

APPENDIX E
Storm Drain Impact Analysis

MEMORANDUM

DATE: January 26, 2022
TO: Amber Sharp, David J. Powers & Associates
FROM: Charles D. Anderson, PE
SUBJECT: Second Harvest Food Bank Storm Drain Impact Study,
Planning Number 21-016

Introduction

David J. Powers and associates hired Schaaf & Wheeler to analyze the impact of proposed development for the Second Harvest Food Bank (Second Harvest) on the City of San Jose's storm drain system. Second Harvest is located at 4553 and 4653 North First Street in the Alviso community of San Jose.

Schaaf & Wheeler previously studied the impact of development at the Second Harvest site, which at that point was called the "Cisco 6 Site." The results of that analysis were presented in the "Analysis of Cisco 6 Site Stormwater Runoff Impact on City System" technical memorandum dated November 4, 2013. That analysis determined that storm drain improvements were required to support the new development.

Changes have been made to the development plan since the 2013 analysis was completed, including the percent of proposed new impervious area increasing from 70 percent to 87 percent. The City of San Jose also developed a new storm drain master plan which is modeled in InfoWorks ICM version 10.5. A new analysis is required to determine the impact of the updated Second Harvest development plans using the City's new storm drain master plan model. The Second Harvest site is shown in Figure 1.



Figure 1 - Second Harvest Site Location

Impact Analysis

The Second Harvest site overlaps two subcatchments in the City’s storm drain system model. Subcatchment sc357 flows to a pipe in the Oakmead Storm Drain System and Subcatchment sc578 flows to a pipe in the Alviso Storm Drain System. The Second Harvest site is undeveloped in the existing condition, and this is reflected in the percent pervious and impervious values of the modeled subcatchments.

The percent pervious and impervious of subcatchments sc578 and sc357 have been adjusted to reflect the proposed condition of the Second Harvest site, for a comparison to the existing condition. The site is assigned an impervious value of 87percent, and GIS tools are used to assign weighted percent pervious and impervious values to the subcatchments. The location of the Second Harvest site in respect to the City’s storm drain system model is shown in Figure 2. Existing and proposed condition percent pervious and impervious values for subcatchments sc357 and sc578 are shown in Table 1. The City’s ICM model has been run for the existing and proposed condition for both the 10-year and 100-year storm events.

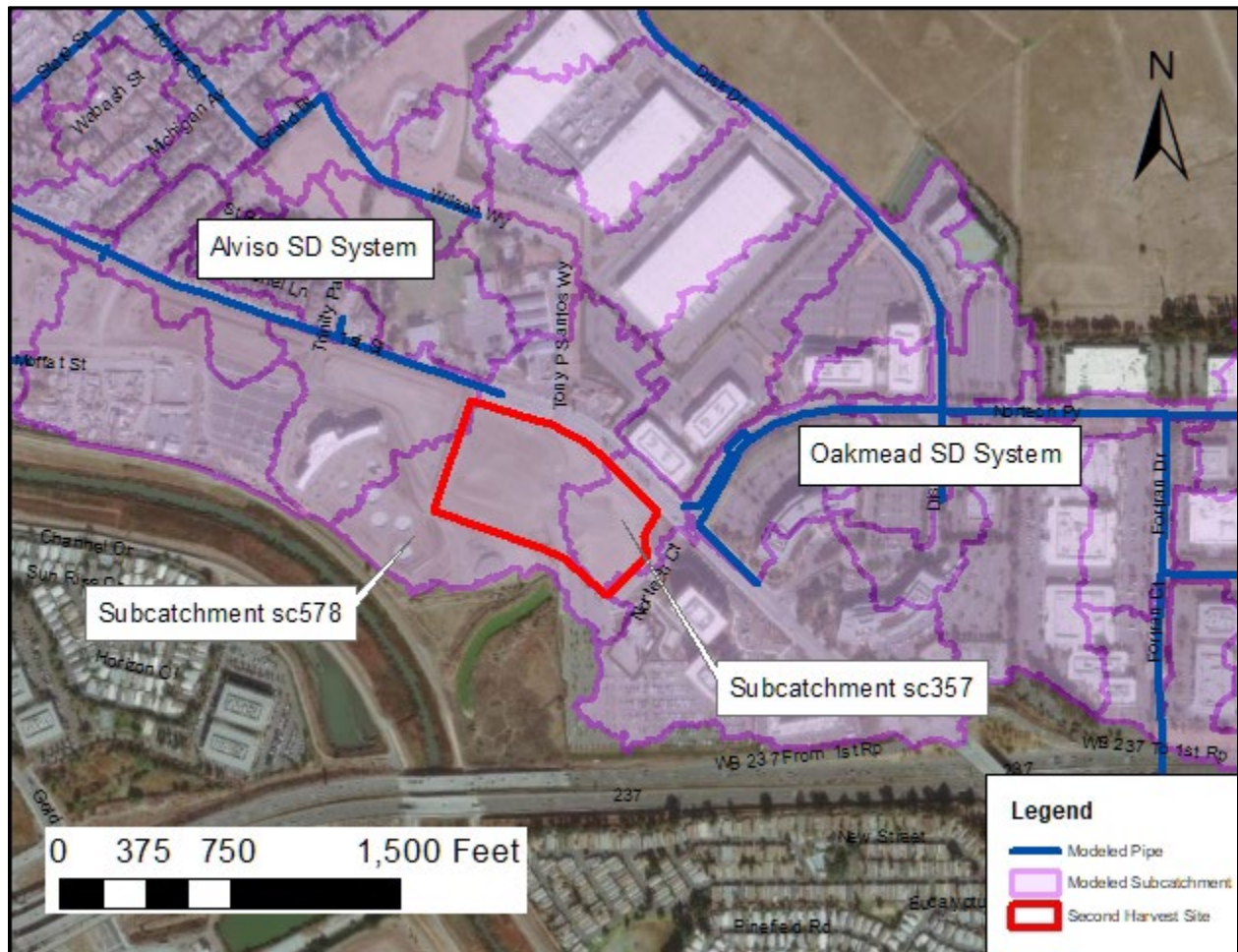


Figure 2 - Second Harvest Site and City's Modeled Storm Drain System

Table 1. Existing and Proposed Percent Pervious and Impervious Values

| | Existing Condition | | Proposed Condition | |
|-------------------|--------------------|-------|--------------------|-------|
| | sc578 | sc357 | sc578 | sc357 |
| % Pervious | 82.9 | 87.5 | 61.0 | 37.5 |
| % Impervious | 17.1 | 12.5 | 39.0 | 62.5 |
| Total Area (acre) | 22.5 | 5.0 | 22.5 | 5.0 |

Impact Analysis Results

Results from the impact analysis model runs show that the development of the Second Harvest site has an insignificant impact on the City's system. The storm drain segments the site connects to do not experience flooding in the existing or proposed condition during the 10-year storm event. The maximum rise in water surface elevation in the post-developed condition of 0.4 foot occurs just downstream of the Second Harvest connection to the Alviso system.

There are still 3.5 feet of freeboard at this location so this rise in water surface elevation has no impact on system performance and creates no additional storm water inundation anywhere in the system. That is, the 10-year hydraulic grade remains 3.5 feet below the ground surface.

The maximum rise in water surface elevation in the Oakmead system due to proposed development at the Second Harvest site is 0.1 foot. This occurs at and immediately downstream of the connection point to the storm drain system. The freeboard at this location is 8.7 feet.

Flooding does occur within the Alviso storm drain segment the site connects to during the 100-year storm event, but there is no rise in water surface elevation caused by the proposed development at this location. The greatest rise in flood elevation due to the development occurs downstream of the Oakmead connection point. However, the rise is less than 0.1 foot in magnitude and is considered insignificant.

Furthermore, this location is already mapped within a Zone AE (Elevation 12 feet NAVD) on the effective FEMA Flood Insurance Rate Map, and will remain so with or without the proposed development at Second Harvest.

Conclusions

The City's storm drain system does not experience flooding near the Second Harvest site during the 10-year storm event. Development of the site causes a maximum rise in water surface elevation of 0.4 foot just downstream of the Alviso system connection point. However, there is still 3.5 feet of freeboard below the street elevation at that location so the rise in water surface elevation is not impactful in any way.

Flooding near the Second Harvest site occurs during the 100-year storm event. The maximum rise in flooding due to the site is less than 0.1 foot and considered insignificant, noting that this location is already mapped within the 100-year floodplain and will remain so with or without development at the Second Harvest site.