

Appendix J

Water Supply Assessment

For the

Development at Lafayette Street and Dale Evans Parkway

Prepared for

The Town of Apple Valley
14955 Dale Evans Parkway
Apple Valley, California 92307

Prepared by

Terra Nova Planning & Research, Inc.
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November 16, 2022

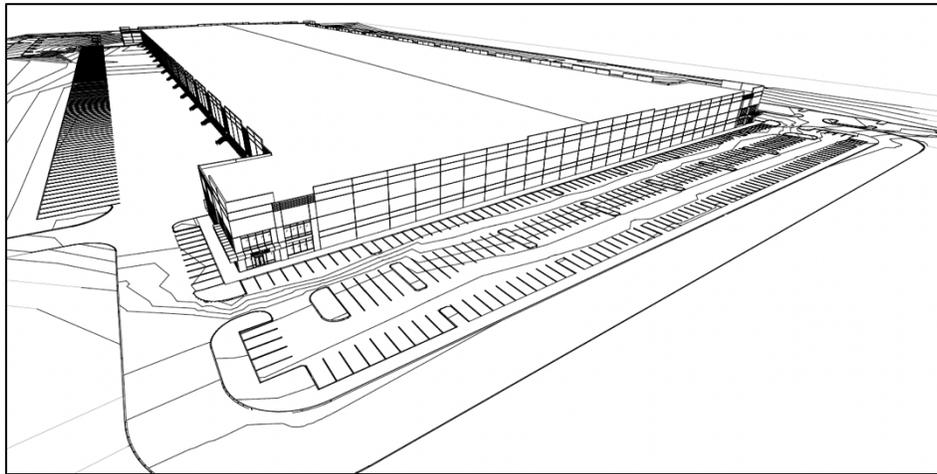
And

Approval email

December 12, 2022



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1 – Summary and Requirements

The environmental review of the proposed Development at Dale Evans and Lafayette (referred to hereafter as Project and/or the Proposed Project) is being prepared in compliance with the California Environmental Quality Act. The Town of Apple Valley is the Lead Agency for the planning and environmental review of the proposed Project and has identified Liberty Utilities – Apple Valley as the Public Water System (PWS). A Water Supply Assessment (WSA) is required as part of the environmental review for the Project.

The Proposed Project is the development of an approximately 78-acre property with industrial land uses within the Town of Apple Valley, San Bernardino County, California. The property is currently vacant and located in the northern portion of the Town of Apple Valley. The Proposed Project will include the development of a building comprised of 1,147,167 square feet of warehouse and 60,377 square feet of office space. Table 1 shows the proposed acres and square footage of development for each land use.

Table 1: Land Use Description

Land Use	Area/Quantity
Site area (gross)	3,395,599 SF / 77.95 AC
Building footprint	1,207,544 SF
Landscaping	744,626 SF
Stormwater Detention	83,867 SF
Stormwater Drainage Channel	194,932 SF
Building Use	Area/Quantity
Warehouse	1,147,167 SF
Office	60,377 SF
Parking Stalls Provided (auto)	1,272 stalls
Parking Stalls Provided (trailer)	263 stalls

Source: "Conceptual Site Plan – Lafayette Street & Dale Evans Parkway," prepared by Ware Malcomb, 8/8/2022.

Based on the analysis in this Water Supply Assessment, the projected total water demand for the Development at Dale Evans and Lafayette will be 65.42 acre-feet per year (AFY). The Project's water demand of 65.42 AFY accounts for approximately 1.69 percent of Liberty Utilities' total planned increases in demand of 3,881 AF by 2045. This WSA demonstrates that sufficient water supplies will exist to meet the projected demands of the Project, in addition to current and future water demands within Liberty Utilities' service area in normal, single-dry, and multiple-dry years over a 20-year projection.

This WSA has been prepared in compliance with the requirements of SB 610 by Terra Nova Planning and Research in consultation with Liberty Utilities and the Town of Apple Valley. This WSA does not relieve the Project from complying with all applicable state, county, city, and local ordinances, and performance standards provided in the CWC.

1.1 Regulatory Requirements

The purpose of this WSA Report is to satisfy the requirements under California Water Code Section 10910 et seq. enacted as Senate Bill 610 (SB610) to demonstrate that there are adequate water supplies and there will be adequate water supplies available to meet the water demand associated with the proposed

Project. This WSA has been prepared by Terra Nova Planning and Research in consultation with Liberty Utilities and the Town of Apple Valley. Information and analyses utilized in preparing this report were derived from source including, but not limited to, Liberty Utilities' 2020 UWMP, Mojave Water Agency's 2020 UWMP, and California's Groundwater Update (Bulletin 118).

1.1.1 Senate Bill 610

Senate Bill 610 (SB 610), also known as the Water Supply Assessment, was enacted in 2001 and became effective as of January 1, 2002. SB 610 amended Section 21151.9 of the Public Resources Code, and amended Sections 10631, 10656, 10910, 10911, 10912 and 10915, repealed Section 10913, and added and amended Section 10657 of the California Water Code. It requires cities and counties to request specific information on water supplies from the Public Water Supply (PWS) that would serve any project subject to CEQA and defined as a "project" in Water Code Section 10912, and to include this information into environmental review documents prepared pursuant to CEQA.

According to the California Water Code (CWC) Section 10912, a "project" includes:

- A proposed residential development of more than 500 dwelling units;
- A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space;
- A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space;
- A proposed hotel or motel, or both, having more than 500 rooms;
- **A proposed industrial, manufacturing, or processing plant, or industrial park, planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor space;**
- A mixed-use project that includes one or more of the projects specified in this subdivision; or
- A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project (about 250 acre-feet per year).

SB610 stipulates that when an Environmental Impact Report (EIR) is required in connection with a project, the appropriate water supply agency must provide an assessment on whether its total projected water supplies will meet the projected water demand associated with the proposed project.

1.2 Water Management Planning Documents

The Proposed Project is within the service area of Liberty Utilities – Apple Valley, a sub-agency of Mojave Water Agency (MWA). Both Liberty Utilities and MWA have prepared long-term planning documents, discussed in the following sections, to support the management of the water supplies within their service areas, as well as for compliance with SB 610.

1.2.1 Urban Water Management Planning Act

The Urban Water Management Planning Act (UWMPA) was established by Assembly Bill 797 (AB 797) on September 21, 1983. This law stipulates that every urban water supplier that either provides over 3,000 acre-feet of water annually or services more than 3,000 urban connects is required to submit an Urban Water Management Plan (UWMP) every five years. UWMPs support the supplier's long-term planning, requiring an assessment of the reliability of water sources, description of water demand management

measures and shortage contingency plans, reporting on progress towards urban water consumption targets, and description of the current and planned use of recycled water.¹

1.2.1.1 Mojave Water Agency 2020 Urban Water Management Plan

The Mojave Water Agency (MWA) was formed in 1960 in order to “to do any and every act necessary to be done so that sufficient water may be available for any present or future beneficial use of the lands and inhabitants of the agency”.² The MWA is a State Water Project contractor, watermaster for the Mojave Basin Area, and a wholesale water supplier.

The MWA’s service area extends over 4,900 square miles in the eastern San Bernardino County, California. The Mojave Basin Area covers the Upper, Middle, and Lower Mojave River Basins. There are five Subareas within the Mojave Basin: Alto, Baja, Centro, Este, and Oeste. The groundwater supply is contained within two aquifers: the Regional Aquifer and Floodplain Aquifer.

The MWA prepared its 2020 Urban Water Management Plan (UWMP) as an update to its 2015 UWMP, documenting the Agency’s “existing and future supply reliability, forecasts future water uses, presents demand management progress, and identifies local and regional cooperative efforts to meet projected water use”.³

The MWA supplies water to many small retail suppliers as well as ten retail water suppliers that are large enough to require their own UWMP, including Liberty Utilities – Apple Valley.⁴

1.2.1.2 Liberty Utilities – Apple Valley 2020 Urban Water Management Plan

Liberty Utilities was first created in 1947 by Apple Valley Ranchos Development Company. In 2016, Liberty Utilities, a subsidiary of Algonquin Power and Utilities Corp., purchased Apple Valley Ranchos Water Company. Liberty Utilities’ service area covers approximately 50 square miles in the High Desert region of San Bernardino County, including the Town of Apple Valley and adjacent unincorporated areas.

Liberty Utilities prepared its 2020 UWMP in compliance with CWC Sections 10608 through 10657 and according to the organization recommended in DWR’s 2020 UWMP Guidebook. It provides a reliable management action plan for long-term resource planning to ensure adequate water supplies are available to meet existing and future water supply needs, incorporating water supply reliability determinations accounting for potential prolonged drought, regulatory revisions, and/or changing climate conditions.⁵

1.2.2 Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act (SGMA), comprised of Assembly Bill 1739, Senate Bill 1319, and Senate Bill 1168, was passed in 2014. SGMA created a framework to guide local management ensuring the long-term protection of groundwater resources. *California’s Groundwater* (Bulletin 118) identified and prioritized groundwater basins, requiring the formation of Groundwater Sustainability Agencies (GSA), and subsequently the development of Groundwater Sustainability Plans (GSP), for basins designated as high- or medium-priority.

The Upper, Middle, and Lower Mojave River Valley Basins are included in the Mojave Basin Area Judgment. Apple Valley is located within the Upper Mojave River Valley Basin (Basin Number 06-42),

¹ California Water Code, Section 10610-10656 Urban Water Management Plans.

² California Water Code Appendix, Mojave Water Agency Law, Section 97-1 et seq., 1960.

³ MWA Urban Water Management Plan (2020), p. 1-2.

⁴ MWA Urban Water Management Plan (2020), p. 1-1

⁵ Liberty Utilities Urban Water Management Plan (2020), p.1-2.

designated as a very low priority basin according to the SGMA 2019 Basin Prioritization Results.⁶ As a result of the low priority designation, the Upper Mojave River Valley Basin is exempt from the requirement to form a GSA and adopt a GSP.

There are five Subareas within the Mojave Basin: Alto, Baja, Centro, Este, and Oeste. Apple Valley is located in the Alto Subarea.

2 – Public Water System

The Town of Apple Valley is the Lead Agency for this planning and environmental review of the proposed Development at Dale Evans and Lafayette. The Proposed Project is located within the water service area boundary for Liberty Utilities – Apple Valley (public water system number CA3610003), a sub-agency of the Mojave Water Agency (MWA). Liberty Utilities Corp. (formerly known as Apple Valley Ranchos Water and referred to as Liberty Utilities or Liberty Utilities – Apple Valley) will be the Urban Water Supplier (UWS) for the project.

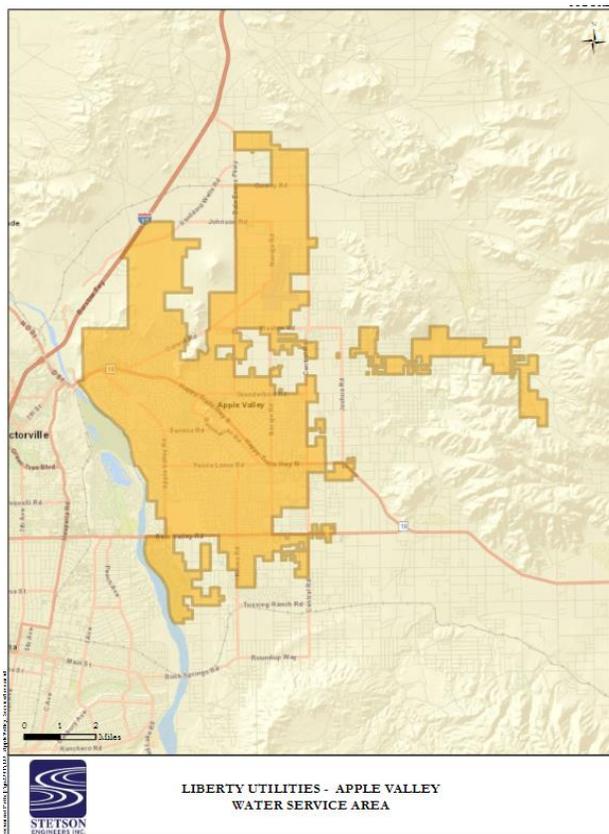
2.1 Liberty Utilities – Apple Valley

Liberty Utilities was first created in 1947 by Apple Valley Ranchos Development Company. In 2016, Liberty Utilities, a subsidiary of Algonquin Power and Utilities Corp., purchased Apple Valley Ranchos Water Company. Liberty Utilities is an “urban water supplier” pursuant to Section 10617 of the CWC and directly serves potable water to more than 3,000 customers.⁷ As shown in Figure 1, Liberty Utilities’ service area covers approximately 50 square miles in the “High Desert” region of San Bernardino County, including the Town of Apple Valley and adjacent unincorporated areas; it has approximately 21,000 connections.⁸ Liberty Utilities is a sub-agency of the Mojave Water Agency.

Groundwater is Liberty Utilities’ only water source. All wells supplying Liberty Utilities are within the Mojave Basin Area.⁹ Liberty Utilities’ existing water supply provides domestic water from potable wells in addition to water for agricultural purposes from groundwater wells.

According to the 2020 UMWP, it is projected that the population will increase in Liberty Utilities’ service area over a 25-year period, as shown in Table 2.

Figure 1: Liberty Utilities’ Water Service Area Boundary



Source: Liberty Utilities Urban Water Management Plan (2020), Figure 1.

⁶ DWR Sustainable Groundwater Management Act, 2019 Basin Prioritization (2019).

⁷ Liberty Utilities Urban Water Management Plan (2020), p.1-1.

⁸ MWA Urban Water Management Plan (2020), p. 2-6.

⁹ Liberty Utilities Urban Water Management Plan (2020), p.3-3.

Table 2: Population – Current and Projected

Population Served	2020	2025	2030	2035	2040	2045 (opt)
	61,444	64,828	68,399	72,166	76,141	80,334

Source: Liberty Utilities Urban Water Management Plan (2020), p.3-7.

2.2 Mojave Basin Area Hydrology

Liberty Utilities relies on groundwater produced from the Mojave Basin Area – Alto. The Mojave Basin Area – Alto Subarea is a subbasin of the Upper Mojave River Valley Groundwater Basin. The groundwater in the Mojave Basin Area is replenished through natural storm water flows, the infiltration of the Mojave river and tributaries, State Water Project (SWP) imports to recharge basins, wastewater imports, as well as irrigation and wastewater return flow.¹⁰ The Mojave River Pipeline provides additional replenishment to the groundwater.

Climate in Liberty Utilities’ service area is characterized as a dry climate with an average minimum monthly temperature of approximately 30 degrees Fahrenheit, and warm summers reaching an average maximum monthly temperature of approximately 98 degrees Fahrenheit, as shown in Table 3. Most of the precipitation occurs between December and February.

Table 3: Liberty Utilities – Apple Valley Service Area Climate Information (1917 -2015)

Month	Average Temperature (F)	Average Min. Temperature (F)	Average Max. Temperature (F)	Average Total Precipitation (In)	ETo (In)
January	44.55	30.14	58.94	0.95	2.22
February	47.79	33.39	62.17	1.01	3.01
March	52.04	37.06	66.98	0.78	4.98
April	58.12	42.01	74.24	0.36	6.48
May	65.18	48.16	82.19	0.11	7.98
June	73.35	54.89	91.81	0.04	9.11
July	79.85	61.47	98.22	0.14	9.53
August	78.95	60.69	97.21	0.19	8.80
September	72.99	54.62	91.35	0.22	6.55
October	62.57	44.91	80.22	0.32	4.52
November	51.21	35.03	67.44	0.48	2.74
December	44.47	29.79	59.22	0.87	2.02
Annual	60.90	44.40	77.38	5.36	67.94

Source: Liberty Utilities Urban Water Management Plan (2020), p.3-5

3– Public Water System: Existing Supply and Demand

¹⁰ MWA Urban Water Management Plan (2020), p.2-2.

The Mojave Water Agency's water supply is almost entirely sourced from groundwater. MWA also supplies its service area with water sourced from the State Water Project (SWP), which, via the Mojave River Pipeline, supports the recharge of the Mojave River Basin groundwater.¹¹

Groundwater is the only water source for Liberty Utilities, a sub-agency of MWA. All of Liberty Utilities' wells are located in the Mojave Basin Area. This water supply provides domestic water from potable wells in addition to raw water for agricultural purposes from two groundwater wells, separate from the potable water system.¹²

3.1 Groundwater

Groundwater is the main source of potable water in the Mojave Basin Area. The MWA has the legal authority to manage groundwater in the Mojave Basin Area and serves as Watermaster according to the Mojave Basin Area Adjudication.

The groundwater that Liberty Utilities uses to provide urban potable water is sourced from wells the Mojave Basin Area – Alto Subarea.¹³ Liberty Utilities uses groundwater to provide water service to residential, commercial, industrial, institutional, landscape, and agricultural uses.¹⁴

3.1.1 Upper Mojave River Valley Groundwater Basin

The Upper Mojave River Valley Groundwater Basin covers approximately 413,000 acres along a north-south running valley, from the San Bernardino Mountains in the south, to the Middle Mojave River Valley Groundwater Basin in the north.

The MWA service area covers or partially overlaps with 36 groundwater basins and subbasins. As shown in Figure 2, the Town of Apple Valley is in the Upper Mojave River Valley Basin area (Basin Number 6-042). The Upper Mojave River Valley Basin has been identified as a very-low priority basin according to DWR Bulletin 118.¹⁵ As a very low priority basin, the MWA is not required to form a groundwater sustainability agency (GSA) or a groundwater sustainability plan (GSP).¹⁶

The northern boundary of the Upper Mojave River Valley is demarcated by a line drawn from the basement rock outcrops near the town of Helendale, to the rock outcrops in the Shadow Mountains. The line of contact between Quaternary sedimentary deposits and the unconsolidated basement rocks of the San Bernardino Mountains forms the southern boundary of the basin. Southeastern and eastern boundaries of the Upper Mojave basin are marked by the Helendale fault and the basement exposures of the mountains surrounding Apple Valley, respectively. The boundary to the west is formed by a contact between alluvium and basement rocks that form the Shadow Mountains, and a surface drainage divide between the Upper Mojave Basin and El Mirage Valley Basins.¹⁷

The division of the Mojave Basin Area into subareas is based on a variety of factors, including hydrologic divisions defined in previous studies from the California Department of Water Resources.¹⁸ Groundwater

¹¹ Ibid.

¹² Liberty Utilities Urban Water Management Plan (2020), p.3-3.

¹³ Liberty Utilities Urban Water Management Plan (2020), p.4-20.

¹⁴ Liberty Utilities Urban Water Management Plan (2020), p.4-1

¹⁵ Department of Water Resources, SGMA Basin Prioritization Dashboard <https://gis.water.ca.gov/app/bp-dashboard/final/>

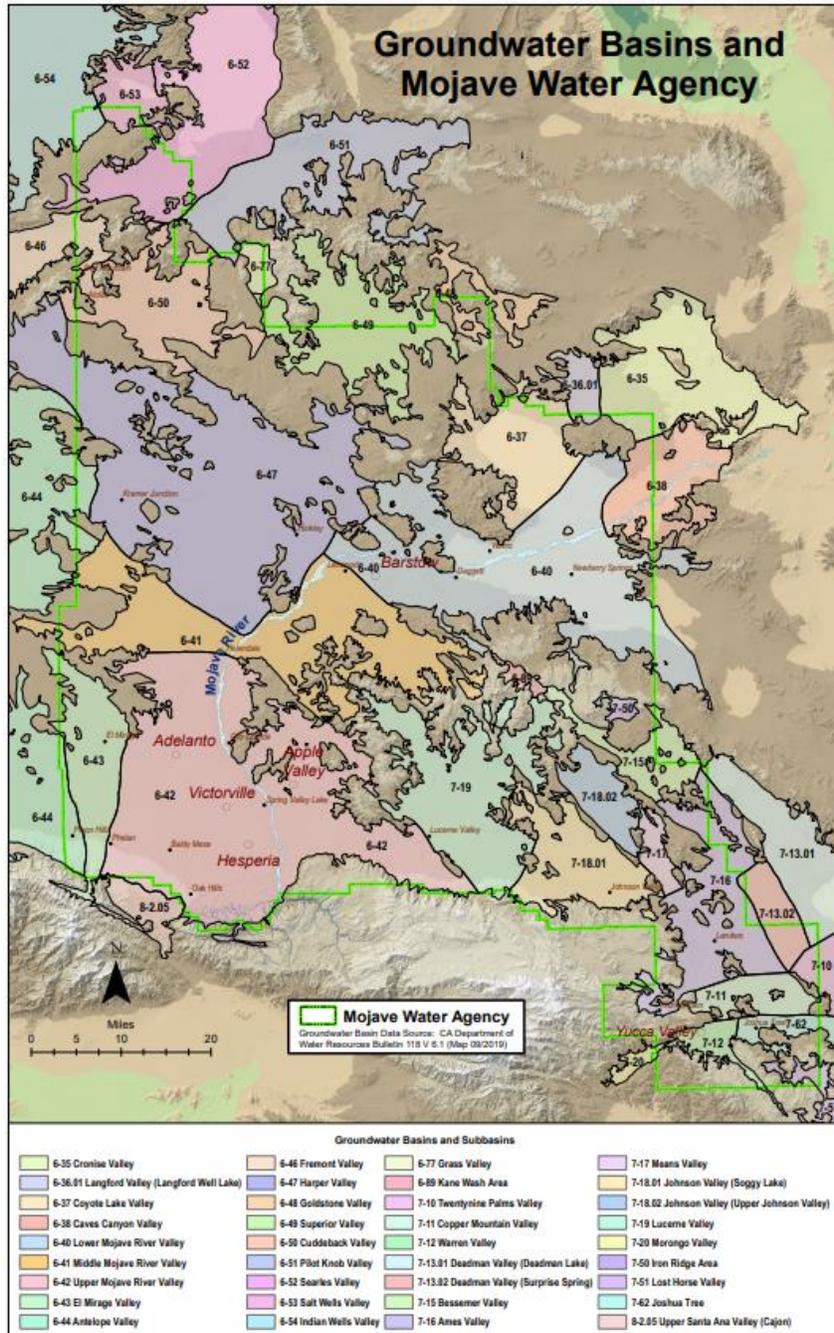
¹⁶ Mojave Water Agency: Sustainable Groundwater Management Act <https://www.mojavewater.org/basin-management/regional-planning/sgma/>

¹⁷ Department of Water Resources California's Groundwater Update (2013), South Lahontan Hydrologic Region.

¹⁸ MWA Urban Water Management Plan (2020), p.3-17

flows between these subareas, in addition to groundwater-surface water and groundwater-atmosphere movement, the Mojave Basin Area is mostly a closed basin.¹⁹ The Mojave River is the primary source of groundwater recharge, however a small proportion of recharge comes from storm runoff from the mountains, wastewater discharge, and imported water.²⁰

Figure 2: Groundwater Basins and Mojave Water Agency



¹⁹ MWA Urban Water Management Plan (2020), p.3-13

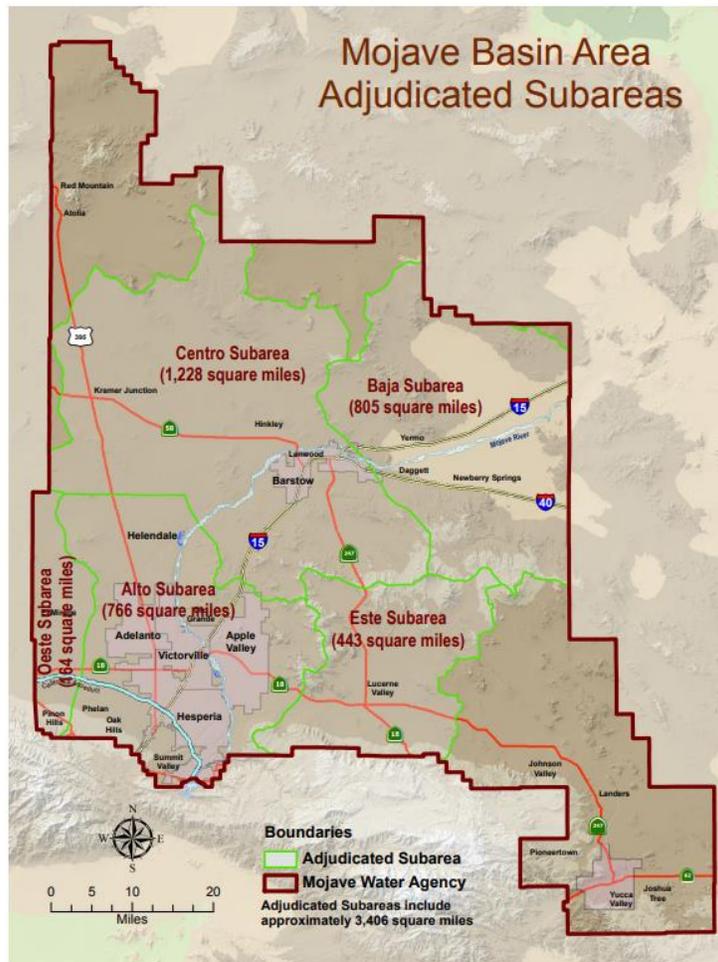
²⁰ Liberty Utilities Urban Water Management Plan (2020), p.6-10

Source: Mojave Water Agency – Regional Basins and Subbasins https://www.mojavewater.org/wp-content/uploads/2022/01/Regional_Basins_Subbasins.pdf

3.1.1.1 Mojave Basin Area – Subareas

The Mojave Basin Area is divided into seven subareas for management purposes: Cuddeback Lake, Centro, Superior Lake, Baja, Kramer, Alto, Oeste, Este, and Morongo. As shown in Figure 3., five of these subareas are adjudicated: Alto, Baja, Centro, Este, and Oeste. The Subarea boundaries have evolved based on “a combination of hydrologic, geologic, engineering, and political considerations”.²¹ The Upper Mojave River Valley Groundwater Basin approximately underlies the Alto subarea as well as around one third of the Este subarea.²²

Figure 3: Mojave Basin Area Adjudicated Subareas



Source: Mojave Water Agency <https://www.mojavewater.org/wp-content/uploads/2022/01/adjudicatedsubareasmap.pdf>. Accessed 07/06/2022.

According to the MWA’s 2020 UWMP, the MWA stores a total of 192,948 acre-feet of groundwater. Of the totally groundwater supply, 191,915 AF is stored in the Mojave Basin, and 1,033 AF is stored in the

²¹ MWA Urban Water Management Plan (2020), p.3-17

²² Upper Mojave River Valley Groundwater Basin - California’s Groundwater Update 2003 (Bulletin 118).

adjacent Ames-Reche and Joshua basins. The capacities of the Mojave Basin adjudicated subareas are shown in Table 4.

Table 4: MWA Groundwater Stored by Mojave Basin Subarea (September 2020).

Mojave Basin	Alto	Baja	Centro	Este	Oeste
191,915	141,219	24,754	24,622	1,320	0

Source: MWA Urban Water Management Plan (2020), p.3-11.

3.1.2 Groundwater Demand

Apple Valley is supplied with potable water from Liberty Utilities, which obtains groundwater from the Mojave Basin Area. Liberty Utilities’ production of water from the Mojave Basin Area – Alto Subarea from 2016-2020 is shown in Table 5. Over the past 5-years, Liberty Utilities has produced an average of 14,131 AFY of groundwater from the Mojave Basin Area - Alto Subarea.

the Mojave Basin Area – Alto Subarea.

Table 5: Groundwater Volume Pumped

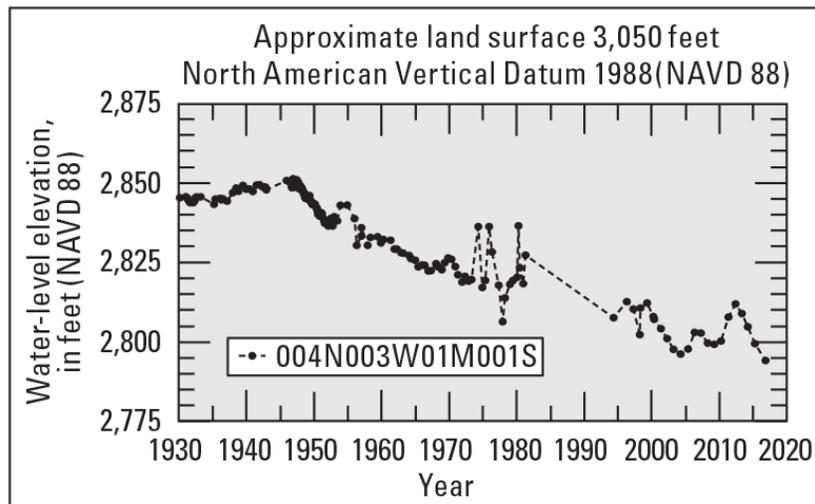
Groundwater Type	Location or Basin Name	2016	2017	2018	2019	2020
Alluvial Basin	Mojave Basin Area	13,724	14,106	14,307	13,539	14,979
TOTAL		13,724	14,106	14,307	13,539	14,979

Source: Liberty Utilities Urban Water Management Plan (2020), Table 6-1.

3.1.3 Groundwater Sustainability

Groundwater sustainability is typically assessed based on long term changes in groundwater storage. The USGS National Water Information System constructed groundwater-level hydrographs to show long-term groundwater level changes in the Mojave River groundwater basin from 1930-2016. According to the long-term hydrographs groundwater levels declined more than 50 feet in the Alto subarea of the Mojave River Basin from 1930 to 2020, as shown in Figure 4.

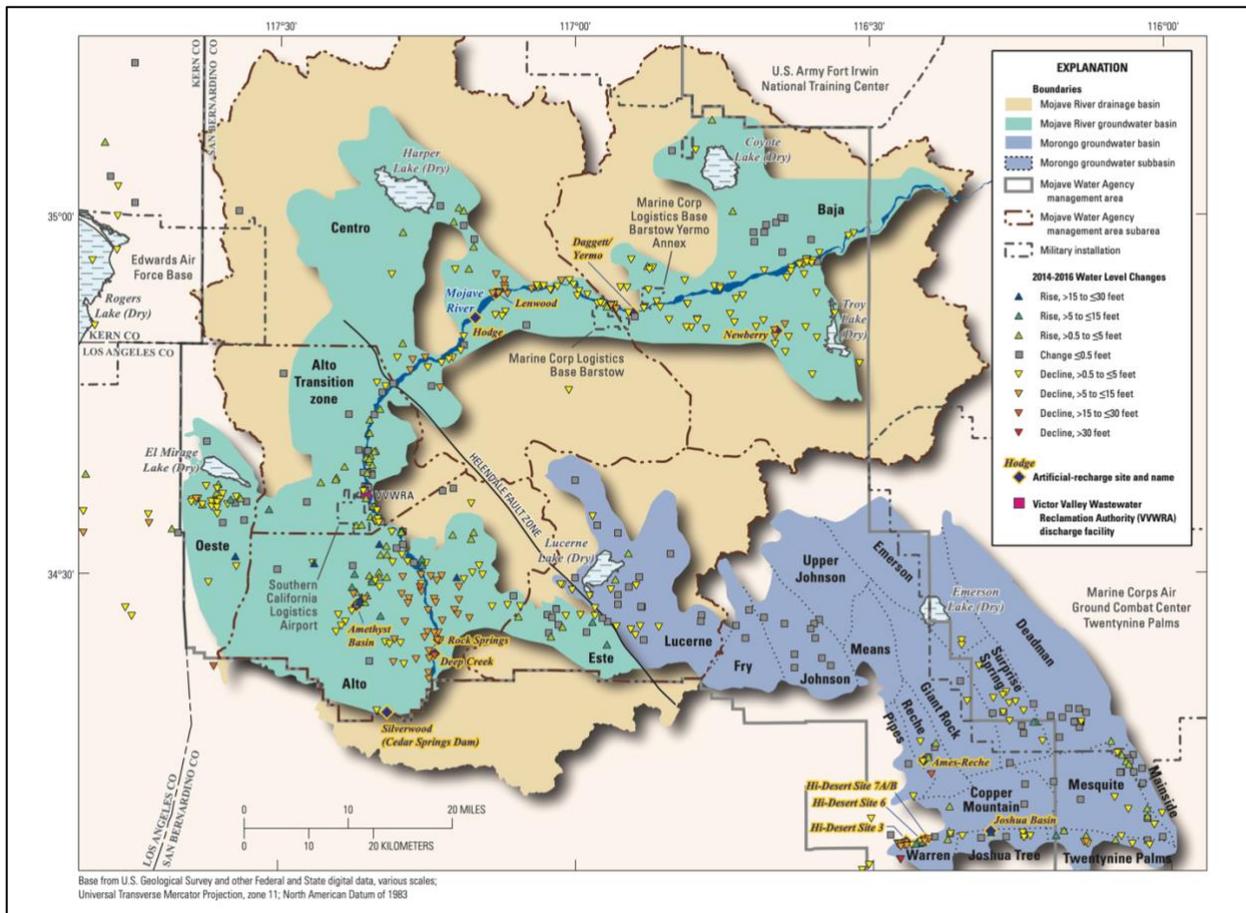
Figure 4: Long term hydrograph for the Alto Subarea 1930 – 2020



Source: USGS, Regional Water Table (2016) In the Mojave River and Morongo Groundwater Basins, Southwestern Mojave Desert, California, by Meghan C. Dick and Adam R. Kjos.

Figure 5, below, shows the groundwater-level changes for wells in the Mojave River and Morongo Groundwater Basins between spring 2014 and spring 2016. While the data overall shows a mix of increases and decreases in groundwater-level, the majority of the groundwater levels in the Alto subarea declines between 5 and 15 ft over the two-year period. Differences in groundwater level trends between wells in the same area are likely anomalies due to fluctuations in pumping and distance to artificial recharge areas.²³

Figure 5: Water Level Changes from 2014 to 2015 in the Mojave River and Morongo Groundwater Basins, southwestern Mojave Desert, California.



Source: USGS, Regional Water Table (2016) In the Mojave River and Morongo Groundwater Basins, Southwestern Mojave Desert, California, by Meghan C. Dick and Adam R. Kjos.

²³ Regional Water Table (2016) In the Mojave River and Morongo Groundwater Basins, Southwestern Mojave Desert, California, by Meghan C. Dick and Adam R. Kjos, <https://ca.water.usgs.gov/mojave/mojave-2016-water-levels.html> (accessed November 2022).

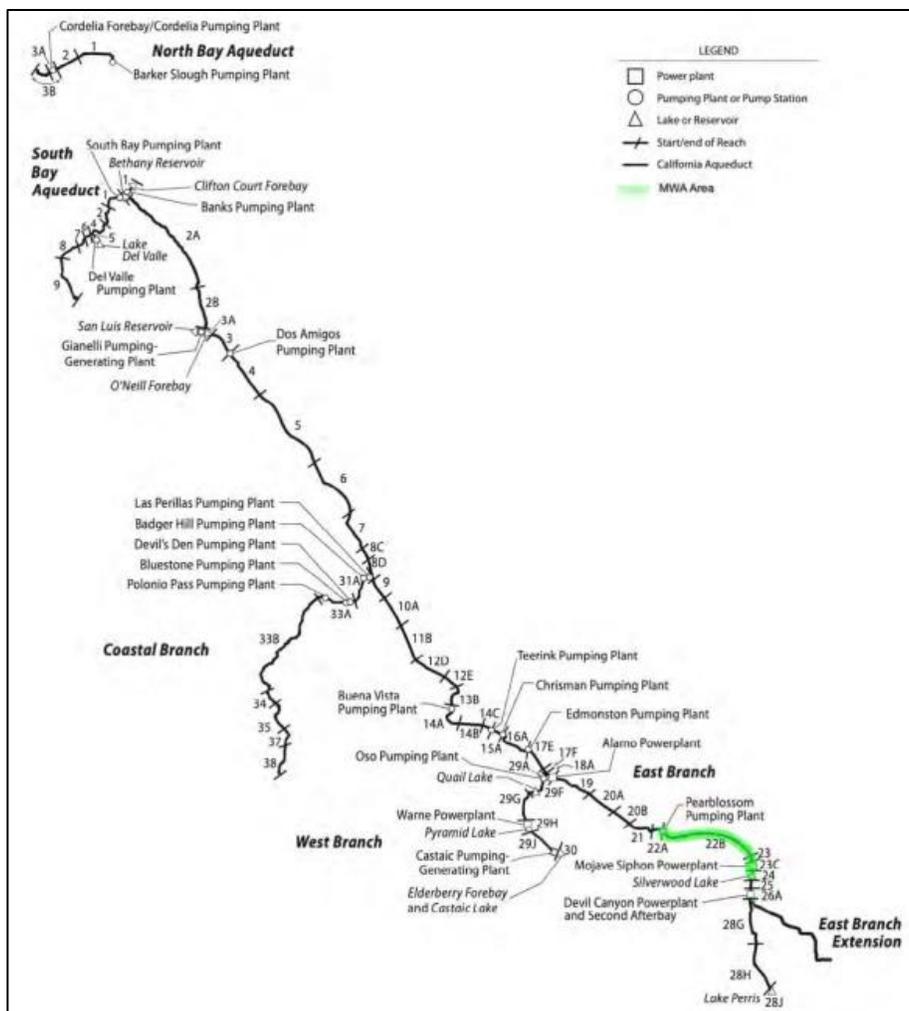
3.2 Imported Water

Liberty Utilities does not directly import water supplies to meet its water demands.²⁴ However, in order to recharge the groundwater basin, the MWA imports water through the State Water Project (SWP). This imported water is supplied to the groundwater basins in the Mojave Basin Area.²⁵

3.2.1 State Water Project

The SWP was built and has been operated by the California Department of Water Resources (DWR) since legislation was passed for the California Aqueduct in 1959. The construction of most SWP facilities was completed by 1973. It remains the largest state-built, multi-purpose water project in the United States.²⁶ The MWA entered a SWP water service contract with the DWR in June of 1963.²⁷

Figure 6: MWA Area on the SWP Facility Map



Source: MWA Urban Water Management Plan (2020), Figure 3-1 (Modified Figure B-4 from DWR Bulletin 132-20)

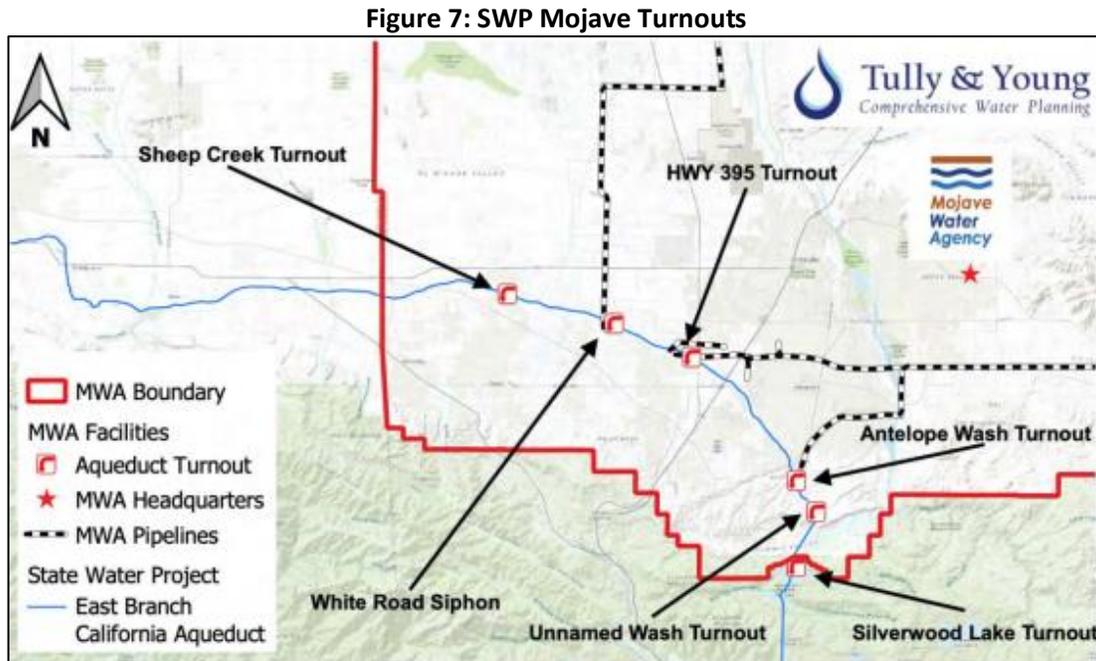
²⁴ Liberty Utilities Urban Water Management Plan (2020), p.6-4.

²⁵ MWA Urban Water Management Plan (2020), p. 3-24.

²⁶ MWA Urban Water Management Plan (2020), p. 3-2.

²⁷ MWA Urban Water Management Plan (2020), p. 3-1.

As shown in Figure 6, MWA gets its water from the SWP via the east branch of the 444-mile long California Aqueduct. The MWA has six turnout locations on the East Branch, as shown in Figure 7: Sheep Creek Turnout, White Road Turnout, Highway 395 Turnout, Antelope Siphon Turnout, Unnamed Wash, and Cedar Springs Dam (Silverwood Lake). These turnout facilities deliver the SWP supplied water to recharge local groundwater basins within the MWA service area.²⁸



Source: MWA Urban Water Management Plan (2020), Figure 3-3

The Department of Water Resources has SWP with 29 agencies, including the MWA. Each SWP contract contains a “Table A Annual Amount” that lists maximum amount of water an agency may receive through the SWP under its contract. MWA’s Table A Annual Amounts are shown in Table 8. The Table A Annual Amount represents the “maximum contract amount that could be available each year assuming that the SWP could deliver 100% of contract supplies to all SWP suppliers”.²⁹ SWP Table A allocations are typically less than the whole Table A Annual Amount – the allocations are determined by the DWR based on hydrology, water storage, and regulatory criteria in the Delta.

Table 6: SWP Table A Allocations and Deliveries (values in acre-feet)

Year	Table A Annual Amount	Percent Allocation	Allocation Amount
2010	82,800	50%	41,00
2011	82,800	80%	66,240
2012	82,800	65%	53,820
2013	82,800	35%	28,980
2014	82,800	5%	4,140
2015	85,800	20%	17,160

²⁸ Ibid.

²⁹ MWA Urban Water Management Plan (2020), p.3-5

2016	85,800	60%	51,480
2017	85,800	85%	72,930
2018	85,800	35%	30,030
2019	85,800	75%	64,350
2020	89,800	20%	17,960

Source: MWA 2020 UWMP p.3-7

MWA directly stores imported SWP water in basins in the MWA service area. MWA’s groundwater storage accounts in the various Mojave Basin Adjudication Subareas is shown in Table 7. The total stored water in the MWA service area in September 2020 was approximately 191,915 AF.

Table 7: MWA Groundwater Stored by Mojave Basin Subarea (September 2020).

Mojave Basin	Alto	Baja	Centro	Este	Oeste
191,915	141,219	24,754	24,622	1,320	0

Source: MWA Urban Water Management Plan (2020), p.46.

MWA’s SWP contract permits carryover – forgoing a delivery of its SWP Table A Amount and retaining a portion of that allocated supply for future use. MWA’s carryover is stored and regulated in the San Luis Reservoir.³⁰

3.3 Surface Water

Liberty Utilities does not currently use or intend to use local surface water to meet its water demands.³¹ MWA also does not use local surface water as part of its water supply, but as described in Section 3.2.1, it does import SWP surface water to recharge groundwater basins in its service area. Local stormflow runoff is captured and used for groundwater recharge.³²

3.3.1 River/Stream Diversion

The Alto, Centro, and Baja Subareas of the Mojave Basin Area contain both the Floodplain Aquifer and the Regional Aquifer. The Floodplain Aquifer is directly recharged through the infiltration of surface flows from the Mojave River during the winter rainy season. The Regional Aquifer is recharged in part by runoff from the San Gabriel and San Bernardino Mountains, as well as from runoff from local intermittent streams and washes.³³ Approximately 80% of natural basin recharge is from the infiltration of water from the Mojave River.³⁴

3.3.2 Stormwater Capture

The Mojave River, overlying the Upper, Middle, and Lower Mojave River Valley groundwater basins, is the largest drainage system in the Mojave Desert.³⁵ The river is an ephemeral stream, deriving its flow from the drainage of 217 square miles of the northern slope of the San Bernardino Mountains.³⁶ Within the Mojave Basin Area, the Alto Subarea contains both the Floodplain Aquifer and the Regional Aquifer. The

³⁰ MWA Urban Water Management Plan (2020), p.3-9.

³¹ Liberty Utilities Urban Water Management Plan (2020).

³² MWA Urban Water Management Plan (2020), p.3-13.

³³ MWA Urban Water Management Plan (2020), p.3-15.

³⁴ Liberty Utilities Urban Water Management Plan (2020), p. 6-10.

³⁵ DWR – 2013 South Lahontan Hydrologic Region, p.33.

³⁶ MWA Urban Water Management Plan (2020), p. 2-1.

Floodplain Aquifer is composed of sand and gravel weathered from metamorphic and granitic rocks of the San Gabriel and the San Bernardino Mountains, respectively, and deposited in a fluvial environment. The Regional Aquifer underlies and surrounds the Floodplain Aquifer with interconnected alluvial fan and basin fill deposits.

The climate in the MWA service area is extreme and very arid due to its location in the High Desert region of San Bernardino County and the rain shadow effect of the surrounding mountains. While occasional monsoonal thunderstorms bring flash flooding and hail to otherwise extremely hot and dry summers, most of the region's precipitation occurs in the winter, including through occasional snowfall.³⁷ The average annual precipitation in Liberty Utilities' service area is 5.4 inches³⁸, and the average in the greater MWA service area is 5.8 inches of rainfall in Victorville and 5.00 inches in Barstow.³⁹

Stormflow runoff water from the San Bernardino Mountains into the Mojave River, as well as storm runoff into small streams and desert washes, is the primary means through which the groundwater basin is recharged.⁴⁰

3.4 Wastewater and Recycled Water

Highly treated wastewater can be reused for purposes such as landscape irrigation. Liberty Utilities does not currently use wastewater and recycled water supplies to meet its water demands because the infrastructure is not available. However, the Victor Valley Wastewater Reclamation Authority (VWVRA), already provides wastewater collection and treatment services to Liberty Utilities has upcoming plans to construct facilities serving recycled water in Liberty Utilities' service area.⁴¹

MWA imports treated wastewater effluent from three wastewater entities serving communities in the San Bernardino Mountains outside MTA's service area, including wastewater from the Lake Arrowhead Community Service District that is imported to the Alto Subarea. Wastewater imports make up a relatively small portion of MWA's overall water supplies, but for the purposes of its 2020 UWMP, it is assumed that approximately 2,800 acre-feet will be delivered into the MWA Service Area on an annual basis through to 2065.⁴²

3.5 Conservation

Both Liberty Utilities and MWA are members of the Alliance for Water Awareness and Conservation (AWAC), a local coalition of agencies committed to reaching water conservation goals in the MWA service area.

Liberty Utilities has utilized multiple programs to promote water conservation in its service area. It runs a tiered conservation pricing rate for both residential and non-residential customers to encourage customers to conserve water. Liberty Utilities also offers free water audits and conservation devices, as well as a rebate program for hot water recirculation pumps.⁴³

³⁷ MWA Urban Water Management Plan (2020), p.2-7.

³⁸ Liberty Utilities Urban Water Management Plan (2020), p.3-5.

³⁹ MWA Urban Water Management Plan (2020), p.2-8.

⁴⁰ MWA Urban Water Management Plan (2020), p.3-13.

⁴¹ Liberty Utilities Urban Water Management Plan (2020), p.6-15.

⁴² MWA Urban Water Management Plan (2020), p.3-23.

⁴³ Liberty Utilities Urban Water Management Plan (2020), p.9-7.

Liberty Utilities and MWA also promote water conservations using public information programs – such as brochures, public outreach displays, and workshops – as well as awareness campaigns – including paid advertising and media events. Liberty Utilities and MWA each employ conservation coordinators, who work together on the oversight and implementation of water conservation programs. MWA’s conservation coordinator also prepares reports and annual conservation budgets.⁴⁴

3.6 Landscape ordinance

Liberty Utilities supports local ordinances to reduce water waste, such as the Town of Apple Valley’s Ordinances No. 58 (“Water Conservation Plan”), which includes restrictions to watering hours, duration, and application, and No. 479, which regulates water management and waste prevention for existing landscapes.⁴⁵ In 2016 the Town of Apple Valley adopted Ordinance No.476 as amendment to the existing code, ensuring compliance with the California Model Water Efficient Landscape Ordinance (MWELo). MWELo (California Code of Regulations, Title 23) establishes practices to reduce the consumption of water the landscape irrigation of new developments.⁴⁶

Liberty Utilities also implements rules approved by the California Public Utilities Commission, such as Rule No. 14.1 (“Water Shortage Contingency Plan”), Schedule 14.1 (“Water Shortage Contingency Plan with Staged Mandatory Reductions, Restrictions and Drought Surcharges”), and Rule No. 20 (“Water Conservation”). These reduction methods include restrictions on the use of potable water for construction, landscaping and for washing buildings and vehicles, the mandatory enactment of conservation restrictions in the case of water shortages and promotes the use of water saving devices.⁴⁷

3.7 Water shortage Contingency Planning

Liberty Utilities’ plan for water usage during periods of shortage is designed to incorporate six standard water shortage levels. As shown in Table 8, these levels correspond to progressive ranges from up to 10, 20, 30, 40, and 50 percent shortages, and greater than 50 percent shortage. Liberty Utilities’ water shortage plan requires customer to reduce their consumption by the percent corresponding to the declared shortage level. Liberty Utilities may enact additional demand reduction actions such as restrictions to irrigation and other outdoor water use and rate structure changes.⁴⁸

Table 8: Urban Water Shortage Contingency Plan Shortage Levels

2020 Shortage Level	Percent Shortage Range
1	≤10%
2	10 to 20%
3	20 to 30%
4	30 to 40%
5	40 to 50%
6	> 50%

Source: Liberty Utilities Urban Water Management Plan (2020), p.8-9

⁴⁴ Liberty Utilities Urban Water Management Plan (2020), p.9-6, 9-7.

⁴⁵ Liberty Utilities Urban Water Management Plan (2020), p.9-4.

⁴⁶ Town of Apple Valley Ordinance No. 479.

⁴⁷ Liberty Utilities Urban Water Management Plan (2020), p.9-5.

⁴⁸ Liberty Utilities Urban Water Management Plan (2020), p.8-9.

4 – Public Water System: Projected Supply and Demand

MWA sources its potable and non-potable water supplies from the SWP, natural and recharged groundwater, imported wastewater, return flow, and SWP carryover supplies.⁴⁹ MWA and Liberty Utilities' responses to service outages from these sources would depend on the type and location of such an event.

4.1 Projected Demand and Supply

Table 9 shows the projected potable and non-potable water use for the Liberty Utilities service area in five-year increments from 2025 to 2045, broken down by water sectors. These projections are based on Liberty Utilities' review of SB X7-7 calculations, water use factors based on currently demand, and population projects.⁵⁰

Table 9: Use for Potable and Non-Potable Water – Projected

Use Type	Projected Water Use				
	2025	2030	2035	2040	2045
Single Family	7,107	7,579	8,077	8,602	9,156
Commercial	1,837	1,909	1,984	2,064	2,149
Industrial	2	2	2	2	2
Institutional/Government	547	568	591	615	640
Landscape	622	646	672	699	727
Agricultural Irrigation	4,950	4,950	4,950	4,950	4,950
Losses	751	781	812	844	876
Other	30	31	32	34	35
TOTAL	15,846	16,466	17,120	17,810	18,538

Source: Liberty Utilities Urban Water Management Plan (2020), Table 4-2

Table 10 shows a summary of the projected potable and non-potable water supplies in five-year increments from 2025 to 2045 for the Mojave Basin Area. Liberty Utilities' actual water supplies for 2020 was 10,067 AF drinking water, 4,912 AF non-potable water, and 14,979 AF total (all non-desalinated groundwater).⁵¹

Table 10: Water Supplies - Projected

Water Supply		Projected Water Supply				
Groundwater (not desalinated)	Mojave Basin Area (Potable)	11,256	11,876	12,530	13,220	13,948
Groundwater (not desalinated)	Mojave Basin Area (Agricultural)	4,590	4,590	4,590	4,590	4,590
TOTAL		15,846	16,466	17,120	17,810	18,538

Source: Liberty Utilities Urban Water Management Plan (2020), Table 6-9

⁴⁹ MWA 2020 UWMP, p.5-3

⁵⁰ Liberty Utilities 2020 UWMP, p. 4-14

⁵¹ Liberty Utilities 2020 UWMP, p.6-30

4.2 Normal, Single-Dry, Multiple-Dry Year Comparison

The following tables provide Liberty Utilities' projected water supplies and demands in a normal year, single-dry year, and multiple-dry years. Table 11 shows a summary of Liberty Utilities' projected water demand and supplies over the next 25 years, in five-year increments. It indicates that Liberty Utilities will be able to meet current and future water demand during normal years.

Table 11: Liberty Utilities Normal Year Supply and Demand Comparison

	2025	2030	2035	2040	2045
Supply totals	15,846	16,466	17,120	17,810	18,538
Demand totals	15,846	16,466	17,120	17,810	18,538
Difference	0	0	0	0	0

Source: Liberty Utilities Urban Water Management Plan (2020), Table 7-2

Table 12 shows Liberty Utilities' projected water demand and supply over the next 25 years in 5-year increments during single dry years. It indicates that Liberty Utilities can meet water demands during single dry years over the next 25 years.

Table 12: Liberty Utilities Single Dry Year Supply and Demand Comparison

	2025	2030	2035	2040	2045
Supply totals	14,922	15,506	16,122	16,722	17,458
Demand totals	14,922	15,506	16,122	16,722	17,458
Difference	0	0	0	0	0

Source: Liberty Utilities Urban Water Management Plan (2020), Table 7-3

Liberty Utilities' projected water demand and supplies over the next 25 years in five-year increments during five consecutive years of drought it shown in Table 13. It indicates that Liberty Utilities can meet water demands in these conditions over the next 25 years. Liberty Utilities' total water demand in 2020 was 14,979 AF.

Table 13: Liberty Utilities Multiple Dry Years Supply and Demand Comparison

		2025	2030	2035	2040	2045
First year	Supply totals	19,285	20,039	20,835	21,675	22,561
	Demand totals	19,285	20,039	20,835	21,675	22,561
	Difference	0	0	0	0	0
Second year	Supply totals	17,760	18,454	19,188	19,961	20,777
	Demand totals	17,760	18,454	19,188	19,961	20,777
	Difference	0	0	0	0	0
Third year	Supply totals	18,114	18,823	19,571	20,360	21,192
	Demand totals	18,114	18,823	19,571	20,360	21,192
	Difference	0	0	0	0	0
Forth year	Supply totals	17,440	18,122	18,842	19,602	20,403
	Demand totals	17,440	18,122	18,842	19,602	20,403
	Difference	0	0	0	0	0
Fifth year	Supply totals	14,296	14,856	15,446	16,069	16,726
	Demand totals	14,296	14,856	15,446	16,069	16,726
	Difference	0	0	0	0	0

Source: Liberty Utilities Urban Water Management Plan (2020), Table 7-4

5 – Project Description

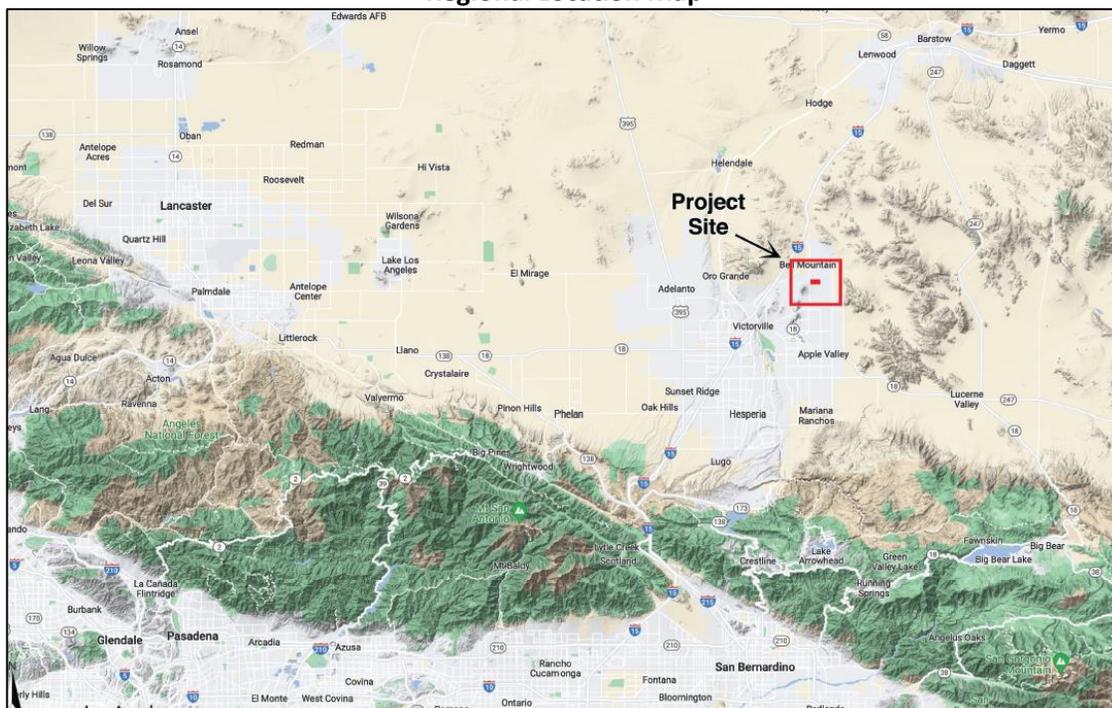
The Development at Dale Evans and Lafayette (Project) is located within the Town of Apple Valley, in the southwest of San Bernardino County, as shown in Figure 6. The Project is bounded by Lafayette Street to the north, Dachshund Avenue to the east, Burbank Avenue to the south, and Dale Evans Parkway to the west, as shown in Figure 7. It will be accessible from Lafayette Street, Burbank Avenue, and Dachshund Avenue. The property is currently vacant and undeveloped. As shown in Figure 8 and Table 14, the Project proposes to develop approximately 78 acres to include a 1,207,544 SF industrial building, comprised of 1,147,167 SF of warehouse and 60,377 SF of office space, 1,535 parking spaces (auto and trailer, approx.), 744,626 SF of landscaping, 83,867 SF of stormwater detention, and a 194,932 SF drainage channel.

Table 14: Land Use Description

Land Use	Area/Quantity
Site area (gross)	3,395,599 SF / 77.95 AC
Building footprint	1,207,544 SF
Landscaping	744,626 SF
Stormwater Detention	83,867 SF
Stormwater Drainage Channel	194,932 SF
Building Use	Area/Quantity
Warehouse	1,147,167 SF
Office	60,377 SF
Parking Stalls Provided (auto)	1,272 stalls
Parking Stalls Provided (trailer)	263 stalls

Source: “Conceptual Site Plan – Lafayette Street & Dale Evans Parkway,” prepared by Ware Malcomb, June 6th, 2022

**Exhibit 1
Regional Location Map**



**Exhibit 2
Vicinity Map**



**Exhibit 3
Project Location Map**

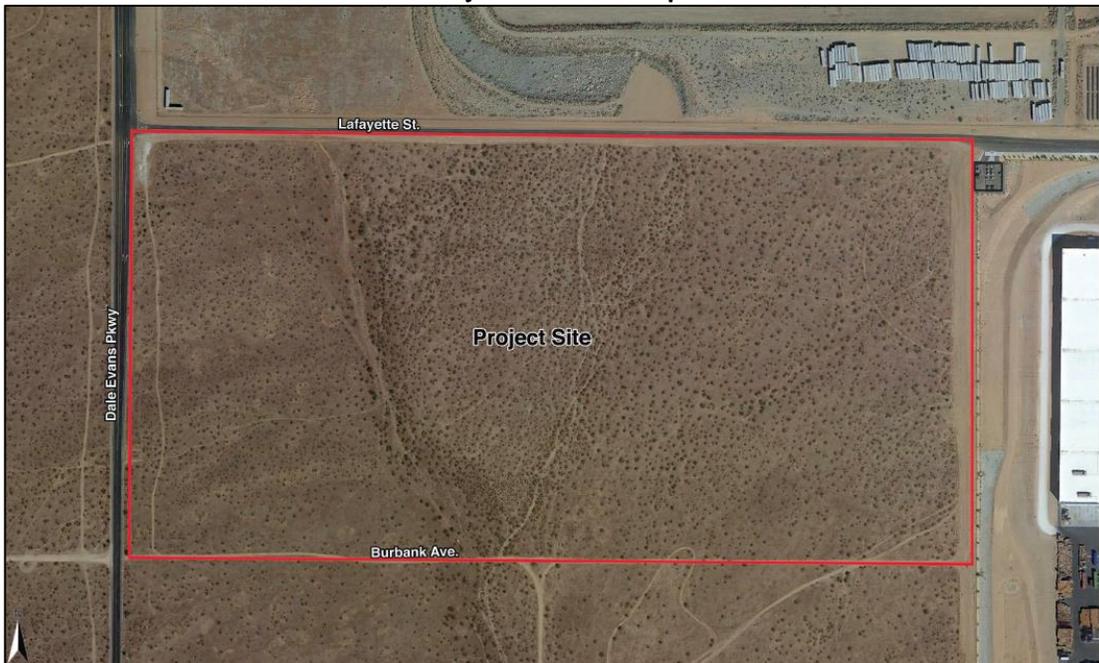
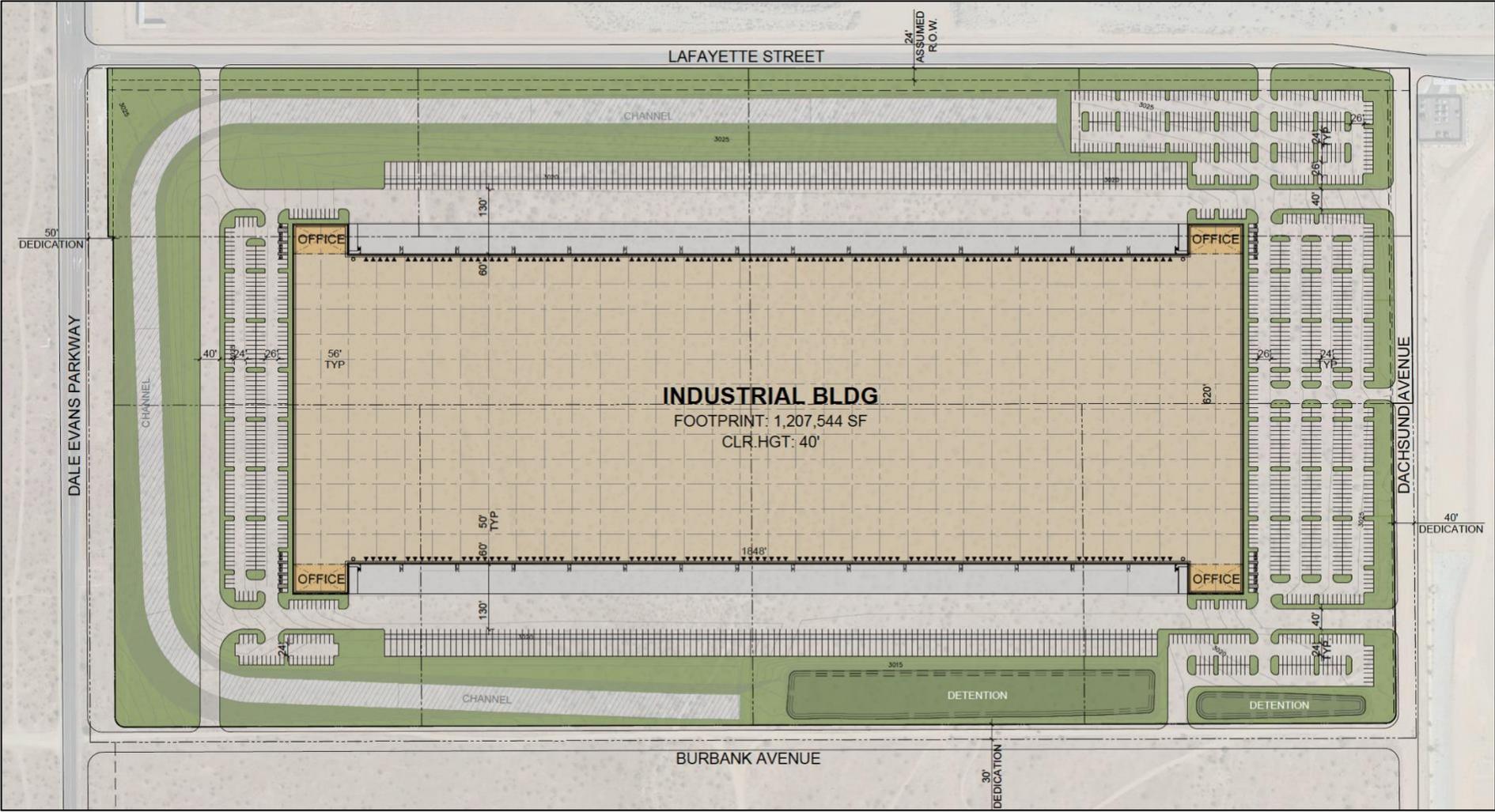


Exhibit 4
Site Plan



Source : Conceptual Site Plan prepared by Ware Malcomb 8/8/2022

6 – Project Water Demands

The Development at Lafayette Street and Dale Evans Parkway Project proposes to develop approximately 78 acres of vacant land in the Town of Apple Valley to include 1,207,544 square feet of industrial/warehouse uses, and 828,493 SF irrigated space⁵².

6.1 Projected Indoor Commercial and Industrial Water Demand

The projected indoor commercial and industrial unit usage for this WSA are based on the American Water Works Association Research Foundations (AWWARF's) Commercial and Industrial End Uses of Water. The projected indoor commercial and industrial water demand for the Project totals 18.46 AFY as shown in Table 15.

Table 15: Project Indoor Commercial and Industrial Water Demand

Use	Indoor Area (ft ²)	Water Demand Factor(gal/SF/year) ¹	Water Demand (gpd)	Water Demand (AFY)
Office	60,377	35	5,789.58	6.49
Warehouse	1,147,167	3.4	10,685.94	11.97
TOTAL	1,207,360		16,475.52	18.46

¹ Office water demand factor from AWWA Commercial and Industrial End Uses of Water; Warehouse water demand factor from U.S. Energy Information Administration 2012 Commercial Buildings Energy Consumption Survey, Water Consumption in Large Buildings Summary.

6.2 Projected Outdoor Irrigation Water Demand

The projected outdoor irrigation water usage is based on the Maximum Applied Water Allowance (MAWA) equation from the Town of Apple Valley Ordinance No. 479, which is compliant with the Department of Water Resources Code of Regulations Title 23, Division 2, Chapter 2.7 "Model Water Efficient Landscape Ordinance". The projected outdoor irrigation water demand for the Project is 46.96 AFY as shown in Table 16 below.

Table 16: Projected Outdoor Irrigation Water Demand

Planning Area	Landscaped Area (ft ²)	ETo (in/yr) ¹	ETAF ²	Conversion Factor (gal/ft ²) ³	Water Demand (gpd)	Water Demand (AFY)
Project Wide	828,493	66.2	0.45	0.62	41,923.56	46.96
TOTAL	828,493				41,923.56	46.96

¹ Reference Evapotranspiration (ETo) from Town of Apple Valley Ordinance No. 479.

² Evapotranspiration Adjustment Factor (ETAF) from Town of Apple Valley Ordinance No. 479.

³ Conversation Factor from Town of Apple Valley Ordinance No. 479.

⁵² Irrigated space includes landscaping and detention space.

6.3 Projected Total Water Demand

The total projected water demand for the Project is 65.42 AFY, as shown in Table 17, below.

Table 17: Projected Total Water Demand

Planning Area	Land Area (Acres)	Indoor Commercial and Industrial Demand (AFY)	Outdoor Irrigation Demand (AFY)	Total Water Demand (AFY)
Office	60,377	6.49		6.49
Warehouse	1,147,167	11.97		11.97
Project Wide	828,493		46.96	46.96
TOTAL	--	18.46	46.96	65.42

6.4 Projected Water Sources

The anticipated water source for the Project will be Liberty Utilities' groundwater sourced from the Mojave Basin Area potable supply.

7 – Assessment: Availability of Sufficient Supplies

7.1 Water Supply Assessment

Based on the analysis in this Water Supply Assessment, the projected total water demand for the Development at Dale Evans and Lafayette (Project) will be 65.42 acre-feet per year (AFY). Liberty Utilities' long-term water management planning ensures that adequate water supplies are available to meet existing and futures water needs within its service area. Liberty Utilities' actual potable water demand for 2020 was 10,067 acre-feet (AF), and the projected urban water demand is 13,948 AF for 2045. The Project's water demand of 65.42 AFY accounts for approximately 1.69 percent of the total planned increases in demand of 3,881 AF by 2045.

This WSA provides an assessment of the availability of adequate water supplies during normal, single-dry, and multiple-dry years over a 20-year projection to meet the project demands of the Project, in addition to existing and planned Liberty Utilities, as required by Senate Bill 610 (SB 610). This WSA also includes identification of existing water supply entitlements, water rights, water service contracts, and agreements relevant to the identified water supply for the Project and quantities of water received in prior years pursuant to those entitlements, rights, contracts, and agreements.

This WSA has been prepared in compliance with the requirements of SB 610 by Terra Nova Planning and Research in consultation with Liberty Utilities and the Town of Apple Valley.

This WSA does not relieve the Project from complying with all applicable state, county, city, and local ordinances, and indoor water use performance standards provided in the CWC.

8 – References

American Water Works Association Research Foundation Commercial and Industrial End Uses of Water (2000).

California Water Code, Section 10610-10656 Urban Water Management Plans

California Water Code Appendix, Mojave Water Agency Law, Section 97-1 et seq., 1960.

Department of Water Resources California's Groundwater Update 2003 – Upper Mojave River Valley Groundwater Basin.

Department of Water Resources California's Groundwater Update 2013: A Compilation of Enhanced Content for California Water Plan Update 2013 - South Lahontan Hydrologic Region.

DWR Sustainable Groundwater Management Act, 2019 Basin Prioritization (2019).

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Mojave Water Agency Sustainable Groundwater Management Act; <https://www.mojavewater.org/basin-management/regional-planning/sgma/>, Accessed 07/05/2022.

Mojave Water Agency Urban Water Management Plan (2020).

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U.S. Energy Information Administration Commercial Buildings Energy Consumption Survey, Water Consumption in Large Buildings Summary (2012); <https://www.eia.gov/consumption/commercial/reports/2012/water/>; Accessed 07/11/2022.

Ware Malcomb, Conceptual Site Plan - Lafayette Street & Dale Evans Parkway, Jun 6th, 2022.

Subject: FW: Requests to Prepare Water Supply Assessment (WSA)
Date: Tuesday, January 17, 2023 at 10:47:16 AM Pacific Standard Time
From: Kelly Clark <kclark@terranovalplanning.com>
To: Kimberly Cuza <kcuza@terranovalplanning.com>
Attachments: image001.png, image002.jpg, image003.jpg, image004.png

Kim – below is the email chain confirming that the Town received the approval of the Redwood West WSA from Liberty Utilities. Can you please PDF and place in the WSA folder? Thank you!
Kelly

From: Daniel Alcayaga <dalcayaga@applevalley.org>
Date: Tuesday, January 17, 2023 at 9:50 AM
To: Kelly Clark <kclark@terranovalplanning.com>
Cc: Yenifer Cid <ycid@applevalley.org>, Orlando Acevedo <OAcevedo@applevalley.org>
Subject: RE: Requests to Prepare Water Supply Assessment (WSA)

Hi Kelly: The Town has received and acknowledges receipt of Liberty's approval of the WSA.

Thank you,



**Daniel
Alcayaga, AICP**
Planning Manager

Town of Apple Valley
760.240.7000 x7205

From: Kelly Clark <kclark@terranovalplanning.com>
Sent: Monday, January 16, 2023 7:52 AM
To: Daniel Alcayaga <dalcayaga@applevalley.org>
Cc: Yenifer Cid <ycid@applevalley.org>
Subject: Re: Requests to Prepare Water Supply Assessment (WSA)

Good Morning Daniel,

Can you please confirm that the Town has received and acknowledges Liberty's approval of the Development at Lafayette and Dale Evans Parkway WSA? We will use this email chain for our records.

Thank you!

Kelly Clark



TERRA NOVA PLANNING & RESEARCH, INC.®