

**Town of Los Altos Hills  
Sanitary Sewer Collection System Progress Report  
Contract Year 2015**

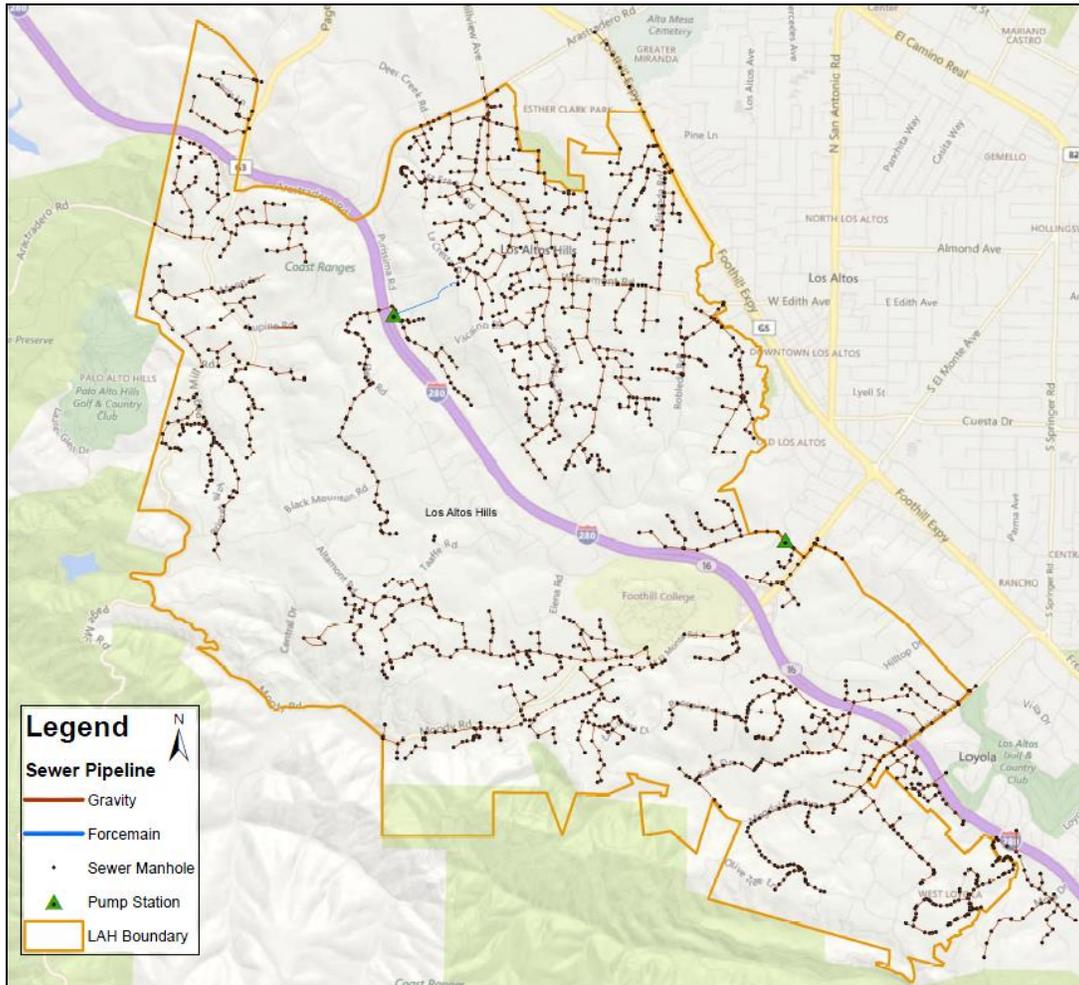
**Reporting Month: July 2016  
Report Date: November 10, 2016**

**I. INTRODUCTION**

Figure 1 shows the Town of Los Altos Hills sewer system.

- Area served: 8.8 square miles
- Miles of sewer pipelines: 55.78
- Number of residential parcels: 1,773
- Number of non-residential connections: 8

**Figure 1. Town of Los Altos Hills Sewer System**



**II. PUBLIC WORKS DIRECTOR/CITY ENGINEER HIGHLIGHTS**

**a. SEWER SYSTEM MAINTENANCE HIGHLIGHTS**

During the month of July 2016, the Town’s sewer maintenance contractor, West Bay Sanitary District (West Bay), completed all contract tasks on schedule. This month marks the end of West Bay’s year 2 contract that started in August 2015.

No significant issues were noted during cleaning and pump station inspection. During CCTV inspections, West Bay marked 3 pipes with structural grade 3 defects (described by NASSCO PACP as likely requiring action after 10 years), 1 pipe with structural grade 4 defect, and 1 with grade 5 defect (both described by NASSCO PACP as likely requiring action within 1 to 10 years) for follow up. Follow up will involve either repair/rehabilitation under a future CIP, or pipe patch by West Bay under their current maintenance contract. The actions flagged by West Bay are not urgent, and the Town is reviewing their collective field notes and prioritizing follow up actions.

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

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

**Table 1. Summary of Completed Tasks (Contract Year August 2015 – July 2016)**

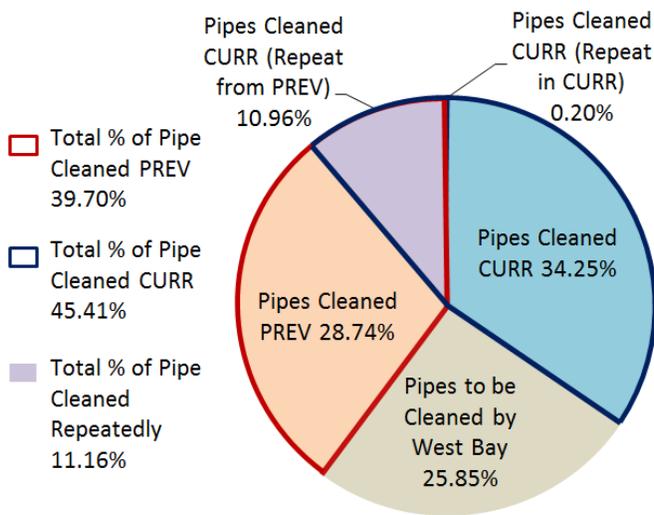
Task	Month of July 2016	Contract Year to Date	Compare to One Year Goal
Sewer Cleaning <ul style="list-style-type: none"> <li>• 36-month and 24-month Schedule</li> <li>• High Frequency (12- and 6-month)</li> <li>• Other, Unscheduled Cleaning</li> </ul>	<ul style="list-style-type: none"> <li>• 0.26 miles</li> <li>• 0.97 miles</li> <li>• 0 miles</li> </ul>	<ul style="list-style-type: none"> <li>• 17.04 miles</li> <li>• 8.85 mile</li> <li>• 0 miles</li> </ul>	101.24% of Goal (100% of Time Elapsed)
Pump Station <ul style="list-style-type: none"> <li>• Preventive Maintenance</li> <li>• Unscheduled repairs</li> </ul>	<ul style="list-style-type: none"> <li>• 4X</li> <li>• 0X</li> </ul>	<ul style="list-style-type: none"> <li>• 50X</li> <li>• 2X</li> </ul>	100% of Goal
CCTV Inspection <ul style="list-style-type: none"> <li>• Routine Schedule (30 mos)</li> <li>• Other Unscheduled CCTV</li> </ul>	<ul style="list-style-type: none"> <li>• 1.02 miles</li> <li>• 0 miles</li> </ul>	<ul style="list-style-type: none"> <li>• 17.73 miles</li> <li>• 0.04 mile</li> </ul>	100.85% of Goal
SSO Response <ul style="list-style-type: none"> <li>• No. of SSOs – Sewer Main</li> </ul>	<ul style="list-style-type: none"> <li>• 0</li> </ul>	<ul style="list-style-type: none"> <li>• 5</li> </ul>	N/A

Cleaning

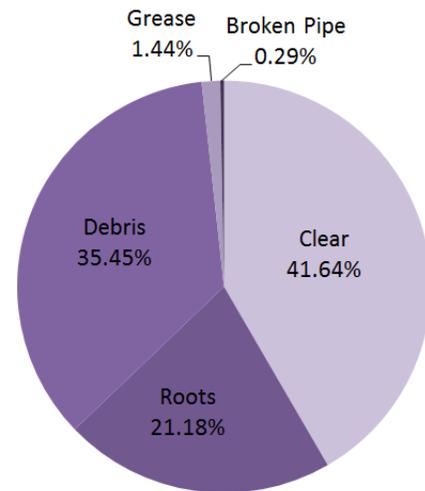
Figure 2a shows previous contract year (PREV) cleaning and current contract year (CURR) cleaning progress for the Town’s pipes. Since August 1, 2014, 74.15 percent of the pipes within the Town’s collection system have been cleaned. The cleaning progress percentages were re-calculated after revising the progress chart to show pipes that have been cleaned more than once in both previous and current contract year. These repeat cleaning instances are due to pipes on the high frequency cleaning 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 compared to pipe lengths due to discrepancies between existing records and field observations.

Figure 2b shows cleaning results for the Town’s pipes for the current contract year only. These cleaning results represent 45.41 percent of the system. In the new contract year, 35.45 percent of the cleaned pipes had debris, 21.18 percent had roots, 1.44 percent had grease, and 41.64 percent were clear. Small amounts of broken pipe debris were encountered by cleaning crews during the current contract year.

**Figure 2a. Cleaning Progress as of July 31, 2016**



**Figure 2b. Cleaning Results for the Current Year to Date. (Chart represents 45.41% of system).**



Prior to hiring West Bay, the Town did not have an aggressive and structured sewer pipe cleaning program. As a result, debris from prior years has been found inside the pipes. After West Bay cleans the entire system at least one time, the volume of debris in the system should decrease along with other cleaning issues. The Town is expecting to finish cleaning the entire system at least once as part of West Bay’s Year 3 contract.

During the previous contract year, West Bay had focused on cleaning pipes in the system that had high volumes of SSOs. As a result, there are fewer “Clear” pipes encountered in the system as shown in Tables 2 and 3. In the current contract year, cleaning, which has occurred on a branch by branch basis, shows more “Clear” pipe. However, roots and debris in the pipes have remained an issue in the Town’s collection system.

High frequency pipe cleaning and chemical root control programs are two measures that the Town is implementing as a result of the cleaning issues in the system. In addition, the ongoing Capital Improvement Program that aims to replace pipes in the worst structural condition will also aid in addressing these issues in the system. Some of the pipes that have the worst structural defects also contribute to presence of debris and roots in the system.

**Table 2. Cleaning Results PER CONTRACT YEAR by Percent of Pipe Segments**

Pipe Cleaning Result	Previous Contract Year (39.70% of System Cleaned)	Current Contract Year (45.41% of System Cleaned)
Clear	17.86%	41.64%
Roots	26.32%	21.18%
Debris	54.23%	35.45%
Other	1.59%	1.73%
<b>Total</b>	100% of Cleaned Pipes	100% of Cleaned Pipes

*Note: The sum of the previous contract year percentage (39.70%) and current contract year (45.41%) is not the total percentage of pipe cleaned in the system to date. There is a 10.96% overlap between the 2 contract years because of the pipes that have been cleaned more than once due to High Frequency cleaning schedule.*

**Table 3. Cleaning Results TO DATE by Percent of Pipe Segments**

Pipe Cleaning Result	Previous and Current Contract Year (74.15% of System Cleaned)
Clear	30.31%
Roots	23.66%
Debris	44.37%
Other	1.66%
<b>Total</b>	100% of Cleaned Pipes

Figure 3 shows West Bay cleaning progress since they started maintaining the Town’s sanitary sewer collection system in August 2014. West Bay has been effective in meeting each year’s total cleaning footage goal on average, as projected in the previous and current contract.

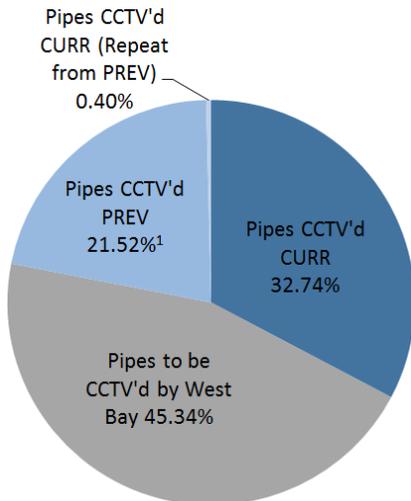
**Figure 3. West Bay Cleaning Progress**



CCTV Inspection

Figure 4 shows the progress of CCTV inspection performed by West Bay in the Town’s system. Percentages are shown based on the number of pipe segments inspected instead of pipe length for consistency. As of July 2016, 54.66 percent of the system had been inspected. Of the 54.66 percent, 33.14 percent was inspected during the current contract year including several pipes inspected from the previous contract year.

**Figure 4. CCTV Inspection Results as of July 31, 2016**

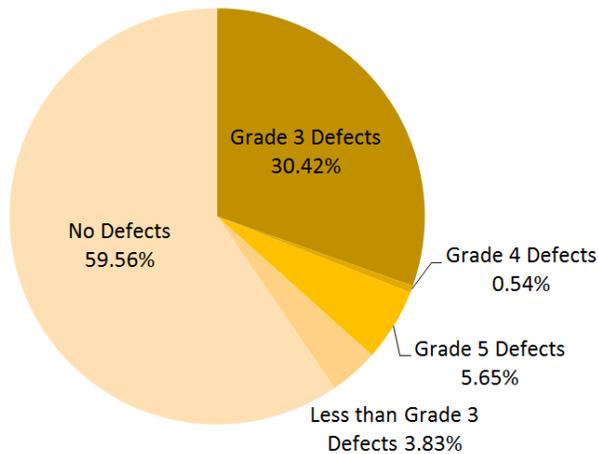


*Note: <sup>1</sup>This percentage in addition to Pipes CCTV'd CURR (repeat from PREV) is the total percentage of pipes CCTV'd in the previous contract year.*

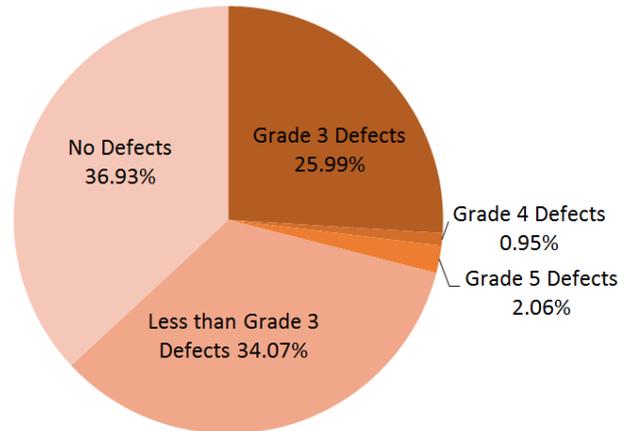
As part of West Bay’s CCTV Operations, pipes with NASSCO PACP Grade 4 or 5 Operations and Maintenance (O&M) defects are placed on the hot spot list. Pipes on the hot spot list receive a more frequent cleaning schedule of 12 and 6 months. Cleaning these pipes more frequently will help address these O&M defects before they affect the pipe’s structural condition. It will also help prevent potential blockages inside the pipes. These pipes showing Grade 4 or 5 O&M defects will remain on the hot spot list until the O&M issues are resolved. The hot spot list is maintained by West Bay outside of the Lucity database. According to West Bay, high frequency schedules for all pipes maintained through July 2016 have been uploaded to Lucity. VWHA retrieved the current hotspot list (12 month or 6 month cleaning schedule) from Lucity and sent to West Bay for confirmation. The pipe cleaning

frequency schedule in Lucity will allow West Bay and the Town to keep track of pipes that need more attention. The remaining 45.34 percent of pipes in the system have not been inspected by West Bay, and will be inspected as part of their Year 3 contract with the Town.

**Figure 5a. CCTV Inspection Results CURR August 2015 – July 31, 2016 (Structural). (Chart represents 33.14% of system).**



**Figure 5b. CCTV Inspection Results CURR August 2015 – July 31, 2016 (O&M). (Chart represents 33.14% of system).**



Figures 5a and 5b show structural and O&M defects found during the current contract year. These charts reflect results for 33.14 percent of the system.

During this period, 59.56 percent of inspected pipes had no structural defects, 34.25 percent had Grade 3 or better structural defects, and 6.19 percent had Grade 4 or 5 structural defects.

From the pipes inspected this current contract year, 3.01 percent have NASSCO PACP O&M Grade 4 and 5 defects. In addition, 60.06 percent of the inspected pipes have been recorded to have Grade 3 or lower defects not including the 36.93 percent that have no defects.

The current contract year focused CCTV operations on Branch 5 of the system, which had the largest number of prior SSO locations. As a result, West Bay encountered more pipes in the system having NASSCO PACP Structural Grade 5 defects compared to the previous year as shown in Tables 4 and 6. West Bay also performed CCTV operations for Branches 3, 6, and pipes in Branch 2 of the system that have not been CCTV'd. The CCTV results, combined with West Bay's field follow up notes, have been used to develop the Capital Improvement Program to address the most critical pipes with Grade 4 and 5 structural issues. For the Year 3 contract, West Bay will begin CCTV operations on remaining pipes in Branch 2 that have not yet been inspected.

The O&M CCTV results are summarized in Tables 5 and 7. In the previous contract year, West Bay prioritized video inspection in lines with known issues (based on existing maintenance records and the Town's understanding of the system) and those lines with incomplete videos. As a result of this approach, more pipes with the worst NASSCO PACP O&M Grade (4 or 5) results were encountered by West Bay in the previous year compared to the current contract year. However, the number of pipes with minor O&M defects has generally remained the same. As part of the Year 3 contract, the Town should continue to be aggressive with its sewer pipe cleaning and CCTV program. The

programs such as High Frequency Cleaning, Root Foaming, and detailed CCTV operations will ensure that these pipe defects are well maintained and in due course reduce the chance of an overflow.

**Table 4. Structural CCTV Results PER CONTRACT YEAR by Percent of Pipe Segments**

Pipe Structural Grade	Previous Contract Year (21.92% of System CCTV'd)	Current Contract Year (33.14% of System CCTV'd)
Grade 5	2.29%	5.65%
Grade 4	0.28%	0.54%
Grade 3 or Less	97.43% includes 65.71% with no defects	93.81% includes 59.56% with no defects
<b>Total</b>	100% of CCTV'd Pipes	100% of CCTV'd Pipes

*Note: The sum of the previous contract year percentage (21.92%) and current contract year (33.14%) is not the total percentage of pipe in the system inspected. There is a 0.40% overlap between the 2 years because of the pipes that have been CCTV'd more than once. VWHA is working with West Bay to determine the reason for these repeat inspections.*

**Table 5. O&M CCTV Results PER CONTRACT YEAR by Percent of Pipe Segments**

Pipe O&M Grade	Previous Contract Year (21.92% of System CCTV'd)	Current Contract Year (33.14% of System CCTV'd)
Grade 5	7.11%	2.06%
Grade 4	0.61%	0.95%
Grade 3 or Less	92.28% includes 23.17% with no defects	96.99% includes 36.93% with no defects
<b>Total</b>	100% of CCTV'd Pipes	100% of CCTV'd Pipes

*Note: The sum of the previous contract year percentage (21.92%) and current contract year (33.14%) is not the total percentage of pipe in the system inspected. See note on Table 4.*

**Table 6. Structural CCTV Results TO DATE by Percent Pipe Segments**

Pipe Structural Grade	Previous and Current Contract Year (54.66% of System CCTV'd)
Grade 5	4.34%
Grade 4	0.44%
Grade 3 or Less	95.22% (includes 61.96% with no defects)
<b>Total</b>	100% of CCTV'd Pipes

**Table 7. O&M CCTV Results TO DATE by Percent Pipe Segments**

Pipe O&M Grade	Previous and Current Contract Year (54.66% of System CCTV'd)
Grade 5	4.27%
Grade 4	0.81%
Grade 3 or Less	94.92% (includes 30.90% with no defects)
<b>Total</b>	<b>100% of CCTV'd Pipes</b>

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

**Figure 6. West Bay CCTV Progress**



Pump Station Maintenance

During this month, routine maintenance was conducted at Purissima and O'Keefe pump stations. There were no issues observed during West Bay's weekly inspections.

SSO Review

Table 8 shows SSOs to date by cause. During this month, there were no reported SSO within the Town's Sewer Collection System.

In the 2 years since West Bay started maintaining the Town's collection system, West Bay has managed to reduce the number of SSOs within the Town's system. There have been 12 SSOs since West Bay took over the Town's sewer maintenance operations in August 2014. This is a significant improvement compared to the 40 SSOs in the 3 years prior to West Bay's involvement. Although the

ongoing drought may have influenced this outcome, the Town’s effort to implement a structured maintenance program has been the key to reducing SSOs.

**Table 8. SSOs to July 31 2016, by Cause**

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

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

**b. Summary of Meetings Held during Reporting Month**

During the month of July 2016, VWHA provided Town Council with an update on the sewer management program, and attended the 2016 CIP construction kickoff meeting.

**c. Computerized Maintenance Management System (CMMS) Updates**

During the reporting month, routine input of cleaning and CCTV inspection progress to date was added to the CMMS. All High Frequency schedules for the Year 2 contract have been uploaded to Lucity.

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

West Bay has stated that they are updating the Town’s GIS mapping maintenance system on a regular basis. The most recent GIS update received by VWHA/the Town was dated February 2, 2016.

**e. Maintenance Planning**

West Bay has continued to implement the agreed maintenance plan from previous discussions with the Town and VWHA. West Bay will continue to clean and CCTV remaining pipes in Branch 2 and 5 of the system in the beginning of Year 3 contract.

**f. Other**

Table 9 provides updates and progress on the Town’s sewer system management activities that are completed in addition to operations, maintenance, and SSO response.

**Table 9. Staff Support Activities Summary of Progress**

Staff Support Activities	Progress and Comments	Future Milestones	Date Scheduled	Date Completed
Sewer System Management Plan	<ul style="list-style-type: none"> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>Biennial audit</li> </ul>	<ul style="list-style-type: none"> <li>May 2018</li> </ul>	
2016 Sewer CIP	<ul style="list-style-type: none"> <li>The Town's risk model has been completed. Based on risk model results, a repair list was developed for the CIP.</li> <li>VWHA submitted the final document for the CIP that includes input from both the Town and West Bay.</li> <li>The City Council awarded the construction contract on May 19, 2016.</li> </ul>	<ul style="list-style-type: none"> <li>Project Construction</li> </ul>	<ul style="list-style-type: none"> <li>In Progress</li> </ul>	<ul style="list-style-type: none"> <li>In Progress</li> </ul>
Cleaning and CCTV programs	<ul style="list-style-type: none"> <li>West Bay continues to perform cleaning and CCTV of pipes in Branch 2 of the system.</li> </ul>	<ul style="list-style-type: none"> <li>Complete Year 2 Contract</li> </ul>	<ul style="list-style-type: none"> <li>July 31, 2016</li> </ul>	<ul style="list-style-type: none"> <li>July 31, 2016</li> </ul>
2015-16 Hot Spot program	<ul style="list-style-type: none"> <li>West Bay has uploaded all High Frequency (hot spot) schedule in Lucity this month as part of the year 2 contract goal. West Bay will continue to update the hotspot list in Lucity based on cleaning and CCTV results encountered this coming Year 3 contract.</li> </ul>	<ul style="list-style-type: none"> <li>Upload all High Frequency Schedule in Lucity</li> </ul>	<ul style="list-style-type: none"> <li>July 31, 2016</li> </ul>	<ul style="list-style-type: none"> <li>Waiting confirmation from West Bay</li> </ul>
Sanitary Sewer Master Plan	<ul style="list-style-type: none"> <li>West Bay has collected MH data this month and will continue this work over the next several months. Master Plan development will follow data collection.</li> <li>V&amp;A has completed collecting rainfall data. VWHA is analyzing the collected data and will prepare a summary, including an evaluation of dry weather flow allocation per connected parcel. Draft report is anticipated to be completed in July 2016, with a final report in August 2016.</li> </ul>	<ul style="list-style-type: none"> <li>Master Plan RFP</li> <li>Average Flow Calculation Draft Report</li> </ul>	<ul style="list-style-type: none"> <li>September 2016</li> <li>August 2016 for FM Report. Other activities are ongoing.</li> </ul>	<ul style="list-style-type: none"> <li>In Progress</li> <li>In Progress</li> </ul>

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



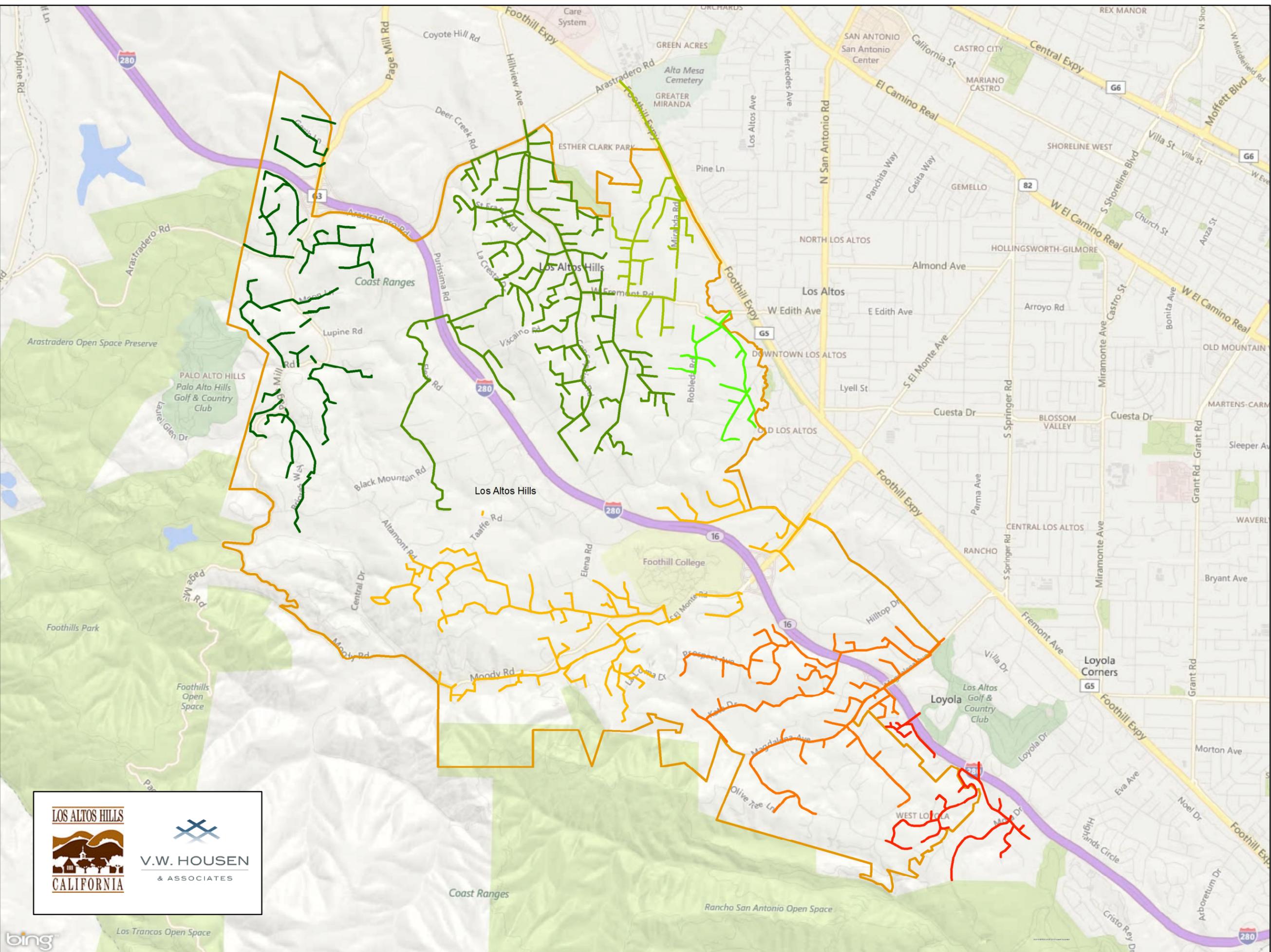
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Feet

## Legend

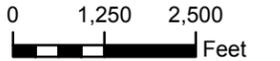
- Branch 1
- Branch 2
- Branch 3
- Branch 4
- Branch 5
- Branch 6
- Branch 7
- LAH Boundary

**LOS ALTOS HILLS**  
**CALIFORNIA**

**V.W. HOUSEN**  
& ASSOCIATES



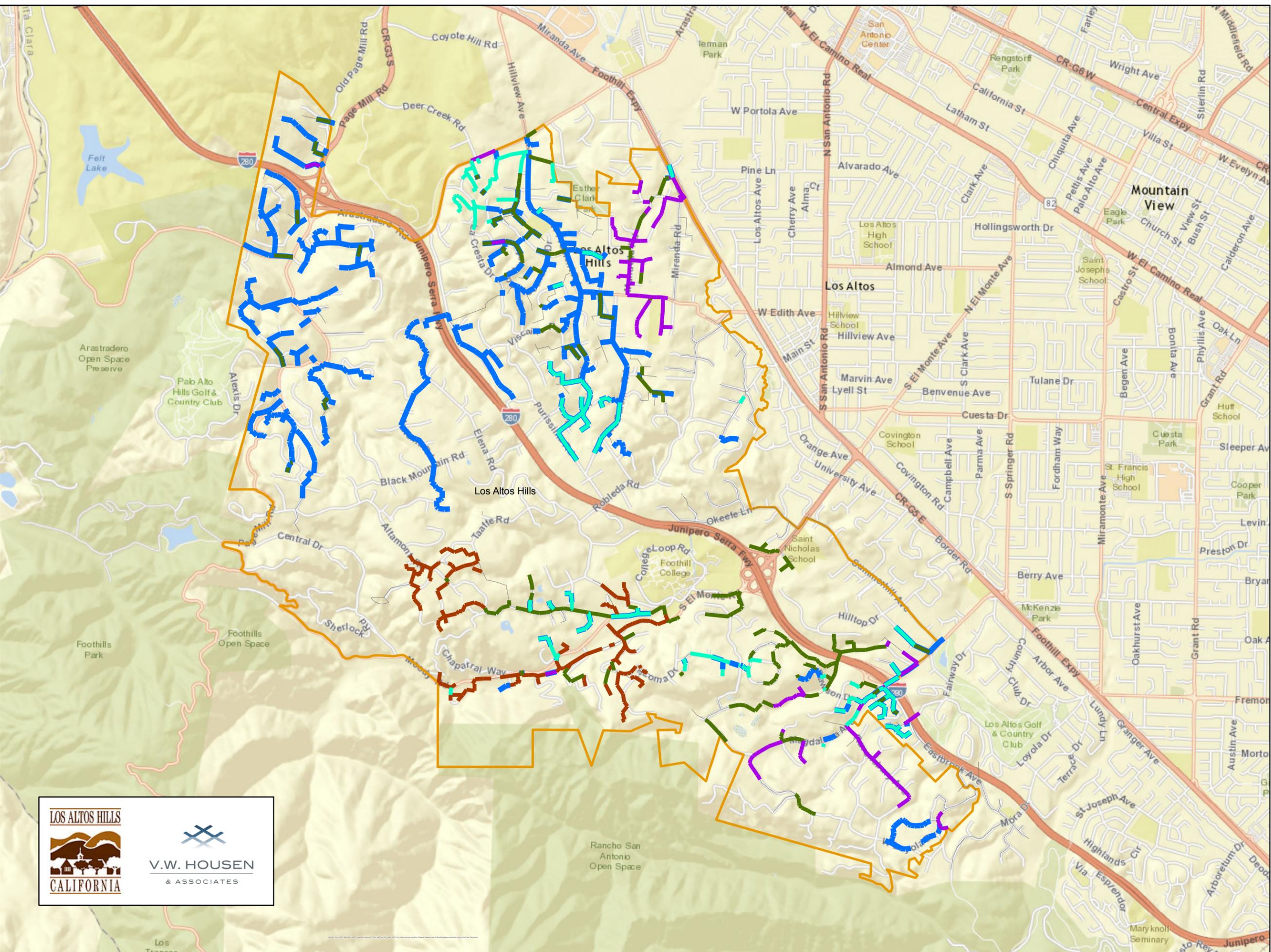
Town of Los Altos Hills  
 Sanitary Sewer Collection System Map  
 Pipes Cleaned from Aug 2014 - July 2016



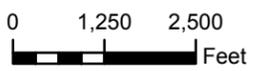
**Legend**

-  Prev Yr Aug14 - Jul15
-  Qtr 1 (Aug15 - Oct15)
-  Qtr 2 (Nov15 - Jan16)
-  Qtr 3 (Feb16 - Apr16)
-  Qtr 4 (May16 - Jul16)
-  Sewer Pipeline
-  LAH Boundary



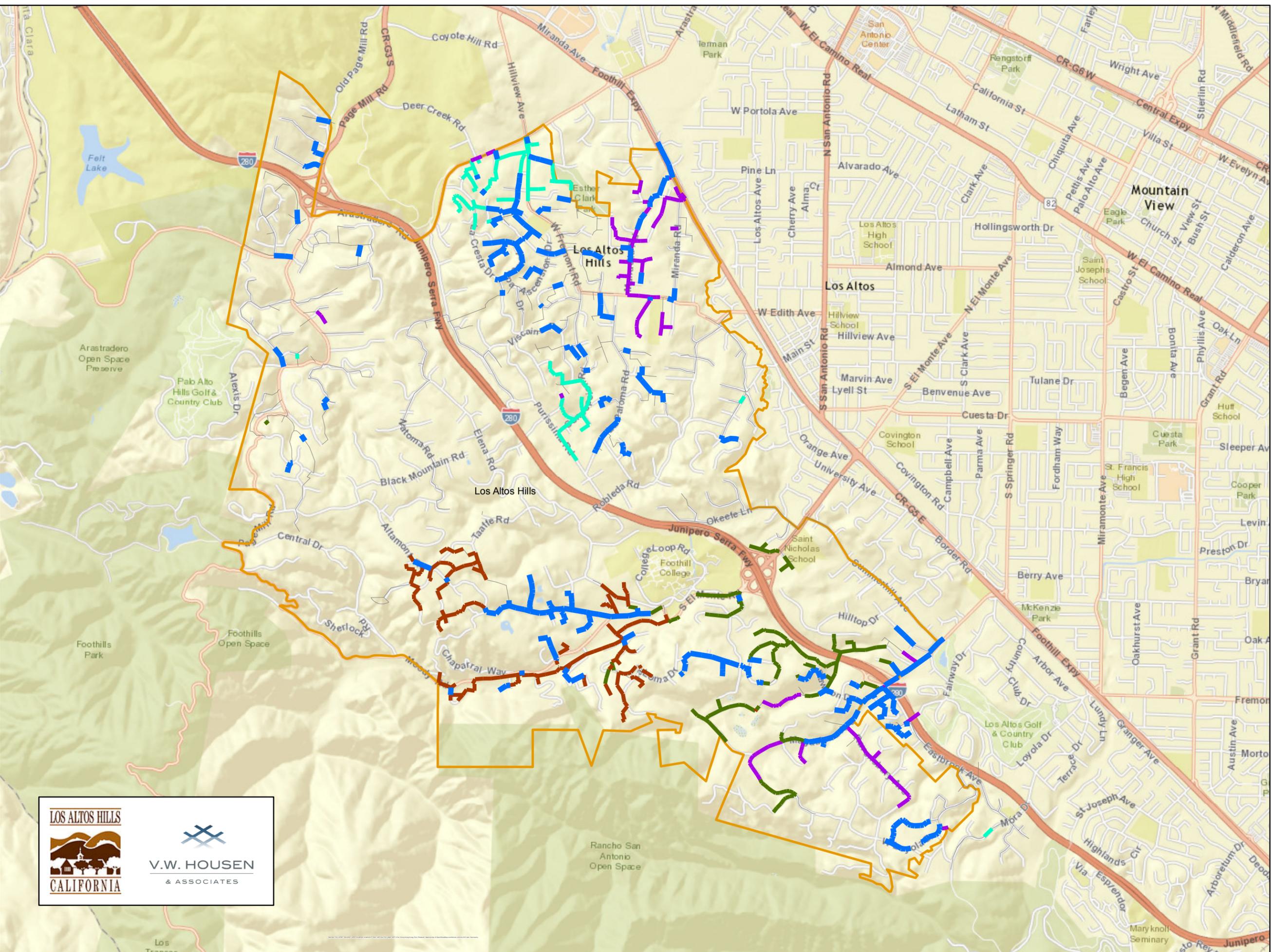


Town of Los Altos Hills  
 Sanitary Sewer Collection System Map  
 Pipes CCTV'd from Aug 2014 - July 2016

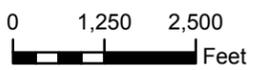


**Legend**

- Prev Yr (Aug14 - Jul15)
- Qtr 1 (Aug15 - Oct15)
- Qtr 2 (Nov15 - Jan16)
- Qtr 3 (Feb16 - Apr16)
- Qtr 4 (May16 - Jul16)
- Sewer Pipeline
- LAH Boundary



Town of Los Altos Hills  
 Sanitary Sewer Collection System Map  
 SSOs from 2013 - July 2016



**Legend**

-  2015-2016 SSOs (all Cat 3)
-  2013-2014 SSOs
-  Sewer Pipeline
-  LAH Boundary



