1st Draft

Water and Sewer Master Plan

Hume SoCal

Prepared for:
Hume SoCal

Prepared by:

Kimley»Horn

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Table of Contents

List of Tables

List of Figures

Appendices

Introduction

This Water and Sewer Master Plan analyzes the capacity of the Hume SoCal (Hume or "the Camp") campground water and sewer infrastructure for the proposed expansion from a capacity of 300-occupants to a capacity of approximately 3,000-occupants (Project) and outlines necessary improvements that will be needed to accommodate the future expansion. This would be accomplished through the continued use of existing campground infrastructure as well as the development of additional campground and recreational water and sewer infrastructure within a 251-acre area of the Green Valley Lake community. The Project is located directly east of Green Valley Lake Road and approximately 0.4 miles northwest of State Route 18. The Project would be developed on five parcels totaling approximately 251 acres.

Project Location

The 251-acre Project site (APN 0328-071-05, 0328-071-07, 0328-071-10, 0328-121-40, 0328-121-42) is located immediately east of Green Valley Lake Road and approximately 0.4 miles northwest of State Route 18 in Green Valley Lake, CA (Figure 1). The City is in unincorporated San Bernardino County (the County). The Project is bounded by National Forest to the north, south, west, and east.

Figure 1 Regional Location Map

Proposed Expansion

Development of the Project site would be completed in five phases (Figure 2). Each phase of the Project would include the development of expanded infrastructure, additional amenities, support structures, and buildings necessary to accommodate expanded camper capacity as well as paved parking areas and paved access roadways.

- Phase 1 of the Project would involve the development of facilities to be used as a Junior High Camp where existing and proposed facilities would accommodate up to 784 occupants.
- Phase 2 of the Project would involve the development of facilities to be used as a High School Camp where existing and proposed facilities would accommodate up to 1,000 occupants.
- Phase 3 of the Project proposes the development of an Adult Lodge where existing and proposed facilities accommodate up to 140 occupants.
- Phase 4 of the Project would include the development of an Elementary Age Camp and associated facilities where existing and proposed facilities would accommodate up to 500 occupants.
- Phase 5 of the Project proposes the creation of a tent-based youth camp, Wildwood Camp where existing and proposed facilities would accommodate up to 130 occupants.

Figure 2 Conceptual Site Plan

Land Use and Population

Existing Land Use Data

The Project site is designated as undeveloped recreational land, falling under the Hilltop/Special Development-Residential zoning category per the County's General Plan. The site covers a hilly terrain containing slopes between 15-35% per the United States Department of Agriculture (USDA) Natural Resource Conservation Service's Web Soil Survey located in Appendix A. The hydraulic soil groups of the existing soils are B and D which have moderate and slow infiltration rates. The proposed site is undeveloped land that is forested with some rocky areas.

Population and Projections

Currently, Hume has a capacity of 300 – occupants, including campers and staff. The staff is comprised of 12 full-time residents, 20 part-time employees, 35 winter seasonal employees, and 68 summer seasonal employees.

The summer and winter seasonal periods, which are each 9-weeks long, consist of alternating sessions of high school campers, middle school campers, and combined age campers. The sessions during the seasonal periods range from two to six-night stays. It is assumed that all age groups of campers have full occupancy approximately 50 days and nights, or approximately 13%, out of each year. Future number of staff members were assumed to be proportional to the increase in camp capacity, an increase of approximately 1,000%. Table 3 displays the breakdown of occupants, including campers and staff, and their corresponding occupancy duration.

Water System

Water System Design Criteria

The Camp's existing and proposed water system analysis was based on the San Bernardino County (County) Special Districts Water Design Standards. The Project water demand was calculated using the County's domestic water use average daily domestic demand of 180 gallons per capita per day (GPCPD). Additionally, peak daily flows were estimated at two times the average daily demand and peak hourly flows were estimated at four times the average daily demand. Table 1 further details the County's water system design criteria utilized for the following analysis.

Table 1 Water System Design Criteria

Water System Criteria	Design Criteria
Storage Volume	Peak Daily Demand and Fire Flow Storage
Water Pipe Velocity	Maximum 8 Feet per Second (FPS)
Water Pipe Size	Minimum 8-inch Diameter
Pressure Range (Without Fire Flow)	40 psi - 125 psi (Pressure Reducing Valves Required Past 90 psi)
Pressure Range (With Fire Flow)	20 psi - 125 psi (Pressure Reducing Valves Required Past 90 psi)

Existing Supply Sources

The Camp has historically relied on its five groundwater wells to meet both its potable and non-potable water demands. *Table 2* displays the on-site wells and their production.

Table 2 Existing on-site groundwater wells

Well No.	Well Use	Well Production (gpm)
1	Domestic	44
2	Non-Domestic, Recreational	Unknown
3	Domestic, Non-Operational, Abandoned	-
4	Domestic	46
5	Domestic	85

Well No. 5 has the highest production rate and has served as the Camp's main source of drinking water. Additionally, Well No. 5 is the most recently constructed well at the Camp. Wells No. 1 and No. 4 are primarily used for irrigation with a valve to reroute flow to for potable water use, pending water quality approval. Well No. 3 is currently out of service with no plan for well reactivation. Well No. 2 is primarily used to fill a seasonal 1.5 million-gallon, lined, recreational pond. The potable water pumped from Wells No. 1, No. 2, and No. 3 are directed to the existing 212,000-gallon water tank which then feeds the Camp's potable water supply by gravity.

Existing Potable Water Distribution System

The Camp currently has an existing 212,000-gallon welded steel potable water tank bolted to a concrete ring foundation. The water tank is 24 feet high with a 38-foot diameter. Additionally, there is an existing 50,000-gallon irrigation tank which sits on dirt and has a concrete ring filled with gravel. The tanks display visible signs of deterioration, with multiple patches that indicate previous damage which has been effectively repaired. Currently, the tank inlet and outlet connections do not have any seismic coupling to accommodate potential ground movement.

Water distribution within the Camp operates on a gravity-fed system, utilizing 8-inch and 10-inch diameter mains to distribute domestic water. These mains then branch off in a series of 1-inch to 3-inch PVC distribution pipes that service the Camp buildings. The existing water distribution system is depicted in Appendix B.

Proposed Water Demands

The Project water demand was calculated using San Bernardino County's domestic water use planning value of 180 gallons per capita per day (GPCPD) and the proposed populations calculated in the Water Supply Assessment prepared by Kimley-Horn & Associates (KH). This assessment considers the projected number of occupants at each expansion phase and determines a corresponding water demand based on occupancy duration. This calculation is used to determine the annual domestic water demand for different phases and categories of occupants, including campers, staff, and guests. Table 3 displays the proposed water demand per occupant type.

Table 3 Estimated Camp Expansion Water Demand

	Occupant Type	Count	Occupancy Duration (% of year)	Equivalent Days	Annual Domestic Demand[1] (Gallons)
Employee	Full Time Employees	120	100%	365	7,884,000
	Part Time Employees	200	50%	182.5	6,570,000
	Winter Seasonal	350	17%	63.145	3,978,135
	Summer Seasonal	680	17%	63.145	7,728,948
Camper/Guest	High School Guests	1000	13%	50	9,000,000
	Middle School Guests	784	13%	50	7,056,000
	Adult Lodge	140	13%	50	1,260,000
	Elementary Age Guests	500	13%	50	4,500,000
	Wildwood Camp	130	13%	50	1,170,000
			Total Demand		54,607,870 Gallons per Year (GPY)
					150.82 Acre-Feet per Year (AFY)
					134,650 Gallons per Day (GPD)

In addition to the total potable water demand, the total demand for a fire event was calculated assuming that 2,000 gallons per minute would be needed for a 2-hour fire event. Table 4 outlines the County's fire flow requirements.

Table 4 Estimated Fire Flow Demand

Fire Flow (GPM)	Duration (Hours)	Total Demand (Gallons)
2000	2	240,000

The ratio of campers for each phase was also used to estimate a total water demand for each phase. Table 5 summarizes the resulting demands for each phase of the Project.

Table 5 Estimated Water Demand by Phase

	Occupant Type	Phase	% of Camp	Equivalent Daily Domestic Demand (GPD)	Daily Peak Demand (GPD)	Peak Hourly Demand (GPD)
Camper/Guest	High School Guests	2	39%	52,721	105,442	210,885
	Middle School Guests	1	31%	41,333	82,667	165,334
	Adult Lodge	3	5%	7,381	14,762	29,524
	Elementary Age Guests	4	20%	26,361	52,721	105,442
	Wildwood Camp	5	5%	6,854	13,708	27,415
				134,650	269,300	538,600

Proposed Water System

Three proposed water distribution system options were analyzed due to the Project's elevation challenges. Particularly, the domestic water tank elevation is lower than the planned expansions in Phases 3 and 4, resulting in low pressure within a gravity-fed system. The three options analyzed were:

1. Option 1 – Two New Tanks with Well Pipe Reconstruction: This option proposed rebuilding the water storage tanks at the system's highest elevation within Phase 3, ensuring adequate pressure throughout. This would involve construction two new tanks and rerouting the groundwater well pipes to the new tanks.
2. Option 2 – Two New Tanks with Existing Intermediate Tank: This option proposed adding two new tanks within Phase 3 and utilizing the existing 212,000-gallon tank as an intermediate tank. A booster pump station near the existing tank will then pump the water up to the two new tanks, thus maintaining a gravity-fed system.
3. Option 3 – One New Tank with Booster Pumps: This option involves constructing three booster pump stations for low pressures Phases 3, 4, and 5, in addition to construction a new 300,000-gallon tank near the existing 212,000-gallong tank. The existing tank will remain in use.

Schematic alignments of the proposed water system and the proposed improvements for the scenarios are depicted in the Appendix B. A construction cost analysis for each option is attached in Appendix C.

Hydraulic Model

To accurately assess system pressures, water pipe diameters, and fire flow capacities, a hydraulic model was prepared using Bentley System's WaterCAD. The model simulated conditions by assigning demands are various nodes throughout the Camp's expansion phases for the scenarios outlined above. The model tests the County's required fire flow of 2,000 gallons per minute at various fire hydrants throughout the Camp expansion phases to evaluate the system pressure under maximum demand. Tested fire hydrant locations are shown in Appendix B. The WaterCAD results for the various system options analyzed are detailed their following corresponding section.

Water Storage

The existing 212,000-gallon potable water tank does not satisfy the County's tank minimum storage requirements under a peak daily demand with fire flow, necessitating an additional 297,300 gallons to reach the minimum required 509,300-gallon storage requirement. To accommodate the Camp expansion demand, KH recommends constructing a 300,000-gallon welded steel tank, including necessary seismic supports and interconnections. The proposed supplementary tank is intended not only to increase storage capacity to satisfy the Camp's storage requirements but also to serve as an auxiliary reservoir during maintenance or emergency.

Option 1 – Two New Tanks with Well Pipe Replacement

This option involves constructing two new potable water storage tanks at the Camp's highest accessible point within Phase 3 as depicted in Appendix B. Set at an elevation of 6,680 feet, the highest within the proposed development area, this option ensures adequate gravity-fed pressures throughout the system. The proposed tanks include a 300,000-gallon tank, measuring 34 feet in diameter and 50 feet in height, alongside a secondary 210,000-gallon tank, with a 28-foot diameter and equal height. This option requires replacing the existing pipelines from the groundwater wells to the proposed, elevated tanks, potentially incorporating booster pumps to overcome the increase in head required to reach the tanks. Necessary adjustments such as grading for access roads and tank foundation will be required. To manage pressures exceeding 90 psi in certain phases, pressure reducing valves in various high pressure locations throughout the system. Option 1 system pressures are displayed below in Table 6 and detailed in Appendix C. The highlighted Junctions in Table 6 indicate pressures above the acceptable range for Peak Hourly demand, thus will require pressure reducing valves.

Table 6 Option 1 - Peak Hourly Flow Junction Pressures

Junction	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-15	6,445.00	146	6,701.30	111
J-16	6,630.00	21	6,722.36	40
J-17	6,549.56	146	6,711.16	70
J-18	6,578.96	146	6,708.66	56
J-19	6,503.46	146	6,701.86	86
J-20	6,470.57	146	6,701.49	100
J-21	6,466.45	146	6,701.40	102
J-22	6,497.60	146	6,701.59	88
J-23	6,508.88	115	6,705.00	85
J-24	6,518.74	19	6,705.00	81
J-25	6,544.94	19	6,704.99	69
J-26	6,470.05	115	6,704.89	102
J-27	6,479.63	115	6,706.91	98
J-28	6,489.00	115	6,707.43	95
J-29	6,530.00	115	6,707.37	77
J-31	6,502.29	115	6,705.14	88
J-34	6,560.00	73	6,705.05	63
J-35	6,602.00	73	6,705.04	45
J-37	6596.02	21	6,722.36	55

The primary advantage of this approach is its reliance on gravity to distribute water, which minimizes energy consumption and mechanical failure risk. However, this option entails significant construction and infrastructure costs, including two tanks, the expense of rerouting the groundwater well pipelines, and potential need for a booster pump to pump groundwater up to the new tank site.

Option 2 – Two New tanks with Existing Intermediate Tank

Similar to Option 1, this option involves the addition of two new potable water storage tanks at the Camp's highest accessible elevation in Phase 3. This option, however, utilizes the existing 212,000-gallon tank as an intermediate tank and proposes a booster pump station at the existing tank site to pump the water to the two new tanks. By incorporating a booster pump at the existing tank site, the existing tank is able to be used as an intermediate tank before being pump up to the higher elevation, proposed tanks. This option minimizes disruption to the existing groundwater wells and allows the existing well discharge piping to remain in place. This maintains the gravity-fed water system and leverages the existing tank, preserving and enhancing the existing system. The disadvantage to Option 2 includes the costs of construction two new tanks, a booster pump station, and the necessary pipelines to convey water from the existing tank to the proposed tanks. Due Option 2 utilizing the same gravity-fed system from the two proposed tanks as in Option 1, the system pressures will be the same as shown in Table 6.

Option 3 – One New Tank with Booster Pumps

Option 3 involves constructing booster pump stations for low pressures Phases 3, 4, and 5, in addition to construction a new 300,000-gallon tank near the existing 212,000-gallong tank. The existing tank will remain in use. This option addresses the low-pressure areas within the proposed water system by installing booster pumps. Booster pump stations will be positioned new the low-pressure phases to standardize pressure throughout the Camp.

The water system was modeled with the proposed tank without the use of booster pumps to determine the low pressure zones within the system, which necessitate the addition of booster pumps. The pressures from utilizing the existing tank with booster pump system can be seen in Table 7. The highlighted Junctions in Table 6 indicate pressures below the acceptable range for Peak Hourly demand, thus will require booster pumps to provide adequate pressure in those zones. Based on the results, pumps will be needed in Phases 3, 4, and 5 to address low-pressure zones. The proposed booster pump locations are shown in Appendix B.

Table 7 Option 2 - Peak Hourly Flow Junction Pressures

Junction	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-15	6,445.00	146	6,601.02	68
J-16	6,630.00	21	6,604.97	-11
J-17	6,549.56	146	6,604.97	24
J-18	6,578.96	146	6,608.39	13
J-19	6,503.46	146	6,601.58	42
J-20	6,470.57	146	6,601.22	57
J-21	6,466.45	146	6,601.13	58
J-22	6,497.60	146	6,601.31	45
J-23	6,508.88	115	6,598.82	39
J-24	6,518.74	19	6,598.81	35
J-25	6,544.94	19	6,598.81	23
J-26	6,470.05	115	6,598.71	56
J-27	6,479.63	115	6,600.73	52
J-28	6,489.00	115	6,601.25	49
J-29	6,530.00	115	6,601.18	31
J-31	6,502.29	115	6,598.96	42
J-34	6,560.00	73	6,598.87	17
J-35	6,602.00	73	6,598.86	-1

Conclusion

The evaluation of the three distribution system options for the Camp expansion presents a comprehensive overview of potential strategies to enhance the Camp's infrastructure in alignment with anticipated growth and demand. Each option presents a set of financial and operational considerations, ranging from initial construction costs to long-term maintenance. The findings in the Water Master Plan have provided a comparison of the advantages and disadvantages of each option, offering potential pathways to meet future Camp expansion water demands.

Sewer System

Sewer System Design Criteria

The Camp's proposed sewer system planning adheres to the County's Standards for Sanitary Sewer. A peaking factor of 3.4 was applied to the average annual sewer generation to determine peak sewer generation at the Camp. Table 8 outlines the County's design criteria which was used in the following sewer analysis. Additionally, sewer lift stations were designed to handle peak flows from the corresponding tributary area with the use of a single pump.

Table 8 Sewer System Design Criteria

Sewer System Criteria	Design Criteria
Projected Flow (Mountain Areas)	80 Gallons per Capita per Day (GPCPD)
Maximum Velocity	8 FPS
Roughness Coefficient	n = 0.013
Minimum Velocity	2 FPS
Maximum Pipe Capacity	50% Full
Minimum Pipe Slope	0.008 – 0.01 Feet per Foot
Manhole Spacing	Every 300 Feet

Existing Private Sewer System

The Camp's existing sewer system is primarily composed of 4-inch and 6-inch gravity sewer which feed into duplex, submersible lift station. The sewage is pumped the lift station by 6-inch force towards the entrance to the Camp, eventually connecting into the Running Springs Water District public sewer system in Green Valley Road. The existing sewer system is depicted in Appendix B. Existing manhole invert elevations are provided in Appendix B derived from Camp utility record drawings, which can be seen in Appendix E.

Existing Public Sewer System

Sewer in Green Valley Lake is managed by Running Springs Water District which collects, treats, and disposes of the Camp's wastewater. The existing sewer system in Green Valley Lake Road contains a 6-foot diameter lift station across the road from where Hume connects to their system in Green Valley Lake Road. An existing 8-inch gravity sewer line runs south down Green Valley Lake Road until flowing into the lift station at the entrance to the Hume camp which pumps to an 8-inch force main which runs down Green Valley Lake Road until reaching Highway-18. Hume's wastewater flows through their private system into a discharge manhole at the entrance to the camp which gravity flows into the existing lift station. This existing infrastructure is depicted Appendix E.

Proposed Sewer Generation

In accordance with the County standards, a peaking factor of 3.4 was applied to average daily demand to determine peak flow for the Camp. The average daily sewer generation and corresponding peak flows for individual occupant types are shown in Table 9.

Table 9 Estimated Camp Expansion Sewage Generation

	Occupant Type	Count	Occupancy Duration (% of year)	Equivalent Days	Annual Sewage Generation[1] (Gallons)	Peak Sewage Flows (Gallons)
Employee	Full Time Employees	120	100%	365	3,504,000	11,913,600
	Part Time Employees	200	50%	182.5	2,920,000	9,928,000
	Winter Seasonal	350	17%	63.145	1,768,060	6,011,404
	Summer Seasonal	680	17%	63.145	3,435,088	11,679,299
Camper/Guest	High School Guests	1000	13%	50	4,000,000	13,600,000
	Middle School Guests	784	13%	50	3,136,000	10,662,400
	Adult Lodge	140	13%	50	560,000	1,904,000
	Elementary Age Guests	500	13%	50	2,000,000	6,800,000
	Wildwood Camp	130	13%	50	520,000	1,768,000
			Total Demand	21,843,148 Gallons per Year (GPY)		74,266,703 Gallons per Year (GPY)
				59,844 Gallons per Day (GPD)		203, 470 Gallons per Day (GPD)

[1] *Annual domestic Demand = Equivalent Days * Count * 180 GPCPD (San Bernardino County, Special Districts Department, Standards for Sewer Systems, 2012)*

This method for calculating peak sewer flow for each development involved determining the proportion of campers per phase and multiplying this percentage to the overall projected peak flow for the entire proposed development, as shown in Table 10.

Table 10 Sewer Generation per Phase

	Occupant Type	Phase	Percentage of Camp	Peak Sewage Generation per Phase (GPD)
Camper/Guest	High School Guests	2	39%	79,667.19
	Middle School Guests	1	31%	62,459.08
	Adult Lodge	3	5%	11,153.41
	Elementary Age Guests	4	20%	39,833.59
	Wildwood Camp	5	5%	10,356.73
			100%	203,470

Proposed Sewer System

To accommodate the Camp's expansion, which includes additional dwelling units and facilities, significant updates to the existing sewer system are required. Specifically, due to the hilly natural terrain of the camp, a traditional gravity sewer system will not be feasible. The planning for the expanded sewer system is segmented into three parts, each aimed at servicing the proposed buildings and integrating the proposed sewer system into the existing infrastructure. Detailed layouts for the proposed sewer improvements are provided in Appendix B, with a summary of each phase improvement below:

1. Phases 1, 2, and 3: Improvements in these phases include conveying the sewer generation into the Camp's existing sewer system. A list station is proposed at the southern edge of Phase 2 to manage the elevation differential across Phases 2 and 3. The sewage will travel by gravity to this lift station, labeled Lift Station 1 in Appendix B, where it will be pumped by force main into the existing sewer system near the existing water tank and gravity flow to the existing lift station located in Phase 1. The existing lift station will pump the additional sewage by 6-inch force main off-site and discharge into the Running Springs Water District's system in Green Valley Lake Road.

2. Phase 4: Located across Green Valley Lake Road, sewer generation from Phase 4 will connect directly into Running Springs Water District's sewer lift station located along Green Valley Lake Road. Connecting directly into the public lift station eliminates the need for an easement through the Green Valley Lake Road Right-of-Way. Additional off-site lift station analysis is recommended to determine the lift station's capacity and potential point of connection.

3. Phase 5: Sewer from this phase will connect to Running Springs Water District's 8-inch gravity sewer in Green Valley Lake Road by proposed lift station, labeled Lift Station 2 in Appendix B, and force main. Lift Station 2 shall be located at the southern end of Phase 5, at the lowest elevation. The force main will connect to a proposed discharge manhole within the Camp property and be conveyed by 8-inch gravity sewer into Running Springs Water District's public system. To connect to the public system, a manhole shall be constructed in Green Valley Lake Road within Running Springs Water District's Right-of-Way.

The proposed sewer system is depicted in Appendix B with corresponding construction costs for the improvements detailed in Appendix C.

Proposed Sewer Pipe Capacities

To support the Camp expansion, an analysis was performed to determine the minimum pipe slopes and diameters required to effectively handle the cumulative flow anticipated. While each phase primarily handles its distinct flow, Phase 1 is an exception, as it will also accommodate additional flows from Phases 2 and 3. Bentley System's Flowmaster software was utilized to perform the sewer capacity calculations. The detailed Flowmaster results are displayed in Appendix F and summarized in Table 11.

Table 11 Proposed Sewer System Pipe Capacities

	Pipe Diameter (in)	Total Flow (GPD)	Channel Slope	Normal Depth (in)	Percent Full	Velocity (FPS)
Phase 1	6	153,279	0.5%	3.5	57.6%	2.03
	8	153,279	0.5%	2.9	36.1%	2.09
	10	153,279	0.5%	2.6	26.4%	2.06
Phase 2	6	79,667	0.7%	2.1	35.0%	2.01
	8	79,667	0.8%	1.8	22.8%	2.05
Phase 3	6	11,153	3.5%	0.5	8.9%	2.01
Phase 4	6	39,834	1.2%	1.3	21.4%	2.00
Phase 5	6	10,356	3.7%	0.5	8.4%	2.01

Sewer Pipe Improvements

Due to the additional sewer generation anticipated from the Camp expansion, particularly impacting Phase 1 from increased generation in Phases 2 and 3, increasing pipe diameters is recommended to satisfy pipe capacity requirements. In Phase 1, the current 4-inch and 6-inch gravity sewer pipes shall be replaced with 8-inch and 10-inch diameter pipes, respectively. Sewer pipe diameters for each phase are displayed in Table 11.

Proposed Lift Stations

The Camp has an existing lift station with an estimated 5-foot diameter wet well at the southwestern end of the existing site. To accommodate the Camp's expansion, two additional lift stations (Proposed Lift Stations 1 and 2) are proposed at low elevation locations in Phases 2 and 5. The existing lift station is assumed to receive peak flows from Phase 1, 2, and 3. Proposed Lift Station 1 will receive flows from Phase 2 and the proposed Lift Station 2 will receive flows from Phase 5. The locations, elevations, and discharge inverts of proposed Lift Stations 1 and 2 are depicted in Appendix B.

Conclusion

The Sewer Master Plan developed for the Camp's expansion accommodates the future sewer generation and adheres to the sewer design guidelines established by San Bernardino County. By incorporating a segmented sewer system approach overcomes the Camp's topography challenges while meeting sewer design criteria. This approach ensures the sewer infrastructure is adequately planned to support the Camp's future development needs, maintaining operational efficiency and compliance with regulatory standards.

Permitting Requirements

Running Spring Water District

The public sewer service provider for the Camp is the Running Springs Water District. For customers requiring new connections to the existing system with new construction will have to apply and follow the steps provided on the Running Springs Water District webpage. The proposed water system is private, but there are proposed sewer connection to existing lines within Green Valley Lake Road.

To obtain a permit for a sewer connection, the applicant will have to complete a Service Availability Application and return it to the office located at: 31242 Hilltop Boulevard, Running Springs, CA 92382. The applicant shall then complete the following steps to apply for a permit:

1. An owner desiring water, sewer, and fire protection services shall make application at the District office. A plan check fee of $220 is due at the time of application along with the submittal of the required plans prior to plan check processing and issuance of service availability letters.

2. Current Plan Check Fees:
    a. $50 Water and Sewer
    b. $170 Fire Letter
    c. $197 Fire Sprinkler Plan

3. Plot Plans: At the time of application, plans shall be submitted on 11” x 17” or larger sheets at a minimum scale of 1” = 10’, printed and stapled together to form a complete set. Two complete sets will be required with each application (one electronic copy is also preferred) along with the following items within the plan sets:
    a. Legal owner’s name and phone number
    b. Lot, Block, and Tract
    c. Address
    d. Assessor’s Parcel Number
    e. Lot Dimensions
    f. Names of surrounding streets
    g. Distances to structures on adjacent lots, if structures are less than 30 feet from construction (including, but not limited to, existing or proposed neighboring properties including homes, barns, garages, sheds, wells, outhouses, etc.)
    h. Topographical Survey including points of access
    i. Square Footage
    j. New Construction - all livable and non-livable/residential storage
    k. Addition - existing and proposed
    l. Additions - floor plans for the existing structure

4. Letters take three (3) weeks for processing and only the owner may pick up the set of Letters. An agent must provide the District with a notarized Letter of Authorization from owner to pick up plans.

Crestline Lake Arrowhead Water Agency (CLAWA)

The Camp has a public water connection to the Crestline Lake Arrowhead Water Agency's (CLAWA) potable water system. CLAWA is a State Water Project purveyor and has the capacity to serve the Camp in the future following the proposed Project. The *Water Supply Assessment* prepared by KH outlines the future demand and various scenarios for satisfying the demand. The Camp prefers to integrate CLAWA's water into the Camp's supply to ensure water supply sustainability and reliability. The objective of the *Water Supply Assessment* is to establish a maximum allotted supply from CLAWA to the Camp.

San Bernardino County

To connect to the existing sewer in Green Valley Lake Road, the applicant will require an Encroachment Permit from the County of San Bernardino to trench within the right of way and connect to the existing sewer system along with crossing the Right-of-Way to supply water to Phase 4. The requirements and applications for an Encroachment Permit can be found on the San Bernardino County permitting website.

If this construction requires road closures, then a Road Closure permit will also be required from the County of San Bernardino.

Appendix A – Web Soil Survey

Appendix B – Water and Sewer Exhibits

Appendix C – Opinion of Probable Construction Costs

Appendix D – WaterCAD Results

Appendix E – Record Drawings

Appendix F – Flowmaster Results

Appendix G – Excerpts from San Bernardino County Design Manuals