# Water System Design Report for Amended Vesting Tentative Tract No. 53138 Deerlake Ranch

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**Las Virgenes Municipal Water District**

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| Date | August 31, 2017 |

60322621

# Las Virgenes Municipal Water District
# Preliminary Water System Design Report
# for
# Amended Vesting Tentative Tract No. 53138
# Deerlake Ranch
# Los Angeles County, California

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## Section 1 - Introduction

Amended Vesting Tentative Tract No. 53138 is located on approximately 232.87 acres in the hills northeast of the Topanga Canyon Blvd. interchange with California Highway 118 (Simi Valley Freeway) in Los Angeles County, California. The development includes 314 single-family residential lots, one recreation building, one sheriff facility, and 31 open space/slope lots.

The purpose of this Water System Design Report (WSDR) is to investigate the feasibility of providing potable water service to Amended Vesting Tentative Tract No. 53138, and to develop criteria for the facilities required to provide adequate service. Potable water demand for the proposed development is based on the HDR Technical Memorandum Water Demand Estimate Study, May 2 2017. Fire protection requirements are as determined by the Los Angeles County Fire Department.

The owner and developer of Amended Vesting Tentative Tract No. 53138 is Forestar Chatsworth, LLC, 4590 MacArthur Blvd., Suite 600, Newport Beach, California 92660, (949) 748-6714. The developer's engineer is United Civil Inc., 30141 Agoura Road, Suite 215, Agoura Hills, California 91301, (818) 707-8648.

The Preliminary WSDR for Amended Vesting Tentative Tract No. 53138 was completed by Boyle Engineering Corporation on April 24, 2001. The report has since undergone five revisions, which were completed in January 2002, July 2003, March 2004, and December 2014 and August 2017 (Reference 2). Revision 5 included the Kennedy Jenks Consultants Storage and Pumping Capacity Study dated July 16, 2016 and the HDR Technical Memorandum Water Demand Estimate Study dated May 2, 2017.

## Section 2 - Proposed Development

Amended Vesting Tentative Tract No. 53138, shown on **Plate 1**, comprises approximately 232.87 acres, in an unincorporated area of Los Angeles County, northeast of the Topanga Canyon Boulevard Interchange with California State Highway 118. Access to the proposed development will be from Topanga Canyon Boulevard on the west and from Canoga Avenue on the south.

The proposed development is zoned R-1-6000 (Low Density Urban Residential) and A-1-1 (Non-urban Residential), and includes 314 single-family residential lots, one recreation building, one sheriff facility, and 31 open space/slope lots. The grading quantity is 1,874,600 CY which will be balanced on site. According to the developer's tentative tract map (**Appendix A**), ground elevations within the proposed development range from approximately 1,160 feet at the horse trail in the southeast corner, to 1,485.1 at the end of Wurster Way on the north edge of the tract. Proposed building pad elevations range from 1,261.5 feet on Poema Place (lot 18), east of the bridge, to 1,485.1 feet at lot 174 on Wurster Way.

## Section 3 - Potable Water Demand

The potable water demand estimated for the proposed development is shown in **Tables 1, 2, and 3**. Each table represents a different phase of the project. Demand will be generated by residential use and landscape irrigation. The demands are based on the HDR Technical Memorandum dated May 2, 2017; (**Appendix D)** The Los Angeles County Fire Department requires that a 1,250 gpm fire flow be available to serve the residential units, with a residual pressure of 20-psi maintained for two hours at the flowing fire hydrants. The recreation building and sheriff facility requires a 1,500 gpm fire flow at 20 psi for a duration of 2 hrs. Pipeline sizes were determined by analyzing maximum day demand with concurrent fire flow, and peak hour demand. However, The Church at Rocky Peak is the largest structure within the subsystem with a required fire flow of 3,750 gpm for three (3) hrs.

## TABLE 1

## Phase 1 Estimated Potable Water Demand for Amended Vesting Tentative Tract No. 53138

| | | | | Estimated Water Demand (gpm) | | |
|---|---|---|---|---|---|---|
| **Hydraulic Gradient Zone** | **Land Use** | **No. of Units or Acres** | **Demand Criteria** | **Avg. Day Demand** | **Max. Day Demand** | **Peak Hour Demand** |
| 1585 | Interior Residential | 103 Units | 240 gpd/unit (1) | 17.5 | 64.8 | 87.6 |
| 1585 | Level Landscaped Private Areas | 7.83 | 5 acre-ft./acre/year (2) (3.08 gpm/acre) | 24.3 | 89.8 | 121.3 |
| 1585 | Sloped Private Areas | 16.58 | 1.3 acre-ft./acre/year(3) (.80 gpm/acre) | 13.4 | 49.4 | 66.8 |
| 1585 | Common Landscaped Areas | 20.65 | 2.5 acre-ft./acre/year(4) (1.55 gpm/acre) | 32.0 | 118.4 | 160.0 |
| 1585 | Sheriff Station | 0.44 | 3 acre-ft./acre/year (5) (1.85 gpm/acre) | 0.82 | 2.63 | 4.1 |
| 1585 | Rec Center | 1.96 | 3 acre-ft./acre/year(5) (1.85 gpm/acre) | 3.64 | 11.7 | 18.2 |
| | | | **Total Demand** | **91.6** | **336.8** | **458.00** |

MDD factor - 3.7 & PHD factor = 5.0 from HDR report

(1) Interior demand criteria from HDR report 80 gpcd * 3 persons per unit.

(2) Level landscaped private areas = 3,310.61 sf per lot, from HDR table 7 entry divided by 314 units

(3) Sloped private areas = 7,011.69 sf per lot, from HDR table 7 entry divided by 314 units

(4) Common area = 44.7 ac from HDR report prorated to phase I & II based on 2/9/2016 WSDR

(5) Sheriff & Rec center from 2/9/2016 WSDR

## TABLE 2

## Phases 1 & 2 Estimated Potable Water Demand for Amended Vesting Tentative Tract No. 53138

| | | | | Estimated Water Demand (gpm) | | |
|---|---|---|---|---|---|---|
| **Hydraulic Gradient Zone** | **Land Use** | **No. of Units or Acres** | **Demand Criteria** | **Avg. Day Demand** | **Max. Day Demand** | **Peak Hour Demand** |
| 1585 | Interior Residential | 245 Units | 240 gpd/unit (1) | 41.7 | 64.8 | 208.3 |
| 1585 | Level Landscaped Private Areas | 18.62 | 5 acre-ft./acre/year (2) (3.08 gpm/acre) | 57.7 | 89.8 | 288.6 |
| 1585 | Sloped Private Areas | 39.44 | 1.3 acre-ft./acre/year(3) (0.80 gpm/acre) | 31.8 | 49.4 | 158.9 |
| 1585 | Common Landscaped Areas | 29.05 | 2.5 acre-t./acre/year(4) (1.55 gpm/acre) | 45.0 | 118.4 | 225.1 |
| 1585 | Sheriff Station | 0.44 | 3 acre-ft./acre/year (5) (1.85 gpm/acre) | 0.82 | 2.63 | 4.1 |
| 1585 | Rec Center | 1.96 | 3 acre-ft./acre/year (5) (1.85 gpm/acre) | 3.64 | 11.7 | 18.2 |
| | | | **Total Demand** | **180.6** | **666.2** | **903.2** |

MDD factor - 3.7 & PHD factor = 5.0 from HDR report

(1) Interior demand criteria from HDR report 80 gpcd * 3 persons per unit.

(2) Level landscaped private areas = 3,310.61 sf per lot, from HDR table 7 entry divided by 314 units

(3) Sloped private areas = 7,011.69 sf per lot, from HDR table 7 entry divided by 314 units

(4) Common area = 44.7 ac from HDR report prorated to phase I & II based on 2/9/2016 WSDR

(5) Sheriff & Rec center from 2/9/2016 WSDR

## TABLE 3

## Phases 1, 2, & 3 Estimated Potable Water Demand for Amended Vesting Tentative Tract No. 53138

| | | | | Estimated Water Demand (gpm) | | |
|---|---|---|---|---|---|---|
| **Hydraulic Gradient Zone** | **Land Use** | **No. of Units** | **Demand Criteria** | **Avg. Day Demand** | **Max. Day Demand** | **Peak Hour Demand** |
| 1585 | Interior Residential | 314 Units | 240 gpd/unit (1) | 53.4 | 197.5 | 266.9 |
| 1585 | Level Landscaped Private Areas | 23.86 | 5 acre-ft./acre/year (2) (3.08 gpm/acre) | 74.0 | 273.7 | 369.9 |
| 1585 | Sloped Private Areas | 50.54 | 1.3 acre-ft./acre/year(3) (0.80 gpm/acre) | 40.7 | 150.7 | 203.7 |
| 1585 | Common Landscaped Areas | 44.70 | 2.5 acre-ft./acre/year(4) (1.55 gpm/acre) | 69.3 | 256.4 | 346.4 |
| 1585 | Sheriff Station | 0.44 | 3 acre-ft./acre/year (5) (1.85 gpm/acre) | 0.82 | 2.63 | 4.1 |
| 1585 | Rec Center | 1.96 | 3 acre-ft./acre/year (5) (1.85 gpm/acre) | 3.64 | 11.7 | 18.2 |
| | | | **Total Demand** | **241.8** | **892.6** | **1,209.2** |

MDD factor - 3.7 & PHD factor = 5.0 from HDR report

(1) Interior demand criteria from HDR report 80 gpcd * 3 persons per unit.

(2) Level landscaped private areas = 3,310.61 sf per lot, from HDR table 7 entry divided by 314 units

(3) Sloped private areas = 7,011.69 sf per lot, from HDR table 7 entry divided by 314 units

(4) Common area = 44.7 ac from HDR report prorated to phase I & II based on 2/9/2016 WSDR

(5) Sheriff & Rec center from 2/9/2016 WSDR

## Section 4 - Existing Potable Water System

Amended Vesting Tentative Tract No. 53138 will be served from the District's 1,585-foot gradient Twin Lakes Subsystem. At present, the 1,585-foot Twin Lakes Subsystem is isolated from the rest of the District. The Subsystem is supplied by Twin Lakes Pump Station via Metropolitan Water District's West Valley Feeder No. 2 at the LV-3 Turnout with an emergency connection to Los Angeles Department of Water and Power. The tanks have a combined capacity of 2.0 MG. The pump station is designed to be operated 18-hours, for 24-hour period per the LVWMD Potable Water Master Plan Update 2014.

The pump station maintains the gradient in the Twin Lakes Tanks (HWL=1,585 feet). This source was represented in the hydraulic model as a reservoir with an HGL of 1,580 feet at the intersection of Topanga Canyon Boulevard and Poema Place in the LVMWD Potable Water Mater Plan. This HGL accounts for the head loss in the pipelines from the storage tanks to the intersection of Topanga Canyon Boulevard and Poema Place as simulated in the LVMWD's 2014 Master Plan model. The Upper Twin Lakes subsystem was not used as a source because it has a nominal capacity of only 400 gpm which would not be enough to satisfy Deerlake Ranch's maximum day demand of 892.6 gpm.

The pump station currently has a nominal capacity of 2,500 gpm. Duty pumps include two 430 gpm, one 585 gpm, two 225 gpm pumps and one standby 585 gpm pump. The existing maximum day demand for the Twin Lakes system is 1,200 gpm, with Upper Twin Lakes drawing an additional 400 gpm, yielding a total maximum day demand of 1,600 gpm.

The total projected demand within the Twin Lakes Subsystem after the development of Amended Vesting Tentative Tract No. 53138 is shown in **Tables 4, 5, and 6** depending on the construction phase.

## TABLE 4

### Required Tank and Pump Station Capacities For Twin Lakes Subsystem with Proposed Development (Phase 1)

| **Projected Demands:** | | **Maximum Day Demand (MDD)** |
|---|---|---|
| Existing Twin Lakes Subsystem: | | 1,200 gpm |
| Projected Infill Demand | | 13 |
| Projected Tract 53138 Demand: | | 337 gpm |
| **Total Projected Demand:** | | **=1,550 gpm** |
| | | |
| **Pumping Capacity:** | | **Capacity** |
| MDD (pumping required) | = (MDD*(24 hr. /18 hr.))[6] | = 2,061 gpm |
| Upper Twin Lakes Requirement | = (MDD*(24 hr. /18 hr.))[6] | = 532 gpm |
| **Total Pumping Capacity** | | = **2,593 gpm** |
| **Existing Pumping Capacity** | =2,593 gpm (24 hr/18 hr.) | = **2,500 gpm** |
| **Required Pumping Capacity** | | **= 93 gpm** |
| | | |
| **Tank Capacity:** | | **Capacity** |
| Daily Regulation Storage | | = 929,880 gallons |
| Fire Storage | = (MDD*(600 min)) | = 675,000 gallons |
| Emergency Storage | = (3750gpm*3 hrs.*60/min/hr.)[7] | = 464,940 gallons |
| **Total Required Storage** | = (MDD*(5 hr.)(60 min/hr.)) [6] | **= 2,069,820 gallons** |
| **Existing Storage** | | **= 2,000,000 gallons** |
| **Required Storage** | | **= 69,820 gallons** |

Notes:

(6) Upper Twin Lakes MDD = 400 gpm from HDR Technical Memorandum, pumping is based on 18 hrs which yields a pumping rate of 532 gpm.

(7) Fire flow of 3,750 gpm for 3 hrs. is required in the subsystem for the Church at Rocky Peak

## TABLE 5

### Required Tank and Pump Station Capacities
### For Twin Lakes Subsystem with Proposed Development (Phases 1 & 2)

| **Projected Demands:** | | **Maximum Day Demand (MDD)** |
|---|---|---|
| Existing Twin Lakes Subsystem: | | 1,200 gpm |
| Projected Infill Demand | | 13 |
| Projected Tract 53138 Demand: | | 666 gpm |
| **Total Projected Demand:** | | **=1,879 gpm** |
| | | |
| **Pumping Capacity:** | | **Capacity** |
| MDD (pumping required) | = (MDD*(24 hr. /18 hr.))[6] | = 2,499 gpm |
| Upper Twin Lakes Requirement | = (MDD*(24 hr. /18 hr.))[6] | = 532 gpm |
| **Total Pumping Capacity** | | = **3,031 gpm** |
| **Existing Pumping Capacity** | | = **2,500 gpm** |
| **Required Pumping Capacity** | | **= 531 gpm** |
| | | **Capacity** |
| | | |
| **Tank Capacity:** | | |
| Daily Regulation Storage | | = 1,127,520 gallons |
| Fire Storage | | = 675,000 gallons |
| Emergency Storage | = (3750gpm*3 hrs.*60/min/hr.)[7] | = 563,760 gallons |
| **Total Required Storage** | = (MDD*(5 hr.)(60 min/hr.)) [6] | **= 2,366,280 gallons** |
| **Existing Storage** | | **= 2,000,000 gallons** |
| **Required Storage** | | **= 366,280 gallons** |

NOTE:

(6) Upper Twin Lakes MDD = 400 gpm from HDR Technical Memorandum, pumping is based on 18 hrs.

(7) Fire flow of 3,750 gpm for 3 hrs. is required in the subsystem for the Church at Rocky Peak

## TABLE 6

### Required Tank and Pump Station Capacities For Twin Lakes Subsystem with Proposed Development (Phases 1, 2, & 3)

| **Projected Demands:** | | **Maximum Day Demand (MDD)** |
|---|---|---|
| Existing Twin Lakes Subsystem: | | 1,200 gpm |
| Projected Infill Demand | | 13 |
| Projected Tract 53138 Demand: | | 893 gpm |
| **Total Projected Demand:** | | **=2,106 gpm** |
| | | |
| **Pumping Capacity Calculations:** | | **Capacity** |
| MDD (pumping required) | = (MDD*(24 hr. /18 hr.)) [6] | = 2,800 gpm |
| Upper Twin Lakes Requirement | = (MDD*(24 hr. /18 hr.))[6] | = 532 gpm |
| **Total Pumping Capacity** | | **=3,332 gpm** |
| **Existing Pumping Capacity** | =3,332 gpm (24 hr. /18 hr.) | **=2500 gpm** |
| **Required Pumping Capacity** | | **= 832 gpm** |
| | | **Capacity** |
| **Tank Capacity Calculations:** | =MDD (600 min) | |
| Daily Regulation Storage | | = 1,263,360 gallons |
| Fire Storage | | = 675,000 gallons |
| Emergency Storage | = ((3750gpm*3 hrs.*60/min/hr.)) [7] | = 631,680 gallons |
| **Total Required Storage** | =MDD (5 hr.)(60 min/hr.) [6] | **= 2,570,040 gallons** |
| **Existing Storage** | | **= 2,000,000 gallons** |
| **Required Storage** | | **= 570,040 gallons** |

Notes:

(6) Upper Twin Lakes MDD = 400 gpm from HDR Technical Memoradum, pumping is based on 18 hrs

(7) Fire flow of 3,750 gpm for 3 hrs. is required in the subsystem for the Church at Rocky Peak

Demand generated by Tract No. 53138 exceeds current pumping and storage capacity in the Twin Lakes zone for all proposed construction phases. In **Table 4**, which details pumping and storage capacity calculations for Phase 1, the recommended pumping capacity is 93 gpm over the 2,500 gpm available and the recommended storage capacity is 0.346 million gallons (MG) over the 2.0 MG available. **Table 5** contains the pumping and storage capacity calculations for Phases 1 and 2, the recommended additional pumping capacity is 531 gpm over the existing 2,500 gpm available and the recommended additional storage capacity is 0.366 MG over the 2.0 MG available. Finally, in **Table 6**, are the pumping and storage capacity calculations for Phases 1, 2, and 3, the recommended pumping capacity is 832 gpm over the 2,500 gpm available and the recommended storage capacity is 0.570 MG over the 2.0 MG available.

Phase 1 does not require any changes due to the negligible impact in the subsystem. However, to provide the capacity needed in Phase 2, a seventh pump having a capacity of approximately 500 gpm is required. This would increase the capacity of Twin Lakes Pump Station to 3,000 gpm with all pumps running. To maintain a stand-by pump unit, an eighth pump having a capacity of approximately 500-600 gpm is recommended. Phase 3 requires the addition of a ninth pump with a capacity of approximately 400 gpm for a total pumping capacity of 3,400 gpm at the Twin Lakes Pump Station. Additional storage of 0.36 MG is required for Phase 2 and 0.21 MG for Phase 3. It is not practical to build storage in these increments so 0.6 MG of storage should be provided in Phase 2.

An existing 8-inch suction line transmits water from the LV-3 turnout to the Twin Lakes Pump Station. Modifications to the existing turnout were not analyzed in this report. Additionally, physical modifications to the Twin Lakes Pump Station and Tanks were not analyzed in this report.

## Section 5 - Proposed Potable Water System

The proposed potable water system necessary to serve Amended Vesting Tentative Tract No. 53138 is shown on **Plates 2, 3, and 4,** depending on the phase of the project. Different distribution pipeline sizes and configurations were sized ranging from 8 to 16 inches in diameter based on the grading plans provided by the Developer showing finished pad elevations ranging from 1261 feet to 1485 feet. The adequacy of the proposed distribution system to serve Deerlake Ranch was analyzed under maximum day demand plus concurrent fire flow.

The maximum day demand of 893 gpm for Phases 1, 2, and 3 was analyzed concurrently with fire flows. The required fire flow of 1,250 gpm for residential, was analyzed at all fire hydrants within the distribution system. The recreation building and sheriff facility, which had a fire flow of 1,500 gpm was not used in the analysis, however the proposed water main to the recreation bldg. will be a 10-inch pipeline and is capable of providing the 1500 gpm fire flow. It was assumed that there will be only one fire at a time within the development. The analysis shows that all fire hydrants will be able to supply the required fire flows while maintaining residual pressures above 20 psi as required by Los Angeles County Fire Department fire flow requirements.

The peak hour demand of 1,209.2 gpm for all three phases of development was analyzed. The peak hour demand pressure distribution shows that the pressures would be approximately 35 psi at the higher elevations of 1,480 feet up to approximately 140 psi at lower elevations of 1,240 feet all of which meet the 35 psi minimum pressure and 150-psi maximum criteria of LVMWD. However, some locations along the southern part of Canoga Avenue such as open space lot 322 have pressures up to approximately 170 psi which should not present significant problems since these are landscape areas. Locations with elevations below approximately 1370 feet will have pressures in excess of the maximum 80-psi required by the Uniform Plumbing Code and therefore would require pressure regulators. All pipelines have been adequately sized with pipeline velocities below the maximum 5 fps as required by LVMWD's design criteria.

The final water distribution system configuration that satisfied LVMWD's design criteria for Phase 1 of development is described as follows:

- The water main between the Twin Lakes tanks and the intersection of Topanga Canyon Boulevard and Poema Place should be 16-inches in diameter.

- The water main along Poema Place from Topanga Canyon Boulevard to Bulfinch Road should be 16 inches in diameter.

- The water main from the intersection of Poema Place and Bullfinch Road, along Poema Place to the intersection of Poema Place and Canoga Avenue should be 10 inches in diameter.

- The water main from the intersection of Poema Place and Bullfinch Road, along Bullfinch Road to the intersection of Bullfinch Road and Nogan Drive should be 10 inches in diameter.

- The water main from the intersection of Bullfinch Road and Nogan Drive, along Nogan Drive and Canoga Ave to the intersection of Poema Place and Canoga Avenue should be 10 inches in diameter.

- The water main from the intersection of Poema Place and Canoga Avenue, going south along Canoga Avenue should be 6 inches in diameter since it will be tied into the existing system and will mainly be used for landscape irrigation.

- The remaining mainline pipelines should be 8-inches and should be reduced to 4-inch to 6-inch after the last fire hydrant terminating in cul-de-sacs.

The final water distribution system configuration that satisfied LVMWD's design criteria for Phase 2 and 3 of development is described as follows:

- The water main from the intersection of Nogan Drive and Canoga Avenue, along Canoga Avenue and Bullfinch Road to the intersection of Bullfinch Road and Nogan Drive should be 10 inches in diameter.

- The remaining pipelines including those terminating in cul-de-sacs should be 8-inches and should be reduced to 4-inch to 6-inch in diameter after the last fire hydrant terminating in cul-de-sacs.

- The water main from the intersection of Bullfinch Road and Schindler Way, along Schindler Way and Sullivan Way to the intersection of Sullivan Way and Bullfinch Road should be 10 inches in diameter.

- The remaining pipelines including those terminating in cul-de-sacs should be 8-inches and should be reduced to 4-inch to 6-inch in diameter after the last fire hydrant due to residential and landscaping demands.

The Los Angeles County Fire Department has determined that the development will require 37 new fire hydrants, located throughout the development (**Appendix B**). These hydrants shall conform to AWWA Standard C503 with 6"x 4"x 2-1/2" bronze heads. The minimum flow required is 1250 gpm for 2 hours at all locations except the recreation building, which requires 1500 gpm for 2 hours. The proposed system will be capable of providing fire flow to all hydrants at pressures greater than the current required minimum residual pressure of 20 psi.

In order to serve the proposed development for all three phases, the water main between the Twin Lakes tanks and the intersection of Topanga Canyon Boulevard and Poema Place should be 16-inches in diameter. Phase 1 does not require any additional pumping or storage because the changes have negligible impact in the subsystem. However, to provide the capacity needed in Phase 2, a seventh pump having a capacity of approximately 500 gpm is required. This would increase the capacity of Twin Lakes Pump Station to 3,000 gpm with all pumps running. To maintain a stand-by pump unit, an eighth pump having a capacity of approximately 500-600 gpm is recommended. Phase 3 requires the addition of a ninth pump with a capacity of approximately 400 gpm for a total pumping capacity of 3,400 gpm at the Twin Lakes Pump Station. Additional storage of 0.36 MG is required for Phase 2 and 0.21 MG for Phase 3. It is not practical to build storage in these increments so 0.6 MG of storage should be provided in Phase 2.

There is a possibility of future development within the District's service boundary in the area north of Tract 53138. However, the terrain, elevation, and location of this property, along with environmental concerns, suggest that the likelihood of development is remote. Access to the property through Tract 53138 would be unlikely because of steep slopes and rugged terrain. Because development is unlikely in

this area, and would probably not be accessed through Tract 53138, the proposed facilities needed to serve Tract 53138 were not sized to serve any future developments.

## Section 6 - Recycled Water

There are currently no reclaimed water facilities adjacent to the proposed development (Reference 3). The development is located in the northeast corner of the District's service area, far from any of the District's recycled water facilities. A connection to the District's recycled water system would be impractical, so the landscape will be irrigated with potable water as discussed in the previous sections.

## Section 7 - Sewer System

Amended Vesting Tentative Tract No. 53138 is presently located within the Las Virgenes Municipal Water District's sewer service area. The District has extended the existing Sanitation Improvement District B by annexation to include the new development. Sanitation Improvement District B presently covers both areas west and east of Topanga Canyon Blvd. The estimated average daily sewage that will be generated by Tract 53138 is shown in **Table 5**.

**TABLE 5**

**Sewage Generation**

| Land Use | Units | Daily Generation Rate (gallons/unit/day) | Daily Total (gallons/day) |
|---|---|---|---|
| Residential | 314 | 280 | 87,920 |
| Sheriff Office(10) | 1,100 SFT | 120 GPD/1000 SFT | 132 |
| Recreational Center (10) | 4,340 SFT | 200 GPD/1000 SFT | 868 |
| Existing Twin Lakes Sewer | 492 | 224 | 110,146 |
| Septic Conversion of Existing Old Twin Lake | 213 (191 units + 22 undeveloped) | 360 | 76,680 |
| | | TOTAL | **275,746** |

This development is located in an area that is not within reach of the District's sewerage collection facilities (Reference 4). The Las Virgenes Municipal Water District is under agreement with the City of Los Angeles to convey and treat sewage from developments in the area.

The City of Los Angeles requires the metering of flows into their sewer system above 0.5 cfs (323,160 gallons/day) or if sewer discharge includes surface water runoff[11] this report assumed surface water runoff will not be collected and discharged to the sewer system. A separate storm drain system will collect and remove storm water from the tract. The estimated sewage generated is approximately 85% of the minimum flow required to install a meter, so a meter is not required. However, the City of Los Angeles may require a meter to be installed based on their analysis of the system. The Developer will be responsible to install an additional meter if required by the County of Los Angeles.

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(10) Sewer Area Study for Outlet Point 1 & 2, January 5 2016

11 Agreement Between the City of Los Angeles and the Las Virgenes Municipal Water District for the Conveyance, Treatment, and Disposal of Wastewater, July 1, 1999, Section IV.B.1.b

## Section 8 - Construction Phasing and Acceptance

Construction of Amended Vesting Tentative Tract No. 53138 is anticipated to be performed in three phases. The first phase involves the construction of 102 residential units, Sheriff Facility, Recreation Building, and 21 open space lots. Phase 2 will result in the construction of 143 residential units and two open space lots. Phase 3 will complete tract development with 69 residential units and seven open space lots.

Analysis of the potable water demands, system upgrades, and proposed potable water systems were performed in Sections 3, 4, and 5, respectively. These sections analyzed the impact each construction phase.

In accordance with standard policy, the District will consider final acceptance of the potable water system when a previously defined, separately bonded phase of the project is completed. Construction shall be considered complete for a phase when all facilities related to the potable and recycled water systems have been installed in accordance with the District's standards and the approved Water System Design Report, and all meter boxes have been set to grade in concrete sidewalks.

The Developer must comply with the Special Conditions for bonds, temporary risers and hose bibs, and repair of damage to accepted water system components set forth in the District's memorandum entitled, "Review of Policy - Acceptance of Tract Water Systems (July 14, 1989)."

## Section 9 - Water Conservation

To obtain maximum benefit of the limited water resources of the State of California, the State of California and the District have adopted ordinances that require plant materials and irrigation systems to be water efficient.

The State of California Model Water Efficient Landscape Ordinance (Cal. Code Regs. Titl 23, § 492.3 (2015)) specifies the development of a Landscape Documentation Package for new and rehabilitated landscaping. Significant provisions include:

- New construction projects with an aggregate landscape area equal to or greater than 500 square feet require a building or landscape permit, plan check or design review.
- Rehabilitation projects with an aggregate landscape area equal to or greater than 2,500 square feet require a building or landscape permit, plan check, or design review.
- The Maximum Applied Water Allowance (MAWA) is calculated based on an Evapotranspiration Adjustment Factor (ETAF) of 55% for residential areas and 45% for non-residential projects.
- Dedicated landscape water meters or private sub-meters are required for residential landscapes over 5,000 square feet and non-residential landscapes (in conjunction with California Code Water Code 535) of 1,000 square feet or greater.
- Turf shall not exceed 25% of the landscape area in residential areas, and there shall be no turf in non-residential areas. Turf shall not be planted on sloped areas which exceed a slope of 1 foot vertical elevation change for every 4 feet of horizontal length.

In an effort to assure the appropriate use of water, the District assesses penalties for the wasteful use of water. In 2016, the District established a water budget based billing system that designates a specific amount of water for each property. Exceeding the designated water budget for a property could result in escalating penalties. Water District Code 3-4.202 specifies:

- No customer shall knowingly permit waste or leaks of water. Where water is wastefully or negligently used on the customer's premises, the District may discontinue the service, if such conditions are not corrected within five days after the General Manager gives the customer written notice.
- A water budget shall be established for each customer of the District, and customers shall be notified of the basis for calculating their water budgets. Water use exceeding twice a customer's water budget is a waste of water, a violation of the District's rules and regulations, and shall be subject to escalating administrative penalties.

In accordance with Water District Code 3-4.402, the following water conservation measures are required:

- Customers shall conserve water supplied by the District by the prevention and elimination of all waste or leakage of water.

- For residential development, all toilets installed shall use 1.6 gallons or less per flush, and all showerheads shall flow at 2.5 gallons per minute, or less, at 80 psi.

In addition, if a model home display is to be provided, one of the models must be landscaped with water efficient (Xeriscape) plant materials and irrigated with appropriate water conserving irrigation system. Further, the Xeriscape model shall be designed to be drought tolerant, and irrigation and intensive planting are discouraged. Turf shall occupy no more than 30% of the landscaping. The model home display shall draw attention to the specific landscape materials and irrigation techniques utilized.

In accordance with Water District Code 3-4.404, specific water conservation actions must be performed including:

- Potable water shall not be used to clean or sweep hard surfaces such as sidewalks, walkways, driveways, or parking areas and only as necessary to protect the public health and safety.
- Car washing is permitted only with the use of a nozzle having an automatic shut-off.

- Fountains and other decorative water features shall recirculate water.
- Irrigation shall occur after 5:00 p.m. and before 10:00 a.m. No irrigation is permitted during and within 48 hours after measurable rainfall.
- Irrigation shall not run off to streets, gutters or adjacent properties.
- Limit the number of watering days, if and as determined by the Board, except that watering is permitted at any time with a hand-held hose equipped with an automatic shut-off, a faucet filled bucket of five gallons or less, or a drip irrigation system.

Section 3-4.406 of the Water District Code specifies that violations of ordinances are subject to penalties including increasing penalties for non-compliance.

## Section 10 - Financial Impact on District

The 2014 Potable Water Master Plan determined that an additional 1.5 MG of storage and 1,878 gpm of pumping is needed in the Twin Lake Subsystem by the year 2035. The estimated cost for these future improvements were included in the total estimated cost of $32,159,050 for the facilities needed for future demand for the entire District. This total was then used in the 2016 Capacity Fee Study when calculating the incremental component of the potable water capacity fee.

Because the costs of additional storage and pumping in the Twin Lakes Subsystem were anticipated an incremental component of the potable water capacity fee the District should participate in the construction of these improvements. However, the Master Plan's estimated cost for storage did not include acquiring or construction of a tank site, providing an inlet/outlet piping to the tank or the design of the facilities. These costs are the responsibility of the developer.

In summary the responsibilities are:
Developer:

- Pay full capacity fee.
- Provide a tank site ready for construction and an inlet/outlet piping before service to any Phase 2 lots[1].
- Fund design of the facilities.

District:

- Participate in the construction of a 600,000 gallon tank concurrent with Phase 2
- Participate in the construction of 500 gpm of pumping capacity including 500 gpm of stand-by pumping concurrent with Phase 2 and 400 gpm of pumping concurrent with Phase 3 at the Twin Lakes Pump Station.

[1] The preferred location is site S-9 per the KJ Study.

## Section 11 - Environmental Review

The District is a "Responsible Agency" for the purpose of environmental review of this project under the California Environmental Quality Act (CEQA). The "Lead Agency" for the environmental review of this project under the CEQA is the County of Los Angeles, Board of Supervisors. On August 10, 2004, the County Board of Supervisors certified the Final Environmental Impact Report (FEIR) (**Appendix C**). On September 16, 2008, an Amended Vesting Tentative Tract Map was approved by the County Hearing Officer. CEQA Section 15164 authorizes a Lead Agency to prepare an Addendum to a previously certified Environmental Impact Report if changes or additions to the document are necessary, provided the changes meet conditions outlined in Section 15164.

The Amended Vesting Tentative Tract No. 53138 will implement the same mitigation measures as previously approved on an appropriate pro rata basis. Since the current Amended Vesting Tentative Track Map results in a reduction of each potential impact identified in the original FEIR, a subsequent EIR is not required.

The District will act as "Lead Agency" if any further environmental reviews are required for water facilities. The developer will fund further environmental reviews for supporting improvements which were not identified or included within previous drafts of the Water System Design Report or as included within the certified FEIR. These improvements include but are not limited to additional pumping capacity, additional storage tank and site, and other improvement required for water facilities.

## Section 12 - Conclusions and Recommendations

A. It is concluded that:

1. To provide adequate potable water service to the proposed development, the following facilities must be installed by the developer:

   a) The water mains shown on **Plates 2, 3, and 4**, depending on the construction phase. This study does not address in detail the alignment of this pipe and related easements.

   b) Thirty –seven (37) new fire hydrants. 35 residential fire hydrants and 2 commercial fire hydrants along with necessary mainline valves at locations approved by the District

   c) Pipeline from Twin Lakes Tanks to development's point of connection, the intersection of Topanga Canyon Boulevard and Poema Place.

   d) Twin Lakes Pump Station and Tank upgrades for capacity based on the construction phase. This study does not address in detail of the upgrades required.

   e) District to participate in the tank and pump upgrades construction.

2. All units served by the 1585-ft pressure zone below 1400-feet will experience pressures in excess of 80 psi. Each of these service connections will require an individual pressure regulator ahead of building plumbing in accordance with the 80 psi limitation imposed by the Uniform Plumbing Code.

3. All potable water system improvements served by the 1585-ft pressure zone should be designed to accommodate hydraulic gradients not less than 1585 feet.

4. Pipe appurtenances, such as backflow devices and meters, were not considered in this analysis, but maybe required by the District based on actual conditions.

5. The developer must be required to dedicate rights-of-way to the District for all pipelines, including off-site facilities, not within public streets.

6. Recycled water will not be available for irrigation of common areas within Tract 53138. Common areas will be irrigated with potable water.

7. The proposed development is located within the service area of the District's Sanitation Improvement District. The district has expanded Sanitation Improvement District B by annexation. Developer is not responsible to install a new meter as required by the agreement between City of Los Angeles Sanitation and LVMWD since the total sewage flow is less than the threshold of 0.5 cfs (323.160 gallons/day).

8. Developer may be required to install a new Sewer Meter base on County of Los Angeles flow requirement.

9. Environmental documentation, in compliance with CEQA, has been completed. However, if additional documentation is required for water facilities the District will act as "Lead Agency".

B. It is recommended that:

1. The potable water system facilities shown on **Plates 2, 3, and 4** and outlined above be approved for installation by the developer.

2. The District requires the developer to dedicate rights-of-way for all pipelines, including off-site piping not in public streets.

3. The District require all above-ground District-owned facilities (i.e. meters larger than 2 inches, detector check installations, and backflow prevention devices) be installed above ground and screened from view in accordance with District standard plans.

4. The District will participate in the construction of additional pumping capacity and storage. The Developer shall pay in full connection fees for sewer and water services.

5. The Developer shall provide a tank ready site as well as the inlet/outlet piping before service to any lot for Phase 2 and Phase 3.

## Section 13 - Limitations

*Report Intent*. This Water System Design Report is intended only to develop the hydraulic information necessary to design a water system. No effort has been made at this time to precisely locate existing or proposed facilities. Conflicts may develop as more information is discovered about both existing and proposed pipelines, street grades, etc. Corrections of conflicts related to this project will be the responsibility of the applicant.

*Project Changes*. This Water System Design Report is based upon maps of Tract 53138 prepared by United Civil Inc. dated July 2015 and upon information submitted by the developer of the subject property and his representatives. Accordingly, this design report may be subject to modification to reflect changes made by the applicant or conditions imposed by the environmental review process. This report may also be subject to modification to reflect additions or amendments to the District's Water Ordinance and the District's Design Standards prior to approval of the final design. Any revision in the above information or development map or deviation therefrom may invalidate the conclusions and recommendations. A supplemental or amended report must be prepared for the use of the District at the applicant's sole expense if the project or the data is changed.

*Other Agency Approvals*. This Water System Design Report has been prepared at the request of the developer of Tract 53138. Approval of this report does not indicate the District either supports or opposes the underlying project or any related project. District staff will answer questions concerning this report. However, the project proponent is solely responsible for securing necessary project approvals from state, regional, and local agencies with jurisdiction by law without the express or implied intervention or support of the District.

*Project Delays*. This Water System Design Report is based upon the assumption that the project will be implemented in due course. A supplement, amendment or complete report must be prepared for the use of the District at the proponent's sole expense if the project is unduly delayed.

*Warranty of Supply*. The approval of this Water System Design Report does not constitute a commitment by the District to supply water or provide sanitation service to the project. The project will

be assured of connection to the water and sanitation systems of the District only if the proponent also satisfies all terms and conditions for service as set forth in the District's code, and capacity is available at the time arrangements for service are finalized.

# References

1. *Potable Water System Master Plan Update 2014 for the Las Virgenes Municipal Water District*, Kennedy/Jenks Consultants, June 2014 (LVMWD Report No. 2562.00).

2. *Preliminary Water System Design Report for Tentative Tract No. 53138 Chatsworth Ridge:*

   - Revision 0, LVMWD Report 2130.00, April 2001 (Boyle Engineering Corporation)
   - Revision 1, LVMWD Report 2130.01, January 2002 (Boyle Engineering Corporation)
   - Revision 2, LVMWD Report 2130.02, July 2003 (Boyle Engineering Corporation)
   - Revision 3, LVMWD Report 2130.03, March 2004 (Boyle Engineering Corporation)
   - Revision 4, LVMWD Report 2130.04, December 2014 (AECOM)

3. *Recycled Water Master Plan Update 2014 for the Joint Powers Authority of: Las Virgenes Municipal Water District and Triunfo Sanitation District and Calleguas Municipal Water District*, Kennedy/Jenks Consultants, June 2014 (LVMWD Report No. 2561.00).

4. *Sanitation Master Plan Update 2014 for the Joint Powers Authority of: Las Virgenes Municipal Water District and Triunfo Sanitation District*, Kennedy/Jenks Consultants, June 2014 (LVMWD Report No. 2560.00).

5. *HDR Technical Memorandum Water Demand Estimate Study, Revised August 30, 2017*

6. *Kennedy/Jenks Consultants Storage and Pumping Capacity Study, July 25, 2017*

7. *United Civil Inc. - Sewer Area Study TR No. 53138 January 5, 2016*

# Plates

1. Vicinity Map
2. Phase 1 Potable Water Distribution System
3. Phase 2 Potable Water Distribution System
4. Phase 3 Potable Water Distribution System

# Appendices

A. Amended Vesting Tentative Tract No. 53138 drawings, July 22, 2015

B. County of Los Angeles Fire Department, Water System Requirements – Unincorporated, July 12, 2011 – Amendment

C. Regional Planning Commission County of Los Angeles, Amended Conditions, July 18, 2012

D. HDR Technical Memorandum Water Demand Estimate Study, Revised August 30, 2017

E. Kennedy/Jenks Consultants Storage and Pumping Capacity Study, July 25, 2017

F. United Civil Inc. Sewer Area Study January 5, 2016

G. Amended Vesting Tentative Tract No. 53138 drawings Fire Hydrant Locations, July 22, 2015

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TRACT
NO. 53138

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TWIN LAKES
TANKS

27

TWIN LAKES
PUMP STATION

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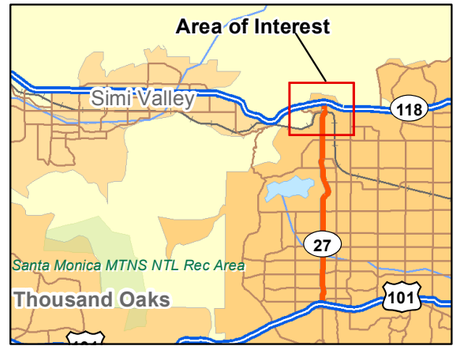
Feet

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**Las Virgenes Municipal Water District**
**Water System Design Report**
**Deerlake Ranch**

**Amended Vesting Tentative**
**Tract No. 53138**
**Vicinity Map**

| 60322621 | August, 2017 | **Plate 1** |
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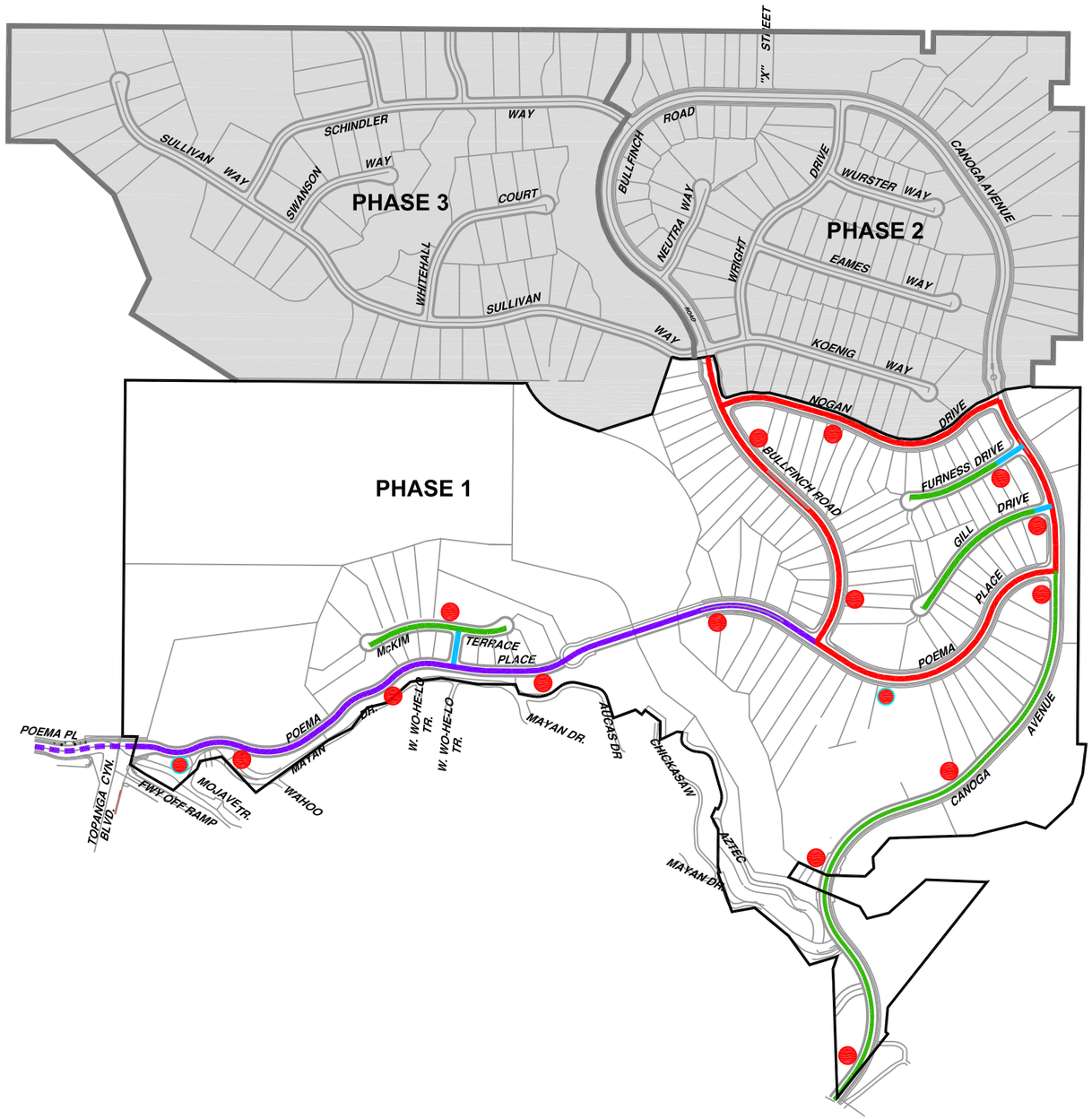



**LEGEND**

- NEW 16"Ø PIPE
- NEW 10"Ø PIPE
- NEW 8"Ø PIPE
- NEW 6"Ø PIPE
- EXISTING 16"Ø PIPE
- RESIDENTIAL FIRE HYDRANTS
- COMMERCIAL FIRE HYDRANTS


0 250' 500' 1000'

SCALE IN FEET

AECOM

**Las Virgenes Municipal Water District**
**Water System Design Report**
**Deerlake Ranch**

**Amended Vesting Tentative**
**Tract No. 53138**
**Phase 1 Potable Water Distribution System**

60322621 AUGUST 2017 **Plate 2**

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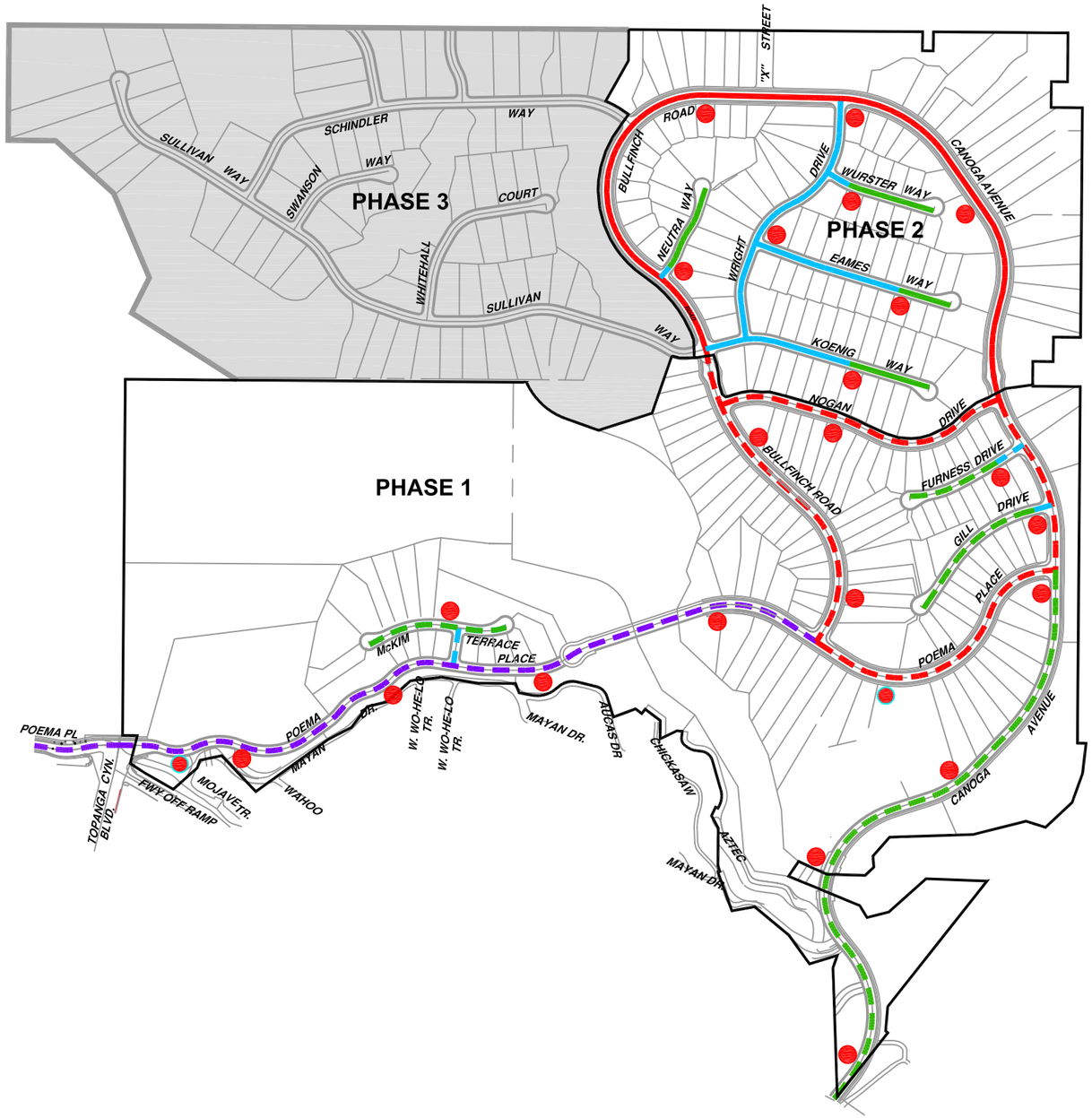


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**LEGEND**

- EXISTING 16"Ø PIPE
- EXISTING 10"Ø PIPE
- EXISTING 8"Ø PIPE
- EXISTING 6"Ø PIPE
- NEW 10"Ø PIPE
- NEW 8"Ø PIPE
- NEW 6"Ø PIPE
- RESIDENTIAL FIRE HYDRANTS
- COMMERCIAL FIRE HYDRANTS


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**Las Virgenes Municipal Water District**
**Water System Design Report**
**Deerlake Ranch**

**Amended Vesting Tentative**
**Tract No. 53138**
**Phase 2 Potable Water Distribution System**

60322621 AUGUST 2017 **Plate 3**

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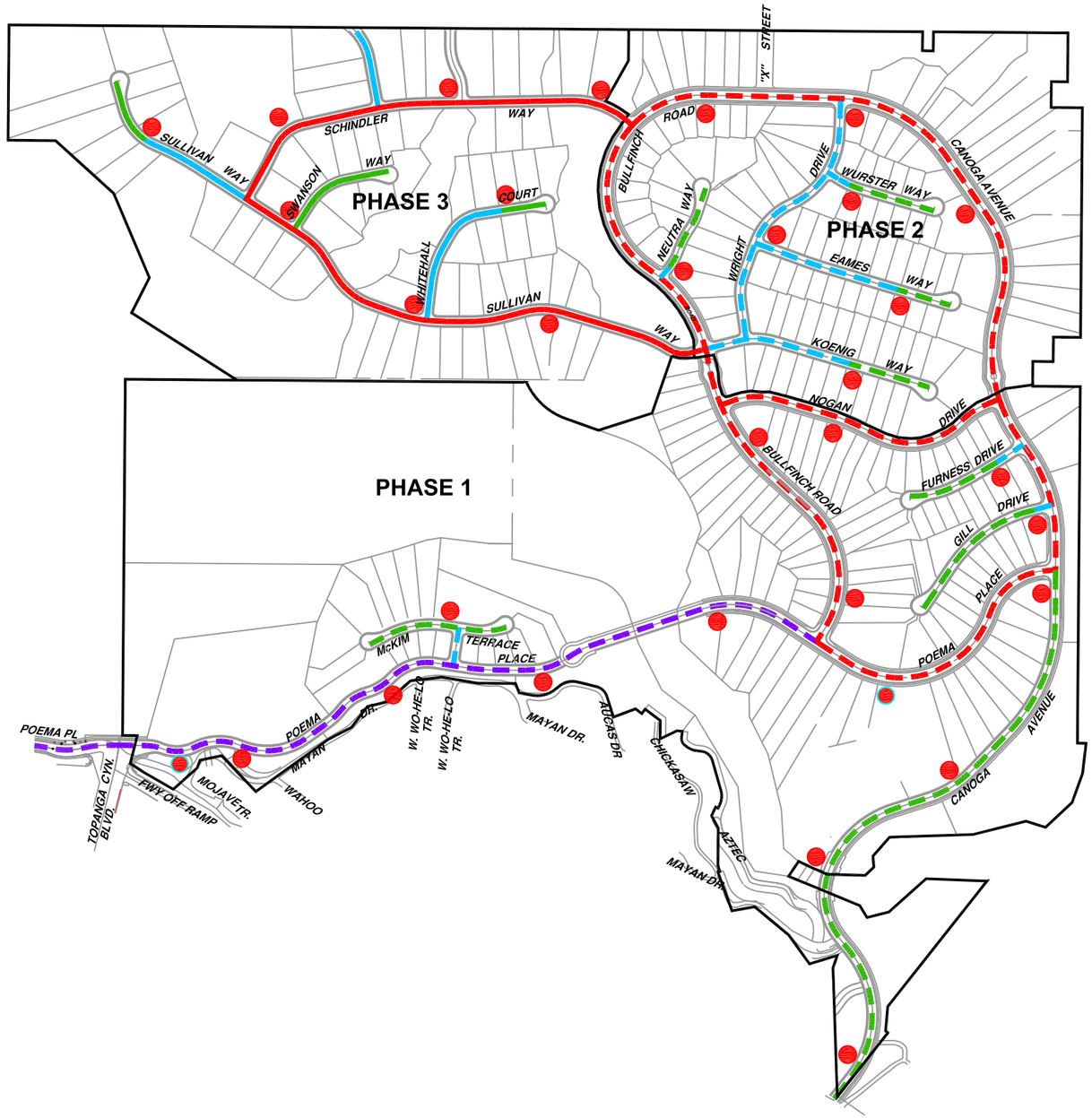


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**LEGEND**

- EXISTING 16"Ø PIPE
- EXISTING 10"Ø PIPE
- EXISTING 8"Ø PIPE
- EXISTING 6"Ø PIPE
- NEW 10"Ø PIPE
- NEW 8"Ø PIPE
- NEW 6"Ø PIPE
- RESIDENTIAL FIRE HYDRANTS
- COMMERCIAL FIRE HYDRANTS

0 250' 500' 1000'

SCALE IN FEET


AECOM

**Las Virgenes Municipal Water District**
**Water System Design Report**
**Deerlake Ranch**

**Amended Vesting Tentative**
**Tract No. 53138**
**Phase 3 Potable Water Distribution System**

60322621 AUGUST 2017 **Plate 4**

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