Appendix K
Water Supply Assessment

DRAFT

Water Supply Assessment

Cordova Complex and Quarry/ Pawnee Complex Project, San Bernadino County, California

JULY 2023

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Acronyms and Abbreviations

Acronym/Abbreviation	Definition
AF	acre-feet
AFY	acre-feet per year
APN	Assessor's Parcel Number
BAP	Base Annual Production
CEQA	California Environmental Quality Act
CWC	California Water Code
DWR	California Department of Water Resources
gpd	gallons per day
gpm	gallons per minute
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
mg/L	milligrams per liter
PSY	Production Safe Yield
PWS	public water system
SB	Senate Bill
SGMA	Sustainable Groundwater Management Act
USGS	United States Geological Survey
Watermaster	Mojave Basin Area Watermaster
WSA	Water Supply Assessment

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1 Introduction

1.1 Purpose of Document

Senate Bill (SB) 610 was passed on January 1, 2002, amending the California Water Code (CWC) to require detailed analysis of water supply availability for certain types of development projects. The primary purpose of SB 610 is to improve the linkage between water and land use planning by ensuring greater communication between water providers and local planning agencies, as well as ensuring that land use decisions for certain large development projects are fully informed as to whether a sufficient water supply is available to meet project demands. SB 610 requires preparation of a Water Supply Assessment (WSA) for a project that is subject to the California Environmental Quality Act (CEQA) and meets certain requirements. SB 610 is codified in CWC Division 6, Part 2.10 (Sections 10910–10915).

The Cordova Complex and Quarry/Pawnee Complex Projects (Project) has been determined to be subject to CEQA by the Town of Apple Valley (Town) acting as lead agency. The Project satisfies the statutory definition of a "project" for the purpose of determining SB 610 applicability because it is considered an industrial development occupying more than 40 acres of land and has more than 650,000 square feet of floor area, per CWC Section 10912(a)(5). The lead agency will make an independent determination as to whether there is adequate water supply for the proposed Project, having considered the entire administrative record. In compliance with SB 610, this WSA examines the availability of the identified water supply under normal-year, single-dry-year, and multiple-dry-year conditions over a 20-year projection, accounting for the projected water demand of the Project plus other existing and planned future uses of the identified water supply.

1.2 Project Location and Description

The approximately 160-acre Project is comprised of two proposed warehouse buildings located in the northern part of the Town, which is within the Victor Valley Region of San Bernardino County (Figure 1). Apple Valley is bordered by the City of Victorville to the west, the City of Hesperia to the southwest, and unincorporated San Bernardino County to the north and east. Regional Access to Apple Valley is provided by Interstate 15 and State Route 18. The Project consists of two proximately located warehouse buildings, the Cordova Complex and Quarry Pawnee Complex (Project), which are separated by approximately 1,750 feet (Figure 1). The anticipated use of Project facilities is logistics and distribution.

Cordova Complex

The approximate 87-acre Cordova Complex site is bounded by Cordova Road to the north, Navajo Road to the east, Johnson Road to the south, and Dachshund Avenue to the west. The site consists of Assessor's Parcel Numbers (APNs) 046-321-305, 046-321-306, 046-321-307, 046-321-308, 046-321-309, 046-321-316, 046-321-333, 046-321-334, 046-321-335 and 046-321-336.

The Cordova site is currently vacant and undeveloped land. Surrounding uses include Ecco Stoves, a sporting goods store which is located west of the site, as well as a Walmart Distribution Center and Victor Valley College Regional Public Safety Training Center, located south of the site. Further south of the site is Fresenius Medical Care Distribution and Big

Lots Distribution Center. Areas directly east and north of the site consist of undeveloped land. Scattered rural residential units are located northwest of the site.

The Cordova site is identified under the Specific Plan land use designation in the Town of Apple Valley General Plan and is also zoned as Specific Plan (SP) (Town of Apple Valley 2015, 2022). The site falls within the North Apple Valley Industrial Specific Plan, which designates the site under the Specific Plan Industrial land use (Town of Apple Valley 2012).

The Project would include construction of a 1,559,952 square foot (sf) warehouse building at the Cordova site. The Cordova site design drawings can be found in Appendix A. The first floor would include warehouse operations and 5,000 sf of office space, while the second floor would include an additional 5,000 sf of office space. The warehouse would include 133 loading dock doors on the northern warehouse facade with an additional 133 loading dock doors along the southern facade.

The Project includes landscaped areas totaling approximately 720,900 sf. The plantings are drought tolerant, native species and would be watered using drip irrigation. Other onsite improvements would include surface parking, parking for electric vehicles and bicycles; and construction of new detention basins for onsite drainage and stormwater/rain capture.

Because the Cordova site is currently undeveloped, new domestic water, sanitary sewer, stormwater, and electrical connections would be required. New utility connections would tie into the Town's existing utility infrastructure.

Tenants of the Cordova site have not yet been identified. It is assumed that the tenants will be related to logistics and distribution business operations and will not be especially water-intensive use businesses. Business operations would be expected to be conducted within the enclosed building, with the exception of ingress and egress of trucks and passenger vehicles accessing the site; passenger and truck parking; the loading and unloading of trailers within designated truck courts/loading areas; and the internal and external movement of materials around the Project site via forklifts, pallet jacks, yard hostlers, and similar equipment. It is anticipated that the facilities would be operated 24 hours a day, 7 days a week.

Quarry Pawnee Complex

The approximate 75-acre Quarry Pawnee Complex is located proximate to the Cordova site and is bounded by Quarry Road to the north and Flint Road to the east. The site consists of APNs 046-321-406, 046-321-407, 046-321-408 and 046-321-409.

The Quarry Pawnee site is currently vacant with undeveloped land. Surrounding uses to the north, south, and west consist of undeveloped land. A single rural residence is located directly east of the Project boundary, east of Flint Road. Additional scattered rural residences are located farther to the north of the site and the Apple Valley Speedway is located farther northeast of the site.

The Quarry Pawnee site is identified under the Specific Plan land use designation in the Town of Apple Valley General Plan and is also zoned as Specific Plan (Town of Apple Valley 2015, 2021). The site falls within the North Apple Valley Industrial Specific Plan, which designates the site under the Specific Plan Industrial land use (Town of Apple Valley 2012).

This component of the Project would include construction of a 1,462,342-sf warehouse building. The Quarry Pawnee site design drawings can be found in Appendix B. The first floor would include warehouse operations and 5,000 sf office space, while the second floor would include an additional 5,000 sf of office space. The warehouse

would include 118 loading dock doors on the eastern warehouse façade with an additional 117 loading dock doors along the western façade.

The Project includes landscaped areas totaling approximately 500,765 sf. The plantings are drought tolerant, native species and would be watered using drip irrigation. Other onsite improvements include surface parking for vehicles, EV vehicles, and trucks; and construction of new of detention basins for onsite drainage and stormwater/rain capture.

Because the Quarry Pawnee site is currently undeveloped, new domestic water, sanitary sewer, stormwater, and electrical connections would be required. New utility connections would tie into the Town's existing utility infrastructure.

Tenants of the Quarry Pawnee site have not yet been identified. It is assumed that the tenants will be related to logistics and distribution business operations and will not be especially water-intensive use businesses. Business operations would be expected to be conducted within the enclosed building, with the exception of ingress and egress of trucks and passenger vehicles accessing the site; passenger and truck parking; the loading and unloading of trailers within designated truck courts/loading areas; and the internal and external movement of materials around the project site via forklifts, pallet jacks, yard hostlers, and similar equipment. It is anticipated that the facilities would be operated 24 hours a day, 7 days a week.

1.3 Water Supply Assessment Applicability

SB 610 amended California Water Code (CWC) Sections 10910 and 10912 to create a direct relationship between water supply and land use. SB 610 establishes the legal framework for assessing the sufficiency of water supply for new development which qualify as a "Project". Per California Water Code Section 10912(a), a "Project" means any of the following:

- Proposed residential development of more than 500 dwelling units
- Proposed shopping center or business establishment employing more than 1,000 persons, or having more than 500,000 square-feet of floor space
- Proposed commercial office building employing more than 1,000 persons or having more than 250,000 square-feet of floor space
- Proposed hotel or motel or both, having more than 500 rooms
- 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 area
- Proposed mixed-use project that includes one or more of the above components
- Proposed project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project. (Water Code Section 10912(a).)

The Project qualifies as a "Project" per California Water Code Section 10912(a) because it is a proposed industrial facility that occupies more than 40 acres of land and has more than 650,000 square-feet of floor space. A WSA has also been prepared to assist in responding to the CEQA Guidelines Utilities and Service System impact questions. The CWC, as amended by SB 610, requires that a WSA address the following questions:

- Is there a public water system that will service the project?
- Is there a current Urban Water Management Plan] (UWMP) that accounts for the project demand?

- Is groundwater a component of the supplies for the project?
- Are there sufficient supplies to serve the project over the next 20 years?

The primary question to be answered in a WSA per the requirements of SB 610 is: *Will the total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection meet the projected water demand of the proposed project, in addition to existing and planned future uses of the identified water supplies, including agricultural and manufacturing uses?*

The response to this question also informs and assists the lead agency in responding to the CEQA Guidelines Utilities and Service Systems question: *Would the Project have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry, and multiple dry years?*

1.3.1 Identification of a Public Water System

Section 10912 of the CWC defines a "public water system" as a system that has 3,000 or more service connections and provides piped water to the public for human consumption. Under SB 610, WSA reports must be prepared and furnished to local governments by the water utility serving that community for inclusion in any environmental documentation for projects meeting the specified requirements under Section 10912 (a) of the CWC and subject to CEQA. According to CWC Section 10910 (g)(1), "[…] the governing body of each public water system, or the city or county if either is required to comply with this act […] shall approve the assessment prepared pursuant to this section at a regular or special meeting." According to SB 610, the public water system serving the project area is required to prepare the WSA report.

The Project is within the water service area of the Mojave Water Agency (SGMA Data Viewer) and the water service area established for Liberty Utilities (Figure 2; Liberty Utilities 2021). Liberty Utilities (Apple Valley Ranchos Water Company, also referred to as Liberty Utilities) is an investor-owned public utility, meeting the definition of a Public Water System. Liberty Utilities provides water service primarily within the Town. As of 2020, Liberty Utilities provides approximately 21,000 municipal connections (Liberty Utilities, 2021).

1.3.2 Urban Water Management Plan Coverage

Urban Water Management Plans (UWMPs) are prepared by California's urban water suppliers to support long-term resource planning and ensure adequate water supplies. UWMPs must be updated and submitted to the California Department of Water Resources (DWR) every 5 years for review and approval. The DWR has identified the UWMP as a foundational document in the preparation of a WSA, noting that a thorough UWMP can provide the required information to fulfill the standards set forth by SB 610. Every urban water supplier that either delivers more than 3,000 acre-feet per year (AFY) of water annually or serves more than 3,000 connections is required to assess the reliability of its water sources over a 20-year period under normal-year, dry-year, and multiple dry-year scenarios; these are the same requirements of a WSA, as specified by SB 610. A WSA may also rely on additional water supply data beyond the information in the UWMP.

An UWMP was created and submitted to DWR to satisfy 2020 requirements by Liberty Utilities. The 2020 UWMP for Liberty Utilities contains detailed information about the urban water supplier's water supply and demand estimates. The 2020 UWMP serves as an update to Liberty Utilities water resource needs, water use efficiency programs, water reliability assessment and strategies to mitigate water shortage conditions and builds upon the

previous UWMP that was submitted in 2015 (Liberty Utilities, 2021). The water demand for the Project is not accounted for in the 2020 UWMP for Liberty Utilities. The Project sites are designated as Specific Plan Industrial land use, which allows for a broad range of clean manufacturing and warehousing uses, ranging from manufacturing to warehouse distribution facilities (Town of Apple Valley, 2012).

The UWMP projects future industrial water use in 5-year increments based on recent water demands and the total population projections based on land use trends within the Liberty Utilities service area. The projected future water use for each individual water sector is based on the percentage breakdown of water use reported from each individual water use sector in 2020 (Liberty Utilities 2021). The UWMP reported that 2 AF of water demand was reported for the industrial sector in 2020 and projects a 2 AFY water demand for the industrial sector to remain constant between 2025 and 2045.

The UWMP projects future commercial water use in 5-year increments by scaling existing/metered commercial water use within its service area along with general population growth trends, as established using DWR's Population Tool (Liberty Utilities, 2021). For example, the UWMP projects a 101 AF increase in yearly commercial water demand between 2020 and 2025 (and continues to increase it in five-year increments thereafter). Given Liberty Utilities' projected population forecasts, the Project's water demand (discussed in Section 2) reasonably fits within this projected increase. The UWMP indicates that Liberty Utilities can meet water demands during normal years, single dry years, and a five consecutive year drought period over the next 25 years (Liberty Utilities, 2021). The rationale for this conclusion is: (1) although the underlying basin is adjudicated, there is no hard limit on the amount of groundwater that can be produced annually, (2) Liberty Utilities has been able to meet demands during historical 5-year droughts, and (3) Liberty Utilities has a water shortage contingency plan and demand management measures in place (Liberty Utilities, 2021).

1.3.3 Groundwater as a Component of Project Water Supply

Groundwater is the only source of water supply for the Liberty Utilities' distribution system and the only source proposed for the Project. Liberty Utilities provides domestic water from potable supply wells within its service area and provides water for agricultural purposes from groundwater production wells which are separate from Liberty Utilities' potable water system.

1.3.4 Sufficiency of Supplies Over the Next 20 Years

As described in Section 2, Project Water Demand; Section 4, Water Resources Inventory; and Section 5, Reliability of Water Supplies, there is adequate water available to supply the proposed Project. Although the future business that is conducted in the warehouses would increase the existing Liberty Utilities water demand, Project related impacts to water supply should not be an issue based on other existing and planned future uses, under normal-year, single-dry-year, and multiple-dry-year conditions over a 20-year projection (Liberty Utilities, 2021).

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2 Project Water Demand

Construction of the Cordova and Quarry Pawnee Complex warehouses is anticipated to commence in the third quarter of 2024 (if the Project is approved) with an 8- to 13-month construction duration. Construction activities would include site clearing and grading, trenching for utilities, building construction, paving, and landscaping. Construction water demand was not provided and is estimated to be insignificant. During construction, it is anticipated that water would be delivered to the Project by truck.

During operation, water would be supplied to the Project through a water main. The estimated water demand during the anticipated 35-year operation and maintenance life of the Project also includes irrigation demand. Due to the unknown plans and water demands of future tenants, water demand from three different similar businesses was used to estimate potential annual water use volumes. Table 1 shows the water use for the example warehouse developments provided by Liberty Utilities (G. Miles, personal communication, June 20, 2022). This estimate was based on average water use per square foot of similar project types (distribution centers) within the Liberty Utilities service area. Table 2 shows the three different water use rates averaged and applied to the Project footprint. Each scenario for operational water demand has been converted to AFY and collectively averaged for the estimation of 20 AFY of water for the Cordova Complex and 18 AFY for the Quarry/Pawnee Complex. Plans for decommissioning and potential revegetation of the site at the end of the 35-year project life are not yet complete and no water demand is estimated for decommissioning at this time.

The irrigation use demands were calculated using DWR's Model Water Efficient Landscape Ordinance worksheet and assumed that the entire landscape area of both Project sites would be low water use plantings requiring drip irrigation. The irrigation calculations are included as Appendix C and are summarized in Table 2 along with the operational demands.

Table 1. Water Usage for Example Warehouses

Business	Size (sq ft)	Gallons per day	Acre feet per year	Gallon/day per sq ft
Big Lots	1,360,875	673	0.75	0.0005
Fresenius Medical Blue	150,000	378	0.42	0.003
WalMart DC	1,080,000	29,920	33.51	0.03

Source: G. Miles, personal communication, June 20, 2022.
Notes: sf = square feet

Table 2. Estimated Water Usage for Project Operation and Irrigation

Project Site	Size (sq ft)	Operation gpd per sf[1]	Operation (gpd)	Operation (AFY)	Operation Average Use (AFY)[2]	Irrigation Use (AFY)	Total Use (AFY)
Cordova Complex	1,559,952	0.0005	780	0.9	20	34	**54**
		0.003	4,667	5.2			
		0.03	46,770	52.4			

Table 2. Estimated Water Usage for Project Operation and Irrigation

Project Site	Size (sq ft)	Operation gpd per sf[1]	Operation (gpd)	Operation (AFY)	Operation Average Use (AFY)[2]	Irrigation Use (AFY)	Total Use (AFY)
Quarry/Pawnee Complex	1,461,240	0.0005	731	0.8	18	20	**38**
		0.003	4,384	4.9			
		0.03	43,387	49.1			
				Total	**38**	**54**	**92**

Notes: sf=square foot; gpd=gallons per day; AFY = acre-feet per year; 1 acre-foot = 325,851 gallons.

1 Representative similar distribution center project demands. See Table 1.

2 Average of similar distribution center projects demands applied to the Project footprint.

The total estimated Project operation and irrigation water usage demands are 54 AFY for the Cordova Complex and 38 AFY for the Quarry/Pawnee Complex, which totals 92 AFY for both Projects.

3 Water Resources Plans and Programs

The following provides a description of water resources plans and programs applicable to the Project.

3.1 Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act (SGMA) is a package of three bills (Assembly Bill 1739, SB 1168, and SB 1319) and provides local agencies with a framework for managing groundwater basins in a sustainable manner. The SGMA establishes minimum standards for sustainable groundwater management, roles and responsibilities for local agencies that manage groundwater resources, priorities, and timelines to achieve sustainable groundwater management within 20 years of adoption of a Groundwater Sustainability Plan (GSP). The SGMA also requires all high and medium priority basins be sustainably managed. The Mojave Basin Area is considered an adjudicated and very low priority[2] basin in DWR's 2019 SGMA Basin Prioritization and thus is exempt from the requirements of developing a Groundwater Sustainability Plan (DWR, 2019). The Basin is managed by a court-appointed water master, as discussed below in Section 3.2.

3.2 Mojave Basin Area Adjudication

The Mojave Watershed was adjudicated in 1996 in an effort to preserve the limited resources typical of arid regions by regulating groundwater allocations. The adjudication was initiated by a 1990 lawsuit filed by the City of Barstow and Southern California Water Company, claiming excessive water use in the upper Mojave River Basin, thus reducing the amount of surface and groundwater available to the central Basin. Additional cross-complaints were filed, and several parties joined the lawsuit. For more than 18 months, water producers of all types who were reliant upon the Mojave River Basin commenced negotiations which eventually produced the "Final Judgment" on how the groundwater supply could be fairly distributed (Water Education Foundation, 2022).

Mojave Water Agency is the current Court-appointed Watermaster for the Mojave Basin Area Judgment. The Watermaster's main responsibilities are to monitor and verify water production, collect required assessments, conduct studies, and prepare an annual report. The adjudication is primarily concerned with maintaining groundwater levels to help maintain a specified level of groundwater pumping in the area (Mojave Water Agency, 2022). The Watermaster does not have a specific obligation towards maintaining water quality; however, it is noted that continued pumping in depleted areas may result in long-term local negative water quality impacts such as migration of lesser quality water. The Watermaster is currently responsible for reporting the following types of data in the Mojave Basin Area:

- Verification of reported groundwater production
- Mojave River flows
- Precipitation Page 6-4 Salt and Nutrient Management Plan, Mojave Water Agency
- Wastewater discharges
- Subsurface inflow

[2] Under the 2019 Basin Prioritization, all adjudicated basins were automatically assigned a very low priority because they are excluded from SGMA. A "very low" priority in this case does not suggest that a basin does not have problems with respect to groundwater.

- State Water Project and wastewater imports
- Groundwater levels
- Ungauged surface water inflows

3.3 Urban Water Management Planning Act

The Urban Water Management Planning Act (CWC Sections 10610–10657) requires urban water suppliers to prepare a UWMP every 5 years and to submit it to the DWR, the California State Library, and any city or county within which the supplier provides water supplies. All urban water suppliers, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet (AF) annually are required to prepare a UWMP (CWC Section 10617).

The Urban Water Management Planning Act was enacted in 1983. Over the years, it has been amended in response to water resource challenges and planning imperatives confronting California. A significant amendment was made in 2009 as a result of the governor's call for a statewide 20% reduction in urban water use by 2020, referred to as "20x2020," the Water Conservation Act of 2009, and "SB X7-7." This amendment required urban retail water suppliers to establish water use targets for 2015 and 2020 that would result in statewide water savings of 20% by 2020. Beginning in 2016, urban retail water suppliers were required to comply with the water conservation requirements in SB X7-7 in order to be eligible for state water grants or loans.

A subsequent substantial revision to the Urban Water Management Planning Act was made in 2018 through a pair of bills (Assembly Bill 1668 and SB 606), described below in Section 3.4, Water Use Efficiency Standards. These changes include, among other things, additional requirements for Water Shortage Contingency Plans, expansion of dry-year supply reliability assessments to a 5-year drought period, establishment of annual drought risk assessment procedures and reporting, and new conservation targets referred to as "annual water use objectives," which will require retailers to continue to reduce water use beyond the 2020 SB X7-7 targets. The Urban Water Management Planning Act contains numerous additional requirements that a UWMP must satisfy.

3.4 Water Use Efficiency Standards

The Water Conservation legislation of 2018 (SB 606 and Assembly Bill 1668)— referred to as "Making Water Conservation a California Way of Life" or the "2018 Water Conservation Legislation"— established a new foundation for long-term improvements in urban water supplier conservation and drought planning in order to adapt to climate change and the longer, more intense droughts in California. Together, Assembly Bill 1668 and SB 606 lay out a new long-term water conservation framework for California. This new framework is far-reaching for both the urban and agricultural sectors of California and represents a major shift in focus. Programs and initiatives are organized around four primary goals:

1. Use water more wisely
2. Eliminate water waste
3. Strengthen local drought resilience
4. Improve agricultural water use efficiency and drought planning

Collectively, this legislation provides a road map for all Californians to work together to ensure that we will have enough water now and, in the years, ahead. One of the major outcomes of the legislation is the adoption of long-term standards for the efficient use of water and performance measures for commercial, industrial, and institutional water use on or before June 30, 2022. The bill establishes a standard for indoor water use of 55 gallons per capita daily to be reached by 2025, 52.5 gallons per capita daily beginning in 2025, decreasing to 50 gallons per capita daily beginning in 2030, or an alternative to this standard as determined jointly by DWR and State Water Resources Control Board in accordance with necessary studies and investigations.

On July 8, 2021, the Governor signed Executive Order N-10-21 which asks Californians to voluntarily reduce water use by 15% from 2020 levels. The Executive Order was in direct response to California experiencing the second driest year on record and the ongoing drought.

On January 4, 2022, the State Water Resources Control Board adopted an emergency regulation that prohibits certain wasteful water use practices statewide and encourages Californians to monitor their water use more closely while building habits to use water wisely.

3.5 Water Shortage Contingency Plan

Liberty Utilities includes a water shortage contingency plan within their UWMP that presents how the water supplier will respond in the event of an actual water shortage contingency. The main management measures in the plan are summarized below:

1. Beginning in 2022, Liberty Utilities will be required to submit an Annual Assessment reviewing unconstrainted water demands for the current year and the potential upcoming single dry year
2. Liberty Utilities will incorporate multiple standard water shortage levels into their management plans ranging from 10 percent to greater than 50 percent
3. Customers will be required to reduce their consumption levels by the percentage specified in the plan
4. Increased tracking of customer water usage and outdoor usage restrictions
5. Emergency Response Plan

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4 Water Resources Inventory

The following provides a description of the potential water sources available to the Project.

4.1 Local Surface Water

Liberty Utilities does not use surface water to meet its water demands (Liberty Utilities 2021). The nearest major river to the Project site is the Mojave River, which is approximately 9-miles west of the Project site (Figure 2).

4.2 Groundwater

The following provides a description of the groundwater supply available to the Project.

4.2.1 Groundwater Basin Description

The Project site is located within the Upper Mojave River Valley Groundwater Basin (DWR Basin No. 6-042) as mapped by the DWR as well as the Mojave Basin (Alto Subarea), as designated by the Mojave Basin Area Watermaster (Figure 2). The Basin is an adjudicated groundwater basin and is exempt from the requirements of developing a Groundwater Sustainability Plan (GSP) as it is designated as a very-low priority basin. The groundwater basin is bounded on the north from basement rock outcrops near Helendale to those in the Shadow Mountains. The southern boundary is the contact between Quaternary sedimentary deposits and unconsolidated basement rocks of the San Bernardino Mountains (Figure 3). The basin is bounded on the southeast by the Helendale fault and on the east by basement exposures of the mountains surrounding Apple Valley. In the west, the boundary is marked by a surface drainage divide between this basin and El Mirage Valley Basin, and a contact between alluvium and basement rocks that form the Shadow Mountains. (DWR, 2004). It is important to note that the definition of the Upper Mojave River Valley Groundwater Basin and the Mojave Basin Area are distinctly separate from each other with the Mojave Basin area being smaller in size and more closely following the shape of the Mojave River.

4.2.2 Groundwater Supply Description

Liberty Utilities has historically pumped groundwater directly from the Mojave Basin Area to serve its customers. The Basin Area is subdivided into five smaller areas (Oeste, Alto, Este, Centro, and Baja) and the Project would be located within the Alto Subarea (Figure 2). Groundwater movement occurs between each of the subbasins with the primary form of recharge being predominantly from infiltration from the Mojave River (Liberty Utilities, 2021). The Mojave Basin Area Watermaster monitors groundwater levels in three separate areas within the Alto subarea: (1) the Western portion located generally west of the Mojave River (the river is included in the western portion); (2) the Eastern portion located generally east of the Mojave River; and (3) the Alto Transition Zone. The Project is in the eastern portion of the Alto Subarea, east of the Mojave River.

The Alto Subarea has the largest water supply in the Mojave Basin (Town of Apple Valley, 2009). Water levels in the Alto subarea in wells located near the Mojave River exhibit seasonal variation, rising in winter and falling in summer. The Mojave Basin Area Watermaster (2022) notes that variability showing lower water level lows and lower water level highs is an indication of groundwater extractions exceeding recharge over time. Water levels in the western portion of the Alto Subarea in the regional aquifer exhibit water level declines consistent with locally heavy pumping and limited

local recharge. Water levels in the eastern portion of the Alto Subarea indicate similar water level trends to the western portion, although to a lesser extent, most likely due to limited pumping in the regional aquifer east of the river. Water levels in wells located near the Mojave River, particularly in the south part of the Alto Subarea, have experienced a trend of decline for 7 years consistent with limited recharge due to drier than average conditions. Water supply conditions for the past 10 years have been dry. During the 2021-2022 Water Year the precipitation at Lake arrowhead amounted to 46.64 inches, which is about 112 percent of the 60-year Base Period average of 41.5 inches. The Mojave Basin Area Watermaster has determined that continuation of dry conditions from below normal precipitation will result in further water level declines (Mojave Basin Area Watermaster, 2022).

According to the Sustainable Groundwater Management Act (SGMA) Basin Prioritization Dashboard, DWR has designated the Upper Mojave River Valley Groundwater Basin as very low priority and the Basin has been adjudicated to determine the water rights of the various producers (DWR, 2022a). Because the Project is within an adjudicated area, it is not subject to the requirements of California's Sustainable Groundwater Management Act, but instead is subject to groundwater pumping allocations under the court adjudication set up to mitigate long-term overdraft, to keep subareas in balance, and to meet biological resource mitigation obligations (Mojave Basin Area Watermaster 2022). Final Judgment was entered in 1996 adopting the physical solution set forth in the Judgment. The purpose of the Judgment was to create incentives to conserve local water, guarantee that downstream producers will not be adversely affected by upstream producers, and assess producers to obtain funding for the purchase of imported water. To carry out the Mojave Basin Judgment and sustainability manage and mitigate the observed water level declines, the Mojave Water Agency has assigned Base Annual Production amounts to each producer using 10-acre feet per year or more.

4.2.3 On-Site Well Inventory and Groundwater Levels

Figure 4 shows wells in the vicinity of the Project site according to the National Water Information System Mapper (USGS 2023), SGMA Data Viewer (DWR 2023), and Groundwater Ambient Monitoring and Assessment Program (SWRCB 2023). According to the SGMA Data Viewer, there are numerous groundwater wells surrounding the Project site. Only one well, a 120-foot deep residential well (State Well Number 06N03W08N001S), has had regular (yearly or twice-yearly) monitoring of groundwater levels since 1993 (DWR 2023). This well indicates that groundwater levels within the Project area specifically have remained stable throughout the period ranging between 71 and 74 feet below ground surface (Figure 5; DWR 2023). There are no active wells on the subject property and only one active well adjacent to the property according to the datasets. The nearest wells are approximately 400-feet east and 1,200-feet north of the subject property (Figure 4).

4.2.4 Groundwater Quality

Within the Mojave Basin, calcium bicarbonate character groundwater is present near the San Bernardino Mountains and the Mojave River channel. Sodium bicarbonate groundwater is present in the area of the Basin near Victorville. Sodium bicarbonate-sulfate groundwater is present in the area of the Basin near Adelanto. Sodium-calcium sulfate groundwater is present in the area of the Basin west of Victorville. Sodium chloride groundwater is present in the area of the Basin near Apple Valley. Elevated nitrate concentrations occur in the southern portion of the Basin and elevated iron and manganese concentrations are found in the area of the Basin near Oro Grande. Groundwater has been contaminated with trichloroethane at the former George Air Force Base, now a Superfund site. Leaking underground storage tanks in and around Victorville have introduced fuel additives benzene, toluene, ethlybenzene, xylene, and methyl tertiary butyl ether (MTBE) into groundwater (DWR, 2004).

There are no groundwater quality issues present in groundwater delivered for potable use. The UWMP provides the following information regarding groundwater quality served by Liberty Utilities (2021):

> Liberty Utilities currently obtains potable groundwater supplies from 20 active wells in the Mojave Basin Area. According to Liberty Utilities' annual Consumer Confidence Reports, potable groundwater quality within Liberty Utilities' service area currently meets all the regulatory requirements. There have been no contaminants detected that exceed any federal or state drinking water standards. Hundreds of samples analyzed every month and thousands every year by Liberty Utilities contract certified laboratories assure that all primary (health related) and secondary (aesthetic) drinking water standards are met. [...] Currently, water quality does not affect water supply reliability in the Liberty Utilities service area. Therefore, no anticipated change in reliability or supply due to water quality is anticipated based on the present data.

4.3 Imported Water and Wastewater/Recycled Water

Liberty Utilities does not purchase imported water supplies to meet its current water demands: however, it does have to pay a replacement water fee to the Mojave Basin Area Watermaster for any supply it uses in excess of its pumping limits. Base annual production limits are discussed in detail in Section 5. The Watermaster also manages the transfer of surplus water between producers in the Basin. Surplus and deficits between the producers are calculated annually.

Liberty Utilities also does not rely on any recycled water at the current time. According to the 2020 UWMP, the Victor Valley Wastewater Reclamation Authority, which provides wastewater collection and treatment services to Liberty Utilities, has constructed facilities to serve recycled water within Liberty Utilities' service area, if needed in the future.

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5 Reliability of Water Supplies

The Project is within the Town of Apple Valley; therefore, it would receive water from Liberty Utilities. Actual and projected water supplies for the Town without the Project are shown in Table 3 and Table 4. These projections were taken from the 2020 UWMP for Liberty Utilities – Apple Valley and show the actual and projected supply and demand estimates for a normal water year in 5-year increments. Table 5 and Table 6 show the projected supply and demand estimates for a single dry year, and multiple dry years, respectively. The supply and demand totals are the same because Liberty Utilities only pumps the amount of water necessary to serve the demand in any given year. Although the basin is adjudicated, there is no hard limit on the amount of water than can be produced. The UWMP states the following with regard to limits on groundwater production (Liberty Utilities 2021):

> The Mojave Basin Area Judgment assigned Base Annual Production (BAP) rights to producers which historically used 10 AFY or more, based on historical production. BAP is defined as the producer's highest annual use verified for the five-year base period from 1986 to 1990. Parties to the Judgment are assigned a variable Free Production Allowance (FPA) by the Watermaster, which is a percentage of BAP set for each Subarea for each year. The allocated FPA represents each producer's share of the water supply available for that Subarea. [Liberty Utilities'] current FPA for the Alto Subarea is 55 percent of BAP for municipal and industrial and 70 percent of BAP for agriculture.
>
> Production Safe Yield (PSY) is determined for each Subarea within the Mojave Basin Area. The PSY in each Subarea is assumed to equal the average net natural water supply plus the expected return flow from the previous year's water production. Exhibit H of the Judgment requires that in the event the FPA exceeds the estimated PSY by five percent or more of BAP, Watermaster recommend a reduction in FPA equal to, but not more than, a full five percent of the aggregate Subarea BAP. [...] If Liberty Utilities pumps more than its FPA, then it must pay the Watermaster to purchase SWP replacement water equal to the amount of production in excess of the FPA. Alternatively, Liberty Utilities may meet its obligation by transferring unused FPA from another party within the Subarea.

Liberty Utilities' BAP to the Mojave Basin Area – Alto Subarea was 13,610 AFY and its FPA was 7,486 AFY (55% of the total BAP) for FY 2021-22 (Mojave Area Basin Watermaster 2023). The BAP for Liberty Utilities has increased approximately 280 AF since FY 2011-2012 as a result of acquiring additional water rights. While water suppliers are allowed to exceed their FPA limits, they are responsible for paying a fee for any water needed in surplus of the FPA. For FY 2021-2022 Liberty Utilities had a replacement water obligation of 792 AF, which the Watermaster was responsible for acquiring. According to the Watermaster 2021-2022 Annual Report:

> Producers in each Subarea are allowed to produce as much water as they need annually to meet their requirements, subject only to compliance with the Physical Solution set forth in the Judgment. An underlying assumption of the Judgment is that sufficient water will be made available to meet the needs of the Basin in the future from a combination of natural supply, imported water, water conservation, water reuse and transfers of FPA among parties.

Groundwater is the only source of water available to meet the Project's water demands and would be required for various activities including construction, operations, and eventual decommissioning. The type of tenants that would occupy the proposed warehouses is unknown, although the type of operations have a direct correlation to the actual water demand use. It is assumed that the tenants will be related to logistics and distribution business operations and

will not be especially water-intensive use businesses. For this report, the estimated average water demand of 54 AFY for the Cordova Complex and 38 AFY for the Quarry/Pawnee Complex (totaling 92 AFY) was used based on data from Liberty Utilities. Table 7 shows the population forecast for Liberty Utilities service area. Tables 8, 9, and 10 show the projected water supply and demand for a normal year, single dry year, and multiple dry years through 2045. Liberty Utilities is expecting a water demand growth increase for the next 20 years which includes associated building growth such as the Project. According to the UWMP, Liberty Utilities has been able to meet its demands even with decreasing supply and increasing population and demand. In 2011, Liberty Utilities pumped 18,230 AF from the Basin, the highest amount in the last 10 years. This supply, however, is nearly equivalent to the demand estimated for 2045 and shows that Liberty is well-equipped to handle the reduced supply and anticipated population and demand growth into the future. Based on this analysis, the additional 92 AFY needed for the Project can be added to the supply projections and will not negatively impact long-term supplies.

Table 3. Current and Projected Water Supply and Demand Comparison (without Project) for Normal Year

	Actual (AF)	Projected (AF)				
Water Sources	2020	2025	2030	2035	2040	2045
Demand						
Single Family	6,486	7,107	7,579	8,077	8,602	9,156
Industrial	2	2	2	2	2	2
Commercial	1,736	1,837	1,909	1,984	2,064	2,149
Institutional/Government	517	547	568	591	615	640
Landscape	588	622	646	672	699	727
Agricultural Irrigation	4,912	4,950	4,950	4,950	4,950	4,950
Losses	710	751	781	812	844	879
Other	28	30	31	32	34	35
Total	**14,979**	**15,846**	**16,466**	**17,120**	**17,810**	**18,538**

Source: Liberty Utilities, 2021.
Notes: AF = acre-feet; 1 acre-foot = 325,851 gallons.

Table 4. Projected Water Supply and Demand Comparison (without Project) for Normal Year

	Projected (AF)				
Supply/Demand	2025	2030	2035	2040	2045
Total Water Demand	15,846	16,466	17,120	17,810	18,538
Total Potable Supply	15,846	16,466	17,120	17,810	18,538

Source: Liberty Utilities, 2021.
Notes: AF = acre-feet; 1 acre-foot = 325,851 gallons.
"Normal year" is represented by Calendar Year 2020 in which the total amount of rainfall was similar to the historical average rainfall.

Table 5. Projected Water Supply and Demand Comparison (without Project) for Single Dry Year

Supply/Demand	Projected (AF)				
	2025	2030	2035	2040	2045
Total Water Demand	14,922	15,506	16,122	16,772	17,458
Total Potable Supply	14,922	15,506	16,122	16,772	17,458

Source: Liberty Utilities, 2021.
Notes: AF = acre-feet; 1 acre-foot = 325,851 gallons.
"Single dry year" is represented by Calendar Year 2017, in which the total amount of rainfall was below the historical average rainfall.

Table 6. Projected Water Supply and Demand Comparison (without Project) for Multiple Dry Years

		Projected (AF)				
		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
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
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
Fourth 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
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

Source: Liberty Utilities, 2021.
Notes: AF = acre-feet; 1 acre-foot = 325,851 gallons.
Table 6 shows the projected water supply and demand incorporating the estimated demand from Table 2 added to the average project supply and demand forecasts from Table 4 for a normal water year. While it is difficult to predict actual supply and demand numbers given a multitude of factors, the population growth for the town of Apple Valley is expected to see moderate growth of approximately 1.2% percent over the next 25 years. Population projections can be seen in Table 8.
"Multiple Dry Years" is represented by Calendar Year 2011 to Calendar Year 2015, where the total amount of rainfall during each of these years was less than the historical average rainfall.

Table 7. Liberty Utilities Service Area Population – Current and Projected

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

Source: Liberty Utilities, 2021

Table 8. Projected Water Supply and Demand Comparison (with Project) for Normal Year

	Projected (AF)				
	2025	2030	2035	2040	2045
Total Potable Supply	15,938	16,558	17,212	17,902	18,630
Total Water Demand	15,938	16,558	17,212	17,902	18,630

Source: Liberty Utilities, 2021.
Notes: AF = acre-feet; 1 acre-foot = 325,851 gallons.
"Normal year" is represented by Calendar Year 2020 in which the total amount of rainfall was similar to the historical average rainfall.

Table 9. Projected Water Supply and Demand Comparison (with Project) for Single Dry Year

Supply/Demand	Projected (AF)				
	2025	2030	2035	2040	2045
Total Water Demand	15,014	15,598	16,214	16,864	17,550
Total Potable Supply	15,014	15,598	16,214	16,864	17,550

Source: Liberty Utilities, 2021
Notes: AF = acre-feet; 1 acre-foot = 325,851 gallons.
"Single dry year" is represented by Calendar Year 2017, in which the total amount of rainfall was below the historical average rainfall.

Table 10. Projected Water Supply and Demand Comparison (with Project) for Multiple Dry Years

	Projected (AF)					
		2025	2030	2035	2040	2045
First Year	Supply Totals	19,377	20,131	20,927	21,767	22,653
	Demand Totals	19,377	20,131	20,927	21,767	22,653
Second Year	Supply Totals	17,852	18,546	19,280	20,053	20,869
	Demand Totals	17,852	18,546	19,280	20,053	20,869
Third Year	Supply Totals	18,206	18,915	19,663	20,452	21,284
	Demand Totals	18,206	18,915	19,663	20,452	21,284
Fourth Year	Supply Totals	17,532	18,214	18,934	19,694	20,495
	Demand Totals	17,532	18,214	18,934	19,694	20,495
Fifth Year	Supply Totals	14,388	14,948	15,538	16,161	16,818
	Demand Totals	14,388	14,948	15,538	16,161	16,818

Source: Liberty Utilities, 2021.
Notes: AF = acre-feet; 1 acre-foot = 325,851 gallons.
"Multiple Dry Years" is represented by Calendar Year 2011 to Calendar Year 2015, where the total amount of rainfall during each of these years was less than the historical average rainfall.

6 Conclusion

Liberty Utilities – Apple Valley relies on water pumped from the Alto Subarea of the Mojave River Basin which has seen a declining trend in groundwater levels for over 25 years. Due to increased pumping and unsustainable yields, the Mojave River Basin was Adjudicated in 1996 in an effort to control water levels and manage the future for the growing basin population. Liberty Utilities has met 100 percent of its total water demands with supplies from the Mojave Basin area during the last drought between 2011 and 2015 and has a water shortage contingency plan in place in the event of severe drought occurrence. In addition, Liberty has also reduced their pumping supply since 2011 and has continued to meet the demand of its service area. The 2021-2022 Watermaster Report has also shown that Liberty Utilities is able to meet its demand annually in times of recent drought. Despite a nearly 50% FPA reduction in the Basin and Subbasin, Liberty Utilities has met demand through a series of carry-overs, transfers, and replacement water agreements.

While Liberty Utilities service area is expected to experience population growth over the next 25 years, the 2020 UWMP has also considered increased development as a result. Furthermore, Victor Valley Wastewater Reclamation Authority has constructed facilities to increase recycled water supply for Liberty Utilities in the future. As seen in the tables presented in Section 5, Liberty Utilities has projected supply and demand estimates for normal, dry, and multiple dry water years and expects water supply to match demand for the next 20 years. Given this information, the Cordova Complex and Quarry/Pawnee Complex Projects water demand estimated to be 92 AFY would likely not adversely affect the water supply for Liberty Utilities for the duration of the Project life .

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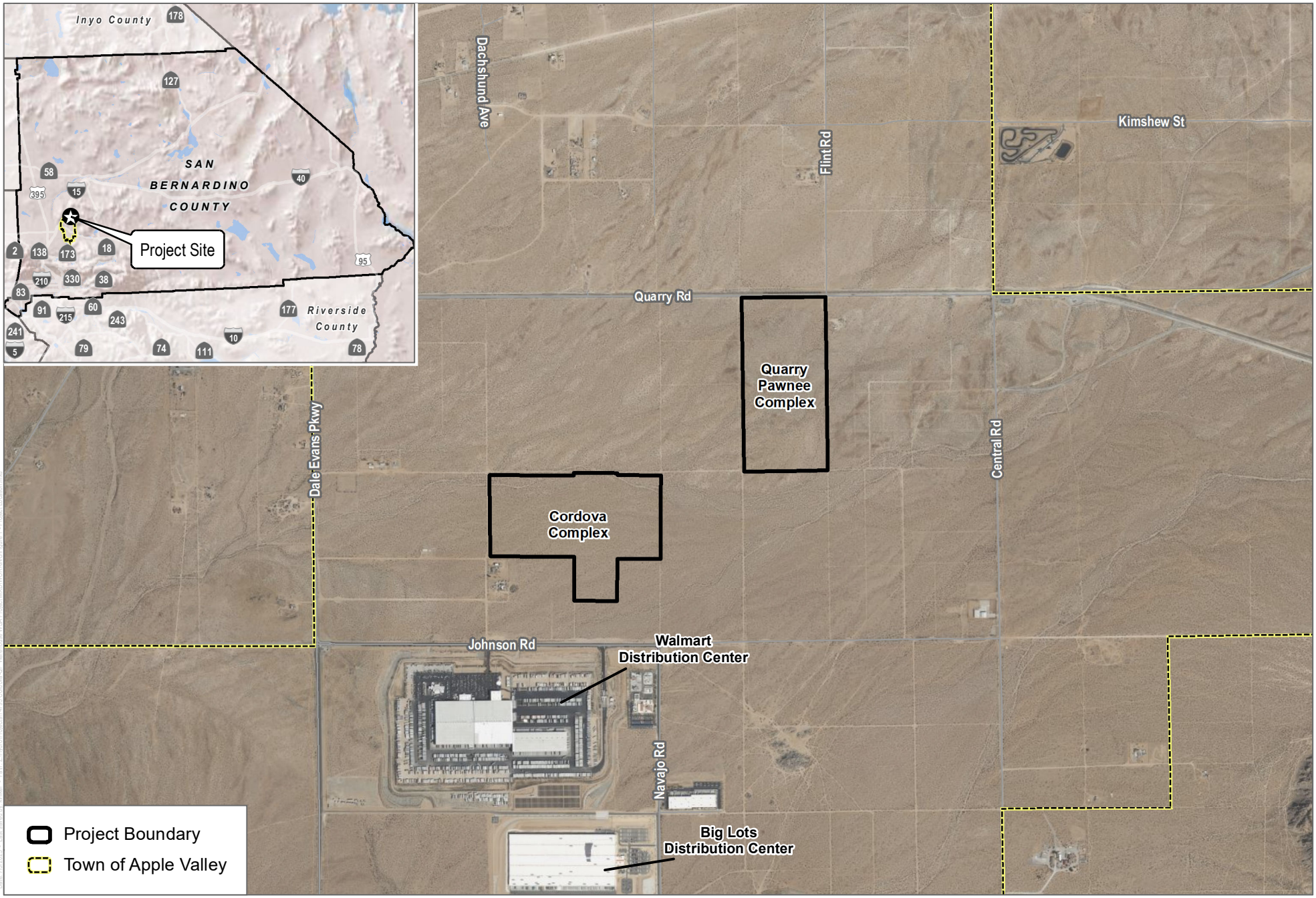

SOURCE: Bing Imagery 2021

DUDEK

0 1,000 2,000 Feet

FIGURE 1

Project Location

Cordova Complex and Quarry/Pawnee Complex Project - Water Supply Assessment

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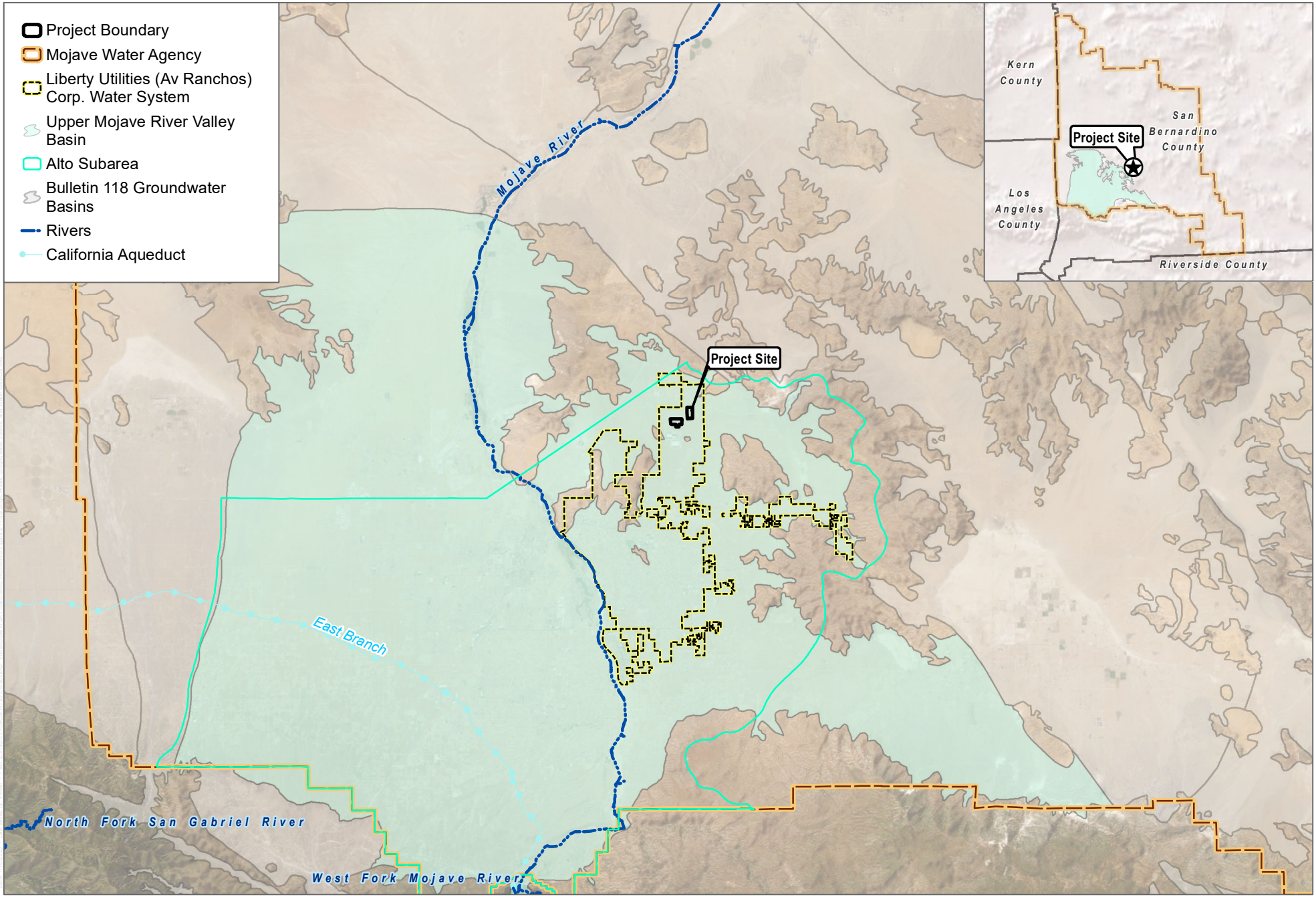

SOURCE: ESRI; DWR; NHD

DUDEK

0 2.5 5 Miles

FIGURE 2

Hydrologic Areas, Groundwater Basins, and Water Districts

Cordova Complex and Quarry/Pawnee Complex Project - Water Supply Assessment

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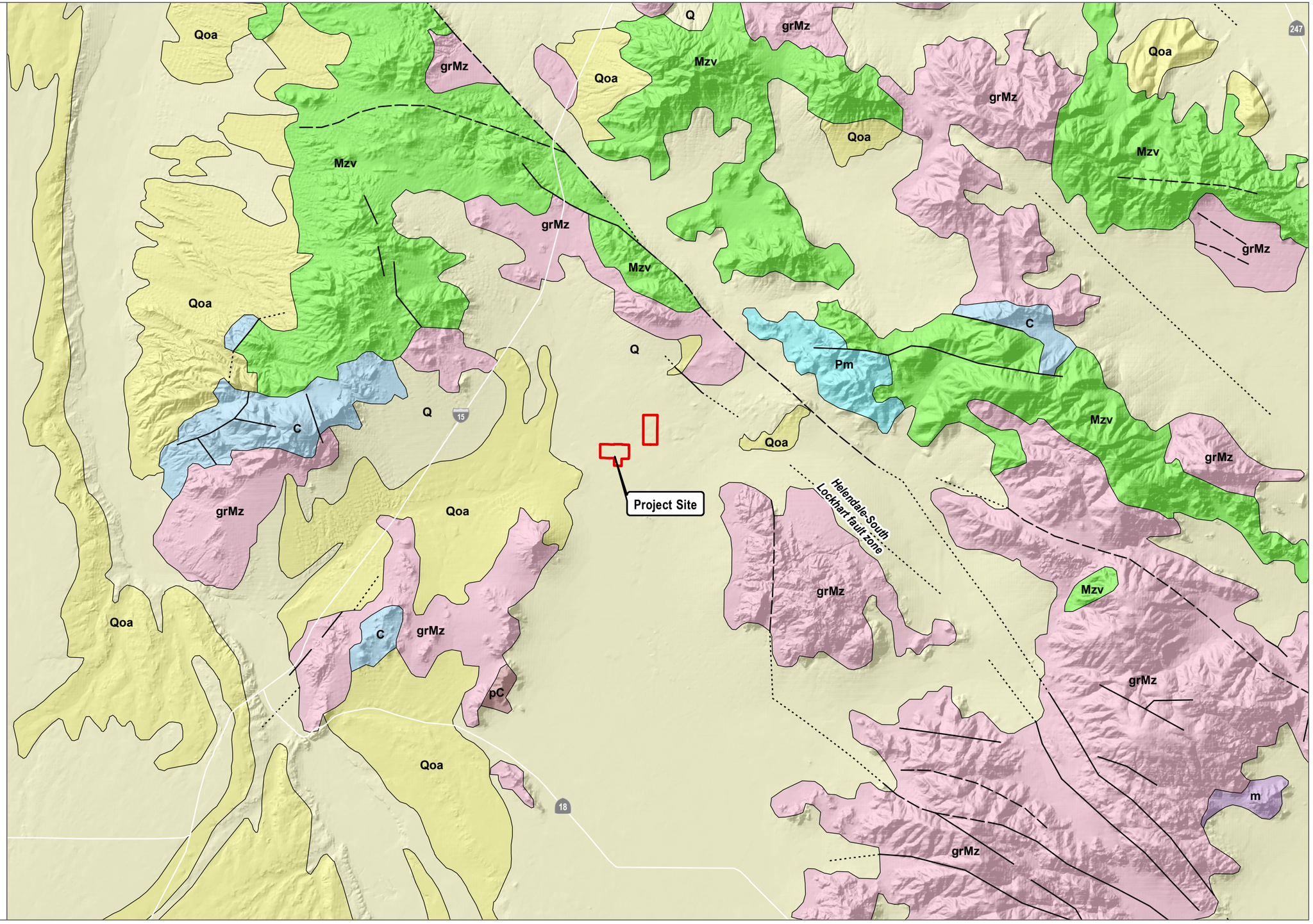
Project Boundary

Contacts and Faults

- contact, certain
- fault, approx. located
- fault, certain
- fault, concealed
- dextral fault, concealed

Geologic Units

- Q - Alluvium, lake, playa, and terrace deposits
- Qoa - Older alluvium, lake, playa, and terrace deposits
- Mzv - Undivided Mesozoic volcanic and metavolcanic rocks
- grMz - Mesozoic granite, quartz monzonite, granodiorite, and quartz diorite
- Pm - Permian shale, conglomerate, limestone, dolomite, sandstone, slate, hornfels, and quartzite; minor pyroclastic rocks
- C - Carboniferous shale, sandstone, conglomerate, limestone, dolomite, chert, hornfels, marble, and quartzite; minor pyroclastic rocks
- m - Undivided pre-Cenozoic metasedimentary and metavolcanic rocks of great variety
- pC - Conglomerate, shale, sandstone, limestone, dolomite, marble, gneiss, hornfels, and quartzite



SOURCE: California Department of Conservation

DUDEK

0 1.25 2.5 Miles

FIGURE 3

Regional Geologic Map

Cordova Complex and Quarry/Pawnee Complex Project - Water Supply Assessment

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Legend

- Project Boundary
- 1-mile Buffer

NWIS Mapper Wells

SGMA Data Viewer Wells

GAMA Wells

- Water Supply, Other

State Well Number:
06N03W08N001S

SOURCE: ESRI; DWR, USGS, SWRCB

DUDEK

0 1,000 2,000 Feet

FIGURE 4

Groundwater Well Locations

Cordova Complex and Quarry/Pawnee Complex Project - Water Supply Assessment

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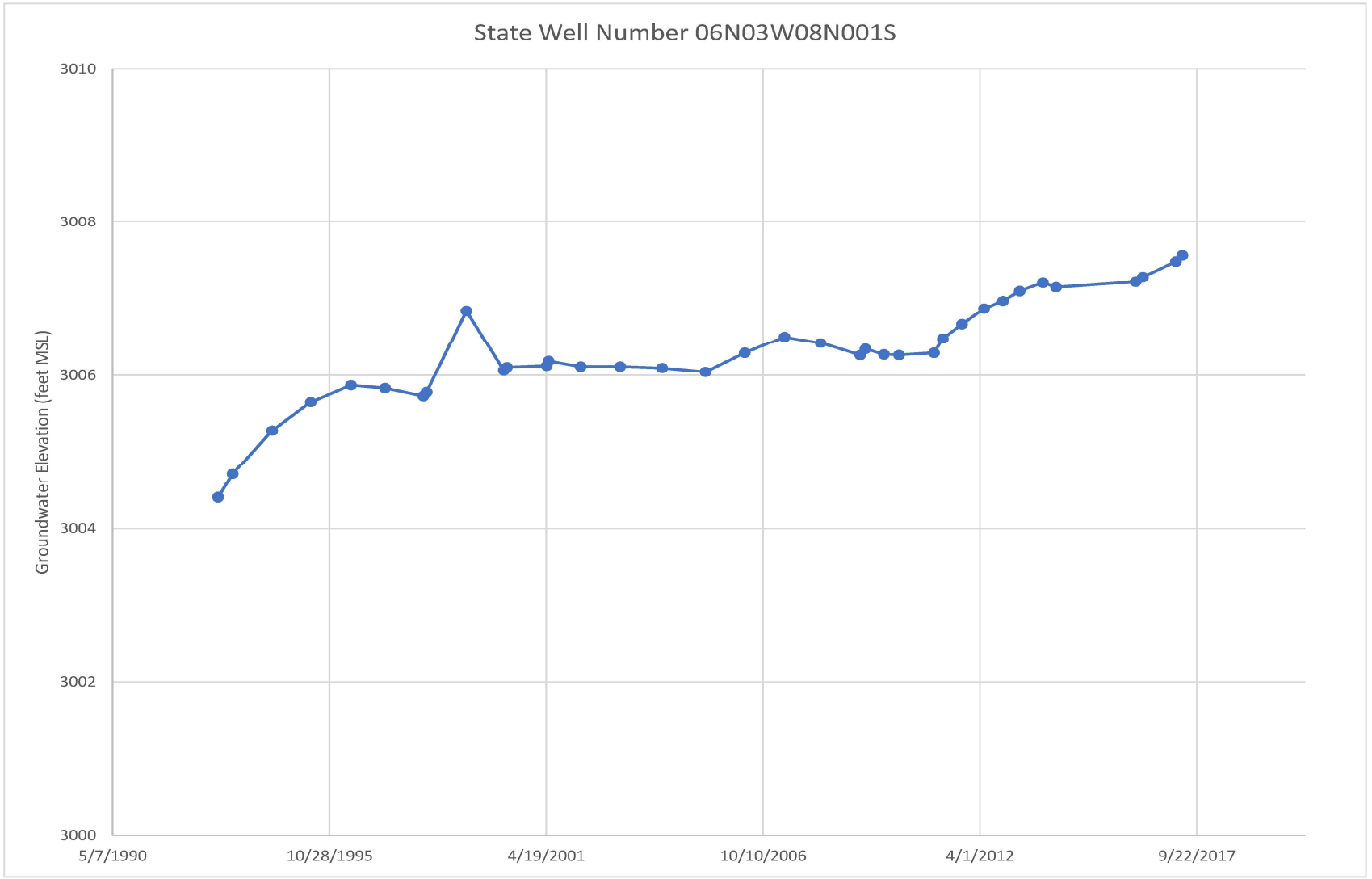

FIGURE 5

State Well Number 06N03W08N001S Hydrograph

Cordova Complex and Quarry/Pawnee Complex Project - Water Supply Assessment

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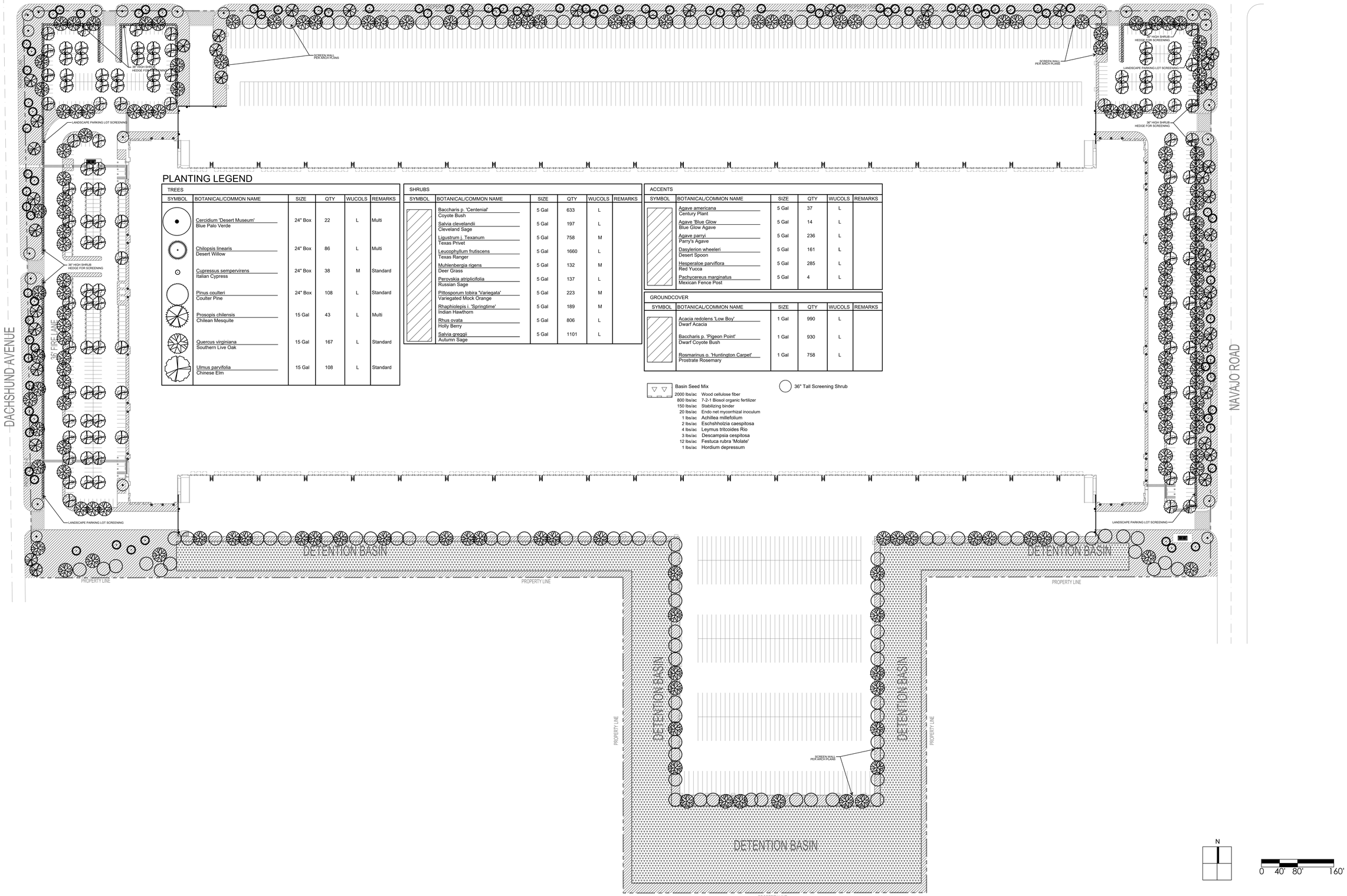
Appendix A

Cordova Complex Site Drawings



PLANTING LEGEND

TREES

SYMBOL	BOTANICAL/COMMON NAME	SIZE	QTY	WUCOLS	REMARKS
	Cercidium 'Desert Museum' Blue Palo Verde	24" Box	22	L	Multi
	Chilopsis linearis Desert Willow	24" Box	86	L	Multi
	Cupressus sempervirens Italian Cypress	24" Box	38	M	Standard
	Pinus coulteri Coulter Pine	24" Box	108	L	Standard
	Prosopis chilensis Chilean Mesquite	15 Gal	43	L	Multi
	Quercus virginiana Southern Live Oak	15 Gal	167	L	Standard
	Ulmus parvifolia Chinese Elm	15 Gal	108	L	Standard

SHRUBS

SYMBOL	BOTANICAL/COMMON NAME	SIZE	QTY	WUCOLS	REMARKS
	Baccharis p. 'Centenial' Coyote Bush	5 Gal	633	L	
	Salvia clevelandii Cleveland Sage	5 Gal	197	L	
	Ligustrum j. Texanum Texas Privet	5 Gal	758	M	
	Leucophyllum frutiscens Texas Ranger	5 Gal	1660	L	
	Muhlenbergia rigens Deer Grass	5 Gal	132	M	
	Perovskia atriplicifolia Russian Sage	5 Gal	137	L	
	Pittosporum tobira 'Variegata' Variegated Mock Orange	5 Gal	223	M	
	Rhaphiolepis i. 'Springtime' Indian Hawthorn	5 Gal	189	M	
	Rhus ovata Holly Berry	5 Gal	806	L	
	Salvia greggii Autumn Sage	5 Gal	1101	L	

ACCENTS

SYMBOL	BOTANICAL/COMMON NAME	SIZE	QTY	WUCOLS	REMARKS
	Agave americana Century Plant	5 Gal	37	L	
	Agave 'Blue Glow Blue Glow Agave	5 Gal	14	L	
	Agave parryi Parry's Agave	5 Gal	236	L	
	Dasylerion wheeleri Desert Spoon	5 Gal	161	L	
	Hesperaloe parviflora Red Yucca	5 Gal	285	L	
	Pachycereus marginatus Mexican Fence Post	5 Gal	4	L	

GROUNDCOVER

SYMBOL	BOTANICAL/COMMON NAME	SIZE	QTY	WUCOLS	REMARKS
	Acacia redolens 'Low Boy' Dwarf Acacia	1 Gal	990	L	
	Baccharis p. 'Pigeon Point' Dwarf Coyote Bush	1 Gal	930	L	
	Rosmarinus o. 'Huntington Carpet' Prostrate Rosemary	1 Gal	758	L	

Basin Seed Mix

2000 lbs/ac	Wood cellulose fiber
800 lbs/ac	7-2-1 Biosol organic fertilizer
150 lbs/ac	Stabilizing binder
20 lbs/ac	Endo net mycorrhizal inoculum
1 lbs/ac	Achillea millefolium
2 lbs/ac	Eschshholzia caespitosa
4 lbs/ac	Leymus tritcoides Rio
3 lbs/ac	Descampsia cespitosa
12 lbs/ac	Festuca rubra 'Molate'
1 lbs/ac	Hordium depressum

36" Tall Screening Shrub

Cardova Rd and Flint Road

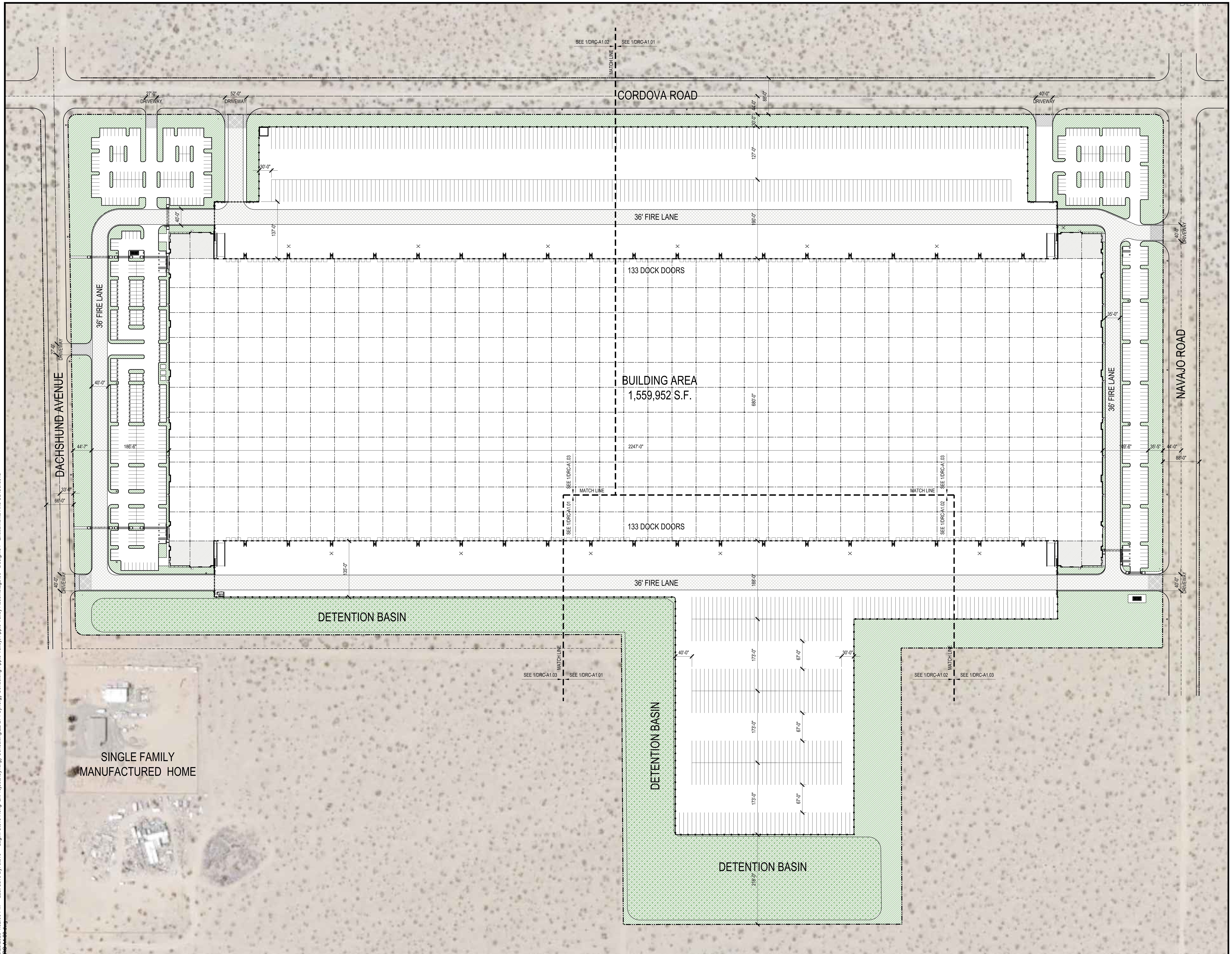
22-136
10.31.22
02.13.23
07.05.23

Apple Valley, California

HUNTER LANDSCAPE
711 FEE ANA STREET PLACENTIA, CA 92870
714.986.2400 FAX 714.986.2408

Appendix B

Quarry Pawnee Complex Site Drawings



MASTER SITE PLAN

TRUE NORTH

SCALE 1" = 80'-0"

1

SKH

4590 MACARTHUR BLVD. SUITE 500
NEWPORT BEACH CA 92660
PROJECT MANAGER: STEVE HONG
714 - 822 - 1171, STEVE@SKHARCHITECT.COM

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REN. 12-31-23
STATE OF CALIFORNIA

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CORDOVA COMPLEX

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SYNERGYCONSULTINGCA

SYNERGY CONSULTING

410 PATTI ANN WOODS DRIVE
HENDERSON NV 89002

No.	ISSUANCE	DATE

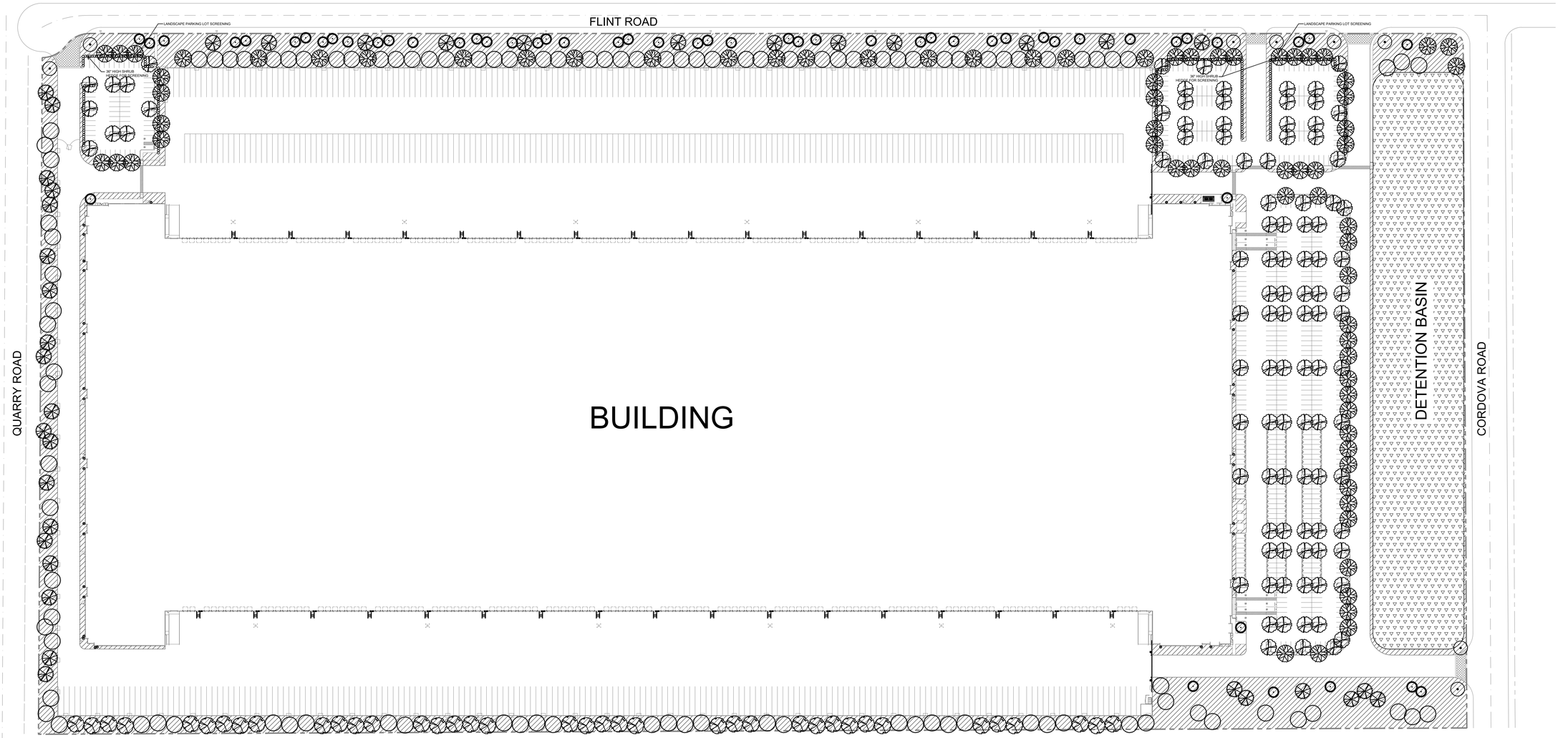
JOB No.
22-274

DRAWN STEVE HONG
CHECKED STEVE HONG

SHEET TITLE
ARCHITECTURAL
OVERALL SITE PLAN

SHEET NUMBER
DRC-A1.00

Plot Date: 6/28/2023 4:02:00 PM Last Save By: steve Login: Steve Hong L:\Projects\Synergy Consulting\22-274 Synergy Consulting Apple Valley, Apple Valley Assemblage\03 - Design\04 - Entitlements And CD\Cordova



PLANTING LEGEND

TREES

SYMBOL	BOTANICAL/COMMON NAME	SIZE	QTY	WUCOLS	REMARKS
	Cercidium 'Desert Museum' Blue Palo Verde	24" Box	8	L	Multi
	Chilopsis linearis Desert Willow	24" Box	50	L	Multi
	Cupressus sempervirens Italian Cypress	24" Box	35	M	Standard
	Pinus coulteri Coulter Pine	24" Box	38	M	Standard
	Pinus eldarica Afghan Pine	24" Box	106	M	Standard
	Prosopis chilensis Chilean Mesquite	15 Gal	37	L	Multi
	Quercus virginiana Southern Live Oak	15 Gal	75	L	Standard
	Ulmus parvifolia Chinese Elm	15 Gal	102	L	Standard

SHRUBS

SYMBOL	BOTANICAL/COMMON NAME	SIZE	QTY	WUCOLS	REMARKS
	Baccharis p. 'Centenial' Coyote Bush	5 Gal	633	L	
	Salvia clevelandii Cleveland Sage	5 Gal	197	L	
	Ligustrum j. Texanum Texas Privet	5 Gal	758	M	
	Leucophyllum frutiscens Texas Ranger	5 Gal	1660	L	
	Muhlenbergia rigens Deer Grass	5 Gal	132	M	
	Perovskia atriplicifolia Russian Sage	5 Gal	137	L	
	Pittosporum tobira 'Variegata' Variegated Mock Orange	5 Gal	223	M	
	Rhaphiolepis i. 'Springtime' Indian Hawthorn	5 Gal	189	M	
	Rhus ovata Holly Berry	5 Gal	806	L	
	Salvia greggii Autumn Sage	5 Gal	1101	L	

ACCENTS

SYMBOL	BOTANICAL/COMMON NAME	SIZE	QTY	WUCOLS	REMARKS
	Agave americana Century Plant	5 Gal	37	L	
	Agave 'Blue Glow Blue Glow Agave	5 Gal	14	L	
	Agave parryi Parry's Agave	5 Gal	236	L	
	Dasylerion wheeleri Desert Spoon	5 Gal	161	L	
	Hesperaloe parviflora Red Yucca	5 Gal	285	L	
	Pachycereus marginatus Mexican Fence Post	5 Gal	4	L	

GROUNDCOVER

SYMBOL	BOTANICAL/COMMON NAME	SIZE	QTY	WUCOLS	REMARKS
	Acacia redolens 'Low Boy' Dwarf Acacia	1 Gal	990	L	
	Baccharis p. 'Pigeon Point' Dwarf Coyote Bush	1 Gal	930	L	
	Rosmarinus o. "Huntington Carpet' Prostrate Rosemary	1 Gal	758	L	

Basin Seed Mix

2000 lbs/ac	Wood cellulose fiber
800 lbs/ac	7-2-1 Biosol organic fertilizer
150 lbs/ac	Stabilizing binder
20 lbs/ac	Endo net mycorrhizal inoculum
1 lbs/ac	Achillea millefolium
2 lbs/ac	Eschshholzia caespitosa
4 lbs/ac	Leymus tritcoides Rio
3 lbs/ac	Descampsia cespitosa
12 lbs/ac	Festuca rubra 'Molate'
1 lbs/ac	Hordium depressum

36" Tall Screening Shrub

N

0 40' 80' 160'

Quarry Rd and Flint Rd

22-136
10.31.22 07.05.23
02.13.23
04.07.23

Apple Valley, California

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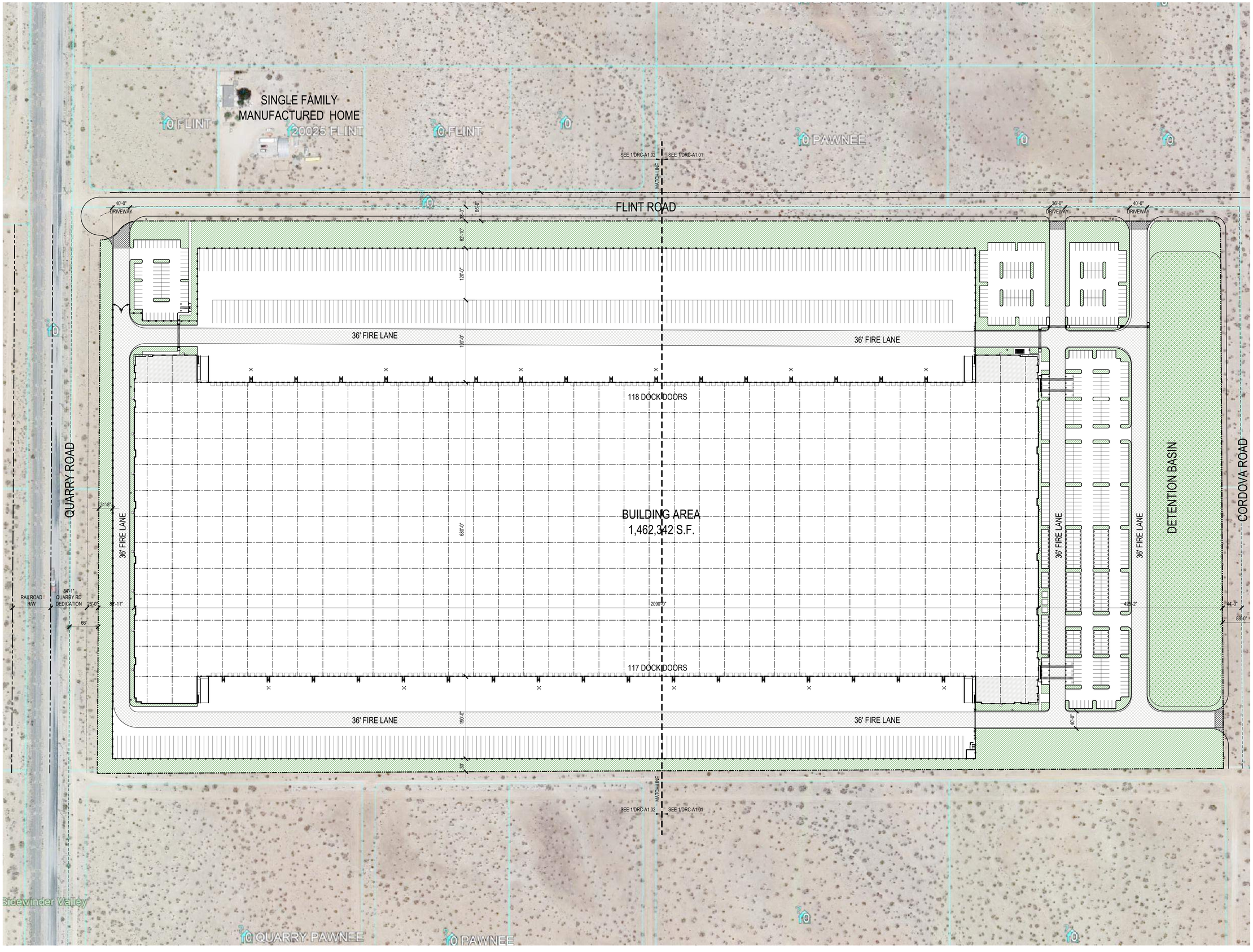

MASTER SITE PLAN

TRUE NORTH

SCALE 1" = 80'-0"

1

SKH
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QUARRY AT PAWNEE

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Appendix C

Model Water Efficient Landscape Ordinance Calculations

Cordova Complex

WATER EFFICIENT LANDSCAPE WORKSHEET

This worksheet is filled out by the project applicant and it is a required element of the Landscape Documentation Package.

Reference Evapotranspiration (ETo) 66.5 (zone 17)

Hydrozone # /Planting Description[a]	Plant Factor (PF)	Irrigation Method[b]	Irrigation Efficiency (IE)[c]	ETAF (PF/IE)	Landscape Area (sq, ft,)	ETAF x Area	Estimated Total Water Use (ETWU)[e]
Regular Landscape Areas							
2	0.3	Drip	0.81	0.37	720,898	266,723	**10,997,371**
				Totals	(A)	(B)	
Special Landscape Areas							
	[redacted]			1			
				1			
				1			
				Totals	(C)	(D)	
						ETWU Total	**10,997,371**
						Maximum Allowed Water Allowance (MAWA)[e]	13,375,181

[a] ***Hydrozone #/Planting Description***
E.g
1.) front lawn
2.) low water use plantings
3.) medium water use planting

[b] ***Irrigation Method***
overhead spray
or drip

[c] ***Irrigation Efficiency***
0.75 for spray head
0.81 for drip

[d] ***ETWU*** **(Annual Gallons Required) =**
Eto x 0.62 x ETAF x Area
where 0.62 is a conversion factor that converts acre-inches per acre per year to gallons per square foot per year.

[e] ***MAWA (Annual Gallons Allowed)*** *= (Eto) (0.62) [(ETAF x LA) + ((1-ETAF) x SLA)]*
where 0.62 is a conversion factor that converts acre-inches per acre per year to gallons per square foot per year, LA is the total landscape area in square feet, SLA is the total special landscape area in square feet, and ETAF is .55 for residential areas and 0.45 for non-residential areas.

ETAF Calculations

Regular Landscape Areas

Total ETAF x Area	(B)
Total Area	(A)
Average ETAF	**B ÷ A**

Average ETAF for Regular Landscape Areas must be 0.55 or below for residential areas, and 0.45 or below for non-residential areas.

All Landscape Areas

Total ETAF x Area	(B+D)
Total Area	(A+C)
Sitewide ETAF	**(B+D) ÷ (A+C)**

Quarry/Pawnee Complex

WATER EFFICIENT LANDSCAPE WORKSHEET

This worksheet is filled out by the project applicant and it is a required element of the Landscape Documentation Package.

Reference Evapotranspiration (ETo) 57.0 (zone 14)

Hydrozone # /Planting Description[a]	Plant Factor (PF)	Irrigation Method[b]	Irrigation Efficiency (IE)[c]	ETAF (PF/IE)	Landscape Area (sq, ft,)	ETAF x Area	Estimated Total Water Use (ETWU)[e]
Regular Landscape Areas							
2	0.3	Drip	0.81	0.37	500,765	185,283	6,547,902
				Totals	(A)	(B)	
Special Landscape Areas							
				1			
				1			
				1			
				Totals	(C)	(D)	
						ETWU Total	**6,547,902**
						Maximum Allowed Water Allowance (MAWA)[e]	7,963,666

[a] ***Hydrozone #/Planting Description***
E.g
1.) front lawn
2.) low water use plantings
3.) medium water use planting

[b] ***Irrigation Method***
overhead spray
or drip

[c] ***Irrigation Efficiency***
0.75 for spray head
0.81 for drip

[d] ***ETWU*** **(Annual Gallons Required) =**
Eto x 0.62 x ETAF x Area
where 0.62 is a conversion factor that converts acre-inches per acre per year to gallons per square foot per year.

[e] ***MAWA (Annual Gallons Allowed)*** *= (Eto) (0.62) [(ETAF x LA) + ((1-ETAF) x SLA)]*
where 0.62 is a conversion factor that converts acre-inches per acre per year to gallons per square foot per year, LA is the total landscape area in square feet, SLA is the total special landscape area in square feet, and ETAF is .55 for residential areas and 0.45 for non-residential areas.

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Total ETAF x Area	(B+D)
Total Area	(A+C)
Sitewide ETAF	**(B+D) ÷ (A+C)**