Appendix WSA

Water Supply Assessment

Technical Memorandum

Date:	May 11, 2022
Project:	Larkfield Water Supply Assessment
To:	Candace Coleman California American Water
From:	Stephanie Ard, PE Marshall Kosaka, PE Murraysmith
Reviewed By:	Linda Scroggs, PE Murraysmith
Re:	Larkfield Water Supply Assessment

1.0 Introduction and Background

On November 24, 2021, Sonoma County Permit and Resource Management Department (Permit Sonoma) sent California American Water (CAW) a letter via email requesting a water supply assessment (WSA) for the rezoning of eight parcels known as the Larkfield Sites (Sites). The Sites are being rezoned for increased density to accommodate the Sonoma County's (County) share of the Bay Area's Regional Housing Need Allocation.

This technical memorandum is intended to provide sufficient information to allow CAW to assess its ability to supply water to the Sites, in accordance with the requirements of Senate Bill 610 (SB 610) and Senate Bill 221 (SB 221) (California Water Code sections 10910, et seq, and Government Code Sections 66473, et seq, respectively. Permit Sonoma stated in its November 24th letter that a WSA is required for the proposed rezoning of the Sites to account for an increase of 10 percent or more of CAW's existing service connections in the Larkfield service area, thereby meeting the definition of "project" as provided in Water Code § 10912(b).

2.0 Project Description and Rezoning

To meet the housing needs of people at all income levels, the State set a regional growth target naming the total number of new homes each region needs to build. The County's assigned share of the region's growth target for the next cycle is 3,881 housing units, which is a significant increase over the allocation of 515 for the current cycle. To help accommodate this significant increase, Sonoma County is proposing to rezone the Sites.

The Sites consist of eight parcels and approximately 12.87 acres located in the northwest of CAW's Larkfield service area and shown in **Figure 1**. The County proposes to rezone these parcels as shown in **Table 1.** As the table shows, the rezoning will increase the potential number of dwelling units (DU) from 62 units to 305 units.

On April 22, 2022, Marshall Kosaka (Murraysmith); Eric Gage, Chelsea Holup, and Ross Markey (Sonoma County); and Katherine Green and Darcy Kremin (Rincon Consultants) discussed inconsistencies between parcel acreages listed in the WSA request and Sonoma County's GIS parcel data. It was concluded that parcel acreages in **Table 1** represent the latest GIS data available from the County.

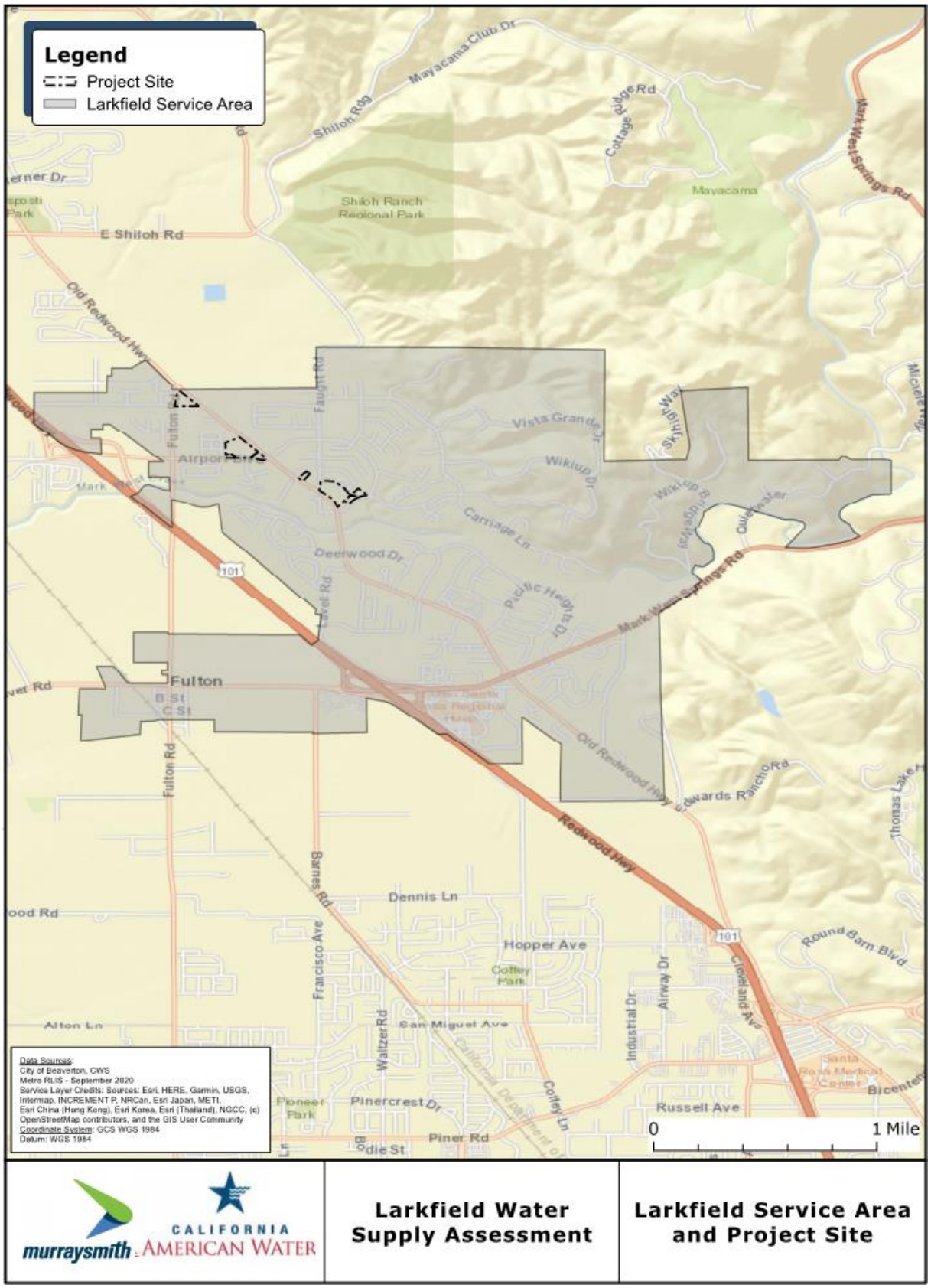
Table 1 | Existing & Proposed Zoning of Parcels

EIR ID	Parcel ID	Area (ac)	Existing			Proposed		
			Zoning Description[1]	Max Density (DU/ac)	Units	Zoning Description	Max Density (DU/ac)	Units
LAR-1	039-320-051	1.78	Planned Community[2]	7[3]	12	Residential	11	97
		2.59	Limited Commercial	n/a	0			
LAR-2	039-040-040	0.76	Office Buildings	n/a	0	Residential	11	16
LAR-3	039-025-060	0.45	Office Buildings	n/a	0	Residential	11	16
LAR-4	039-025-026	0.29	Residential	9	2[4]	Residential	11	7
LAR-5	039-025-028	4.49	Residential	9	41[4]	Residential	11	99
LAR-6	039-040-035	0.51	Office Buildings	n/a	0	Residential	11	14
LAR-7	039-380-018	1.51	Residential	5	7	Residential	11	44
LAR-8	039-390-022	0.46	Office Buildings	n/a	0	Residential	24	12
	Total	**12.84**			**62**			**305**

Notes:

1. A detailed summary of the zoning terminology can be found at sonomacounty.ca.gov/PRMD/Services/Zoning-and-Parcel-Report/Zoning-Codes-County/.
2. Special purpose zone allowing a diverse mix of uses, buildings, structures, lot sizes, and open spaces.
3. Based on minimum lot size of 6,000 square feet per Sec. 26-14-040 of the Sonoma County Code.
4. LAR-4 and LAR-5 are adjacent parcels; units calculations are based on the total area of the two parcels together

Figure 1 | Larkfield Service Area & Larkfield Sites



3.0 Methodology

This section describes the methodology used to assess the potential increase in water demand caused by the proposed rezoning. It also analyzes CAW's existing and proposed water supply for the Larkfield service area for average, single dry, and multiple dry year scenarios.

For this analysis, CAW's Internal 2019 Comprehensive Planning Study (Internal 2019 CPS) and Internal 2020 Urban Water Management Plan (Internal 2020 UWMP) were used. Both were developed as internal planning documents for the Larkfield service area. CAW was not required to submit the UWMP because the Larkfield service area does not provide over 3,000 acre-feet of water annually nor does it serve more than 3,000 urban connections.

3.1 Projected Water Demands for the Larkfield Sites

The Sites' buildout water demand was calculated based on the existing and proposed zoning designations. The buildout water demands were then compared to evaluate the total change in water demand associated with the rezoning of the Sites.

Water demand for residential lots was calculated by multiplying the estimated number of units by an assumed water use per unit value. Assumptions used for the water use per unit value were provided by CAW. Residential indoor use was expected to meet the state goal of 50 gallons per person per day. Residential outdoor use was based on a combination of historical demands, California use goals, census data, and various development guides from other water providers.

Water demand for non-residential lots was assumed to be 1,800 gallons per day per acre. This assumption was provided by CAW and is consistent with other water demand projections calculated by CAW.

The water demands for the buildout of the parcels using the existing and proposed zoning designations are summarized in Table 2 and Table 3, respectively. Peaking factors from CAW's Internal 2019 CPS were applied to average day demand to estimate maximum day demand and peak hour demand.

Using the existing zone designations, the buildout annual demand for the Sites is estimated to be 0.027 million gallons per day (MGD). The buildout annual demand for the proposed zoning designations is estimated to be 0.088 MG. Therefore, the proposed rezoning for the Sites is estimated to increase the buildout water demand for the Larkfield service area by approximately 0.060 MGD.

Note that these demands do not include fire flow requirements. Fire flows are not considered a component of either use or supply and as such, are not addressed in this document.

Table 2 | Existing Buildout Water Demand for Sites Area

Zoning Description	Units	Acres	Water Use per Unit (gpd)	Water Use per Acre (gpd)	Average Day Demand (gpd)	Maximum Day Demand (gpd)	Peak Hour Demand (gpd)	Average Annual Demand (MGD)
Low-density Residential	7	1.51	375	-	2,625	6,038	9,056	0.003
Medium-density Residential	43	4.78	293	-	12,582	28,938	43,407	0.013
Planned Community	12	1.78	293[1]	-	3,511	8,076	12,114	0.004
Limited Commercial	-	2.59	-	1,800[2]	4,662	10,723	16,084	0.005
Administrative and Professional Office	-	2.18	-	1,800[2]	3,924	9,025	13,538	0.004
Total	**62**	**12.84**			**27,304**	**62,799**	**94,199**	**0.027**

Notes:

1. Medium-density residential demand assumed.
2. A potable water use factor of 60% is applied to the assumed water use per acre of 3000 gallons per acre per day.

Table 3 | Larkfield Proposed Water Demands

Zoning Description	Units	Acres	Water Use per Unit (gpd)	Average Day Demand (gpd)	Maximum Day Demand (gpd)	Peak Hour Demand (gpd)	Average Annual Demand (MGD)
Medium Density	293	12.38	293	85,732	197,183	295,775	0.086
High Density	12	0.46	155	1,865	4,289	6,434	0.002
Total	**305**	**12.84**		**87,597**	**201,472**	**302,208**	**0.088**

Notes:

1. Medium-density residential demand assumed.
2. High-density residential demand assumed.

3.2 Existing and Projected Water Demand for the Larkfield Service Area

The Larkfield water system primarily serves residential and commercial customers. The historical demand for this service area is presented in **Table 4**. The Tubbs fire in 2017 caused significant damage to structures in the area and resulted in a decrease in water demand in 2018 and 2019. By 2020 the data shows that demand increased to pre-fire levels.

Table 4 | Larkfield Historical Water Use

Year	Residential (MGD)	Commercial (MGD)	Other (MGD)	Non-revenue (MGD)	Total (MGD)
2011	0.510	0.260	0.008	0.052	0.830
2012	0.529	0.260	0.008	0.090	0.888
2013	0.389	0.211	0.003	0.071	0.674
2014	0.430	0.241	0.005	0.044	0.721
2015	0.381	0.219	0.011	0.049	0.660
2016	0.400	0.230	0.005	0.044	0.679
2017	0.416	0.238	0.016	0.096	0.767
2018	0.321	0.230	0.011	0.079	0.641
2019	0.362	0.247	0.008	0.055	0.671
2020	0.438	0.233	0.003	0.079	0.753

Recovery from the fire damage is continuing and CAW anticipates a full recovery by 2025. In its Internal 2020 UWMP, CAW stated that expected growth in this area after 2025 is minimal. However, the rezoning of the Sites may change that assumption. The future demand stated in CAW's Internal 2020 UWMP is listed in **Table 5** alongside the additional demand caused by the rezoning of the Sites. The Sites' additional potential demand is added to Larkfield's planned future demand for each planning year because of the uncertainty of when the Sites could be developed.

Table 5: | Larkfield Projected Water Demand (MGD)

	2025	2030	2035	2040
Planned Future Demand	0.773	0.775	0.784	0.792
Additional Demand - Larkfield Sites	0.060	0.060	0.060	0.060
Total Future Demand	**0.833**	**0.836**	**0.844**	**0.852**

3.3 Existing and Projected Water Supply for the Larkfield Service Area

The Larkfield service area is primarily supplied by four active CAW groundwater wells, located in the Santa Rosa Valley Basin. The groundwater supply is augmented with wholesale water from Sonoma County Water Agency (SCWA). CAW has an interconnection and water supply agreement with the SCWA that expires in 2040. This agreement allows CAW to purchase up to an average of 0.8 million gallons per day (MGD) in any month and up to 700 acre-feet (228 million gallons) of

potable water per fiscal year. Additionally, CAW has an agreement with SCWA to purchase additional supply to meet peak demands, but this agreement expires in 2024 and it is unknown at this time if this agreement can be extended.

Historical supply for CAW's Larkfield service area is shown in **Table 6**.

Table 6 | Historical Larkfield Supply

Source	Rate of Supply (MGD)				
	2016	2017	2018	2019	2020
SCWA	0.241	0.290	0.192	0.233	0.238
Groundwater Wells	0.438	0.479	0.449	0.438	0.512
Total Supply	**0.679**	**0.770**	**0.641**	**0.671**	**0.751**

Notes:
1. Provided from the Santa Rosa aqueduct.
2. Pumps from alluvial deposits and fractured rock.

The supply for the Larkfield service area is summarized in **Table 7**. The purchase agreement with SCWA is not guaranteed and is therefore not included in the safe yield.

Table 7 | Larkfield Water Supplies

Supply Type	Source	Available Drinking Water (MGD)	Safe Yield
Groundwater	Santa Rosa Valley Basin	1.389	1.389
Purchased Water[1]	Sonoma County Water Agency	0.625	0.000
	Larkfield Total	**2.014**	**1.389**

Notes:
1. Safe Yield is defined here as reasonable supply in a dry period. Because water from SCWA is not guaranteed during a dry period, it is assumed to be zero.

3.4 Water Service Reliability for the Larkfield Service Area

The reliability of water supply to CAW's Larkfield service area was determined by comparing projected water demand with the volume of water expected to be available in a normal year, a dry year, and five consecutive dry years. Groundwater supplies were assumed to be drought resistant; therefore, supplies were assumed to be similar in average years, single dry years, and consecutive dry years. To be conservative, only the firm capacity of CAW's groundwater wells was used for the single-dry and consecutive dry years. Because the purchased supply from SCWA is not guaranteed, it was assumed that this source will not be available in dry and consecutive dry years.

Both annual demand and maximum month demand scenarios were reviewed as part of this analysis. The annual scenario assumed all wells are active. However, the maximum month scenario assumed that the largest well is inactive. A summary of water supply used for the normal, single-dry, and consecutive dry year scenarios is provided in **Table 8**.

Table 8 | Available Supply for Various Supply Scenarios

Year Type	Available Supplies if Year Type Repeats	
	Annual Scenario Rate Available (MGD)[1]	Max Month Scenario Rate Available (MGD)[2]
Normal Year	2.014	1.54
Single-Dry Year	1.389	0.74
Consecutive Dry Years 1st – 5th	1.389	0.74

Notes:

1. Rate available is total capacity of active wells. Purchased water from SCWA is assumed to be available only during normal year scenario.
2. Rate available for maximum month scenario is firm capacity, computed with the largest producing well offline. Purchased water from SCWA is assumed to be available only during normal year scenario.

In **Table 9**, CAW's planned future annual demand for the Larkfield service area with the additional demand associated with rezoning the Larkfield Sites is compared to the supply conditions listed in **Table 8**.

Table 9 | Larkfield Service Area's Projected Water Supply vs Annual Demand

Annual Demand (MGD)		2025	2030	2035	2040
Normal Year					
	Supply Totals	2.014	2.014	2.014	2.014
	Demand Totals	0.833	0.836	0.844	0.852
	Difference	**1.181**	**1.178**	**1.170**	**1.162**
Single Dry Year					
	Supply Totals	1.389	1.389	1.389	1.389
	Demand Totals	0.833	0.836	0.844	0.852
	Difference	**0.556**	**0.553**	**0.545**	**0.537**
Consecutive Dry Years					
1st – 5th	Supply Totals	1.389	1.389	1.389	1.389
	Demand Totals	0.833	0.836	0.844	0.852
	Difference	**0.556**	**0.553**	**0.545**	**0.537**

Projected maximum month demand for the Larkfield service area with the additional demand associated with rezoning the Larkfield Sites is compared to available supply for normal and dry years in **Table 10**. As shown in **Table 8**, CAW's groundwater supply is considered as firm supply, computed with largest producing well offline for the maximum month scenario, and purchased water from SCWA is assumed to be unavailable in the dry year scenarios.

Table 10 | Larkfield Service Area's Projected Supply vs Maximum Month Demand

Maximum Month Demand (MGD)		2025	2030	2035	2040
Normal Year					
	Supply Totals	1.54	1.54	1.54	1.54
	Demand Totals	1.15	1.16	1.17	1.18
	Difference	**0.39**	**0.38**	**0.37**	**0.36**
Single Dry Year					
	Supply Totals	0.74	0.74	0.74	0.74
	Demand Totals	1.15	1.16	1.17	1.18
	Difference	**-0.41**	**-0.42**	**-0.43**	**-0.44**
Consecutive Dry Years					
$1^{st} - 5^{th}$	Supply Totals	0.74	0.74	0.74	0.74
	Demand Totals	1.15	1.16	1.17	1.18
	Difference	**-0.41**	**-0.42**	**-0.43**	**-0.44**

3.5 Future Water Supply Projects for the Larkfield Service Area

As part of its Internal 2019 CPS, CAW identified a supply capital improvement project for the Larkfield service area that would construct an emergency supply connection with the neighboring City of Windsor. As this would be an emergency supply connection, the actual volume of water to be supplied is unknown.

An Integrated Water Supply Master Plan for the Larkfield service area is planned to be completed in 2024. The purpose of this study will be to determine possible supplemental sources and evaluate their implementation feasibility. The study may include exploration of groundwater and surface water sources, aquifer storage and recovery, and reuse. Potential supply sources may be collaborations with nearby water providers or regional water supply solutions. Considerations will be given to water quality, accessibility to the existing distribution system, and availability in dry and critical years. The study may also include field feasibility testing, coordination with local governments and water providers, and exploration of project funding opportunities. The outcome of the study will be a prioritized list of supply options including planning level cost estimates.

4.0 Comparison and Determination of Sufficient Supply

In this section the calculations and information provided in previous sections are analyzed in terms of the requirements stated in SB 610 and SB 221.

4.1 SB 610 Water Supply Assessment

The SB 610 assessment evaluates whether there is sufficient supply to meet the proposed projected demands in addition to all existing and planned future demands.

The increased water demand associated with the proposed rezoning of the Sites was calculated in Section 3.1 to be approximately 0.060 MGD. When compared to the expected water supply during

normal, single dry, and consecutive dry years in Section 3.4, the analysis showed that the Larkfield service area has sufficient supply to meet these demands during normal, single dry, and consecutive dry year scenarios.

However, the Larkfield service area does not have sufficient supply to meet the maximum month demand with the largest source out of service. It's worth noting that without the additional demand from the Larkfield Sites rezoning, the analysis still shows a supply deficit during the single dry and consecutive dry year scenarios.

In conclusion, CAW has sufficient supply for the increased water demand associated with the Larkfield Sites rezoning. However, CAW cannot guarantee sufficient supply during maximum month demand scenarios during dry year scenarios without acquiring additional water sources.

4.2 SB 221 Water Supply Verification

Written verification is required by SB 221 stating the availability of sufficient water supply from the applicable public water system. The SB 610 assessment presented in Section 4.1 of this memorandum is sufficient to meet most of the requirements of SB 221. The additional requirements to comply with SB 221 are addressed in this section.

The historical record of water supply availability for the last 20 years must be considered when verifying the sufficiency of the water supply (Government Code section 66473.7 subdivision (a)(2)). Historical supply for the Larkfield service area is summarized in Table 6, and a full list of supply for the past 20 years is included in Table 11.

Table 11 | 20-Year History of Larkfield Service Area Water Supply

Year	System Delivery (MGD)
2002	1.170
2003	1.170
2004	1.241
2005	1.090
2006	1.049
2007	1.060
2008	1.079
2009	0.910
2010	0.819
2011	0.830
2012	0.860
2013	0.849
2014	0.721
2015	0.660
2016	0.679
2017	0.770

Year	System Delivery (MGD)
2018	0.641
2019	0.671
2020	0.751
2021	0.721

The ability to meet the Government Code 66473.7 (2) (B) requirement for an "urban water shortage contingency analysis prepared pursuant to Section 10632 of the water code" must be assessed. The CAW Water Shortage Contingency Plan complies with Government Code section 10632 and will apply to the Sites.

Supply reduction for specific water use sector per the resolution adopting water shortage contingency plans must not conflict with Water Code Section 354. Section 354 addresses ensuring that the governing body of CAW allocates and sets aside the amount of water which will be necessary to supply water needed for domestic use, sanitation, and fire protection uses. CAW prioritizes these needs over other uses, and for purposes of this verification, is considered to be in accordance with Water Code Section 354.

The amount of water that can be reasonably relied upon from specified supply projects must be considered in determining sufficiency. These are limited in SB 221 specifically to other water supply projects including conjunctive use, reclaimed water, water conservation, and water transfers. Additional supply projects for the Larkfield service area are described in Section 3.5.

Water supply verification must be based on substantial evidence, which Government code section 66473.7(c) clarifies as urban water management plans or assessments. The water supply projections utilized in the SB 610 assessment are based on the supply projections shown in CAW's Internal 2020 UWMP.

Government Code Section 66473.7 subdivision (j) states that the verification must be consistent with the water supplier's obligation to grant priority for water to low-income housing projects. Subdivision (g) of the same section requires a description of the impacts to agricultural and industrial uses from supplying water to the proposed subdivision. There are no proposed low-income housing projects for which provision of water resources or services by CAW would be precluded if water is provided to the Sites. Similarly, no impacts on the availability of water resources for agricultural and industrial uses within the CAW service area boundary are expected to result from CAW providing water to the Sites.

5.0 Recommendations

Based on the results of the SB 610 water supply assessment and SB 221 verification of the availability of sufficient water supply presented herein, both of which are based on substantial evidence, CAW has sufficient water supply to serve the proposed rezoning of the Larkfield Sites. However, CAW cannot guarantee sufficient supply during maximum month demand scenarios during dry year scenarios without acquiring additional water sources. CAW has insufficient supply

to meet existing maximum month demand with the largest well out of service during dry year scenarios. Therefore, it cannot support any increase in demand without an increase in available supply during dry year scenarios.

The following recommendations are offered for consideration.

1. Upon receipt of the final version of this Technical Memorandum, CAW should issue its concurrence with the findings stated wherein.

2. Upon receipt of evidence that the CAW has approved the water supply assessment, Sonoma County should include the assessment and any additional water supply information in the CEQA document.