

Appendix H

Utility Infrastructure Analysis



FINAL REPORT FOR THE WEST BROADWAY SPECIFIC PLAN UTILITY INFRASTRUCTURE ANALYSIS

City Agreement #2018-0459

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INTRODUCTION

The 2030 General Plan adopted in March 3, 2009 (GP), set forth a new direction for the City of Sacramento (City). The GP set forth the Guiding Vision that “Sacramento be the most livable City in America.” Downtown Sacramento would be vibrant with arts, culture, entertainment, and a 24-hour population. The GP favored developing inward, rather than expanding outward through encouragement of infill development, and reuse of underutilized properties. The 2035 General Plan was a technical update of the 2030 General Plan and incorporated the City’s Climate Action Plan.

The West Broadway Specific Plan (WBSP) will include land use regulations and policies designed to streamline the infill housing, commercial, and mixed-use development process and identify necessary public improvements to support urban development. The anticipated development will be consistent with the framework for the City’s 2035 General Plan which anticipates a mix of traditional and urban scale housing with neighborhood commercial uses. The WBSP focuses on reintegrating the western portion of Broadway and the Upper Land Park area into the fabric and activity of the City.

The WBSP area encompasses approximately 293 acres that includes the Miller Regional Park and Marina, the Leataata Floyd Elementary School & Health Professions High School, the Marina Vista and Alder Grove public housing, the Land Park Woods Affordable Housing, the newly developing Northwest Land Park Planned Unit Development (PUD), and an existing industrial area. The redevelopment of the existing land uses is anticipated to bring an additional 3,787 residential dwelling units (du) ranging in density between 18.5 to 85 dwelling units per acre (du/ac) together with a relatively small amount of 27,500 to 42,500 square feet of public/park/recreation buildings to the WSBP area. There is an anticipated reduction of between 10,775 to 50,776 square feet of commercial/industrial building uses largely due to the redevelopment of the existing industrial areas. There are two options proposed for the redevelopment of the Miller Regional Park and Marina. Scenario A includes a reconfiguration of the marina area, while Scenario B is without the reconfiguration of the marina area. A complete land use and development assumption summary together with a comparison of the existing and planned potential land uses contained in Appendix A.

This Utility Infrastructure Analysis is the first step in understanding any known infrastructure deficiencies in the plan area. This analysis is a preliminary engineering, planning level effort that will ultimately aid the City and developers in creating a development fee structure to share the costs of improvements, attracting development funding assistance, and provide potential developers with information to evaluate their probable infrastructure costs.

The area is served by the City of Sacramento for sanitary sewer and storm drainage. The majority of the area is served by the City’s Combined Sewer System (CSS) for both sanitary sewer and stormwater collection. This legacy system generally works well except during heavy rainfall storm events. The Miller Regional Park and Marina area stormwater is not connected to the CSS system and instead discharges directly to the Sacramento River. Future development in the WBSP will be required to mitigate any increases to sanitary sewer and/or stormwater flows to the CSS.

The area is also served by the City of Sacramento for water supply and distribution. The City has sufficient water supply for development consistent with the growth assumptions envisioned by the City’s General Plan. While the existing water system in the WBSP is generally adequate, strategic upgrades will likely be required to serve proposed growth. Future development will most likely be required to upgrade the existing water main grid to provide adequate water for both domestic and fire suppression needs.

The area is served by the Sacramento Municipal Utility District (SMUD) for electrical, PG&E for natural gas, and a combination of AT&T & Comcast for telecommunications services. Redevelopment in the WBSP would require the construction of an on-site underground distribution system to provide service.



There are existing fuel storage facilities operated by Chevron USA and Phillips 66. The Cities of Sacramento and West Sacramento by 2007 City Council Resolutions are working to relocate these facilities to the Port of Sacramento located in West Sacramento. Per the information contained in the Summary Status of Joint City of West Sacramento and City of Sacramento Riverfront Transition Strategies and Action Plans that Relate to Local Geographies memorandum prepared by Tom Trscinski Consulting for the City of West Sacramento Department of Economic Development (March 30, 2107), the Cities worked together on the SacPort Terminal Relocation proposal in 2006-8 with the City of West Sacramento as the project lead. Since 2008, the Cities have pursued relocation of their terminals separately. The City of West Sacramento has been actively pursuing de-industrialization of these terminals since 2014.

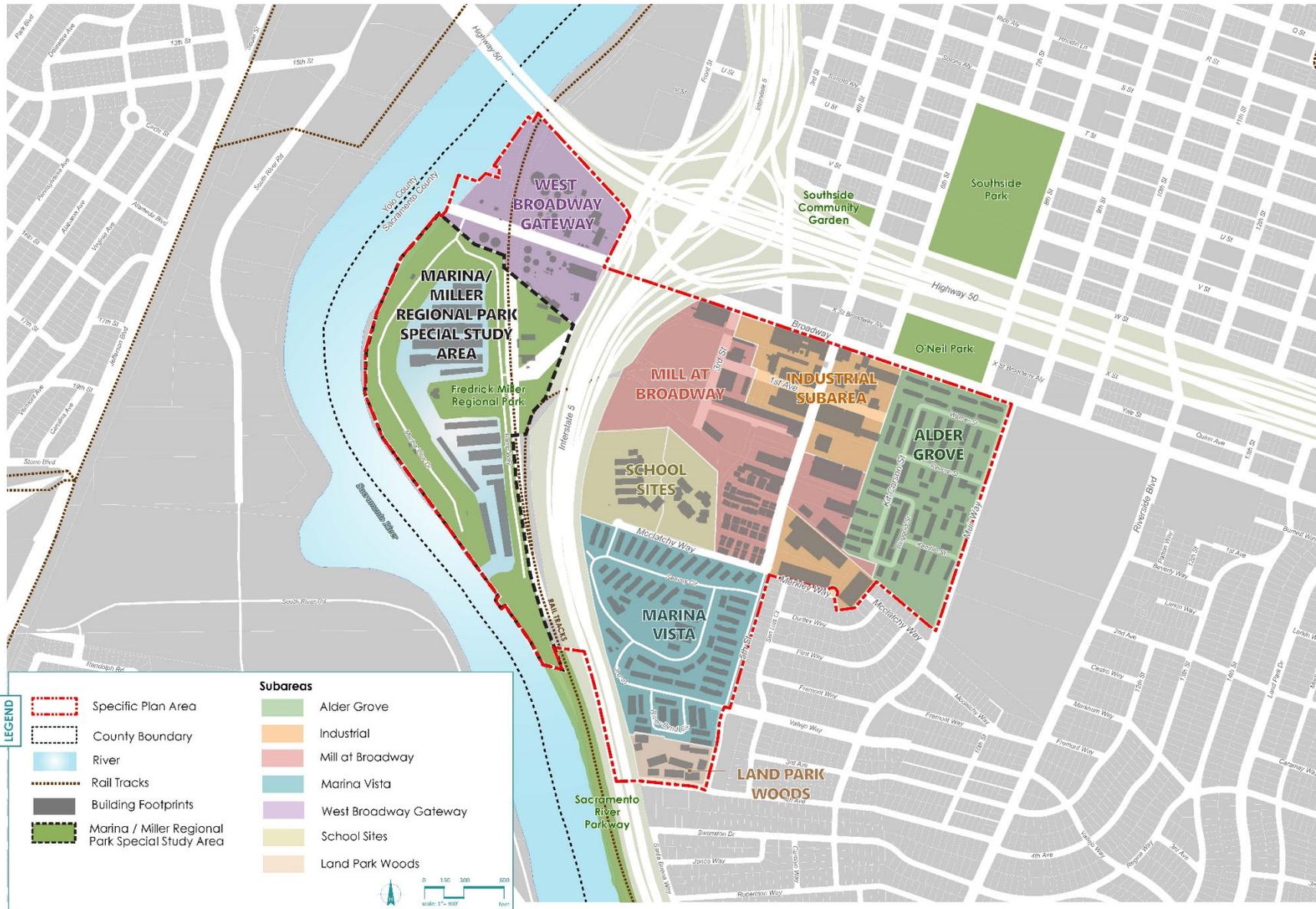


Figure 1: Planning Subareas

Source: Ascent Environmental, Inc., 2018



WASTEWATER & STORM DRAINAGE

General Information

The WBSP is served by the Combined Sewer System (CSS) with the exception of the Miller Regional Park and Marina area which is served by the CSS for sanitary sewer, but storm drainage is discharged directly to the Sacramento River. The CSS is the legacy storm drain and sanitary sewer system that conveys both stormwater and sanitary sewer flows. It encompasses approximately 7,500 acres of the Downtown, East Sacramento, and Land Park areas. Another 3,700 acres including the River Park, California State University, and eastern Sacramento areas utilize the system for sanitary sewer only. The City discontinued constructing combined sewer and storm systems in 1946, although continued connections to the existing CSS were allowed.

Combined Sewer System

The CSS is a collection system of pipes that convey both sanitary sewage and stormwater in a single pipeline. The piping system is greatly oversized for the sanitary sewer component, but inadequate for the City's current storm drainage design standard of 10-year capacity.

The CSS area is currently regulated by the Central Valley Regional Water Quality Control Board (RWQCB) per Cease and Desist Order No. 85-342 (Order). The Order, including its amendments, requires the City to make operational improvements to reduce combined sewer and runoff overflows and to ultimately provide 10-year capacity for the CSS.

The CSS is plagued by combined sewer outflows (CSO) and overflows where flows to the CSS exceed the system capacity. Outflows are when surcharges to the CSS flow onto the streets. Overflows are defined as the rare instances when untreated flows discharge to the Sacramento River. Outflows and the rare overflow usually occur only during heavy rainfall storm events.

The City has developed an improvement program to reduce CSO events. These improvements include rehabilitating and expanding Sumps 1/1A and 2, rehabilitating and converting Pioneer Reservoir into a treatment facility, rehabilitating and up-sizing of the sewer mains in the CSS, and rehabilitating the Combined Wastewater Treatment Plant (CWTP). Many of these projects have been completed.

Currently all flows into the CSS are conveyed westerly to two pumping stations (Sump 2 and 1/1A) located on the Sacramento River. For secondary treatment and disinfection of the flow, the City has entered into an agreement with the Sacramento Regional Wastewater Treatment Plant (SRWTP) to convey 60 million gallons per day (mgd). This treatment capacity is currently sufficient for dry weather flows.

During heavy storms where the capacity is exceeded, the CWTP at South Land Park Drive and 35th Avenue is utilized to provide primary treatment of an additional 130 mgd. Excess flows from SRWTP and CWTP are diverted to the Pioneer Reservoir storage and treatment facility that has a capacity of 350 mgd. When all three treatment facilities (SRWTP, CWTP, and Pioneer) have reached capacity, excess flows are directly discharged into the Sacramento River without treatment from Sump 2. Sump 1 also has the ability to discharge flows directly to the river. When the pipeline system and treatment plant capacities are surpassed, the excess flows flood local streets in the Downtown area through maintenance holes and catch basins.

The City prepared a Combined Sewer System Improvement Plan (CSSIP) Update Report dated August 2014. This CSSIP Update Report is an ongoing, multi-year project intended to evaluate and provide recommendations for projects to alleviate flooding in the CSS area during a 10-year event and to prevent structure flooding during the 100-year event. The CSSIP Update Report analysis of the system



improvements includes an allowance of increased sewer flows from future development. Recommendations for specific project improvements that provide localized or system-wide reductions to flooding have been identified. The projects are prioritized based on considerations such as flood-reduction benefits, cost-effectiveness, ensuring no increase in untreated discharges, sewer condition/age, cost-sharing opportunities, and City/community interests.

The City adopted the Combined Sewer Development Fee (City Code 13.08.490) which is an impact mitigation fee that requires mitigation of any significant increase in wastewater flows over the present level. If a proposed development project is determined to have a significant impact on the CSS, an acceptable mitigation plan is required by the City. The current CSS Development Fee (effective 7/1/2019) is \$142.76 per Equivalent Single-Family Dwelling (ESD) for up to 25 ESD and \$3,562.53 per ESD for more than 25 ESDs. The payment of the fees mitigates the project's sewer impacts.

In lieu of paying the fees, a developer may mitigate the impacts to the system with a mitigation plan approved by the City Department of Utilities (DOU). The mitigation plan could include on-site storage with retention, sewer main up-sizing, diversion of flows, rerouting or replacement of pipes, connection to separated areas, and/or other mitigation measures depending on the site.

There is a second fee associated with the sanitary sewer system, the Facility Impact Fee levied by the Sacramento Regional County Sanitation District (SRCSD). This fee pays for planning, designing, construction, and other related costs for wastewater conveyance, treatment, and disposal facilities for system expansion.

The SRCSD Facility Impact Fee currently (effective 7/1/2019) is calculated by multiplying the ESDs generated by the development by the fee of \$3,602 per ESD for infill single-family projects and \$2,701 per unit for multi-family projects. It is possible in certain cases to receive a credit of 1 ESD per parcel as credit for previously paid fees. Sacramento County (County) policy determines when the credit is allowed. The County has published the method of calculating the ESDs for the different types of development. Additional information is available on line at <http://www.srcsd.com>.

Existing Conditions

Combined Sewer System

The CSS that serves both the sanitary sewage and much of the stormwater needs of the area consists of pipes ranging in size from 8-inches to 120-inches in diameter. The largest pipe in the CSS is the 120-inch Pioneer Interceptor (force main) which conveys flows from Sump 2 to Pioneer Reservoir. Piping material includes brick, polyvinyl chloride (PVC), reinforced concrete pipe (RCP), and vitrified clay pipe (VCP). Flows for the system are through the WBSP area and are generally from the north to the south.

In the WBSP area east of Interstate 5 collection system generally flows towards a 60-inch CSS pipeline located in 5th Street that flows through the WBSP area from north to south. The easterly portion of the WBSP area including the Alder Grove public housing project is collected into a 30-inch CSS main that flows towards Riverside Boulevard. The 120-inch CSS Pioneer Interceptor follows Front Street and along the westerly edge of Interstate 5 to a point west of Leataata Floyd Elementary School where it crosses under the freeway and then follows the easterly side of Interstate 5.

The drainage and sanitary sewage is typically collected in 8-inch to 12-inch piping systems located in the alleyways and streets. The collection system has collector pipelines ranging in size from 16-inch to 30-inch diameter. Development within the WBSP area will require the upsizing of the smaller drain lines and inlet leads to a minimum of 12-inch to 15- inch diameter.



Miller Regional Park and Marina

The Miller Regional Park and Marina area sanitary sewer system consists of four sewer pump stations Sumps 3, 123, 124, and 125. These are small pump stations that collect the sewer from the area and discharge it to the CSS through a 6-inch force main located in Front Street. Sumps 123, 124, and 125 are all small duplex (two) pump stations with a firm capacity of 0.2 million gallons per day (mgd) that feed into the larger Sump 3 duplex pump station that has a firm capacity of 0.3 mgd. The storm drainage is collected in a 6-inch to 10-inch gravity system at three main points, two of which discharge into the water area of the Marina docks and the third discharges directly to the Sacramento River.

Combined Sewer System Improvement Plan (CSSIP)

The CSSIP does not identify any projects directly within the WBSP area. However, it does identify three projects along Riverside Boulevard to the east of the WSBP area. These recommended projects include:

1. WA3-5: Beverly Way In-line Storage
2. WA3-7: Target Parking Storage
3. WA6-2: Riverside Boulevard Upsizing

Stormwater Quality

The City adopted the Stormwater Quality Design Manual (SQDM) for the Sacramento and South Placer Regions (May 2007), a joint effort of the communities in the greater Sacramento region. The SQDM provides locally-adapted information for design and selection of three categories of stormwater quality control measures: source control, runoff reduction, and treatment control. Per the requirements, multi-family and commercial projects greater than 1 acre are required to implement permanent post-construction treatment measures.

The WBSP area is subject to the requirements of the SQDM only for those projects that fall within the boundary of Miller Regional Park and Marina. All projects greater than 1 acre will be required to comply with the stormwater quality measures outlined in the SQDM. These measures may include treatment measures such as bioswale planters, stormwater treatment vaults, green roofs, etc. – either used as a single treatment or as a combination of several measures. Developers are urged to discuss their project with the Stormwater Quality Section of the City DOU while in the planning stages so that proper permanent post-construction stormwater quality treatment measures can be effectively implemented into the project.

The remainder of the WBSP area is within the CSS, which is under separate permit regulations for stormwater discharges. The stormwater flows from the CSS are treated at the SRWTP, CWTP, and the Pioneer treatment facilities. Therefore, projects within the CSS are not required to have additional stormwater quality control measures.

Proposed Improvements

Combined Sewer System

The WBSP area is largely developed at this time with a variety of land uses including office, commercial, and residential. The redevelopment of the existing land uses is anticipated to bring an additional 3,787 residential dwelling units (du) ranging in density between 18.5 to 85 dwelling units per acre (du/ac) together with a relatively small amount of 27,500 to 42,500 square feet of public/park/recreation buildings to the WSBP area. There is an anticipated reduction of between 10,775 to 50,776 square feet of commercial uses largely due to the redevelopment of the existing industrial areas.



Sanitary sewer flows are expected to increase because of the future increased density of the residential land uses. Since the majority of the sites are previously developed with highly impervious surfaces (i.e.; roof tops, parking lots, sidewalks, etc.), the stormwater runoff flows from the projects are not anticipated to increase with the new development. However, the Alder Grove and Marina Vista subareas currently contain a fair amount of pervious open space areas within the projects. Redevelopment of these projects with increased densities may increase the amount of impervious surface areas which would lead to increased storm water runoff. Any increase will need to be mitigated through either on-site or off-site storm water retention, and/or pervious pavements. Mitigation fees by agreement may be available on a project by project basis as approved by the Department of Utilities (DOU). The increased sanitary sewer flows are anticipated to be relatively small compared to the stormwater component of the CSS design flows.

Sanitary Sewer: The anticipated future development in the WBSP area is expected to increase the sanitary sewer flows primarily due to the increase in the residential uses. The small increase of public/park/recreation building uses is offset by the anticipated reduction commercial/industrial uses and is considered negligible compared to the increase in residential uses for this report. The addition of over 3,787 new residences will affect the existing sewer system.

The City of Sacramento Design and Procedures Manual contains the standards for sewer generation rates (Section 9 – Sanitary Sewer Design Standards dated 7/24/18) contain average daily flow rates and factors for residential and non-residential uses. The recently adopted standard for sewer generation is 310 gallons per day (gpd) per ESD.

A factor of 0.75 ESD per residential unit was selected based on the multi-family nature of the residential. This factor when multiplied by 310 gpd per ESD yields a sewer generation rate of 232.5 gpd per residential unit.

Given the anticipated development of 3,787 dwellings units in the WBSP area, the anticipated increase in the residential Average Dry Weather Flow (ADWF) is 0.88 mgd (= 3,787 DUs x 0.75 ESDs x 310 gpd/ESD).

The City requires the developer to mitigate the increased sewer flows. The City will consider one of the following approaches to mitigate the impacts:

1. Project developer pays the established CSS mitigation fee.
2. At the City's discretion, the project developer can participate in a City-sponsored project that improves the system in the area and can be upsized to incorporate mitigation of the project. A separate cost sharing agreement shall be executed for this option.

The stormwater runoff characteristics of the current and proposed land uses are similar. As a result, the peak stormwater flow rate and volume of rainfall-runoff is not expected to significantly change when the land use changes. The City requires the developer to mitigate the increased drainage flows. The City will consider one of the following approaches to mitigate the impacts:

1. Project developer directly mitigates the impacts utilizing low impact development Best Management Practices (BMPs) per section 9.4.12 of the City's Design and Procedure Manual.
2. Project developer directly mitigates the impacts via public and/or private storage and other measures in accordance with Section 11 of the Design and Procedures Manual and the Onsite Design Manul. The setup of hydraulic models shall be in accordance with the CSS model user guide. Prior to hydraulic modeling, the Designer shall schedule a meeting with the DOU to review the Project, the modeling parameters, and discuss possible drainage solutions.
3. At the City's discretion, project developer can share in a City-sponsored project that improves the system in the area and can be upsized to incorporate mitigation of the project. A separate cost sharing agreement shall be executed for this option.



4. Per the City DOU draft Onsite Design Manual for onsite drainage storage within the CSS, the project developer provides a minimum of 7,600 cubic feet of onsite storage per acre of increased impervious area for the 100-year storage volume. The nominal capacity for discharges to the CSS is 0.18 cubic feet per second (cfs) per acre. It should be noted that these requirements are contained in a draft of the Onsite Design Manual and therefore subject to change.

Alternatively, a project developer may enter into a mitigation agreement with the DOU and pay a CSS drainage impact fee. The fee would be based on the square footage increase of impervious surface. The agreement and exact fee is subject to approval by DOU.

Recommended System Improvements:

The areas of the WBSP is well served by the existing CSS collection system. The existing large diameter CSS trunk collection mains within the WBSP area is adequate to serve the area and the anticipated increase sewer flows with the redevelopment of the area with proper mitigation and contributions to improve the greater CSS system. The majority of the redevelopment subareas within the WBSP area are large single land owner properties. These include the Alder Grove, Marina Vista, The Mill Phase V, and Miller Regional Park areas. These projects and the other properties within the WBSP area will provide utility infrastructure to serve their specific project areas with the redevelop the properties, and will be required to mitigate any impacts to the CSS. There are no identified regional improvements that would benefit all of the potential redevelopment properties within the WBSP.

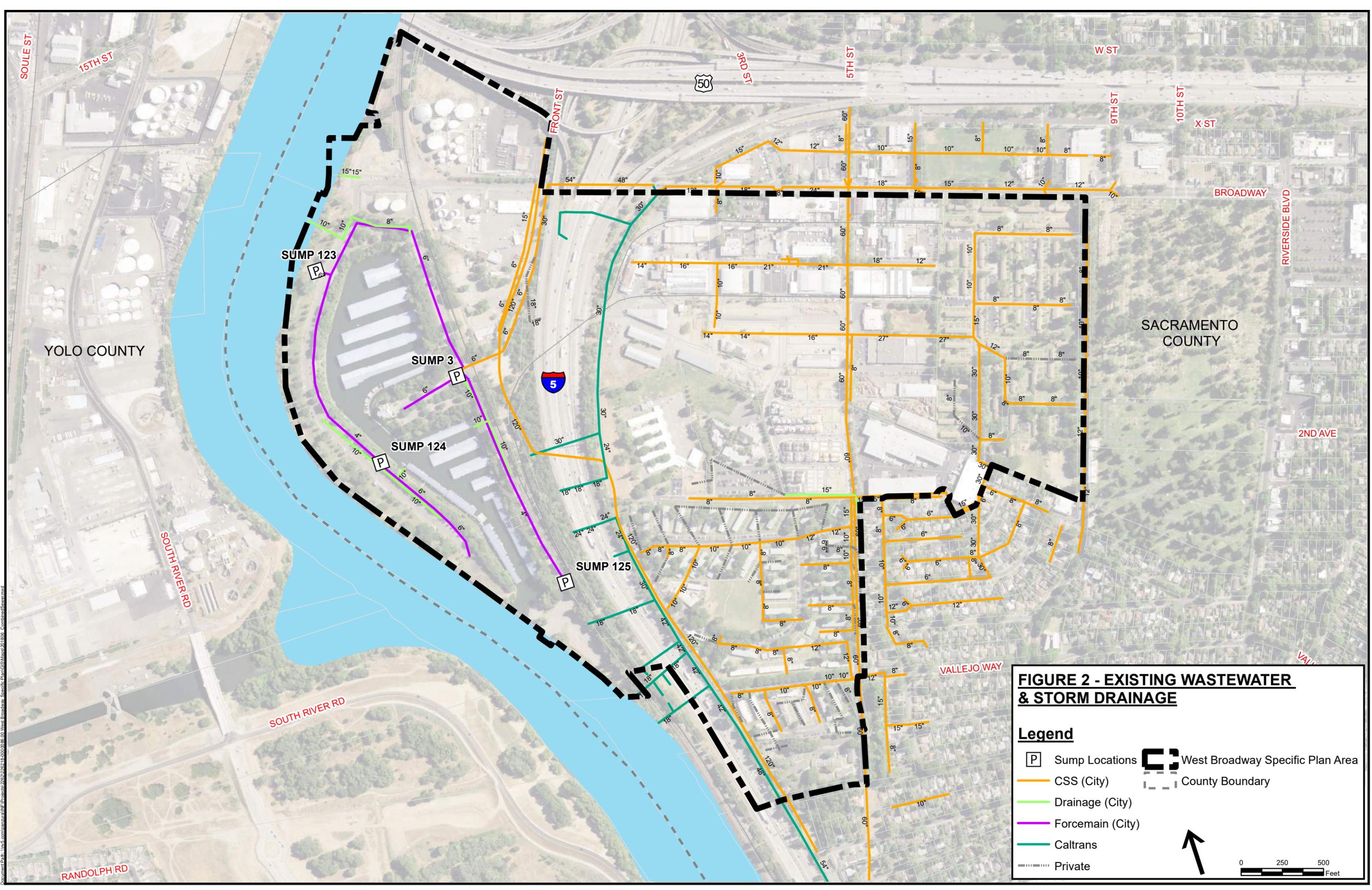


FIGURE 2 - EXISTING WASTEWATER & STORM DRAINAGE

Legend

- P Sump Locations
- West Broadway Specific Plan Area
- CSS (City)
- Drainage (City)
- Forcemain (City)
- Caltrans
- Private
- County Boundary

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WATER SUPPLY

General Information

The City provides domestic water to the WBSP area. The City utilizes both surface water and groundwater to meet the water demands. The City treats surface water diverted from the Sacramento River and American River through the Sacramento River Water Treatment Plant (SRWTP) and the E.A. Fairbairn Water Treatment Plant (FWTP), respectively. Additionally, the City extracts groundwater from both the North Sacramento and Central Sacramento basins. The current reliable water production capacity is approximately 280 mgd.

Sacramento River Water Treatment Plant: The SRWTP began operation in 1924 with an initial capacity of 32 mgd and treats water diverted from the Sacramento River approximately one-half mile downstream of the confluence of the American River. A new water intake structure, located approximately 700 feet downstream of the old intake structure, was completed in 2003. Other expansions and modifications completed by the City since the 1920s increased the treatment plant design capacity to 160 mgd. The most recent project was completed in 2016, which replaced many of the older facilities at the SRWTP in order maintain the 160 mgd capacity into the foreseeable future.

E.A. Fairbairn Water Treatment Plant: The FWTP is located adjacent the American River approximately seven miles upstream with the Sacramento River. The FWTP began operation in 1964 and has a current diversion limit of 200 mgd following an expansion completed in 2005. Currently, the California Department of Public Health (CDPH) has permitted a capacity of 160 mgd. However, the amount of water diverted is further limited by the so-called Hodge Flow Criteria which restricts diversions from the FWTP under certain low river flow conditions. Hodge conditions have historically occurred about 50% of the time, and can be present in any month of the year. During the time of peak demand, most often in June, July, or August, the Hodge Flow Criteria could limit the diversion rate at the FWTP to 100 mgd. As a result of this constraint, sufficient pipe capacity to move the 160 mgd into the distribution system has not been constructed. The current facility is physically constrained to approximately 130 mgd, when Hodge is not triggered.

Groundwater Wells: The City currently operates 27 municipal groundwater supply wells; 25 wells are located in the northern portion of the City, north of the American River, while the remaining two are located south of the American River. The total pumping capacity of the City's municipal supply wells is approximately 20 mgd, assuming 90% of the production capacity is available. The City has recently completed a well rehabilitation program that improved capacity at a number of existing wells. Overall, the groundwater facilities operated by the City are known to be at or near the end of useful life, and the City is currently preparing a groundwater master plan to help determine the direction and anticipated future capacity of the collective groundwater facilities. The City is nearing completion on two new wells in the southern portion of the system at Shasta Park. The projects are anticipated to supply potable water by 2019-2020. The City anticipates the groundwater pumping capacity to increase to approximately 25 mgd after the activation of the rehabilitated wells and completion of the new groundwater wells.

Distributed Storage: The City maintains eleven enclosed distributed water storage reservoirs together with a total capacity of 45 million gallons (MG). This water is used to meet the water demand for fire flows, emergencies, and peak hours where demands exceed the maximum day supply rates. A new 4 MG distribution storage tank at the Shasta Park Site in the southern portion of the City is anticipated to be completed in 2019-2020, which will increase the total storage to 49 MG. In addition to the reservoirs, the SRWTP and FWTP together maintain a combined on-site storage of over 44 MG.



The City operates pumping facilities throughout the area. There are high lift service pumps at the SRWTP and FWTP to move the treated water from the facility reservoirs into the distribution system. The City also maintains pumping facilities at ten of the City’s storage reservoirs. These pump stations are of varying sizes and capacities.

The City differentiates the water mains into two distinct categories: water distribution mains and water transmission mains. Water distribution mains are smaller pipelines located in the streets and alleys utilized for water services. Water transmission mains are larger pipelines utilized to convey water to the distribution mains.

It is City policy to only utilize the water distribution mains for water services, fire services, and fire hydrants. These pipes are typically 4-inches to 12-inches in diameter. These pipes may be tapped only with the approval of the City DOU. Considering each service tap is a potential weakening of the water main, the City currently has the policy to restrict the installation of service taps until after a project has been reviewed and approved by the City. This is to restrict the number of taps to the mains to those that are in the ultimate location per an approved development plan. This reduces the number of service taps that are abandoned due to changes in the development plans.

Transmission mains are 14-inches and larger in diameter. They are used to convey large volumes of water from the treatment plants to selected points throughout the distribution system. They are also utilized to transfer water to and from the storage reservoirs to meet fluctuating daily and seasonal demands. These mains cannot be tapped for water services, fire services, or fire hydrants.

The City DOU has an active CIP for maintaining and upgrading the water supply system. The implementation of the water improvements necessary to serve a specific project site is typically the responsibility of future developers. City policy is to require the developer to construct any infrastructure necessary to support the project in question without compromising service or water quality to the project area. To determine if water needs for a project can be met, a water supply test is performed on the existing system. Depending on the location of the project, a water study may also be required of new development to determine if there is sufficient water supply to support the project. If the existing water system is sufficient to meet the needs, no infrastructure upgrades are necessary. If the existing infrastructure is found to be insufficient for the project’s needs, the developer is required to construct necessary infrastructure improvements.

The current City policy could prove burdensome to a small developer whose project exceeds the capacity of the water system. One project could, under this approach, be held responsible for major infrastructure improvements, creating the possibility of a financial responsibility making the project no longer viable. One possible mitigation for this problem could include the developer entering into agreements with adjacent developers to construct the required facilities as a small assessment district. This process, however, would be complex, expensive, and could be infeasible due to intractable owners.

The infrastructure improvements required for all new development will need to meet current City standards. Looped water main systems are typically required due to the unreliability of dead end mains, and the potential for water quality problems as a result of stagnant water. Additional water main installation may also be required depending on the existing system layout. All new water services are required to be metered.

Temporary source of water for construction is easily acquired two different ways. First, the contractor can purchase a construction service. This potentially could be the ultimate water service tap for the project. Secondly, the contractor can arrange to purchase water from an adjacent fire hydrant.

The City Design Standards for water (Section 13 – Water Distribution System Design Standards dated 7/24/18) contains the planning and design criteria for water systems.



Existing Conditions

The WBSP area is generally served by an extensive system of service mains ranging in size from 6-inches to 12-inches in diameter. These mains are typically older steel pipelines. The development of the Northwest Land Park PUD will provide a network of new water mains within this portion of the WBSP area. Strategic replacement of the smaller 6-inch and 8-inch pipelines is envisioned to serve the remaining potential infill development areas within the WBSP.

A major transmission main serving the greater Downtown Sacramento area from the SRWTP enters the area at the northwest corner of the WBSP area at Front Street. This 42-inch pipeline continues easterly through the WBSP area along Broadway and then turns south along 5th Street to the southerly end of the WBSP area. A 24-inch transmission main continues easterly along Broadway from the intersection at Broadway & 5th Street and then turns south following Muir Way along the easterly edge of the WBSP boundary.

There are no active wells or reservoirs within the limits of the WBSP area; however, there is an inactive irrigation well (Well #8) located near the end of Front Street northerly of the entrance to Miller Regional Park and Marina. The nearest reservoir outside of the SRWTP is the Riverside Reservoir located south of the WBSP area on the westerly side of Riverside Boulevard between 10th and 11th Avenues. This reservoir together with the SRWTP are identified by the City as Critical Infrastructure items.

Proposed Improvements

Water Demands: The types of development envisioned with the redevelopment of the WBSP area projects sites are high-density urban infill type projects. The redevelopment of the existing land uses is anticipated to bring an additional 3,787 residential dwelling units (du) ranging in density between 18.5 to 85 dwelling units per acre (du/ac) together with a relatively small amount of between 27,500 to 42,500 square feet of public/park/recreation buildings to the WSBP area. There is an anticipated reduction of 10,775 to 50,776 square feet of commercial uses largely due to the redevelopment of the existing industrial areas.

Projects within the WBSP area are anticipated to have smaller residential units (700-1000 square feet) with a smaller per capita occupancy rate per unit than traditional single-family or multi-family units in suburban areas. The domestic water demands for these smaller residential units is anticipated to be substantially reduced compared to the City's typical single-family or multi-family water usage criteria. Fire flow demand for the WBSP area is assumed to be 2,500 gpm. Ultimately, the minimum fire flow for a specific building is designated by the fire department during plan review.

The adoption by the State of California of SB7–“20 x 2020” Water Conservation Standards requiring a 20% reduction in urban water usage by the year 2020 and the CalGreen Building Code will require reductions in overall water usage through stricter indoor and outdoor usage. These requirements mandating water conservation will further justify the use of the reduced water rates for the future development in the CCSP area.

The City Water Study Design Manual dated January 2018 contains the Water Distribution System Criteria (WDS Criteria) which is a summary of the recommended potable water system performance and operational criteria. The WDS Criteria provides a table of gross unit water use factors for various land uses. The demands are broken into two categories of water use factors, residential and non-residential. The residential factors are based on the acre-feet per year per DU (afy/du) and the non-residential is based on acre-feet per year per employee (afy/employee). For the WBSP, all of the anticipated dwelling units

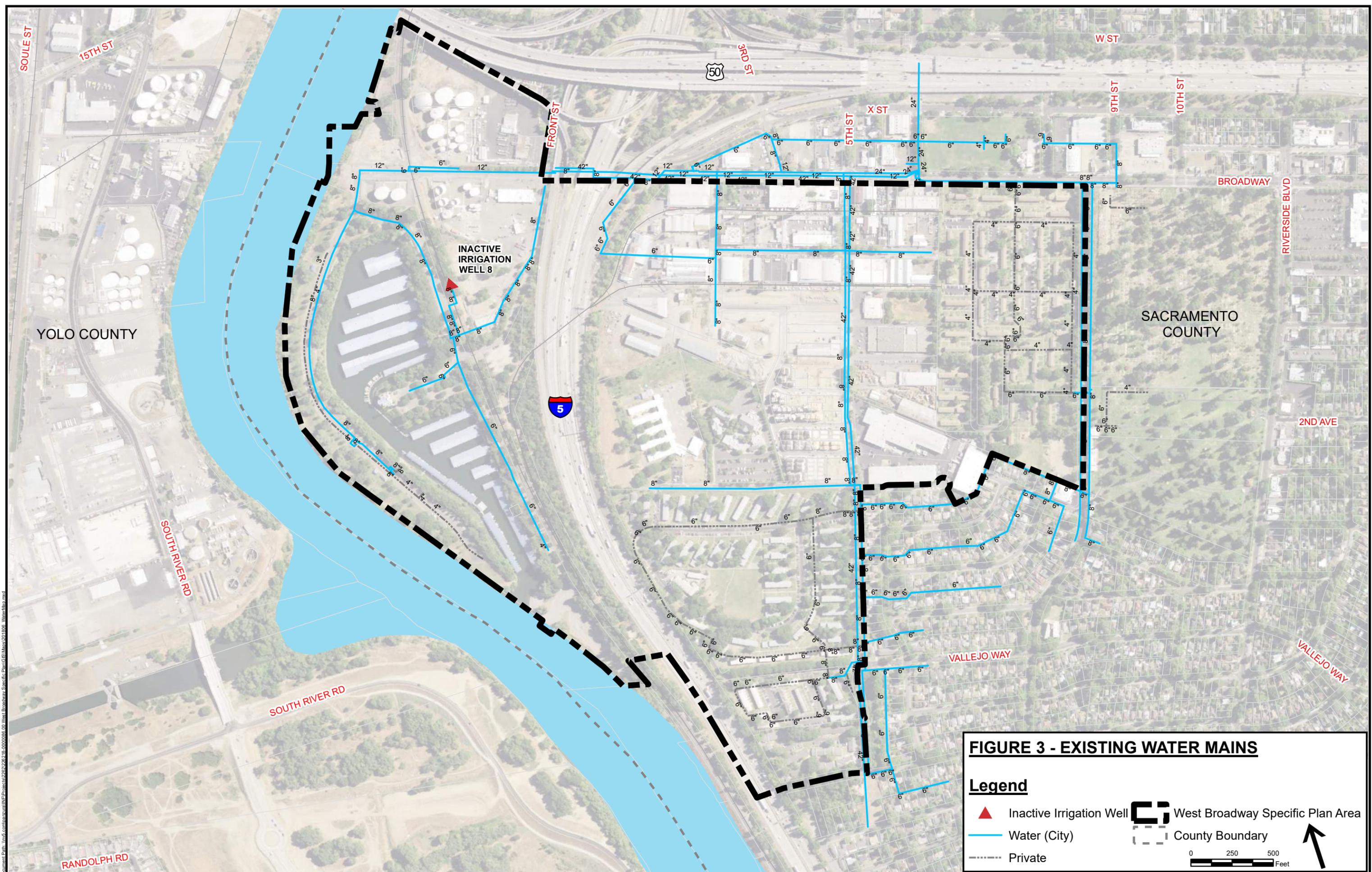


are anticipated to be the Residential High category which has a residential factor of 0.12 afy/du. The Commercial/Office land use has a factor of 0.09 afy/employee.

Given the anticipated development of 3,787 du in the WBSP area, the anticipated increase in the residential average water demand is 454 afy ($= 3,787 \text{ DUs} \times 0.12 \text{ afy/du}$). The small increase of public/park/recreation building uses is offset by the anticipated reduction commercial/industrial uses and is considered negligible compared to the increase in residential uses for this report.

Recommended System Improvements:

The areas of the WBSP is well served by the existing water transmission and distribution system. The existing water transmission and distribution system within the WBSP area is adequate to serve the anticipated increase demands with the redevelopment of the area. The majority of the redevelopment subareas within the WBSP area are large single land owner properties. These include the Alder Grove, Marina Vista, The Mill Phase V, and Miller Regional Park areas. These projects and the other properties within the WBSP area will provide utility infrastructure to serve their specific project areas with the redevelop the properties, and will be required to upgrade the pipelines to serve their project areas. There are no identified regional improvements that would benefit all of the potential redevelopment properties within the WBSP.



INACTIVE IRRIGATION WELL 8

FIGURE 3 - EXISTING WATER MAINS

Legend

- ▲ Inactive Irrigation Well
- Water (City)
- - - Private
- West Broadway Specific Plan Area
- County Boundary



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NATURAL GAS

General Information

Pacific Gas & Electric Company (PG&E) supplies natural gas to the Sacramento area. During the winter, approximately 70% is imported from Canada and the balance is supplied from California production wells. During the summer, this ratio is reversed. Also during the summer, gas prices are lower so gas is stored in underground reservoirs for use during winter peak use periods.

The PG&E gas distribution system has high and low pressure distribution systems. The high pressure system pipelines are generally 4-inch diameter and larger, carry gas at approximately 40 pounds per square inch (psi). Low pressure system pipelines, generally 2-inch diameter, carry gas at a pressure of 7-inch water column (about 0.25 psi). Service is generally provided from the low pressure system unless usage exceeds about 3,000 cubic feet per hour; however, in the WBSP area the system is all high pressure. Regulators are used to reduce high pressure to low pressure.

Existing Conditions

A major 24" gas transmission main Line 108 runs through the WSBP project area. The line enters the WSBP area from the north on 3rd Street to the intersection at Broadway and then runs easterly on Broadway to Muir Way where it turns southerly along Muir Way exiting at the southern WSBP boundary. This is identified by PG&E as a critical infrastructure facility. There is also a 20-inch high pressure distribution main located in Broadway from easterly edge of Interstate 5 to that extends beyond the WSBP easterly boundary.

The high pressure gas system generally is served by a grid system throughout the WSBP area. The high pressure system pipelines range in size from 2-inch to 6-inch diameter. These mains are generally located in the streets with the exception of the Marina Vista and Alder Grove public housing developments, the William Land Woods Affordable Housing development, where the mains are sometimes located in the private streets, but mostly located in the open space between the buildings.

Proposed Improvements

PG&E has indicated they are currently making improvements to their system in accordance with a number of projects and initiatives which may negate the need for future improvements when or if the new developments are constructed. PG&E will service the new developments and infrastructure as they are constructed and require service. PG&E would expand/upgrade the natural gas system to extend service to the new development on a case by case basis as additional information is received on the actual development square footage and maximum and minimum gas loads.

PG&E was unable to provide a draft of necessary system improvements and/or review of their gas system without specific information regarding gas loads at each potential development site together with an application for service.

If the user is a core (non-interruptible) customer in the service area and will accept service at 7-inch water column pressure, the company is generally obligated by California Public Utilities Commission (CPUC) regulations to provide service without additional cost for service. If the user is a non-core (interruptible) customer, or needs an elevated pressure service for large volume use, there are charges for service according to PG&E new business tariffs. Whether a project is a core (non-interruptible) user or a non-core (interruptible) user is dependent on the type of use for the facility or business. Projects in the CCSP are most likely to be core (non-interruptible) customers.

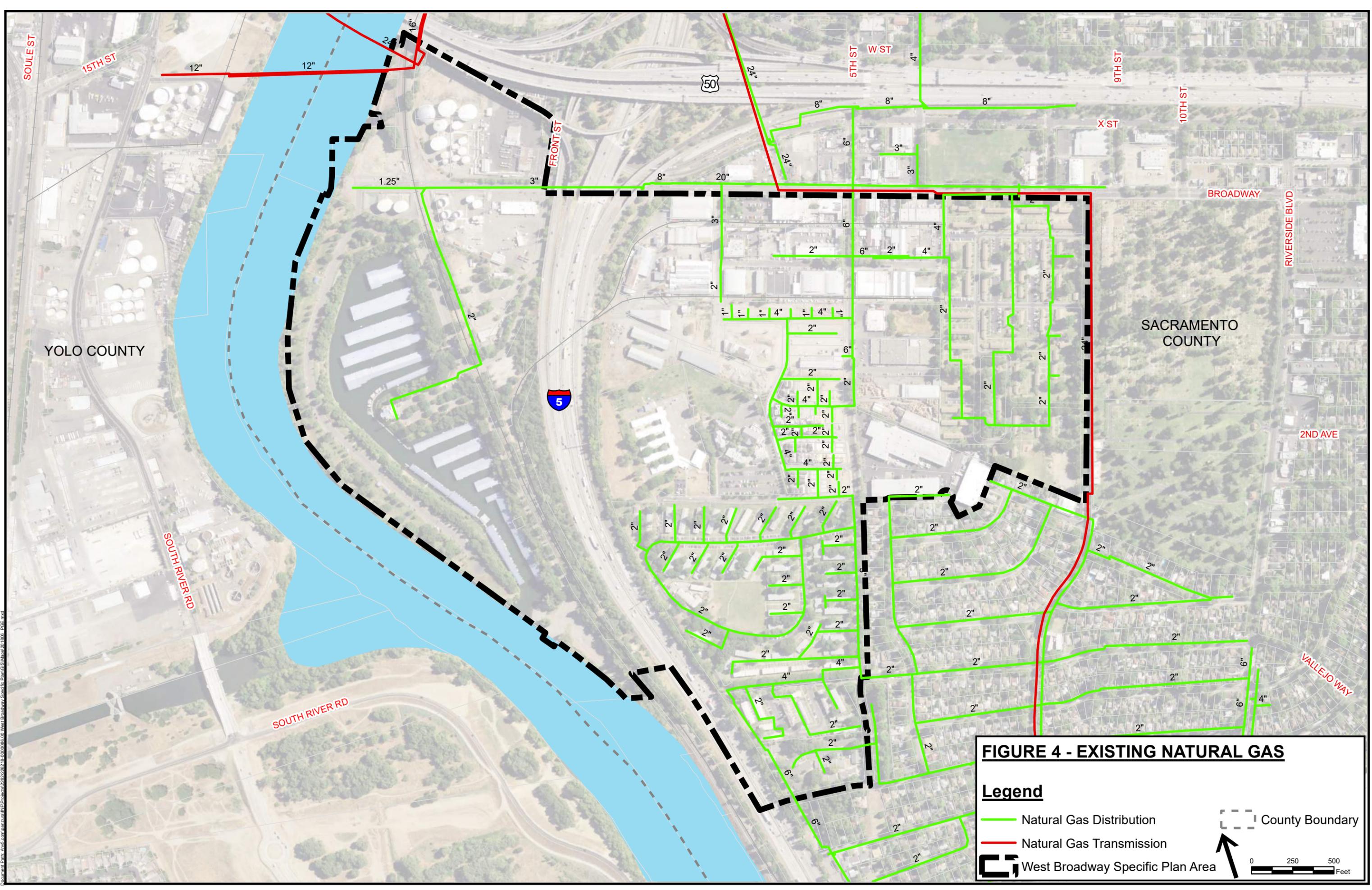


FIGURE 4 - EXISTING NATURAL GAS

Legend

- Natural Gas Distribution
- Natural Gas Transmission

West Broadway Specific Plan Area

County Boundary





PETROLEUM

General Information

Kinder Morgan’s SFPP (Santa Fe Pacific Pipelines) system consists of the North Line, which consists of approximately 864 miles of trunk pipeline in five segments that transport products from Richmond and Concord, Calif., to Brisbane, Sacramento, Chico, Fresno, Stockton and San Jose, Calif., and Reno, Nevada. The products delivered through the North Line come from refineries in the San Francisco Bay Area and from various pipeline and marine terminals. SFPP also includes the San Diego Line, a 135-mile pipeline serving major population areas in Orange County and San Diego; the Oregon Line, which is a 114-mile pipeline transporting products to Eugene, Oregon for shippers from marine terminals in Portland, Oregon; the West Line which is approximately 515 miles of primary pipeline and currently transports products from the Los Angeles Basin to Colton and Imperial, California, and Phoenix, Arizona; and the East Line which is approximately 400 miles of pipeline originating in El Paso, Texas transporting products to Tucson and Phoenix, Arizona.

Existing Conditions

A Kinder Morgan 10-inch pipeline crosses the Sacramento River from West Sacramento at the westerly end of Broadway. The pipeline turns southward just east of the railroad tracks and terminates at the existing fuel storage facility south of Broadway.

Proposed Improvements

It is anticipated that with the relocation of the existing fuel storage facilities described below, the existing Kinder Morgan 10-inch pipeline may be abandoned and/or repurposed for other utilities needing to cross the river.

Existing Fuel Storage Facilities

There are several existing fuel storage facilities (aka tank farms) located in the northeast corner of the WBSP. These facilities are owned by Chevron USA and Phillips 66.

Per a memorandum titled “Summary Status of Joint City of West Sacramento and City of Sacramento Riverfront Transition Strategies and Action Plans that Relate to Local Geographies” dated March 30, 2017 prepared by the City of West Sacramento, Department of Economic Development the following is the status of the proposed relocation of these facilities:

Through City Council Resolutions in 2007, the Cities of Sacramento and West Sacramento agreed to work jointly to facilitate the relocation of the oil terminals along the east and west banks of the Sacramento River to the Port of Sacramento in accordance with the Sacramento Riverfront Master Plan, the California Environmental Quality Act, and other applicable laws.

The Cities worked together on the SacPort Terminal Relocation proposal in 2006-8 with the City of West Sacramento was the project lead. Since 2008, the Cities have pursued relocation of their terminals separately. West Sacramento has been actively pursuing de-industrialization of these terminals since 2014.

Proposed Fuel Storage Facilities

The relocation of the existing fuel storage facilities will allow for the redevelopment of the West Broadway Gateway subarea within the WBSP for future redevelopment of approximately 1,300 residential dwelling units, 132,670 square feet of commercial uses, and civic/recreation/community center/park activities uses.

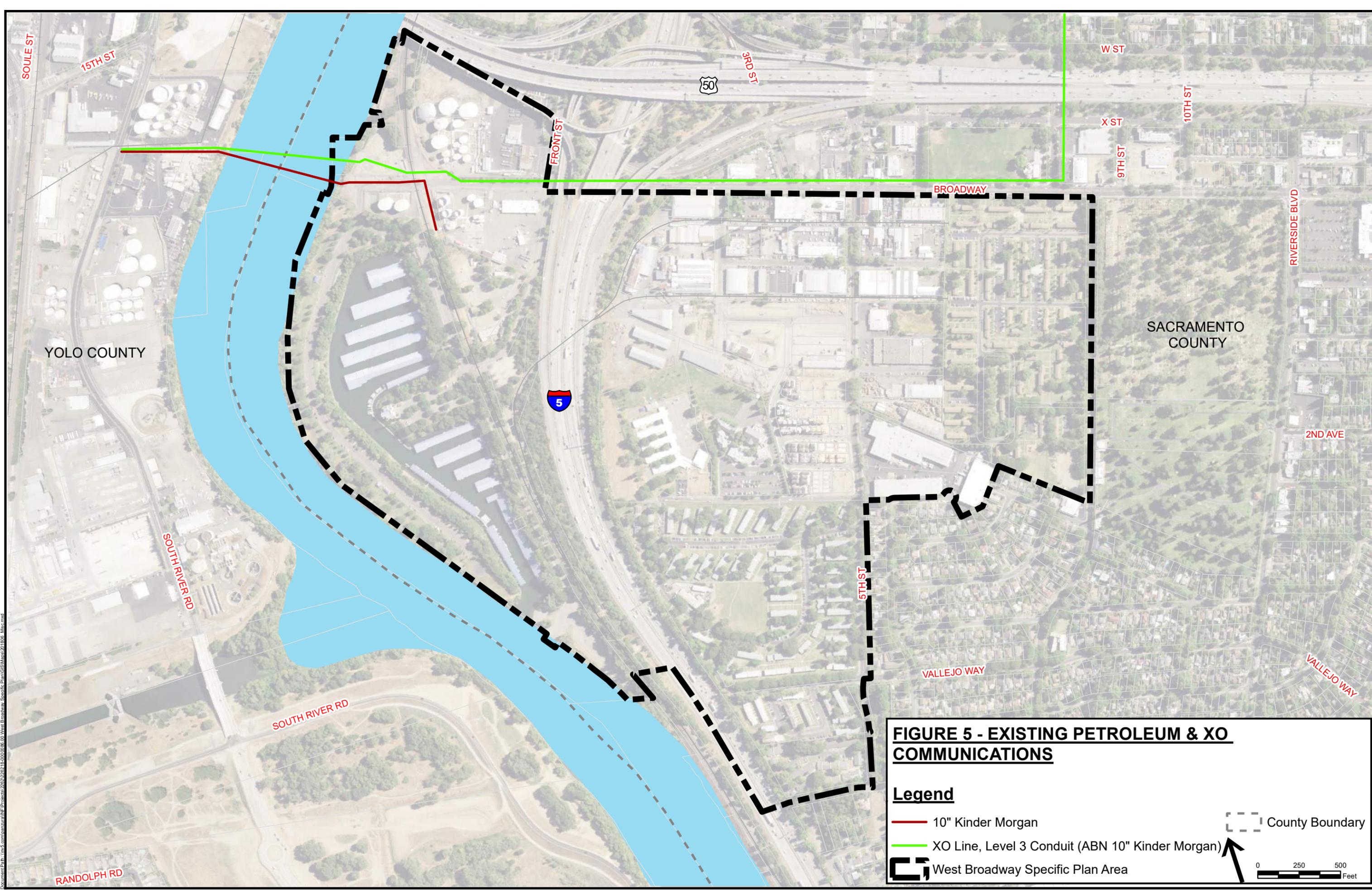


FIGURE 5 - EXISTING PETROLEUM & XO COMMUNICATIONS

Legend

- 10" Kinder Morgan
- XO Line, Level 3 Conduit (ABN 10" Kinder Morgan)
- West Broadway Specific Plan Area
- County Boundary

0 250 500 Feet

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ELECTRICAL

General Information

SMUD provides electrical service to customers located within the WBSP area. Power is transmitted to the WBSP area by a 21kV distribution system off of Station D located at 8th and R Streets in Downtown Sacramento. There are two feeders from the substation within the WBSP area, STD2301 and STD2303.

Station D substation steps down the 115kV to 21 kV to serve the overall West Broadway area. The existing feeders will likely be used to serve new development within the WBSP area.

Existing Conditions (Facilities)

The entirety of the WBSP area is served by the 21kV distribution system, consisting of mainly overhead facilities. This system is fed by Station D feeders 2301 and 2303. Station D's two feeders total approximately 20MVA of load carrying capacity (based on Station D's bank limit). Recently developed properties such as the newly developing Northwest Land Park PUD often place the aerial facilities underground, generally in a joint trench with other dry utilities along the street frontage or in an alley.

Proposed Improvements

The two existing circuits do not have sufficient capacity to service the entire WBSP area at buildout based on the land use plan under both Scenario A and B. As such, additional 21 kV feeders will likely be brought into the WBSP area to meet the overall demand requirements. Likely avenues of entry include, but are not limited to, Front Street, 3rd Street, and Riverside Boulevard.

Furthermore, as the area develops, SMUD will likely extend 21 kV infrastructure and facilities adjacent to and potentially within developed lots. This extension, depending on the requirements of each development, may be overhead or underground. In both cases, dedicated easements and/or space sufficient to house and operate the necessary infrastructure, facilities, and equipment will be required. Typical easement requirements are 12.5 feet wide, but can vary based on specific needs and requirements.

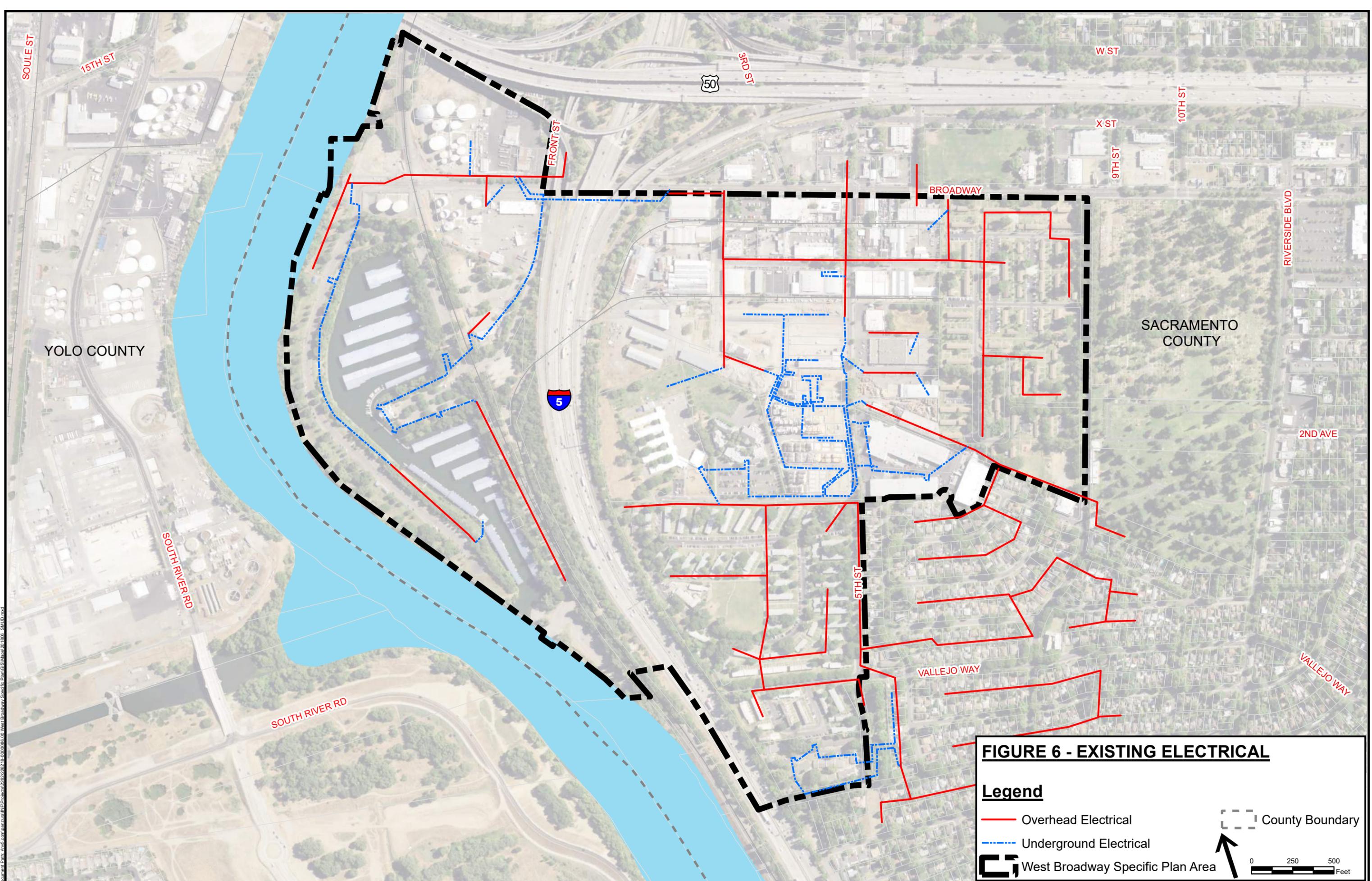
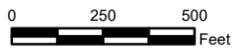


FIGURE 6 - EXISTING ELECTRICAL

Legend

- Overhead Electrical
- - - Underground Electrical
- - - County Boundary
- ☐ West Broadway Specific Plan Area



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TELECOMMUNICATIONS

General

Within the WBSP area there are numerous telecommunications providers. The following are the main providers for telephone and cable services.

AT&T – Telecommunications

AT&T supplies local and long distance telephone service, and also data communications, in most of the Sacramento area. The WBSP area is served by the Main Wire Center at 14th and J Streets.

AT&T serves the WBSP area with a combination of overhead and underground conduit systems. The main lines are generally located in the streets with the exception of the Marina Vista and Alder Grove public housing and the William Land Woods Affordable Housing where the service lines are located throughout the developments.

Recently-developed properties such as the newly developing Northwest Land Park PUD often place the aerial facilities underground, generally in a joint trench with other dry utilities along the street frontage or in an alley. Cabling in underground conduits can be either copper wire or fiber optic cable.

Comcast/AT&T Broadband

Comcast provides cable television service in the Sacramento area. AT&T Broadband leases conduit space and fiber optic cable capacity from Comcast in the WBSP area.

Comcast serves the Sacramento area with a combination of underground and overhead fiber optic and copper coaxial cable. The signal is generated at a downtown site on N Street near the Capitol and is distributed to hub sites throughout the service area, from which local service is distributed.

XO Communications and Level 3

XO Communications provides network, internet, and telecommunications in the Sacramento area. They have fiber optic lines located inside an abandoned underground Kinder Morgan pipeline crossing the Sacramento River. The pipeline crosses the river from West Sacramento at the westerly end of Broadway following Broadway to 8th Street where it turns northward and exits the WBSP area.

City of Sacramento

The City currently owns an existing fiber network that provides Municipal and Smart City services. The network provides connections between various traffic signals, utility sumps, reservoirs, and City facilities spread throughout the City. The network consists of approximately 160 miles of underground fiber optic cables and conduits that transverse the main corridors of the City. The fiber network currently enables the City to run efficient operations and reduces operational costs, while expanding capabilities. The telecommunications system consists of single or multiple underground conduits, pull boxes, and utility vaults that are interconnected with the traffic signals, utility services, and various City facilities. Within the WBSP area this system is located along the Broadway corridor from Front Street eastward. The system is connected and looped though the Miller Regional Park and Marina area following the Front Street entrance.

The following link shows how the Public Works - Transportation Division utilizes this infrastructure:
<http://www.cityofsacramento.org/Public-Works/Transportation/Traffic-Signals/Traffic-Operations-Center>



Proposed Telecommunications

Telecommunications providers have indicated the existing system within the WBSP area should be sufficient to serve the proposed projects and opportunity sites with relatively minor additions. In general, service to each of the new sites will be coordinated with the main electrical service in a common joint trench. Typically, a few 2-inch conduits will be added to the joint utility trench for service to the projects.



APPENDIX A:

LAND USE SUMMARY

Table 2-1: Land Use and Development Assumptions Summary

Subareas	Area (gross acres)	DEVELOPMENT ASSUMPTIONS					SPECIFIC PLAN DETAILS			
		Residential Density (units/gross acre)	Non- Residential FAR	Percent Residential	Percent Commercial	Percent Other Non- Residential	Dwelling Units	Commercial/In- dustrial Building Area (sq. ft.)	Public/Park/ Recreation Building Area (sq. ft.)	Park/Open Space (acres)
West Broadway Gateway	25.4	85	0.5	60%	24%	36%	1,300 [3]	132,670	10,000	9.3
Marina/Miller Regional Park Special Study Area Scenario A	62.7	85	0.2	3%	7.8%	89.2%	150	40,000	20,000	59.3
Marina/Miller Regional Park Special Study Area Scenario B	62.7	85	0.2	3%	0	97.0%	150	0	5,000	59.3
Industrial Subarea	23.5	40	0.6	70%	30%	0%	660	185,200	0	0.0
Mill at Broadway	37.3	-	-	-	-	-	1,125 [4]	37,350	11,000	3.4
Alder Grove	35.2	29	0.4	90.5%	1%	8.5%	930	34,000	6,000	3.0
Marina Vista	38.8	18.5	-	95%	0%	5%	680	0	12,500	2.5
Land Park Woods	4.1	-	-	100%	-	-	55	0	3,800	0.0
School Sites	17.0	-	-	-	-	-	0	0	99,500	2.0
Project Total (Miller Regional Park Scenario A)	244.0						4,900	429,220	162,800	79.5
Totals with Option (Miller Regional Park Scenario B)	244.0						4,900	389,220	147,800	79.5

Notes:

sq. ft. = square feet

[1] Other non-residential uses include parks and open space, public, and recreational buildings, and 300 boat slips in the Sacramento Marina.

[2] Other non-residential uses include parks and open space, public, and recreational buildings, and 475 boat slips in the Sacramento Marina.

[3] Assumes 1,300 residential dwelling units or a mix of residential homes and hotel rooms.

[4] Note development assumptions for The Mill include 300 units planned in Phase 5 of the project on lands located adjacent to the Industrial Subarea, east of 5th Street.

Source: City of Sacramento Parcel Data, assembled by Ascent Environmental, Inc., 2019

Table 2-2: Comparison of the Potential Land Uses under the Proposed West Broadway Specific Plan to Existing and Planned Land Uses

Subareas	Area (gross acres)	EXISTING DEVELOPMENT CONTEXT				PLANNED AND APPROVED BUT NOT DEVELOPED				NET CHANGE WITH SPECIFIC PLAN			
		Dwelling Units	Commercial/Industrial Building Area (sq. ft.)	Public/Park/Recreation Building Area (sq. ft.)	Park/Open Space (acres)	Dwelling Units	Commercial/Industrial Building Area (sq. ft.)	Public/Park/Recreation Building Area (sq. ft.)	Park/Open Space (acres)	Dwelling Units	Commercial/Industrial Building Area (sq. ft.)	Public/Park/Recreation Building Area (sq. ft.)	Park/Open Space (acres)
West Broadway Gateway [1]	25.4	0	26,045 [1]	0	0	0	0	0	0.0	1,300	106,625	10,000	9.3
Marina/Miller Regional Park Special Study Area Scenario A	62.7	0	0	5,000	62.7 [3]	0	0	0	0.0	150	40,000	15,000	-3.4
Marina/Miller Regional Park Special Study Area Scenario B	62.7	0	0	5,000	62.7 [3]	0	0	0	0.0	150	0	0	-3.4
Industrial Subarea	23.5	0	413,950	0	0.0	0	0	0	0.0	660	-228,750	0	0
Mill at Broadway [4]	37.3	307	0	0	0.0	518	37,350	11,000	3.4	818	37,350	11,000	3.4
Alder Grove	35.2	360	0	6,000	0.0	0	0	0	0.0	570	34,000	0	3.0
Marina Vista	38.8	391	0	6,000	0.0	0	0	0	0.0	289	0	6,500	2.5
Land Park Woods	4.1	55	0	3,800	0.0	0	0	0	0.0	0	0	0	0
School Sites	17.0	0	0	99,500	0.0	0	0	0	2.0	0	0	0	2.0
Total with Miller Regional Park Scenario A	244.0	1,113	439,995	120,300	62.7	518	37,350	11,000	5.4	3,787	-10,775	42,500	16.8
Total with Miller Regional Park Scenario B	244.0	1,113	439,995	120,300	62.7	518	37,350	11,000	5.4	3,787	-50,776	27,500	16.8

Notes: sq. ft. = square feet

- [1] The building area identified includes the existing buildings for Chevron and ConocoPhillips located adjacent to Front Street. The existing fuel storage tanks and other miscellaneous structures are not included in this calculation.
- [2] Assumes 1,300 residential dwelling units or a mix of residential homes and hotel rooms.
- [3] The parks and open space area for Miller Regional Park includes the tunnel under I-5. The proposed project, Scenario A for Miller Regional Park provides for 300 boat slips within the Sacramento Marina. Scenario B for Miller Regional would maintain the 475 boat slips within the Sacramento Marina.
- [4] Note development assumptions for The Mill in the existing context are based on number of existing Phase 1 and Phase 2 units constructed and occupied in 2018 at the time of the release of the Notice of Preparation. The Planned Context encompasses the remainder of the planned development, approved as part of the Northwest Land Park PUD Guidelines (Phase 1-4). Additionally, planning for The Mill Phase 5 to include another 300 units on new lands located east of 5th Street is underway and assumed in the future Specific Plan condition.

Source: City of Sacramento Parcel Data, assembled by Ascent Environmental, Inc., 2019