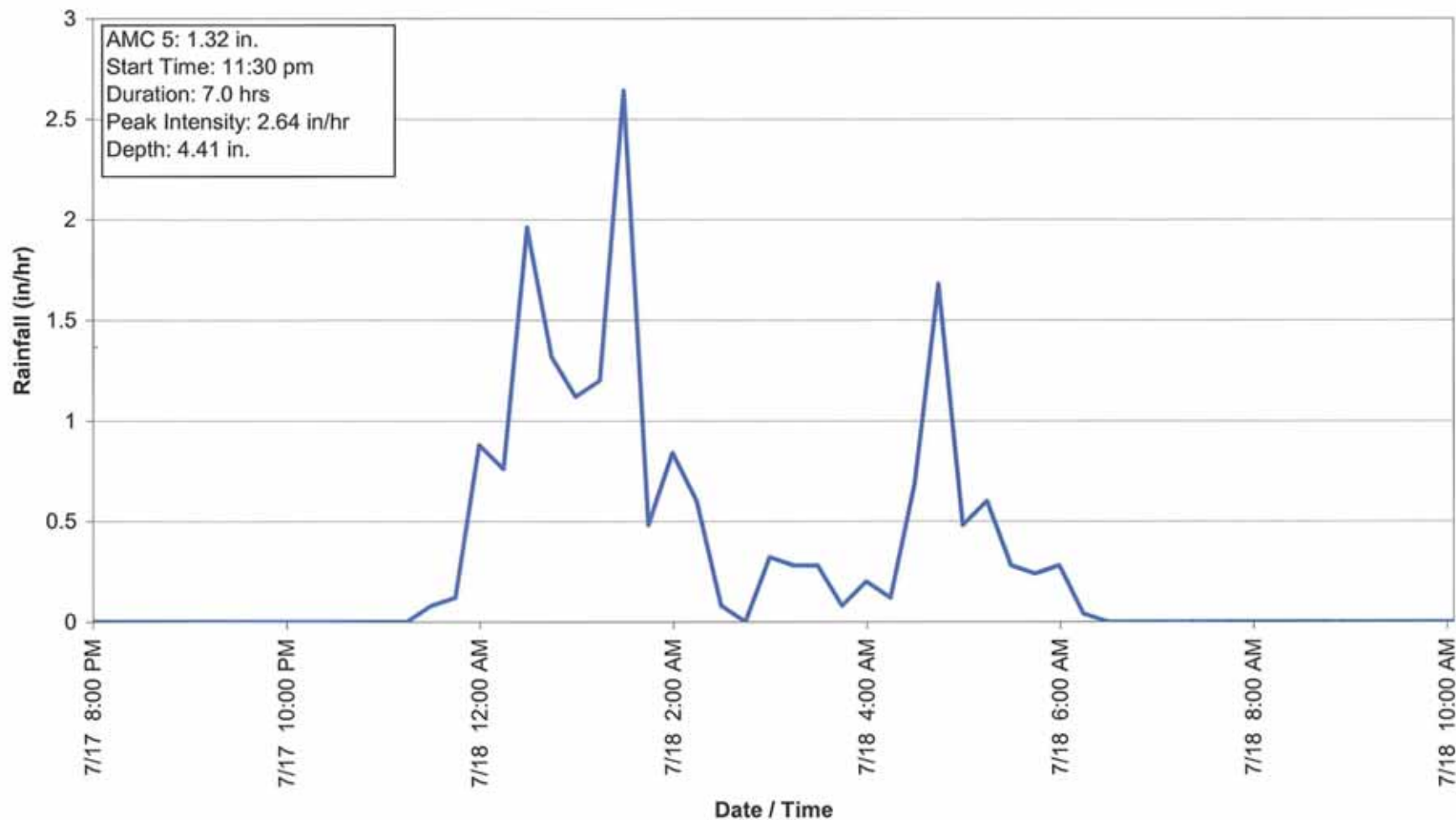
University Precipitation Gauge
Event 10: July 16
Short-Duration, High Intensity Storm



University Precipitation Gauge
Event 11: July 16
Small Depth Storm



University Precipitation Gauge
Event 12: July 17 - 18
Long-Duration, High Intensity Storm

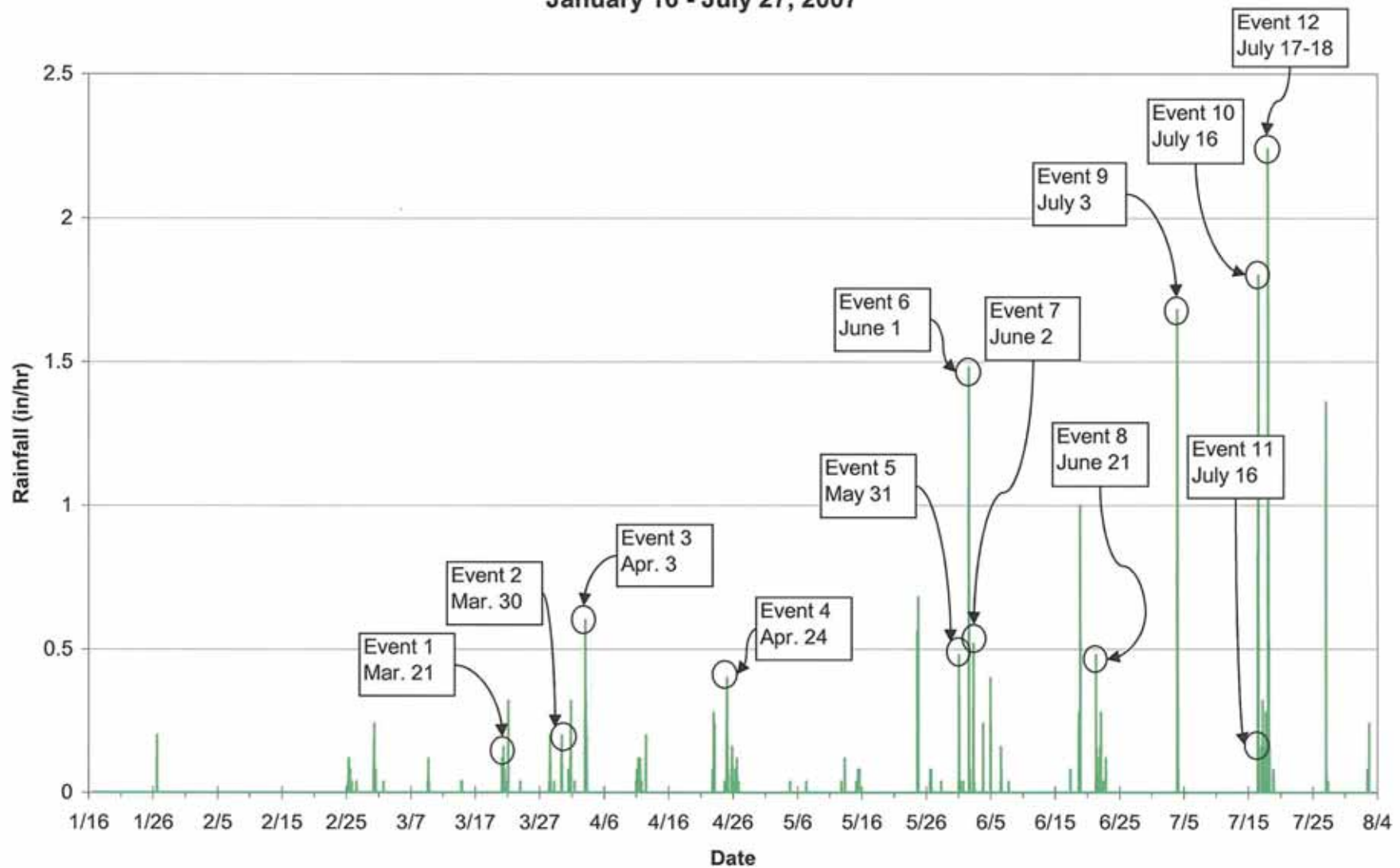


City of Dubuque Precipitation Gauge Data

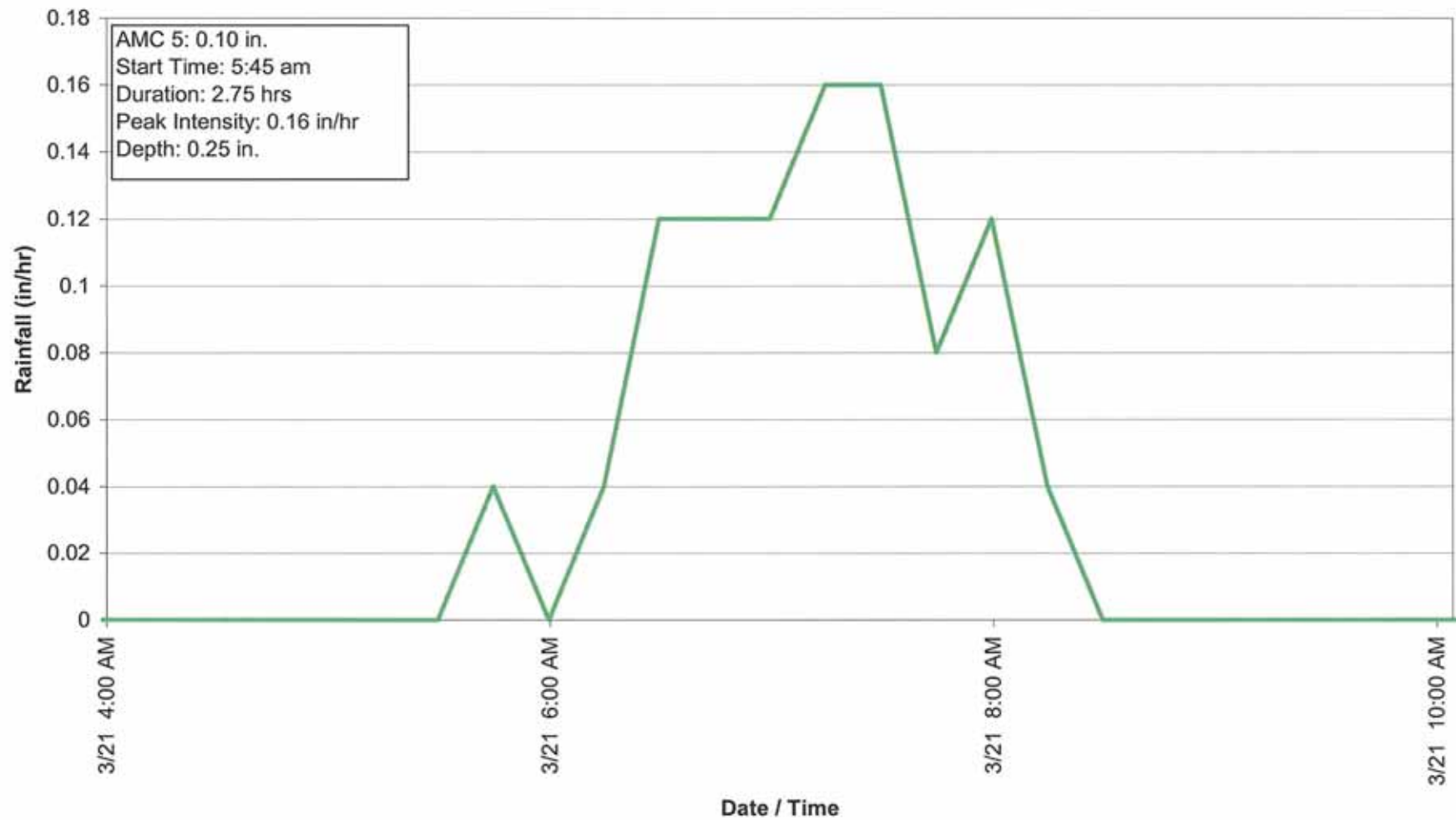
32ND ST PRECIPITATION GAUGE

	Date	Depth (in)	Duration (hr)	Average Intensity (in/hr)	Event
Small Depth	Mar 21st	0.25	2.75	0.09	1
	Mar 30th	0.26	3	0.09	2
	May 31st	0.27	2.5	0.11	5
	June 21st	0.27	1.75	0.15	8
	July 16th	0.19	1.75	0.11	11
Long-Duration, Low Intensity	Apr 3rd	1.22	7.5	0.16	3
	Apr 24th	0.93	7	0.13	4
Short-Duration, High Intensity	June 1st	0.57	1.25	0.46	6
	June 2nd	0.35	1.25	0.28	7
	July 3rd	1.97	3	0.66	9
	July 16th	1.38	2.75	0.50	10
Long-Duration, High Intensity	July 17-18th	3.48	7.25	0.48	12

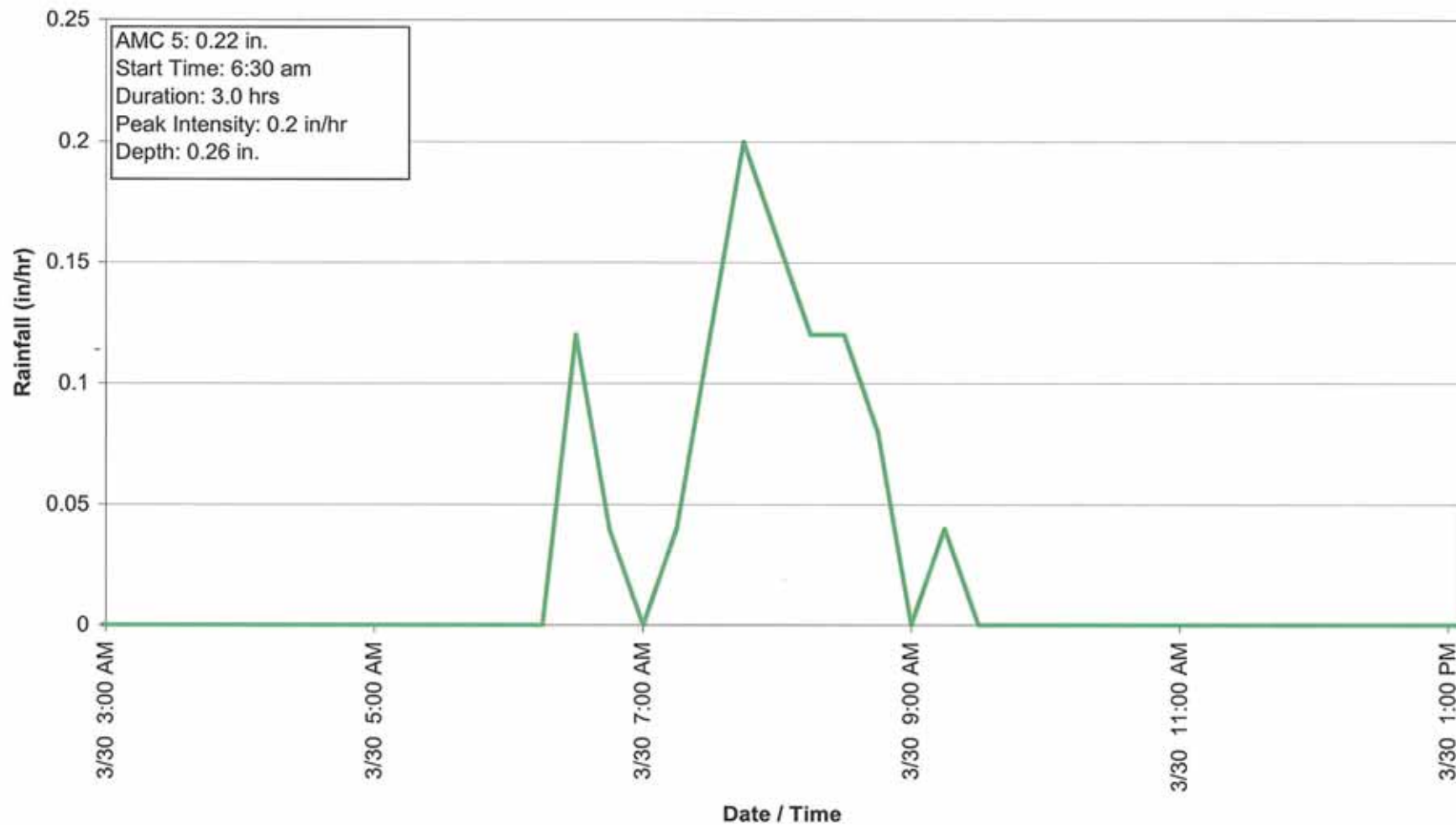
**32nd Street Precipitation Gauge
January 16 - July 27, 2007**



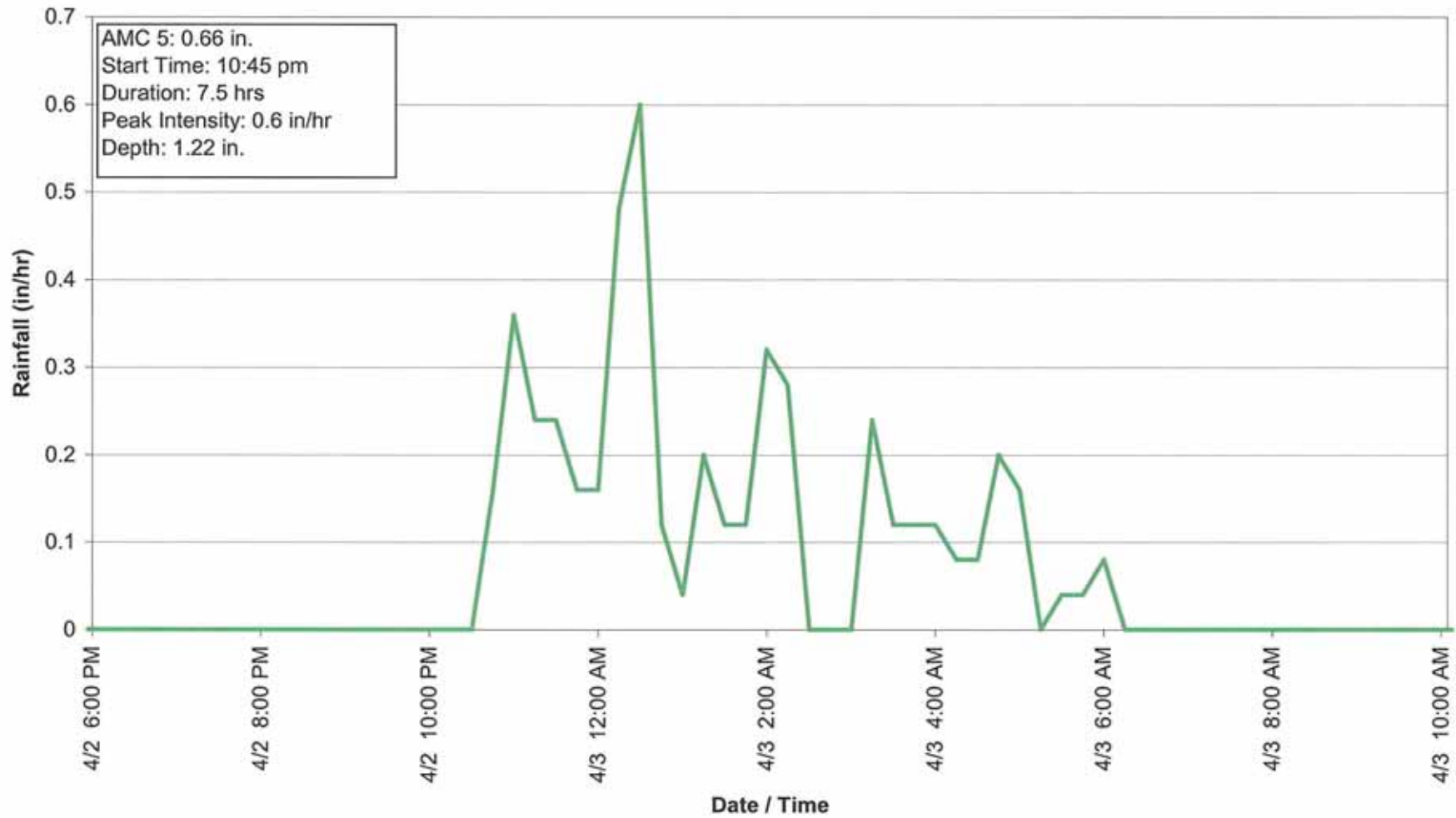
32nd Street Precipitation Gauge
Event 1: March 21
Small Depth Storm



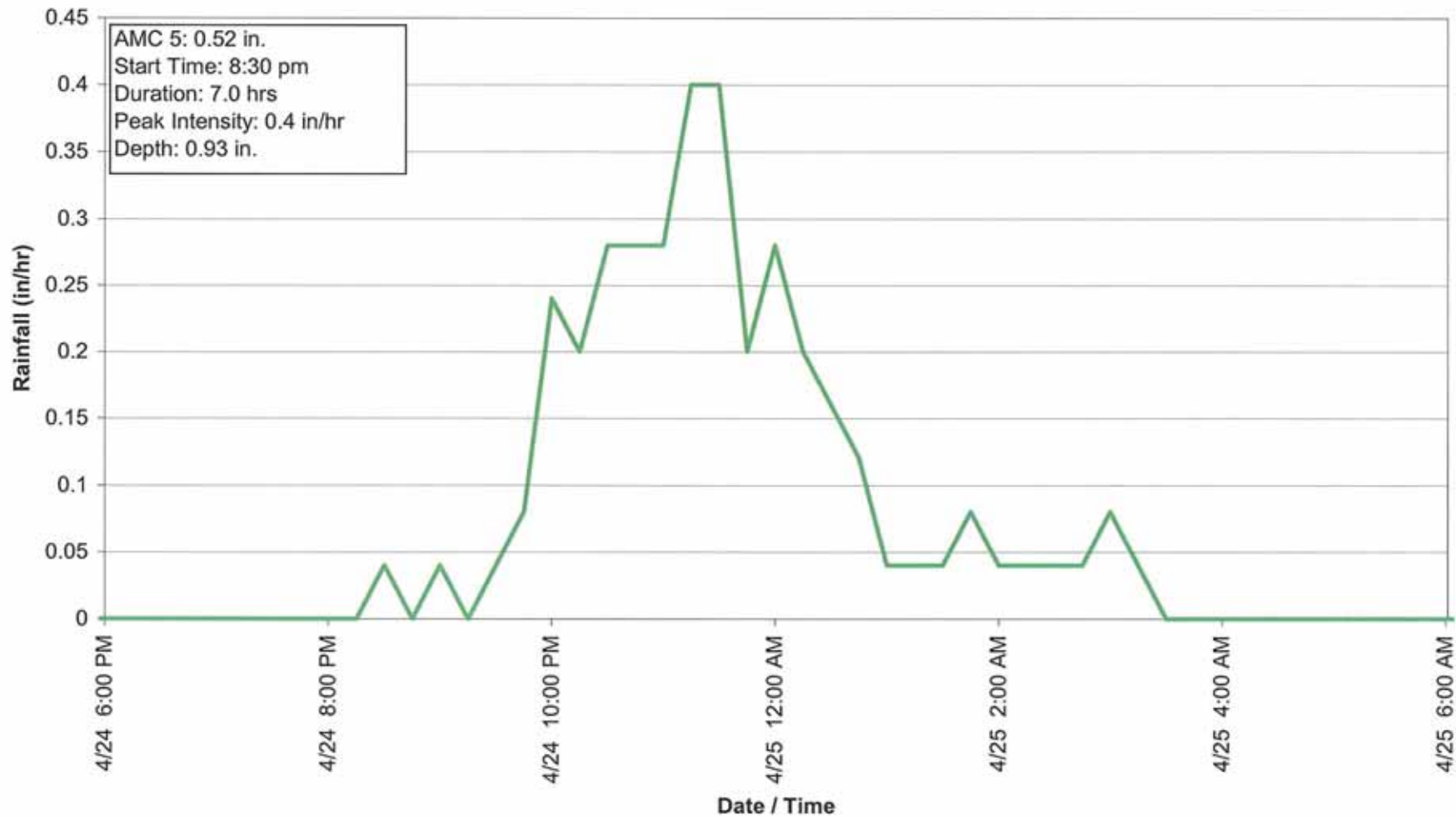
32nd Street Precipitation Gauge
Event 2: March 30
Small Depth Storm



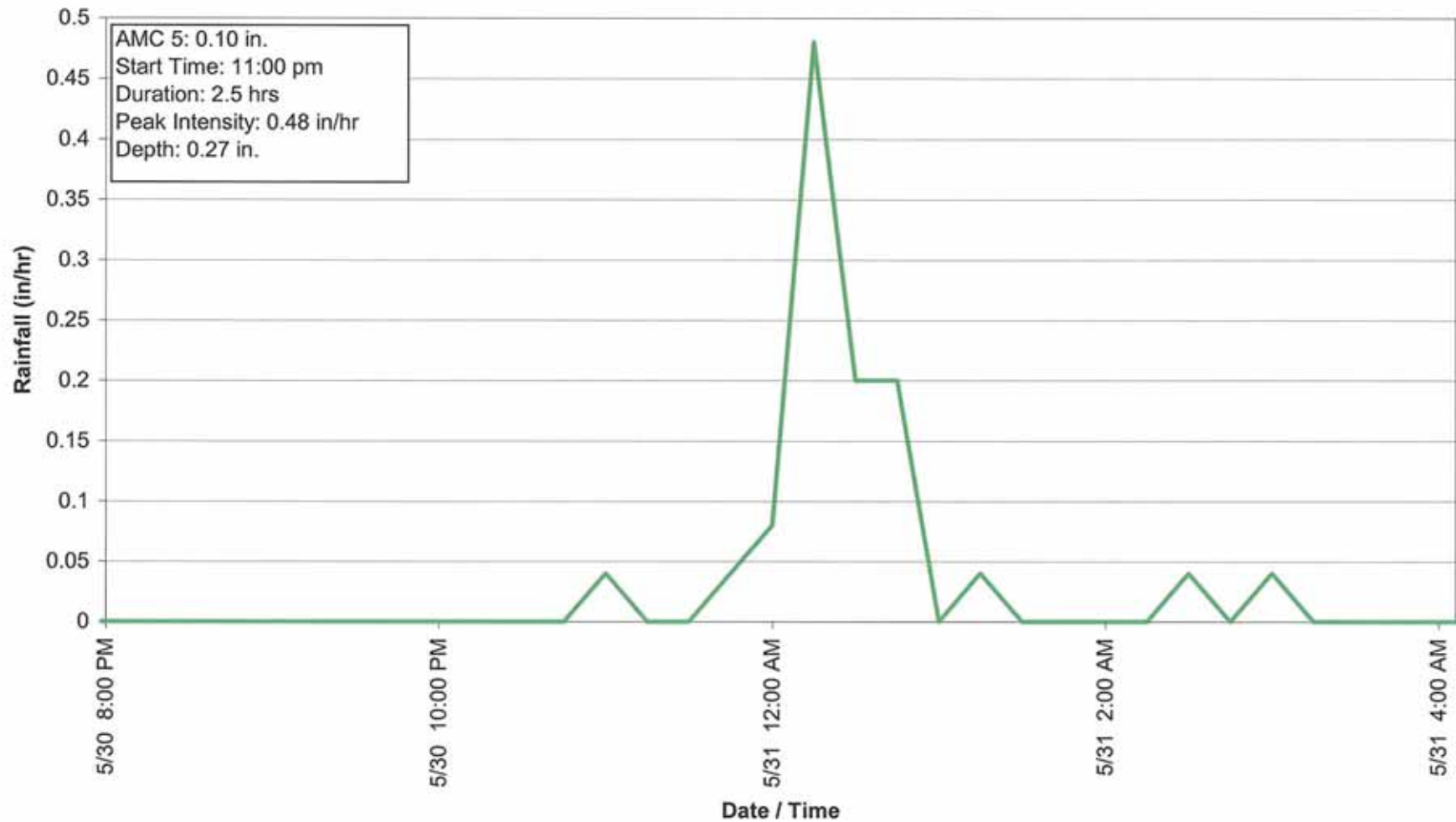
**32nd Street Precipitation Gauge
Event 3: April 2 - 3
Long-Duration, Low Intensity Storm**



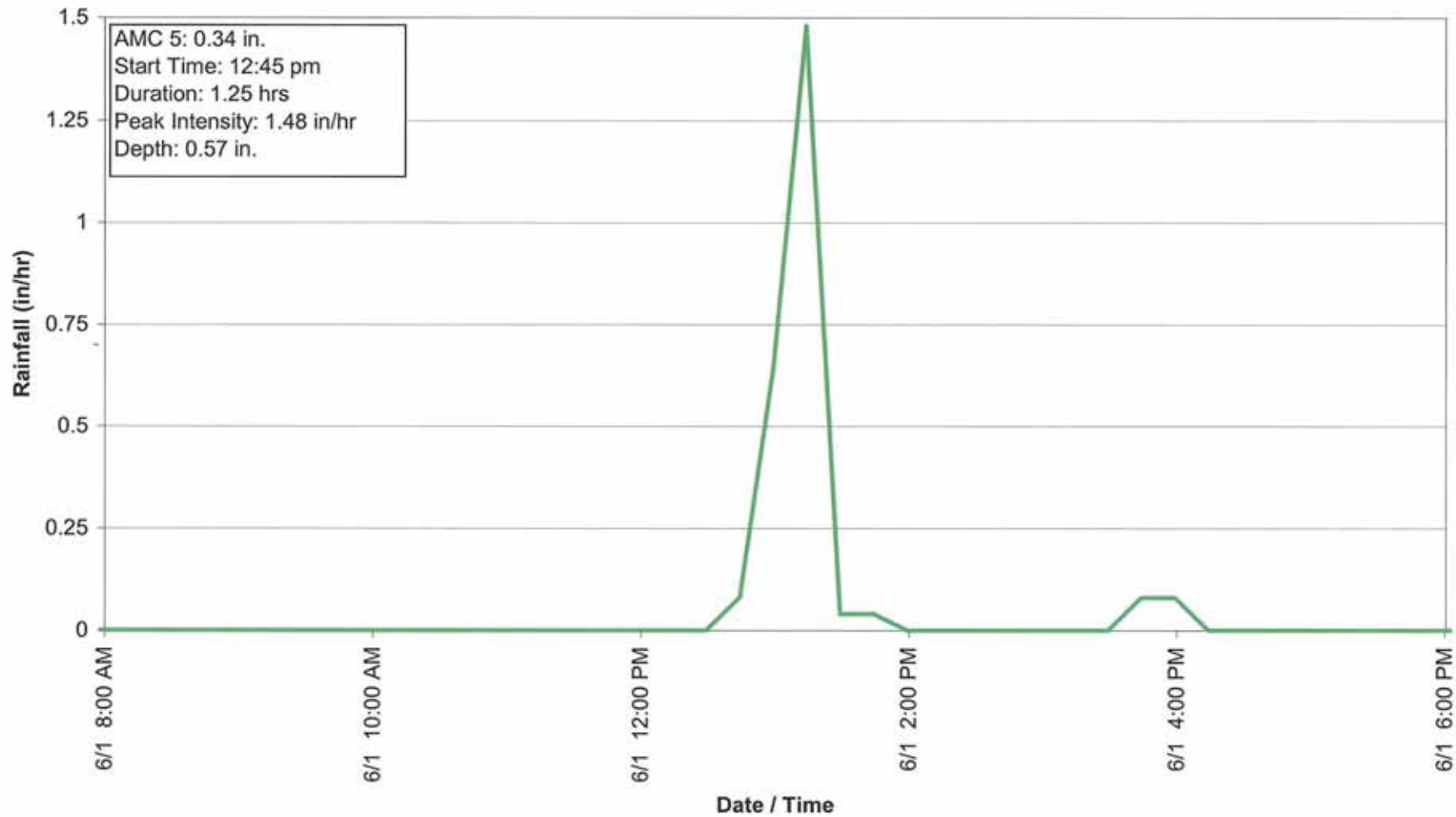
**32nd Street Precipitation Gauge
Event 4: April 24 - 25
Long-Duration, Low Intensity Storm**



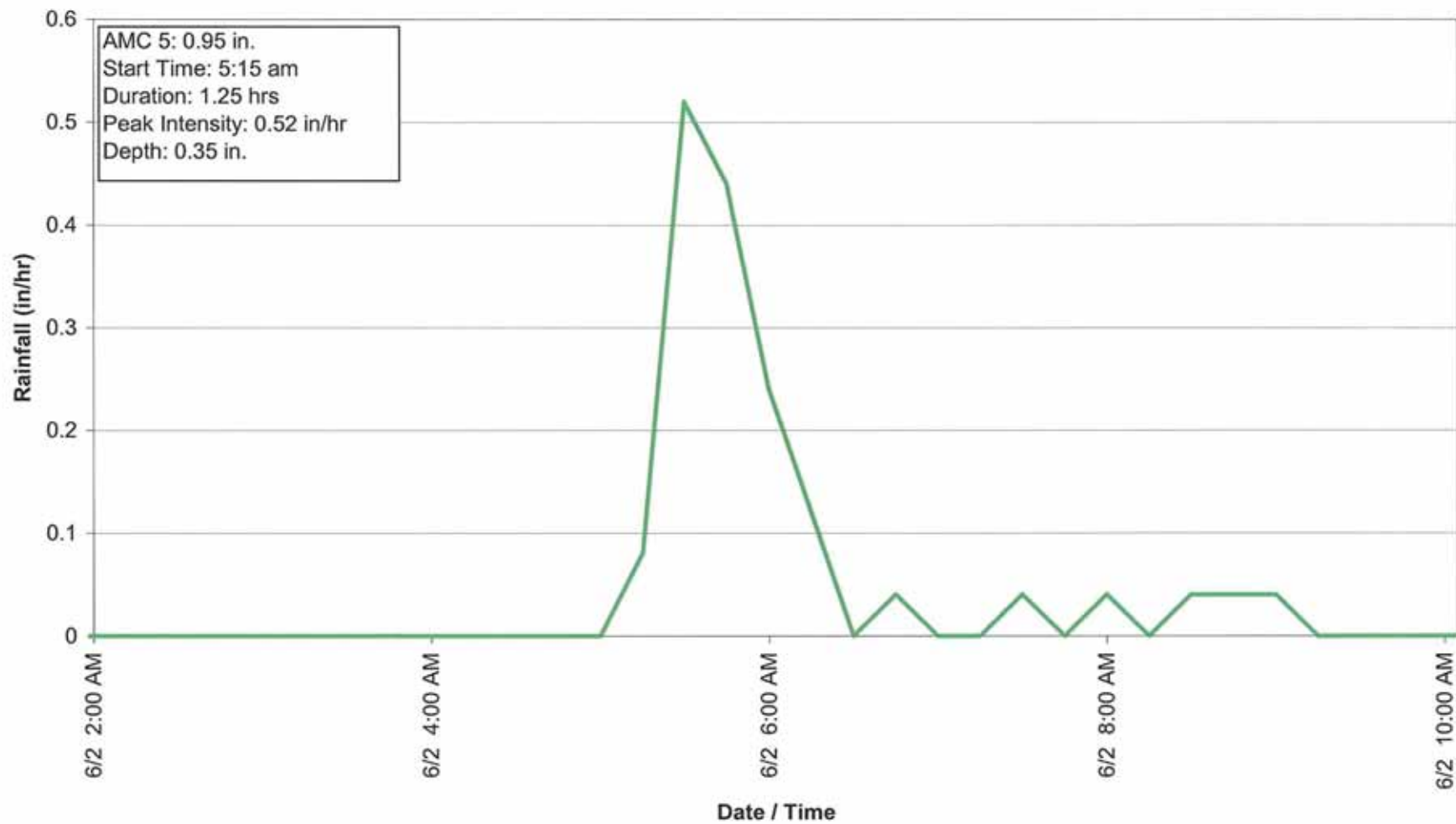
32nd Street Precipitation Gauge
Event 5: May 30 - 31
Small Depth Storm



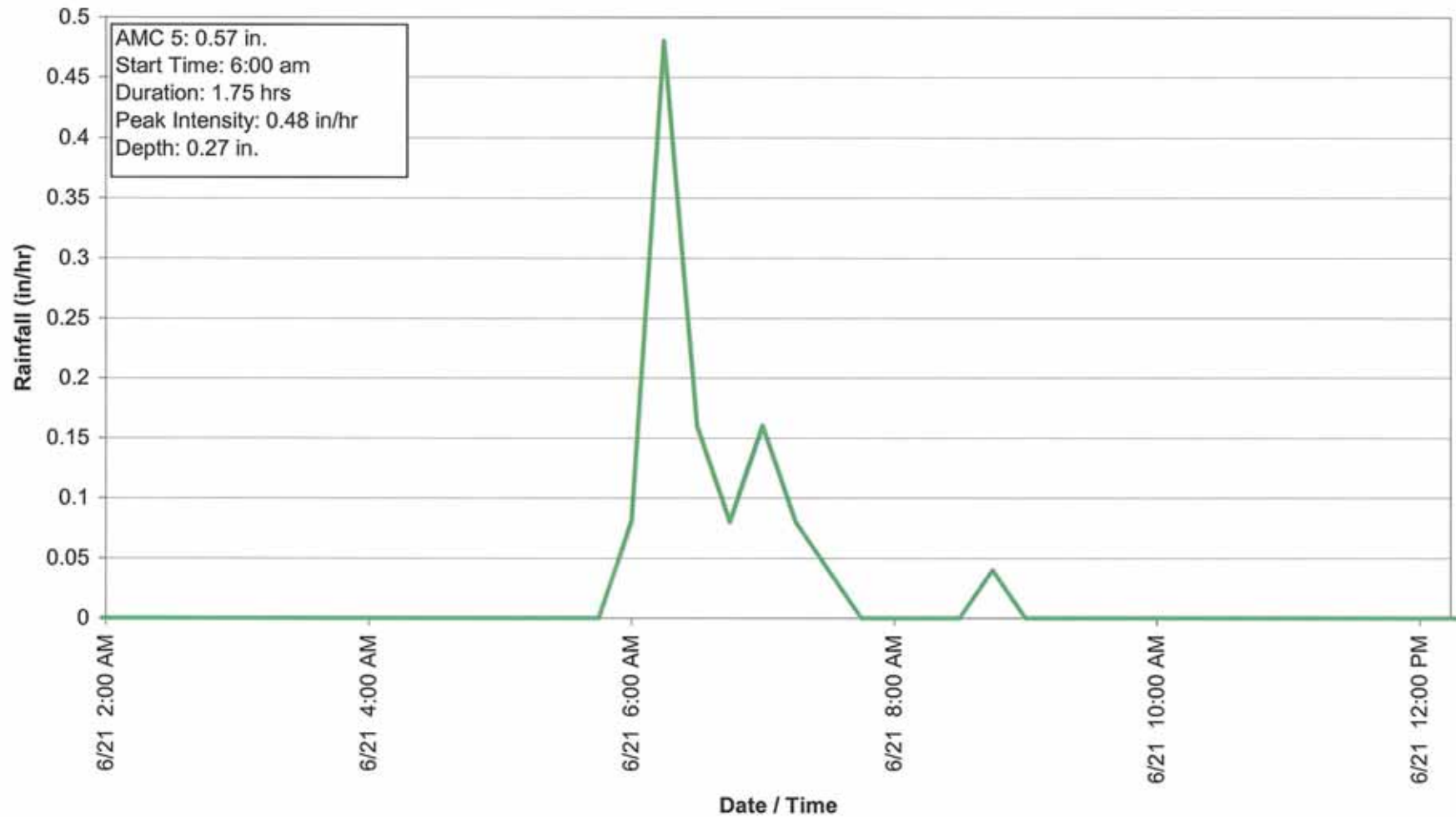
32nd Street Precipitation Gauge
Event 6: June 1
Short-Duration, High Intensity Storm



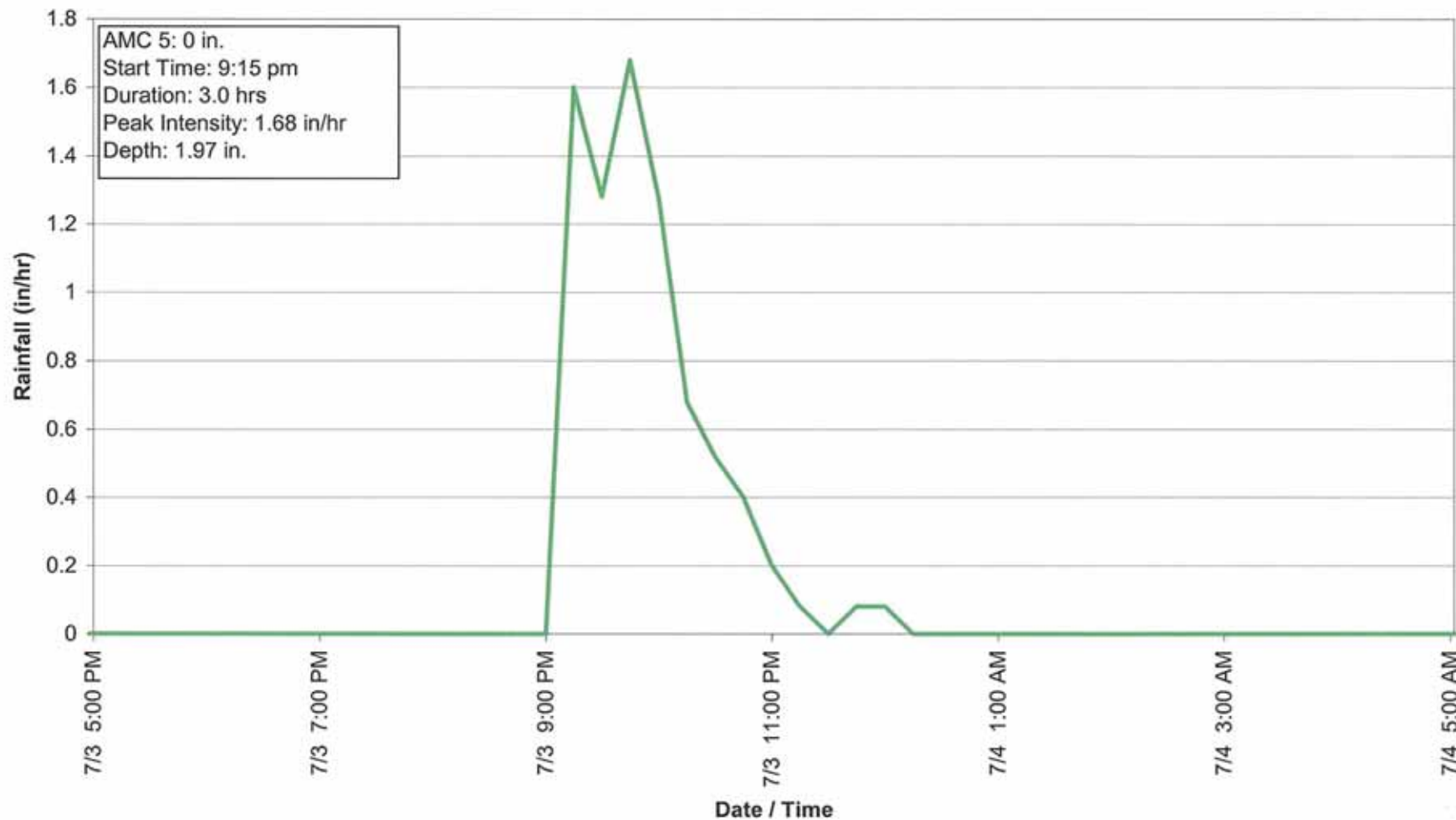
**32nd Street Precipitation Gauge
Event 7: June 2
Short-Duration, High Intensity Storm**



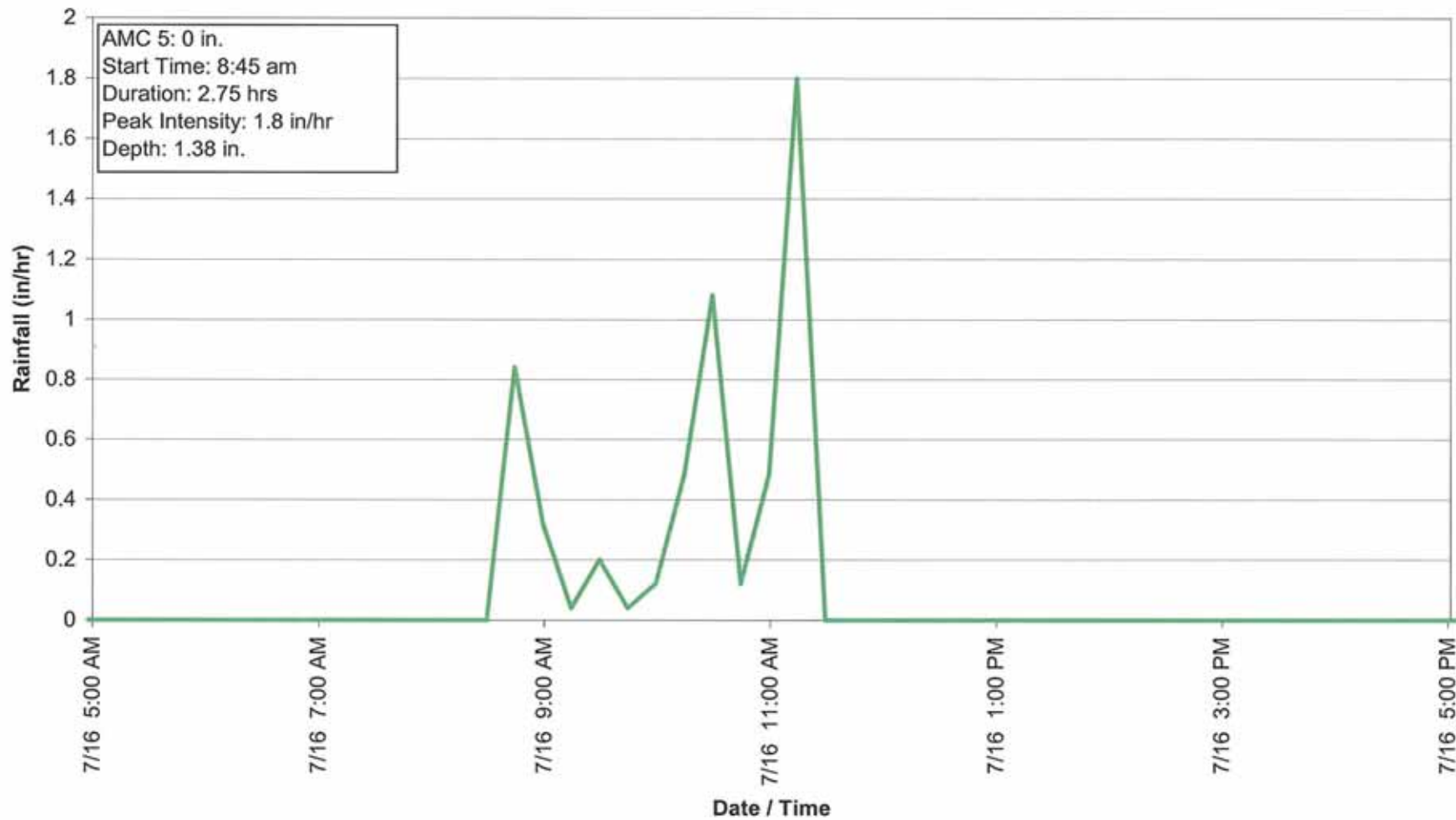
**32nd Street Precipitation Gauge
Event 8: June 21
Small Depth Storm**



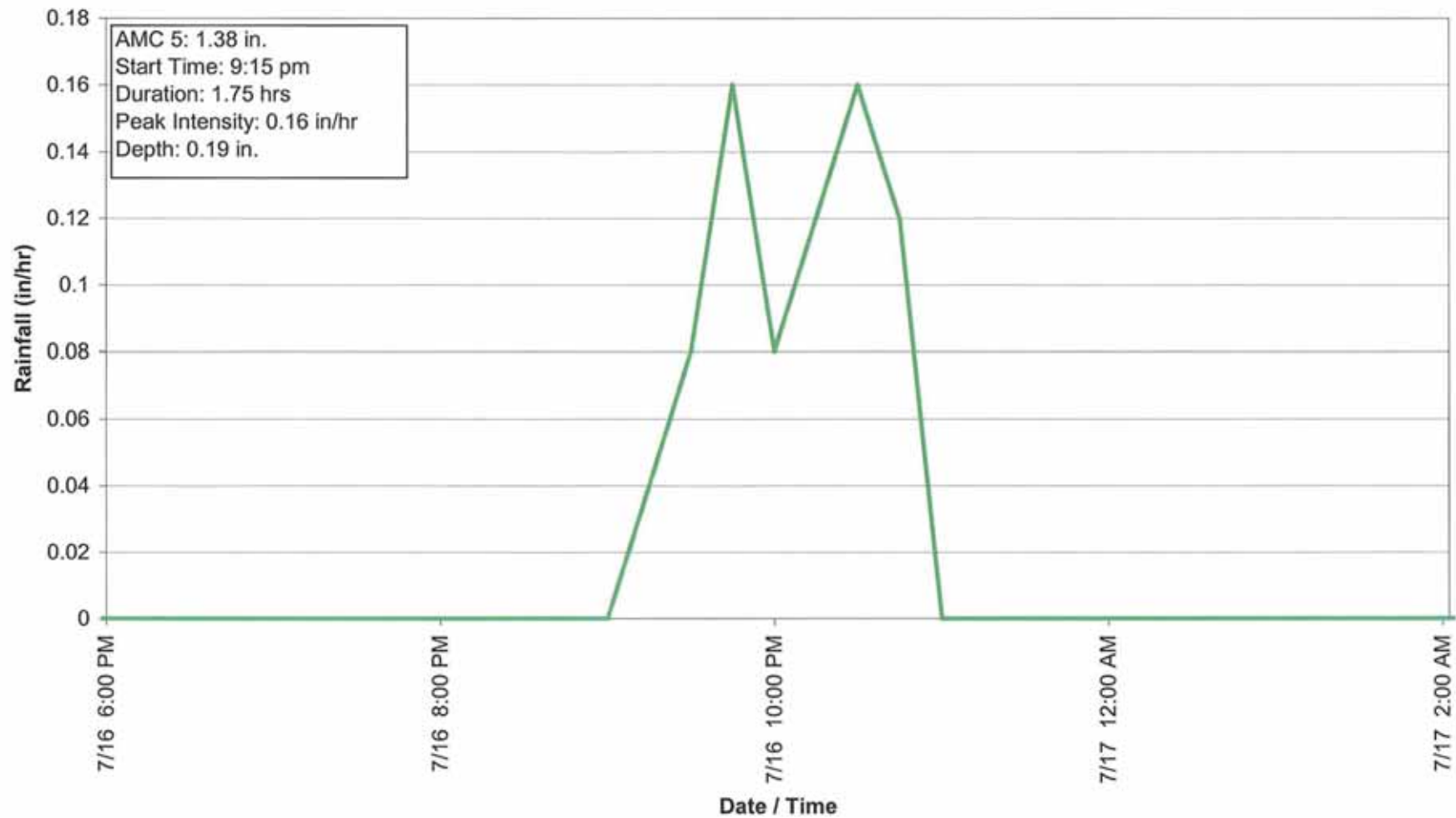
**32nd Street Precipitation Gauge
Event 9: July 3
Short-Duration, High Intensity Storm**



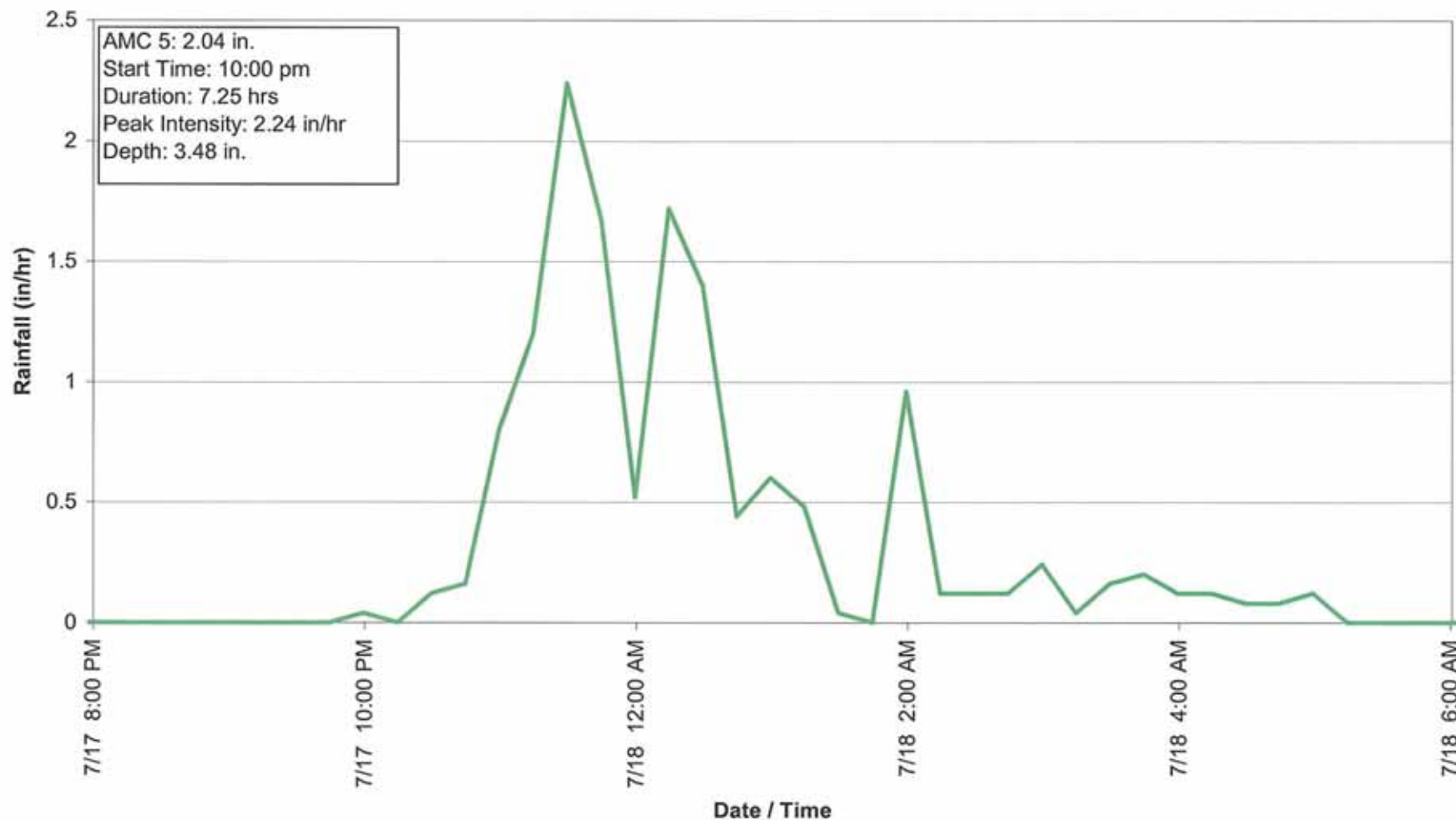
**32nd Street Precipitation Gauge
Event 10: July 16
Short-Duration, High Intensity Storm**



32nd Street Precipitation Gauge
Event 11: July 16
Small Depth Storm



**32nd Street Precipitation Gauge
Event 12: July 17 - 18
Long-Duration, High Intensity Storm**

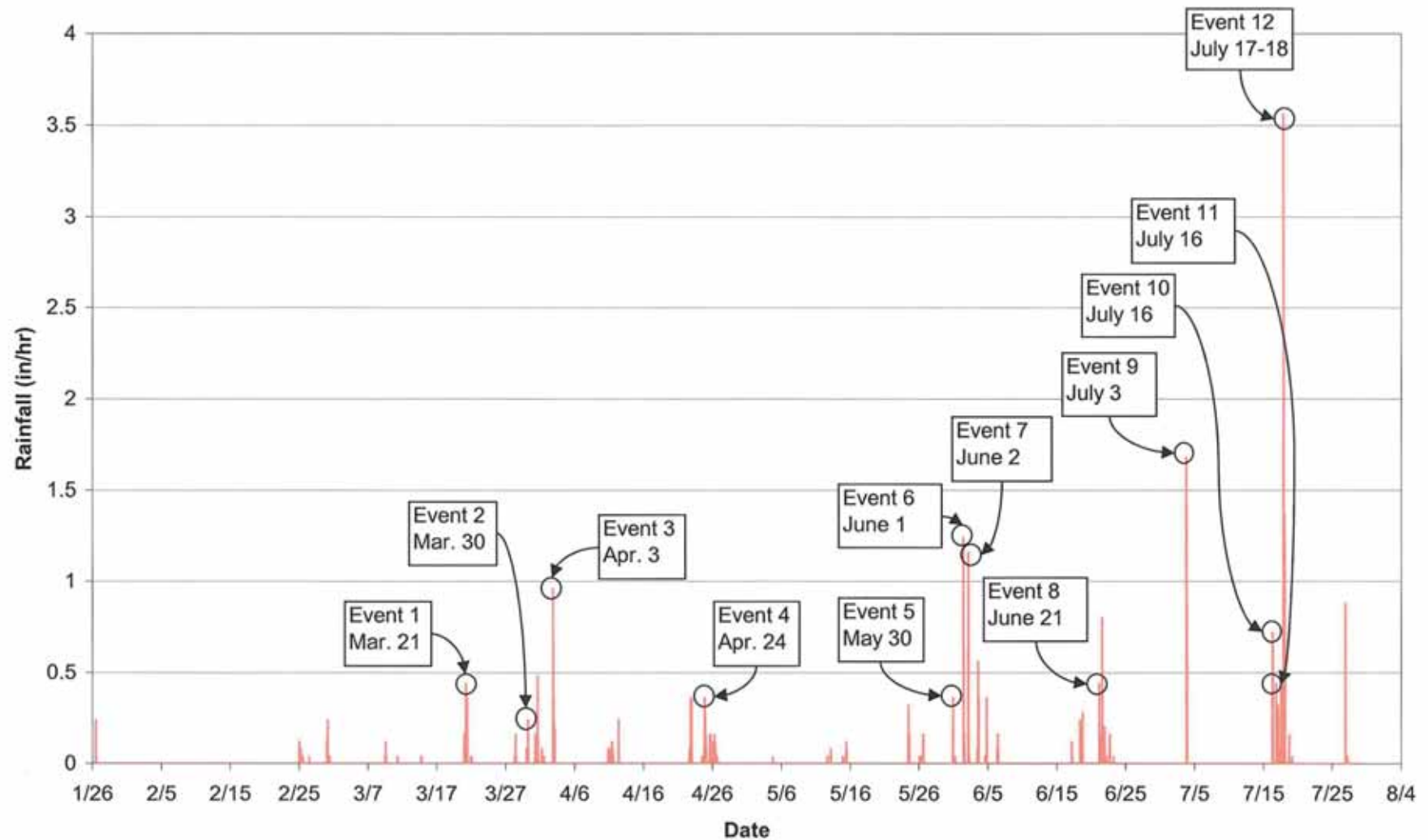


City of Dubuque Precipitation Gauge Data

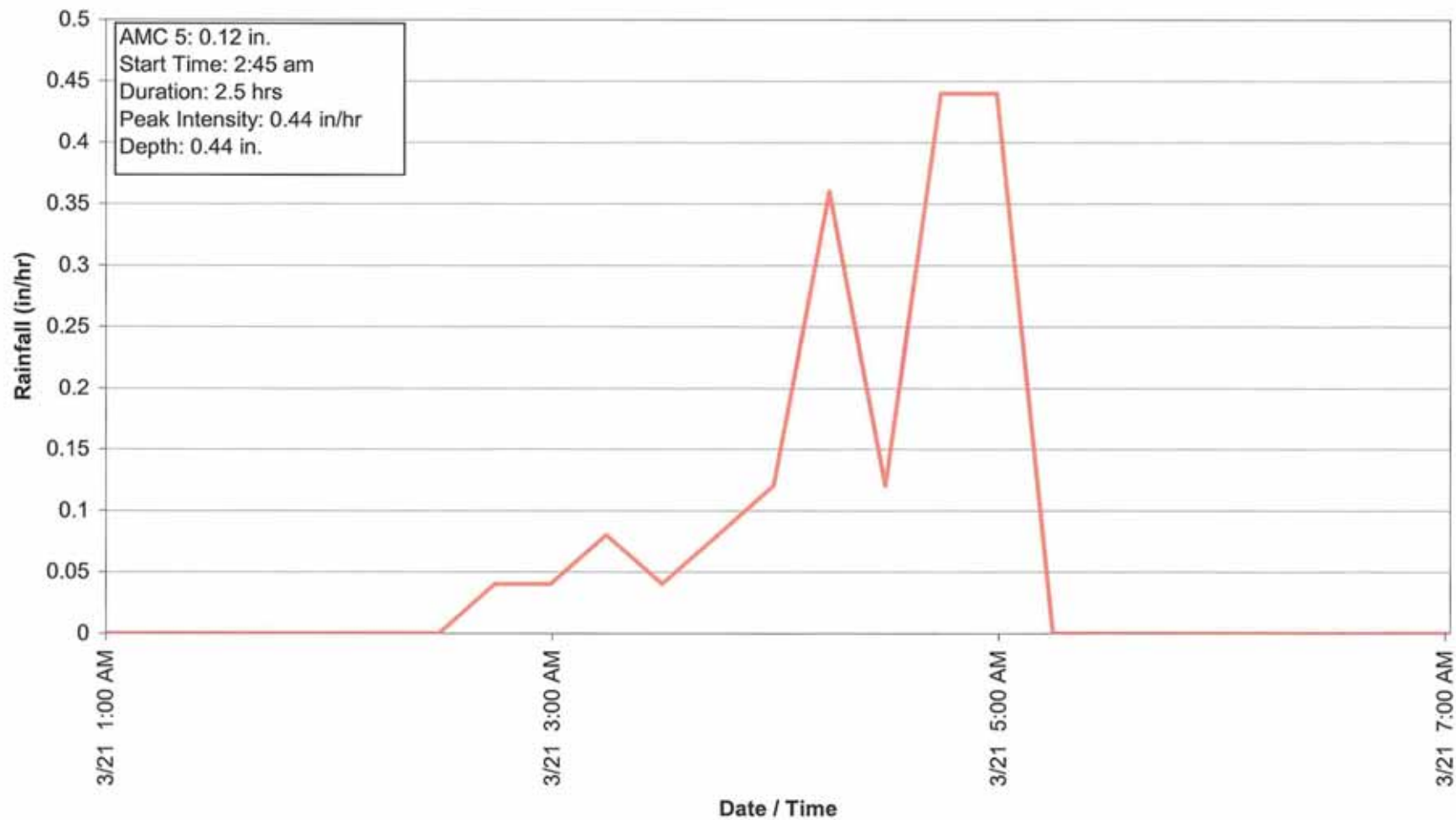
WASTEWATER PRECIPITATION GAUGE

	Date	Depth (in)	Duration (hr)	Average Intensity (in/hr)	Event
Small-Depth	Mar 21st	0.44	2.5	0.18	1
	Mar 30th	0.38	3	0.13	2
	May 30th	0.25	2	0.13	5
	June 21st	0.28	1.5	0.19	8
	July 16th	0.26	1.75	0.15	11
Long-Duration, Low Intensity	Apr 3rd	1.2	7.75	0.15	3
	Apr 24th	1.1	6.75	0.16	4
Short-Duration, High Intensity	June 1st	0.43	1.25	0.34	6
	June 2nd	0.52	1.25	0.42	7
	July 3rd	2.29	3.75	0.61	9
	July 16th	0.73	2.25	0.32	10
Long-Duration, High Intensity	July 17-18th	4.24	7.25	0.58	12

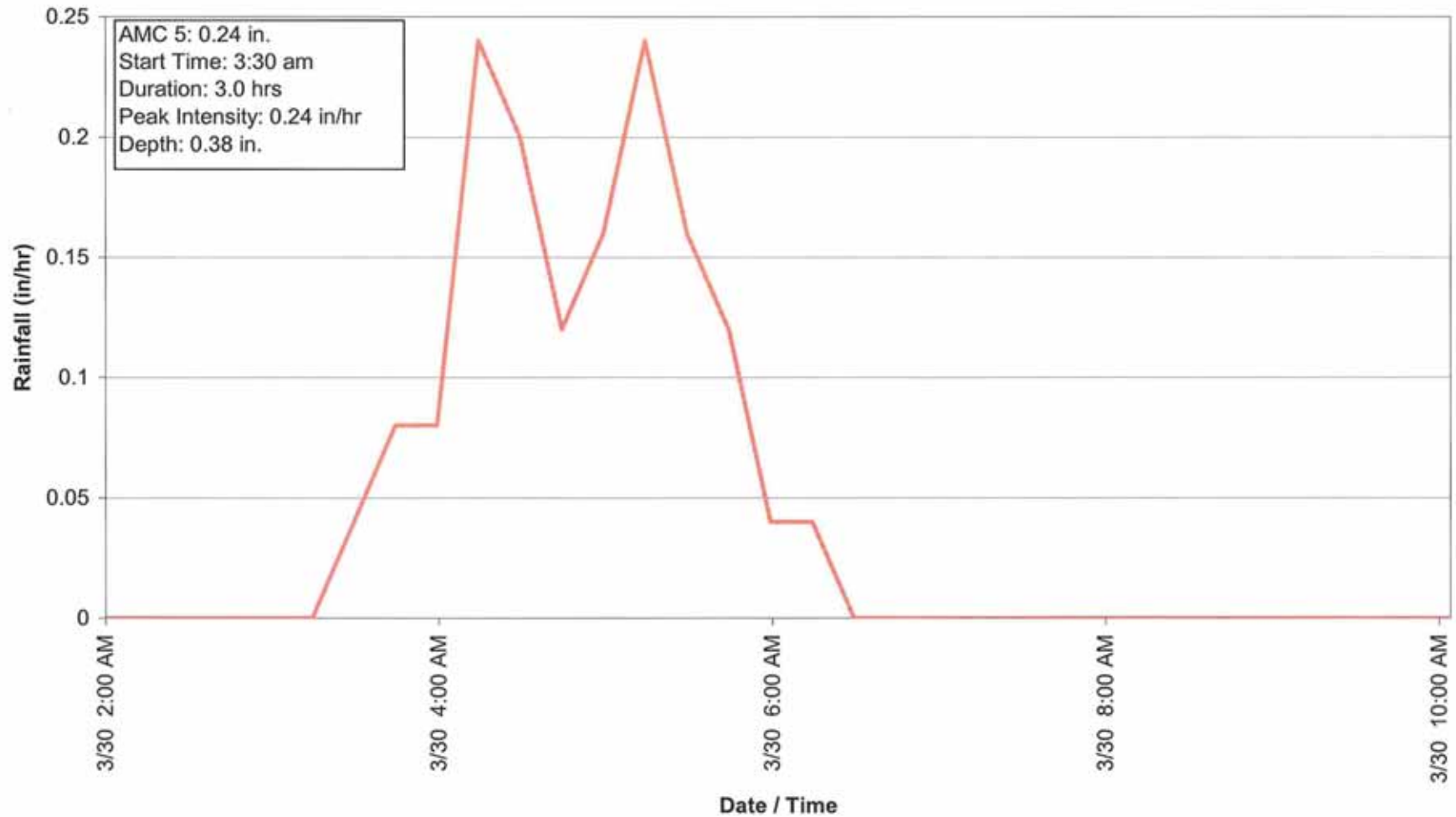
Wastewater Precipitation Gauge
Jan. 26 - July 28, 2007



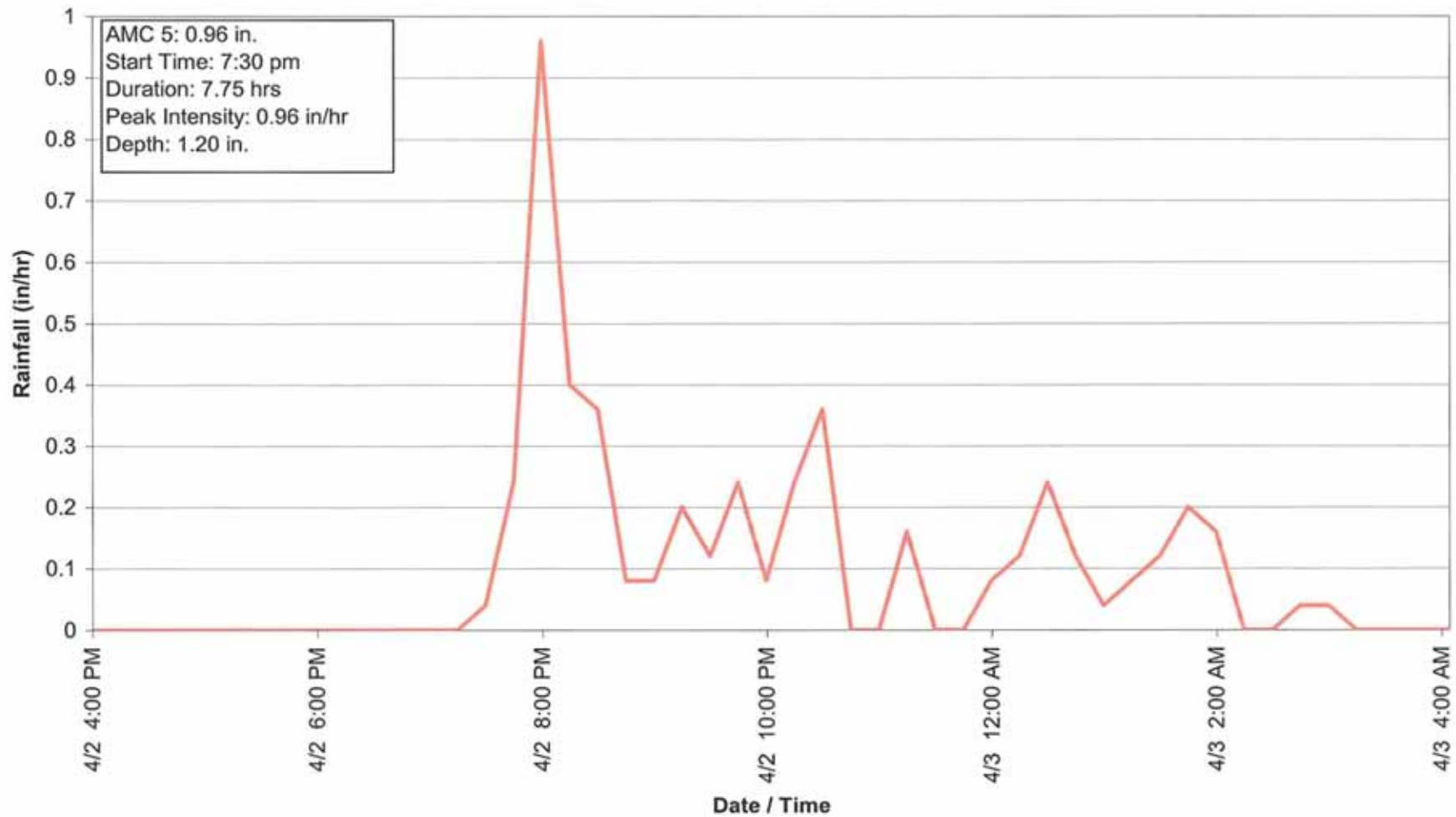
Wastewater Precipitation Gauge
Event 1: March 21
Small Depth Storm



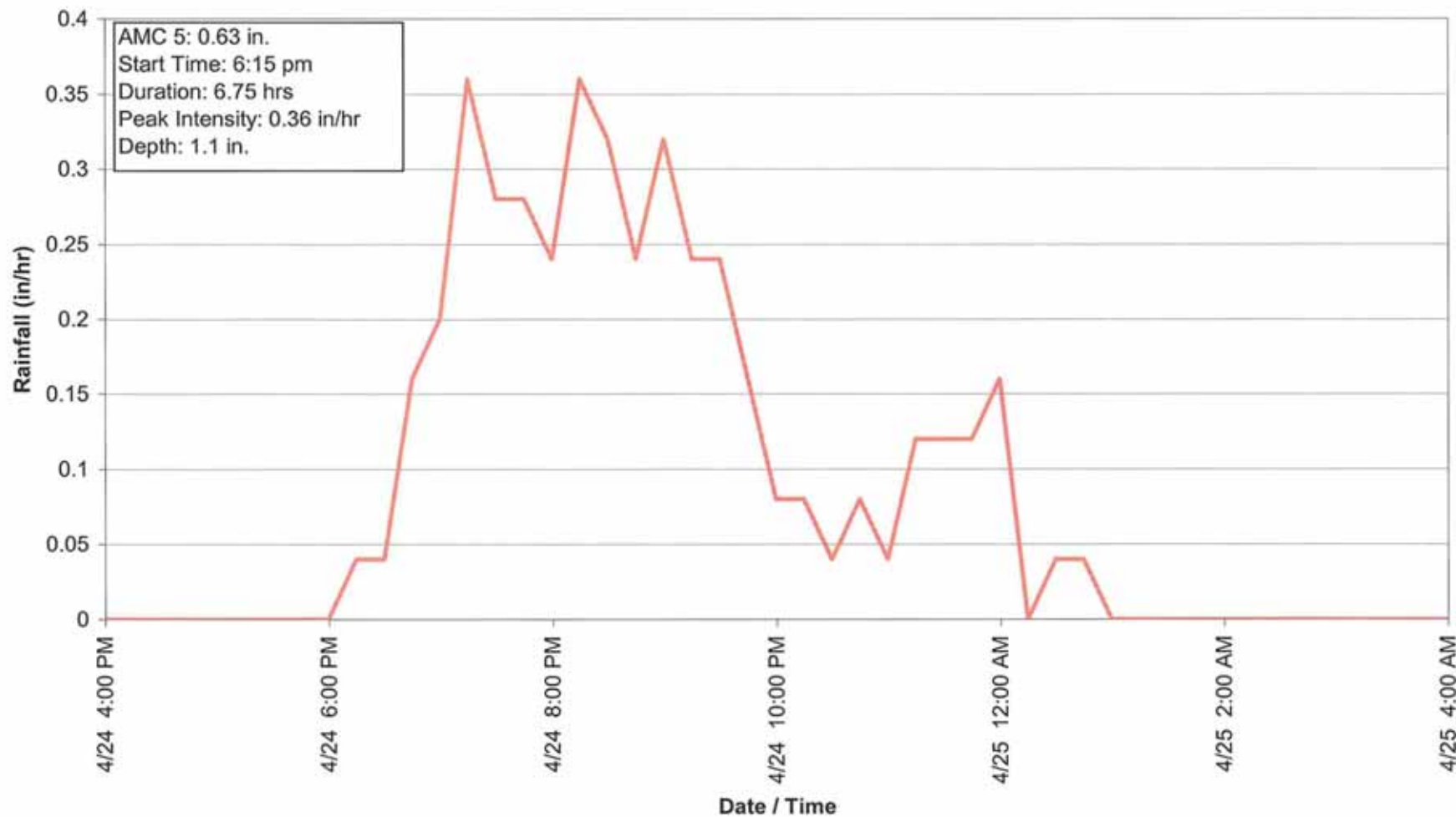
Wastewater Precipitation Gauge
Event 2: March 30
Small Depth Storm



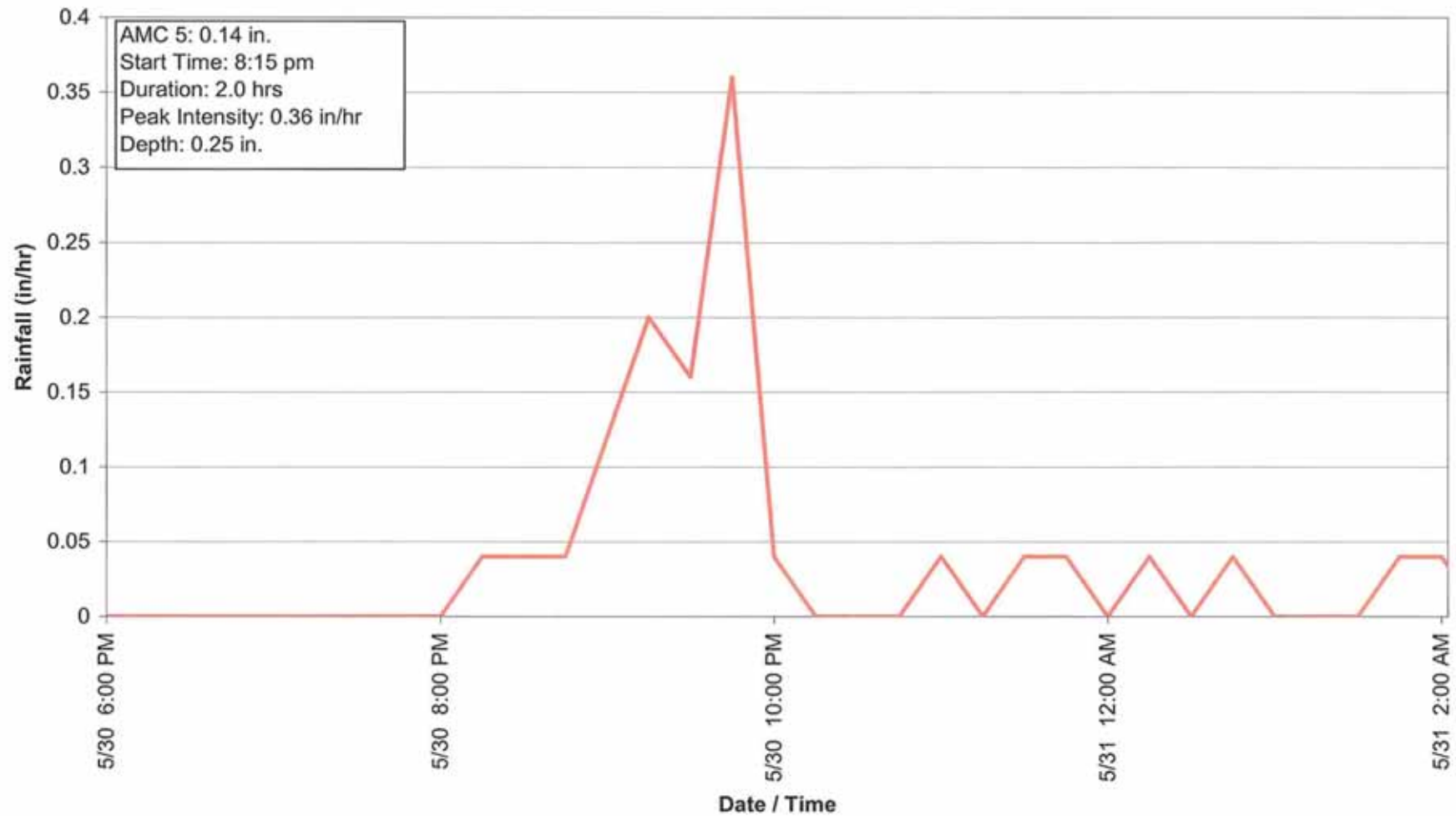
**Wastewater Precipitation Gauge
Event 3: April 3
Long-Duration, Low Intensity Storm**



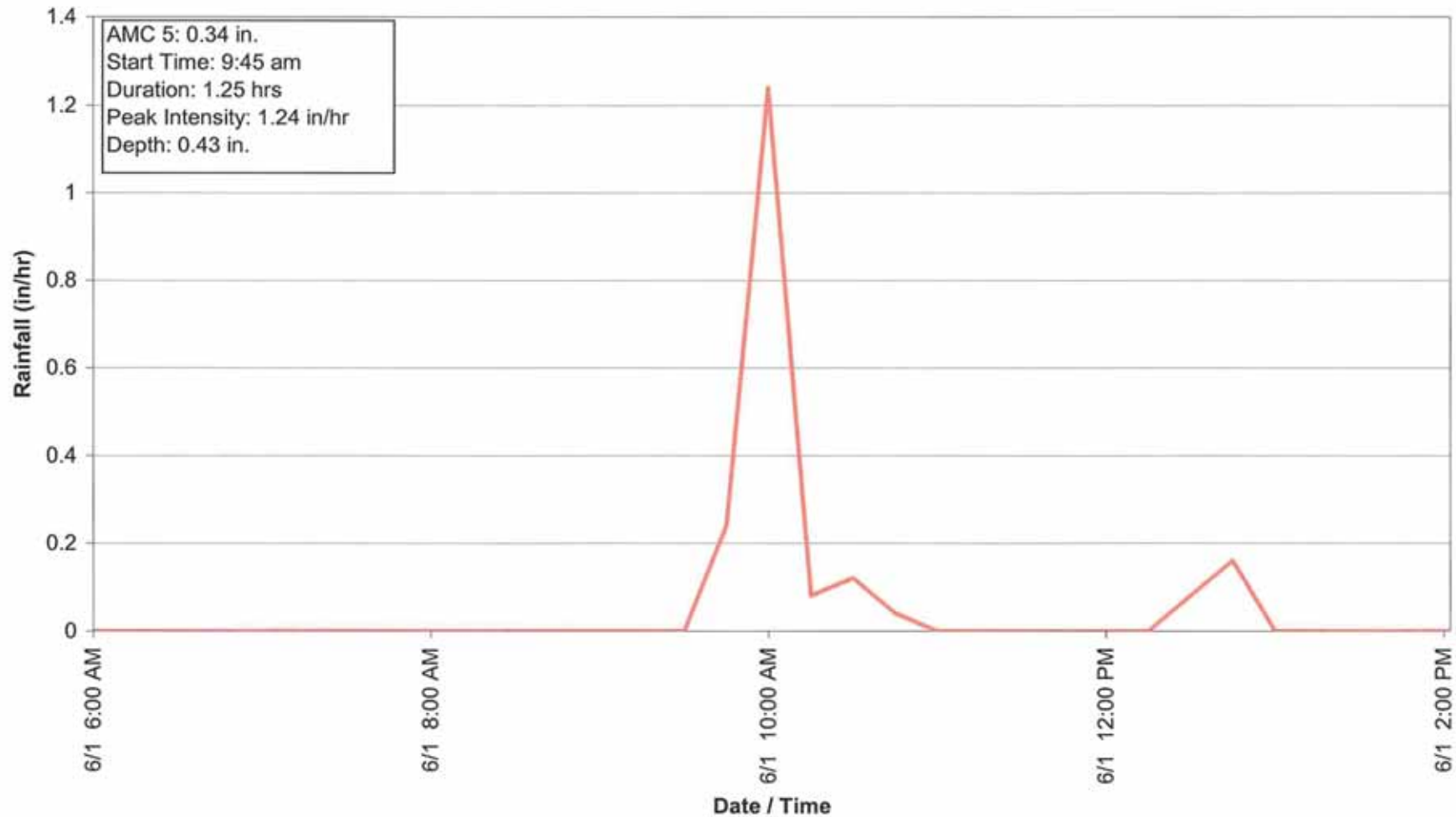
**Wastewater Precipitation Gauge
Event 4: April 24
Long-Duration, Low Intensity Storm**



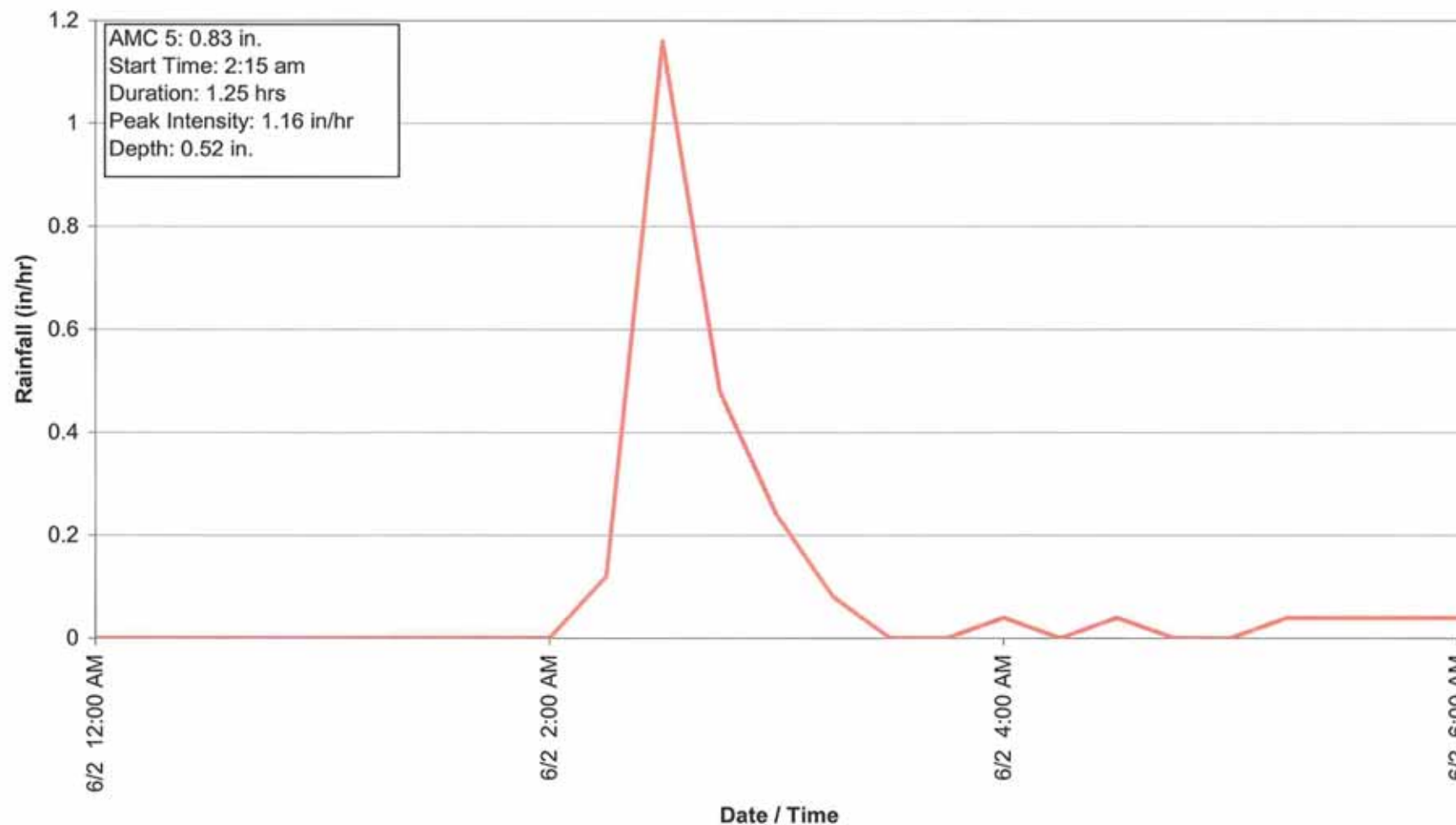
Wastewater Precipitation Gauge
Event 5: May 30
Small Depth Storm



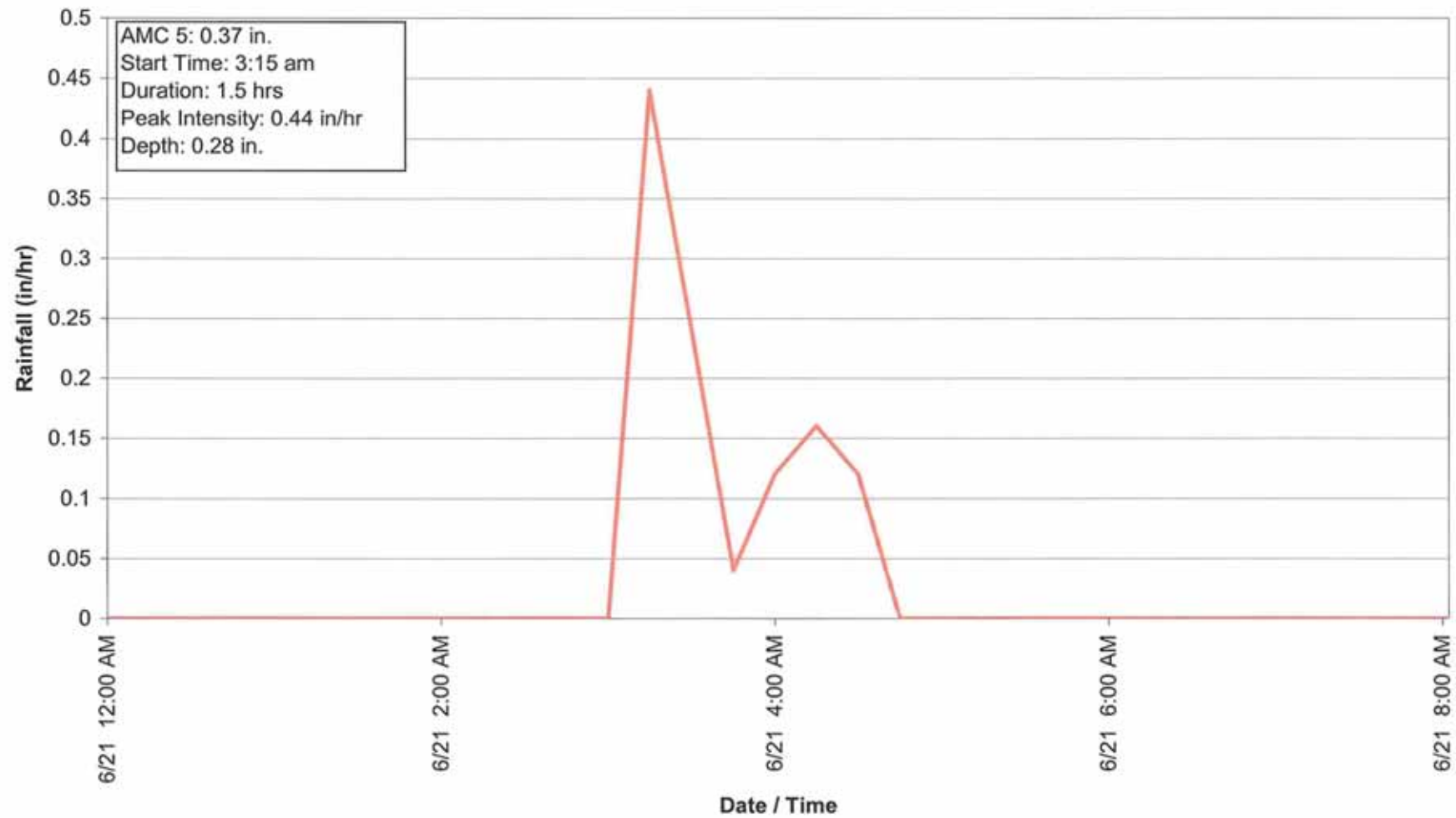
Wastewater Precipitation Gauge
Event 6: June 1
Short-Duration, High Intensity Storm



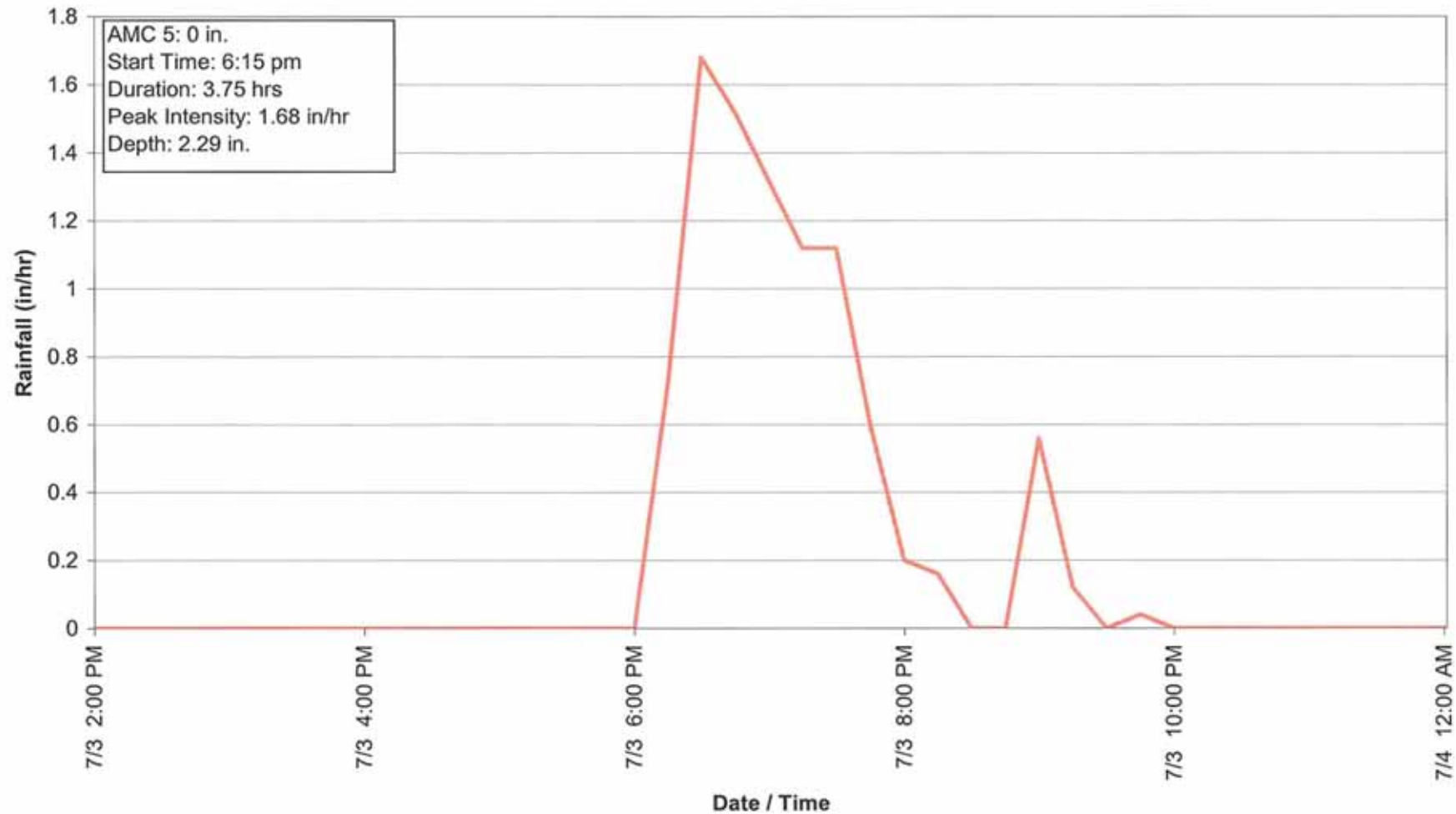
Wastewater Precipitation Gauge
Event 7: June 2
Short-Duration, High Intensity Storm



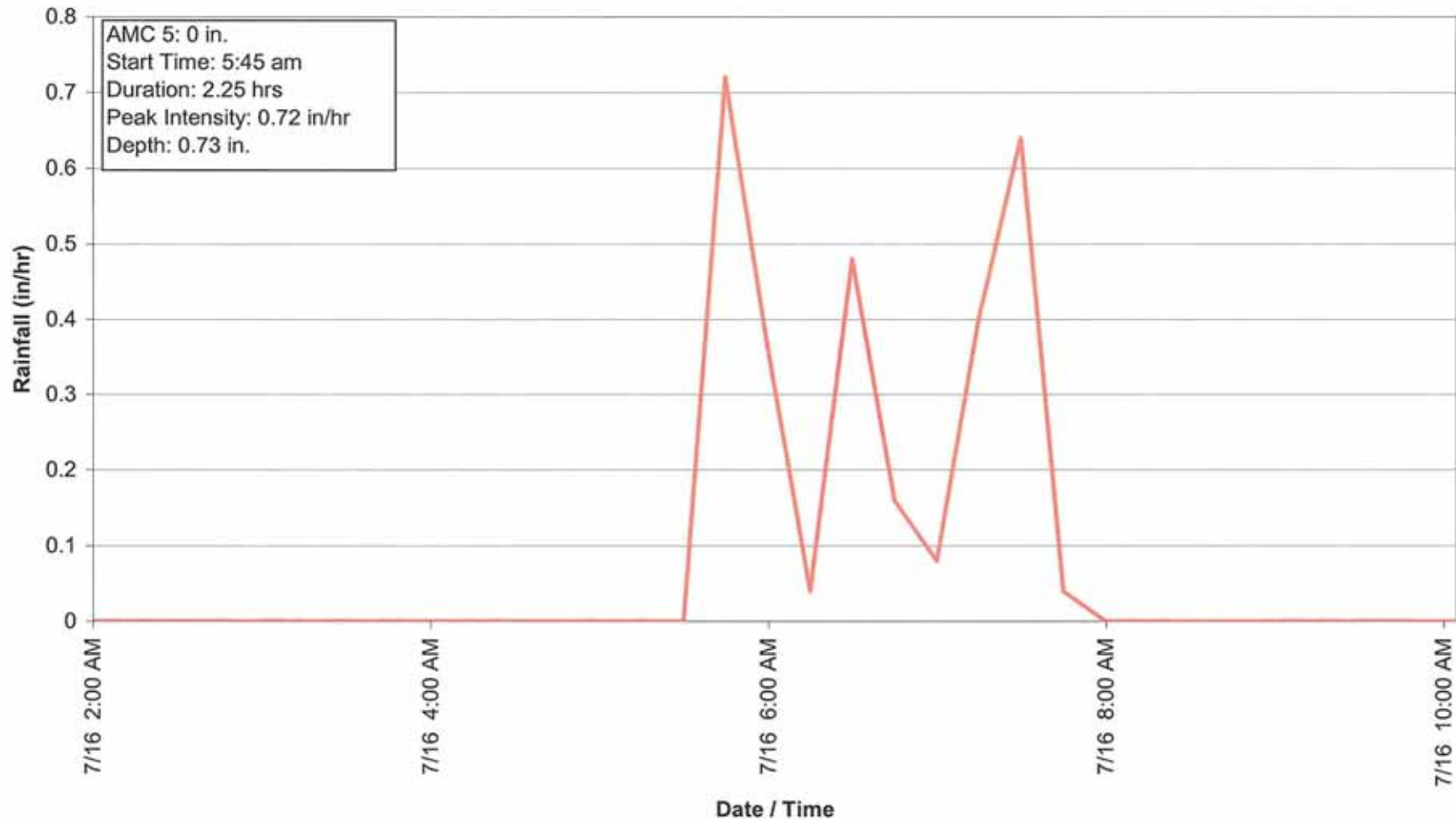
**Wastewater Precipitation Gauge
Event 8: June 21
Small Depth Storm**



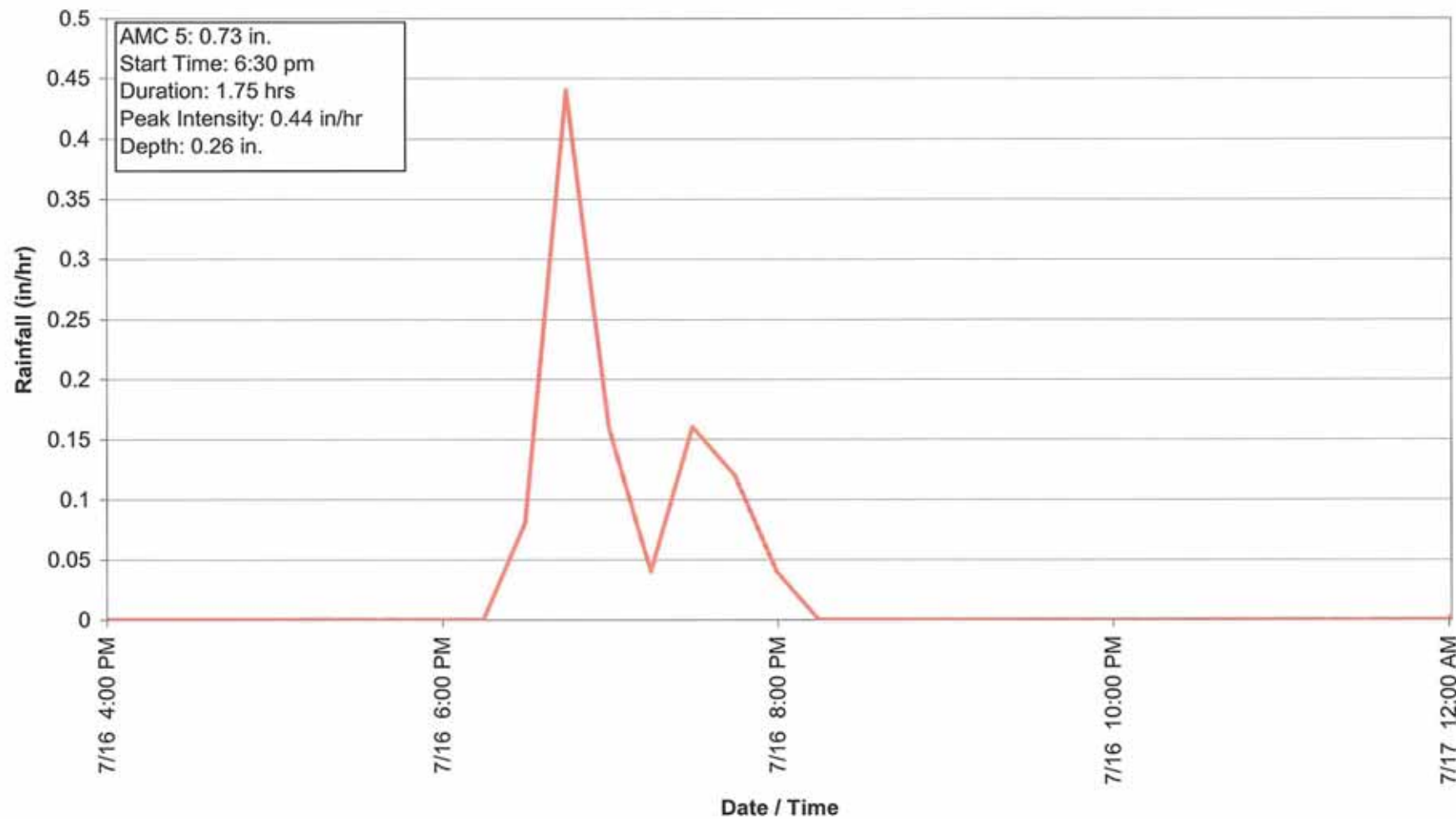
Wastewater Precipitation Gauge
Event 9: July 3
Short-Duration, High Intensity Storm



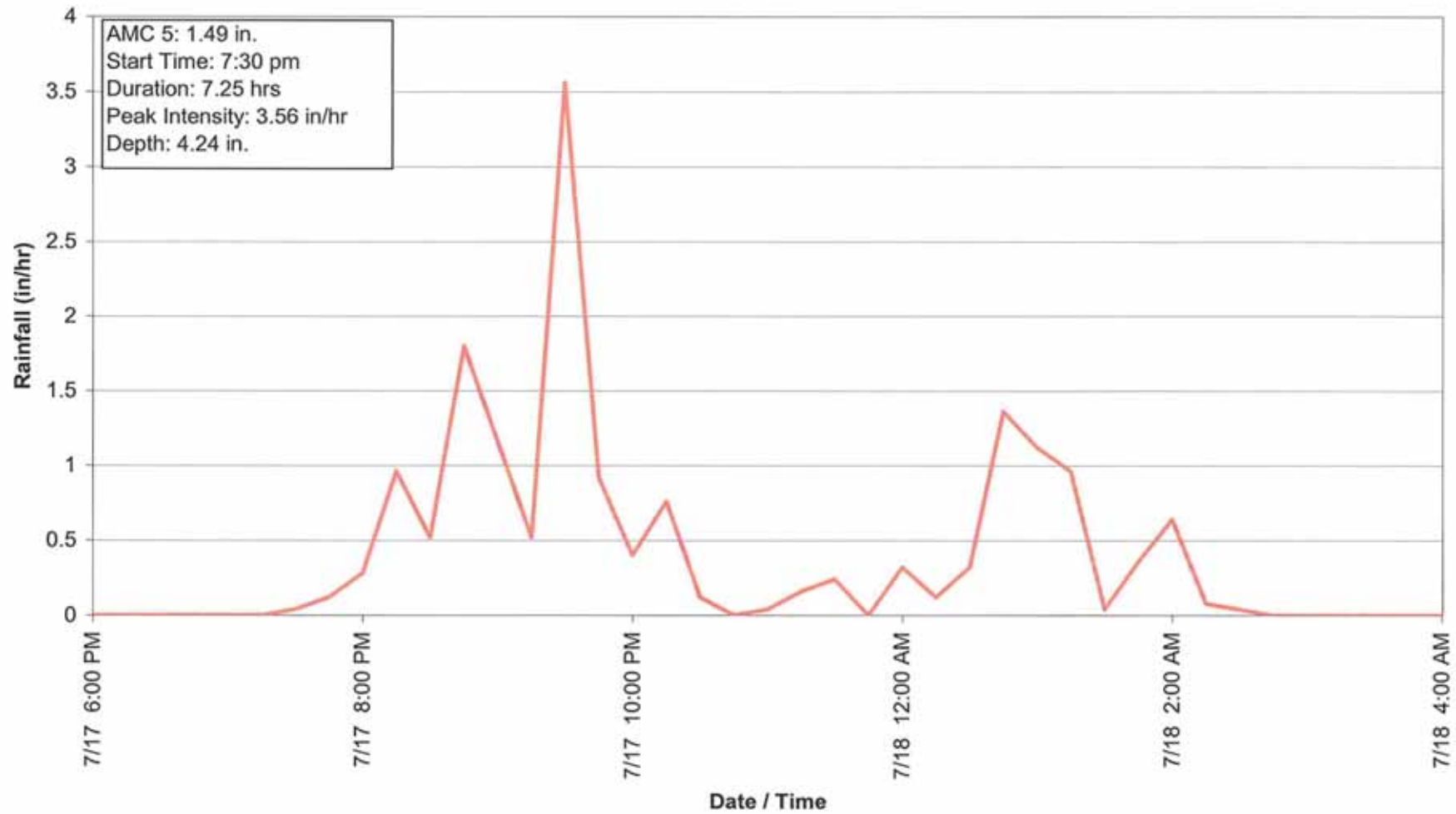
Wastewater Precipitation Gauge
Event 10: July 16
Short-Duration, High Intensity Storm



Wastewater Precipitation Gauge
Event 11: July 16
Small Depth Storm

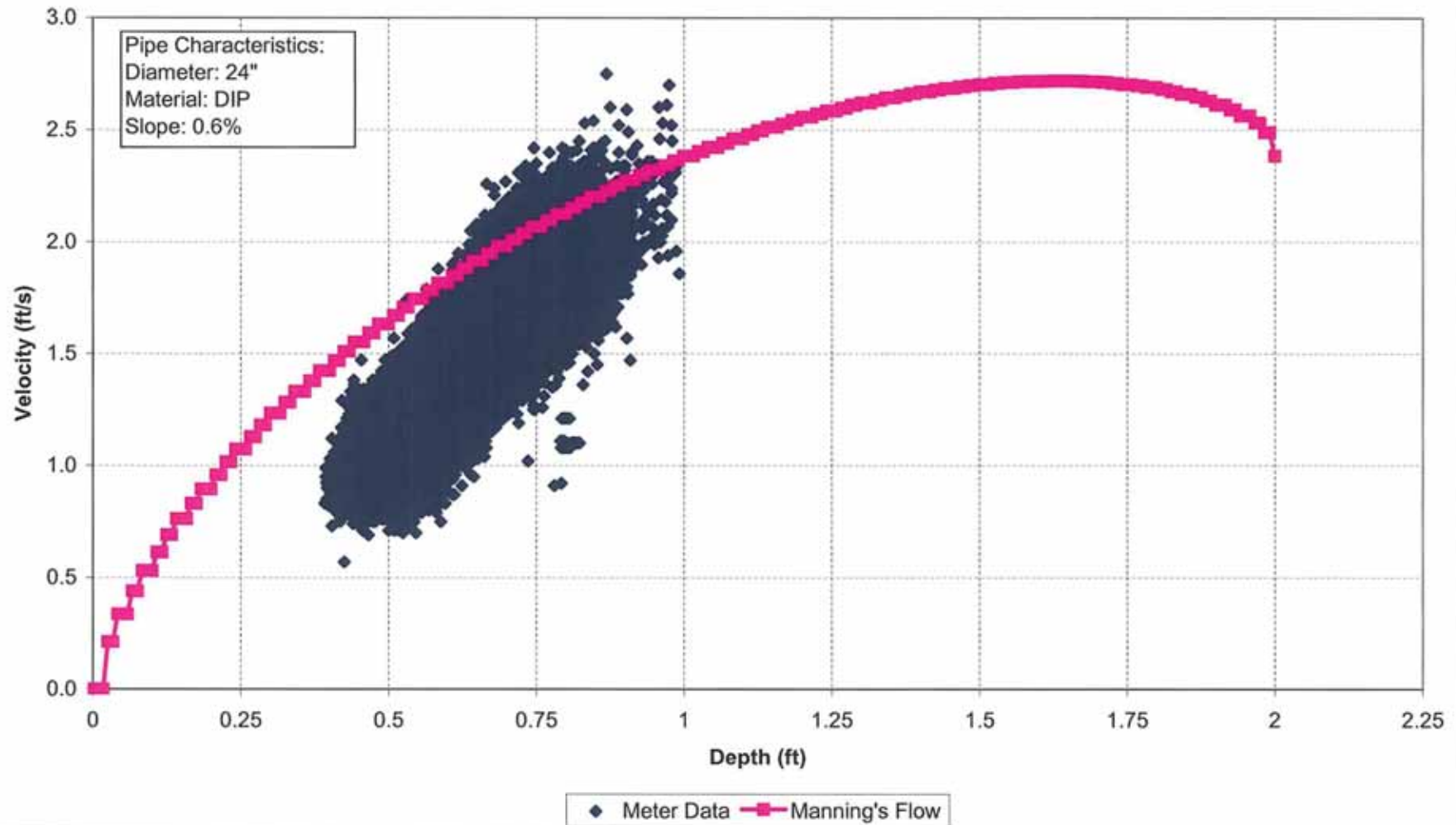


Wastewater Precipitation Gauge
Event 12: July 17 - 18
Long-Duration, High Intensity Storm

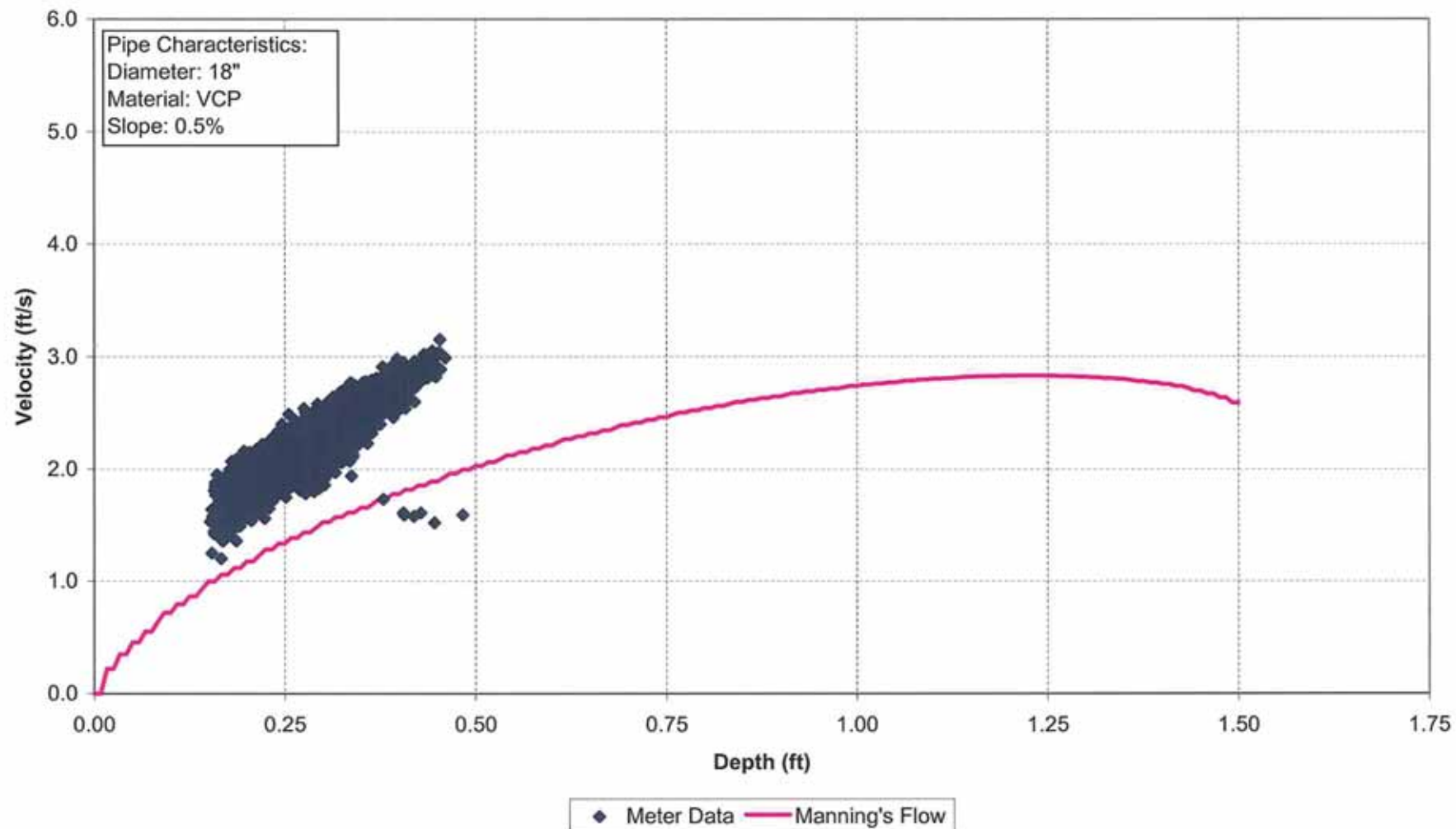


DEPTH VS. VELOCITY

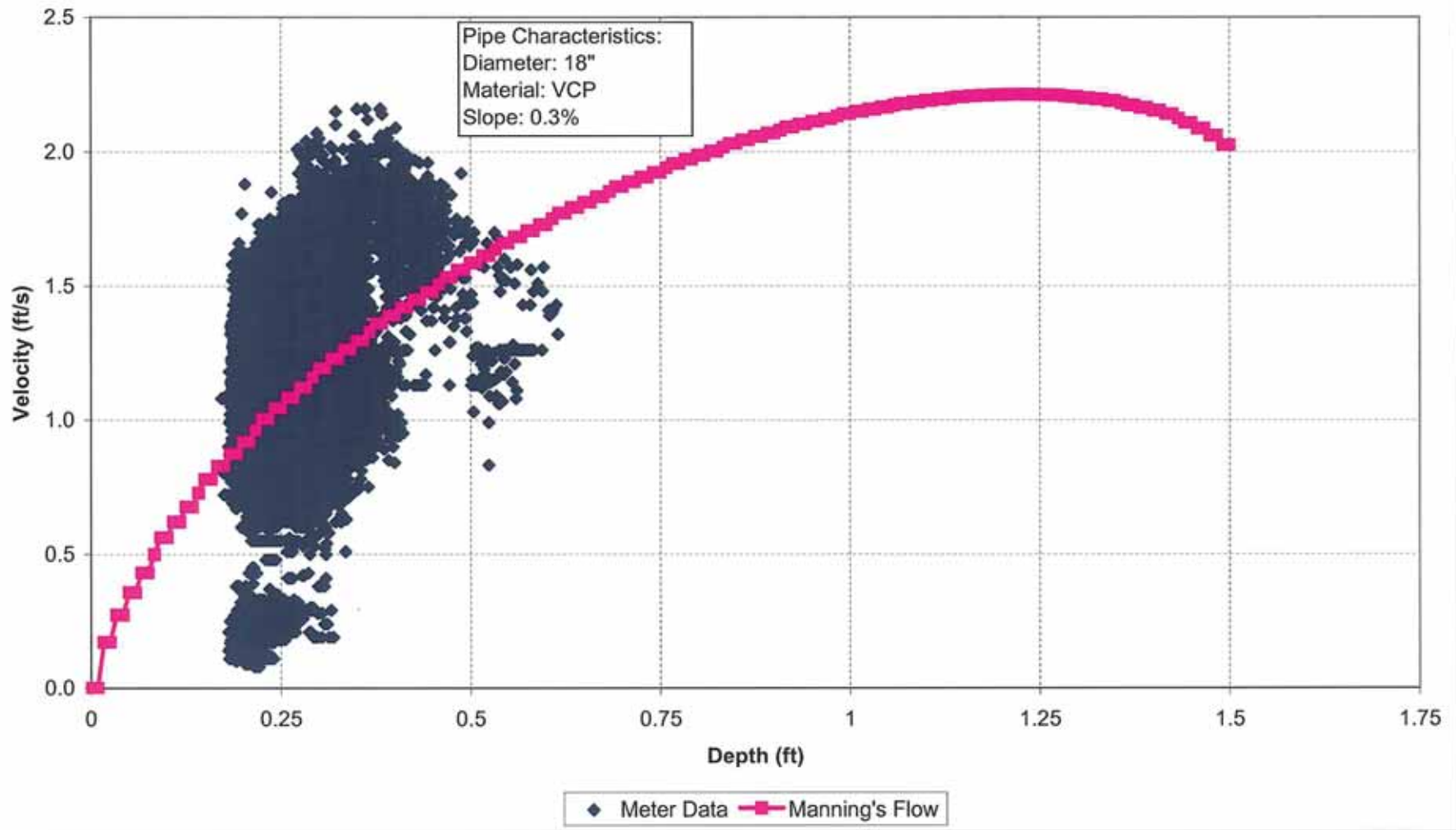
Catfish, Meter 1
At Dodge St, between Devon and Brunskill St.
Depth vs Velocity



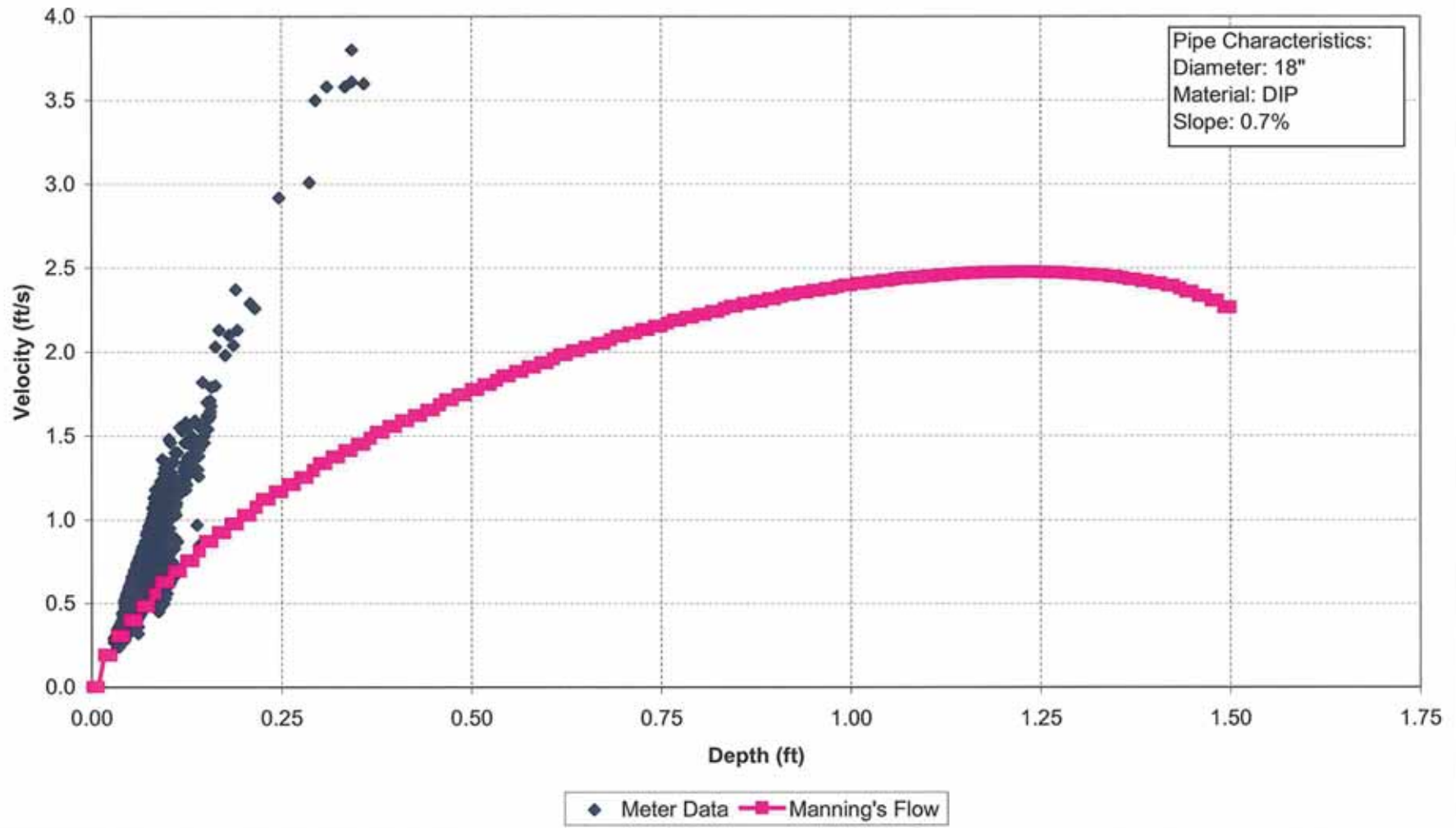
Catfish, Meter 2
Inbetween Cedar Cross and Brunskill St.
Depth vs Velocity



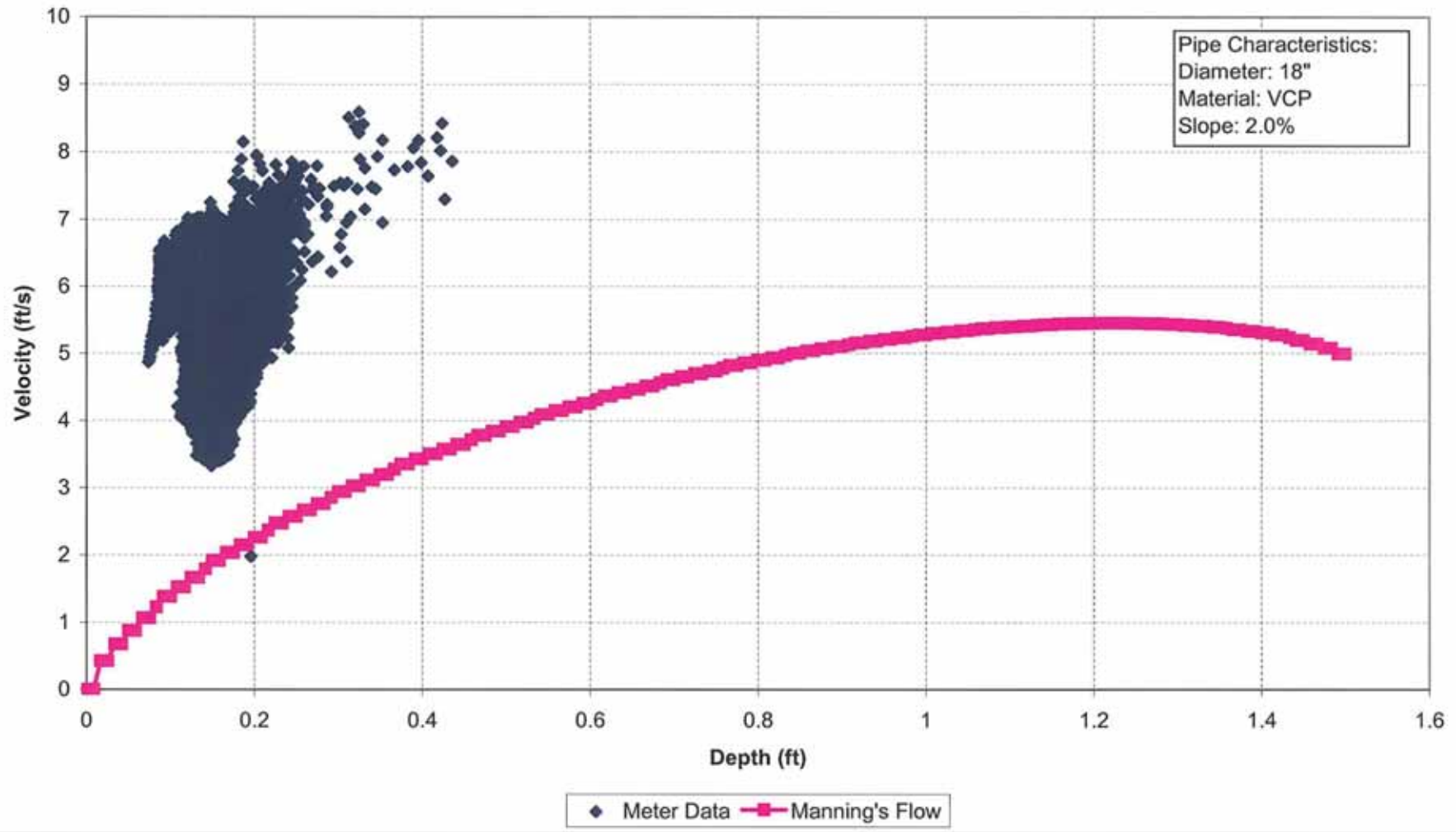
Catfish, Meter 3
Southeast of the Manson and Old Mill Intersection
Depth vs Velocity



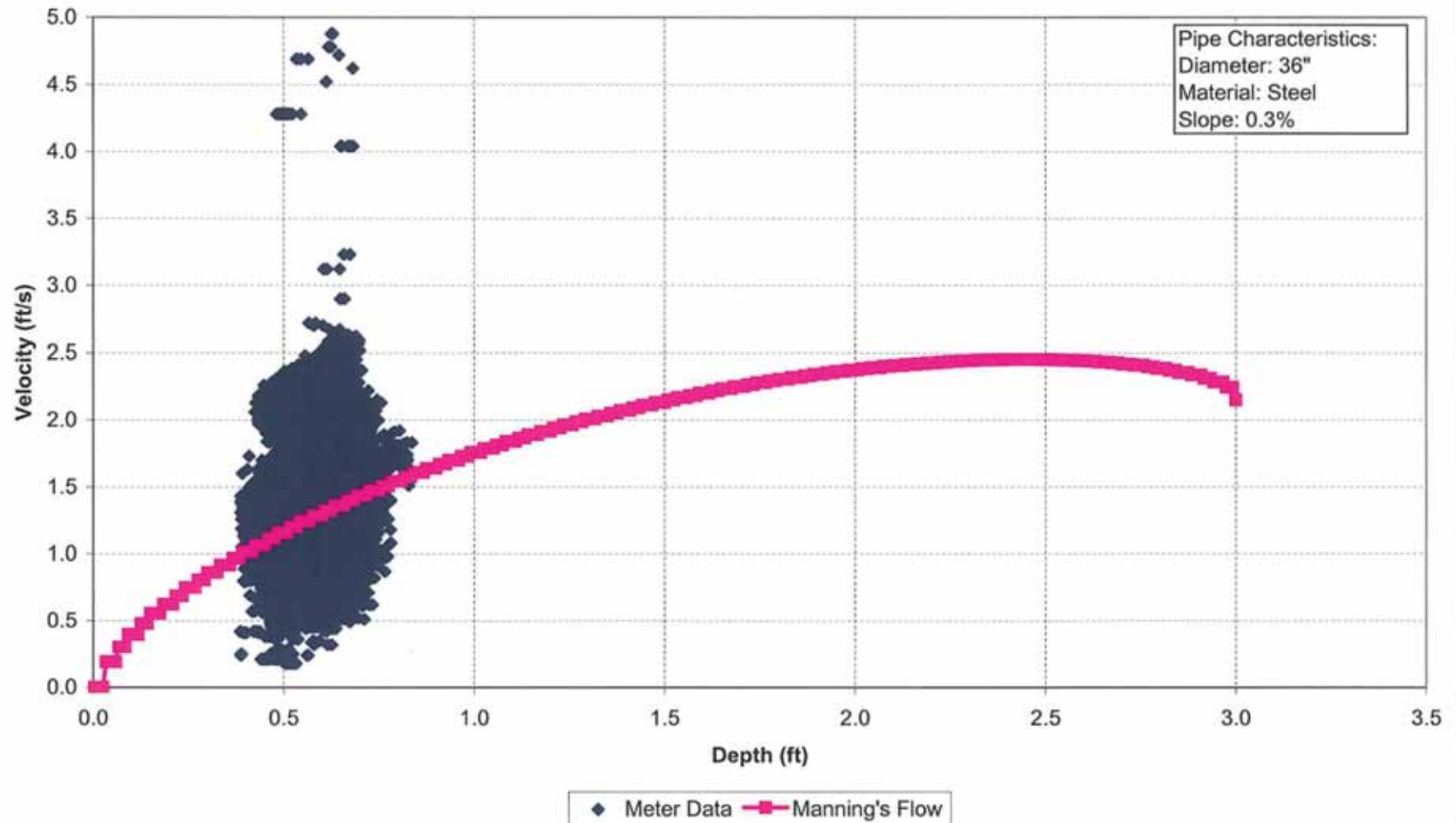
Granger, Meter 4
South of Mar Jo Quarry Rd
Depth vs Velocity



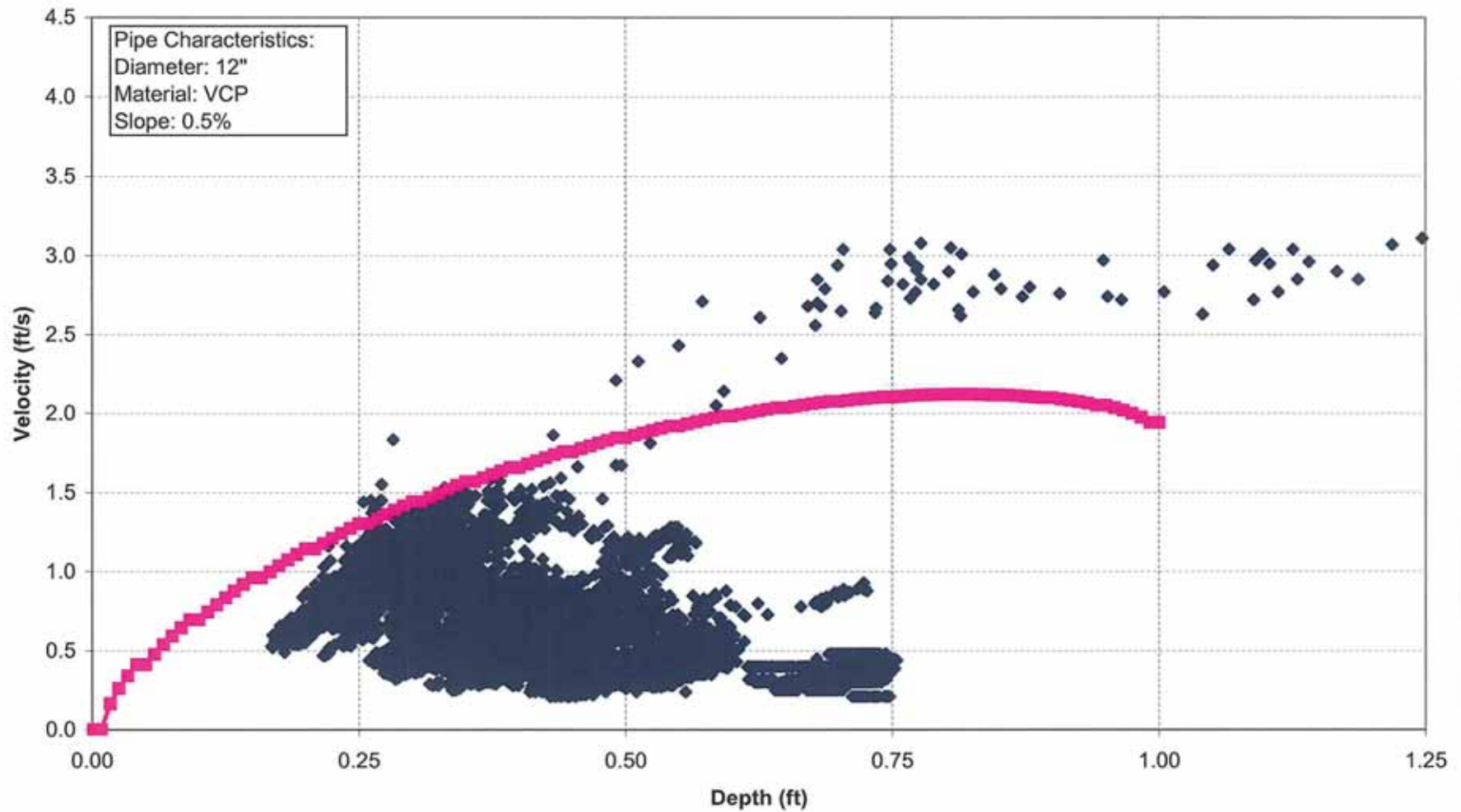
W. 32nd Ave., Meter 5
At 32nd St, Just East of Carter St.
Depth vs Velocity



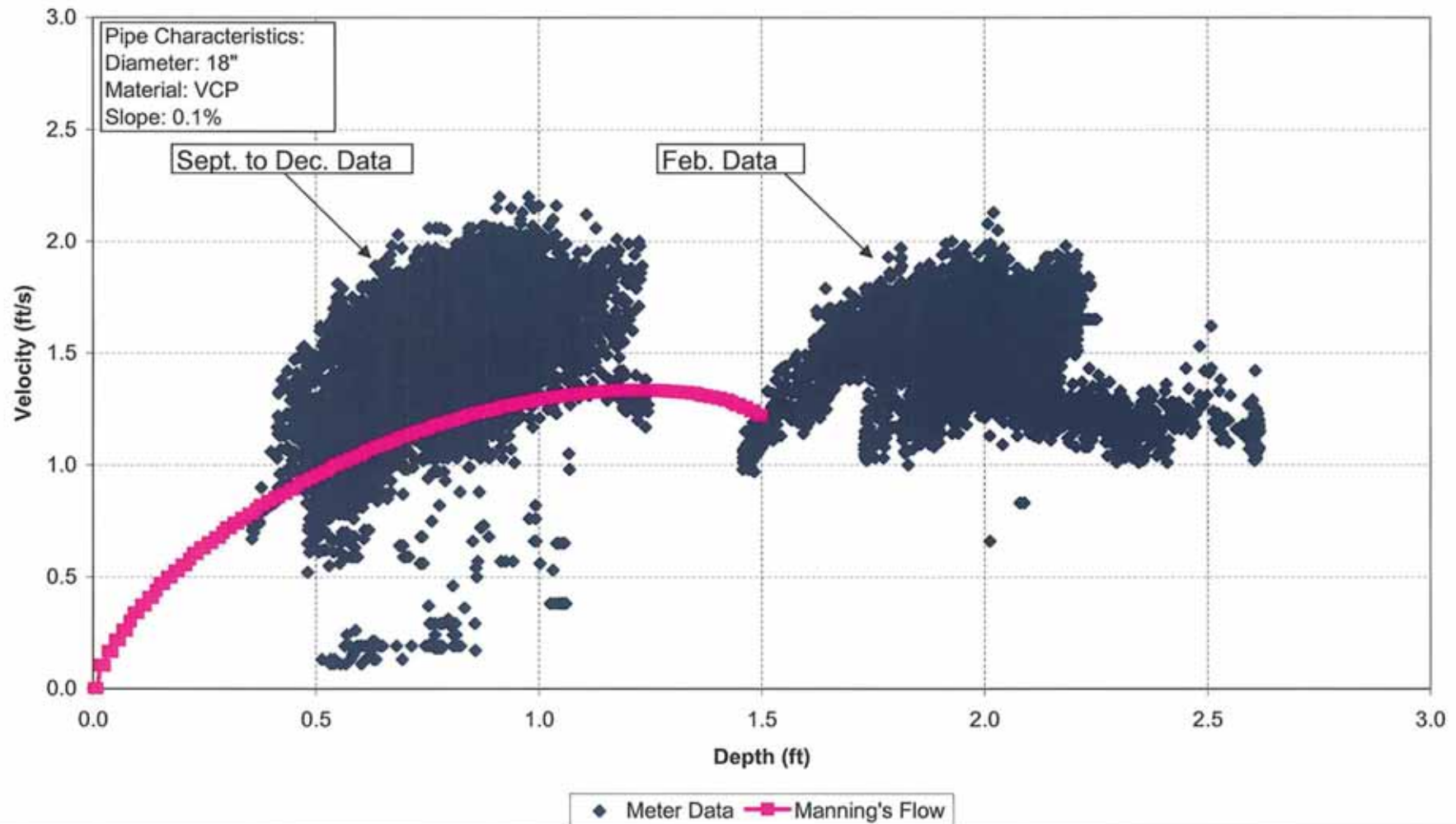
Peru, Meter 6
Southeast of 32nd St, near the east side of Liebe St.
Depth vs Velocity



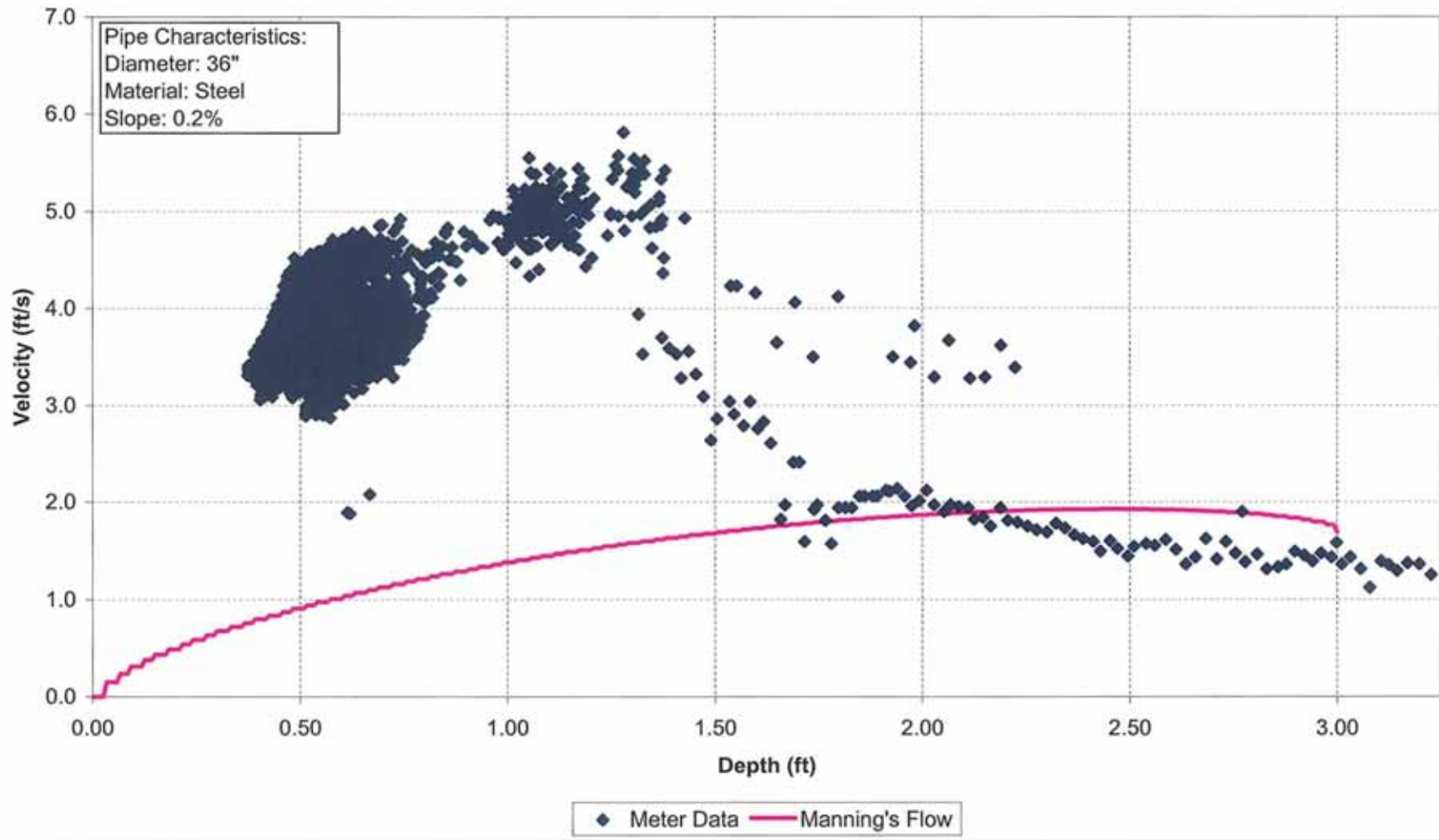
Kaufmann, Meter 7
Southeast of 23rd St, inbetween Francis and Central St.
Depth vs Velocity



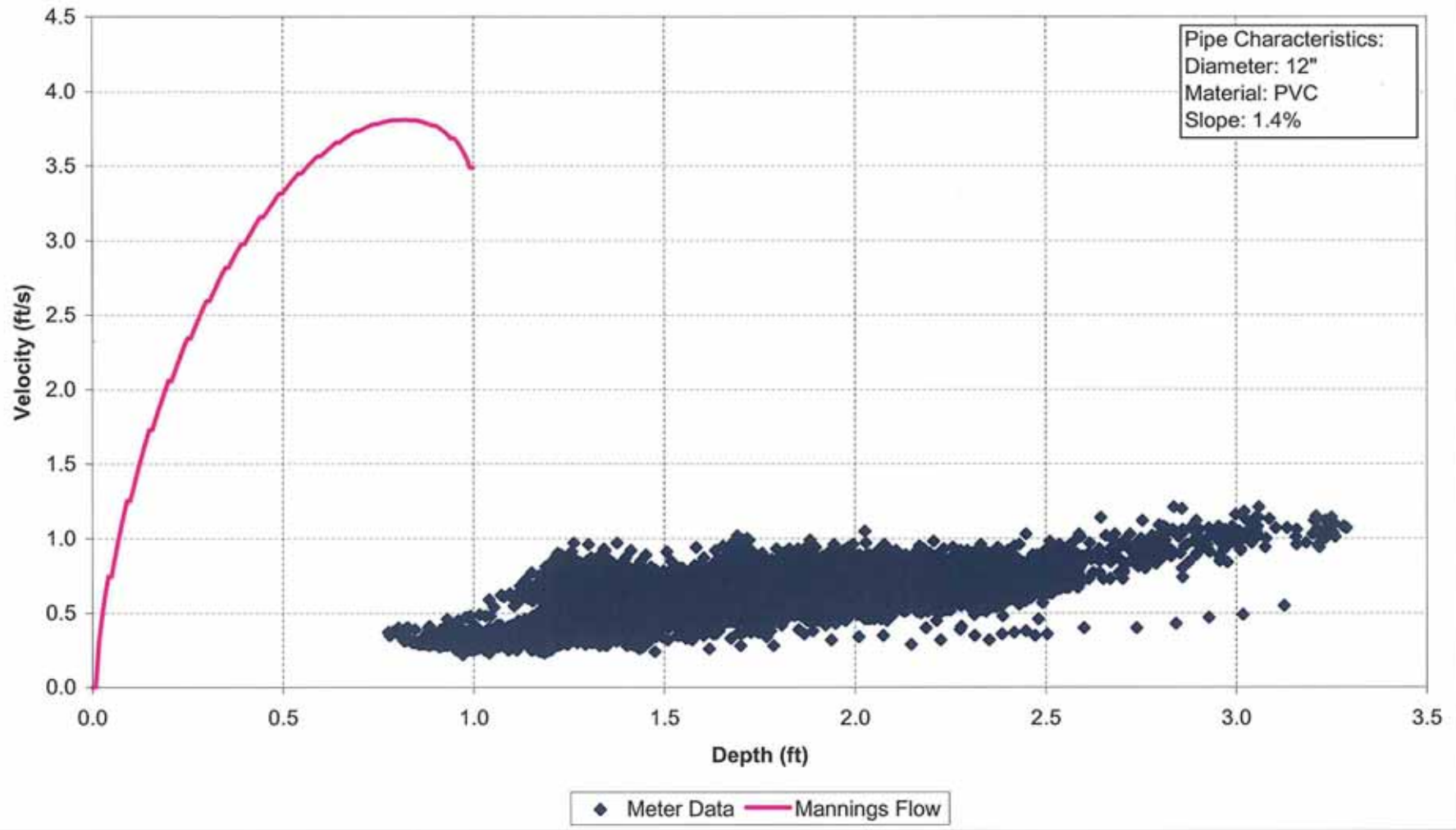
Kerper, Meter 8
At 18th Street, Just West of Kerper St.
Depth vs Velocity



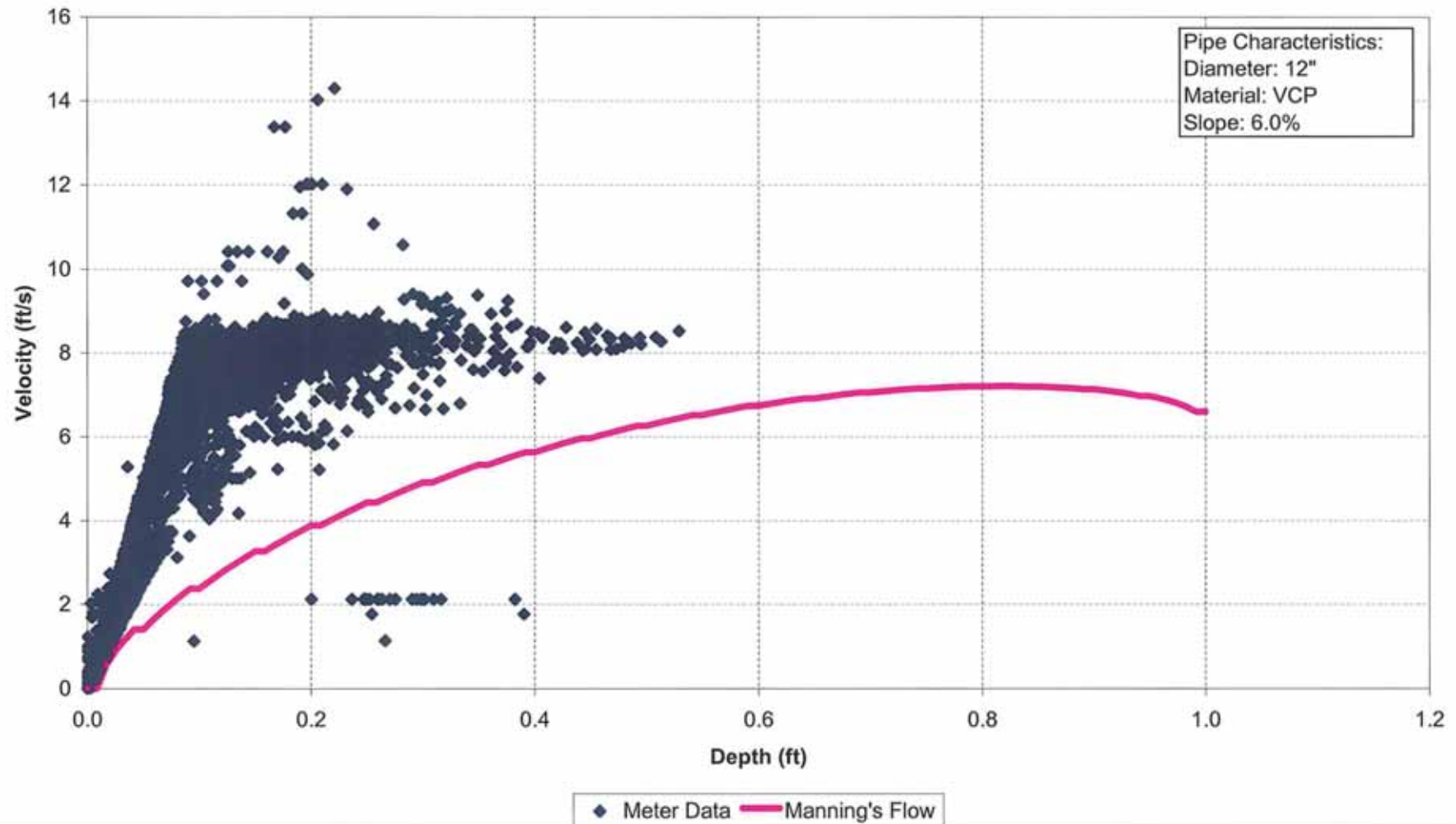
Catfish, Meter 10
At the intersection of Kniest and Lincoln St.
Depth vs Velocity



W. Locust, Meter 11
At Locust, Just East of Foye
Depth vs Velocity

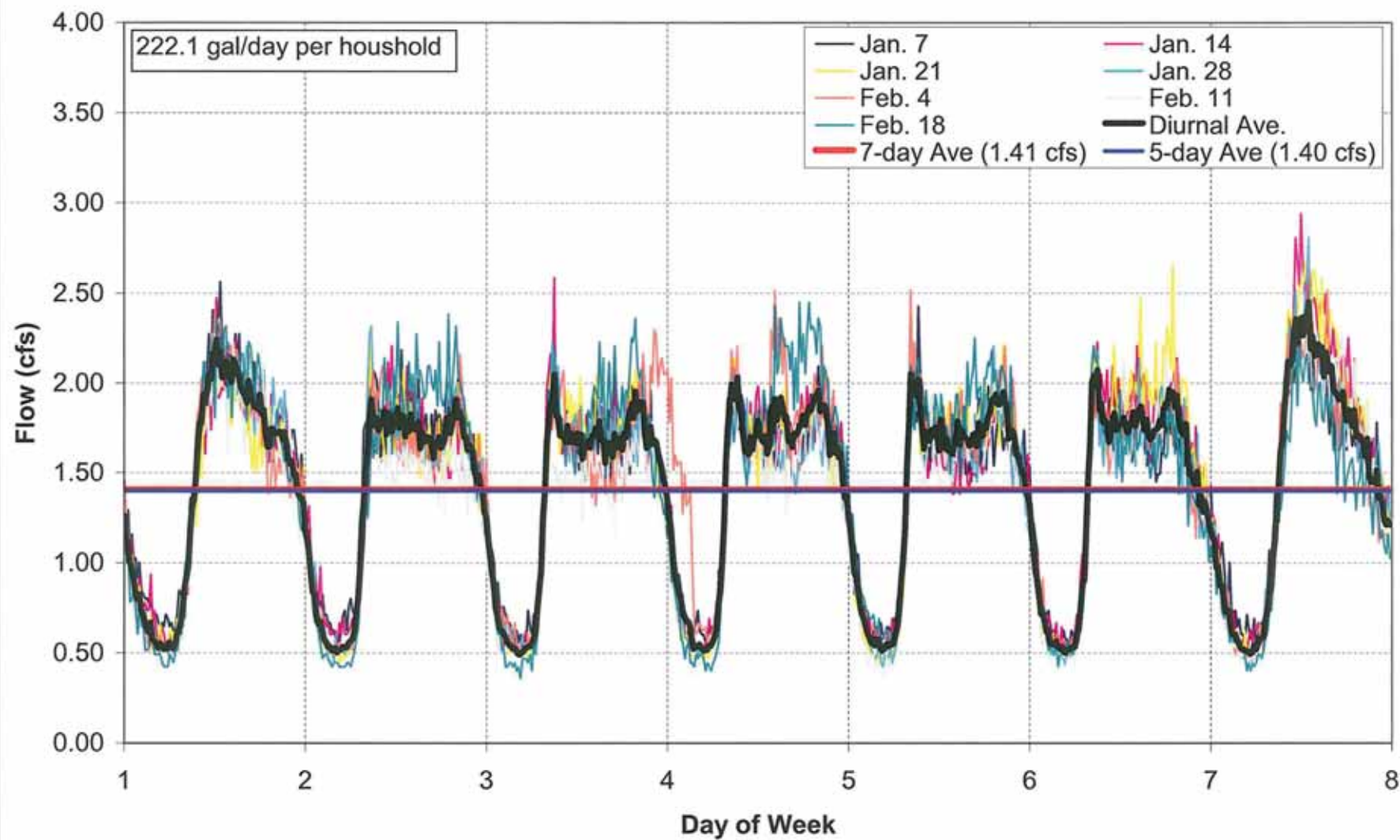


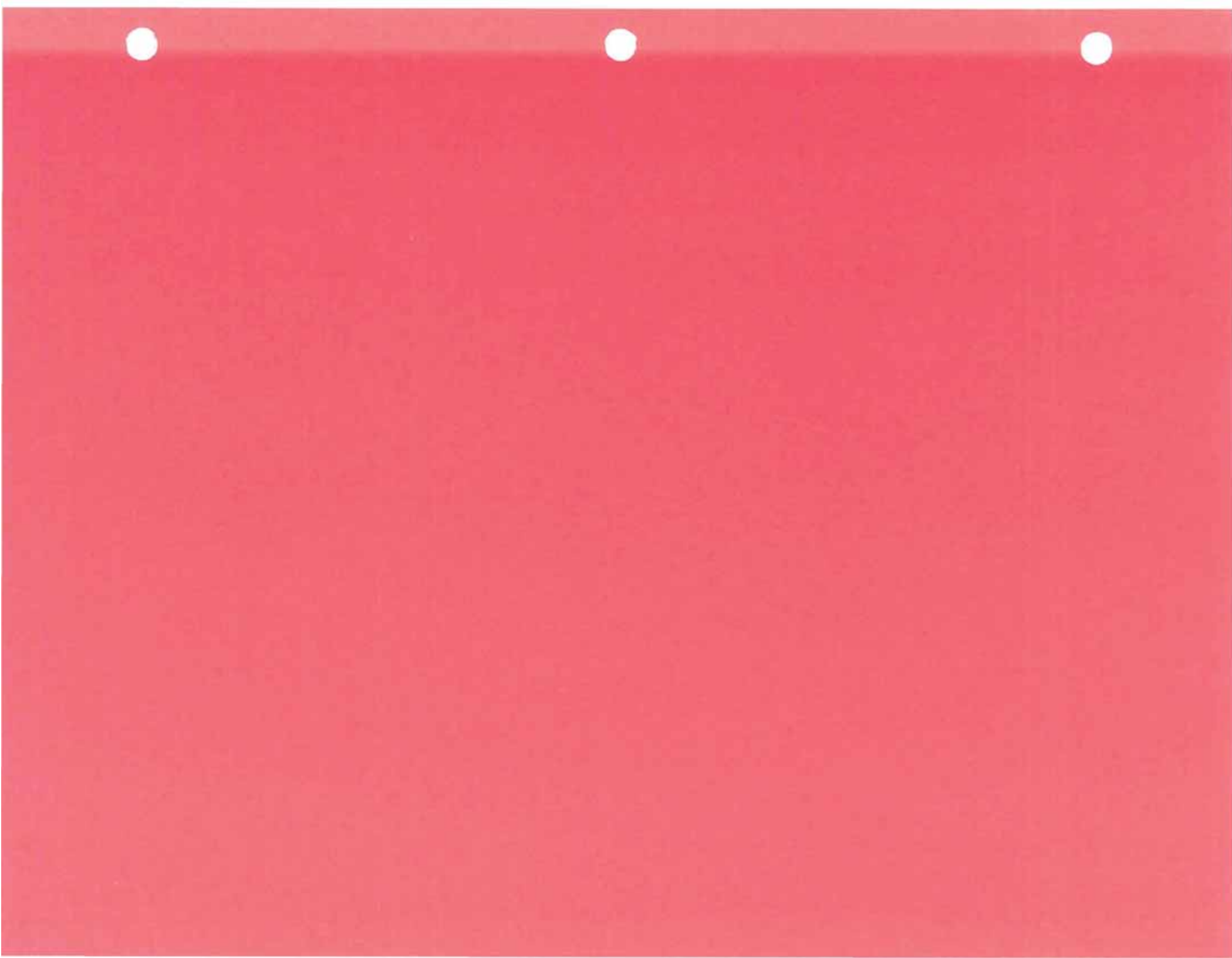
1st Street, Meter 12
At 1st St, between Bluff and Locust St.
Depth vs Velocity



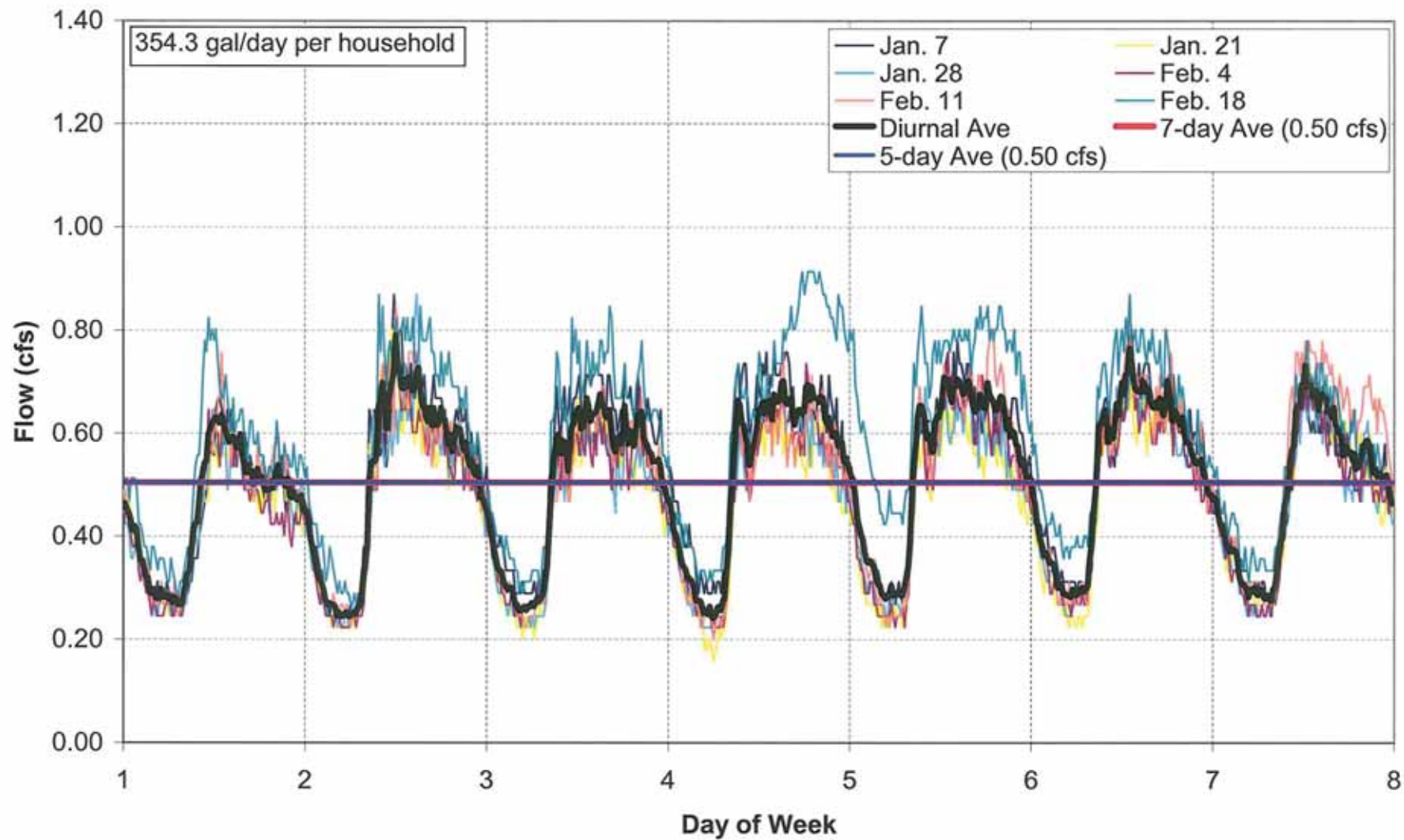
DWF

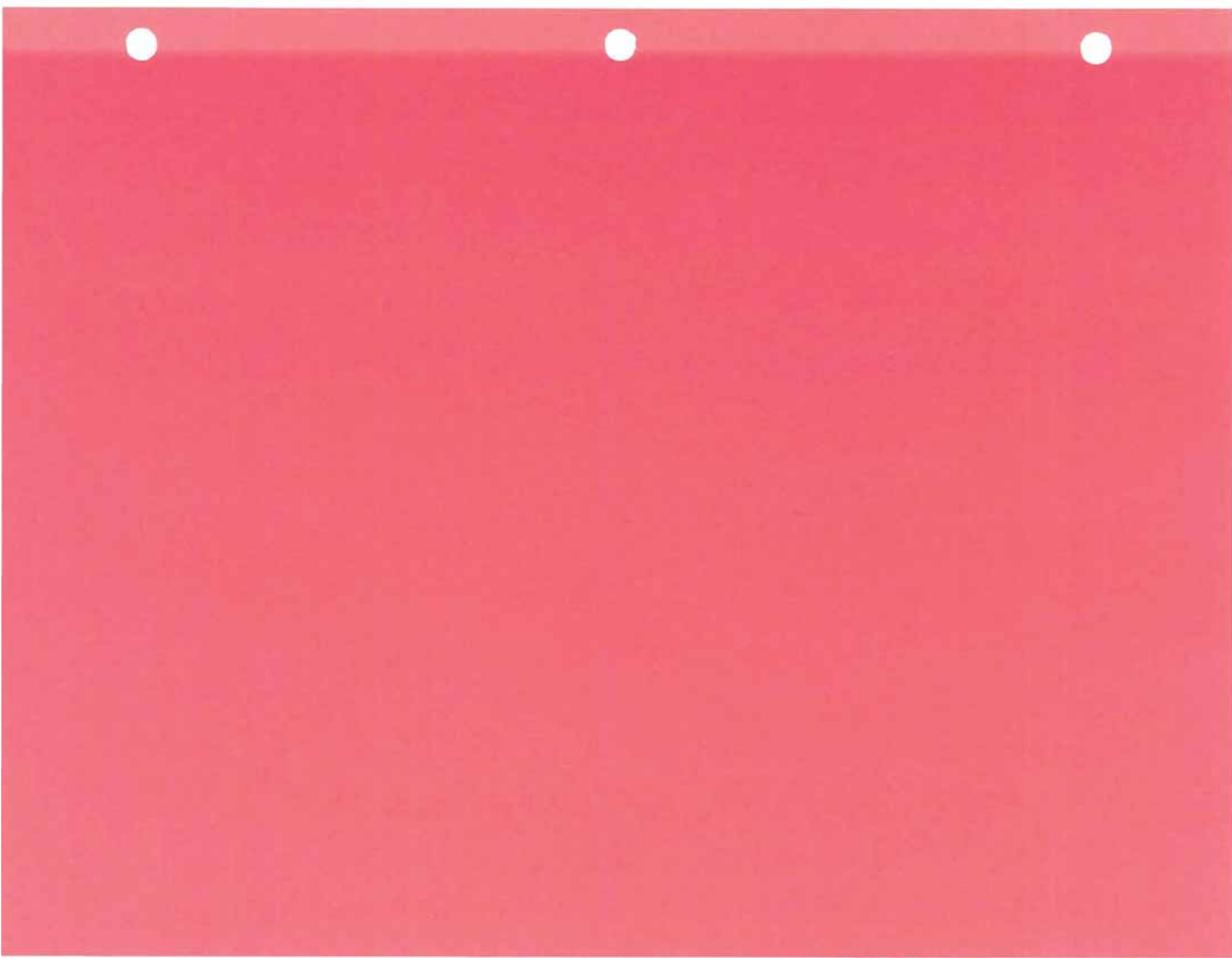
Catfish Meter 1
Weekly Average Flow (January-March, 2007)



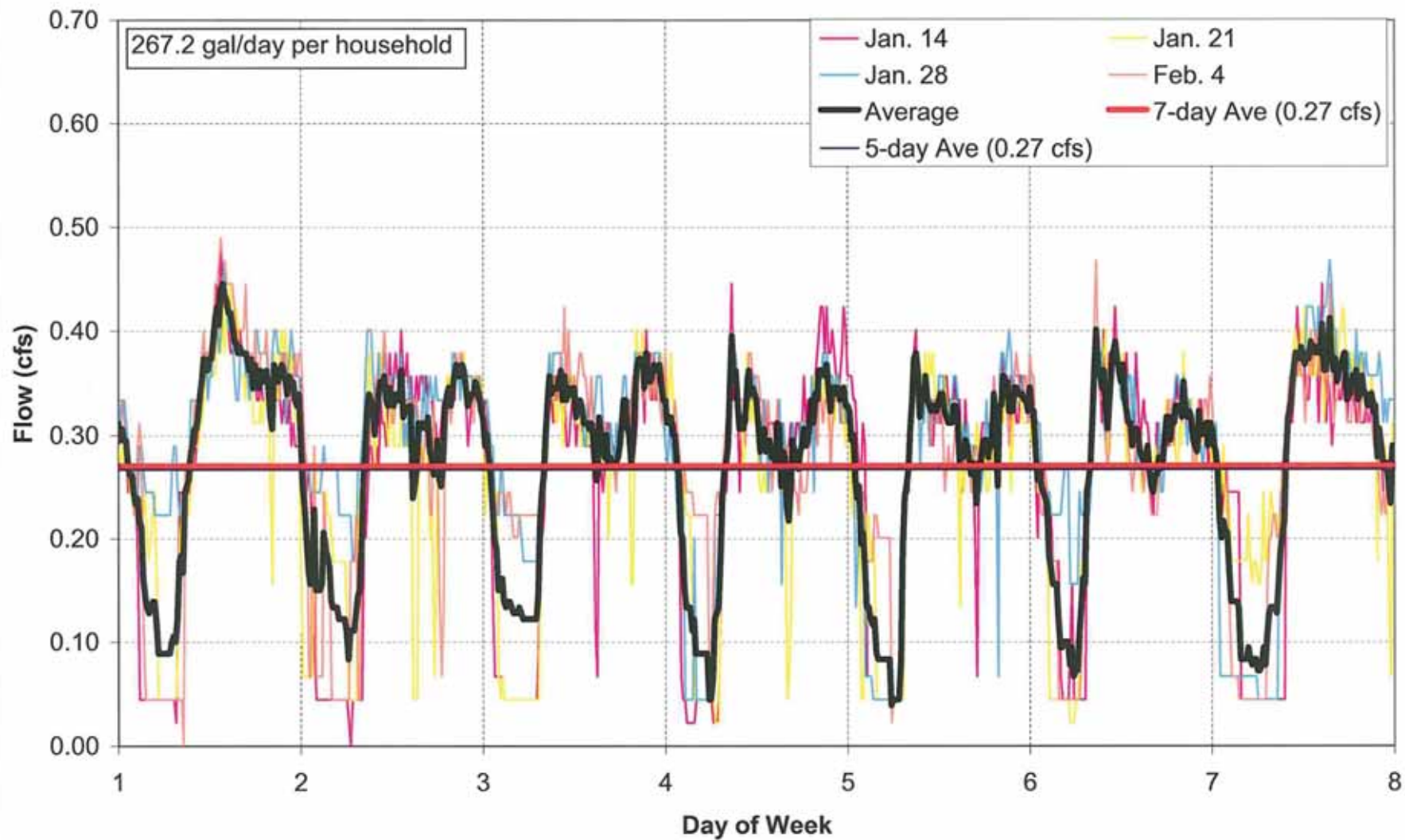


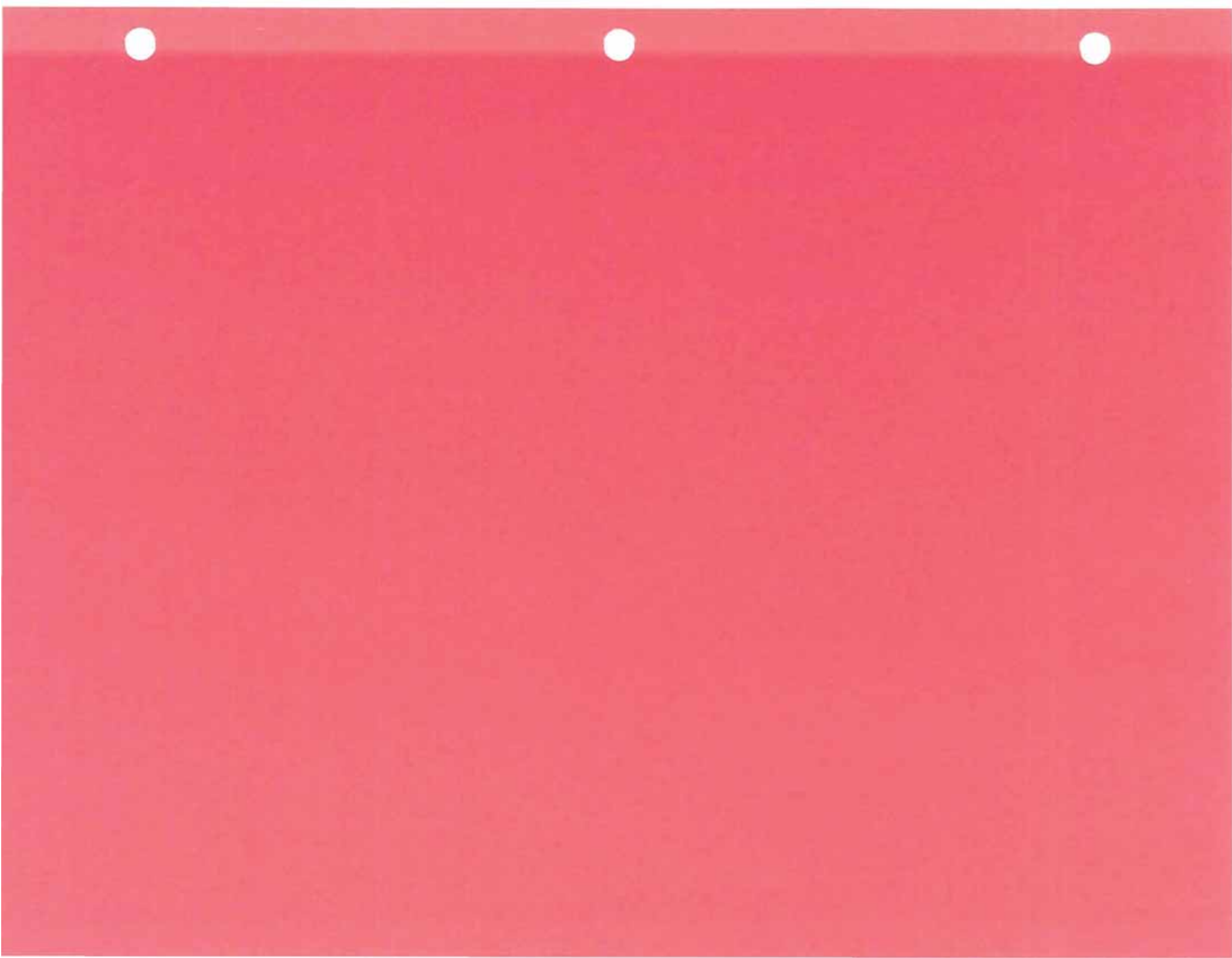
Catfish Meter 2
Weekly Average Flow (January-March, 2007)



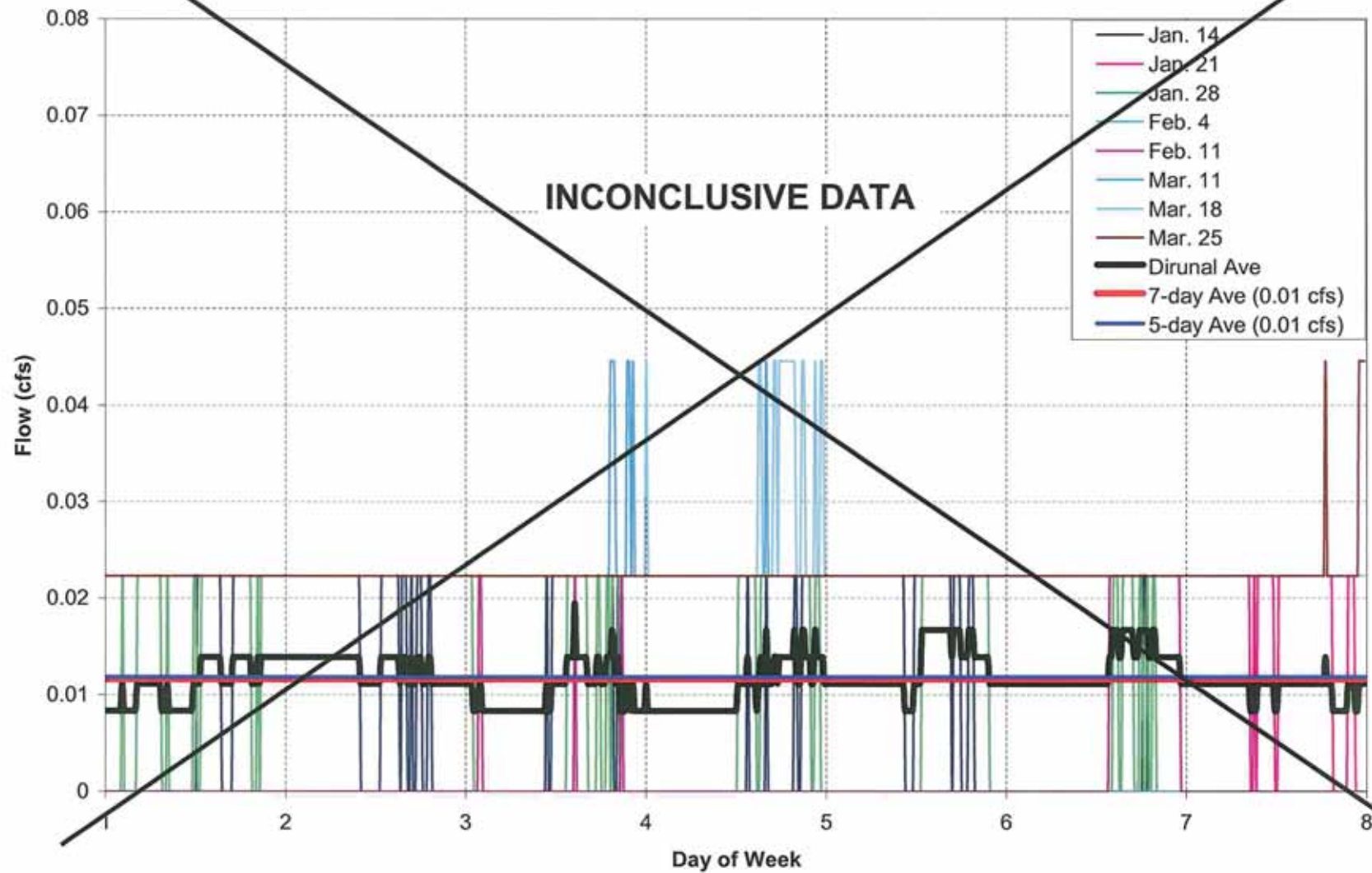


Catfish Meter 3
Weekly Average Flow (January-March, 2007)

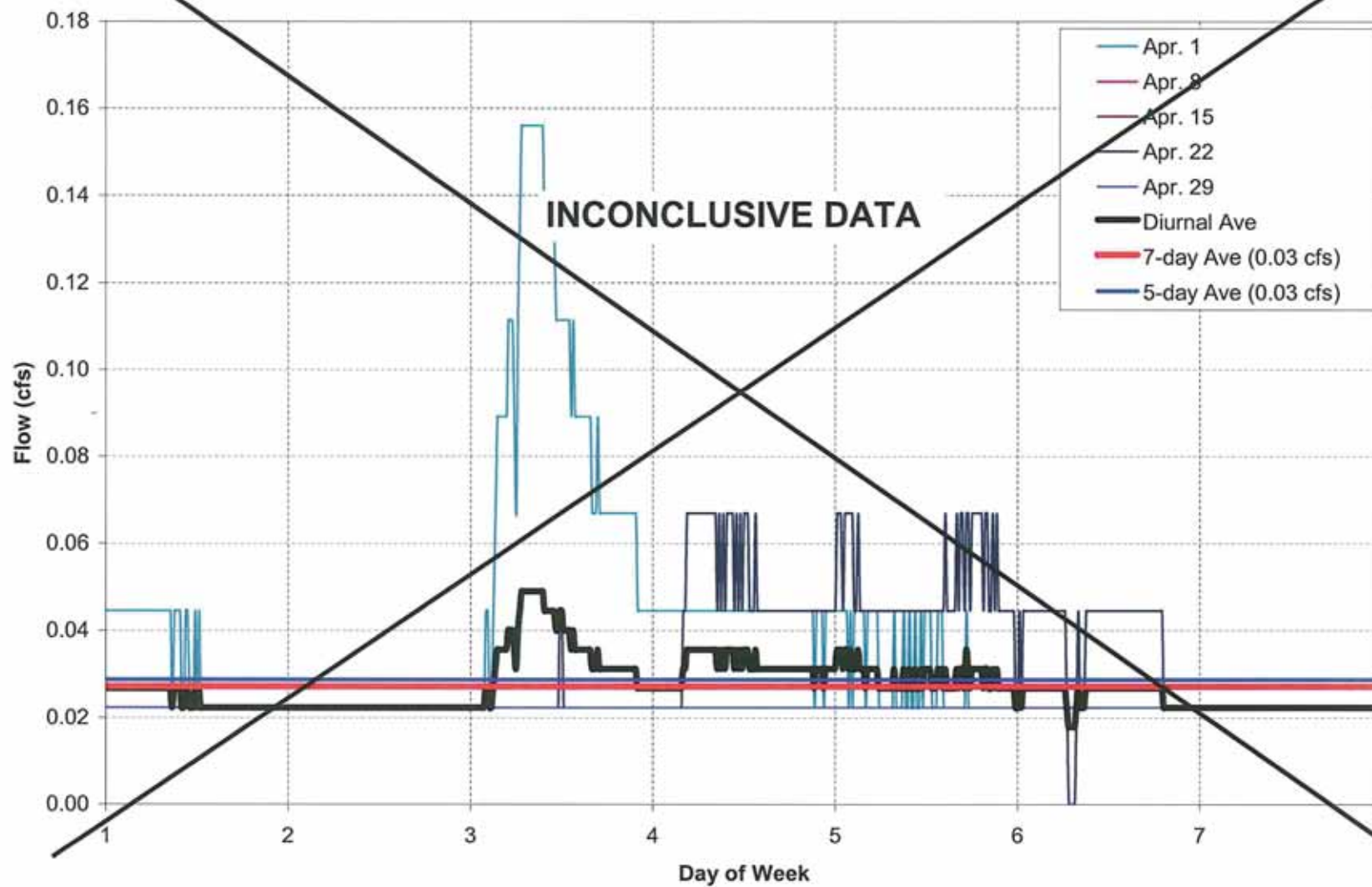


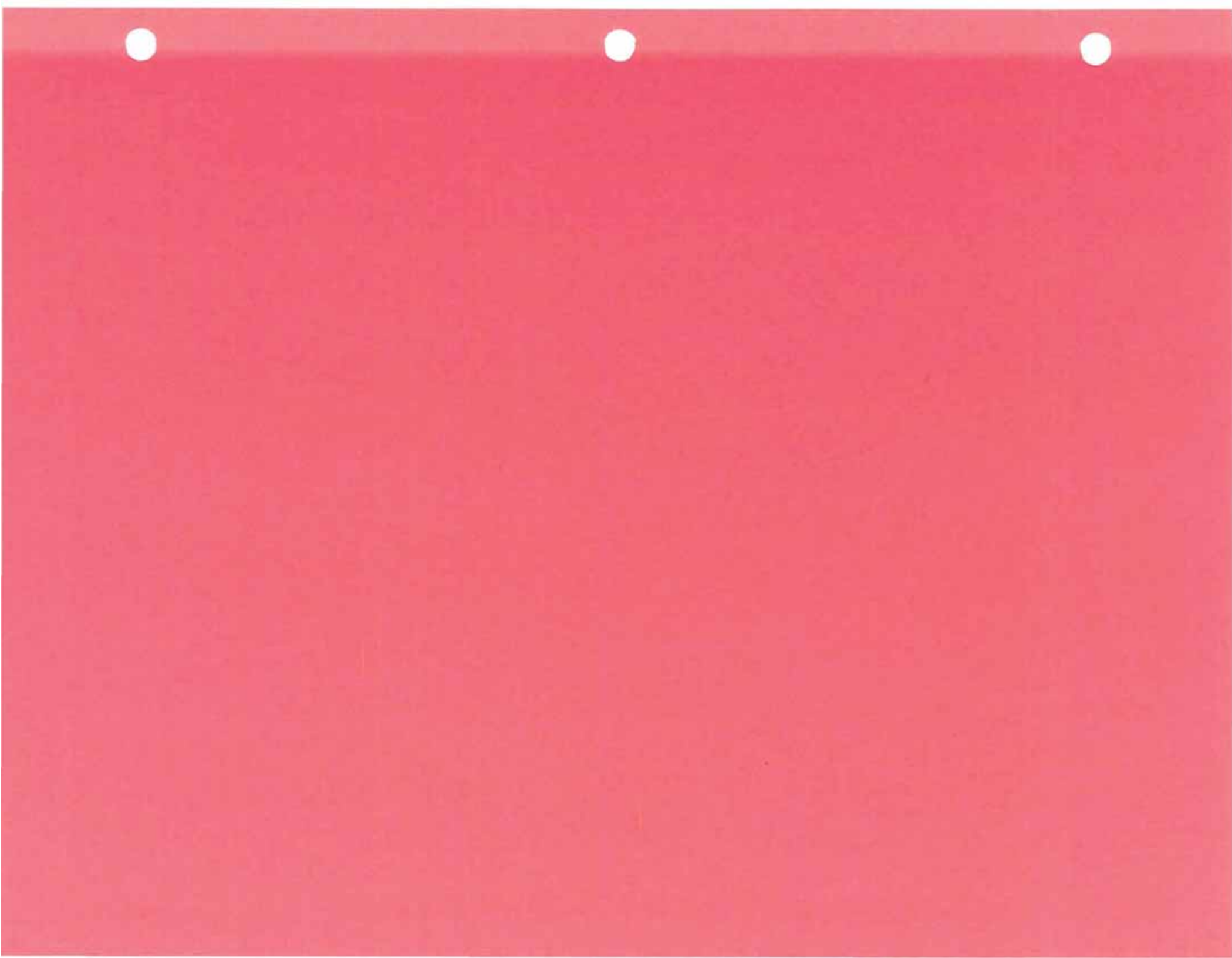


Granger Meter 4
Weekly Average Flow (January - March, 2007)

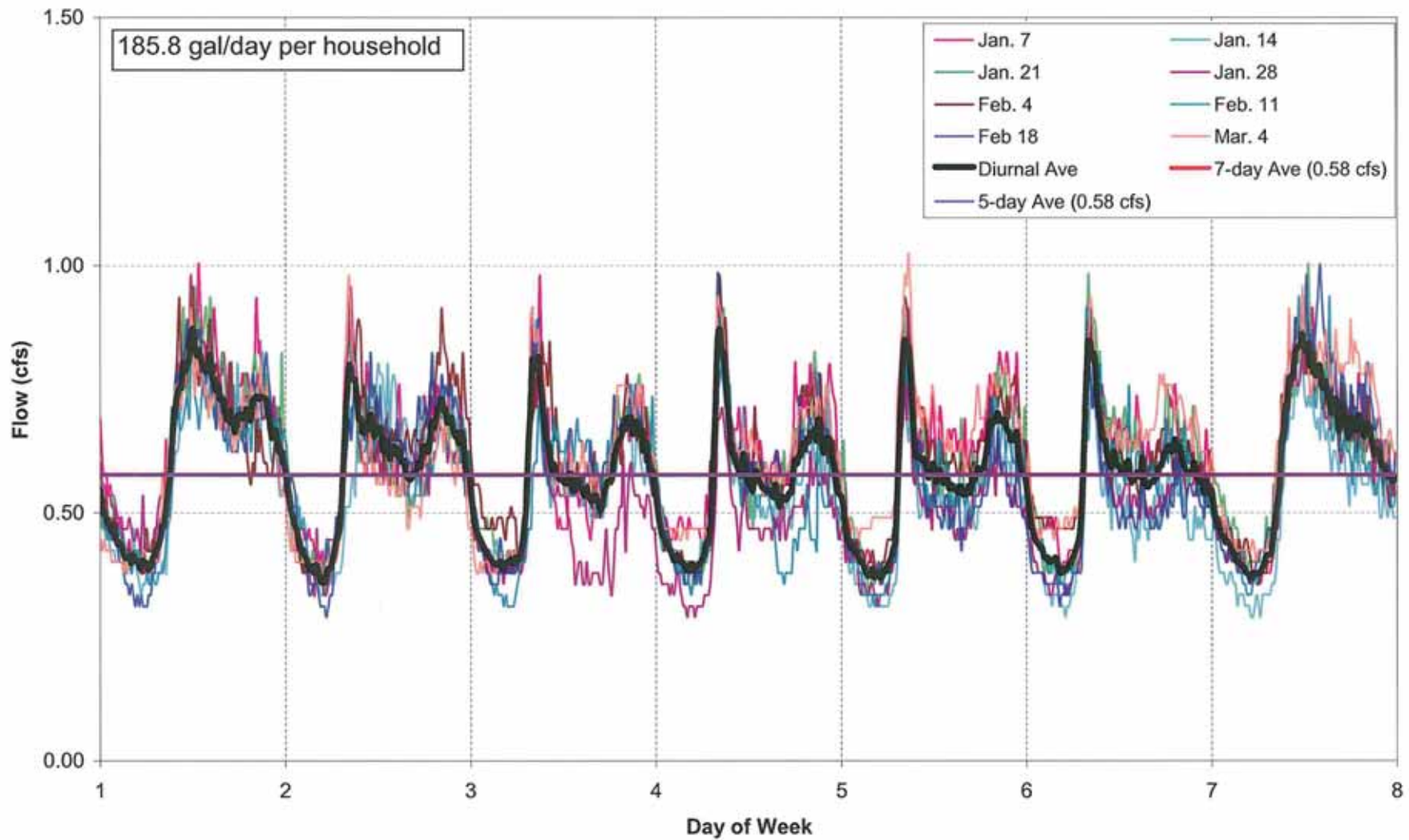


Granger Meter 4
Weekly Average Flow (April - July, 2007)

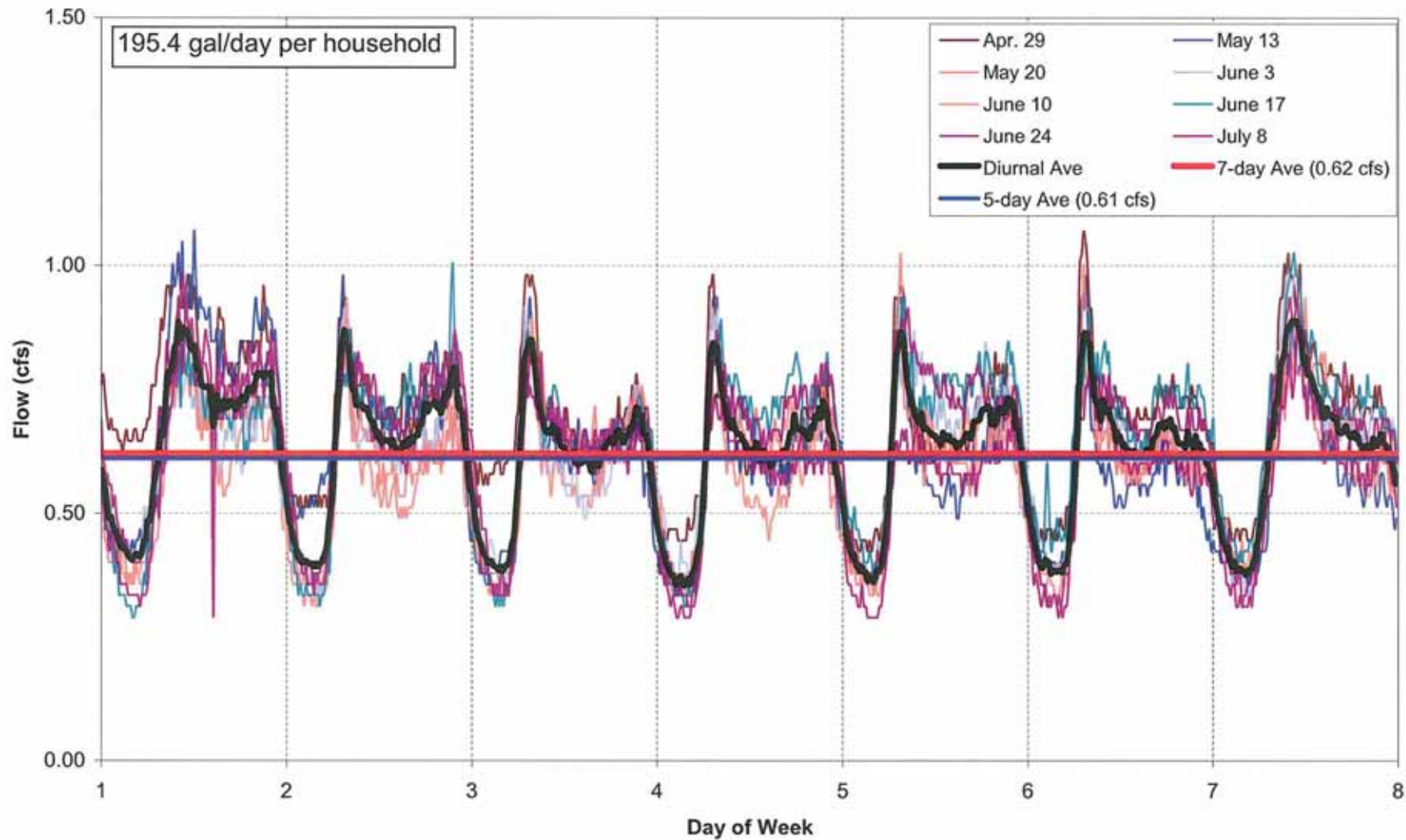


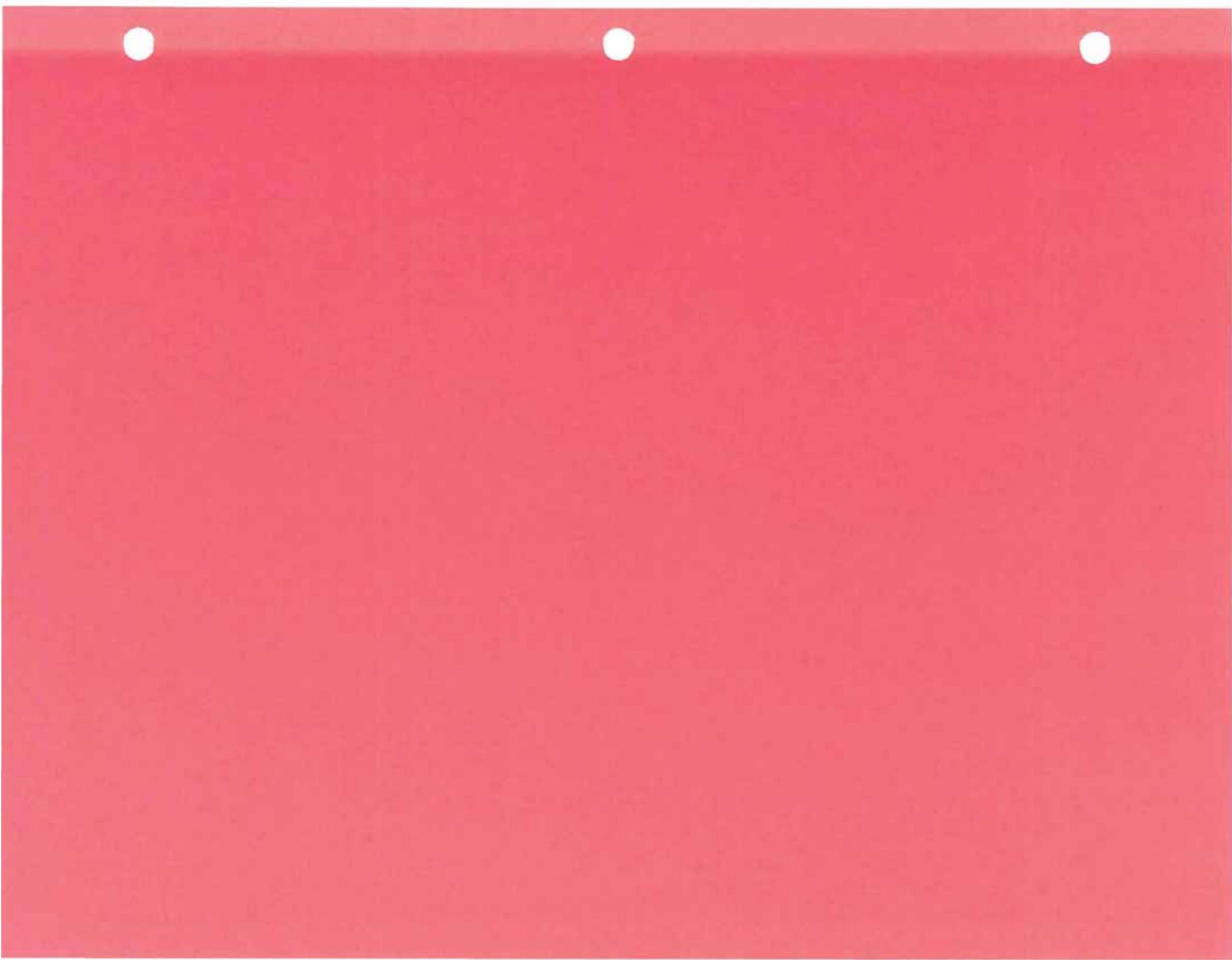


W32nd Ave, Meter 5
Weekly Average Flow (January - March, 2007)

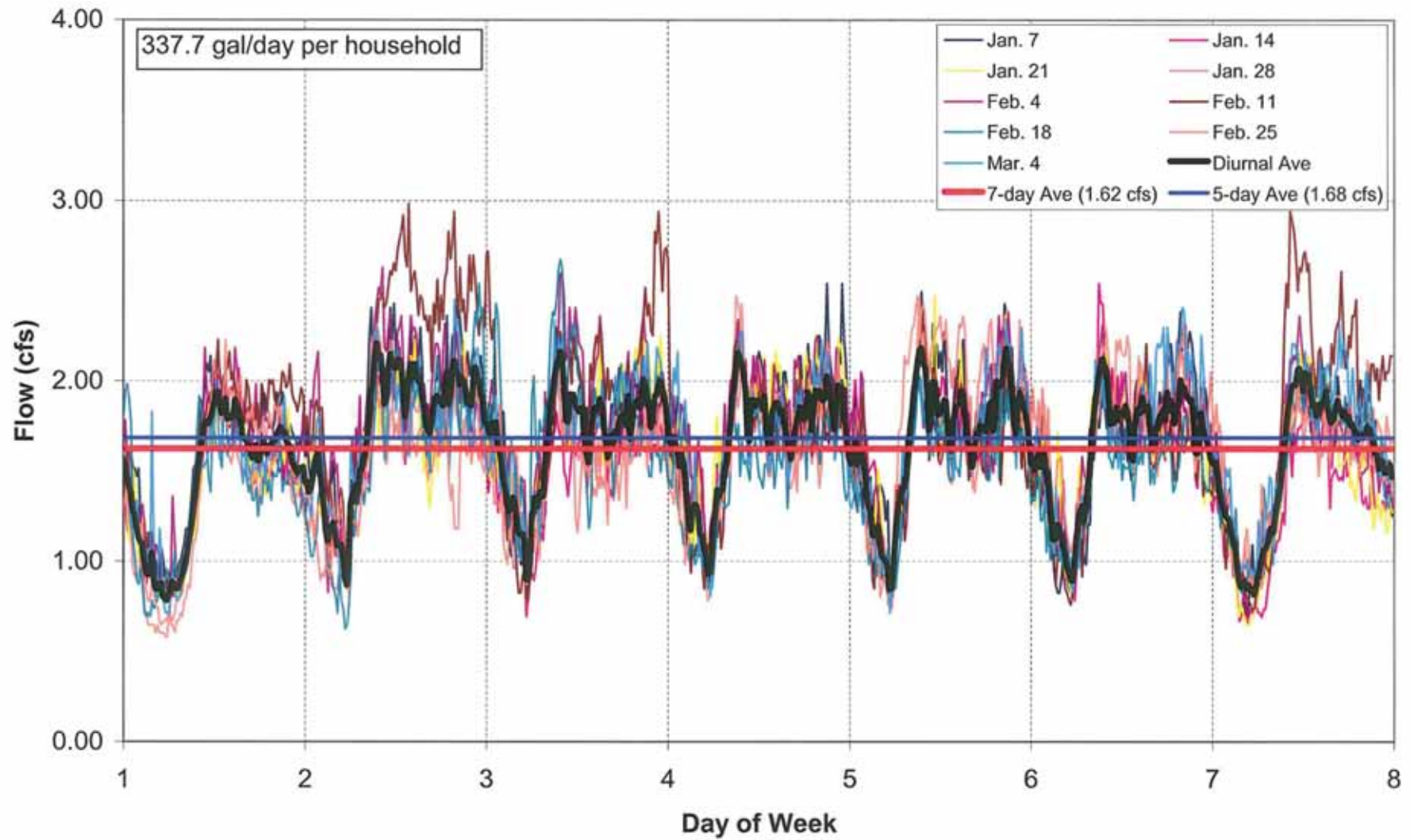


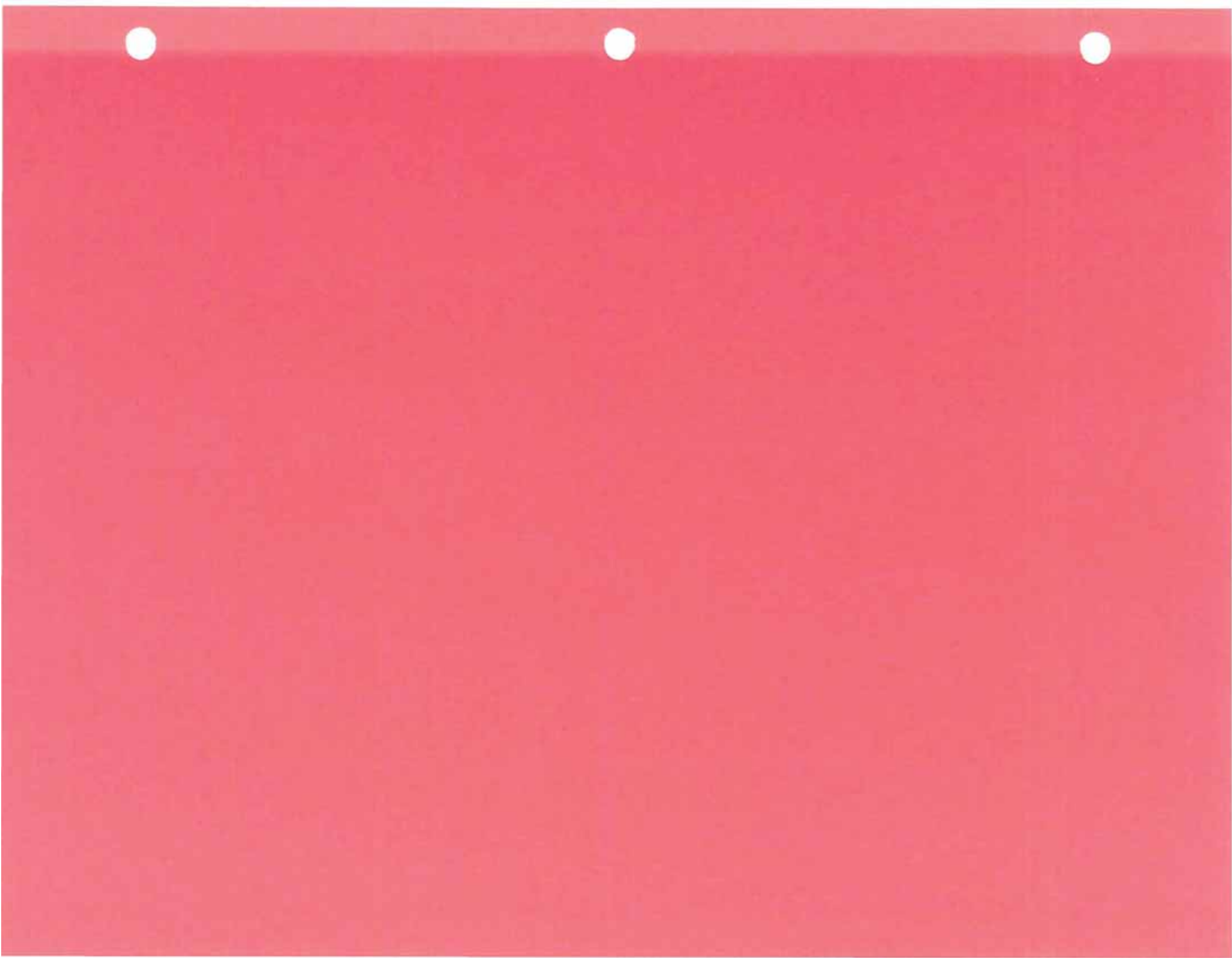
W32nd Ave, Meter 5
Weekly Average Flow (April - July, 2007)



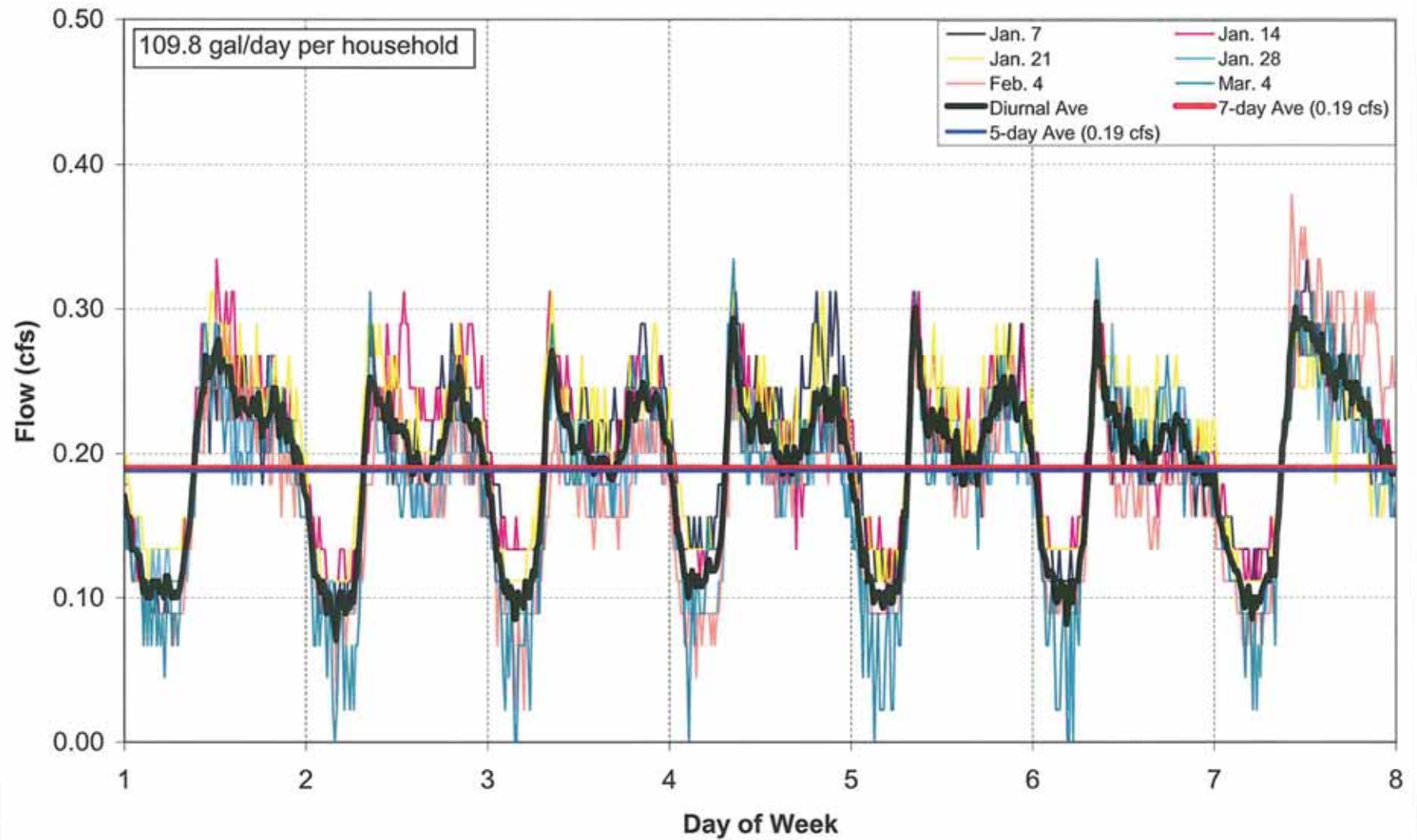


Peru, Meter 6
Weekly Average Flow (January - March, 2007)

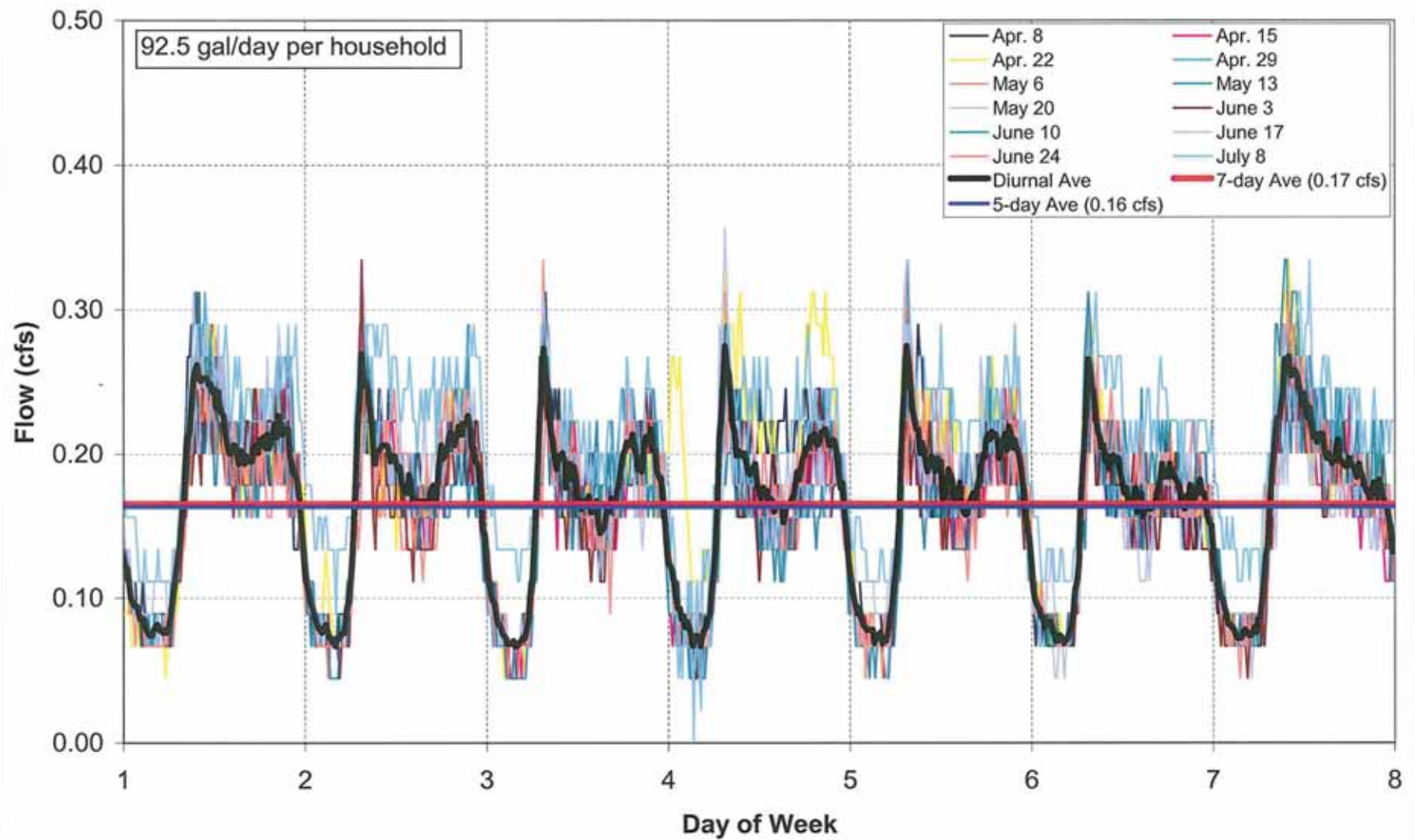


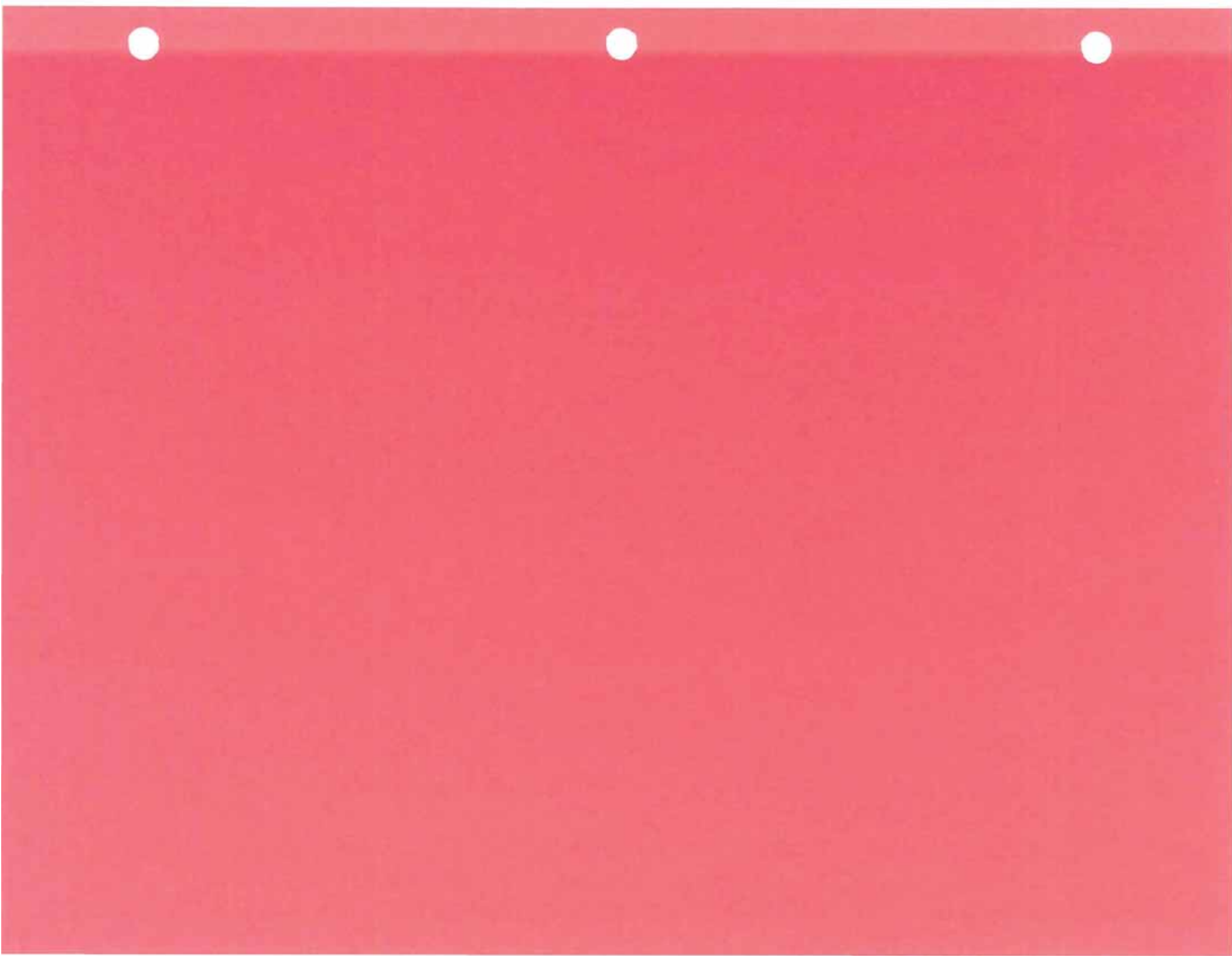


Kaufmann, Meter 7
Weekly Average Flow (January - March, 2007)

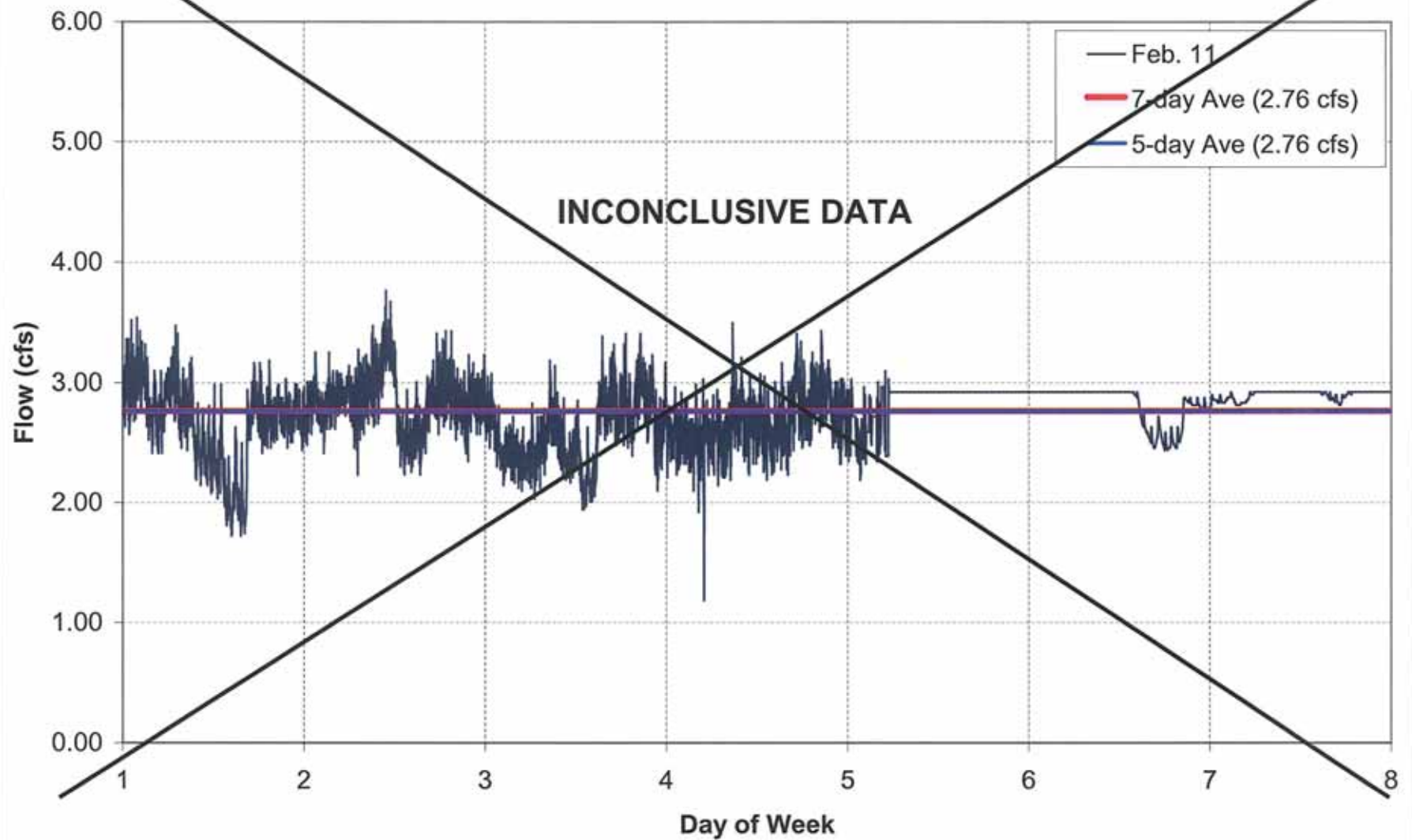


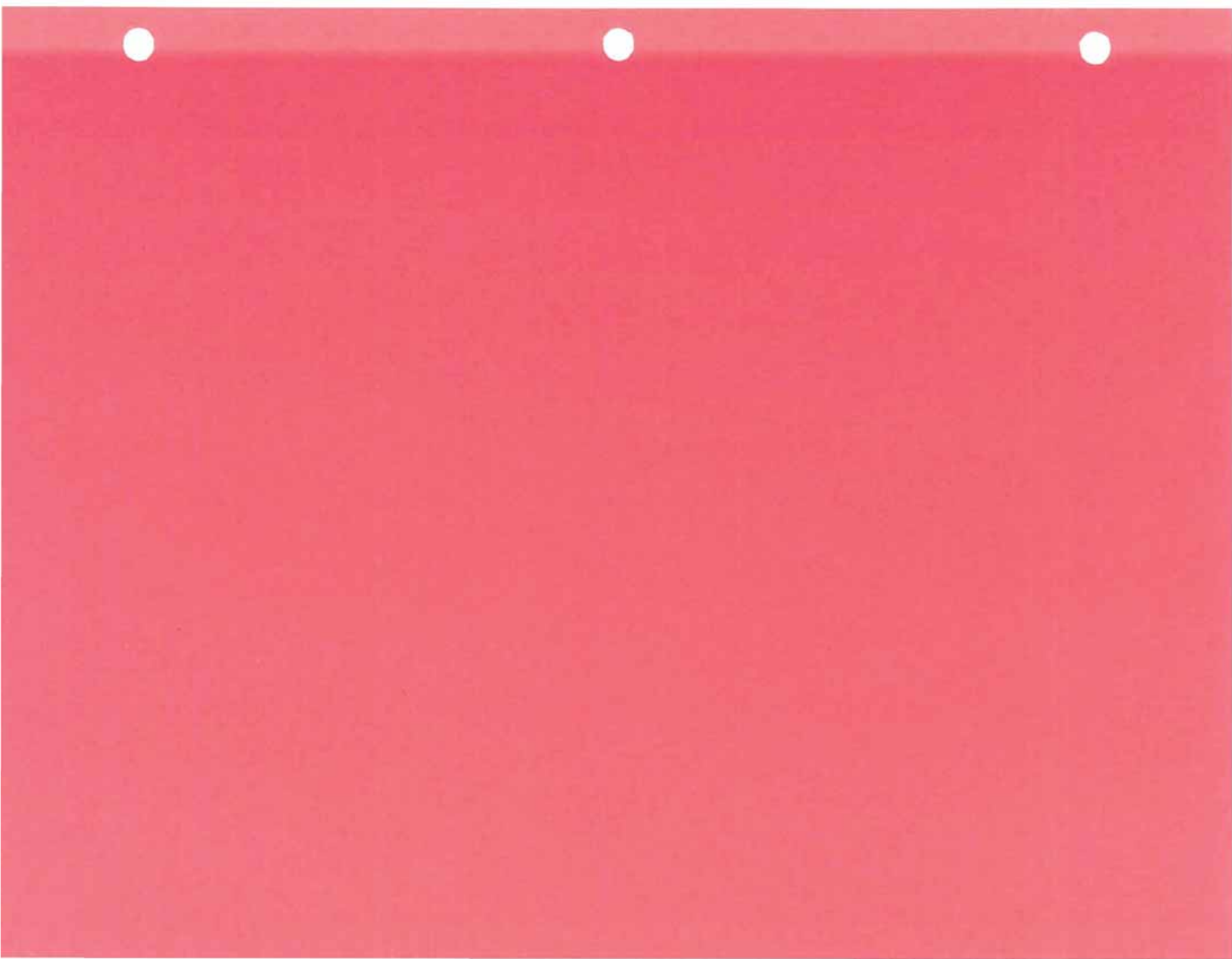
Kaufmann, Meter 7
Weekly Average Flow (April - July, 2007)



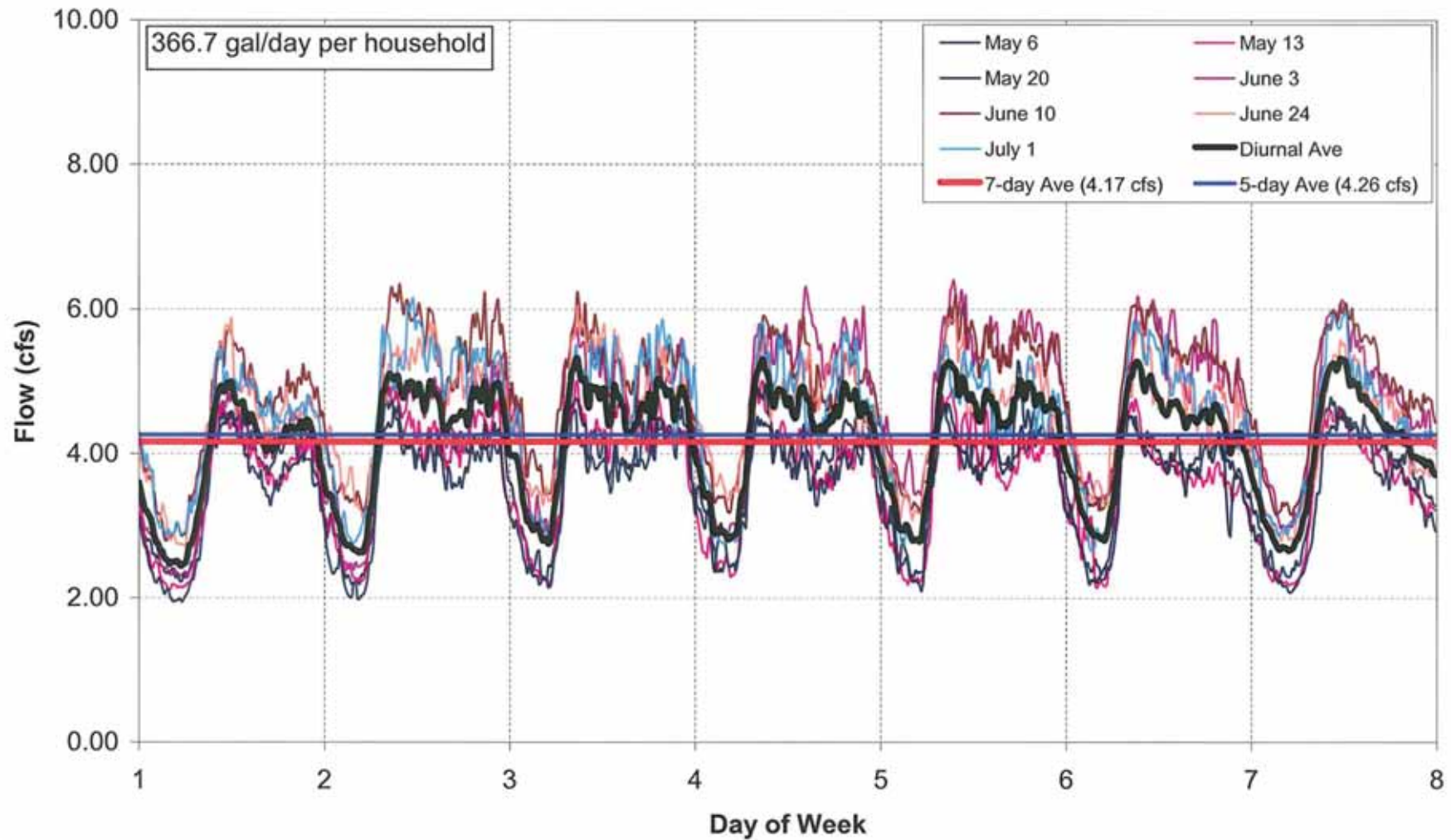


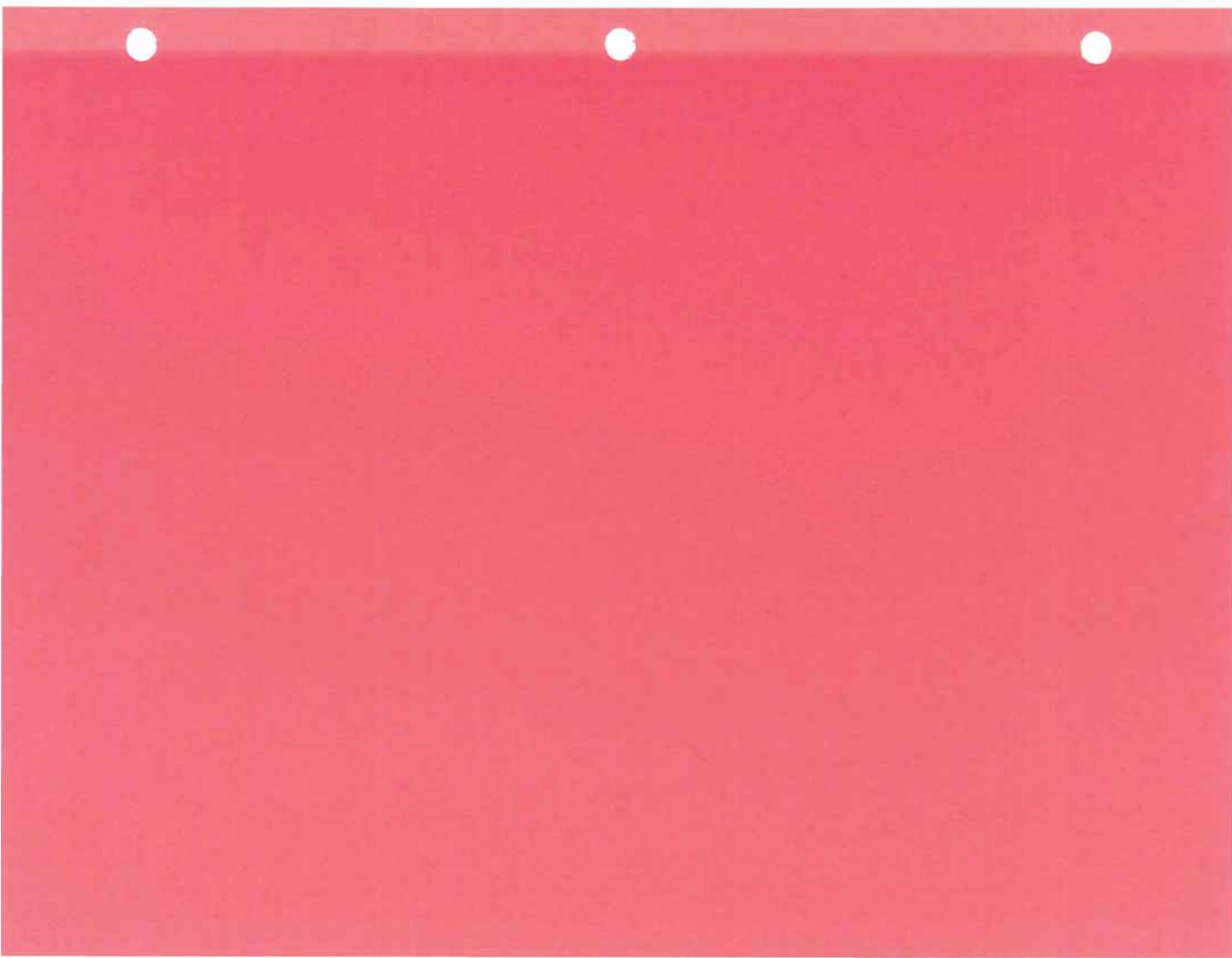
Kerper, Meter 8
Weekly Average Flow (February, 2007 - only 1 week of data)



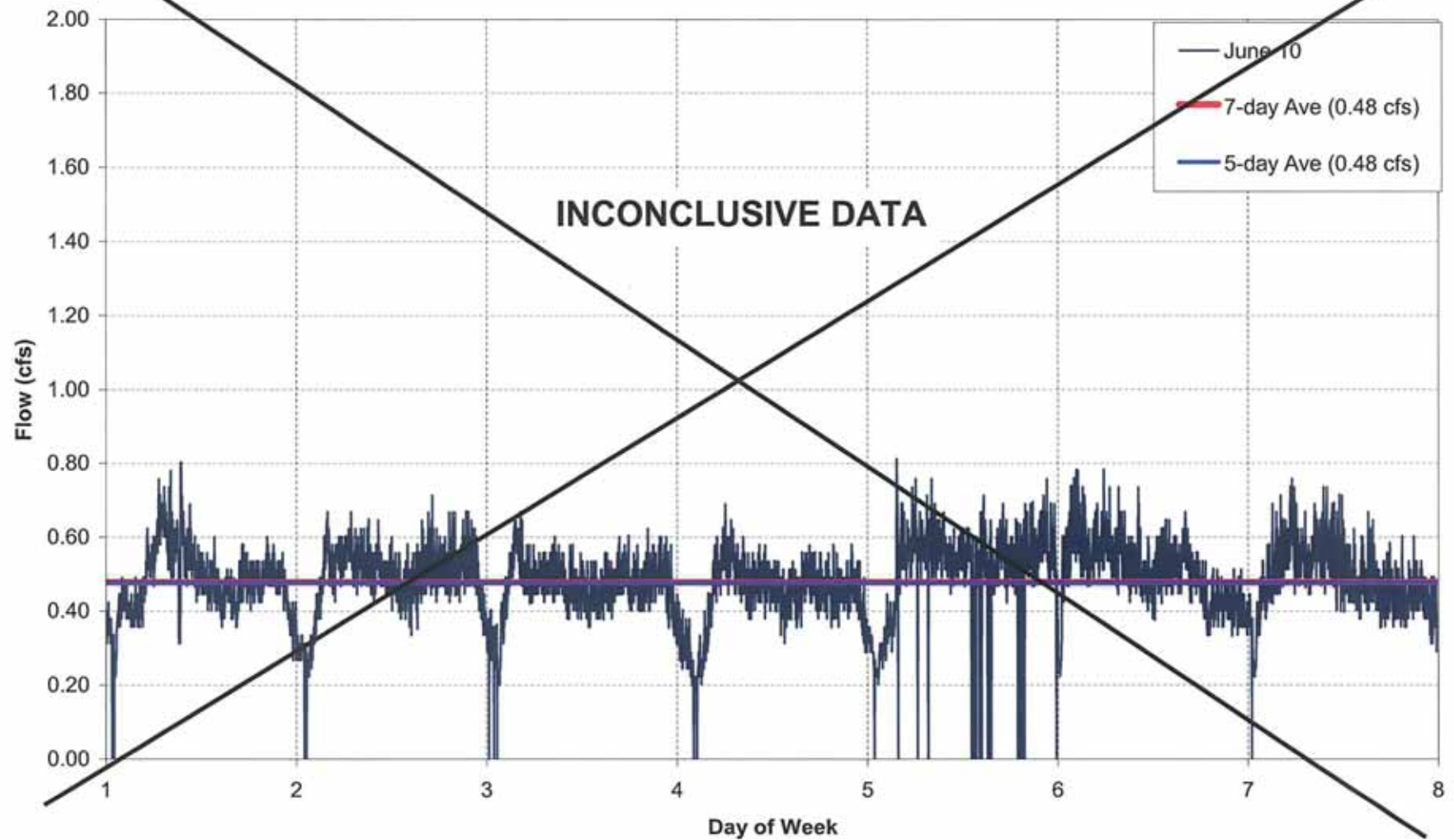


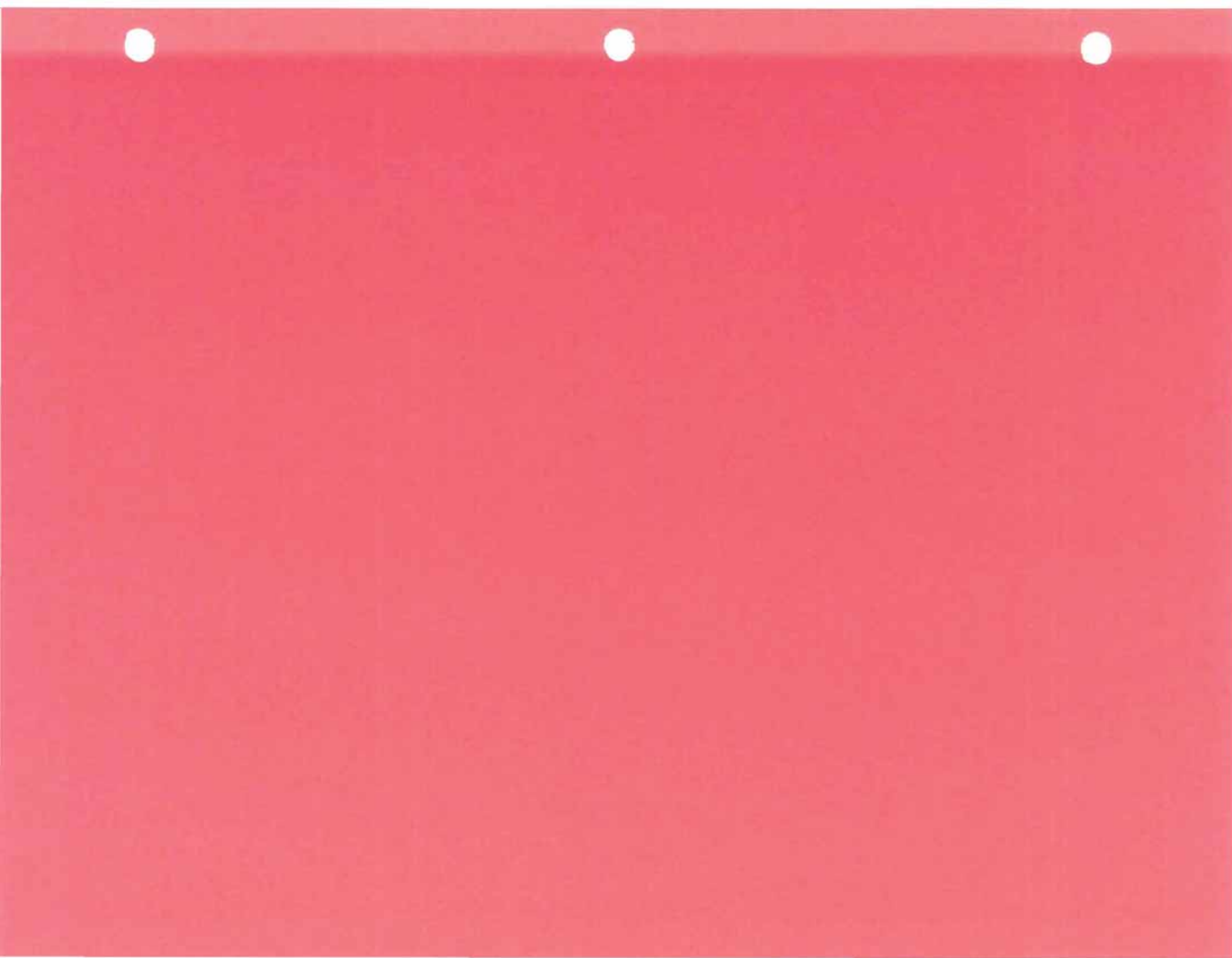
Catfish, Meter 10
Weekly Average Flow (March - July, 2007)



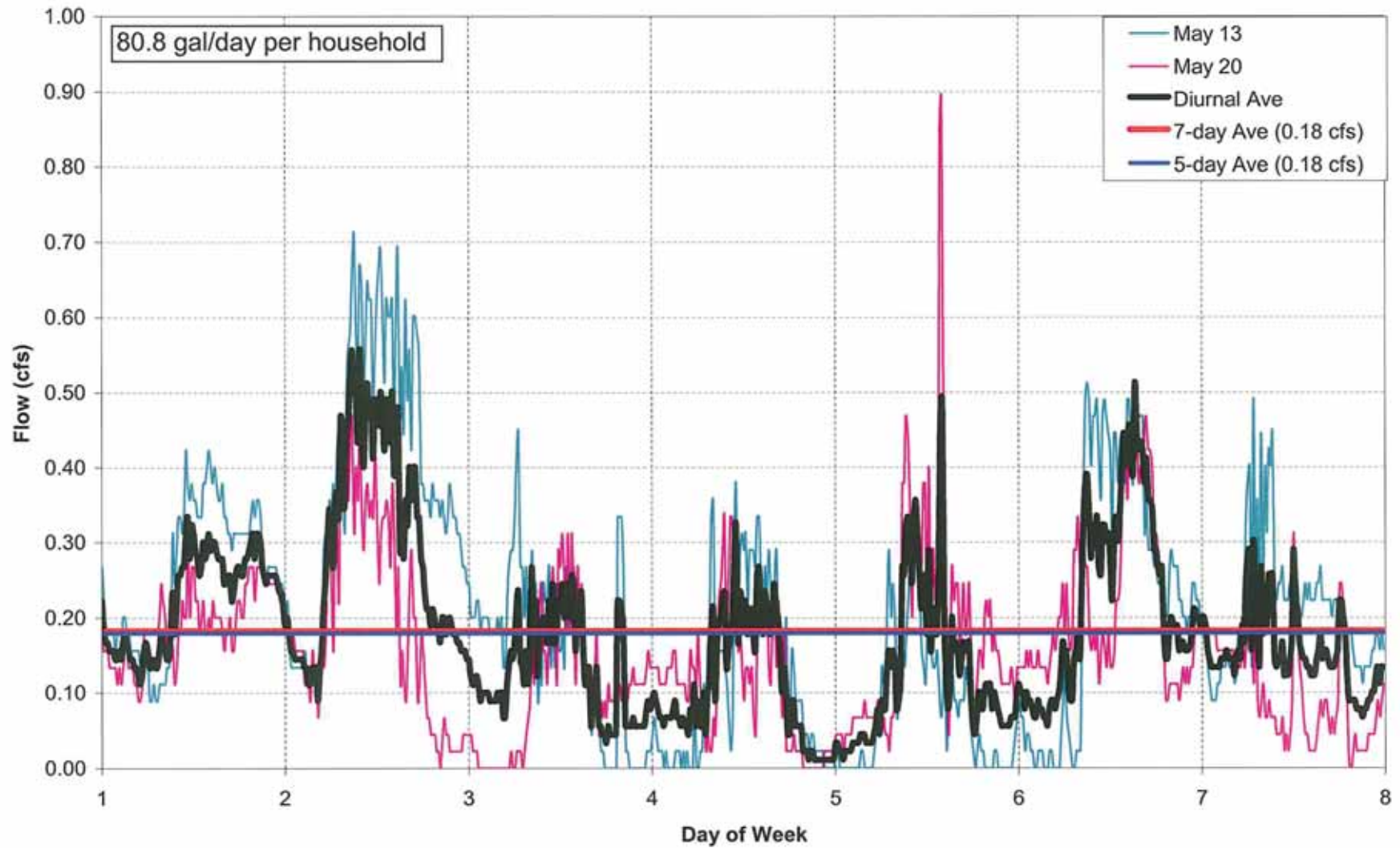


W. Locust ML 11
Weekly Average Flow (June, 2007 - only 1 week of data)



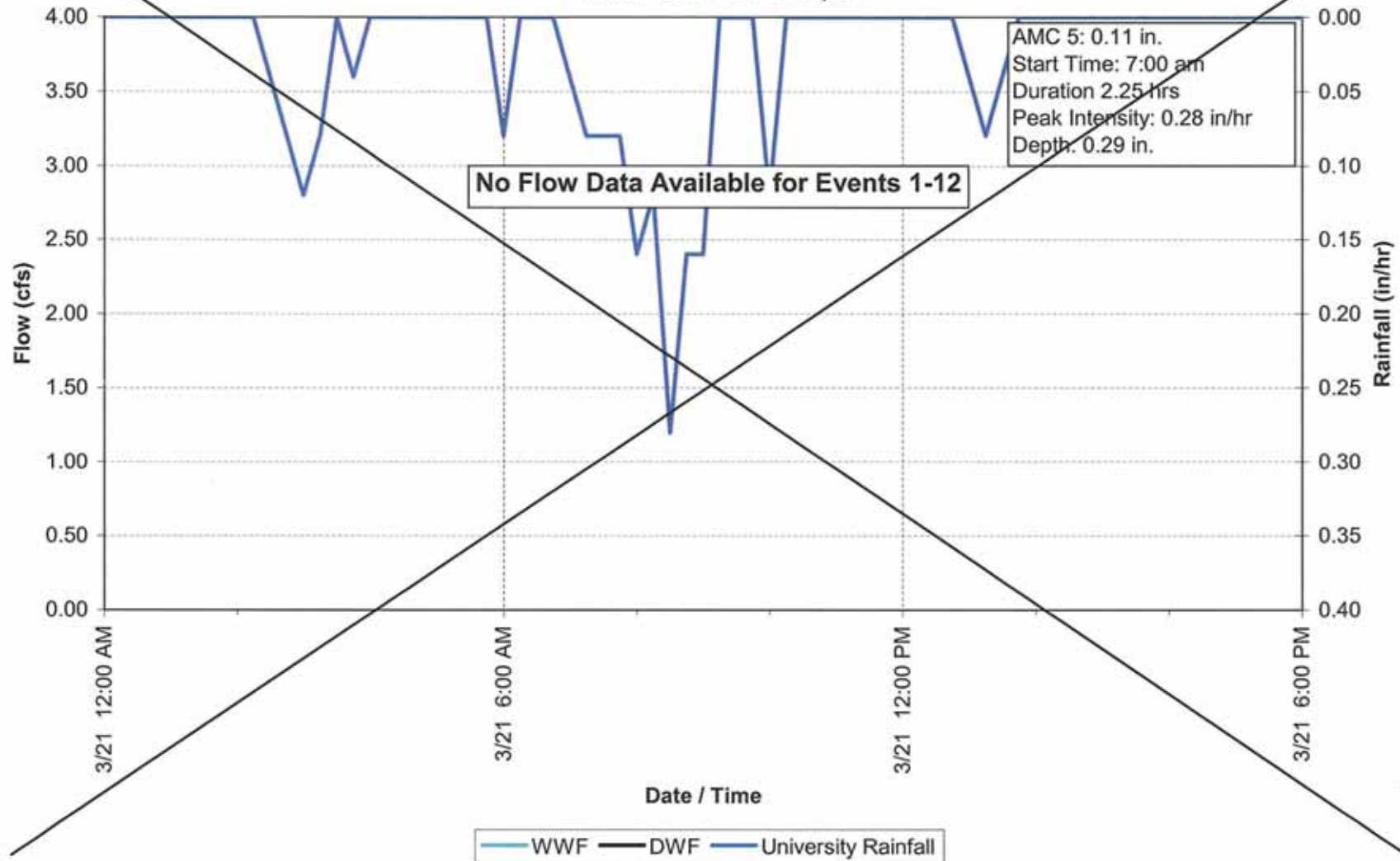


1st Street, Meter 12
Weekly Average Flow (March - July, 2007)

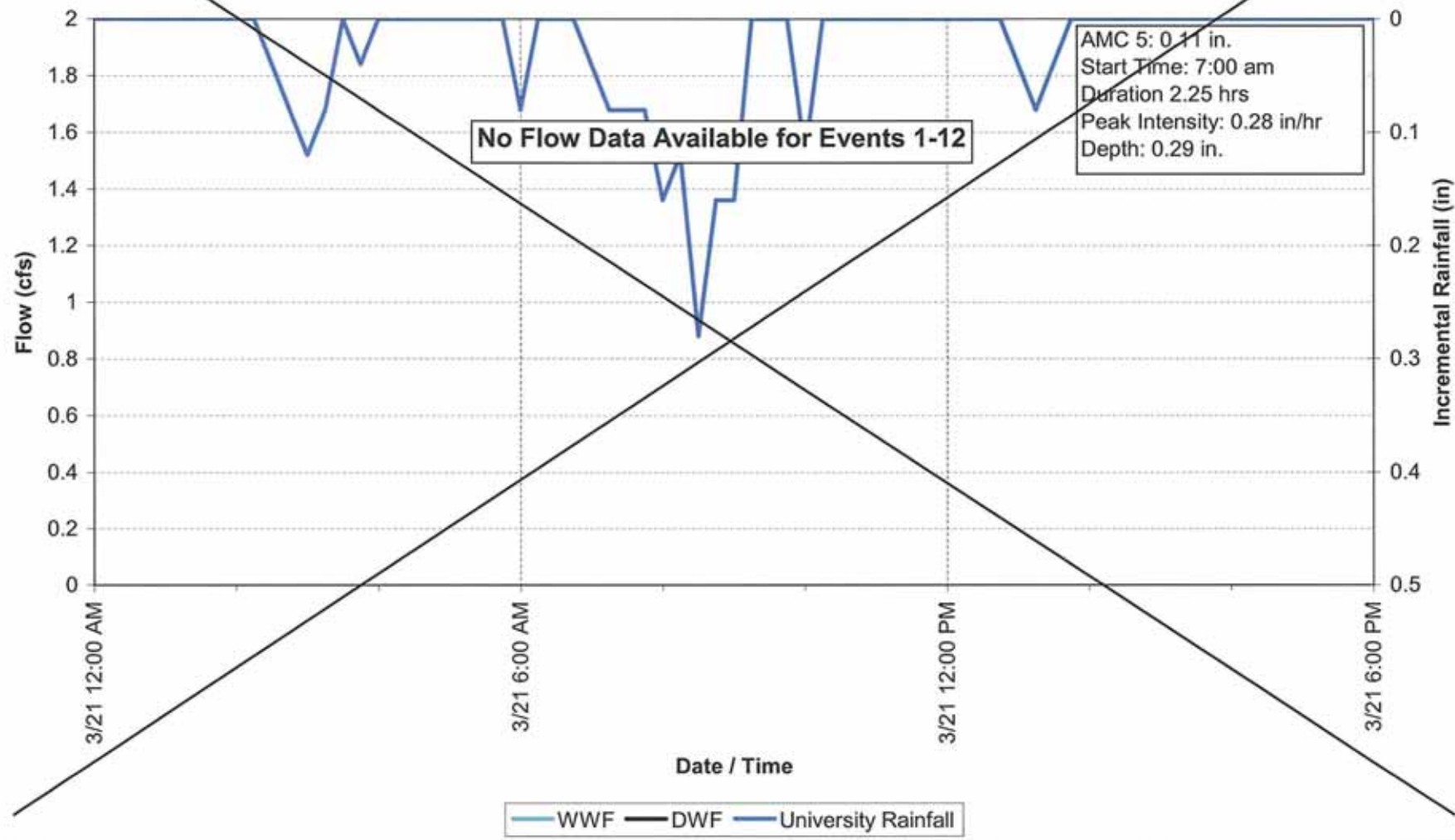


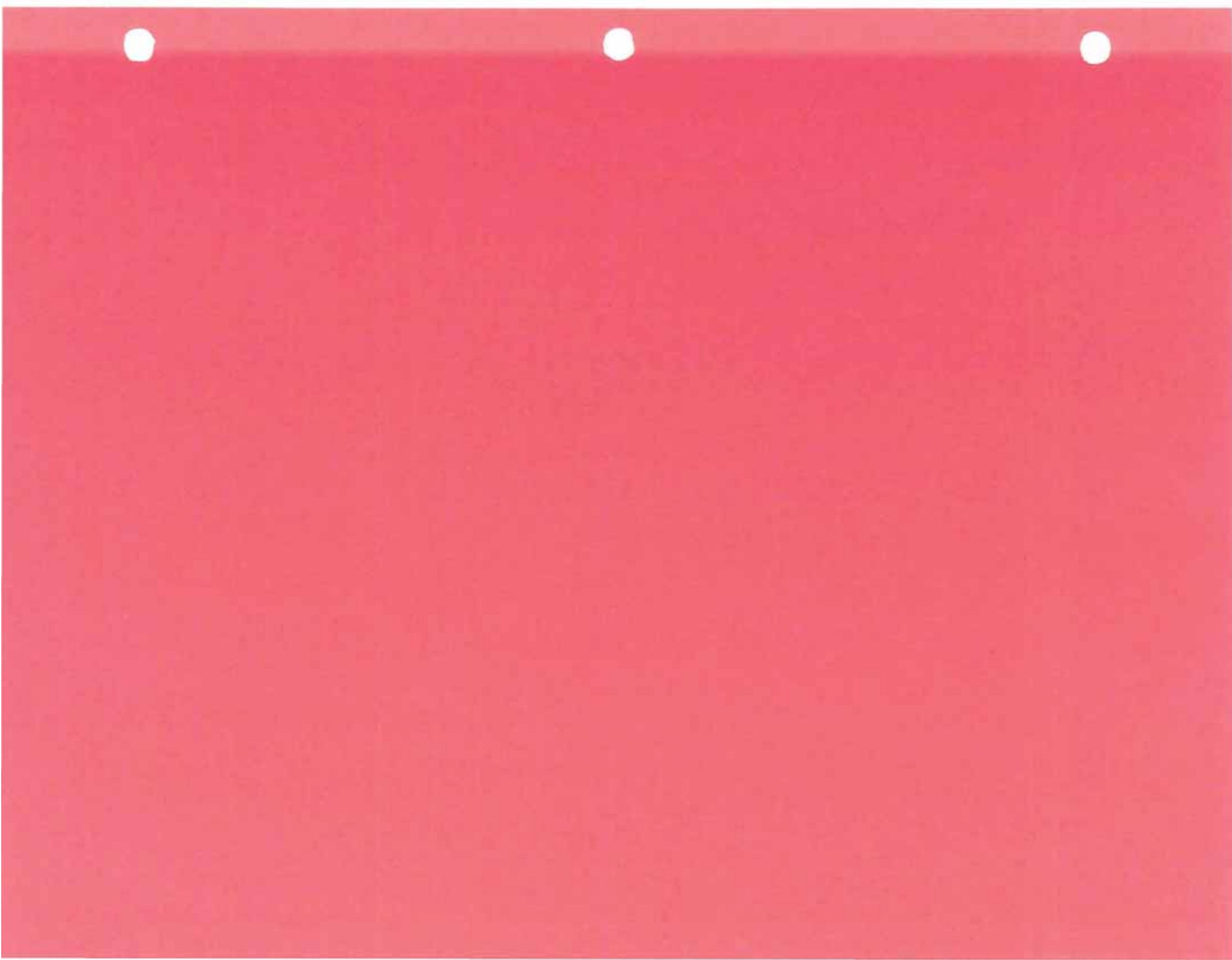
WWF

Catfish, Meter 1
Event 1: March 21, 2007; Small Depth Storm
WWF and DWF Graph

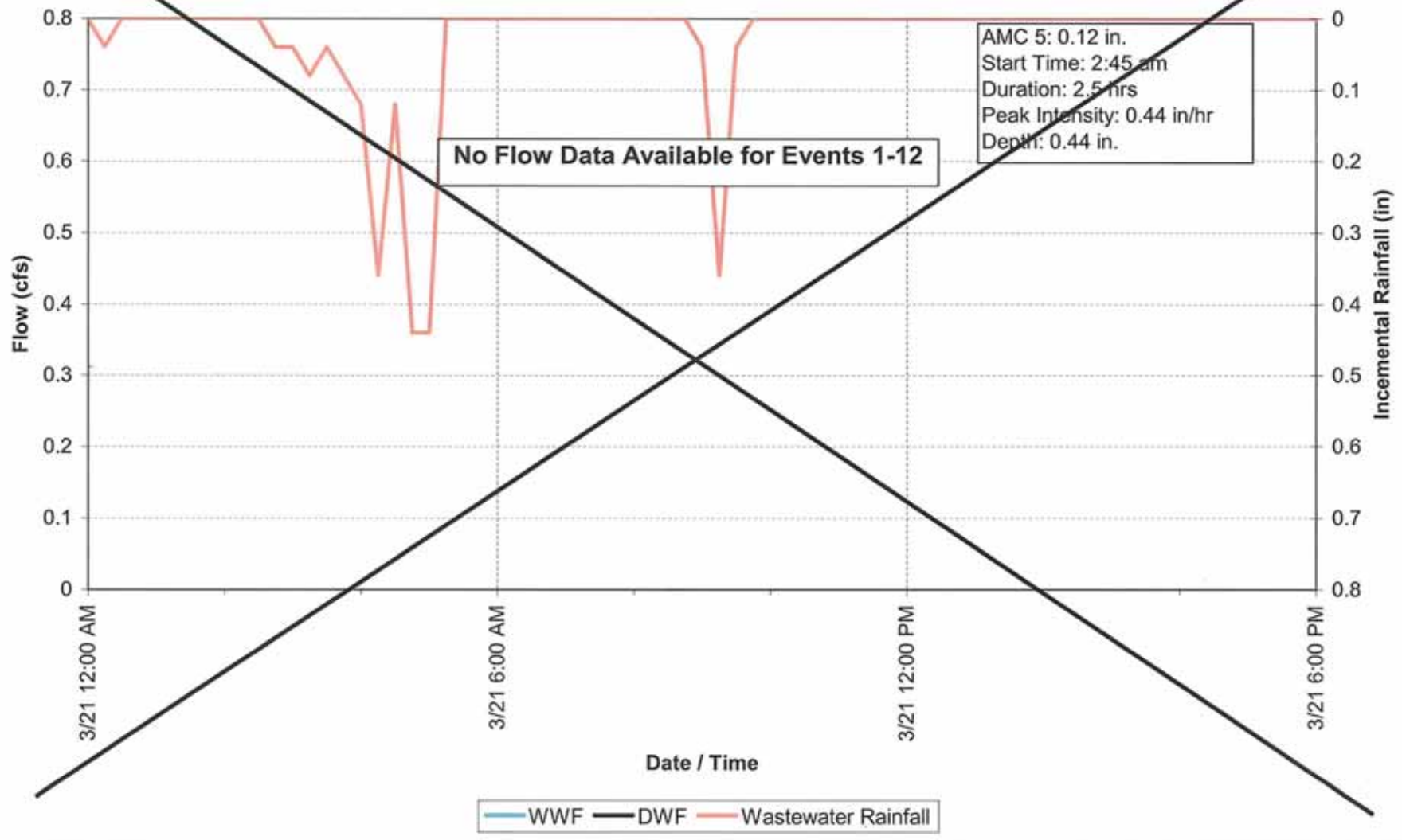


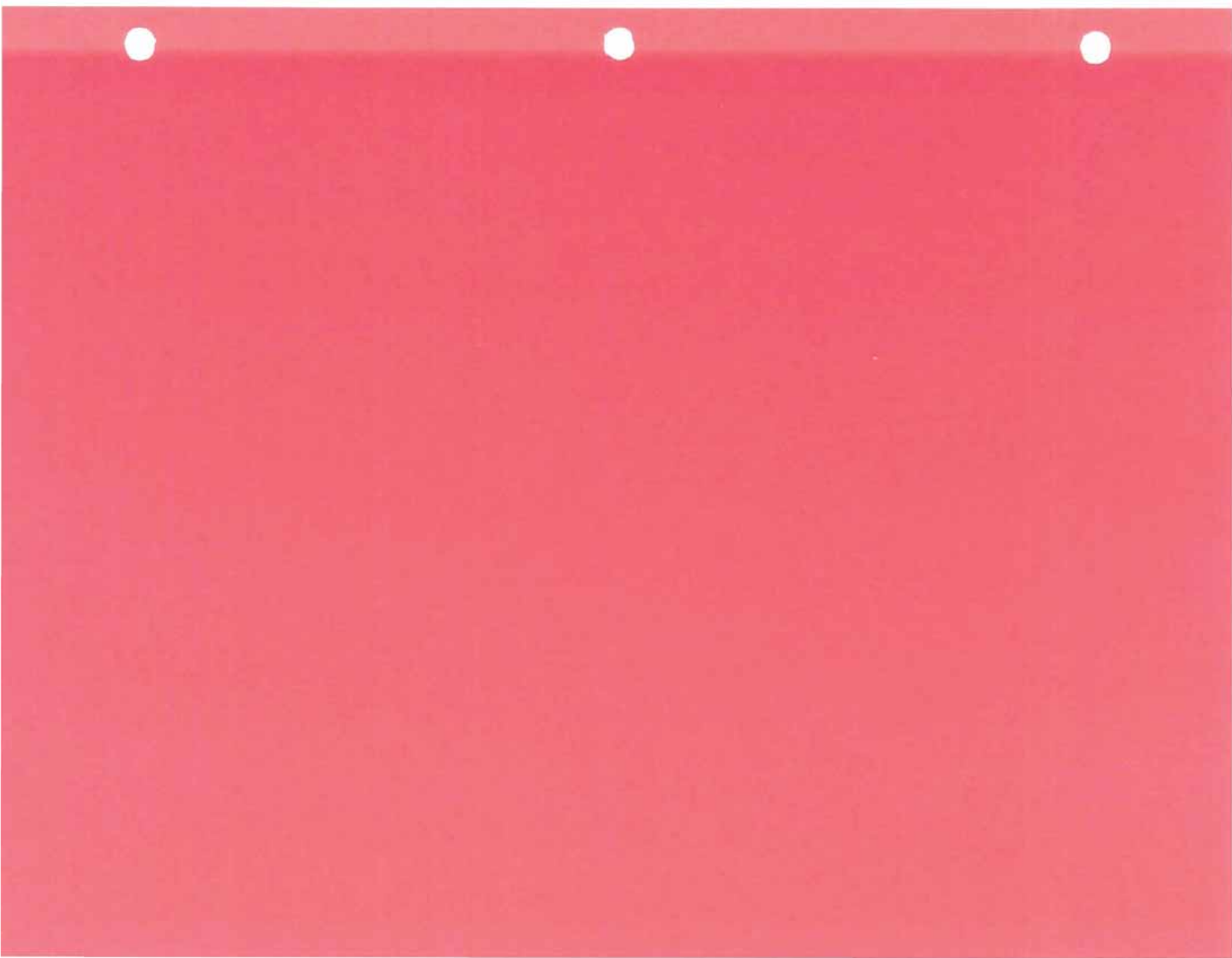
Catfish, Meter 2
Event 1: March 21, 2007; Small Depth Storm
WWF and DWF Graph



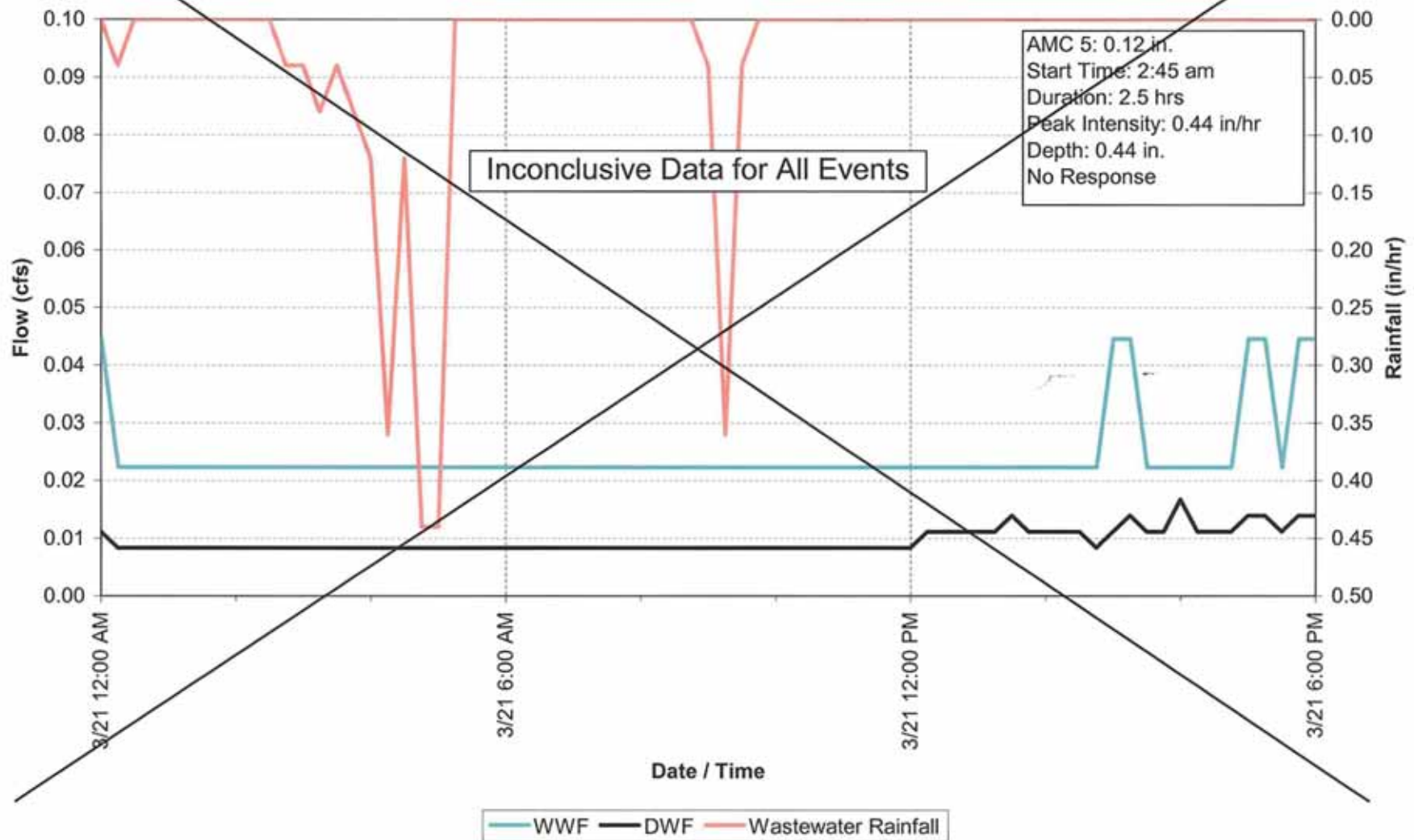


Catfish, Meter 3
Event 1: March 21, 2007; Small Depth Storm
WWF and DWF Graph

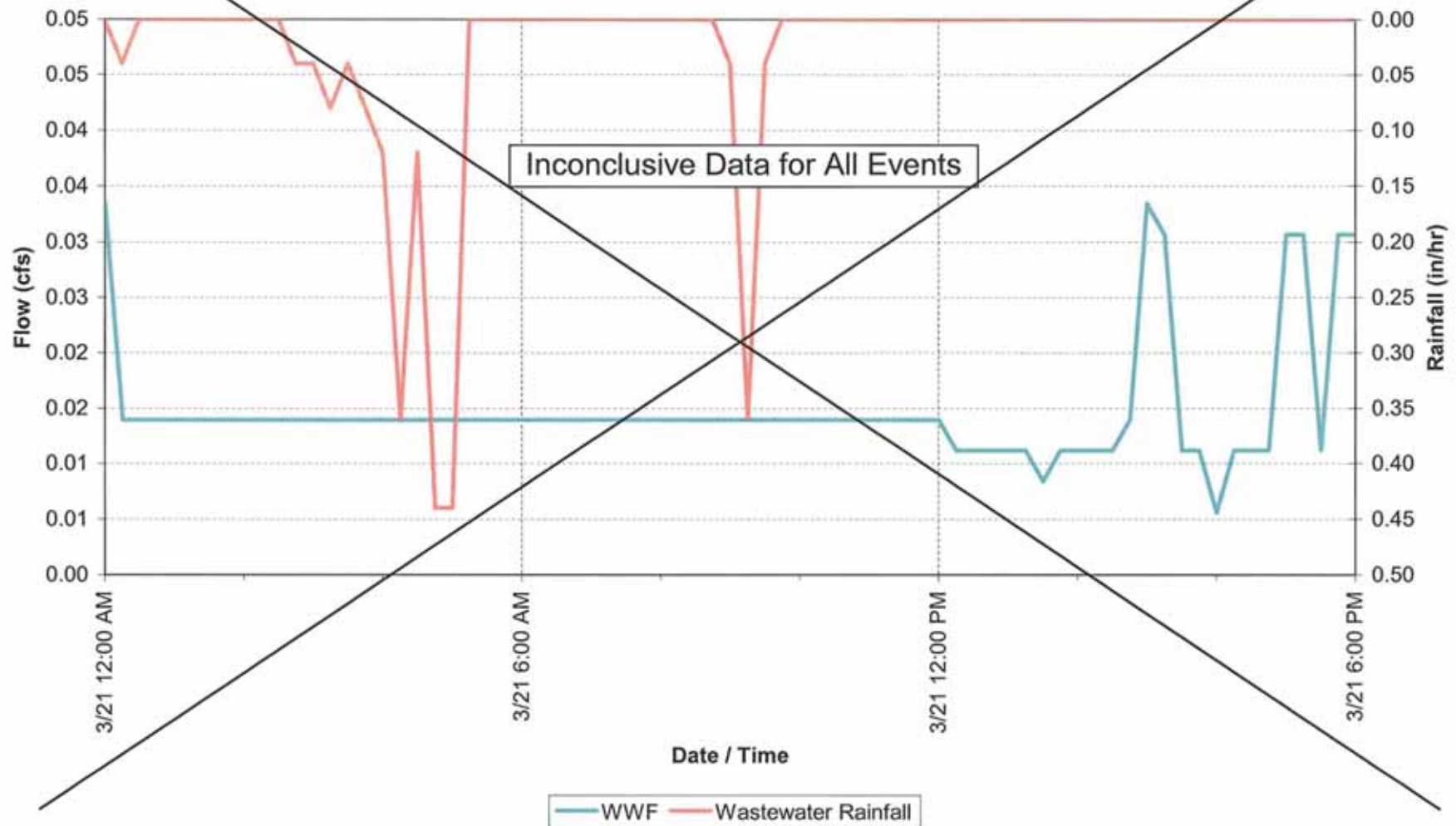


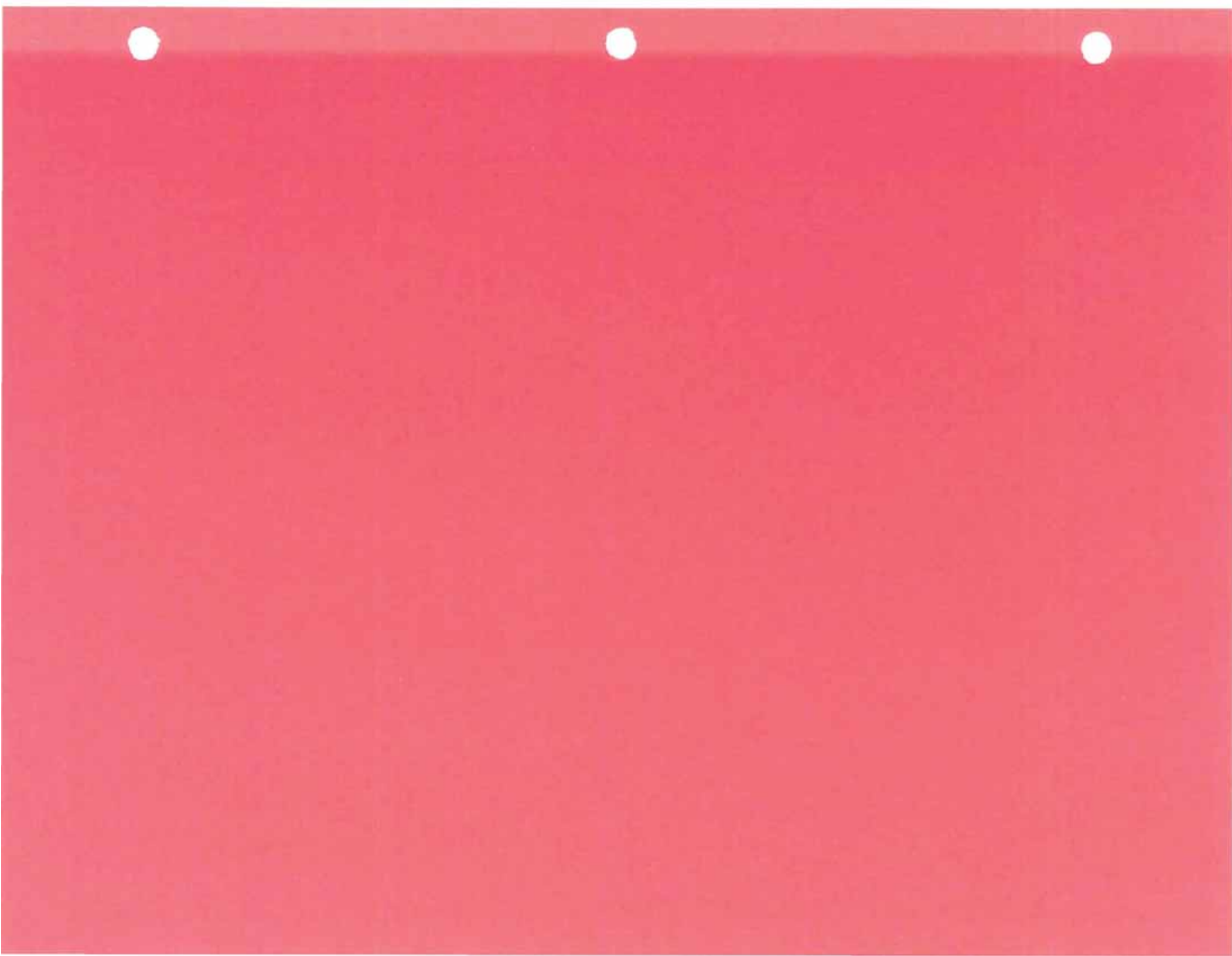


Granger, Meter 4
Event 1: March 21, 2007; Small Depth Storm
WWF and DWF Graph

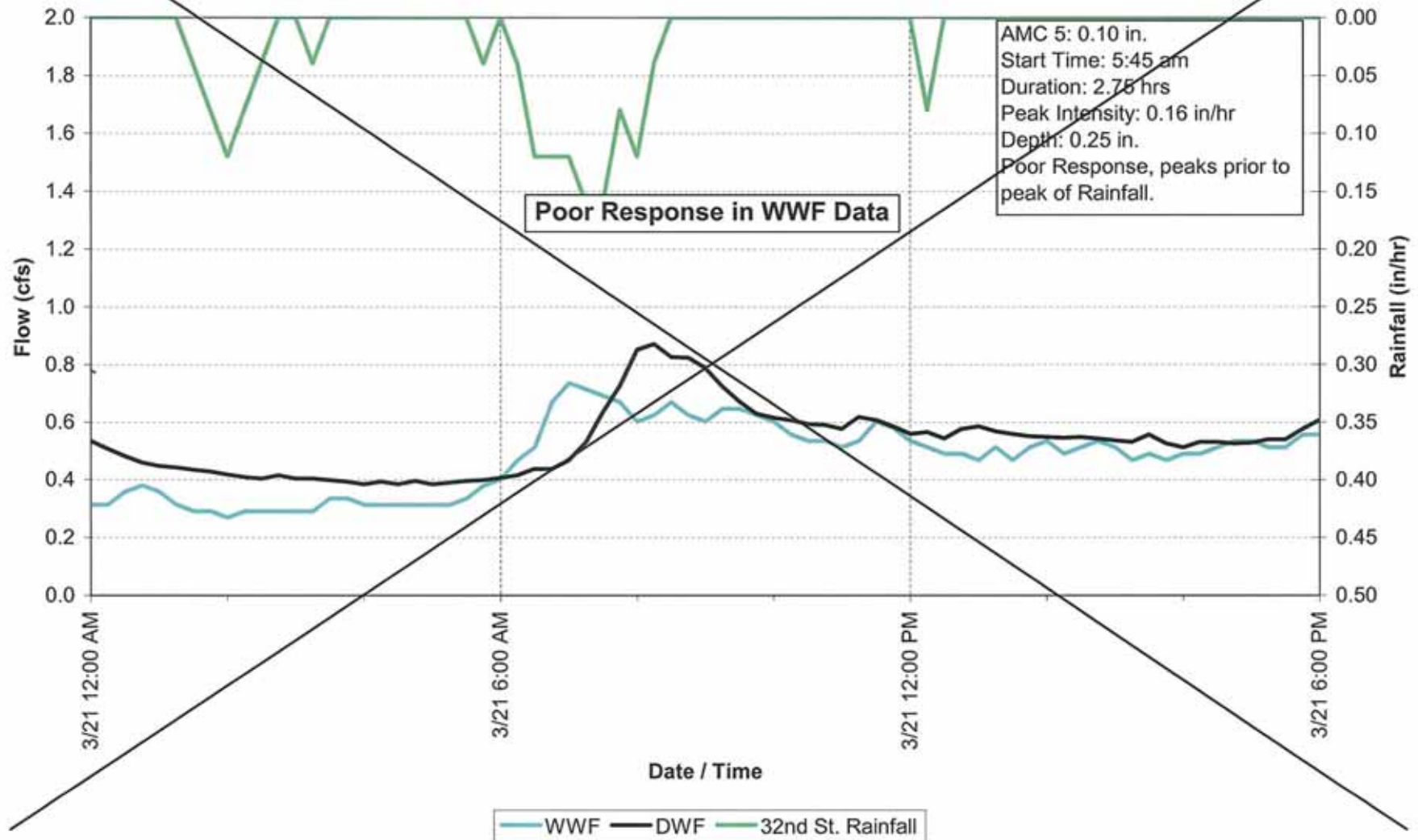


Granger, Meter 4
Event 1: March 21, 2007; Small Depth Storm
WWF Only (DWF Subtracted Out)

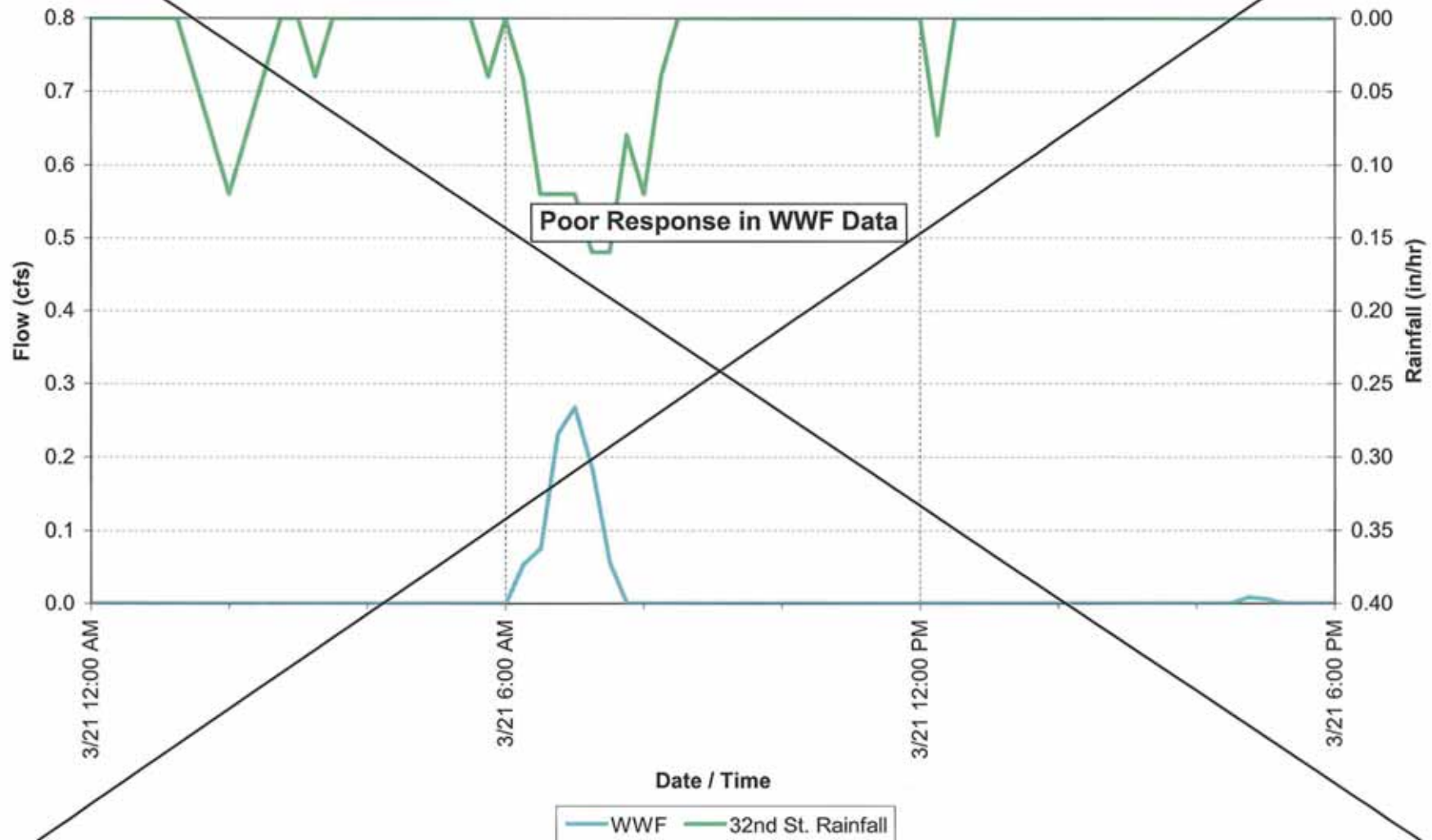




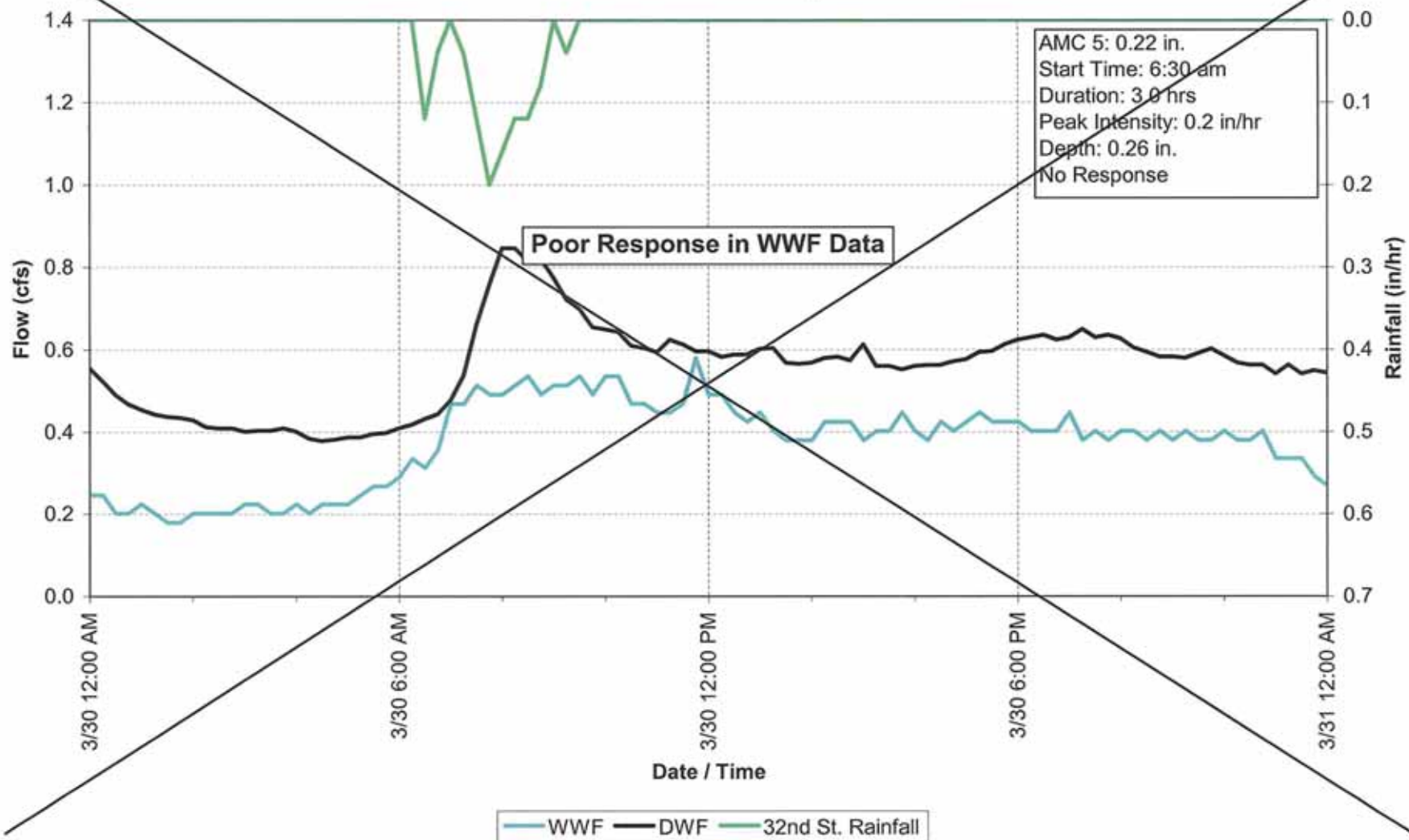
W32nd Ave, Meter 5
Event 1: March 21, 2007; Small Depth Storm
WWF and DWF Graph



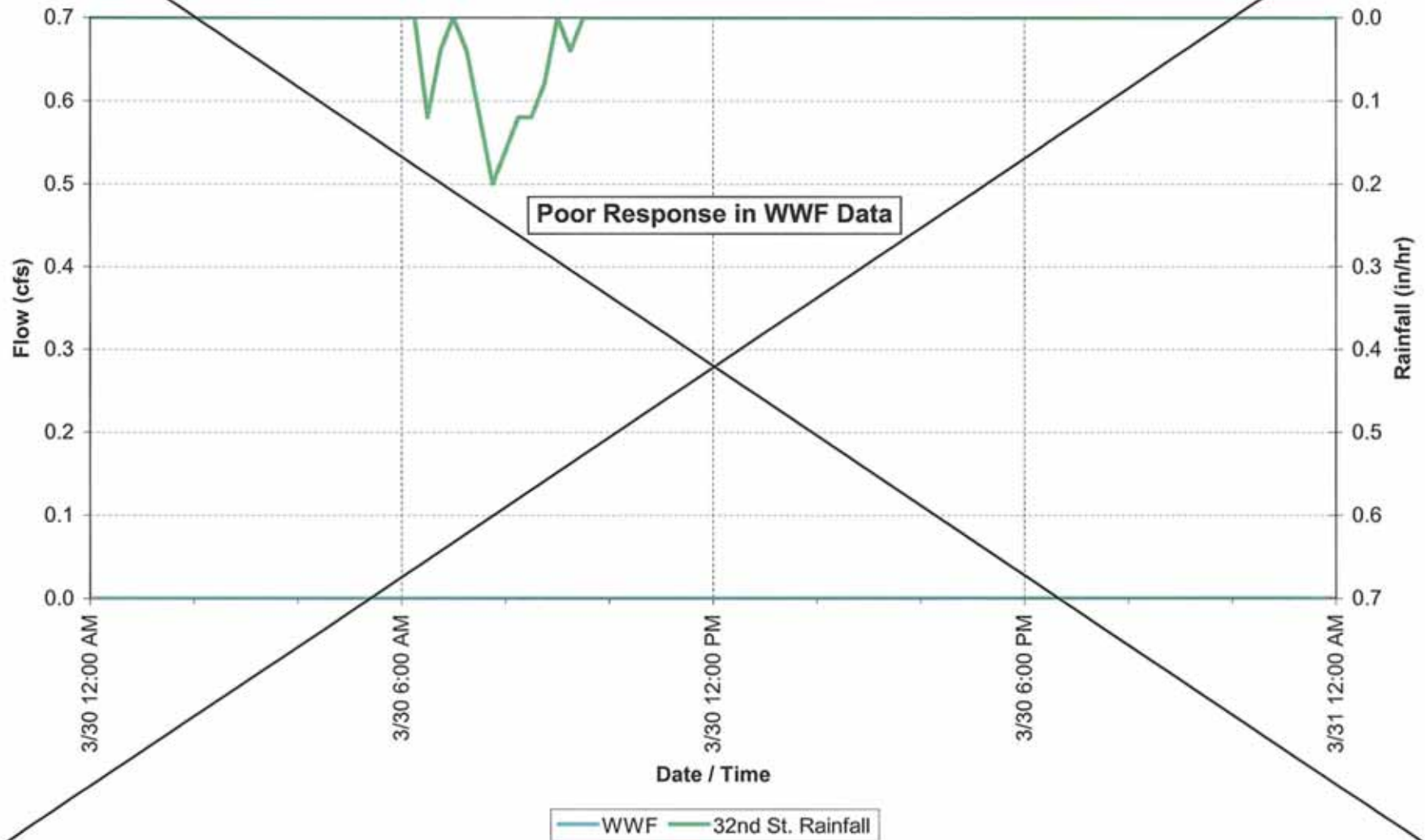
W32nd Ave, Meter 5
Event 1: March 21, 2007; Small Depth Storm
WWF Only (DWF Subtracted Out)



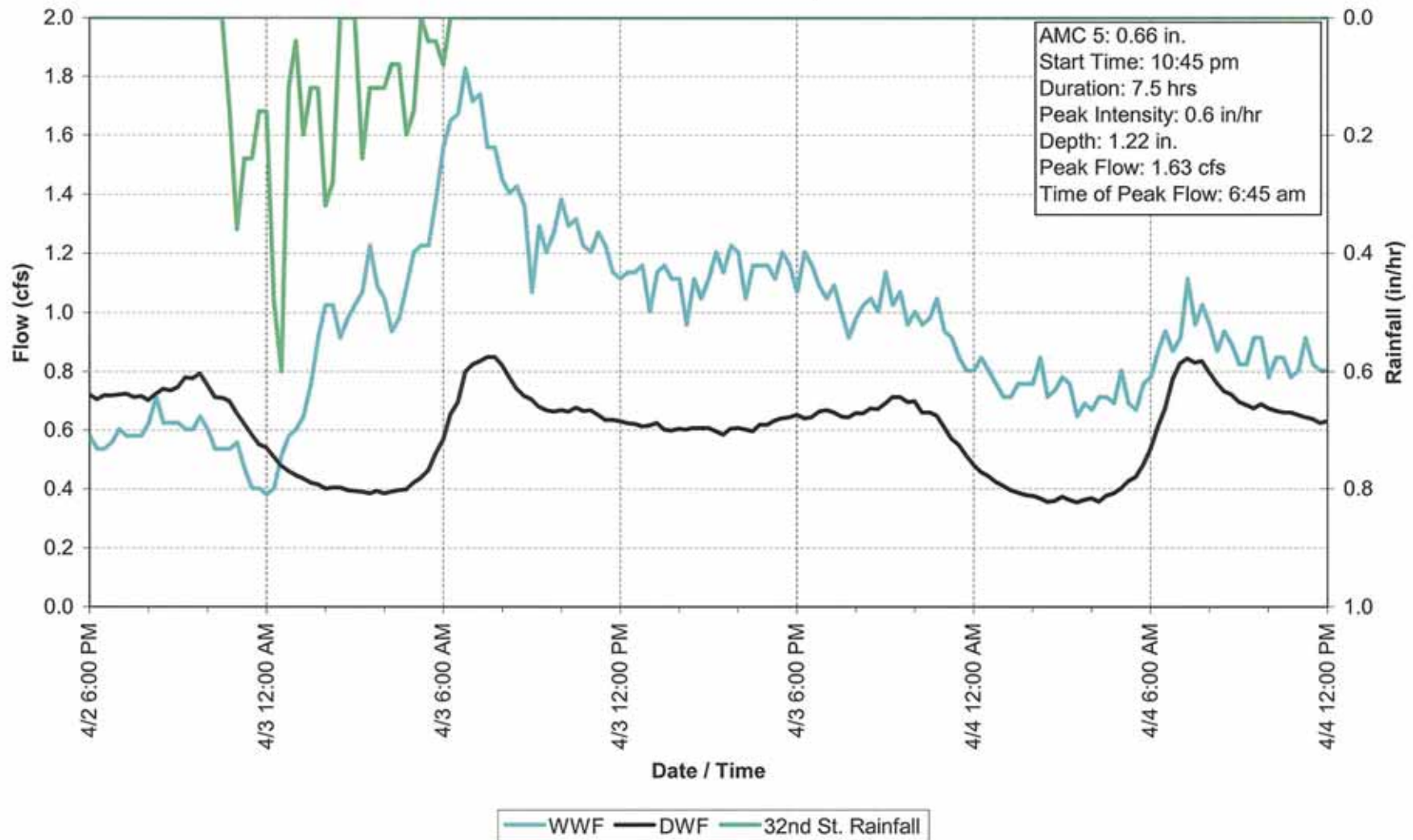
W32nd Ave, Meter 5
Event 2: March 30, 2007; Small Depth Storm
WWF and DWF Graph



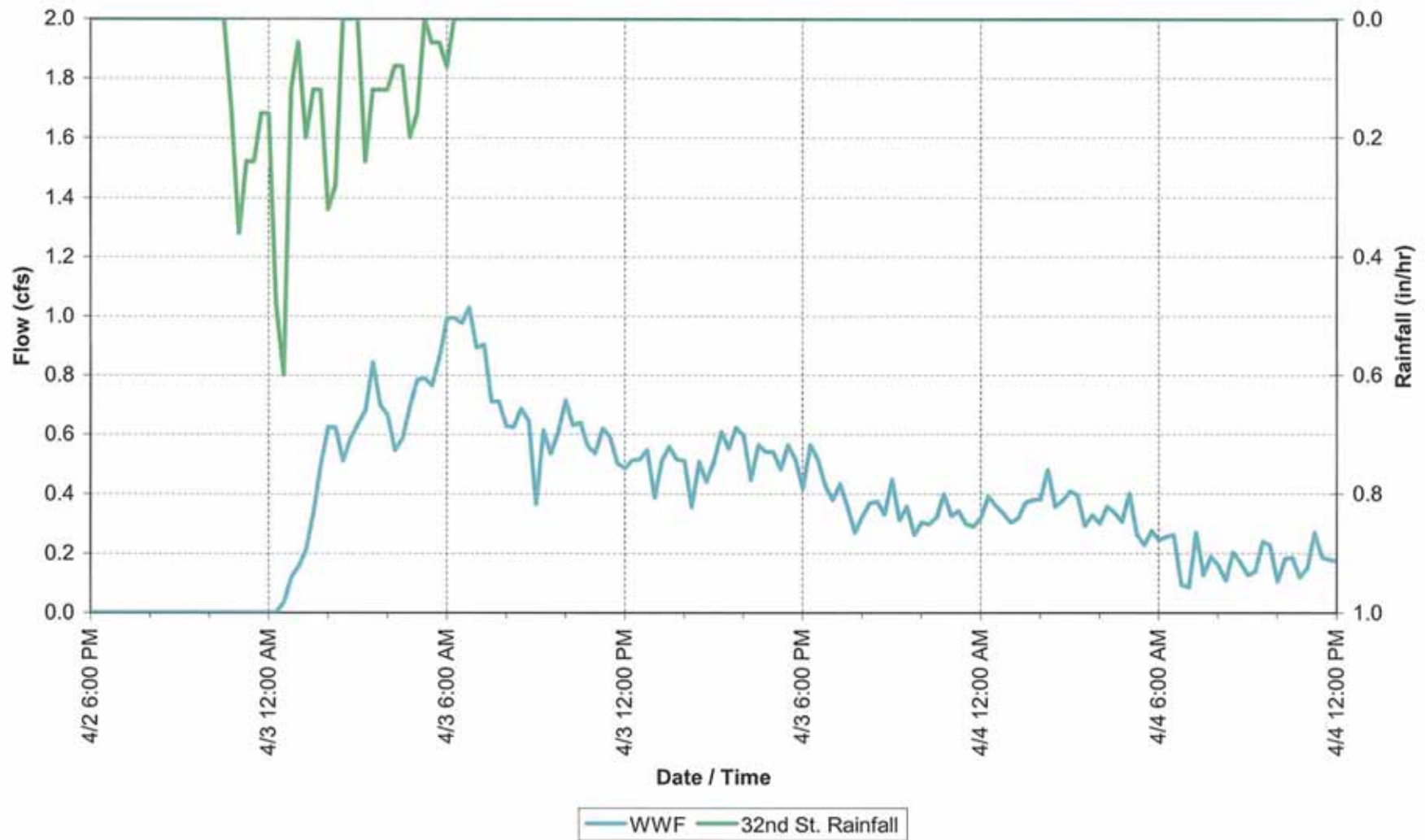
W32nd Ave, Meter 5
Event 2: March 30, 2007; Small Depth Storm
WWF Only (DWF Subtracted Out)



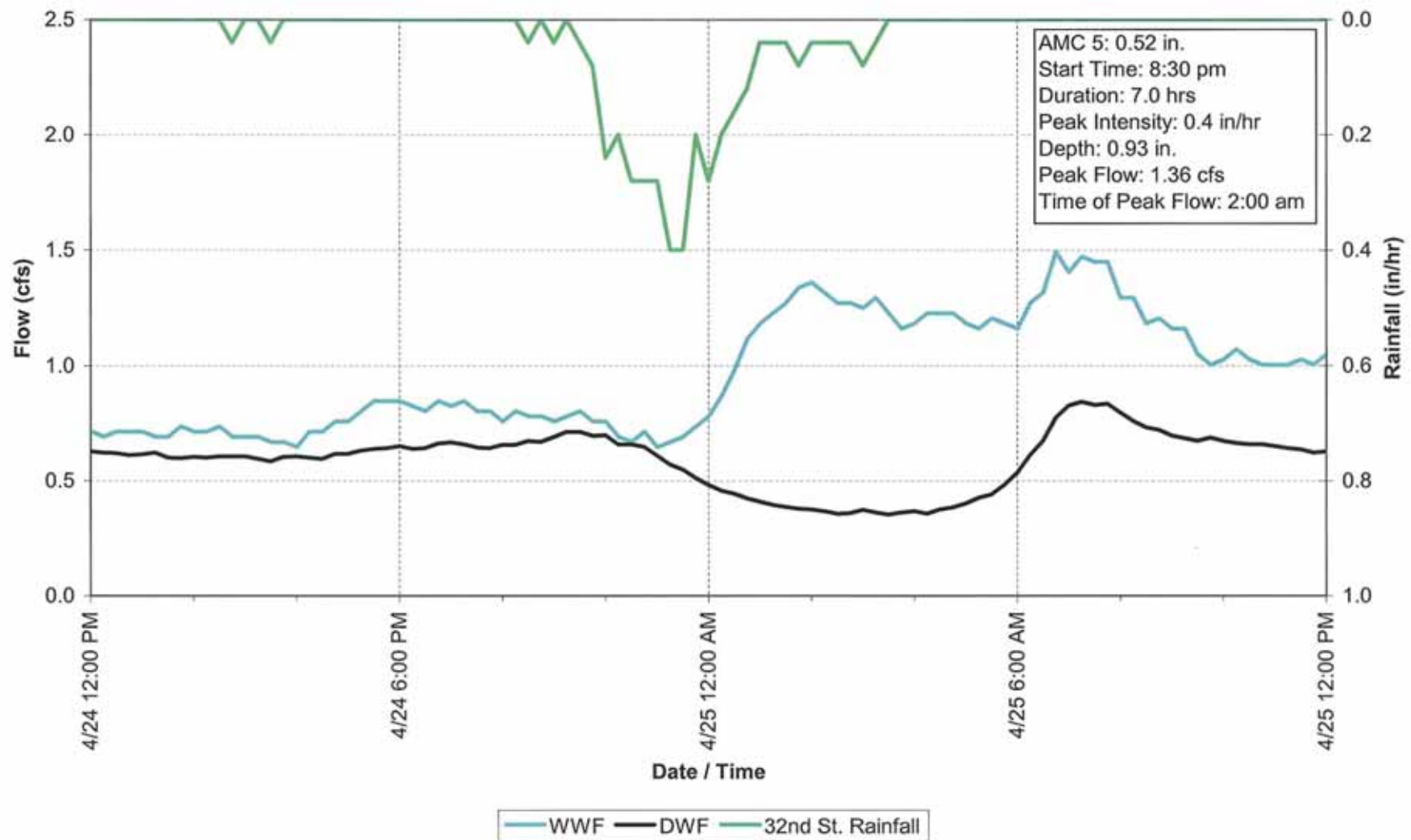
W32nd Ave, Meter 5
Event 3: April 2 - 3, 2007; Long-Duration, Low Intensity Storm
WWF and DWF Graph



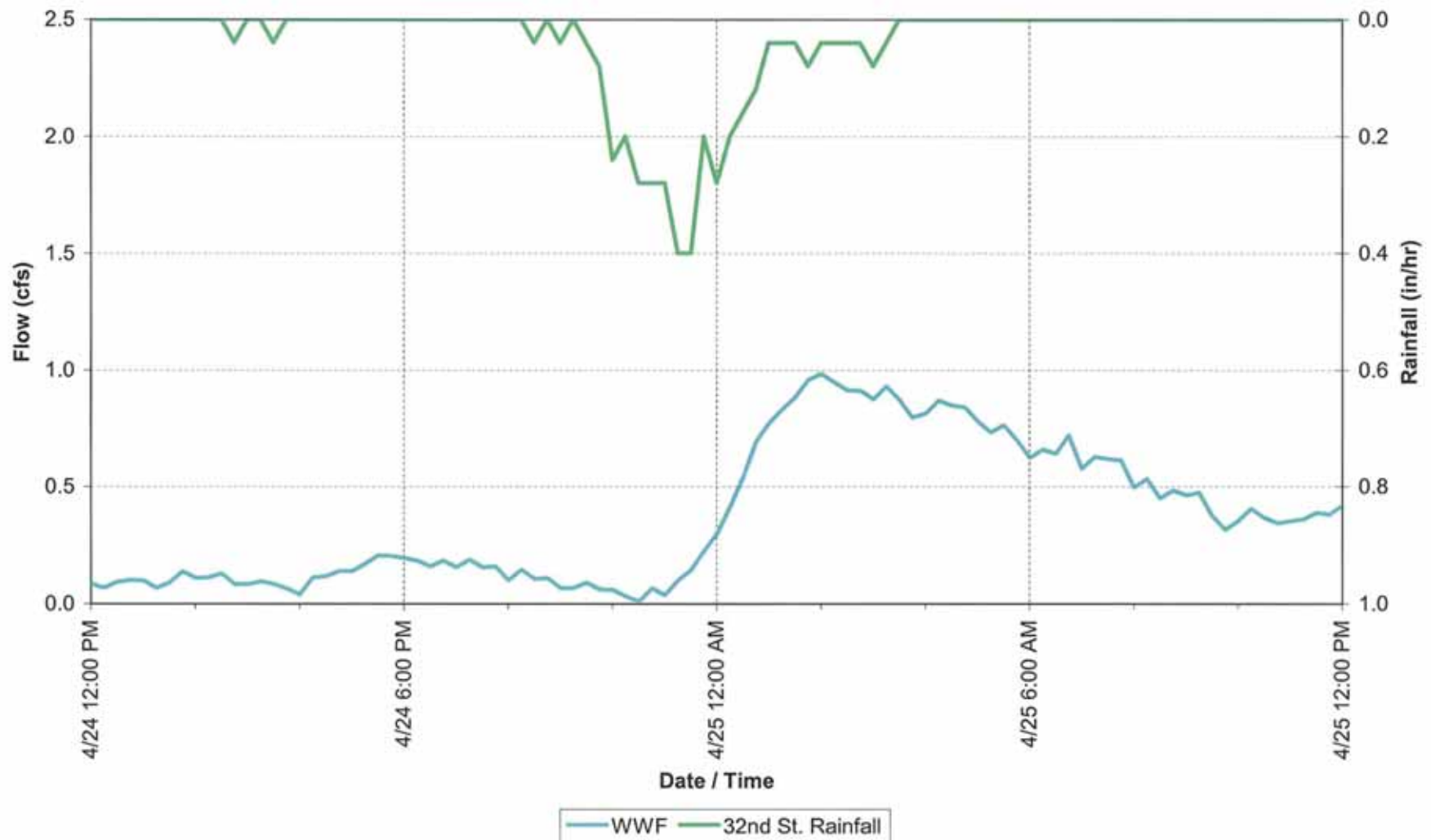
W32nd Ave, Meter 5
Event 3: April 2 - 3, 2007; Long-Duration, Low Intensity Storm
WWF Only (DWF Subtracted Out)



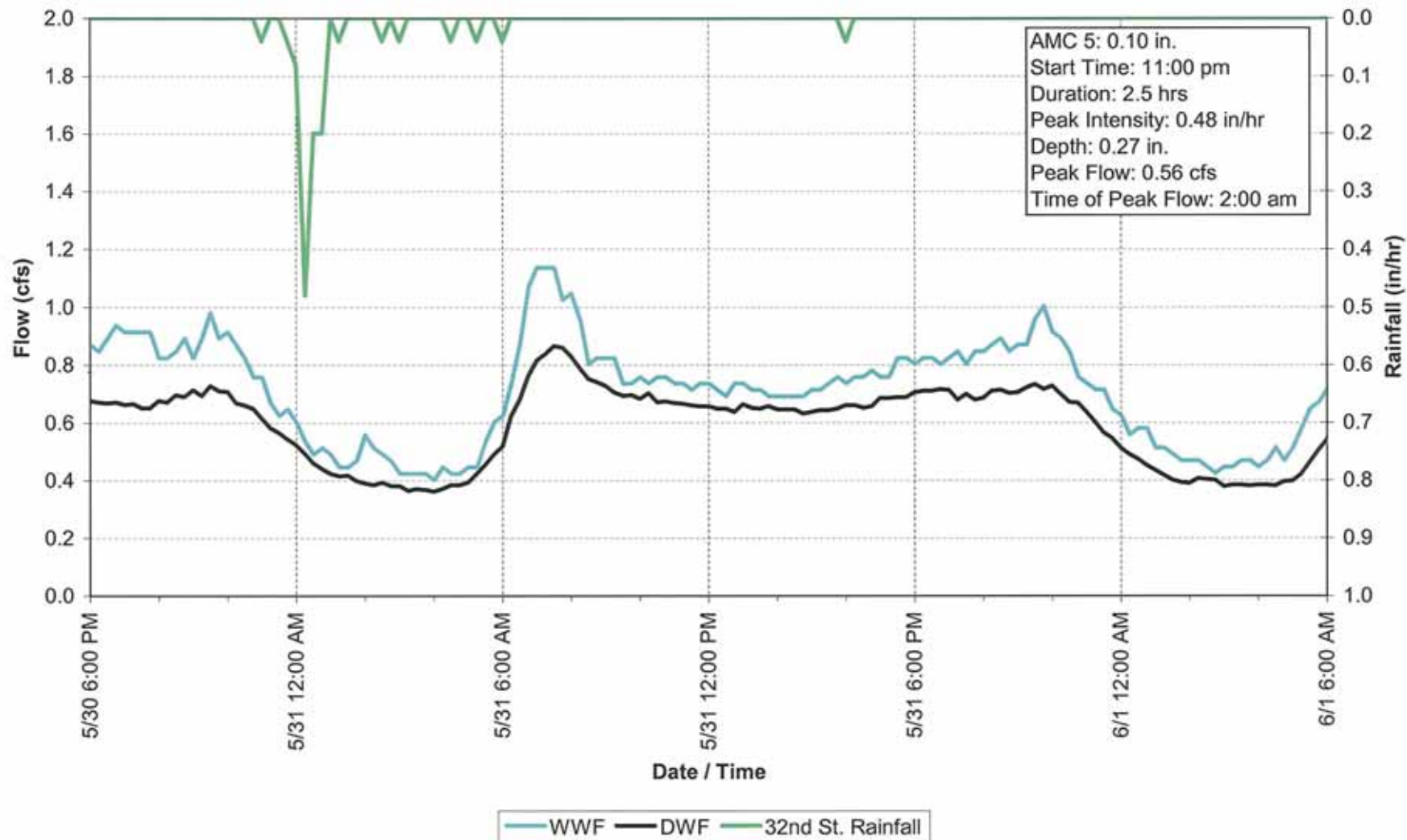
W32nd Ave, Meter 5
Event 4: April 24 - 25, 2007; Long-Duration, Low Intensity Storm
WWF and DWF Graph



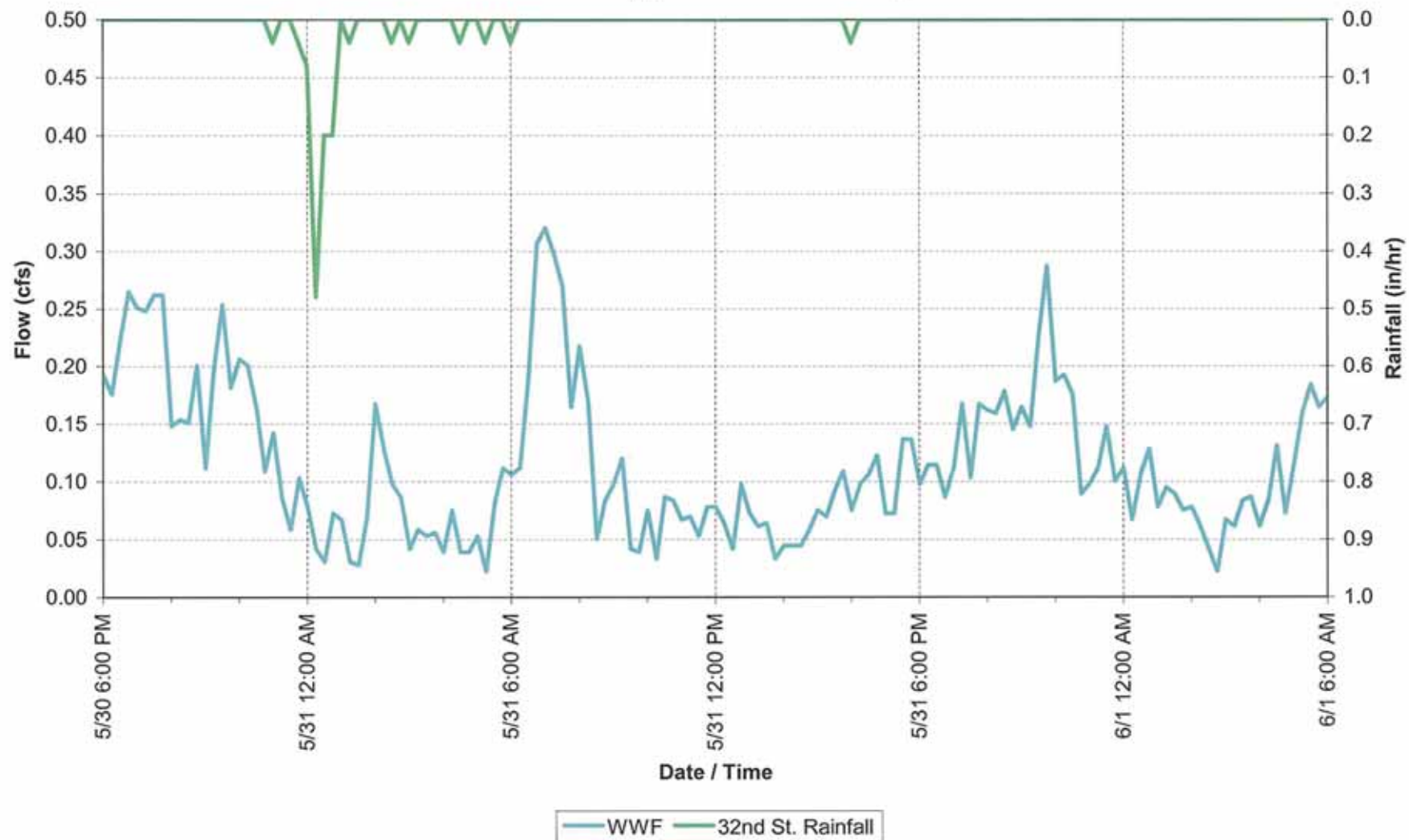
W32nd Ave, Meter 5
Event 4: April 24 - 25, 2007; Long-Duration, Low Intensity Storm
WWF Only (DWF Subtracted Out)



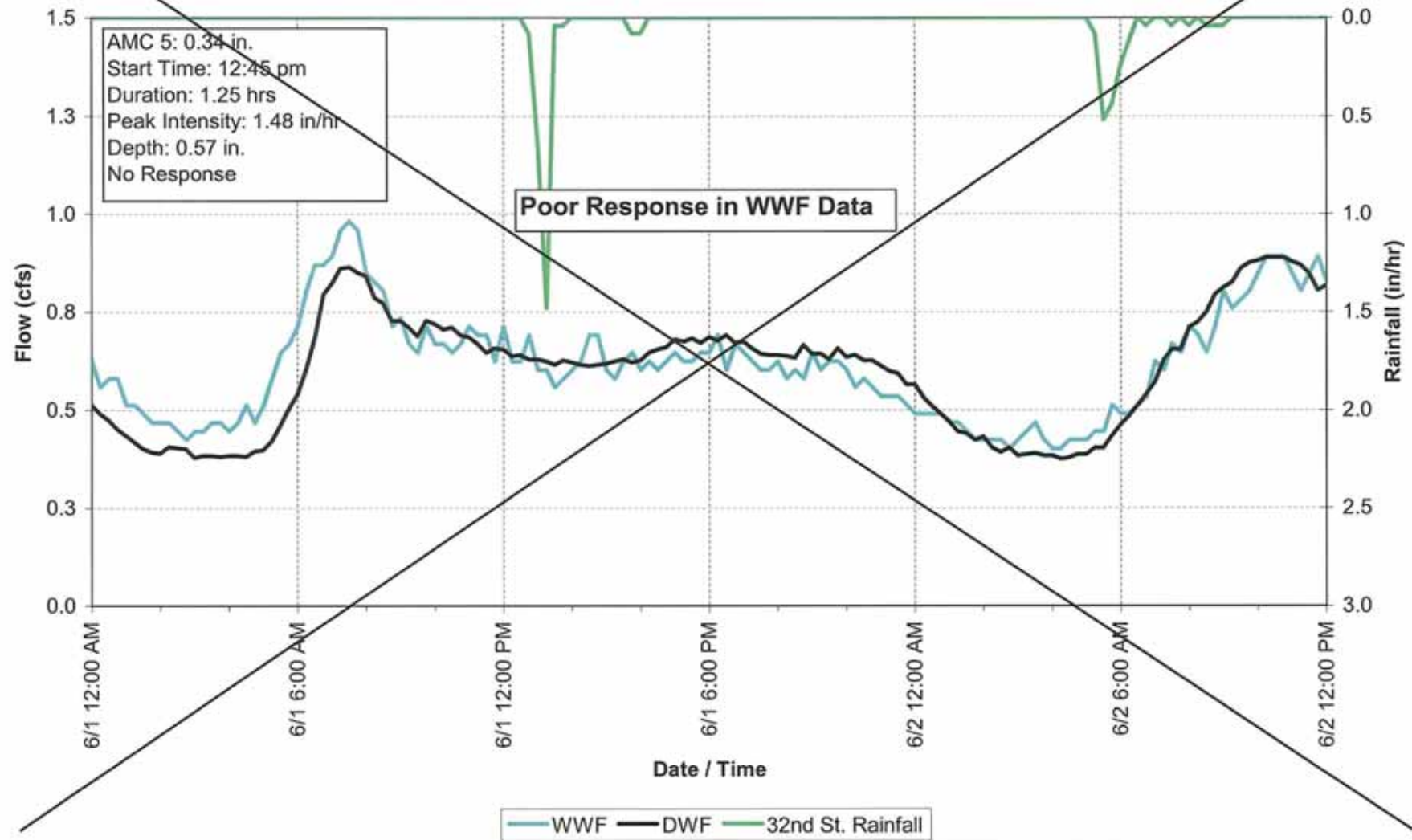
W32nd Ave, Meter 5
Event 5: May 30 -31, 2007; Small Depth Storm
WWF and DWF Graph



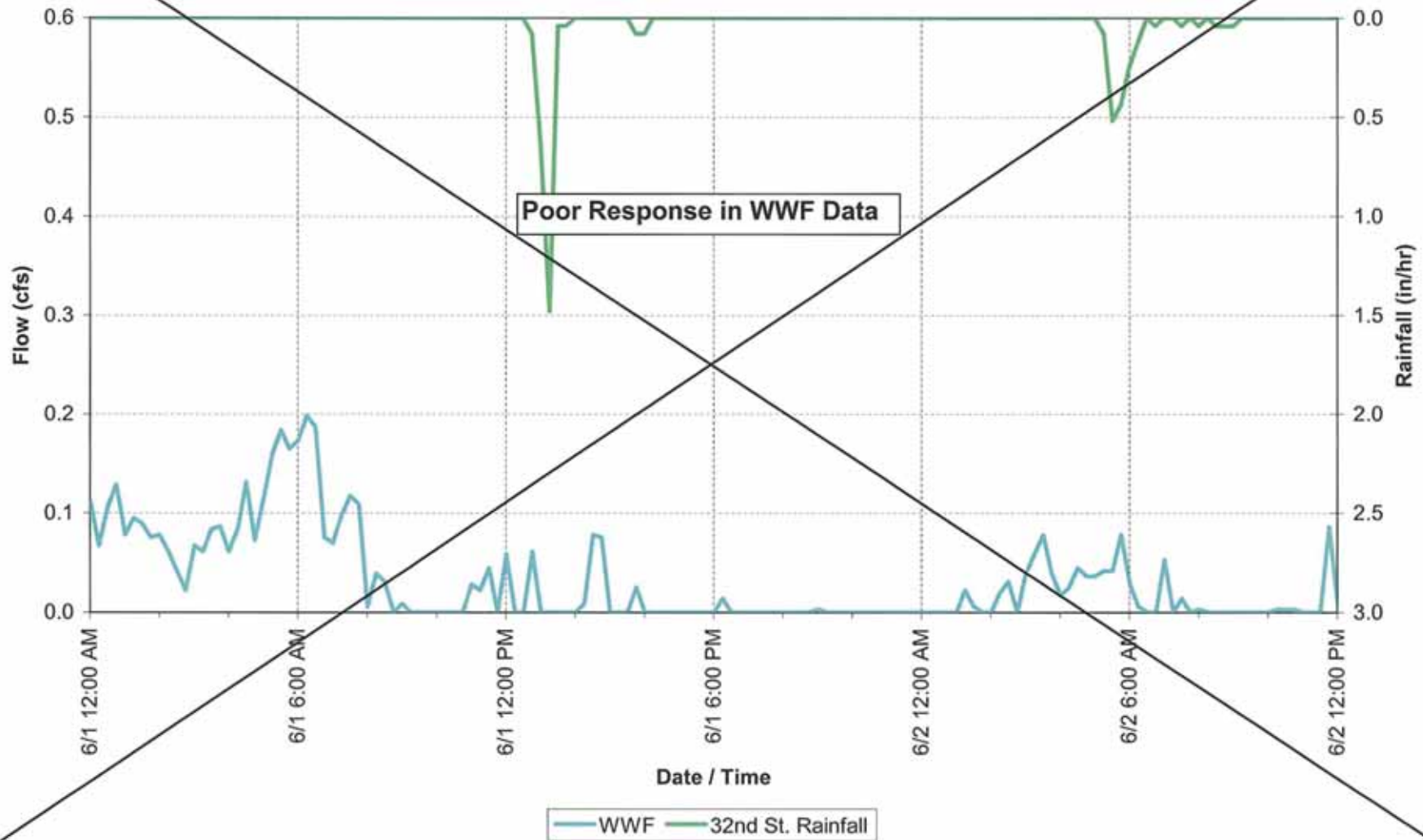
W32nd Ave, Meter 5
Event 5: May 30 -31, 2007; Small Depth Storm
WWF Only (DWF Subtracted Out)



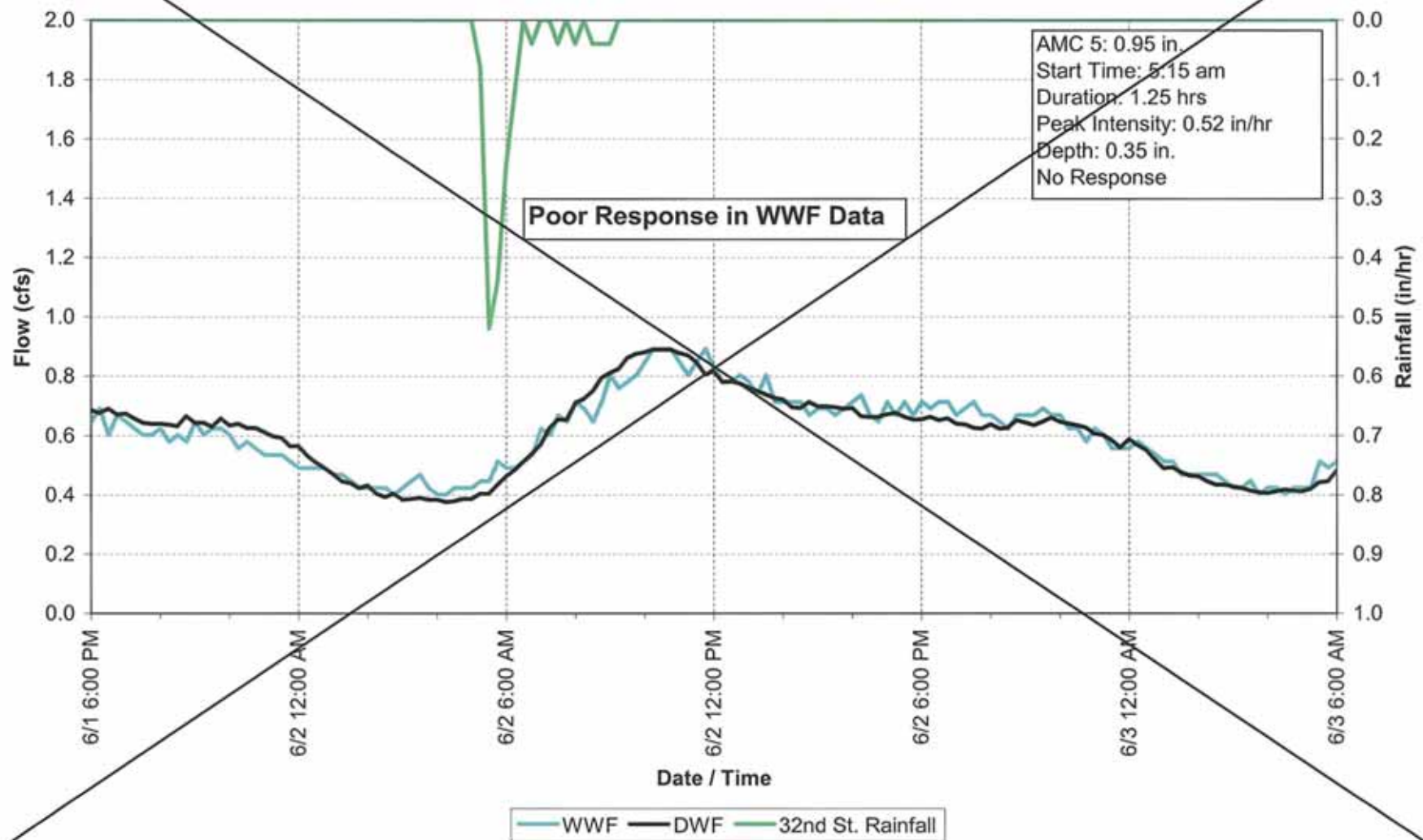
W32nd Ave, Meter 5
Event 6: June 1, 2007; Short-Duration, High Intensity Storm
WWF and DWF Graph



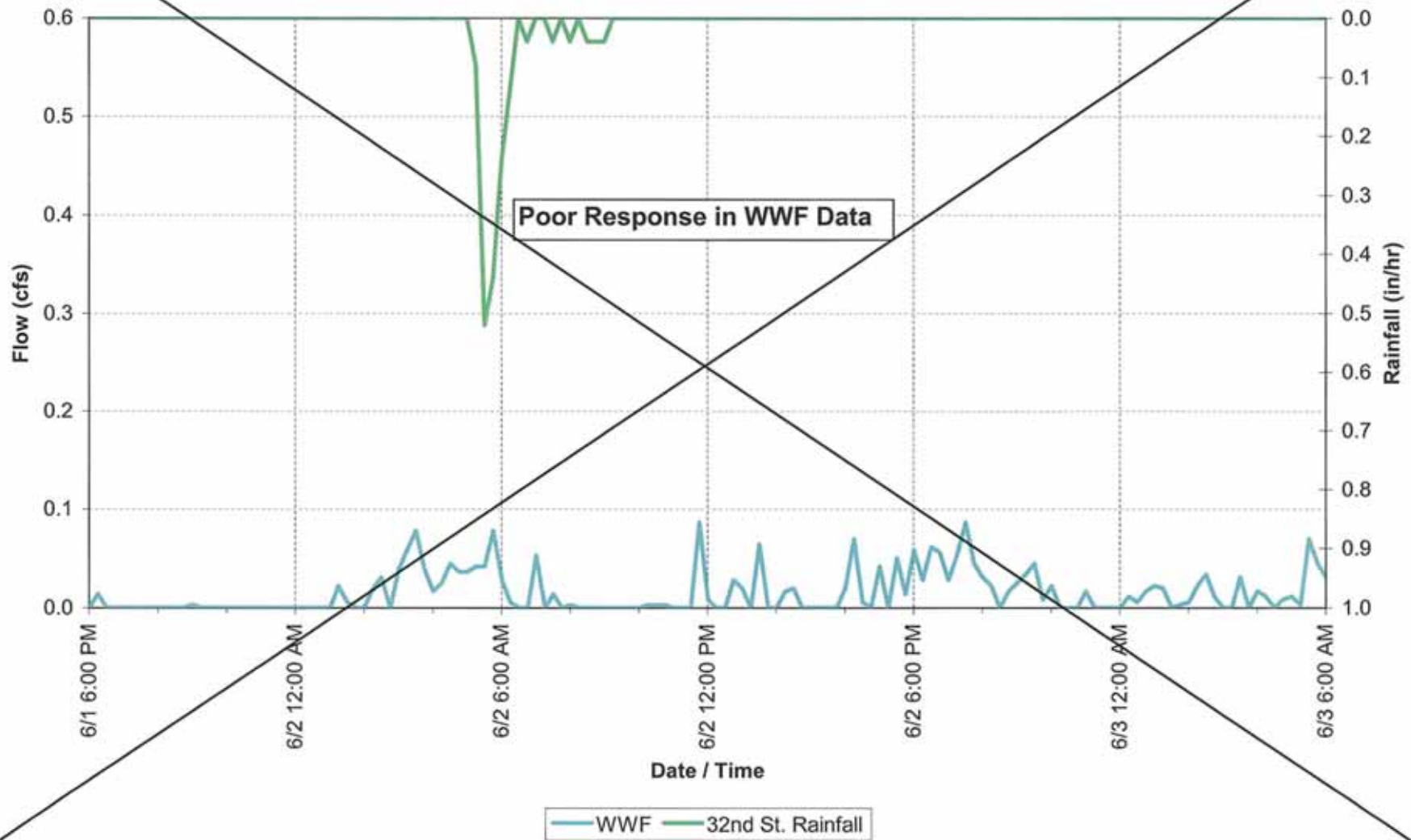
W32nd Ave, Meter 5
Event 6: June 1, 2007; Short-Duration, High Intensity Storm
WWF Only (DWF Subtracted Out)



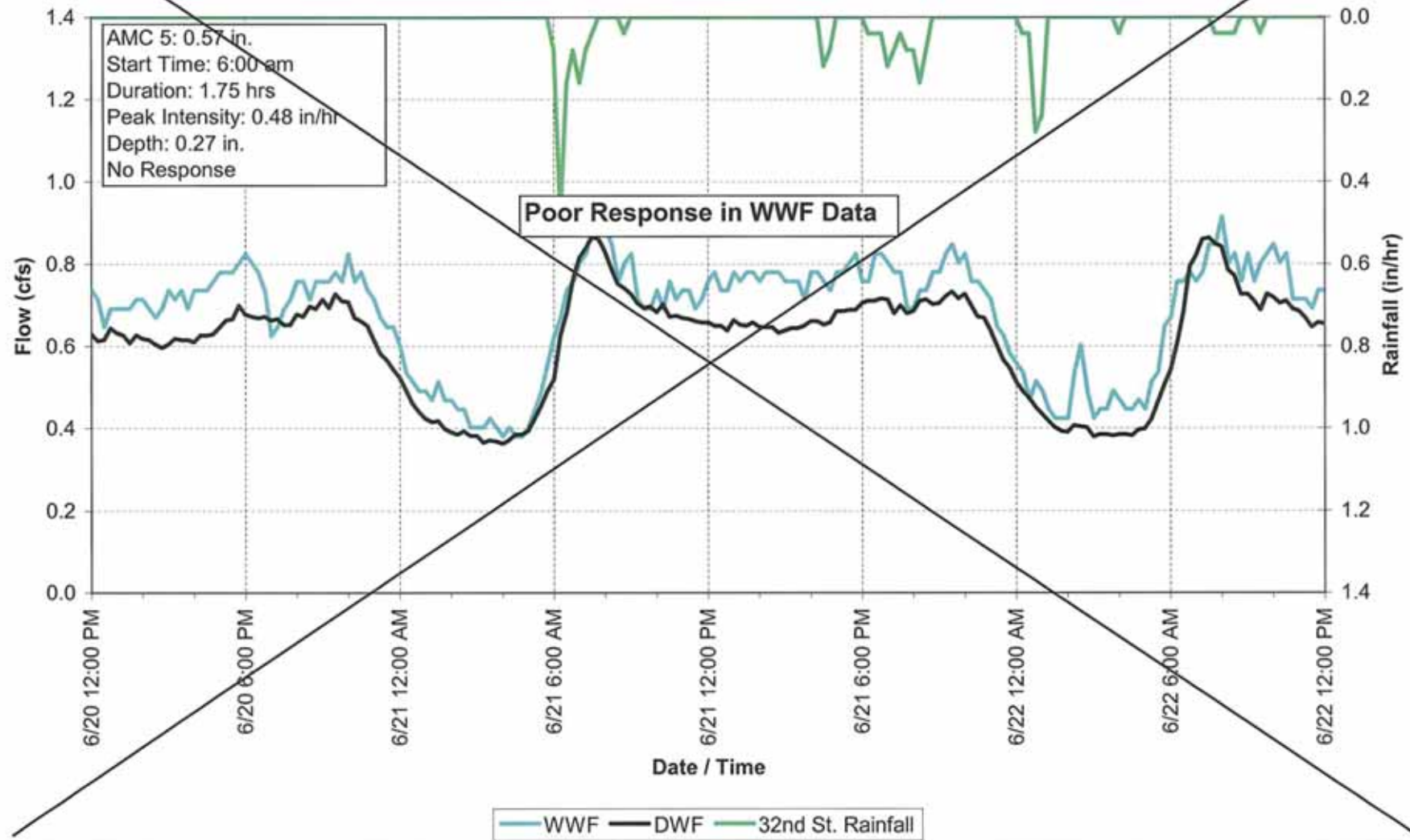
W32nd Ave, Meter 5
Event 7: June 2, 2007; Short-Duration, High Intensity Storm
WWF and DWF Graph



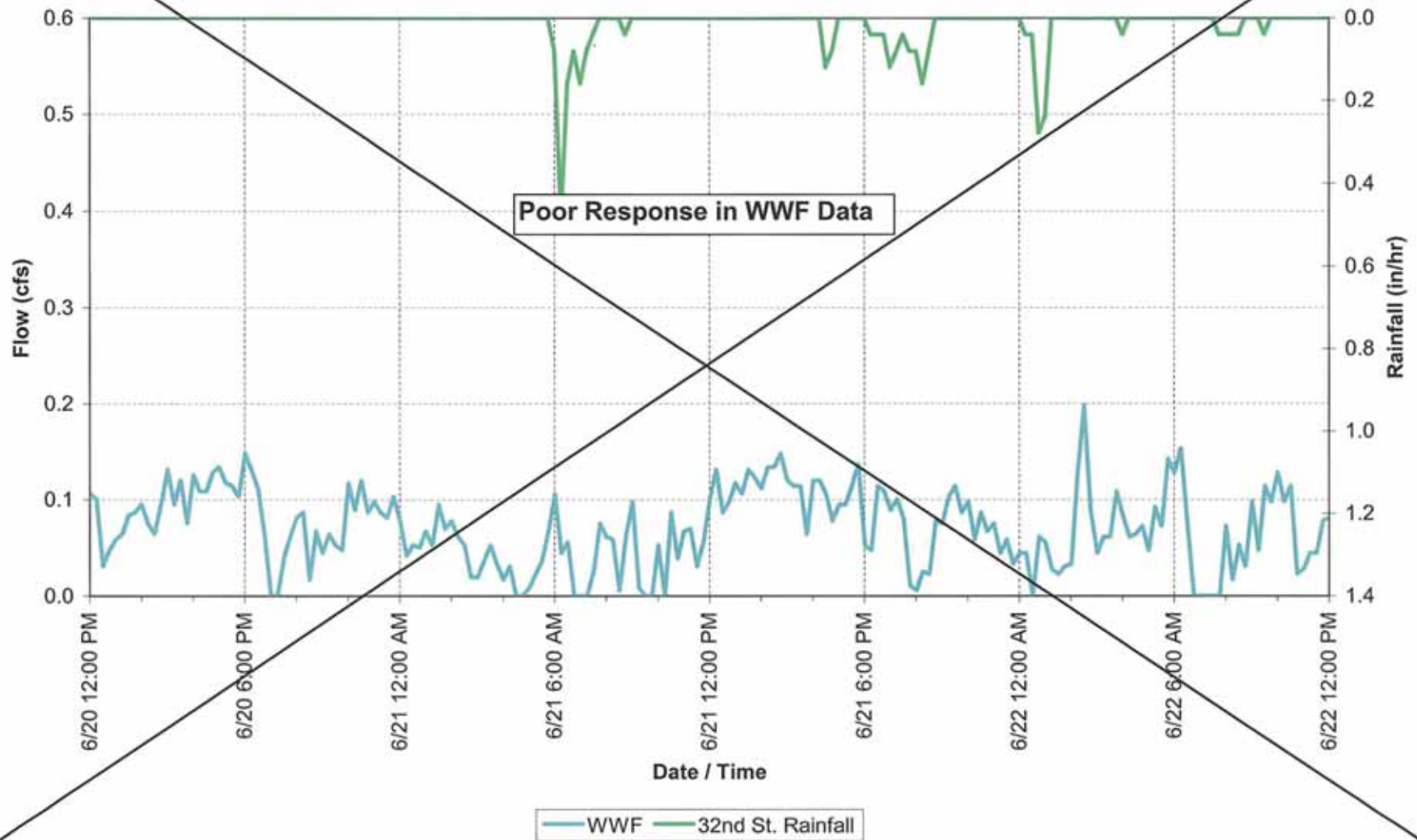
W32nd Ave, Meter 5
Event 7: June 2, 2007; Short-Duration, High Intensity Storm
WWF Only (DWF Subtracted Out)



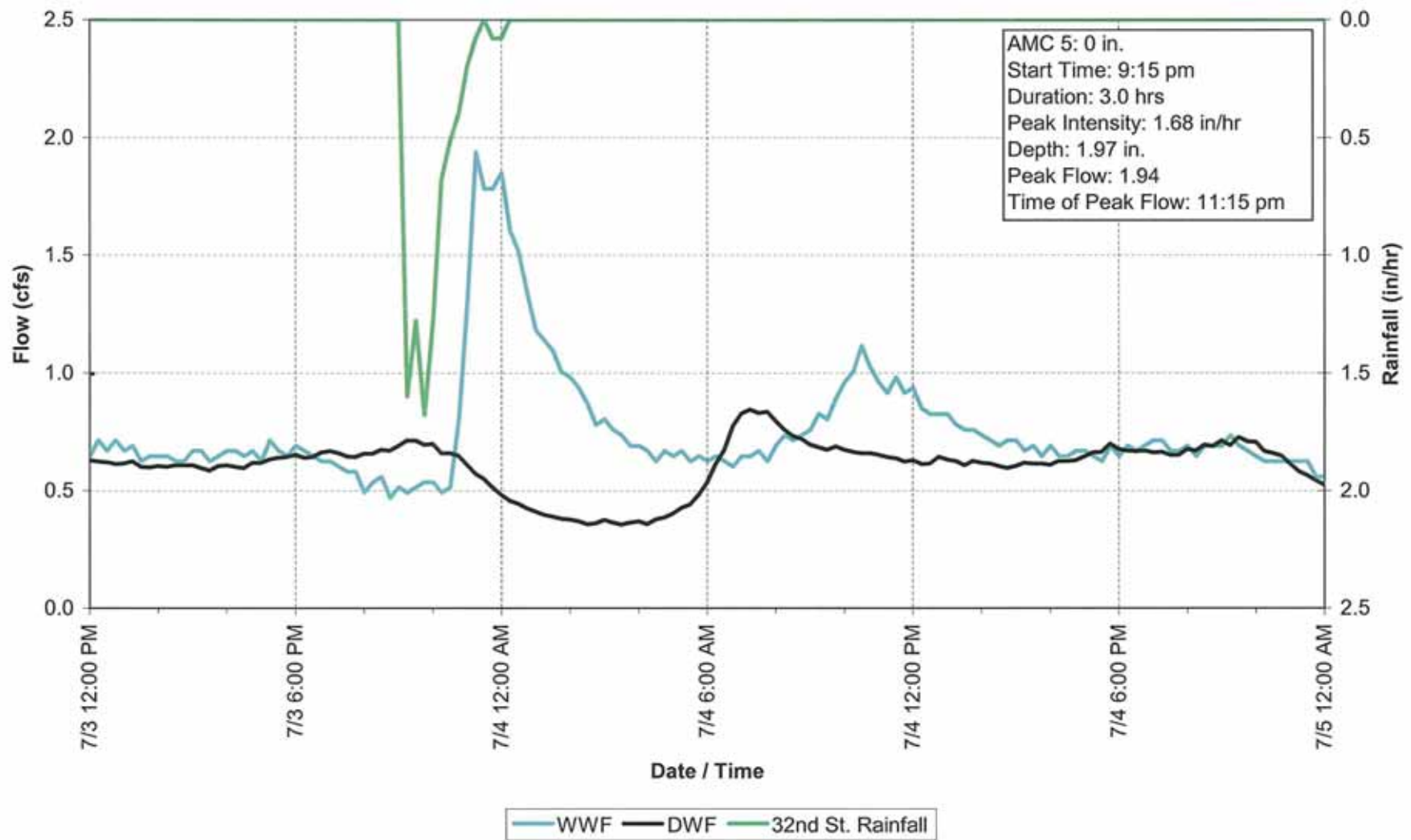
W32nd Ave, Meter 5
Event 8: June 21, 2007; Small Depth Storm
WWF and DWF Graph



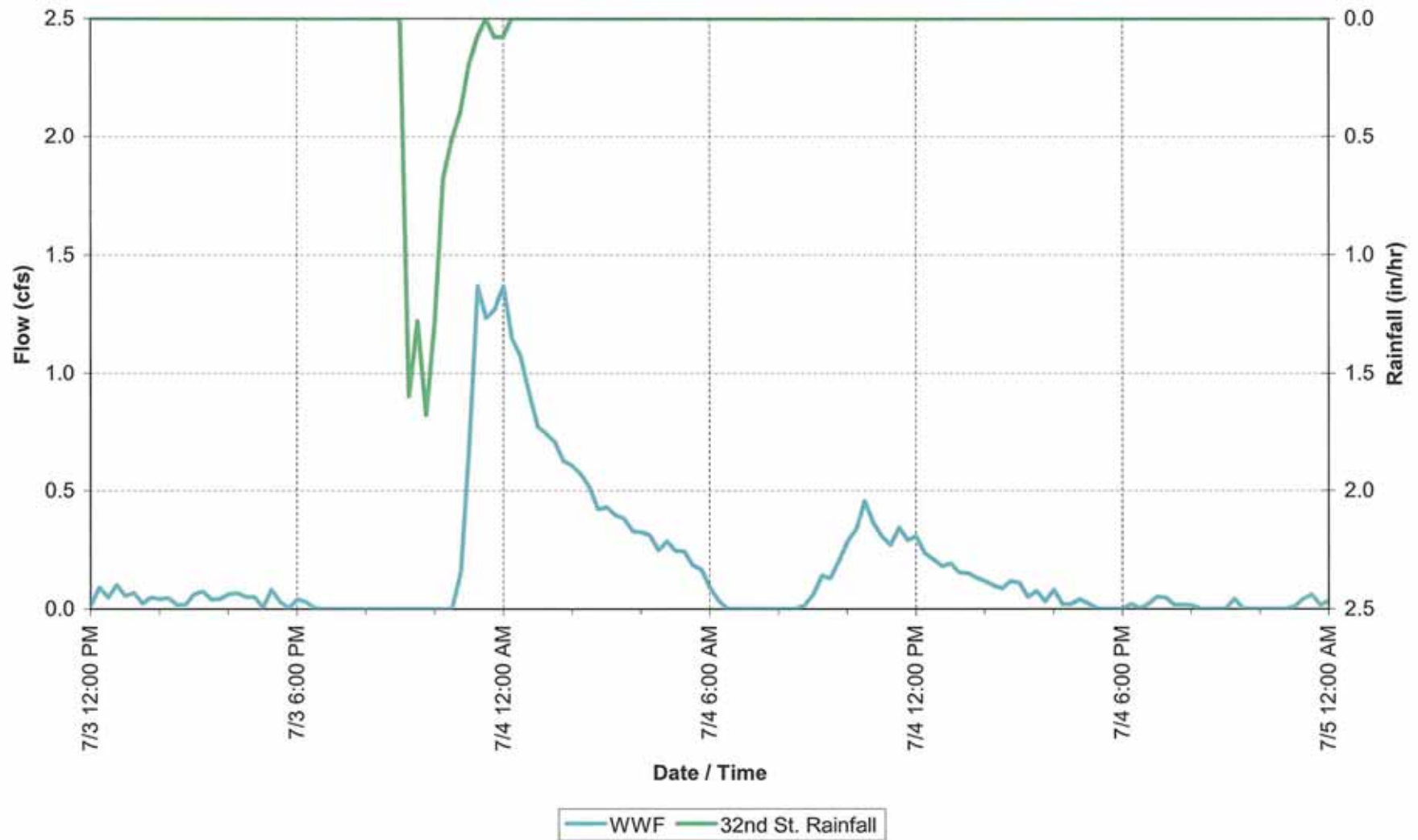
W32nd Ave, Meter 5
Event 8: June 21, 2007; Small Depth Storm
WWF Only (DWF Subtracted Out)



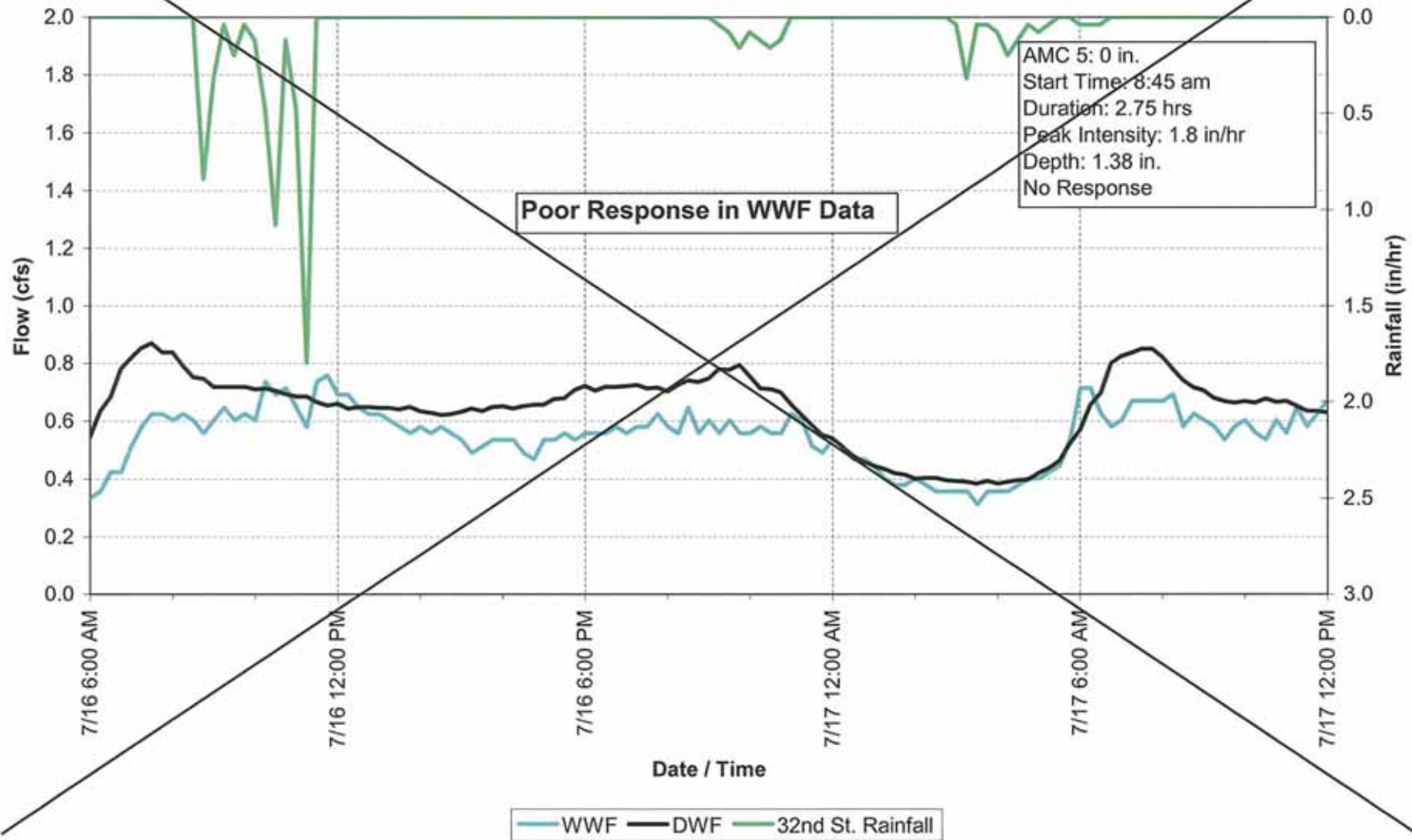
W32nd Ave, Meter 5
Event 9: July 3, 2007; Short-Duration, High Intensity Storm
WWF and DWF Graph



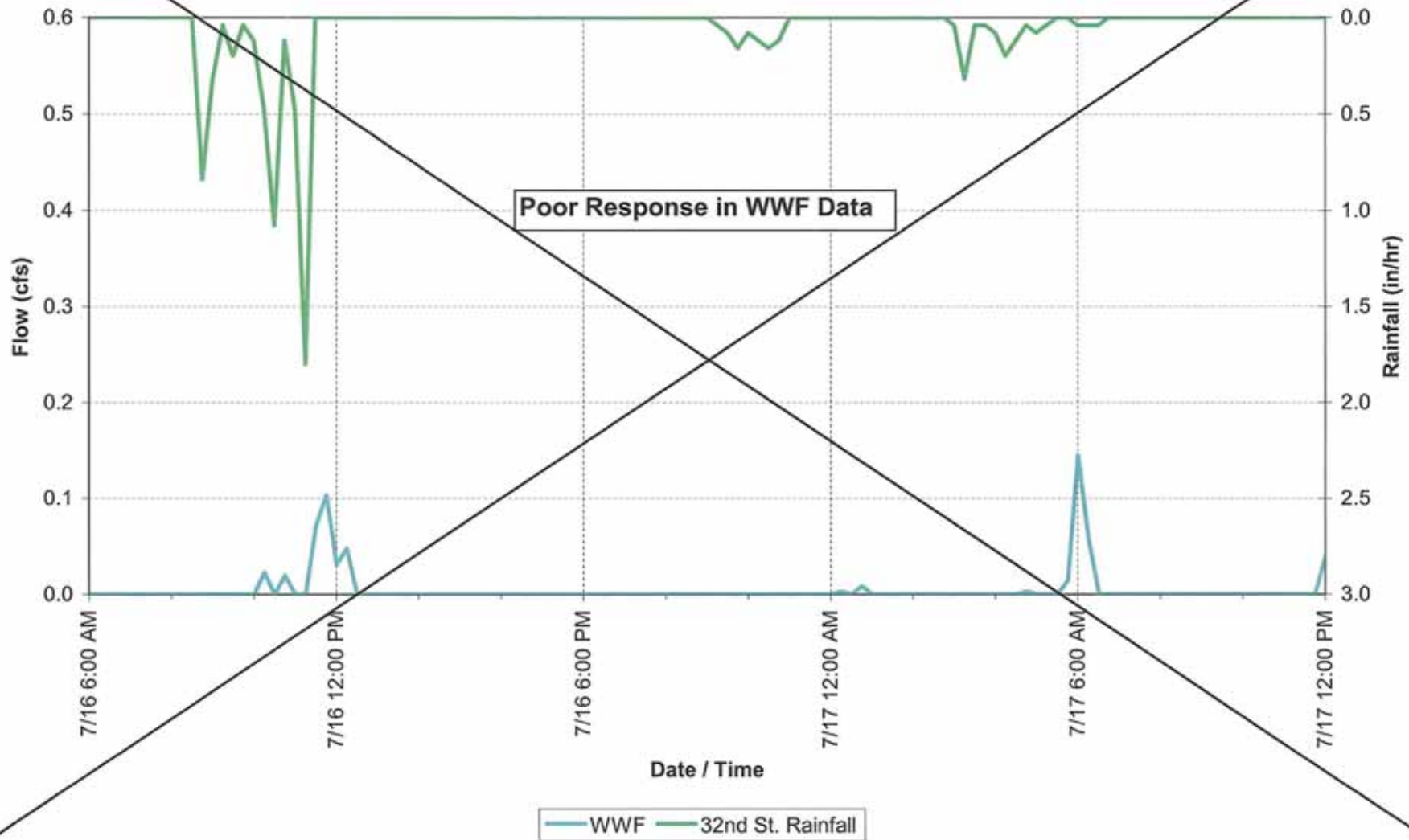
W32nd Ave, Meter 5
Event 9: July 3, 2007; Short-Duration, High Intensity Storm
WWF Only (DWF Subtracted Out)



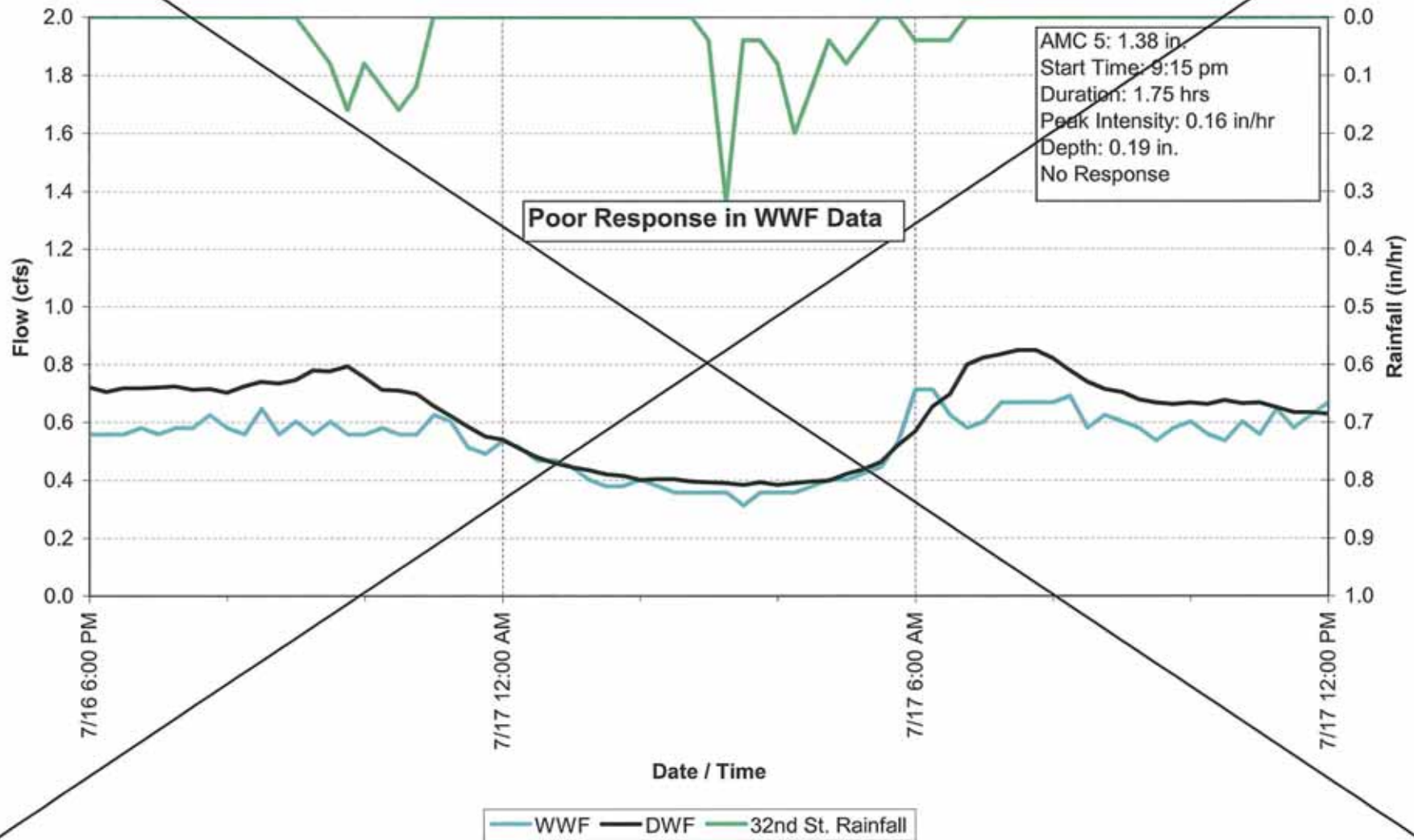
W32nd Ave, Meter 5
Event 10: July 16, 2007; Short-Duration, High Intensity Storm
WWF and DWF Graph



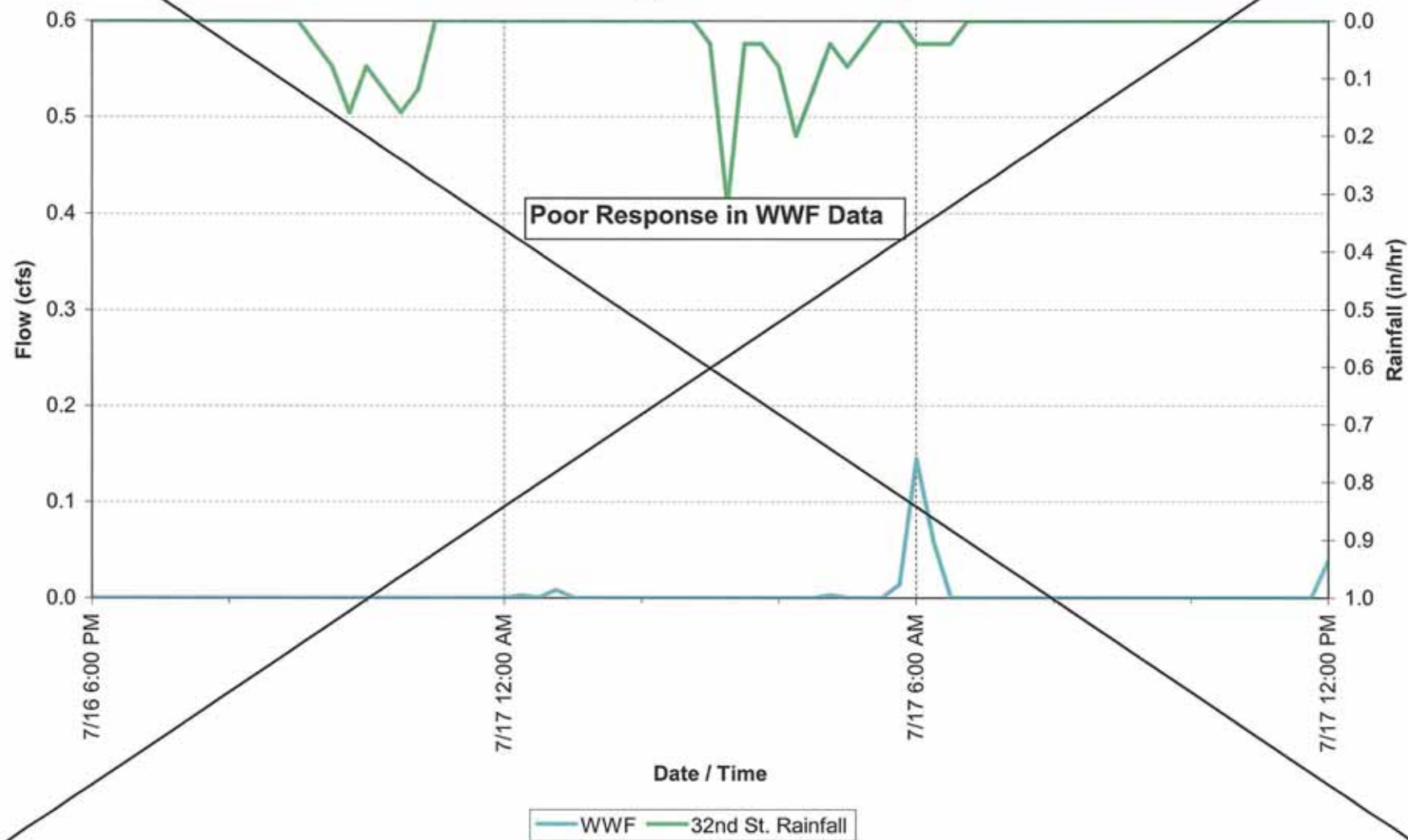
W32nd Ave, Meter 5
Event 10: July 16, 2007; Short-Duration, High Intensity Storm
WWF Only (DWF Subtracted Out)



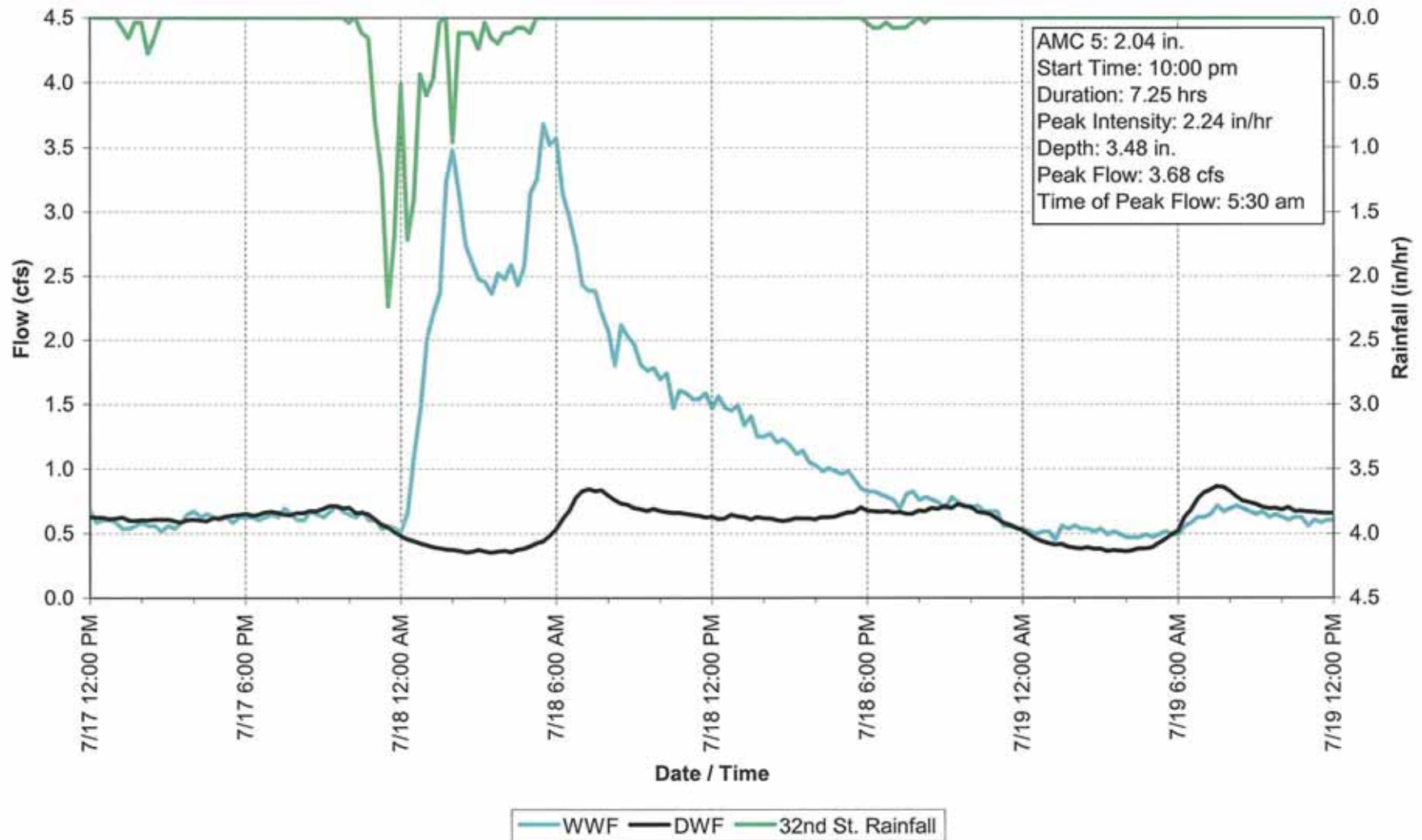
W32nd Ave, Meter 5
Event 11: July 16, 2007; Small Depth Storm
WWF and DWF Graph



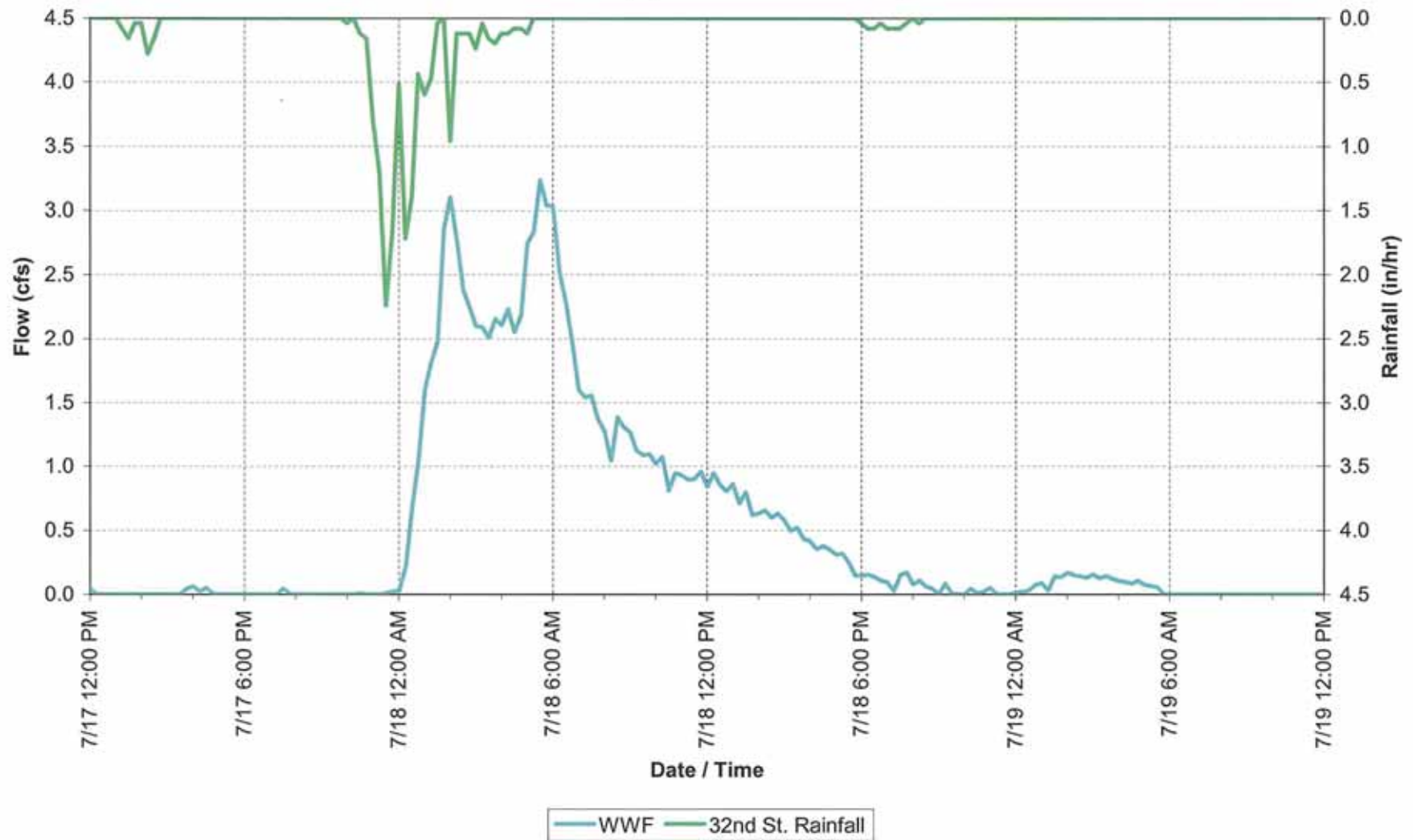
W32nd Ave, Meter 5
Event 11: July 16, 2007; Small Depth Storm
WWF Only (DWF Subtracted Out)



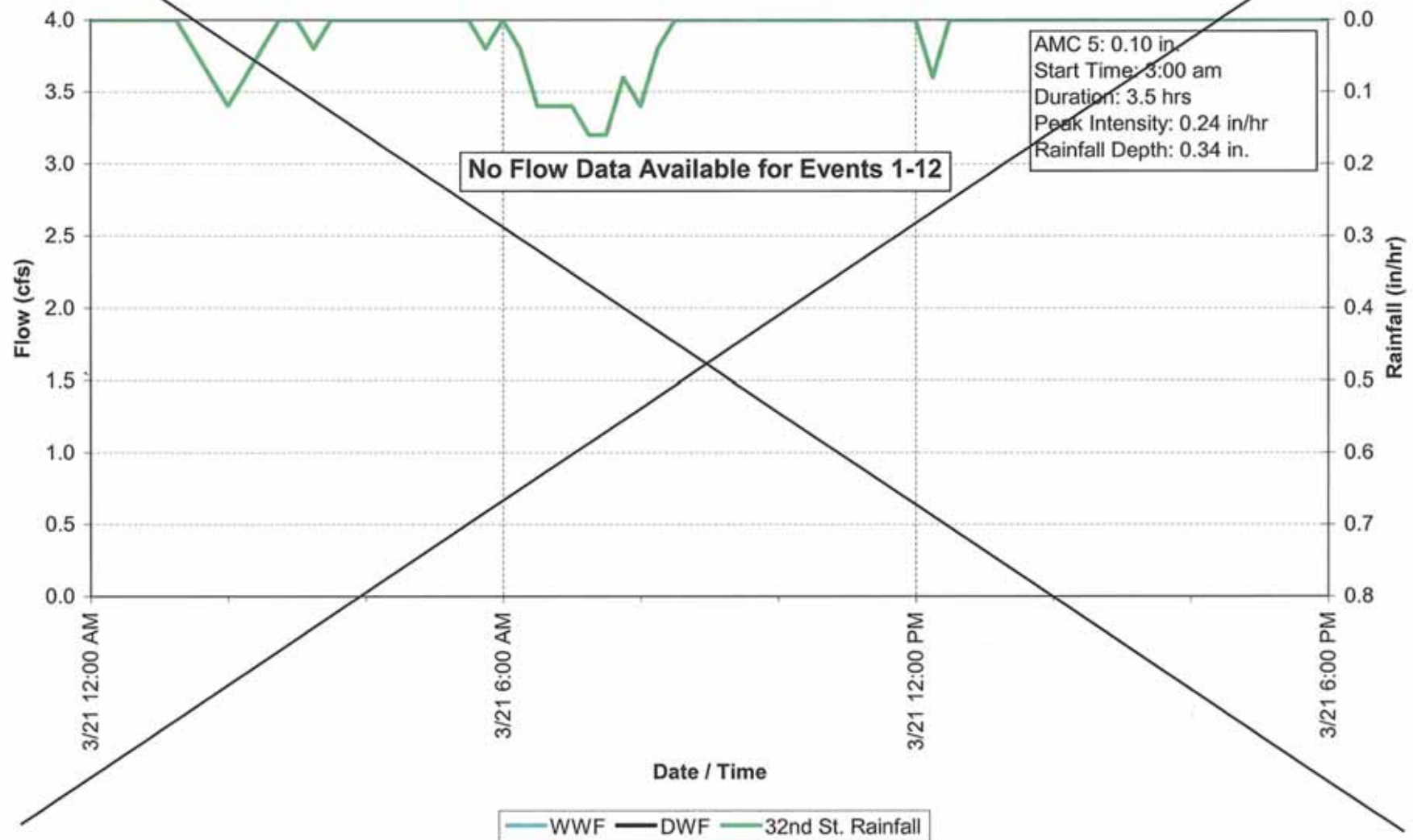
W32nd Ave, Meter 5
Event 12: July 17 - 18, 2007; Long-Duration, High Intensity Storm
WWF and DWF Graph



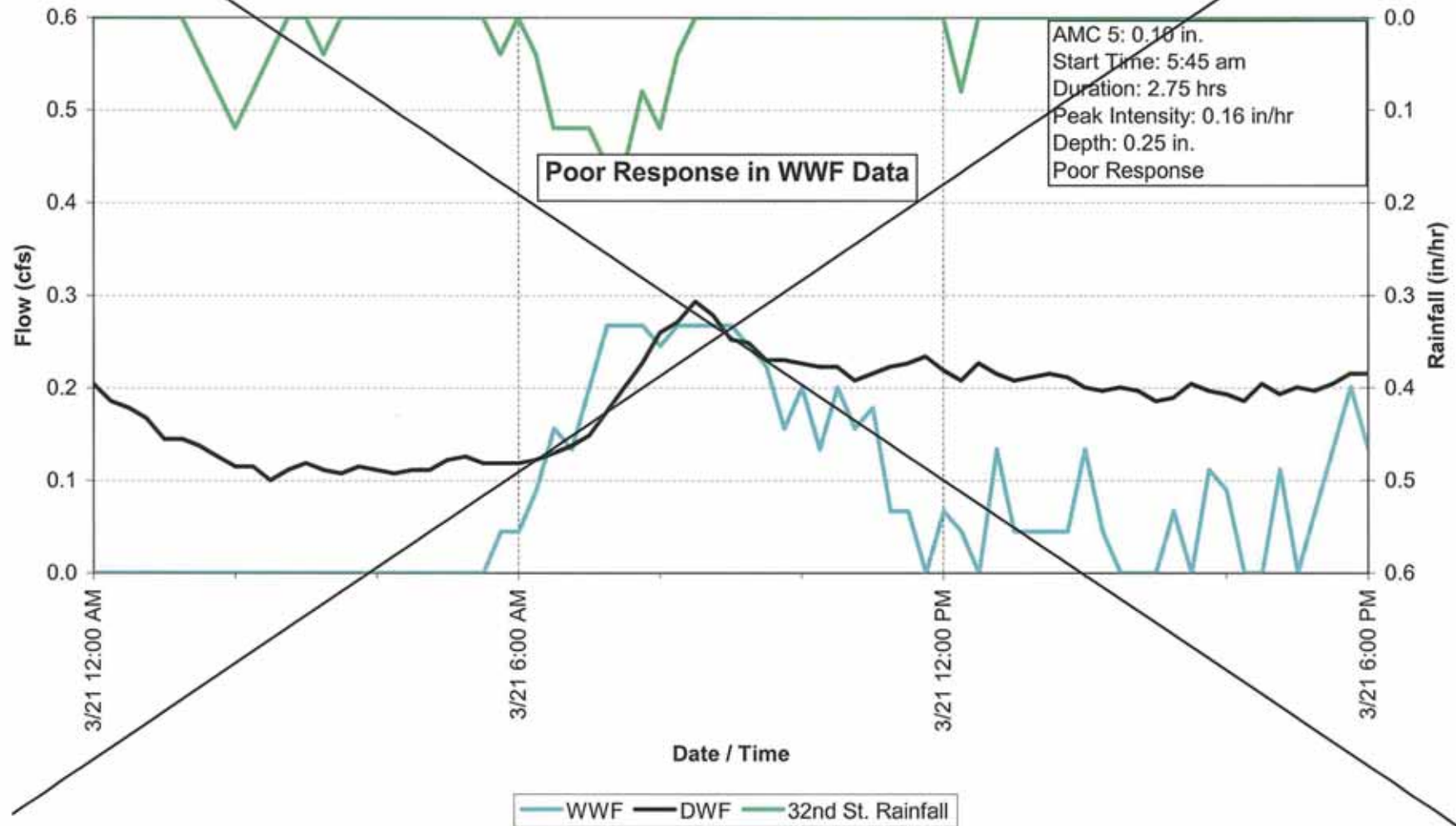
W32nd Ave, Meter 5
Event 12: July 17 - 18, 2007; Long-Duration, High Intensity Storm
WWF Only (DWF Subtracted Out)



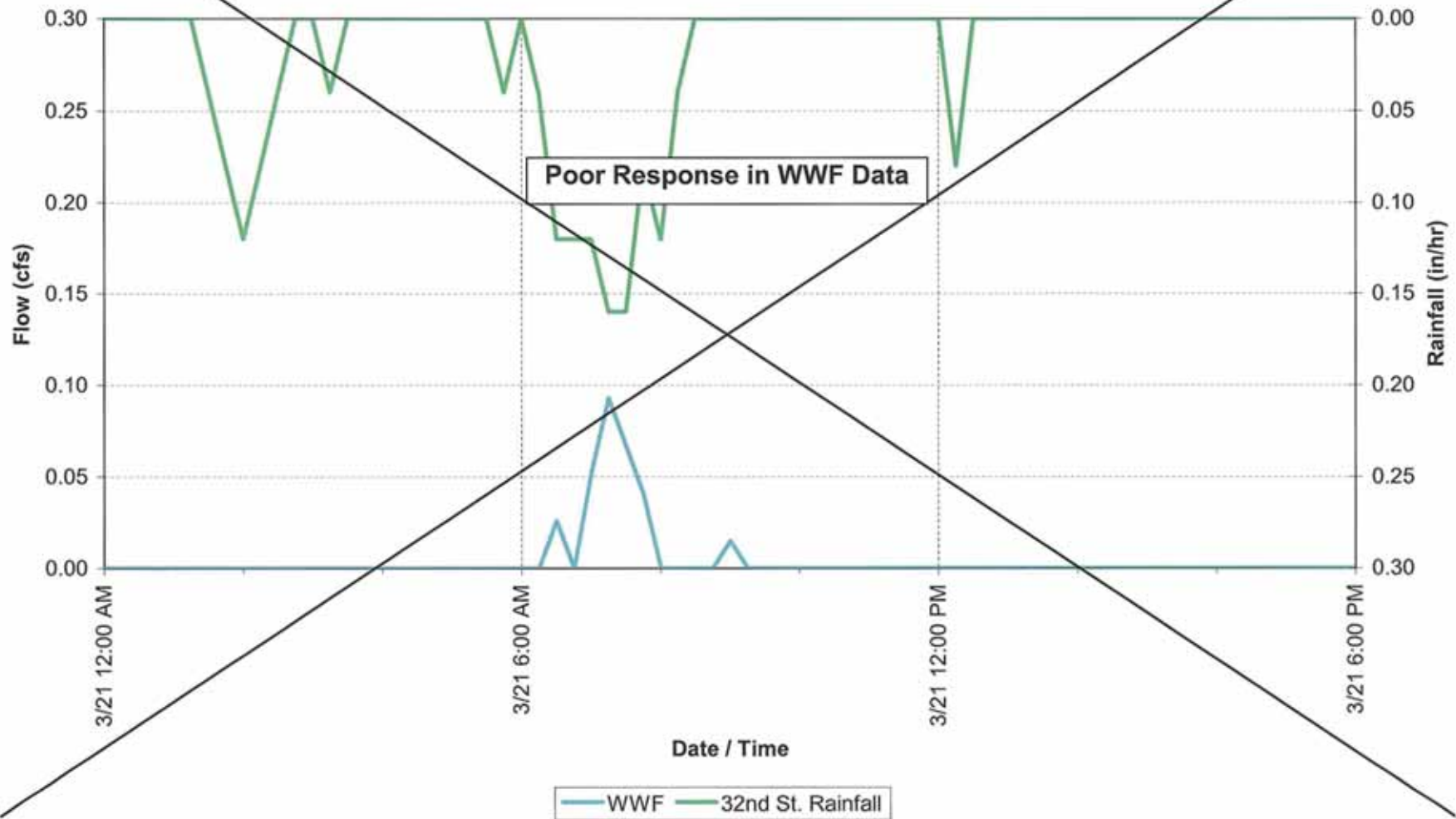
Peru, Meter 6
Event 1: March 21, 2007; Small Depth Storm
WWF and DWF Graph



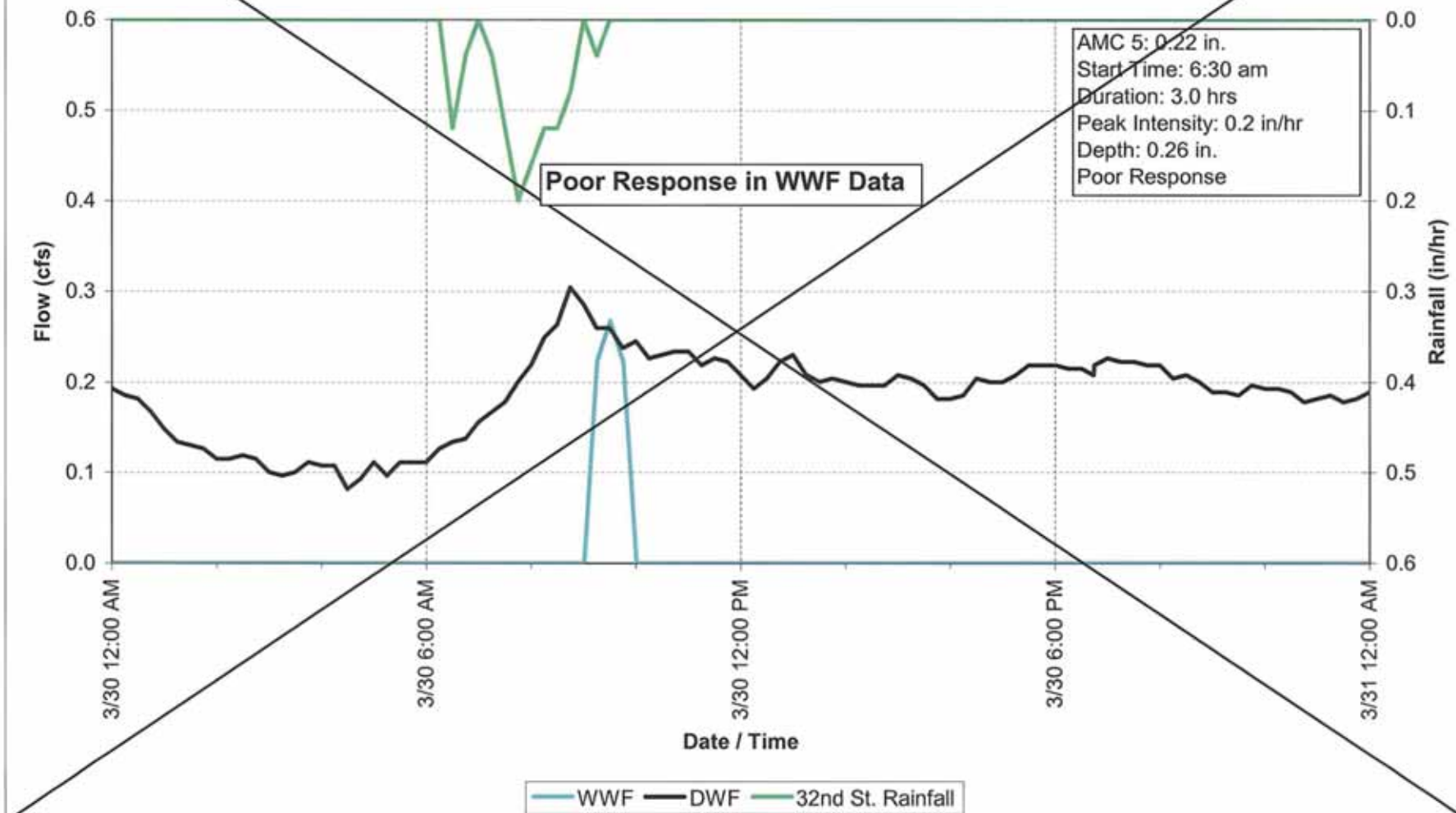
Kaufmann, Meter 7
Event 1: March 21, 2007; Small Depth Storm
WWF and DWF Graph



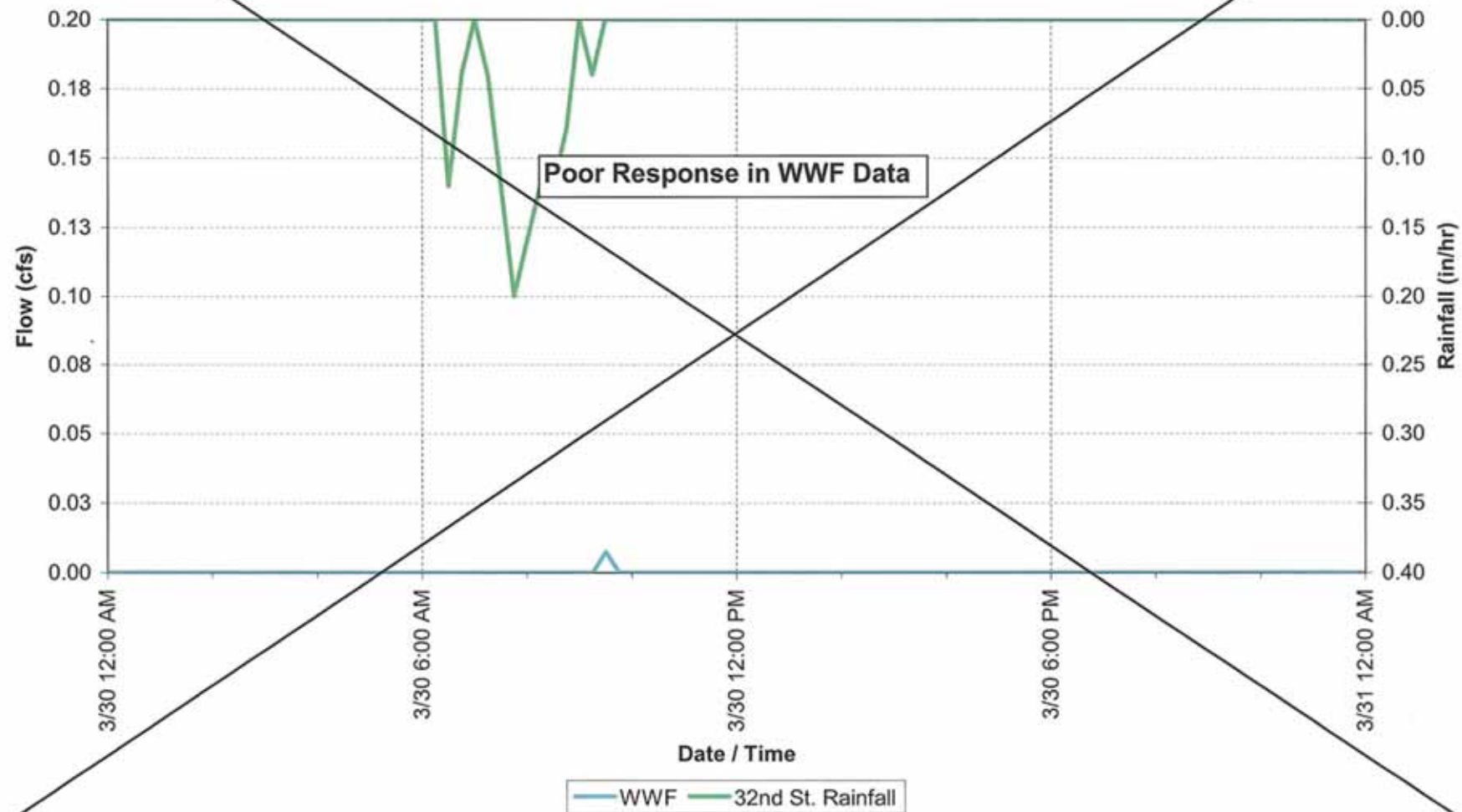
Kaufmann, Meter 7
Event 1: March 21, 2007; Small Depth Storm
WWF Only (DWF Subtracted Out)



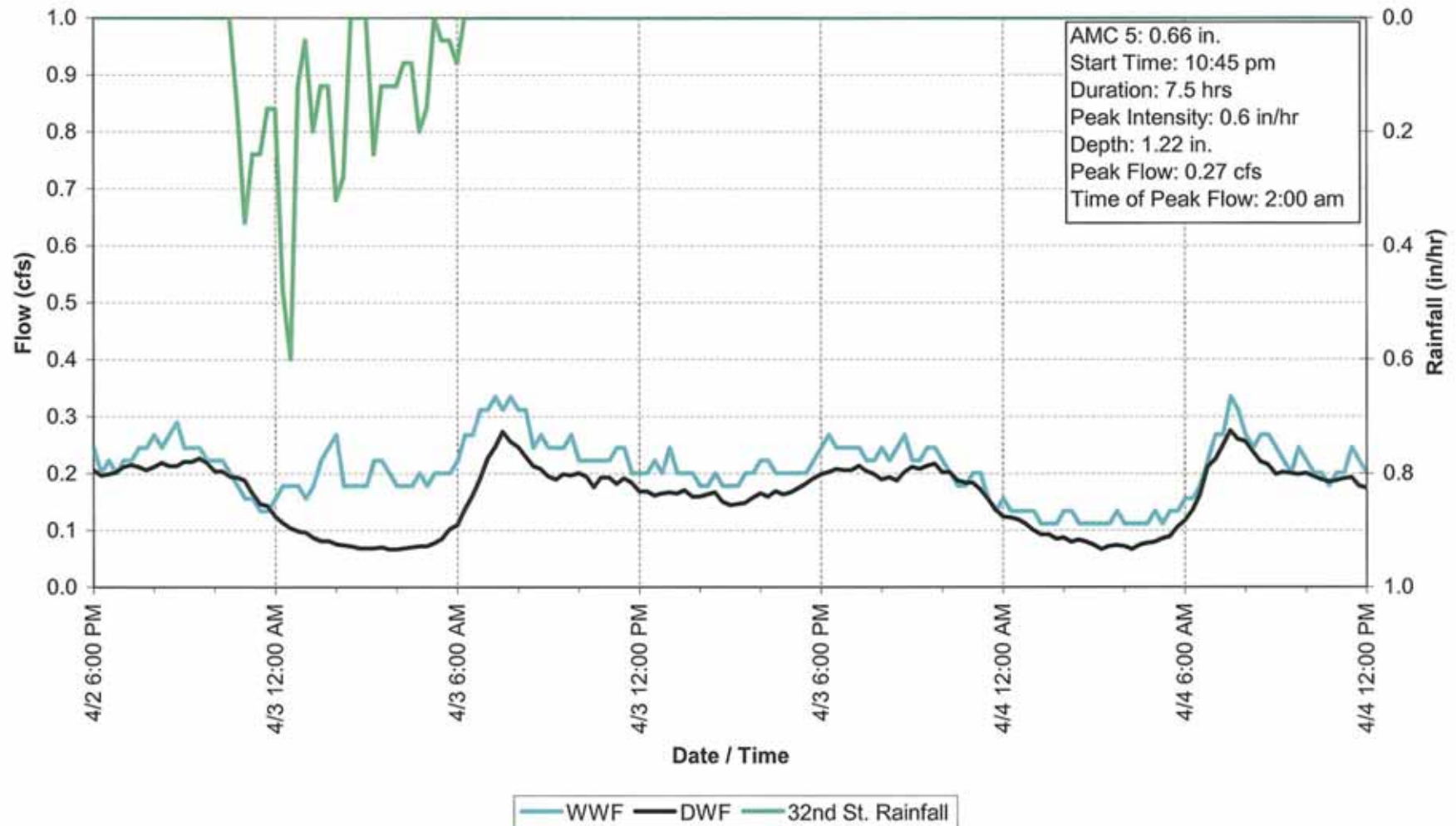
Kaufmann, Meter 7
Event 2: March 30, 2007; Small Depth Storm
WWF and DWF Graph



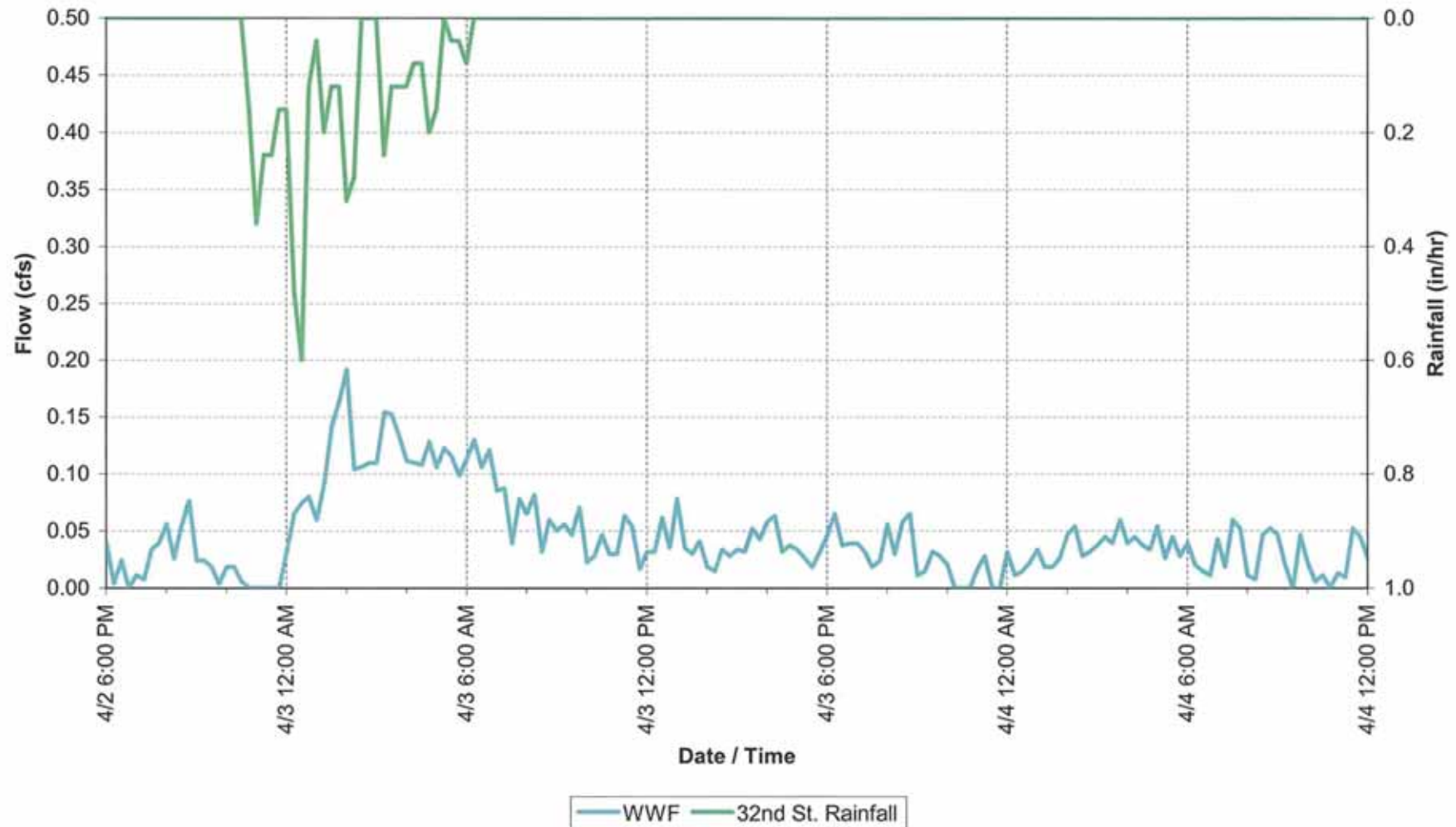
Kaufmann, Meter 7
Event 2: March 30, 2007; Small Depth Storm
WWF Only (DWF Subtracted Out)



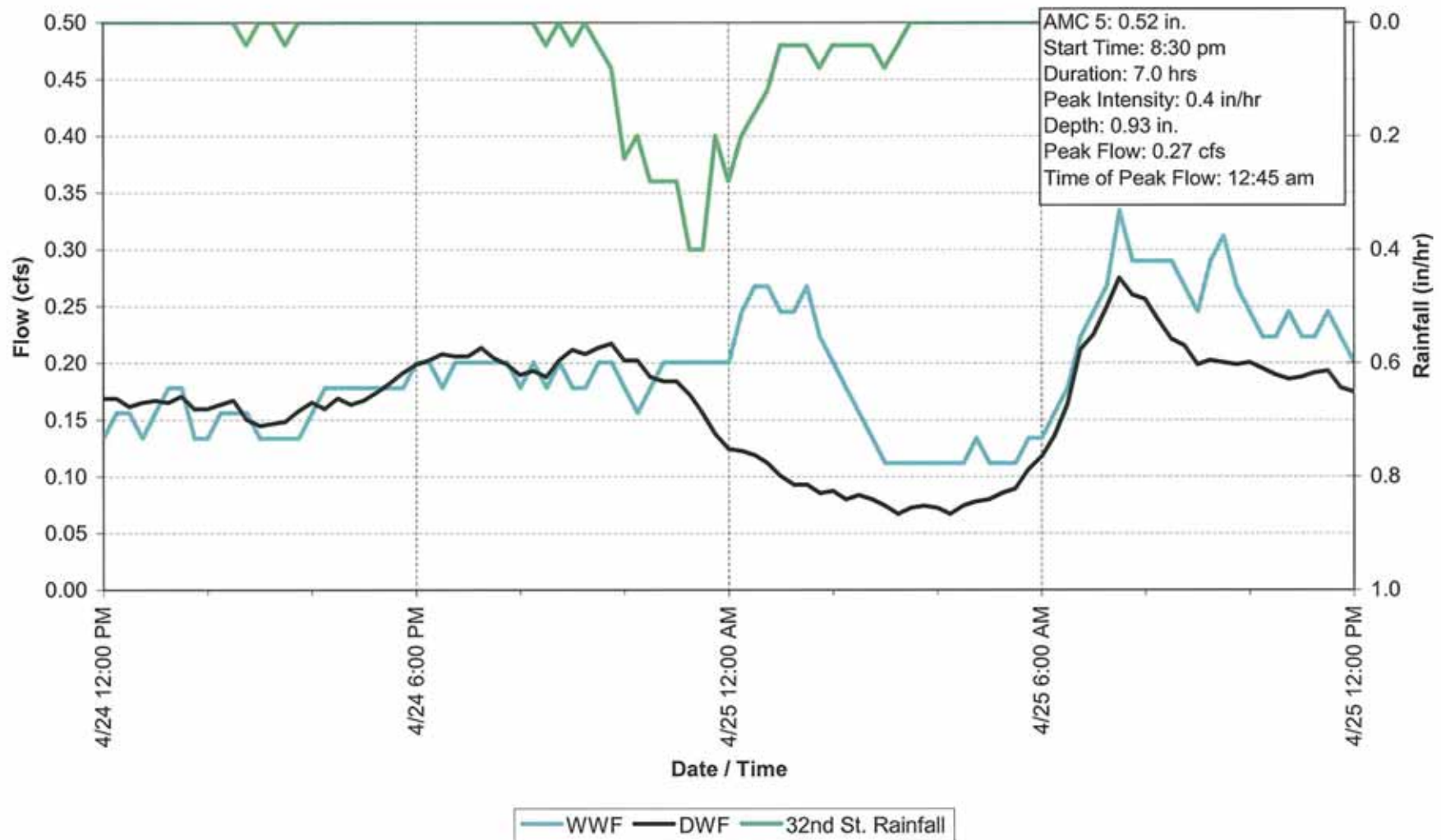
Kaufmann, Meter 7
Event 3: April 3, 2007; Long-Duration, Low Intensity Storm
WWF and DWF Graph



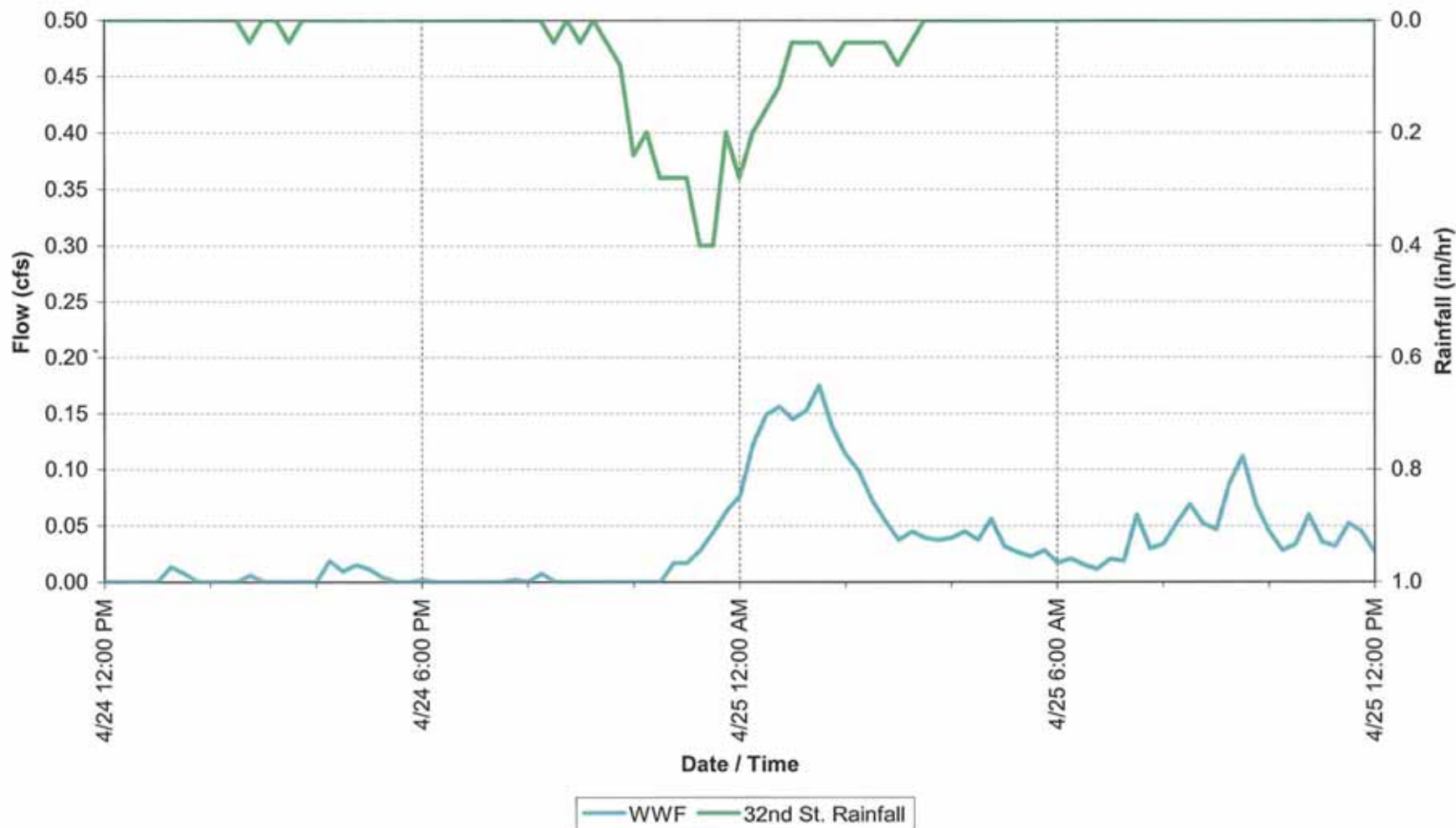
Kaufmann, Meter 7
Event 3: April 3, 2007; Long-Duration, Low Intensity Storm
WWF Only (DWF Subtracted Out)



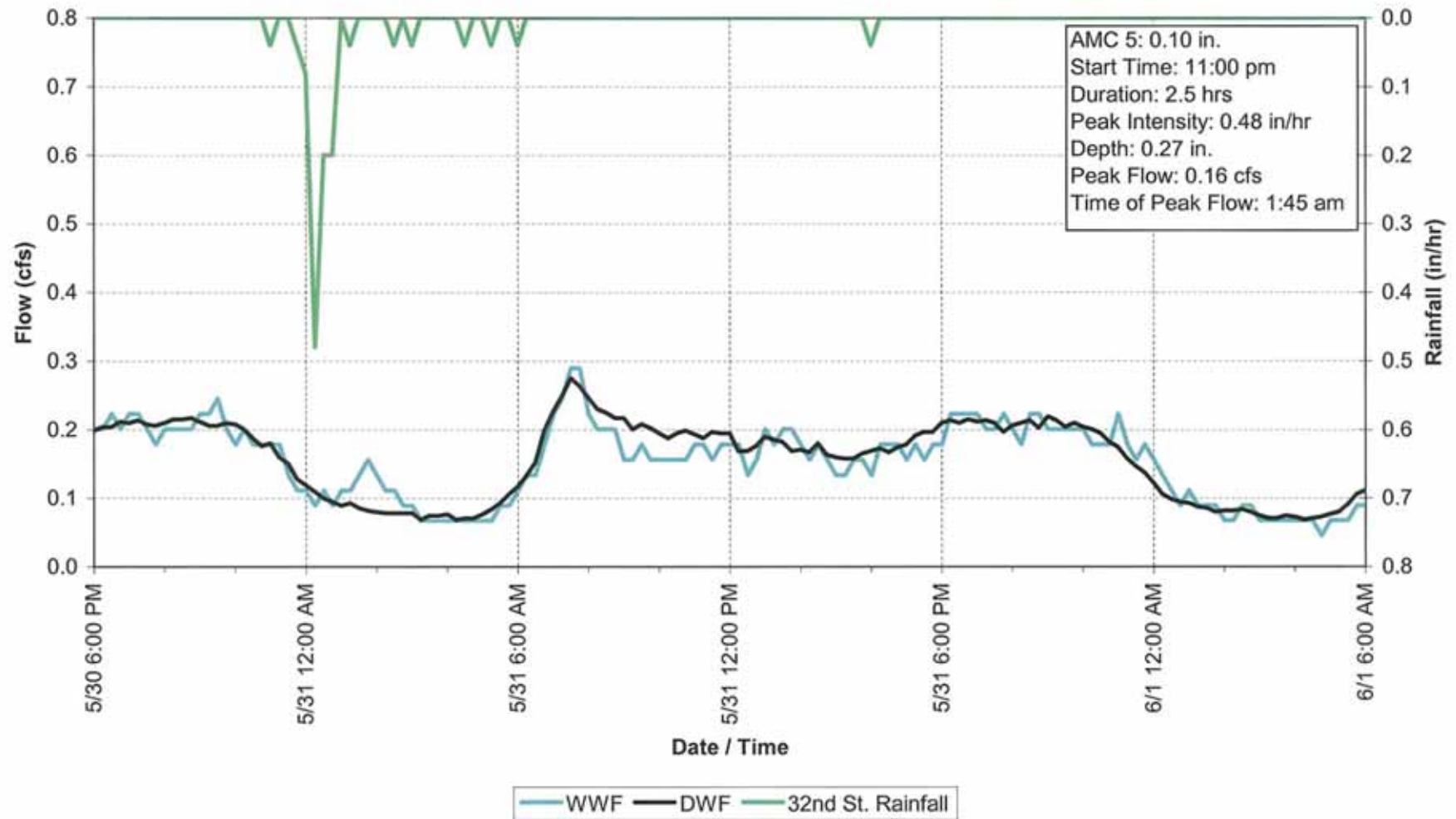
Kaufmann, Meter 7
Event 4: April 24, 2007; Long-Duration, Low Intensity Storm
WWF and DWF Graph



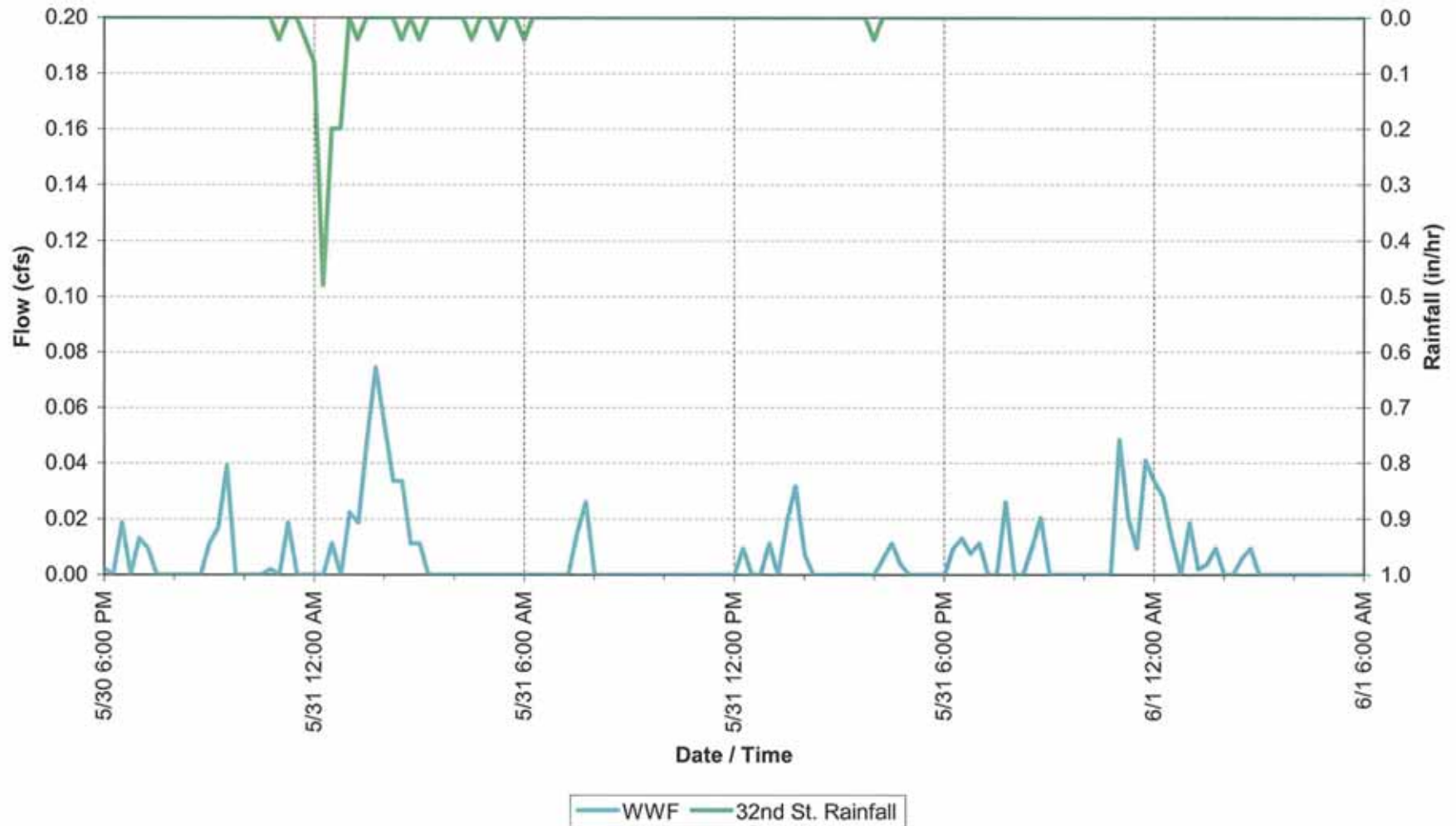
Kaufmann, Meter 7
Event 4: April 24, 2007; Long-Duration, Low Intensity Storm
WWF Only (DWF Subtracted Out)



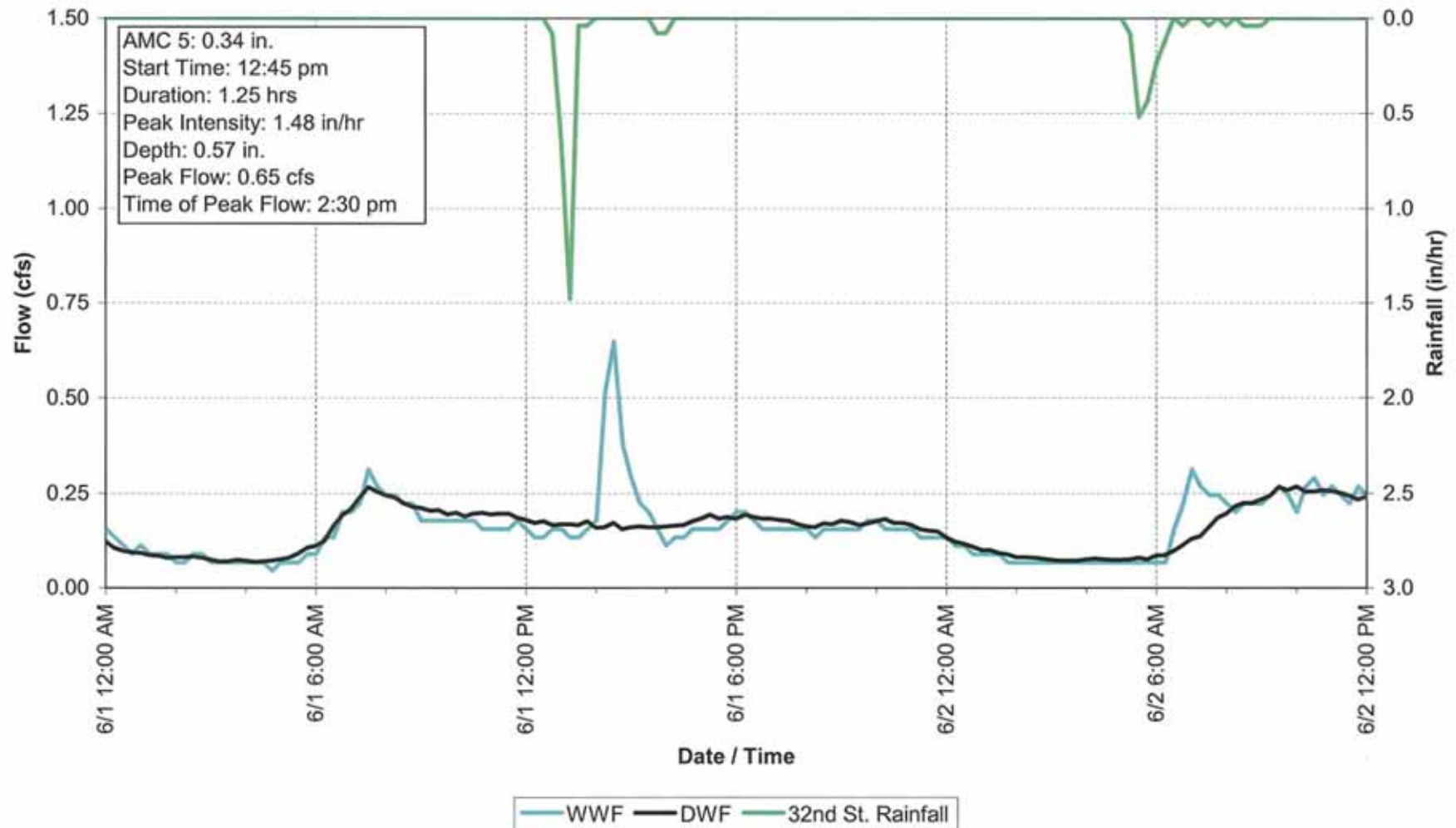
Kaufmann, Meter 7
Event 5: May 31, 2007; Small Depth Storm
WWF and DWF Graph



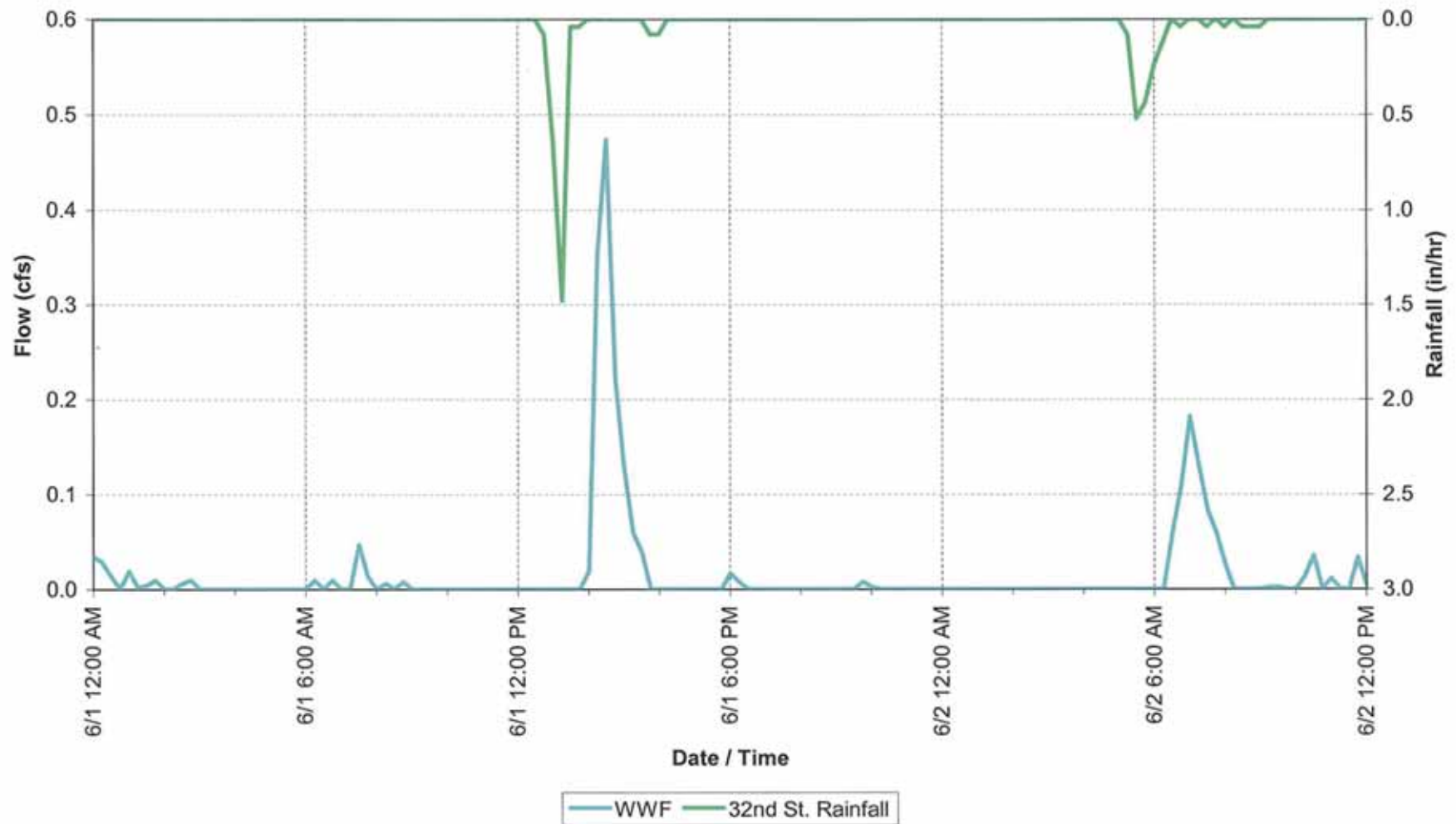
Kaufmann, Meter 7
Event 5: May 31, 2007; Small Depth Storm
WWF Only (DWF Subtracted Out)



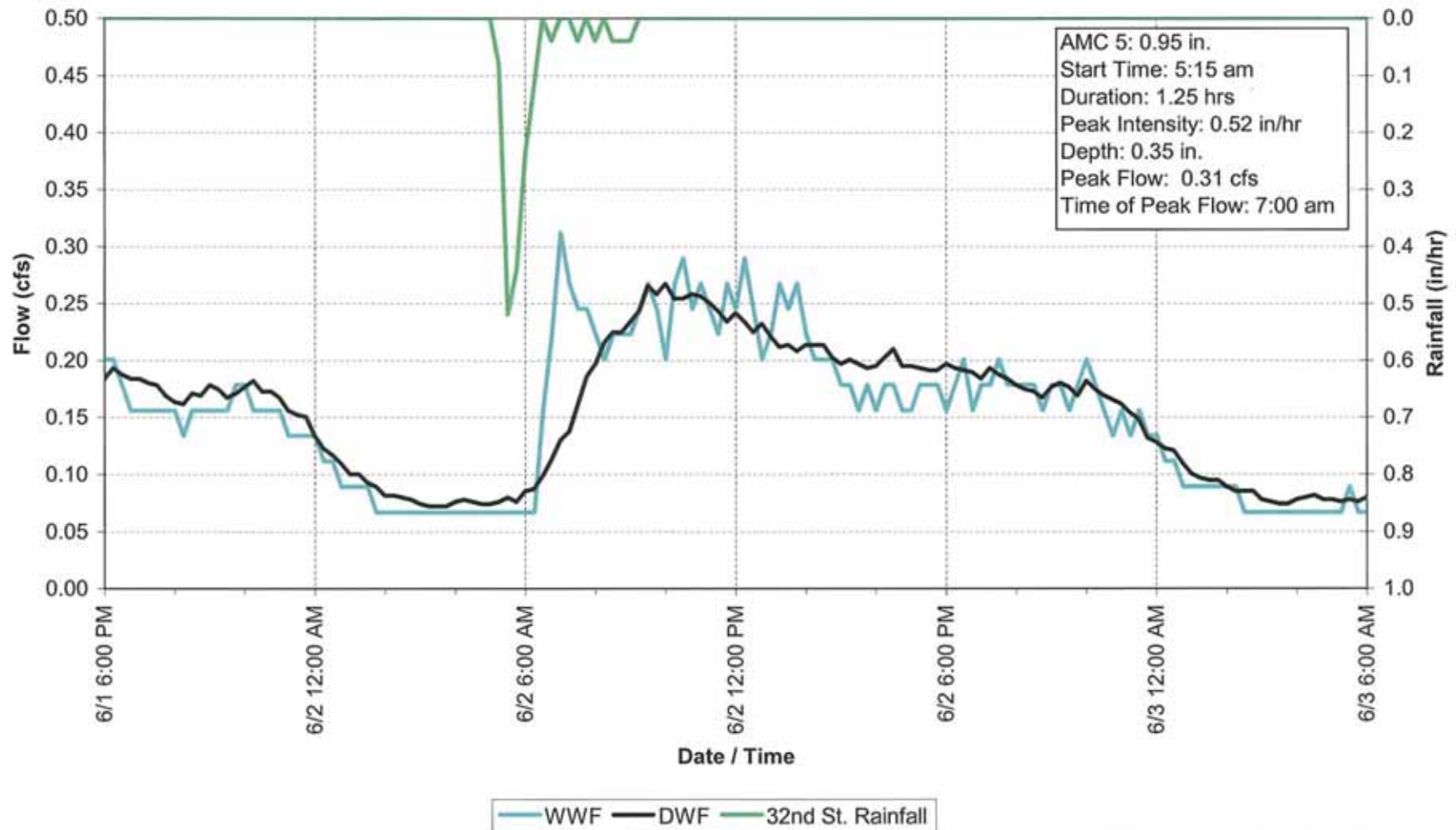
Kaufmann, Meter 7
Event 6: June 1, 2007; Short-Duration, High Intensity Storm
WWF and DWF Graph



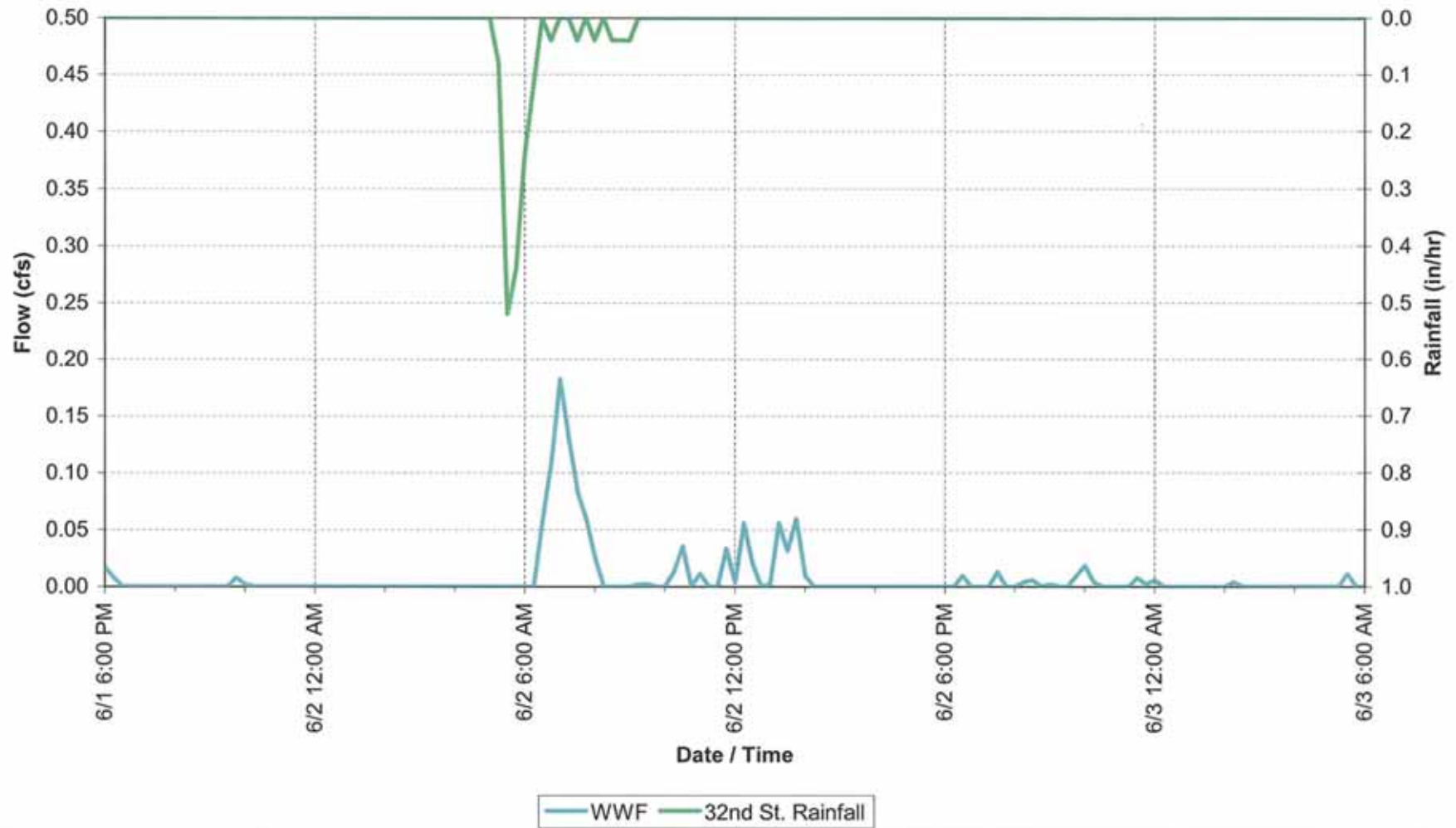
Kaufmann, Meter 7
Event 6: June 1, 2007; Short-Duration, High Intensity Storm
WWF Only (DWF Subtracted Out)



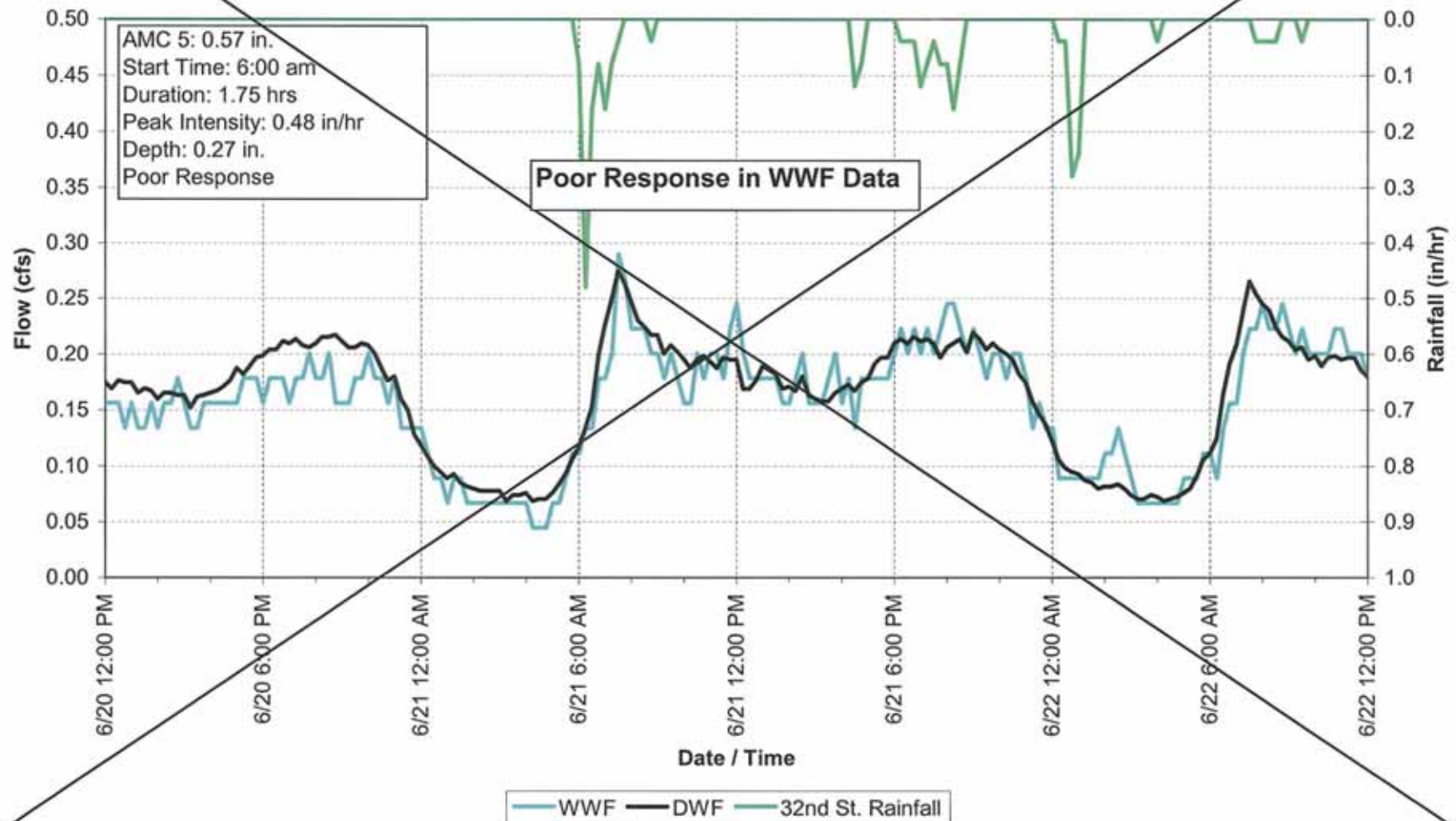
Kaufmann, Meter 7
Event 7: June 2, 2007; Small Depth Storm
WWF and DWF Graph



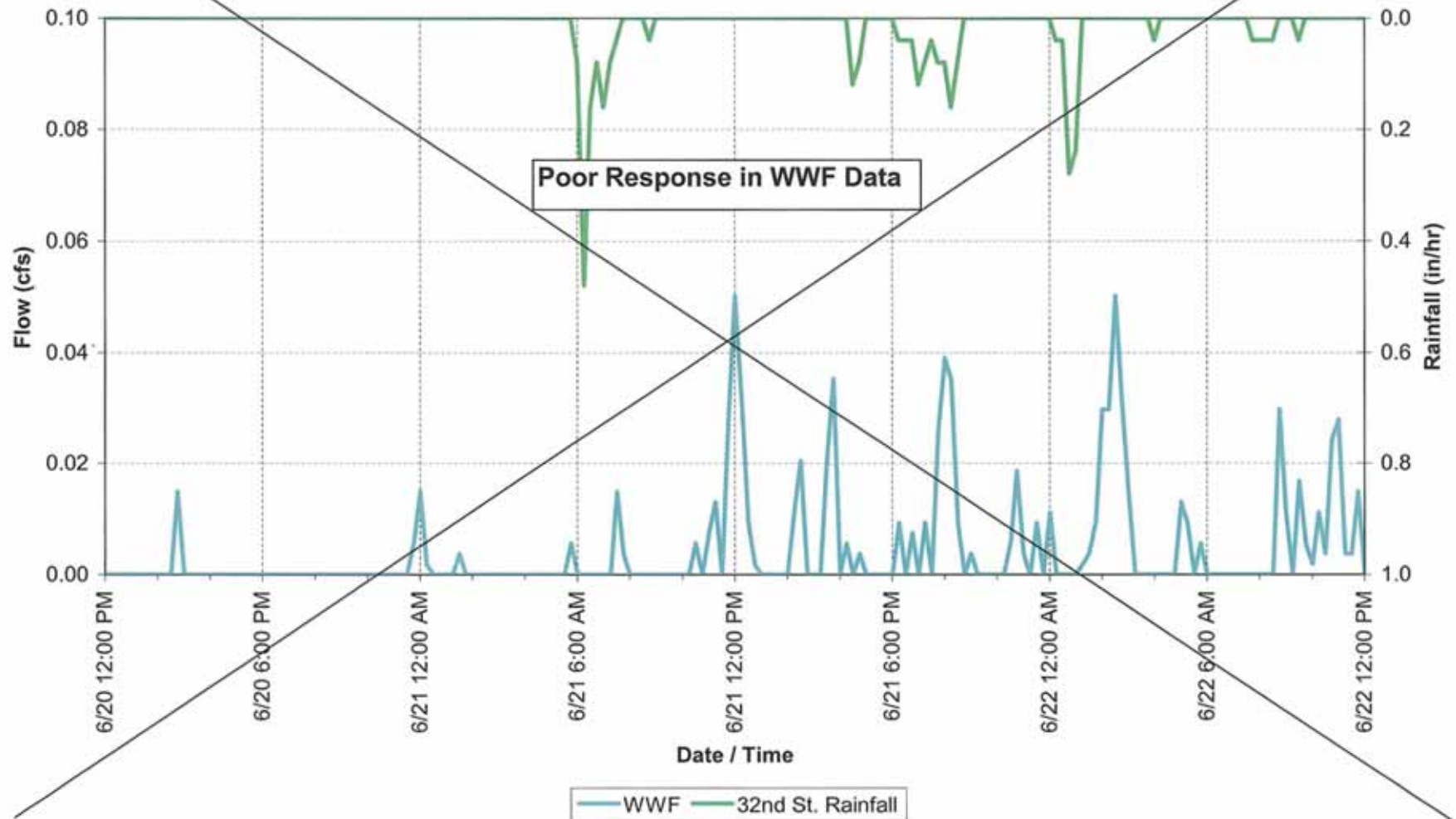
Kaufmann, Meter 7
Event 7: June 2, 2007; Small Depth Storm
WWF Only (DWF Subtracted Out)



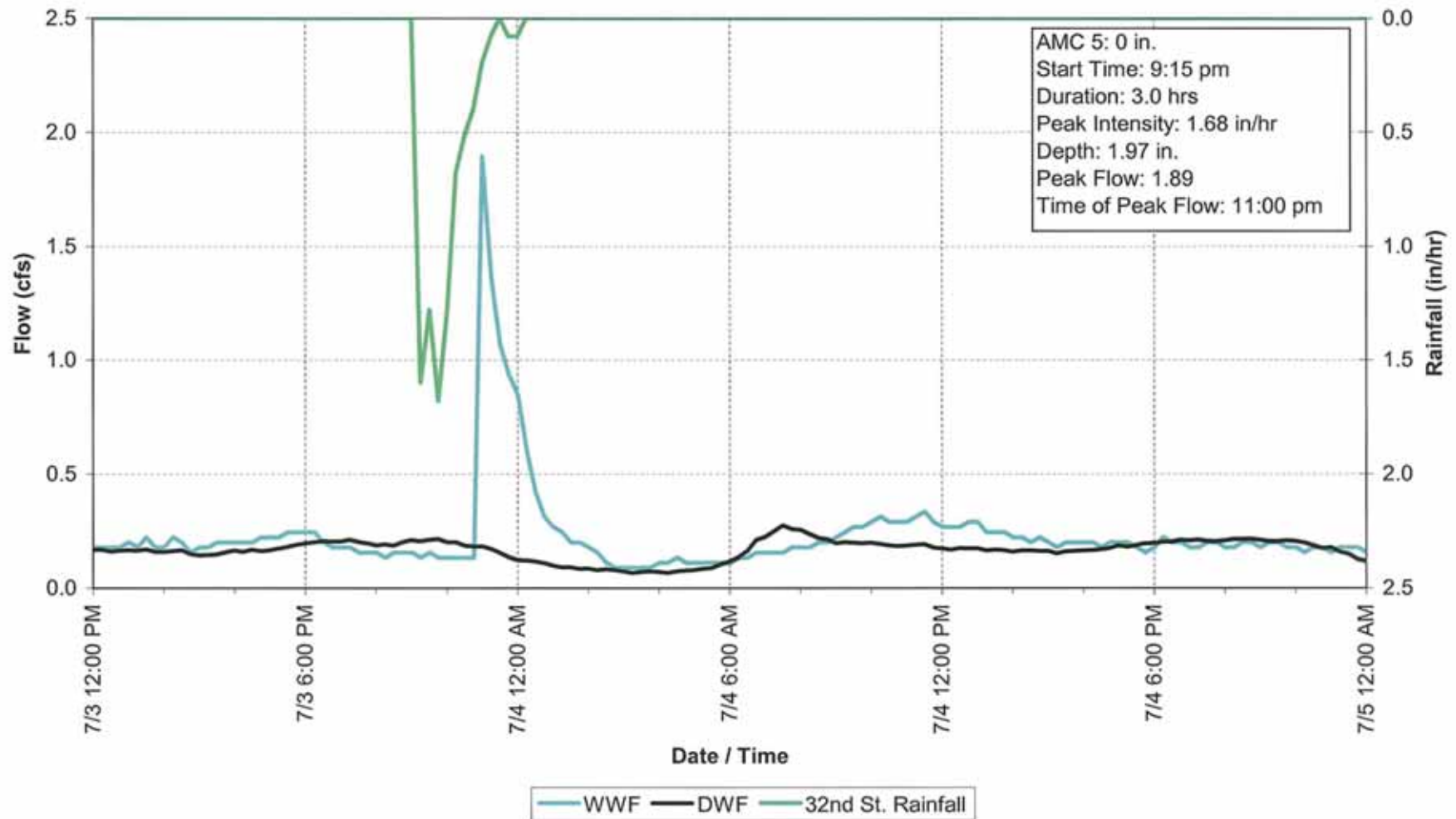
Kaufmann, Meter 7
Event 8: June 21, 2007; Small Depth Storm
WWF and DWF Graph



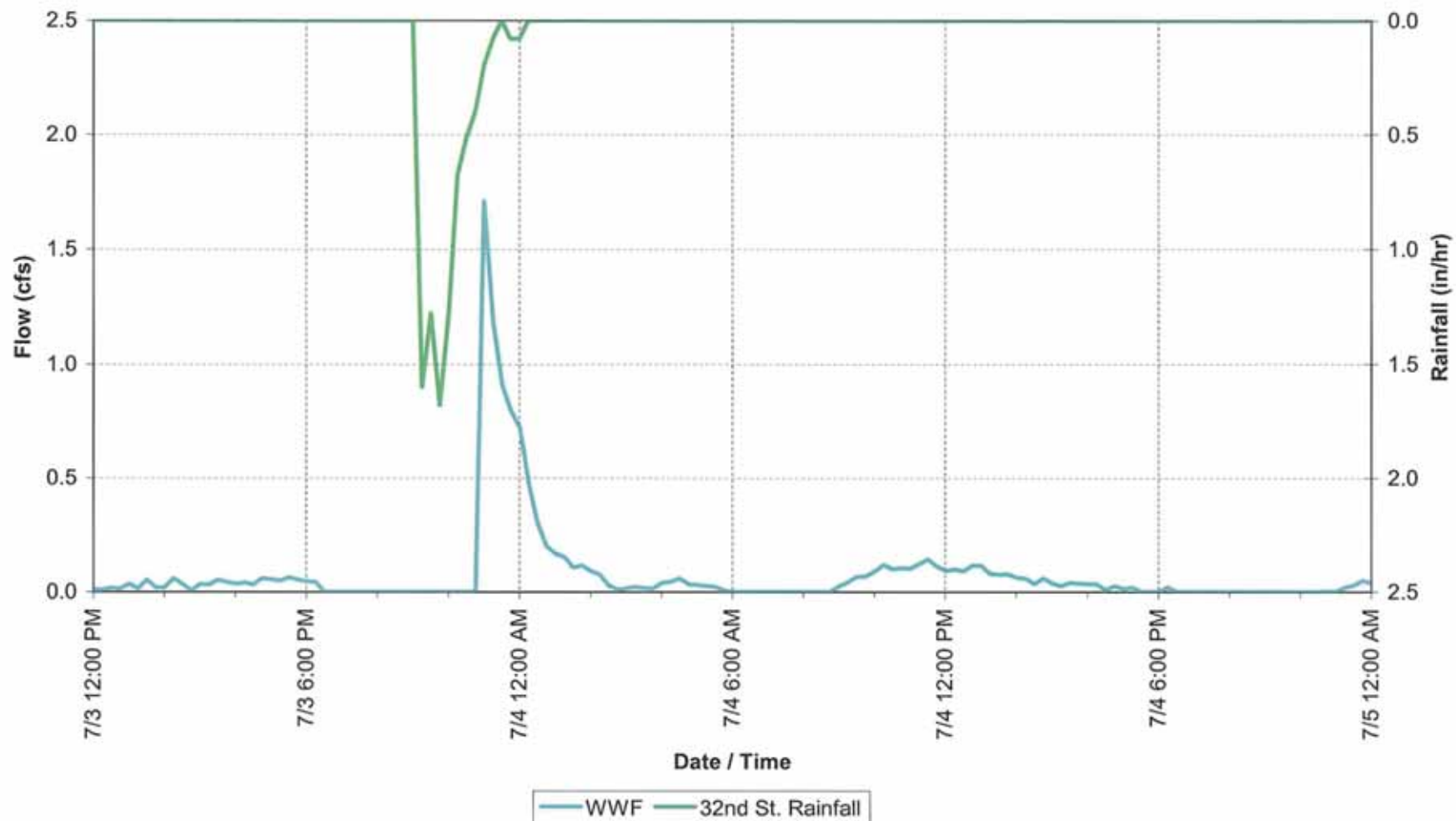
Kaufmann, Meter 7
Event 8: June 21, 2007; Small Depth Storm
WWF Only (DWF Subtracted Out)



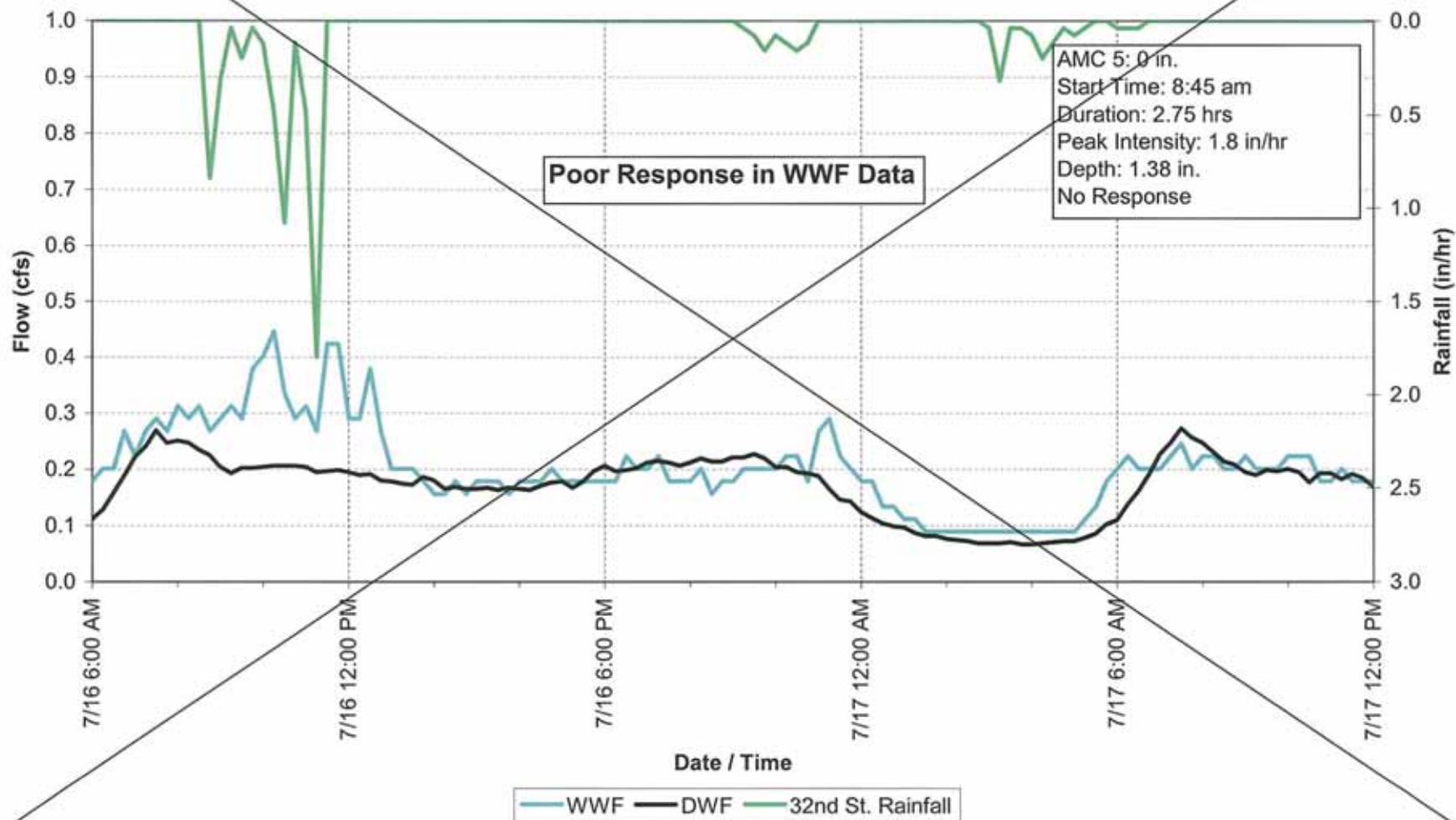
Kaufmann, Meter 7
Event 9: July 3, 2007; Short-Duration, High Intensity Storm
WWF and DWF Graph



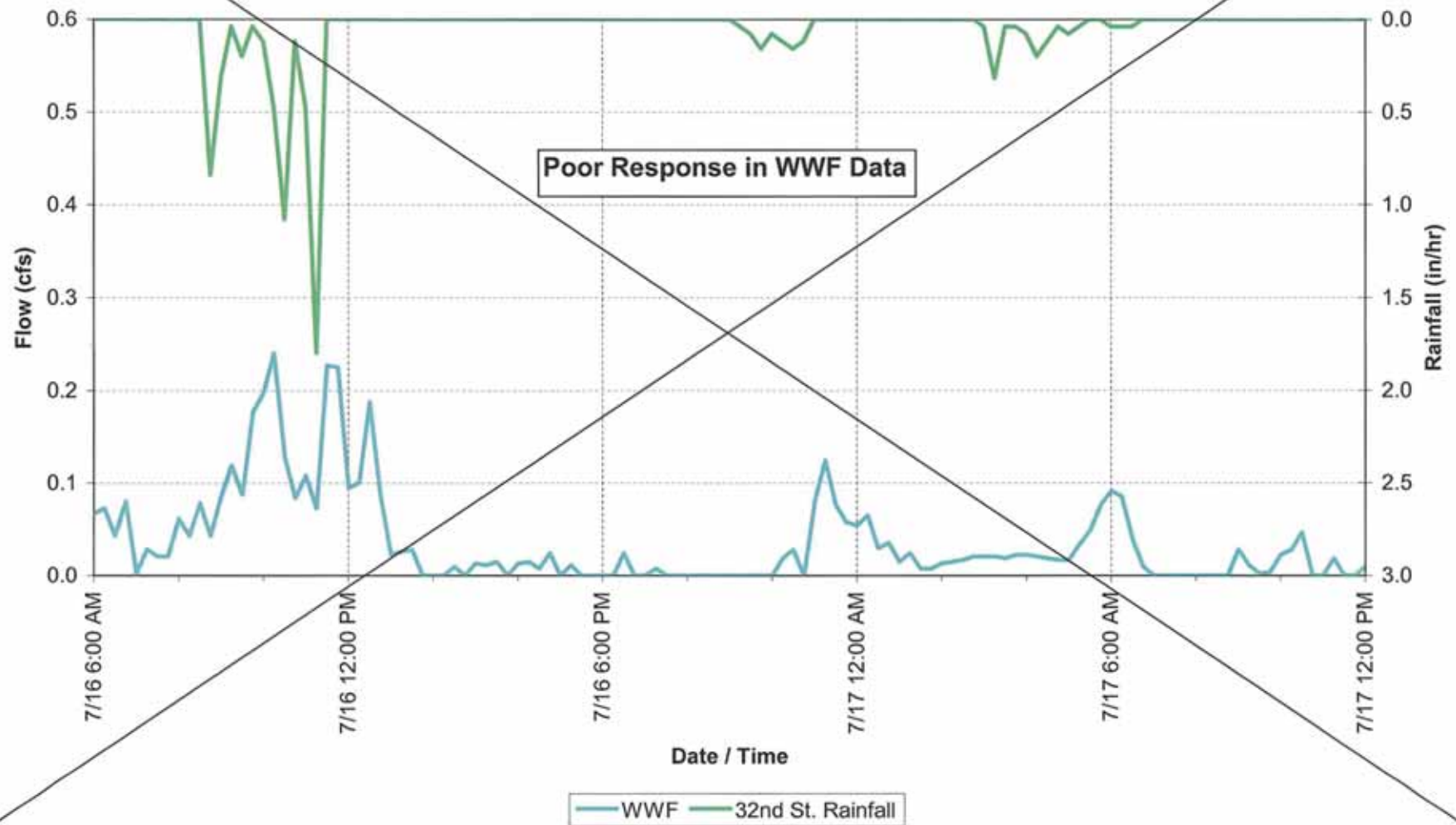
Kaufmann, Meter 7
Event 9: July 3, 2007; Short-Duration, High Intensity Storm
WWF Only (DWF Subtracted Out)



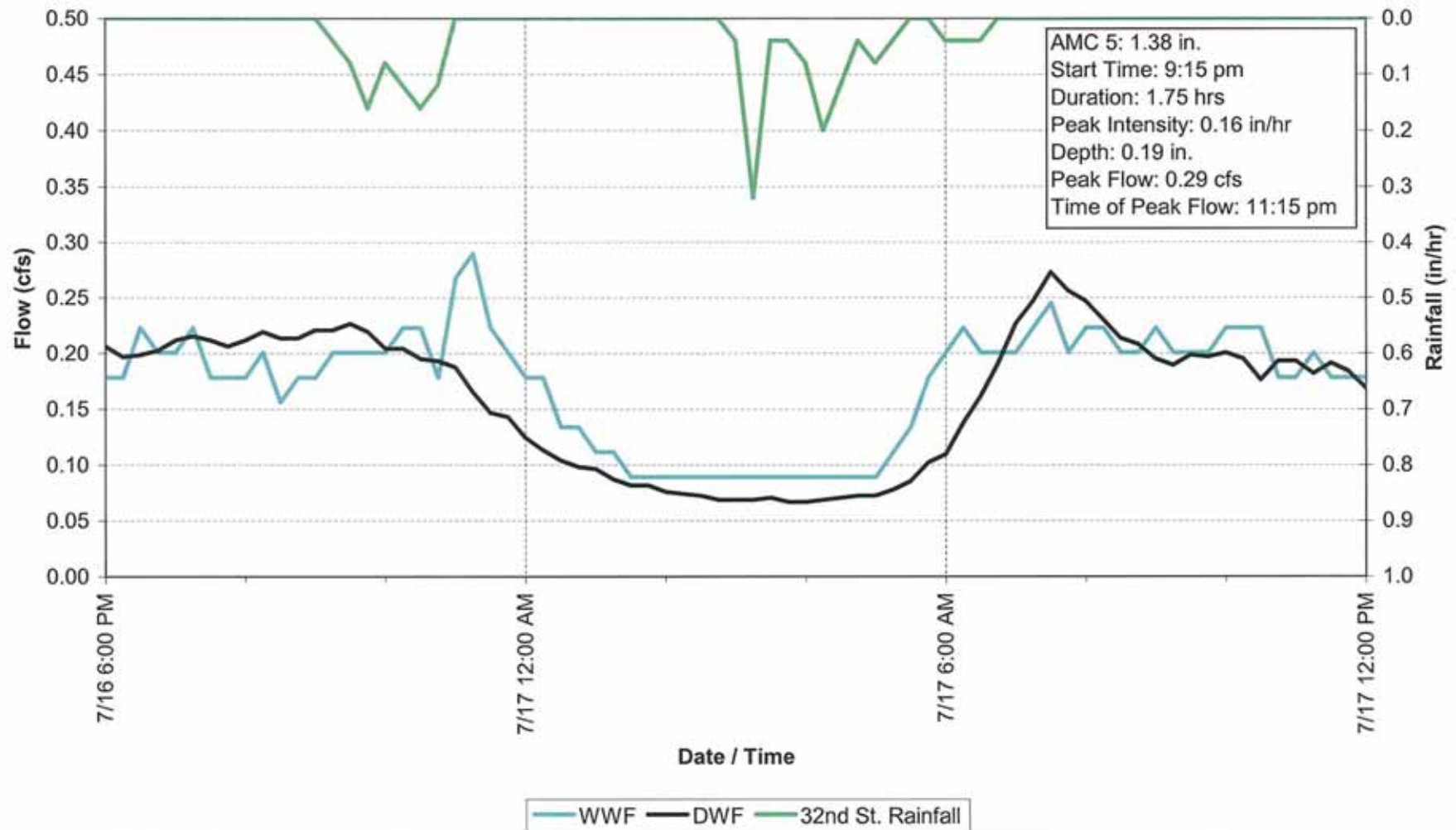
Kaufmann, Meter 7
Event 10: July 16, 2007; Short-Duration, High Intensity Storm
WWF and DWF Graph



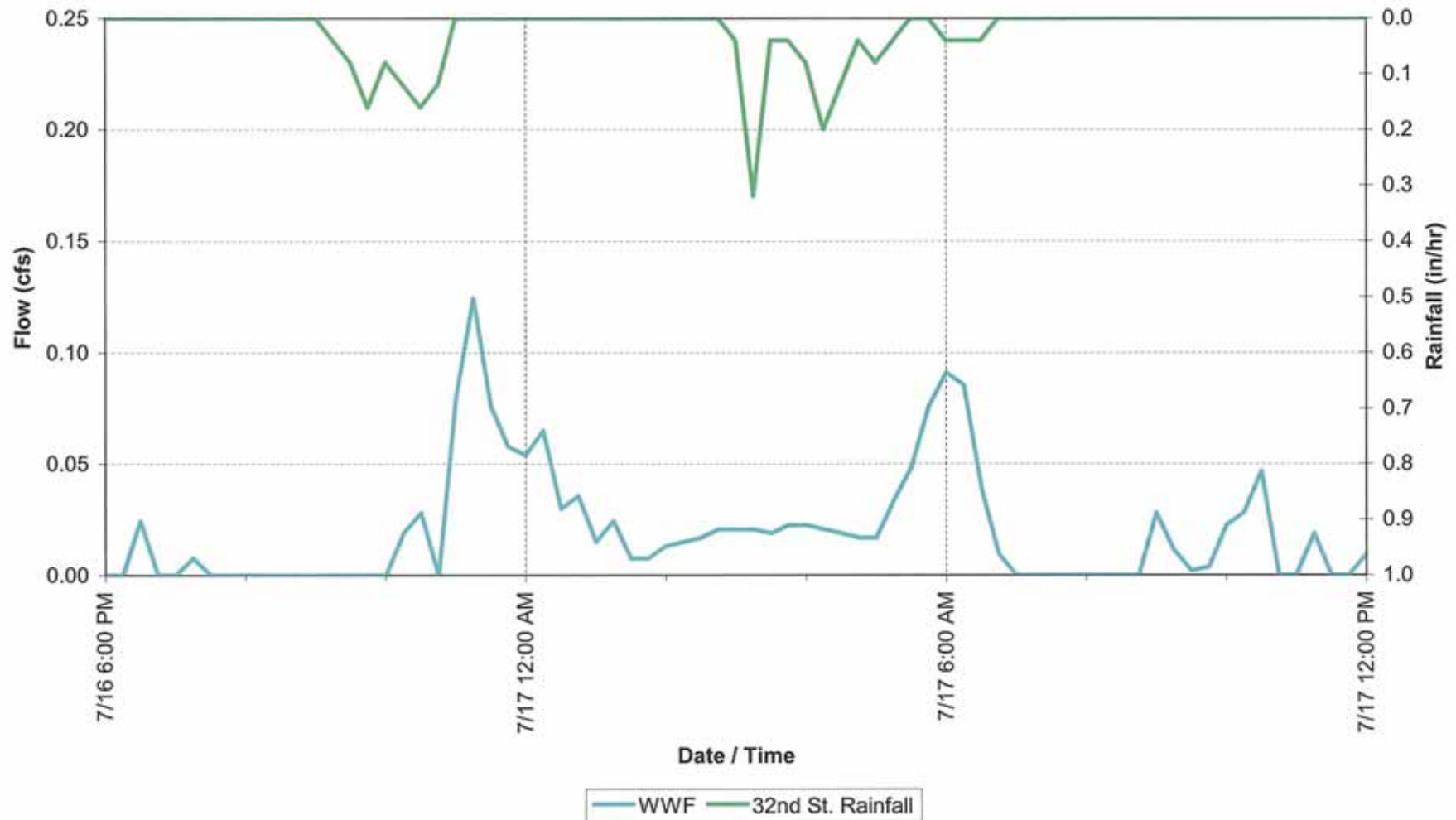
Kaufmann, Meter 7
Event 10: July 16, 2007; Short-Duration, High Intensity Storm
WWF Only (DWF Subtracted Out)



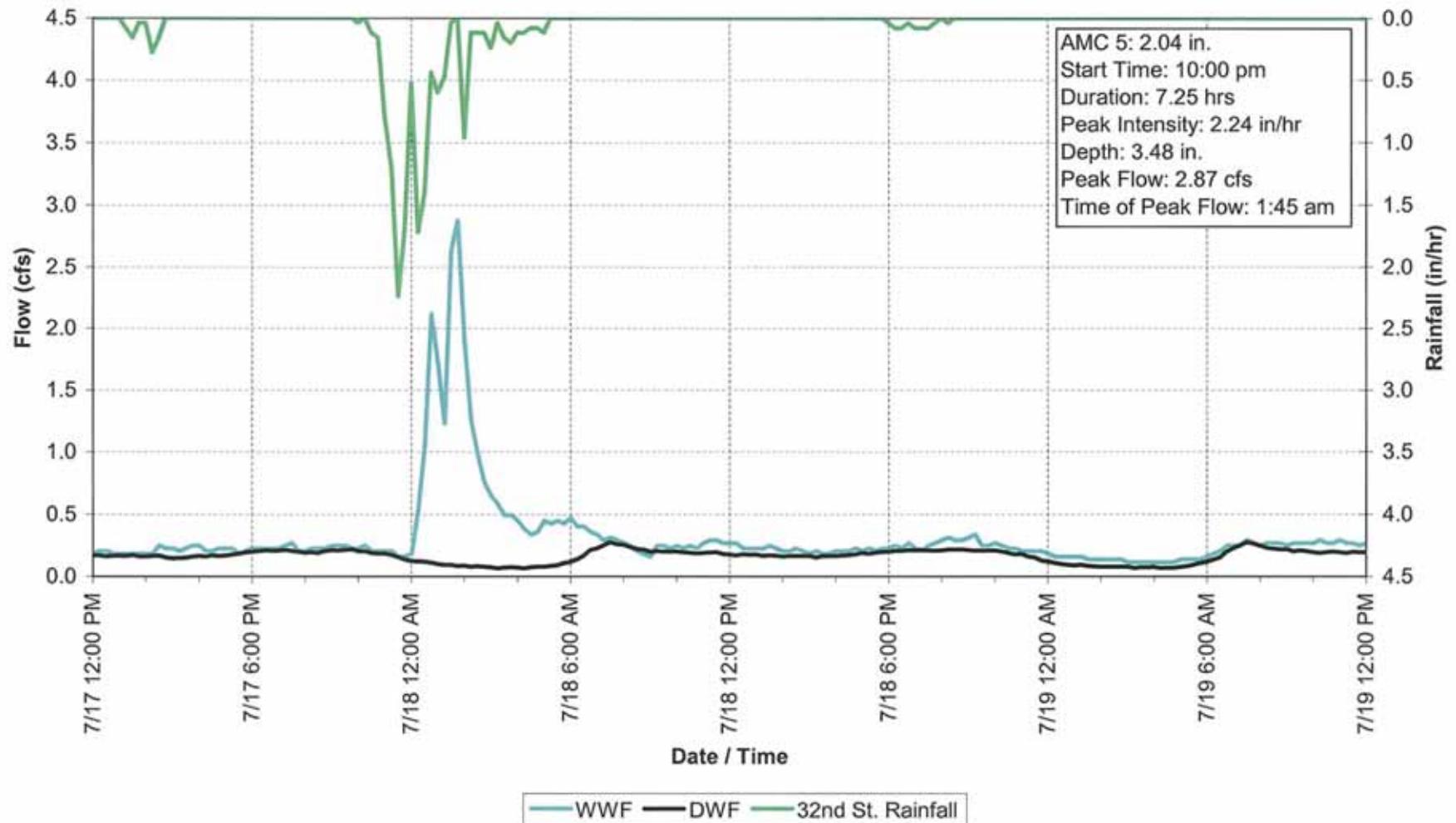
Kaufmann, Meter 7
Event 11: July 16, 2007; Small Depth Storm
WWF and DWF Graph



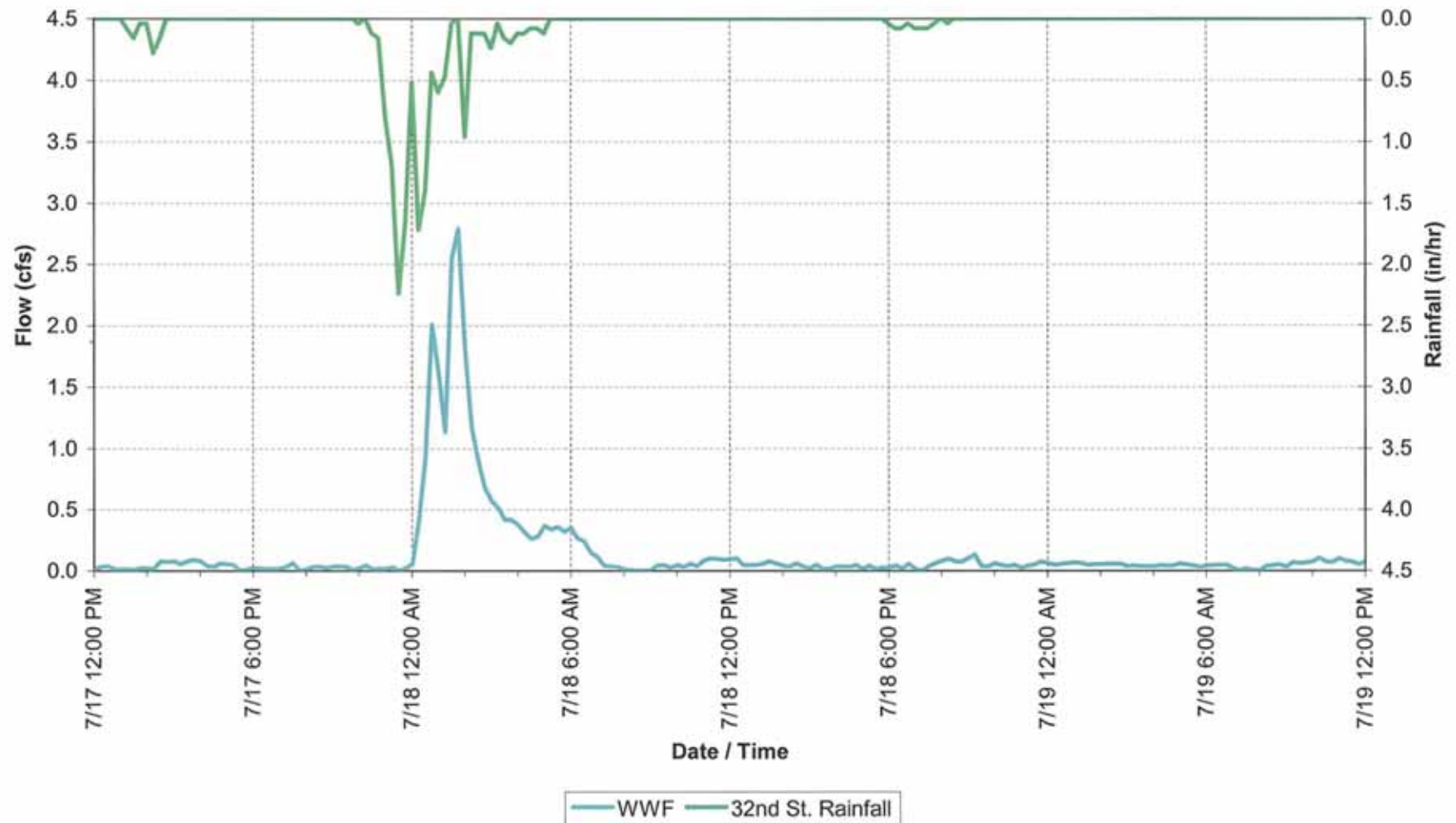
Kaufmann, Meter 7
Event 11: July 16, 2007; Small Depth Storm
WWF Only (DWF Subtracted Out)



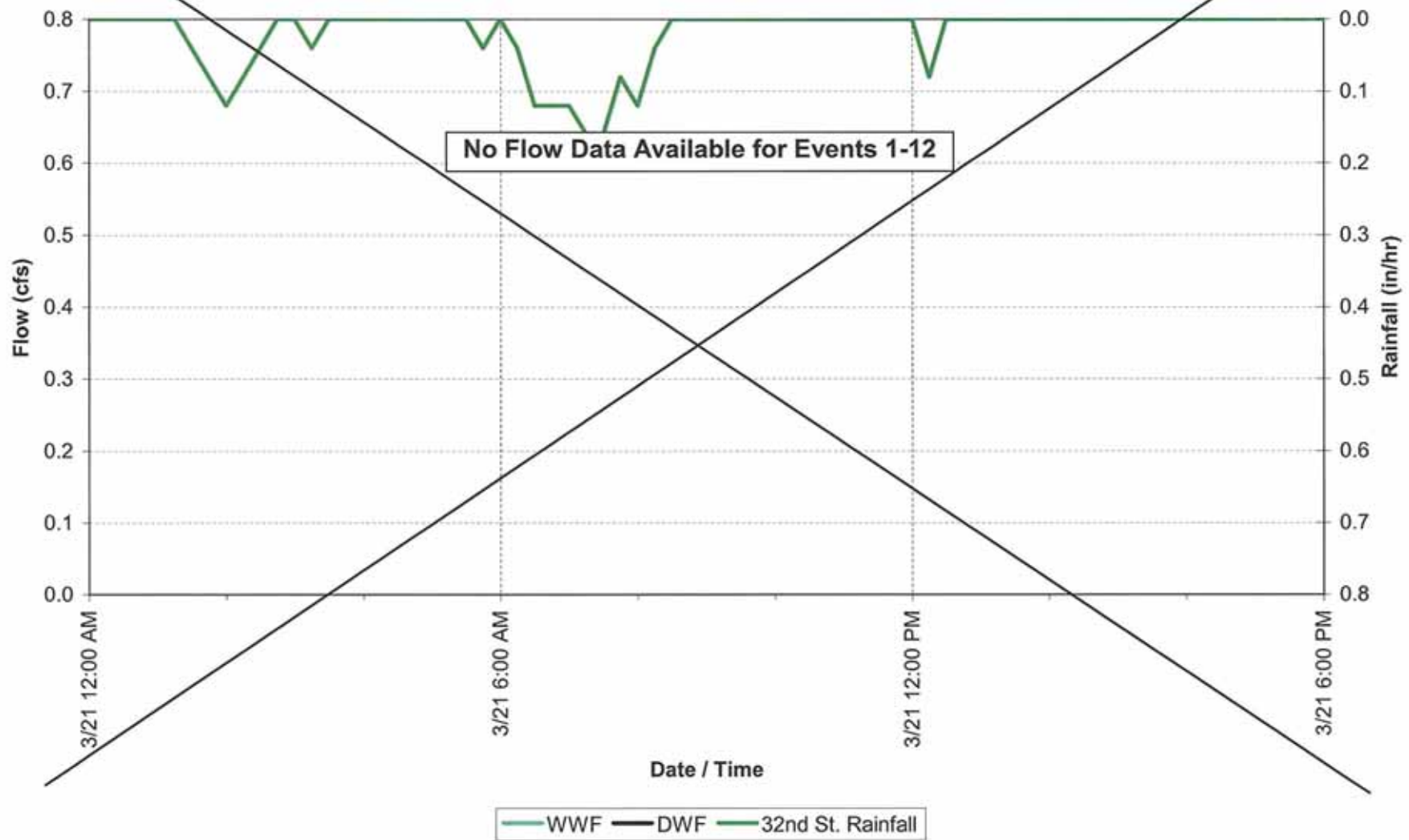
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Event 12: July 17 - 18, 2007; Short-Duration, High Intensity Storm
WWF and DWF Graph



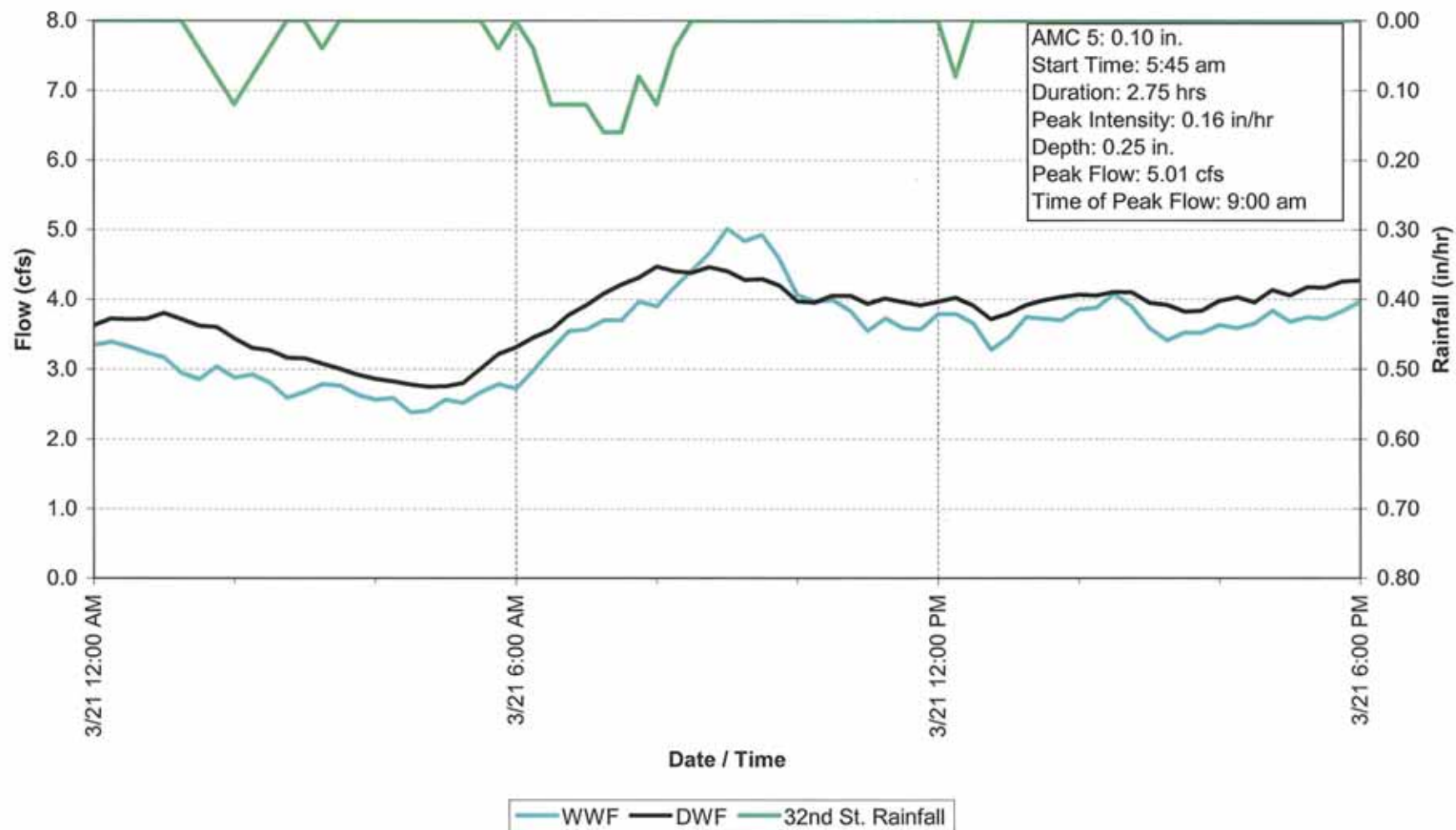
Kaufmann, Meter 7
Event 12: July 17 - 18, 2007; Short-Duration, High Intensity Storm
WWF Only (DWF Subtracted Out)



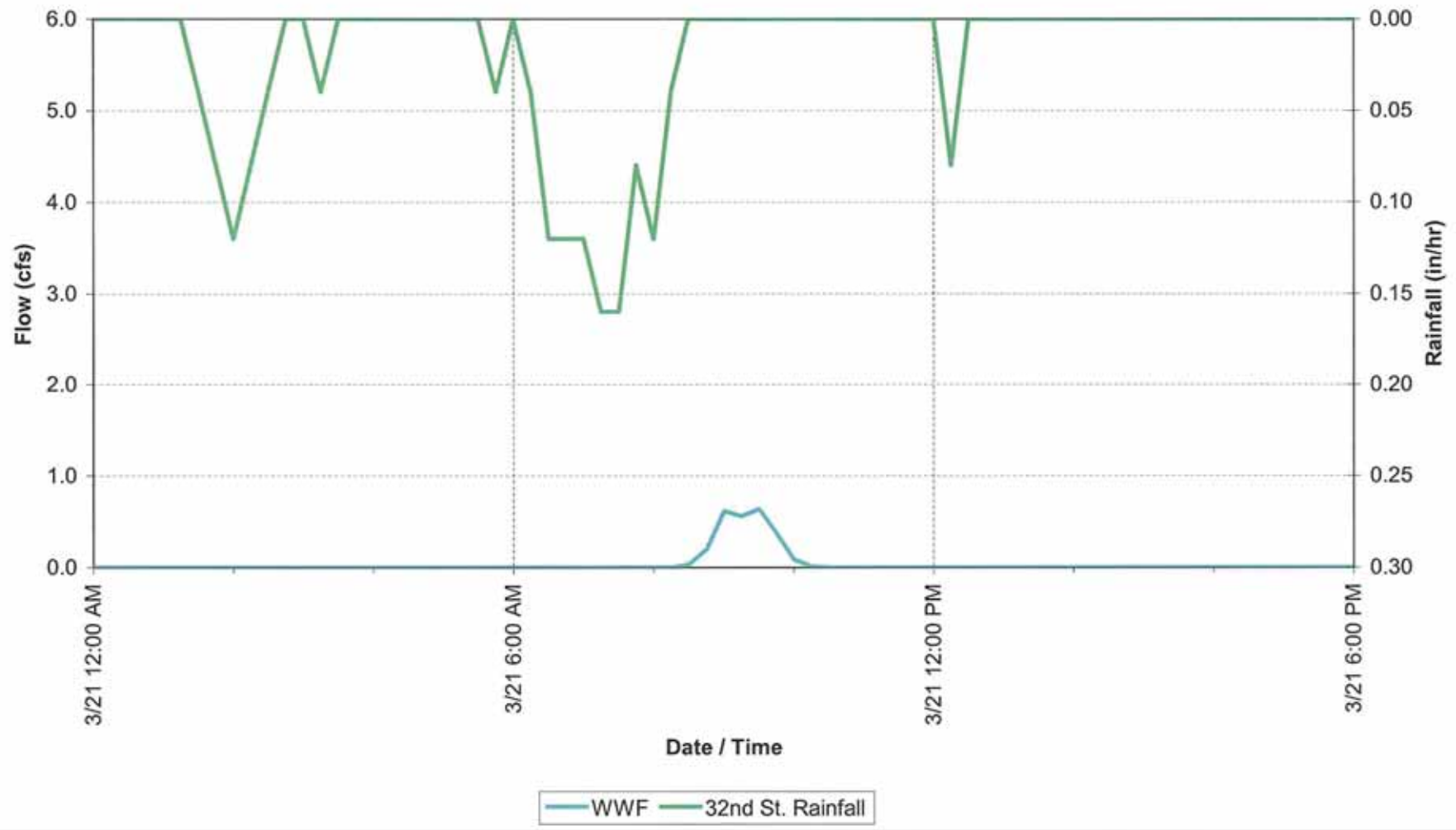
Kerper, Meter 8
Event 1: March 21, 2007; Small Depth Storm
WWF and DWF Graph



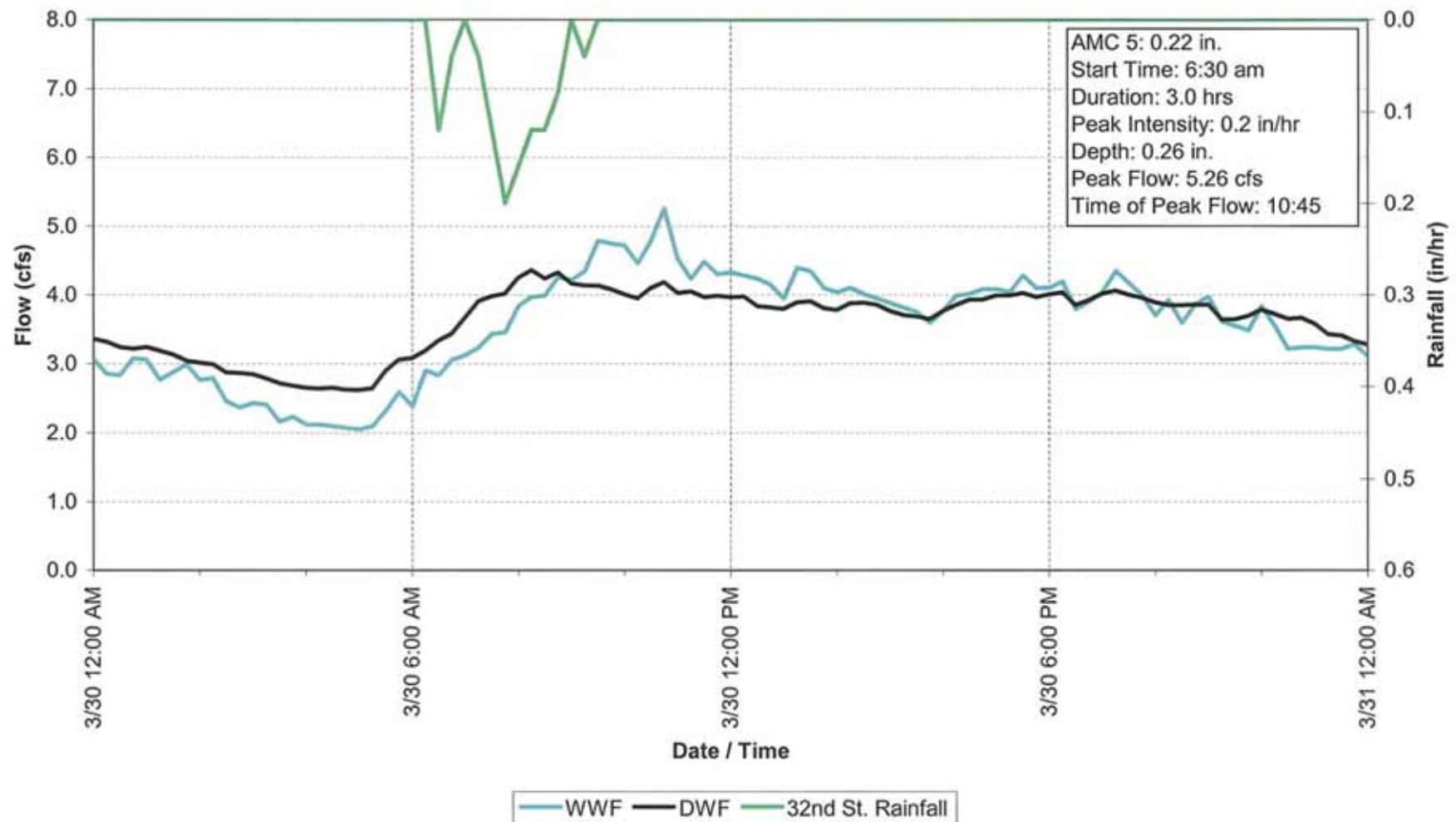
Catfish, Meter 10
Event 1: March 21, 2007; Small Depth Storm
WWF and DWF Graph



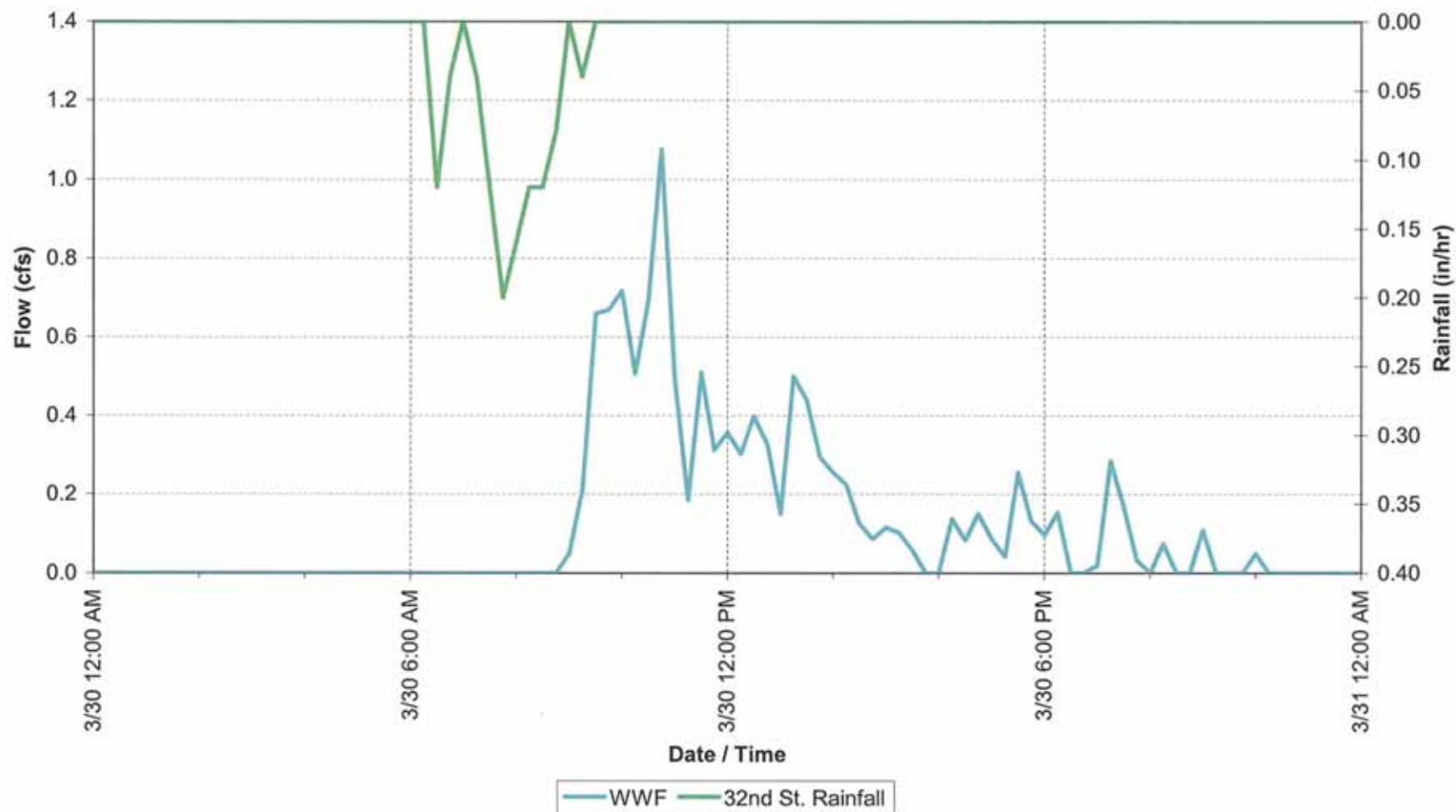
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Event 1: March 21, 2007; Small Depth Storm
WWF Only (DWF Subtracted Out)



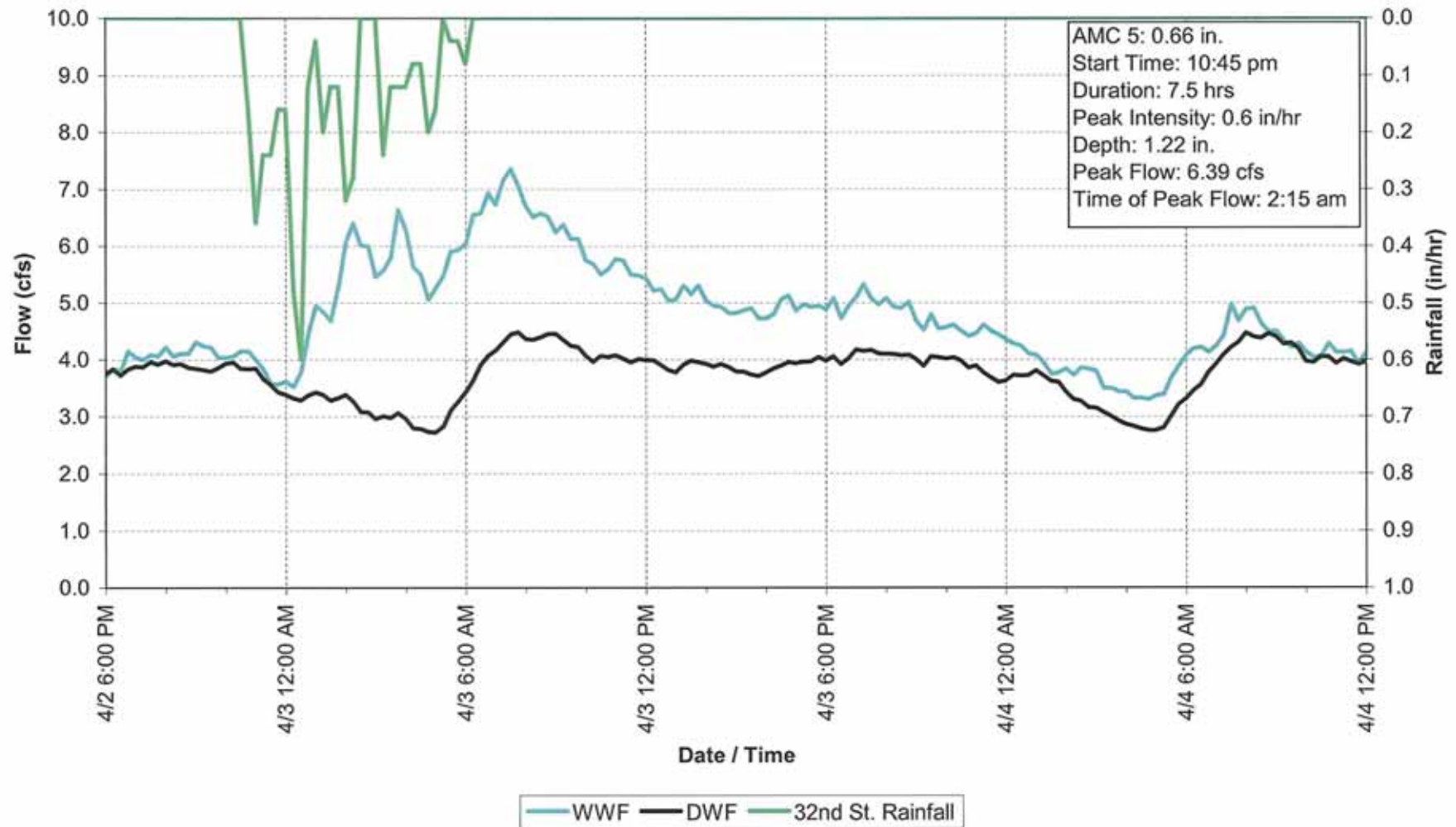
Catfish, Meter 10
Event 2: March 30, 2007; Small Depth Storm
WWF and DWF Graph



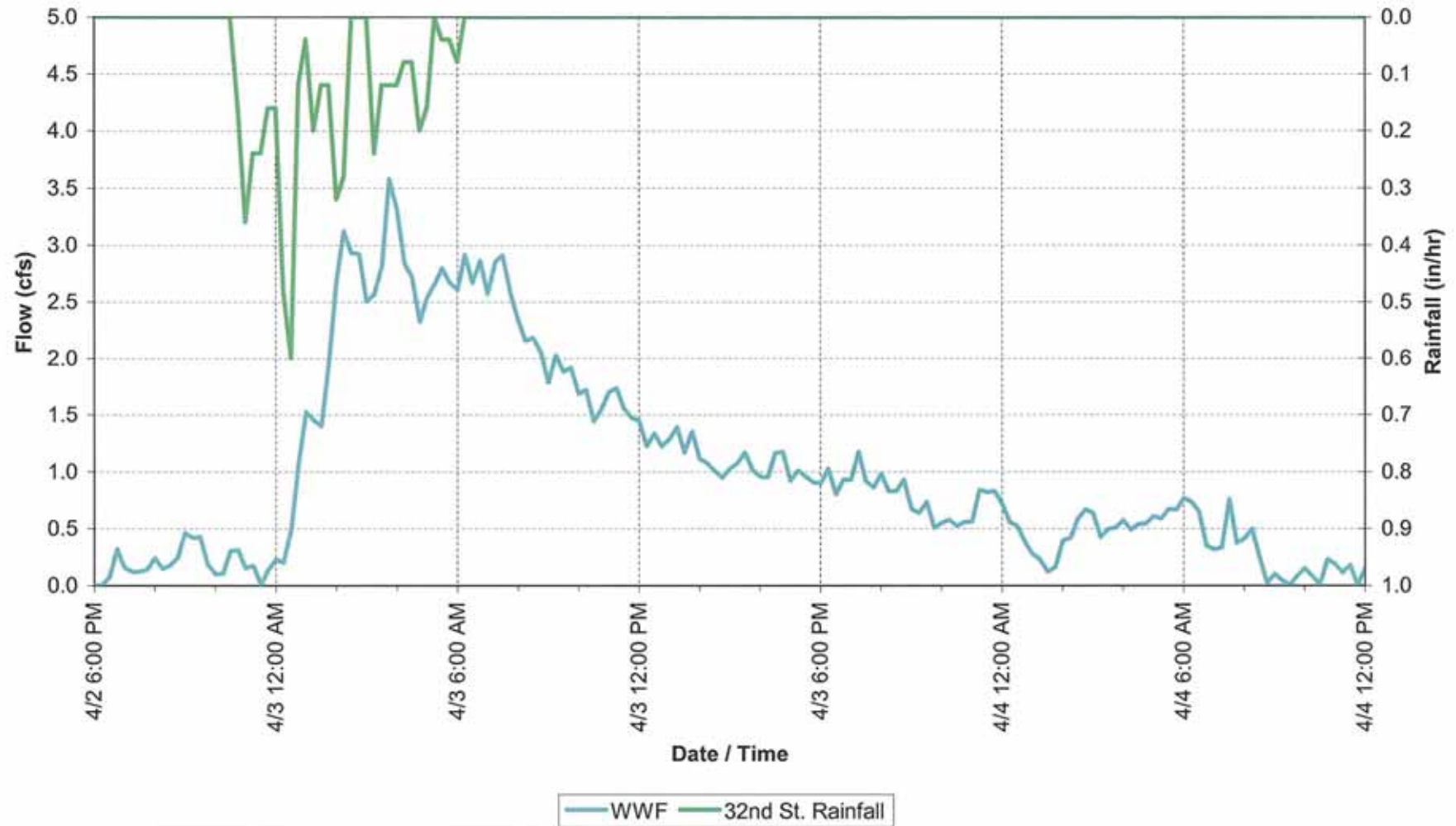
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WWF Only (DWF Subtracted Out)



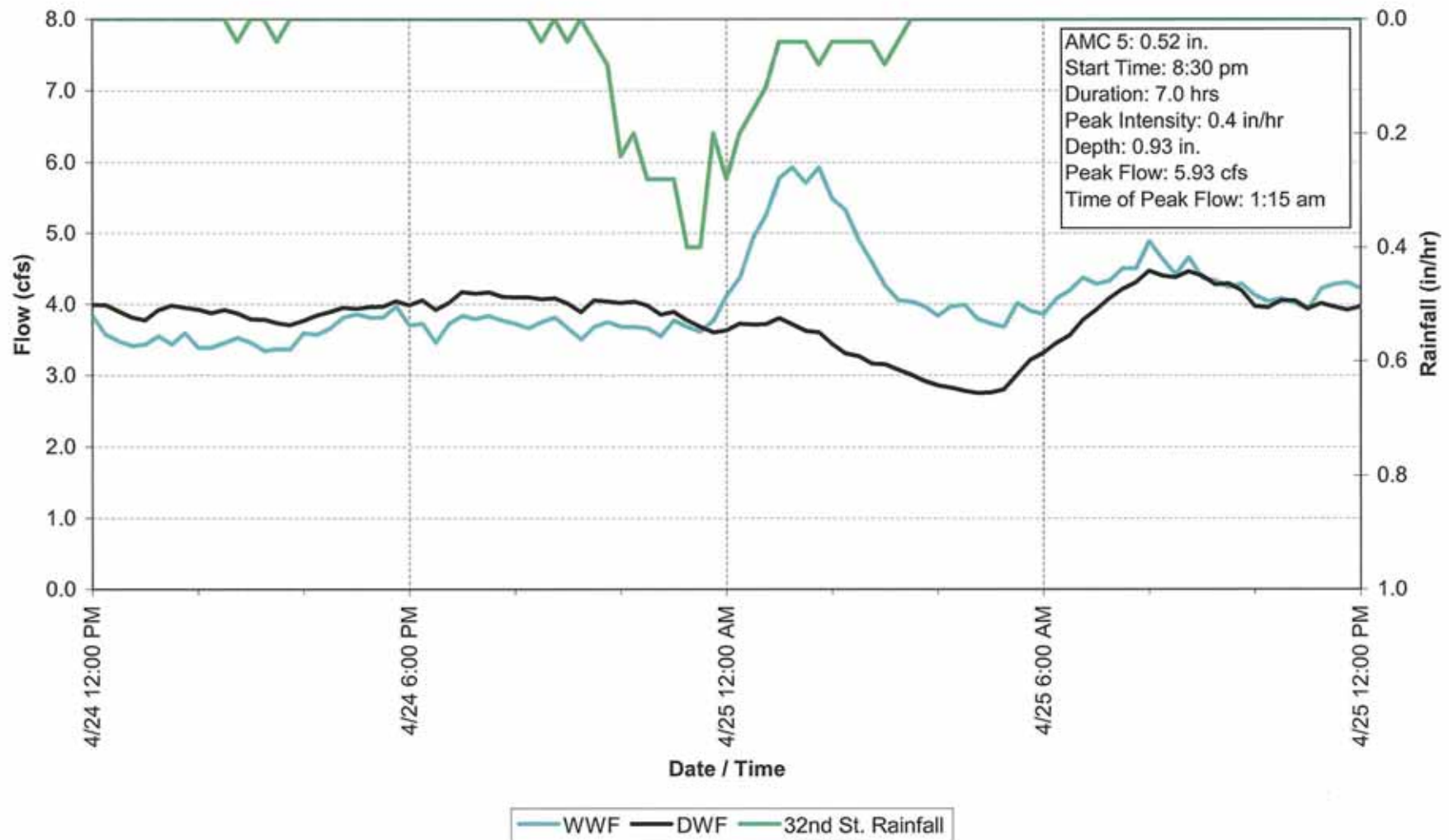
Catfish, Meter 10
Event 3: April 3, 2007; Long-Duration, Low Intensity Storm
WWF and DWF Graph



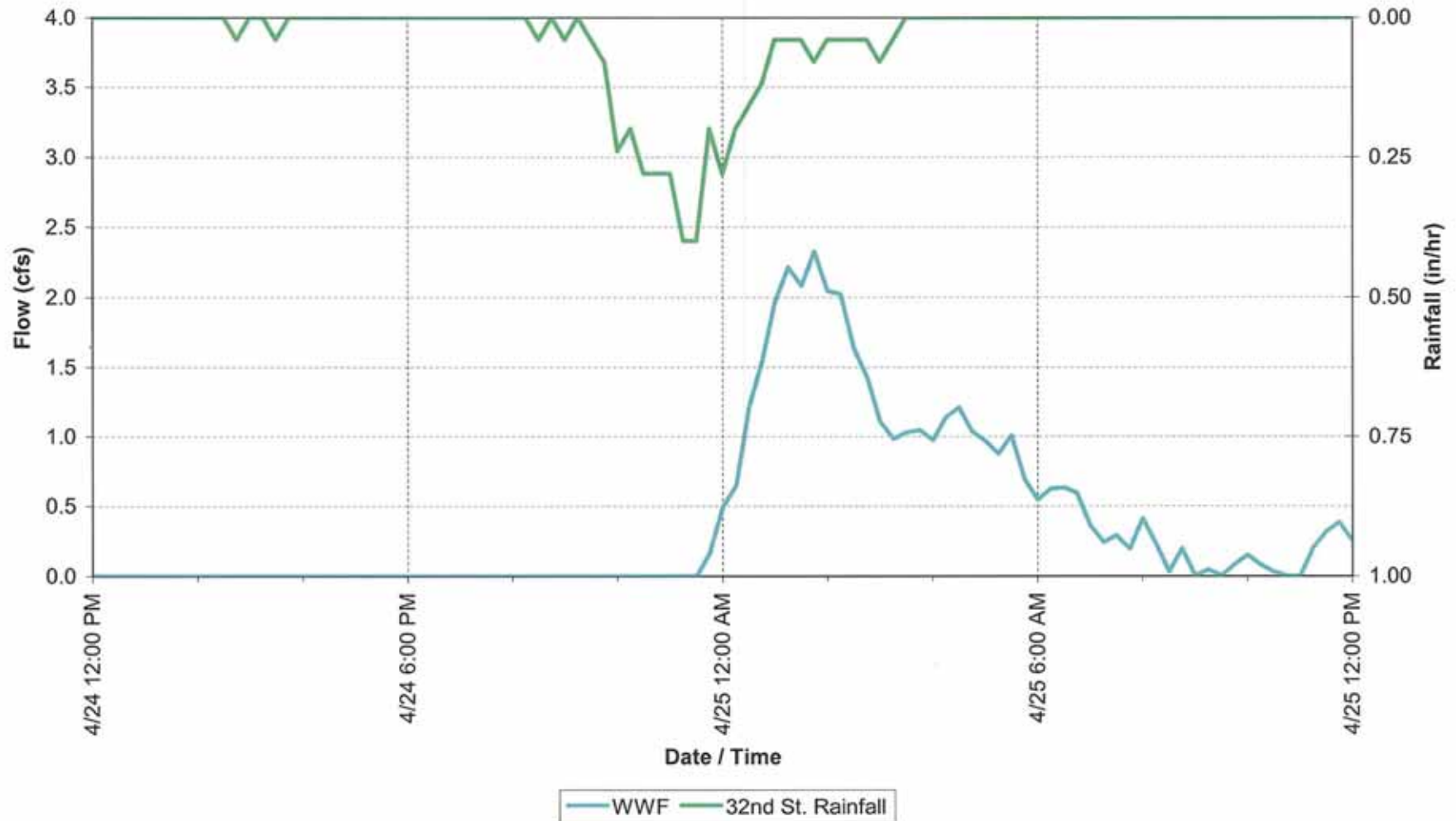
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Event 3: April 3, 2007; Long-Duration, Low Intensity Storm
WWF Only (DWF Subtracted Out)



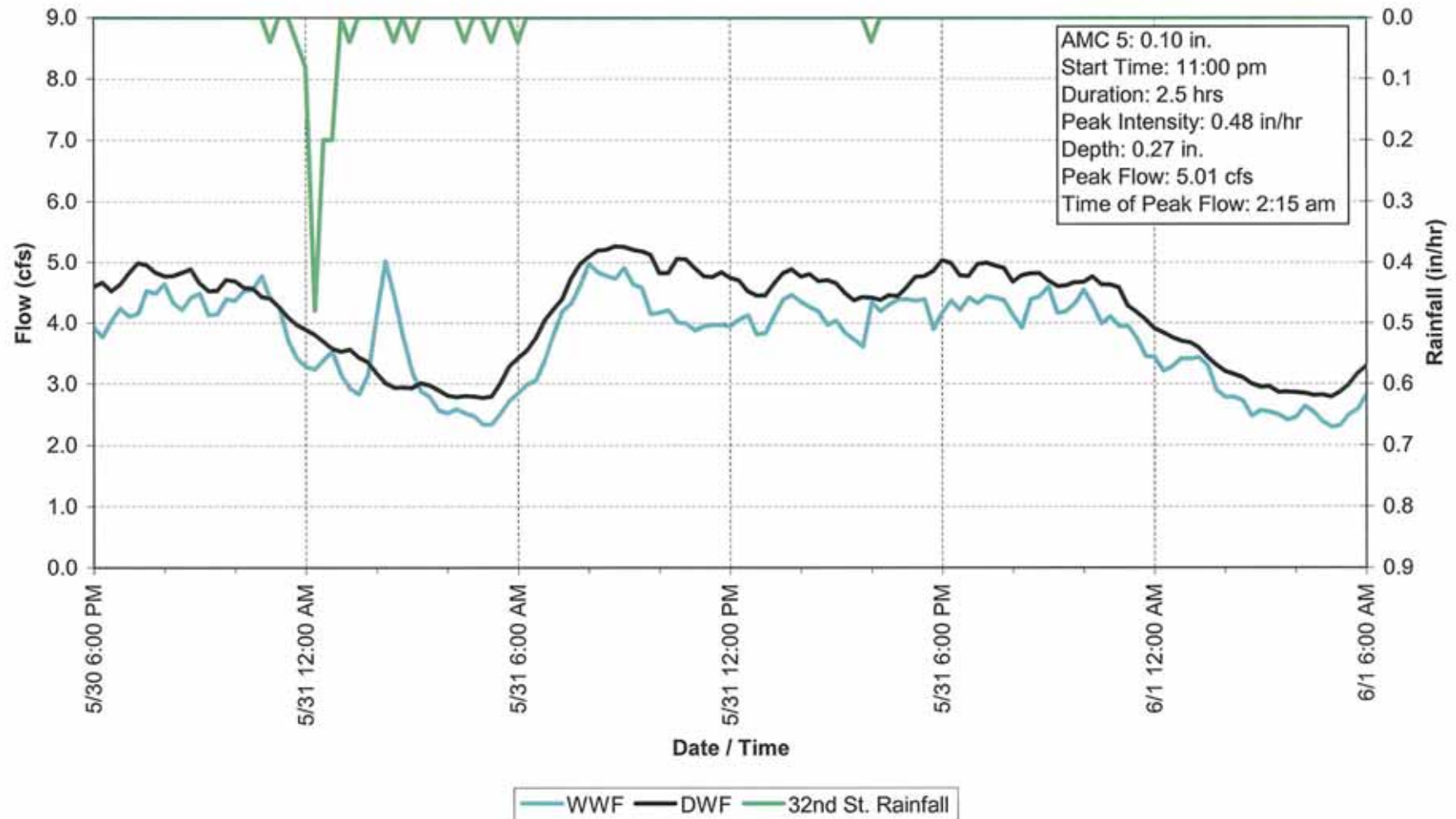
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Event 4: April 24, 2007; Long-Duration, Low Intensity Storm
WWF and DWF Graph



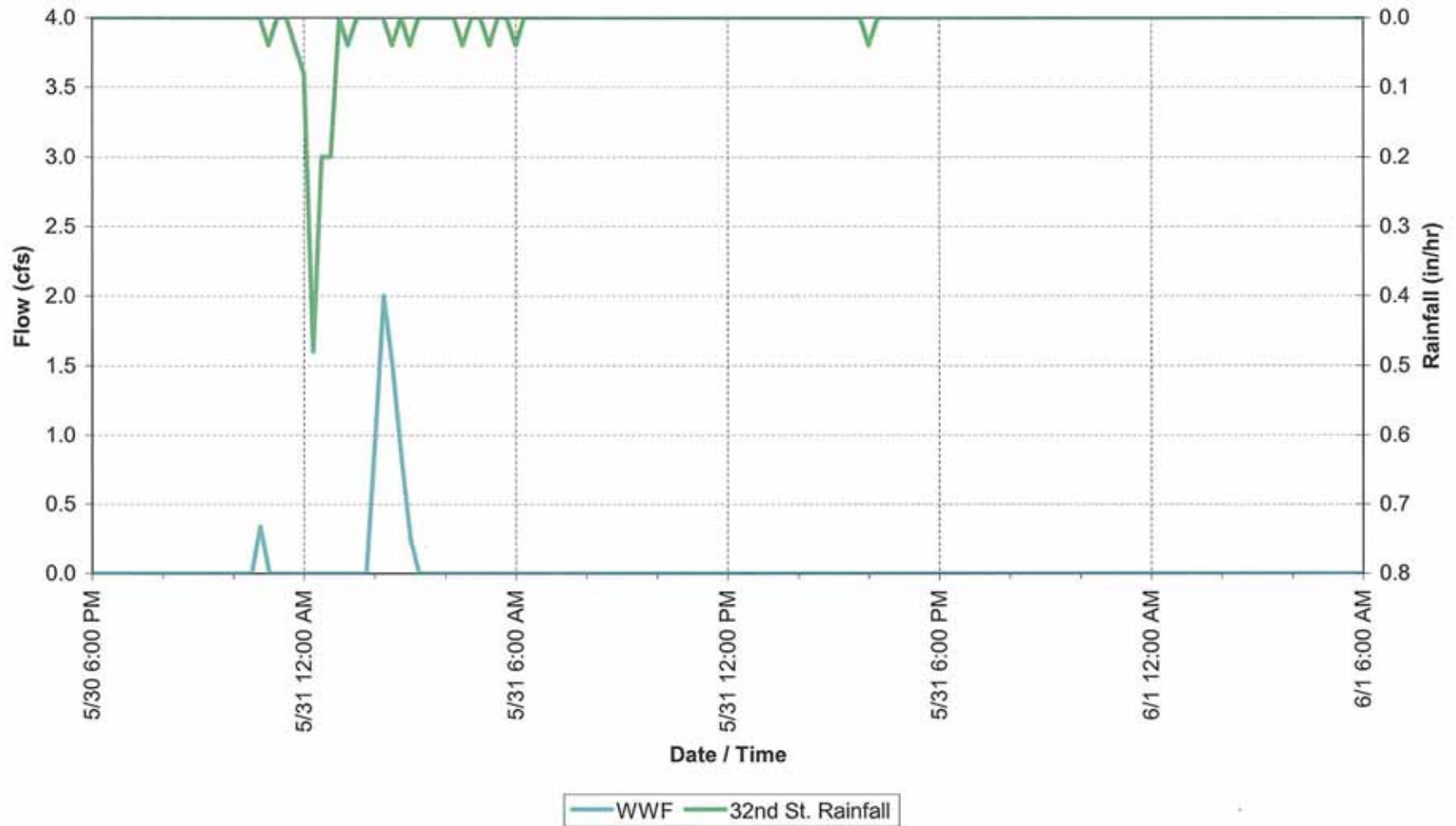
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Event 4: April 24, 2007; Long-Duration, Low Intensity Storm
WWF Only (DWF Subtracted Out)



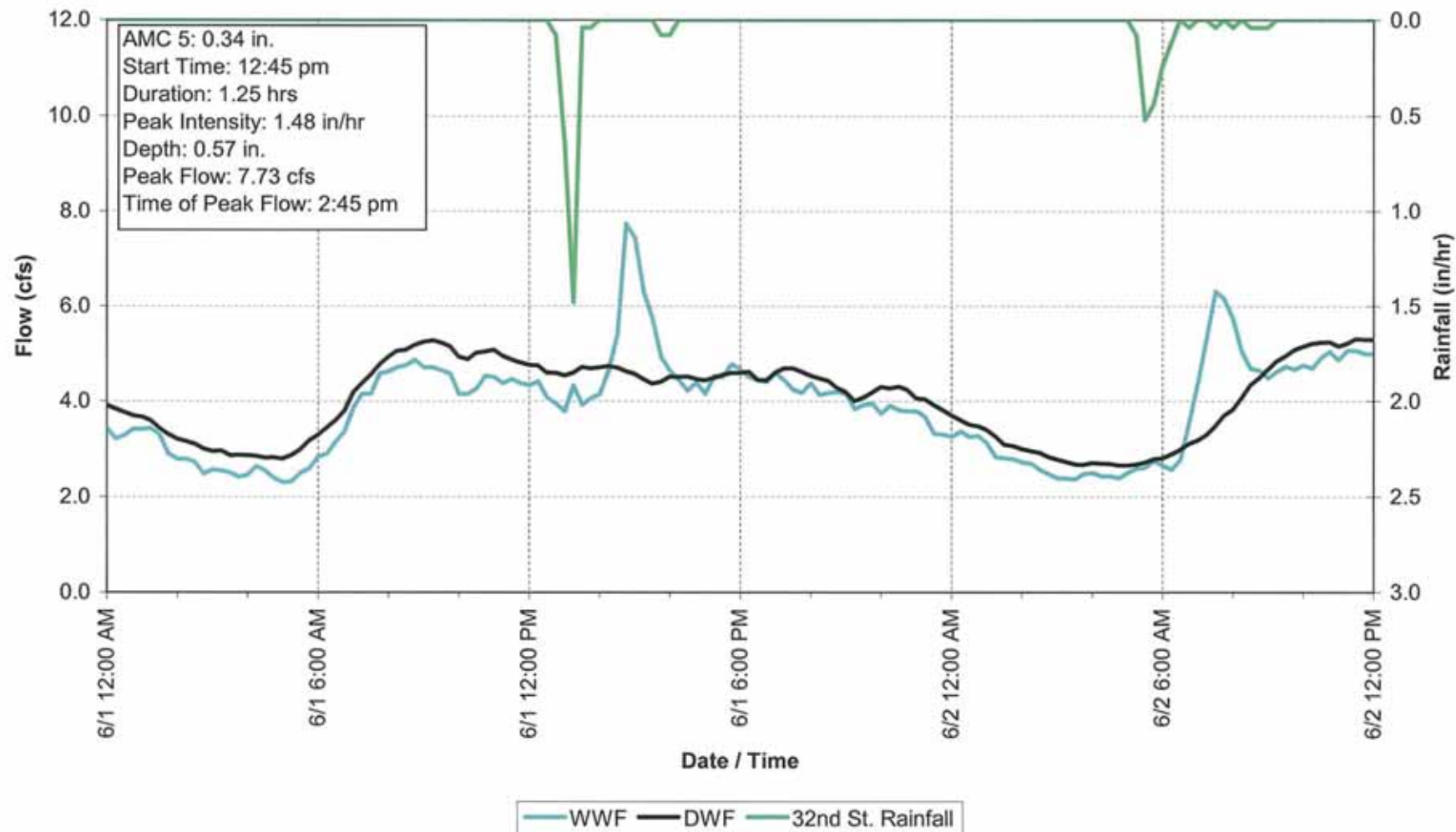
Catfish, Meter 10
Event 5: May 31, 2007; Small Depth Storm
WWF and DWF Graph



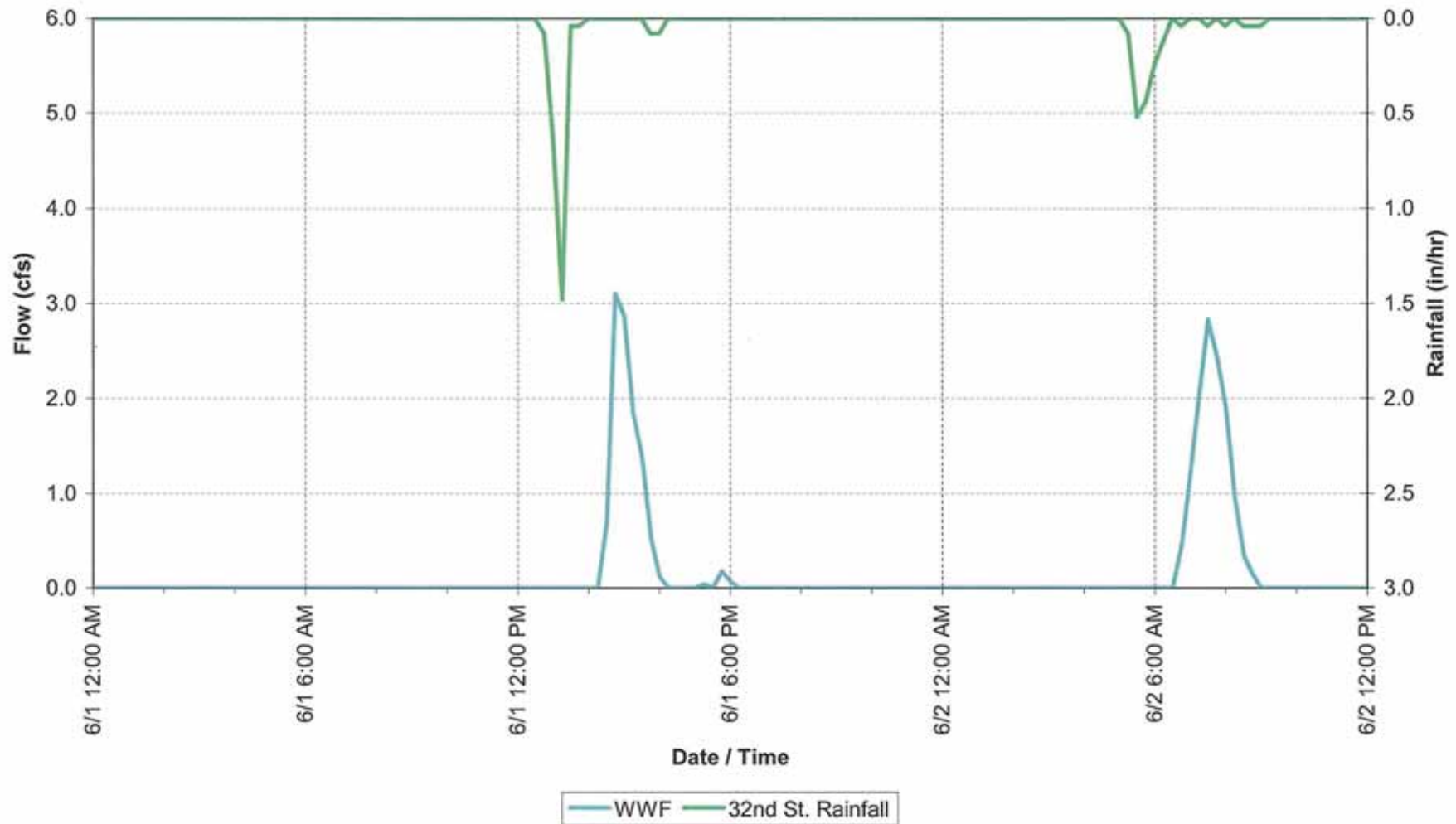
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Event 5: May 31, 2007; Small Depth Storm
WWF Only (DWF Subtracted Out)



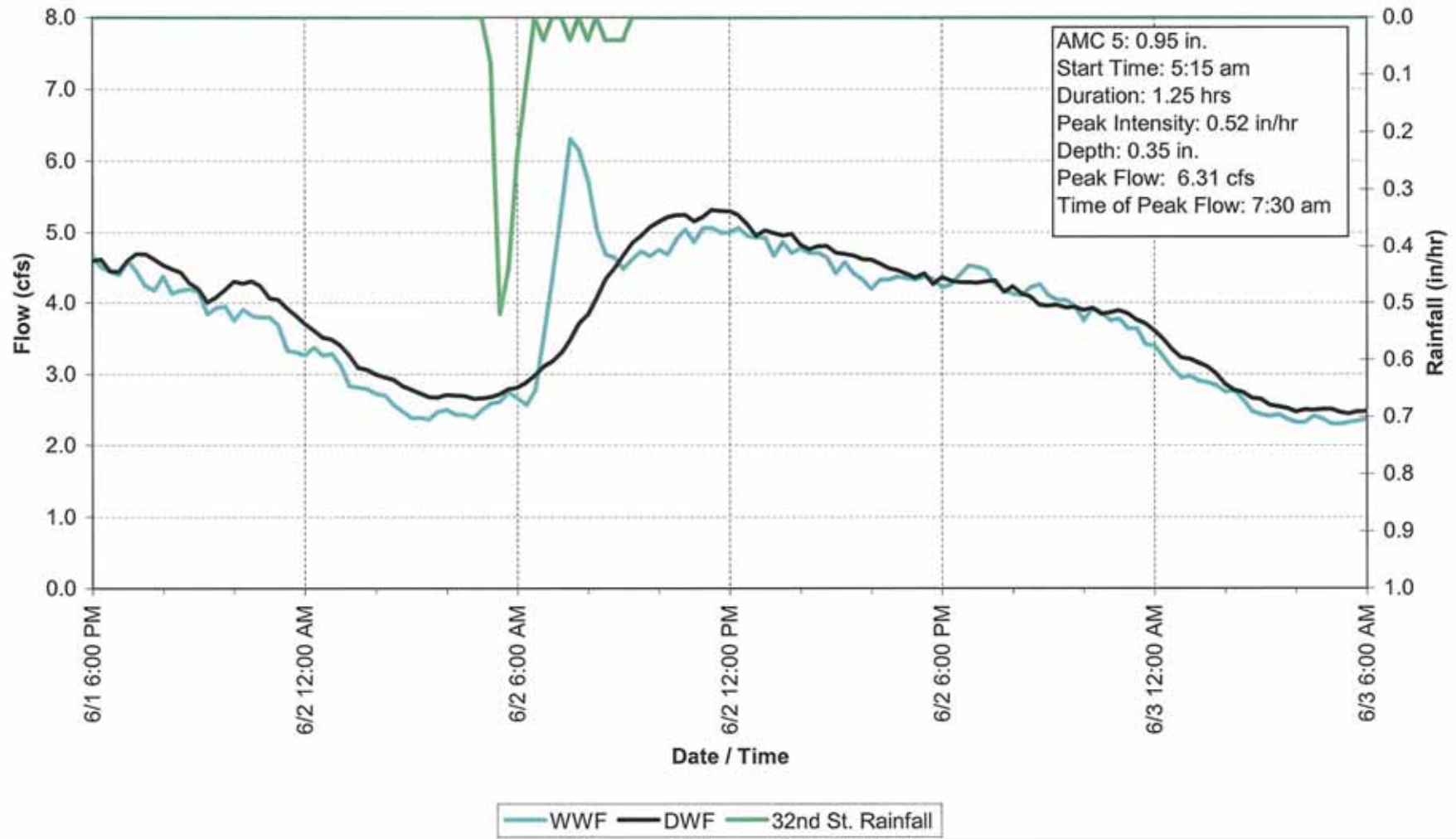
Catfish, Meter 10
Event 6: June 1, 2007; Short-Duration, High Intensity Storm
WWF and DWF Graph



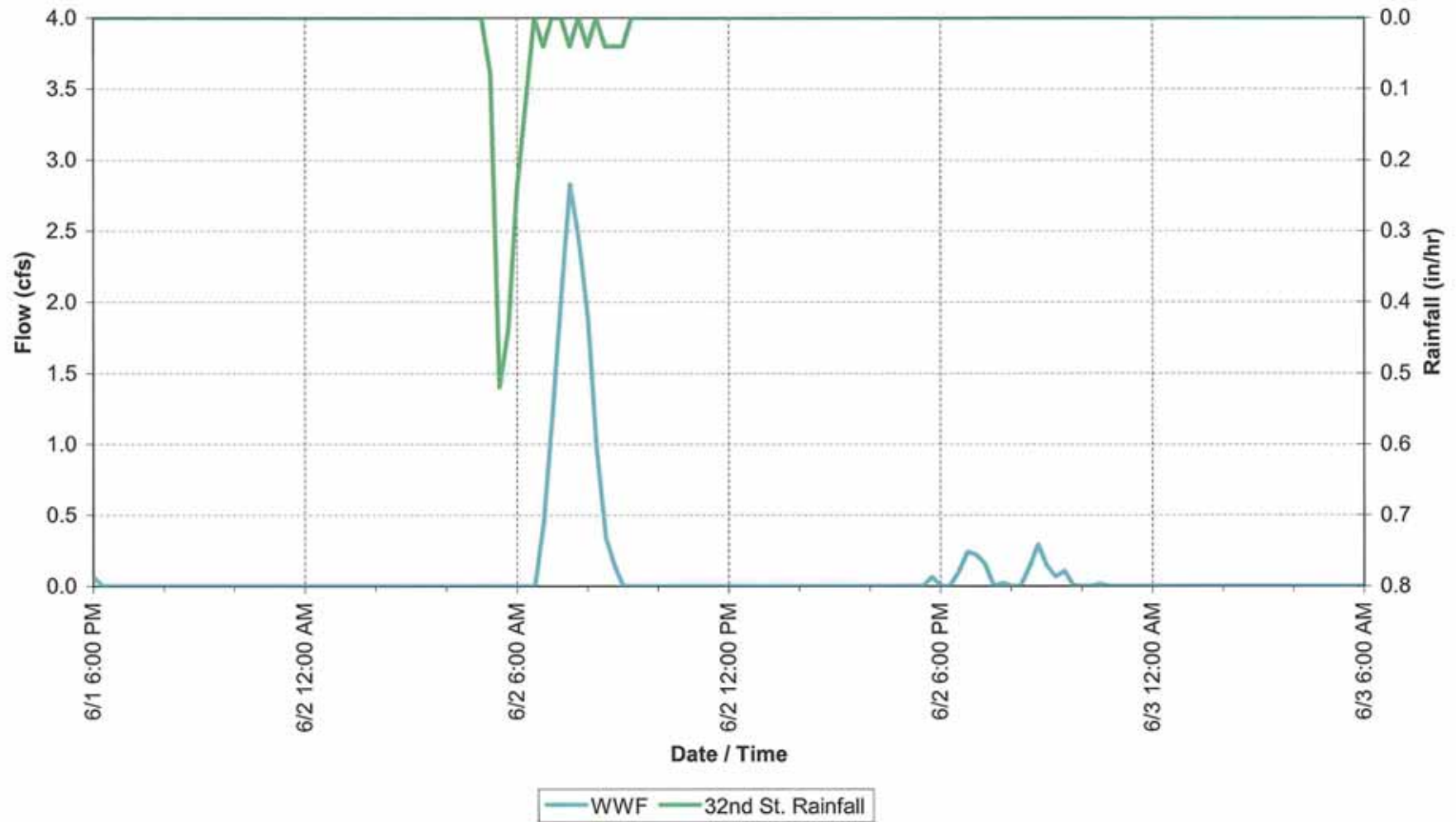
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Event 6: June 1, 2007; Short-Duration, High Intensity Storm
WWF Only (DWF Subtracted Out)



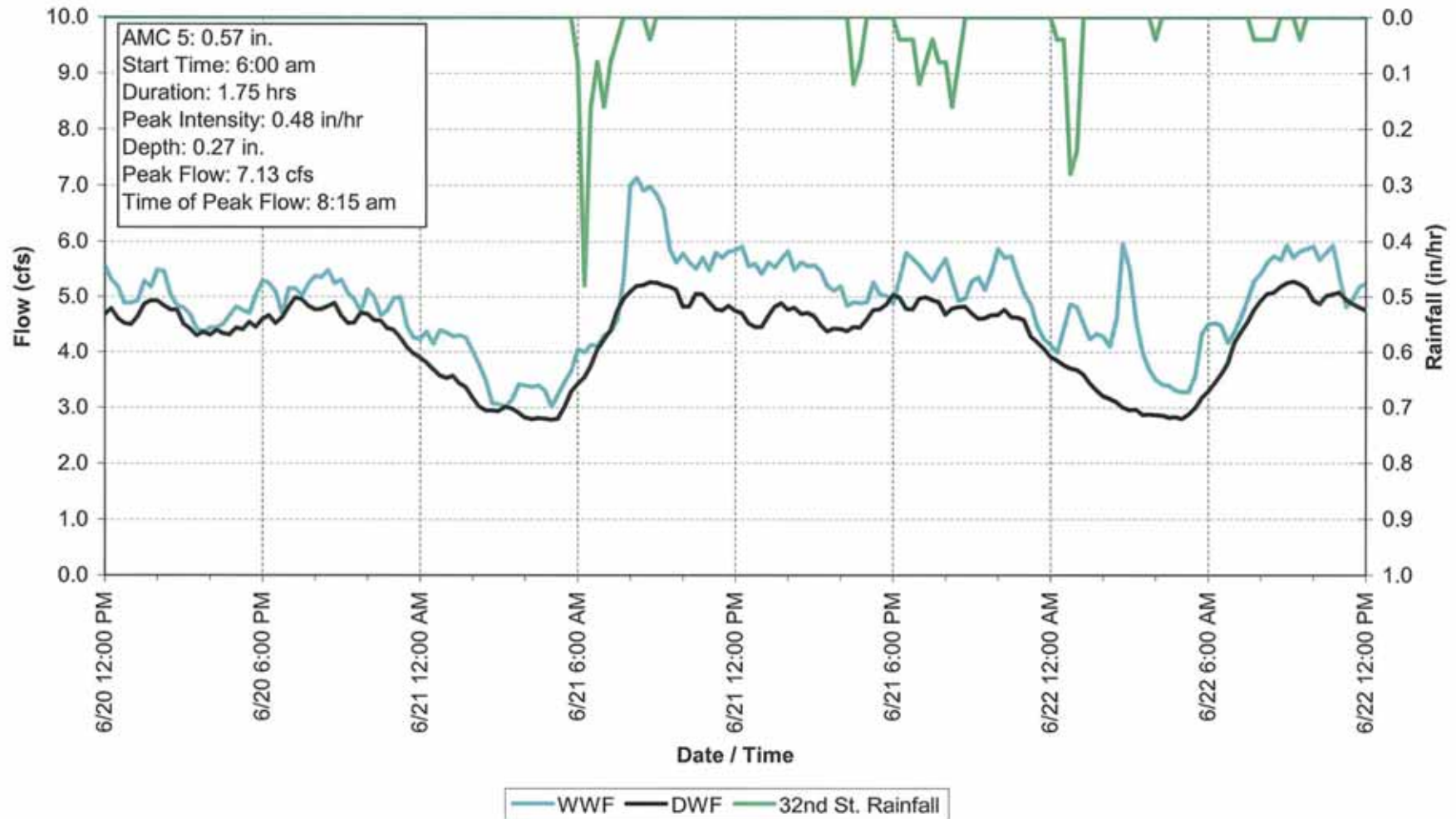
Catfish, Meter 10
Event 7: June 2, 2007; Small Depth Storm
WWF and DWF Graph



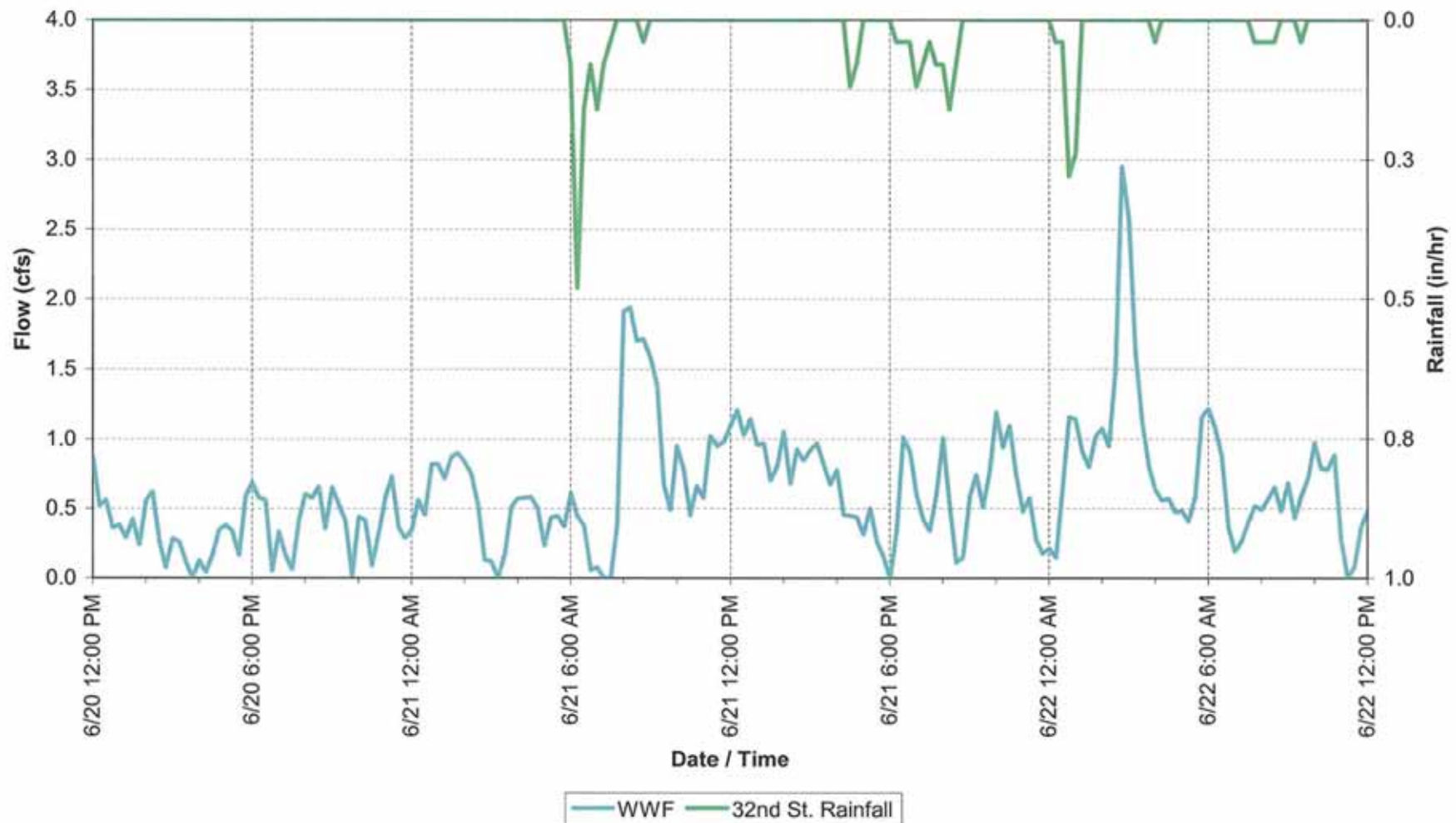
Catfish, Meter 10
Event 7: June 2, 2007; Small Depth Storm
WWF Only (DWF Subtracted Out)



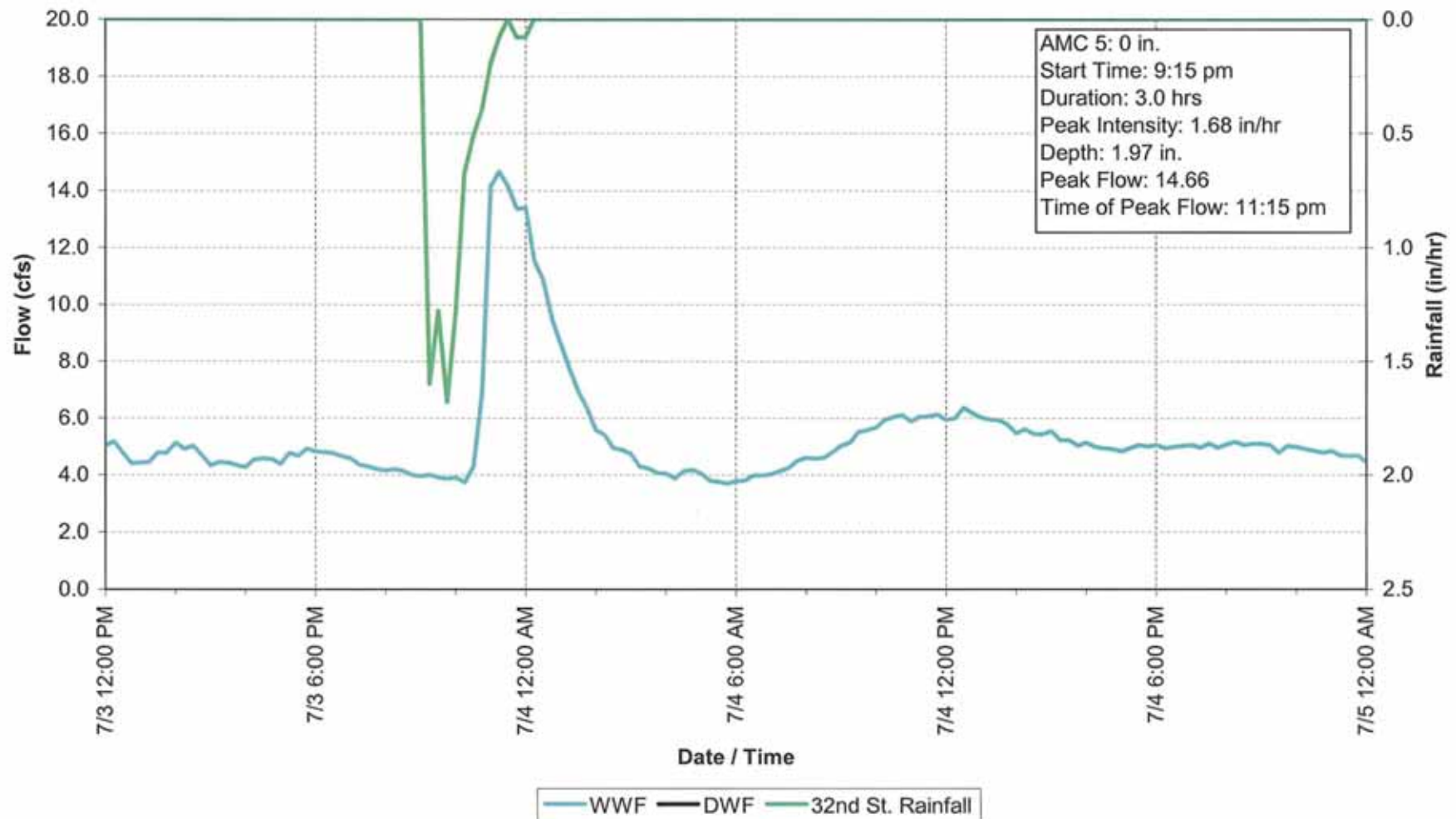
Catfish, Meter 10
Event 8: June 21, 2007; Small Depth Storm
WWF and DWF Graph



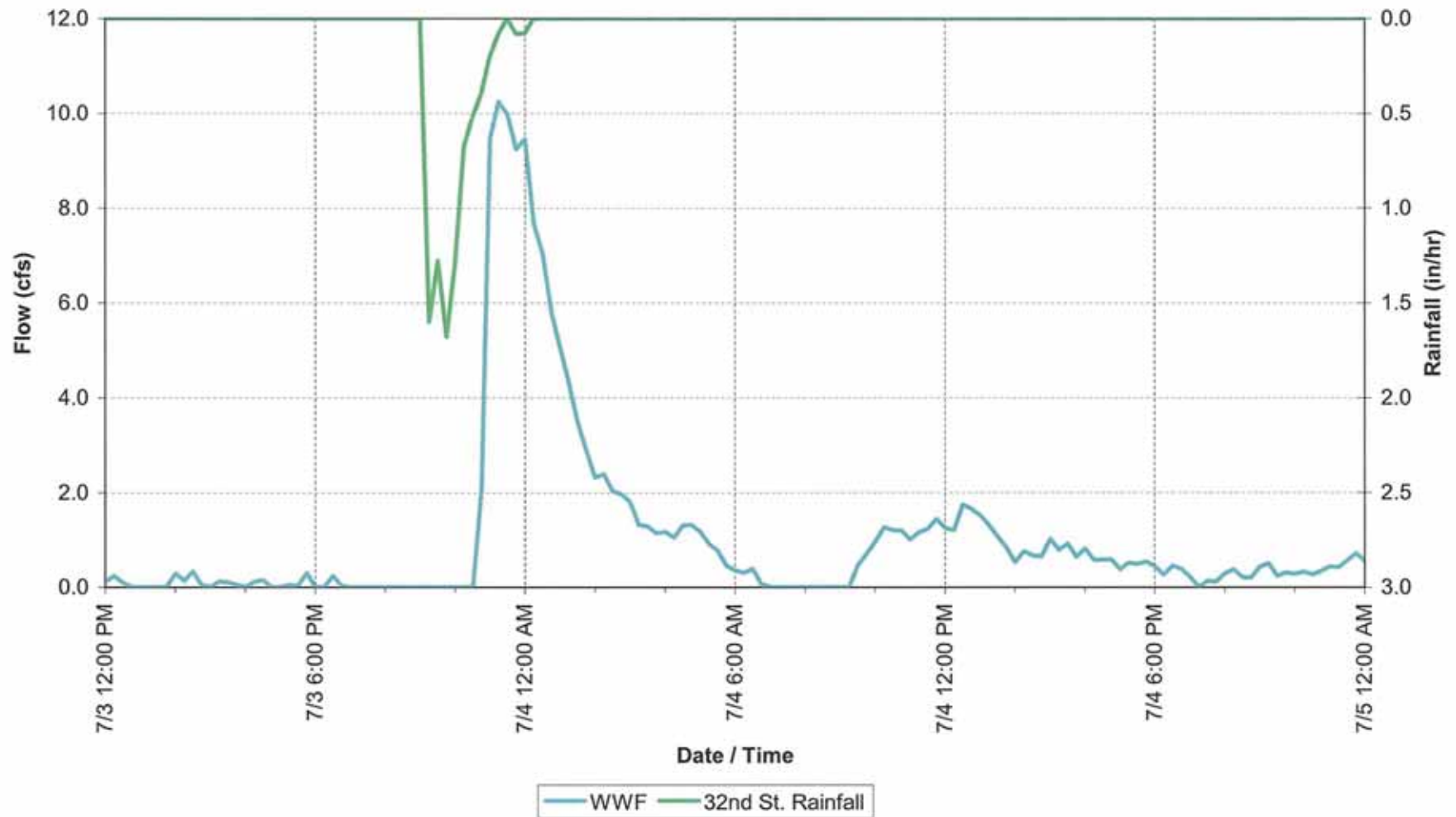
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Event 8: June 21, 2007; Small Depth Storm
WWF Only (DWF Subtracted Out)



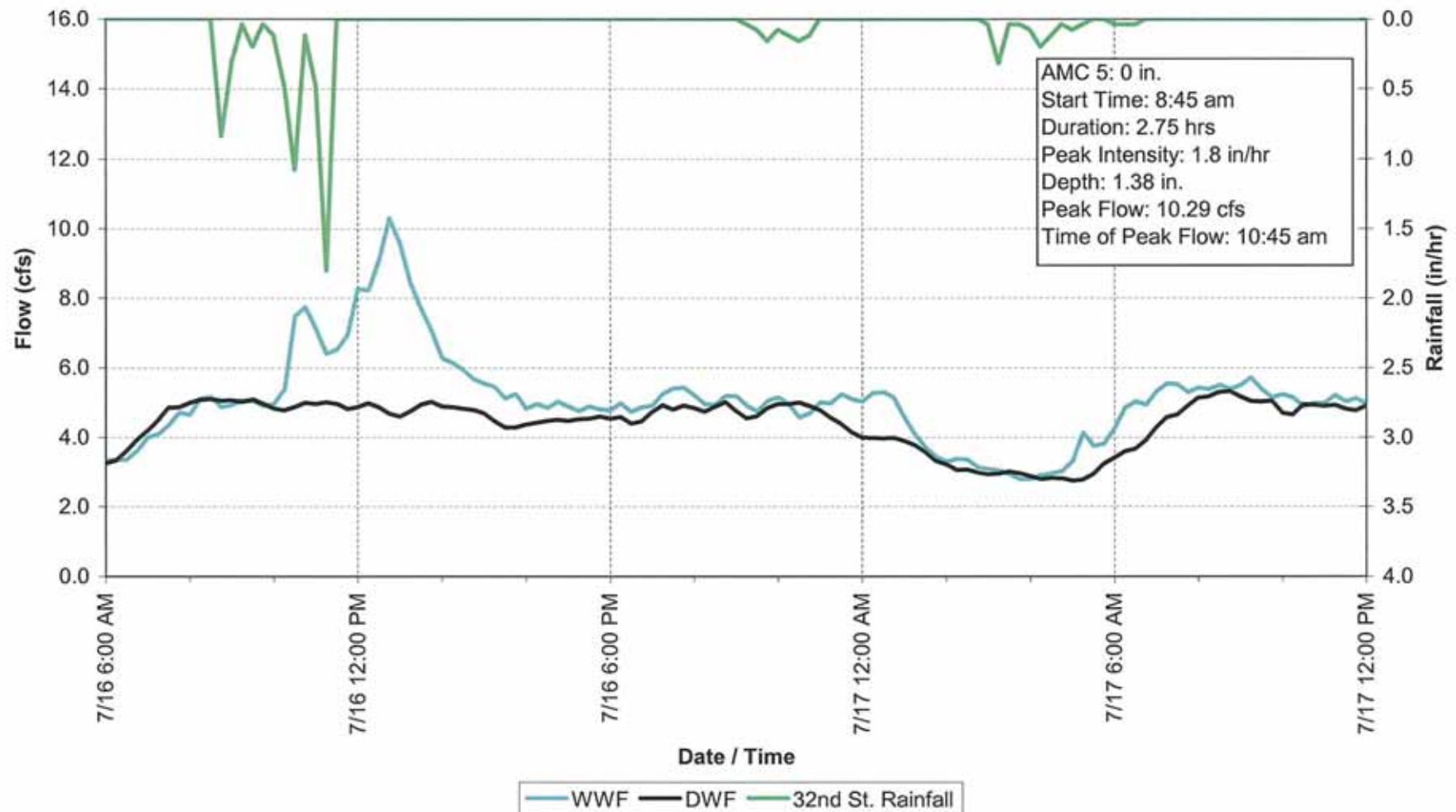
Catfish, Meter 10
Event 9: July 3, 2007; Short-Duration, High Intensity Storm
WWF and DWF Graph



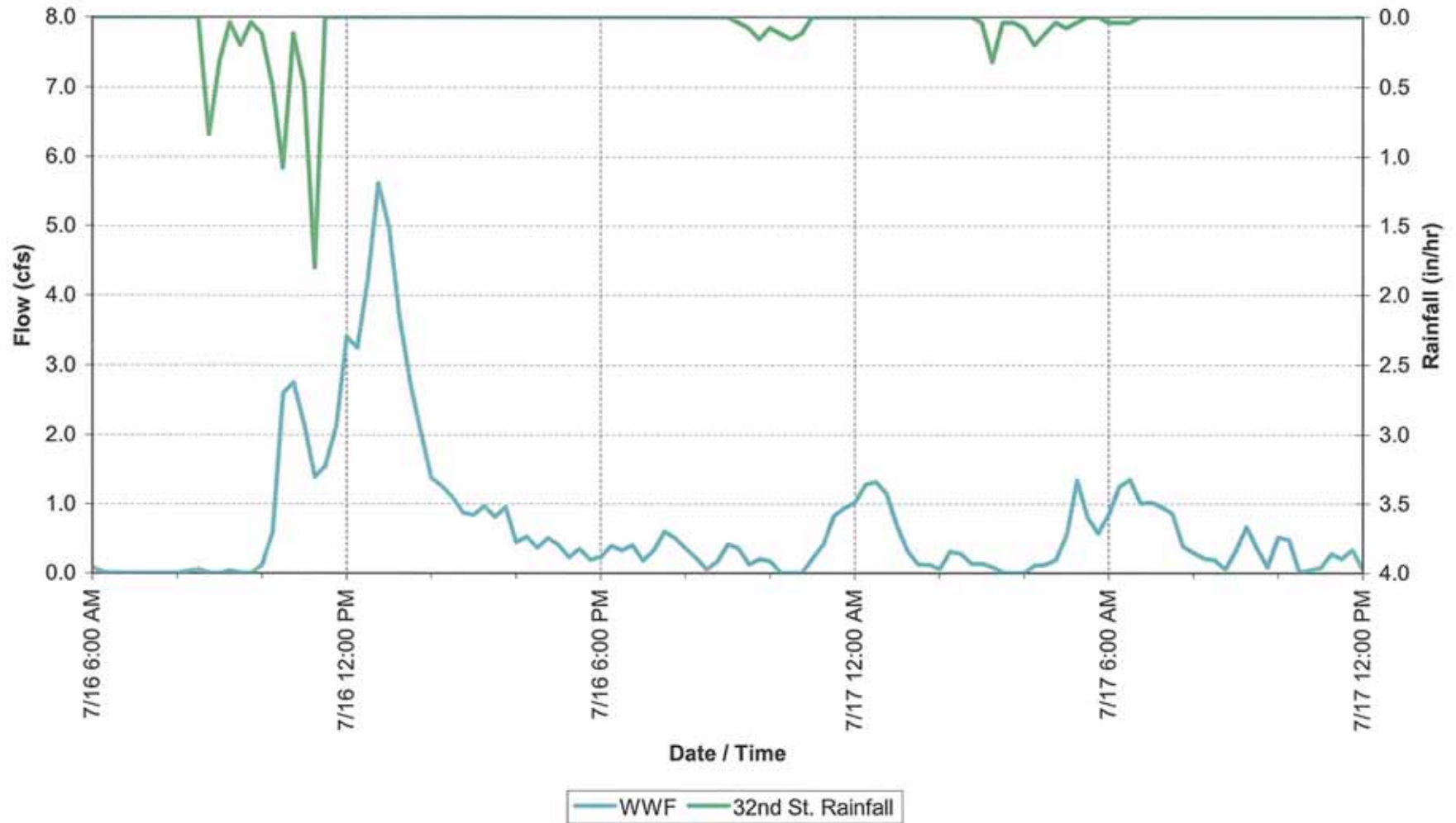
Catfish, Meter 10
Event 9: July 3, 2007; Short-Duration, High Intensity Storm
WWF Only (DWF Subtracted Out)



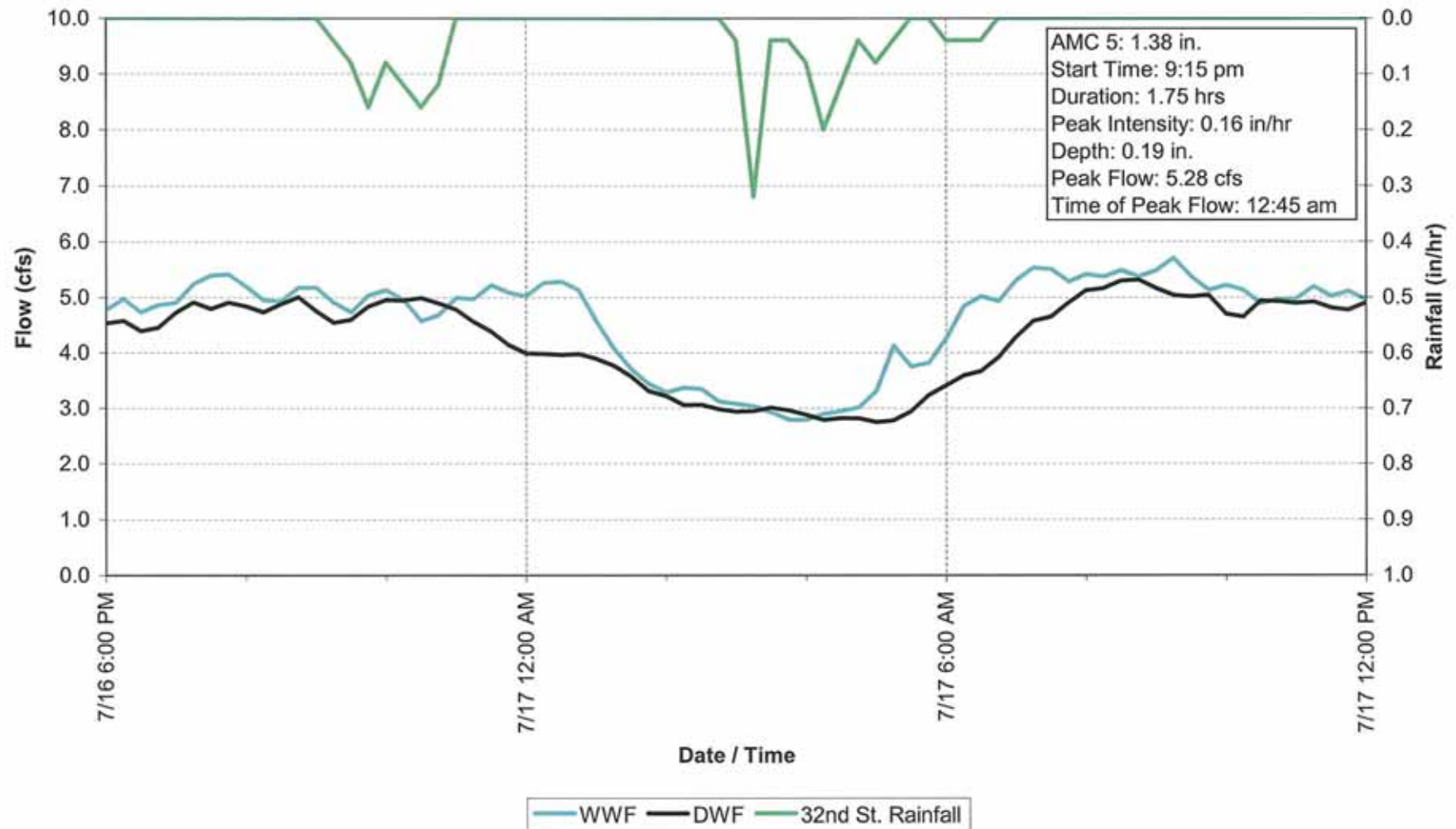
Catfish, Meter 10
Event 10: July 16, 2007; Short-Duration, High Intensity Storm
WWF and DWF Graph



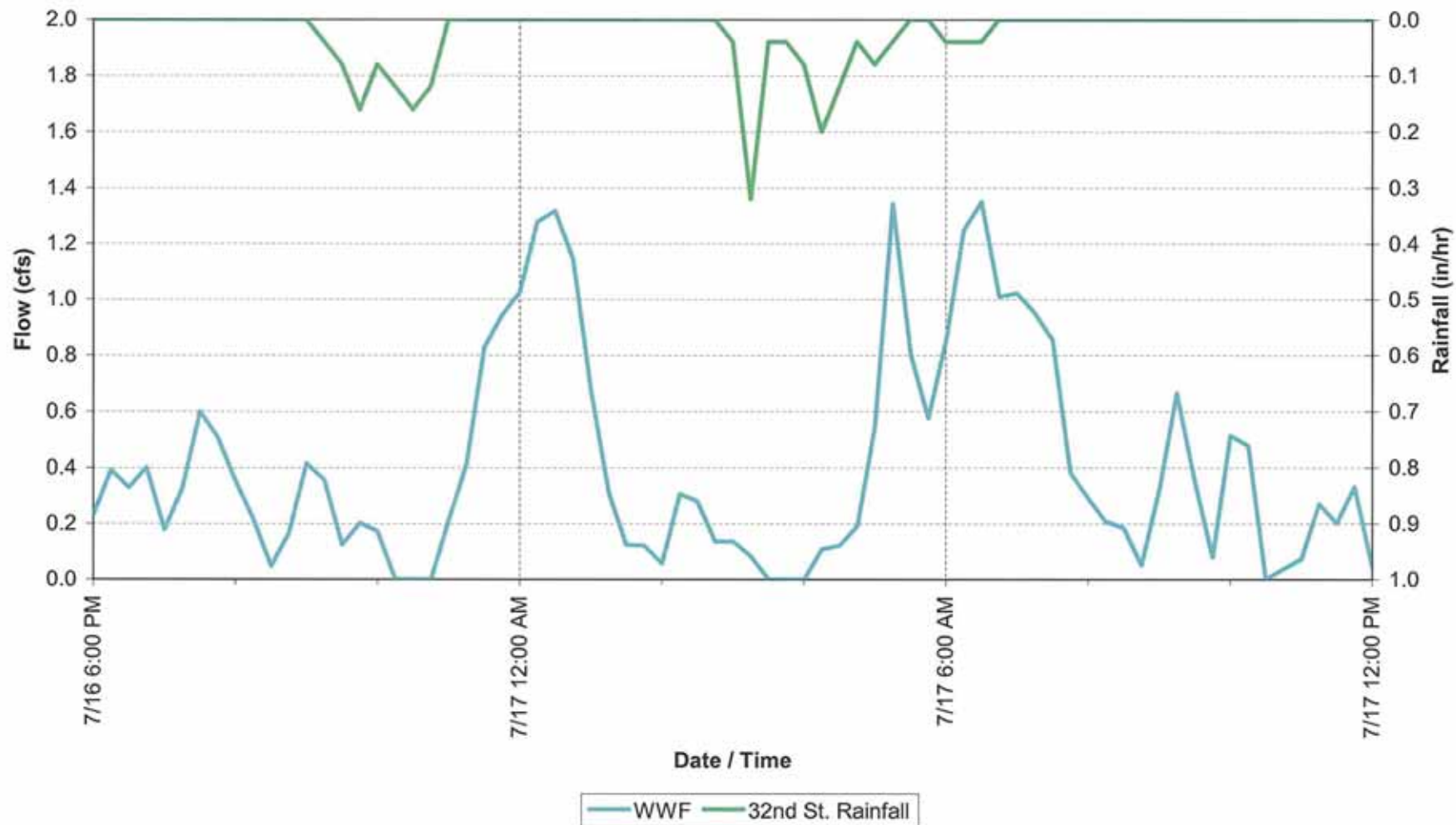
Catfish, Meter 10
Event 10: July 16, 2007; Short-Duration, High Intensity Storm
WWF Only (DWF Subtracted Out)



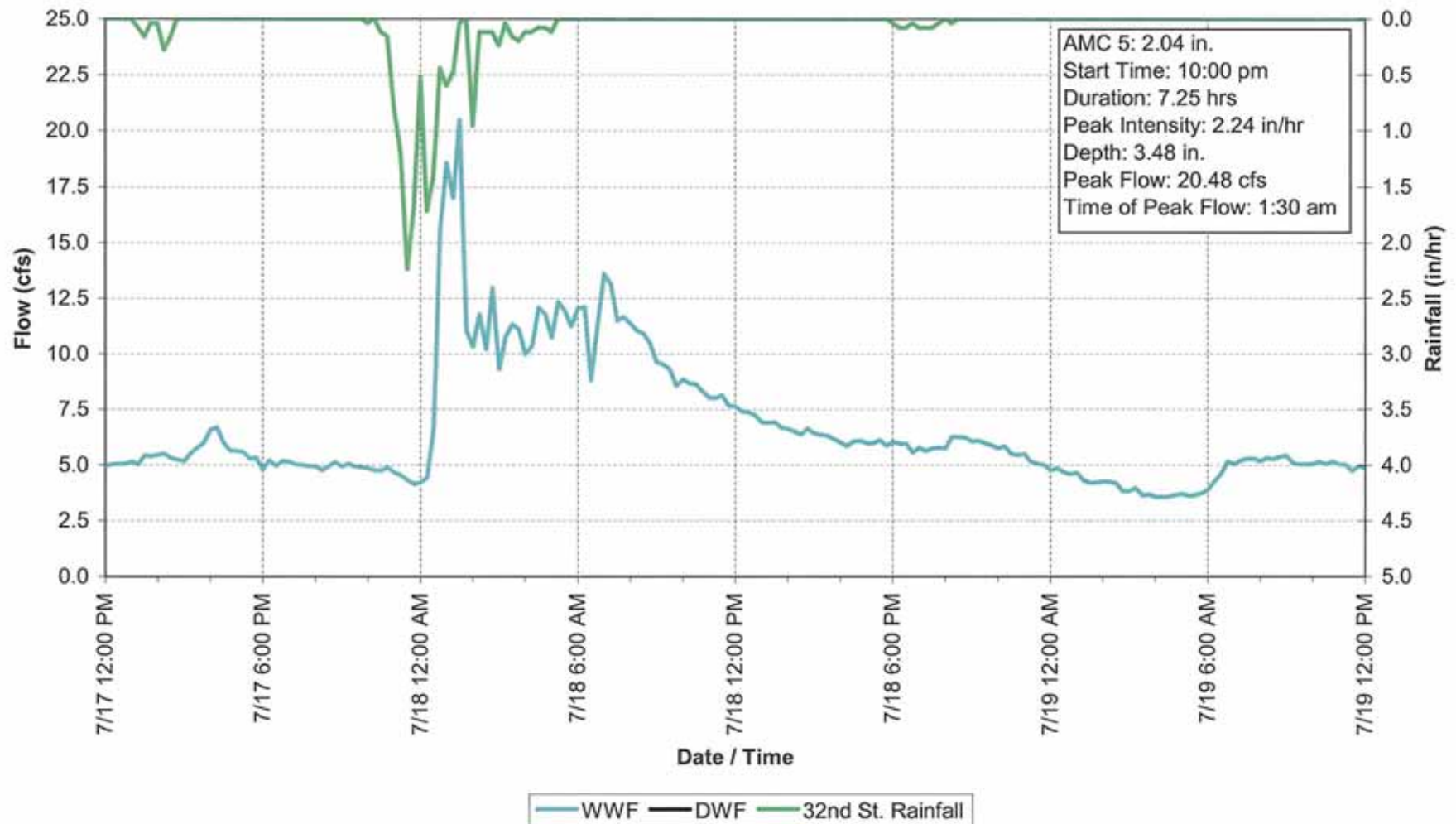
Catfish, Meter 10
Event 11: July 16, 2007; Small Depth Storm
WWF and DWF Graph



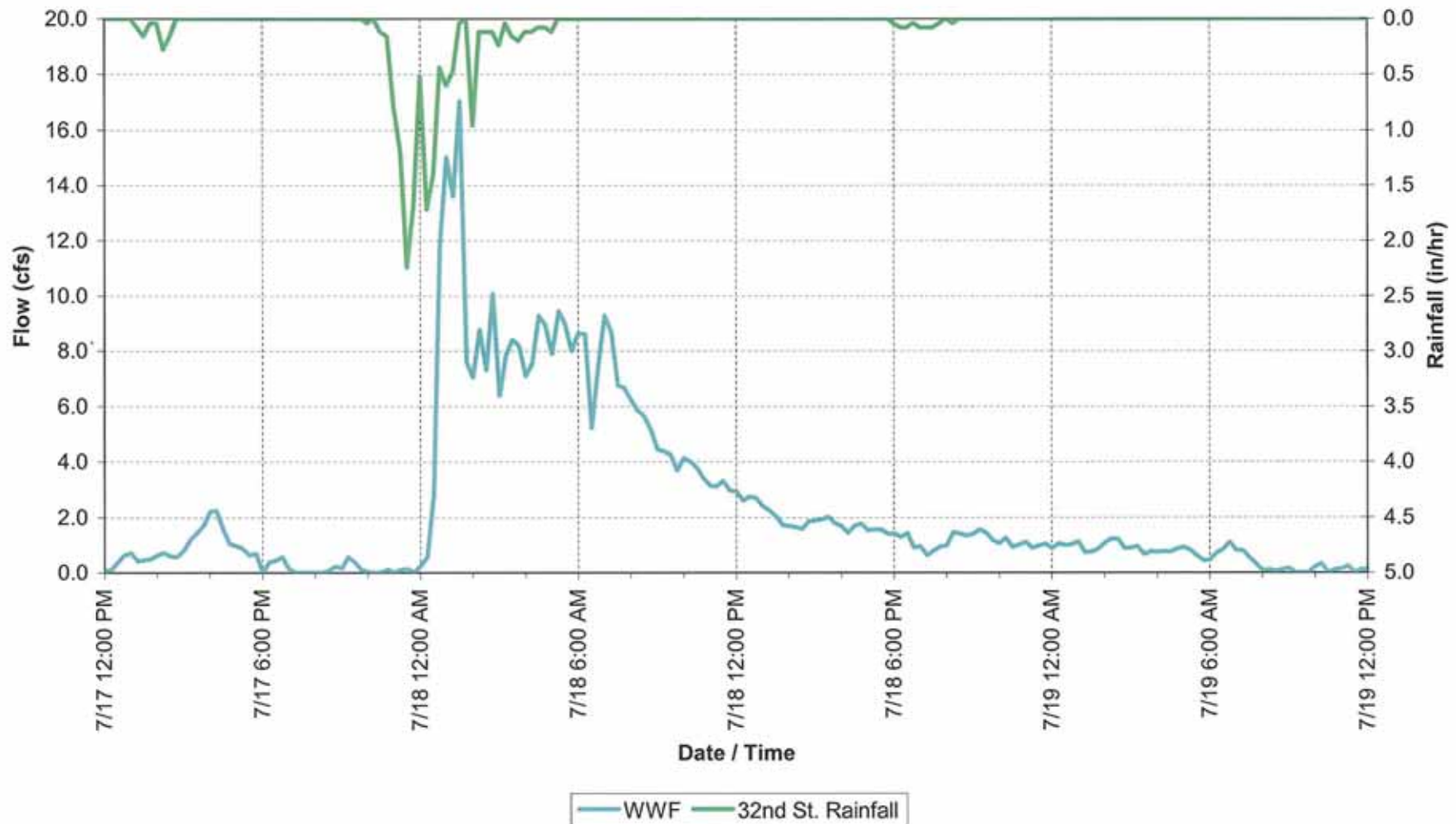
Catfish, Meter 10
Event 11: July 16, 2007; Small Depth Storm
WWF Only (DWF Subtracted Out)



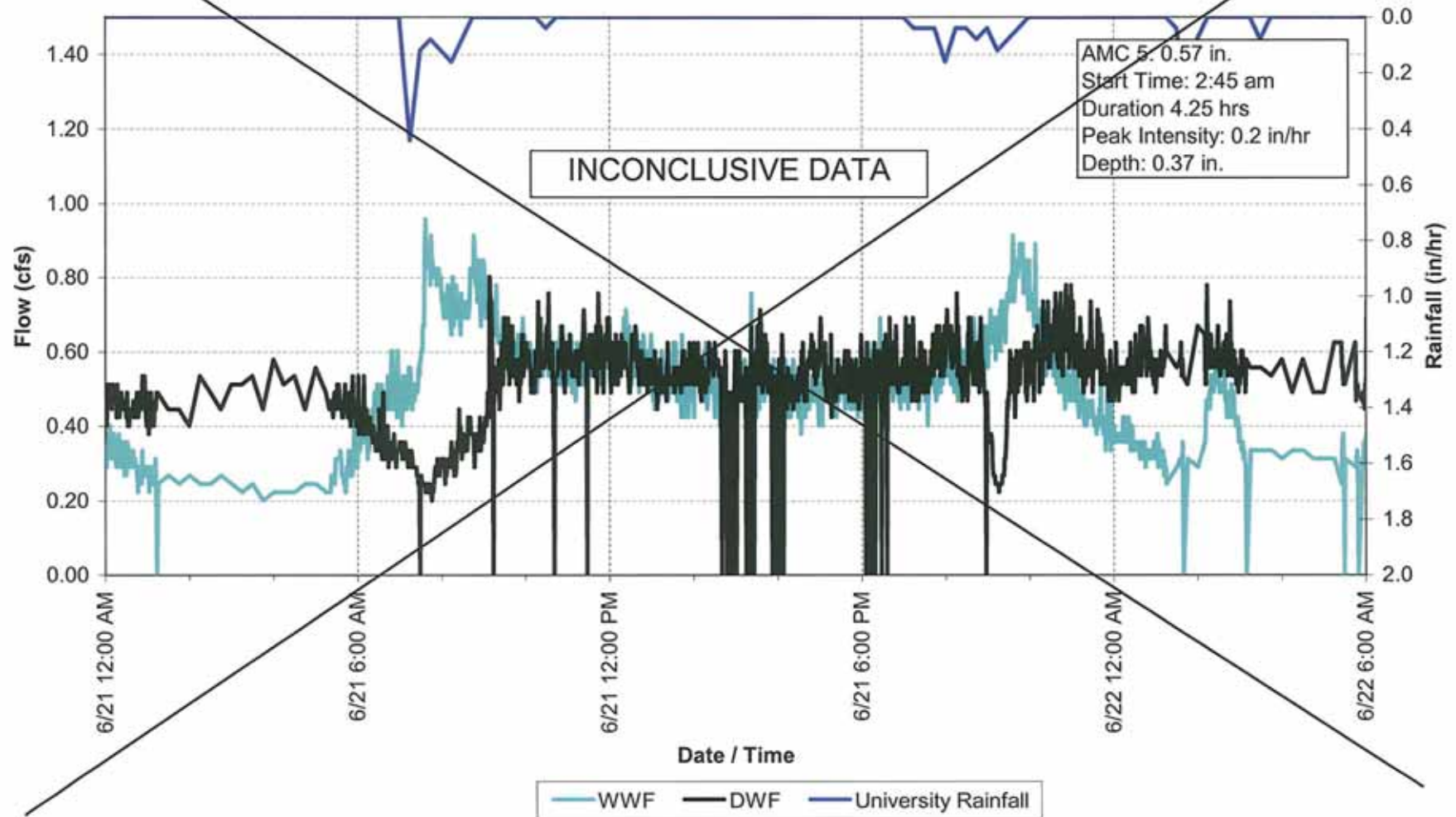
Catfish, Meter 10
Event 12: July 17 - 18, 2007; Short-Duration, High Intensity Storm
WWF and DWF Graph



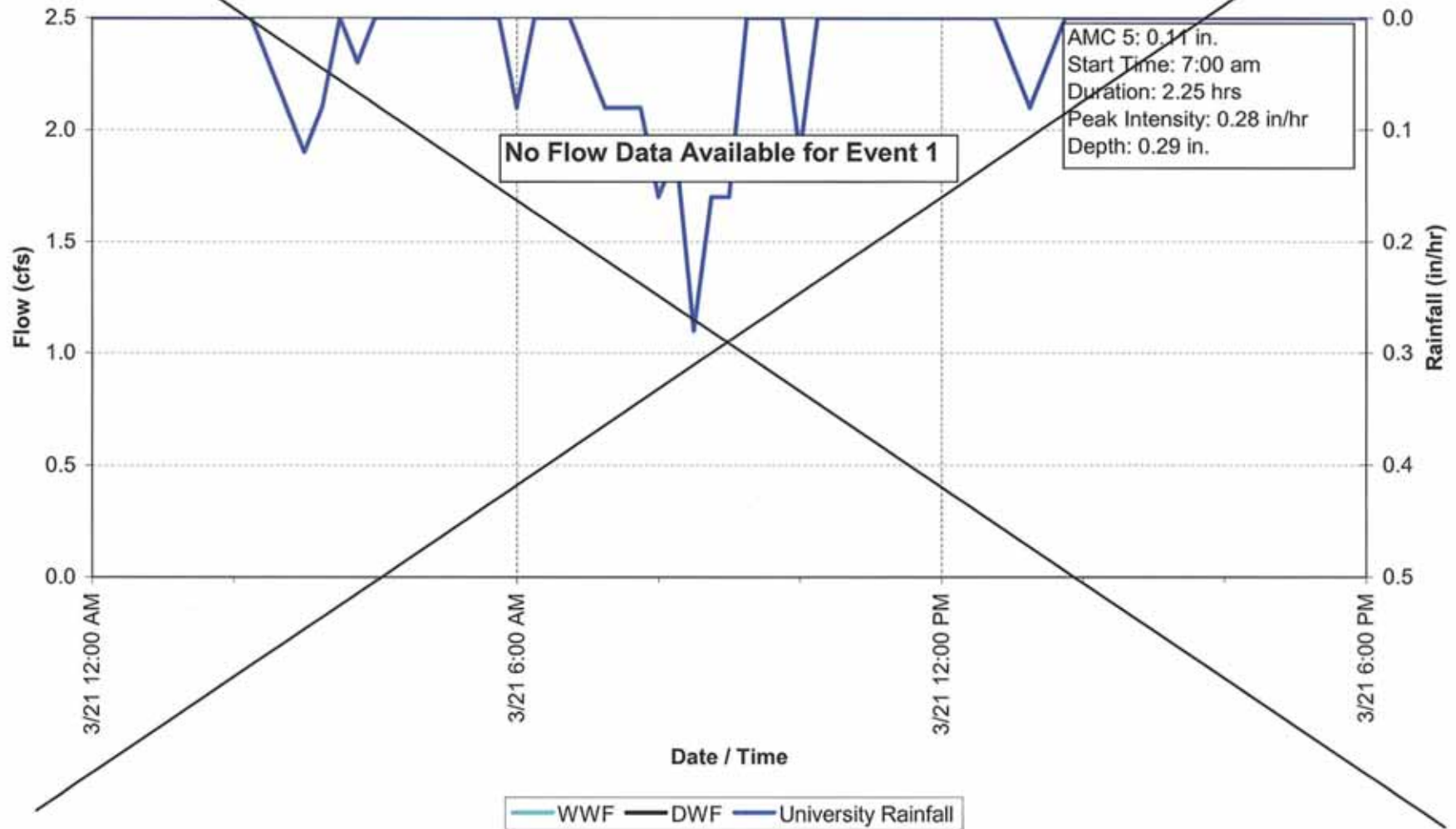
Catfish, Meter 10
Event 12: July 17 - 18, 2007; Short-Duration, High Intensity Storm
WWF Only (DWF Subtracted Out)



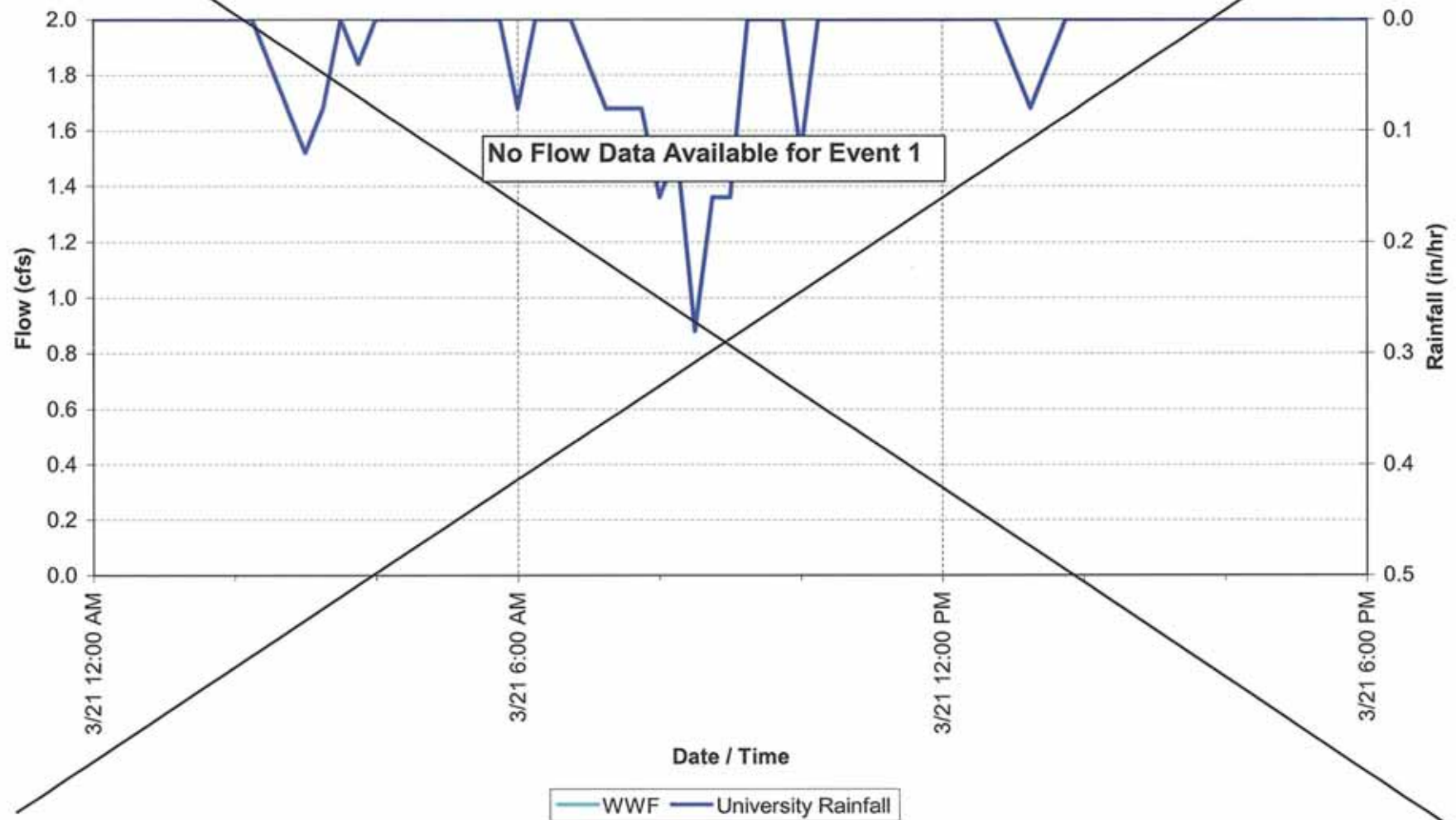
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Event 8: June 21, 2007; Small Depth Storm
WWF and DWF Graph



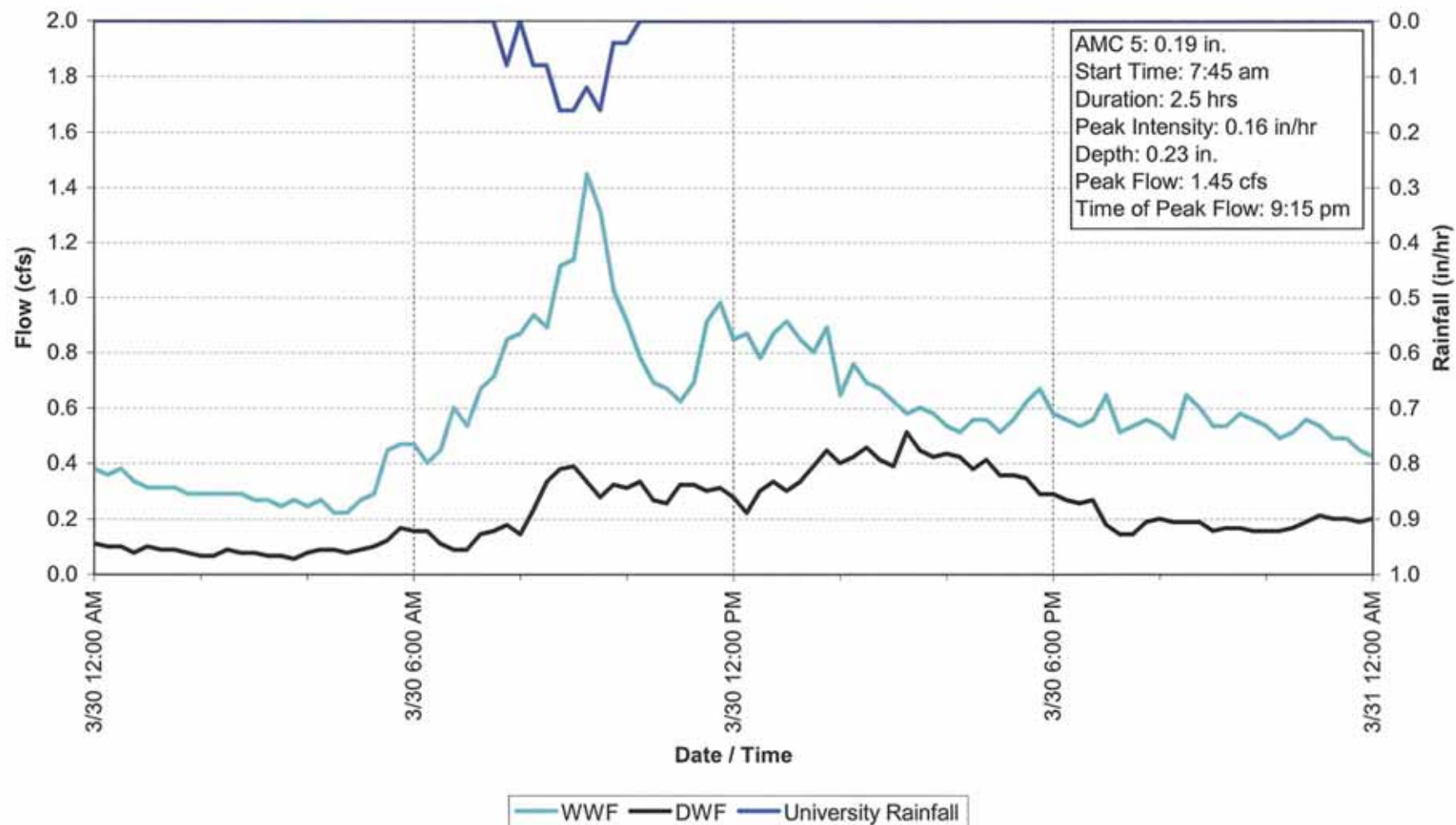
1st Street, Meter 12
Event 1: March 21, 2007; Small Depth Storm
WWF and DWF Graph



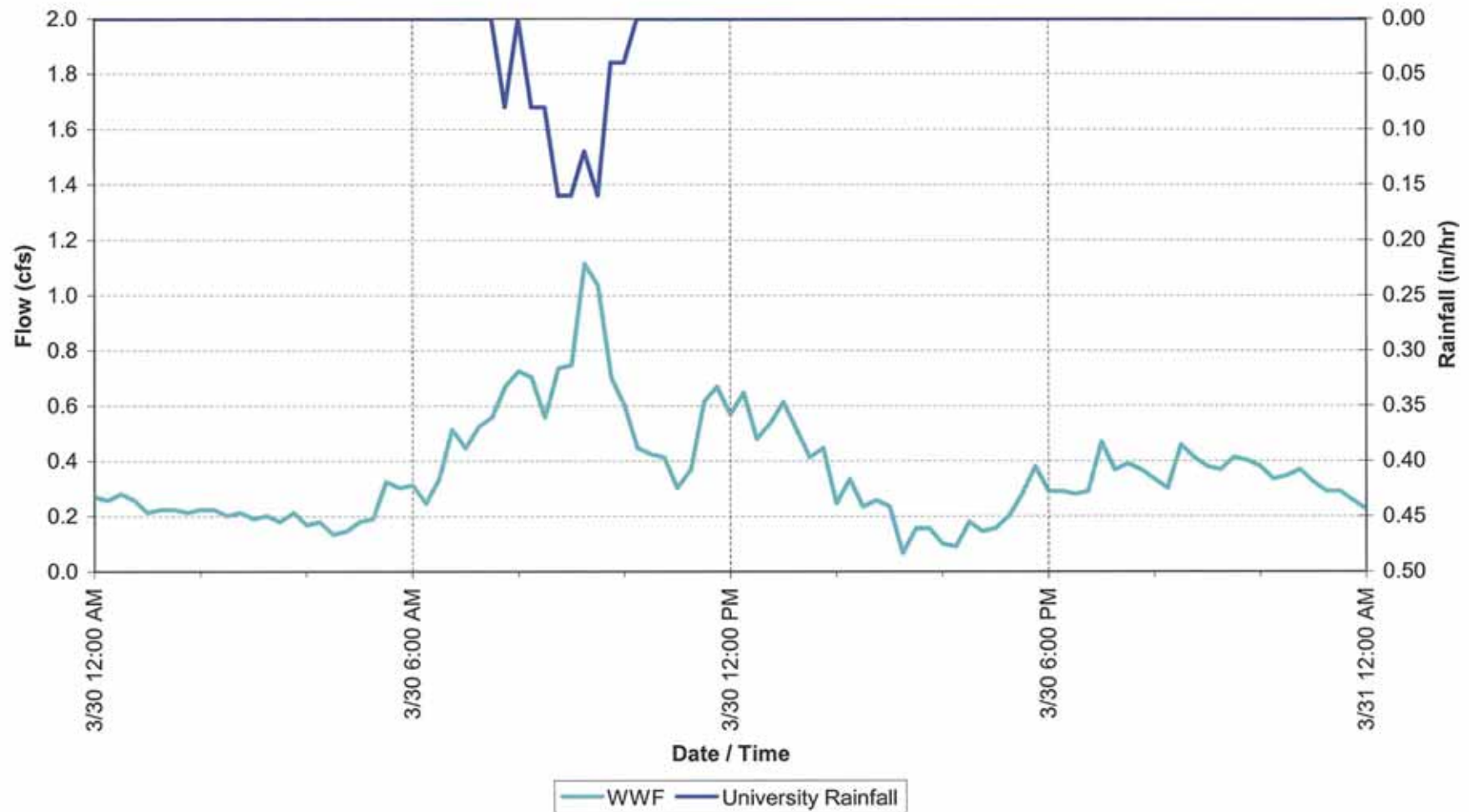
1st Street, Meter 12
Event 1: March 21, 2007; Small Depth Storm
WWF Only (DWF Subtracted Out)



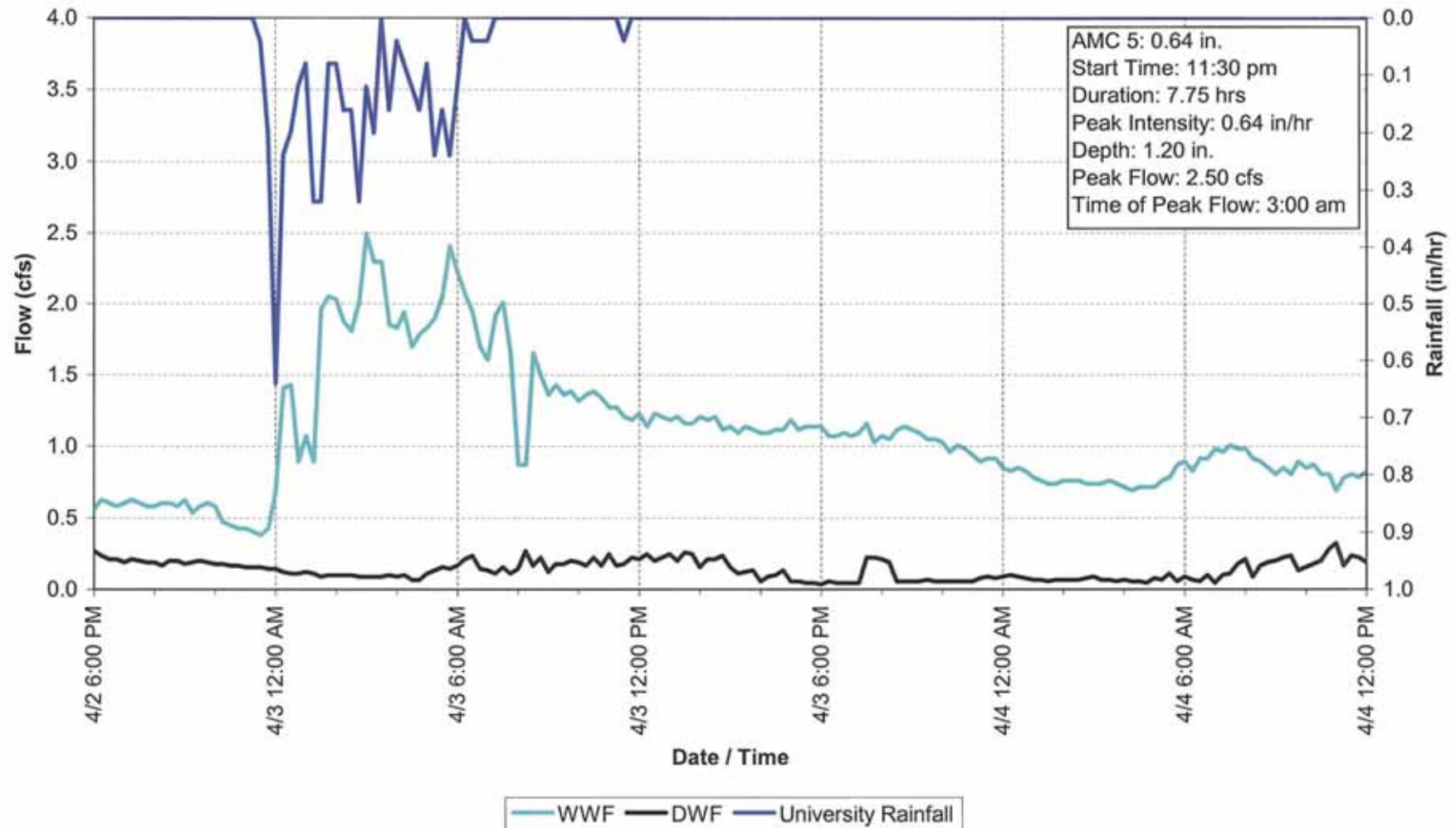
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Event 2: March 30, 2007; Small Depth Storm
WWF and DWF Graph



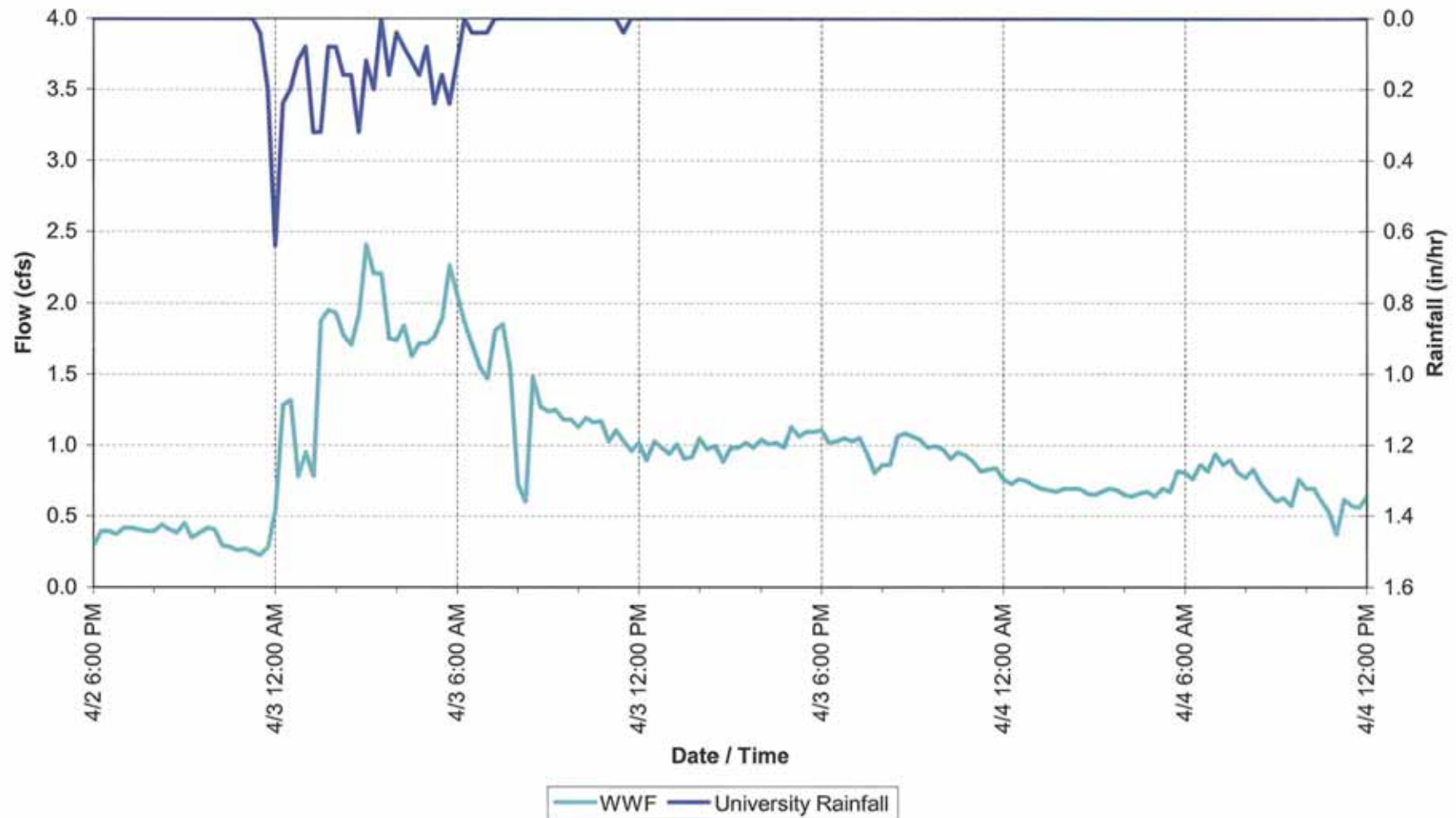
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WWF Only (DWF Subtracted Out)



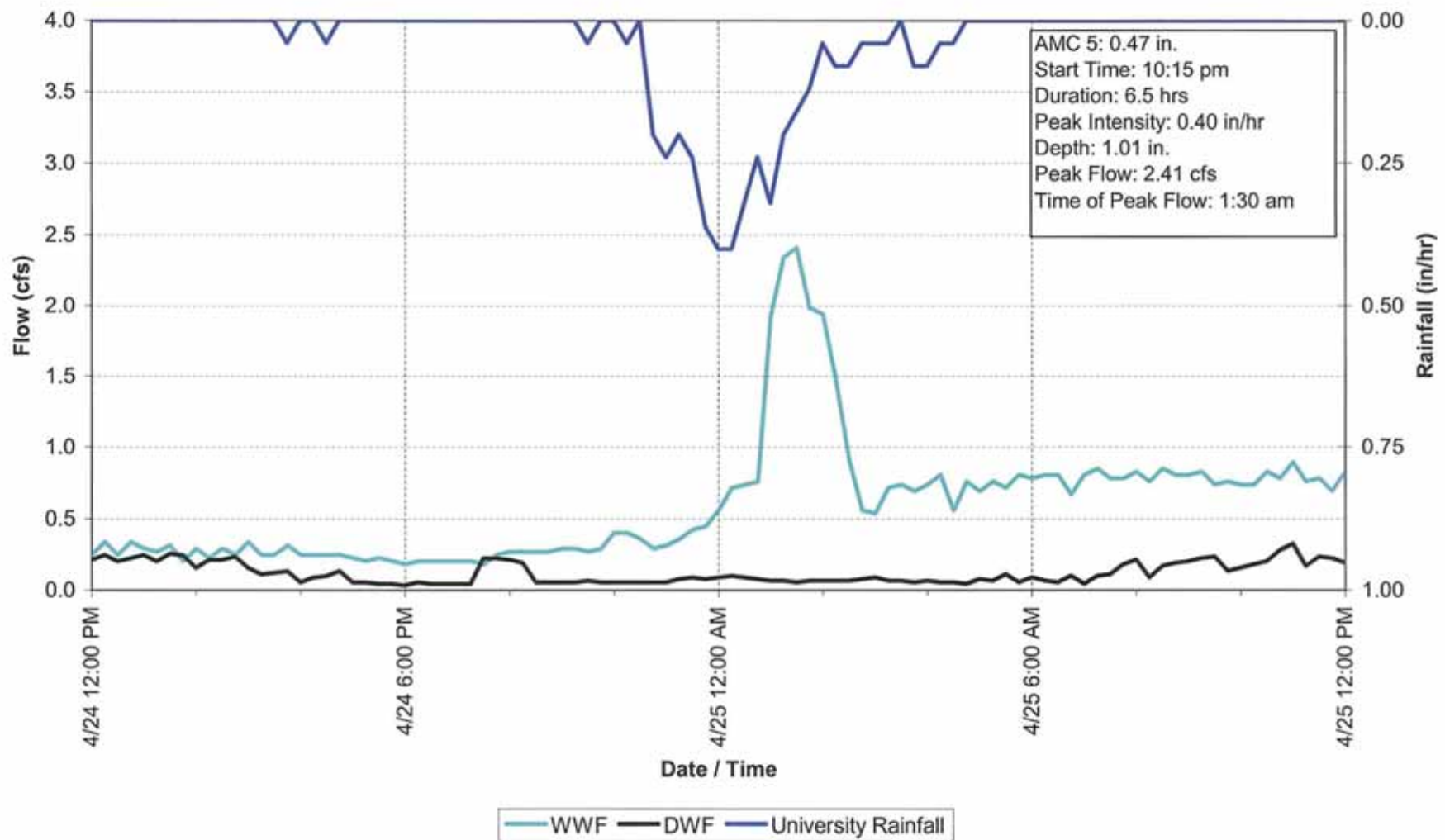
1st Street, Meter 12
Event 3: April 3, 2007; Long-Duration, Low Intensity Storm
WWF and DWF Graph



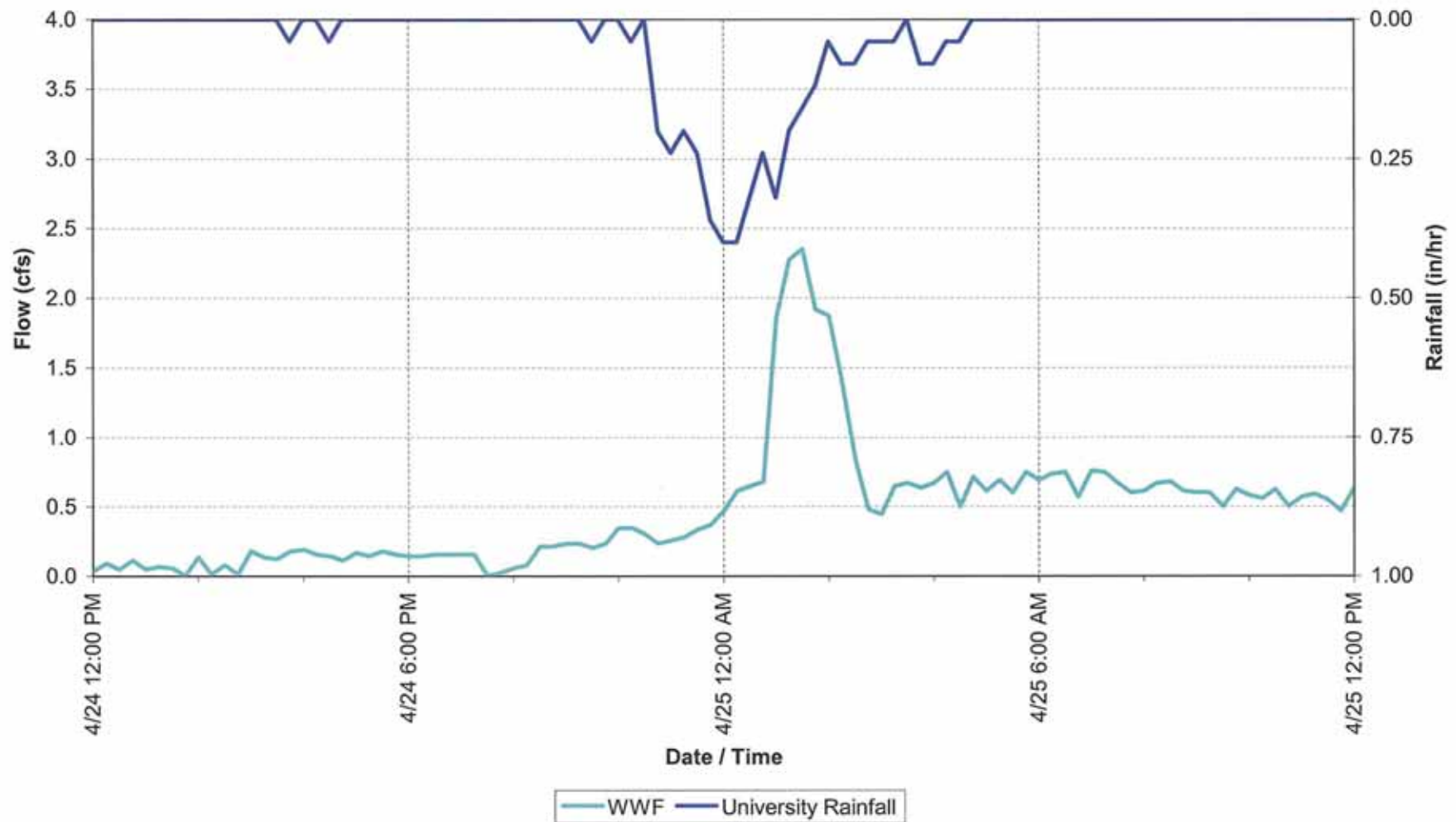
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Event 3: April 3, 2007; Long-Duration, Low Intensity Storm
WWF Only (DWF Subtracted Out)



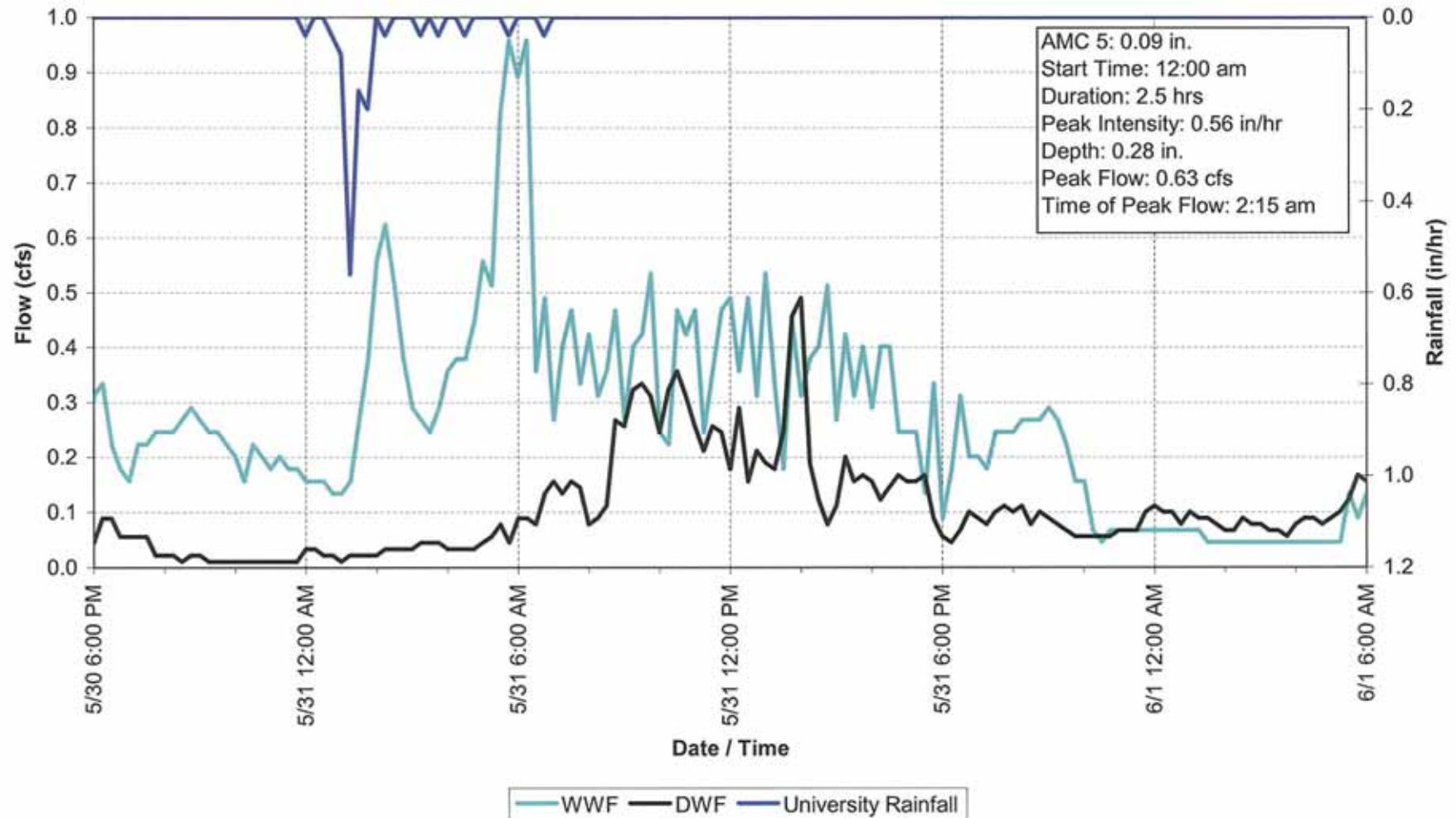
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Event 4: April 24, 2007; Long-Duration, Low Intensity Storm
WWF and DWF Graph



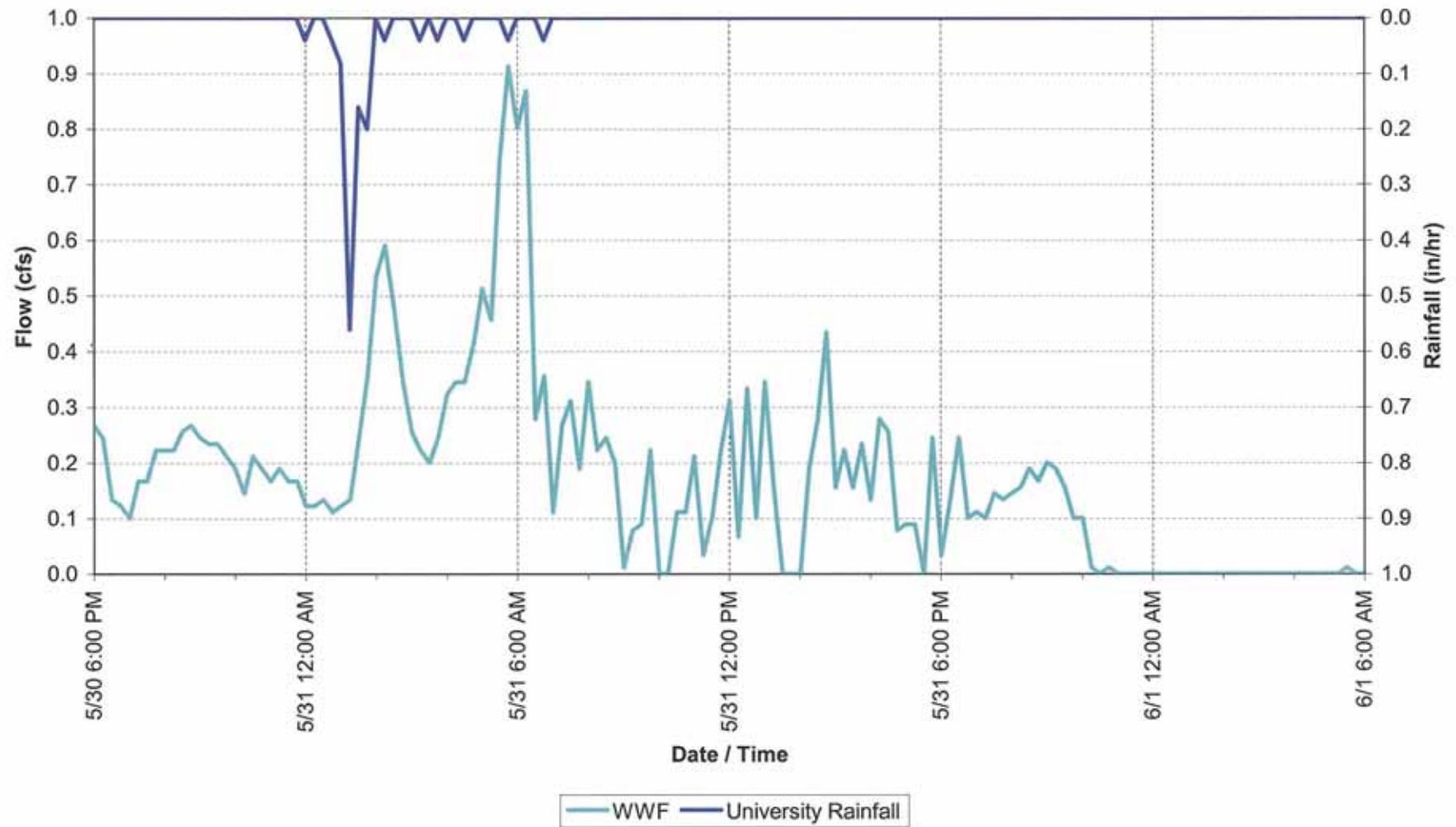
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Event 4: April 24, 2007; Long-Duration, Low Intensity Storm
WWF Only (DWF Subtracted Out)



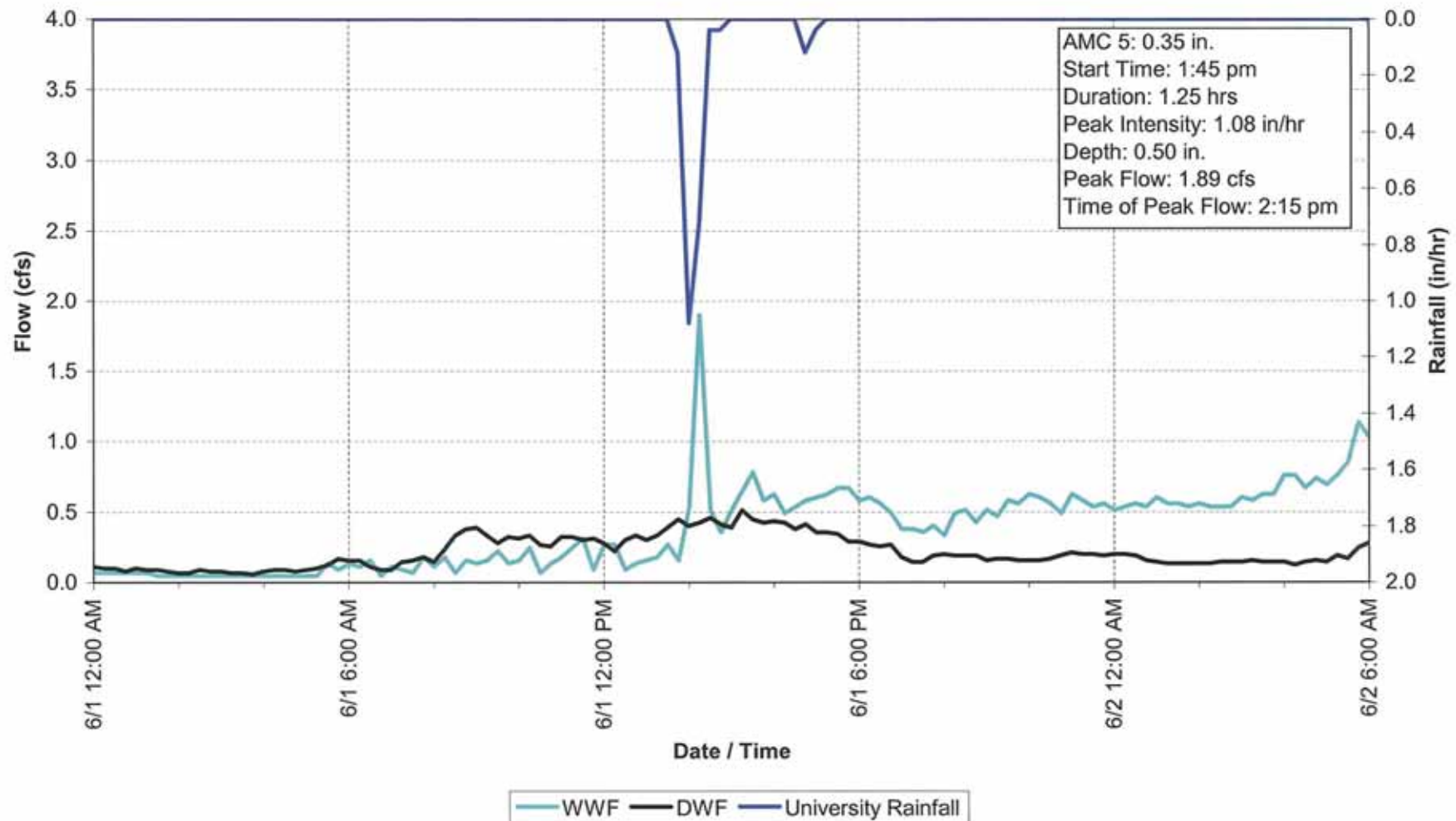
1st Street, Meter 12
Event 5: May 31, 2007; Small Depth Storm
WWF and DWF Graph



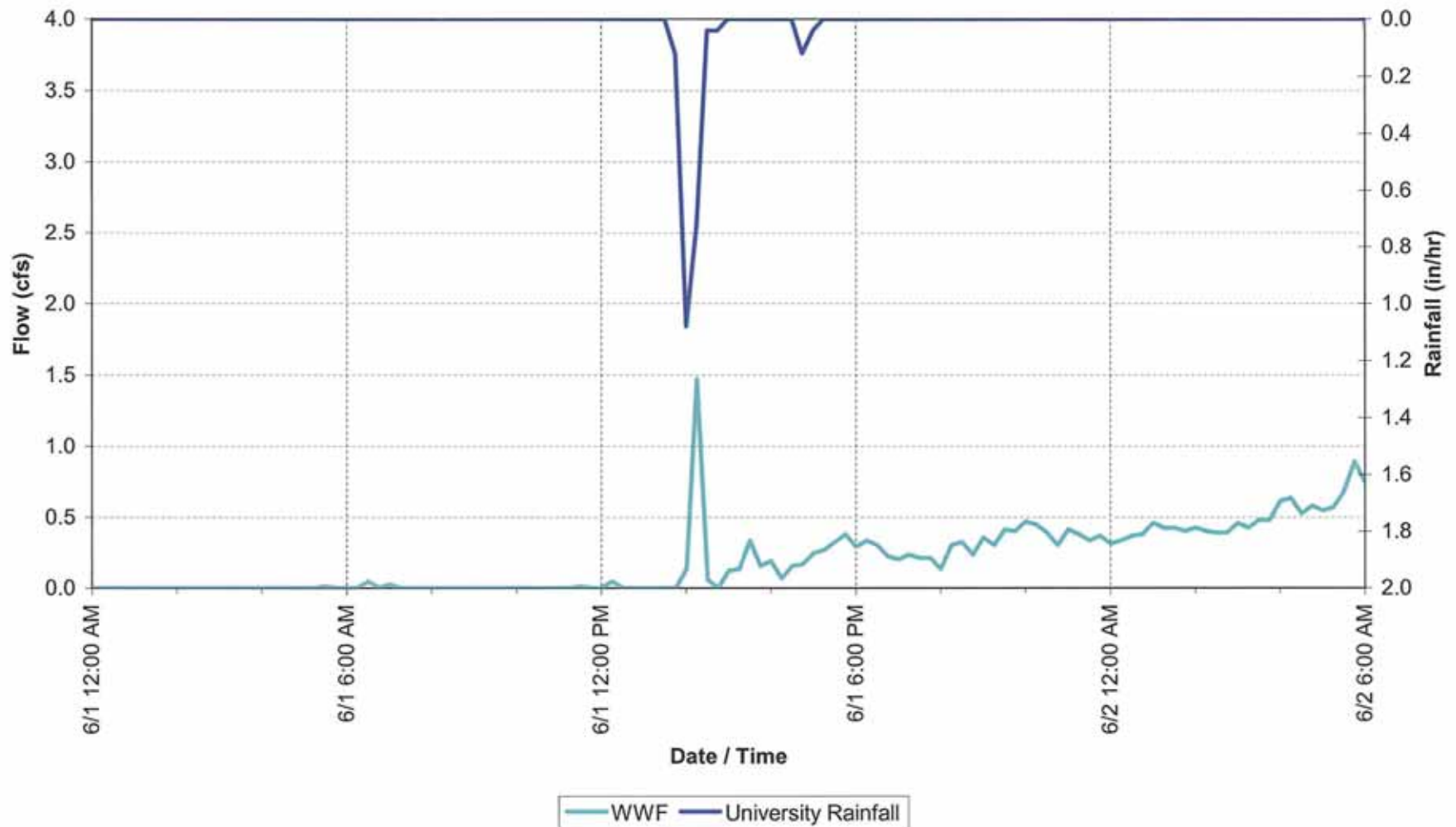
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Event 5: May 31, 2007; Small Depth Storm
WWF Only (DWF Subtracted Out)



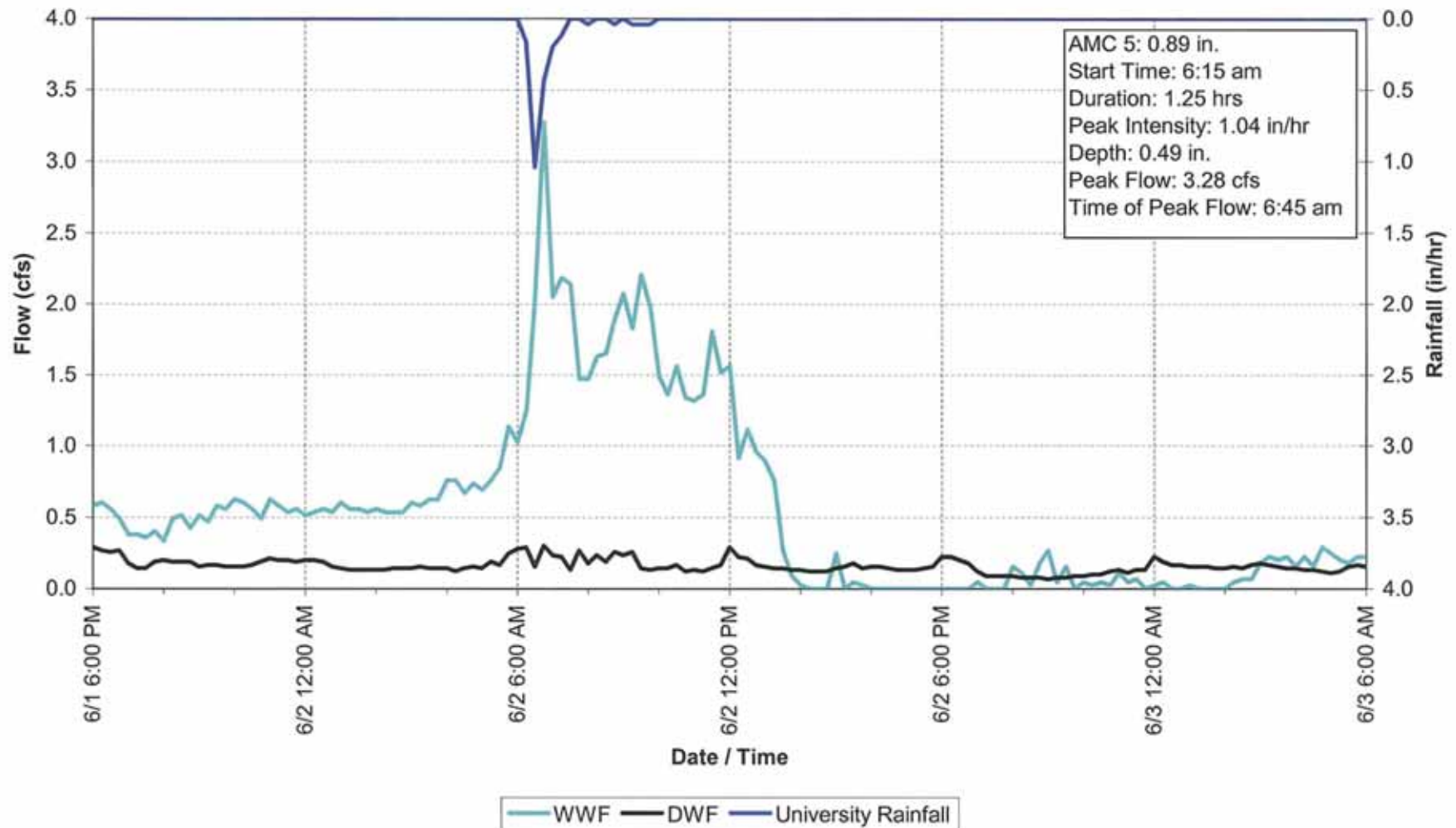
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Event 6: June 1, 2007; Short-Duration, High Intensity Storm
WWF and DWF Graph



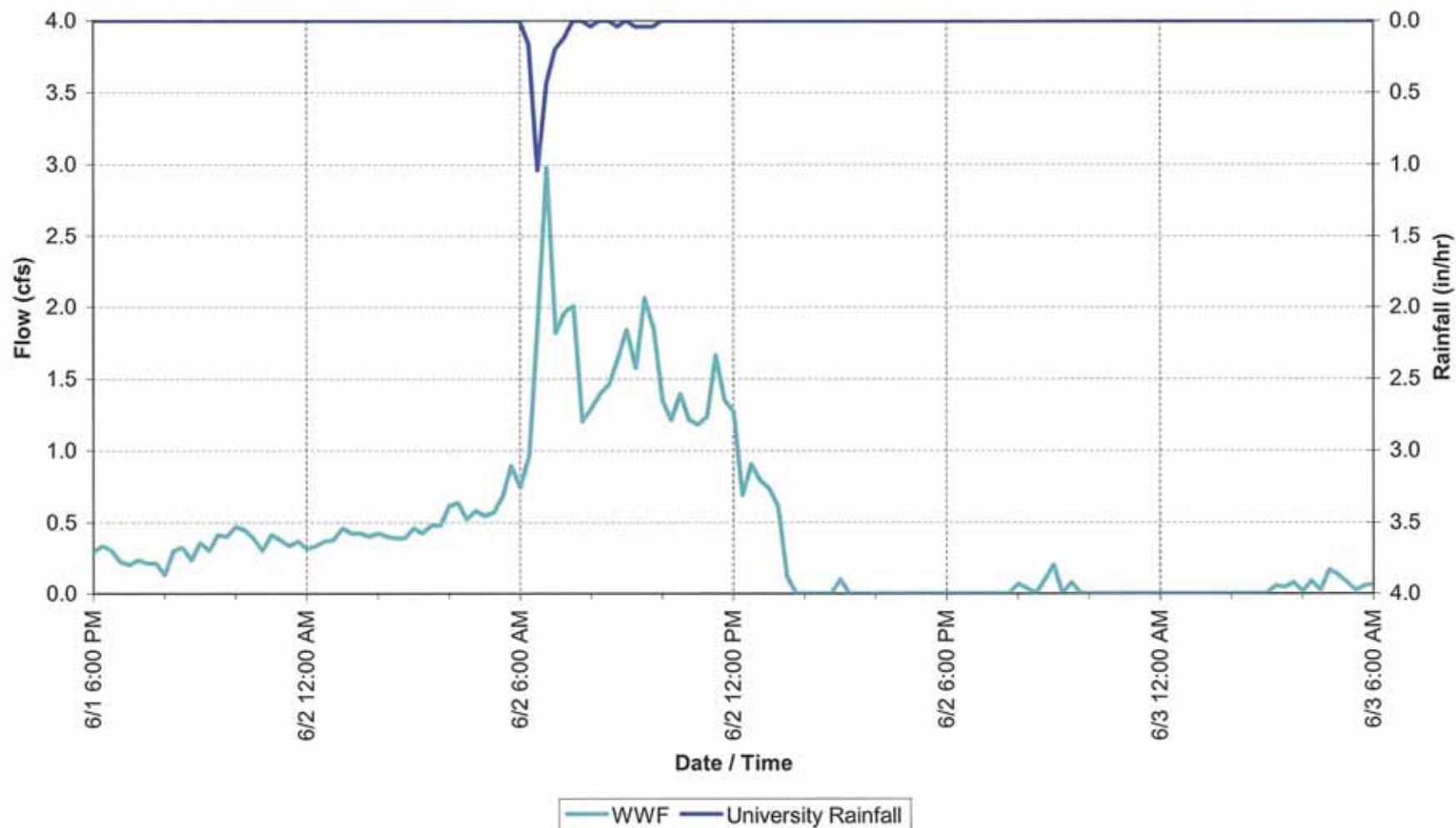
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Event 6: June 1, 2007; Short-Duration, High Intensity Storm
WWF Only (DWF Subtracted Out)



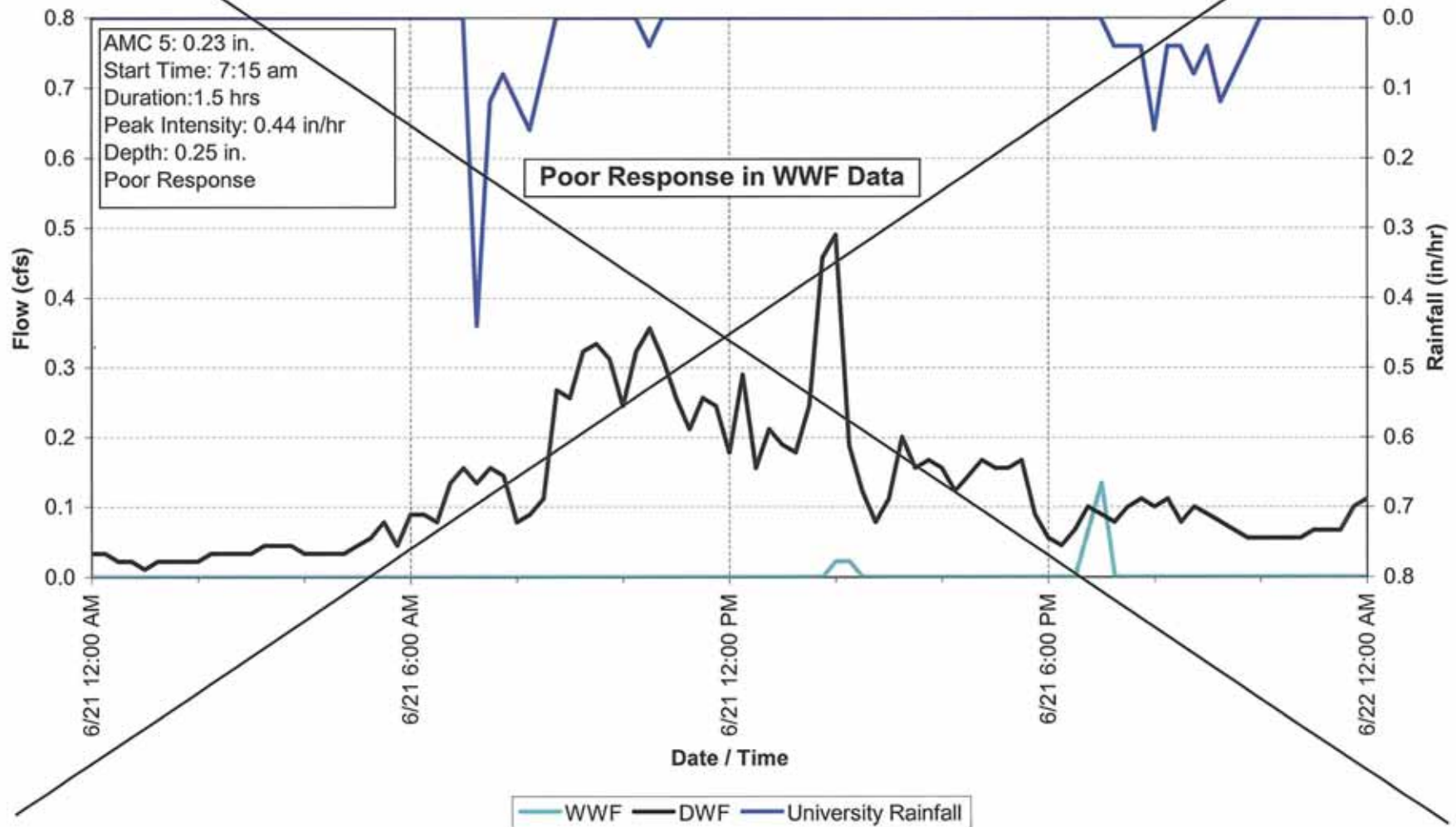
1st Street, Meter 12
Event 7: June 2, 2007; Short-Duration, High Intensity Storm
WWF and DWF Graph



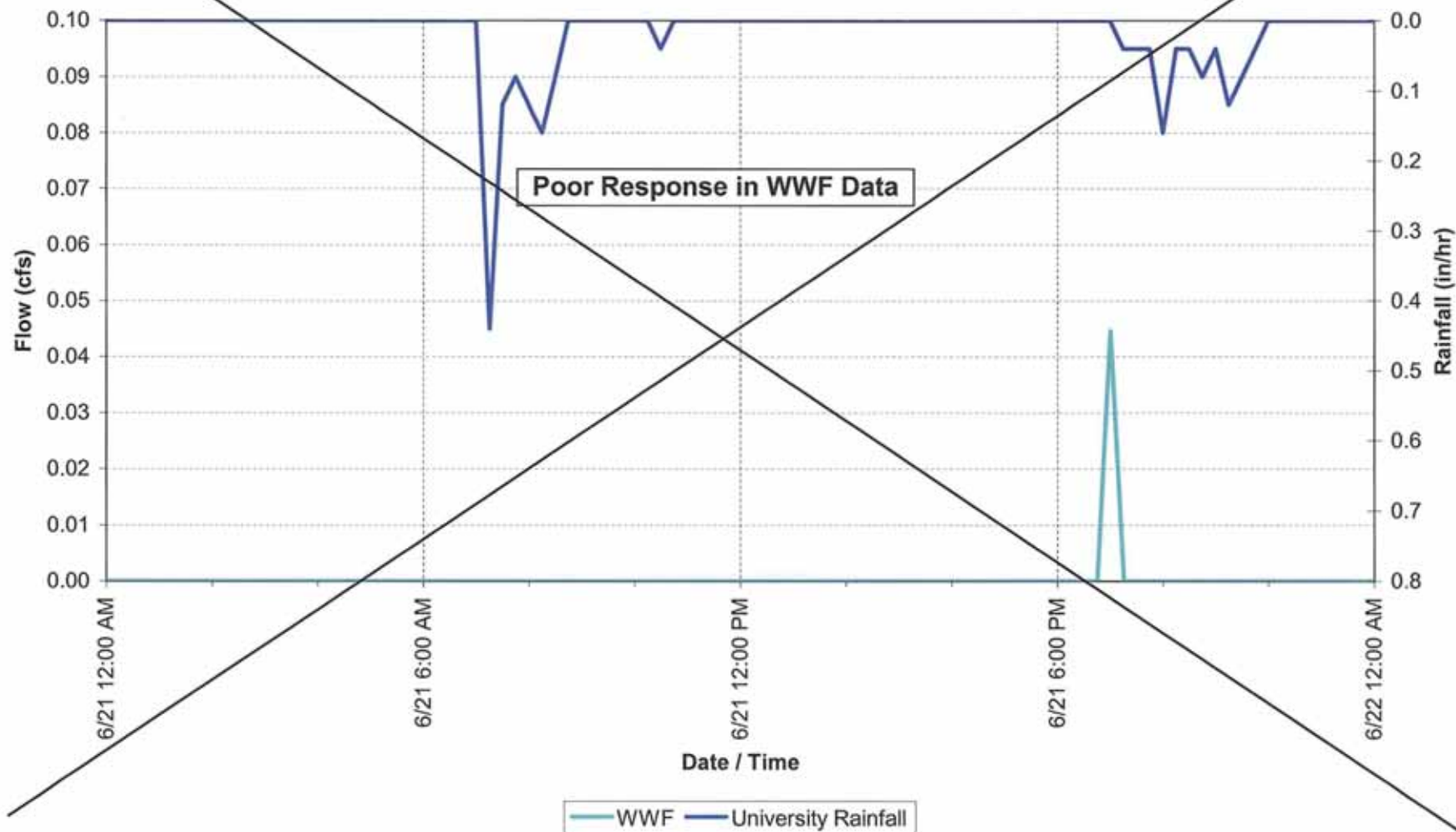
1st Street, Meter 12
Event 7: June 2, 2007; Short-Duration, High Intensity Storm
WWF Only (DWF Subtracted Out)



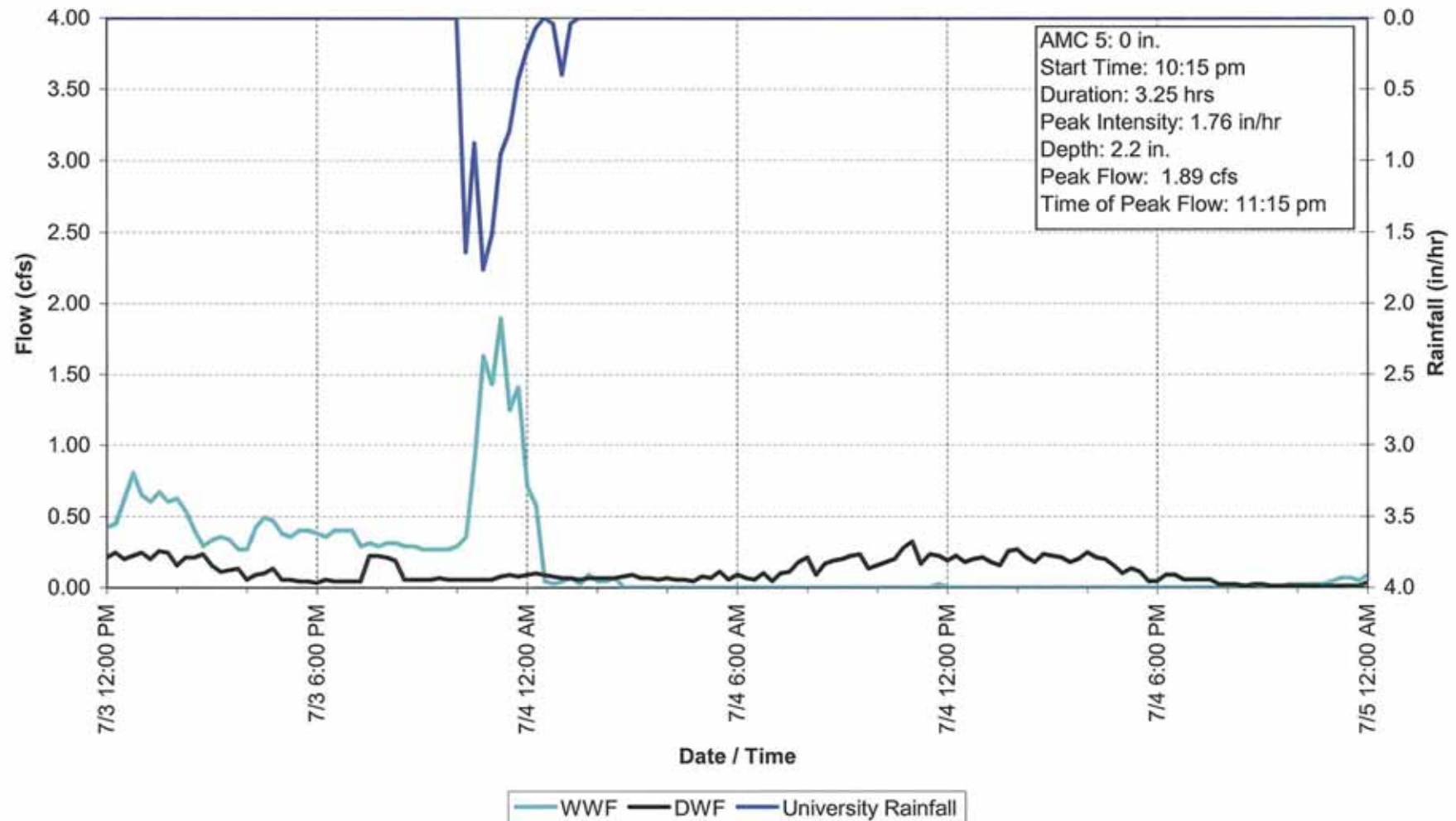
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Event 8: June 21, 2007; Small Depth Storm
WWF and DWF Graph



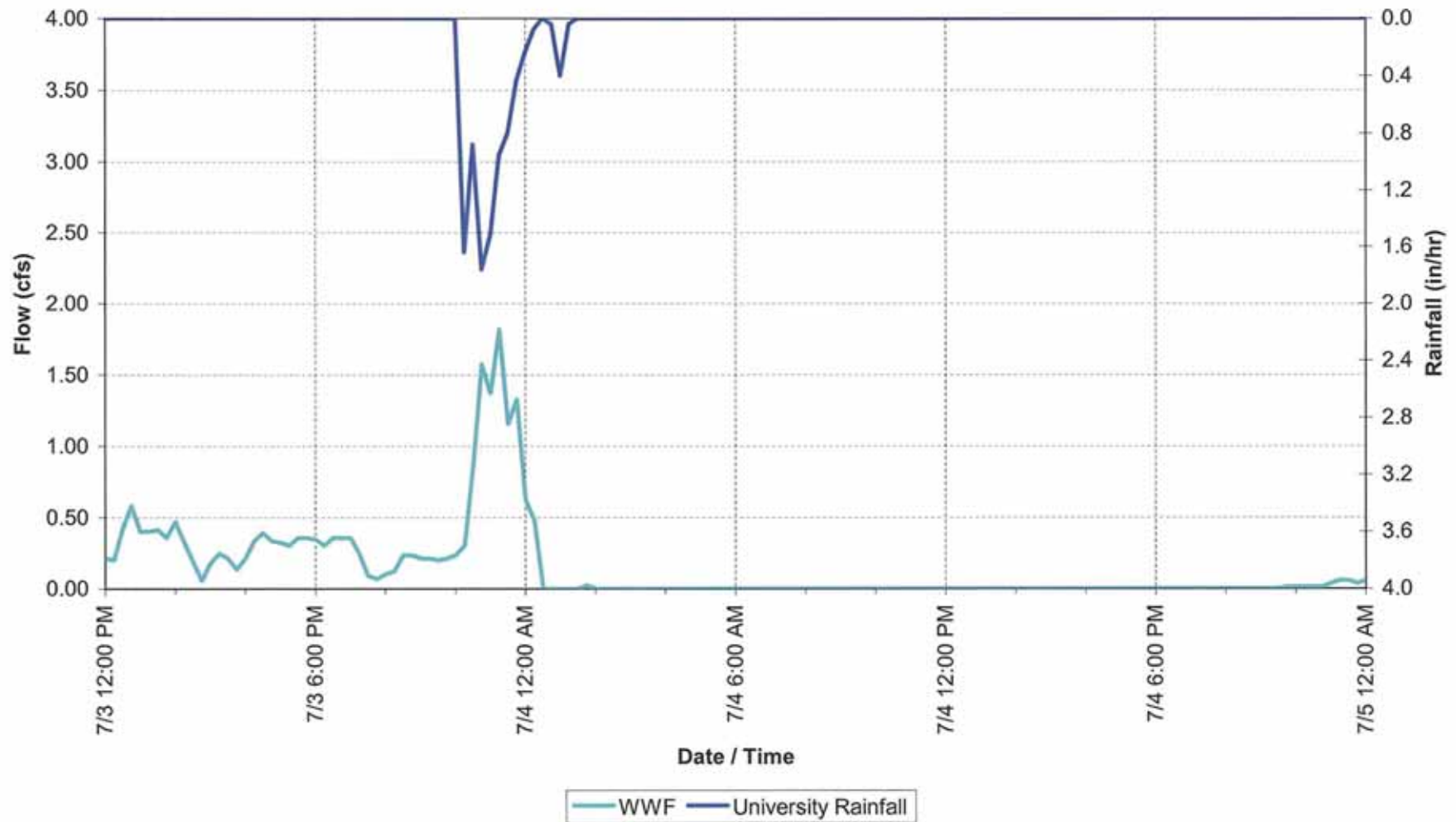
1st Street, Meter 12
Event 8: June 21, 2007; Small Depth Storm
WWF Only (DWF Subtracted Out)



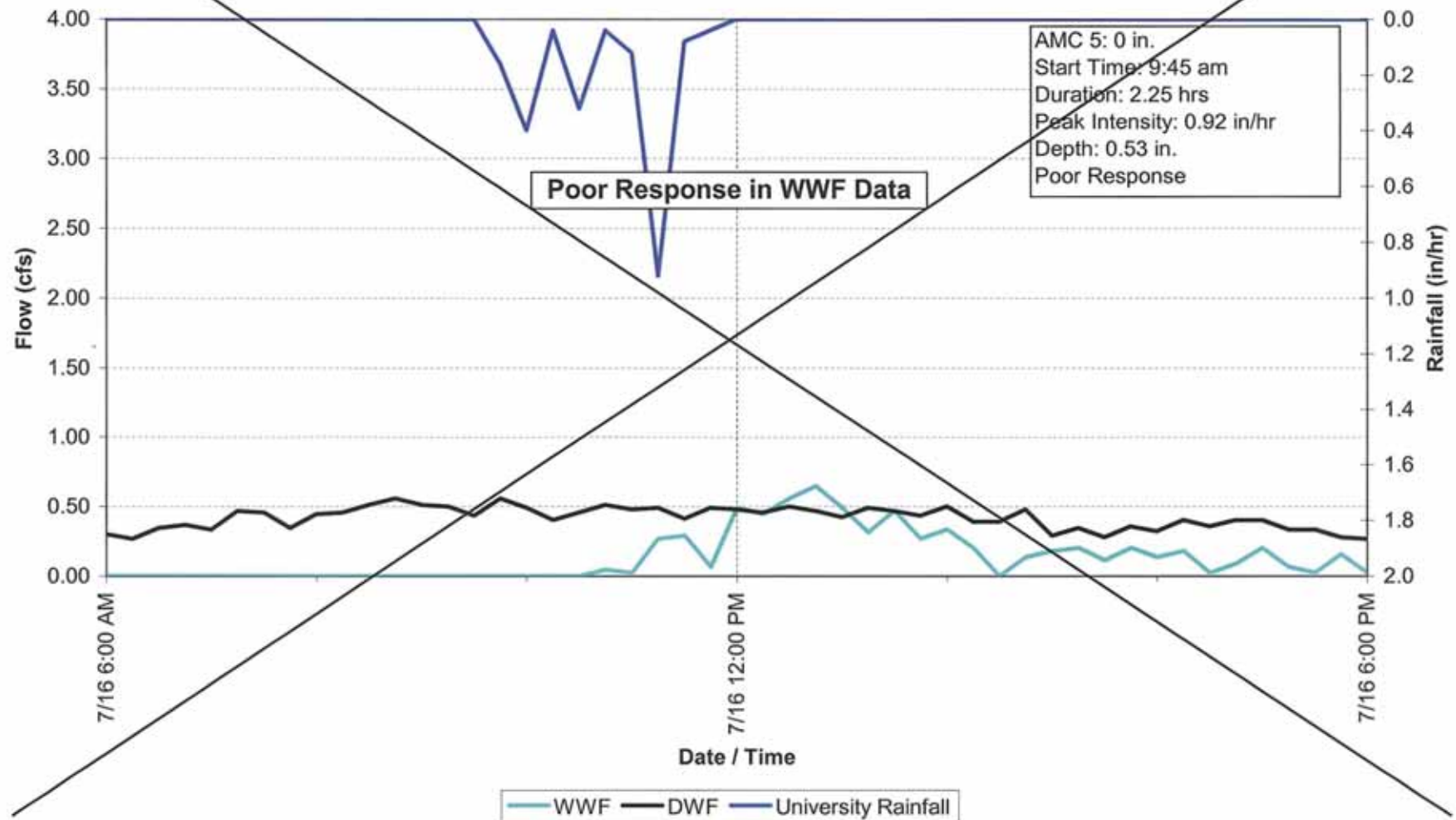
1st Street, Meter 12
Event 9: July 3, 2007; Short-Duration, High Intensity Storm
WWF and DWF Graph



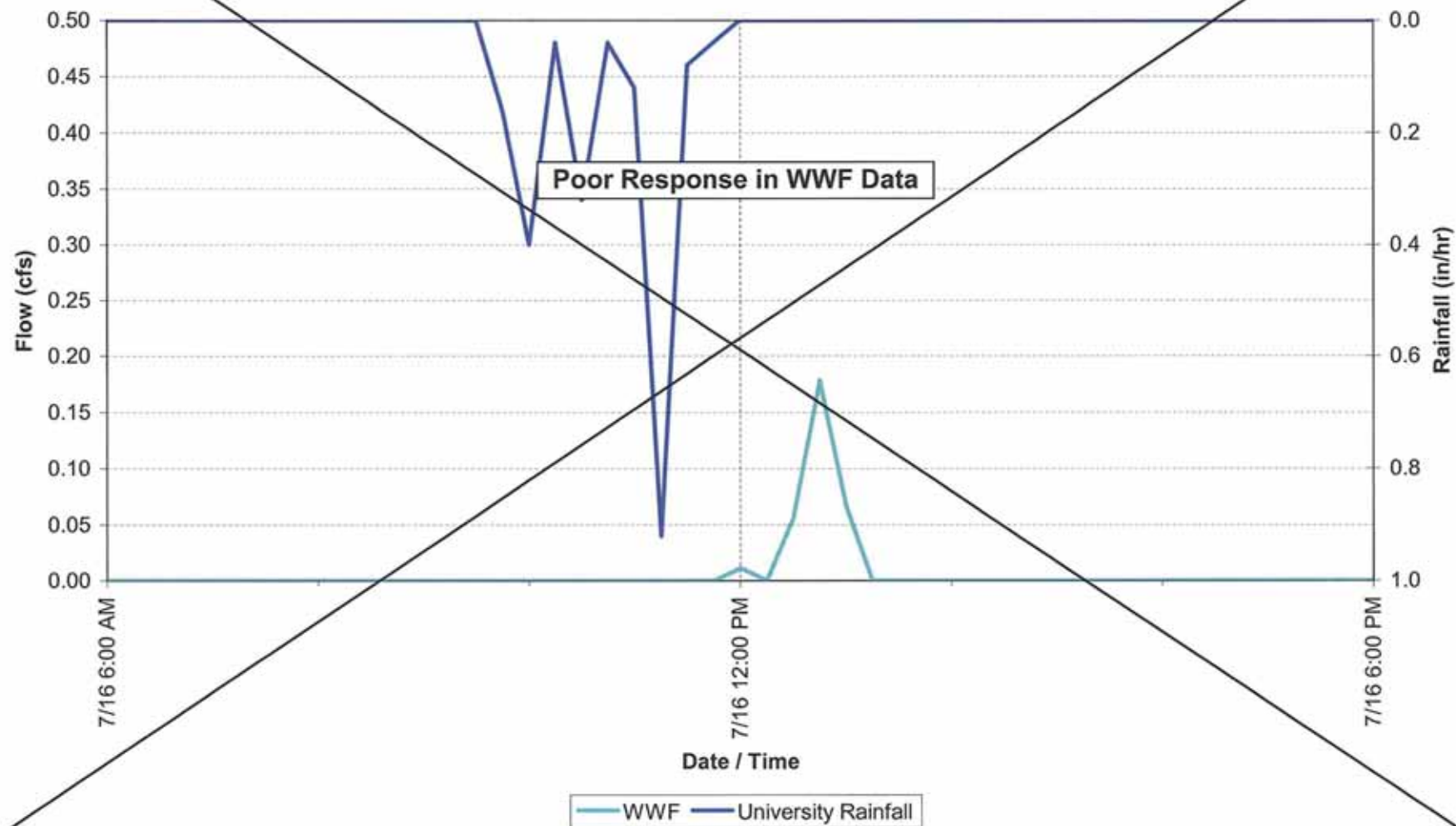
1st Street, Meter 12
Event 9: July 3, 2007; Short-Duration, High Intensity Storm
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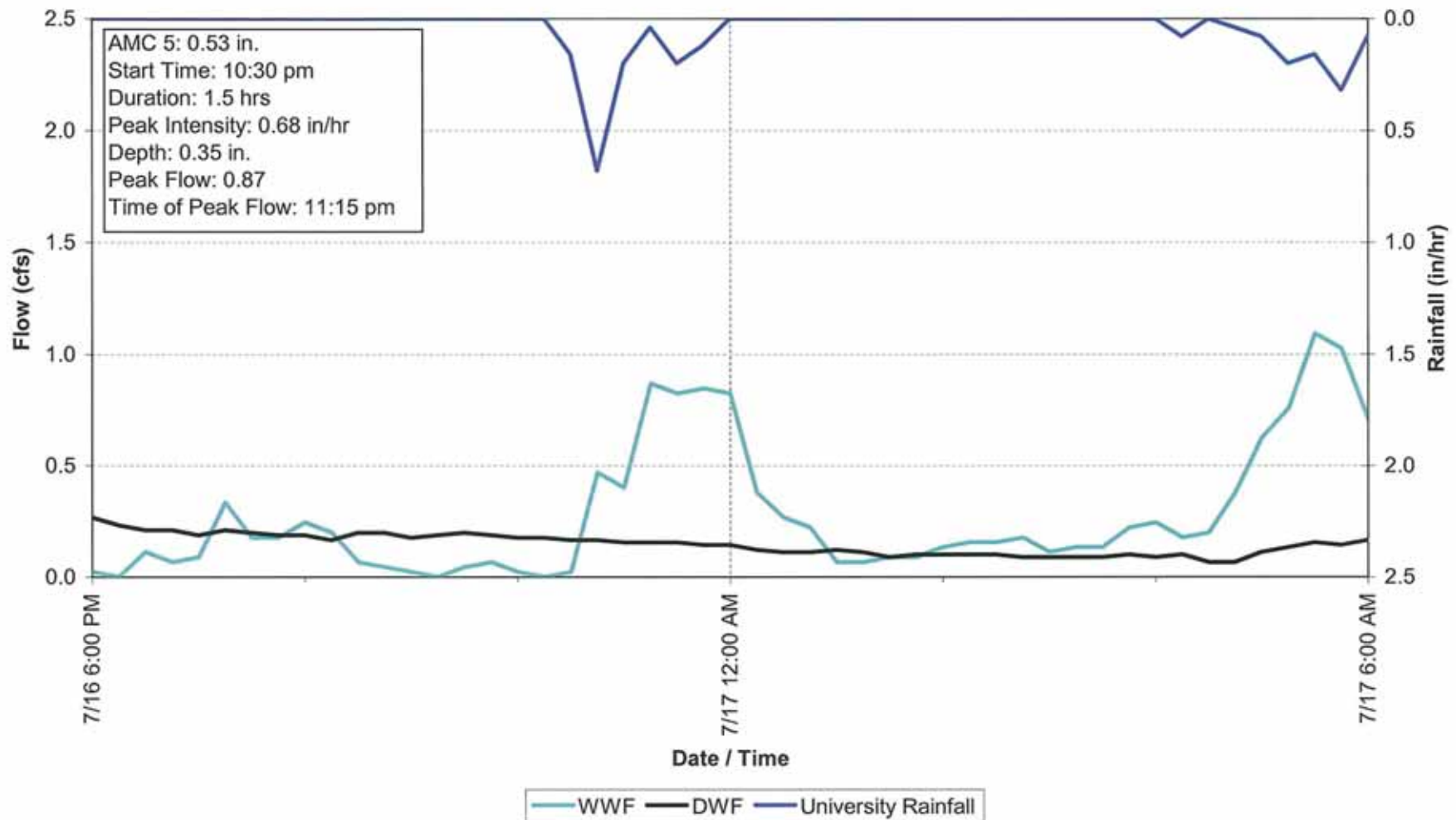
1st Street, Meter 12
Event 10: July 16, 2007; Short-Duration, High Intensity Storm
WWF and DWF Graph



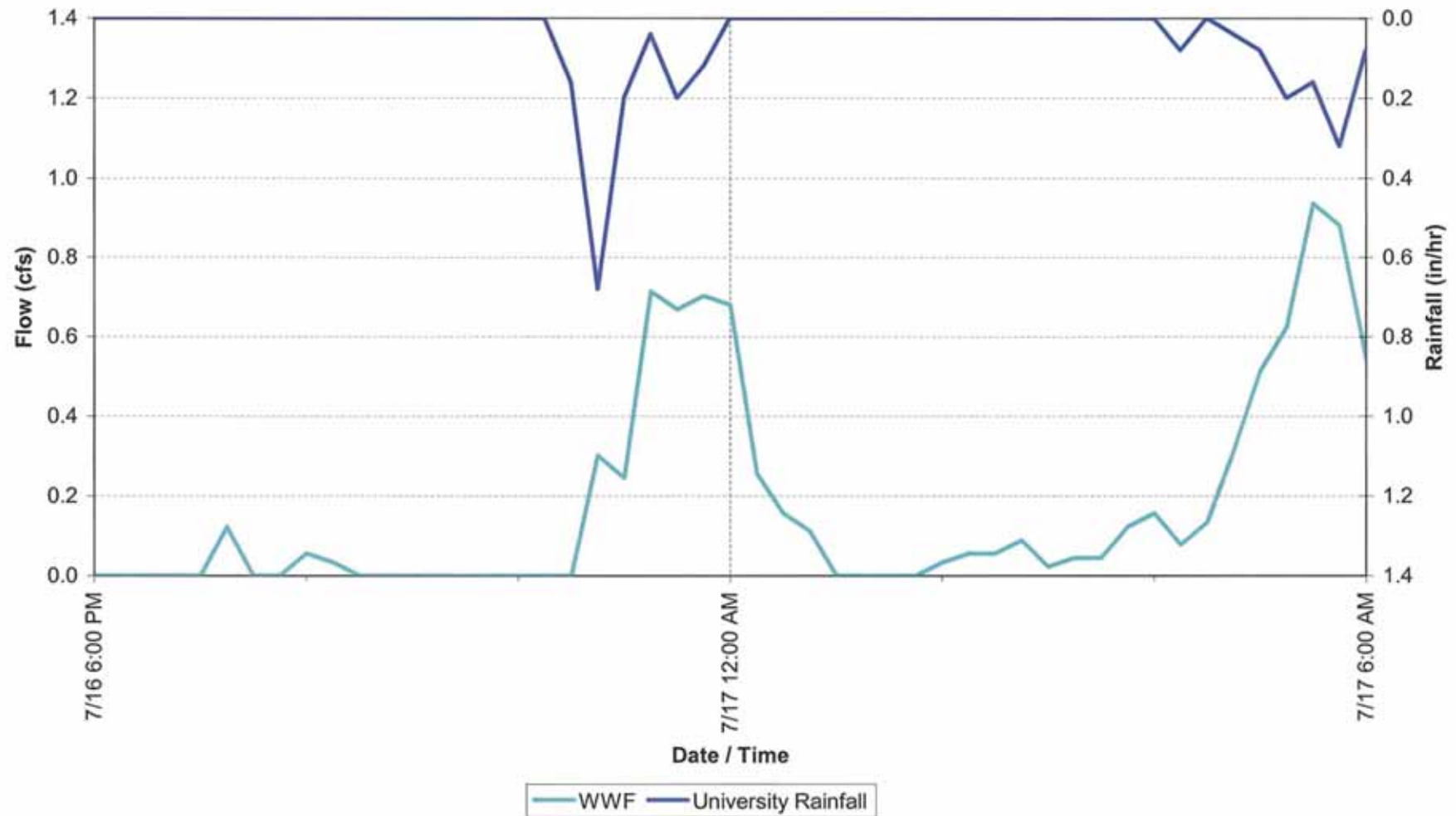
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Event 10: J July 16, 2007; Short-Duration, High Intensity Storm
WWF Only (DWF Subtracted Out)



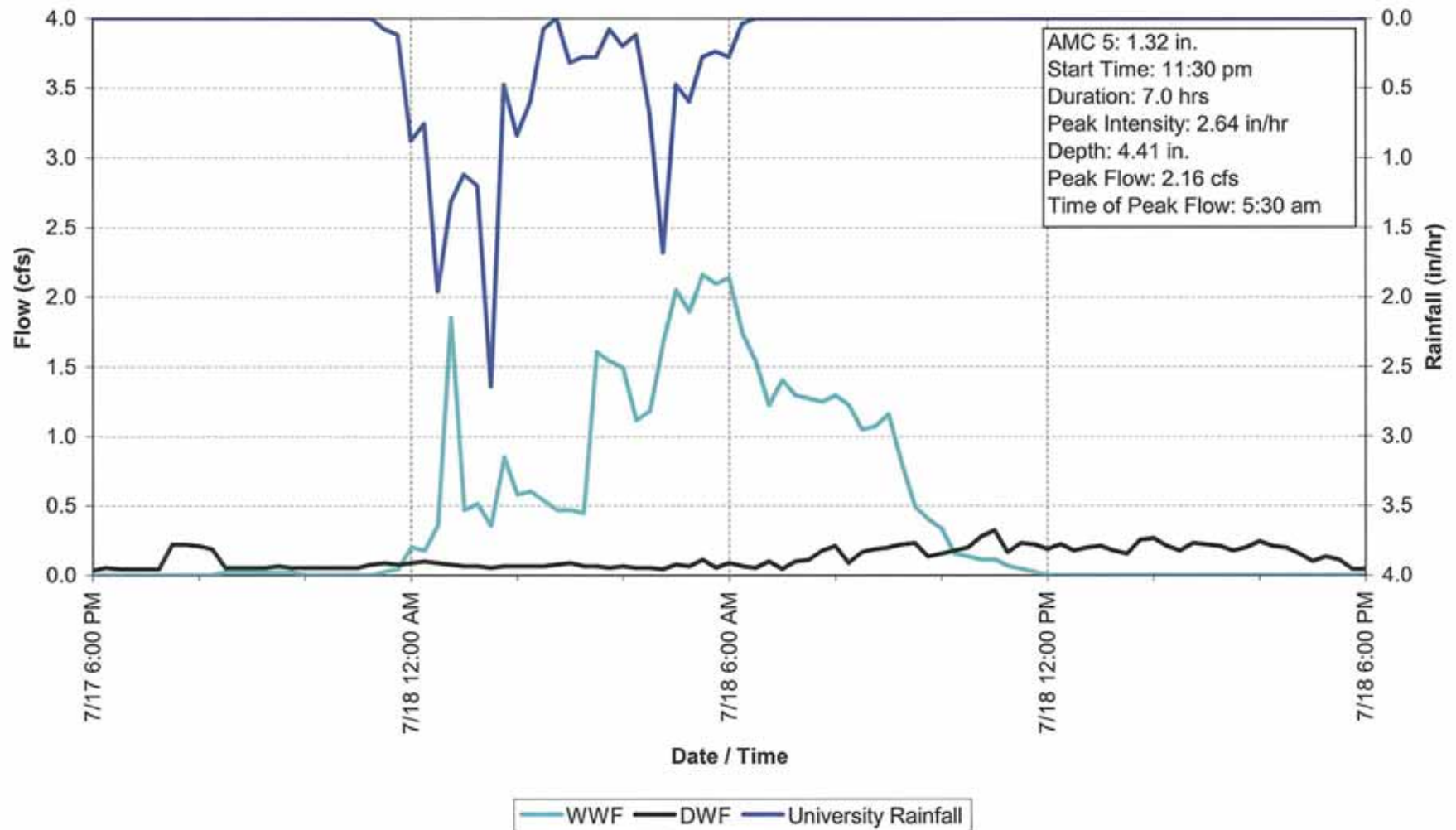
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Event 11: July 16, 2007; Small Depth Storm
WWF and DWF Graph



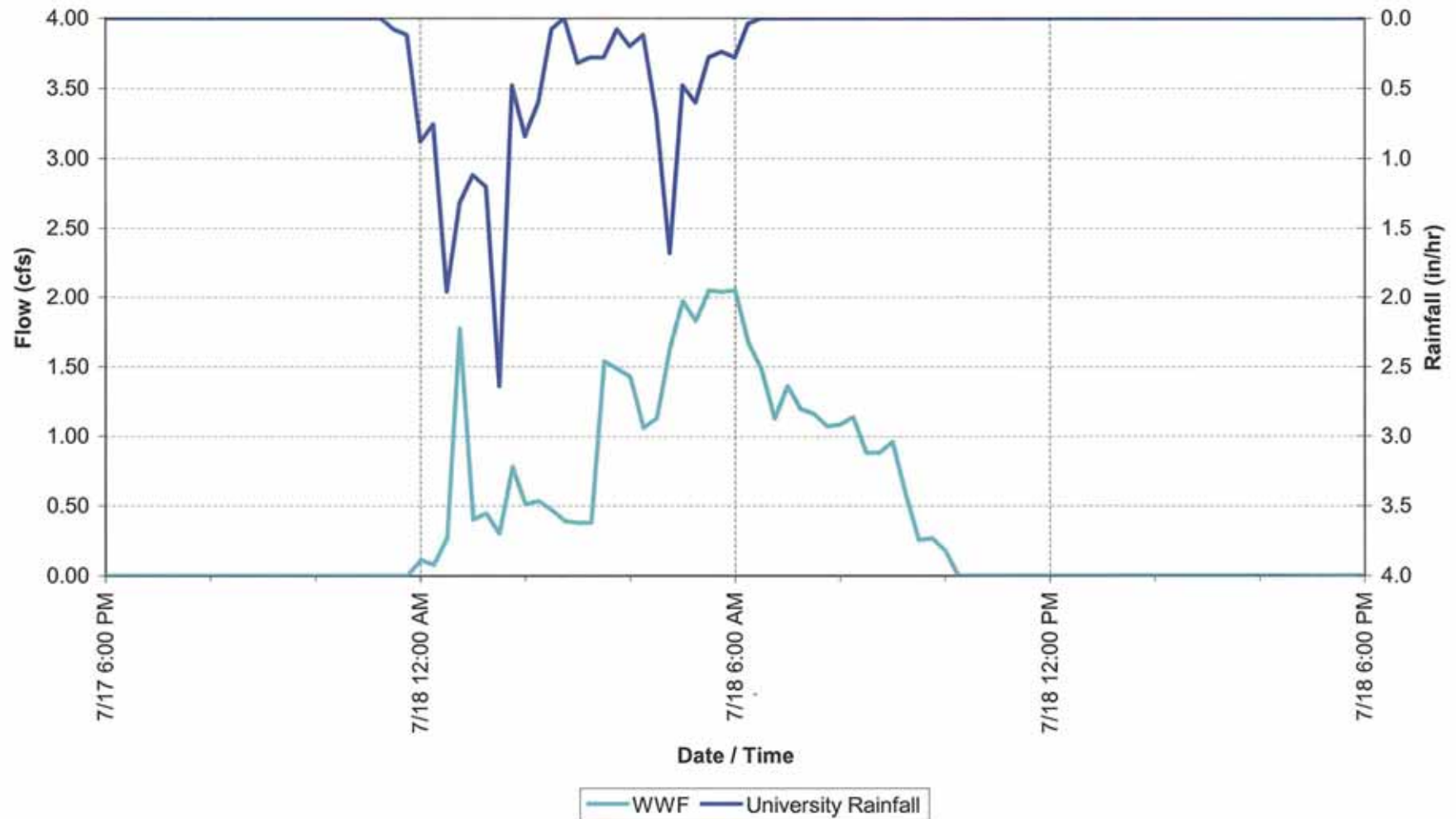
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Event 11: July 16, 2007; Small Depth Storm
WWF Only (DWF Subtracted Out)



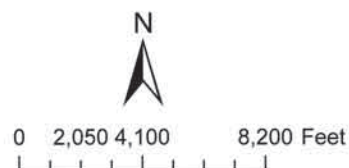
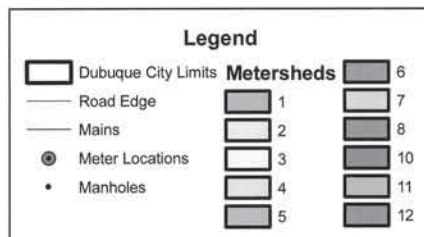
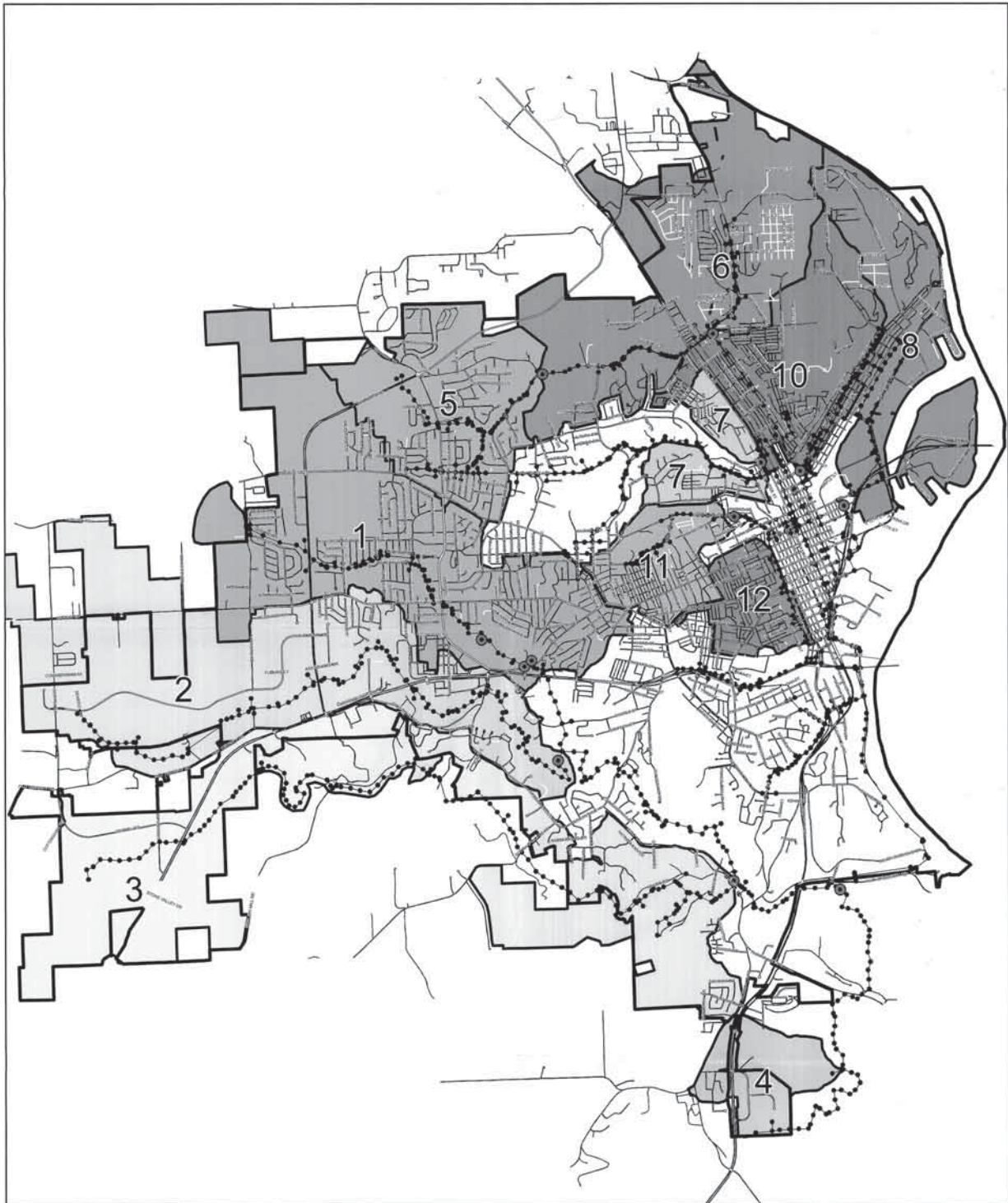
1st Street, Meter 12
Event 12: July 17 - 18, 2007; Long-Duration, High Intensity Storm
WWF and DWF Graph



1st Street, Meter 12
Event 12: July 17 - 18, 2007; Long-Duration, High Intensity Storm
WWF Only (DWF Subtracted Out)



City of Dubuque Sanitary Sewer System Metersheds



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