APPENDIX J

Water Information

APPENDIX J1

Water Supply Assessment Report

Water Supply Assessment Report

Kaiser Permanente Moreno Valley Medical Center

February 20, 2019

Water Supply Assessment Report for the Kaiser Permanente Moreno Valley Medical Center

Section I – Introduction

1.1 Purpose

Water Code 10910 (a) (b) (c)

The purpose of this Water Supply Assessment (WSA) Report is to satisfy the requirements under Senate Bill 610 (SB610), Water Code Section 10910 et seq., Senate Bill 221 (SB221), and Government Code Section 66473 that adequate water supplies are or will be available to meet the water demand associated with a proposed project. SB610 focuses on the content of a water supply agency's Urban Water Management Plan (UWMP) and 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. SB610 applies to a proposed residential development of more than 500 dwelling units, or large commercial, industrial or mixed use development. SB221 requires water supply verification when a tentative map, parcel map, or development agreement for a project is submitted to a land use agency for approval. SB221 applies to proposed residential development of more than 500 dwelling units with some exceptions. The need for an assessment or verification is determined by the lead agency for the project.

1.2 Project Description

The City of Moreno Valley is the lead agency for the preparation of an EIR pursuant to the California Environmental Quality Act (CEQA), Public Resources Code Section 21000, and et seq. for the Kaiser Permanente Moreno Valley Medical Center (Proposed Project). The Proposed Project is located on approximately 30 acres in the City of Moreno Valley and consists of a Central Utility Plant (CUP) of approximately 28,100 square feet, four patient bed towers, a Diagnostics and Treatment Center (D&T), an Emergency Department totaling 458 beds and 850,000 square feet, and three parking structures with a total of 2,550 parking stalls. The Proposed Project is located within the City of Moreno Valley in Riverside County, bounded by Cactus Street to the far north, Oliver Street to the east, Nason Street to the west, and Iris Avenue to the south. The estimated annual demand for the Proposed Project is 318 AF. The developer for the Proposed Project is Kaiser Permanente and the location is shown in Figure 2.

1.3 Requirements

The City of Moreno Valley has requested that Eastern Municipal Water District (EMWD) prepare a WSA for the Proposed Project. Although the Proposed Project is an expansion of an existing facility and therefore not specifically accounted for in EMWD's 2015 UWMP, EMWD has confirmed that the projected demand from the Proposed Project is within the demand projected in the UWMP. As authorized by Water Code Section 10910 (c)(2), EMWD has elected to incorporate information from the 2015 UWMP (attached as Appendix A) in this WSA.

In accordance with Water Code Section 10910 (d)-(f), the WSA shall:

1. Identify any existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the Proposed Project, and provide a

description of the quantities of water received in prior years by the public water system under existing water supply entitlements, water rights, or water service contracts;

2. If no water has been received in prior years by the public water system, identify other public water systems of water service contract holders that receive a water supply or have existing water supply entitlements, water rights or water service contracts to the same source of water as the public water system; and

3. If groundwater is included in the proposed supply, identify the groundwater basin or basins from which the Proposed Project will be supplied and include any applicable documentation of adjudicated rights to pump. If the basin is not adjudicated, regardless of whether the basin has been identified as over drafted, provide a detailed description and analysis of the amount and location of groundwater pumped by the public water system for the past five years from any groundwater basin from which the Proposed Project will be supplied; and provide a detailed description and analysis of the amount and location of groundwater from the basin or basins from which the Proposed Project will be supplied to meet the projected water demand associated with the Proposed Project.

If the Proposed Project includes a "subdivision" of more than 500 residential dwelling units as defined by Government Code Section 66473.7 (a)(1), the public water system shall also provide verification as to whether the public water system is able or unable to provide a sufficient water supply based upon an analysis of whether water supplies available during normal, single-dry, and multiple-dry years within a 20-year projection will meet the projected demand associated with the proposed subdivision which considers:

1. The historical record for at least 20 years;

2. The applicability of any urban water shortage contingency analysis;

3. The reduction in water supply for "specific water use sector" per an adopted resolution, ordinance or contract; and

4. The amount of water that can be reasonably relied upon from specified supply projects.

This assessment is a technical, informational, advisory opinion only. It is a supporting document for an EIR and is not a commitment by EMWD to supply water for the Proposed Project. The information included is based on information available at the time of the report and changing circumstances could affect EMWD's water supply evaluation presented in this document.

This assessment does not specifically address funding of new or existing supplies. The cost of water supplies will increase over time and the developer of this project will be required to fund the acquisition of new, supplemental supplies, treatment or recycled water facilities, and water efficiency measures for existing customers. The extent of additional funding will be determined by EMWD and may take the form of a new component of connection fees or a separate charge.

New customers may also be required to pay a higher commodity rate for water used than existing customers to help offset the rising costs of new supplies.

Prior to project construction, the developer of the Proposed Project is required to meet with EMWD staff to establish development design conditions, which will detail water, wastewater, and recycled water requirements to serve the Proposed Project. If there is a change in the circumstances detailed in this assessment, EMWD will address the changes in the development design conditions for the Proposed Project. Modifications at the development design conditions stage could reduce the amount of water available to serve the Proposed Project.

1.4 Background

EMWD was formed in 1950 and annexed into the Metropolitan Water District of Southern California (MWD) in 1951 to deliver imported water. In 1971, EMWD assumed the additional role of a groundwater producer with the acquisitions of the Fruitvale Mutual Water Company. Presently, EMWD's supply portfolio includes desalinated groundwater, recycled water, potable groundwater and imported water.

EMWD provides both retail and wholesale water supplies to a service area encompassing over 500 square miles with an estimated population of over 780,000 people. Agencies through which EMWD provides water supplies indirectly via wholesale service include the following:

- City of Hemet Water Department
- City of Perris / North Perris Water System
- City of San Jacinto Water Department
- Lake Hemet Municipal Water District (LHMWD)
- Murrieta Division of Western Municipal Water District (WMWD)
- Nuevo Water Company
- Rancho California Water District (RCWD)

1.5 Urban Water Management Plan

Water Code 10910 (c) (1)

In June of 2016, the EMWD Board of Directors adopted the 2015 UWMP. This plan details EMWD's provides information on EMWD's projected supplies and demands in five-year increments through the year 2040, and reports EMWD's progress on water use efficiency targets as defined in the Water Conservation Act of 2009. The 2015 UWMP shows that the majority of EMWD's existing and future planned demand is to be met through imported water delivered by MWD. Demand for EMWD shown in the 2015 UWMP is projected across the District as a whole and is not project specific. The 2015 UWMP relies heavily on information and assurances contained within MWD's 2015 Urban Water Management Plan (UWMP-MWD) when determining supply reliability. The 2015 UWMP-MWD is attached as Appendix B.

1.6 Population Projection

In 2015, EMWD updated the population projections from its 2010 UWMP using information from the District's Database of Proposed Projects and the 2015 Empire Economics Absorption Study. EMWD's prior UWMP used the Riverside County Center for Demographic Research (RCCDR) 2010 Projection, which considers land use and land agency information to develop

future population projections, which was adopted by the Western Riverside Council of Governments.

Consistent with the significant percentage of undeveloped land within EMWD's service area, growth is anticipated to continue throughout the 2015 UWMP's 25-year planning horizon (as shown below in Table 1). Currently, approximately 40 percent of the District's service area is built out. As population and the associated water demands increase, EMWD will increase the amount of water imported via MWD. Alternatively, local supply projects may eventually offset some of the imported water increases.

Table 1: Projected Population (2020 - 2040)

	2020	2025	2030	2035	2040
EMWD – Retail Service Area	617,100	699,800	784,100	864,200	939,100
City of Hemet Water Department	26,900	27,900	28,900	29,800	30,800
City of Perris / North Perris Water System	13,100	13,800	14,500	15,100	15,800
City of San Jacinto Water Department	16,100	18,500	20,800	23,100	25,500
Lake Hemet Municipal Water District	47,200	51,400	55,500	59,400	63,700
Nuevo Water Company	2,600	3,000	3,400	3,900	4,300
Other (Murrieta Division, etc.)	5,000	6,200	7,600	8,700	10,100
Rancho California Water District	128,500	146,500	160,400	174,400	185,300
Total	**856,500**	**967,100**	**1,075,200**	**1,178,600**	**1,274,600**

(1) Data Sources: American Community Survey, Empire Economics, EMWD, RCCDR, United States Census.

Section 2 – Identification of Supply and Quantity

Water Code 10910 (d)(1)

2.1 Overview of Supplies

EMWD has four sources of water supply: imported water purchased from MWD, local potable groundwater, local desalinated groundwater, and recycled water. On average from 2010 through 2015, EMWD's water supply portfolio averaged approximately 57 percent imported water, 10 percent groundwater, 4 percent desalinated groundwater, and 29 percent recycled water. These figures include water that was indirectly served as wholesale water. Please note that the average proportion of imported water in EMWD's water supply portfolio was affected by sizeable reductions in 2015 (relative to prior years) due to the mandatory water use restrictions enacted by the State Water Resources Control Board in response to severe statewide drought conditions. An annual breakdown of EMWD's supplies is shown in Table 2, which supplements information from the 2015 UWMP. General locations of EMWD's water supplies are shown in Figure 1.

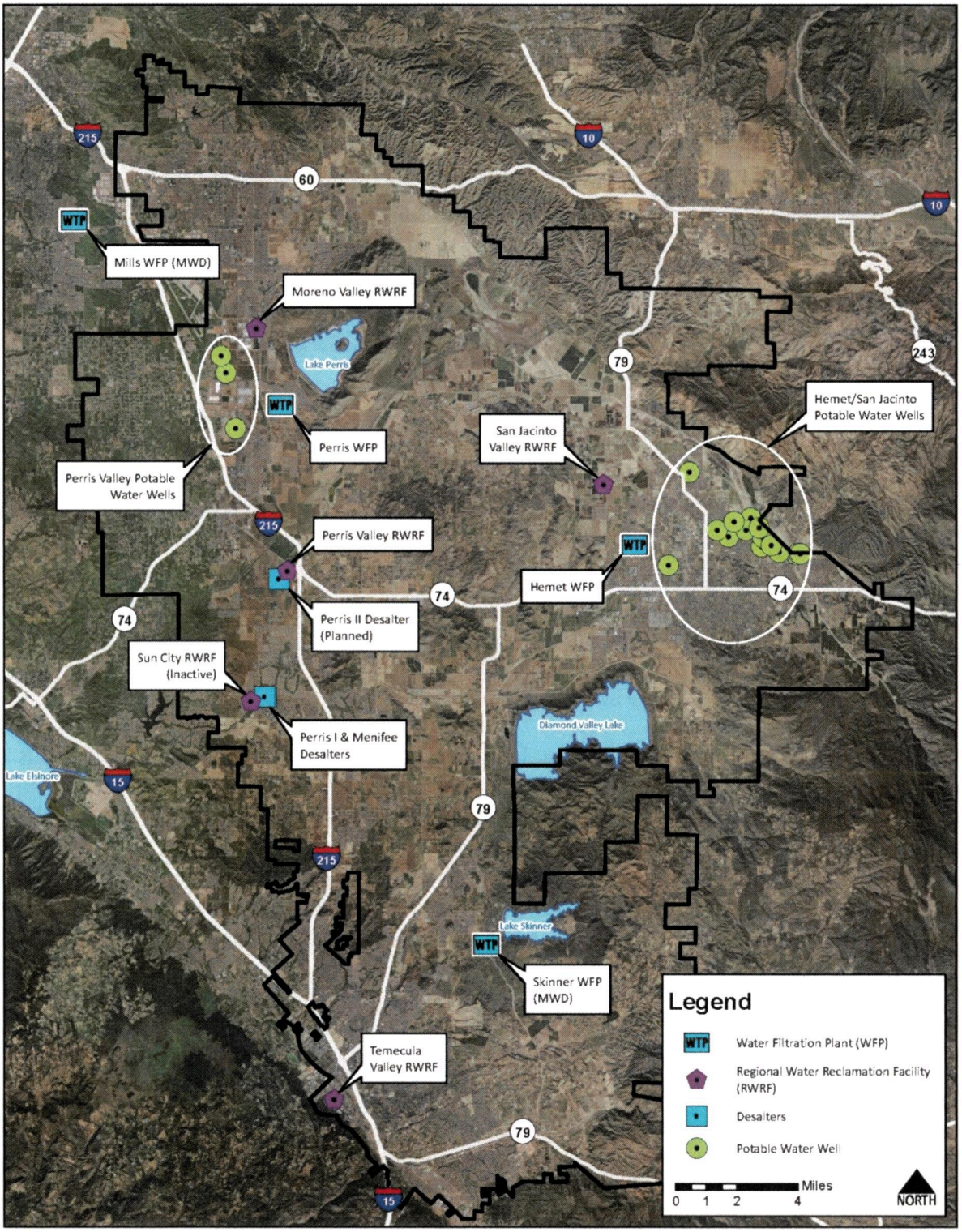
Table 2: Water Supply Portfolio (AF)

Type	Source	2012	2013	2014	2015	2016	2017
Imported – MWD Treated	Metropolitan Water District	62,000	62,200	66,900	39,200	47,700	58,000
Imported – EMWD Treated	Metropolitan Water District	18,300	18,200	21,600	18,600	15,500	12,900
Imported - Raw	Metropolitan Water District	13,300	16,000	15,300	11,900	13,300	7,600
Groundwater[1]	San Jacinto River Groundwater Basin	15,500	18,800	12,800	14,600	14,900	13,300
Desalination[2]	San Jacinto River Groundwater Basin	5,700	4,800	6,800	7,300	6,500	6,300
Recycled Water	Regional Water Reclamation Facilities	44,900	44,900	46,900	45,200	44,800	43,800
	Total	**159,700**	**164,900**	**170,300**	**136,800**	**142,700**	**141,900**

(1) Groundwater totals may include raw, brackish groundwater used to augment recycled water system (served to agricultural customers). Portions of the groundwater basin from which EMWD pumps potable groundwater are adjudicated under the Hemet-San Jacinto Watermaster and subject to adjusted base production rights.

(2) Refers to flow effluent from EMWD's desalination facilities (as opposed to total pumping from brackish wells, which are the influent flow).

Figure 1: Location of Supply Sources



emwd

Eastern Municipal Water District
Key Facilities

As future development increases the water demands within EMWD's service area, it is anticipated that the majority of the new demands will be met through additional imported water from MWD. Imported supply sources will be supplemented by local supply projects increasing the desalination of brackish groundwater and use of recycled water. EMWD also plans to continue its efforts to enhance water use efficiency within its service area. Table 3 shows EMWD's projected water supplies for both retail and wholesale service throughout the planning horizon set within its UWMP under the assumption that new demands will primarily be met with increases in imported water. These estimates do not account for all potential new local supply projects under development by EMWD or by agencies to which EMWD provides wholesale service.

Table 3: Projected Water Supplies - Average Year Hydrology

Type	Source	2020	2025	2030	2035	2040
Imported Water[1]	Metropolitan Water District	131,697	143,197	158,197	172,797	186,897
Groundwater[2]	San Jacinto River Groundwater Basin	12,303	12,303	12,303	12,303	12,303
Desalination	San Jacinto River Groundwater Basin	7,000	10,100	10,100	10,100	10,100
Recycled Water	Regional Water Reclamation Facilities	46,901	53,100	55,200	57,400	58,900
	Total	**197,901**	**218,700**	**235,800**	**252,600**	**268,200**

(1) Includes 7,500 acre-feet annually to be delivered by MWD to meet the Soboba Settlement Agreement.
(2) Portions of the groundwater basin from which EMWD pumps potable groundwater are adjudicated under the Hemet-San Jacinto Watermaster and subject to adjusted base production rights.

EMWD's water supply reliability is primarily established through MWD, of which EMWD is a member agency. In the 2015 UWMP-MWD, the reliability of water delivery through the State Water Project (SWP) and the Colorado River Aqueduct (CRA) was assessed by MWD. MWD determined that its water sources will continue to provide a reliable supply to its member agencies during normal, single-dry, and multiple-dry years during the UWMP planning horizon. Unprecedented shortages are addressed in the Water Shortage Contingency Analysis and Catastrophic Supply Interruption Planning portions of the UWMP-MWD.

2.2 Wholesale Water Supplies

2.2.1 Written Contracts of Other Proof of Entitlement

Water Code Section 10910 (d)(2)(A)

EMWD is one of the 26 member agencies that make up MWD. The statutory relationship between MWD and its member agencies establishes the scope of EMWD's entitlements from MWD. Typically there are no set limits on supply quantities to member agencies and MWD has provided evidence in the 2015 UWMP – MWD that its supplies will meet member agency demands during normal, single-dry, and multiple-dry years within a 20-year projection.

During unprecedented shortage events, the MWD Water Supply Plan (WSAP) is implemented, requiring a reduction in demand by member agencies. The allocation plan takes into account member agency population growth and investments in local resources. Member agencies are allocated a portion of their anticipated demand with the assurance that a member agency will not see a retail shortage greater than the regional shortage. Water supply is not limited under the allocation plan but water use above a member agency's allocation is charged at a much higher rate. In 2015, after four years of dry conditions, MWD implemented Condition Three of its Water Supply Allocation Plan to preserve stored water. This action follows the principles in the Water Surplus and Drought Management Plan as described in the 2015 UWMP – MWD. During the allocation from MWD, EMWD implemented demand reduction strategies as outlined in its Water Shortage Contingency Plan and reduced imported demand below the allocation level. In 2016, MWD rescinded Condition Three and declared a "Water Supply Alert" (Condition Two).

In 2014, the governor declared the State of California to be in a state of emergency due to drought. Beginning in June of 2015, urban water suppliers, including member agencies of MWD, have been subject to a mandatory conservation standard relative to 2013 demands under the emergency regulation enacted by the SWRCB. EMWD was initially subject to a mandatory conservation standard of 28 percent. In 2016, the SWRCB relaxed the mandatory conservation standards on an interim basis due to slight improvement in the statewide drought conditions; this was followed by an end to the declared drought emergency in April 2017.

2.2.2 Metropolitan Water District of Southern California Supplies

EMWD relies on MWD to provide the majority of its potable water supply and a small percent of its non-potable water supply. The northern portion of EMWD's service area is supplied by MWD's Mills Water Filtration Plant (WFP), while the southeastern portion of EMWD's service area is supplied by MWD's Skinner WFP. Untreated water from MWD is treated at EMWD's Perris and Hemet WFPs, and is also delivered directly to a number of agricultural and wholesale customers.

The majority of new water demands caused by growth are to be met through additional imported water from MWD, although increases in local supplies such as brackish groundwater desalination and recycled water are expected to offset this to an extent. The 2015 UWMP-MWD concludes that MWD will have a reliable source of water to meet member agency needs through 2040 and includes reliability analysis for historic single-dry and multiple-dry years. Unprecedented shortages are addressed in the Water Shortage Contingency Analysis and Catastrophic Supply Interruption Planning portions of the UWMP-MWD.

2.2.3 Metropolitan Water District of Southern California – UWMP

The 2015 UWMP-MWD provides information about MWD's supply reliability and projected demands. MWD does not provide supply projections for each member agency; instead, MWD uses a regional approach to developing projections. Demand for the entire Southern California region is calculated, and then, based on available information about existing and proposed local projects, MWD determines the amount of imported water needed during future years. EMWD staff coordinated with MWD on the UWMP-MWD, exchanging information about demands, local supply projects, and population projections. Based on the information provided by EMWD

and other member agencies, MWD states that it is able to meet projected demands for all member agencies through 2040, even during dry periods. Under extreme conditions, water supplies could be allocated using the WSAP to preserve supplies in storage. The 2015 UWMP-MWD is included as Appendix B of this WSA.

2.3 Local Resources

Water Code 10910 (d)(1)

In an effort to reduce dependency of imported water from MWD and increase overall system reliability, EMWD has developed several programs to take advantage of local resources. High-quality groundwater is a source of water for local customers within the Hemet/San Jacinto area, as well as a limited area in Moreno and Perris Valley. EMWD also operates two desalination facilities (with a third in design) to take advantage of a region of brackish groundwater located within its service area. The product water from the desalination facilities is fed into the EMWD's potable distribution system.

2.4 Groundwater

Water Code Section 10910 (f)

Groundwater information is included in this assessment to assist the lead agency in determining the adequacy of EMWD's total supply. Groundwater is not being proposed to serve this project, as EMWD considers current groundwater production to be utilized completely by existing customers. New developments, including the Proposed Project, will be supplied with additional imported water from one of the following sources: (1) treated imported water from MWD; (2) untreated imported water from MWD, which is subsequently treated by EMWD; or (3) untreated imported water treated by EMWD and recharged into the San Jacinto River Groundwater Basin for later withdrawal.

2.4.1 Urban Water Management Plan Review

Water Code Section 10910 (f)(1)

The 2015 UWMP discusses projected groundwater use by EMWD and explains assumptions made about groundwater. In the following sections, portions of the 2015 UWMP are summarized or excerpted below for informational purposes only. The water supply for the Proposed Project will not include groundwater.

2.4.2 Basin Description – Groundwater Management Zones in EMWD's Service Area

Water Code Section 10910 (f)(2)

EMWD's service area overlies the San Jacinto Groundwater Basin, which is primarily comprised of alluvium-filled valleys carved into the elevated bedrock plateau of the Perris Block. The San Jacinto Groundwater Basin is generally considered a closed basin surrounded by impermeable bedrock mountains and hills. For groundwater management plan and reporting purposes, the San Jacinto Groundwater Basin is further separated into the Hemet/San Jacinto Basin, where the San Jacinto Fault Zone strongly influences the groundwater hydrology, and the West San Jacinto Basin.

Groundwater management zones within the San Jacinto Groundwater Basin as a whole are delineated based on groundwater flow, groundwater divides, and changes in groundwater quality. The Hemet/San Jacinto Basin is comprised of the Hemet South, Canyon, and San Jacinto Upper Pressure Management Zones, as well as the Hemet North portion of the Lakeview/Hemet North Management Zone. The West San Jacinto Basin covers the Perris North, Perris South, San Jacinto Lower Pressure, and Menifee Management Zones, and the Lakeview portion of the Lakeview/Hemet North Management Zone. EMWD produces water for potable use or blending in four of the management zones: Perris North, Hemet South, San Jacinto Upper Pressure and Canyon. Desalter production wells are located in the Perris South and Lakeview/Hemet North Management Zones.

Detailed descriptions of each Management Zone and other additional information may be found in Section 6 of the 2015 UWMP attached as Appendix A of this WSA.

2.4.3 Groundwater Management

Water Code 10910 (f)(2)

The San Jacinto Groundwater Basin is managed under two groundwater management plans. The Hemet/San Jacinto Groundwater Management Plan (HSJ Management Plan) covers the Hemet South, Canyon, San Jacinto Upper Pressure, and Hemet North portion of the Lakeview/Hemet North Groundwater Management Zones. The West San Jacinto Groundwater Basin Management Plan (WSJ Management Plan) covers the Perris North, Perris South, San Jacinto Lower Pressure, Menifee, and the Lakeview portion of the Lakeview/Hemet North Management Zones.

2.4.3.1 Hemet/San Jacinto Groundwater Management Plan

In 2001, the Cities of Hemet and San Jacinto, LHMWD, EMWD, and representatives of the private groundwater producers, with DWR acting as an impartial mediator, began working on a groundwater management plan for the Hemet/San Jacinto Basin. The group discussed and resolved several controversial issues, including San Jacinto Tunnel seepage water, the Fruitvale Judgment and Decree, export of groundwater from the basins, and how to maximize the use of recycled water. As a result of their efforts, a final HSJ Management Plan was completed in 2007 and a Stipulated Judgment was entered with the Superior Court of the State of California for the County of Riverside in April of 2013.

The HSJ Management Plan:

- Limits the amount of water being extracted from the basin free of the replenishment charge to a sustainable yield.
- Implements continued recharge of the basin using imported water through the IRRP.
- Ensures settlement claims by the Soboba Tribe are facilitated and accommodated.
- Expands the existing water production and water services system to meet future urban growth through the use of imported water recharged into the basin.
- Protects and/or enhances water quality in the Hemet/San Jacinto Basin.
- Supports cost-effective water supplies and treatment by the public agencies.
- Eliminates groundwater overdraft and enhances basin yield.

- Continues the monitoring program to promote and provide for best management and engineering principles to protect water resources.

Long-term groundwater management includes plans for artificial recharge using MWD replenishment water via permanent facilities through the IRRP Program. An agreement with the Soboba Tribe requires MWD to deliver, on average, 7,500 AFY of water for the next 30 years to EMWD, LHMWD, and the Cities of Hemet and San Jacinto as part of an effort to recharge groundwater in the Hemet/San Jacinto Basin, fulfilling the Soboba Tribe's water rights and addressing chronic groundwater overdraft.

EMWD's rights under the HSJ Management Plan will be a long-term base groundwater production right of 7,303 AFY. EMWD's base production right will be gradually adjusted to the long-term value. In 2018, EMWD's adjusted base production right was 7,469 AF, not including previously recharged water credited to it. Any pumping above that amount is subject to replenishment fees.

2.4.3.2 West San Jacinto Groundwater Basin Management Plan

In the West San Jacinto area, a cooperative groundwater management plan helps insure the reliability and quality of the water supply. In June 1995, EMWD adopted the WSJ Management Plan in accordance with the statutes in the California Water Code Sections 10750 through 10755 resulting from the passage of AB 3030. The plan was adopted after extensive public outreach and meetings with interested individuals and agencies.

Implementation of the WSJ Management Plan began directly after its adoption. Initial efforts to implement the WSJ Management Plan included establishing an advisory committee; prioritizing the management zones; evaluating groundwater resources including establishing groundwater quality, level, and extraction monitoring programs; and conducting hydro-geophysical investigations. The West San Jacinto Groundwater Basin Management Plan Annual Report, documenting the implementation of the plan and activities in the groundwater management zones, has been published annually since 1996.

2.4.4 Groundwater Recharge

EMWD has undertaken groundwater recharge operations with imported surplus MWD water within the Hemet/San Jacinto area since 1990 through the use of temporary facilities constructed under various pilot programs. Long term facilities for recharge were placed in operation under the Integrated Recharge and Recovery Program (IRRP), which plays an integral role in both the HSJ Management Plan and the Soboba Settlement. Facilities for the first phase of the IRRP include approximately 35 acres of basins/ponds for recharge, three extraction wells, three monitoring wells, modifications to two existing pump stations and pipelines within and adjacent to the San Jacinto River. Approximately 6,000 AF was recharged in 2012, 7,500 AF was recharged in 2013, and 3,500 AF was recharged in 2014. No recharge occurred in 2015 due to severe drought conditions statewide. Recharge resumed in 2016, and a total of 12,656 AF was recharged. Approximately 19,686 AF was recharged in 2017.

EMWD also contributes to the replenishment of the basin by providing recycled water to customers for use in lieu of private groundwater production. This program can deliver up to

8,540 AF annually to local agricultural users and the costs are borne jointly by EMWD, LHMWD, and the Cities of Hemet and San Jacinto. Agreements that set limits on groundwater production and support portions of operational and maintenance costs have been in place since 2008.

2.4.5 Groundwater Pumping Rights

Water Code 10910 (f)

The Hemet/San Jacinto area forms the bulk of the eastern portion of EMWD's service area and is adjudicated through the Hemet-San Jacinto Watermaster and managed under the HSJ Management Plan. The groundwater native to this region is generally of high quality and is a major source of municipal as well as private production. EMWD's adjusted base groundwater production right in this area for 2018 is 7,469 AF and will eventually step down to a long term value of 7,303 AF. Any pumping above this amount is subject to replenishment fees or must be offset by groundwater recharge.

EMWD also has a number of potable wells in the Moreno Valley/North Perris area and a number of brackish wells that feed EMWD's desalination facilities. These wells are located outside of the Hemet/San Jacinto area and are not subject to pumping restrictions.

2.4.6 Surface Diversion Rights

License Number 10667

EMWD holds a right to divert up to 5,760 AF of San Jacinto River flows for recharge and subsequent use. The diversion right applies annually from November 1st through June 30th each year. EMWD's diversion and recharge of San Jacinto River flows takes place within the Canyon Groundwater Management Zone at EMWD's Grant Avenue Ponds located in the Valle Vista area. Diversions are recharged into the groundwater basin and are not sold or used directly. Flows in the San Jacinto River are ephemeral and in any given year, flows may not be sufficient for any amount of diversion at all. In 2017, approximately 3,150 AF of San Jacinto River flows were diverted. Additional information about surface water diversions is available in the 2016 Annual Report of the HSJ Management Plan.

2.4.7 Past Groundwater Extraction

Water Code 10910 (f)(3)

Historic groundwater extractions by EMWD are documented in Table 2. The majority of EMWD's groundwater is extracted from the Hemet/San Jacinto area, with the remainder coming from the area covered by the WSJ Management Plan. The general location of wells and desalination facilities are shown in Figure 1.

2.4.8 Projected Groundwater Extraction

Water Code 10910 (f)(4)

EMWD's projected groundwater supplies are shown in Table 3. Groundwater produced from the Hemet/San Jacinto area is adjudicated by the Hemet-San Jacinto Watermaster. For 2018, EMWD has a base production right of 7,469 AF. This will step down annually to a long term base production right of 7,303 AF. Any pumping above the base production right will be subject

to replenishment fees or offset by groundwater recharge. Groundwater production outside the Hemet/San Jacinto area is not restricted and includes EMWD's wells located in Moreno Valley and North Perris, as well as the wells feeding EMWD's desalter system. The general locations of the facilities shown in Figure 1 are anticipated to remain consistent for the foreseeable future.

2.4.9 Analysis of the Sufficiency of Groundwater

Water Code 10910 (f)(5)

Protecting the groundwater supply available to EMWD is an important part of the District's planning efforts. EMWD is actively working with other agencies and groups to ensure that groundwater will continue to serve as a reliable water resource in the future. This effort includes the replacement of groundwater extracted beyond a given basin's safe yield.

EMWD extracts groundwater within its service area under the HSJ and WSJ Management Plans. Under the HSJ Management Plan, imported water will be recharged in the Hemet/San Jacinto area to support groundwater extractions, while pumping in the WSJ area will remain relatively constant.

The groundwater produced by EMWD is allocated towards meeting existing demands. Although the planned expansion of the District's desalination facilities will provide an additional supply of water, the amount will not be sufficient to accommodate the proposed growth within the District's service area. The majority of the increased water demand created by this project will be met by increasing the use of imported water from MWD, recognizing the conditions of approval outlined in this document.

2.5 Recycled Water

Water Code 10910 (d)(1)

Recycled water is used extensively in EMWD's service area in place of potable water. This offset to municipal demand comes from recycled water use to irrigate landscape and for industrial purposes. The majority of EMWD's agricultural customers also use recycled water, in some cases, in lieu of groundwater production.

EMWD's recycled water supply will expand as the population within EMWD's service area continues to grow. EMWD currently uses all of its recycled water and is limited only by the amount available to serve during peak demands and by system losses. EMWD stores recycled water during low demand periods and does not discharge recycled water. The District anticipates that this will continue even as the supply grows via programs to retrofit additional landscape customers currently using potable water and future indirect potable recharge.

2.6 Water Use Efficiency Measures

The Water Conservation Act of 2009 (SBx7-7) set a requirement for water agencies to reduce their per capita water use by the year 2020. The overall goal is to reach a statewide reduction of per capita urban water use of 20 percent by December 31, 2020, with an intermediate 10 percent reduction by December 31, 2015. Demand reduction can be achieved through both conservation and the use of recycled water as a potable demand offset.

EMWD's conservation effort primarily utilizes three methodologies:

1. Budget Based Tiered Rates – EMWD implemented a tiered rate billing structure for its residential and landscape customers in April of 2009. Customers are provided an allocation for reasonable water use and are required to pay a higher rate for water use over their allocated limit. A study by the University of California, Riverside showed that budget based rates reduced demand from existing residential customers by 15 percent;

2. Water Use Efficiency Requirements for New Development – These requirements focus on the installation of lower water use landscape and interior fixtures. Water use efficiency is mandated statewide through existing ordinances, plumbing codes, and legislation. To enforce water use efficiency, EMWD has lowered the water budget allocations for new developments. Any residential or dedicated landscape account installed after January 1, 2011, has an outdoor budget allocation based on only 70 percent of evapotranspiration (ET) and non-functional turf is prohibited. Similar accounts installed after April 2015, have an outdoor budget allocation that is reduced to 50 percent of ET. As of January 2018, accounts with an outdoor budget allocation of 100 percent of ET have been reduced to 80 percent of ET.

3. Active Conservation Program – EMWD implements a variety of water use efficiency programs that encourage the replacement of inefficient devices and includes monetary rebates, distribution, and direct installation programs.

In addition to these outlined conservation efforts, EMWD continues to expand its recycled water system to offset potable demand.

2.7 Local Resources Documentation

2.7.1 Written Contracts or Other Proof

Water Code 10910 (d)(2)(A)

The following is a list of documents related to EMWD's local water supply:

- **EMWD 2015 Urban Water Management Plan (June 2016)**: EMWD's 2015 Urban Water Management Plan is attached as Appendix A. This plan supplies additional information on EMWD, its service area, water management, and supply capabilities.
- **Hemet/San Jacinto Groundwater Management Area – 2016 Annual Report (June 2017)**: This annual report contains detailed information on the history and progress of groundwater management and the groundwater monitoring program in the Hemet/San Jacinto area. This report can be found on EMWD's website (www.emwd.org).
- **Hemet/San Jacinto Groundwater Management Area – Water Management Plan**: This plan was developed by stakeholders in the Hemet/San Jacinto area to provide a foundation to guide and support responsible water management into the future. The plan was finalized in 2007.
- **West San Jacinto Groundwater Management Area – 2016 Annual Report (June 2017)**: This annual report contains detailed information on the history and progress of groundwater management and the groundwater monitoring program in the West San

Jacinto area (including Perris and Moreno Valley). This report can be found on EMWD's website (www.emwd.org).

With respect to EMWD's ownership and use of reclaimed/recycled water, the California Water Code, Section 1210 states:

> *The owner of a wastewater treatment plant operated for the purpose of treating wastes from a sanitary sewer system shall hold the exclusive right to the treated wastewater as against anyone who has supplied the water discharged into the wastewater collection and treatment system, including a person using water under a water service contract, unless otherwise provided by agreement.*

With respect to the Water Use Efficiency Ordinance that will result in additional supplies through conservation:

- The County of Riverside Board of Supervisors approved an update to Ordinance Number 859 on October 20, 2009, requiring water efficient landscaping in any new development requiring a permit.

- EMWD's Administrative Code requires water efficient landscaping in new developments and water efficiency by all customers. The efficiency is enforced through allocation based tiered rates. EMWD's Administrative Code can be found on EMWD's website (www.emwd.org).

2.7.2 EMWD's Capital Improvement Plan

Water Code 10910 (d)(2)(B)

EMWD maintains and periodically updates a comprehensive Water Facilities Master Plan (WFMP). This working plan defines water supplies, transmission mains, and storage facilities required for the accommodation of projected growth within EMWD. On a yearly basis, a five-year Capital Improvement Plan (CIP) is prepared, which is based on a further refinement of the WFMP. The CIP outlines specific projects and their funding source. Each project is also submitted individually to the EMWD Board of Directors for authorization and approval. This allows EMWD to accurate match facility needs with development trends. Financing information for the desalter plant construction, expansion of the regional water reclamation facilities, and well replacement can also be found in the CIP.

2.7.3 Federal, State and Local Permits Needed for Construction

Water Code 10910 (d)(2)(c)

As part of EMWD's CIP, an Environment Review Committee (Committee) has been established. This Committee, made of representatives from the Engineering, Water Supply Planning, Groundwater Management and Facilities Planning, and Environmental and Regulatory Compliance Departments, discuss each project and the steps needed to comply with regulatory requirements. EMWD works with various government agencies, including the United States Department of Fish and Wildlife, the United States Army Corps of Engineers, the California Department of Public Health, the California Division of Drinking Water, the California State Water Resources Board, the California Air Quality management District, and the California

Department of Fish and Game to obtain permits when necessary. The Engineering Department procures additional construction permits on a case-by-case basis. EMWD has already, or is in the process of, obtaining Environmental Impact Reports or other environmental documents necessary for desalter construction, expansion of regional water reclamation facilities, and well replacements. Any necessary permits secured by EMWD are kept on file at the District's headquarters facility.

2.7.4 Regulatory Approvals

Water Code 10910 (d)(2)(D)

The California Division of Drinking Water (DDW) has issued a system-wide permit for EMWD's water supply system. EMWD's Environmental and Regulatory Compliance Department conforms to specific regulations and obtains any additional necessary approvals. As new facilities are constructed by EMWD, they are subject to inspection and testing by regulatory agencies and the DPH permit is amended.

Section 3 – Demands

3.1 Demand Projections

Water Code 10910 (c)(2), 10631 (e)(1)

EMWD's primary retail customers for potable/raw water can be divided into residential, commercial, industrial, institutional, and landscape sectors. The residential sector is EMWD's largest customer segment; however, each sector plays a role in the growth and development of EMWD's service area. The historic and projected customer distribution and water use by the various potable/raw retail customer types are shown in Table 4 and Table 5.

Table 4: Retail Potable/Raw Customer Account Distribution

	Actual Accounts			Projected Accounts				
Use Type	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**
Single Family	114,100	129,400	136,200	154,300	173,600	193,200	212,000	230,500
Multi-Family	1,000	4,300	4,300	4,900	5,500	6,100	6,800	7,300
Commercial	1,500	2,100	2,600	3,000	3,300	3,700	4,100	4,400
Industrial	100	100	200	200	200	200	200	300
Institutional	40	500	500	600	700	800	900	900
Landscape[1]	1,500	2,200	2,800	2,200	2,200	2,200	2,200	2,100
Agriculture	200	100	700	700	700	700	700	700
Total	**118,440**	**138,700**	**147,300**	**165,900**	**186,200**	**206,900**	**226,900**	**246,200**

(1) Landscape accounts are projected to remain constant or decrease over time due to anticipated conversion to recycled water.

Table 5: Retail Potable/Raw Water Deliveries by Customer Type (2005 - 2040)

	Actual Deliveries - AF			Projected Deliveries – AF [2]				
Use Type[1]	2005	2010	2015	2020	2025	2030	2035	2040
Single Family	62,300	54,000	45,700	64,800	72,900	81,100	89,000	96,800
Multi-Family	5,500	6,100	5,800	8,300	9,300	10,300	11,400	12,300
Commercial	3,900	4,200	4,600	6,500	7,300	8,100	8,900	9,700
Industrial	400	400	300	400	400	500	500	600
Institutional	2,900	2,300	2,000	3,000	3,300	3,700	4,100	4,400
Landscape[3]	7,500	8,900	7,700	7,500	7,500	7,500	7,500	7,300
Agriculture (Potable)	2,400	1,800	1,900	1,900	1,900	1,900	1,900	1,900
Agriculture (Raw)	100	500	900	1,000	1,000	1,000	1,000	1,000
Total	**85,000**	**78,200**	**68,900**	**93,400**	**103,600**	**114,100**	**124,300**	**134,000**

(1) Figures do not include system losses.
(2) Passive water savings due to restrictions outlined in the Administrative Code are included in the demand projections.
(3) Landscape demands remain constant or decrease over time as landscape accounts are offset by conversion to the recycled water system.

EMWD also provides wholesale water service to a number of sub-agencies, serves recycled water, and imports water for recharge purposes. These demands, along with system losses, are shown in Table 6 and Table 7. Total demands are shown in Table 8.

Table 6: Wholesale Deliveries to Other Agencies (2005 – 2040)

	Actual Sales - AF			Projected Sales - AF				
Agency	2005	2010	2015	2020	2025	2030	2035	2040
City of Hemet	100	0	0	0	0	0	0	0
City of Perris	1,900	1,700	1,500	1,800	1,900	2,000	2,100	2,200
City of San Jacinto	0	0	0	0	0	0	0	0
Lake Hemet Municipal Water District[1]	100	1,300	4,300	4,700	5,100	5,500	5,900	6,300
Nuevo Water Company	800	600	200	400	500	600	600	700
Murrieta Division (WMWD)	100	1,600	700	2,500	3,900	5,200	6,500	7,900
Rancho California Water District	26,300	21,900	15,000	33,600	35,200	36,900	38,600	40,200
Hemet-San Jacinto Watermaster[2]	0	0	0	7,500	7,500	7,500	7,500	7,500
Total	**29,300**	**27,100**	**21,700**	**50,500**	**54,100**	**57,700**	**61,200**	**64,800**

(1) Deliveries to Lake Hemet Municipal Water District may include non-potable supplies used to meet agricultural demand or may be in the form of recharge managed through the Hemet/San Jacinto Water Management Plan.

(2) Deliveries to the Hemet-San Jacinto Watermaster will support groundwater recharge activities under the Hemet/San Jacinto Water Management Plan.

Table 7: Other Water Uses (2005 - 2040)

	Actual Use - AF			Projected Use - AF				
Category	2005	2010	2015	2020	2025	2030	2035	2040
Recycled Water[1][2]	32,600	28,200	46,100	46,900	53,100	55,200	57,400	58,900
Recharge Water[2]	7,000	0	0	0	0	0	0	0
Other/System Losses[3]	7,700	8,400	9,100	7,100	7,900	8,800	9,700	10,500
Total	**47,300**	**36,600**	**55,200**	**54,000**	**61,000**	**64,000**	**67,100**	**69,400**

(1) Recycled water projections include recycled water that is delivered to sub-agencies.

(2) Recycled water totals may include brackish groundwater used to supplement the recycled water system during high demand months.

(3) Total recharge water does not include water that is wholesaled to the Hemet-San Jacinto Watermaster for recharge purposes (totals are shown in Table 7).

(4) Includes real and apparent losses for retail and the wholesale system, unbilled, authorized consumption, etc.

Table 8: Summary of System Water Demands (2005 - 2040)

	Actual Demands - AF			Projected Demands - AF				
Category	2005	2010	2015	2020	2025	2030	2035	2040
Retail Demands	85,000	78,200	68,900	93,400	103,600	114,100	124,300	134,000
Wholesale Demands	29,300	27,100	21,700	50,500	54,100	57,700	61,200	64,800
Other Water Uses(1)	47,300	36,600	55,200	54,000	61,000	64,000	67,100	69,400
Total	**161,600**	**141,900**	**145,800**	**197,900**	**218,700**	**235,800**	**252,600**	**268,200**

(1) Includes retail and wholesale recycled water demands.

3.2 Project Demands

The City of Moreno Valley is the lead agency for the preparation of an EIR pursuant to the California Environmental Quality Act (CEQA), Public Resources Code Section 21000, and et seq. for the Kaiser Permanente Moreno Valley Medical Center (Proposed Project). The Proposed Project is located on approximately 30 acres in the City of Moreno Valley and consists of a Central Utility Plant (CUP) of approximately 28,100 square feet, four patient bed towers, a Diagnostics and Treatment Center (D&T), an Emergency Department totaling 458 beds and 850,000 square feet, and three parking structures with a total of 2,550 parking stalls. The Proposed Project is located within the City of Moreno Valley in Riverside County, bounded by Cactus Street to the far north, Oliver Street to the east, Nason Street to the west, and Iris Avenue to the south. The estimated annual demand for the Proposed Project is 318 AF. The developer for the Proposed Project is Kaiser Permanente and the location is shown in Figure 2.

The estimate of annual demand for this project is shown below in Table 9.

Table 9: Project Demand Estimate

Category	Average Day Demand (gpd)	Annual Demand (MG)	Annual Demand (AF)
Hospital	94,348	34	106
Commercial Office Building	11,111	4	12
Cooling Tower Make-Up	126,875	46	142
Steam Boiler Make-Up	36,165	13	41
Recycled Water Usage - Irrigation	15,225	6	17
Total	**283,724**	**103**	**318**

The demand for this project is based on calculations and estimates submitted by the developer. Cooling tower and steam boiler demand calculations are based on industry standard practice. Staff review determined that these estimates are consistent with demand from similar facilities within EMWD's service area. The reduction in recycled water demands is due to the planned

implementation of drought tolerant landscaping. Demand for facilities planning will be based on peak flows and is to be determined as part of the development design conditions for this project.

All new development is required to install water efficient devices and landscaping. The use of turf for non-functional purposes is prohibited. For reference, a document titled "Water Efficient Guidelines for New Development" is available on EMWD's website (www.emwd.org) to help increase water use efficiency for this project.

3.3 Database of Proposed Projects

Water Code 10910 (c)(3)

To develop the projections used in this WSA, EMWD uses a development tracking database that assesses future water demands for specific projects. EMWD uses this database to help plan for future water supply and infrastructure needs by monitoring new projects through various stages of development. Subject to the Board of Director's approval of this WSA, information associated with this project will be updated in the supply and demand projections EMWD uses for planning. Changes in density and land use are also tracked in this database for planning purposes. The developer is required to notify EMWD if any changes to project density or land use occur.

Section 4 – Evaluation of Supply and Demand

Water Code 10910 (c)(2)

4.1 Supply and Demand Evaluation under Historic Conditions

EMWD's 2015 UWMP includes estimates of EMWD's demand during average, single and multiple dry years. The estimates for EMWD's retail system are documented below in Table 10, Table 11, and Table 12 and are taken directly from the 2015 UWMP document. Similar estimates for EMWD's wholesale system are shown in Table 13, Table 14, and Table 15. More details on this analysis can be found in Section 7.6 (Supply and Demand Assessment) of the 2015 UWMP.

Table 10: Retail Normal Year Supply and Demand Comparison (AF)

	2020	2025	2030	2035	2040
Supply Totals	145,745	159,834	172,917	185,800	197,800
Demand Totals	145,745	159,834	172,917	185,800	197,800
Difference	**0**	**0**	**0**	**0**	**0**

Table 11: Retail Single-Dry Year Supply and Demand Comparison (AF)

	2020	2025	2030	2035	2040
Supply Totals	166,300	182,400	197,400	212,000	225,700
Demand Totals	166,300	182,400	197,400	212,000	225,700
Difference	**0**	**0**	**0**	**0**	**0**

Table 12: Retail Multiple-Dry Years Supply and Demand Comparison (AF)

		2020	2025	2030	2035	2040
First Year	Supply Totals	166,300	182,400	197,400	212,000	225,700
	Demand Totals	166,300	182,400	197,400	212,000	225,700
	Difference	**0**	**0**	**0**	**0**	**0**
Second Year	Supply Totals	142,500	155,400	167,400	179,000	190,100
	Demand Totals	142,500	155,400	167,400	179,000	190,100
	Difference	**0**	**0**	**0**	**0**	**0**
Third Year	Supply Totals	149,500	162,700	175,100	186,900	198,600
	Demand Totals	149,500	162,700	175,100	186,900	198,600
	Difference	**0**	**0**	**0**	**0**	**0**

Table 13: Wholesale Normal Year Supply and Demand Comparison (AF)

	2020	2025	2030	2035	2040
Supply Totals	52,156	58,866	62,883	66,800	70,400
Demand Totals	52,156	58,866	62,883	66,800	70,400
Difference	**0**	**0**	**0**	**0**	**0**

Table 14: Wholesale Single-Dry Year Supply and Demand Comparison (AF)

	2020	2025	2030	2035	2040
Supply Totals	58,500	66,200	70,700	75,200	79,300
Demand Totals	58,500	66,200	70,700	75,200	79,300
Difference	**0**	**0**	**0**	**0**	**0**

Table 15: Wholesale Multiple-Dry Years Supply and Demand Comparison (AF)

		2020	2025	2030	2035	2040
First Year	Supply Totals	58,500	66,200	70,700	75,200	79,300
	Demand Totals	58,500	66,200	70,700	75,200	79,300
	Difference	**0**	**0**	**0**	**0**	**0**
Second Year	Supply Totals	48,500	54,700	58,200	61,700	64,900
	Demand Totals	48,500	54,700	58,200	61,700	64,900
	Difference	**0**	**0**	**0**	**0**	**0**
Third Year	Supply Totals	52,000	57,400	61,100	64,600	68,000
	Demand Totals	52,000	57,400	61,100	64,600	68,000
	Difference	**0**	**0**	**0**	**0**	**0**

EMWD's 2015 UWMP discusses the supply reliability for EMWD during dry years. It is anticipated that the majority of water for future development will be supplied by imported water from MWD during single dry years. Typically, MWD does not place imported water limits on a member agency, but predicts the future water demand based on regional growth information. The 2015 UWMP – MWD shows that MWD would have the ability to meet all of its member agencies' project supplemental demand through 2040, even under a repeat of historic drought scenarios.

4.2 Contingency Planning

EMWD maintains a Water Shortage Contingency Plan (WSCP) that aims to reduce demand during water shortage using significant penalties for wasteful water use. EMWD's WSCP details demand reductions for several stages of shortage through a 50 percent or greater reduction. Additional information about contingency planning is included in Chapter 8 of EMWD's 2015 UWMP.

The WSCP was last updated on January 20, 2016, and is located in Title 5, Article 10 of the EMWD Administrative Code, which is available on EMWD's website (www.emwd.org).

EMWD is currently in Stage 2 of the WSCP in response to improved statewide water supply conditions and the declared end of the drought emergency.

Section 5 – Water Supply Assessment

5.1 Potable Water

From a facilities perspective, the Proposed Project would be conditioned to construct off-site and on-site water facilities needed to distribute water throughout the project area. Prior to construction, the developer should contact EMWD staff to establish development design conditions and determine if any revisions are required to the master plan. Figure 3 shows existing water facilities in relation to the project.

The project demand will be served using imported water from MWD, supplemented with new local supply projects during multiple-dry years, if needed. Allocation from MWD may result in water supplies being made available at a significantly higher cost depending on circumstances.

5.2 Recycled Water

EMWD policy recognizes recycled water as the preferred source of supply for all non-potable water demands, including irrigation of recreation areas, greenbelts, open space common areas, commercial landscaping, and supply for aesthetic impoundment or other water features.

According to the District's policies, the project may be conditioned to construct a recycled water system separately from the potable water system. The system will need to be constructed to recycled water standards. The project may also be conditioned to construct off-site recycled water facilities. EMWD will make a final determination on requirements for recycled water use and facilities during the development design conditions phase of the project.

5.3 Duration of Approval

This assessment will be reviewed every three years until the project beings construction. The project applicant shall notify EMWD when construction has begun. The review will ensure that the information included in this assessment remains accurate and no significant changes to either the project or EMWD's water supply have occurred. Furthermore, if the EIR for the project is not certified within three years after the adoption of this WSA, the WSA may be updated at such time if there are changed circumstances warranting updated analysis. If the EIR is certified within three years of the adoption of the WSA, then the applicant shall provide updates to EMWD every three years on the status of the project until construction commences; however, in such an instance, the WSA shall not be amended or invalidated by EMWD. If neither the project applicant nor the lead agency contacts EMWD within three years of approval of this WSA, it is assumed that the Proposed Project no longer requires the estimated water demand calculated, and the demand for this project will not be considered in assessments for future projects. The assessment provided by this document will then become invalid.

5.4 Conclusion

EMWD relies on MWD to meet the needs of its growing population. MWD stated in the 2015 UWMP – MWD that with the addition of all water supplies, existing and planned, MWD has the ability to meet all of its member agencies' projected supplemental demand through 2040, even under a repeat of historic multiple-year drought scenarios.

Based on present information and the assurance that MWD is engaged in identifying solutions that, when combined with the rest of its supply portfolio, will ensure a reliable long-term water supply for its member agencies, EMWD has determined that it will be able to provide adequate water supplies to meet the potable water demand for this project as part of its existing and future demands.

In the event that the lead agency determines adequate water supply exists for the Proposed Project, the developer of this project is required to meet with EMWD Development Services Staff to establish development design conditions. The development design conditions will

detail water, wastewater, and recycled water requirements to serve the Proposed Project. An agreement developed prior to construction will determine additional funding required to reduce existing customer demand on imported supplies through the expansion of local resources. The reduction of existing customer demand on imported water supplies will free up allocated imported water to be used to serve this project under multiple dry year conditions. The amount of funding will be determined by the EMWD and may take the form of a new component of connection fees or a separate charge. The estimated cost of desalinated water is between $1,400 and $1,700 per AF. These costs are expected to increase over time.

If there is a change in the circumstances detailed in this assessment, EMWD will address the changes in the development design conditions for the project. Modifications at the development design conditions stage could reduce the amount of water available to serve this project.

Section 6 – Conditions of Approval

This assessment is not a commitment to serve the project, but a review of EMWD supplies based on present information available. This assessment is conditioned on MWD's ability to continue to supply imported water to meet EMWD's requirements, including the requirements for this project. This project is subject to any special or additional requirements imposed by MWD or EMWD on such deliveries, including increased pricing or a different pricing structure.

All new development is required to install water efficient devices and landscaping. The use of turf for non-functional purposes is prohibited. A document titled "Water Efficient Guidelines for New Development" is available on EMWD's website to help increase water efficiency for this project.

The lead agency for the project is responsible to evaluate the adequacy of the water supply assessment and make the ultimate decision of the sufficiency of the water supply. The developer for the project is responsible for keeping EMWD informed about progress in the planning and development of the project. The project applicant will contact EMWD with project status information and updates every three years until the project begins construction. This will insure that the information included in this assessment remains accurate and no significant changes to either the project or EMWD's water supply have occurred. Furthermore if the EIR for the project is not certified within three years after the adoption of this WSA, the WSA may be updated at such time if there are changed circumstances warranting updated analysis. If the EIR is certified within three years of the adoption of the WSA, then the applicant shall provide updates to EMWD every three years on the status of the project until construction commences; however, in such instance, the WSA shall not be amended or invalidated by EMWD. If neither the project applicant nor the lead agency contacts EMWD within three years of approval of this WSA, it is assumed that the Proposed Project no longer requires the estimated water demand calculated, and the demand for this project will not be considered in assessments for future projects. The assessment provided by this document will then become invalid.

If the lead agency determines adequate water supply exists for this project, to the greatest extent possible, recycled water shall be used on the Proposed Project. Details about the

feasibility of recycled water use shall be included in the development design conditions for the project.

Section 7 – Additional Figures

Figure 2: Project Location

emwd

Water Supply Assessment - Figure 2
Vicinity Map

0 187.5 375 750 1,125 1,500 Feet

N

Figure 3: Project Location in Relation to Existing Waterlines

Water Supply Assessment Report

Supplemental Information

Appendix A

EMWD – 2015 Urban Water Management Plan

Appendix B

MWD – 2015 Urban Water Management Plan

Appendix C

EMWD CIP Budget

APPENDIX J2

Water Study Report

WATER STUDY REPORT

FOR THE

KAISER PERMANENTE
MORENO VALLEY MEDICAL CENTER

April 12, 2019

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INTERNATIONAL

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_____ _____
Signature Date

MBI JN 169814

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Figure Index

Table Index

Section 1 - Introduction

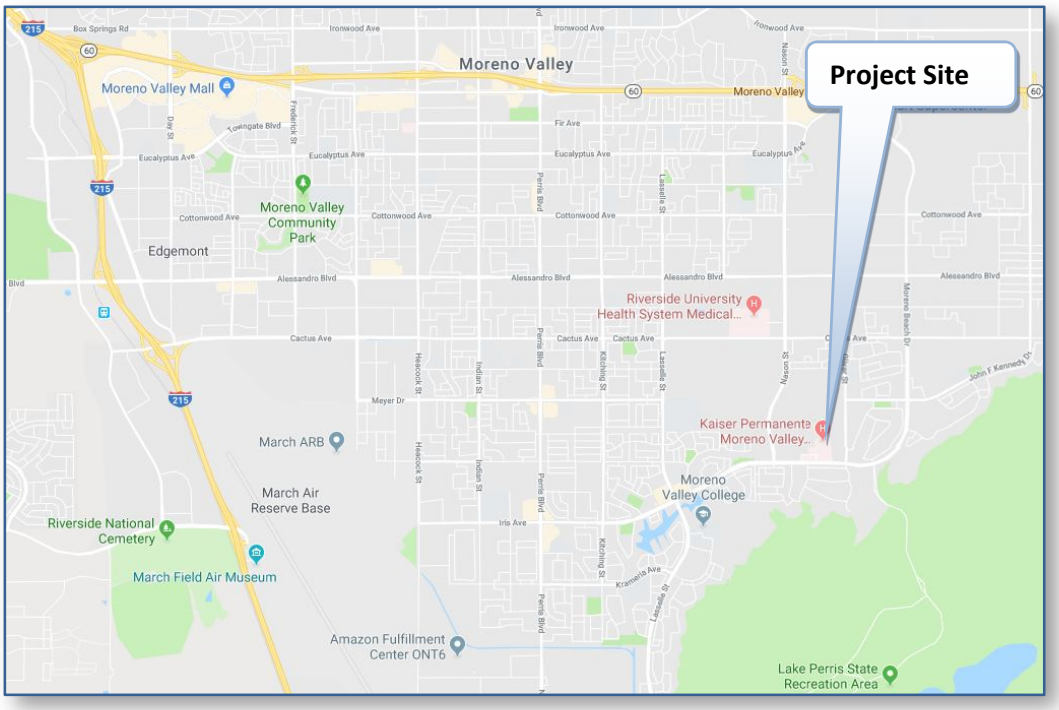
This report provides background data, hydraulic analysis, and a summary of results as part of a water study for the proposed Kaiser Permanente Moreno Valley Hospital project. The purpose of this study is to determine the potential impact of the proposed project on the existing public water distribution system and to verify design of the proposed onsite domestic water, fire loops and irrigation to meet the project's domestic, fire flow and irrigation demands.

Section 2 - Project Description

2.1 Project Location:

The proposed expansion of Kaiser Permanente Moreno Valley Medical Center site is comprised of a 29.8-acre dual-parcel (APN 486-310-033 and APN 486-310-034) that is currently developed with a hospital, patient tower, medical offices and onsite parking. Located at 27300 Iris Avenue in Moreno Valley, California, the Project site abuts undeveloped open space to the west, north and east, Fresenius Medical Care facility to the northeast, and residential single-family homes and golf course located to the east and south. The Project site is shown in Figure 2-1.

Figure 2-1
Project Site (Google Maps)



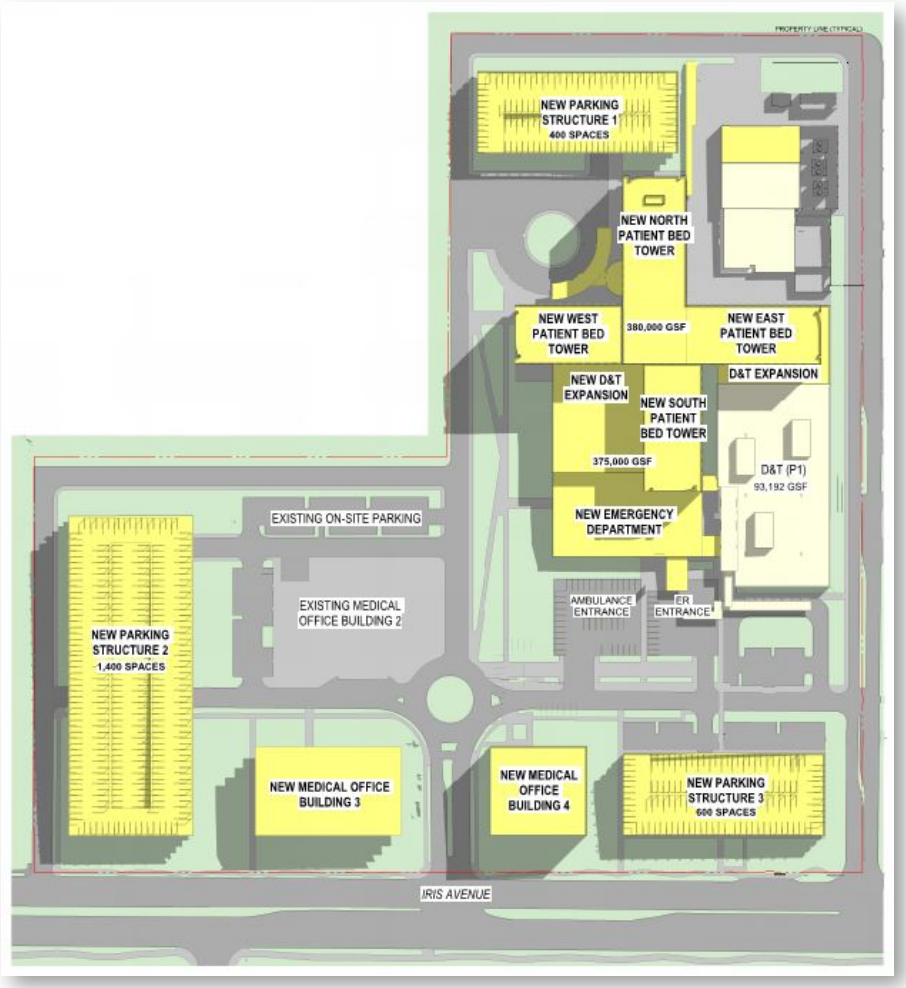
2.2 Proposed Project:

The proposed project will be an expansion to the existing medical campus. The new Kaiser Permanente Moreno Valley Medical Center (Medical Center) will be analyzed in two (2) segments – Early Project and Ultimate Project. This study addresses the total ultimate development for both segments which will include four (4) patient bed towers, a Diagnostics and Treatment Center (D&T), and an Emergency Department totaling 458 beds and 850,000 square feet. The project will also include a Central Utility Plant (CUP) of approximately 28,100 GSF and Parking Structures with a total of 2,550 parking stalls. Table 2-1 summarizes the existing, early, and ultimate project totals at the end of each proposed project segment. The development process for each project segment includes temporary on-site facilities and demolition of existing facilities which are not included in the report. Figure 2-2 depicts the schematic site layout for the Ultimate Project including the location of the patient bed towers, D&T, Emergency Department, CUP, medical office buildings, and parking structures within the Project area. See Appendix A for existing, early and ultimate project site layouts.

Table 2-1
Proposed Project Summary

	Existing Project	Early Project	Ultimate Project
Patient Towers; Emergency Department; D&T Expansion	99 Beds 133,000 SF	105 Beds 230,900 SF	458 Beds 850,000 SF
CUP	--	20,100 SF	28,100 SF
Medical Office Buildings	74,400 SF	84,500 SF	234,400 SF
Parking Structure	685 Stalls	730 Stalls	2,550 Stalls

Figure 2-2
Proposed Site Layout



2.3 Prior Site Planning

The Kaiser Permanente Moreno Valley Community Hospital currently consists of a two buildings, hospital and medical office building, respectively built in 1989 and 1997, and provides patient care services. This project currently designates the aging infrastructure as a facility requiring upgrades and renovations to meet current OSHPD requirements. The hospital will be demolished and restored in segments, along with demolition to existing on-site parking, to accommodate the proposed Project. The project area encompasses two zones including community commercial and office commercial per the City of Moreno Valley Zoning Atlas.

2.4 Study Area

The subject study area is roughly bounded by Delphinium Avenue to the north, Oliver Street to the east, Iris Avenue to the south, and Nason Street to the west. The primary zoning for the project area consists of a mixture of community commercial and office commercial along Iris Avenue. In accordance with the requirements specified in the Addendum #1 Entitlement Documents, the proposed project is required to prepare a preliminary water study to establish the potential impact of the proposed project on the existing public water infrastructure and to verify design of the proposed onsite domestic water, fire loops and irrigation meet the project's water demands.

The local water distribution system is comprised primarily of 4-inch and 6-inch domestic water and 6-inch and 10-inch looped fire service mains throughout the study area. The local distribution system mains within the study area connect to the 18-inch water pipeline at the Kaiser Permanente Moreno Valley Community Hospital main entrance along the south side of Iris Avenue. The proposed project will expand the on-site water distribution system and connect the new facilities to the existing domestic water and fire flow system. Refer to Figure 2-3 and Figure 2-4 for the Preliminary Utility Plan showing the proposed domestic water, fire flow, and recycled water mains within the project area.

2.5 Proposed Points of Connection

The proposed development will maintain the existing domestic water and fire flow main connections to the existing 18-inch water main on Iris Avenue. The existing water and fire mains will be extended to service new facilities, including the new D&T building and energy center depending on the construction segment. The existing and proposed on-site water and fire flow system will be modified for each construction segment described in further detail below:

As shown on

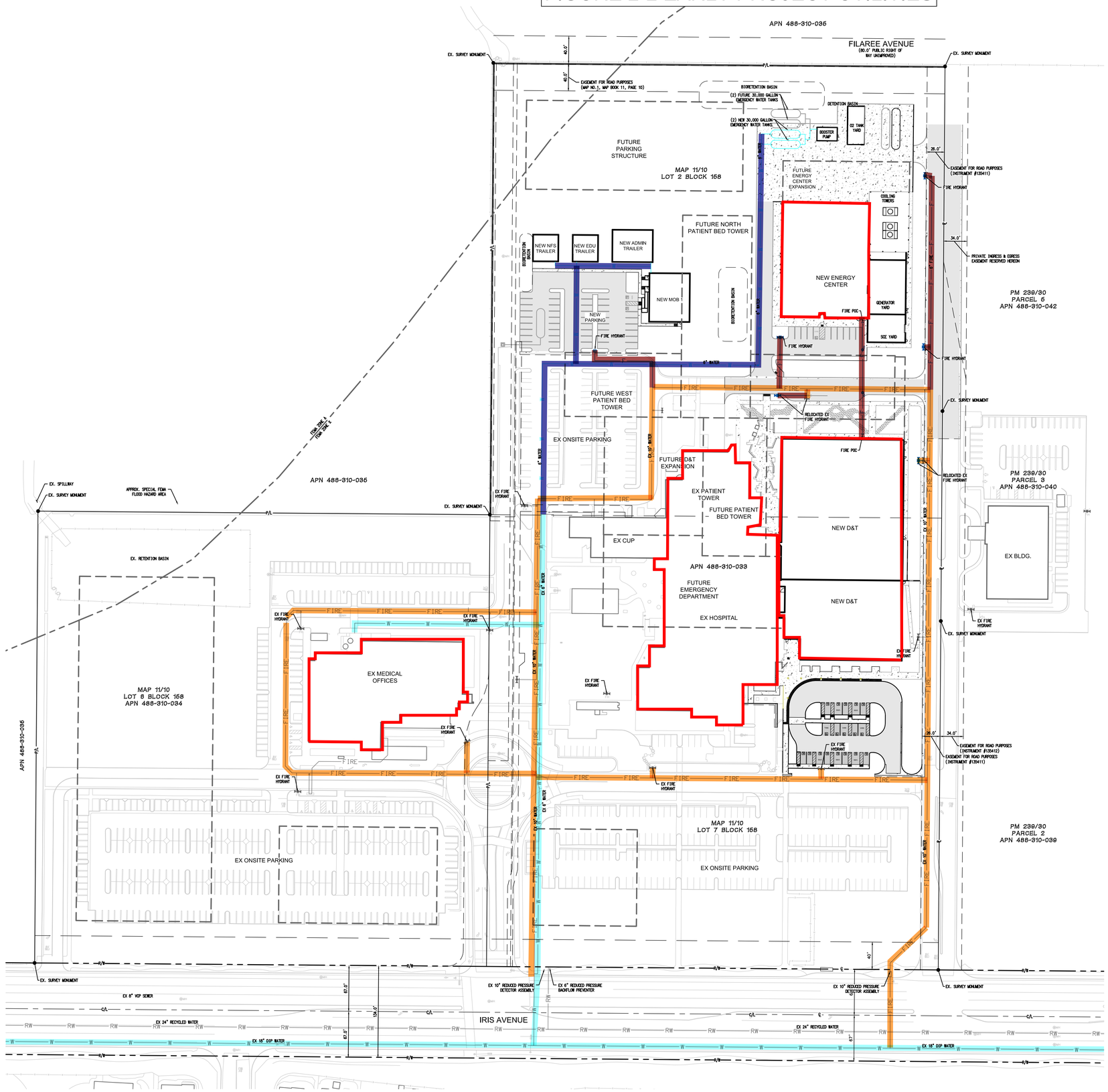
Figure 2-3, the Early Project includes the installation of a new 6-inch domestic water main that feeds directly into the proposed 20,000-gallon emergency water tanks at the north end of the project site. The supply and discharge lines to the emergency water tanks will both provide a point of connection to service the new Energy Center and new cooling towers, respectively, on the west side of the facility. This 6-inch water main also connects to the new NFS Trailer, EDU Trailer, Admin Trailer, and MOB at the north edge of the project site. Additional 10-inch fire lines will be added to provide flows for additional fire hydrants responsible for servicing new facilities at the north end of the project site. At the south end of the site fire line connections are provided for the Future Parking Structures 2 and 3 as well as Medical Office Buildings 3 and 4.

As shown on Figure 2-4, the Ultimate project includes two additional water line connections to the Medical Office Buildings 3 and 4. Also shown is an extension of the 10-inch fire line to feed proposed hydrants at the north end and central location of the site. At the south end of the site fire line connections are provided for the Future Parking Structures 2 and 3 as well as Medical Office Buildings 3 and 4.

2.6 Onsite Domestic Water Storage (OSHPD Required Redundancy)

The California Office of Statewide Health Planning and Development (OSHPD) provides specific design requirements and oversight for health care facilities. Specific criteria have been developed for mission critical health care facilities that require a 96-hour reserve of onsite stored water to meet critical hospital water needs. As a result of the OSHPD requirements, the proposed Kaiser Permanente Moreno Valley Community Hospital will incorporate 60,000 gallons of potable storage contained in two (2) underground storage tanks for the Early Project. The Ultimate Project will include an additional 60,000 gallons of potable storage contained in two (2) underground storage tanks for a total of four (4) underground storage tanks with 120,000 gallons of potable water storage. As this design requirement is driven by OSHPD, the storage sizing requirements are beyond the scope of this Water Study. However, this requirement should be understood as meeting the necessity for domestic water supply redundancy for this project.

FIGURE 2-2 EARLY PROJECT UTILITIES



EXISTING DOMESTIC WATER

PROPOSED DOMESTIC WATER

EXISTING FIRE

PROPOSED FIRE

CO ARCHITECTS

5055 Wilshire Boulevard, 9th Floor
Los Angeles, California 90036
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AGENCY STAMP

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9755 Clairemont Mesa Blvd., San Diego, CA 92124
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MORENO VALLEY MEDICAL CENTER
DIAGNOSTIC & TREATMENT ADDITION

27300 IRIS AVENUE MORENO VALLEY, CA 92555
KAISER Proj: K0130 OSHPD FACILITY: 106334048

OSHPD PROJECT #

KEY PLAN

E	A
F	B
G	C
H	D

N

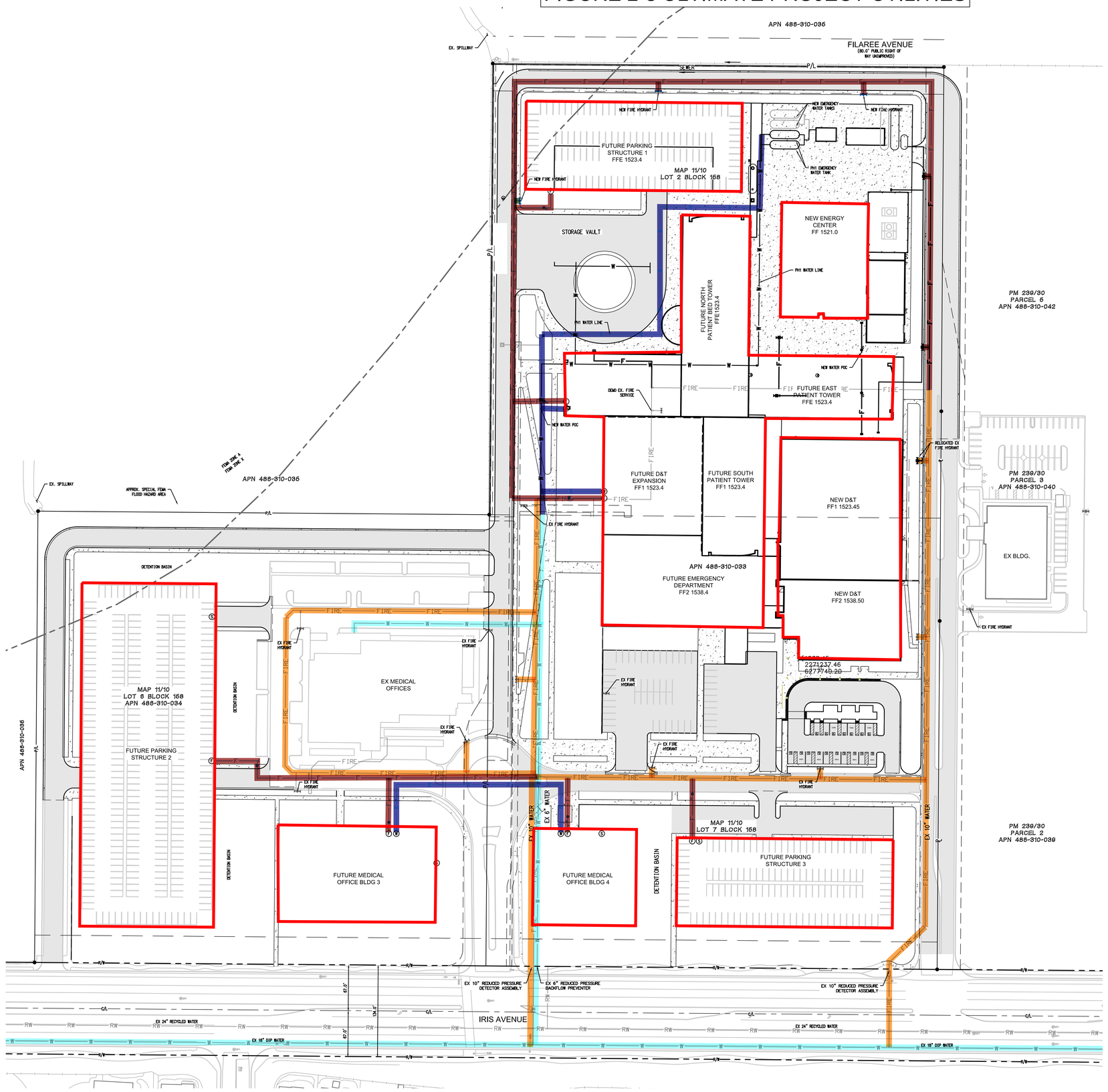
PHASE 1 - COLOR UTILITY EXHIBIT

SCALE:AS INDICATED
DATE OF ISSUE: APRIL 2, 2019

SCHEMATIC DESIGN
CO PROJECT NO.: 17009.000

H:\PDATA\16814\CADD\WATER\EXHIBITS\EARLY PHASE WATER EXHIBIT.DWG WEINTRAUB, AHARON 4/10/2019 9:16 AM

FIGURE 2-3 ULTIMATE PROJECT UTILITIES



EXISTING DOMESTIC WATER

PROPOSED DOMESTIC WATER

EXISTING FIRE

PROPOSED FIRE

H:\PDATA\169814\CADD\WATER\EXHIBITS\VLT PHASE WATER EXHIBIT.DWG MEINTRAUB, AHARON 4/10/2019 11:19 AM

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KAISER Proj: K0130 OSHPD FACILITY: 106334048

OSHPD PROJECT #

KEY PLAN

E	A
F	B
G	C
H	D

N

MASTER PHASE - COLOR
UTILITY EXHIBIT

SCALE: AS INDICATED
DATE OF ISSUE: APRIL 2, 2019

SCHEMATIC DESIGN
CO PROJECT NO.: 17009.000

C1.00

Section 3 - Water Demands

Water demands for the proposed project were developed for both the Early Project and Ultimate Project conditions. These project demands were produced using existing onsite water meter data from January 2018 through December 2018 obtained from EMWD and include domestic, fire, and irrigation water usage. The total existing metered data was analyzed to determine the total amount of flow designated to three onsite facilities, including the hospital, medical office building, and energy center. Water demands for each existing facility was further examined by hospital bed count and square footage under each project buildout to determine the projected water demands for the core future facilities, including the hospital, medical office buildings, diagnostics and treatment center (D&T), and energy center. The total amount of water delivered to these new facilities are expressed as an Average Day Demand (ADD) and can be found in Figure 3-1.

The Maximum Day Demand and Peak Hour Demands (MDD and PHD, respectively) were calculated using the maximum day and peak hour peaking factors obtained from the EMWD Water System Planning & Design Principle Guidelines Criteria (See Appendix E). The City of Moreno Valley Zoning Map designates the medical campus as office and commercial zoning. Therefore, the peaking factors designated to the Commercial and Industrial land use are used to calculate the MDD and PHD. Sample calculations are found below and represent the MDD and PHD for the medical office building. The MDD and PHD water demand calculations for both the Early Project and Ultimate Project are found in Figure 3-1.

MDD = ADD * PF_{maxday} where PF_{maxday} = 1.5
= 21.66 gpm * 1.5
= 3.56 gpm

PDD = ADD * $PF_{peakhour}$ where $PF_{peakhour}$ = 2.0
= 2.37 gpm * 2.3
= 4.74 gpm

Peaking factors for the Energy Center cooing and heating calculations are independent of the peaking factors provided by EMWD. The existing heating and cooling load profiles from January 2018 through December 2018 were provided by ARUP. Cooling and heating loading were analyzed to determine the projected makeup water for the new Energy Center. Domestic water supplied by EMWD is used for the existing energy center and will continue to be used for the new energy center.

Hospital Demands – Demands for the Main Hospital Building were determined based on the total bed count for each phase provided by CO Architects multiplied by an industry average indoor Hospital water usage of 206 gpd/bed. The total number of beds planned for the Early Project and Ultimate Project is 105 and 458 beds respectively. This leads to an approximate AAD of 7.9 million gallons and 34.4 million

gallons for the Early and Ultimate Project phases respectively. The MDD and PHD were calculated by multiplying the AAD by the respective peaking factors of 1.5 and 2.0.

Medical Office Building – Average Annual Demand (AAD) for the Medical Office Buildings were determined based on an existing building area of 82,000 square feet, Early Project building area of 74,000 square feet, and Ultimate Project building area of 234,00 square feet. Each respective phases square footage was multiplied by the EMWD's unit water demand rate of 2,000 gpd/gross acre (0.0459 gpd/sf) to determine each respective phases expected water demand. The MDD and PHD were calculated by multiplying the AAD by the respective peaking factors of 1.5 and 2.0.

Diagnostics and Treatment – The diagnostics and treatment center demand is accounted for as an independent facility for the Early Project and is incorporated into the Hospital facilities demands for the Ultimate Project. This leads to an AAD of 1.6 million gallons for the early project. The MDD and PHD were calculated by multiplying the AAD by the respective peaking factors of 1.5 and 2.0.

Energy Center – The energy center is comprised of the cooling tower and steam boilers. The cooling tower and steam boilers were analyzed without conservation to observe extreme conditions. Recycled condensation was excluded from the heating makeup water demand and the chillers were analyzed at 4 cycles of concentration.

Irrigation Demands - Appendix A shows the hospital irrigation recycled water existing and proposed demands. All irrigation water is supplied by recycled water and not domestic water therefore it is briefly explained in this water study but not used in any of the hydraulic analysis. This table shows during the existing conditions a demand of approximately 21,000 gallons per year. A reduction of approximately 11,000 gallons to a demand of 10,000 gallons per year is expected during the Early Project phase. During the final phase a demand of approximately 15,000 gallons per is expected. The Early and Ultimate project demands were provided by Ridge Landscape Architects.

Figure 3-1
Water Demands Summary

Use Location	Early Project (gpm)			Ultimate Project (gpm)		
	ADD	MDD	PHD	ADD	MDD	PHD
Demand 1 - Hospital, D&T, Energy Center						
Hospital	15.02	22.53	30.04	65.52	98.28	131.04
Diagnostic & Treatment[1]	2.97	4.46	5.94	-	-	-
Energy Center[2]	33.06	55.40	55.40	113.22	189.76	189.76
Total Demand 1	**51.05**	**82.39**	**91.39**	**178.74**	**288.04**	**320.80**
Demand 2 - Medical Office Buildings						
MOB 1[3]	-	-	-	-	-	-
MOB 2	2.37	3.56	4.74	2.37	3.56	4.74
MOB 3	-	-	-	2.07	3.11	4.14
MOB 4	-	-	-	3.03	4.54	6.06
Total Demand 2	**2.37**	**3.56**	**4.74**	**7.47**	**11.21**	**14.95**
Total Domestic Demand	**53.42**	**85.95**	**96.13**	**186.22**	**299.25**	**335.74**

1. D&T Addition area included in Hospital Buildings area as shown per CO Architects' D&T Addition Schematic/Design Development Progress Set dated 11/30/18. D&T Addition is broken out to calculate water demand by facility size only for Early Project.
2. Multiplier factors for the Max Day and Peak Hour per EMWD are not incorporated into the Energy Center demands.
3. MOB 1 is a temporarily facility that receives minimal flow in comparison to MOB 2. This demand is negligible for the calculations.

Section 4 - Hydraulic Analysis

The analysis of the proposed fire service distribution system was performed using the InfoWater modeling software program by Innovyze. The water model was developed by imputing junction and pipe data taken from utility drawings and hydrant flow test data provided by EMWD. The water model only includes a segment of domestic water main along Iris Avenue and water utilities located within the project area. The model is calibrated using the fire flow test data to mimic existing onsite conditions.

Ground elevations in the general area of the proposed site range from approximately 1,514 feet above mean sea level (MSL) along the northwestern area of the project area (near the existing medical office building) to 1,559 feel MSL along the southeastern boundary (near the intersection of Iris Avenue and Oliver Street). A conservative Hazen-Williams pipe roughness coefficient ("C" factor) of 110 was utilized for existing public and private water mains and 120 for the proposed on-site domestic and fire service mains (PVC C900). Existing and proposed pipes and junctions, representative of the domestic and fire distribution systems, were assigned identification numbers which correspond to the type of function (i.e. Domestic Water, Fire Water, etc.) the section of pipe serves.

4.1 Boundary Conditions and Settings

Boundary conditions for the hydraulic model were established based on the known and planned operating hydraulic conditions within the project area. A reduced pressure detector assembly was located on the existing public fire loop and the public domestic water lead servicing the existing project area. Basic model calibration was performed based on fire hydrant testing data provided by EMWD (dated March 18, 2019) for two existing points of connection on the existing 18" water main along Iris

Avenue (Refer to Appendix B). No public fire hydrants were identified near the project area and points of connection were used to obtain fire flow data. The results of the hydrant flow test were used to verify the initial boundary conditions and calibration of the hydraulic model.

4.2 Analysis Criteria

In accordance with EMWD Water System Planning & Design Guideline the following analysis criteria will be verified:

1. Fire Flow Demand (Commercial): 4,000 gpm for a 4-hour duration
2. Operating Pressures:
   - Minimum Static (No Demand): 60 psi
3. Minimum Allowable Residual Pressures:
   - Under Peak Hour Demand: 50 psi
   - Under Max-Day plus Fire Flow: 20 psi
4. Maximum Pipeline Velocity (without Fire): 10 ft/s

The projected domestic water demands were assigned to two nodes in the Early Project scenarios and four nodes in the Ultimate Project scenarios. Except for domestic water servicing the medical office buildings, all domestic water is directed to the existing energy center. For the Early Project and Ultimate Project, domestic water will travel to the proposed water tanks and booster station prior to entering the new energy center. Water from the new energy center will be distributed to the expanded hospital and new D&T facility. One node is designated to represent all water servicing the new energy center, expanded hospital, and D&T facility.

The existing medical office building (MOB 2) will remain under the Early Project and Ultimate Project expansion. The new medical office buildings (MOB 3 and MOB 4) will be incorporated into the Ultimate project. Each medical office buildings is assigned a water demand node.

Two onsite fire hydrants were assigned an initial demand of 50.0 gpm to assist with model calibration. Three onsite fire hydrants were allotted a fire flow demand of 1,333 gpm to analyze the onsite water flow conditions under each scenario. The selected fire hydrants are located at the furthest distance away from the existing 18” water main along Iris Avenue.

4.3 Model Results – Domestic Water

Four (4) steady-state scenarios were developed for the Early Project and Ultimate Project (a total of 8 scenarios) to simulate water system behavior under Average Day Demand (ADD), Maximum Day Demand (MDD), Peak Hour Demand (PHD), and MDD plus 4,000 gpm fireflow (MDD + 4,000 FF). Model output data for each steady-state scenario is provided in Appendix C. Graphical color-coded

representations of the entire system node pressures and pipeline velocities area provided in Appendix B. Brief summaries of the model results are provided below.

Early Project ADD – Under this scenario, onsite pressure ranged between 83.1 and 94.6 pounds per square inch (psi) in the onsite domestic and fire loop systems. Pipe velocities range between 0.00 to 0.61 feet per second (ft/s).

Early Project MDD – Under this scenario, onsite pressure ranged between 82.8 and 94.6 pounds per square inch (psi) in the onsite domestic and fire loop systems. Pipe velocities range between 0.00 to 0.98 ft/s.

Early Project PHD – Under this scenario, onsite pressure ranged between 83.1 and 94.6 pounds per square inch (psi) in the onsite domestic and fire loop systems. Pipe velocities range between 0.00 to 1.09 ft/s.

Ultimate Project ADD – Under this scenario, onsite pressure ranged between 83.1 and 94.6 pounds per square inch (psi) in the onsite domestic and fire loop systems. Pipe velocities range between 0.00 to 2.11 ft/s.

Ultimate Project MDD – Under this scenario, onsite pressure ranged between 70.6 and 90.4 pounds per square inch (psi) in the onsite domestic and fire loop systems. Pipe velocities range between 0.00 to 8.39 ft/s. The fire hydrants assigned with a 1,333 gpm fire flow demand display a hydrant lead velocity of 15.13 and 15.14 ft/s. Maximum velocity limits were not applied to the hydraulic model settings.

Ultimate Project PHD – Under this scenario, onsite pressure ranged between 83.1 and 94.5 pounds per square inch (psi) in the onsite domestic and fire loop systems. Pipe velocities range between 0.00 to 3.81 ft/s.

4.4 Model Results – Fire Flow

The hydraulic fire flow analysis was run with two hydrant fire flows running simultaneously. This analysis determines the maximum fire flow that can be sustained onsite using multiple concurrent hydrants while maintaining a minimum residual pressure of 20 psi throughout the public and onsite water distribution system. The following tables provide the results of the multiple concurrent hydrant fire flow analysis.

Table 4-1: Results – Early Project Multiple Concurrent Hydrant Fire Flows

ID	Base Demand (gpm)	Base Pressure (psi)	Initial Fire Demand (gpm)	Combined Demand (gpm)	Residual Pressure (psi)	Available Flow (gpm)	Available Pressure (psi)
J404	0	92.22	1,333	1,333	72.39	2,492.29	20.0
J406	0	89.62	1,333	1,333	70.93	3,166.15	20.0
J420	0	91.35	1,333	1,333	70.48	2,201.20	20.0

Cumulative Fire Flow (All Hydrants)	**7,859.64**	

Early Project MDD + 4,000 FF – Under this scenario, onsite pressure ranged between 69.0 and 94.6 psi in the onsite domestic and fire loop systems. Pipe velocities range between 0.00 to 10.89 ft/s. The fire hydrants assigned with a 1,333 gpm fire flow demand display a hydrant lead velocity of 15.13 ft/s. Maximum velocity limits were not applied to the hydraulic model settings.

Table 4-2: Results – Ultimate Project Multiple Concurrent Hydrant Fire Flows

ID	Base Demand (gpm)	Base Pressure (psi)	Initial Fire Demand (gpm)	Combined Demand (gpm)	Residual Pressure (psi)	Available Flow (gpm)	Available Pressure (psi)
J404	0	92.18	1,333	1,333	71.93	2,715.16	20.0
J630	0	93.35	1,334	1,334	71.93	2,041.37	20.0
J628	0	94.18	1,333	1,333	73.70	3,067.83	20.0
Cumulative Fire Flow (All Hydrants)						**7,824.36**	

Ultimate Project MDD + 4,000 FF – Under this scenario, onsite pressure ranged between 70.3 and 90.4 pounds per square inch (psi) in the onsite domestic and fire loop systems. Pipe velocities range between 0.00 to 8.63 ft/s. The fire hydrants assigned with a 1,333 gpm fire flow demand display a hydrant lead velocity of 15.13 and 15.14 ft/s. Maximum velocity limits were not applied to the hydraulic model settings.

Section 5 - Conclusions

Based on the discussion provided in Sections 2 and 3, and the analysis results provided in Section 4 regarding the proposed Kaiser Permanente Moreno Valley Medical Center project, the following conclusions are provided:

1. During domestic demand analysis under Early Project conditions, the onsite static demands during ADD, MDD, and PHD design scenarios range between 82.7 and 92.4 psi. The onsite velocities under the same scenarios range between 0.00 and 1.09 ft/s. During domestic demand analysis under Ultimate Project conditions, the onsite static demands during ADD, MDD, and PHD design scenarios range between 82.5 to 91.1 psi. The onsite velocities under the same scenarios range between 0.00 and 3.64 ft/s.

2. The fire flow results in the Early Project and Ultimate Project both exceed a fire flow of 4,000 gpm and approach 7,860 gpm and 7,825 gpm, respectively.

The result of the Fire Flow design test indicated that the offsite system has adequate capacity to easily deliver a fire flow demand of 4,000 gpm to the project site as required by EMWD.

Section 6 - Appendices

A. Phase Exhibits

B. Water Model Exhibits

- Node and Pipe Labels
- Early Project – ADD, MDD, PHD, MDD + 4,000 FF
- Ultimate Project – ADD, MDD, PHD, MDD + 4,000 FF

C. Model Output Data

D. Fire Flow Test Data from EMWD

E. Water System Planning & Design Principle Guidelines Criteria from EMWD

APPENDIX A – PHASE EXHIBITS

CO ARCHITECTS

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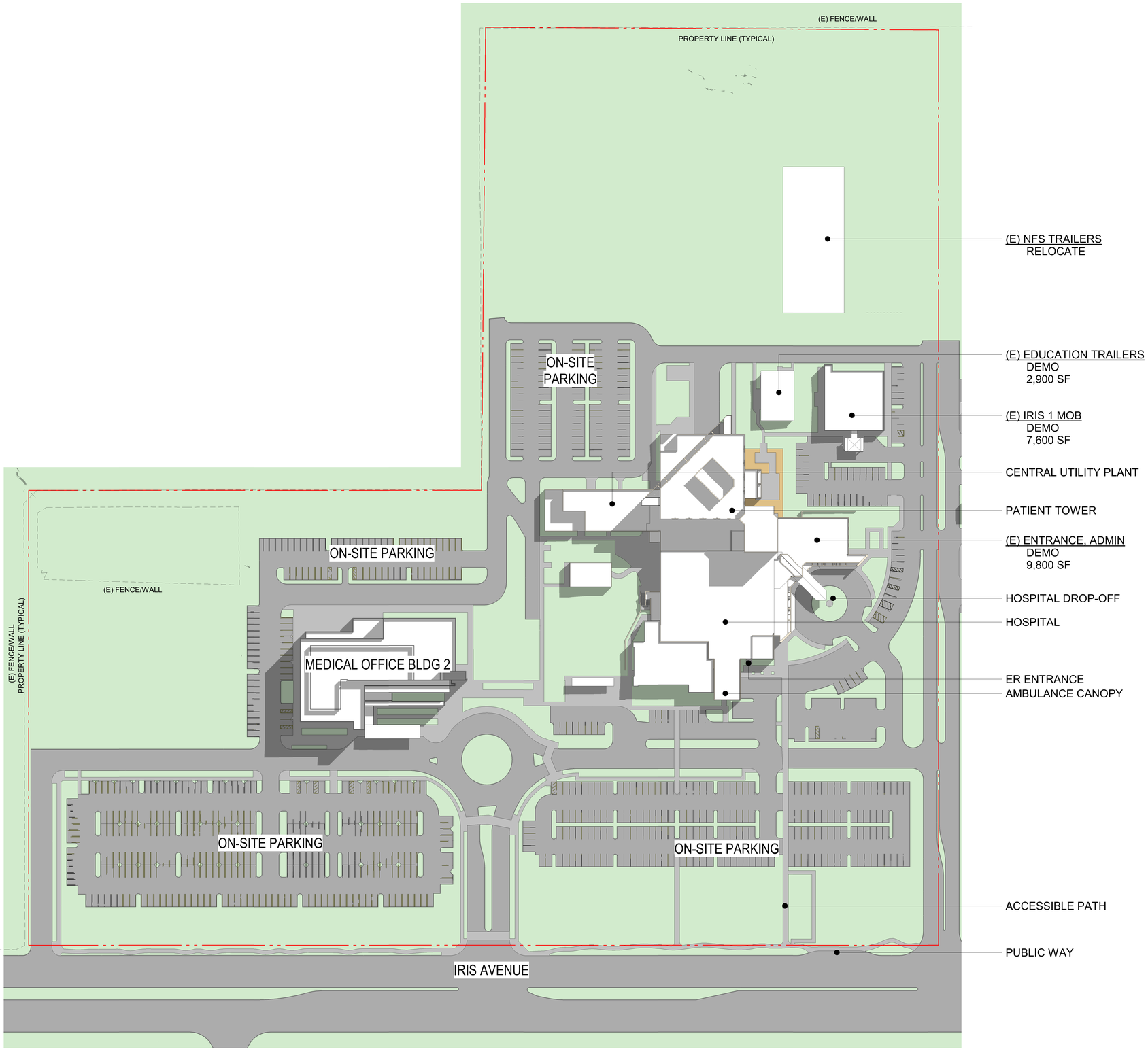
323.525.0500 phone, 323.525.0955 fax



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DIAGNOSTIC & TREATMENT ADDITION

27300 IRIS AVENUE MORENO VALLEY, CA 92555

KAISER Proj: K0130 OSHPD FACILITY: 106334048

OSHPD PROJECT #

KEY PLAN

N

SITE PLAN - EXISTING

SCALE: 1" = 60'-0"
DATE OF ISSUE: NOVEMBER 30, 2018

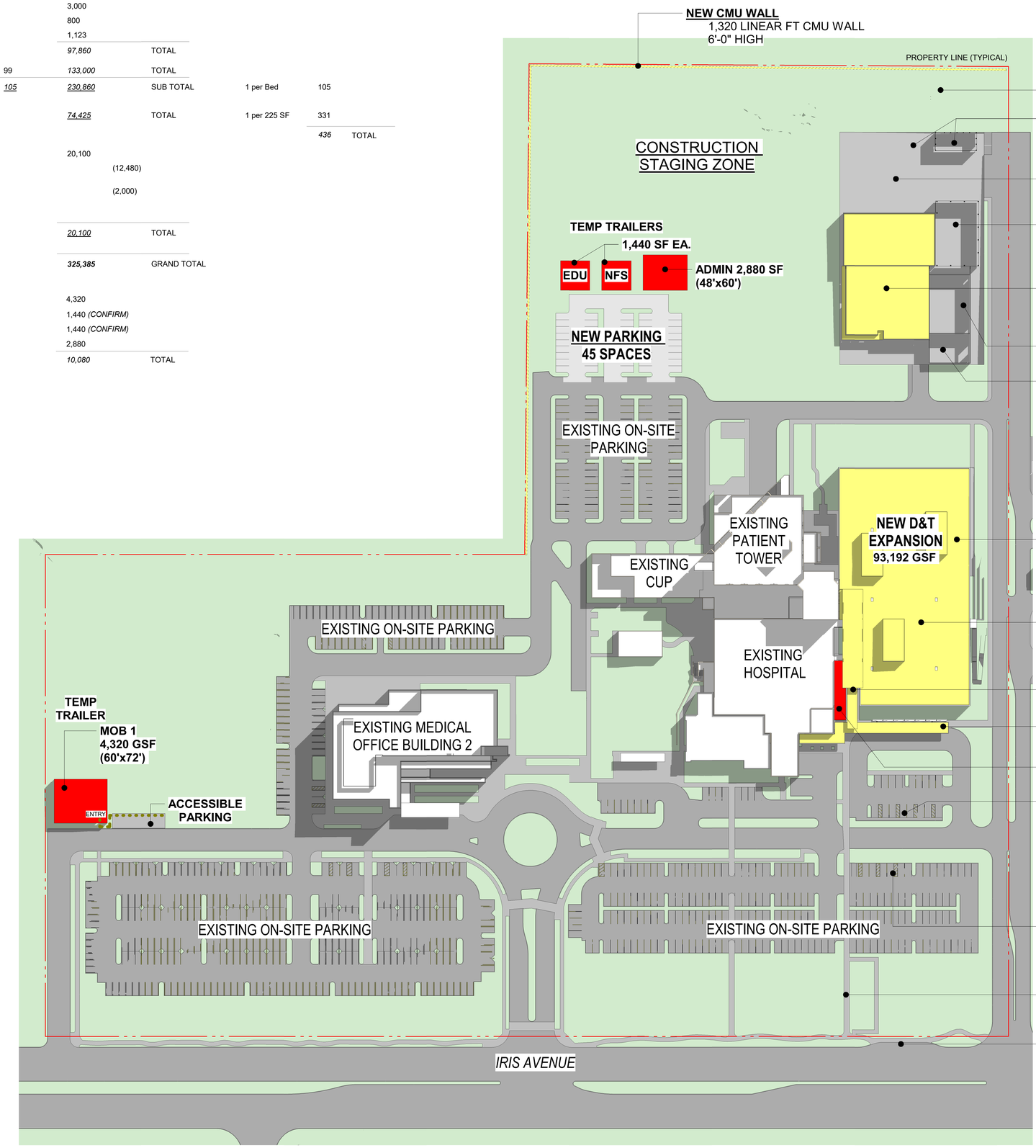
SCHEMATIC DESIGN
CO PROJECT NO.: 17009.000

A1.00

PROGRAM SUMMARY - EARLY PROJECT

	Beds	GSF		Parking Factor	Parking Required
New D&T Expansion	6 (NICU)	93,192			
Drop-off Canopy (covered)		3,000			
Entrance Canopy (covered)		800			
Entrance		1,123			
		97,860	TOTAL		
Existing Hospital	99	*133,000*	TOTAL		
	105	*230,860*	SUB TOTAL	1 per Bed	105
Existing MOB 2		*74,425*	TOTAL	1 per 225 SF	331
					436 TOTAL
New CUP					
Energy Center		20,100			
Yard - Cooling Towers, Emergency Gen., SCE (uncovered)			(12,480)		
Yard - O2, Pump (uncovered)			(2,000)		
Underground Tanks					
		20,100	TOTAL		
		325,385	GRAND TOTAL		
New Temp Trailers					
MOB 1		4,320			
EDU		1,440 *(CONFIRM)*			
NFS		1,440 *(CONFIRM)*			
Admin		2,880			
		10,080	TOTAL		

Parking Spaces		
Existing	685	
New Temporary	45	
	730	TOTAL



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KAISER Proj: K0130 OSHPD FACILITY: 106334048

OSHPD PROJECT #

KEY PLAN

N

SITE PLAN - EARLY PROJECT

SCALE: As indicated
DATE OF ISSUE: NOVEMBER 30, 2018

SCHEMATIC DESIGN
CO PROJECT NO.: 17009.000

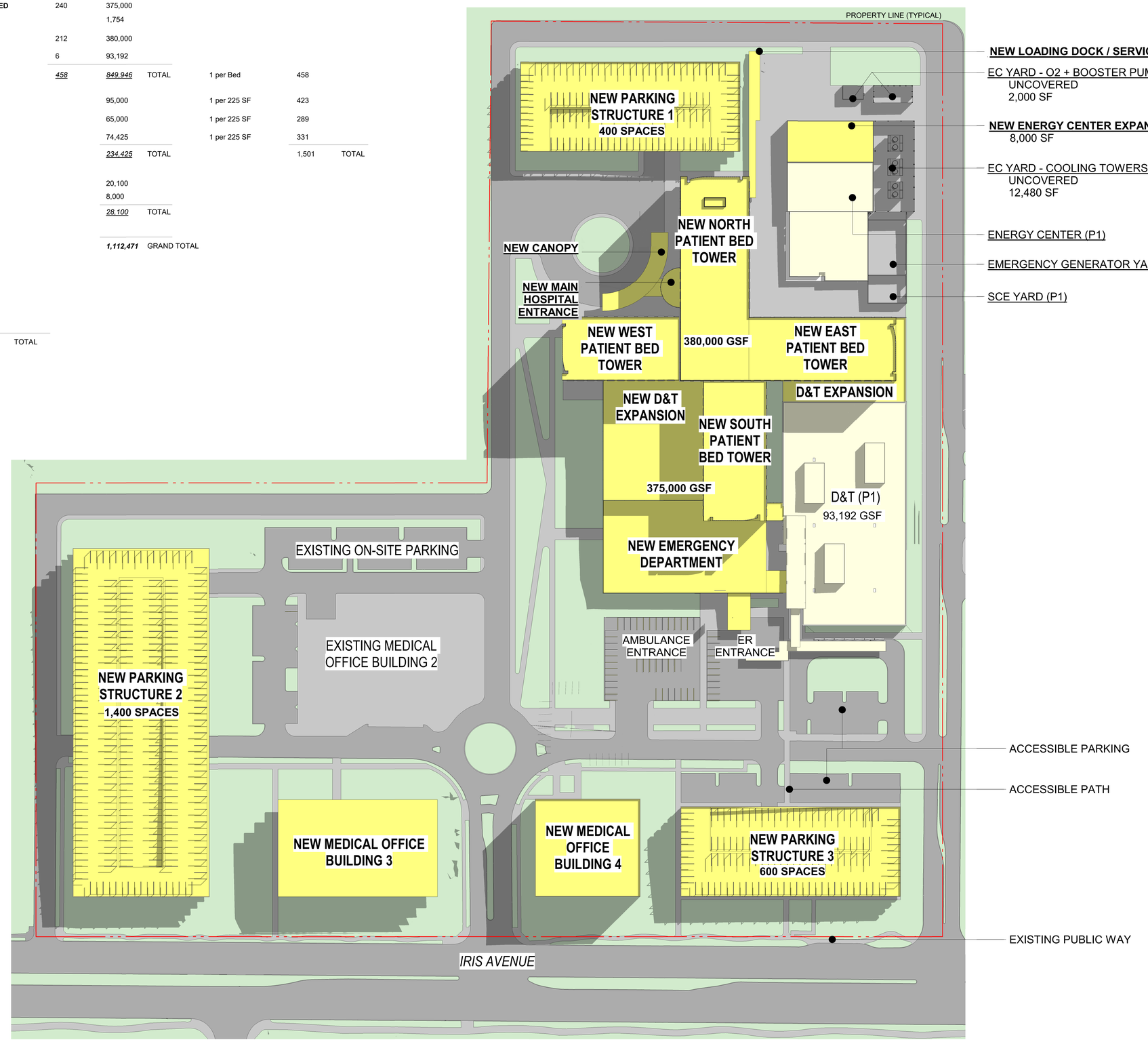
A1.10

PROGRAM SUMMARY - ULTIMATE PROJECT

	Beds	GSF		Parking Factor	Parking Required	
New Patient Bed Towers, D&T Expansion, and ED	240	375,000				
ED Entrance Canopy		1,754				
New Patient Bed Towers and D&T Expansion (P2)	212	380,000				
D&T (P1)	6	93,192				
	458	*849,946*	TOTAL	1 per Bed	458	
New MOB 4		95,000		1 per 225 SF	423	
New MOB 3		65,000		1 per 225 SF	289	
Existing MOB 2		74,425		1 per 225 SF	331	
		234,425	TOTAL		1,501	TOTAL
CUP (P1)		20,100				
New CUP Expansion		8,000				
		28,100	TOTAL			
		1,112,471	GRAND TOTAL			

Parking Spaces

Existing	150	
New Structure 1	400	
New Structure 2	1,400	
New Structure 3	600	
	2,550	TOTAL



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KAISER Proj: K0130 OSHPD FACILITY: 106334048

OSHPD PROJECT #

KEY PLAN

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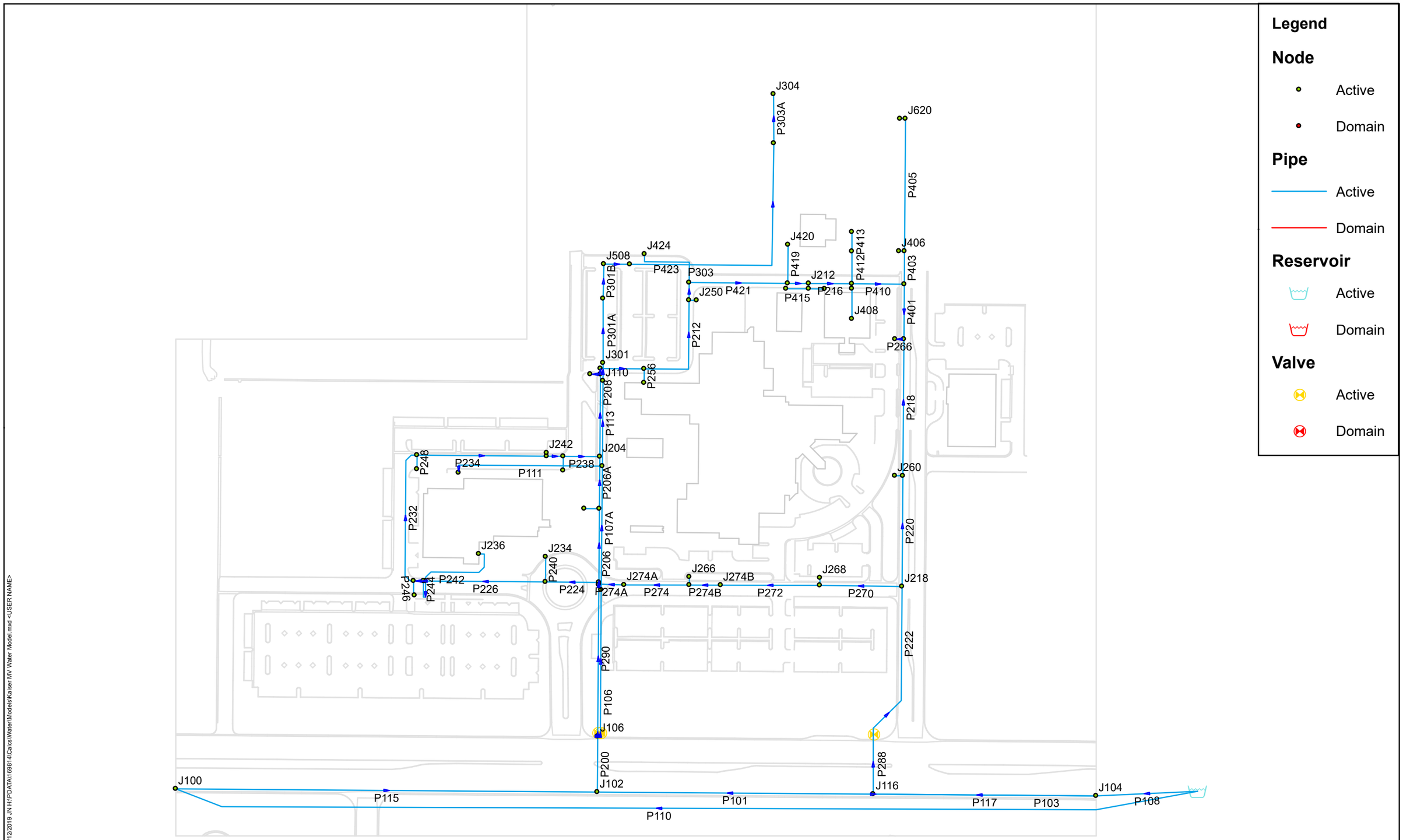
SITE PLAN - ULTIMATE PROJECT

SCALE: As indicated
DATE OF ISSUE: NOVEMBER 30, 2018

SCHEMATIC DESIGN
CO PROJECT NO.: 17009.000

A1.12

APPENDIX B – WATER MODEL EXHIBITS



Legend

Node
- Active
- Domain

Pipe
- Active
- Domain

Reservoir
- Active
- Domain

Valve
- Active
- Domain

4/12/2019 JN H:\PDATA\169814\Cals\Water\Models\Kaiser MV Water Model.mxd <USER NAME>

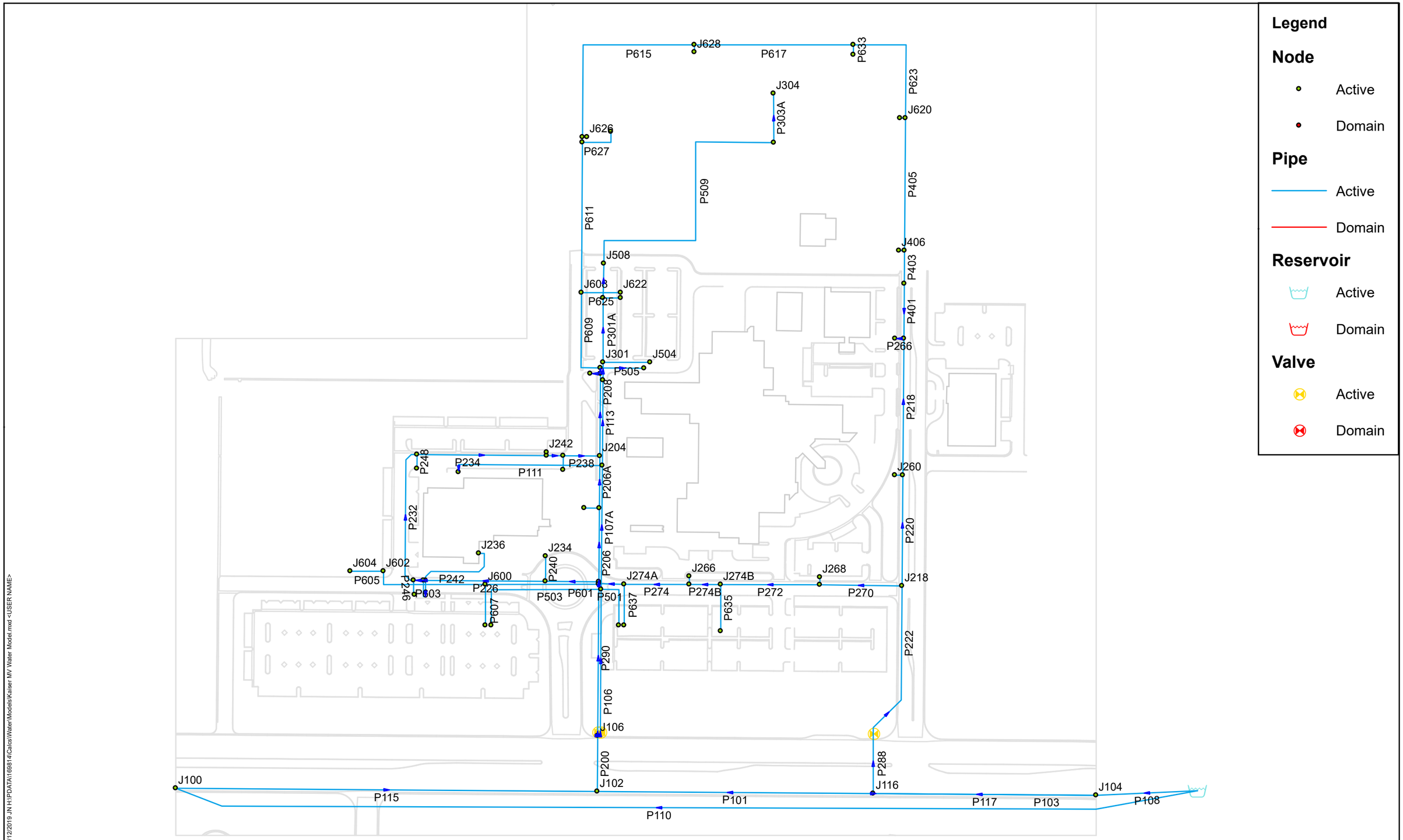
Michael Baker INTERNATIONAL

0 125 250 500 Feet

Source:

KAISER MORENO VALLEY MEDICAL CENTER

Early Project - Node and Pipe Labels



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Michael Baker INTERNATIONAL

0 125 250 500 Feet

Source:

KAISER MORENO VALLEY MEDICAL CENTER

Ultimate Project - Node and Pipe Labels

J620 Fireflow demand of 1,333 gpm drawn from fire hydrant

J420 Fireflow demand of 1,333 gpm drawn from fire hydrant

J406 Fireflow demand of 1,333 gpm drawn from fire hydrant

92.60
92.26
92.22
91.67
92.22
91.35
91.14
90.49
89.62
91.35
90.05
90.05
88.75
88.75
91.02
90.92
87.89
87.45
90.92
89.62
89.94
89.62
86.55
85.72
89.62
86.55
85.64
85.72
85.29
87.39
85.73
85.60
86.59
85.60
84.60
84.86
84.43
83.91
83.13
82.78
86.59
89.38
94.58
92.28
89.25
84.22

Legend

PRESSURE

- <20.00
- 20.00 ~ 40.00
- 40.00 ~ 80.00
- 80.00 ~ 100.00
- >100.00

VELOCITY

- <2.00
- 2.00 ~ 10.00
- 10.00 ~ 15.00
- >15.00

TYPE

- Active
- Domain

TYPE

- Active
- Domain
- Existing Building
- Existing Roadway

4/11/2019 J:\N:\SANDCA1FS1.bkr.mbakercorp.com\HROOT\PDATA\169814\Calcs\WaterModels\Kaiser.MV Water Model.mxd <USER NAME>

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0 125 250 500 Feet

Source:

KAISER MORENO VALLEY MEDICAL CENTER

Early Project - Average Day Demand

J620 Fireflow demand of 1,333 gpm drawn from fire hydrant

J420 Fireflow demand of 1,333 gpm drawn from fire hydrant

J406 Fireflow demand of 1,333 gpm drawn from fire hydrant

92.45 92.11 92.22 91.55 92.22 91.35 91.13 90.48 89.62 90.90 91.35 90.92 90.05 90.05 88.75 88.75 87.88 87.45 90.92 89.62 89.83 89.62 86.54 85.72 89.62 86.54 85.57 85.72 85.29 87.39 85.72 85.59 86.59 86.59 85.59 84.60 84.86 84.42 83.90 83.12 82.78 89.37 94.58 92.28 89.25 84.22

Legend

PRESSURE

- <20.00
- 20.00 ~ 40.00
- 40.00 ~ 80.00
- 80.00 ~ 100.00
- >100.00

VELOCITY

- <2.00
- 2.00 ~ 10.00
- 10.00 ~ 15.00
- >15.00

TYPE

- Active
- Domain

TYPE

- Active
- Domain
- Existing Building
- Existing Roadway

4/11/2019 J:\N:\SANDCA1FS1.bkr.mbakercorp.com\HROOT\PDATA1698141\Calcs\WaterModels\Kaiser.MV Water Model.mxd <USER NAME>

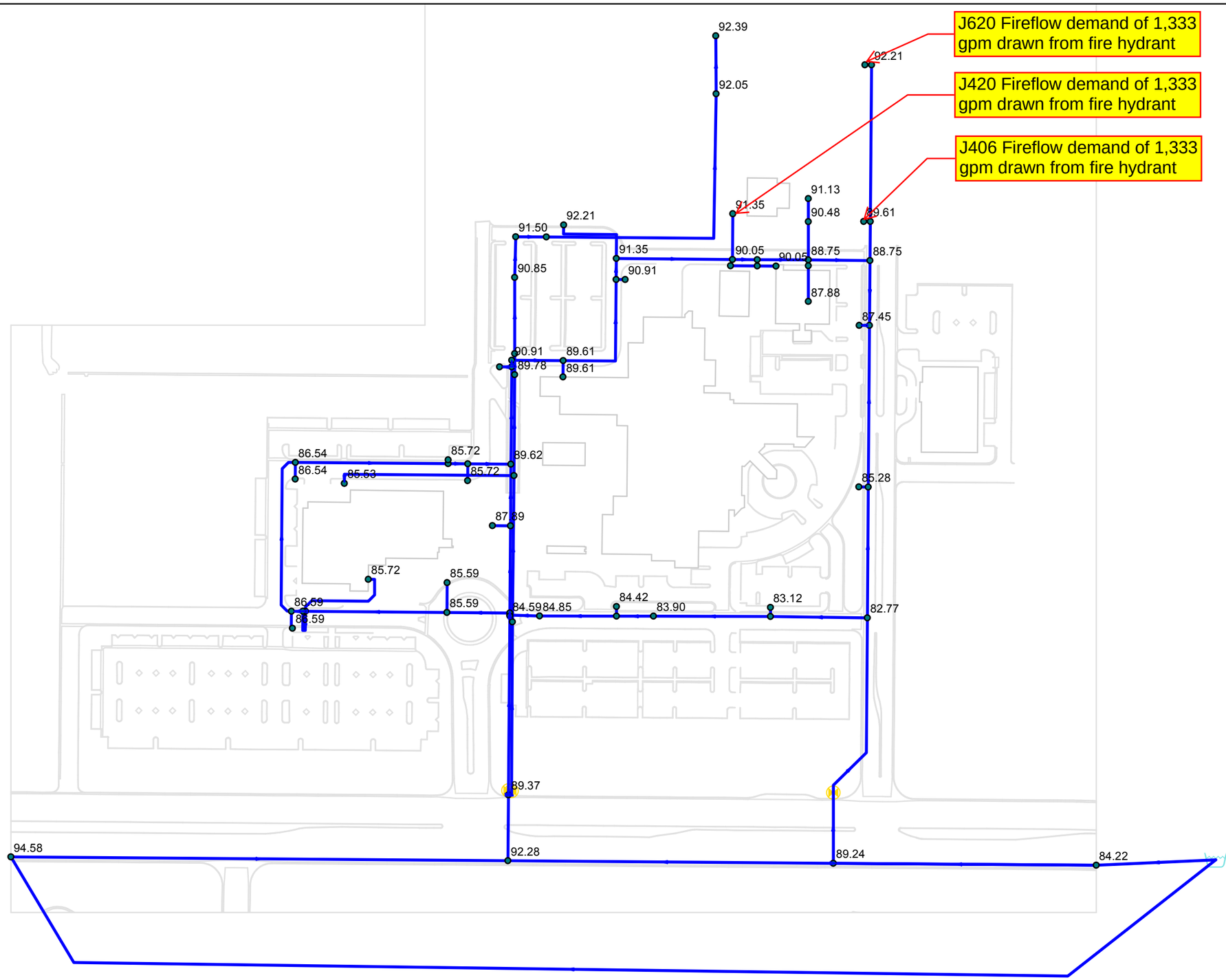
Michael Baker INTERNATIONAL

0 125 250 500 Feet

Source:

KAISER MORENO VALLEY MEDICAL CENTER

Early Project - Maximum Day Demand



Legend

PRESSURE

- <20.00
- 20.00 ~ 40.00
- 40.00 ~ 80.00
- 80.00 ~ 100.00
- >100.00

VELOCITY

- <2.00
- 2.00 ~ 10.00
- 10.00 ~ 15.00
- >15.00

TYPE

- Active
- Domain

TYPE

- Active
- Domain
- Existing Building
- Existing Roadway

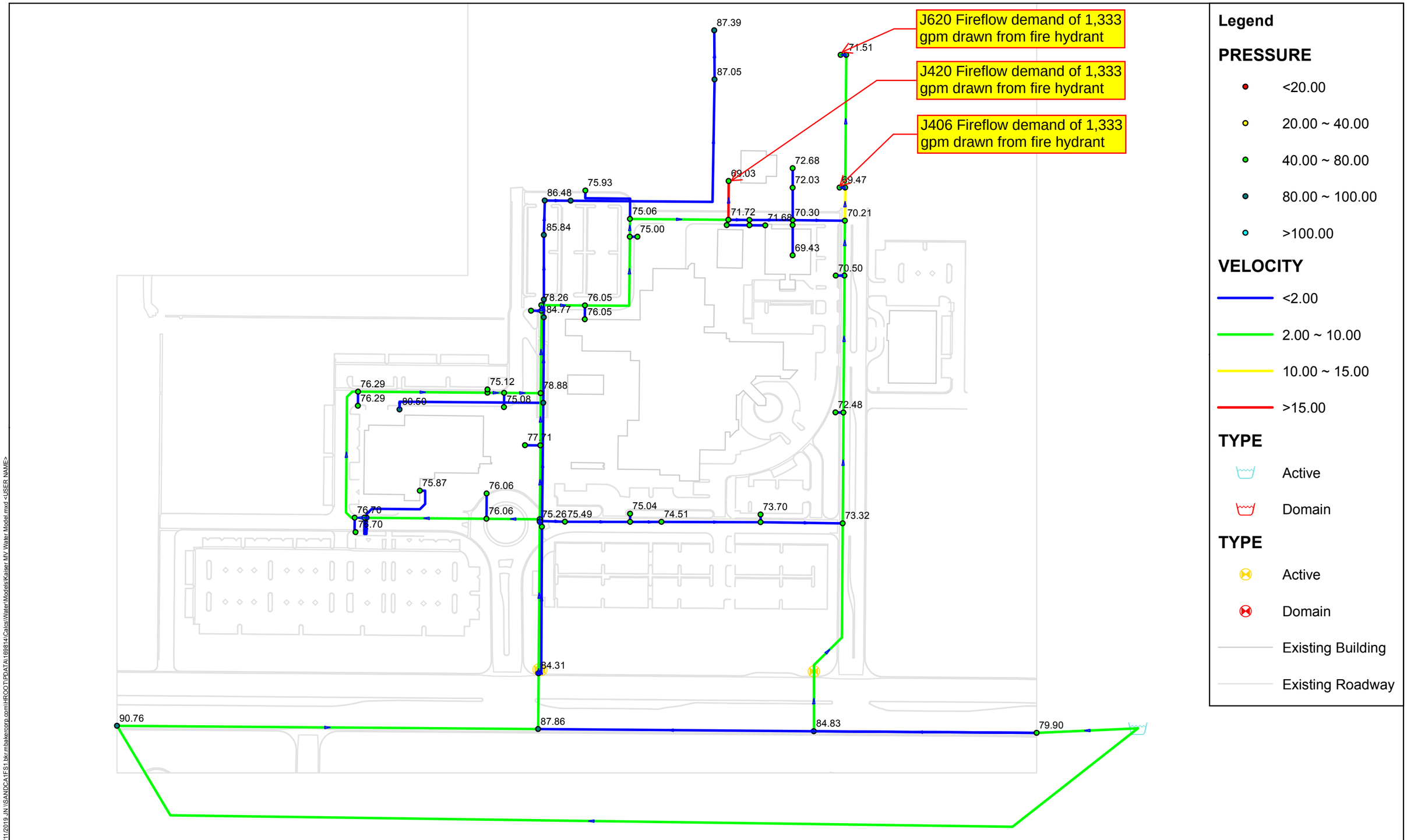
Michael Baker INTERNATIONAL

0 125 250 500 Feet

Source:

KAISER MORENO VALLEY MEDICAL CENTER

Early Project - Peak Hour Demand



4/11/2019 J:\N\SANDCA1FS1.bkr.mbakercorp.com\HROOT\PDATA\169814\Calcs\Water\Models\Kaiser MV Water Model.mxd <USER NAME>

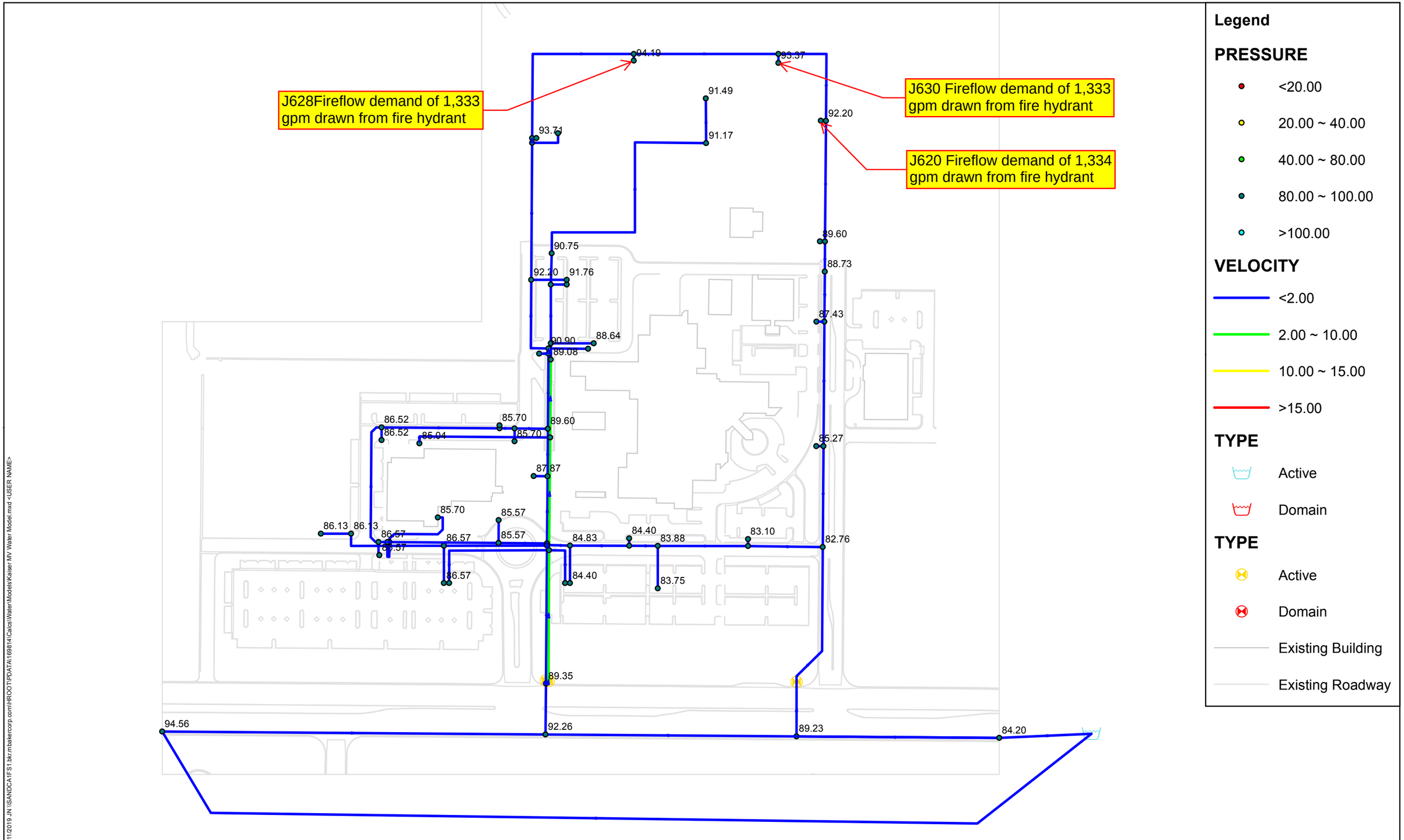
Michael Baker INTERNATIONAL

0 125 250 500 Feet

Source:

KAISER MORENO VALLEY MEDICAL CENTER

Early Project - Maximum Day + 4000 Fireflow Demand



Legend

PRESSURE

- <20.00
- 20.00 ~ 40.00
- 40.00 ~ 80.00
- 80.00 ~ 100.00
- >100.00

VELOCITY

- <2.00
- 2.00 ~ 10.00
- 10.00 ~ 15.00
- >15.00

TYPE

- Active
- Domain

TYPE

- Active
- Domain
- Existing Building
- Existing Roadway

4/11/2019 JN \\SANDCA1FS1.bkr.mbakercorp.com\HROOT\PDATA\169814\Calcs\Water\Models\Kaiser MV Water Model.mxd <USER NAME>

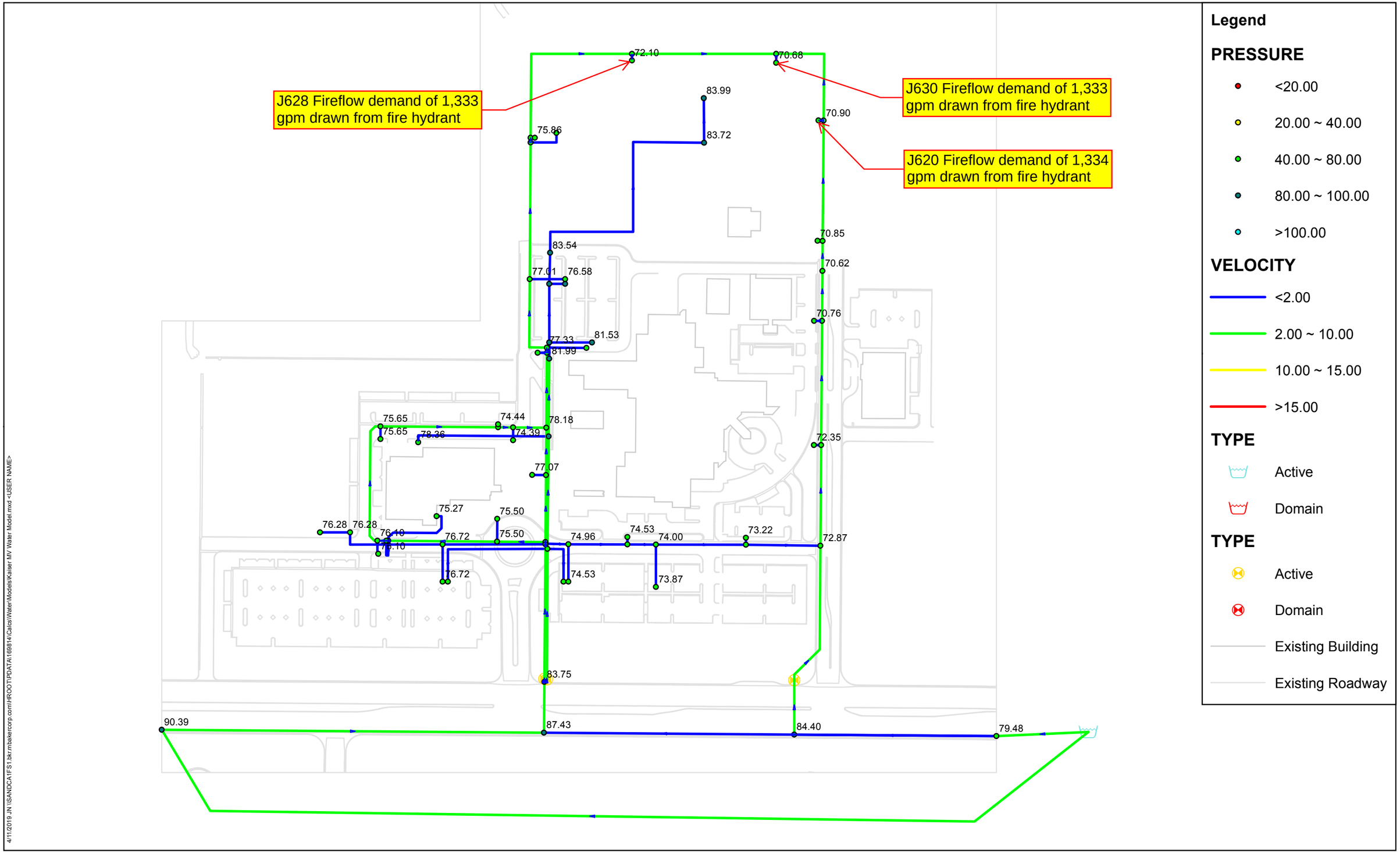
Michael Baker INTERNATIONAL

0 125 250 500 Feet

Source:

KAISER MORENO VALLEY MEDICAL CENTER

Ultimate Project - Average Day Demand



Legend

PRESSURE

- <20.00
- 20.00 ~ 40.00
- 40.00 ~ 80.00
- 80.00 ~ 100.00
- >100.00

VELOCITY

- <2.00
- 2.00 ~ 10.00
- 10.00 ~ 15.00
- >15.00

TYPE

- Active
- Domain

TYPE

- Active
- Domain
- Existing Building
- Existing Roadway

4/11/2019 JN \\SANDCA1FS1.bkr.mbakercorp.com\HROOT\PDATA1\69814\Caltcs\Water\Models\Kaiser MV Water Model.mxd <USER NAME>

Michael Baker INTERNATIONAL

0 125 250 500 Feet

Source:

KAISER MORENO VALLEY MEDICAL CENTER

Ultimate Project - Maximum Day Demand

J628 Fireflow demand of 1,333 gpm drawn from fire hydrant

J630 Fireflow demand of 1,333 gpm drawn from fire hydrant

J620 Fireflow demand of 1,334 gpm drawn from fire hydrant

94.14
93.32
88.77
92.15
93.67
88.52
89.55
88.44
88.68
92.15
91.72
87.38
90.85
86.45
86.92
86.48
85.65
89.55
86.48
83.45
85.65
85.22
87.82
85.65
85.53
86.09
86.09
86.52
86.52
85.53
84.79
84.36
83.84
83.06
82.71
86.52
84.36
83.71
89.30
94.53
92.22
89.19
84.17

Legend

PRESSURE

- <20.00
- 20.00 ~ 40.00
- 40.00 ~ 80.00
- 80.00 ~ 100.00
- >100.00

VELOCITY

- <2.00
- 2.00 ~ 10.00
- 10.00 ~ 15.00
- >15.00

TYPE

- Active
- Domain

TYPE

- Active
- Domain
- Existing Building
- Existing Roadway

4/11/2019 JN \\SANDCA1FS1.bkr.mbakercorp.com\HROOT\PDATA\169814\Calcs\Water\Models\Kaiser MV Water Model.mxd <USER NAME>

Michael Baker INTERNATIONAL

0 125 250 500 Feet

Source:

KAISER MORENO VALLEY MEDICAL CENTER

Ultimate Project - Peak Hour Demand

J628 Fireflow demand of 1,333 gpm drawn from fire hydrant

J630 Fireflow demand of 1,333 gpm drawn from fire hydrant

J620 Fireflow demand of 1,334 gpm drawn from fire hydrant

72.10
70.68
83.99
70.90
75.86
83.72
70.85
83.54
70.62
77.01
76.58
70.76
77.33
81.53
81.99
75.65
74.44
78.18
75.65
78.36
74.39
72.35
77.07
75.27
75.50
76.28
76.28
76.40
76.72
75.50
74.96
74.53
74.00
73.22
72.87
76.10
76.72
74.53
73.87
83.75
90.39
87.43
84.40
79.48

Legend

PRESSURE

- <20.00
- 20.00 ~ 40.00
- 40.00 ~ 80.00
- 80.00 ~ 100.00
- >100.00

VELOCITY

- <2.00
- 2.00 ~ 10.00
- 10.00 ~ 15.00
- >15.00

TYPE

- Active
- Domain

TYPE

- Active
- Domain
- Existing Building
- Existing Roadway

4/11/2019 JN \\SANDCA1FS1.bkr.mbakercorp.com\HROOT\PDATA1\69814\Calcs\Water\Models\Kaiser MV Water Model.mxd <USER NAME>

Michael Baker INTERNATIONAL

0 125 250 500 Feet

Source:

KAISER MORENO VALLEY MEDICAL CENTER

Ultimate Project - Maximum Day + 4000 Fireflow Demand

APPENDIX C – MODEL OUTPUT DATA

```
  ****************************************************************
  ***                                                          ***
  ***                  Comprehensive Analysis of               ***
  ***              Water Distribution Piping Network           ***
  ***                                                          ***
  ****************************************************************

  Kaiser Moreno Valley MC
  Early Project
  ADD

      Input Data File ..................
\\SANDCA1FS1.BKR.MBAKERCORP.COM\HROOT\PDATA\169814\CALCS\WATER\MODELS\KAISER MV
WATER MODEL.OUT\SCENARIO\EP1\~INP
      Number of Junctions.............. 70
      Number of Reservoirs............. 1
      Number of Tanks ................. 0
      Number of Pipes ................. 79
      Number of Pumps ................. 0
      Number of Valves ................ 3
      Headloss Formula ................ Hazen-Williams
      Hydraulic Timestep .............. 1.00 hrs
      Hydraulic Accuracy .............. 0.001000
      Status Check Frequency ............ 2
      Maximum Trials Checked ............ 10
      Damping Limit Threshold ........... 0.000000
      Maximum Trials .................. 500
      Quality Analysis ................ None
      Specific Gravity ................ 1.00
      Relative Kinematic Viscosity ..... 1.00
      Relative Chemical Diffusivity ..... 1.00
      Demand Multiplier ............... 1.00
      Total Duration .................. 0.00 hrs
      Reporting Criteria:
         All Junctions/Tanks/Reservoirs
         All Pipes
         All Pumps/Valves


  Node Results:
  ----------------------------------------------------------------
                                        Demand      Head  Pressure
  Node                                     gpm        ft       psi
  ----------------------------------------------------------------
  J100                                    0.00   1752.98     94.58
  J102                                    0.00   1752.98     92.28
  J104                                    0.00   1752.98     84.22
```

J106	0.00	1752.97	89.38
J107	0.00	1727.74	83.69
J108	0.00	1727.64	88.67
J110	0.00	1727.57	89.94
J114	2.37	1727.64	85.64
J116	0.00	1752.98	89.25
J200	0.00	1729.85	84.60
J202	0.00	1729.85	84.60
J202A	0.00	1729.85	84.60
J204	0.00	1729.84	89.62
J206	0.00	1729.84	90.49
J206A	0.00	1729.84	87.89
J208	0.00	1729.84	89.62
J210	0.00	1729.83	90.92
J210A	0.00	1729.84	90.92
J212	0.00	1729.83	90.05
J214	0.00	1729.83	87.45
J216	0.00	1729.84	85.29
J218	0.00	1729.85	82.78
J220	0.00	1729.85	85.60
J222	0.00	1729.84	86.59
J224	0.00	1729.84	86.59
J226	0.00	1729.84	86.59
J228	0.00	1729.84	86.55
J230	0.00	1729.84	85.72
J232	0.00	1729.84	85.72
J234	0.00	1729.85	85.60
J236	0.00	1729.84	85.73
J238	0.00	1729.84	86.59
J240	0.00	1729.84	86.55
J242	0.00	1729.84	85.72
J244	0.00	1729.84	85.72
J246	50.00	1729.83	90.48
J248	0.00	1729.84	89.62
J250	0.00	1729.83	90.92
J254	0.00	1729.83	90.05
J256	0.00	1729.83	90.05
J258	50.00	1729.83	87.45
J260	0.00	1729.84	85.29
J262	0.00	1729.85	83.13
J264	0.00	1729.85	84.43
J266	0.00	1729.85	84.43
J268	0.00	1729.85	83.13
J274A	0.00	1729.85	84.86
J274B	0.00	1729.85	83.91
J278	0.00	1729.84	87.89
J300	0.00	1727.55	91.23
J301	0.00	1727.57	89.94

J301B	0.00	1727.56	91.02	
J303	0.00	1727.51	92.26	
J304	51.05	1727.51	92.60	
J400	0.00	1729.83	88.75	
J402	0.00	1729.83	89.62	
J404	0.00	1729.83	92.22	
J406	0.00	1729.83	89.62	
J408	0.00	1729.83	87.89	
J410	0.00	1729.83	88.75	
J410A	0.00	1729.83	88.75	
J412	0.00	1729.83	90.49	
J414	0.00	1729.83	91.14	
J416	0.00	1729.83	90.05	
J418	0.00	1729.83	90.05	
J420	0.00	1729.83	91.35	
J422	0.00	1729.83	91.35	
J424	0.00	1729.83	92.22	
J508	0.00	1727.55	91.67	
J620	0.00	1729.83	92.22	
RES9000	-153.45	1753.00	-	Reservoir

Pipe Results:

Link	Flow gpm	Velocity fps	Headloss /1000ft
P101	-27.00	0.03	0.00
P103	39.51	0.05	0.00
P106	53.42	0.61	0.12
P107	53.42	0.61	0.01
P107A	53.42	0.61	0.10
P108	79.02	0.10	0.02
P110	74.43	0.09	0.02
P111	2.37	0.03	0.00
P113	51.05	0.58	0.07
P115	74.43	0.09	0.00
P117	-39.51	0.05	0.00
P200	101.43	0.29	0.01
P202	48.01	0.20	0.00
P202A	48.01	0.20	0.00
P204	55.83	0.23	0.00
P206	37.95	0.16	0.00
P206A	37.95	0.16	0.00
P208	55.82	0.23	0.01
P210	5.82	0.02	0.00
P210A	5.82	0.02	0.00
P212	5.82	0.02	0.00

P214	5.82	0.02	0.00
P216	5.81	0.02	0.00
P218	-44.20	0.18	0.01
P220	-44.20	0.18	0.01
P222	52.01	0.21	0.01
P224	17.88	0.07	0.00
P226	17.87	0.07	0.00
P228	16.84	0.07	0.00
P230	17.87	0.07	0.00
P232	17.87	0.07	0.00
P234	17.87	0.07	0.00
P236	17.87	0.07	0.00
P238	17.87	0.07	0.00
P240	0.00	0.00	0.00
P242	0.00	0.00	0.00
P244	-1.03	0.01	0.00
P246	0.00	0.00	0.00
P248	0.00	0.00	0.00
P250	0.00	0.00	0.00
P252	0.00	0.00	0.00
P254	50.00	0.57	0.01
P256	0.00	0.00	0.00
P258	0.00	0.00	0.00
P260	0.00	0.00	0.00
P264	0.00	0.00	0.00
P266	50.00	0.57	0.01
P268	0.00	0.00	0.00
P270	7.82	0.03	0.00
P272	7.82	0.03	0.00
P274	7.81	0.03	0.00
P274A	7.81	0.03	0.00
P274B	7.82	0.03	0.00
P276	0.00	0.00	0.00
P278	0.00	0.00	0.00
P286	0.00	0.00	0.00
P288	52.01	0.15	0.00
P290	48.01	0.20	0.01
P301	51.05	0.33	0.00
P301A	51.05	0.33	0.01
P301B	51.05	0.33	0.00
P301C	51.05	0.33	0.00
P303	51.05	0.33	0.04
P303A	51.05	0.33	0.01
P401	5.80	0.02	0.00
P403	0.00	0.00	0.00
P405	0.00	0.00	0.00
P407	0.00	0.00	0.00
P409	0.00	0.00	0.00

P410	5.81	0.02	0.00
P411	0.00	0.00	0.00
P412	0.00	0.00	0.00
P413	0.00	0.00	0.00
P415	0.00	0.00	0.00
P417	5.82	0.02	0.00
P419	0.00	0.00	0.00
P421	5.82	0.02	0.00
P423	0.00	0.00	0.00
P621	0.00	0.00	0.00

Valve Results:

Link	Flow gpm	Velocity fps	Headloss /1000ft	
V8000	52.01	0.21	23.12	GPV
V8002	48.01	0.20	23.12	GPV
V8004	53.42	0.61	25.11	GPV

```
  ****************************************************************
  ***                                                          ***
  ***                  Comprehensive Analysis of               ***
  ***              Water Distribution Piping Network           ***
  ***                                                          ***
  ****************************************************************

  Kaiser Moreno Valley MC
  Early Project
  MDD

      Input Data File ..................
\\SANDCA1FS1.BKR.MBAKERCORP.COM\HROOT\PDATA\169814\CALCS\WATER\MODELS\KAISER MV
WATER MODEL.OUT\SCENARIO\EP2\~INP
      Number of Junctions.............. 70
      Number of Reservoirs............. 1
      Number of Tanks ................. 0
      Number of Pipes ................. 79
      Number of Pumps ................. 0
      Number of Valves ................ 3
      Headloss Formula ................ Hazen-Williams
      Hydraulic Timestep .............. 1.00 hrs
      Hydraulic Accuracy .............. 0.001000
      Status Check Frequency ............ 2
      Maximum Trials Checked ............ 10
      Damping Limit Threshold ........... 0.000000
      Maximum Trials .................. 500
      Quality Analysis ................ None
      Specific Gravity ................ 1.00
      Relative Kinematic Viscosity ..... 1.00
      Relative Chemical Diffusivity ..... 1.00
      Demand Multiplier ............... 1.00
      Total Duration .................. 0.00 hrs
      Reporting Criteria:
         All Junctions/Tanks/Reservoirs
         All Pipes
         All Pumps/Valves


  Node Results:
  ----------------------------------------------------------------
                                        Demand      Head  Pressure
  Node                                     gpm        ft       psi
  ----------------------------------------------------------------
  J100                                    0.00   1752.97     94.58
  J102                                    0.00   1752.97     92.28
  J104                                    0.00   1752.97     84.22
```

J106	0.00	1752.96	89.37
J107	0.00	1727.73	83.68
J108	0.00	1727.48	88.60
J110	0.00	1727.32	89.83
J114	3.56	1727.48	85.57
J116	0.00	1752.97	89.25
J200	0.00	1729.83	84.60
J202	0.00	1729.83	84.60
J202A	0.00	1729.83	84.60
J204	0.00	1729.83	89.62
J206	0.00	1729.82	90.48
J206A	0.00	1729.83	87.89
J208	0.00	1729.82	89.62
J210	0.00	1729.82	90.92
J210A	0.00	1729.82	90.92
J212	0.00	1729.82	90.05
J214	0.00	1729.82	87.45
J216	0.00	1729.83	85.29
J218	0.00	1729.84	82.78
J220	0.00	1729.83	85.59
J222	0.00	1729.83	86.59
J224	0.00	1729.83	86.59
J226	0.00	1729.83	86.59
J228	0.00	1729.83	86.54
J230	0.00	1729.83	85.72
J232	0.00	1729.83	85.72
J234	0.00	1729.83	85.59
J236	0.00	1729.83	85.72
J238	0.00	1729.83	86.59
J240	0.00	1729.83	86.54
J242	0.00	1729.83	85.72
J244	0.00	1729.83	85.72
J246	50.00	1729.82	90.48
J248	0.00	1729.82	89.62
J250	0.00	1729.82	90.92
J254	0.00	1729.82	90.05
J256	0.00	1729.82	90.05
J258	50.00	1729.82	87.45
J260	0.00	1729.83	85.29
J262	0.00	1729.84	83.12
J264	0.00	1729.83	84.42
J266	0.00	1729.83	84.42
J268	0.00	1729.84	83.12
J274A	0.00	1729.83	84.86
J274B	0.00	1729.83	83.90
J278	0.00	1729.83	87.89
J300	0.00	1727.27	91.11
J301	0.00	1727.31	89.83

J301B	0.00	1727.29	90.90	
J303	0.00	1727.18	92.11	
J304	82.39	1727.16	92.45	
J400	0.00	1729.82	88.75	
J402	0.00	1729.82	89.62	
J404	0.00	1729.82	92.22	
J406	0.00	1729.82	89.62	
J408	0.00	1729.82	87.88	
J410	0.00	1729.82	88.75	
J410A	0.00	1729.82	88.75	
J412	0.00	1729.82	90.48	
J414	0.00	1729.82	91.13	
J416	0.00	1729.82	90.05	
J418	0.00	1729.82	90.05	
J420	0.00	1729.82	91.35	
J422	0.00	1729.82	91.35	
J424	0.00	1729.82	92.22	
J508	0.00	1727.28	91.55	
J620	0.00	1729.82	92.22	
RES9000	-185.98	1753.00	-	Reservoir

Pipe Results:

Link	Flow gpm	Velocity fps	Headloss /1000ft
P101	-41.33	0.05	0.00
P103	47.79	0.06	0.00
P106	85.95	0.98	0.29
P107	85.95	0.98	0.01
P107A	85.95	0.98	0.25
P108	95.58	0.12	0.03
P110	90.40	0.11	0.03
P111	3.56	0.04	0.00
P113	82.39	0.93	0.16
P115	90.40	0.11	0.00
P117	-47.79	0.06	0.00
P200	131.73	0.37	0.01
P202	45.78	0.19	0.00
P202A	45.78	0.19	0.00
P204	55.54	0.23	0.00
P206	37.75	0.15	0.00
P206A	37.75	0.15	0.00
P208	55.53	0.23	0.01
P210	5.53	0.02	0.00
P210A	5.53	0.02	0.00
P212	5.53	0.02	0.00

P214	5.52	0.02	0.00
P216	5.51	0.02	0.00
P218	-44.49	0.18	0.01
P220	-44.49	0.18	0.01
P222	54.25	0.22	0.01
P224	17.78	0.07	0.00
P226	17.78	0.07	0.00
P228	16.76	0.07	0.00
P230	17.78	0.07	0.00
P232	17.78	0.07	0.00
P234	17.78	0.07	0.00
P236	17.78	0.07	0.00
P238	17.78	0.07	0.00
P240	0.00	0.00	0.00
P242	0.00	0.00	0.00
P244	-1.02	0.01	0.00
P246	0.00	0.00	0.00
P248	0.00	0.00	0.00
P250	0.00	0.00	0.00
P252	0.00	0.00	0.00
P254	50.00	0.57	0.01
P256	0.00	0.00	0.00
P258	0.00	0.00	0.00
P260	0.00	0.00	0.00
P264	0.00	0.00	0.00
P266	50.00	0.57	0.01
P268	0.00	0.00	0.00
P270	9.76	0.04	0.00
P272	9.76	0.04	0.00
P274	9.75	0.04	0.00
P274A	9.75	0.04	0.00
P274B	9.76	0.04	0.00
P276	0.00	0.00	0.00
P278	0.00	0.00	0.00
P286	0.00	0.00	0.00
P288	54.25	0.15	0.00
P290	45.78	0.19	0.01
P301	82.39	0.53	0.01
P301A	82.39	0.53	0.02
P301B	82.39	0.53	0.01
P301C	82.39	0.53	0.01
P303	82.39	0.53	0.09
P303A	82.39	0.53	0.02
P401	5.51	0.02	0.00
P403	0.00	0.00	0.00
P405	0.00	0.00	0.00
P407	0.00	0.00	0.00
P409	0.00	0.00	0.00

P410	5.51	0.02	0.00
P411	0.00	0.00	0.00
P412	0.00	0.00	0.00
P413	0.00	0.00	0.00
P415	0.00	0.00	0.00
P417	5.52	0.02	0.00
P419	0.00	0.00	0.00
P421	5.52	0.02	0.00
P423	0.00	0.00	0.00
P621	0.00	0.00	0.00

Valve Results:

Link	Flow gpm	Velocity fps	Headloss /1000ft	
V8000	54.25	0.22	23.12	GPV
V8002	45.78	0.19	23.12	GPV
V8004	85.95	0.98	24.93	GPV

```
**********************************************************************
***                                                                ***
***                  Comprehensive Analysis of                     ***
***              Water Distribution Piping Network                 ***
***                                                                ***
**********************************************************************

Kaiser Moreno Valley MC
Early Project
PHD

     Input Data File ..................
\\SANDCA1FS1.BKR.MBAKERCORP.COM\HROOT\PDATA\169814\CALCS\WATER\MODELS\KAISER MV
WATER MODEL.OUT\SCENARIO\EP3\~INP
     Number of Junctions.............. 70
     Number of Reservoirs............. 1
     Number of Tanks ................. 0
     Number of Pipes ................. 79
     Number of Pumps ................. 0
     Number of Valves ................ 3
     Headloss Formula ................ Hazen-Williams
     Hydraulic Timestep .............. 1.00 hrs
     Hydraulic Accuracy .............. 0.001000
     Status Check Frequency ............ 2
     Maximum Trials Checked ............ 10
     Damping Limit Threshold ........... 0.000000
     Maximum Trials .................. 500
     Quality Analysis ................ None
     Specific Gravity ................ 1.00
     Relative Kinematic Viscosity ..... 1.00
     Relative Chemical Diffusivity ..... 1.00
     Demand Multiplier ............... 1.00
     Total Duration .................. 0.00 hrs
     Reporting Criteria:
        All Junctions/Tanks/Reservoirs
        All Pipes
        All Pumps/Valves


Node Results:
----------------------------------------------------------------------
                                      Demand      Head  Pressure
Node                                     gpm        ft       psi
----------------------------------------------------------------------
J100                                    0.00   1752.97     94.58
J102                                    0.00   1752.96     92.28
J104                                    0.00   1752.97     84.22
```

J106	0.00	1752.95	89.37
J107	0.00	1727.71	83.68
J108	0.00	1727.40	88.57
J110	0.00	1727.21	89.78
J114	4.74	1727.40	85.53
J116	0.00	1752.97	89.24
J200	0.00	1729.83	84.59
J202	0.00	1729.83	84.59
J202A	0.00	1729.83	84.59
J204	0.00	1729.83	89.62
J206	0.00	1729.82	90.48
J206A	0.00	1729.83	87.89
J208	0.00	1729.82	89.61
J210	0.00	1729.82	90.91
J210A	0.00	1729.82	90.91
J212	0.00	1729.82	90.05
J214	0.00	1729.82	87.45
J216	0.00	1729.83	85.28
J218	0.00	1729.83	82.77
J220	0.00	1729.83	85.59
J222	0.00	1729.83	86.59
J224	0.00	1729.83	86.59
J226	0.00	1729.83	86.59
J228	0.00	1729.83	86.54
J230	0.00	1729.83	85.72
J232	0.00	1729.83	85.72
J234	0.00	1729.83	85.59
J236	0.00	1729.83	85.72
J238	0.00	1729.83	86.59
J240	0.00	1729.83	86.54
J242	0.00	1729.83	85.72
J244	0.00	1729.83	85.72
J246	50.00	1729.81	90.48
J248	0.00	1729.82	89.61
J250	0.00	1729.82	90.91
J254	0.00	1729.82	90.05
J256	0.00	1729.82	90.05
J258	50.00	1729.81	87.45
J260	0.00	1729.83	85.28
J262	0.00	1729.83	83.12
J264	0.00	1729.83	84.42
J266	0.00	1729.83	84.42
J268	0.00	1729.83	83.12
J274A	0.00	1729.83	84.85
J274B	0.00	1729.83	83.90
J278	0.00	1729.83	87.89
J300	0.00	1727.15	91.06
J301	0.00	1727.20	89.78

J301B	0.00	1727.18	90.85	
J303	0.00	1727.04	92.05	
J304	91.39	1727.02	92.39	
J400	0.00	1729.82	88.75	
J402	0.00	1729.82	89.61	
J404	0.00	1729.82	92.21	
J406	0.00	1729.82	89.61	
J408	0.00	1729.82	87.88	
J410	0.00	1729.82	88.75	
J410A	0.00	1729.82	88.75	
J412	0.00	1729.82	90.48	
J414	0.00	1729.82	91.13	
J416	0.00	1729.82	90.05	
J418	0.00	1729.82	90.05	
J420	0.00	1729.82	91.35	
J422	0.00	1729.82	91.35	
J424	0.00	1729.82	92.21	
J508	0.00	1727.16	91.50	
J620	0.00	1729.82	92.21	
RES9000	-196.16	1753.00	-	Reservoir

Pipe Results:

Link	Flow gpm	Velocity fps	Headloss /1000ft
P101	-45.72	0.06	0.00
P103	50.38	0.06	0.00
P106	96.13	1.09	0.36
P107	96.13	1.09	0.02
P107A	96.13	1.09	0.31
P108	100.76	0.13	0.03
P110	95.40	0.12	0.03
P111	4.74	0.05	0.00
P113	91.39	1.04	0.19
P115	95.40	0.12	0.00
P117	-50.38	0.06	0.00
P200	141.12	0.40	0.01
P202	44.99	0.18	0.00
P202A	44.99	0.18	0.00
P204	55.42	0.23	0.00
P206	37.67	0.15	0.00
P206A	37.67	0.15	0.00
P208	55.41	0.23	0.01
P210	5.41	0.02	0.00
P210A	5.41	0.02	0.00
P212	5.41	0.02	0.00

P214	5.41	0.02	0.00
P216	5.40	0.02	0.00
P218	-44.60	0.18	0.01
P220	-44.61	0.18	0.01
P222	55.04	0.22	0.01
P224	17.74	0.07	0.00
P226	17.74	0.07	0.00
P228	16.73	0.07	0.00
P230	17.74	0.07	0.00
P232	17.74	0.07	0.00
P234	17.74	0.07	0.00
P236	17.74	0.07	0.00
P238	17.74	0.07	0.00
P240	0.00	0.00	0.00
P242	0.00	0.00	0.00
P244	-1.01	0.01	0.00
P246	0.00	0.00	0.00
P248	0.00	0.00	0.00
P250	0.00	0.00	0.00
P252	0.00	0.00	0.00
P254	50.00	0.57	0.01
P256	0.00	0.00	0.00
P258	0.00	0.00	0.00
P260	0.00	0.00	0.00
P264	0.00	0.00	0.00
P266	50.00	0.57	0.01
P268	0.00	0.00	0.00
P270	10.43	0.04	0.00
P272	10.43	0.04	0.00
P274	10.43	0.04	0.00
P274A	10.43	0.04	0.00
P274B	10.43	0.04	0.00
P276	0.00	0.00	0.00
P278	0.00	0.00	0.00
P286	0.00	0.00	0.00
P288	55.04	0.16	0.00
P290	44.99	0.18	0.01
P301	91.39	0.58	0.01
P301A	91.39	0.58	0.03
P301B	91.39	0.58	0.01
P301C	91.39	0.58	0.01
P303	91.39	0.58	0.11
P303A	91.39	0.58	0.02
P401	5.40	0.02	0.00
P403	0.00	0.00	0.00
P405	0.00	0.00	0.00
P407	0.00	0.00	0.00
P409	0.00	0.00	0.00

P410	5.40	0.02	0.00
P411	0.00	0.00	0.00
P412	0.00	0.00	0.00
P413	0.00	0.00	0.00
P415	0.00	0.00	0.00
P417	5.40	0.02	0.00
P419	0.00	0.00	0.00
P421	5.40	0.02	0.00
P423	0.00	0.00	0.00
P621	0.00	0.00	0.00

Valve Results:

Link	Flow gpm	Velocity fps	Headloss /1000ft	
V8000	55.04	0.22	23.12	GPV
V8002	44.99	0.18	23.12	GPV
V8004	96.13	1.09	24.87	GPV

```
  ****************************************************************
  ***                                                          ***
  ***                  Comprehensive Analysis of               ***
  ***              Water Distribution Piping Network           ***
  ***                                                          ***
  ****************************************************************

  Kaiser Moreno Valley MC
  Early Project
  Max Day + 4,000 Fireflow

      Input Data File ..................
\\SANDCA1FS1.BKR.MBAKERCORP.COM\HROOT\PDATA\169814\CALCS\WATER\MODELS\KAISER MV
WATER MODEL.OUT\SCENARIO\EP4\~INP
      Number of Junctions.............. 70
      Number of Reservoirs............. 1
      Number of Tanks ................. 0
      Number of Pipes ................. 79
      Number of Pumps ................. 0
      Number of Valves ................ 3
      Headloss Formula ................ Hazen-Williams
      Hydraulic Timestep .............. 1.00 hrs
      Hydraulic Accuracy .............. 0.001000
      Status Check Frequency ............ 2
      Maximum Trials Checked ............ 10
      Damping Limit Threshold ........... 0.000000
      Maximum Trials .................. 500
      Quality Analysis ................ None
      Specific Gravity ................ 1.00
      Relative Kinematic Viscosity ..... 1.00
      Relative Chemical Diffusivity ..... 1.00
      Demand Multiplier ............... 1.00
      Total Duration .................. 0.00 hrs
      Reporting Criteria:
         All Junctions/Tanks/Reservoirs
         All Pipes
         All Pumps/Valves


  Node Results:
  ----------------------------------------------------------------
                                        Demand      Head  Pressure
  Node                                     gpm        ft       psi
  ----------------------------------------------------------------
  J100                                    0.00   1744.17     90.76
  J102                                    0.00   1742.77     87.86
  J104                                    0.00   1743.00     79.90
```

J106	0.00	1741.27	84.31
J107	0.00	1716.04	78.62
J108	0.00	1715.79	83.54
J110	0.00	1715.63	84.77
J114	3.56	1715.79	80.50
J116	0.00	1742.77	84.83
J200	0.00	1708.24	75.24
J202	0.00	1708.15	75.20
J202A	0.00	1708.29	75.26
J204	0.00	1705.05	78.88
J206	0.00	1700.89	77.95
J206A	0.00	1706.33	77.71
J208	0.00	1698.52	76.05
J210	0.00	1693.09	75.00
J210A	0.00	1700.62	78.26
J212	0.00	1687.42	71.68
J214	0.00	1690.71	70.50
J216	0.00	1700.27	72.48
J218	0.00	1708.02	73.32
J220	0.00	1707.83	76.06
J222	0.00	1707.09	76.73
J224	0.00	1707.08	76.73
J226	0.00	1707.02	76.70
J228	0.00	1706.17	76.29
J230	0.00	1705.37	75.12
J232	0.00	1705.27	75.08
J234	0.00	1707.83	76.06
J236	0.00	1707.09	75.87
J238	0.00	1707.02	76.70
J240	0.00	1706.17	76.29
J242	0.00	1705.37	75.12
J244	0.00	1705.27	75.08
J246	50.00	1700.89	77.94
J248	0.00	1698.52	76.05
J250	0.00	1693.09	75.00
J254	0.00	1687.42	71.68
J256	0.00	1687.42	71.68
J258	50.00	1690.71	70.50
J260	0.00	1700.27	72.48
J262	0.00	1708.08	73.70
J264	0.00	1708.18	75.04
J266	0.00	1708.18	75.04
J268	0.00	1708.08	73.70
J274A	0.00	1708.22	75.49
J274B	0.00	1708.15	74.51
J278	0.00	1706.33	77.71
J300	0.00	1715.58	86.05
J301	0.00	1715.63	84.76

J301B	0.00	1715.60	85.84	
J303	0.00	1715.49	87.05	
J304	82.39	1715.48	87.39	
J400	0.00	1687.02	70.21	
J402	0.00	1684.66	70.05	
J404	1333.00	1680.71	70.94	
J406	1333.00	1683.34	69.47	
J408	0.00	1687.24	69.43	
J410	0.00	1687.24	70.30	
J410A	0.00	1687.24	70.30	
J412	0.00	1687.24	72.03	
J414	0.00	1687.24	72.68	
J416	0.00	1687.42	71.68	
J418	0.00	1687.51	71.72	
J420	1333.00	1678.31	69.03	
J422	0.00	1692.24	75.06	
J424	0.00	1692.24	75.93	
J508	0.00	1715.59	86.48	
J620	0.00	1682.04	71.51	
RES9000	-4184.95	1753.00	-	Reservoir

Pipe Results:

Link	Flow gpm	Velocity fps	Headloss /1000ft
P101	-123.05	0.16	0.01
P103	1081.27	1.36	0.23
P106	85.95	0.98	0.29
P107	85.95	0.98	0.01
P107A	85.95	0.98	0.25
P108	2162.55	2.73	10.00
P110	2022.41	2.55	8.83
P111	3.56	0.04	0.00
P113	82.39	0.93	0.16
P115	2022.41	2.55	1.40
P117	-1081.27	1.36	0.23
P200	2145.46	6.09	1.49
P202	2059.51	8.41	0.22
P202A	2059.51	8.41	0.04
P204	1868.87	7.63	0.09
P206	1270.49	5.19	1.82
P206A	1270.49	5.19	1.29
P208	1868.86	7.63	4.15
P210	1818.86	7.43	0.27
P210A	1818.86	7.43	2.10
P212	1818.86	7.43	5.43

P214	1818.86	7.43	0.85
P216	485.86	1.98	0.18
P218	-2230.14	9.11	9.56
P220	-2230.14	9.11	7.74
P222	2039.50	8.33	9.45
P224	598.37	2.44	0.33
P226	598.37	2.44	0.73
P228	556.13	2.27	0.01
P230	598.37	2.44	0.06
P232	598.37	2.44	0.85
P234	598.37	2.44	0.79
P236	598.37	2.44	0.10
P238	598.37	2.44	0.22
P240	0.00	0.00	0.00
P242	0.00	0.00	0.00
P244	-42.24	0.48	0.01
P246	0.00	0.00	0.00
P248	0.00	0.00	0.00
P250	0.00	0.00	0.00
P252	0.00	0.00	0.00
P254	50.00	0.57	0.01
P256	0.00	0.00	0.00
P258	0.00	0.00	0.00
P260	0.00	0.00	0.00
P264	0.00	0.00	0.00
P266	50.00	0.57	0.01
P268	0.00	0.00	0.00
P270	-190.64	0.78	0.06
P272	-190.64	0.78	0.07
P274	-190.64	0.78	0.05
P274A	-190.64	0.78	0.02
P274B	-190.64	0.78	0.02
P276	0.00	0.00	0.00
P278	0.00	0.00	0.00
P286	0.00	0.00	0.00
P288	2039.50	5.79	1.46
P290	2059.51	8.41	8.92
P301	82.39	0.53	0.01
P301A	82.39	0.53	0.02
P301B	82.39	0.53	0.01
P301C	82.39	0.53	0.01
P303	82.39	0.53	0.09
P303A	82.39	0.53	0.02
P401	-2180.14	8.91	3.69
P403	2666.00	10.89	2.36
P405	1333.00	5.45	2.62
P407	1333.00	15.13	1.33
P409	0.00	0.00	0.00

P410	485.86	1.98	0.22
P411	0.00	0.00	0.00
P412	0.00	0.00	0.00
P413	0.00	0.00	0.00
P415	0.00	0.00	0.00
P417	485.86	1.98	0.09
P419	1333.00	15.13	9.20
P421	1818.86	7.43	4.73
P423	0.00	0.00	0.00
P621	1333.00	15.13	1.33

Valve Results:

Link	Flow gpm	Velocity fps	Headloss /1000ft	
V8000	2039.50	8.33	23.83	GPV
V8002	2059.51	8.41	23.84	GPV
V8004	85.95	0.98	24.93	GPV

```
  ****************************************************************
  ***                                                          ***
  ***                  Comprehensive Analysis of               ***
  ***              Water Distribution Piping Network           ***
  ***                                                          ***
  ****************************************************************

  Kaiser Moreno Valley MC
  Ultimate Project
  ADD

      Input Data File ..................
\\SANDCA1FS1.BKR.MBAKERCORP.COM\HROOT\PDATA\169814\CALCS\WATER\MODELS\KAISER MV
WATER MODEL.OUT\SCENARIO\UP1\~INP
      Number of Junctions.............. 73
      Number of Reservoirs............. 1
      Number of Tanks ................. 0
      Number of Pipes ................. 82
      Number of Pumps ................. 0
      Number of Valves ................ 3
      Headloss Formula ................ Hazen-Williams
      Hydraulic Timestep .............. 1.00 hrs
      Hydraulic Accuracy .............. 0.001000
      Status Check Frequency ............ 2
      Maximum Trials Checked ............ 10
      Damping Limit Threshold ........... 0.000000
      Maximum Trials .................. 500
      Quality Analysis ................ None
      Specific Gravity ................ 1.00
      Relative Kinematic Viscosity ..... 1.00
      Relative Chemical Diffusivity ..... 1.00
      Demand Multiplier ............... 1.00
      Total Duration .................. 0.00 hrs
      Reporting Criteria:
         All Junctions/Tanks/Reservoirs
         All Pipes
         All Pumps/Valves


  Node Results:
  ----------------------------------------------------------------
                                        Demand      Head  Pressure
  Node                                     gpm        ft       psi
  ----------------------------------------------------------------
  J100                                    0.00   1752.94     94.56
  J102                                    0.00   1752.93     92.26
  J104                                    0.00   1752.93     84.20
```

J106	0.00	1752.91	89.35
J107	0.00	1727.26	83.48
J108	0.00	1726.27	88.08
J110	0.00	1725.60	89.08
J114	2.37	1726.27	85.04
J116	0.00	1752.93	89.23
J200	0.00	1729.79	84.57
J202	0.00	1729.79	84.57
J202A	0.00	1729.79	84.57
J204	0.00	1729.78	89.60
J206	0.00	1729.78	90.46
J206A	0.00	1729.78	87.87
J208	0.00	1729.78	89.60
J210A	0.00	1729.78	90.90
J214	0.00	1729.78	87.43
J216	0.00	1729.78	85.27
J218	0.00	1729.79	82.76
J220	0.00	1729.79	85.57
J222	0.00	1729.79	86.57
J224	0.00	1729.79	86.57
J226	0.00	1729.79	86.57
J228	0.00	1729.78	86.52
J230	0.00	1729.78	85.70
J232	0.00	1729.78	85.70
J234	0.00	1729.79	85.57
J236	0.00	1729.79	85.70
J238	0.00	1729.79	86.57
J240	0.00	1729.78	86.52
J242	0.00	1729.78	85.70
J244	0.00	1729.78	85.70
J246	50.00	1729.77	90.46
J258	50.00	1729.77	87.43
J260	0.00	1729.78	85.27
J262	0.00	1729.79	83.10
J264	0.00	1729.79	84.40
J266	0.00	1729.79	84.40
J268	0.00	1729.79	83.10
J274A	0.00	1729.79	84.83
J274B	0.00	1729.79	83.88
J278	0.00	1729.78	87.87
J301	0.00	1725.57	89.07
J301B	0.00	1725.48	90.12
J303	0.00	1725.02	91.17
J304	178.74	1724.95	91.49
J400	0.00	1729.78	88.73
J402	0.00	1729.78	89.60
J404	0.00	1729.78	92.20
J406	0.00	1729.78	89.60

J500	3.03	1727.26	83.31	
J502	2.07	1727.26	85.47	
J504	0.00	1725.57	88.64	
J506	0.00	1725.48	89.90	
J508	0.00	1725.43	90.75	
J600	0.00	1729.79	86.57	
J602	0.00	1729.79	86.13	
J604	0.00	1729.79	86.13	
J606	0.00	1729.79	86.57	
J608	0.00	1729.78	92.20	
J610	0.00	1729.78	93.71	
J612	0.00	1729.78	93.71	
J614	0.00	1729.78	94.19	
J616	0.00	1729.78	93.37	
J620	0.00	1729.78	92.20	
J622	0.00	1729.78	91.76	
J624	0.00	1729.78	93.71	
J626	0.00	1729.78	93.71	
J628	0.00	1729.78	94.19	
J630	0.00	1729.78	93.37	
J632	0.00	1729.79	83.75	
J634	0.00	1729.79	84.40	
RES9000	-286.25	1753.00	-	Reservoir

Pipe Results:

Link	Flow gpm	Velocity fps	Headloss /1000ft
P101	-82.96	0.10	0.00
P103	73.30	0.09	0.00
P106	186.21	2.11	1.21
P107	186.21	2.11	0.05
P107A	181.11	2.06	1.00
P108	146.59	0.18	0.07
P110	139.66	0.18	0.06
P111	2.37	0.03	0.00
P113	178.74	2.03	0.67
P115	139.66	0.18	0.01
P117	-73.30	0.09	0.00
P200	222.61	0.63	0.02
P202	36.40	0.15	0.00
P202A	36.39	0.15	0.00
P204	53.71	0.22	0.00
P206	36.51	0.15	0.00
P206A	36.51	0.15	0.00
P208	53.70	0.22	0.01

P210	3.70	0.02	0.00
P210A	0.00	0.00	0.00
P218	-46.31	0.19	0.01
P220	-46.32	0.19	0.01
P222	63.63	0.26	0.02
P224	17.19	0.07	0.00
P226	17.19	0.07	0.00
P228	17.51	0.07	0.00
P230	17.19	0.07	0.00
P232	17.19	0.07	0.00
P234	17.19	0.07	0.00
P236	17.19	0.07	0.00
P238	17.18	0.07	0.00
P240	0.00	0.00	0.00
P242	0.00	0.00	0.00
P244	0.32	0.00	0.00
P246	0.00	0.00	0.00
P248	0.00	0.00	0.00
P250	0.00	0.00	0.00
P252	0.00	0.00	0.00
P254	50.00	0.57	0.01
P266	50.00	0.57	0.01
P268	0.00	0.00	0.00
P270	17.32	0.07	0.00
P272	17.32	0.07	0.00
P274	17.31	0.07	0.00
P274A	17.31	0.07	0.00
P274B	17.31	0.07	0.00
P276	0.00	0.00	0.00
P278	0.00	0.00	0.00
P286	0.00	0.00	0.00
P288	63.63	0.18	0.00
P290	36.40	0.15	0.01
P301	178.74	1.14	0.03
P301A	178.74	1.14	0.09
P301B	178.74	1.14	0.05
P303A	178.74	1.14	0.07
P401	3.69	0.02	0.00
P403	-3.69	0.02	0.00
P405	-3.69	0.02	0.00
P407	0.00	0.00	0.00
P501	3.03	0.03	0.00
P503	2.07	0.02	0.00
P505	0.00	0.00	0.00
P507	0.00	0.00	0.00
P509	178.74	1.14	0.41
P601	0.00	0.00	0.00
P603	0.00	0.00	0.00

P605	0.00	0.00	0.00
P607	0.00	0.00	0.00
P609	3.69	0.02	0.00
P611	3.69	0.02	0.00
P613	3.69	0.02	0.00
P615	3.69	0.02	0.00
P617	3.69	0.02	0.00
P621	0.00	0.00	0.00
P623	3.69	0.02	0.00
P625	0.00	0.00	0.00
P627	0.00	0.00	0.00
P629	0.00	0.00	0.00
P631	0.00	0.00	0.00
P633	0.00	0.00	0.00
P635	0.00	0.00	0.00
P637	0.00	0.00	0.00

Valve Results:

Link	Flow gpm	Velocity fps	Headloss /1000ft	
V8000	63.63	0.26	23.12	GPV
V8002	36.40	0.15	23.11	GPV
V8004	186.21	2.11	24.38	GPV

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  ***                                                          ***
  ***                  Comprehensive Analysis of               ***
  ***              Water Distribution Piping Network           ***
  ***                                                          ***
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  Kaiser Moreno Valley MC
  Ultimate Project
  MDD

      Input Data File ..................
\\SANDCA1FS1.BKR.MBAKERCORP.COM\HROOT\PDATA\169814\CALCS\WATER\MODELS\KAISER MV
WATER MODEL.OUT\SCENARIO\UP2\~INP
      Number of Junctions.............. 73
      Number of Reservoirs............. 1
      Number of Tanks ................. 0
      Number of Pipes ................. 82
      Number of Pumps ................. 0
      Number of Valves ................ 3
      Headloss Formula ................ Hazen-Williams
      Hydraulic Timestep .............. 1.00 hrs
      Hydraulic Accuracy .............. 0.001000
      Status Check Frequency ............ 2
      Maximum Trials Checked ............ 10
      Damping Limit Threshold ........... 0.000000
      Maximum Trials .................. 500
      Quality Analysis ................ None
      Specific Gravity ................ 1.00
      Relative Kinematic Viscosity ...... 1.00
      Relative Chemical Diffusivity ..... 1.00
      Demand Multiplier ............... 1.00
      Total Duration .................. 0.00 hrs
      Reporting Criteria:
         All Junctions/Tanks/Reservoirs
         All Pipes
         All Pumps/Valves


  Node Results:
  ----------------------------------------------------------------
                                        Demand      Head  Pressure
  Node                                     gpm        ft       psi
  ----------------------------------------------------------------
  J100                                    0.00   1743.31     90.39
  J102                                    0.00   1741.77     87.43
  J104                                    0.00   1742.04     79.48
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J106	0.00	1739.99	83.75
J107	0.00	1713.25	77.41
J108	0.00	1710.84	81.39
J110	0.00	1709.21	81.99
J114	3.56	1710.84	78.36
J116	0.00	1741.78	84.40
J200	0.00	1707.01	74.70
J202	0.00	1706.91	74.66
J202A	0.00	1707.05	74.72
J204	0.00	1703.43	78.18
J206	0.00	1698.78	77.03
J206A	0.00	1704.87	77.07
J208	0.00	1698.47	76.03
J210A	0.00	1698.47	77.33
J214	0.00	1691.31	70.76
J216	0.00	1699.96	72.35
J218	0.00	1706.97	72.87
J220	0.00	1706.54	75.50
J222	0.00	1705.72	76.14
J224	0.00	1705.71	76.13
J226	0.00	1705.64	76.10
J228	0.00	1704.68	75.65
J230	0.00	1703.79	74.44
J232	0.00	1703.68	74.39
J234	0.00	1706.54	75.50
J236	0.00	1705.72	75.27
J238	0.00	1705.64	76.10
J240	0.00	1704.68	75.65
J242	0.00	1703.79	74.44
J244	0.00	1703.68	74.39
J246	50.00	1698.77	77.03
J258	50.00	1691.30	70.76
J260	0.00	1699.96	72.35
J262	0.00	1706.98	73.22
J264	0.00	1707.00	74.53
J266	0.00	1707.00	74.53
J268	0.00	1706.98	73.22
J274A	0.00	1707.00	74.96
J274B	0.00	1706.99	74.00
J278	0.00	1704.87	77.07
J301	0.00	1709.15	81.96
J301B	0.00	1708.93	82.95
J303	0.00	1707.81	83.72
J304	288.04	1707.64	83.99
J400	0.00	1687.98	70.62
J402	0.00	1686.51	70.85
J404	1334.00	1679.29	70.32
J406	0.00	1686.51	70.85

J500	4.54	1713.25	77.23	
J502	3.11	1713.25	79.40	
J504	0.00	1709.15	81.53	
J506	0.00	1708.93	82.73	
J508	0.00	1708.81	83.54	
J600	0.00	1707.05	76.72	
J602	0.00	1707.05	76.28	
J604	0.00	1707.05	76.28	
J606	0.00	1707.05	76.72	
J608	0.00	1694.73	77.01	
J610	0.00	1688.79	75.95	
J612	0.00	1688.58	75.86	
J614	0.00	1680.53	72.85	
J616	0.00	1679.80	71.71	
J620	0.00	1680.62	70.90	
J622	0.00	1694.73	76.58	
J624	0.00	1688.79	75.95	
J626	0.00	1688.58	75.86	
J628	1333.00	1678.79	72.10	
J630	1333.00	1677.43	70.68	
J632	0.00	1706.99	73.87	
J634	0.00	1707.00	74.53	
RES9000	-4399.25	1753.00	-	Reservoir

Pipe Results:

Link	Flow gpm	Velocity fps	Headloss /1000ft
P101	-227.45	0.29	0.02
P103	1136.37	1.43	0.26
P106	299.25	3.40	2.92
P107	299.25	3.40	0.12
P107A	291.60	3.31	2.41
P108	2272.73	2.87	10.96
P110	2126.52	2.68	9.69
P111	3.56	0.04	0.00
P113	288.04	3.27	1.63
P115	2126.52	2.68	1.54
P117	-1136.37	1.43	0.26
P200	2353.97	6.68	1.77
P202	2054.72	8.39	0.22
P202A	2054.72	8.39	0.04
P204	1986.70	8.12	0.10
P206	1350.62	5.52	2.04
P206A	1350.62	5.52	1.44
P208	1986.70	8.12	4.65

P210	1936.70	7.91	0.31
P210A	0.00	0.00	0.00
P218	-2113.30	8.63	8.65
P220	-2113.30	8.63	7.01
P222	2045.29	8.35	9.50
P224	636.08	2.60	0.37
P226	636.08	2.60	0.82
P228	598.51	2.44	0.01
P230	636.08	2.60	0.07
P232	636.08	2.60	0.96
P234	636.08	2.60	0.89
P236	636.08	2.60	0.11
P238	636.08	2.60	0.25
P240	0.00	0.00	0.00
P242	0.00	0.00	0.00
P244	-37.57	0.43	0.01
P246	0.00	0.00	0.00
P248	0.00	0.00	0.00
P250	0.00	0.00	0.00
P252	0.00	0.00	0.00
P254	50.00	0.57	0.01
P266	50.00	0.57	0.01
P268	0.00	0.00	0.00
P270	-68.02	0.28	0.01
P272	-68.02	0.28	0.01
P274	-68.02	0.28	0.01
P274A	-68.02	0.28	0.00
P274B	-68.02	0.28	0.00
P276	0.00	0.00	0.00
P278	0.00	0.00	0.00
P286	0.00	0.00	0.00
P288	2045.29	5.80	1.47
P290	2054.72	8.39	8.88
P301	288.04	1.84	0.06
P301A	288.04	1.84	0.22
P301B	288.04	1.84	0.12
P303A	288.04	1.84	0.17
P401	-2063.30	8.43	3.33
P403	2063.30	8.43	1.47
P405	2063.30	8.43	5.89
P407	0.00	0.00	0.00
P501	4.54	0.05	0.00
P503	3.11	0.04	0.00
P505	0.00	0.00	0.00
P507	0.00	0.00	0.00
P509	288.04	1.84	1.00
P601	0.00	0.00	0.00
P603	0.00	0.00	0.00

P605	0.00	0.00	0.00
P607	0.00	0.00	0.00
P609	1936.70	7.91	3.74
P611	1936.70	7.91	5.94
P613	1936.70	7.91	0.21
P615	1936.70	7.91	8.05
P617	603.70	2.47	0.73
P621	1334.00	15.14	1.33
P623	-729.30	2.98	0.82
P625	0.00	0.00	0.00
P627	0.00	0.00	0.00
P629	0.00	0.00	0.00
P631	1333.00	15.13	1.74
P633	1333.00	15.13	2.37
P635	0.00	0.00	0.00
P637	0.00	0.00	0.00

Valve Results:

Link	Flow gpm	Velocity fps	Headloss /1000ft	
V8000	2045.29	8.35	23.84	GPV
V8002	2054.72	8.39	23.84	GPV
V8004	299.25	3.40	23.70	GPV

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  ***                                                          ***
  ***                  Comprehensive Analysis of               ***
  ***              Water Distribution Piping Network           ***
  ***                                                          ***
  ****************************************************************

  Kaiser Moreno Valley MC
  Ultimate Project
  PHD

      Input Data File ..................
\\SANDCA1FS1.BKR.MBAKERCORP.COM\HROOT\PDATA\169814\CALCS\WATER\MODELS\KAISER MV
WATER MODEL.OUT\SCENARIO\UP3\~INP
      Number of Junctions.............. 73
      Number of Reservoirs............. 1
      Number of Tanks ................. 0
      Number of Pipes ................. 82
      Number of Pumps ................. 0
      Number of Valves ................ 3
      Headloss Formula ................ Hazen-Williams
      Hydraulic Timestep .............. 1.00 hrs
      Hydraulic Accuracy .............. 0.001000
      Status Check Frequency ............ 2
      Maximum Trials Checked ............ 10
      Damping Limit Threshold ........... 0.000000
      Maximum Trials .................. 500
      Quality Analysis ................ None
      Specific Gravity ................ 1.00
      Relative Kinematic Viscosity ..... 1.00
      Relative Chemical Diffusivity ..... 1.00
      Demand Multiplier ............... 1.00
      Total Duration .................. 0.00 hrs
      Reporting Criteria:
         All Junctions/Tanks/Reservoirs
         All Pipes
         All Pumps/Valves


  Node Results:
  ----------------------------------------------------------------
                                        Demand      Head  Pressure
  Node                                     gpm        ft       psi
  ----------------------------------------------------------------
  J100                                    0.00   1752.86     94.53
  J102                                    0.00   1752.84     92.22
  J104                                    0.00   1752.85     84.17
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J106	0.00	1752.79	89.30
J107	0.00	1725.54	82.73
J108	0.00	1722.58	86.48
J110	0.00	1720.60	86.92
J114	4.74	1722.58	83.45
J116	0.00	1752.85	89.19
J200	0.00	1729.68	84.53
J202	0.00	1729.68	84.53
J202A	0.00	1729.68	84.53
J204	0.00	1729.68	89.55
J206	0.00	1729.67	90.42
J206A	0.00	1729.68	87.82
J208	0.00	1729.67	89.55
J210A	0.00	1729.67	90.85
J214	0.00	1729.67	87.38
J216	0.00	1729.68	85.22
J218	0.00	1729.69	82.71
J220	0.00	1729.68	85.53
J222	0.00	1729.68	86.52
J224	0.00	1729.68	86.52
J226	0.00	1729.68	86.52
J228	0.00	1729.68	86.48
J230	0.00	1729.68	85.65
J232	0.00	1729.68	85.65
J234	0.00	1729.68	85.53
J236	0.00	1729.68	85.65
J238	0.00	1729.68	86.52
J240	0.00	1729.68	86.48
J242	0.00	1729.68	85.65
J244	0.00	1729.68	85.65
J246	50.00	1729.67	90.41
J258	50.00	1729.67	87.38
J260	0.00	1729.68	85.22
J262	0.00	1729.69	83.06
J264	0.00	1729.68	84.36
J266	0.00	1729.68	84.36
J268	0.00	1729.69	83.06
J274A	0.00	1729.68	84.79
J274B	0.00	1729.68	83.84
J278	0.00	1729.68	87.82
J301	0.00	1720.52	86.89
J301B	0.00	1720.25	87.85
J303	0.00	1718.88	88.52
J304	320.80	1718.68	88.77
J400	0.00	1729.67	88.68
J402	0.00	1729.67	89.55
J404	0.00	1729.67	92.15
J406	0.00	1729.67	89.55

J500	6.06	1725.54	82.56	
J502	4.14	1725.54	84.73	
J504	0.00	1720.52	86.45	
J506	0.00	1720.25	87.64	
J508	0.00	1720.11	88.44	
J600	0.00	1729.68	86.52	
J602	0.00	1729.68	86.09	
J604	0.00	1729.68	86.09	
J606	0.00	1729.68	86.52	
J608	0.00	1729.67	92.15	
J610	0.00	1729.67	93.67	
J612	0.00	1729.67	93.67	
J614	0.00	1729.67	94.14	
J616	0.00	1729.67	93.32	
J620	0.00	1729.67	92.15	
J622	0.00	1729.67	91.72	
J624	0.00	1729.67	93.67	
J626	0.00	1729.67	93.67	
J628	0.00	1729.67	94.14	
J630	0.00	1729.67	93.32	
J632	0.00	1729.68	83.71	
J634	0.00	1729.68	84.36	
RES9000	-435.77	1753.00	-	Reservoir

Pipe Results:

Link	Flow gpm	Velocity fps	Headloss /1000ft
P101	-139.79	0.18	0.01
P103	111.37	0.14	0.00
P106	335.74	3.81	3.61
P107	335.74	3.81	0.15
P107A	325.54	3.69	2.95
P108	222.74	0.28	0.15
P110	213.03	0.27	0.14
P111	4.74	0.05	0.00
P113	320.80	3.64	1.98
P115	213.03	0.27	0.02
P117	-111.37	0.14	0.00
P200	352.82	1.00	0.05
P202	17.08	0.07	0.00
P202A	17.08	0.07	0.00
P204	48.36	0.20	0.00
P206	32.87	0.13	0.00
P206A	32.87	0.13	0.00
P208	48.35	0.20	0.00

P210	-1.65	0.01	0.00
P210A	0.00	0.00	0.00
P218	-51.67	0.21	0.01
P220	-51.67	0.21	0.01
P222	82.95	0.34	0.03
P224	15.48	0.06	0.00
P226	15.48	0.06	0.00
P228	15.89	0.06	0.00
P230	15.48	0.06	0.00
P232	15.48	0.06	0.00
P234	15.48	0.06	0.00
P236	15.48	0.06	0.00
P238	15.47	0.06	0.00
P240	0.00	0.00	0.00
P242	0.00	0.00	0.00
P244	0.41	0.00	0.00
P246	0.00	0.00	0.00
P248	0.00	0.00	0.00
P250	0.00	0.00	0.00
P252	0.00	0.00	0.00
P254	50.00	0.57	0.01
P266	50.00	0.57	0.01
P268	0.00	0.00	0.00
P270	31.28	0.13	0.00
P272	31.28	0.13	0.00
P274	31.28	0.13	0.00
P274A	31.28	0.13	0.00
P274B	31.28	0.13	0.00
P276	0.00	0.00	0.00
P278	0.00	0.00	0.00
P286	0.00	0.00	0.00
P288	82.95	0.24	0.00
P290	17.08	0.07	0.00
P301	320.80	2.05	0.07
P301A	320.80	2.05	0.27
P301B	320.80	2.05	0.14
P303A	320.80	2.05	0.21
P401	-1.67	0.01	0.00
P403	1.67	0.01	0.00
P405	1.66	0.01	0.00
P407	0.00	0.00	0.00
P501	6.06	0.07	0.00
P503	4.14	0.05	0.00
P505	0.00	0.00	0.00
P507	0.00	0.00	0.00
P509	320.80	2.05	1.22
P601	0.00	0.00	0.00
P603	0.00	0.00	0.00

P605	0.00	0.00	0.00
P607	0.00	0.00	0.00
P609	-1.65	0.01	0.00
P611	-1.66	0.01	0.00
P613	-1.66	0.01	0.00
P615	-1.66	0.01	0.00
P617	-1.66	0.01	0.00
P621	0.00	0.00	0.00
P623	-1.66	0.01	0.00
P625	0.00	0.00	0.00
P627	0.00	0.00	0.00
P629	0.00	0.00	0.00
P631	0.00	0.00	0.00
P633	0.00	0.00	0.00
P635	0.00	0.00	0.00
P637	0.00	0.00	0.00

Valve Results:

Link	Flow gpm	Velocity fps	Headloss /1000ft	
V8000	82.95	0.34	23.13	GPV
V8002	17.08	0.07	23.11	GPV
V8004	335.74	3.81	23.49	GPV

```
  ****************************************************************
  ***                                                          ***
  ***                  Comprehensive Analysis of               ***
  ***              Water Distribution Piping Network           ***
  ***                                                          ***
  ****************************************************************

  Kaiser Moreno Valley MC
  Ultimate Project
  Max Day + 4,000 Fireflow

      Input Data File ..................
\\SANDCA1FS1.BKR.MBAKERCORP.COM\HROOT\PDATA\169814\CALCS\WATER\MODELS\KAISER MV
WATER MODEL.OUT\SCENARIO\UP4\~INP
      Number of Junctions.............. 73
      Number of Reservoirs............. 1
      Number of Tanks ................. 0
      Number of Pipes ................. 82
      Number of Pumps ................. 0
      Number of Valves ................ 3
      Headloss Formula ................ Hazen-Williams
      Hydraulic Timestep .............. 1.00 hrs
      Hydraulic Accuracy .............. 0.001000
      Status Check Frequency ............ 2
      Maximum Trials Checked ............ 10
      Damping Limit Threshold ........... 0.000000
      Maximum Trials .................. 500
      Quality Analysis ................ None
      Specific Gravity ................ 1.00
      Relative Kinematic Viscosity ..... 1.00
      Relative Chemical Diffusivity ..... 1.00
      Demand Multiplier ............... 1.00
      Total Duration .................. 0.00 hrs
      Reporting Criteria:
         All Junctions/Tanks/Reservoirs
         All Pipes
         All Pumps/Valves


  Node Results:
  ----------------------------------------------------------------
                                        Demand      Head  Pressure
  Node                                     gpm        ft       psi
  ----------------------------------------------------------------
  J100                                    0.00   1743.31     90.39
  J102                                    0.00   1741.77     87.43
  J104                                    0.00   1742.04     79.48
```

J106	0.00	1739.99	83.75
J107	0.00	1713.25	77.41
J108	0.00	1710.84	81.39
J110	0.00	1709.21	81.99
J114	3.56	1710.84	78.36
J116	0.00	1741.78	84.40
J200	0.00	1707.01	74.70
J202	0.00	1706.91	74.66
J202A	0.00	1707.05	74.72
J204	0.00	1703.43	78.18
J206	0.00	1698.78	77.03
J206A	0.00	1704.87	77.07
J208	0.00	1698.47	76.03
J210A	0.00	1698.47	77.33
J214	0.00	1691.31	70.76
J216	0.00	1699.96	72.35
J218	0.00	1706.97	72.87
J220	0.00	1706.54	75.50
J222	0.00	1705.72	76.14
J224	0.00	1705.71	76.13
J226	0.00	1705.64	76.10
J228	0.00	1704.68	75.65
J230	0.00	1703.79	74.44
J232	0.00	1703.68	74.39
J234	0.00	1706.54	75.50
J236	0.00	1705.72	75.27
J238	0.00	1705.64	76.10
J240	0.00	1704.68	75.65
J242	0.00	1703.79	74.44
J244	0.00	1703.68	74.39
J246	50.00	1698.77	77.03
J258	50.00	1691.30	70.76
J260	0.00	1699.96	72.35
J262	0.00	1706.98	73.22
J264	0.00	1707.00	74.53
J266	0.00	1707.00	74.53
J268	0.00	1706.98	73.22
J274A	0.00	1707.00	74.96
J274B	0.00	1706.99	74.00
J278	0.00	1704.87	77.07
J301	0.00	1709.15	81.96
J301B	0.00	1708.93	82.95
J303	0.00	1707.81	83.72
J304	288.04	1707.64	83.99
J400	0.00	1687.98	70.62
J402	0.00	1686.51	70.85
J404	1334.00	1679.29	70.32
J406	0.00	1686.51	70.85

J500	4.54	1713.25	77.23	
J502	3.11	1713.25	79.40	
J504	0.00	1709.15	81.53	
J506	0.00	1708.93	82.73	
J508	0.00	1708.81	83.54	
J600	0.00	1707.05	76.72	
J602	0.00	1707.05	76.28	
J604	0.00	1707.05	76.28	
J606	0.00	1707.05	76.72	
J608	0.00	1694.73	77.01	
J610	0.00	1688.79	75.95	
J612	0.00	1688.58	75.86	
J614	0.00	1680.53	72.85	
J616	0.00	1679.80	71.71	
J620	0.00	1680.62	70.90	
J622	0.00	1694.73	76.58	
J624	0.00	1688.79	75.95	
J626	0.00	1688.58	75.86	
J628	1333.00	1678.79	72.10	
J630	1333.00	1677.43	70.68	
J632	0.00	1706.99	73.87	
J634	0.00	1707.00	74.53	
RES9000	-4399.25	1753.00	-	Reservoir

Pipe Results:

Link	Flow gpm	Velocity fps	Headloss /1000ft
P101	-227.45	0.29	0.02
P103	1136.37	1.43	0.26
P106	299.25	3.40	2.92
P107	299.25	3.40	0.12
P107A	291.60	3.31	2.41
P108	2272.73	2.87	10.96
P110	2126.52	2.68	9.69
P111	3.56	0.04	0.00
P113	288.04	3.27	1.63
P115	2126.52	2.68	1.54
P117	-1136.37	1.43	0.26
P200	2353.97	6.68	1.77
P202	2054.72	8.39	0.22
P202A	2054.72	8.39	0.04
P204	1986.70	8.12	0.10
P206	1350.62	5.52	2.04
P206A	1350.62	5.52	1.44
P208	1986.70	8.12	4.65

P210	1936.70	7.91	0.31
P210A	0.00	0.00	0.00
P218	-2113.30	8.63	8.65
P220	-2113.30	8.63	7.01
P222	2045.29	8.35	9.50
P224	636.08	2.60	0.37
P226	636.08	2.60	0.82
P228	598.51	2.44	0.01
P230	636.08	2.60	0.07
P232	636.08	2.60	0.96
P234	636.08	2.60	0.89
P236	636.08	2.60	0.11
P238	636.08	2.60	0.25
P240	0.00	0.00	0.00
P242	0.00	0.00	0.00
P244	-37.57	0.43	0.01
P246	0.00	0.00	0.00
P248	0.00	0.00	0.00
P250	0.00	0.00	0.00
P252	0.00	0.00	0.00
P254	50.00	0.57	0.01
P266	50.00	0.57	0.01
P268	0.00	0.00	0.00
P270	-68.02	0.28	0.01
P272	-68.02	0.28	0.01
P274	-68.02	0.28	0.01
P274A	-68.02	0.28	0.00
P274B	-68.02	0.28	0.00
P276	0.00	0.00	0.00
P278	0.00	0.00	0.00
P286	0.00	0.00	0.00
P288	2045.29	5.80	1.47
P290	2054.72	8.39	8.88
P301	288.04	1.84	0.06
P301A	288.04	1.84	0.22
P301B	288.04	1.84	0.12
P303A	288.04	1.84	0.17
P401	-2063.30	8.43	3.33
P403	2063.30	8.43	1.47
P405	2063.30	8.43	5.89
P407	0.00	0.00	0.00
P501	4.54	0.05	0.00
P503	3.11	0.04	0.00
P505	0.00	0.00	0.00
P507	0.00	0.00	0.00
P509	288.04	1.84	1.00
P601	0.00	0.00	0.00
P603	0.00	0.00	0.00

P605	0.00	0.00	0.00	
P607	0.00	0.00	0.00	
P609	1936.70	7.91	3.74	
P611	1936.70	7.91	5.94	
P613	1936.70	7.91	0.21	
P615	1936.70	7.91	8.05	
P617	603.70	2.47	0.73	
P621	1334.00	15.14	1.33	
P623	-729.30	2.98	0.82	
P625	0.00	0.00	0.00	
P627	0.00	0.00	0.00	
P629	0.00	0.00	0.00	
P631	1333.00	15.13	1.74	
P633	1333.00	15.13	2.37	
P635	0.00	0.00	0.00	
P637	0.00	0.00	0.00	

Valve Results:

Link	Flow gpm	Velocity fps	Headloss /1000ft	
V8000	2045.29	8.35	23.84	GPV
V8002	2054.72	8.39	23.84	GPV
V8004	299.25	3.40	23.70	GPV

APPENDIX D – FIRE FLOW TEST DATA FROM EMWD

COMPUTER MODEL TEST

Grid Number:	55-C	Date:	3-18-2019
Customer Name:	Kaiser Permanente	Address:	9755 Clairemont Mesa Blvd.
City, State Zip:	San Diego, CA 92124		
Contact Name:	Shirley Reppert		
Phone:	858-614-550	Cell:	
Fax:		Email:	Shirley.reppert@mbakerintl.com
Project Record Number:	WS20190000087	WO/CO:	WO 15935
Project Name:	Kaiser Permanente Moreno Valley Medical Center	APN:	486-310-033, 034
(Approximate) Test & Hydrant Location	(1) 952 feet Northeast of the intersection of Turnberry St. & Iris Av. See attached map. (2) 369 feet Northeast of the intersection of Turnberry St. & Iris Av. See attached map.		

MODEL	NBD_EMWD_PORTABLE_20170321_POS FF Diurnal_v2				
POC Test Location:	EMWD RESULTS			Requested	Flow Availability for Fire Department
	Fire Flow				
Elevation (ft):	1,547	1,540			
Steady State, Dynamic (psi):	89	93			
Residual Pressure (psi):	85	88			
Tested FF (gpm):	2,032	2,032			
Combined Total (gpm):	Both Fire Flows were ran together with MDD			4, 064	
Number of Hydrants:	Used 2 Test Nodes			2	
Duration Tested @:	4 Hour			4	

Demand Conditions:	Max Day						
Pressure Zone/ Tank Name(s)/ Level(s):	PZ 1764 / Wolfskill Tank / Base Elevation 1732 Feet						
Pump Operating Status:	ON				Computer Model Setting	EPS	
Number of Points of Connections (POC):	POC (Circle One)		Reason (Circle what Applies)				
	One	Two or More	Plan of Service	Limited Capacity (Existing Systems)	Supply Redundancy	Conditions of Approval	Fire Sprinkler Connection(s)

Comments: The water system is capable of providing 4,064 GPM for 4 hours at a minimum of 20 psi, as shown in the attached map. These Fire Flow test results may need to be complemented by a Design Condition and do not include all facility conditioning that may be required for this project. Fire Agency Conditions were not provided, if any Fire Flow changes occur in the Fire Agency Conditions, you may need to submit another Fire Flow test at the requester's expense.

The above results are not a guarantee the District's system will supply water to the project at any specific flows or pressures. These results were determined from a computer simulation of the District's water system and/or from hydraulic calculations pertaining to distribution pipelines: The capacity of the service laterals, meters, backflow assemblies, on-site fire system, and other appurtenances were not considered in these results. The design and sizing of service laterals and downstream facilities shall be the responsibility of the Project Sponsor.

EMWD's Fire Flow test results are valid for 12 months from the date of testing.

Completed By: RUDY ESPARZA **DRAFT - Pending Formal Fire Agency Conditions**

Should you have any questions or need additional information, please contact me at (951) 928-3777, ext. 4478.

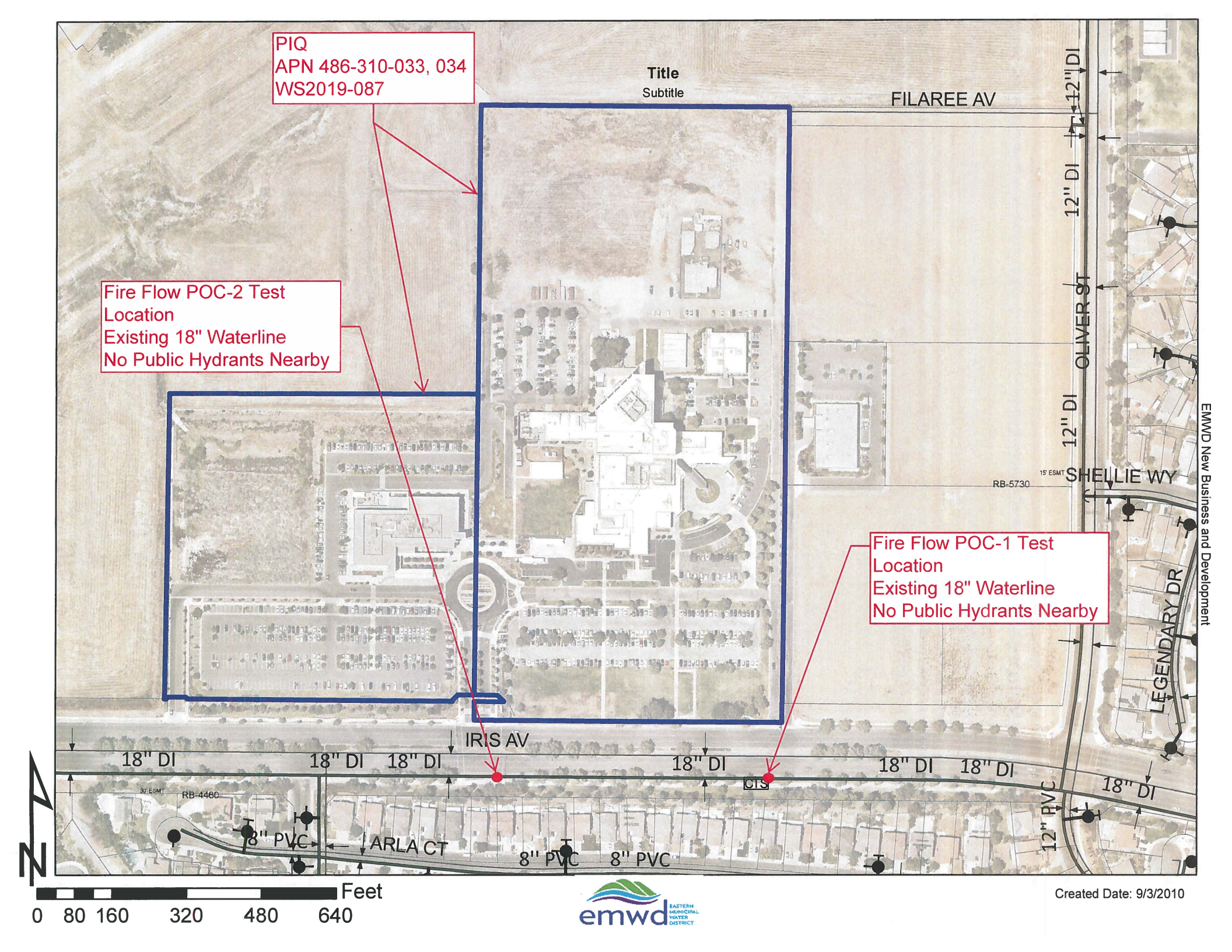
Sincerely, RE

Rudy Esparza
Sr. Engineering Technician
Development Services Department

Date: 3-18-2019

Reviewed By: BAR

Date: 3/18/19


PIQ
APN 486-310-033, 034
WS2019-087
Title
Subtitle
Fire Flow POC-2 Test
Location
Existing 18" Waterline
No Public Hydrants Nearby
Fire Flow POC-1 Test
Location
Existing 18" Waterline
No Public Hydrants Nearby
FILAREE AV
12" DI
OLIVER ST
SHELLIE WY
15' ESMT
RB-5730
LEGENDARY DR
IRIS AV
18" DI
CTS
37' ESMT
RB-4460
8" PVC
ARLA CT
12" PVC
N
Feet
0 80 160 320 480 640
emwd
EASTERN MUNICIPAL WATER DISTRICT
Created Date: 9/3/2010
EMWD New Business and Development

Hydraulic Boundary Conditions, In The Main Water Pipeline[6][7], Based on Hydraulic Model Results

Project Name: Kaiser Permanente Moreno Valley Medical Center
Pressure Zone: 1764 / WS2019-087
Model Version (12)

ADD (GPM): 32
FFD (GPM): 2,000
Duration (Hours): 4

POC Location: Fire Flow & POC-1 See Attached Map
Elevation (ft): 1,547.0
Junction Name: APN 486-310-033,034 (See Attached Exhibit)

	Modeling Scenario (12)	Operational Conditions:	Project Demands[2][3][11] (gpm): Project's Domestic Water Demands[2][3][11] (gpm)	Project Demands[2][3][11] (gpm): Fire Flow Demand[4] (gpm)	Existing system (With No Improvements): HGL (ft)	Existing system (With No Improvements): Pressure (psi)	Existing system (With Improvements)[1]: HGL (ft)	Existing system (With Improvements)[1]: Pressure (psi)
Operational Demand	EPS, MDD, Pumps On (8)	MDD	64		1,752	89		
Operational Demand	EPS, MDD, Pumps On (8)	PHD	128		1,753	86		
Operational Demand	EPS, ADD, Pumps On (8)	MHD						
Fire Flow Demand		FFD + MDD	32	2,000	1,744	85		
Fire Flow Demand	EPS, MDD, Pumps On (8)	FFD + MDD						

Footnotes (see page 2 for additional footnotes):
(1) If improvements are required, please describe the improvements here:

Minimum Pressure Criteria:

50 PSI	...under PHD, MDD, and MHD
20 PSI	...under MDD + FFD

Minimum Criteria, Velocities in Pipelines:
Equal to or less than 5 fps: ...for MDD
Equal to or less than 10 fps: ...for PHD
Equal to or less than 15 fps: ...for FF + MDD

	Adequate?	Comments:
Available Firm Pumping Capacity:	TBD	(TBD indicates To Be Determined) Capacity availability shall be verified separately by the customer and reviewed by Development Services Engineers.
Available Firm Pumping Capacity, w/ Electrical Outage :	TBD	
Available Storage Capacity:	TBD	

Additional Comments:

Prepared by: Rudy Esparza
Date: 3/18/2019

Reviewed by: BAC
Date: 3/18/2019

File: PZ 1764 APN 486-310-033, 034 POC (1) WS2019-087
FORM: NBD-068 (July 25, 2016) --- Date Printed: 3/18/2019, 3:10 PM

Hydraulic Boundary Conditions, In The Main Water Pipeline[6][7], Based on Hydraulic Model Results

Project Name: Kaiser Permanente Moreno Valley Medical Center	**ADD (GPM):**	32
Pressure Zone: 1764 / WS2019-087	**FFD (GPM):**	2,000
Model Version (12)	**Duration (Hours):**	4

Acronyms:

ADD: Average Day Demand, in GPM
EPS: Extended Period Simulation
FFD[3]: Fire Flow Demand, in GPM
FPS: Feet per second
GPM: Gallons Per Minute
HGL: Hydraulic Grade-Line, in feet
MDD: Maximum Day Demand, in GPM
MHD: Minimum Hour Demand, in GPM
PHD: Peak-Hour Demand, in GPM
POC: Point Of Connection
PSI: Pounds Per Inch
SSS: Steady State Simulation

Footnotes (Ct'd):

(2) Project Demands include ADD of the proposed project, peaked for each test scenario, in accordance with the latest EMWD Water Master Plan Design Criteria

(3) Domestic water demands from existing services are already included in the Model

(4) This is NOT a Fire Flow Test Report: The customer shall verify with the Fire Marshall if a separate Fire Flow Test Report/Letter is required for Jurisdictional Project approval.

(5) All required storage and pumping shall be evaluated in a POS report, per the latest EMWD Master Plan Design Criteria

(6) Applicants, or their designees, shall design service laterals, commencing from the point of connection(s) in EMWD's main pipeline(s), including main extension(s), lateral(s), meter(s), and all post-meter appurtenances, taking into consideration resulting head losses, pad elevations, and building height, such that the pressure delivered to each floor level and service is adequate to meet jurisdictional requirements.

(7) In addition to design requirements, operational minimum and maximum pressures are used to identify and record Service Agreements for Low and High pressure conditions in Residential use. Commercial, Institutional, and Industrial uses do not require low and high pressure recordation.

(8) Storage tanks: Initial levels set at 75% full in EPS

(9) Storage tanks: Initial levels set at 50% full in SSS, Pumps Off

(10) Storage tanks: Initial levels set at 50% full in SSS, Pumps On

(11) Existing demands are based on COINS data, calendar-year 2013

(12) For EPS modeling, use file name: ***NBD_EPS_EMWD_POTABLE_2308_WYA20151019.mxd***

Hydraulic Boundary Conditions, In The Main Water Pipeline[6][7], Based on Hydraulic Model Results

Project Name: Kaiser Permanente Moreno Valley Medical Center
Pressure Zone: 1764 / WS2019-087
Model Version (12)

ADD (GPM): 32
FFD (GPM): 2,000
Duration (Hours): 4

POC Location: Fire Flow & POC-2 See Attached Map
Elevation (ft): 1,540.0
Junction Name: APN 486-310-033,034 (See Attached Exhibit)

	Modeling Scenario (12)	Operational Conditions:	Project Demands[2][3][11] (gpm): Project's Domestic Water Demands[2][3][11] (gpm)	Project Demands[2][3][11] (gpm): Fire Flow Demand[4] (gpm)	Existing system (With No Improvements): HGL (ft)	Existing system (With No Improvements): Pressure (psi)	Existing system (With Improvements)[1]: HGL (ft)	Existing system (With Improvements)[1]: Pressure (psi)
Operational Demand	EPS, MDD, Pumps On (8)	MDD	64		1,752	92		
Operational Demand	EPS, MDD, Pumps On (8)	PHD	128		1,745	89		
Operational Demand	EPS, ADD, Pumps On (8)	MHD						
Fire Flow Demand		FFD + MDD	32	2,000	1,744	88		
Fire Flow Demand	EPS, MDD, Pumps On (8)	FFD + MDD						

Footnotes (see page 2 for additional footnotes):
(1) If improvements are required, please describe the improvements here:

Minimum Pressure Criteria:

50 PSI	...under PHD, MDD, and MHD
20 PSI	...under MDD + FFD

Minimum Criteria, Velocities in Pipelines:
Equal to or less than 5 fps: ...for MDD
Equal to or less than 10 fps: ...for PHD
Equal to or less than 15 fps: ...for FF + MDD

	Adequate?	Comments:
Available Firm Pumping Capacity:	TBD	(TBD indicates To Be Determined) Capacity availability shall be verified separately by the customer and reviewed by Development Services Engineers.
Available Firm Pumping Capacity, w/ Electrical Outage :	TBD	
Available Storage Capacity:	TBD	

Additional Comments:

Prepared by: Rudy Esparza
Date: 3/18/2019

Reviewed by: BAR
Date: 3/18/2019

File: PZ 1764 APN 486-310-033, 034 POC (2) WS2019-087
FORM: NBD-068 (July 25, 2016) --- Date Printed: 3/18/2019, 3:10 PM

Hydraulic Boundary Conditions, In The Main Water Pipeline[6][7], Based on Hydraulic Model Results		
Project Name: Kaiser Permanente Moreno Valley Medical Center	**ADD (GPM):**	32
Pressure Zone: 1764 / WS2019-087	**FFD (GPM):**	2,000
Model Version (12)	**Duration (Hours):**	4

Acronyms:

ADD: Average Day Demand, in GPM
EPS: Extended Period Simulation
FFD[3]: Fire Flow Demand, in GPM
FPS: Feet per second
GPM: Gallons Per Minute
HGL: Hydraulic Grade-Line, in feet
MDD: Maximum Day Demand, in GPM
MHD: Minimum Hour Demand, in GPM
PHD: Peak-Hour Demand, in GPM
POC: Point Of Connection
PSI: Pounds Per Inch
SSS: Steady State Simulation

Footnotes (Ct'd):

(2) Project Demands include ADD of the proposed project, peaked for each test scenario, in accordance with the latest EMWD Water Master Plan Design Criteria

(3) Domestic water demands from existing services are already included in the Model

(4) This is NOT a Fire Flow Test Report: The customer shall verify with the Fire Marshall if a separate Fire Flow Test Report/Letter is required for Jurisdictional Project approval.

(5) All required storage and pumping shall be evaluated in a POS report, per the latest EMWD Master Plan Design Criteria

(6) Applicants, or their designees, shall design service laterals, commencing from the point of connection(s) in EMWD's main pipeline(s), including main extension(s), lateral(s), meter(s), and all post-meter appurtenances, taking into consideration resulting head losses, pad elevations, and building height, such that the pressure delivered to each floor level and service is adequate to meet jurisdictional requirements.

(7) In addition to design requirements, operational minimum and maximum pressures are used to identify and record Service Agreements for Low and High pressure conditions in Residential use. Commercial, Institutional, and Industrial uses do not require low and high pressure recordation.

(8) Storage tanks: Initial levels set at 75% full in EPS

(9) Storage tanks: Initial levels set at 50% full in SSS, Pumps Off

(10) Storage tanks: Initial levels set at 50% full in SSS, Pumps On

(11) Existing demands are based on COINS data, calendar-year 2013

(12) For EPS modeling, use file name: ***NBD_EPS_EMWD_POTABLE_2308_WYA20151019.mxd***

APPENDIX E – WATER SYSTEM PLANNING & DESIGN PRINCIPLE GUIDELINES CRITERIA FROM EMWD

CRITERIA

The following criteria and are to be used in the planning and design of facilities for the District's domestic water system. They apply to existing and future conditions.

I. FLOW DEMAND CALCULATION(S):

A. Average Day Demand (ADD)

The recommended rates for determining ADD are:

1. **RESIDENTIAL**

	DU/Ac	C/DU	GPD/C	GPD/Ac
Low Density (0-3)	2.5	4	200*	2,000
Medium Density (4-8)	4.5	3.5	180	2,835
High Density (9-20)	12	2.5	120	3,600
Mobile Home	6	2	100	1,200

2. **NON-RESIDENTIAL**

Institutional	3,000* GPD/Gross Acre
Commercial	2,000* GPD/Gross Acre
Industrial	2,000* GPD/Gross Acre
Agricultural	1 to 5* AF/Ac/Yr
Golf Courses & Ponds	4.5 AF/Ac/Yr

* Note: If site specific data is available and has a higher or lower use rate than the recommended value, it should be used. If no site specific data is available for Agricultural use, a default value of 4 AF/Ac/Yr shall be used.

B. Maximum Day Demand (MDD):

Based on the results of studies conducted to develop the Water Facilities Master Plan, recommended Peaking Factors (PF) are as follows for use in system analysis:

Land Use	Peaking Factor‡	
	Maximum Day	Peak Hour
1. Low and Medium Density Residential		
a. Small Pressure Zones Under 500 gpm ADD	3.0	7.0
b. Medium Pressure Zones 500-2,000 gpm ADD	2.5	5.0
c. Large Pressure Zones Above 2,000 gpm ADD	2.0	3.5
2. High Density Residential and Mobile Homes	1.5	2.5
3. Commercial and Industrial	1.5	2.0
4. Schools and Other Public Institutions (Institutional)	1.5	2.0
5. Parks and Golf Courses	2.5	2.5
6. Agricultural (see WFMP p. 3-23)	2.0	2.0
‡ Reference WFMP Table 3-5		

Notes:

- Maximum Day Demand is equal to Average Day Demand times the Maximum Day Peaking Factor.
- Peak Hour Demand is equal to the Average Day Demand times the Peak Hour Peaking Factor.
- If a Peaking Factor is known to be higher or lower within an existing pressure zone (based upon record data), then it may used.

C. Fire Flow Requirements

These Recommended Fire Flows will be used for District planning and design purposes unless the local (approving) fire department stipulates or requires a different fire flow. It is understood that the minimum Fire Flow in several less developed areas of the District is still 500 gpm.

STRUCTURE	Flow GPM	Duration Hours	Number of Fire Hydrants
Single Family (Residential)	1500	2	2
Multi-Family* (Residential)	3000	2	3
Light Commercial/Industrial (Including Schools)	3000	3	3
Heavy Commercial/Industrial	5000	4	4

*Five or more units per acre