



Memorandum

To: Cary Mutschler
SRCSD Operations Support

FROM: Mark Wilcox
SASD Business Planning/Capacity Management

DATE: October 2, 2012

SUBJECT: N19 Arden Pump Station Maximum Down Time Modeling Evaluation

REQUEST INFORMATION

This memo summarizes the modeling performed to estimate the maximum amount of time the Arden Pump Station (N19) can be shut down until an overflow is predicted in the upstream system.

MODELING PROCESS AND RESULTS

The 2010 SRCSD system model was used to perform this evaluation. To achieve greater accuracy, actual flow data from three flow meter sites upstream of the Arden Pump Station was used instead of the model generated flow calculated from esd and land use information. We estimate that the three flow meter sites, combined, measure approximately 99% of the flow entering the pump station. The portion of the flow not measured is from an SASD pipe entering the SRCSD system at manhole N33-MH0003A with a model predicted average daily flow of 0.12 MGD. **Figure 1** shows the three flow meter sites, which are FM 417 (MH 334-167-1006), FM 418 (N53-MH0005A), and FM 15 (N17-MH0005A).

Recent weekday dry weather flow data was imported into the model for the simulations, and the resulting flow hydrograph at the Arden Pump Station from the combined measured flows can be seen in **Figure 3**.

Table 1 summarizes the results from pump station shut down simulations. The period of shutting down the pump station between the hours of 8 p.m. and 4 a.m. represents the range of maximum shut down duration (12 - 13 hours) while the period between 5 a.m. and 9 a.m. covers the range of typical work day starting hours.

Five predicted overflows occur as a result of shutting down the pump station (**Figure 2**). **Table 2** lists the five predicted overflow manholes in order of overflow occurrence.

Please contact me at 876-6078 if you have any questions.

Figure 1: Map showing the location of the three flow meter sites that measure approximately 99% of the flow entering the Arden Pump Station.

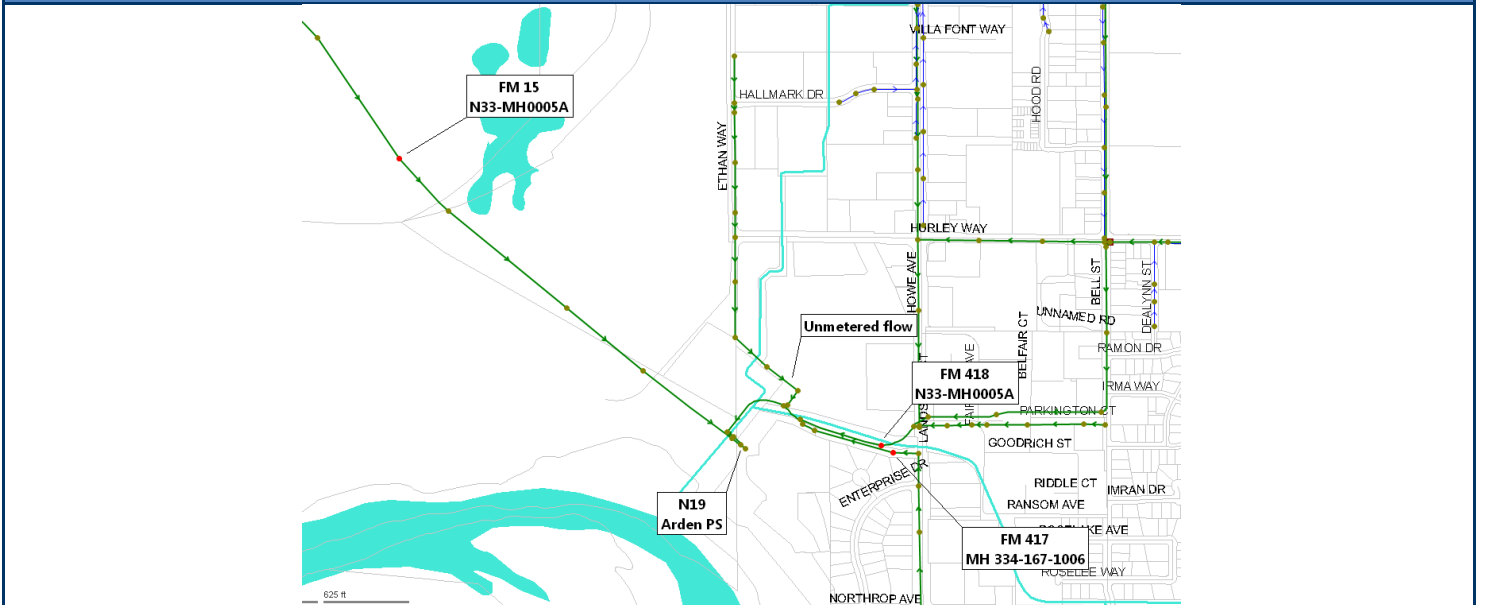


Figure 2: Map showing the location of the five model predicted overflows as a result of backed-up flow when the Arden Pump Station is not in operation.



Table 1. Model results of the Arden Pump Station shut-down times and the corresponding times until a predicted overflow occur at manhole 338-158-1019.

Arden Pump Station Shut –down Time	Time Until a Predicted SSO Occurs
8 p.m.	12 hr. 45 min.
9 p.m.	13 hr. 0 min.
10 p.m.	13 hr. 0 min.
11 p.m.	13 hr. 0 min.
12 a.m.	13 hr. 0 min.
1 a.m.	12 hr. 45 min.
2 a.m.	12 hr. 45 min.
3 a.m.	12 hr. 30 min.
4 a.m.	12 hr. 0 min.
5 a.m.	11 hr. 30 min.
6 a.m.	11 hr. 0 min.
7 a.m.	10 hr. 30 min.
8 a.m.	10 hr. 0 min.
9 a.m.	9 hr. 30 min.

Table 2. The five predicted manhole overflow locations listed in order of overflow occurrence.

SSO Manhole	Rim elevation (ft)
338-158-1019	18.2
S23-MH0002A	19.9
S23-MH0001A	21.0
N17-MH0011A	21.5
N33-MH0002A	21.5

Figure 3. Model hydrograph at the Arden Pump Station when using flow meter data input. The date range used in Table 1 is 8 p.m. July 30th to 9 a.m. July 31st 2012.

