

**Town of Los Altos Hills
Sanitary Sewer Collection System Progress Report
Contract Year 2017**

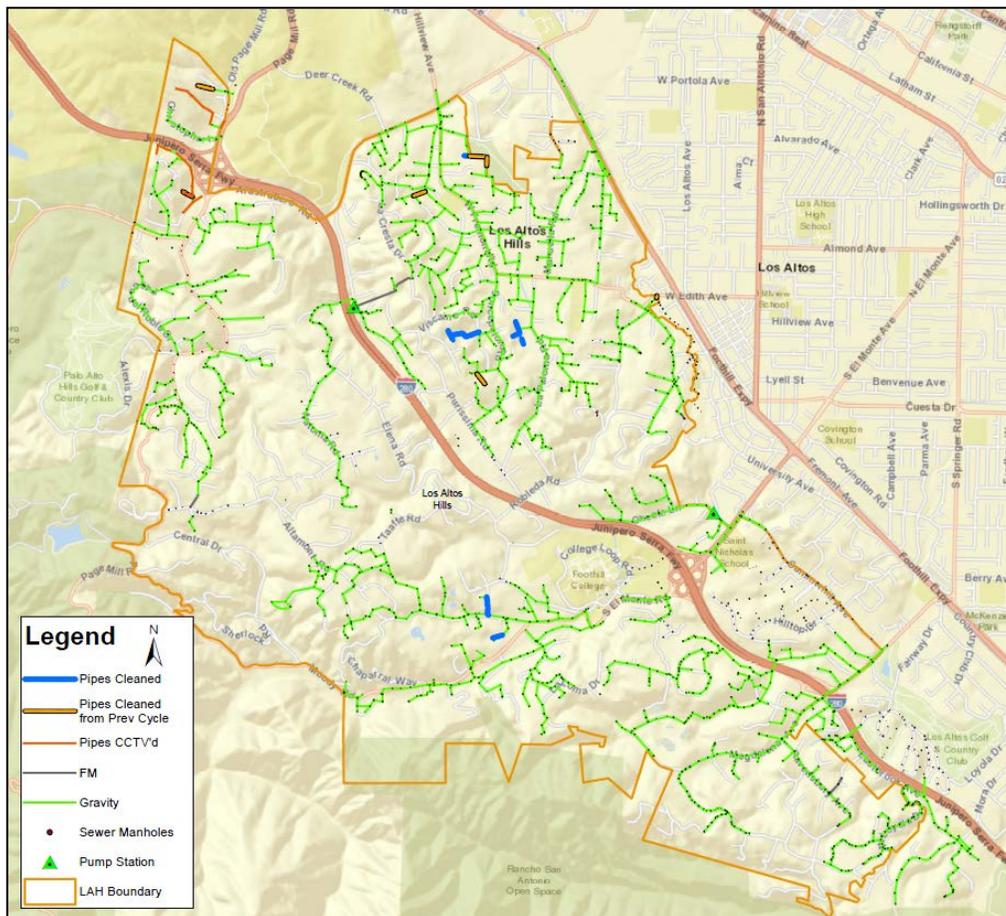
**Reporting Month: August 2017
Report Date: January 9, 2017**

I. INTRODUCTION

Figure 1 shows the Town of Los Altos Hills sewer system, including a summary of pipes cleaned and inspected from August 1, 2017 through the current period.

- Area served: 8.8 square miles
- Miles of sewer pipelines: 56.39¹
- Number of residential parcels: 1,773
- Number of non-residential connections: 14

Figure 1. Town of Los Altos Hills Sewer System



¹ During the prior cleaning cycle, West Bay cleaned three additional lines, with a combined length of 137.1 lineal feet, that are labeled in GIS as not owned by the Town. These lines are not included in the total, and the cleaning records are not counted in this report. This discrepancy is currently under review.

II. PUBLIC WORKS DIRECTOR/CITY ENGINEER HIGHLIGHTS

In June 2014, the City Council authorized the City Manager to execute an agreement with West Bay Sanitary District (West Bay) to provide operation and maintenance services as well as emergency overflow response services to the Town's sewer collection system.

In June 2015, West Bay's contract with the Town was extended for another three years. The extension was authorized to provide maintenance consistency and budget predictability for the Town. West Bay substantially completed one full round of cleaning of the entire sewer system by the end of the third contract year, as discussed in the July 2017 monthly report. West Bay is under contract to complete one full round of CCTV inspection in the fourth contract year, which ends on July 31, 2018.

a. Sewer System Maintenance Highlights

This month, West Bay Sanitary District began its fourth contract year of providing sewer system maintenance for the Town of Los Altos Hills.

There were no significant issues noted during this month's pipeline cleaning operations. West Bay also performed routine maintenance operations at both the Purissima and O'Keefe pump stations. No unscheduled repairs were required at either pump station.

During CCTV inspections, West Bay marked five pipes with structural grade 3 defects (described by NASSCO PACP as likely requiring action after 10 years) for follow-up. Follow-up may involve either repair/rehabilitation under a future capital improvement program (CIP)², pipe patch by West Bay under their current maintenance contract, or in the case of marked manholes, raising/exposing buried manholes.

During this month there were no SSOs reported in the Town's collection system.

A summary of completed sewer maintenance tasks is provided in Table 1 on the following page. More detailed information is provided later in this report, and is also shown in the attached maps.

² All structural defects observed through September 2017 that were not addressed by previous CIP projects will be reviewed for action in a future capital program using the Town's CIP development process. This process utilizes the Town's risk model results, supplemented by applied field knowledge and engineering judgment.

Table 1. Summary of Completed Tasks (Current Contract Year August 2017 – July 2018)

Task	Month of August 2017	Contract Year to Date	Compare to One Year Goal ³
Sewer Cleaning <ul style="list-style-type: none"> • 36-mo and 24-month Schedule • High Freq (12- and 6-month) • Other, Unscheduled Cleaning 	<ul style="list-style-type: none"> • 0.37 miles • 0.18 miles • 0.0 miles 	<ul style="list-style-type: none"> • 0.37 miles • 0.18 miles • 0.0 miles 	2.17% of Goal (8.33% of Time Elapsed)
Pump Station <ul style="list-style-type: none"> • Preventive Maintenance • Unscheduled repairs 	<ul style="list-style-type: none"> • 5X • 0X 	<ul style="list-style-type: none"> • 5X • 0X 	8.33% of Goal
CCTV Inspection <ul style="list-style-type: none"> • Routine Schedule (30 mos) • Other Unscheduled CCTV 	<ul style="list-style-type: none"> • 0.74 miles • 0 miles 	<ul style="list-style-type: none"> • 0.74 miles • 0 miles 	4.20% of Goal
SSO Response <ul style="list-style-type: none"> • No. of SSOs – Sewer Main 	<ul style="list-style-type: none"> • 0 	<ul style="list-style-type: none"> • 0 	N/A

Cleaning

Figure 2a shows pipe cleaning progress for the current (CURR) contract year. Between August 1, 2014 and July 31, 2017, 100 percent of the Town’s collection system pipes were scheduled to be cleaned. During this period, 95.49 percent of the Town’s collection system pipes were cleaned. The remaining 4.51 percent of the system pipes remain to receive their first round of cleaning. Cleaning progress for the uncleaned lines will be reported separately from the remaining pipes, until they receive their first cleaning. During August 2017, 8 of the remaining uncleaned lines from Years 1 through 3 were cleaned.

The progress charts show cleaning progress beginning on August 1, 2017, for all pipes that are in their second cycle of cleaning. The charts include information regarding pipes that have been cleaned more than once due to their inclusion on the High Frequency schedule. Percentages are based on the number of pipe segments cleaned excluding repeat cleaning. Calculating percentages using the number of pipes is a more consistent approach than using pipe lengths, due to differences between existing records and field observations. These cleaning results represent 0.97 percent of the system. During the current contract year, 6.67 percent of the cleaned pipes had roots, 93.33 percent had debris, 0.00 percent had grease, and 0.00 percent were clear.

³ Performance is based on annual targets. Monthly comparisons are provided for reference only.

Figure 2a. Cleaning Progress as of August 31, 2017.

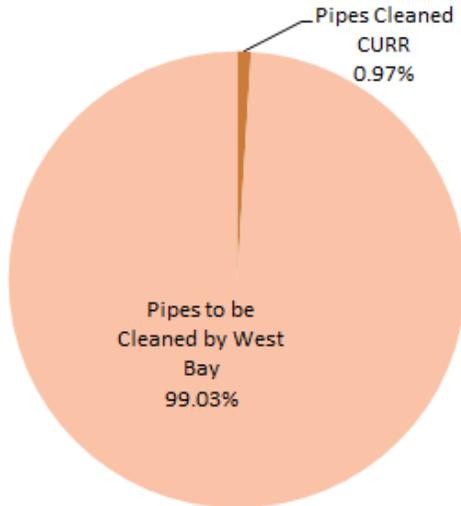
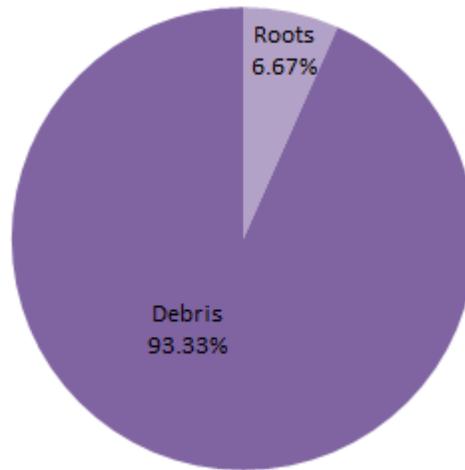


Figure 2b. Cleaning Results for the Current Year to Date. (Chart represents 0.97% of system).



During the first contract year, from August 2014 through July 2015, West Bay focused on cleaning pipes that had high numbers of SSOs. During the second and third contract years, from August 2015 through July 2017, West Bay performed cleaning operations one sewer “branch” or drainage area at a time. The second cycle of cleaning began in Branches 2 and 5, with the intention of continuing sequentially through the remaining Branches. Cleaning results re-starting from the current contract year are summarized in Table 2.

Table 2. Cleaning Results FOR THE CURRENT CONTRACT YEAR by Percent of Pipe Segments

Pipe Cleaning Result	Current Contract Year (0.97% of System Cleaned)
Clear	0.00%
Roots	6.67%
Debris	93.33%
Other	0.00%
Total	100% of Cleaned Pipes

Figure 3 shows West Bay’s cleaning progress since they started maintaining the Town’s sanitary sewer collection system in August 2014.

Figure 3. West Bay Cleaning Progress

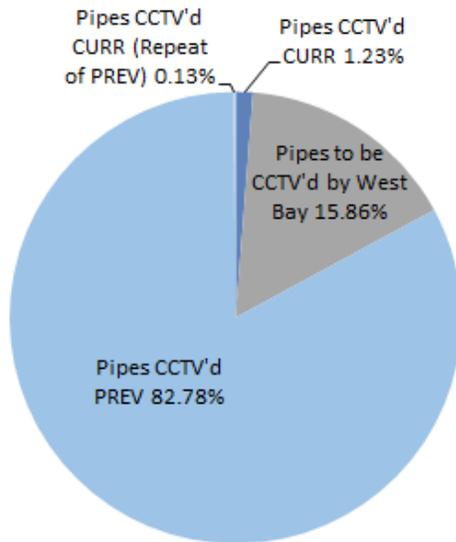


Note: PM = Preventive Maintenance; HF = High Frequency

CCTV Inspection

Figure 4 shows the progress of West Bay’s CCTV inspection of the Town’s system. For consistency, percentages shown are based on the number of pipe segments inspected rather than pipe length. As of August 31, 2017, 84.14 percent of the system had been inspected. Of the 84.14 percent, 1.36 percent was inspected during the current contract year. The remaining 15.86 percent of pipes in the system are scheduled to be inspected by the end of the fourth contract year.

Figure 4. CCTV Inspection Progress as of August 31, 2017.



As part of West Bay’s CCTV process, pipes with NASSCO PACP Grade 4 or 5 Operations and Maintenance (O&M) defects are identified for placement on the hot spot list. Pipes on the hot spot list receive a more frequent cleaning schedule of 12 and 6 months. Cleaning these pipes more frequently is intended to help address these O&M defects in order to minimize maintenance-related blockages and SSOs. Pipes with Grade 4 or 5 O&M defects will remain on the hot spot list until the O&M issue in question is resolved. West Bay uploads changes to the hot spot list to Lucity approximately monthly.

Figures 5a and 5b show structural and O&M defects found during the current contract year. These charts reflect results for 1.36 percent of the system.

During this period, 66.67 percent of inspected pipes had no structural defects, 33.33 percent had Grade 3 or lower structural defects, 0.00 percent had Grade 4 defects, and 0.00 percent had Grade 5 structural defects.

Figure 5a. CCTV Inspection Results CURR August 2017 (Structural). (Chart represents 1.36% of system).

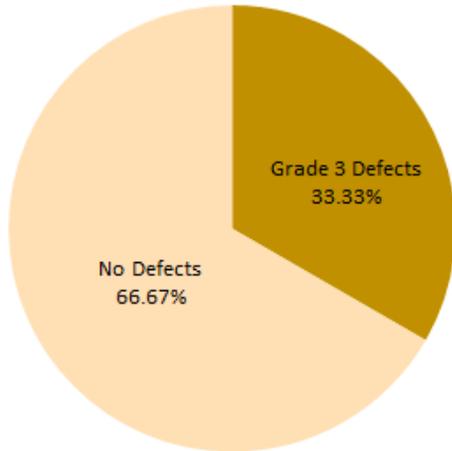
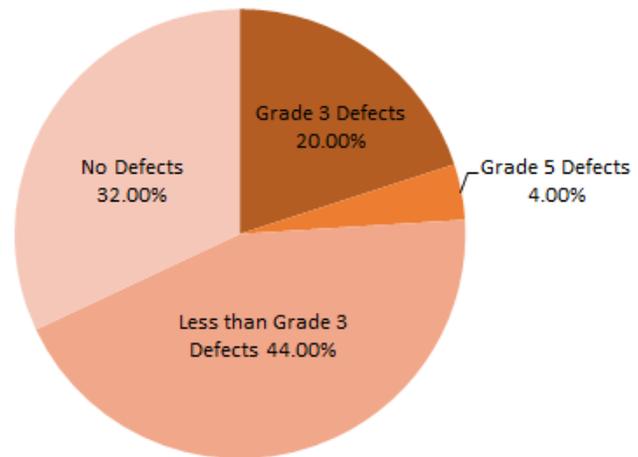


Figure 5b. CCTV Inspection Results CURR August 2017 (O&M). (Chart represents 1.36% of system).



For the pipes inspected in the current contract year, 4.00 percent had NASSCO PACP O&M Grade 5 defects, while no pipes had O&M Grade 4 defects. In addition, 64.00 percent of the inspected pipes had O&M Grade 3 or lower defects. This group excludes the 32.00 percent of pipes with no O&M defects.

West Bay is continuing to CCTV pipes in Branch 1 that have not been inspected. After this Branch is completed, they will begin inspecting the remaining, uninspected system pipes. In addition, West Bay has continued to provide field follow-up notes to the Town as part of the CCTV process. These field notes are being used to help evaluate and refine Risk Model results, and to develop the Capital Improvement Program.

The observed CCTV Structural and O&M defects are summarized in Tables 3 through 6. During the first year of West Bay's contract, video inspection was prioritized for lines with known issues (based on existing maintenance records and the Town's understanding of the system) and incomplete inspections. This approach helped identify pipes that needed more immediate repair and rehabilitation. In addition, the approach helped identify pipes that require more frequent maintenance. Of note, as West Bay begins the fourth year of CCTV inspection, is that the number of Grade 4 and 5 defects has remained consistent across all contract years. This result indicates that the Town should expect to maintain the current level of pipeline repairs through the next several years, in order to continue to address identified Grade 5 defects as they are discovered.

Table 3. Structural CCTV Results PER CONTRACT YEAR by Percent of Pipe Segments

Pipe Structural Grade	Previous Contract Years 1 - 3 (82.78% of System CCTV'd) ⁴	Current Contract Year (1.36% of System CCTV'd)
Grade 5	4.16%	0.00%
Grade 4	0.44%	0.00%
Grade 3 or Less	95.40% includes 68.47% with no defects	100.00% includes 66.67% with no defects
Total	100% of CCTV'd Pipes	100% of CCTV'd Pipes

Table 4. O&M CCTV Results PER CONTRACT YEAR by Percent of Pipe Segments

Pipe O&M Grade	Previous Contract Years 1 - 3 (82.78% of System CCTV'd)	Current Contract Year (1.36% of System CCTV'd)
Grade 5	3.38%	4.00%
Grade 4	0.79%	0.00%
Grade 3 or Less	95.83% includes 34.92% with no defects	96.00% includes 32.00% with no defects
Total	100% of CCTV'd Pipes	100% of CCTV'd Pipes

Table 5. Structural CCTV Results TO DATE by Percent Pipe Segments

Pipe Structural Grade	Previous Contract Years (1 - 3) and Current Contract Year (84.14% of System CCTV'd)
Grade 5	4.10%
Grade 4	0.43%
Grade 3 or Less	95.47% (includes 68.44% with no defects)
Total	100% of CCTV'd Pipes

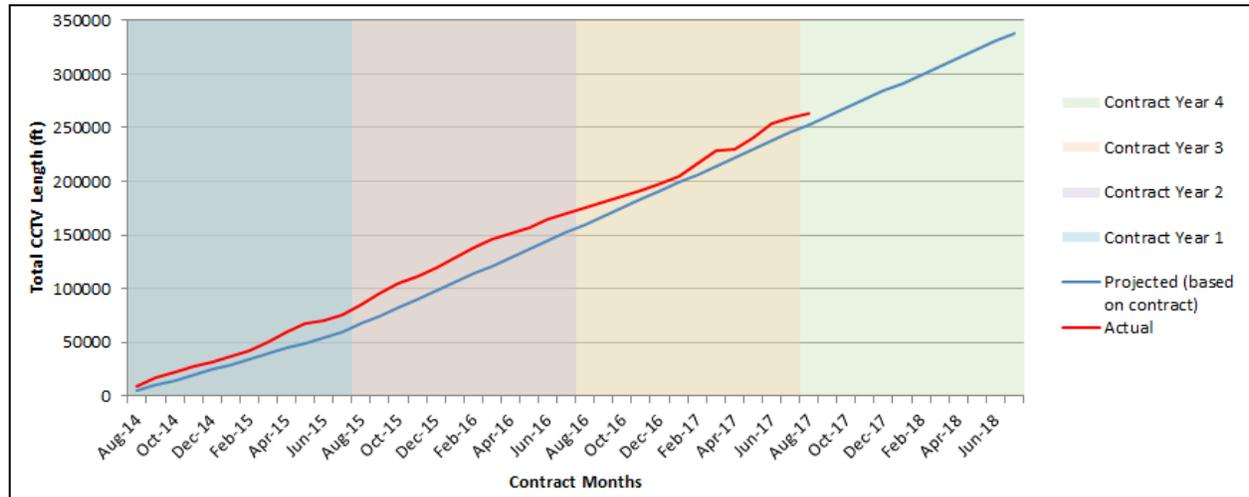
Table 6. O&M CCTV Results TO DATE by Percent Pipe Segments

Pipe O&M Grade	Previous Contract Years (1 - 3) and Current Contract Year (84.14% of System CCTV'd)
Grade 5	3.40%
Grade 4	0.77%
Grade 3 or Less	95.83% (includes 34.88% with no defects)
Total	100% of CCTV'd Pipes

Figure 6 shows West Bay's CCTV progress since they began maintaining the Town's sanitary sewer collection system in August 2014. West Bay has consistently exceeded the cumulative CCTV inspection goal required by previous and current contract years.

⁴ See Footnote 2.

Figure 6. West Bay CCTV Progress



Pump Station Maintenance

This month, West Bay conducted routine maintenance at Purissima and O’Keefe pump stations. No unscheduled repairs were required this month.

SSO Review

Table 7 shows SSOs to date by cause. During this month, there were no SSOs reported in the Town’s Sewer Collection System.

In the three years since West Bay started maintaining the Town’s collection system, the Town has reduced the number of SSOs. There have been 14 SSOs since West Bay began sewer maintenance operations in August 2014, with the majority of these SSOs occurring in the early part of the contract before significant cleaning could be achieved. This is a significant improvement compared to the 40 SSOs in the 3 years prior to West Bay’s involvement. The Town’s effort to proactively implement a structured sewer system maintenance program has been the key to reducing SSOs.

Table 7. SSOs to August 31, 2017, by Cause

Cause of SSO	2017	2016	2015	2014	2013	2012
Root Intrusion	1	1	5	16	9	10
Debris	0	0	1	1	2	0
Grease	0	0	0	0	0	0
Structural	0	0	0	1	0	1
Pump Station Failure	0	0	0	0	0	1
Other	1	0	1	0	1	2
Total SSOs/yr	2	1	7	18	12	14

Attachment I include maps providing additional information on cleaning and CCTV inspection results, and SSOs.

b. Summary of Meetings Held during Reporting Month

During this month, the Town, VWHA, and Woodard & Curran held a conference call to check in on the status of the Sewer Master Plan.

c. Computerized Maintenance Management System (CMMS) Updates

During the reporting month, routine cleaning and CCTV inspection results were added to the CMMS.

d. Geographic Information System (GIS) and Progress on Manhole Data Collection

In December 2016, the GIS database was updated to match the Lucity CMMS database. In 2017, VWHA began requesting updated GIS data from West Bay on a quarterly basis. In June 2017, West Bay provided VWHA with an updated GIS asset list, which included changes made prior to this reporting period. A subsequent update was provided in November 2017. The November update was used in the development of this monthly report.

e. Maintenance Planning

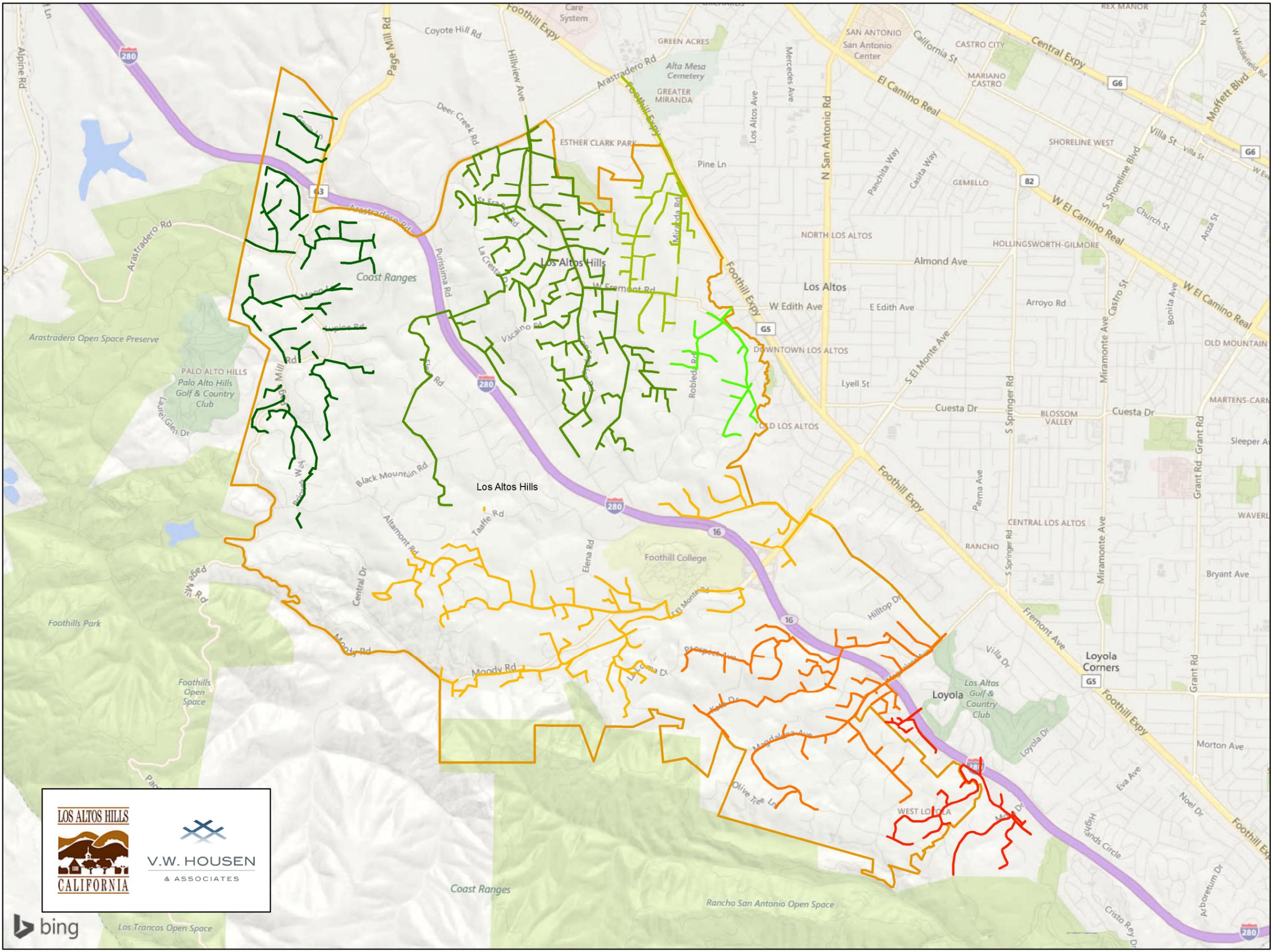
West Bay began a second round of pipe cleaning, starting in Branches 2 and 5, and also cleaned pipes in Branches 1, 2, and 4 that were missed in the first cleaning cycle. Cleaning will progress sequentially, through the Town's sewer branches. West Bay also continued to CCTV uninspected pipes, with the goal of completing system-wide inspection by mid-year. Using results from the first cycle of system cleaning, VWHA and Town staff developed an updated strategy for hot spot cleaning that is under review by West Bay. Once finalized, this strategy will be implemented beginning in this contract year.

f. Other

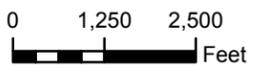
Table 8 provides updates on the progress of the Town's sewer system management activities that are completed in addition to operations, maintenance, and SSO response.

Table 8. Staff Support Activities Summary of Progress

Staff Support Activities	Progress and Comments	Milestones	Date Scheduled	Date Completed
Sewer System Management Plan	<ul style="list-style-type: none"> SSMP update was completed and adopted by Council. No formal actions will be required for the next five years, other than the SSMP audit to be completed every two years. 	<ul style="list-style-type: none"> Biennial audit 	<ul style="list-style-type: none"> May 2018 	
2017 and 2018 Sewer CIPs	<ul style="list-style-type: none"> Town staff accepted the 2017 CIP, which was completed in October 2017. Risk model update for the 2018 CIP will begin in November 2017. 	<ul style="list-style-type: none"> Project Construction for 2017 CIP Provide preliminary recommendations for 2018 CIP 	<ul style="list-style-type: none"> July 2017 February 2018 	<ul style="list-style-type: none"> Completed In Progress
Cleaning and CCTV programs	<ul style="list-style-type: none"> West Bay continues to perform cleaning and CCTV of system pipes. 	<ul style="list-style-type: none"> Complete Year 3 Contract Complete Year 4 Contract 	<ul style="list-style-type: none"> July 31, 2017 July 31, 2018 	<ul style="list-style-type: none"> Completed except for 62 pipes. Cleaning continues for these lines. In Progress
2015-16 Hot Spot program	<ul style="list-style-type: none"> West Bay continues to upload the High Frequency schedule to Lucity on a regular basis. 	<ul style="list-style-type: none"> Upload all High Frequency Schedules to Lucity. 	<ul style="list-style-type: none"> Ongoing 	<ul style="list-style-type: none"> In Progress
Sanitary Sewer Master Plan	<ul style="list-style-type: none"> West Bay collected MH data for hydraulic model development in Year 3. V&A completed collection of rainfall and flow data. VWHA and Town staff are finalizing estimates for average flow allocations to be assigned to EDUs flowing to the cities of Los Altos and Palo Alto following discussions between Town and City staff. Woodard & Curran (W&C) provided details on the required water billing and parcel data; reviewed and imported available manhole data and flow meter data to the model; reviewed network for connectivity and identified preliminary trunk network for model; completed model calibration; began developing project report. 	<ul style="list-style-type: none"> Include in Master Plan Develop Average Flow Calculation Results Hydraulic Model calibration Hydraulic Model report 	<ul style="list-style-type: none"> Complete with tasks listed below. Ongoing June 2017 for preliminary calibration results November 2017 for draft report 	<ul style="list-style-type: none"> Completed for all accessible manholes. Discussions underway Completed In Progress
Root Control Program	<ul style="list-style-type: none"> Develop 2018 plan for Duke's Root Control, Inc. 	<ul style="list-style-type: none"> List of pipes to be root foamed. Chemical root control of target pipes. 	<ul style="list-style-type: none"> February 2018 Spring/Summer 2018 	<ul style="list-style-type: none"> Planned Planned

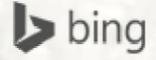


Town of Los Altos Hills Sanitary Sewer Collection System Map Sewer Basins (Branches)



Legend

- Branch 1
- Branch 2
- Branch 3
- Branch 4
- Branch 5
- Branch 6
- Branch 7
- LAH Boundary



Los Trancos Open Space

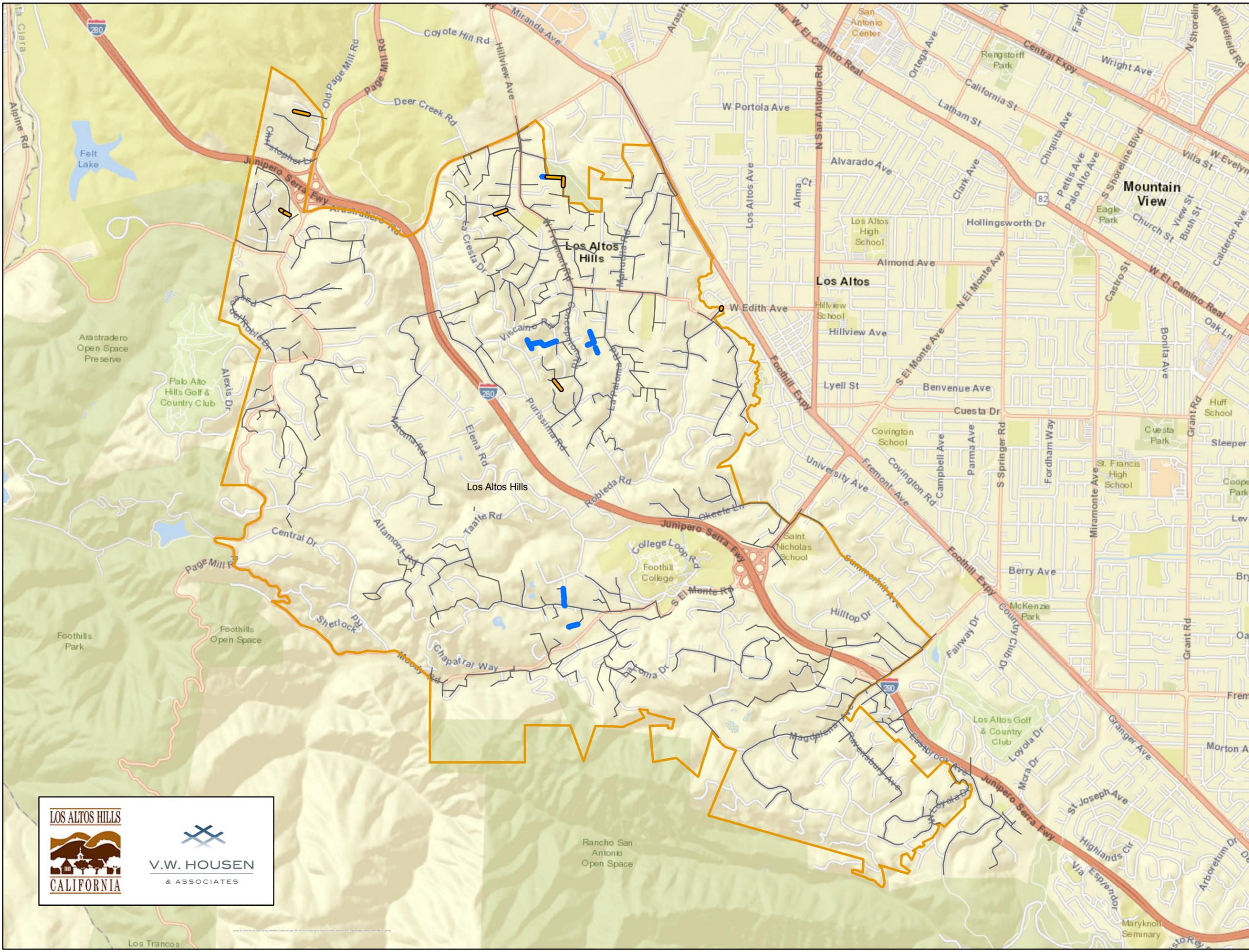
Town of Los Altos Hills
Sanitary Sewer Collection System Map
Pipes Cleaned Aug 2017



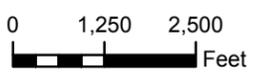
0 1,250 2,500
Feet

Legend

-  Pipes Cleaned
-  Pipes Cleaned from Prev Cycle
-  Sewer Pipeline
-  LAH Boundary

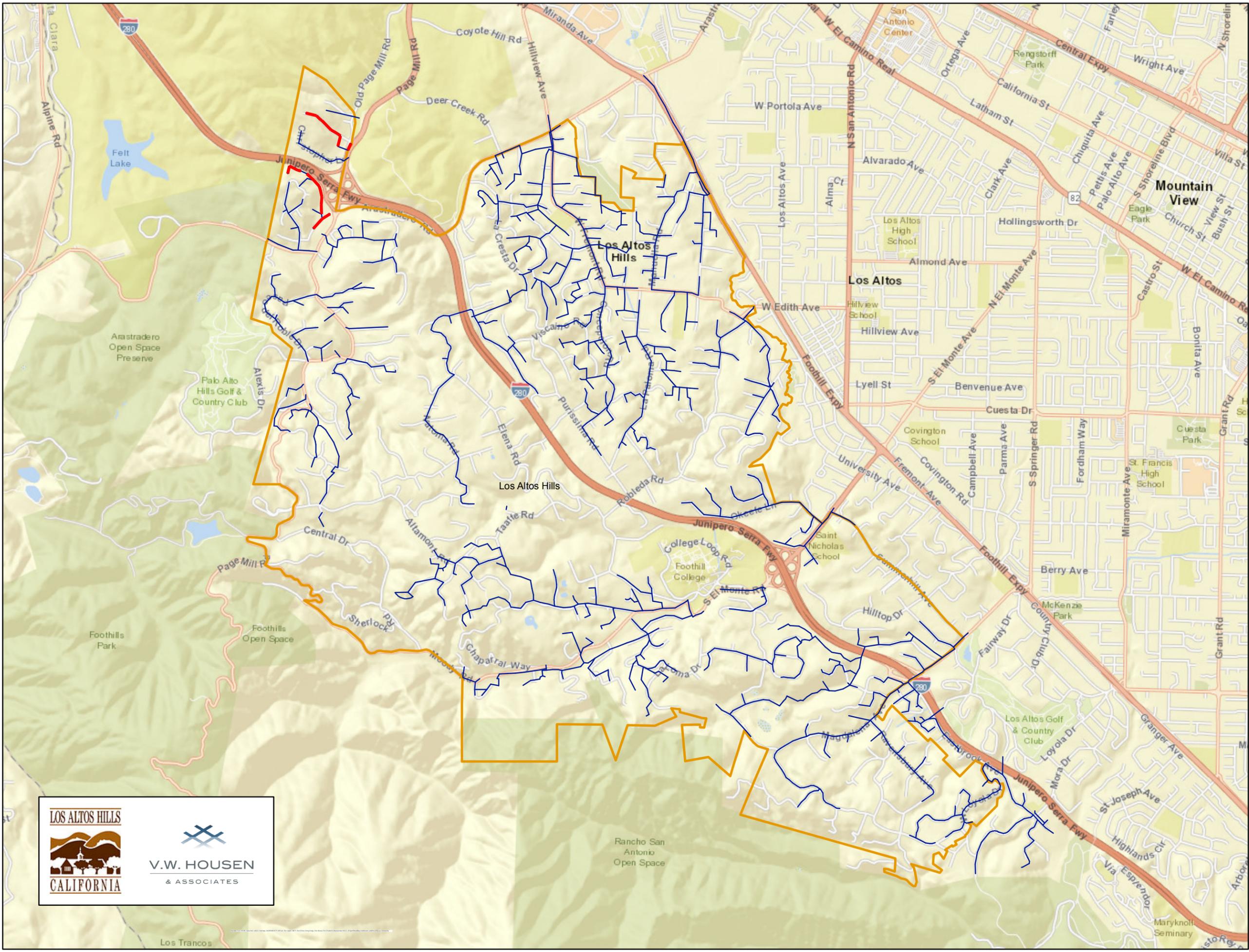


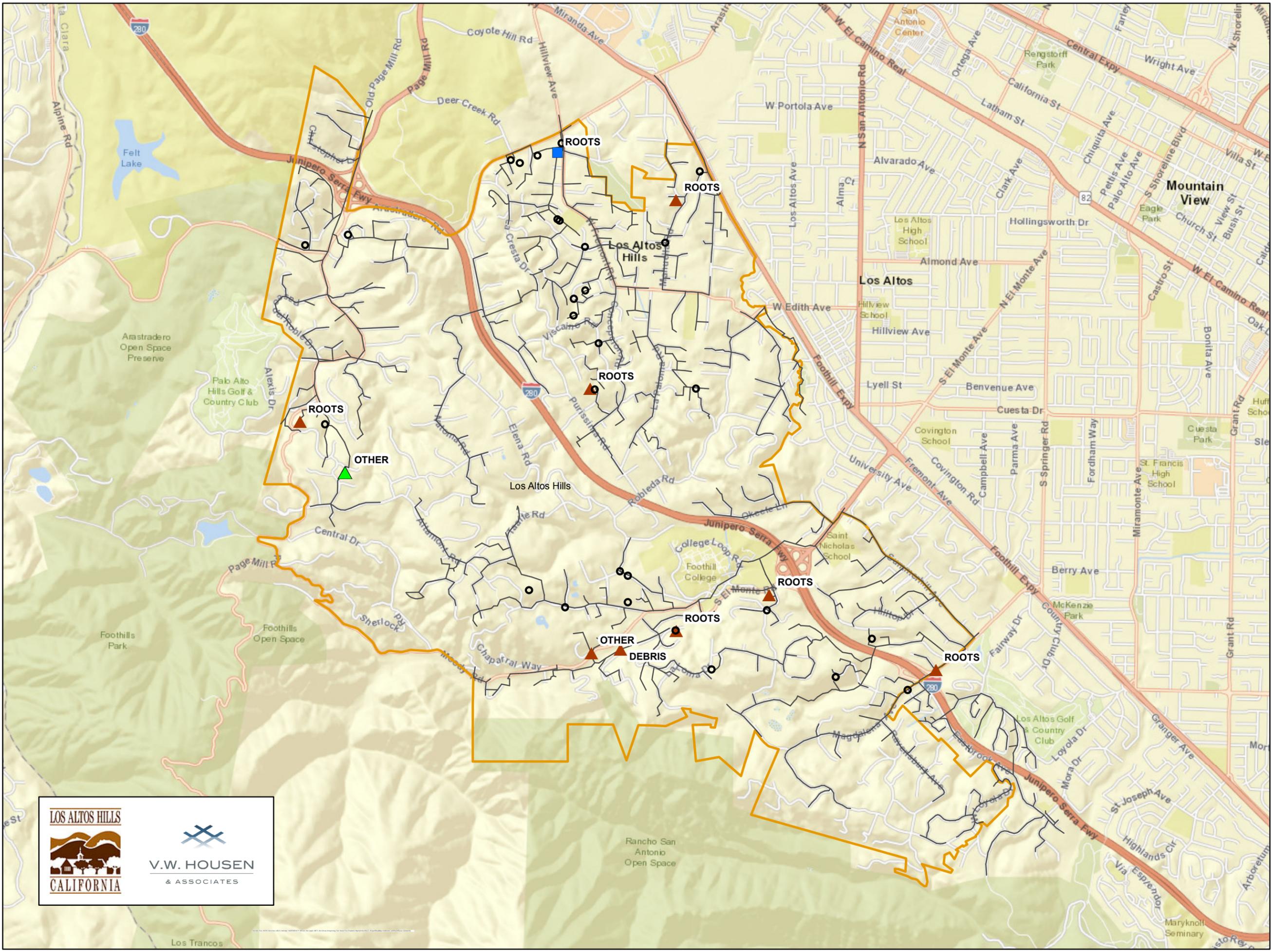
Town of Los Altos Hills
Sanitary Sewer Collection System Map
Pipes CCTV'd Aug 2017



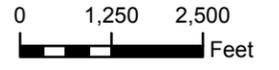
Legend

- Qtr 1 (Aug17)
- Sewer Pipeline
- LAH Boundary





Town of Los Altos Hills Sanitary Sewer Collection System Map SSOs



Legend

- ▲ 2017 SSO Cat 3
- 2017 SSO Cat 1
- ▲ 2015-2016 SSOs (all Cat 3)
- 2013-2014 SSOs
- Sewer Pipeline
- LAH Boundary

