

APPENDIX 5.17 GP-1: CONDITIONS INFRASTRUCTURE REPORT

CITY OF BARSTOW GENERAL PLAN UPDATE

PROPOSED CONDITIONS INFRASTRUCTURE REPORT
FOR WATER, SEWER, STORM DRAINAGE, AND WATER
QUALITY

CITY OF BARSTOW

SAN BERNARDINO COUNTY, CALIFORNIA

PREPARED FOR:

PLACEWORKS
3 MacArthur Pl, Suite 1100
Santa Ana, CA 92707

PREPARED BY:

FUSCOE ENGINEERING, INC.
15535 Sand Canyon Ave, Unit 100
Irvine, CA 92618
949.474.1960
www.fuscoengineering.com

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1. INTRODUCTION

1.1 PROJECT DESCRIPTION

The City of Barstow ("City") is currently undergoing a General Plan Update (GPU) which is intended to shape development in the City and its area over the next 25-plus years. A General Plan is the principal long-range policy and planning document for guiding the physical development, conservation, and enhancement of California cities and counties. As part of the California Environmental Quality Act (CEQA) process associated with General Plan Updates, infrastructure such as water, sewer, storm drainage and water quality systems that support the existing and proposed land uses will be analyzed consistent with the city-wide program-level planning of an EIR.

The Barstow GPU area encompasses the incorporated City of Barstow and its surrounding sphere of influence (SOI). The Barstow GPU area is located in northern San Bernardino County, roughly halfway between the cities of Las Vegas and Los Angeles. The City's sphere of influence is comprised of the incorporated area as well as lands outside of the incorporated city considered as possibilities for annexation to the City at some point in the future. The entire City encompasses approximately 26,240 acres or 41.34 square miles. The City's SOI is significantly larger at approximately 127,160 acres or 198 square miles. The City's SOI is the planning boundary outside of an agency's legal boundary that designates the agency's probable future boundary and service area. See Figure 1 for an aerial extent of the Barstow GPU area.

1.2 SCOPE OF WORK

This infrastructure assessment report describes the primary wet utility infrastructure systems that support the City of Barstow and its SOI, including water, sewer, storm drainage systems, and water quality programs. As part of the California Environmental Quality Act (CEQA) process associated with GPUs, infrastructure, and utilities that support the existing and proposed land uses will be analyzed at a level consistent with the GPU city-wide program-level planning as part of an Environmental Impact Report ("EIR"). This report will evaluate the existing conditions of the infrastructure systems including water, sewer, storm drain and water quality regulations that serve the City and SOI ("Barstow GPU"). Under the proposed GPU, the proposed buildout and land use changes will alter demands on existing infrastructure and utilities. The analysis within this report will review, identify, and summarize the effects of the proposed conditions on the existing infrastructure within the water, sewer, storm drainage, and water quality systems. Analysis will utilize GIS tools, data, and communication with City staff and local providers.

1.3 LAND USE DESCRIPTION

The City's existing land use conditions is provided below as Table 1. Table 2 contains the City's proposed General Plan buildout. Table 3 displays the net change between the proposed General Plan buildout and the City's existing conditions as well as the net change between the proposed General Plan and current General Plan.

Table 1 City of Barstow Existing Conditions

Land Use	Dwelling Units	Area (SF)
Single Family	8,564	-
Multi Family	4,557	-
Commercial	-	4,269,362
Industrial	-	3,492,337
Institutional	-	3,309,893
Open Space (maintained)	-	10,054,083

Table 2 City of Barstow Proposed General Plan

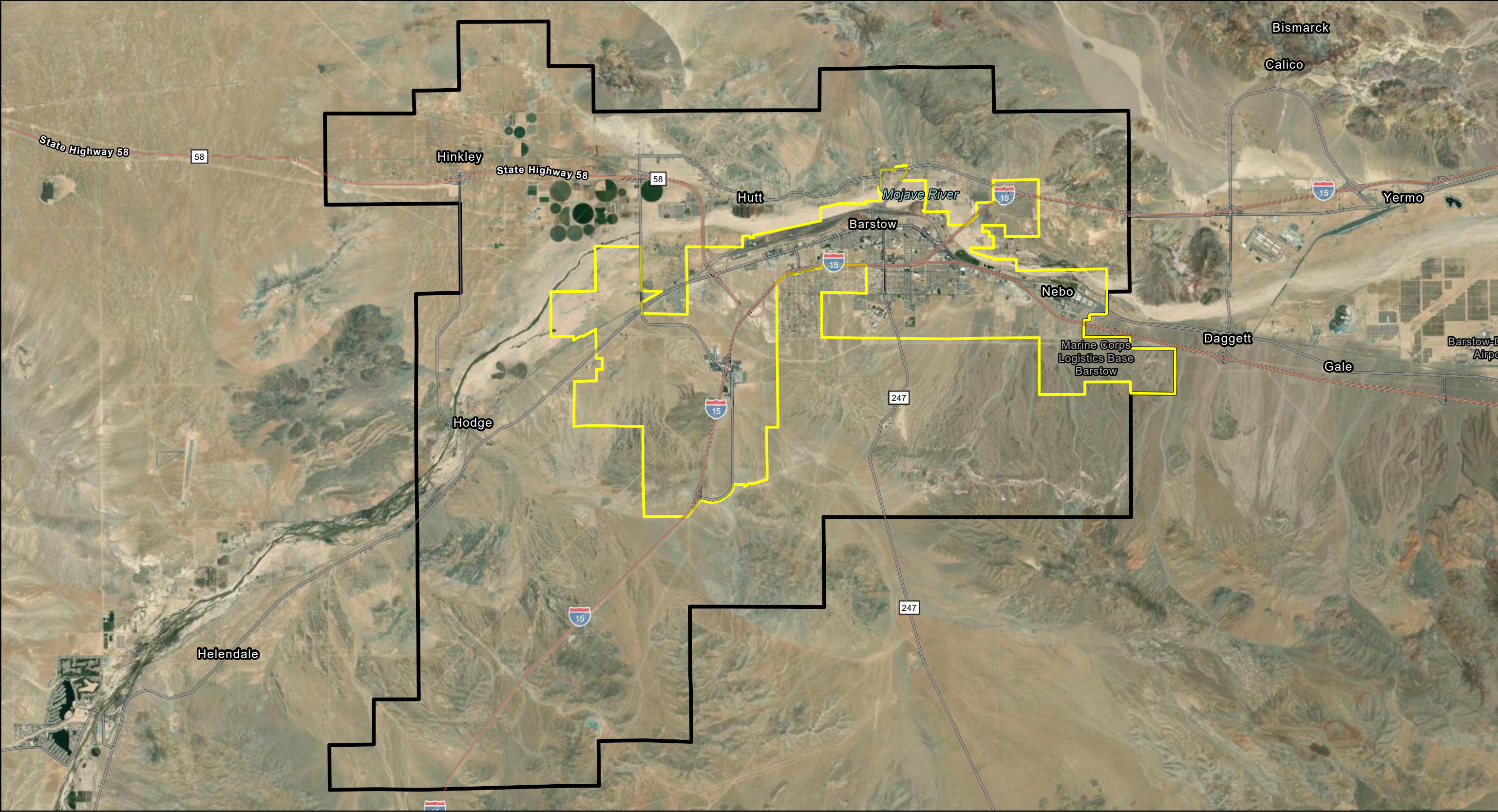
Land Use	Dwelling Units	Area (SF)
Single Family	12,583	-
Multi Family	7,155	-
Commercial	-	6,160,192
Industrial	-	15,869,462
Institutional	-	4,383,136
Open Space (maintained)		11,872,386

Table 3 Land Use Net Change

Land Use	Dwelling Units	Area (SF)
Single Family	+4,019	-
Multi Family	+2,598	-
Commercial	-	+ 1,890,830
Industrial	-	+ 12,377,125
Institutional	-	+ 1,073,243
Open Space (maintained)		+ 1,818,303

See Figure 1 for an aerial extent of the Barstow GPU area. See Figure 2 for the Barstow GPU proposed buildout.

Currently, the City has a large development project that is entitled and working on securing final permits. The BNSF Railway Company's (BNSF) Barstow International Gateway Project (BIG) is 4,354 acres and is located across the western side of the City and within unincorporated San Bernardino County. This project is represented within the proposed industrial land use.



City of Barstow GPU Aerial Extent

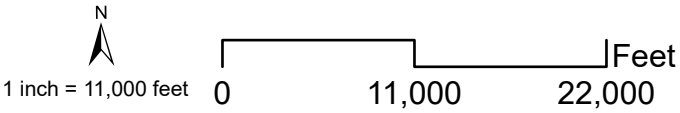
Barstow, CA

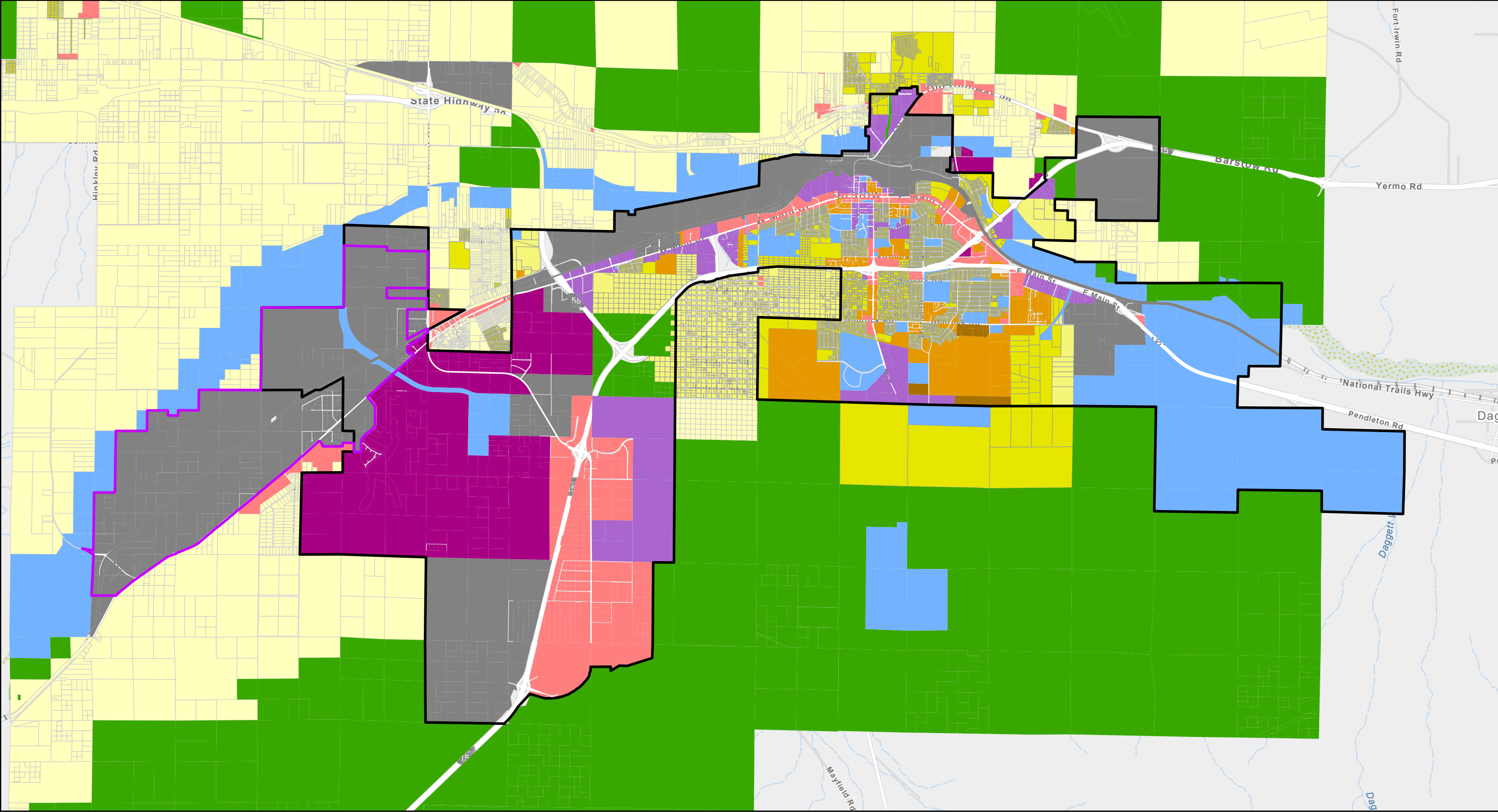


- City Boundary
- City's Sphere of Influence Boundary

Figure 1

1/4/2024





City of Barstow Proposed General Plan Land Use

Figure 2

Barstow, CA

BNSF BIG
City Boundary

General Plan Parcels
MAY 2024
Estate Residential

Low Density Residential
Single Family Residential
Medium Density Residential
High Density Residential
Diverse Use
General Commercial
General Industrial
Business Park
Open Space
Public / Quasi-Public

1 inch = 6,000 feet
0 5,000 10,000 Feet

9/27/2024

2. WATER

2.1 WATER SYSTEM ENVIRONMENTAL SETTING & INFRASTRUCTURE

The Golden State Water Company (GSWC) manages the potable water system within a majority of the City as well as surrounding unincorporated areas of San Bernardino County. As of 2020, the potable water system consists of 8,926 municipal connections, approximately 186 miles of distribution pipelines, eleven facilities that provide stored water for delivery by gravity or through booster pumping stations, and fourteen active wells. The fourteen active wells extract water from the Mojave River Basin-Centro Sub-Basin. The systems' wells pump water directly into the distribution system. Groundwater supply is the primary source of supply to meet demands within the service area,¹. The Mojave Water Agency (MWA) is the Watermaster of the greater Mojave Basin. See Figure 3 for the water infrastructure and facilities within the City.

The MWA service area encompasses approximately 4,900 square miles of western San Bernardino County. Its service area is divided into seven Subareas, each one affiliated with a hydrological groundwater basin. MWA is a State Water Project (SWP) contractor and Watermaster and wholesale supplier to ten (10) retail water suppliers that are large enough to require preparing their own Urban Water Management Plans. There are a number of smaller retail suppliers in the MWA service area which do not meet the Urban Water Management Planning Act's minimum threshold statutory criteria. MWA's goals include sound fiscal and organizational policies, effectively managing water resources in conjunction with the SWP, maintaining water quality, and promoting efficient use of the region's resources through regional conservation programs and public awareness². Groundwater pumping under the Mojave Basin Area Judgement (adjudication) is granted by the Riverside Superior Court. MWA is the acting Watermaster to ensure that the terms of the Judgement are followed by all Stipulating Parties. MWA is also responsible for all groundwater recharge activities. The Watermaster collects Replacement Obligation assessments from the Parties to the Mojave Basin Area Judgement when the Parties pump more than what is allowed. Under the assumptions of this report, GSWC will not incur a Replacement Obligation unless further order from the Court reduces the threshold that GSWC is allowed to pump without incurring a Replacement Obligation. The City also contains two other water districts within its jurisdiction, Bar-Len Mutual Water Company and Odessa Water District, that do not meet the threshold to create an Urban Water Management Plan. These two water districts cover approximately less than 1% of the City's jurisdiction. Due to the small size of these service areas, the impact to the larger water supply/demand planning for the GPU area is considered minimal and are not included in the analyses within this report.

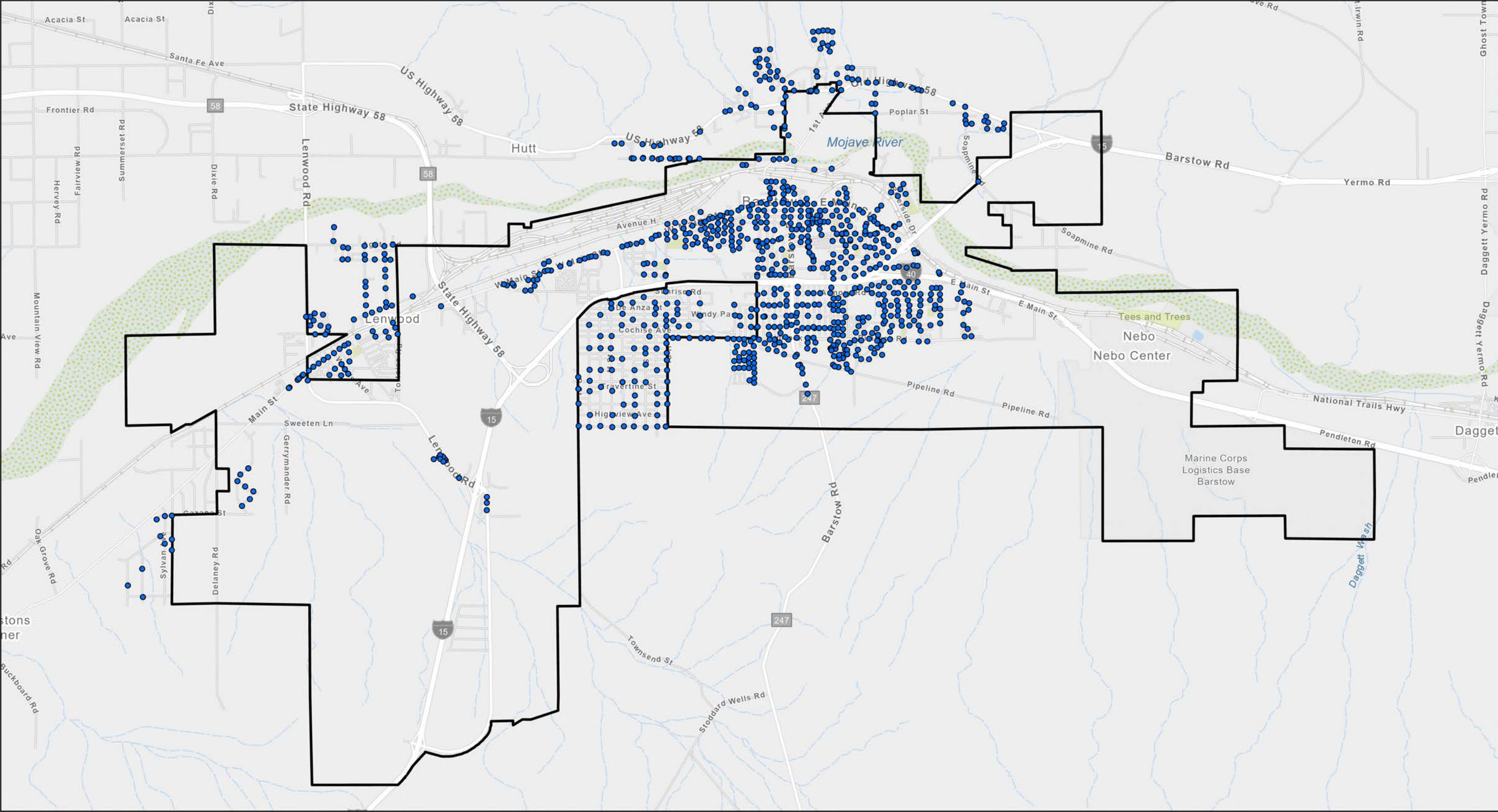
¹ Golden State Water Company Barstow Service Area 2020 Urban Water Management Plan

² Mojave Water Agency 2020 Urban Water Management Plan

The proposed GPU includes areas that are located outside of a retail water district's service area but are within the MWA service area. These areas primarily rely on local domestic groundwater wells for water supply. All local domestic groundwater wells must obtain a Well Permit from the San Bernardino County Department of Public Health³ and must complete a Notice of Intent to Extract Water with MWA⁴. For a conservative analysis, these areas will be analyzed at an equivalent water demand rate as the development within a retail water district's service area.

³ San Bernardino County Department of Public Health Application for Well Permit. Found here: <https://www.sbcounty.gov/uploads/dph/EHS/Programs/WaterAndWaste/well-permit-application.pdf>

⁴ Mojave Water Agency Well Permitting/Ordinance 14. Found here: <https://www.mojavewater.org/well-permitting/>



City of Barstow Existing Water System Facilities

Barstow, CA

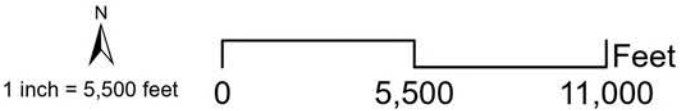


- Hydrants
- ▭ City Boundary

Note: Well Locations are available in Appendix A

Figure 3

6/24/2025



2.2 EXISTING WATER DEMANDS

For existing land uses within the City, water demands were estimated from MWA's Urban Water Management Plan (UWMP) methodology. MWA tracks water use within the entire Mojave Basin area, and water use is also included in Watermaster annual Verified Production reports. The large urban water suppliers within the region also track their individual production and report it to the State Water Resources Control Board (SWRCB) as part of monthly reporting⁵. Table 4 displays GSWC water use as it was reported to the SWRCB and population data for 2023.

As shown in Table 4 below the existing water service connections in the City have a total annual water demand of approximately 5,414 acre-feet (AF) as of 2023. The water system is functioning effectively to deliver these demands and the GSWC and the City consistently track and monitor the condition of the water infrastructure to provide a reliable water infrastructure network.

Table 4 GSWC Existing Water Demands

Water Supplier	Year	Population	Current Customer GPCD*	Current Customer Demand (AFY)
Golden State Water Company – Barstow System	2023	34,486	140	5,414
*GPCD = Gallons per Capita per Day				

2.3 PROPOSED WATER DEMANDS

Although GSWC is the retail water provider for the GPU area, GSWC's 2020 UWMP demand figures reflect the current 2015 General Plan and its associated growth forecast. Additionally, GSWC's demand methodology and data collection process intermingles some commercial and multifamily accounts. Accordingly, the City coordinated with MWA, the regional wholesale water provider, to more accurately project water demand associated with the proposed 2048 General Plan forecast and better align with the upcoming 2025 UWMP update (at the regional and local level). MWA develops a multi-factor water forecasting formula for the entire region---a methodology that was used in the MWA's 2020 UWMP and will be used in MWA's 2025 Regional UWMP, which will include GSWC as one of eleven urban retail suppliers.

MWA's methodology examines both existing and new customers within a specific service area in the region. The methodology to forecast existing customer use and new customer use differs slightly but is primarily developed

⁵ Water Conservation and Production Reports. State Water Resources Control Board. Found here: https://www.waterboards.ca.gov/conservation/conservation_reporting.html

by multiplying the population of each service area by a water factor based on gallons per capita per day (GPCD). The water factor considers both residential and non-residential uses, indoor and outdoor water uses, as well as incorporating the use of water efficient technologies over time. A detailed explanation of MWA’s methodology is described in Section 4.2 of the MWA UWMP⁶.

Population growth is based on MWA’s 2020 UWMP projections for the region and MWA expects that population growth projections will be driven by development projects that will be necessary to accommodate growth throughout the water service system. See Table 5 below for GSWC’s projected water demands for 2025 to 2045 that were developed in the 2020 MWA UWMP.

Table 5 GSWC Proposed Water Demands

Water Supplier	2025	2030	2035	2040	2045
Golden State Water Company – Barstow System	5,730	5,780	5,830	5,870	5,920
Source: MWA 2020 UWMP Table 4-3 Future Regional Water Use					

As shown in the table above, GSWC expects to be required to deliver 5,730 AFY to 5,920 AFY of potable water from 2025 to 2045. Based on these demands, GSWC expects an increase of 190 AF from 2025 to 2045.

PROPOSED GPU WATER DEMAND METHODOLOGY

The proposed GPU water demand calculations were developed in conjunction with MWA using the 2020 UWMP water demand projection methodology by integrating the GPU growth projections into the water demand forecast model for the GSWC service area through 2048.

Table 6 Proposed GP Water Demand

Year	Population (2048)	Current Customer GPCD (2023)	Current Customer Demand (2023) (AFY)	Additional Future Customer Demand (2048) (AFY)	Total Demand (AFY)	Combined GPCD
2048	52,748	139	5,360	2,399	7,758	131

⁶ Section 4.2 Forecasting Regional Water Use - Mojave Water Agency 2020 Urban Water Management Plan

Table 6 shows the projected total water demand for the GSWC service area to be 7,758 AFY by 2048. Of the total water demand, 5,360 AFY is projected to be generated from current customers and 2,399 AFY is projected to be generated from future customers within the service area. Current customer demand is generated using water use data reported to the SWRCB and population data as of 2023 with the assumption of implementation of water efficient technology over time.

The BNSF BIG has completed an approved Water Supply Assessment (WSA) with GSWC that calculates the project's water demand and necessary water supply source. Within BNSF BIG's WSA, there are two total water demand phases listed: the construction phase water demand and operational phase water demand. BNSF BIG's construction phase water demand is estimated to be a 3,538 AFY, with 3,227 AFY being non-potable water and 311 AFY being potable water. The construction phase water demand is temporary and would not have an impact on water demand/supply once construction of the BNSF BIG project is complete. The post-construction operational phase water demand is estimated to be 404 AFY of potable water. The operational phase water demand is included in the new customer water demand in Table 6.

Table 7 presents the net change increase in water demand from existing water demand to the proposed General Plan. As of 2048, the proposed Barstow GPU has an estimated increase in water demand of 2,344 AFY over existing conditions outlined in Table 4⁷.

Table 7 Net Change Water Demands

Proposed General Plan - Existing Conditions	
Net Change (AFY)	+2,344

2.4 WATER SUPPLY

The City's water supply is primarily provided by GSWC. GSWC operates as an investor-owned utility, serving over one million individuals across 80 communities in California. Within San Bernardino County's Mojave Desert, specifically the Mojave River Basin area, GSWC provides water to residential consumers in the City and surrounding unincorporated areas, alongside commercial, and industrial users.

⁷ Table 4 shows existing water demand reported to the SWRCB for 2023, which equals 5,414 AFY. Table 6 shows what current (2023) customer water demands will be in 2048 based upon the increase in water efficiency practices, which is estimated to be 5,360 AFY. The estimated increase in water demand over existing conditions is calculated by subtracting existing water demand in Table 4 from the forecasted water demand in Table 6 (7,758 – 5,414 = 2,344).

The City's water supply system primarily consists of local groundwater, which is sustained by imported water and surface water supplies. MWA is integral in the groundwater basin management in the Mojave Area. As mentioned, MWA acts as the Watermaster and is responsible for overseeing supply management needed to accomplish long-term basin sustainability goals. MWA primarily receives water from the State Water Project (SWP) through its contract and delivers the water to various recharge sites throughout the Mojave Basin.

GROUNDWATER

The local groundwater in the Mojave Basin Area is managed across five distinct subareas: Oeste, Este, Alto, Centro, and Baja, these subareas are separated based on hydrological, geological, engineering, and political considerations. GSWC's primary water source is groundwater extracted from the Middle Mojave River Valley subbasin, or notably the Centro Subarea per the California Department of Water Resources Bulletin 118⁸. The Centro subarea has annual allocations determined by the Watermaster's assessments. Additionally, GSWC supplements its supply with surplus water from prior years. Collaborative efforts with MWA are essential to enhancing the groundwater basin reserves and complying with regulations outlined in the Mojave Basin Adjudication, which governs the water rights.

Adjudication – Under the Mojave Basin Adjudication, each subarea received a Base Annual Production (BAP) value, alongside subsequent Free Production Allowance (FPA) calculations based on a percentage of the BAP. GSWC derives its water from the Centro subarea, which has a BAP of 14,407 AF and an FPA allocation of 70% for the 2020-2021 water year, amounting to 10,085 AFY. Projections suggest that the Mojave Adjudication FPA within the GSWC area will stabilize after 2025, with an anticipated consistent yield of 7,204 AFY from 2025 through 2045 under all normal, single dry, and multiple dry year scenarios.

Carryover Groundwater Supplies – GSWC has taken actions to protect its water supplies against hydrological and regulatory variability. Specifically, GSWC has invested time and effort into storing water assets for future use through the carryover of water from the Mojave Basin Adjudication. The carryover water supplies are derived from GSWC's unused FPA in each year. This carryover supply cannot exceed the previous year's FPA, thus any unused carryover supply is returned to the Centro Subarea to be considered in the Watermaster's annual basin reports. As of 2020-2021, GSWC's carryover supply totals were 11,526 AF. However, the GSWC understands that supplies will diminish due to non-use and represent this trend in the UWMP by gradually decreasing their carryover FPA until it was within 5% of the Production Safe Yield as defined within the Mojave Basin Adjudication. Thus GSWC, respectively, maintains 55% of its FPA for 2025 supply projections and 50% of its FPA as maximum carryover supplies for all years following 2025 through 2045.

⁸ California's Groundwater (Bulletin 118). California Department of Water Resources. November 2021. Found here: <https://data.cnra.ca.gov/dataset/california-s-groundwater-bulletin-118-archive>

IMPORTED WATER

Although GSWC does not have any imported water connections or emergency interconnections, imported water is available from the MWA, which is contracted to receive imported water from the State Water Project (SWP). The water that MWA receives is used to directly store water in and recharge local groundwater basins. Specifically, MWA captures and stores surplus imported water in normal and wet years to use those water assets to meet regional demands in dry years.

SURFACE WATER

Groundwater is recharged into the basin through the infiltration of water from surface waters coming from the Mojave River. Other sources of surface water recharge include storm runoff from the mountain, desert washes, and other activities such as irrigation return flows, wastewater discharge, and recharge with imported surface water. When available the MWA also stores these water resources in the Mojave Basin and the Morongo Basin for future uses.

RECYCLED WATER

As of 2020, GSWC was developing recycled water supplies for potential future use, but these supplies are limited until the tertiary treatment methodologies can better address total dissolved solids contained in the produced water⁹.

WATER SUPPLY PROJECTIONS

Looking ahead, GSWC anticipates its water supplies to range from 14,408 AF to 15,128 AF under normal conditions and during multiple dry years from 2025 to 2045. These total water supplies are derived from GSWC's projected Mojave Adjudication FPA as well as projected carryover supplies from unused FPA. See Table 8 for GSWC's water supply projections through 2025-2045 for Normal, Single Dry, and Five Consecutive Dry Years¹⁰.

⁹ Golden State Water Company, Barstow Service Area 2020 Urban Water Management Plan

¹⁰ Table 3-7: Total Supplies Available in GSWC Barstow Service Area Through 2045 (AFY). Golden State Water Company, Barstow Service Area 2020 Urban Water Management Plan

Table 8 GSWC Projected Water Supply Through 2045 (AFY)

Total Supply		2025	2030	2035	2040	2045
Normal		15,128	14,408	14,408	14,408	14,408
Single Dry Year		15,128	14,408	14,408	14,408	14,408
Multi-Year Drought	Year 1	15,128	14,408	14,408	14,408	14,408
	Year 2	14,408	14,408	14,408	14,408	14,408
	Year 3	14,408	14,408	14,408	14,408	14,408
	Year 4	14,408	14,408	14,408	14,408	14,408
	Year 5	14,408	14,408	14,408	14,408	14,408
Source: GSWC – Barstow Area 2020 UWMP Table 3-7: Total Supplies Available in GWSC Barstow Service Area through 2045 (AFY)						

As shown above, GSWC projects that they will have a water supply ranging from 15,128 AF in normal dry year conditions for 2025 to 14,408 AF of water available in the worst 5th dry year scenario for 2045.

WATER SURPLUS EVALUATION

For this evaluation, the City coordinated with MWA to obtain updated supply figures based on the preliminary assessment for the 2025 Regional UWMP. Unfortunately, the 2025 Regional UWMP is not due until July 1, 2026, and published supply data may not be available until early 2026. Accordingly, the City confirmed with MWA that the best available published water supply data is from GSWC's 2020 UWMP and MWA's 2020 Wholesale UMWP. Importantly, MWA's mission is to ensure water supplies are available for all uses and users within its service area. Thus, MWA is committed to continuing to manage water supplies to meet all growth, including that associated with the City's updated General Plan.

Taking the difference between the projected demands shown in Table 5 and the projected available supply in Table 8, it is evident that GSWC will have a surplus of water available to its service area. See Table 9 below for a summary of the difference between GSWC's projected UWMP supply and demand totals to determine the available water supply surplus.

Table 9 GSWC Projected Water Surplus

Projected Water Supply & Demands (AFY)	
	2045
Supply Totals ¹	14,408
Demand Totals ²	7,758
SURPLUS (AFY)	6,650
¹ GSWC water supply totals from Table 8. ² MWA 2048 proposed General Plan projected water demand from Table 6.	

The demands within Table 9 are based on the proposed General Plan projected water demand through 2048 that are listed in Table 6. The supply within Table 9 are based on GSWC's projected water supply through 2045 that is listed in Table 8. When comparing the difference of available water supplies to total demands, GSWC will continually have a surplus of water supply of 6,650 AFY.

In determining the environmental impacts of the City's GPU through a CEQA lens, the projected demands from the proposed GPU will fall well within GSWC's total available water supply projections. GSWC's robust water supply projections indicate that they are more than capable of accommodating the projected demand of 7,758 AFY. Furthermore, the City and GSWC will continue to collaborate on various planning documents, such as the City's GPU, to prepare for future developments, zoning updates, and necessary infrastructure and supply improvements.

See Table 10 below for a description of some of the water supply capital improvement plans that MWA's Mojave Region Integrated Regional Water Management Plan (IRWMP) has planned or ongoing for the City and regional supply reliability.

Table 10 Water Supply Capital Improvement Plan

Project Name	Status	Project Summary
Replacement Water Supply for Perchlorate/Nitrate Affected Groundwater – Barstow Area	In progress	A feasibility study will be done to determine the most cost effective and sustainable manner to design, construct and operate an alternative water supply for residents adversely affected by perchlorate and nitrate polluted groundwater in an unincorporated area northeast of Barstow
Annual Cooperative Water Resources Program between the Mojave Water Agency and the United States Geological Survey	Conceptual	Continuation of the basin management program that monitors surface water & groundwater levels & water quality.
Barstow Cemetery District	In progress	Replace high water consuming turf, plants, and trees with native varieties, which are drought tolerant and water conserving. In addition to irrigation upgrades, refurbishing well equipment and retention basins.
Source: Mojave Water Agency, Mojave Region IRWM Plan and Colorado Funding Area, updated 03/21/2024. Found here: https://www.mojavewater.org/wp-content/uploads/2024/04/IRWMP-Project-List-Update-03202024.pdf		

As shown above there are several capital improvements occurring throughout the City and region that will support water supply. MWA alongside the other purveyors within the regional water management group are fundamental to shaping the IRWMP and future capital improvements. Alongside other resources and initiatives the City, GSWC, and MWA all work together to ensure that water supply and infrastructure capital improvement plans and projects are financed, completed, and maintained throughout the region.

2.5 WATER CAPACITY ASSESSMENT

NEW BUSINESS NARRATIVE

GSWC has specific procedures within their New Business Narrative¹¹ that outlines the management, design, and construction of water source, storage, and distribution facilities for applicant-funded water system improvements. These procedures have been designed to promote efficient completion of projects at the lowest possible costs and maintain compliance with California Public Utilities Commissions (CPUC) rules and regulations. The New Business

¹¹ Golden State Water Company – New Business Narrative. October 2023. Found here: https://www.gswater.com/sites/main/files/file-attachments/nb_narrative_rev_oct_2023_website.pdf?1697751311

Narrative discusses the initial application and cost, fire flow requirements and testing, requirements for design and construction phases, as well as facility agreements and project closeout. The document also states that applications for water service outside of GSWC's currently approved service area will be reviewed on a case-by-case basis and may or may not be approved by GSWC. Approval depends on an analysis of the project impact to GSWC's existing water system and existing customers.

GENERAL RATE CASE

GSWC is committed to responsibly maintaining the local water infrastructure to ensure it can continue providing customers with premium water service. These investments protect the safety and reliability of the local water system. GSWC approved their 2020 General Rate Case (GRC) on June 29, 2023, that invests over \$22 million in the Barstow water system projects going through 2024. The new rates are being invested in the service area's waste disposal systems, power loss prevention at treatment plants, water tank upgrades, and backup power equipment.

GSWC has prepared their GRC 2023 for projects throughout 2025-2027. The rates proposed for 2025-2027 will provide customers with long-term value by investing over \$27.9 million in proactive capital investments and maintenance of local water infrastructure essential to the delivery and treatment of reliable, quality water. Investments in the service area include, but are not limited to, water distribution projects, seismic and structural upgrades to two reservoirs, a treatment plant and a well, backup generators needed for uninterrupted treatment and delivery of water in the event of power outages, natural disasters and to reduce the strain on the electrical grid, and the replacement of aging infrastructure including water mains, electrical works, pumping and purification and safety equipment¹².

WATER CONSERVATION PLAN

The City provides a comprehensive framework for water conservation efforts within the City's municipal code. In addition to defining terms and specifying the applicability of the regulations to all water users, the code describes the responsibility of individuals and entities to manage their water usage, with an emphasis on preventing excess runoff. It outlines specific prohibitions, such as restrictions on certain watering practices and car washing methods, aiming to minimize water wastage. Specifically, the code sets standards for new developments and mandates that water-efficient fixtures and infrastructure be incorporated to reduce water demands and wastage. The code also encourages the use of drought-tolerant plant species for landscaping and promotes water recycling and reuse processes among larger water users. Exceptions to the regulations may be granted in exceptional circumstances, and the code establishes penalties, including fines, for violations,

¹² Golden State Water Company Barstow – Capital Projects. Found here: <https://www.gswater.com/barstow>

demonstrating the city's commitment to enforcing water conservation measures effectively. Overall, these conservation measures will contribute to sustainable development and efficient water usage throughout the region.

WATER SUPPLY ASSESSMENTS/VERIFICATIONS (WSA)

Since the California State Legislature passed SB 610 (Costa) and SB 221 (Kuehl), mandating official water supply assessments and verifications, GSWC has consistently made proactive planning efforts by tracking future water use through service applications for new developments. WSAs play a critical role in closely linking land use planning with water supply reliability. Governed by SB 610, these assessments determine water supply adequacy for a 20-year projection, encompassing existing and planned future uses like agriculture and manufacturing. They are obligatory for projects proposing commercial development exceeding 250,000 square feet or retail centers exceeding 500,000 square feet. Additionally, under SB 221, before a city or county approves residential subdivisions with 500 or more units, GSWC must provide written verification of sufficient water supply. This verification is prepared before the final subdivision map adoption and ensures adequate water supply availability before construction commences. Thus, as new developments that fit within the GPUs projected growth are fulfilled project specific assessments will be conducted to ensure that adequate water infrastructure and supply are available for new developments.

2.5.1 WATER CAPITAL IMPROVEMENT PLANS

Table 11 includes a list of GSWC Capital Improvement Plan (CIP) projects that are either in progress or are proposed as part of the 2023 GRC. These projects are either specific infrastructure improvements or specific studies and reports that will aid GSWC.

Table 11 Water System Capital Improvement Plan

Project Name	Status	Project Summary
Agarita Reservoir Upgrades	In Progress	Rehabilitation of Agarita Plant Reservoir will consist of new tank coating, tank repairs and safety upgrades.
Install Backup Generators – Phase 1	Proposed	Install permanent backup generators at three critical plant sites to increase the reliability of the Barstow System. Two generators are proposed at the Bradshaw Plant Sites and one generator at the Glen Road Plant Site.

Project Name	Status	Project Summary
Systemwide Hydraulic Evaluation	Proposed	Perform systemwide hydraulic evaluation to evaluate pressure zone boundaries, system operations, and facility locations
2025 Urban Water Management Plan	Proposed	Retain engineering consultant to complete 2025 UWMP for the Barstow System
Bradshaw Plant Wells 13 and 14 Electrical Upgrades	Proposed	Upgrade electrical equipment
Glen Road Plant Well 2 Electrical Upgrades	Proposed	Upgrade electrical equipment
Arrowhead Plant Well 2 Electrical Upgrades	Proposed	Upgrade electrical equipment
Bradshaw Plant Expand Nitrate Treatment – Phase 1	Proposed	Expand nitrate treatment
Basalt Zone Area Main Replacement and Zone Realignment – Phase 1	Proposed	Replace approximately 10,500 linear feet of small diameter steel mains with 8-inch and 12-inch diameter PVC mains
Eaton Road Area Main Replacement	Proposed	Replace approximately 3,240 linear feet of small diameter AC mains with 8-inch diameter PVC mains

2.6 PROPOSED LAND USE AND CEQA THRESHOLD ANALYSIS

The following question regarding Utilities and Service Systems are identified in the CEQA Checklist related to water.

Would the Project:

- A. Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?
- B. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

Should the answer to this prove to be a potentially significant impact, mitigation measures would be required to reduce those impacts to a less-than-significant threshold. The following impact assessments are based on the significance criteria established earlier in the section.

Impact A: Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

Impact Analysis: Implementation of proposed land uses within the Barstow GPU will have the potential for water demands total of 7,758 AFY. Implementation of projects consistent with the land use will require the construction of new water infrastructure where existing water lines are not sufficient to accommodate the increased demands. These determinations will be made on a project-by-project basis and include site specific fire flow tests and hydraulic pressure analyses. The proposed improvements may include upsizing water lines on-site and off-site and additions of boosters in low pressure areas. In those conditions, where hydraulic or capacity impacts affect other service areas, the developer is responsible for paying for the impacts through their connection fees. In addition, the 2025 UWMPs will be required to incorporate the proposed land use changes into their water demand and supply projections out to 2050.

Additionally, the Barstow GPU will require the construction of new water infrastructure on-site and off-site in areas of the City that are undeveloped under the current condition. Potential off-site infrastructure includes new potable water lines, reservoirs and pumps. Additionally, potential on-site infrastructure may include new potable water lines and booster pumps. All infrastructure must abide by the standards of the respective water districts.

The construction of the on-site and off-site water infrastructure and associated improvements will primarily include trenching for the pipelines, along with water quality testing following pipeline installation. All construction will be performed in accordance with the Construction General Permit and all associated requirements. Any work that may affect services to the existing water lines will be coordinated with the City and GSWC. When considering impacts resulting from the installation of any required water infrastructure, all construction-related impacts are of a relatively short-term duration and would cease to occur once the installation is complete. Therefore, project impacts on water associated with construction activities would be less than significant.

Furthermore, a Construction Management Plan or equivalent, which would ensure safe pedestrian access as well as emergency vehicle access and safe vehicle travel in general, will be implemented to reduce any temporary pedestrian and emergency and other vehicle traffic impacts occurring as a result of construction activities. Moreover, when considering impacts resulting from the installation of any required water infrastructure, all impacts are of a relatively short-term duration and would cease to occur once the installation is complete. Therefore, project impacts on water associated with construction activities would be less than significant.

Once the improvements are complete, no additional environmental impacts are anticipated for the operation and on-going aspects of the water system.

Impact B: Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

Impact Analysis: Implementation of proposed land uses within the Barstow GPU will have the potential for water demand total of 7,758 AFY. After analyzing GSWC's projected water supply and demand, GSWC is projected to have a projected water supply of 14,408. The Barstow GPU estimated water demand falls well within GSWC's projected water supply.

Implementation of projects consistent with the land uses described within the Barstow GPU and are located outside of GSWC's service area will require annexation into GSWC's service area. Projects will need to follow GSWC's New Business Narrative to analyze water supply impacts.

3. SEWER

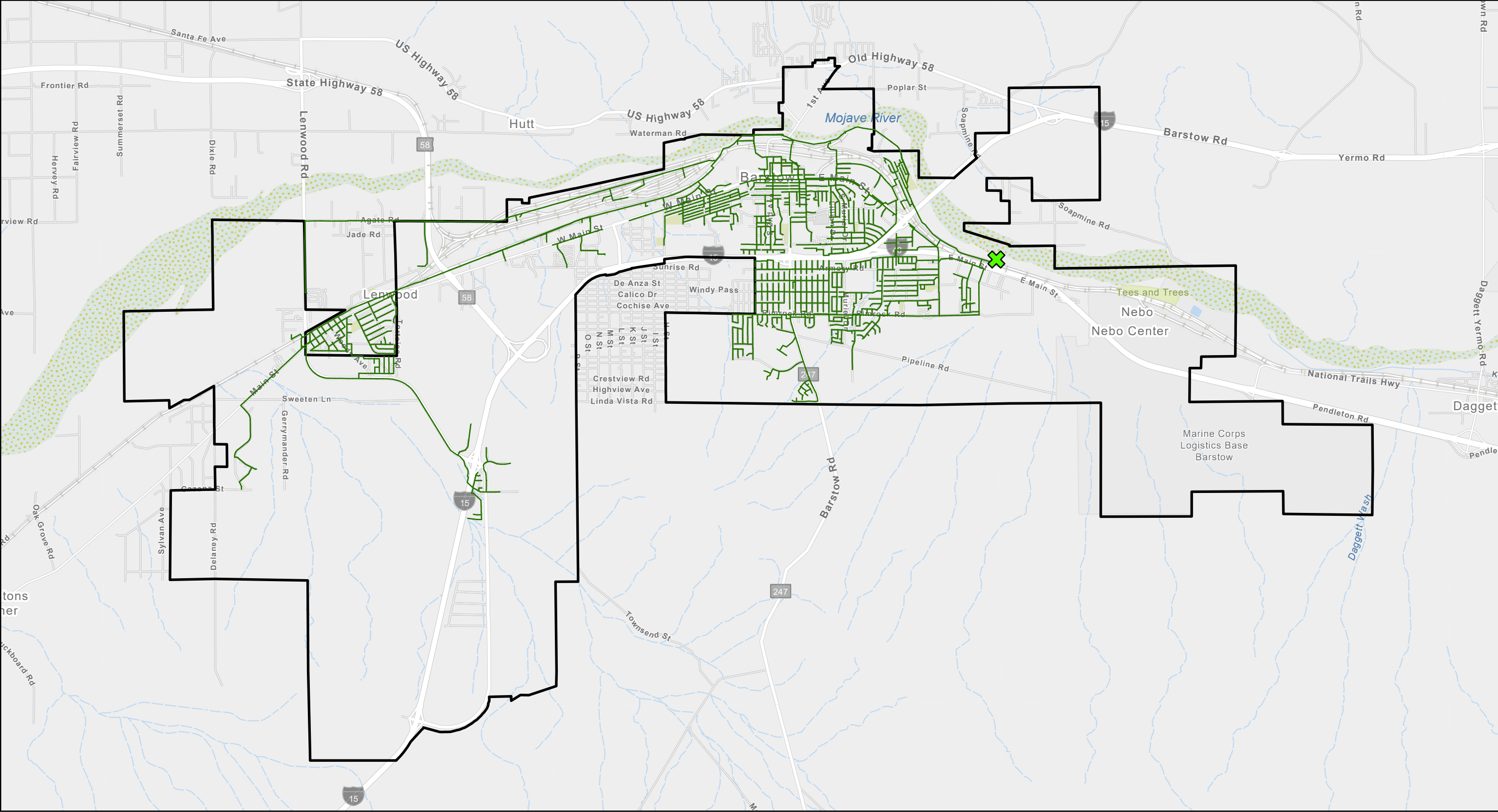
3.1 SEWER SYSTEM ENVIRONMENTAL SETTING & INFRASTRUCTURE

The City's sewer system consists of approximately 113 miles of gravity sewer lines, owned and maintained by the City. Sixty-four percent of wastewater generated is collected by the gravity sewer lines and transported to the Barstow Regional Wastewater Treatment Facility (WWTF), owned and operated by the City. The remaining effluent is handled by private septic systems. The majority of the sewer system serving the City is comprised of vitrified-clay pipe (VCP) ranging from 4" to 33" in diameter. However, the minimum diameter of sewer mains are typically 8", while 4" to 6" sizes are often used for lateral connections.

Additionally, while the unincorporated Lenwood community is covered by County Service Area (CSA) 70 S7 for sanitary sewer service, the City has a separate agreement with San Bernardino County whereby the City is responsible for inspecting and maintain sanitary sewer service and the County is responsible for DigAlert service for properties within Lenwood.

The locations of the existing sewer system facilities are depicted in Figure 4.

The Barstow Regional WWTF provides primary and secondary treatment but not the tertiary treatment of effluent required to meet recycled water standards set forth in Title 22 of the California Code of Regulations. Wastewater is currently disposed of in percolation ponds after treatment.



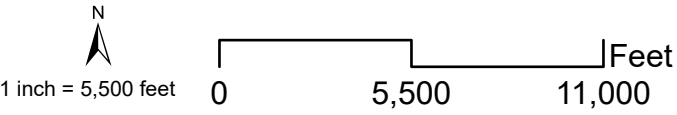
City of Barstow Existing Sewer System Facilities



- Sewer Mainline
- City Boundary
- Barstow Wastewater Treatment Facility

Figure 4

5/8/2024



3.2 EXISTING & PROPOSED SEWER FLOWS

The City is currently undergoing an update to the Citywide Sewer Master Plan (SMP) in tandem with the City's GPU. The SMP is being prepared by the City's consultant, Carollo Engineers, Inc. (Carollo). The SMP's purpose is to evaluate the capacity of the City's wastewater collection system and treatment plant to provide sanitary services throughout the year 2048 and develop capital improvement programs to address existing and future system needs. As part of this effort, Carollo developed flow projections consistent with the City's GPU proposed land uses, which considered growth under the 2048 and ultimate buildout planning horizons. Average and maximum daily dry weather flow projections for existing conditions, 2048 and buildout planning horizons are provided below in Table 12.

Table 12 Existing and Proposed Sewer Demands

Planning Horizon	ADWF (mgd)	MDDWF* (mgd)
Existing	2.25	2.65
2048	5.02	5.93
ADWF: Average Dry Weather Flow MDDWF: Maximum Daily Dry Weather Flow *The MDDWFs were estimated using a MDDWF to ADWF peaking factor of 1.18. Source: Carollo Engineering Inc. Citywide Wastewater and Sewage Facilities Master Plan Project Memorandum. April 2025.		

Table 12 shows the existing average and maximum (dry weather) daily sewer demand to be 2.25 mgd and 2.65 mgd respectively. The 2048 average and maximum daily sewer demand are projected to be 5.02 mgd and 5.93 mgd respectively. The 2048 buildout sewer flow projections were calculated by developing sewer demand factors per land use based on flow monitoring data gathered throughout the City.

3.3 SEWER CAPACITY ASSESSMENT

In addition to determining various sewer flows for different planning horizons, the SMP update is also intended to evaluate the capacity and condition of the City's sewer system. This portion of the SMP is currently on-going, however, the existing conditions analysis has been completed, and no significant deficiencies have been identified in the existing system¹³. Carollo has taken the GPU data and mapped out which parcels that are projected to be developed by 2048 and identified future connections to the City's sewer system, which includes as assumption that the BIG Specific Plan will be connected concurrently with its opening in 2028. This information is used to create the hydraulic model for the SMP. The hydraulic model will incorporate the

¹³ Email coordination and phone call conversations with Carollo Engineers, Inc. on September 1, 2023.

proposed land uses and sewer flows that are described in the City's GPU and presented in Table 12.

Although Carollo has not completed their hydraulic modeling, a preliminary assessment of the treatment capacity of the Barstow Regional WWTF has been completed. The preliminary assessment has determined that there is not sufficient capacity to treat the 2048 projected sewer flows¹⁴. The Barstow Regional WWTF has a design capacity of 7.65 mgd, however, it was determined that the clarifiers, a key part of wastewater treatment plants, do not have sufficient capacity to treat projected sewer flows.

General Plan Policy PFS-1.5 establishes that the City will "Monitor, maintain, and make sewer system improvements as necessary to ensure safe, reliable, and cost-effective wastewater collection and treatment facilities." The City maintains and periodically updates its sewer master plan to identify necessary improvements to accommodate projected growth. Additionally, the City applies conditions of approval, enters into development agreements, and applies development impact fees to ensure that proposed development will pay for and establish required sewer improvements, both for individual site and (in a proportional manner) the overall system.

3.4 PROPOSED CONDITION AND CEQA THRESHOLD ANALYSIS

The following questions regarding Utilities and Service Systems are identified in the CEQA Checklist related to sewer.

Would the Project:

- A. Require or result in the relocation or construction of new or enhanced water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?
- B. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

Should the answers to these environmental factors prove to be a potentially significant impact, mitigation measures would be required to reduce those impacts to a less-than-significant threshold.

Impact A: Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric

¹⁴ Email coordination with Carollo Engineers, Inc. on July 24, 2024.

power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

Impact Analysis: Implementation of the Barstow GPU will require construction of new sewer infrastructure on-site and off-site in areas of the City that are undeveloped under the current conditions. All new development is intended to ultimately be connected to the City's sewer system, and the City's SMP will identify the backbone alignment and sizing to accommodate the future growth. Some portions of the City will not be connected until full buildout occurs. Off-site infrastructure includes installation of new sewer lines with the anticipation that the majority of off-site improvements would occur within the proposed roadway network. On-site infrastructure will include new 8-inch or larger sewer lines for most projects within the City with larger trunk lines in the public right of way leading to the treatment plant.

The construction of the on-site and off-site sewer infrastructure and associated improvements will primarily include trenching for installation of the pipelines, along with temporary bypass systems at connections to the existing sewer mains. All construction will be performed in accordance with the Construction General Permit and all associated requirements. Any work that may include connections of new services to the existing sewer lines will be coordinated with the City.

Furthermore, a Construction Management Plan or equivalent, which would ensure safe pedestrian access as well as emergency vehicle access and safe vehicle travel in general, will be implemented to reduce any temporary pedestrian and emergency and other traffic impacts occurring as a result of construction activities. Moreover, when considering impacts resulting from the installation of any required wastewater infrastructure, all impacts are of a relatively short-term duration and would cease to occur once the installation is complete. Therefore, impacts on wastewater associated with construction activities would be less than significant.

Once the improvements are complete, no additional environmental impacts are anticipated for the operational and on-going aspects of the sewer system.

Impact B: Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

Impact Analysis: The existing daily maximum wastewater flow within the system is approximately 2.65 mgd. The 2048 daily maximum

projected sewer flows are projected to be 5.93 mgd which will increase the amount of treatment required at the Barstow Regional WWTF by 3.28 mgd. The Barstow Regional WWTF has a maximum design capacity of 7.65 mgd. Although the WWTF appears to have sufficient capacity to process the projected 2048 wastewater flows based on design capacity, it has been determined through Carollo's preliminary analysis for the SMP update that the clarifiers within the City's treatment plant do not have the ability to adequately handle the projected daily maximum flows for the 2048 planning horizon. Therefore, the development anticipated under the Barstow GPU would exceed the available wastewater treatment capacity of the Barstow Regional WWTF. As part of the SMP, improvements will be identified on strategies to modify the clarifiers to meet the projected treatment flow rates. According to the City, if additional wastewater treatment facilities need to be constructed (beyond improvements in the clarifiers), there is more than adequate space on the existing WWTF property to accommodate new facilities and no new land would need to be acquired or impacted.

4. STORM DRAINAGE AND WATER QUALITY

4.1 STORM DRAINAGE ENVIRONMENTAL SETTING & INFRASTRUCTURE

4.1.1 DRAINAGE FACILITIES

The City partners with San Bernardino County Flood Control District (SBCFCD) to maintain the local storm drain systems. The storm drain systems are comprised of catch basins, debris basins, and storm drain lines that convey stormwater runoff within roadways and underground. The City's GPU area also contains numerous channels that convey the collected water to the Mojave River. There is also a designated spreading ground location within the City that is utilized as a water conservation facility by retaining surface water long enough to allow it to percolate into the soil. The City and SBCFCD monitor and maintain the drainage infrastructure to ensure the systems function effectively. Figure 5 shows the existing drainage infrastructure within the City's GPU area.

The County has a Master Storm Water System Maintenance Plan¹⁵ (Maintenance Plan) that serves as a comprehensive guide to the maintenance of the County's existing drainage facilities. The Maintenance Plan includes a complete description of maintains activities, standard operating procedures (SOPs), the frequency with which activities are conducted, seasonal restrictions, and methods for environmental compliance and reporting. The GPU area resides within Zone 4 (Desert Region) of the County's jurisdiction. The Maintenance Plan does not include the construction of new drainage facilities. The County must obtain environmental clearance, including CEQA review and obtain relevant resource permits, for the construction of any new drainage facilities. It is also assumed that the long-term maintenance of new facilities will be incorporated into the Maintenance Plan, with any SOPs, mitigation measures, and/or permit conditions for those facilities incorporated into the Maintenance Plan and the applicable appendices of the Maintenance Plan updated. As a result, the Maintenance Plan would serve as the County's current comprehensive guide detailing all maintenance activities, SOPs, mitigation measures, and/or permit conditions.

The City utilizes the City's Master Plan of Drainage and the San Bernardino County's (County's) Hydrology Manual¹⁶ to ensure all development within the City does not adversely impact the current hydrologic conditions within the City. The County's Public Works Department Water Resources Division includes a Hydrology Section that collects a variety of climatology data from around the County. Precipitation, stream flow, and temperature comprise most of the available data, though not all of it is accessible online. This data is stored in a specialized database and is used in flood control storm warnings, structure and

¹⁵ San Bernardino County Master Storm Water System Maintenance Plan. January 2019. Found here: <https://www.sbcounty.gov/uploads/DPW/cmsdocuments/Appendix-A-n.pdf>

¹⁶ San Bernardino County Hydrology Manual. April 1986. Found here: <https://www.sbcounty.gov/uploads/DPW/docs/HydrologyManual.pdf>

channel design, runoff calculations, environmental studies, and as supporting evidence in claims and litigations.

The County's Hydrology Manual was developed in 1983 and revised in 1986. The best available data at the time was the National Oceanic and Atmospheric Administration (NOAA) Atlas II rainfall records and statistics published in 1973; it was the basis of the manual. The County participated with NOAA by providing a portion of the funding to study an additional 30 years of rainfall records. NOAA Atlas XIV was published in 2004 and revised in 2006. After reviewing the updated rainfall data, the County's Hydrology Manual was re-evaluated to determine if any changes or revisions were justified. This exercise found that the arid desert regions were affected. From these changes, the County completed an Addendum¹⁷ to the Hydrology Manual in April 2010 that addresses the Antecedent Moisture Condition (AMC) for arid regions of the County. These areas have been evaluated and have been determined to utilize AMC-1 for hydrologic analyses. AMC-1 denotes areas of lower antecedent moisture and is associated with reduced runoff potential. Figure ADD-1 AMC¹⁸ within the Addendum shows where in the County this information has been updated and it includes the entire City's GPU area.

A Draft Hydrology Report is currently being prepared for the BNSF BIG project. The report mentions that the surface water within the BIG footprint, generally flows in a south to north direction toward the Mojave River. The Mojave River lies north of but is outside the BIG footprint. The report states that the water features in BIG are potentially jurisdictional to the U.S. Army Corps of Engineers (Corps), Regional Water Quality Control Board (RWQCB), and California Department of Fish and Wildlife (CDFW).

The Draft Hydrology Report states that BIG footprint supports approximately 142.36 acres (301,452 linear feet) of potential non-wetland waters of the U.S./State jurisdictional by the Corps and RWQCB, respectively, and approximately 594.42 acres of vegetated streambed, 55.13 acres of unvegetated streambed (301,452 linear feet of vegetated and unvegetated streambed combined), and 74.47 acres of watercourse jurisdictional by the CDFW. The report states that no Section 10 navigable waters of the U.S. were identified within the BIG footprint.

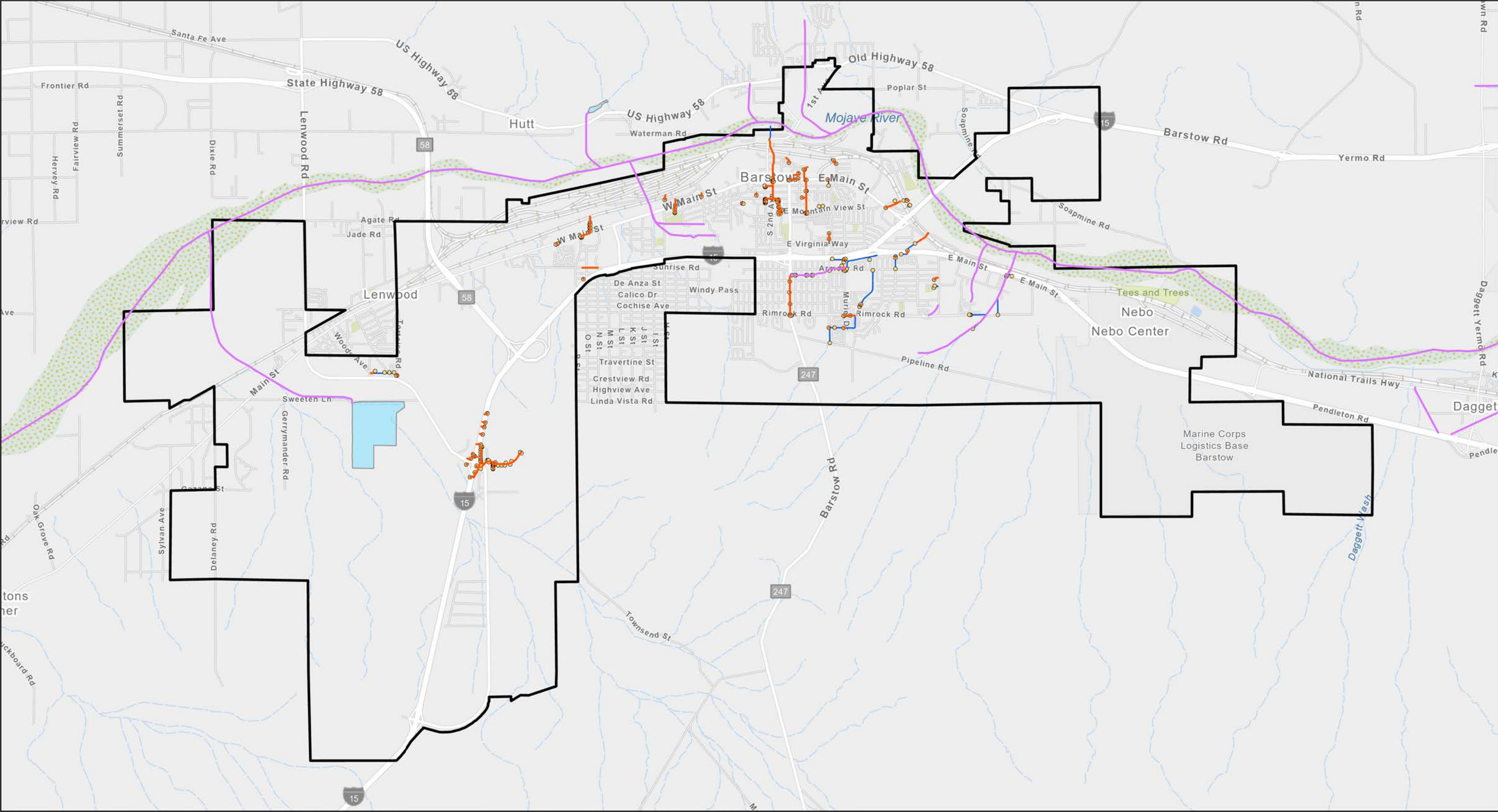
The Draft Hydrology Report states that the Mojave River lies north of BIG and transects the surface water study area from the west to the east. The Mojave River headwaters originate on the San Bernardino Mountains' northern slope, then continues via surface and subsurface flows through the Mojave Desert. The ultimate discharge point of the Mojave River is Soda Lake near Baker.

¹⁷ San Bernardino County Hydrology Manual Addendum for Arid Regions. April 2010. Found here: https://www.sbcounty.gov/uploads/DPW/docs/20100412_addendum.pdf

¹⁸ San Bernardino County Hydrology Manual Addendum for Arid Regions. Figure ADD-1 Antecedent Moisture Condition. April 2010. Found here: https://www.sbcounty.gov/uploads/DPW/docs/20100412_map.pdf

BIG would include the development of approximately 4,354 acres of land. The existing drainage pattern for the BIG footprint and the general area is characterized by sheet flow, shallow concentrated flow, and open channel flow. Under existing conditions, the BIG footprint naturally drains from the southeast to the northwest towards the Mojave River, which is located on the north side of the BIG footprint.

According to the Draft Hydrology Report, there are two flood control facilities near BIG: the Lenwood Spreading Grounds to the south and the Waterman Road Basin to the northeast. However, drainage from BIG would not be conveyed to these facilities, but to onsite detention basins located on the western boundary and adjacent to the transload warehouse center and onsite detention basins located on the solar farm site. Overflows from these basins would be directed toward Lenwood Channel, to be improved by BIG, and the Mojave River. With the installation of these onsite detention basins, all stormwater and surface flows (including operational runoff [e.g., washdown, maintenance, etc.]) up to the 100-year storm events would be captured on site and allowed to infiltrate into the ground, allowing it to recharge groundwater flows, or be inflow into the Mojave River. While BIG operations would consist of a large number of impervious surfaces, such as roadways, concrete, buildings, etc., these onsite stormwater basins would collect all stormwater runoff and runoff from operations (e.g., washdown, maintenance, etc.) within the BIG footprint and allow any rainwater/runoff to percolate and infiltrate into the ground. As previously stated, once the water has percolated into the ground, it would generally flow underground toward the Mojave River. Additionally, the solar farm portion of BIG would generally remain as pervious soils and would allow for percolation during sheet flow and shallow concentrated flow toward the onsite detention basins that would then allow runoff to percolated into the groundwater reservoirs.



City of Barstow and SBCFCD Existing Storm Drain Facilities

Figure 5

Barstow, CA



 City Boundary

 City Storm Drain Inlet

 City Storm Drain Main

 City Storm Drain Channel

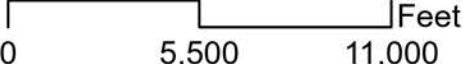
 SBCFCD Drainage Facilities

 SBCFCD Spreading Grounds



N

1 inch = 5,500 feet



0 5,500 11,000 Feet

4.1.2 DRAINAGE CAPITAL IMPROVEMENT PLANS

Table 13 includes a list of drainage system CIP projects that are proposed within the GPU area to improve the overall drainage infrastructure. These projects are completed in partnership between the City and the County. The City manages project design and construction and then receives partial reimbursement from the County for project costs. The County then takes over operation and maintenance of the system.

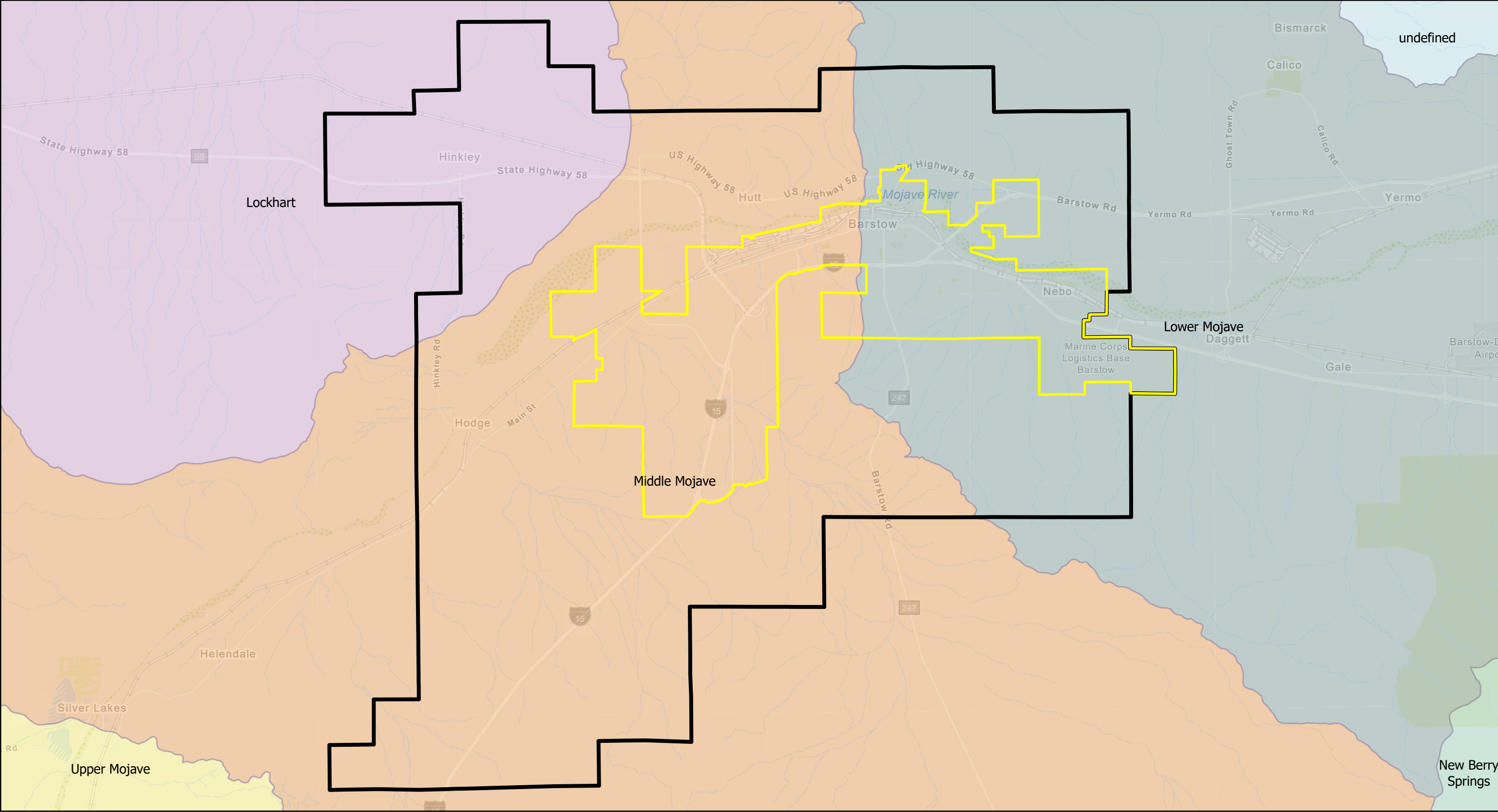
Table 13 Drainage System Capital Improvement Plans

Project Name	Status	Project Summary
Laverne Drainage Improvements	Phase I: Constructed	Phase I: Drainage improvements including catch basins and an improved drainage system on Laverne Ave, south of Main Street and continuing north along Laverne Court
	Phase II: Pending Construction	Phase II: Design and construction of a sedimentation/desiltation based at the south end of Laverne Avenue along with drainage improvements within the street (curb/gutter and AC pavement).

4.1.3 WATERSHED SETTING

The City resides within the two different watersheds, Lower Mojave and Middle Mojave. Both watersheds are within the Mojave Hydrologic Unit. Approximately fifty percent of the City is within both watersheds. Each watershed is comprised of a number of channels that ultimately delivers stormwater to the portion of the Mojave River that runs throughout the City. The Mojave River itself is considered a subterranean stream, which means that it can be characterized as a body of groundwater flowing through known and definite channels. The Mojave River does not have any listed impairments.

See Figure 6 below for a map of the watersheds within and surrounding the City.



City of Barstow Watersheds

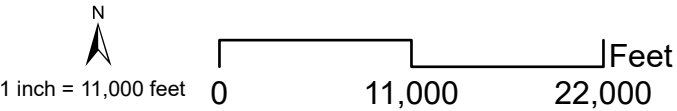
Barstow, CA



- City Boundary
- City's Sphere of Influence Boundary

Figure 6

5/8/2024



4.2 FLOOD PLAIN MAPPING

The National Flood Insurance Act (1968) established the National Flood Insurance Program, which is based on the minimal requirements for flood plain management and is designed to identify and minimize the potential for flood damage within Special Flood Hazard Areas (SFHA's). The Federal Emergency Management Agency (FEMA) is the agency that administrates the National Flood Insurance Program. Special Flood Hazard Areas (SFHA) are defined as areas where the base flood has a 1-percent chance of being equaled or exceeded in any given year. The base flood is also referred to as the 100-year flood. Additionally, SFHA's may include areas where depths of flooding greater than 1 foot may be anticipated to occur. Flood Insurance Rate Maps (FIRMs) were developed to identify areas of flood hazards within a community. Various flood hazard zones have been developed. According to the Flood Zone determination, the entire City is designated as Zone X (Shaded & Unshaded), which denotes areas that are not within the SFHA, as defined by FEMA. Other FEMA defined zones include Zone D, Zone A, Zone AE, and Zone AO. Table 14 describes each FEMA flood zone designation.

Additionally, California's Department of Water Resources (DWR) has also identified 100-year floodplains throughout California. This data is referenced as DWR Awareness and is published on DWR's Best Available Map (BAM)¹⁹ that utilizes the best information currently available.

Any development within these areas will be required to follow FEMA and the City's floodplain safety requirements including flood analysis, proper setbacks, and sufficient pad elevations.

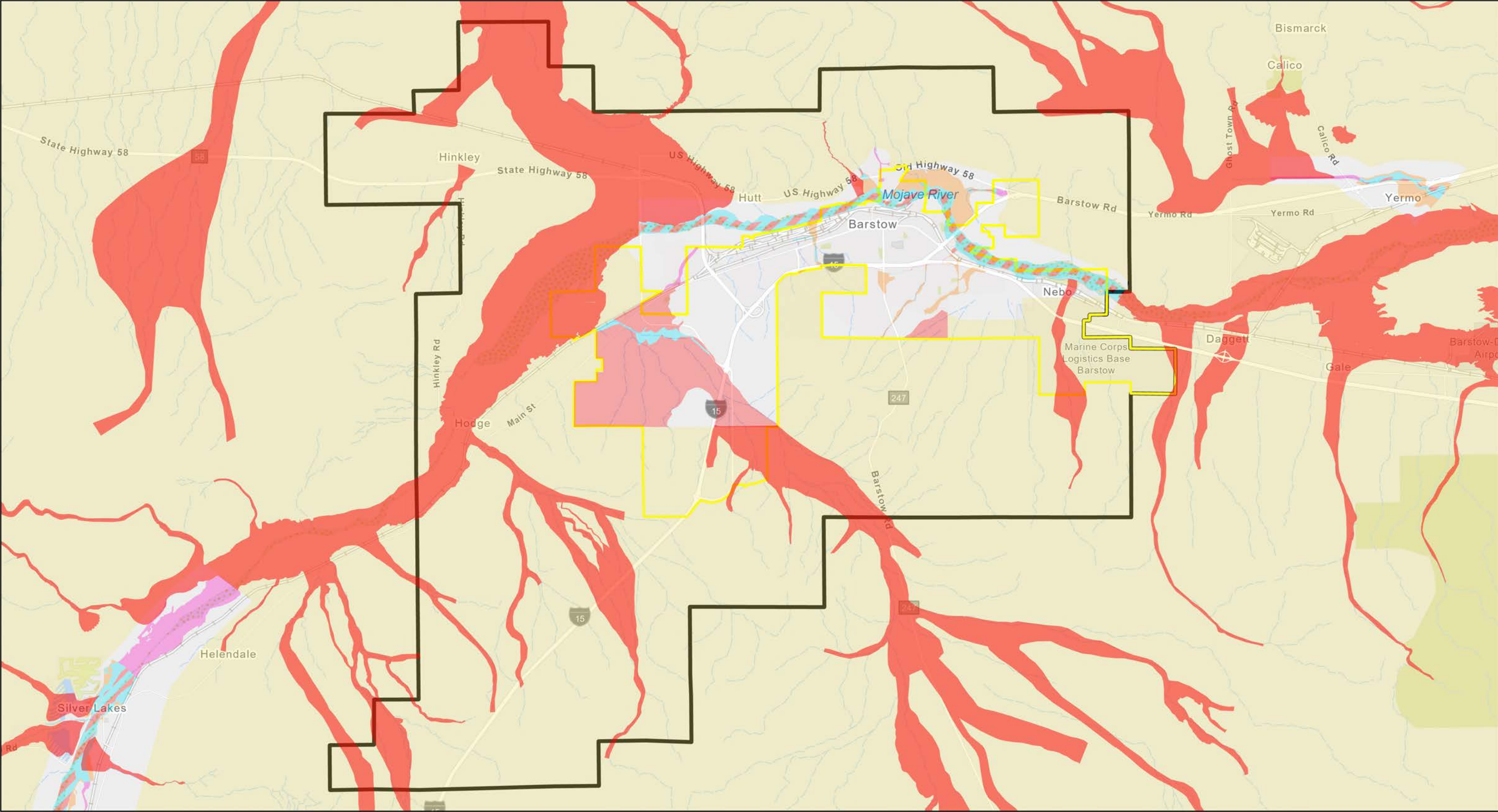
See Figure 7 below for a map of the FEMA flood zones and DWR Awareness 100-year floodplain areas within the City's GPU²⁰.

¹⁹ California Department of Water Resources. Best Available Map. Accessed June 2024. Found here: <https://gis.bam.water.ca.gov/bam/>

²⁰ FEMA, Flood Map Service Center. Accessed July 2023. Found here: <https://msc.fema.gov/portal/search?AddressQuery=Lomita%2C%20CA>

Table 14 FEMA Flood Zone Designations

Zone Designation	Zone	Zone Description
Special Flood Hazard Area – With Base Flow Elevation or Depth	Zone A	Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.
	Zone AE	The base floodplain where base flood elevations are provided.
	Zone AO	River or stream flood hazard areas, and areas with a 1% of greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones.
Other Areas of Flood Hazard	Zone X	<u>Shaded</u> : Area of 500-year flood; area subject to the 100-year flood with average depths of less than 1 foot or with contributing drainage area less than one square mile; and areas protected by levees from the base flood. <u>Unshaded</u> : Area determined to be outside the 500-year floodplain
	Zone D	Areas with possible but undetermined flood hazards. No flood hazard analysis has been conducted. Flood insurance rates are commensurate with the uncertainty of the flood risk.
Source: FEMA, Glossary. Found here: https://www.fema.gov/about/glossary .		



City of Barstow Flood Zones

Barstow, CA



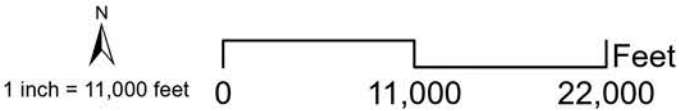
- City Boundary
- City's Sphere of Influence Boundary
- DWR Awareness 100-Year Floodplain

Flood Hazard Zones

- Zone AE: Regulatory Floodway
- Zone X: 0.2% Annual Chance Flood Hazard
- Zone D: Area of Undetermined Flood Hazard
- Zone AE: 1% Annual Chance Flood Hazard with Base Flood Elevations Determined
- Zone A: 1% Annual Chance Flood Hazard
- Zone AO: 1% Annual Chance Flood Hazard with flood depths of 1' - 3'

Figure 7

6/11/2024



4.3 FLOOD PLAIN REQUIREMENTS FOR PROPOSED DEVELOPMENTS

Portions of the City and SOI are within Special Flood Hazard Areas (SFHA's), as defined by FEMA. Construction activities within SFHA's require coordination with FEMA and the local Floodplain Administrator (City of Barstow). The following are the requirements for new development within SFHA's.

For construction within the FEMA SFHA floodplain, grading operations would raise the finish floor elevation (FFE) of all construction structure to above the FEMA floodplain elevations, and a Conditional Letter of Map Revision (CLOMR) and Letter of Map Revision (LOMR) action would be required. This would cause a revision to the FEMA FIRMs and would demonstrate that the risk of flooding and inundation at the affected areas of the project footprint would be minimized by implementing specific construction elements (i.e. raising FFE's, floodproofing). A CLOMR is required prior to the issuance of grading permits for specific developments within the floodplain that would alter the floodplain, while a LOMR is required prior to the issuance of certificates of occupancy to verify the alterations to the floodplain.

The following list includes provisions for flood hazard reduction including standards of construction; standards for utilities; standards for subdivisions and other proposed development; standards for manufactured homes and recreational vehicles; and for floodways.

(1) Until a regulatory floodway is adopted, no new construction, substantial development, or other development (including fill) shall be permitted within Zones A1-30 and AE, unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other development, will not increase the water surface elevation of the base flood more than one foot at any point within the City.

(2) Within an adopted regulatory floodway, the City shall prohibit encroachments, including fill, new construction, substantial improvements, and other development, unless certification by a registered civil engineer is provided demonstrating that the proposed encroachment shall not result in any increase in flood levels during the occurrence of the base flood discharge.

(3) If subsections (1) and (2) above of this section are satisfied, all new construction, substantial improvement and other proposed new development shall comply with all other applicable flood hazard reduction provisions of this section.

(4) Prohibit the placement of any manufactured home, temporary or permanent, within a SFHA.

Table 15 below presents a summary of the GPU's proposed buildout located within FEMA Flood Zone AO (Areas with a 1% of greater chance of shallow flooding each year with an average depth ranging from 1-3 feet).

Table 15 Development Within FEMA Zone AO

Land Use	Area (Acres)
Business Park	2,918
Diverse Use	258
General Commercial	382
General Industrial	296
High Density- Residential	28
Medium Density Residential	167
Single Family Residential	3
Public/Quasi-Public	202
Right-of-Way	2
TOTAL	4,257

4.4 WATER QUALITY REGULATIONS

The Barstow GPU area discharges into one major receiving water body, the Mojave River. The Mojave River does not have any listed 303(d) pollutant impairments and therefore does not have a Total Maximum Daily Load (TMDL) requirement.

The City's Municipal Separate Storm Sewer System (MS4) is classified as a traditional small MS4 system and is regulated by the California State Water Resources Control Board (State Board) Phase II Small MS4 Permit (Order No. WQ-2013-0001; NPDES Permit No. CAS000004). The current State Board's Phase II Small MS4 Permit became effective on February 5, 2013, and is designed to provide permit coverage for smaller municipalities as well as non-traditional Small MS4s, which includes facilities such as military bases, public campuses, prison and hospital complexes. This permit covers Phase II permittees statewide. This permit contains information regarding effluent limitations, receiving water limitations (RWLs), minimum control measures (MCMs), and TMDL provisions (if applicable). Future projects that meet certain thresholds within the GPU area must follow development requirements of

Phase II Small MS4 Permit which includes incorporating Low Impact Development (LID) Best Management Practices (BMP) into individual projects to further help protect water quality in receiving waters. Future development will also be required to implement hydromodification management practices if susceptible to hydrologic conditions of concern as required by the Phase II Small MS4 Permit. The City's website provides resources for project applicants to help them navigate water quality protection practices such as erosion control measures during the construction phase, Water Quality Management Plan (WQMP) templates that describe project specific LID BMPs and hydromodification requirements, templates for non-structural and structural BMPs, operation and maintenance instructions and recording instructions²¹.

As a requirement of the State Board's Phase II Small MS4 Permit, the City maintains a Stormwater Management Plan and submits a Program Effectiveness Assessment and Improvement Plan (PEAIP) each year to the State Board that tracks annual and long-term effectiveness of the storm water program. The PEAIP assists the City to maintain compliance with the Phase II Small MS4 Permit and to adaptively manage the City's storm water program by making necessary modifications to the program to improve program effectiveness at reducing pollutants of concern and protecting water quality.

4.4.1 GROUNDWATER CONDITIONS

The GPU area lies within the Lower Mojave River Valley Groundwater Basin (Basin 6-40), the Middle Mojave River Valley Groundwater Basin (Basin 6-41) and the Harber Valley Groundwater Basin (Basin 6-47). These groundwater basins are part of the greater Mojave region and are three of thirty-six groundwater basins within this region. Groundwater basins located along the Mojave River are referred to collectively as the Mojave River Groundwater Basin and the area is commonly referred to as the Mojave Basin Area. The Lower Mojave River Vally Groundwater Basin is approximately 286,000 acres (447 square miles). The Middle Mojave River Valley Groundwater Basin is approximately 211,000 acres (329 square miles). The Harper Valley Groundwater Basin is approximately 410,000 acres (641 square miles). All three groundwater basins are located entirely within San Bernardino County.

The Mojave Water Agency manages and monitors all basins within the Mojave River Groundwater Basin.

²¹ City of Barstow Community Services Department – Engineering Services Division. Found here: <https://www.barstowca.org/departments/community-services-department/engineering-services-division>

Figure 8 displays the groundwater basins located within the City GPU area.

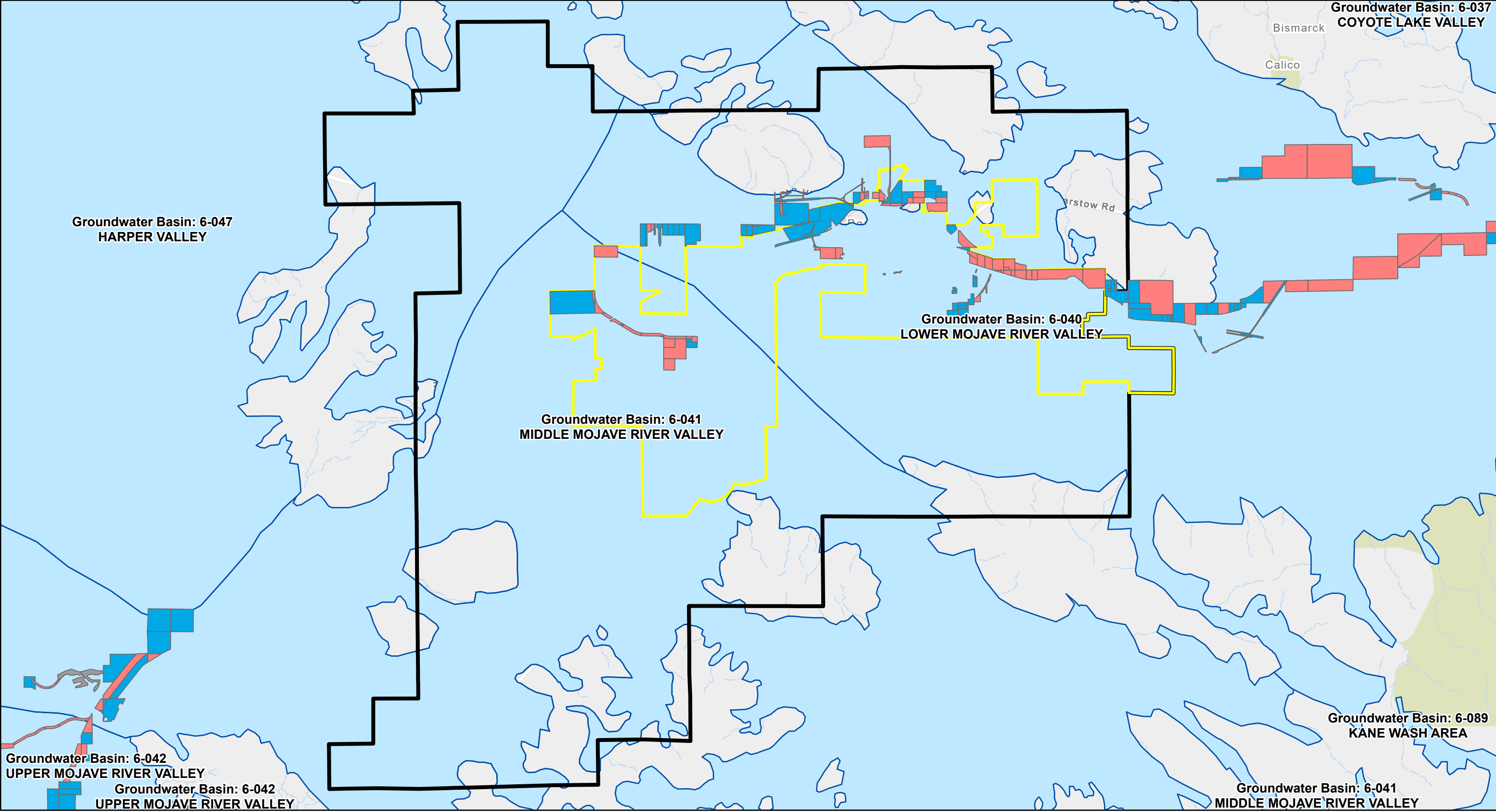
Groundwater is recharged into the basins predominantly by infiltration of water from the Mojave River. Other sources of recharge include infiltration of storm runoff from the mountain, desert washes, and other activities such as irrigation return flows, infiltration from spreading grounds, wastewater discharge, and enhanced recharge with imported water.

In 2017, the County completed a Countywide Plan²² that analyzed water, wastewater, and hydrology. Within this plan, there was a large focus on groundwater recharge possibilities. The plan identified numerous parcels within the County that are vital for groundwater recharge. Figure 8 includes the parcels noted within the Countywide Plan that are within or near the GPU area. The figure also identifies whether these parcels are under private or public ownership. These parcels will be analyzed individually upon trigger of a WQMP and follow the LID hierarchy where infiltration is the top priority.

Sustainable Groundwater Management Act

The California Sustainable Groundwater Management Act ("SGMA"), a three-bill package signed into law in 2014, creates a framework for the management of groundwater sources throughout the state. Under SGMA, local agencies form Groundwater Sustainability Agencies ("GSAs") and create Groundwater Sustainability Plans (GSPs) for basins designated as high and medium priority. Other than annual reporting, SGMA does not apply to existing adjudicated areas, such as the Lower Mojave River Valley Groundwater Basin, because they have existing court-mandated governance, oversight, and management in place. Furthermore, local agencies, in low- or very-low-priority basins, like the Lower Mojave River Valley Groundwater Basin, Middle Mojave River Valley Groundwater Basin, and Harper Valley Groundwater Basin are not required to form GSAs and develop GSPs but may do so voluntarily.

²² County of San Bernardino. San Bernardino Countywide Plan for Water, Wastewater and Hydrology Existing Conditions. Prepared by Dudek and Placeworks. May 2017.



City of Barstow GPU Groundwater Basins



- City Boundary
- City's Sphere of Influence Boundary
- Groundwater Basins

- Potential Groundwater Recharge Parcel Ownership
- Public
 - Private
 - Other

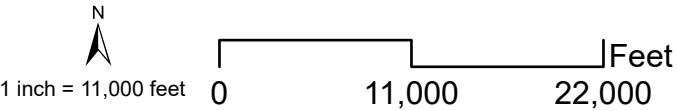


Figure 8

5/8/2024

4.5 PROPOSED STORMWATER CONDITION AND CEQA THRESHOLD ANALYSIS

California Environmental Quality Act (CEQA) significance criteria are used to evaluate the degree of impact caused by a development project on environmental resources such as hydrology and water quality. According to Appendix G of the CEQA Guidelines²³, a project would normally have a significant effect on the environment if the project would impact any of the items listed below.

Would the Project:

- A. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?
- B. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.
- C. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:
 - (i) Result in a substantial erosion or siltation on- or off-site;
 - (ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;
 - (iii) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or
 - (iv) Impede or redirect flood flows?
- D. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?
- E. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Should the answers to these environmental factors prove to be a potentially significant impact, mitigation measures would be required to reduce those impacts to a less-than-significant threshold.

²³ California Natural Resources Agency, CEQA appendix G. Found here:
<https://resources.ca.gov/CNRALegacyFiles/ceqa/docs/ab52/final-approved-appendix-G.pdf>

Impact A: Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?

Impact Analysis: Construction activities within the GPU area could potentially result in soil erosion and temporary adverse impacts to surface water quality from construction materials and wastes if left unregulated or unmitigated.

Implementation of State and Local regulations will effectively mitigate construction storm water runoff impacts from the proposed land use changes that take place during construction. Standard erosion control practices shall be implemented for all construction within the City. Additionally, construction sites over one acre will be required to prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) in accordance with the requirements of the Statewide Construction General Permit and subject to the oversight of the California State Water Quality Control Board. The SWPPP must include BMPs to reduce or eliminate erosion and sedimentation from soil disturbing activities, as well as proper materials and waste management. Implementation of these State and Local requirements would effectively prohibit projects from violating any water quality standards or waste discharge requirements resulting from construction activities.

In terms of post-construction related impacts, the incorporation of site design, LID BMPs, and hydromodification management controls as required under the State's Phase II Small MS4 Permit implemented by the City of Barstow are designed to protect surface waters and groundwater. The development of un-developed sites will result in improvement to water quality runoff based on the implementation of water quality BMPs that do not exist under current conditions.

The individual development and redevelopment projects within the GPU will effectively retain or treat the 85th percentile 24-hour stormwater runoff for pollutants such as bacteria, metals, nutrients, oil & grease, organics, pesticides, sediment, trash, and oxygen demanding substances prior to discharge off their property. As properties within the City undergo redevelopment, existing properties that do not have water quality BMPs will be replaced with projects incorporating LID BMPs. Therefore, long-term surface water quality of runoff from the GPU areas would be expected to improve over existing conditions as more LID BMPs are installed and implemented. This is considered an overall benefit of the proposed land use changes associated with implementation of the GPU. Impacts to surface water and groundwater quality will be less than significant.

Impact B: Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.

Impact Analysis:

During construction, the proposed development would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality through the use of best management practices and low impact development practices identified within a project's specific water quality management plan. Additionally, all development and construction documents would be required to be reviewed by the appropriate plan check agencies to ensure compliance and conformance with the City, County, and State standards and regulations governing water quality.

It is the intent for all proposed development projects to route stormwater runoff to existing spreading grounds or proposed retention basin that would allow up to 100-year storm events to infiltrate into the soils and providing groundwater recharge. Additionally, it is not anticipated that any development projects would rely on project specific or local water wells for water supply. All water will be managed and delivered via GSWC. Therefore, the impacts are expected to be less than significant.

Impact C: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

- (i) Result in a substantial erosion or siltation on- or off-site;
- (ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;
- (iii) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or
- (iv) Impede or redirect flood flows?

Impact Analysis:

Proposed development would be required to comply with and acquire a General Construction Stormwater Permit that provides measures to reduce erosion and siltation as a result of surface water runoff during construction.

The proposed development would alter the existing drainage pattern through addition of impervious surfaces, increasing surface runoff but would not result in on- or off-site flooding since any new development would be required to be designed and constructed to accommodate the

100-year storm events, and storm flows would be directed into channels and/or on-site detention basins. Additionally, the general existing drainage pattern, including flood flows, for the proposed development would be maintained during construction and operations.

In general, the existing drainage patterns will be maintained. Mitigation will be provided as needed to ensure that the proposed development will not result in substantial erosion or siltation. Where needed, mitigation Best Management Practice (BMP) systems will be implemented to ensure that the amount of surface runoff is not substantially increased, which would result in onsite or offsite flooding.

Impact D: In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

Impact Analysis: The Project is not susceptible to inundation by a tsunami because of distance (approximately 90 miles) to the Pacific Ocean. In addition, various topographic features exist between the Project and the Pacific Ocean that would serve as physical barriers (San Gabriel Mountains, San Bernardino Mountains, etc.). There are no large, enclosed waterbodies immediately adjacent to the Project, and therefore there is no immediate risk of seiche in the City.

The BIG project, located at the northwest corner of the City, is within the inundation area of the Cedar Springs, Mojave River, and the New Lake Arrowhead dams, as identified in the Draft EIR for BIG project. Should dam failure occur, flooding of the communities of Hesperia, Victorville, Apple Valley, Barstow, and other communities adjacent to the Mojave River may occur. Future development would ensure that the FFE would be raised above the potential dam inundation areas, identified at the BIG project area.

Additionally, as previously discussed, for proposed construction within the current FEMA floodplain, grading operations would raise the FFE of all new structures to be above the FEMA floodplain and also above dam inundation areas (at BIG project). A CLOMR and LOMR action would be required for this to occur. Processing of CLOMR/LOMR would cause a revision to the FEMA FIRMs, which would demonstrate that the risk of flooding at any of the affected areas of the new development would be minimized. As such, a less than significant impact would occur, and no additional mitigation would be required, other than what would be required by FEMA.

Impact E: Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

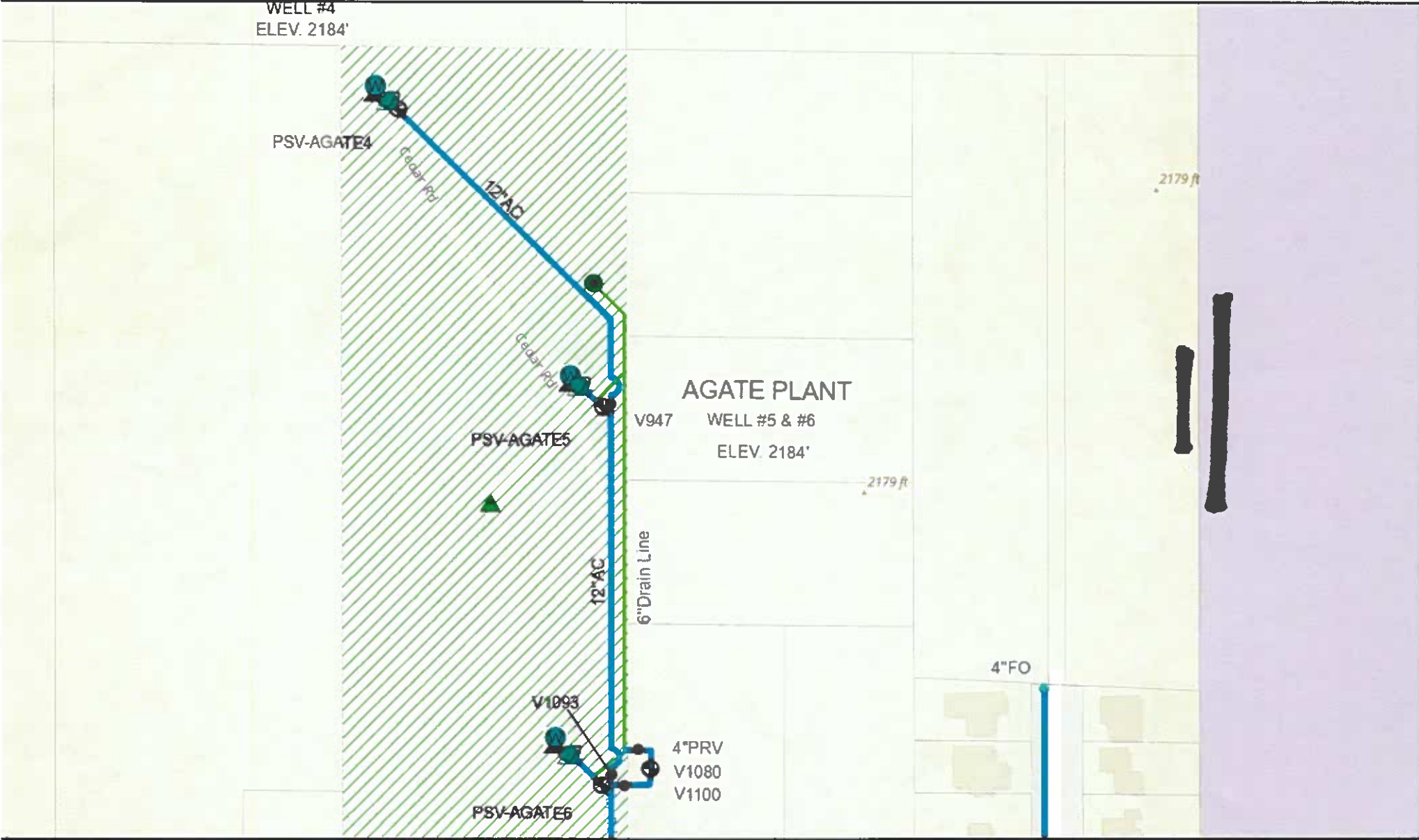
Impact Analysis: New development and redevelopment within the City of Barstow does not impact implementation of local or regional water quality control plans or sustainable groundwater management plans. All development within the City will follow the State Water Quality Control Board's Phase II Small MS4 permit. Groundwater levels are managed by various stakeholders, and development projects with infiltration will be reviewed for conformance with groundwater management goals. Impacts to water quality and groundwater management will be less than significant.

5. APPENDICES

Appendix A Water Production Well Locations

APPENDIX A

WATER PRODUCTION WELL LOCATIONS



Water Fittings

		Water System Valves	

Scale

1:2,257

0 0.01 0.03 0.06 mi

0 0.03 0.05 0.1 km

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ArcGIS Web AppB

Esri Community Maps Contributors, California State Parks, OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc., MET/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA, USFWS | Numerous county and cities contributed

ARROWHEAD PLANT

WELL #2, #3 & #4
ELEV. 2099'

6"CI
49-4987

8"AC
64-822

V215

8"C.V.

12"AC
V216

64-822
V222

V217

V220

V219

V224

V230

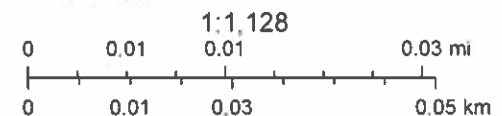
4"CI

52-5924

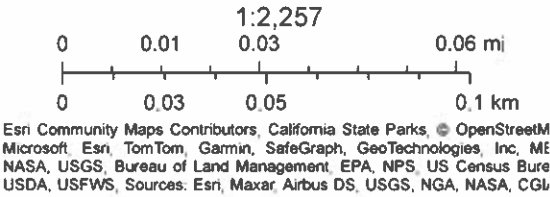
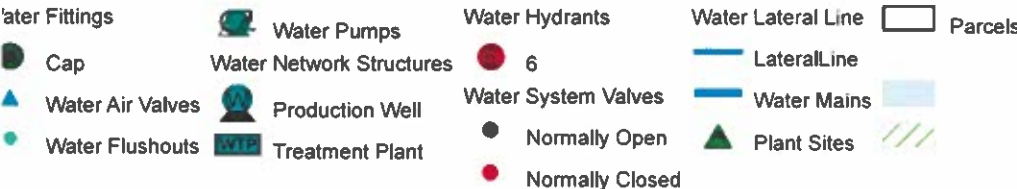
4"EO

34700304

- Water Flushouts
- Water Pumps
- Water Network Structures
- Production Well
- Water System Valves
- Normally Open
- Parcels
- Plant Sites
- Water Mains
- Leaders



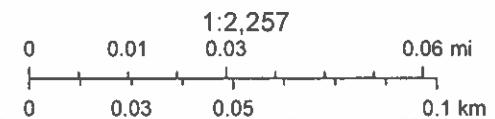
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Commercial Services

- | | | | | |
|---------------------------|------------------|---------------------|--------------------|---------|
| Domestic and Fire Service | Water Air Valves | Treatment Plant | Water Lateral Line | Parcels |
| Water Fittings | Water Pumps | Water System Valves | LateralLine | |
| Water Network Structures | Normally Open | Normally Closed | Water Mains | |
| Cap | Production Well | Plant Sites | | |

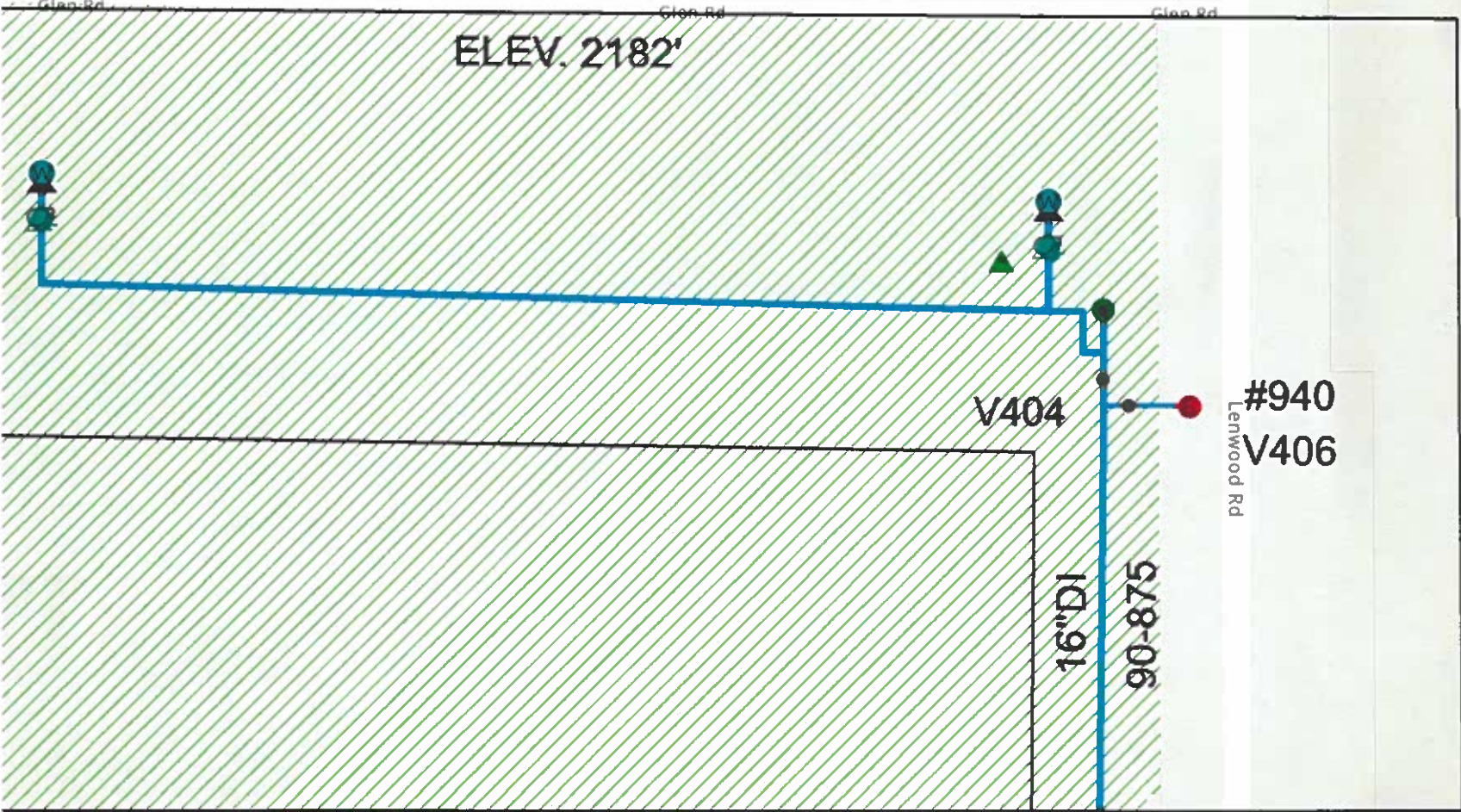


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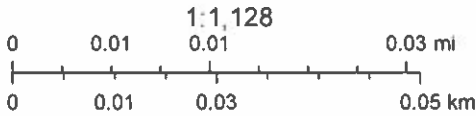
GLEN ROAD PLANT

WELL #1 & #2

ELEV. 2182'



- | | | | |
|-----------------------|---------------------------------|----------------------------|--------------------|
| Water Fittings | Water Network Structures | Water System Valves | Plant Sites |
| Cap | Production Well | Normally Open | Parcels |
| Water Pumps | Water Hydrants | Water Lateral Line | Other |
| | | Lateralline | |
| | | Water Mains | |



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