Lead Service Line Inventory

Hybrid Work Plan

Records Review, Field Inspections, Interpolation, and Stratified Random Sampling

January 16, 2024

Created by: Carpinteria Valley Water District
Engineering Department

CARPINTERIA, CALIFORNIA

Table of Contents

I. Introduction

In response to the Lead and Copper Rule Revisions (LCRR) published in 2021, the Carpinteria Valley Water District (CVWD) is planning their Lead Service Line (LSL) Inventory following an intensive records review. CVWD has a total of 4,564 water services at the time of this writing. These include the following categories: Agriculture, Commercial, Fire Protection, Hospitality, Industrial, Landscape Irrigation, Multi-family, Master Meter, Public Authority, Residential, and CVWD Water District accounts. Temporary construction water meters are not included in the LSL as they are connected to fire hydrants for short-term projects without upstream or downstream piping. Additionally, there are four "exchange meters" that service Casitas Municipal Water District (CMWD) customers in Ventura County, which are served from CVWD's distribution system through a special agreement for a grand total of 4,568 services to review. One of the "exchange meters" is 4" in size and, therefore, it can be ruled out that the upstream and downstream piping is not lead, but the three other "exchange meters" will have individual field inspections performed.

It is not thought that any lead service lines were used in Carpinteria Valley Water District's jurisdiction due to the young age of our system (1941), historical work orders showing that copper was used for new installations and water service line replacements through the late 50s, and institutional knowledge from current and retired staff members. The Operations Manager from the mid-60s through the mid-90s was interviewed in the fall of 2023 regarding his knowledge of lead within CVWD's distribution system, and he stated that lead was never used for water service lines nor found at any time during his tenure. Additionally, the current Distribution Foreman has worked at CVWD for 25 years and has stated that he has never come cross any lead service lines when repairing or replacing leaking old water service lines.

The Engineering Department has already undergone a review of available records including As-builts, work orders for service line repairs, and Santa Barbara (SB) County's year of construction data at the parcel level. Staff have already eliminated the need to visit 769 of the 4,568 water meters by finding records showing the service line material or date of installation and demonstrating that the date of construction occurred between 1986 and present. Additionally, another 134 meters in the inventory were able to be completed due to the service line pipe diameter being greater than or equal to 4" in size. Interpolation can be performed to obtain data as described in Section IV for another 1,236 water services by sampling 10% within each defined Interpolation Areas (Section V) and using the outlined Field Inspection Protocol (Section III).

The remaining 2,425 meters will need to be completed using stratified random sampling. Using the relationship between the water account and the parcel(s) served, the SB County's year of construction data will be used to group the remaining 2,425 water accounts into 10-year periods. The District will perform the Field Inspection Protocol (Section III) on a random sample of meters in each 10-year period in order to achieve a 95% confidence level. The 10-year periods and quantity of meters in each group are outlined in Section VI and the individual years and quantity of meters are provided in **Appendix C**.

A summary of the total number of meters that will be accomplished using the various LSL methods is provided in **Table 1**.

Table 1. Summary of the Quantity of CVWD Meters and Various LSL Inventory Methods

Number of Services	Method of LSL Inventory Completion	Number of Meters to Field Inspect	Status
134	Greater than or equal to 4" in diameter	0	Completed
769	Historical records/Year of Construction/As-built material	0	Completed
1	CMWD "Exchange meter" greater than or equal to 4" in diameter	0	Completed
1,236	Interpolation & Field Inspections (Summary in Appendix B)	136	Pending Approval
2,425	Stratified random sampling & Field Inspections (Summary in Section VI)	967	Pending Approval
3	CMWD "Exchange meters" < 4" & Field Inspections	3	Pending Approval
4,568	***Grand Total to Field Inspect using the Field Inspection Protocol →***	1,106	

II. Request for DDW Approval

CVWD is requesting approval from the Division of Drinking Water (DDW) to complete our LSL Inventory using pipe diameter and our completed records review in addition to the proposed field inspection protocol, interpolation, and stratified random sampling outlined in this hybrid work plan.

III. Field Inspection Protocol

1. Protocol

Field inspections will be conducted using ArcGIS Field Maps and ArcGIS Survey123 on CVWD iPhones. A map of the randomly selected meters that must be field inspected to meet the proposed interpolation and stratified random sampling requirements will be published in a map in ArcGIS Field Maps showing the GPS locations of each meter. CVWD field staff will arrive at the site, open the meter box, dig out the dirt if required, click the meter in the map, and press a link that will take them to the LSL Inventory survey in ArcGIS Survey123.

A. Where to Test

The field staff must expose the pipe on CVWD's side of the water meter and the customer side of the meter and rigorously clean the pipe for inspection. Through the survey interface, field staff are required to perform a visual inspection and note the pipe color, a scratch test to determine if the pipe is hard or soft, a magnet test on all metallic pipe, and a lead test with Exposome BioScience's Lead Test Swabs if the metallic pipe is determined to be non-magnetic. Observations regarding the pipe's color and photographs are also required. Field staff will be provided with a copy of **Appendix A: Field Test Guidance** for reference so that the data submitted is accurate and consistent.

If a backflow assembly is installed within 1-5 feet from the water meter, field staff have the *option* to either get the customer's pipe material in the water meter box or to expose the pipe material underground downstream (on the customer side) of the backflow assembly. If the customer's pipe is not visible in the box and there is no backflow device installed, then CVWD staff will dig just outside of the water meter box on the customer side and test the pipe at that location. These options are displayed in **Figure 1**.

Figure 1. Options for Testing the Customer's Pipe Material

B. Access Issues

If there is no customer pipe accessible/visible in the box, the customer side of the meter box is not accessible, or the downstream side of a backflow assembly cannot be exposed (for example, if concrete has been poured around the meter box and the backflow assembly), field staff are instructed to navigate back to their map in ArcGIS Field Maps and mark the meter as an "Access Issue" rather than "Complete" or "Incomplete" and move on to the next meter. The Operations Manager will have to determine how to proceed. If access is not easily achievable and involves cutting into or removing existing infrastructure (including, but not limited to, sidewalks, pavers, fences, or walls) then CVWD will select the meter with the next lowest random number assigned for the specific group being sampled, as outlined in future Sections.

C. Survey123 Details

The ArcGIS Survey123 interface is shown in **Figure 2** with an example inspection shown using false information to demonstrate all the fields and photos required to be submitted if lead were to be found. Each of the fields, field types, and options are also outlined in **Table 2**.

Figure 2. ArcGIS Survey123 user-interface filled out to demonstrate the survey questions

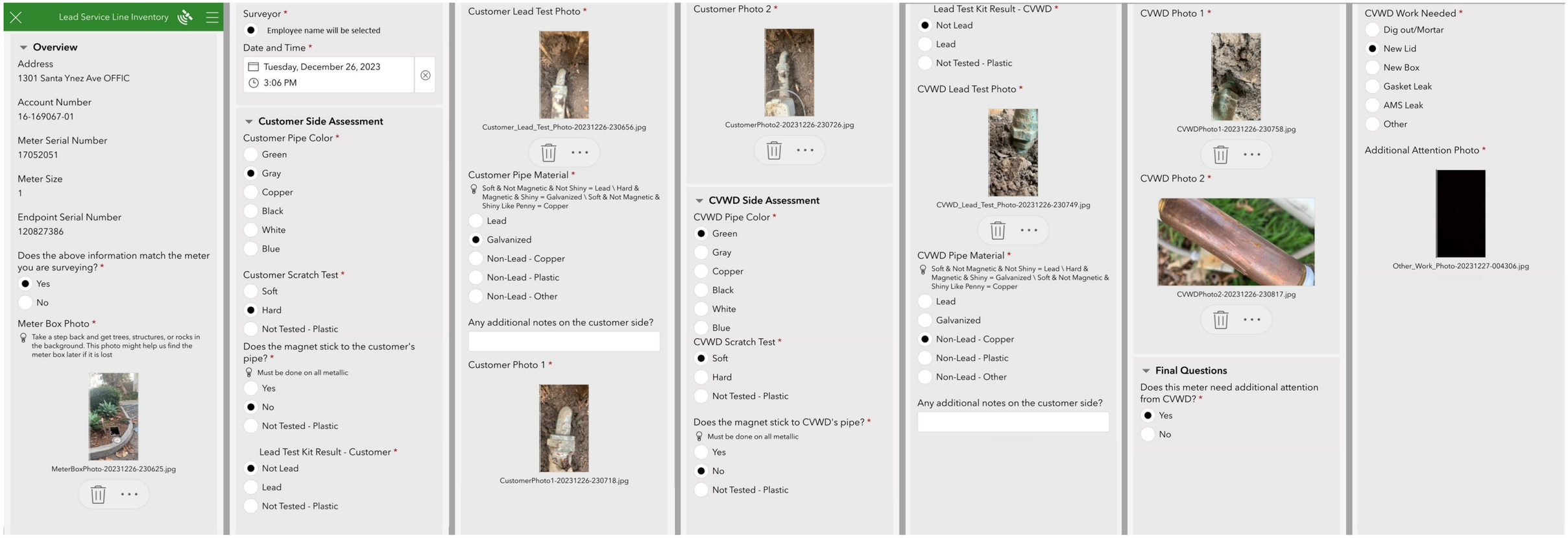


Table 2. Description of Survey123 Fields for CVWD's Field Inspection Protocol

Field #	Field Name	Field Type	Editable/ Not Editable	Hidden/Visible/ Dependent	Default/ Optional/ Required	Options	Note
1	Address	Text	Not Editable	Visible	Default		
2	Site Latitude	Decimal	Not Editable	Hidden	Default		
3	Site Longitude	Decimal	Not Editable	Hidden	Default		
4	Account Number	Text	Not Editable	Visible	Default		
5	Meter Serial Number	Text	Not Editable	Visible	Default		
6	Meter Size	Text	Not Editable	Visible	Default		
7	Endpoint Serial Number	Text	Not Editable	Visible	Default		
8	Does the information above match the meter?	Select one	Editable	Visible	Required	Yes/No	
9	Meter Box Photo	Photo	Editable	Visible	Required		
10	Surveyor Name	Select one	Editable	Visible	Required	(All field staff names are listed in a picklist)	
11	Date and Time	Date/Time	Editable	Visible	Required	Defaults to current date and time	
12	Customer Pipe Color	Select one	Editable	Visible	Required	Green/Gray/Copper/Black/White/Blue	
13	Customer Scratch Test	Select one	Editable	Visible	Required	Soft/Hard/Not Tested - Plastic	
14	Does the magnet stick to the customer's pipe?	Select one	Editable	Visible	Required	Yes/No/Not Tested - Plastic	
15	Lead Test Kit Result - Customer	Select one	Editable	Visible	Required	Not Lead/Lead/Not Tested - Plastic	Required only if "No" is selected for field 14 (pipe not magnetic)
16	Lead Test Photo - Customer	Photo	Editable	Visible	Required		Required only if "Lead" is selected for field 15
17	Customer Pipe Material	Select one	Editable	Visible	Required	Lead/Galvanized/Non-Lead – Copper/ Non-Lead – Plastic/Non-Lead - Other	
18	Additional notes on the customer side	Text	Editable	Visible	Optional		

Field #	Field Name	Field Type	Editable/ Not Editable	Hidden/Visible/ Dependent	Default/ Optional/ Required	Options	Note
19	Customer Photo 1	Photo	Editable	Visible	Required		
20	Customer Photo 2	Photo	Editable	Visible	Required		
21	CVWD Pipe Color	Select one	Editable	Visible	Required	Green/Gray/Copper/Black/White/Blue	
22	CVWD Scratch Test	Select one	Editable	Visible	Required	Soft/Hard/Not Tested - Plastic	
23	Does the magnet stick to CVWD's pipe?	Select one	Editable	Visible	Required	Yes/No/Not Tested - Plastic	
24	Lead Test Kit Result – CVWD	Select one	Editable	Visible	Required	Not Lead/Lead/Not Tested - Plastic	Required only if "No" is selected for field 23 (pipe not magnetic)
25	Lead Test Photo – CVWD	Photo	Editable	Visible	Required		Required only if "Lead" is selected for field 24
26	CVWD Pipe Material	Select one	Editable	Visible	Required	Lead/Galvanized/Non-Lead – Copper/ Non-Lead – Plastic/Non-Lead - Other	
27	Any additional notes on the customer side?	Text	Editable	Visible	Required		
28	CVWD Photo 1	Photo	Editable	Visible	Required		
29	CVWD Photo 2	Photo	Editable	Visible	Required		
30	Does this meter need additional attention from CVWD?	Select one	Editable	Visible	Required	Yes/No	
31	CVWD Work Needed	Select one	Editable	Visible	Required	Dig out or Mortar/New Lid/New Box/Gasket Leak/AMS Leak/Other	Required only if "Yes" is selected for field 30
32	"Other" Work Needed	Text	Editable	Visible	Required		Required only if "Other" is selected for field 31
33	Additional Attention Photo	Photo	Editable	Visible	Required		Required only if "Yes" is selected for field 30

(**Table 2** continued)

2. If Lead is Found

If lead is found, customers will be notified and provided with supplies as required. Additionally, CVWD staff will schedule a meeting with DDW's Lead and Copper Unit to determine how to apply the lead finding to the particular interpolation area or stratified random sampling group.

IV. Interpolation Methods: Tracts & Same Year of Construction

CVWD is seeking permission from DDW to use interpolation methods to determine service line materials in our jurisdiction. A total of 25 interpolation areas have been defined and outlined in the following pages. Individual maps of each interpolation area are provided. If additional maps or GIS data are requested by DDW please contact CVWD's Engineering Analyst, Danielle Rose at danielle@cvwd.net.

1. Protocol

Interpolation areas were determined by using SB County's parcel shapefile in ArcGIS Pro and looking through their 'Tract' and 'YearBuilt' fields to find contiguous parcels built within the same time frame or in the same housing tract for areas constructed prior to 1986 when the lead ban went into effect. The District proposes to sample 10% of the water accounts in each interpolation area. To achieve this, all water accounts serving the parcels within each interpolation area that do not have known water service material on both sides will be brought into Microsoft Excel. If there are water service line repair records and the material is known on one side of the meter (CVWD side) those water accounts will not be brought into Microsoft Excel to determine the random sample as surveying these meters may not be representative of the original service line standard used when the meters were first installed. Random numbers will be assigned to each record with unknown material on both sides using the =rand() function and then the records will be sorted from lowest to highest based on the random number. The sample will be selected using the meters with the lowest random numbers. As an example, if 10 accounts in the interpolation area must be checked, the accounts brought into Microsoft Excel with the lowest 10 random numbers will be surveyed. If both sides of all the meters at each of the sample sites are determined to be non-lead, then all other meters in the interpolation area without records will be assumed to be non-lead on both sides and will be reported as "Non-lead – Other" in the final report provided to the state. For those with known material on CVWD's side, the customer side material will be interpolated only and the known material from service line replacement records will be maintained. A summary of the interpolation areas and how many meters will be sampled within each is provided in **Appendix B: Summary Table of Interpolation Areas, Percentages, and Totals.**

2. If Lead is Found

If lead is found, customers will be notified and provided with supplies as required. Additionally, CVWD staff will schedule a meeting with DDW's Lead and Copper Unit to determine how many additional meters would need to be surveyed in the particular interpolation area.

V. Interpolation Areas

I. Area 1: Homes Developed in 1974 with polyethylene water service lines

A. Historical records

The current District Operations and Maintenance Manager, District Engineer, District General Manager, and Distribution foreman have extensive knowledge and experience working on and repairing plastic service lines found within the housing tract along Camino Trillado, Granada

Way, El Portal St, Ogan Road, and Santa Rosa Ln. CVWD staff have found that the contractor did not install corporation stops on these atypical polyethylene water services. Any repairs in this tract require large shutdowns due to the inability to isolate a particular water service line. It is assumed that all service lines for the tract are polyethylene except where water service line repair records exist.

B. Total number of properties in the Interpolation Area

There are a total of 75 individually metered properties in this proposed interpolation area shown in the map in **Figure 3**. Of the 75 properties, CVWD knows the CVWD-side service line material for 4 properties (shown in red in **Figure 3**) based on service line repair records:

- 5387 Santa Rosa Ln: Copper (03/19/2013)
- 1368 El Portal Ave: Copper (04/10/2014)
- 1339 El Portal Ave: Copper (04/10/2014)
- 1309 El Portal Ave: Municipex plastic (10/2021)

C. Map of Interpolation Area 1

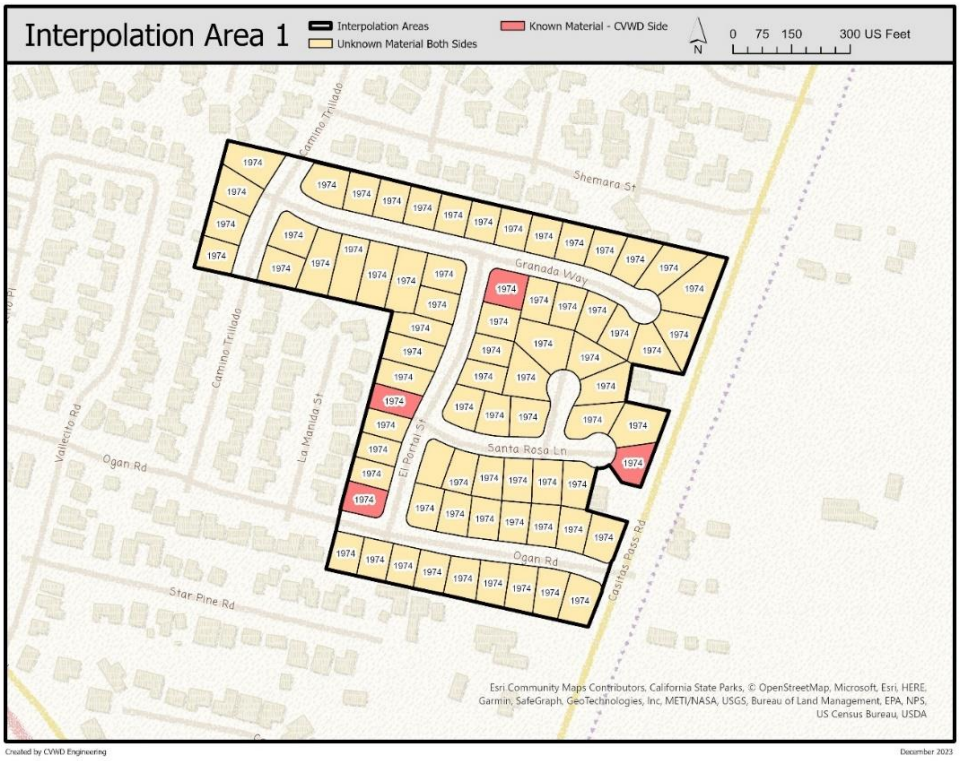


Figure 3. Map of Interpolation Area 1 with parcels labeled by the 'YearBuilt' field provided by the Santa Barbara County Assessor's Office parcel shapefile.

D. How was the interpolation group determined?

These properties are adjacent and were all built in 1974 according to SB County records, indicative of being within the same Tract or period of construction with identical materials assumed to be utilized.

E. Percent or number that would be verified per group and how that number was determined?

Carpinteria Valley Water District staff will verify 10%. In Interpolation Area 1, a total of 8 homes will be checked using the Field Inspection Protocol outlined in Section III. The randomly selected 10% sample will not include the 4 properties with known material on CVWD's side. If non-lead results are found on both sides of the 8 randomly selected water accounts with unknown material on both sides, then non-lead results would be interpolated to the other 67 properties in Area 1. For the 4 properties with known material on CVWD's side, the customer side will be interpolated based on what is found in the sample.

Random numbers will be generated in Microsoft Excel for the 71 meters with unknown material on both sides of the meter and the meters with the lowest 8 random numbers will be surveyed using the Field Inspection Protocol.

2. Area 2: Homes developed in 1974 – Verano Dr, Santa Monica Rd, La Quinta Dr

A. Historical records

The District does not have institutional knowledge of or construction documents showing the material used to construct the meters serving the properties depicted in **Figure 4**.

B. Total number of properties in the Interpolation Area

There are a total of 19 individually metered properties in this proposed interpolation area shown in the map in **Figure 4.** There are no known service line repair records for these properties and the material is unknown on both sides for all 19 properties.

C. Map of Interpolation Area 2

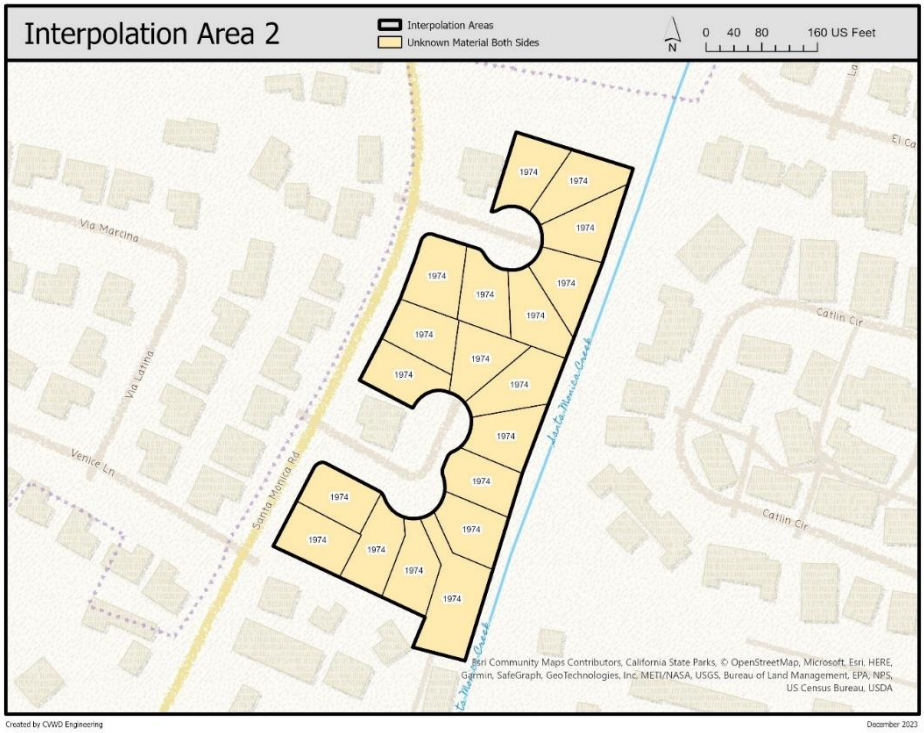


Figure 4. Map of Interpolation Area 2 with parcels labeled by the 'YearBuilt' field provided by the Santa Barbara County Assessor's Office parcel shapefile

D. How was the interpolation group determined?

These properties are adjacent and were all built in 1974 according to SB County records, indicative of being within the same Tract or period of construction with identical materials assumed to be utilized.

E. Percent or number that would be verified per group and how that number was determined?

Carpinteria Valley Water District staff will verify 10%. In Interpolation Area 2, a total of 2 homes will be checked using the Field Inspection Protocol outlined in Section III. If non-lead results are found on both sides of the 2 randomly selected water accounts with unknown materials on both sides, then non-lead results would be interpolated to the other 17 properties in Area 2.

Random numbers will be generated in Microsoft Excel for the 19 meters with unknown material on both sides of the meter and the meters with the lowest 2 random numbers will be surveyed using the Field Inspection Protocol.

3. Area 3: Homes Developed in 1984 & 1985 -- Seacoast Village Development

A. Historical records

The District does not have institutional knowledge of or construction documents showing the material used for the installation of the meters serving the properties depicted in **Figure 5** and **Figure 6**. The as-built document for the development indicates that meters were installed according to what was "typical", but no service line material was referenced.

B. Total number of properties in the Interpolation Area

There are a total of 55 individually metered properties in this proposed interpolation area shown in the map in **Figure 5** and **Figure 6**. There are a total of 55 residential meters and 1 home owner's association (HOA) landscape meter for a total of 56 meters. There are no known service line repair records for these properties and the material is unknown on both sides for all 56 meters.

C. Maps of Interpolation Area 3

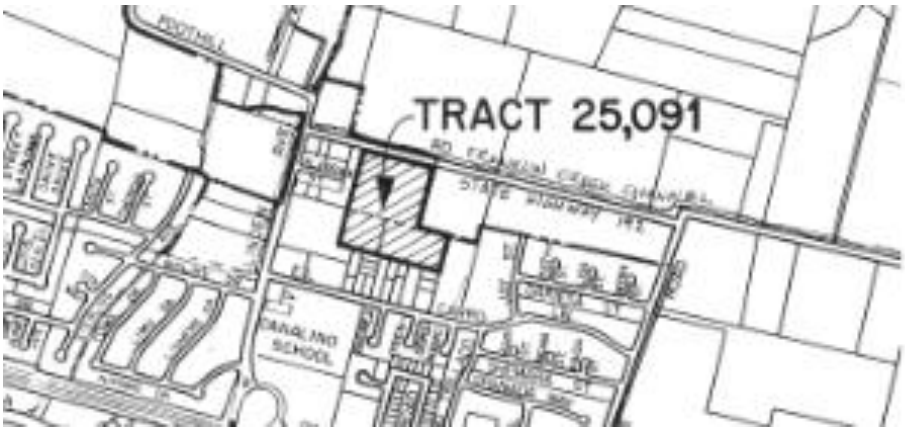


Figure 5. Tract overview map provided on As-Built for the development

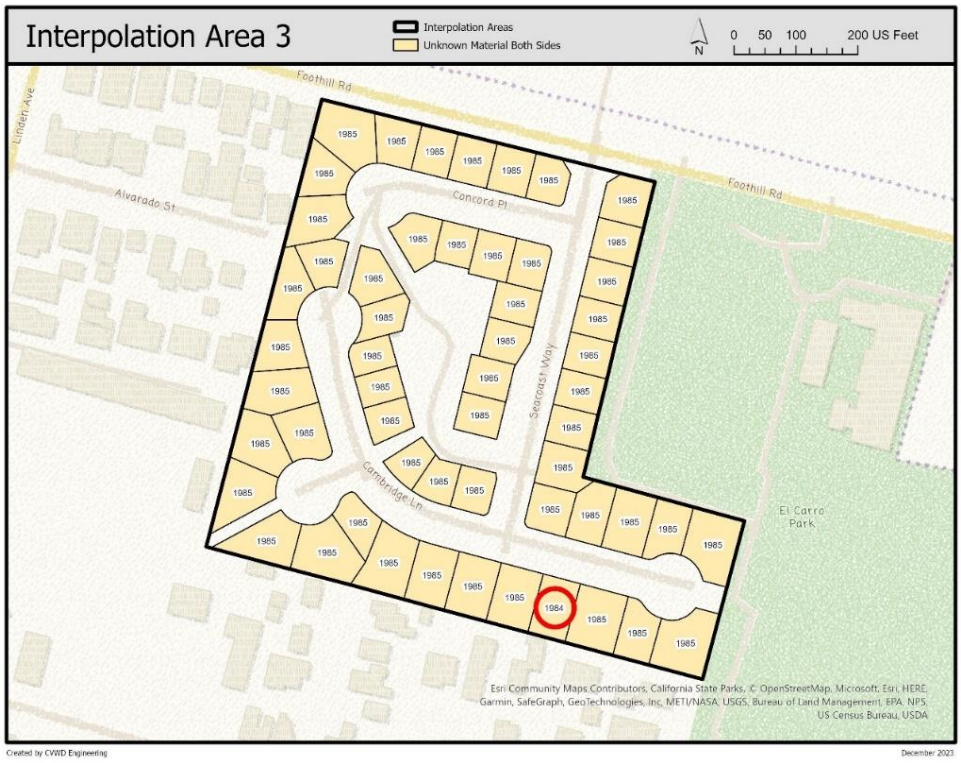


Figure 6. Map of Interpolation Area 3 with parcels labeled by the 'YearBuilt' field provided by the Santa Barbara County Assessor's Office parcel shapefile. One home was constructed in 1984 (circled in red) while the others were constructed in 1985.

D. How was the interpolation group determined?

All homes were constructed in either 1984 or 1985 as part of the Seacoast development, Tract 25,091.

E. Percent or number that would be verified per group and how that number was determined?

Carpinteria Valley Water District staff will verify 10%. In Interpolation Area 3, a total of 6 homes will be checked using the Field Inspection Protocol outlined in Section III. If non-lead results are found on both sides of the 6 randomly selected water accounts with unknown material on both sides, then non-lead results would be interpolated to the other 50 properties in Area 3.

Random numbers will be generated in Microsoft Excel for the 56 meters with unknown material on both sides of the meter and the meters with the lowest 6 random numbers will be surveyed using the Field Inspection Protocol.

4. Area 4: Homes constructed in 1957 in Concha Loma Neighborhood

A. Historical records

The District does not have construction documents showing the material used for the meters serving the properties depicted in **Figure 7**. Based on CVWD observations while repairing leaking service lines over the years, the original water service lines were constructed using copper t-branches with one water service running to two separate water meters. Without construction documents, the District plans to sample within this neighborhood.

B. Total number of properties in the Interpolation Area

There are a total of 68 individually metered properties in this proposed interpolation area shown in the map in **Figure 7.** Of the 68 properties, CVWD knows the CVWD-side service line material for 8 properties (shown in red in **Figure 7**) based on service line repair records:

- 591 Calle Dia: Non-Lead – Other (08/2011)
- 579 Calle Dia: Non-Lead – Other (08/2011)
- 5615 Canalino Dr: Non-Lead – Other (07/2017)
- 5631 Canalino Dr: Non-Lead – Other (07/2017)
- 5647 Canalino Dr: Non-Lead – Other (08/2017)
- 5661 Canalino Dr: Non-Lead – Other (08/2017)
- 485 Arbol Verde St: Non-Lead – Other (09/2013)
- 455 Arbol Verde St: Non-Lead – Other (09/2013)

C. Map of Interpolation Area 4

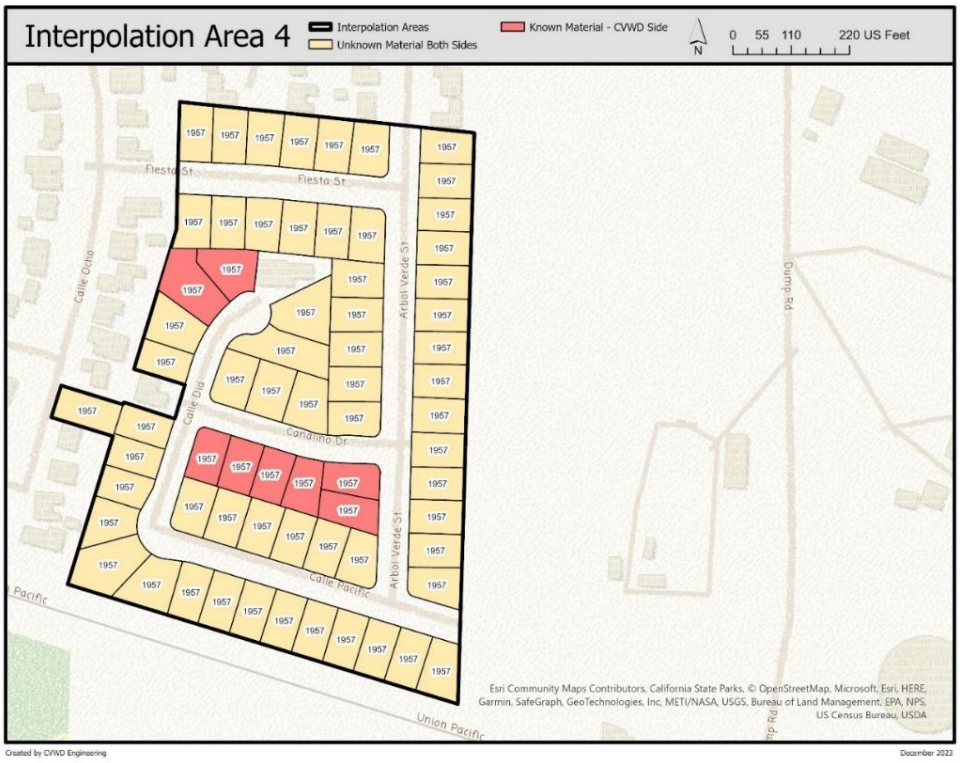


Figure 7. Map of Interpolation Area 4 with parcels labeled by the 'YearBuilt' field provided by the Santa Barbara County Assessor's Office parcel shapefile

D. How was the interpolation group determined?

These properties are adjacent and were all built in 1957 according to SB County records, indicative of being within the same Tract or period of construction with identical materials assumed to be utilized.

E. Percent or number that would be verified per group and how that number was determined?

Carpinteria Valley Water District staff will verify 10%. In Interpolation Area 4, a total of 7 homes will be checked using the Field Inspection Protocol outlined in Section III. The randomly selected 10% sample will not include the 8 properties with known material on CVWD's side. If non-lead results are found on both sides of the 7 randomly selected water accounts with unknown material on both

sides, then non-lead results would be interpolated to the other 61 properties in Area 1. For the 8 properties with known material on CVWD's side, only the customer side will be interpolated based on what is found in the sample.

Random numbers will be generated in Microsoft Excel for the 60 meters with unknown material on both sides of the meter and the meters with the lowest 7 random numbers will be surveyed using the Field Inspection Protocol.

5. Area 5: Homes Developed in 1958 & 1959 – Tomol, Limu, Linhere, Nipomo, & Malibu

A. Historical records

The District does not have construction documents showing the material used for the meters serving the properties depicted in **Figure 8**. Based on CVWD observations while repairing leaking service lines over the years, the original water service lines were constructed using copper t-branches with one water service running to two separate water meters. Without construction documents, the District plans to sample within this neighborhood

B. Total number of properties in the Interpolation Area

There are a total of 121 individually metered properties in this proposed interpolation area shown in the map in **Figure 8**. Of the 121 properties, CVWD knows the CVWD-side service line material for 42 properties (shown in red in **Figure 8**) based on service line repair records:

- 4870 Malibu Drive: Non-Lead – Other (07/2015)
- 4856 Malibu Drive: Non-Lead – Other (07/2015)
- 1431 Tomol Drive: Non-Lead – Other (01/2012)
- 1423 Tomol Drive: Non-Lead – Other (01/2012)
- 1430 Tomol Drive: Non-Lead – Other (12/2011)
- 1422 Tomol Drive: Non-Lead – Other (12/2011)
- 1395 Tomol Drive: Non-Lead – Other (03/2012)
- 1385 Tomol Drive: Non-Lead – Other (03/2012)
- 1377 Tomol Drive: Non-Lead – Other (03/2012)
- 1369 Tomol Drive: Non-Lead – Other (03/2012)
- 1359 Tomol Drive: Non-Lead – Other (11/2011)
- 1351 Tomol Drive: Non-Lead – Other (11/2011)
- 1341 Tomol Drive: Non-Lead – Other (2011)
- 1333 Tomol Drive: Non-Lead – Other (2011)
- 1350 Tomol Drive: Non-Lead – Other (02/2018)
- 1340 Tomol Drive: Non-Lead – Other (02/2018)
- 4841 Nipomo Drive: Non-Lead – Other (10/2011)
- 4857 Nipomo Drive: Non-Lead – Other (10/2011)
- 4871 Nipomo Drive: Non-Lead – Other (08/2011)
- 4885 Nipomo Drive: Non-Lead – Other (08/2011)
- 1333 Limu Drive: Non-Lead – Other (12/2011)
- 1408 Linhere Drive: Non-Lead – Other (12/2008)
- 1341 Limu Drive: Non-Lead – Other (12/2011)
- 1369 Limu Drive: Non-Lead – Other (12/2008)
- 1377 Limu Drive: Non-Lead – Other (12/2008)
- 1385 Limu Drive: Non-Lead – Other (11/2017)
- 1395 Limu Drive: Non-Lead – Other (11/2017)
- 1405 Limu Drive: Non-Lead – Other (08/2016)
- 1415 Limu Drive: Non-Lead – Other (08/2016)
- 1408 Limu Drive: Non-Lead – Other (10/2011)
- 1414 Limu Drive: Non-Lead – Other (10/2011)
- 1394 Limu Drive: Non-Lead – Other (09/2010)
- 1402 Limu Drive: Non-Lead – Other (09/2010)
- 1378 Limu Drive: Non-Lead – Other (06/2008)
- 1386 Limu Drive: Non-Lead – Other (06/2008)
- 1330 Linhere Drive: Non-Lead – Other (01/2019)
- 4930 Nipomo Drive: Non-Lead – Other (01/2019)
- 1350 Linhere Drive: Non-Lead – Other (11/2011)
- 1340 Linhere Drive: Non-Lead – Other (11/2011)
- 1386 Linhere Drive: Non-Lead – Other (09/2010)
- 1378 Linhere Drive: Non-Lead – Other (09/2010)
- 1414 Linhere Drive: Non-Lead – Other (12/2008)

C. Map of Interpolation Area 5

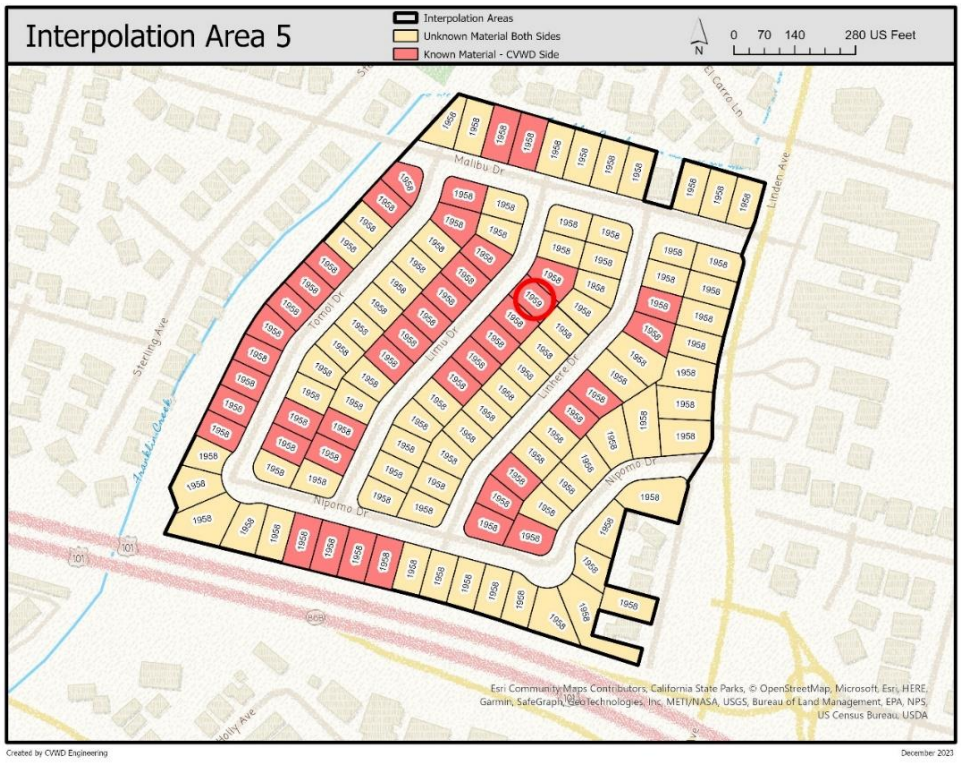


Figure 8. Map of Interpolation Area 5 with parcels labeled by the 'YearBuilt' field provided by the Santa Barbara County Assessor's Office parcel shapefile

D. How was the interpolation group determined?

These properties are adjacent and were all built in 1958, with one exception being constructed in 1959 (circled), according to SB County records, indicative of being within the same Tract or period of construction with identical materials assumed to be utilized.

E. Percent or number that would be verified per group and how that number was determined?

Carpinteria Valley Water District staff will verify 10%. In Interpolation Area 5, a total of 13 homes will be checked using the Field Inspection Protocol outlined in Section III. The randomly selected 10% sample will not include the 42 properties with known material on CVWD's side. If non-lead results are found on both sides of the 13 randomly selected water accounts with unknown material on both sides, then non-lead results would be interpolated to the other 108 properties in Area 1. For the 42 properties with known material on CVWD's side, the customer side will be interpolated based on what is found in the sample.

Random numbers will be generated in Microsoft Excel for the 79 meters with unknown material on both sides of the meter and the meters with the lowest 13 random numbers will be surveyed using the Field Inspection Protocol.

6. *Area 6: Homes Developed in 1958 – Arbol Verde Street*

A. Historical records

The District does not have construction documents showing the material used for the meters serving the properties depicted in **Figure 9**. Based on CVWD observations while repairing leaking service lines over the years, the original water service lines were constructed using copper t-branches with one water service running to two separate water meters. Without construction documents, the District plans to sample within this neighborhood.

B. Total number of properties in the Interpolation Area

There are a total of 36 individually metered properties in this proposed interpolation area shown in the map in **Figure 9**. Of the 36 properties, CVWD knows the CVWD-side service line material for 6 properties (shown in red in **Figure 9**) based on service line repair records:

- 856 Arbol Verde Street: Non-Lead – Other (10/04/2016)
- 864 Arbol Verde Street: Non-Lead – Other (10/04/2016)
- 767 Calle Rey Mar: Non-Lead – Other (08/2018)
- 759 Calle Rey Mar: Non-Lead – Other (08/2018)
- 725 Arbol Verde Street: Non-Lead – Other (2014)
- 737 Arbol Verde Street: Non-Lead – Other (2014)

C. Map of Interpolation Area 6

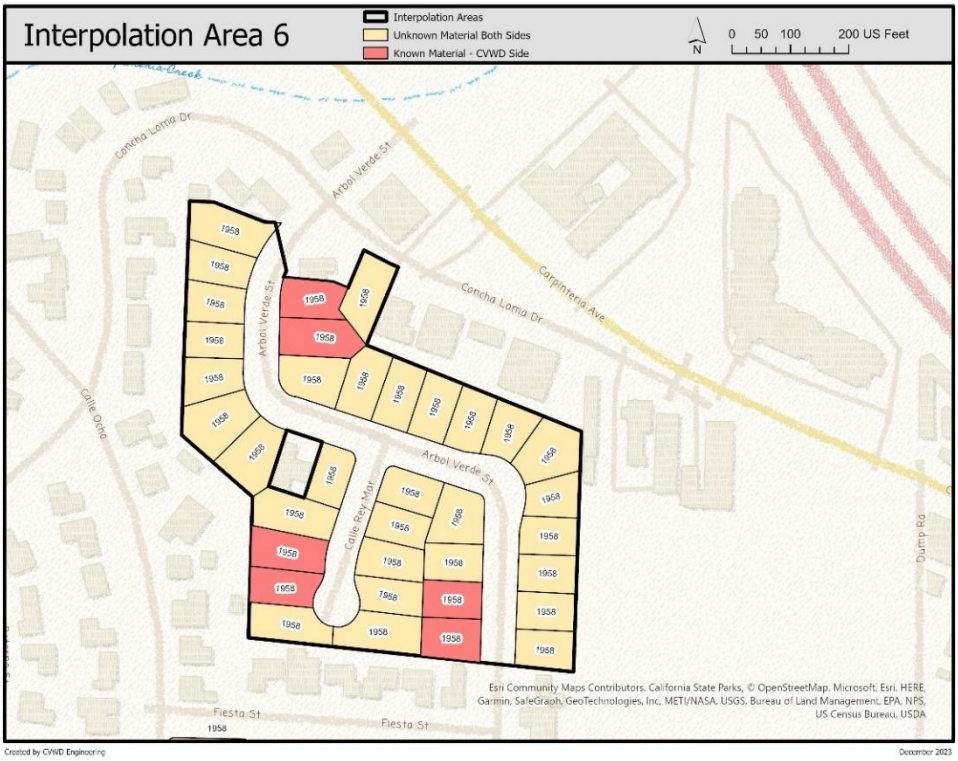


Figure 9. Map of Interpolation Area 6 with parcels labeled by the 'YearBuilt' field provided by the Santa Barbara County Assessor's Office parcel shapefile

D. How was the interpolation group determined?

These properties are adjacent and were all built in 1958 according to SB County records, indicative of being within the same Tract or period of construction with identical materials assumed to be utilized.

E. Percent or number that would be verified per group and how that number was determined?

Carpinteria Valley Water District staff will verify 10%. In Interpolation Area 6, a total of 4 homes will be checked using the Field Inspection Protocol outlined in Section III. The randomly selected 10% sample will not include the 6 properties with known material on CVWD's side. If non-lead results are found on both sides of the 4 randomly selected water accounts with unknown material on both sides, then non-lead results would be interpolated to the other 32 properties in Area 6. For the 6 properties with known material on CVWD's side, the customer side will be interpolated based on what is found in the sample.

Random numbers will be generated in Microsoft Excel for the 30 meters with unknown material on both sides of the meter and the meters with the lowest 4 random numbers will be surveyed using the Field Inspection Protocol.

7. Area 7: Homes Developed in 1961 – Camino Trillado, La Manida St, Ogan Rd

A. Historical records

The District does not have construction documents showing the material used for the meters serving the properties depicted in **Figure 10**. Based on CVWD observations while repairing leaking service lines over the years, the original water service lines were constructed using copper t-branches with one water service running to two separate water meters. Without construction documents, the District plans to sample within this neighborhood.

B. Total number of properties in the Interpolation Area

There are a total of 24 individually metered properties in this proposed interpolation area shown in the map in **Figure 10**. Of the 24 properties, CVWD knows the CVWD-side service line material for 12 properties (shown in red in **Figure 10**) based on service line repair records:

- 1311 Camino Trillado: Non-Lead – Other (02/2018)
- 1305 Camino Trillado: Non-Lead – Other (02/2018)
- 1335 Camino Trillado: Non-Lead – Other (06/2014)
- 1329 Camino Trillado: Non-Lead – Other (06/2014)
- 1341 Camino Trillado: Non-Lead – Other (04/2013)
- 1347 Camino Trillado: Non-Lead – Other (04/2013)
- 1343 La Manida: Non-Lead – Other (08/2014)
- 1337 La Manida: Non-Lead – Other (08/2014)
- 1329 La Manida: Non-Lead – Other (09/2013)
- 1321 La Manida: Non-Lead – Other (09/2013)
- 1315 La Manida: Non-Lead – Other (03/2018)
- 1307 La Manida: Non-Lead – Other (03/2018)

C. Map of Interpolation Area 7

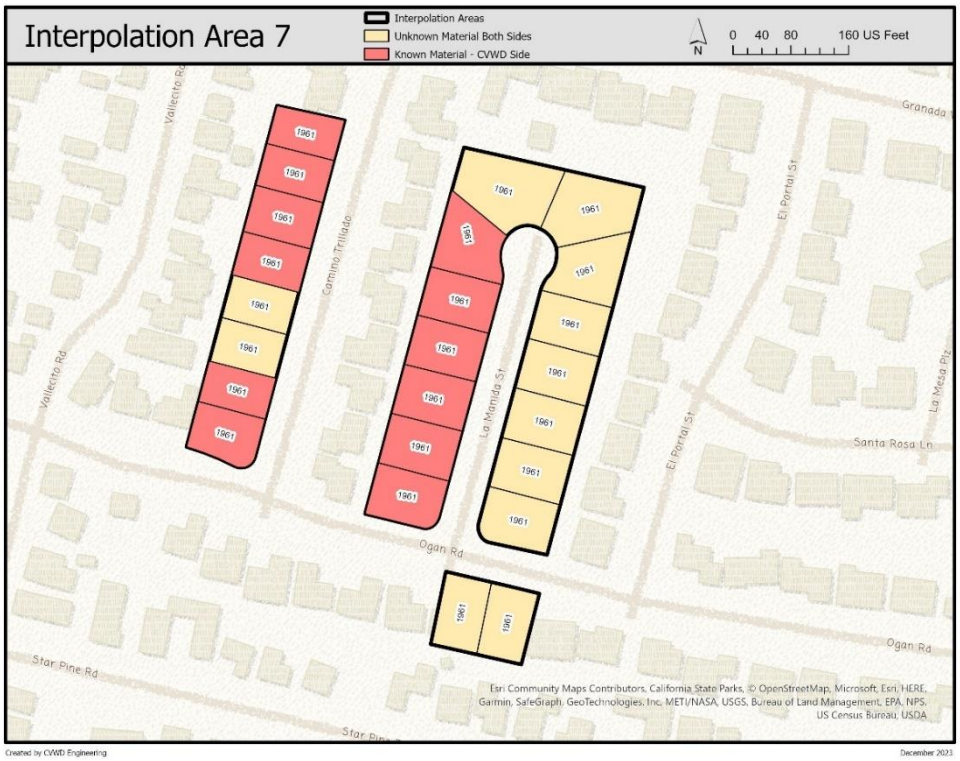


Figure 10. Map of Interpolation Area 7 with parcels labeled by the 'YearBuilt' field provided by the Santa Barbara County Assessor's Office parcel shapefile

D. How was the interpolation group determined?

These properties are adjacent and were built in 1961 according to SB County records, indicative of being within the same Tract or period of construction with identical materials assumed to be utilized.

E. Percent or number that would be verified per group and how that number was determined?

Carpinteria Valley Water District staff will verify 10%. In Interpolation Area 7, a total of 3 homes will be checked using the Field Inspection Protocol outlined in Section III. The randomly selected 10% sample will not include the 12 properties with known material on CVWD's side. If non-lead results are found on both sides of the 3 randomly selected water accounts with unknown material on both sides, then non-lead results would be interpolated to the other 21 properties in Area 7. For the 12 properties with known material on CVWD's side, the customer side will be interpolated based on what is found in the sample.

Random numbers will be generated in Microsoft Excel for the 12 meters with unknown material on both sides of the meter and the meters with the lowest 3 random numbers will be surveyed using the Field Inspection Protocol.

8. Area 8: Homes Developed in 1961 -- Sentar & Serafin

A. Historical records

The District does not have construction documents showing the material used for the meters serving the properties depicted in **Figure 11**. Based on CVWD observations while repairing leaking

service lines over the years, the original water service lines were constructed using copper t-branches with one water service running to two separate water meters. Without construction documents, the District plans to sample within this neighborhood.

B. Total number of properties in the Interpolation Area

There are a total of 15 individually metered properties in this proposed interpolation area shown in the map in **Figure 11**. Of the 15 properties, CVWD knows the CVWD-side service line material for 2 properties (shown in red in **Figure 11**) based on service line repair records:

- 146 Serafin Way: Non-Lead – Other (11/2018)
- 140 Serafin Way: Non-Lead – Other (11/2018)

C. Map of Interpolation Area 8

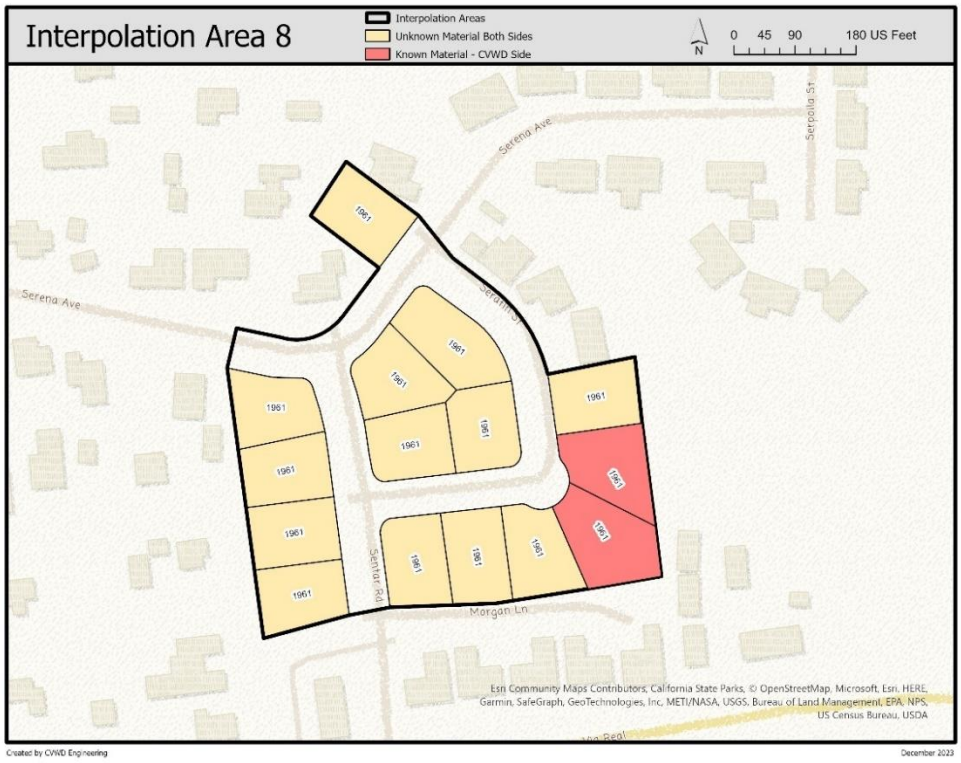


Figure 11. Map of Interpolation Area 8 with parcels labeled by the 'YearBuilt' field provided by the Santa Barbara County Assessor's Office parcel shapefile

D. How was the interpolation group determined?

These properties are adjacent and were all built in 1961 according to SB County records, indicative of being within the same Tract or period of construction with identical materials assumed to be utilized.

E. Percent or number that would be verified per group and how that number was determined?

Carpinteria Valley Water District staff will verify 10%. In Interpolation Area 8, a total of 2 homes will be checked using the Field Inspection Protocol outlined in Section III. The randomly selected 10% sample will not include the 2 properties with known material on CVWD's side. If non-lead results are found on both sides of the 2 randomly selected water accounts with unknown material on both sides, then non-lead results would be interpolated to the other 13 properties in Area 8. For the 2

properties with known material on CVWD's side, the customer side will be interpolated based on what is found in the sample.

Random numbers will be generated in Microsoft Excel for the 13 meters with unknown material on both sides of the meter and the meters with the lowest 2 random numbers will be surveyed using the Field Inspection Protocol.

9. Area 9: Homes Developed in 1962 and 1963 – Sterling Drive Neighborhood

A. Historical records

The District does not have construction documents showing the material used for the meters serving the properties depicted in **Figure 12**. Based on CVWD observations while repairing leaking service lines over the years, the original water service lines were constructed using copper t-branches with one water service running to two separate water meters. Without construction documents, the District plans to sample within this neighborhood.

B. Total number of properties in the Interpolation Area

There are a total of 45 individually metered properties in this proposed interpolation area shown in the map in **Figure 12**. Of the 45 properties, CVWD knows the CVWD-side service line material for 4 properties (shown in red in **Figure 12**) based on service line repair records:

- 1382 Sterling Ave: Non-Lead – Other (01/2014)
- 1370 Sterling Ave: Non-Lead – Other (01/2014)
- 1407 Sterling Ave: Non-Lead – Other (05/2014)
- 4774 Sterling Way: Non-Lead – Other (05/2014)

C. Map of Interpolation Area 9

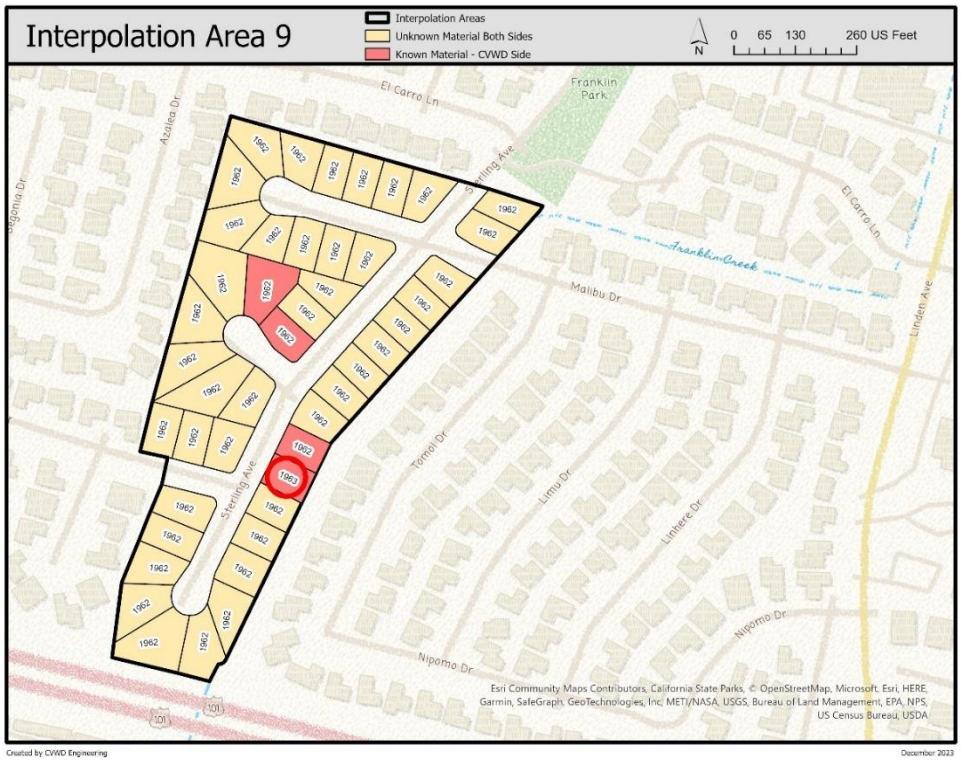


Figure 12. Map of Interpolation Area 9 with parcels labeled by the 'YearBuilt' field provided by the Santa Barbara County Assessor's Office parcel shapefile

D. How was the interpolation group determined?

These properties are adjacent and were all built in 1962, with one exception being constructed in 1963 (circled), according to SB County records, indicative of being within the same Tract or period of construction with identical materials assumed to be utilized.

E. Percent or number that would be verified per group and how that number was determined?

Carpinteria Valley Water District staff will verify 10%. In Interpolation Area 9, a total of 5 homes will be checked using the Field Inspection Protocol outlined in Section III. The randomly selected 10% sample will not include the 4 properties with known material on CVWD's side. If non-lead results are found on both sides of the 5 randomly selected water accounts with unknown material on both sides, then non-lead results would be interpolated to the other 40 properties in Area 9. For the 4 properties with known material on CVWD's side, the customer side will be interpolated based on what is found in the sample.

Random numbers will be generated in Microsoft Excel for the 41 meters with unknown material on both sides of the meter and the meters with the lowest 5 random numbers will be surveyed using the Field Inspection Protocol.

10. Area 10: Homes Developed in 1963 – El Carro Neighborhood

A. Historical records

The District does not have construction documents showing the material used for the meters serving the properties depicted in **Figure 13**. Based on CVWD observations while repairing leaking service lines over the years, the original water service lines were constructed using copper t-branches with one water service running to two separate water meters. Without construction documents, the District plans to sample within this neighborhood.

B. Total number of properties in the Interpolation Area

There are a total of 95 individually metered properties in this proposed interpolation area shown in the map in **Figure 13**. Of the 95 properties, CVWD knows the CVWD-side service line material for 11 properties (shown in red in **Figure 13**) based on service line repair records:

- 1493 Andrea St: Non-Lead – Other (10/2013)
- 1485 Andrea St: Non-Lead – Other (10/2013)
- 1484 Andrea St: Non-Lead – Other (10/2013)
- 1492 Andrea St: Non-Lead – Other (10/2013)
- 1476 Andrea St: Non-Lead – Other (07/2016)
- 1470 Andrea St: Non-Lead – Other (07/2016)
- 5408 El Carro Ln: Non-Lead – Other (11/2015)
- 5438 El Carro Ln: Non-Lead – Other (11/2015)
- 1519 Casitas Pass Rd: Non-Lead – Other (2017)
- 5462 El Carro Ln: Non-Lead – Other (2017)
- 1523 Casitas Pass Rd: Non-Lead – Other (2017)

C. Map of Interpolation Area 10

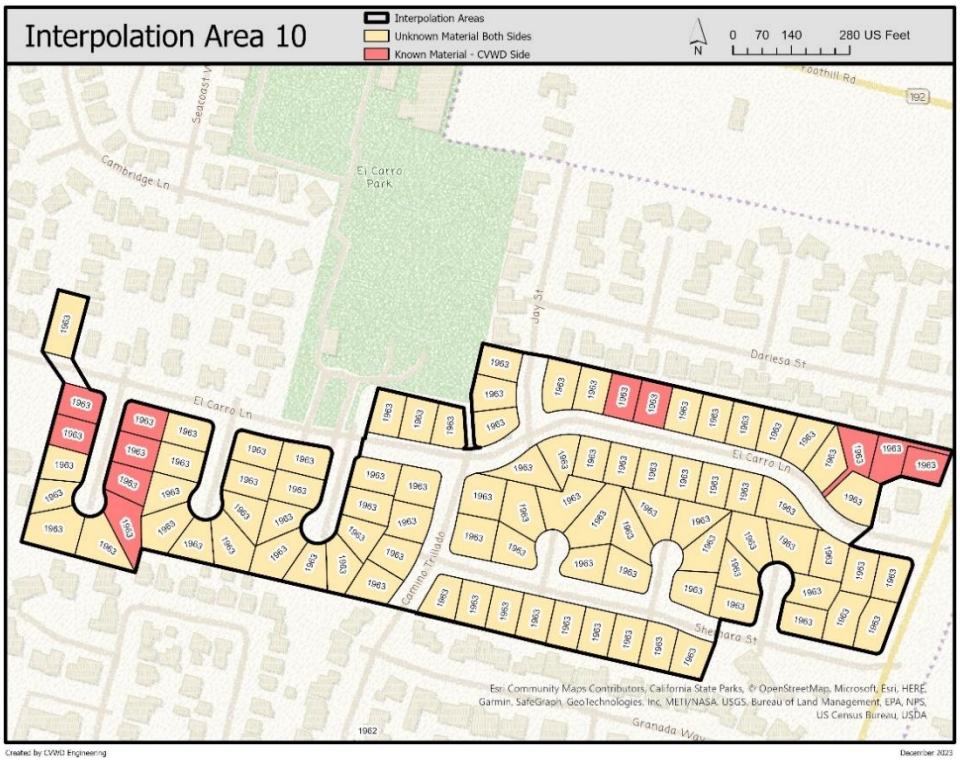


Figure 13. Map of Interpolation Area 10 with parcels labeled by the 'YearBuilt' field provided by the Santa Barbara County Assessor's Office parcel shapefile

D. How was the interpolation group determined?

These properties are adjacent and were all built in 1963 according to SB County records, indicative of being within the same Tract or period of construction with identical materials assumed to be utilized.

E. Percent or number that would be verified per group and how that number was determined?

Carpinteria Valley Water District staff will verify 10%. In Interpolation Area 10, a total of 10 homes will be checked using the Field Inspection Protocol outlined in Section III. The randomly selected 10% sample will not include the 11 properties with known material on CVWD's side. If non-lead results are found on both sides of the 10 randomly selected water accounts with unknown material on both sides, then non-lead results would be interpolated to the other 85 properties in Area 10. For the 11 properties with known material on CVWD's side, the customer side will be interpolated based on what is found in the sample.

Random numbers will be generated in Microsoft Excel for the 84 meters with unknown material on both sides of the meter and the meters with the lowest 10 random numbers will be surveyed using the Field Inspection Protocol.

11. Area 11: Homes Developed in 1963 – Serena Avenue Neighborhood

A. Historical records

The District does not have construction documents showing the material used for the meters serving the properties depicted in **Figure 14**. Based on CVWD observations while repairing leaking service lines over the years, the original water service lines were constructed using copper t-branches with one water service running to two separate water meters. Without construction documents, the District plans to sample within this neighborhood.

B. Total number of properties in the Interpolation Area

There are a total of 19 individually metered properties in this proposed interpolation area shown in the map in **Figure 14**. Of the 19 properties, CVWD knows the CVWD-side service line material for 4 properties (shown in red in **Figure 14**) based on service line repair records:

- 178 Serafin St: Non-Lead – Other (04/2018)
- 190 Serafin St: Non-Lead – Other (04/2018)
- 3233 Serena Ave: Non-Lead – Other (12/2018)
- 3239 Serena Ave: Non-Lead – Other (12/2018)

C. Map of Interpolation Area 11

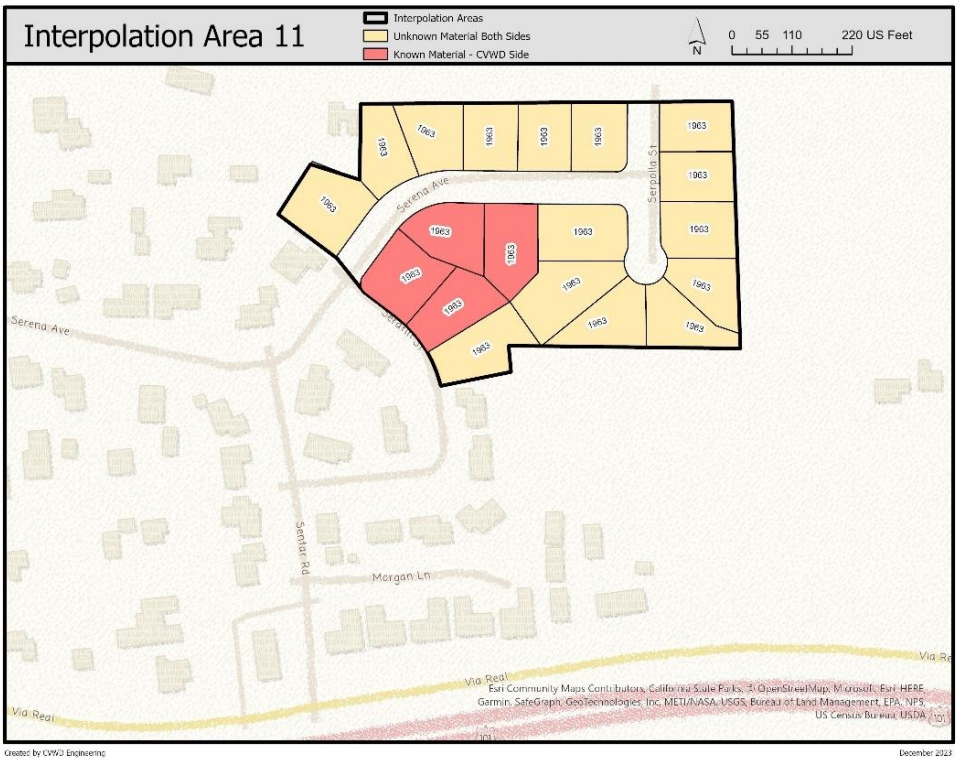


Figure 14. Map of Interpolation Area 11 with parcels labeled by the 'YearBuilt' field provided by the Santa Barbara County Assessor's Office parcel shapefile

D. How was the interpolation group determined?

These properties are adjacent and were all built in 1963 according to SB County records, indicative of being within the same Tract or period of construction with identical materials assumed to be utilized.

E. Percent or number that would be verified per group and how that number was determined?

Carpinteria Valley Water District staff will verify 10%. In Interpolation Area 11, a total of 2 homes will be checked using the Field Inspection Protocol outlined in Section III. The randomly selected 10% sample will not include the 4 properties with known material on CVWD's side. If non-lead results are found on both sides of the 2 randomly selected water accounts with unknown material on both sides, then non-lead results would be interpolated to the other 17 properties in Area 11. For the 4 properties with known material on CVWD's side, the customer side will be interpolated based on what is found in the sample.

Random numbers will be generated in Microsoft Excel for the 15 meters with unknown material on both sides of the meter and the meters with the lowest 2 random numbers will be surveyed using the Field Inspection Protocol.

12. Area 12: Homes Developed in 1964 & 1965 – Eleanor, Chaney, Delta, June

A. Historical records

The District does not have construction documents showing the material used for the meters serving the properties depicted in **Figure 15**. The District plans on sampling within this neighborhood.

B. Total number of properties in the Interpolation Area

There are a total of 54 individually metered properties in this proposed interpolation area shown in the map in **Figure 15**. There are no known service line repair records for these properties and the material is unknown on both sides for all 54 properties.

C. Map of Interpolation Area 12

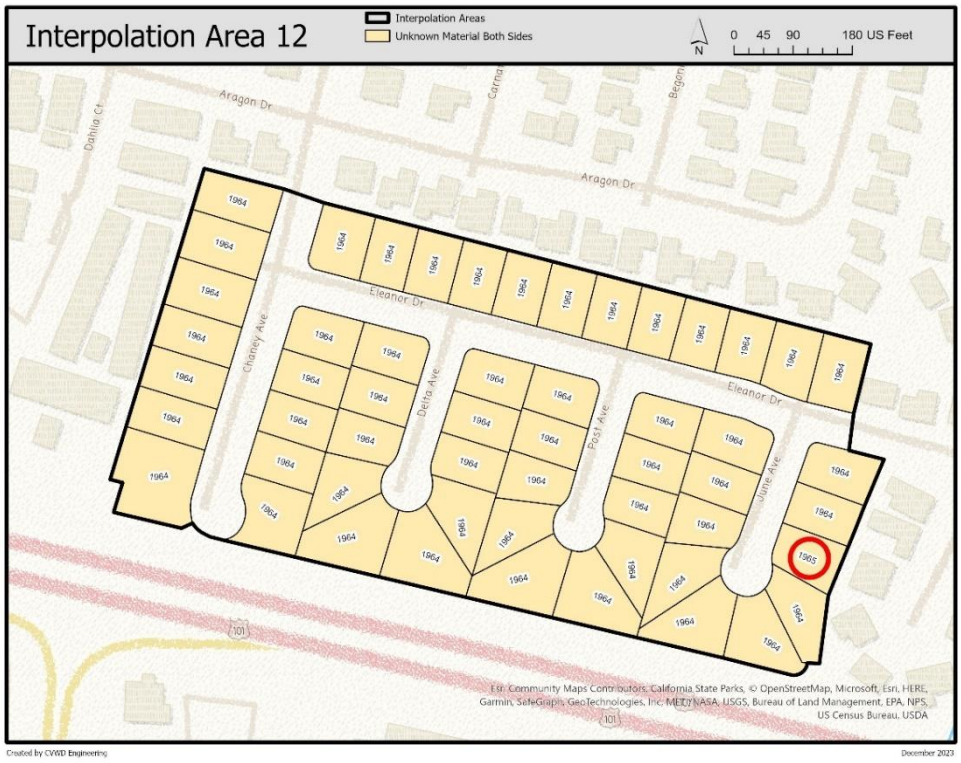


Figure 15. Map of Interpolation Area 12 with parcels labeled by the 'YearBuilt' field provided by the Santa Barbara County Assessor's Office parcel shapefile

D. How was the interpolation group determined?

These properties are adjacent and were all built in 1964, with one exception being constructed in 1964 (circled), according to SB County records, indicative of being within the same Tract or period of construction with identical materials assumed to be utilized.

E. Percent or number that would be verified per group and how that number was determined?

Carpinteria Valley Water District staff will verify 10%. In Interpolation Area 12, a total of 6 homes will be checked using the Field Inspection Protocol outlined in Section III. If non-lead results are found on both sides of the 6 randomly selected water accounts with unknown material on both sides, then non-lead results would be interpolated to the other 48 properties in Area 12.

Random numbers will be generated in Microsoft Excel for the 54 meters with unknown material on both sides of the meter and the meters with the lowest 6 random numbers will be surveyed using the Field Inspection Protocol.

13. Area 13: Homes Developed in 1964 – Jay, Kathy, Dariesa, Lisa, and Myra

A. Historical records

The District does not have construction documents showing the material used for the meters serving the properties depicted in **Figure 16.** Based on CVWD observations while repairing leaking service lines over the years, the original water service lines were constructed using copper t-branches with one water service running to two separate water meters. Without construction documents, the District plans to sample within this neighborhood.

B. Total number of properties in the Interpolation Area

There are a total of 52 individually metered properties in this proposed interpolation area shown in the map in **Figure 16**. Of the 52 properties, CVWD knows the CVWD-side service line material for 6 properties (shown in red in **Figure 16**) based on service line repair records:

- 1545 Jay St: Non-Lead – Other (05/2014)
- 1539 Jay St: Non-Lead – Other (05/2014)
- 1559 Kathy St: Non-Lead – Other (11/2018)
- 1553 Kathy St: Non-Lead – Other (11/2018)
- 1533 Jay St: Non-Lead – Other (05/2017)
- 1525 Jay St: Non-Lead – Other (05/2017)

C. Map of Interpolation Area 13

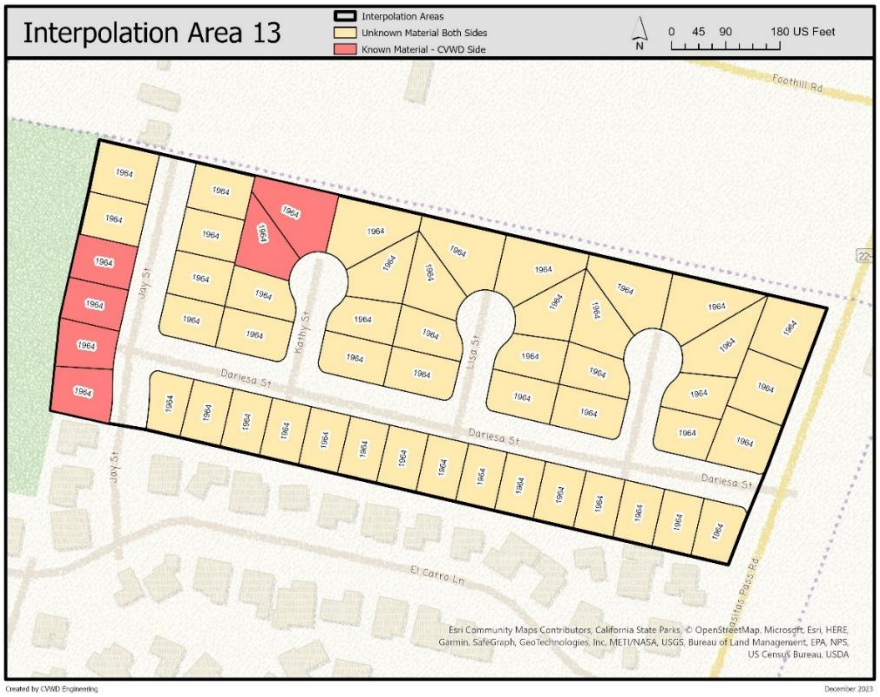


Figure 16. Map of Interpolation Area 13 with parcels labeled by the 'YearBuilt' field provided by the Santa Barbara County Assessor's Office parcel shapefile

D. How was the interpolation group determined?

These properties are adjacent and were all built in 1964 according to SB County records, indicative of being within the same Tract or period of construction with identical materials assumed to be utilized.

E. Percent or number that would be verified per group and how that number was determined?

Carpinteria Valley Water District staff will verify 10%. In Interpolation Area 13, a total of 6 homes will be checked using the Field Inspection Protocol outlined in Section III. The randomly selected 10% sample will not include the 6 properties with known material on CVWD's side. If non-lead results are found on both sides of the 6 randomly selected water accounts with unknown material on both sides, then non-lead results would be interpolated to the other 46 properties in Area 13. For the 6 properties with known material on CVWD's side, the customer side will be interpolated based on what is found in the sample.

Random numbers will be generated in Microsoft Excel for the 46 meters with unknown material on both sides of the meter and the meters with the lowest 6 random numbers will be surveyed using the Field Inspection Protocol.

14. Area 14: Homes Developed in 1965 – Venice, Taranto, Via Latina, Via Marcina, and Trieste

A. Historical records

The District does not have construction documents showing the material used for the meters serving the properties depicted in **Figure 17.**

B. Total number of properties in the Interpolation Area

There are a total of 63 individually metered properties in this proposed interpolation area shown in the map in **Figure 17**. There are no known service line repair records for these properties and the material is unknown on both sides for all 63 properties.

C. Map of Interpolation Area 14

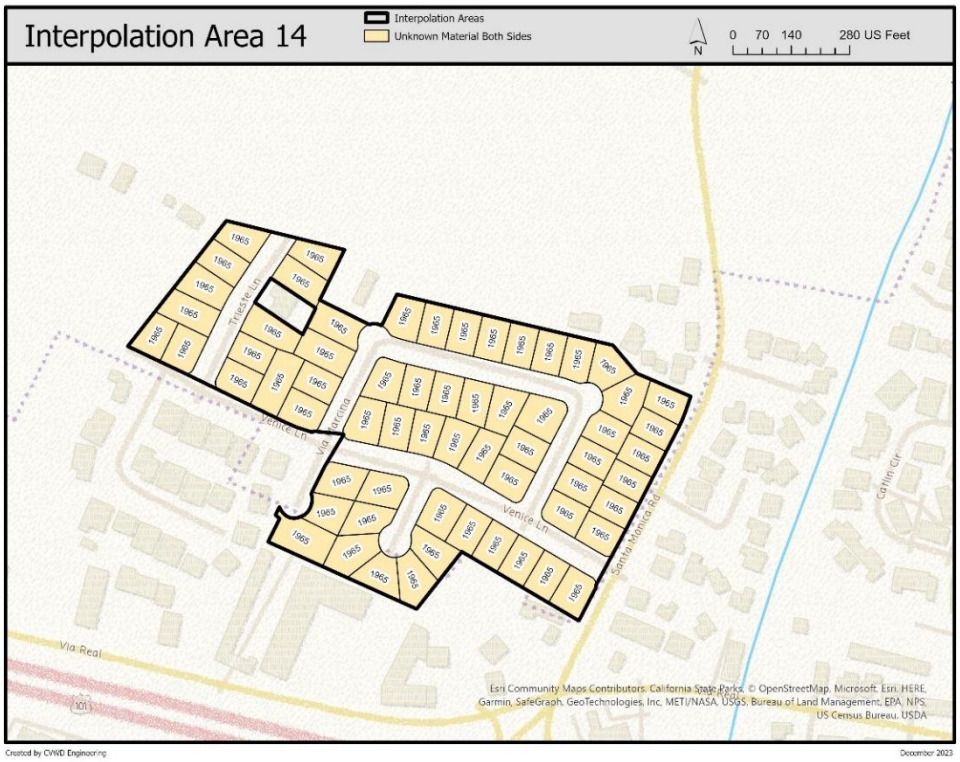


Figure 17. Map of Interpolation Area 14 with parcels labeled by the 'YearBuilt' field provided by the Santa Barbara County Assessor's Office parcel shapefile

D. How was the interpolation group determined?

These properties are adjacent and were all constructed in 1965 according to SB County records, indicative of being within the same Tract or period of construction with identical materials assumed to be utilized.

E. Percent or number that would be verified per group and how that number was determined?

Carpinteria Valley Water District staff will verify 10%. In Interpolation Area 14, a total of 7 homes will be checked using the Field Inspection Protocol outlined in Section III. If non-lead results are found on both sides of the 7 randomly selected water accounts with unknown material on both sides, then non-lead results would be interpolated to the other 56 properties in Area 14.

Random numbers will be generated in Microsoft Excel for the 63 meters with unknown material on both sides of the meter and the meters with the lowest 7 random numbers will be surveyed using the Field Inspection Protocol.

15. Area 15: Homes Developed in 1968 & 1969 – Camellia Circle and Aragon

A. Historical records

The District does not have construction documents showing the material used for the meters serving the properties depicted in **Figure 18.**

B. Total number of properties in the Interpolation Area

There are a total of 31 individually metered properties in this proposed interpolation area shown in the map in **Figure 18**. There are no known service line repair records for these properties and the material is unknown on both sides for all 31 properties.

C. Map of Interpolation Area 15

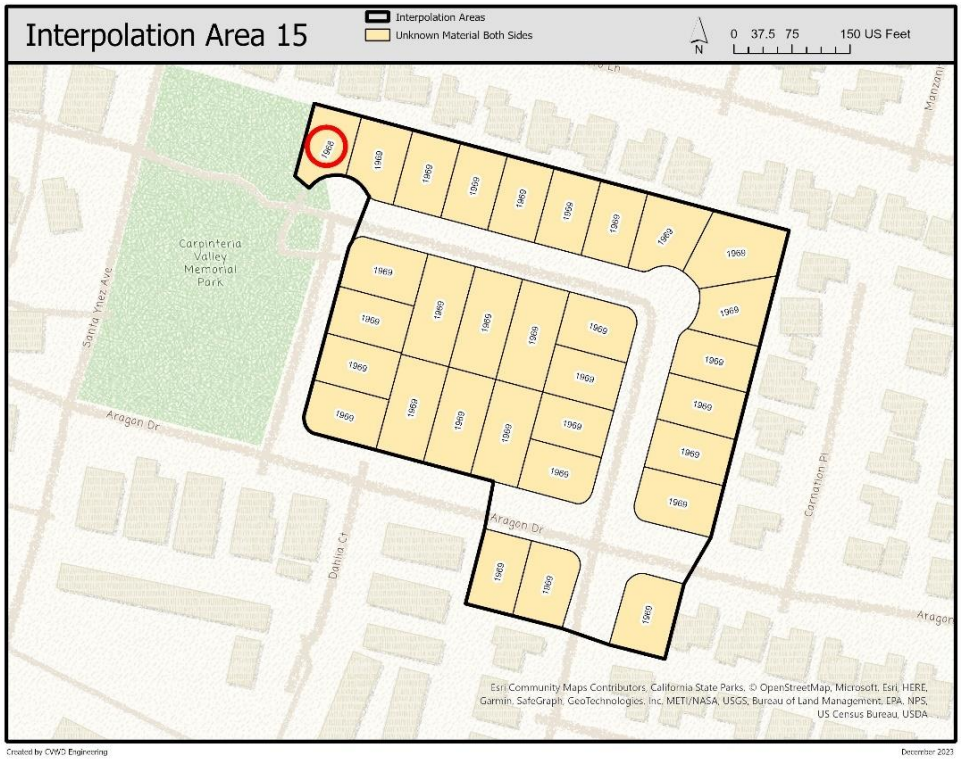


Figure 18. Map of Interpolation Area 15 with parcels labeled by the 'YearBuilt' field provided by the Santa Barbara County Assessor's Office parcel shapefile

D. How was the interpolation group determined?

These properties are adjacent and were all built in 1969, with one exception being constructed in 1968 (circled), according to SB County records, indicative of being within the same Tract or period of construction with identical materials assumed to be utilized.

E. Percent or number that would be verified per group and how that number was determined?

Carpinteria Valley Water District staff will verify 10%. In Interpolation Area 15, a total of 4 homes will be checked using the Field Inspection Protocol outlined in Section III. If non-lead results are found on both sides of the 4 randomly selected water accounts with unknown material on both sides, then non-lead results would be interpolated to the other 27 properties in Area 15.

Random numbers will be generated in Microsoft Excel for the 31 meters with unknown material on both sides of the meter and the meters with the lowest 4 random numbers will be surveyed using the Field Inspection Protocol.

16. Area 16: Homes Developed in 1970 – Carnation, Begonia, and Aragon

A. Historical records

The District does not have construction documents showing the material used for the meters serving the properties depicted in **Figure 19.**

B. Total number of properties in the Interpolation Area

There are a total of 31 individually metered properties in this proposed interpolation area shown in the map in **Figure 19**. There are no known service line repair records for these properties and the material is unknown on both sides for all 31 properties.

C. Map of Interpolation Area 16

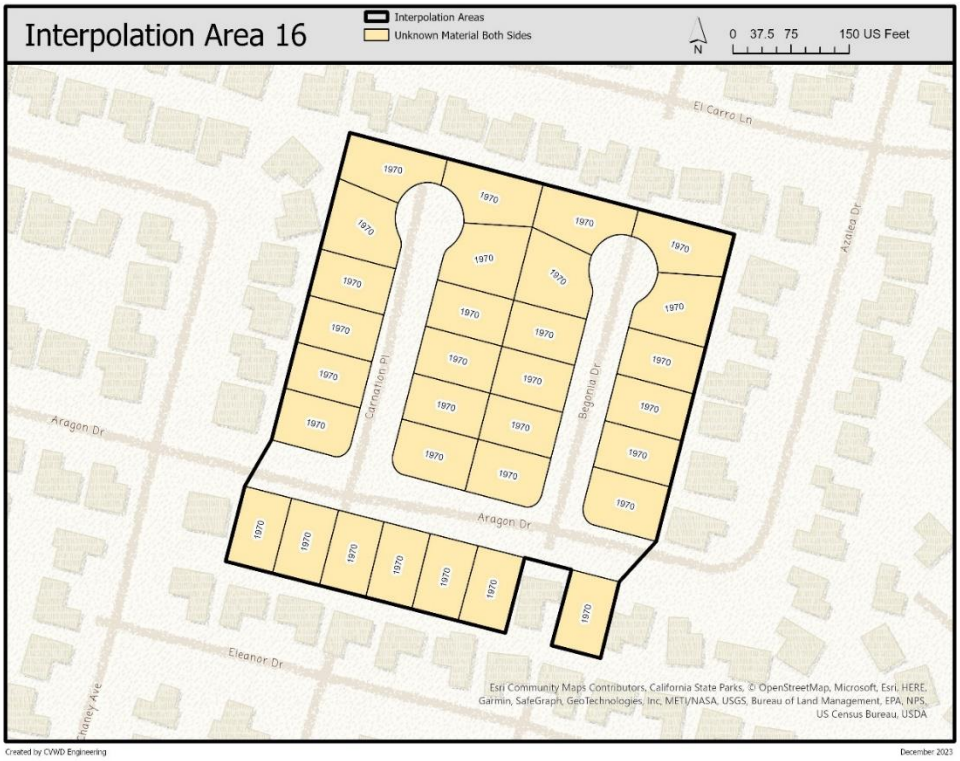


Figure 19. Map of Interpolation Area 16 with parcels labeled by the 'YearBuilt' field provided by the Santa Barbara County Assessor's Office parcel shapefile

D. How was the interpolation group determined?

These properties are adjacent and were all built in 1970 according to SB County records, indicative of being within the same Tract or period of construction with identical materials assumed to be utilized.

E. Percent or number that would be verified per group and how that number was determined?

Carpinteria Valley Water District staff will verify 10%. In Interpolation Area 16, a total of 4 homes will be checked using the Field Inspection Protocol outlined in Section III. If non-lead results are found on both sides of the 4 randomly selected water accounts with unknown material on both sides, then non-lead results would be interpolated to the other 27 properties in Area 16.

Random numbers will be generated in Microsoft Excel for the 31 meters with unknown material on both sides of the meter and the meters with the lowest 4 random numbers will be surveyed using the Field Inspection Protocol.

17. Area 17: Homes Developed in 1971 –El Carro and Santa Ynez

A. Historical records

The District does not have construction documents showing the material used for the meters serving the properties depicted in **Figure 20.**

B. Total number of properties in the Interpolation Area

There are a total of 62 individually metered properties in this proposed interpolation area shown in the map in **Figure 20**. There are no known service line repair records for these properties and the material is unknown on both sides for all 62 properties.

C. Map of Interpolation Area 17

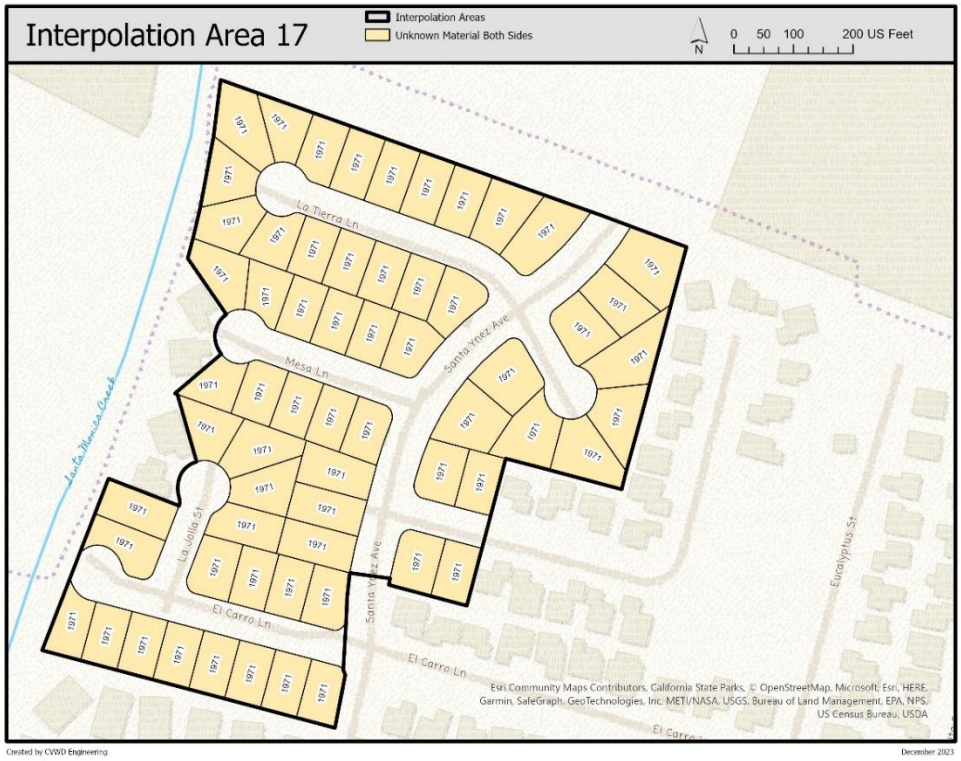


Figure 20. Map of Interpolation Area 17 with parcels labeled by the 'YearBuilt' field provided by the Santa Barbara County Assessor's Office parcel shapefile

D. How was the interpolation group determined?

These properties are adjacent and were all built in 1971 according to SB County records, indicative of being within the same Tract or period of construction with identical materials assumed to be utilized.

E. Percent or number that would be verified per group and how that number was determined?

Carpinteria Valley Water District staff will verify 10%. In Interpolation Area 17, a total of 7 homes will be checked using the Field Inspection Protocol outlined in Section III. If non-lead results are

found on both sides of the 7 randomly selected water accounts with unknown material on both sides, then non-lead results would be interpolated to the other 55 properties in Area 17.

Random numbers will be generated in Microsoft Excel for the 62 meters with unknown material on both sides of the meter and the meters with the lowest 7 random numbers will be surveyed using the Field Inspection Protocol.

18. Area 18: Homes Developed in 1971 – Aragon and Azalea

A. Historical records

The District does not have construction documents showing the material used for the meters serving the properties depicted in **Figure 21.**

B. Total number of properties in the Interpolation Area

There are a total of 18 individually metered properties in this proposed interpolation area shown in the map in **Figure 21**. There are no known service line repair records for these properties and the material is unknown on both sides for all 18 properties.

C. Map of Interpolation Area 18

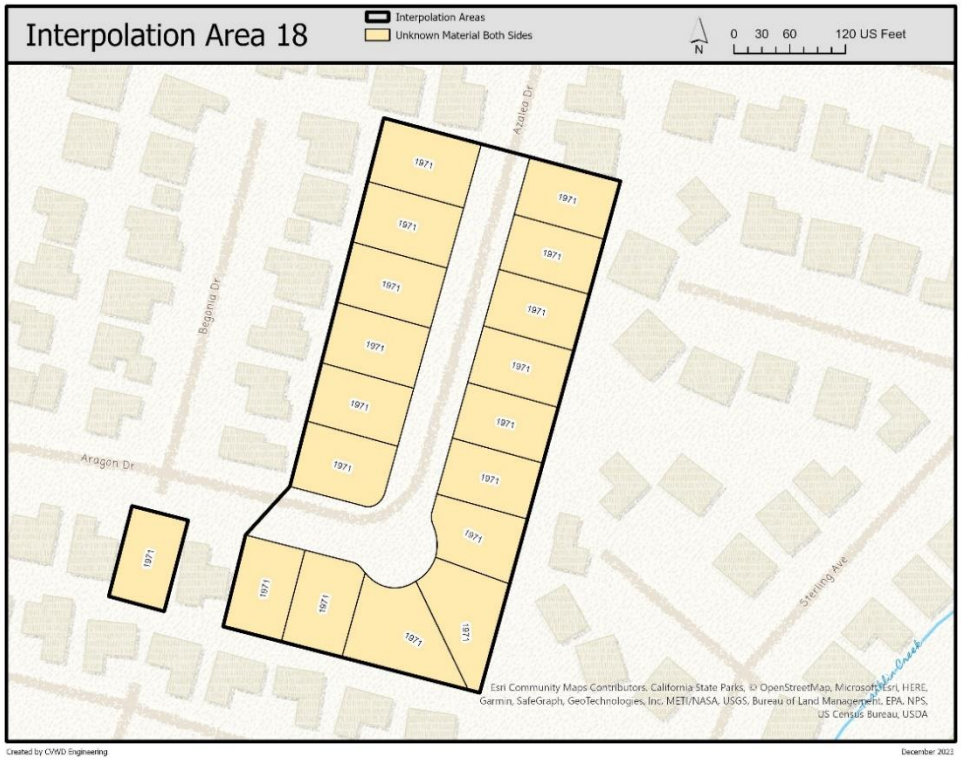


Figure 21. Map of Interpolation Area 18 with parcels labeled by the 'YearBuilt' field provided by the Santa Barbara County Assessor's Office parcel shapefile

D. How was the interpolation group determined?

These properties are adjacent and were all built in 1971 according to SB County records, indicative of being within the same Tract or period of construction with identical materials assumed to be utilized.

E. Percent or number that would be verified per group and how that number was determined?

Carpinteria Valley Water District staff will verify 10%. In Interpolation Area 18, a total of 2 homes will be checked using the Field Inspection Protocol outlined in Section III. If non-lead results are found on both sides of the 2 randomly selected water accounts with unknown material on both sides, then non-lead results would be interpolated to the other 16 properties in Area 18.

Random numbers will be generated in Microsoft Excel for the 18 meters with unknown material on both sides of the meter and the meters with the lowest 2 random numbers will be surveyed using the Field Inspection Protocol.

19. Area 19: Homes Developed in 1972 – El Carro Homes

A. Historical records

The District does not have construction documents showing the material used for the meters serving the properties depicted in **Figure 22.**

B. Total number of properties in the Interpolation Area

There are a total of 119 individually metered properties in this proposed interpolation area shown in the map in **Figure 22**. Of the 119 properties, CVWD knows the CVWD-side service line material for 1 property (shown in red in **Figure 22**) based on service line repair records:

- 1472 Eucalyptus Street: Non-Lead – Plastic (01/2022)

C. Map of Interpolation Area 19

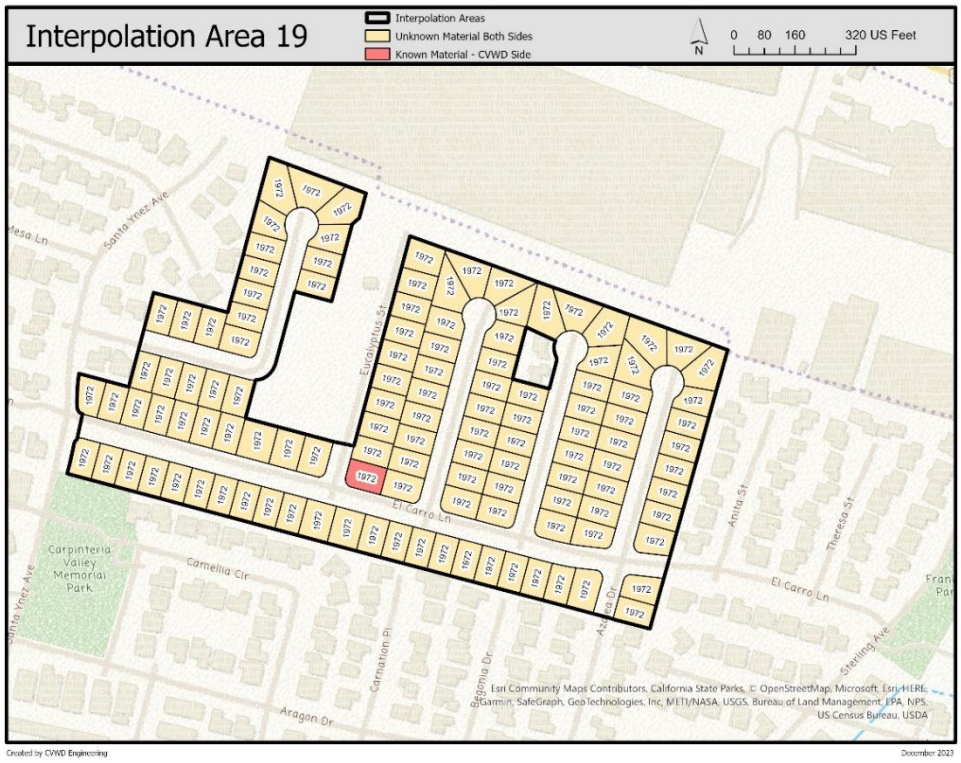


Figure 22. Map of Interpolation Area 19 with parcels labeled by the 'YearBuilt' field provided by the Santa Barbara County Assessor's Office parcel shapefile

D. How was the interpolation group determined?

These properties are adjacent and were all constructed in 1972 according to SB County records, indicative of being within the same Tract or period of construction with identical materials assumed to be utilized.

E. Percent or number that would be verified per group and how that number was determined?

Carpinteria Valley Water District staff will verify 10%. In Interpolation Area 19, a total of 12 homes will be checked using the Field Inspection Protocol outlined in Section III. The randomly selected 10% sample will not include the 1 property with known material on CVWD's side. If non-lead results are found on both sides of the 12 randomly selected water accounts with unknown material on both sides, then non-lead results would be interpolated to the other 107 properties in Area 19. For the 1 property with known material on CVWD's side, the customer side will be interpolated based on what is found in the sample.

Random numbers will be generated in Microsoft Excel for the 118 meters with unknown material on both sides of the meter and the meters with the lowest 12 random numbers will be surveyed using the Field Inspection Protocol.

20. Area 20: Condos Developed in 1972 & 1974 – Bailard Avenue Condos

A. Historical records

The District does not have institutional knowledge of or construction documents showing the material used for the meters serving the properties depicted in **Figure 23.**

B. Total number of properties in the Interpolation Area

There are a total of 280 condos in this proposed interpolation area and 1 separate meter serving the HOA's pool and common area. There are four condos in each building, and each building shares 1 water meter. Therefore, there are 70 condo meters in total and 1 HOA meter for a total of 71 meters in this interpolation area. These properties are shown in the map in **Figure 23**. There are no known service line repair records for these properties and the material is unknown on both sides for all 71 meters.

C. Map of Interpolation Area 20

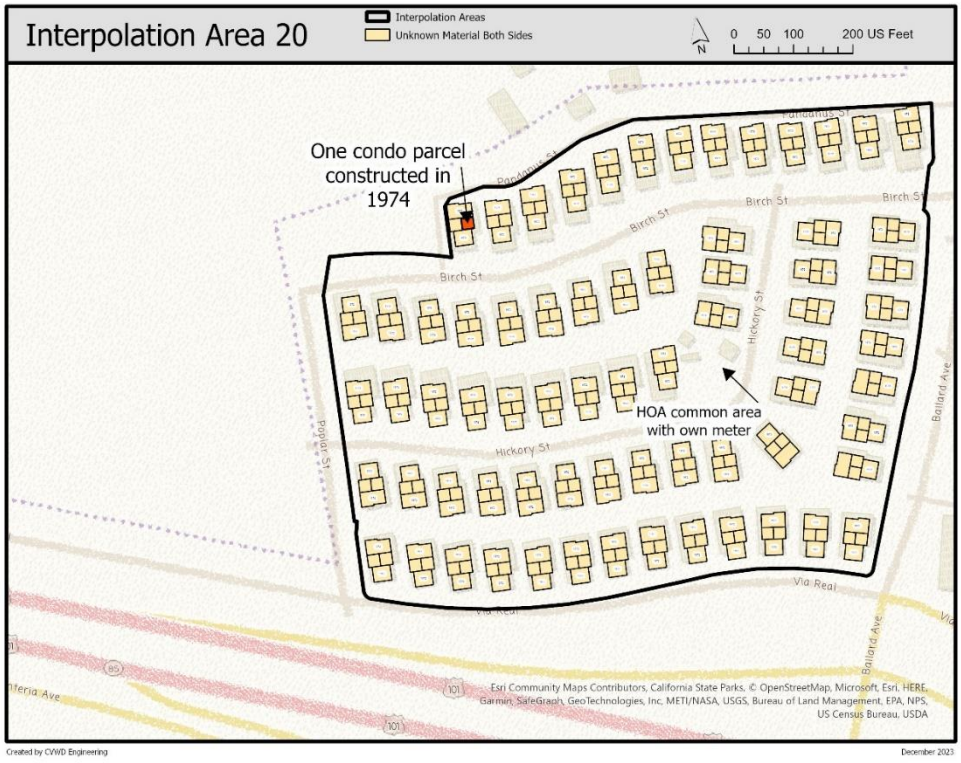


Figure 23. Map of Interpolation Area 20 with parcels labeled by the 'YearBuilt' field provided by the Santa Barbara County Assessor's Office parcel shapefile

D. How was the interpolation group determined?

These properties are adjacent and the same year of construction, indicative of being within the same Tract or period of construction with identical materials assumed to be utilized. All condos were constructed in 1972, with the exception of one that was constructed in 1974, according to SB County records. For the 1974 instance in this development, the 1974 condo shares a meter with 3 condos constructed in 1972. There are four condos per building sharing 1 master residential meter.

E. Percent or number that would be verified per group and how that number was determined?

Carpinteria Valley Water District staff will verify 10%. In Interpolation Area 20, a total of 8 homes will be checked using the Field Inspection Protocol outlined in Section III. If non-lead results are found on both sides of the 8 randomly selected water accounts with unknown material on both sides, then non-lead results would be interpolated to the other 63 properties in Area 20.

Random numbers will be generated in Microsoft Excel for the 71 meters with unknown material on both sides of the meter and the meters with the lowest 8 random numbers will be surveyed using the Field Inspection Protocol.

21. Area 21: Homes developed in 1975 – El Carro, Anita, and Theresa

A. Historical records

The District does not have construction documents showing the material used for the meters serving the properties depicted in **Figure 24.**

B. Total number of properties in the Interpolation Area

There are a total of 42 individually metered properties in this proposed interpolation area shown in the map in **Figure 24**. There are no known service line repair records for these properties and the material is unknown on both sides for all 42 meters.

C. Map of Interpolation Area 21

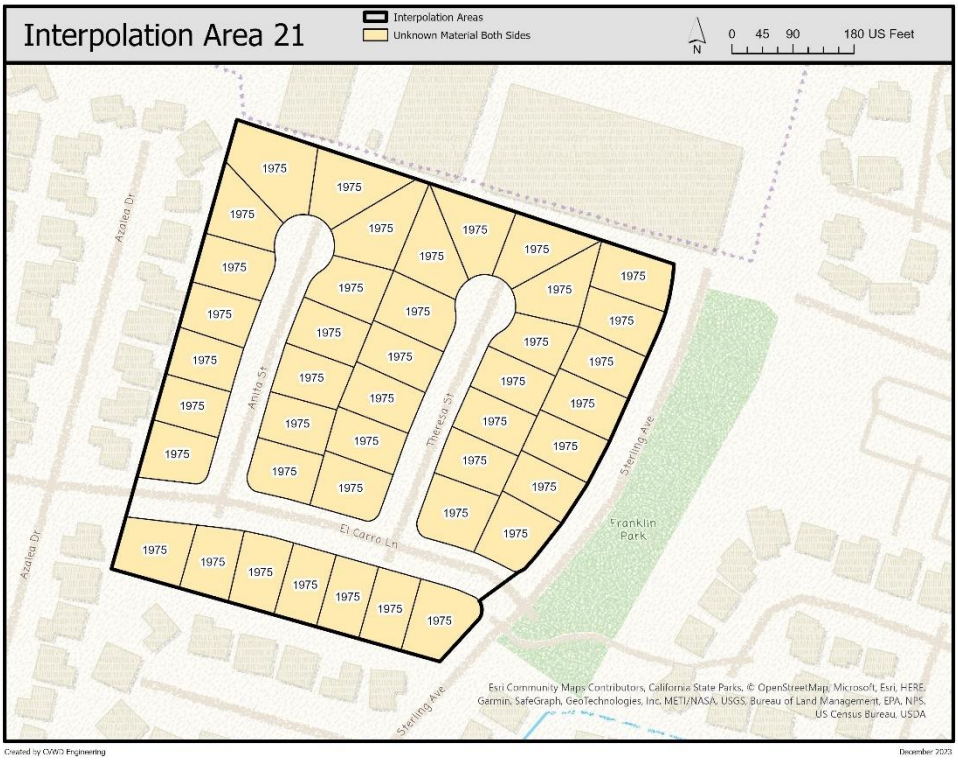


Figure 24. Map of Interpolation Area 21 with parcels labeled by the 'YearBuilt' field provided by the Santa Barbara County Assessor's Office parcel shapefile

D. How was the interpolation group determined?

These properties are adjacent and were all built in 1975 according to SB County records, indicative of being within the same Tract or period of construction with identical materials assumed to be utilized.

E. Percent or number that would be verified per group and how that number was determined?

Carpinteria Valley Water District staff will verify 10%. In Interpolation Area 21, a total of 5 homes will be checked using the Field Inspection Protocol outlined in Section III. If non-lead results are found on both sides of the 5 randomly selected water accounts with unknown material on both sides, then non-lead results would be interpolated to the other 37 properties in Area 21.

Random numbers will be generated in Microsoft Excel for the 42 meters with unknown material on both sides of the meter and the meters with the lowest 5 random numbers will be surveyed using the Field Inspection Protocol.

22. Area 22: Homes Developed in 1977 – Catlin Circle and Santa Monica

A. Historical records

The District does not have construction documents showing the material used for the meters serving the properties depicted in **Figure 25.** Based on CVWD observations while repairing leaking service lines over the years, the original water service lines were constructed using copper t-branches with one water service running to two separate water meters. Without construction documents, the District plans to sample within this neighborhood.

B. Total number of properties in the Interpolation Area

There are a total of 64 residential water meters and one HOA irrigation meter for a total of 65 water meters that are a part of this interpolation area. Of the 65 meters, CVWD knows the CVWD-side service line material for 6 properties (shown in red in **Figure 25**) based on service line repair records:

- 4402 Catlin Cir A: Non-Lead – Other (02/2013)
- 4402 Catlin Cir B: Non-Lead – Other (02/2013)
- 4406 Catlin Cir B: Non-Lead – Other (02/2013)
- 4406 Catlin Cir A: Non-Lead – Other (02/2013)
- 4413 Catlin Cir A: Non-Lead – Plastic (12/2021)
- 4413 Catlin Cir B: Non-Lead – Plastic (12/2021)

C. Map of Interpolation Area 22

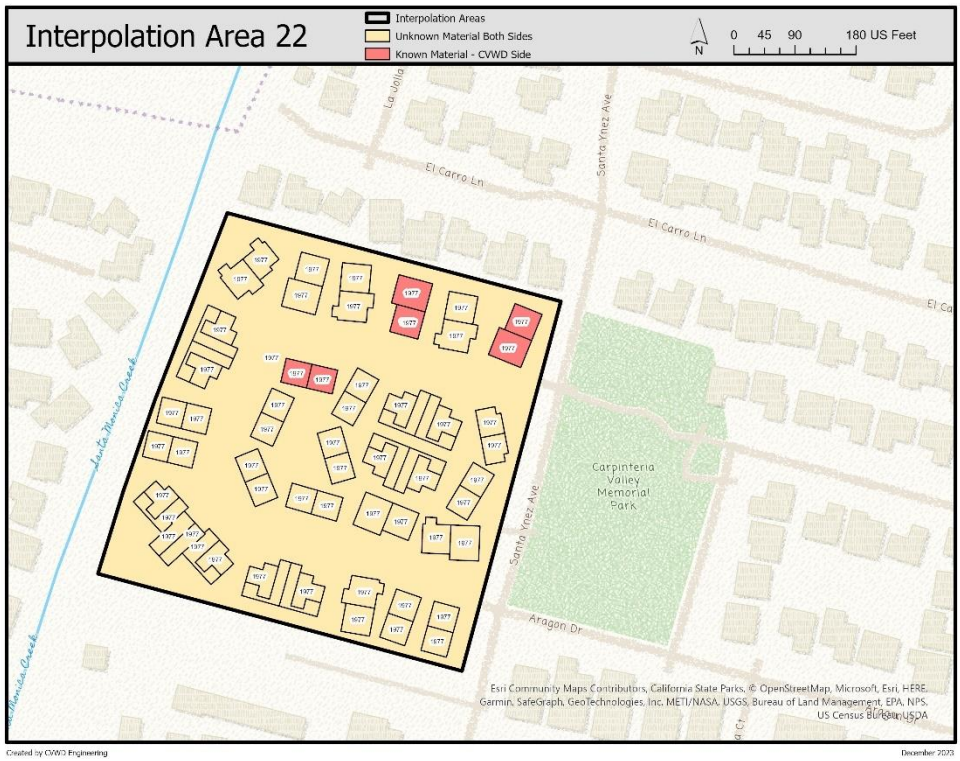


Figure 25. Map of Interpolation Area 22 with parcels labeled by the 'YearBuilt' field provided by the Santa Barbara County Assessor's Office parcel shapefile

D. How was the interpolation area determined?

These properties are adjacent and were all built in 1977 according to SB County records and are all a part of Tract 25,057 according to the As-built.

E. Percent or number that would be verified per group and how that number was determined?

Carpinteria Valley Water District staff will verify 10%. In Interpolation Area 22, a total of 7 homes will be checked using the Field Inspection Protocol outlined in Section III. The randomly selected 10% sample will not include the 6 properties with known material on CVWD's side. If non-lead results are found on both sides of the 7 randomly selected water accounts with unknown material on both sides, then non-lead results would be interpolated to the other 58 properties in Area 22. For the 7 properties with known material on CVWD's side, the customer side will be interpolated based on what is found in the sample.

Random numbers will be generated in Microsoft Excel for the 59 meters with unknown material on both sides of the meter and the meters with the lowest 7 random numbers will be surveyed using the Field Inspection Protocol.

23. Area 23: Homes Developed in 1978 -- Via Real and Hales Ln

A. Historical records

The District does not have construction documents showing the material used for the meters serving the properties depicted in **Figure 26.**

B. Total number of properties in the Interpolation Area

There are a total of 18 individually metered properties in this proposed interpolation area shown in the map in **Figure 26**. There are no known service line repair records for these properties and the material is unknown on both sides for all 18 properties.

C. Map of Interpolation Area 23

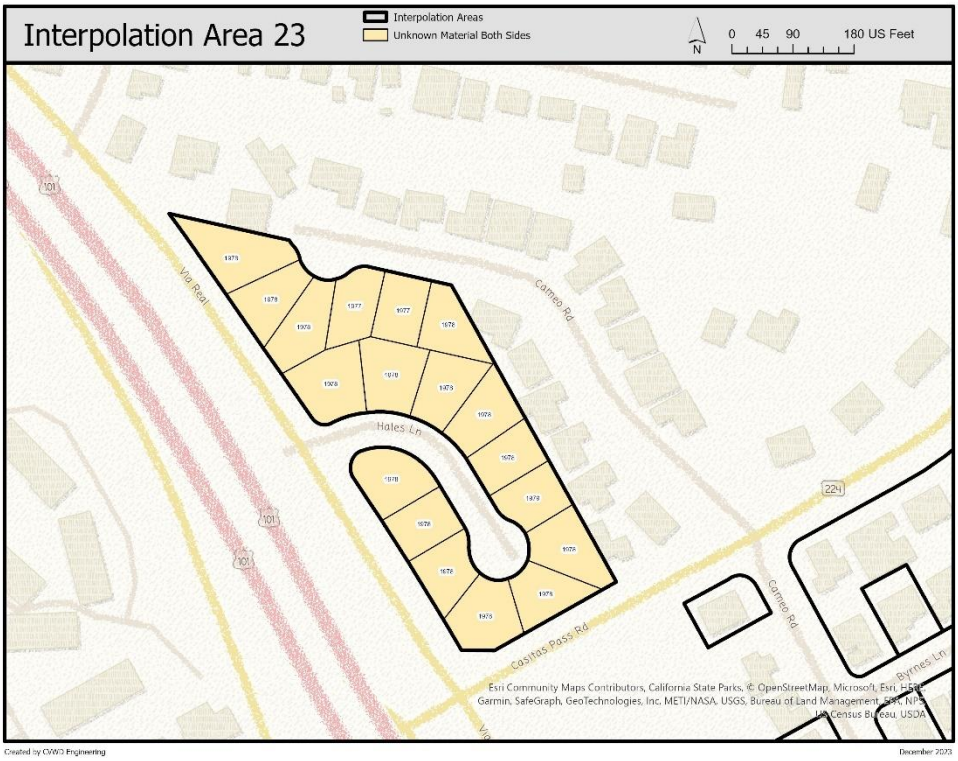


Figure 26. Map of Interpolation Area 23 with parcels labeled by the 'YearBuilt' field provided by the Santa Barbara County Assessor's Office parcel shapefile

D. How was the interpolation area determined?

All homes were constructed in 1977 or 1978 according to SB County records and were all a part of Tract 25,068.

E. Percent or number that would be verified per group and how that number was determined?

Carpinteria Valley Water District staff will verify 10%. In Interpolation Area 23, a total of 2 homes will be checked using the Field Inspection Protocol outlined in Section III. If non-lead results are found on both sides of the 2 randomly selected water accounts with unknown material on both sides, then non-lead results would be interpolated to the other 16 properties in Area 23.

Random numbers will be generated in Microsoft Excel for the 18 meters with unknown material on both sides of the meter and the meters with the lowest 2 random numbers will be surveyed using the Field Inspection Protocol.

24. Area 24: Homes Developed in 1980 – Venice and Trieste

A. Historical records

The District does not have construction documents showing the material used for the meters serving the properties depicted in **Figure 27.**

B. Total number of properties in the Interpolation Area

There are a total of 17 individually metered properties in this proposed interpolation area shown in the map in **Figure 27**. There are no known service line repair records for these properties and the material is unknown on both sides for all 17 properties.

C. Map of Interpolation Area 24

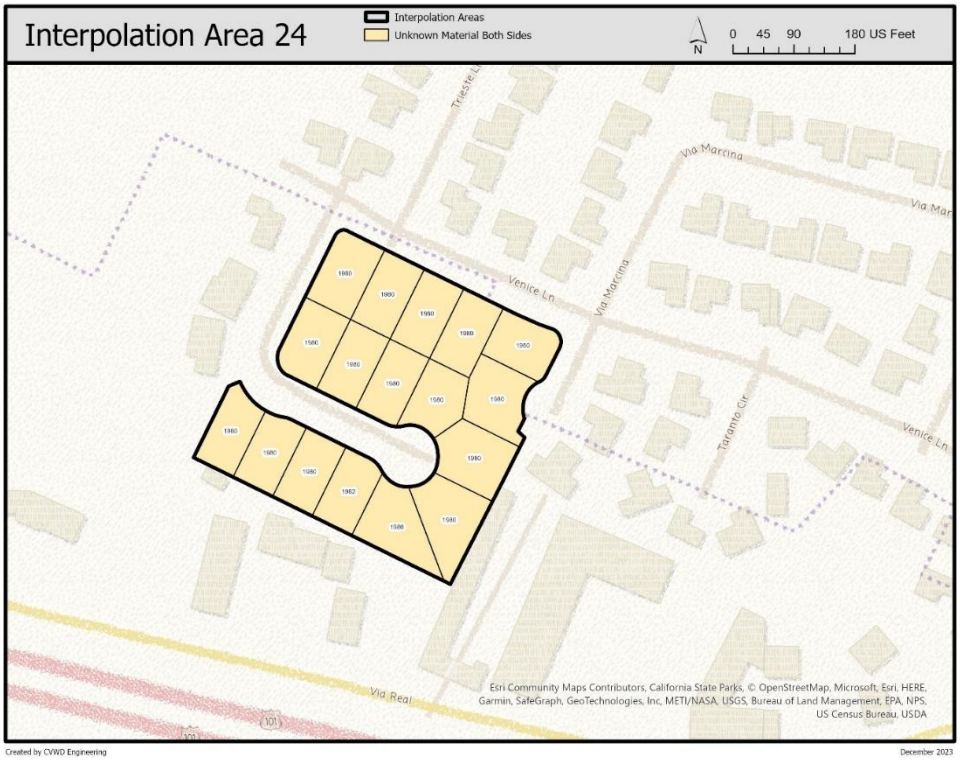


Figure 27. Map of Interpolation Area 24 with parcels labeled by the 'YearBuilt' field provided by the Santa Barbara County Assessor's Office parcel shapefile

D. How was the interpolation area determined?

All homes were constructed in 1980 and 1982 according to SB County records and were all a part of Tract 25,070.

E. Percent or number that would be verified per group and how that number was determined?

Carpinteria Valley Water District staff will verify 10%. In Interpolation Area 24, a total of 2 homes will be checked using the Field Inspection Protocol outlined in Section III. If non-lead results are found on both sides of the 2 randomly selected water accounts with unknown material on both sides, then non-lead results would be interpolated to the other 15 properties in Area 24.

Random numbers will be generated in Microsoft Excel for the 17 meters with unknown material on both sides of the meter and the meters with the lowest 2 random numbers will be surveyed using the Field Inspection Protocol.

25. Area 25: Cameo Road - Tract 10,373

A. Historical records

The District does not have construction documents showing the material used for the meters serving the properties depicted in **Figure 28.**

B. Total number of properties in the Interpolation Area

There are a total of 20 individually metered properties in this proposed interpolation area shown in the map in **Figure 28**. There are no known service line repair records for these properties and the material is unknown on both sides for all 20 properties.

C. Map of Interpolation Area 25

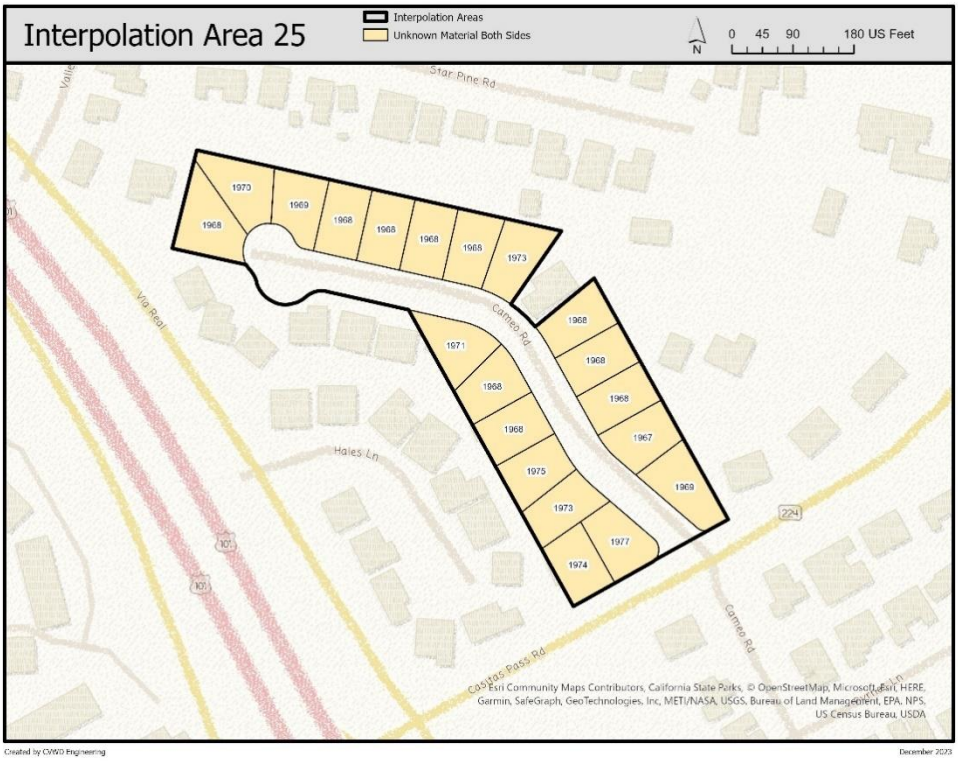


Figure 28. Map of Interpolation Area 25 with parcels labeled by the 'YearBuilt' field provided by the Santa Barbara County Assessor's Office parcel shapefile

D. How was the interpolation area determined?

All homes were constructed between 1967 and 1977 according to SB County records and were all a part of Tract 10,373 (**Figure 29**).

	Situs1	Situs2	YearBuilt	MapType	RecMapNum
1	5476 CAMEO RD	CARPINTERIA, CA 93013	1967	TRACT	10,373
2	5458 CAMEO RD	CARPINTERIA, CA 93013	1968	TRACT	10,373
3	5464 CAMEO RD	CARPINTERIA, CA 93013	1968	TRACT	10,373
4	5470 CAMEO RD	CARPINTERIA, CA 93013	1968	TRACT	10,373
5	5420 CAMEO RD	CARPINTERIA, CA 93013	1968	TRACT	10,373
6	5426 CAMEO RD	CARPINTERIA, CA 93013	1968	TRACT	10,373
7	5432 CAMEO RD	CARPINTERIA, CA 93013	1968	TRACT	10,373
8	5438 CAMEO RD	CARPINTERIA, CA 93013	1968	TRACT	10,373
9	5461 CAMEO RD	CARPINTERIA, CA 93013	1968	TRACT	10,373
10	5467 CAMEO RD	CARPINTERIA, CA 93013	1968	TRACT	10,373
11	5402 CAMEO RD	CARPINTERIA, CA 93013	1968	TRACT	10,373
12	5414 CAMEO RD	CARPINTERIA, CA 93013	1969	TRACT	10,373
13	5488 CAMEO RD	CARPINTERIA, CA 93013	1969	TRACT	10,373
14	5410 CAMEO RD	CARPINTERIA, CA 93013	1970	TRACT	10,373
15	5441 CAMEO RD	CARPINTERIA, CA 93013	1971	TRACT	10,373
16	5444 CAMEO RD	CARPINTERIA, CA 93013	1973	TRACT	10,373
17	5477 CAMEO RD	CARPINTERIA, CA 93013	1973	TRACT	10,373
18	5483 CAMEO RD	CARPINTERIA, CA 93013	1974	TRACT	10,373
19	5473 CAMEO RD	CARPINTERIA, CA 93013	1975	TRACT	10,373
20	5487 CAMEO RD	CARPINTERIA, CA 93013	1977	TRACT	10,373

0 of 20 selected

Figure 29. Snippet of attribute table from Santa Barbara County parcel layer

E. Percent or number that would be verified per group and how that number was determined?

Carpinteria Valley Water District staff will verify 10%. In Interpolation Area 25, a total of 2 homes will be checked using the Field Inspection Protocol outlined in Section III. If non-lead results are found on both sides of the 2 randomly selected water accounts with unknown material on both sides, then non-lead results would be interpolated to the other 18 properties in Area 25.

Random numbers will be generated in Microsoft Excel for the 20 meters with unknown material on both sides of the meter and the meters with the lowest 2 random numbers will be surveyed using the Field Inspection Protocol.

VI. Stratified Random Sampling Based on Year Built

1. Protocol

For the remaining 2,425 meters that cannot be completed based on pipe size, CVWD's records review, or interpolation, CVWD intends to perform stratified random sampling to achieve a 95% confidence level allowing for a margin of error of no more than ± 5%. The meters will be divided into groups of 10-year periods based on the year that the structures were built according to SB County. The number of field inspections that must occur to achieve a 95% confidence level for each group will be determined by using the Sample Size Calculator from Calculator.net, which was recommended to CVWD by the DDW Lead and Copper Rule Unit.

The relationship between an individual water meter and the parcel or parcels it serves has already been established by CVWD staff. The water meter and associated parcels dataset was joined to the SB County parcel dataset containing the year of construction for the structures. There are instances where multiple meters serve one parcel; for these instances, every meter serving that parcel is associated with the one year of construction for the parcel, if it is provided. There are also instances where one or multiple meters serve multiple parcels; for these instances, if the parcels have differing years of construction, or if one parcel has year of construction data and the other parcel's year of construction is empty (aside from undeveloped common areas), then CVWD has updated the year of construction date to "Unknown" due to

a meter potentially serving parcels with conflicting construction dates. These "Unknown" instances (100 records) were grouped with the other properties lacking year of construction data (presented as "Unknown-Empty" in **Appendix C** totaling 1,024 records) from SB County to create the final "Unknown" group totaling 1,124 meters as shown in **Table 3**. If one water meter serves a developed parcel with construction data or several developed parcels with matching construction years in addition to a common area with no construction year reported due to having no built structures, the meter was assigned the construction year of the developed parcel(s).

To achieve 95% confidence for this large "Unknown" group, the sample size calculator recommended that 287 meters be surveyed. To gain more confidence in this sample we added an additional 60 water meters to this group for a total of 347. For each group, random numbers will be assigned to all meters in each group in Microsoft Excel, and then sorted by random number from lowest to highest. The lowest meters will be selected to be inspected. If CVWD has water service replacement records and knows the material on CVWD's side, then that meter will be removed from the sample and the meter with the next lowest random number will be inspected in its place.

Due to the low likelihood of lead after 1950s, the data from SB County for Year Built 1951 through current were grouped into one larger time period before the 95% confidence level calculation was applied.

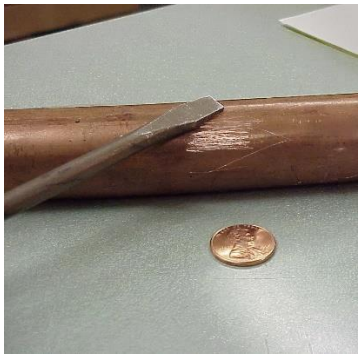
Table 3. Number of Meters to be Inspected per Time Period

Time Period (Year Built data from SB County)	**Number of meters in this group**	**Number of field inspections for a 95% confidence level with a margin of error of no more than ± 5%**
1870-1880	9	9
1881-1890	5	5
1891-1900	24	23
1901-1910	17	17
1911-1920	47	42
1921-1930	94	76
1931-1940	94	76
1941-1950	144	105
POST 1950s: 1951-2030 • 1951-1960: 188 • 1961-1970: 165 • 1971-1980: 165 • 1981-1990: 163 • 1991-2000: 61 • 2001-2010: 91 • 2011-2020: 32 • 2021-2030: 2	867	267
Unknown	1,124	347
Grand Totals	**2,425**	**967**

2. If Lead is Found

If lead is found, customers will be notified and provided with supplies as required. Additionally, CVWD staff will schedule a meeting with DDW's Lead and Copper Unit to determine how many additional meters would need to be surveyed in the particular time period.

APPENDIX A:
Field Test Guidance - Visual, Scratch Test, Magnet Test, and Lead Test

Type of Pipe	Lead Pipe	Copper Pipe	Galvanized Pipe	Plastic Pipe
Reference Image	 Photo Credit: Charleston Water System	 Photo Credit: Lake County, IL	 Photo Credit: Lake County, IL	 Photo Credit: The Home Depot
Visual	• Dull grey • Bendable	• Copper or green • Straight	• Darker grey or black • Straight	• Could be many different colors (typically black, blue, or white) • Straight
Scratch Test	• Shiny and silver • Soft	• Shiny and copper like a penny	• NOT SHINY • Hard to scratch	• May leave a mark • Color remains the same
Magnet Test	• NOT magnetic	• NOT magnetic	• Magnetic	• NOT magnetic
Lead Test	• Positive	• Negative	• Negative	• Negative

APPENDIX B:

Summary Table of Interpolation Areas, Percentages, and Totals

Interpolation Area	Total Number of Properties	Percentage to Verify	Number of Properties Field Verified	Number of Properties Interpolated
Area 1	75	10%	8	67
Area 2	19	10%	2	17
Area 3	56	10%	6	50
Area 4	68	10%	7	61
Area 5	121	10%	13	108
Area 6	36	10%	4	32
Area 7	24	10%	3	21
Area 8	15	10%	2	13
Area 9	45	10%	5	40
Area 10	95	10%	10	85
Area 11	19	10%	2	17
Area 12	54	10%	6	48
Area 13	52	10%	6	46
Area 14	63	10%	7	56
Area 15	31	10%	4	27
Area 16	31	10%	4	27
Area 17	62	10%	7	55
Area 18	18	10%	2	16
Area 19	119	10%	12	107
Area 20	71	10%	8	63
Area 21	42	10%	5	37
Area 22	65	10%	7	58
Area 23	18	10%	2	16
Area 24	17	10%	2	15
Area 25	20	10%	2	18
GRAND TOTALS	**1236**		**136**	**1100**

APPENDIX C:

Complete Year of Construction and Number of Water Meters for the 2,425 Stratified Random Sampling Group

Year Built	Number of Water Meters
1870	1
1871	1
1876	1
1877	1
1880	5
1882	1
1888	1
1890	3
1892	1
1895	1
1900	22
1906	1
1910	16
1911	4
1912	2
1914	1
1915	5
1916	4
1919	3
1920	28
1921	6
1922	2
1923	3
1924	2
1925	20
1926	11
1927	7
1928	8
1929	3
1930	32
1931	12
1932	3
1933	3
1934	2
1935	13
1936	6
1937	10

Year Built	Number of Water Meters
1938	15
1939	13
1940	17
1941	12
1942	6
1944	3
1945	5
1946	16
1947	29
1948	26
1949	20
1950	27
1951	30
1952	13
1953	13
1954	9
1955	11
1956	11
1957	27
1958	24
1959	32
1960	18
1961	22
1962	32
1963	21
1964	17
1965	24
1966	12
1967	6
1968	13
1969	3
1970	15
1971	8
1972	15
1973	19
1974	22
1975	10
1976	10
1977	43
1978	12
1979	15

Year Built	Number of Water Meters
1980	11
1981	12
1982	9
1983	12
1984	65
1985	13
1986	11
1987	19
1988	5
1989	10
1990	7
1991	5
1992	8
1993	7
1994	5
1995	4
1996	9
1997	4
1998	7
1999	11
2000	1
2001	11
2002	5
2003	4
2004	7
2005	8
2006	5
2007	13
2008	20
2009	7
2010	11
2011	4
2012	4
2013	1
2014	1
2015	4
2016	5
2017	6
2018	2
2019	4
2020	1

Year Built	Number of Water Meters
2021	2
Unknown	100
Unknown-Empty	1,024
Grand Total	**2,425**

Carpinteria Valley Water District

Memo

To: Greg Stanford, Operations and Maintenance Manger

From: Brian King, District Engineer

cc: Danielle Harmon, Engineering Analyst

Date: 10/2/2024

Re: District service lines: Interview of past long-term employees.

Background:

For completing the District's 2024 Lead Service Line Inventory report

Interview of past and long-term employees for institutional knowledge of the distribution system. I reached out to several former employees. First interviewed Ray Jimenez retired Operation Manger who worked for the district from 1961 to 1999. Ray states in the time with the District they didn't install lead on service lines. And for that matter he never witnessed finding a service line with lead piping or lead pigtails. For the installation of services, they used soft copper for service lines for smaller meters (5/8, ¾ and 1 inch services) for 1.5 and 2 inch services used hard copper. For installations 3 inch or larger used steel pipe. Ray did mention that he had witness some services with a galvanized pipe on the service line. Next I reached out to Norm Cota retired from the District in 1999 as the District Engineer. Norm was with the District from 1969 to 1999. In 30 years time that Norm was with the District he also stated that he never witnessed a lead service line or for that matter never installed a lead service line.

With these statements for both the Operation Manager and the District Engineer for the District which covers a window of operation from 1961 thru 1999 hope provides additional evidence on the system not having lead service lines.

Brian King P.E.

District Engineer

Carpinteria Valley Water District.