

Appendix Q

Community Infrastructure & Services Technical Report

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**Community Infrastructure & Services
Technical Report**

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**Prepared for:
County of Humboldt
Community Development Services Department
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Community Infrastructure & Services Technical Report

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LIST OF ACRONYMS

- AB – assembly bill
- AC – asbestos cement
- ACLC – administrative civil liability complaint
- ACLO – administrative civil liability order
- ADWF – average dry weather flow
- ARDWP – Annual Report to the Drinking Water Program
- ASBS – Area of Special Biological Significance
- ASCE – American Society of Civil Engineers
- BOD – biological oxygen demand
- CAO – cleanup abatement order
- CCC – California Coastal Commission
- CDBG – Community Development Block Grant
- CDO – cease and desist order
- CEQA – California Environmental Quality Act
- CFC – California Fire Code
- CI – cast iron
- CIP – capital improvements plan
- CPA – Community Planning Area
- CPL – competitive project list
- CPUC – California Public Utilities Commission
- CSD – community services district
- CWD – County water district
- DHS – Department of Health Services
- DI – ductile iron
- DOF – Department of Finance
- DOT – Department of Transportation
- DWR – Department of Water Resources
- EDU – equivalent dwelling unit
- FEMA – Federal Emergency Management Agency
- gpd – gallons per day
- gpm – gallons per minute
- HBMWD – Humboldt Bay Municipal Water District

HP – horsepower
I&I – inflow and infiltration
ISRF – Infrastructure State Revolving Fund
LAFCo – Local Agency Formation Commission
LCP – Local Coastal Plan
LF – lineal feet
LLC – Limited Liability Corporation
MDD – maximum day demand
MG – million gallons
MGD – million gallons per day
MS4 – Municipal Separate Storm Sewer System
NPDES – National Pollutant Discharge Elimination System
NPS – nonpoint source
PALCO – Pacific Lumber Company
PHD – peak hourly demand
POTW – publicly owned treatment works
PVC – polyvinyl chloride
PWWF – peak wet weather flow
RID – resort improvement district
RUS – Rural Utilities Service
RWQCB – Regional Water Quality Control Board
SCWG – Small Community Wastewater Grant
SOI – sphere of influence
SRF – State Revolving Fund
STEP – septic tank effluent pumping
SWMP – Storm Water Management Plan
SWRCB – State Water Resources Control Board
SWTR – Surface Water Treatment Rule
TSS – total suspended solids
USA – urban study area
USDA – U.S. Department of Agriculture
USEPA – U.S. Environmental Protection Agency
WDR – waste discharge requirements
WSA – water study area
WWTF – wastewater treatment facility
WWTP – wastewater treatment plant

Executive Summary

The purpose of this report is to serve as a basis for the development of the General Plan Update and the Community Infrastructure and Services Element in particular. This new General Plan Element will present policies and implementation measures for providing the infrastructure needs to accommodate development within the County through the year 2025. The information contained in this report was developed during the first half of 2007 and represents a "snapshot" in time. Any recommendations herein are based on a realistic analysis of the conditions that existed at that time, including capacity, future demand, and financing options for water and wastewater, police, fire, road, stormwater, street lights, parks and recreation, schools, and public utilities infrastructure and services. This technical report contains planning level estimates for the future facilities and improvements, acceptable levels of service, funding methods and priorities, and the timing of facility and service availability.

Background

There are three significant factors that contribute to the constant need for infrastructure improvements and upgrades within our communities. The first contributing factor is the fact that much of the County's infrastructure is quite old, deteriorating, and in need of improvement. Quite simply, infrastructure ages and needs maintenance and/or replacement over time. Secondly, the County has seen some population growth over time and will continue to grow, thereby requiring additional infrastructure. Lastly, infrastructure improvements are often required to maintain compliance with increasingly complex and changing regulations. This is especially true in the areas of water and wastewater treatment and disposal. It should be noted that these problems and the associated issues are not unique to Humboldt County. An analysis of the state of the San Francisco Bay Area's infrastructure was performed in 2005 by the American Society of Civil Engineers (ASCE). That analysis gave an overall report card grade for the condition of the infrastructure in the Bay area a "C-", using a rating system from "A" to "F". More recently the 2006-2007 Sonoma County Grand Jury issued a report that identified similar problems and issues with the wastewater issues in their County (see http://www.sonomasuperiorcourt.com/index.php?v=gjury_info).

Many areas within the County are currently in need of infrastructure improvements related to the first contributing factor mentioned above – aging infrastructure. The County and all of the service providers will also need to invest in infrastructure improvements to address the other two forces that effect infrastructure – population growth and increasingly stringent regulatory requirements.

The County has defined specific Urban Study Areas (USAs), areas where water and/or sewer systems exist or may be appropriate to consider, for the purpose of evaluating development potential and infrastructure capacity within the County. One of the goals of this analysis was to develop unit costs for providing the required infrastructure to meet development potential within the USAs. These unit costs would then identify areas where development could occur and be the most cost effectively within the County. This approach was used where sufficient data is available. Unfortunately, significant unknowns exist that prevented exact quantification of these unit costs for development in a number of key locations. In many cases, order of magnitude costs have been presented where improvements are needed and there is insufficient information to accurately define the improvements.

Findings

The intent of this report is to provide the technical basis for the County to develop and implement policy changes, which will be described in the Community Infrastructure and Services and the Circulation Element. This report contains numerous findings regarding current service capacities and the condition of the infrastructure in the communities. The following is a summary of current development capacity in the County and a discussion of areas within the County that can most efficiently accommodate growth in the future.

Current Development Capacity

Development capacity is defined by the allowable density and the physical constraints affecting a parcel, as well as the capacity of service providers. This report contains an evaluation of development potential based on the midpoint density of the current General Plan land use designations. The development potential analysis is described in Sections 1.3.1 and 1.4 of this report. The remainder of the report is an analysis of the current capacity of service providers and the improvements required to service current and future development.

Although the capacity of all service providers should be considered when evaluating development potential, federal and state water and wastewater regulatory requirements clearly establish levels of service that must be adhered to. In addition, levels of service for most of the other services have not been definitively established so they cannot be used as a basis for service thresholds.

Current water and wastewater capacity, which ever of the two is more limiting, has been used to identify the maximum number of available connections within each urban study area. For a detailed discussion of the methodology used to determine capacity see Chapter 6, Water Systems, or Chapter 7, Wastewater Systems. As indicated above, other services such as fire protection and law enforcement are very important, but quantifiable levels of service have not been established.

Roadway capacity is a development limitation and, to a certain extent, can be quantified through Level of Service standards as described in Section 2.4.2, Roadway Capacity and Level of Service (LOS), and Section 2.4.3, Volume to Capacity (V/C) Ratio. However, unlike water quality standards for water and wastewater systems that are regulated pursuant to the federal Clean Water and Safe Drinking Water Acts, which involve local, state, and federal agencies, roadway capacity is regulated by the policies of the local land use agency. As a roadway level of service standard is reached or exceeded, traffic delays will necessarily increase but the system continues to function. Whereas, for water or wastewater systems that reach or exceed capacity a moratorium can be imposed by regulators, there is no mandatory regulatory response to congested roadways. In addition, unlike water and wastewater systems, roadway capacity in one community can be affected by development in other communities.

The following table summarizes development potential within urban study areas based on current General Plan land use designations, known physical constraints, and an analysis of water and wastewater capacity. The column labeled "Low Unit Development Estimate" is the net development potential (based on mid-point density of the current General Plan, not maximum density) of residential land after known physical constraints are subtracted (see Section 1.3.1 and 1.4 for a more detailed discussion). The column labeled "Available Capacity" is either the number of available water or sewer connections (which ever is more limiting) or the Low Development Estimate, which ever is lower. The column labeled "Description of Limitation" is a

brief description of the nature of the service limitation (see Chapters 6 and 7 for detailed discussions of each system).

As described above, water and wastewater standards contained in federal and state laws and regulations have been used to establish the available capacity of local service providers. The California Department of Health Services and Regional Water Quality Control Board, and the authorized local agency providers or public utilities, are together responsible for enforcing these laws and regulations. This report has endeavored to consistently apply these water and wastewater standards. Where this report has identified communities with available capacity at or near zero, the governing boards of the local service providers and the appropriate regulators would ultimately make the decision, on a case by case basis, whether or not to approve applications for new service connections. The County Planning and Building Divisions would stop processing applications for new development within a district upon notice by the appropriate governing board that new service connections would not be authorized.

Table ES-1. Summary of infrastructure capacity limitations within the County.

Urban Study Area	Service Provider	Low Unit Development Estimate	Available Capacity	Capacity Limitation*	Description of Limitation
Alderpoint WS	Alderpoint County Water District	44	0	W	The water system is out of compliance with Surface Water Treatment Rule due to lack of treatment.
Benbow WS	Benbow Water Company	55	0	W	The number of available connections in the Benbow WSA was set at zero because treatment capacity is currently exceeded.
Big Lagoon WS	Big Lagoon Community Services District	10	10	LUD	The water system has further capacity, but land use densities limit development.
Briceland WS	Briceland Community Services District	13	0	W	The number of available connections in the Briceland WSA was set at zero because source capacity is currently exceeded.
Arcata USA	City of Arcata	2	2	LUD	The water and wastewater systems have further capacity, although future limitations may occur as Arcata is not meeting discharge requirements. Land use densities currently limit development.
Blue Lake USA	City of Blue Lake	46	46	LUD	The water and wastewater systems have further capacity, although Blue Lake summertime disposal method may come under scrutiny in the future. Land use densities currently limit development.
Blue Lake WS	City of Blue Lake	6	6	LUD	
Fortuna USA	City of Fortuna	294	0	WW	WWTP currently operates at 100% of peak wet weather design capacity.
Rio Dell USA	City of Rio Dell	2	0	WW	The number of available connections was estimated at zero based on the fact that the City is currently under a Cease and Desist Order.
Rio Dell WS	City of Rio Dell	7	7	LUD	The water system has further capacity. Land use densities currently limit development.
Glendale USA	Fieldbrook Community Services District	20	20	LUD	The wastewater system has capacity for an estimated 80 to 100 remaining connections, and the water system has further capacity. Land use densities currently limit development.
Fieldbrook WS	Fieldbrook Community Services District	138	138	LUD	The water system has further capacity. Barring limitations due to site specific suitability for onsite wastewater, land use densities currently limit development.
Glendale WS	Fieldbrook Community Services District	1	1	LUD	
Garberville USA	Garberville Sanitary District	63	0	WW	The WWTP currently operates in excess of both average dry weather flow and peak wet weather flow design capacity.

Urban Study Area	Service Provider	Low Unit Development Estimate	Available Capacity	Capacity Limitation*	Description of Limitation
Garberville WS	Garberville Sanitary District	61	25	W	The number of available connections in the Garberville study areas was estimated based on the District currently being at 94% of its water treatment capacity.
Freshwater WS	Humboldt Community Services District	130	130	LUD	The water system has further capacity. Barring limitations due to site specific suitability for onsite wastewater, land use densities currently limit development.
South Eureka WS	Humboldt Community Services District	13	13	LUD	
Indianola WS	None	99	99	LUD	Capacity is dependent on locating suitable water supply. Barring limitations due to site specific suitability for onsite wastewater, land use densities currently limit development.
Myrtle town WS	Humboldt Community Services District	55	55	LUD	The water system has further capacity. Land use densities currently limit development.
Humboldt Hill USA, South Eureka USA, Myrtle town USA	Humboldt Community Services District	4,116	4,116	LUD	The water system has further capacity, and HCSD has 4,980 available sewer connections based on its contract with the City of Eureka. Certain areas within the HCSD service area may be limited by the City's wastewater collection system capacity. Land use densities currently limit development.
Hydesville USA/WS	Hydesville County Water District	166	166	LUD	The water system has further capacity. Barring limitations due to site specific suitability for onsite wastewater, land use densities currently limit development.
Jacoby Creek WS	Jacoby Creek County Water District	28	28	LUD	The water system has further capacity. Barring limitations due to site specific suitability for onsite wastewater, land use densities currently limit development.
Loleta USA	Loleta Community Services District	87	0	WW	The WWTP is currently out of compliance with its existing discharge requirements.
Manila USA	Manila Community Services District	142	142	LUD	The water and wastewater systems have further capacity. Land use densities currently limit development.
McKinleyville USA	McKinleyville Community Services District	2,224	1,453	WW	The number of available connections was estimated based on the District's current ADWF (0.9 MGD) being 76% of capacity as set forth in their waste discharge requirements (1.18 MGD).
McKinleyville WS	McKinleyville Community Services District	123	123	LUD	The water system has further capacity. Land use densities currently limit development.

Urban Study Area	Service Provider	Low Unit Development Estimate	Available Capacity	Capacity Limitation*	Description of Limitation
Miranda USA	Miranda Community Services District	48	48	LUD	The water system has an estimated capacity of 77 connections, while the wastewater system has an estimated capacity of 59 connections. Land use densities currently limit development.
Myers Flat WS	Myers Flat Mutual Water Company	4	0	W	The number of available connections in the Myers Flat WSA was set at zero due to undersized source capacity and lack of treatment capacity.
Orick USA	Orick Community Services District	19	19	LUD	The water system has further capacity. Barring limitations due to site specific suitability for onsite wastewater, land use densities currently limit development.
Orick WS	Orick Community Services District	36	18	W	The number of available connections in the Orick study areas was estimated based on the District currently being at 79% of its source capacity (37 available connections minus 19 connections in USA). The primary limitation will be based upon site specific suitability for on site wastewater.
Orleans WS	Orleans Community Services District	50	0	W	The number of available connections in the Orleans study area was estimated based on the District currently being at 104% of its treatment capacity. Source capacity is not an issue.
Scotia USA	Pacific Lumber Company	0	0	WW	The number of available connections was estimated at zero until waste discharge requirements are established for the facility.
Phillipsville WS	Phillipsville Community Services District	11	0	W	The number of available connections in the Phillipsville study area was set at zero due to problems with water supply sources and non-compliance with Surface Water Treatment Rule.
Redcrest WS	Redcrest Water Association	12	0	W	The number of available connections in the Redcrest study area was set at zero due to the system being in noncompliance with the Surface Water Treatment Rule.
Redway USA	Redway Community Services District	298	0	WW	The number of available connections in the Redway study area was set at zero due to treatment capacity (0.46 MGD) being unable to meet peak day demands (0.475 MGD).
Shelter Cove USA	Resort Improvement District No. 1	1,088	288	WW	The number of available connections was estimated based on the District's current ADWF being at 59% of capacity as set forth in their NPDES permit.

Urban Study Area	Service Provider	Low Unit Development Estimate	Available Capacity	Capacity Limitation*	Description of Limitation
Shelter Cove WS	Resort Improvement District No. 1	108	108	LUD	The water system has further capacity (535 available water connections in USA/WSA). Land use densities currently limit development.
Riverside WS	Riverside Community Services District	5	5	LUD	The water system has further capacity. Barring limitations due to site specific suitability for onsite wastewater, land use densities currently limit development.
Samoa USA	Samoa Pacific Group	0	0	WW	Existing wastewater treatment plants must be replaced.
Weott USA	Weott Community Services District	34	0	W	The number of available connections in the Weott USA was set at zero due to source and treatment capacity being currently exceeded.
Westhaven WS	Westhaven Community Services District	79	0	W	The number of available connections in the Westhaven study area was set at zero due to inadequate source capacity.
Willow Creek USA/WSA	Willow Creek Community Services District	227	227	LUD	The water system has further capacity. Barring limitations due to site specific suitability for onsite wastewater, land use densities currently limit development.
TOTALS		9,964	7,293		

* W = water; WW = wastewater; LUD = land use densities

Future Growth Areas

After analyzing development potential, infrastructure availability, and the feasibility of improving and expanding infrastructure systems throughout the County, three major development areas have been identified within the County:

- areas served by Humboldt Community Services District (HCSD), i.e. Humboldt Hill, Ridgewood, Cutten and Myrtle town;
- areas served by McKinleyville Community Services District (MCSD);
- the area served by the Fieldbrook Glendale Community Services District (FGCSD) that has both community water and sewer (Glendale).

Roadway Infrastructure

Humboldt County's roadway system has approximately 1,400 miles of county roads and city streets, 378 miles of state highways, including U.S. Highway 101, and roadways on federal lands. These roadways provide for the inter-regional and intra-regional movement of goods and people on California's north coast. Critical issues for the County road system are safety, functionality and road rehabilitation. Roadway maintenance is a challenge for rural areas such as Humboldt County: lower population densities and long travel distances mean fewer funds are available on a per-mile basis. Roadway capacity is generally less of an issue for rural areas due to the lower population densities, but even so there are existing and projected areas of congestion constraints that must be addressed. Roadway capacity is also affected by competition for space in the right-of-way among vehicular traffic and complementary modes of transportation, including transit service, bicycles, pedestrians, and equestrians.

As the County's population grows over the next 20 years, the projected vehicle-volume growth will have varying impacts on roadways in the County roadway system, and particularly in the Urban Study Areas (USAs); in several cases, roadways in the USAs are already experiencing capacity constraints as observed at a.m. and p.m. peak hours. In other cases, roadways currently able to accommodate existing traffic volumes are likely to develop areas of increased congestion as traffic volumes increase.

The County in conjunction with the City of Eureka, Caltrans, and the Humboldt County Association of Governments (HCAOG) has developed a Greater Eureka Area Travel Model (GEATM) to assess impacts of land use and transportation changes in the county over time and to determine the effectiveness of potential improvements to the roadway system. The GEATM identifies roadway segments with both existing and projected capacity constraints. The model used 2005 data and projected 2030 traffic volume estimates based on the General Plan Update Sketch Plan 3, full entitlement build-out,¹ assumptions for the spatial and temporal patterns of new development.

The roadways with the most significant capacity constraints are located primarily in Eureka (Humboldt Hill, Myrtle town, and South Eureka) and McKinleyville. Both areas have been experiencing increased development pressures that have added and are likely to continue to add vehicle volume to the County's roadways. Future development-related growth in the South Eureka USA will add significant vehicle volume to roadways, some of which are already experiencing capacity constraints. Several roadways within the USA already had segments at Level of Service (LOS) E or F in 2005. The McKinleyville USA is also expected to have capacity

¹ Sketch Plan alternatives were developed in 2005 by Humboldt County (Sketch Plan Alternatives Report, Dyett & Bhatia, 2004) as generalized depictions of proposed planned land uses to illustrate various General Plan options. Sketch Plan 3 was the "Focused Urban Communities/Resource Production Protection" alternative.

constraints along Central Avenue north of the Northbound Highway 101 exit. These sections are currently at LOS D. Other USAs expected to experience capacity constraints include Briceland and Freshwater.

The 2003 Humboldt County Road and Bridge Capital Improvement Plan (CIP) report notes that, overall, the County's roads are in "poor" condition, with the County's Overall Condition Index (OCI) rated at 40 on a scale of 1-100 (County of Humboldt, 2003). The report notes that, in 2000, there was approximately \$100 million in deferred maintenance on the County's roadways (not including maintenance costs for local streets). The report also notes that if Humboldt County continues to fund road maintenance at a level of around \$1 million a year on road surfaces—the approximate budget for resurfacing County roads for the previous 20 years—the OCI would continue to decline, and absent other maintenance activities, would drop in another 20 years to an overall level of 15 (at which point the average road in Humboldt County would require reconstruction).

Humboldt County Public Works' adopted 2006-07 budget was \$26.2 million. Road Maintenance and Construction received \$8.9 million out of a total Road Fund budget of \$14.8 million. Of this \$8.9 million, roughly \$6.5 million goes to personnel and equipment. This leaves approximately \$2.5 million for roadway maintenance materials—about 12 percent of what is needed to keep the roads from degrading further.

Current levels of investment in roadways are not adequate and will lead to continued degradation. Significant investment in the County's road infrastructure will be required over the planning period to reverse this trend and to provide adequate levels of service. Please refer to Chapter 2 for more detailed descriptions of study areas and discussion of recommended infrastructure improvements needed to correct current deficiencies, meet current and near term future regulations and to provide adequate capacity for future growth.

Law Enforcement

The Humboldt County Sheriff's Office provides a variety of public safety services Countywide (court services, corrections, emergency operations) and law enforcement services for the unincorporated areas of the County. The Sheriff's Office Operations Bureau is made up of seven units under the command of the Undersheriff. The most visible of these units is Patrol. These deputies are responsible for responding to emergency calls for service, criminal investigations, and crime prevention through neighborhood and beat patrols. Patrol has one Main Station in Eureka, substations in Garberville, Hoopa and McKinleyville, and six resident deputy posts. Most of the urban study areas (USAs) receive law enforcement services solely from the Humboldt County Sheriff's Office (HCSO). Arcata, Blue Lake, Eureka, Ferndale, Fortuna, Rio Dell and Trinidad each have their own police departments that provide mutual aid to the County. The HCSO also has a mutual aid agreement with the California State Highway Patrol.

Revenue sources used by the County to fund Sheriff's Office operations have not kept pace with service costs. As can be expected, budgetary restrictions impact the Sheriff Department's ability to properly allocate the resources needed to deliver services efficiently and equitably. One of these basic resources is personnel. The Humboldt County Sheriff has received many public complaints regarding its ability to respond to calls for service in a timely manner, and its community involvement. Department accessibility by the community for walk-in services is also a concern. All of these functions are limited by staff availability.

The officer-to-population ratio, the number of officers to calls for service ratio and officer response times are standard measures of the level of service for law enforcement operations. Humboldt County Sheriff staff provided anecdotal information on response times, generally

concluding that they are acceptable in McKinleyville and Eureka but inadequate elsewhere (particularly in outlying areas). The current number of sworn officers is considered inadequate to respond to the demand for service.

Accepted standards for officer-to-population ratios (OPR) for adequate service range from 1.5-2:1,000. OPRs below this level can impair the ability of patrol officers to respond to calls for service in a timely manner. The recommended OPR figures are based on an International Association of Chiefs of Police Research Center (IACPRC) directive that sets OPR guidelines for different service population estimates; for an area with a population between 100,000 and 200,000, such as Humboldt County, the IACPRC recommends an OPR of 1.9. In 2007 the Humboldt County Sheriff's Office budgeted for 90 sworn officers, as shown in Table 3.2. Applying 90 sworn officers to Humboldt County's population of approximately 130,000 produces an officer-to-population ratio of 0.7:1,000, well below the 1.9:1,000 recommended benchmark.

Funding sources for the Sheriff's Office include Humboldt County General Fund monies offset by various sources of revenues, including fees and grants. Questions remain about the sufficiency of the tax base to support the Sheriff's Office, and the potential need for new sources of revenue to support the Sheriff's Office's efforts to provide adequate service. Sources of revenue could include: increased operational fees (booking fees, etc.), development fees (however, development fees can only be used new for expanded facilities and equipment), and new taxes (special taxes or sales tax).

Given the general inadequacy of the existing facilities and the anticipated increase in need for personnel and equipment, future costs for upgrades and expansions should be considered as significant. Funding these law enforcement needs will be critical to maintaining adequate levels of law enforcement services within the County.

Additional information on Law enforcement is presented in Chapter 3.

Storm Drainage and Flood Control

The County is responsible for storm drainage within all unincorporated areas of the County and is responsible for the maintenance of flood control levees along the Eel River at Sandy Prairie, the Mad River at Blue Lake, and Redwood Creek at Orick. The majority of the County does not have stormwater conveyance systems, and stormwater therefore follows more in a natural drainage pattern before either infiltrating or entering a waterway. However, portions of the McKinleyville USA, South Eureka USA, Humboldt Hill USA, Myrtle town USA, and Garberville USA do contain stormwater conveyance systems that collect stormwater from roadways and discharge to waterways with minimal or no filtration.

The County also maintains a significant number (estimated in the thousands) of culverts under County roadways. These culverts are located throughout the County's many drainage swales, creeks and streams, and often present a barrier to migrating salmon and other fish passage. The County is part of the Five Counties Salmonid Restoration Program, established in 1997 to prioritize culvert replacement projects and evaluate options for improving County plans, policies, and practices to provide or improve salmonid habitat.

The County's stormwater system varies in condition. Much of the infrastructure is very old and is reaching the end of its design life. The County does not have sufficient funding to make improvements to this system. The County needs a systematic replacement program to begin upgrading and expanding stormwater infrastructure as needed, but lacks the proper funding to do so. In fact, the majority of capital improvement projects outlined in the 1982 McKinleyville master drainage plan have yet to be completed. Funding for maintenance of levees is also

typically in short supply. It will be important for the County to identify problem areas, carryout the proper studies, and implement projects to ensure areas within the County are properly served by stormwater infrastructure and to prevent future drainage problems. Storm drainage infrastructure will be essential to serving future development within the County. New master drainage plans should be developed by the County to reflect changes in the County's roadways and new standards for development and runoff.

There also exists a lack of cohesive development ordinances with respect to stormwater system design. The County does not have comprehensive stormwater ordinance for new development, and current guidelines for return period storms to be used in sizing of stormwater facilities lack a specified duration for the design storm. New stormwater ordinances for development should be prepared, and drainage fees for new developments should be developed. The County should develop a stormwater fund supported by developer fees and also develop mechanisms to fund ongoing maintenance such as special assessments and taxes (such as Mello Roos Community Facilities Districts).

The County should also update the flood hazard regulations to restrict development in the floodway and the flood fringe, consistent with federal guidelines and current practice in comparable jurisdictions. Construction standards and review procedures also should be updated to minimize risk. While the County does impose FEMA's restrictions at the building permit stage, integrating these restrictions into zoning will avoid misunderstanding. They should also update the flood hazard regulations to address the water quality impact of manure storage areas (ponds), and apply for participation in the NFIP's Community Rating System in order to secure lower flood insurance premiums. This may require the implementation of new flood-related programs.

A new law, Assembly Bill No. 162, also requires specific flood control assessment be contained in the Land Use, Housing, and Safety Elements of the General Plan. These updates need to be included in the next revision to the Housing Element after January 1, 2009.

Refer to Chapter 4 for more information on storm drainage and flood control infrastructure.

Fire Protection

Fire protection and emergency medical response services in Humboldt County are provided by a combination of agencies, districts and organizations. They range from federal agencies such as the U.S. Forest Service (USFS) and the Bureau of Land Management (BLM), a state agency—California Department of Forestry and Fire Protection (CAL FIRE)—and local organizations such as community services districts, cities and fire districts and departments not associated with local agencies. With very few exceptions, fire departments in Humboldt County are comprised of all-volunteer firefighters and officers. The County Urban Study Areas (USAs) are primarily served by all-volunteer fire departments.

The Board of Supervisors is the governing board of one fire related district and Humboldt County plays a role in fire planning and protection. The County has taken a significant step in supporting fire protection services, with the formation of a County Fire Safe Council and preparation of a County Master Fire Protection Plan. With the preparation of the Fire Plan, the County has broadened its role in fire planning. The Fire Plan focuses on the County's coordination and oversight role, and incorporates new policies that the County will implement through the General Plan Update.

Fire protection service providers in Humboldt County operate with limited resources and demonstrate a strong need for additional funding. Expenses for essential budget items such as

the maintenance of aging apparatus, worker's compensation, and liability insurance outstrip department revenue. Although local fire organizations are very resourceful—carrying out direct fund raising, using volunteers, surplus and donated equipment, and by working cooperatively to deliver services—most fire departments report that they do not have sufficient funding to support the desired minimum level of service. As a result, fiscal stability is one of the most critical issue facing local fire related organizations.

The capacity of local fire organizations vary widely. Some have dependable revenue sources, paid staff, and up to date equipment that allow them to provide adequate services within their districts. Others have equipment in fair to poor working order, few volunteers, and no source of dependable revenue, other than the donations from the communities they serve. In discussions with local fire personnel, administrative capacity has been identified as the greatest need facing local fire organizations, especially those that are all volunteer. Other deficiencies experienced by local organizations include lack of training and lack of adequate equipment in good working order. These deficiencies prevent local organizations from providing adequate fire protection services.

The boundaries of fire related districts of the local organizations cover most of the USAs within the County. The district boundaries should be expanded to cover all of the USAs, as well as the remaining developed and developable portions of the County, and the provision of services within those areas should be expanded to meet future demand. Upgrading fire services and facilities could be accomplished through the establishment of development impact fees, increases in existing or the establishment of new special assessments and special taxes, and the expansion of existing fire related districts or the formation of a County Service Area (CSA) to fund fire protection services in areas of the county that are experiencing growth. Another service that should be considered by the County is establishing and funding a full time fire services coordinator. This position could be instrumental in assisting local organizations with building their administrative capacity, pooling resources for group equipment, identification of grant funding opportunities, volunteer recruitment and retention, and coordinating training and education programs.

Refer to Chapter 5 for additional information on Fire Protection.

Water and Wastewater

Water and wastewater service providers in Humboldt County include cities, multipurpose special districts, publicly regulated utilities, and private companies. Without exception, all water and wastewater service providers face the need to invest in the maintenance and upgrades required to keep their systems in compliance with state standards. Almost all service providers lack the funding to make the necessary improvements. Further, many of these service providers have limited managerial, financial or technical resources to draw from to solve these problems.

The Humboldt Bay Municipal Water District (HBMWD) was created to provide a reliable supply of water for both domestic and industrial purposes to customers surrounding the greater Humboldt Bay area. The HBMWD provides treated drinking water on a wholesale basis to: the City of Arcata: the City of Eureka: the City of Blue Lake: the Fieldbrook-Glendale CSD: Humboldt CSD: Manila CSD: and McKinleyville CSD, serving water to a population of approximately 80,000 people, or 60% of the Humboldt County population. The District also retails water to approximately 180 customers located in the West End Road and Fairhaven areas. HBMWD has a water right for 75 MGD and currently uses about 40 MGD on a peak day.

It is anticipated that the demands for domestic water will exceed the currently available capacity within the planning time frame of this document, based on County housing and

corresponding population projections. While the HBMWD has sufficient excess water available in its industrial system to meet the shortfall in supply in the domestic system, they will require either expansion of or upgrades to the existing Ranney collectors and treatment facilities to increase the capacity of their domestic water system. In addition, improvements to their transmission system, including replacement of the 15-inch and 18-inch Techite pipelines on the Samoa peninsula, will need to be completed to fully serve future development. The District is also currently exploring options to increase the life of the District's infrastructure and to potentially add capacity to continue to provide a reliable, safe source of drinking water to its customers. It is anticipated that the costs for these improvements will be significant and will be better defined over the next year.

The following is a listing of some of the major infrastructure improvements and issues facing the other water and wastewater service providers. The service providers are listed alphabetically and the list of improvements are not presented in any particular order of importance. This report also includes information on the systems owned and operated by incorporated cities within the County. Several USAs within the county are located just outside of City limits, and in most cases these unincorporated areas can not develop to urban densities unless they annex to the city, there is an existing services district that has a contract for services with the city, or they are able to form a community services district and make use of the existing City system.

Alderpoint County Water District

- **Water** – Provided by an infiltration gallery on the Middle Fork Eel River.
 - System needs additional storage capacity.
 - Currently not in compliance with Surface Water Treatment Rule (SWTR). System needs a treatment plant.
 - Some residents are on boil water advisory due to lack of chlorine contact time.
 - Approximately 1 mile of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
 - System needs a Grade 2 water treatment operator and a Grade 1 water distribution operator.
- **Current Improvement Plans** – The District has not developed a Capital Improvement Plan (CIP) to date for its water system. However, the District is working with the Department of Health Services to develop plans and is exploring funding options for a new water treatment plant.

Benbow Water Company

- **Water** – Provided by an infiltration gallery on the East Branch South Fork Eel River. Privately owned system.
 - System needs considerable storage capacity.
 - Currently overloading treatment filters. System needs additional treatment capacity.
 - Approximately 1.5 miles of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
- **Current Improvement Plans** – The District has not developed a CIP to date for its water system. However, the company wants to increase their water rights and expand source capacity at their infiltration gallery, and have estimated costs for expansion of their treatment facility.

Big Lagoon Community Services District

- **Water** – Provided by District wells with good water quality.
 - System needs additional storage capacity for fire flows.
 - Approximately 0.6 miles of distribution system piping will need to be replaced due to coastal bluff erosion.
- **Current Improvement Plans** – The District has not developed a CIP to date for its water system. However, the District is planning to replace some distribution piping due to coastal bluff erosion.

Briceland Community Services District

- **Water** – Provided by a spring on private property.
 - System needs additional source capacity – currently unable to meet maximum day demands.
 - System needs additional storage capacity – barely able to meet one day of maximum demands.
 - Unable to meet turbidity requirements of SWTR with existing treatment system.
 - Approximately 0.5 miles of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
- **Current Improvement Plans** – The District has no other source options, and carefully watches summertime storage tank levels, is planning treatment related improvements, but has not developed a CIP to date.

City of Arcata

- **Water** - Provided by HBMWD regional system and private wells with good water quality.
 - System meets one day of storage capacity but should consider more.
 - Approximately 15 miles of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
- **Wastewater** – Integrated wetland wastewater treatment facility and disposal to Humboldt Bay.
 - Collection system has peaking factor of ten and needs major renovations to reduce inflow and infiltration (I&I).
 - Treatment system unable to meet existing effluent limits for their permitted discharge, as shown by an Administrative Civil Liability Order and Complaint in the past two years.
- **Current Improvement Plans** – The City is in the process of developing a long-term CIP for both its water and wastewater systems. Plans are underway for increased storage in the water system, as well as improvements to the wetland wastewater treatment system.

City of Blue Lake

- **Water** – Provided by HBMWD regional system.
 - System meets one day of storage capacity but should consider more.
- **Wastewater** – Collection, treatment, and disposal to percolation ponds on Mad River bar.
 - Collection system has peaking factor of six to seven and needs renovation to reduce I&I.
 - Treatment system appears to be exceeding permitted organic loading rates since the Casino came online (allowed 300 lbs/day, currently processing 400 lbs/day on average). Additional upgrades will also likely be needed to address current and near term future regulations.
 - Summertime disposal method will come under increasing scrutiny and will likely not be allowed in the near future.
- **Current Improvement Plans** – The City is in the process of developing a CIP for its wastewater system which identifies \$11 million in improvements over the next 10 years.

City of Eureka

- **Water** – Provided by HBMWD regional system.
 - System meets one day of storage capacity (has about four days).
- **Wastewater** – Collection, treatment, and disposal thru an outfall to the Ocean.
 - Collection system has peaking factor of between 3.3 and ten and needs renovation to reduce I&I.
 - Treatment system is currently being evaluated to meet current and future needs and the results of this evaluation are anticipated to be completed in 2008.

- The City and HCSD have a contract to convey wastewater through the City's collection system and share capacity at the Elk River WWTP.

City of Ferndale

- **Water** – Provided by wells that are owned by a private water company.
- **Wastewater** – Collection, treatment, and disposal to Francis Creek or irrigation on nearby agricultural lands.
 - Collection system has peaking factor of approximately seven to ten and needs renovation to reduce I&I.
 - Treatment and disposal system will need upgrades to address current and near term future regulations. City is currently evaluating alternatives and the results of this evaluation are anticipated to be completed in 2008.

City of Fortuna

- **Water** – Provided by City wells with good water quality.
 - Water demand is approximately 94 % of permit capacity, City of Fortuna may need to seek permits from DWR for additional source capacity
 - No major water system deficiencies found. However, several reservoirs need rehabilitation.
- **Wastewater** – Collection, treatment, and disposal to Strong's Creek or percolation ponds on Eel River bar.
 - Collection system has peaking factor of approximately seven and needs renovation to reduce I&I.
 - Treatment system will need upgrades to address current and near term future regulations.
 - Summertime disposal method will come under increasing scrutiny and will likely not be allowed in the near future.
 - California Toxics Rule (CTR) issues surrounding copper, dichlorobromomethane, and chlorodibromomethane
- **Current Improvement Plans** – The District recently completed a hydraulic study of its water system and developed a CIP that addresses necessary improvements to distribution and storage within its water system. A CIP was also recently completed for the wastewater system that identifies necessary improvements to the collection and treatment systems.

City of Rio Dell

- **Water** – Provided from an infiltration gallery on the Eel River.
 - No major deficiencies found. However, some distribution piping needs replacement.
- **Wastewater** – Collection, treatment, and disposal to the South Fork Eel River or percolation ponds on the South Fork Eel River bar.

- City is currently under a Cease and Desist Order for summertime disposal method and an Administrative Civil Liability Order for effluent limit violations.
- Alternative summertime disposal methods are currently being explored.
- Collection system has peaking factor of six to seven and needs renovations to reduce I&I.
- CTR issues surrounding copper, cyanide, dichlorobromomethane, and MTBE
- **Current Improvement Plans** – The City recently completed a series of improvement projects to the water system and has recently changed focus to necessary improvements within the wastewater system. The City has not yet developed a CIP for either the water or wastewater systems.

Garberville Sanitary District

- **Water** – Recently purchased private water system. Water provided by an infiltration gallery on the South Fork Eel River.
 - System needs additional storage capacity.
 - Approximately 5 miles of distribution system piping is undersized for adequate fire flows or in need of replacement (original system from 1930s).
 - Need emergency backup power at raw water intake and treatment plant.
- **Wastewater** – Collection, treatment, and year-round disposal to percolation ponds on the South Fork Eel River bar.
 - Wastewater system is currently under a Cease and Desist Order for exceeding permitted flows by over 233% and chronic effluent limit violations. The system is under a moratorium for new connections.
 - Collection system has peaking factor of approximately four and needs renovations to reduce I&I.
 - Summertime disposal method will come under increasing scrutiny and will likely not be allowed in the near future.
- **Current Improvement Plans** – The District has not developed a CIP to date for its water system. However, the District has identified a Water System Improvements Project, and is exploring funding for a necessary wastewater system expansion and improvements.

Fieldbrook Glendale Community Services District

- **Water** – Provided by HBMWD regional system.
 - System needs stand by generator at booster pump station.
 - System needs additional storage capacity.
 - System needs booster pump station at Korplex due to low system pressures under full buildout.
- **Wastewater** – Collection by FGCSO and contract with City of Arcata for treatment and disposal.

- Collection system has low peaking factor of approximately two.
- Future development limited by contract with City of Arcata. Alternative treatment and disposal options must be found.
- **Current Improvement Plans** – The District has not developed a CIP to date for its water or wastewater system. However, the District does have plans for water system improvements and is exploring options for wastewater treatment and disposal.

Humboldt Community Services District

- **Water** – Provided by HBMWD regional system and District wells with good water quality.
 - System needs additional storage capacity.
 - Approximately 10 miles of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
- **Wastewater** – Collection by HCSO and contract with City of Eureka to convey, treat, and dispose of wastewater.
 - Collection system has peaking factor of approximately six and needs renovation to reduce I&I.
 - The District is currently operating at approximately 60% of contracted flows.
 - The City of Eureka's collection, treatment and disposal system will need upgrades to serve full build out of the District.
- **Current Improvement Plans** – The District recently completed a hydraulic study of its water system and has developed a CIP for both its water and wastewater systems.

Hydesville County Water District

- **Water** – Provided by District wells with good water quality.
 - Approximately 3 miles of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
 - System needs a Grade 2 water distribution operator.
- **Wastewater** – Residents are not interested in developing a community wastewater system.
- **Current Improvement Plans** – The District has not developed a CIP to date for its water system but has identified some improvements needed in its water system.

Indianola

- **Water** – Most drinking water provided by private, individual wells with poor water quality, some portions of WSA receive water from the City of Eureka system.
 - In need of service provider to extend water service to study area. (There are Local Agency Formation Commission issues with respect to extension of service in this area.)

- **Current Improvement Plans** – Residents have requested service from both HCSD and the City of Eureka. No plans for extension of service have been developed, but HCSD has expressed interest in extending service to this area.

Jacoby Creek County Water District

- **Water** – HBMWD water provided through contract with City of Arcata.
 - System needs additional storage capacity – unable to meet one day of maximum day demands.
 - Approximately 1 mile of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
- **Current Improvement Plans** – System operated by City of Arcata under contract. The District has not developed a CIP to date for its water system.

Loleta Community Services District

- **Water** – Provided by District wells with poor quantity and quality (high levels of iron and manganese).
 - System needs additional sources of supply and potentially upgrades to its treatment system.
 - System needs additional storage capacity.
 - Approximately 1 mile of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
- **Wastewater** – Collection, treatment, and year-round disposal to percolation ponds near a slough associated with the Eel River.
 - Has received a Cease and Desist Order, a Cleanup and Abatement Order, and an Administrative Civil Liability Order within the past three years.
 - Does not have qualified personnel and currently contracts to a licensed operator for supervision.
 - Collection system has peaking factor of approximately ten and needs renovations to reduce I&I.
 - Treatment system will need upgrades to address current and near term future regulations.
 - Summertime disposal method will come under increasing scrutiny and will likely not be allowed in the near future.
 - CTR issues awaiting Reasonable Potential Analysis
- **Current Improvement Plans** – The District has not developed a CIP to date for its water or wastewater systems, but has identified some necessary improvement projects for its water system.

Manila Community Services District

- **Water** – Provided by HBMWD regional system.
 - System needs additional storage capacity.
 - Approximately 1 mile of distribution system piping is undersized for adequate fire flows
- **Wastewater** – Collection, treatment, and year-round disposal to percolation ponds on the North Spit of Humboldt Bay.
 - Collection system has peaking factor of approximately three, indicative of low I&I.
 - Treatment facilities operating well and at about half of design capacity.
- **Current Improvement Plans** – The District has not developed a CIP to date for its water or wastewater systems.

McKinleyville Community Services District

- **Water** – Provided by HBMWD regional system.
 - System has more than one day of storage and is planning to develop additional capacity.
 - System needs upgrade to booster station at North Bank Rd. to improve system pressures and pump performance when HBMWD water levels are low.
- **Wastewater** – Collection, treatment, and disposal to Mad River or percolation ponds or irrigation.
 - Collection system has lowest peaking factor in the County, of approximately two.
 - District is currently under an Administrative Civil Liability Order to improve performance of newly installed wetland to meet effluent limits.
 - Summertime disposal method to percolation ponds will likely come under increasing scrutiny and may not be allowed in the near future.
- **Current Improvement Plans** – The District has developed a CIP that addresses necessary improvements to both its water and wastewater systems.

Miranda Community Services District

- **Water** – Provided by District wells with good water quality but low pH.
 - System needs additional storage capacity.
 - Approximately 0.5 miles of distribution system piping is undersized for adequate fire flows and/or in need of replacement.

- **Wastewater** – Collection, treatment, and disposal to percolation ponds on the South Fork Eel River bar.
 - Collection system has a low peaking factor of approximately three.
 - Summertime disposal method to percolation ponds will come under increasing scrutiny and will likely not be allowed in the near future.
- **Current Improvement Plans** – The District has not developed a CIP to date for its water or wastewater systems.

Myers Flat Mutual Water Company

- **Water** – Provided by private landowner well and surface water source on Pete's Creek.
 - Surface water source not in compliance with SWTR due to lack of treatment.
 - Well source is barely capable of meeting maximum day demands, and its use by the Water Board has been the source of much litigation in the recent past.
 - Approximately 1 mile of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
 - System needs a Grade 1 water distribution operator and will need a Grade 2 water treatment operator if a treatment system is installed.
- **Current Improvement Plans** – The Myers Flat Mutual Water Company has not developed a CIP to date for its water system but has recently completed a study to identify necessary water system improvement projects. The Water Company is also looking into the formation of a CSD.

Orick Community Services District

- **Water** – Provided by District wells with good water quality.
 - System needs additional storage capacity.
 - Approximately 0.5 miles of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
- **Wastewater** – Collection, treatment, and disposal facilities are currently being planned.
- **Current Improvement Plans** – The District has not developed a CIP to date for its water system but has received funding and is in the process of developing plans for a community wastewater system.

Orleans Community Services District

- **Water** – Provided by an infiltration gallery in Peach Creek.
 - System needs considerable storage capacity.
 - Approximately 1 mile of distribution system piping is undersized for adequate fire flows and/or in need of replacement.

- **Current Improvement Plans** – The District has recently completed a CIP for its water system and has plans for improvements to expand source, storage, and treatment capacity.

Phillipsville Community Services District

- **Water** – Provided by surface water spring source and District well with poor water quality.
 - Existing spring source is not in compliance with SWTR, and unable to meet current maximum day demands.
 - Existing well source is high in iron and manganese and has low pH which contributes to corrosion within the water system.
 - System needs additional storage capacity – unable to meet one day of maximum day demands.
 - Approximately 0.5 miles of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
- **Current Improvement Plans** – The District has not developed a CIP to date for its water system but is seeking funding for necessary improvements to the water system.

Redcrest Water Works

- **Water** – Provided by infiltration gallery in Chadd Creek.
 - System needs additional storage capacity – unable to meet one day of maximum day demands.
 - Approximately 0.5 miles of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
 - Unable to meet turbidity requirements of SWTR with existing treatment system.
- **Current Improvement Plans** – The District has not developed a CIP to date for its water system but has plans to improve its treatment system and expand storage capacity.

Redway Community Services District

- **Water** – Provided from an infiltration gallery on the South Fork Eel River and an unnamed spring source.
 - System needs additional storage capacity.
 - Existing capacity of water treatment plant insufficient to meet current maximum day demands.
 - Approximately 0.5 miles of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
- **Wastewater** – Collection, treatment, and disposal to upland percolation ponds and direct discharge to the South Fork Eel River.
 - Treatment system is exceeding BOD and TSS effluent limits for their permitted discharge, as outlined in recent Administrative Civil Liability Order. Upgrades will be needed to correct current deficiencies and to meet near term future regulations.
 - Collection system has a peaking factor of approximately three to four.
 - CTR issues surrounding dichlorobromomethane
- **Current Improvement Plans** – The District is in the process of developing a CIP for both its water and wastewater systems. No plans are underway for the water system, but the District is currently making improvements to its wastewater treatment system as part of a compliance project and has plans for collection system improvements.

Riverside Community Services District

- **Water** – Provided by District wells with good water quality.
 - System needs additional storage capacity.
 - Approximately 1 mile of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
- **Current Improvement Plans** – The District has not developed a CIP to date for its water system and has no need for any major improvements at this time.

Town of Samoa

- **Water** – Will be provided by HBMWD regional system.
 - System needs storage capacity.
 - System needs new distribution system
- **Wastewater** – Collection, treatment, and disposal facilities are being planned.
 - System needs new collection, treatment and disposal facilities. Treatment will likely consist of sequencing batch reactor or equivalent technology with disposal to leaky wetlands.
- **Current Improvement Plans** – All necessary infrastructure improvements are being incorporated as part of the Samoa Town Master Plan development.

Shelter Cove Resort Improvement District #1

- **Water** – Provided from surface water sources on Rick Spring and Telegraph Creek.
 - Approximately 1 mile of old coal tar coated steel pipe in distribution system is in need of replacement.
- **Wastewater** – Collection, treatment, and disposal to ocean outfall and reuse for irrigation.
 - The District is currently under an Administrative Civil Liability Order for BOD and TSS effluent limit violations, primarily related to excessive I&I during winter storms.
 - Collection system has a peaking factor of approximately five and needs renovations to reduce I&I.
- **Current Improvement Plans** – The District has recently completed a CIP for both its water and wastewater systems. The District has identified necessary improvements to its water system, including a treatment plant upgrade, main replacements, and source capacity expansion. Efforts are also underway to reduce I&I within the collection system.

Town of Scotia

- **Water** – Provided from an infiltration gallery on the Eel River. The owner of this private system is looking to form a public service provider.
 - Approximately 3 miles of distribution system piping is undersized for adequate fire flows and/or in need of replacement. New fire hydrants and water meters/ service connections are needed.
 - System needs to be upgraded to meet public system standards.
- **Wastewater** – Collection, treatment, and disposal to the South Fork Eel River or percolation ponds on the South Fork Eel River bar.
 - Town is currently under a Cease and Desist Order for BOD and TSS effluent limit violations.
 - Treatment facility is located within the 100-year floodplain, which makes funding more difficult.
 - Collection system has peaking factor of seven to eight and needs renovations to reduce I&I.
 - Summertime disposal method to percolation ponds will come under increasing scrutiny and will likely not be allowed in the near future.
- **Current Improvement Plans** – A CIP has not been developed to date for Scotia's water or wastewater systems. Necessary improvements were identified in recent studies but will likely not be completed until the fate of the town is identified.

Weott Community Services District

- **Water** – Currently provided by surface water sources on Mill Creek, Corner Creek, and Deck Creek. A new well of poor water quality has been recently developed.
 - Existing sources of water are in newly designated wilderness area, and the new well that has been developed has poor water quality. Needs additional water source.
 - System needs additional storage capacity.
 - Existing capacity of water treatment plant insufficient to meet current maximum day demands.
 - Iron and manganese removal will need to be incorporated into treatment system if new well is to be brought online.
 - Approximately 2.5 miles of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
- **Wastewater** – Collection, treatment, and disposal to a community leach field.
 - Collection system has a low peaking factor of approximately two.
 - Treatment and disposal systems are operating well within their hydraulic and treatment capacity.
- **Current Improvement Plans** – The District has not developed a CIP to date for its water or wastewater systems but has identified improvements needed for the water system.

Westhaven Community Services District

- **Water** – Provided by surface water spring sources on Two Creek and a District well.
 - System needs source capacity –barely able to meet maximum day demands.
 - Approximately 1 mile of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
- **Current Improvement Plans** – The District has not developed a CIP to date for its water system but has plans for necessary improvements to storage and distribution.

Willow Creek Community Services District

- **Water** – Provided by surface water sources on Willow Creek.
 - System needs additional storage capacity.
 - Approximately 2.5 miles of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
- **Wastewater** – Collection, treatment, and disposal facilities are currently being planned.
- **Current Improvement Plans** – The District recently completed a new water treatment facility. A CIP has also been developed for the water system, and plans are underway to develop a community wastewater system.

Please refer to Chapters 6 and 7 for more detailed descriptions of study areas and discussion of recommended infrastructure improvements needed to correct current deficiencies, meet current and near term future regulations and to provide adequate capacity for future growth.

Street Lights

There is evidence that in urban and suburban areas, where there are intersections and concentrations of pedestrians, street lights tend to reduce crashes. In addition to its traffic safety benefits, lighting may serve as a crime deterrent, may aid law enforcement agencies, and contribute to user comfort and community pride. Street lights can be provided by counties, cities, or by special districts. Lighting services can be funded through a portion of the one-percent property tax revenue; through a special assessment, or special tax levied by districts, cities, or a county; as service charges through utility billing; or through other general fund revenue. In Humboldt County, street lighting is provided by each of the seven cities; the Humboldt, McKinleyville, and Willow Creek community services districts; and eight street lighting districts formed by Humboldt County and governed by the Board of Supervisors.

Street lights are available throughout only 21 percent of the USAs/WSAs, partially available within approximately 29 percent of the USAs/WSAs, and not available in 50 percent. The Humboldt County General Plan does not contain policies or standards regarding street lighting, nor does the Humboldt Department of Public Works Roadway Design Standards Manual. The General Plan Update should include policies and standards regarding the provision of street lights serving urbanized areas and well as policies encouraging existing special districts to seek authorization to provide street light services.

Please refer to Chapter 8 for additional information on Street Lights.

Parks and Recreation

Parks and open space areas are important elements of the urban environment. As a rural county, Humboldt County has a wealth of outdoor recreational opportunities. More than twenty percent of the county's 2.3 million acres are protected open space, forests, and recreation areas. Within the county boundaries, there are federal and state parks, 16 county parks and beaches, recreational areas and reserves, city parks, and parks operated by special districts and non-profit organizations. These areas contribute to the quality of life in Humboldt County and provide needed recreation opportunities for residents of neighboring counties and visitors from all over the world. However, most parks in Humboldt County are regional in scope. Outside the seven Humboldt County cities, there are few local community or neighborhood parks.

The National Recreation and Park Association (NRPA) maintains standards and classifications for recreational facilities that are utilized by local agencies across the nation. The state Quimby Act was enacted to preserve open space and parkland in urban areas and allows cities and counties to establish requirements for new development to dedicate land for parks, pay an in-lieu fee, or perform a combination of the two. Aside from Quimby Act related regulations in the Zoning Code, Humboldt County policies and standards relating to community and neighborhood parks and recreation are found in only in a few community plans.

Aside from three community services districts, school grounds, and a few non-profit park facilities, community and neighborhood parks are available only within cities. The General Plan Update should include policies and standards regarding the provision of community and neighborhood parks and recreation facilities serving urbanized areas and well as policies encouraging existing special districts to seek authorization to provide such services.

Please refer to Chapter 9 for additional information on Parks and Recreation.

Schools

Humboldt County communities are served by 32 public school districts, private schools, and schools operated by the Humboldt County Office of Education. Although some schools have experienced growth, public school enrollment in the County has declined at an average annual rate of approximately 0.5 percent per year since 1990. The decline in Humboldt County school enrollment is expected to continue.

Although Humboldt County does not regulate or operate schools, there is a connection between Humboldt County General Plan and school planning and operations. Humboldt County land use planning can lead to changes in school enrollment. As a result, land use decisions should be closely coordinated with school districts to ensure that school capacity is available when student enrollment increases. In addition, school facilities are often utilized as community neighborhood park facilities. As such, school districts should be included in local park and recreation related planning.

Please refer to Chapter 10 for additional information on Schools.

Public Utilities

For the purposes of this analysis public utilities include electricity, natural gas, and telecommunications. Electricity, natural gas, and telephone providers are regulated by the California Public Utilities Commission, which establishes rules relating to service delivery and rates and charges associated with providing and extending service. The County's interaction with public utilities is confined to franchise agreements, referrals regarding development applications, and activities within the County rights of way and land use approvals. Public Utilities are reasonably adequate in Humboldt County with the following exceptions: lack of telecommunications in certain rural Humboldt County communities; and lack of redundancy in Humboldt County's connection to the fiber network. Humboldt County should closely coordinate with public utility providers to ensure that services are available to all areas where development is occurring and where additional utility needs affect existing development.

Please refer to Chapter 10 for additional information on Public Utilities.

Infrastructure Cost Summary

A summary of estimated unit costs for low and high build out conditions in the individual study areas is included below. It is important to understand that these are estimated costs and that a portion of the costs shown are due to improvements needed to address existing deficiencies and changes in the regulations. The costs shown below should be considered a "first cut" to show the order of magnitude of the infrastructure needs for each USA/WSA and should be refined through subsequent detailed studies. As a general rule, the unit costs should be lower under the high build out scenario due to economies of scale. The situations where the low build out costs are less than the high build out costs is usually due to a condition where there is some existing infrastructure that can accommodate the low build out and additional infrastructure is needed in the high build out case.

Table ES-2. Estimated Unit Cost Summary by USA for Water and Wastewater Infrastructure

USA/WSA	Water Unit Costs		Wastewater Unit Costs	
	Low Build-Out	High Build-Out	Low Build-Out	High Build-Out
Alderpoint WS	\$19,034	\$17,193	N/A	N/A
Arcata USA	\$2,551	\$2,468	\$2,881	\$2,973
Benbow WS	\$27,976	\$27,935	N/A	N/A
Big Lagoon WS	\$11,932	\$11,000	N/A	N/A
Blue Lake USA	\$0	\$0	\$19,608	\$16,717
Blue Lake WS	\$0	\$0	N/A	N/A
Briceland WS	\$26,462	\$22,538	N/A	N/A
Fieldbrook WS	\$978	\$1,325	N/A	N/A
Fortuna USA	\$ Unknown	\$ Unknown	\$2,643	\$2,572
Freshwater WS	\$1,257	\$1,257	N/A	N/A
Garberville USA	\$12,182	\$10,655	\$31,056	\$28,409
Garberville WS	\$12,182	\$10,655	N/A	N/A
Glendale USA	\$978	\$1,325	\$27,027	\$3,693
Glendale WS	\$978	\$1,325	N/A	N/A
Humboldt Hill USA	\$1,257	\$1,257	\$ Unknown	\$ Unknown
Hydesville USA	\$2,143	\$1,613	\$	\$
Hydesville WS	\$2,143	\$1,613	N/A	N/A
Indianola WS	\$4,221	\$3,947	N/A	N/A
Jacoby Creek WS	\$2,051	\$2,072	N/A	N/A
Loleta USA	\$4,352	\$4,509	\$30,581	\$28,090
Manila USA	\$1,475	\$1,388	\$0	\$0
McKinleyville USA	\$145	\$419	\$1,465	\$1,148
McKinleyville WS	\$145	\$419	N/A	N/A
Miranda USA	\$7,770	\$7,207	\$25,317	\$21,739
Myers Flat WS	\$10,738	\$10,336	N/A	N/A
Myrtle town USA	\$1,257	\$1,257	\$ Unknown	\$ Unknown
Myrtle town WS	\$1,257	\$1,257	N/A	N/A
Orick USA	\$2,523	\$2,553	\$31,250	\$31,250
Orick WS	\$2,523	\$2,553	N/A	N/A
Orleans WS	\$11,859	\$17,493	N/A	N/A
Phillipsville WS	\$17,250	\$17,250	N/A	N/A
Redcrest WS	\$23,267	\$22,224	N/A	N/A
Redway USA	\$3,673	\$4,300	\$6,083	\$4,492
Rio Dell USA	\$2,222	\$2,211	\$15,244	\$15,174
Rio Dell WS	\$2,222	\$2,211	N/A	N/A
Riverside WS	\$22,495	\$22,495	N/A	N/A
Samoa USA	\$0	\$1,830	\$ Unknown	\$ Unknown
Scotia USA	N/A	N/A	\$ 54,237	\$ 54,237
Shelter Cove USA	\$2,618	\$2,768	\$ Unknown	\$ Unknown
Shelter Cove WS	\$2,618	\$2,768	N/A	N/A
South Eureka USA	\$1,257	\$1,257	\$ Unknown	\$ Unknown
South Eureka WS	\$1,257	\$1,257	N/A	N/A
Weott USA	\$20,310	\$19,786	\$0	\$0
Westhaven WS	\$7,622	\$3,918	N/A	N/A
Willow Creek USA	\$3,686	\$5,818	\$ Unknown	\$ Unknown
Willow Creek WS	\$3,686	\$5,818	N/A	N/A

NOTE: Unknown wastewater unit costs for Humboldt Hill USA, Myrtle town USA, and South Eureka USA are due to ongoing negotiations and uncertainties associated with the future of the Elk River WWTP and the Martin Slough Interceptor.

A summary of estimated infrastructure costs for the unincorporated area of the County are summarized below.

Table ES-3. Estimated Infrastructure Costs for Humboldt County

Infrastructure Category	Estimated Cost for Countywide Improvements (\$)
Roadway Infrastructure ¹	\$28.7 million
Law Enforcement	\$8.5 million
Storm Drainage & Flood Control	Unknown
Fire Protection	Unknown
Water ²	\$110.6 million
Wastewater ²	\$137 million

NOTES: ¹ The roadway infrastructure costs do not include approximately \$44 million in improvements needed for the City of Eureka. Further analyses will be required to determine cost allocation between the City and County.

² Water and wastewater costs shown are representative of high build-out conditions. These values also do not contain infrastructure costs for many systems where infrastructure costs were unknown.

Some of the costs shown in Table ES-2 are labeled as unknown due to lack of available information. For storm drainage and flood control, the County does not currently have a capital improvements plan in effect. A comprehensive evaluation of the infrastructure and a CIP should be developed to estimate these costs. Fire protection costs are also shown as unknown due to funding irregularities for fire protection districts, including district size, location, budget, personnel types of training and equipment. Although capital costs for districts can be identified, costs to operate facilities in the most efficient manner vary by district.

Key Issues

Many key issues were identified during the preparation of the Community Infrastructure and Facilities Technical Report. Key issues are addressed through development of policy options. Several policy proposals and key issues for policy development include the following:

Administration: Many of the service providers represent communities with less than 1,000 service connections. The governing boards of these agencies are volunteers and the small size of their Districts makes it very difficult for them to generate the financial resources to properly operate, maintain and upgrade their services and infrastructure and maintain compliance with generally accepted levels of service and state and federal regulations. These agencies often do not have the sufficient ongoing revenue to attract or retain qualified technical and managerial staff. In some cases, the Districts struggle to find members of the community that are interested in taking on the thankless job of serving on the board of directors. It should also be noted that providers share resources and work cooperatively in an ad hoc manner to provide service.

Ongoing Revenue: Water and sewer service providers set rates that are intended to cover their costs. Historically, these rates were adjusted infrequently and often times only covered their cash needs, without accumulating sufficient funds to cover replacement of the system. In addition to the monthly service charges, these systems have connection charges which represent a payment to the service provider for use of the capacity in the existing system by a new user. The purpose of this charge is to enable the service providers to develop the necessary reserves to expand the system when needed. Many of the service providers are recognizing this shortfall and have been adjusting the monthly rates they charge annually. Costs for all services have been rising ahead of inflation in an effort to address the regulatory, replacement and operational issues outlined herein. While rates for water and sewer service have historically been low and have generally not been adequate to cover the whole cost of providing the service, the increases that will be needed to fund operation and maintenance, capital replacement, and regulatory changes will potentially send "rate shock" through these Districts. Working

collaboratively could provide opportunities to reduce the costs for providing these essential services.

Funding of Infrastructure: The most significant obstacle facing communities with respect to both rehabilitation and construction of new infrastructure is funding. Almost all of the providers serve small communities with limited resources. Assistance from the County would likely help the agencies secure the needed funding. Even large developments, in some cases, may have difficulty utilizing traditional land-based financing mechanisms (such as assessment districts or community facilities special tax districts, to be discussed later in this report) because of the small size, and slow rate of build-out, of the project relative to the cost of improvements.

Historically, nearly all infrastructures in the County and the United States have been built with grant funds paying for a significant portion of the project's costs. In rural America, grant funding for between 75% and 95% of the project's costs were typically needed to make the project affordable. While some grant funding is still available today, many programs have changed to revolving loan or a combination of grant and loan with greater emphasis on the loan program. The result is that the grant programs are more competitive, and local agencies need to submit the most competitive application possible to be successful. The County has secured over \$10 million in grants through Proposition 50 for watershed restoration and water and wastewater projects. For instance, \$2.5 million has been programmed for the Martin Slough Interceptor project and will help address current and future wastewater collection problems in the City of Eureka. The County is working with service providers to secure a similar or greater amount of funding from Proposition 84 funds.

Grant availability for roadway infrastructure has declined in recent years. One key issue for rural roadway expansion or construction is the lack of an adequate infrastructure financing mechanism to ensure that users pay their "fair-share" of off-site impacts in road infrastructure. A challenge for the County will be to strike a balance between funding maintenance (and preservation) of Humboldt County's existing transportation systems and creating roadway (multi-modal) capacity in areas where population growth and travel increases are projected to occur.

For County law enforcement services provided by the Sheriff's Office, a critical, detailed review and assessment of long-term facility needs and associated costs will likely indicate the need for a substantial increase in ongoing or one-time funds. Possible sources in addition to General Fund monies include impact fees, special taxes, or utility user or sales taxes.

Key fire protection issues that have been identified during the preparation of the Capital Facilities Technical report tend to be related to insufficient funding. Some of the major issues include:

- Lack of stable revenues
- Insufficient staffing levels
- Lack of needed and required training
- Lack of administrative capacity
- Lack of Level of Service standards for local fire agencies
- Lack of fire prevention and public safety education
- Outdated or poorly maintained equipment and facilities
- Fire services are being extended beyond adopted service boundaries
- Gaps in services between fire protection districts
- Poor communications
- High cost purchasing and insurance

Interagency Cooperation: Efforts should be made to further develop the County's role in fostering development and supporting infrastructure. The County should work to foster coordination between service providers. The County could facilitate the development of resources such as an "experience exchange;" equipment lending library; providing direct support to special districts (including small districts in the workman's comp insurance pool similar to what the County has offered fire protection districts); and seeking funding for qualified operators to serve multiple small districts, similar to a "circuit rider."

Roadway infrastructure maintenance and improvement activities would benefit from greater County-wide consistency on design standards (functional classifications) and more cooperation and coordination among County departments (particularly Community Development Services (Planning) and Public Works) on transportation system (roadway infrastructure, circulation) management. The Greater Eureka Area Travel Model (GEATM) is a powerful (though currently underutilized) tool that can be utilized for planning roadway maintenance and improvement projects as well as for circulation planning.

The Sheriff's Office efforts to keep Humboldt County citizens safe and secure may be furthered by coordination with the County Community Development Services Department on design standards for new development, particularly on approaches to community design that have been shown in other locations to facilitate a reduction in crime rates.

Influencing State Regulations: The County could proactively support the water and sewer service providers in affecting legislation and state agencies. In particular, issues related to wastewater disposal could have a profound effect on the county's infrastructure needs.

Next Steps

At the request of the service providers, the County could take a leading role in expanding the capacity for infrastructure maintenance and development, especially in more rural areas. The County has already begun this effort with its Master Fire Protection Plan and the Proposition 50 coordinating role. Currently, the County provides planning and some infrastructure, such as roads, storm drainage and law enforcement, and governs one Fire District. For other services such as water, sewer, and fire protection, communities rely on a multitude of individual special districts to provide these services. Historically, the County has provided water and sewer services through several County Service Areas. Many communities would benefit greatly from the County taking a more active role in these services.

Many, if not most of the special Districts within the County are operating on minimal budgets, oftentimes without licensed operators, and have aging and deteriorating infrastructure without the financial ability to make necessary capital improvement projects. Infrastructure is the life blood of the County, enabling its residents to live, work and play. The County could expand its leadership role, beyond the coordinating efforts of the Proposition 50 program and the Humboldt Fire Safe Council, to address some of the deficiencies noted herein. To increase the chances of success, the County could act in a supportive and cooperative manner that brings value to service providers through a partnership. The Community Infrastructure and Services Element will further describe policies that the County could adopt to help solve these problems. The following are some possible roles that the County could take:

If the service providers requested, the County could participate in a range of strategies from the formation of a county wide association of service providers to a memorandum of understanding or some other type of agreement that would allow the County to facilitate various programs.

Additional information is provided in the last chapter of this report which discusses Implementation.

The information contained in this technical report has been used as a basis for the development of the goals, policies, standards and recommended implementations contained in the accompanying Community Infrastructure and Services Element and the Circulation Element. These documents should be reviewed and refined by the public, the Planning Commission and the Board of Supervisors so that they may serve to guide infrastructure development in the County over the next twenty years.

1. Introduction

1.1. Purpose

The purpose of this technical report is to serve as the basis for the Community Infrastructure and Services Element of Humboldt County's General Plan Update. This element is responsible for identifying policies and implementation measures to provide the necessary infrastructure to support existing capacity and future growth within the County. Infrastructure and services considered herein includes water, wastewater, law enforcement, fire protection, roads, and stormwater control. Available financing options for funding infrastructure improvements are also evaluated. Additional roadway related policies and programs are intended to be incorporated into the draft Circulation Element.

1.2. Organization of report

This Report is organized by chapters, each dedicated to a separate infrastructure and public facilities type. Chapters include road infrastructure, law enforcement, storm drainage and flood control, fire protection, water, wastewater, streetlights, parks and recreation, schools, and public utilities. A section dedicated to discussion on funding infrastructure is also included, as well as a section summarizing an implementation plan.

1.3. Methodology

In 2005 the County defined specific Urban Study Areas (USAs), areas where water and/or sewer systems exist or may be appropriate to consider, for the purpose of evaluating development potential and infrastructure capacity within the County. Study areas are further broken down into two main sub-categories: Urban Service Study Areas (USAs) and Water Service Study Areas (WSAs). Urban Service Study Areas are areas where sewer and water service exist or may be feasible to provide, and development densities greater than one unit per acre are appropriate to consider. Water Service Study Areas are areas where only water service exists or may be feasible to provide, and development densities less than one unit per acre are appropriate to consider.

1.3.1. Development Projections

The County has made development projections for residential land within Urban Study Areas to identify the likely number of residential units at buildout, where all developable residential land is occupied by housing units. The County used its extensive GIS database to identify vacant and underdeveloped residential parcels within unincorporated areas of the County. Total acreages and the developable portion of each of these vacant or underdeveloped parcels were determined. The net developable acreage (total minus constrained parcel acres) takes environmental and site constraints, such as wetland and slope constraints, into consideration to determine the actual acreage of land available for development. net developable acreage for each parcel was multiplied by two different residential densities (the number of dwelling units permitted per net acre of land as measured in terms of acres per dwelling unit) to develop "low" and "high" estimates of development potential. The low estimate is based upon the mid point of development potential of the current General Plan land use designations and the high estimate

reflects potential changes in density (such as increasing the allowable density range of the RL designation from 1 to 7 dwelling units per acre to 3 to 8 dwelling units per acre or adding additional multifamily residential land.) The actual development that can (legally) occur on these parcels using the maximum density allowable under the current zoning is higher than the high estimate. The development projections are summarized in Table 1-6.

The County utilized the following data sets to identify constrained areas in identifying developable land:

- National Wetland Inventory, Humboldt County Local Coastal Program Wetlands, and McKinleyville Community Plan wetlands data;
- Humboldt County Streamside Management Area data;
- Federal Emergency Management Agency "Q3" flood map data;
- Freshwater and Elk River Light Detecting and Raging data (LIDAR), as applicable;
- Prime agricultural soil maps;
- Alquist-Priolo Fault Zoning Act maps as established by the California Geological Survey;
- California Division of Mines and Geology Watershed Mapping Historic Landslide Areas;
- U.S. Department of Agriculture National Agricultural Inventory Program imagery; and
- United States Geologic Survey 10-meter digital elevation model data.

In developing this report, the service providers were asked to review the development projections that have been made. Input from the service providers has been valuable and has resulted in revisions to the development estimates.

Like all data bases, the development projections should be subject to regular refinement and updating. There has been some controversy surrounding the accuracy of the development potential as determined using the County's GIS data base. Some of the main issues we heard in our review of this information can be summarized into the following categories:

1. *"In many instances the current infrastructure will not support this level of development."* While this statement may be correct, it fails to recognize that the proper sequence is to define the development potential and then to plan and develop the necessary infrastructure. Otherwise, the long range plan would only be based upon what infrastructure is currently in place without making any improvements.
2. *"Parcels that are currently underdeveloped, based upon current zoning do not have a potential for additional development."* The redevelopment of these parcels will likely not occur until economic conditions make this an attractive alternative. Whether the economic conditions change to make this attractive within the planning period is unknown. However, to remove this ability (for redevelopment) will require the County to "downzone" these parcels, which is not something that we recommend.
3. *"Current owners of parcels do not want to develop them or do not wish to develop them to the density desired by the County."* We believe that the subjective nature of this argument makes it impossible to quantify. Further, we believe it would be a mistake to take these development rights away from the property owners by down zoning their parcels. It should also be noted that the minimum development numbers are based upon the densities required by the state as an average that must be obtained throughout the County. So while individual parcels may be developed at higher or lower densities, the use of this average for planning purposes is appropriate.

The development potential identified by the County GIS database and as updated in this effort served as the basis for determining and planning major infrastructure upgrades and improvements that will be required to accommodate this growth. It is important to note that, based on current general plan and zoning regulations, parcels could be developed with more units than is shown in the high estimate and this needs to be taken into account before building any actual improvements. It is also important to note that the County's "high" and "low" projections reflect what the *land can bare* based on the allowable use of the land and the physical constraints that affect the land. These development projections are not related to a specific planning period or a projected growth rate.

1.3.2. Humboldt County Population and Housing Growth

The County has identified the past rates of growth for each individual USA and WSA based on recent population and housing development. The county building permit database in conjunction with 1990 and 2000 census data were used to identify the housing and population growth that has occurred over the past ten years within Humboldt County.

Past Growth Rates. Based on the development that occurred between Census 1990 and 2000, Humboldt County housing units grew at an annual average growth rate (AAGR) of 0.9 percent. Population during this period grew at an AAGR of 0.6 percent. This same overall growth rate has continued, according to the California Department of Finance (DOF) data (Table E-5 – City/County Population and Housing Estimates): the AAGR for housing units was 0.91 percent from 1995 to 2007 and the rate of growth for population was 0.60 during the same period. Based on DOF data, the average household size in Humboldt County has declined from 2.49 in 1990 to 2.39 in 2000, and is now 2.34 in 2007 (U.S. Census and DOF Table E-5).

The continued decline in average household size is likely the most significant contributor to the difference between the growth rate in housing and the growth rate in population. However, the difference between the rate of housing and population growth did vary during this period. According to DOF Table E-5 the housing and population growth rates were nearly equal between 2000 and 2003. In contrast, between 2005 and 2006 the population growth rate declined to 33 percent while the housing growth rate increased to almost 1.60 percent.

Table 1-1. Humboldt County Population and Household Demographics

Humboldt County										
1980	1990			2000			1990-2000			
Pop	Total Pop	Total H/U	Avg HH Size	Total Pop	Total H/U	Avg HH Size	Pop AAGR	H/U AAGR	Total Δ in Pop	Total Δ in H/U
108,812	119,118	51,134	2.49	126,518	55,912	2.39	0.60%	0.90%	6.21%	9.34%

Source: Census 1990 and 2000.

Table 1-2. Humboldt County Population Growth Statistics

Humboldt County					
Total Housing Units			Average Annual Growth Rate		
1995	2000	2005	1995-2000	2000-2005	1995-2005
54,509	55,912	58,015	0.51%	0.74%	0.63%
New Housing Units			Average New Units Per Year		
1995-2000	2000-2005	1995-2000	2000-2005	1995-2005	1995-2005
1,403	2,103	281	421	351	

Source: DOF Table E-5, State of California, Department of Finance, E-5 Population and Housing Estimates for Cities, Counties and the State, 2001-2007, with 2000 Benchmark. Sacramento, California, May 2007.

Growth Projections. The DOF released population projections for California counties in July, 2007 (State of California, Department of Finance, Population Projections for California and Its Counties 2000-2050, or Table P-1). These new projections show a higher growth rate between 2005 and 2025 than previously expected and a higher total 2025 population, 145,004 (143,100 was previously projected by DOF and is shown in the Building Communities Report and a previously revised Table P-1 showed a year 2025 population of 141,300). The California Department of Housing and Community Development (HCD) prepares housing projections based on DOF demographic projections.

Table 1-3. Humboldt County Population Growth Forecasts

Humboldt County Population Projections			
Year	Projected Population	Projected AAGR	Between Years
2000	126,839		
2005	131,410	0.71%	2000 to 2005
2010	134,785	0.51%	2005 to 2010
2015	138,681	0.57%	2010 to 2015
2020	142,167	0.50%	2015 to 2020
2025	145,004	0.40%	2020 to 2025
Overall Growth Rate		0.54%	2000 to 2025

Source: DOF Table P-1, State of California, Department of Finance, Population Projections for California and Its Counties 2000-2050, Sacramento, California, July 2007.

Ideally, final housing growth projections by HCD would be available for this report. However, this is not the case. For the purposes of this report, a ratio share method based on the projected population growth rate, has been used to project future housing units. This method assumes that the ratio of housing units to population will be the same in the future as it is today. Because this method may over estimate or under estimate future housing units (depending upon shifts in demographics or local economics), this report will present a range that, at the low end is somewhat lower, and, at the high end, considerably higher than past growth in housing units. In addition, the range of housing growth rates was developed to accommodate the unincorporated area's share of the regional housing need at the low end (slightly more than 0.5 percent AAGR) and three times the regional housing need at the high end (slightly less than 2.5 percent AAGR).

Table 1-4. Growth Projections from State and County

Humboldt County Population Projections		
Year	Population AAGR Based on DOF Projections	Housing AAGR Based on Current Population to Housing Ratio
2000-2005	0.71%	1.07%
2005-2010	0.51%	0.76%
2010-2015	0.57%	0.86%
2015-2020	0.50%	0.75%
2020-2025	0.40%	0.59%
2000-2025	0.54%	0.81%

Source: DOF Table P-1; Humboldt County Community Development Services, 2007.

1.3.3. Coordination with Service Providers

The information on the individual service providers was developed in consultation with the service providers, regulators and the authors' knowledge of these issues. Some of these issues,

particularly those related to pending regulations are not finalized and the requirements necessary to meet them may change from those assumed herein. Additional, detailed studies beyond the scope of this study should be completed to refine the improvements noted herein.

These improvements should be designed to reflect potential future development. Typically this information is developed as a part of a master or facilities planning effort that is completed by the service providers. With this update to the County's general plan, the service providers should evaluate their needs to update past planning efforts. In many instances, the most recent master plans were completed 20 or 30 years ago and need to be updated.

1.4. Service Provider Background Data and Information

1.4.1. Current Development and Future Development Potential by USA/WSA

The following tables serve as a reference for future development potential within USAs and WSAs. Table 1-5 summarizes recent development and growth, as well as current demographic conditions within the USAs and WSAs identified by the County. The number of residential units constructed over the past 10 years is shown, along with the corresponding average annual growth rates that have occurred over this period, as well as existing number of dwelling units and existing densities. Table 1-6 serves as a reference for development potential, outlining vacant/underdeveloped acreage, constrained acreage, and net developable acreage for the various USAs and WSAs. Two density ranges were used to estimate a low (based on the Current General Plan) and high estimate (based on a higher density alternative that focuses development in the urbanized areas) of the development potential that could occur on the net developable acreage, also shown in Table 1-6. It should be noted that existing residential density (expressed as dwelling units/acre) shown in Table 1-5 and future residential density (based on Low and High build-out projections) shown in Table 1-6 are based on gross urban study acres. Estimates of resulting densities as shown in the final two columns of Table 1-6 represent a build-out density and include either the project Low or High unit build-out plus dwelling units (2000) and new residential units constructed between 2000 and 2005 (from Table 1-5).

All infrastructure assessments in the following chapters draw from these tables.

1.4.2. Water and Wastewater Rates

Water and wastewater rates are established by each water and wastewater provider pursuant to state law and local policy. Rates are updated periodically according to the requirements of the provider. Table 1-7, Water and Wastewater Rates by Service Provider, displays monthly water and wastewater user rates and connection fees for each service provider USA/WSA. Information is not provided for the towns of Samoa and Scotia because these areas are currently operated as privately owned campuses. Information is also not provided for the Myers Flat and Redcrest mutual water companies. Mutual water companies are member owned non-profit corporations where members share in equity and expenses. Mutual water company shares are appurtenant to the property owned and cannot be sold separately.

Table 1-7 is provided for informational purposes only. Rate and connection fee information was gathered in March and April 2008 and represents only a snap shot in time. Because of the varied methods of calculating user fees utilized by local service providers, Table 1-7 contains estimates, and is not intended to represent the full and complete rate comparison for all users at all levels of consumption. The methodologies used to calculate rates for water and wastewater by each agency can be different (e.g. flat rates vs. consumptive based) and rates can also include taxes and fees that may not be captured in Table 1-7.

Table 1-5. Background information related to growth in Humboldt County

USA/WSA	# of New Residential Units		Average Annual Growth		Existing Development		
	1995 – 2000	2000 - 2005	1995 – 2000	2000 - 2005	Total Acres	Dwelling Units (2000)	Density (Units/Acre)
Alderpoint WS	5	2	1.64%	0.62%	370	64	0.2
Arcata USA	0	2	0.00%	0.21%	178	188	1.1
Benbow WS	5	13	1.02%	2.45%	415	101	0.2
Big Lagoon WS	2	5	0.24%	0.60%	159	165	1.0
Blue Lake USA	0	1	0.00%	0.26%	94	77	0.8
Blue Lake WS	1	4	0.19%	0.76%	238	104	0.4
Briceland WS	2	1	1.18%	0.57%	82	35	0.4
Fieldbrook WS	37	41	1.51%	1.55%	6,879	512	0.1
Fortuna USA	23	39	0.78%	1.27%	3,587	601	0.2
Freshwater WS	35	30	0.93%	0.76%	3,568	773	0.2
Garberville USA	17	19	1.27%	1.33%	740	278	0.4
Garberville WS	3	8	0.44%	1.13%	1,571	139	0.1
Glendale USA	18	19	2.67%	2.48%	456	146	0.3
Glendale WS	8	3	1.76%	0.62%	400	96	0.2
Humboldt Hill USA	57	102	0.69%	1.18%	3,967	1,689	0.4
Hydesville USA	9	9	0.96%	0.92%	579	192	0.3
Hydesville WS	34	26	2.13%	1.48%	2,398	340	0.1
Indianola WS	26	21	1.08%	0.83%	1,916	495	0.3
Jacoby Creek WS	15	11	1.01%	0.71%	899	305	0.3
Loleta USA	11	13	0.85%	0.96%	119	265	2.2
Manila USA	18	25	1.02%	1.34%	1,455	364	0.3
McKinleyville USA	539	778	2.23%	2.85%	5,521	5,162	0.9
McKinleyville WS	28	28	1.45%	1.35%	2,740	403	0.1
Miranda USA	12	6	1.26%	0.60%	315	197	0.6
Myers Flat WS	1	1	0.24%	0.24%	165	84	0.5
Myrtle town USA	61	46	0.73%	0.53%	830	1,714	2.1
Myrtle town WS	0	0	0.00%	0.00%	61	4	0.1
Orick USA	4	3	0.81%	0.59%	268	101	0.4
Orick WS	3	2	0.68%	0.44%	1,509	90	0.1
Orleans WS	3	12	0.33%	1.27%	1,057	184	0.2
Phillipsville WS	0	0	0.00%	0.00%	326	97	0.3
Redcrest WS	2	1	1.30%	0.62%	280	32	0.1
Redway USA	8	46	0.25%	1.39%	1,288	642	0.5
Rio Dell USA	0	0	0.00%	0.00%	87	5	0.1
Rio Dell WS	1	3	0.73%	2.06%	166	28	0.2
Riverside WS	2	2	0.35%	0.35%	1,977	114	0.1
Samoa USA	0	0	0.00%	0.00%	301	104	0.3
Scotia USA	0	0	0.00%	0.00%	464	270	0.6
Shelter Cove USA	54	196	5.11%	12.47%	873	245	0.3
Shelter Cove WS	19	52	5.49%	10.43%	1,899	81	0.0
South Eureka USA	242	291	1.27%	1.43%	6,030	3,963	0.7
South Eureka WS	3	0	0.58%	0.00%	1,199	106	0.1
Weott USA	2	4	0.27%	0.53%	340	148	0.4
Westhaven WS	52	40	1.91%	1.35%	2,072	577	0.3
Willow Creek USA	0	0	0.00%	0.00%	88	20	0.2
Willow Creek WS	50	78	1.12%	1.64%	3,865	922	0.2

Table 1-6. Development Potential in Humboldt County's USAs and WSAs

USA/WSA	Development Potential			Estimate of Potential Dwelling Units				Estimates of Resulting Densities ¹ (Units/Acre)	
	Vacant /Under-developed Acres	Constrained Acres	Net Develop-able Acres	Low		High		Low	High
				New	Total	New	Total		
Alderpoint WS	210	79	130	44	110	66	132	0.3	0.4
Arcata USA	22	10	12	2	192	205	395	1.1	2.2
Benbow WS	103	52	51	55	169	56	170	0.4	0.4
Big Lagoon WS	63	11	53	10	180	14	184	1.1	1.1
Blue Lake USA	73	23	50	46	124	143	221	1.3	2.3
Blue Lake WS	91	6	85	6	114	18	126	0.5	0.5
Briceland WS	53	0	53	13	49	26	62	0.6	0.7
Fieldbrook WS	5,138	1,383	3,755	138	691	575	1,128	0.1	0.2
Fortuna USA	1,414	527	888	294	934	450	1,090	0.2	0.3
Freshwater WS	1,637	613	1,024	130	933	335	1,138	0.3	0.3
Garberville USA	129	51	79	63	360	108	405	0.5	0.5
Garberville WS	1,099	616	483	61	208	103	250	0.1	0.2
Glendale USA	284	66	218	20	185	1,189	1,354	0.4	2.9
Glendale WS	59	12	47	1	100	1	100	0.2	0.2
Humboldt Hill USA	1,937	713	1,224	963	2,754	2,070	3,861	0.7	0.9
Hydesville USA	243	65	178	96	297	554	755	0.5	1.3
Hydesville WS	1,044	456	588	70	436	246	612	0.2	0.2
Indianola WS	1,269	434	835	99	615	162	678	0.3	0.3
Jacoby Creek WS	338	53	286	28	344	101	417	0.4	0.5
Loleta USA	34	3	31	87	365	116	394	3.0	3.2
Manila USA	172	41	131	142	531	233	622	0.3	0.4
McKinleyville USA	2,038	356	1,683	2,224	8,164	4,112	10,052	1.3	1.7
McKinleyville WS	836	166	670	123	554	137	568	0.2	0.2
Miranda USA	113	27	86	48	251	74	277	0.8	0.9
Myers Flat WS	13	5	8	4	89	4	89	0.5	0.5
Myrtle town USA	278	29	249	466	2,226	1,021	2,781	2.6	3.3
Myrtle town WS	18	2	16	55	59	81	85	1.0	1.4
Orick USA	47	28	18	19	123	30	134	0.4	0.5
Orick WS	660	482	178	36	128	36	128	0.1	0.1
Orleans WS	428	155	273	50	246	220	416	0.2	0.4
Phillipsville WS	114	80	34	11	108	11	108	0.3	0.3
Redcrest WS	23	3	20	12	45	16	49	0.2	0.2
Redway USA	850	381	469	298	986	589	1,277	0.7	1.0
Rio Dell USA	6	2	4	2	7	8	13	0.1	0.1
Rio Dell WS	46	6	40	7	38	7	38	0.2	0.2
Riverside WS	56	22	34	5	121	5	121	0.1	0.1
Samoa USA	69	0	68	0	104	318	422	0	1.4
Scotia USA	0	0	0	0	270	0	270	0	0
Shelter Cove USA	160	5	155	1,088	1,529	1,214	1,655	1.5	1.7
Shelter Cove WS	230	143	87	108	241	267	400	0.1	0.2
South Eureka USA	3,207	929	2,279	2,687	6,941	8,048	12,302	1.1	2.0
South Eureka WS	651	477	175	13	119	47	153	0.1	0.1
Weott USA	31	5	26	34	186	61	213	0.5	0.6
Westhaven WS	668	128	541	79	696	424	1,041	0.3	0.5
Willow Creek USA	24	9	15	12	32	76	96	0.4	1.1
Willow Creek WS	1,482	757	726	215	1,215	504	1,504	0.3	0.4

¹Estimates of resulting densities as shown in the final two columns of Table 1-6 represent a build-out density, are based on gross urban study acres and include either the project Low or High unit build-out plus dwelling units (2000) and new residential units constructed between 2000 and 2005 (from Table 1-5).

Table 1-7. Water and Wastewater Rates by Service Provider

USA/WSA	Water Rates				Wastewater Rates			
	Base Rate ¹	Cubic Feet in Base ²	Rate per hcf ³	Connection Fee	Base Rate	Cubic Feet in Base	Rate per hcf	Connection Fee
Alderpoint CWD	\$40.00	1,000	⁴	none	No sewer service provided			
City of Arcata	\$5.20		\$1.44 to \$2.80	\$1,500	\$22.50	450	\$3.15	\$4,320
Benbow WC	\$66.50		\$0.95	\$2,000	No sewer service provided			
Big Lagoon CSD	\$39.08		\$0.03	\$500	No sewer service provided			
City of Blue Lake	\$16.53		\$0.64 to \$1.32	\$2,676.68	\$38.67		flat rate	\$5,395.58
Briceland CSD	\$20.00		flat rate	none	No sewer service			
City of Eureka	\$12.24		\$2.81	\$2,000	\$20.30		flat rate	\$2,130
Fieldbrook-Glendale CSD	\$24.12	1,000	\$1.49	\$5,162	\$56.19		flat rate	\$5,162
City of Fortuna	\$16.49	250	\$1.53	\$2,003	\$33.14	450	\$7.36	\$5,500
Garberville SD	\$28.00	1,000	\$2.20	\$1,000	\$24.19		flat rate	\$1,000
Humboldt CSD	\$10.45		\$1.50	\$1,030	\$23.75		flat rate	\$1,000
Hydesville CWD	\$30.00	750	\$3.00		No sewer service provided			
Jacoby Creek CWD	\$16.50		\$1.60 to \$3.84	\$1,500	\$22.50	450	\$3.15	\$4,320
Loleta CSD	\$24.77		\$2.71	\$2,500	\$30.83		flat rate	\$2,500
Manila CSD	\$23.37		\$0.73	\$5,350	\$38.33		flat rate	\$7,480
McKinleyville CSD	\$6.35		\$0.94 to \$1.40	\$736	\$15.05		\$0.20	\$3,500
Miranda CSD	\$12.00	1,200	\$0.90	\$1,000	\$23.00		flat rate	\$1,000
Orick CSD	\$21.60	300	\$2.76	\$2,500	No sewer service provided			
Orleans CSD	\$35.00		\$1.13	\$2,705	No sewer service provided			
Palmer Creek CSD	\$36.62	800	\$0.85	\$5,300	\$60.00		flat rate	\$3,000
Phillipsville CSD	\$30.00	1,500	\$0.03	\$1,000				
Redway CSD	\$17.70	1,000	\$2.20	\$1,600	\$26.00		flat rate	\$1,840
City of Rio Dell	\$22.00	100	\$2.00	\$2,700	\$48.00		flat rate	\$1,150
Riverside CSD	\$25.00		\$3.37	\$600	No sewer service provided			
Resort Improvement Dist. #1	\$17.50	500	\$5.00 to \$7.50	\$17,500	\$32.50		flat rate	\$7,200
Weott USA	\$35.00		flat rate	\$500	\$42.00		flat rate	\$500
Westhaven CSD	\$32.80	300	\$2.30	\$4,500	No sewer service provided			
Willow Creek CSD	\$37.27		\$4.85	\$8,700	No sewer service provided			

¹"Base Rate" = the rate that users are required to pay regardless of the volume of water consumed

²"Cubic Feet in Base" = volume of water in cubic foot included in base rate

"hcf" = hundred cubic feet (approximately 748 gallons or 7.48 gallons/cubic foot)

³"Rate per hcf" = the consumption rate for the volume of water consumed in addition to the base volume.

⁴2% of volume x \$1.00 for volume in excess of 1000 cu ft

1.5. LAFCo and Service Provider Boundaries

Most local service providers are government agencies, either cities or special districts. Special districts are either single purpose, such as fire protection districts, or multi-purpose local government agencies, such as community services districts. For the purposes of this section the term local agency refers cities and special districts. Each local agency is authorized to provide a specific set of services within a definite service boundary. The set of services and initial boundaries are established, and can change over time, by approval of the affected residents and the Humboldt Local Agency Formation Commission (LAFCo).

This report evaluates services and infrastructure in the Urban Study Areas and identifies issues relating to system condition, capacity, and service boundaries. Many of these issues are also of concern to the Humboldt LAFCo and this report will likely serve as an information source in future LAFCo deliberations. In certain instances, this report recommends that districts expand their Spheres of Influence, annex adjacent land, seek authorization to provide additional services, or that a new special district be formed to provide municipal services within an Urban Study Area. All of these actions would require action by the Humboldt LAFCo.

1.5.1. Local Agency Formation Commission (LAFCo)

LAFCos are independent county-level regulatory commissions created by the California Legislature to act on proposals concerning the formation of cities and special districts and on other changes in jurisdiction or organization of local agencies. LAFCo is also given authority to make studies of existing governmental agencies in an effort to improve the efficiency of urban services.

LAFCo plays an important role in the delivery of services in the County. The State Legislature defined the following objectives for LAFCo: to encourage the orderly formation of local governmental agencies; to preserve agricultural land resources; to discourage urban sprawl. LAFCo carries out these objectives through the planning authorities described below.

Sphere of Influence Studies

Ideally, a local agency provides service within its LAFCo adopted boundaries and plans for the provision of future service outside its boundaries through its LAFCo adopted Sphere of Influence (SOI) study. An SOI is a planning boundary, usually outside of an agency's district boundary, that is defined in Section 56076 of the Government Code as "a plan for the probable physical boundaries and service area of a local agency, as determined by the commission." LAFCo is required to adopt a sphere of influence for each local governmental agency in the county within LAFCo jurisdiction and enact policies designed to promote the logical and orderly development of areas within the SOI. An adopted sphere of influence is primarily a planning tool to guide the review of proposals submitted to LAFCo. Inclusion within an agency's SOI does not indicate that an annexation proposal will be approved. However, annexations will not be approved unless the annexation area is within a local agencies adopted SOI.

Municipal Service Reviews

Municipal Service Reviews (MSR) were added to LAFCo's mandate with the passage of the Cortese-Knox-Hertzberg Act in 2000. An MSR is a comprehensive study designed to better inform LAFCo, local agencies, and the community about the provision of municipal services. MSRs attempt to capture and analyze information about the governance structure and efficiencies of

service providers, and to identify opportunities for greater coordination and cooperation between providers. A completed MSR is a prerequisite to LAFCo's SOI determination and may also lead a LAFCo to take other actions under its authority.

Initiation of Special District Consolidations

LAFCos have the authority to initiate proposals that include the dissolution or consolidation of special districts, or the merging of an existing subsidiary district. Prior to initiating such an action, LAFCo must determine, through an SOI study or other special study that the district's customers would benefit from the proposal.

1.5.2. Service District Boundaries

As indicated in Section 1.3, Urban Study Areas were defined in areas where water and sewer service are currently provided or may be appropriate to consider in the future. Urban Study Areas follow service district boundaries and SOIs, and the SOIs of cities within the County. In certain instances, Urban Study Areas follow the boundaries of private or mutual water companies (Benbow, Myers Flat, and Redcrest WSAs) or include areas beyond district boundaries and SOIs that are currently served by a local agency or that may appropriately be served by a local agency in the future (portions of the Big Lagoon WSA, Orleans WSA, Westhaven WSA, Blue Lake WSA, Fieldbrook WSA, Glendale USA, Indianola WSA, Freshwater WSA, Myrtle town WSA, South Eureka USA and WSA, Humboldt Hill USA, Hydesville USA and WSA, Weott USA, Redway USA, and the Garberville USA and WSA, and all of the Samoa USA and Scotia USA).

In most instances it will be appropriate for an existing city or district to expand its boundaries to include those portions of USAs that already receive its service or areas appropriate for urbanization. In addition, there are areas such as Samoa or Scotia where major redevelopment projects are underway and it may be appropriate for a new district to be formed or for an existing city or district to annex the area. In either case, applications (in the form of landowner petitions or local agency resolutions) would be prepared and LAFCo would consider municipal service reviews, revised SOI reports, and the revised policies and maps contained in the General Plan Update prior to taking any action.

Provision of Service Outside District Boundaries

As described above and detailed in following chapters, there are instances where local agencies of all types are providing services outside of their district boundaries. Pursuant to Government Code Section 56133, local agencies may provide new or extended services by contract or agreement outside jurisdictional boundaries only if the local agency first requests and receives written approval from LAFCo. Services outside district boundaries that were provided prior to January 1, 2001 are exempt from this requirement.

LAFCo may authorize a city or district to provide services outside its jurisdictional boundaries and outside its SOI to respond to an existing or impending threat to the public health or safety of the residents of the affected territory if both of the following requirements are met: (1) the entity applying for the contract approval has provided the commission with documentation of a threat to the health and safety of the public or the affected residents; and (2) The LAFCo has notified any alternate service provider that has filed a map and a statement of its service capabilities with the commission (Government Code Section 56133(c)). The policies of the Humboldt LAFCo contained in the Humboldt County LAFCo Procedures Guide (<http://www.humboldtlaico.org/documents/PROCED03.pdf>) section on "Provision of Services by Contract" apply in addition to Government Code Section 56133.

1.6. Acknowledgements

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2. Road Infrastructure

2.1. Description

Humboldt County's roadway system has approximately 1,400 miles of county roads and city streets, 378 miles of state highways, including U.S. Highway 101, and roadways on federal lands. These roadways provide for the inter-regional and intra-regional movement of goods and people on California's north coast. Humboldt County roadways traverse varying degrees of flat, rolling, and mountainous terrain and provide for limited passing opportunities in many areas.

The County-maintained roadways are integrated with an overall countywide circulation system maintained by local cities, the California Department of Transportation (Caltrans); the U.S. Forest Service, Bureau of Land Management and the Bureau of Indian Affairs; cities; and private property owners. This roadway network contributes to the economic vitality of Humboldt County, providing safe access and travel routes for Humboldt County citizens and visitors, from low-density rural areas to higher-density urban areas.

The purpose of this technical report is to provide information about the current status of the County roadway system and potential future changes, with a focus on the Urban Study Areas being considered as a part of the Humboldt County General Plan Update. This technical report describes the roadway functional classification system and other criteria used by the County to assess and maintain roadways, presents vehicle trip data derived from the Greater Eureka Area Traffic Model developed for the joint use of the County, City of Eureka, and Caltrans, and provides a basis for the roadway improvement goals, policies and programs that will be in the Humboldt County General Plan Community Infrastructure and Services Element. The roadway component of the Community Infrastructure and Services Element will be coordinated with the Circulation Element.

While this portion of the technical report focuses primarily on roadways, it is important to note that County's long term circulation system must include provisions for vehicle as well as truck, bicycle, pedestrian, equestrian, and transit facilities. The General Plan Update will develop policies to ensure that County roadway rights of way better accommodate increased volumes of both vehicular and nonvehicular transportation modes.

Estimates of existing and future roadway capacities and condition help to identify roadways where upgrades, expansions and/or maintenance may be needed. Critical issues for the County road system are safety, functionality and road rehabilitation. Roadway maintenance is a challenge for rural areas such as Humboldt County: lower population densities and long travel distances mean fewer funds are available on a per-mile basis. Roadway capacity is generally less of an issue for rural areas due to the lower population densities, but even so there are existing and projected areas of congestion that must be addressed. Roadway capacity is also affected by competition for space in the right-of-way among vehicular traffic and complementary modes of transportation, including transit service, bicycles and pedestrians.

2.2. Roadway Budget

Funding for roadway maintenance, upgrades and expansions is a critical concern and is often the limiting factor for the determination of project eligibility and the prioritization of projects. Roadway projects typically go through six costly and (often) time-consuming steps: planning, environmental review, design, right-of-way acquisition, permitting, and construction. The environmental and permitting phases are particularly time-consuming due to the increased demands from agencies such as the Corps of Engineers, National Fisheries Marine Service, Fish and Wildlife Service, Department of Fish and Game, Coastal Commission and California Water Quality Control Board, and an ongoing challenge for the County is to find and keep engineers and other technical staff to design, survey, and inspect roadways, and to acquire permits, provide environmental documents, acquire rights-of-way and plan roadway improvements (2003 CIP). The Humboldt County Public Works Roads Fund 2004-2008 budget is shown below.

Table 2-1. Humboldt County Public Works Roads Fund Budget, 2004-2008

1200 - Roads Fund	2004-05 Actual	2005-06 Actual	2006-07 Actual	2007-08 Request	2007-08 Adopted	Increase/ (Decrease)
Revenues						
Taxes	\$2,662,555	\$2,800,912	\$3,427,462	\$3,259,352	\$3,259,352	(\$168,110)
Licenses & Permits	0	0	80,533	0	0	(80,533)
Use of Money & Property	0	11,164	23,580	0	0	(23,580)
Other Gov't Agencies	9,076,558	10,759,727	11,823,508	20,826,688	20,826,688	9,003,180
Charges for Services	745,692	643,939	805,272	688,500	688,500	(116,772)
Other Revenues	40,360	166,586	81,797	621,350	21,350	(60,447)
(To)/From Non-GF Fund Balance	(792,926)	2,625,163	(3,915,600)	2,306,340	2,306,340	6,221,940
Total Revenues	\$11,732,239	\$17,007,492	\$12,326,551	\$27,702,230	\$27,102,230	\$14,775,679
Expenditures						
Contracts	\$2,627,330	\$3,125,935	\$481,376	\$0	\$0	(\$481,376)
Salaries & Benefits	4,408,274	4,858,204	5,776,967	6,669,553	6,669,553	892,586
Supplies & Services	4,442,325	8,758,492	5,452,958	20,738,342	20,138,342	14,685,384
Other Charges	234,605	211,301	575,362	195,505	195,505	(379,857)
Fixed Assets	19,705	53,561	39,887	98,830	98,830	58,943
Total Expenditures	\$11,732,239	\$17,007,492	\$12,326,551	\$27,702,230	\$27,102,230	\$14,775,679
Allocated Positions	111.00	111.00	111.00	112.00	112.00	1.00
Temporary (FTE)	3.35	2.92	3.69	4.75	4.75	1.06
Total Staffing	114.35	113.92	114.69	116.75	116.75	2.06

Source: Humboldt County Adopted Budget Fiscal Year 2007-2008, Page L-33.

The major roadway revenue sources include: State Gas Taxes, Property Taxes, Proposition 42 funds, Transportation Development Act (TDA) Funds, Regional Surface Transportation Program (RSTP) Exchange Funds, Timber Yield Funds, Vehicle-in-Lieu Funds, and Other Revenue. A portion of the Business License fees collected is distributed to roadways. Other revenue includes the sale of surplus equipment, plans and specs, maps and other unanticipated reimbursements or refunds.

Despite healthy revenue growth from FY 2005-06 to FY 2006-07, the roadway budget is facing revenue uncertainties. FY 2005-06 was the final year of a five-year program providing approximately \$900,000 annually from the Forest Service. Grant availability through the State has been reduced. State Transportation Improvement Program (STIP) funds are not guaranteed, are restricted in what they can be used for and are limited in amount; in addition, other entities (e.g., Caltrans) also rely on STIP funding and their funding requests often supersede the County's. Much of the County's non-STIP roadway improvement funding comes from grant programs (e.g., Safe Routes to Schools, Transportation Enhancement Activities), with matching funds from the County's road maintenance program.

The County is developing a five-year Capital Improvement Program (CIP) for the years 2008-2012 to help guide the use of the County's transportation dollars over the next several years. The County is also developing a priority list of road projects from its pavement management system that determines the order of need for roadways in terms of maintenance and rehabilitation. One issue for rural roadway expansion or construction is the lack of an adequate infrastructure financing mechanism that requires users to pay for their "fair-share" of off-site impacts in road infrastructure. This will be further addressed in the Community Infrastructure and Services Element.

Because of the ongoing budget limitations, the County has developed other methods for providing funds for roadway maintenance and improvements. In McKinleyville, the County funds roadway maintenance for new subdivisions through Permanent Road Divisions (PRD). A PRD is a type of special assessment district formed pursuant to California Streets and Highways Code to provide funding for roadway maintenance and improvements. PRDs require the preparation of an engineer's report that calculates and apportions the special benefit to each property within the division. Owners of properties that benefit would vote whether to approve the establishment of a division.

Humboldt County's Regional Transportation Plan (RTP) is a long-range planning document developed by the Humboldt County Association of Governments (HCAOG). The RTP provides guidance on the development of the regional transportation system and assists in the prioritization of projects for funding. The Financial Element of the RTP includes updated funding program information and a funding strategy for financing future transportation improvements. The RTP reflects the importance of creating a balance between maintaining (preserving) Humboldt County's existing transportation systems and creating capacity in areas where population growth and travel increases are projected to occur. The RTP also reflects the importance of bicycle and pedestrian modes as being integral to the multimodal aspects of the regional transportation system. The relationship between County roadway infrastructure and the RTP will be further addressed in the Circulation Element.

2.3. System Standards (Roadway Hierarchy)

2.3.1. Roadway Functional Classifications

Functional classification is the criteria used to group streets and roadways into classes, or systems, according to the character of service they are intended to provide. Basic to this process is the recognition that individual roads and streets do not serve travel independently in any major way. Rather, most travel involves movement through a network of roads. It becomes necessary to determine how this travel can be channelized within the network in a logical and efficient manner.

Functional classification defines the nature of this channelization process by defining the part that any particular road or street should play in serving the flow of trips through a roadway network. The classification identifies the function that a roadway served and the level to which it should be designed. In Humboldt County, many roadways are designed well below the function they have come to serve, and over time, vehicle volumes have increased.

Humboldt County Public Works constructs and maintains roads pursuant to its "Roadway Design Standards Manual" (County of Humboldt, 1971).² The Manual defines the following primary roadway functional classifications:

- *Arterial Road.* An arterial provides service between major traffic generators such as cities or large towns, and normally provides the most direct route to the state system. It usually provides the highest level of service to the County as measured by mobility and traffic volume. An arterial will have some access and traffic control and may be located in either an urban or a rural area. An example of a County arterial road is Central Avenue in McKinleyville.
- *Collector Road.* A collector road moves local traffic from or to arterial roads. A collector can also link arterials or provide access to an arterial. A collector also provides service between minor traffic generators. An example of a County collector is Elk River Road.
- *Local, or Access, Road.* A local road provides access or entrance to residences, businesses or other abutting property. It generally provides the least mobility within the County system and is usually the origin and destination route for a "trip" within the County.

Humboldt County Public Works uses Department of Transportation (DOT) functional classifications for county-maintained roadways. These classifications include: Urban Arterial, Urban Collector, Rural Arterial, Rural Minor Collector, Rural Major Collector, and Local Roads. The following figure illustrates the functional relationship between roadways:

² Other standards that may be applied to projects within USAs include Federal Highway Standards and Caltrans construction standards. Each city within Humboldt County may have its own adopted roadway construction standard as well.

Figure 2-1. Schematic Illustration of a Functionally Classified Rural Roadway Network

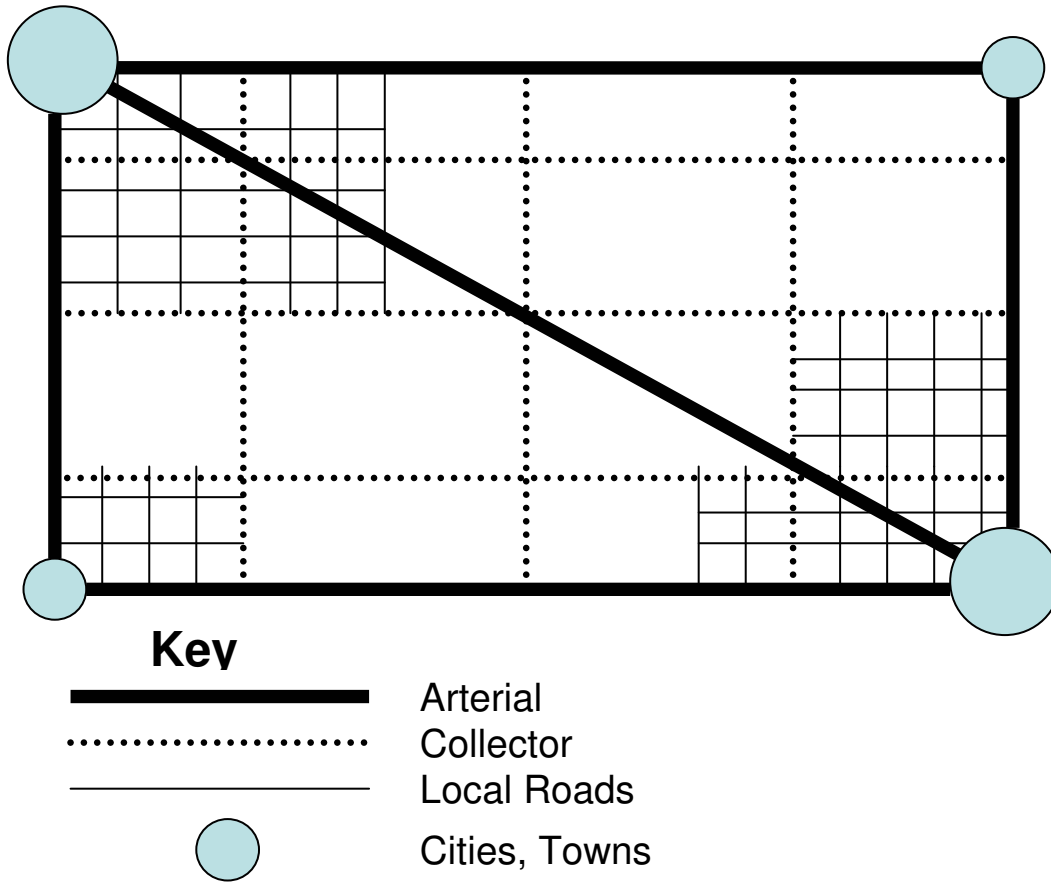
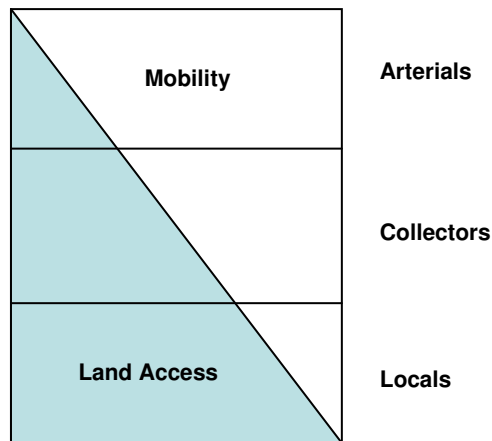


Figure 2-2. Relationship of Mobility and Access to Functional Classification



Allied to the idea of traffic channelization is the dual role the roadway network plays in providing access to property, and travel mobility. Access is a fixed requirement, necessary at both ends of any trip. Mobility, along the path of such trips, can be provided at varying levels, usually referred to as "level of service." It can incorporate a wide range of elements (e.g., riding comfort and freedom from speed changes) but the most basic is operating speed or trip travel time (USDOT, 1989).

The concept of traffic channelization leads logically not only to a functional hierarchy of systems, but also to a parallel hierarchy of relative travel distances served by those systems. This hierarchy of travel distances can be related logically to a desirable functional specialization in meeting the access and mobility requirements. Local facilities emphasize the land access function. Arterials emphasize a high level of mobility for through movement. Collectors offer a compromise between both functions. This is illustrated in Figure 2-2.

2.4. Road System Capacity and Traffic Volumes

2.4.1. Roadway capacity estimates from the GEATM

As the County's population grows over the next 20 years, the projected vehicle-volume growth will have varying impacts on roadways in the County roadway system, and particularly in the Urban Study Areas (USAs); in several cases, roadways in the USAs are already experiencing capacity constraints as observed at a.m. and p.m. peak hours. In other cases, roadways currently able to accommodate existing traffic volumes are likely to develop areas of congestion as traffic volumes increase.

Any effective circulation solution to moving goods and people in, around and through Eureka and the rest of Humboldt County is dependent on the functionality and connectivity of the local and County roadway systems in addition to Highway 101. The analysis here focuses primarily on addressing capacity concerns by accommodating or managing increased volumes, but capacity expansion can also be achieved through the expansion of transit, bicycle and pedestrian facilities and increased use of those modes, as they can offset vehicle volume growth and congestion from planned development. Recommendations for a balanced approach to addressing capacity concerns will be included in the Community Infrastructure and Services Element.

In November 2004, the Greater Eureka Area Corridor Study was initiated, with the development of a region-wide travel demand forecasting model. The model—the Greater Eureka Area Travel Model (GEATM)³—is a planning and decision making tool that can assess impacts of land use and transportation changes along the corridor over time, and help with determining the effectiveness of potential improvements to the local/county/state roadway system. This more comprehensive approach has required close coordination and a cooperative partnership between all affected agencies, including HCAOG, City of Eureka, Caltrans, and the County of Humboldt. Data contained in the traffic model for all roadway segments includes (but is not limited to):

- Location of roadway segment,
- Length of segment,
- Number of lanes,

³"Greater Eureka Area Travel Model County Wide Transportation Network joined to Peak Hour and Average Daily Output Tables for 2005, 2020 & 2030."

- Lane capacity for vehicles (vehicles per hour), and
- Volume-to-capacity (V/C) ratio.

The GEATM simulates traffic levels and patterns for specific geographic areas through the use of input files summarizing land uses, the street network, travel characteristics, and other transportation factors. The model determines the amount of trips generated, where trips begin and end, and the route taken by each trip.

The GEATM is an emerging traffic modeling tool. For this analysis, the model was used primarily as a source of roadway segment-specific information on volume and capacity.⁴ Caltrans traffic modeling staff have pointed out that the model is a very effective tool for projecting future conditions, traffic flows, and areas of congestion based on different land use scenarios. Other tools and methods are then used for determining specific needed improvements. This model has recently been developed and it is anticipated that the ability to use the model will improve over the next year or so as local agency staff become proficient at running the model.

This model is currently being used to evaluate traffic impacts related to two proposed projects (Marina Center and Forster-Gill). While the results from these analyses were not available at the time this report was prepared, we believe that this information will be very useful in refining the needed improvements described below. At a minimum, the results of the existing analyses can be expanded upon to analyze all of the potential development included in this General Plan update. Additional information regarding the scope of the Forster-Gill analysis is described in Section 2.7.2, Capacity-Related Roadway Recommended and Planned Improvements.

2.4.2. Roadway capacity and Level of Service (LOS)

There is a limit to the amount of traffic volume that a given roadway can accommodate. The maximum amount of flow is commonly referred to as the capacity of the roadway. Roadway capacity is affected by a number of factors that influence a driver's ability to maintain a desired operating speed, including:

- The number of lanes
- Lane width
- Average vehicle speed
- The sharpness and steepness of curves
- The amount of heavy vehicles in the traffic stream
- The quality of the signal coordination, and
- The location of lateral obstructions (driveways, intersections)

One of the fundamental aspects of roadway design is the determination of how many lanes will be required to service the anticipated traffic demand. The majority of roadways in Humboldt County adequately meet current and projected demand with two lanes. Certain collectors and arterials may require four lanes to adequately accommodate current and projected vehicle volumes. Other congestion relief measures, such as alternative (bypass) routes, signalization, roundabouts, and left-turn lanes (among others) can be implemented in lieu of more costly capacity expansion.

⁴ Model roadway volume data was derived by taking traffic counts on selected roadway segments, then applying functional classifications and future land use information.

Traffic operations are assessed using the Level of Service (LOS) concept, a qualitative measure of traffic operating conditions. A letter grade, A through F, representing progressively worsening traffic conditions, is assigned to a roadway segment or an intersection. In areas such as Humboldt County, LOS C or better has generally been considered an acceptable traffic operating condition. LOS C provides for stable flows of traffic during peak conditions, and allows drivers at signalized intersections to (typically) proceed in one signal cycle.

There are several factors associated with determining appropriate LOS levels, including whether the roadway is urban or rural, the characteristics of the terrain, and the costs associated with constructing the desired facility. In rural areas, roadway design usually aims to provide LOS C or better as an appropriate balance between more desirable levels of service and cost-effectiveness in providing transportation facilities. Many transportation planners (especially proponents of public transit) recommend aiming for a "C" level of service (particularly in urban areas), one that would slow cars down and make roads safer for pedestrians. LOS D and worse are not generally appropriate design criteria in rural areas; this provides no room for future growth, and can easily lead to substantial deterioration in traffic operations which can decrease safety conditions.

Even so, LOSs lower than designed can be acceptable in some instances, such as during peak travel times, when rights of way must accommodate multiple travel modes, or when existing developments or budgetary restrictions reduce the ability of service providers to remediate congestion problems through costly capacity-expansion projects.

2.4.3. Volume to Capacity (V/C) Ratio

One measure of roadway effectiveness and level of service is the volume-to-capacity (V/C) ratio. The V/C ratio compares roadway demand (vehicle volumes) with roadway supply (carrying capacity). Other measures of roadway effectiveness, such as movement delay, can also be used to assess roadway LOS if data is available. The V/C ratio is used here as it is the primary performance measure available from the GEATM for assessing critical roadway segments.

The V/C ratio can alert transportation providers to areas where traffic mitigation measures such as congestion relief and/or capacity expansion should be considered. In the past, exceeding a V/C ratio of 0.5 was considered a capacity deficiency. A V/C ratio of 0.9 can be considered a more appropriate threshold for the identification of deficiencies due to limited financial resources and because systems operations begin to deteriorate more significantly at this level. The table below lists descriptions of how a roadway section would typically perform with associated V/C ratios (for complete information see the 1994 Highway Capacity Manual, produced by the Transportation Research Board). Levels of Service (LOS) are indicated for different V/C ratio ranges.

Table 2-2. Volume-to-Capacity Ratio (V/C) and Level of Service (LOS) Classifications

V/C ratio (percent)	LOS	Description
< 30	A	Free-flow operations.
30-50	B	Reasonably free-flow operations; ability to maneuver within the traffic stream is only slightly restricted.
50-75	C	Travel speeds still at or near free-flow, but ability to maneuver within the traffic stream is noticeably restricted.
75-90	D	Travel speeds begin to decline with increasing flows; ability to maneuver is more noticeably limited; minor incidents can be expected to create queuing.

V/C ratio (percent)	LOS	Description
90-100	E	Operation at or near capacity and therefore volatile because there are virtually no useable gaps in the traffic stream; maneuverability is extremely limited; any disruption to the traffic stream, such as vehicles entering from ramps or changing lanes, can cause disruptions.
> 100	F	Breakdown in vehicular flow with queues forming behind major breakdown points, such as traffic incidents or recurring points of congestion.

Although the V/C ratio is the most basic measure of roadway demand and supply, factors other than volume and capacity are often critical in determining roadway performance. At higher V/C ratios, roadways can become so congested that the vehicle throughput (volume) will actually decrease. This results in a V/C that is deceptively low because the volume does not adequately represent the demand. An example of this in Humboldt County would be vehicles bypassing congestion on northbound Highway 101 by exiting onto Herrick Avenue and traveling on City of Eureka roadways to reach their destination.

2.4.4. Existing and Projected Capacity Constraints

The GEATM identifies roadway segments that have either existing or projected capacity constraints. The model used 2005 data and projected traffic volume estimates based on the General Plan Update Sketch Plan 3 2030, full entitlement build-out scenario, assumptions for the spatial and temporal patterns of new development. Sketch Plan 3, or the "Focused Growth" scenario, assumed that development would occur primarily in existing developed areas, with limited lower-density development in outlying areas and only a modest extension of existing water service areas. The Sketch Plan-3 2030, full entitlement build-out, scenario projections used to estimate future capacity constraints are thus illustrative of a potential, if not likely, future development pattern. However, the proposed land use alternatives developed through the General Plan Update process should be applied to the GEATM to identify differences in future roadway congestion and capacity.

The projections point to roadway segments where roadway capacity may very likely be inadequate for future traffic volumes. Typically, these segments are at or near junctions with cross-streets, or at points where traffic naturally funnels from connecting streets (for example, a road with a lower classification (local road, collector) to a road with a higher classification (collector, arterial)).

2.4.4.1. Roadways with Capacity Constraints

The roadways with the most significant capacity constraints are located primarily in Eureka (Humboldt Hill, Myrtle town, and South Eureka) and McKinleyville. Both areas have been experiencing increased development pressures that have added and are likely to add vehicle volume to the County's roadways. Future development-related growth in the South Eureka USA will add significant vehicle volume to roadways, some of which are already experiencing capacity constraints. For the USAs in the Eureka area (Humboldt Hill, Myrtle town, South Eureka), the GEATM projects that, at build-out, 12 roadways will have V/C ratios of greater than 90 percent, or LOS E and F, along certain segments; some segments are projected to be over 200 percent of capacity. Several roadways had segments at LOS E or F in 2005.

The circulation network for the South Eureka and Myrtle town USAs are inter-connected with the City of Eureka. The South Eureka USA and the remainder of the Eureka Community Plan area are largely dominated by residential land uses, with residents traveling into the City of Eureka for work, shopping, and other purposes. The development around the City of Eureka and the presence of the Bayshore Mall have contributed to increases in congestion and delays along

Broadway, leading to trips diverting to new routes as they travel through the City. The regional approach to transportation planning embodied in the GEATM and the close coordination and cooperative partnership between HCAOG, City of Eureka, Caltrans, and the County of Humboldt should be used to address current and future traffic congestion within and outside the City of Eureka. Affects of the proposed land use alternatives on County, city, and state roads should be evaluated as part of the General Plan Update environmental impact report.

For the McKinleyville USA, capacity constraints are projected to develop along Central Avenue north of the Northbound 101 exit; these sections are at LOS D (V/C ratio between 75 and 90 percent) as of 2005.

The following tables show 2005 and Sketch Plan-3 2030, full entitlement build-out, scenario GEATM data for Average Daily Traffic (ADT) and Volume-to-Capacity Ratios (V/C)⁵ for specific roadway segments within USA boundaries. Table 2-3A lists roadway segments for which the GEATM predicted an ADT increase of greater than 50 percent, from 2005 to build-out. Table 2-3B lists roadway segments for which the GEATM predicted greater than 90 percent V/C ratio in 2005 and/or build-out (LOS E; calculated by dividing the peak hour volume for roadway segments indicated in the GEATM by the listed capacity for the roadway). This data has been separated into two tables because they display different types of data for impacted roadways. The tables are primarily for illustrative purposes; only the *most* impacted segment is shown for a given roadway. As can be expected, the majority of roadways with significantly increasing volumes or capacity constraints are in the McKinleyville and South Eureka USAs. Additional analysis using the GEATM should be prepared as part of the General Plan Update EIR.

Often, the segment with the maximum ADT or V/C ratio is only a few blocks long. The numbers in the tables do *not* apply to the entire roadway (the GEATM provides roadway segment-specific data), but, again, are presented as illustrative of the type and value of information obtainable through use of the GEATM. The table data represents some of the initial GEATM data runs. GEATM will become even more valuable as local expertise in modeling inputs and outputs increases. Humboldt County, the City of Eureka, Caltrans, and HCAOG will continue their collaboration to develop this local expertise.

The GEATM-derived numbers presented here, and similar numbers contained in the model, are useful in that they direct planners and traffic engineers to roadways that now have, or are likely to develop, capacity constraints. As the GEATM is relatively untested (yet powerful) tool, additional modeling—which was beyond the scope of this analysis—is necessary to confirm and corroborate preliminary numbers such as those contained in the tables below. Further data acquisition and analysis through both field- and computer-based methods are necessary to identify, in greater detail, the specifics of capacity-constrained roadway segments identified by the GEATM. This will allow planners and engineers to draw more meaningful conclusions regarding existing and predicted capacity concerns, and create and test alternative congestion relief solutions.

Maps of roadways that identify specific areas of existing and projected volumes and capacity based on the GEATM are included in Appendix A. The maps display 2005 and 2030 (Sketch Plan

⁵ ADT and V/C are related to each other but are not developed from each other, nor do they necessarily lead to the same conclusion regarding roadway capacity. For example, a roadway may have a relatively low ADT, but could have a high V/C ratio in certain segments owing to high peak-hour traffic volumes or, alternatively, roadway design issues that constrain traffic flow and lead to congestion. Conversely, a roadway could have high ADT (relative to similarly-classified roadways), but have no significant concern over its V/C ratio because peak-hour conditions may permit freer traffic flow with fewer delays.

3 full entitlement) maximum peak hour volume to capacity ratios for selected streets. It should be noted that the GEATM is still being refined by Caltrans, the City of Eureka, and Humboldt County. The figures in Appendix A are provided for illustrative purposes. The GEATM will be updated to reflect the proposed General Plan land use alternatives and refined to ensure greater accuracy.

Table 2-3. Roadway Capacity by Urban Study Area

Table 2-3A, Example USA Roadway Segments from the GEATM Showing 2005- Sketch Plan-3 2030 (Build-Out) ADT Increase of Greater than 50%

GEATM Segment ID	Roadway	USA	Segment Length (feet)	2005 ADT	2030 (Build-out) ADT	ADT increase (%)
6408	Azalea Avenue	McKinleyville	158	577	875	52%
6370	Central Avenue	McKinleyville	634	501	1,263	152%
6345	Murray Road	McKinleyville	370	255	843	231%
6392	Sutter Road	McKinleyville	53	577	875	52%
6346	Redway Drive	Redway	1,109	1,071	1,803	68%
6390	Shelter Cove Road	Shelter Cove	1,742	1,412	2,306	63%
6371	Elk River Road	South Eureka	686	374	1,138	204%
6379	Hemlock Street	South Eureka	422	47	1,019	2,068%
6380	Madison Street	South Eureka	317	433	748	73%
6343	Meyers Avenue	South Eureka	211	516	839	63%
6348	Ridgewood Drive	South Eureka	3,432	3,195	5,780	81%
1295	Walnut Drive	South Eureka	370	3,649	6,081	67%
2777	Westhaven Drive	Westhaven	264	434	959	121%

Table 2-3B, Example USA Roadway Segments from the GEATM Showing 2005, Sketch Plan-3 2030 (Build-Out), scenario V/C Ratios of Greater than 90%

GEATM Segment ID	Roadway	USA	Segment Length (feet)	Roadway Capacity	2005 Peak Hour Volume	2030 (Build-out) Peak Hour Volume	2005 Peak Hour V/C Ratio	2030 (Build-out) V/C Ratio
6344	Harrison Avenue	Myrtle town	370	1,000	1,139	1,194	114%	119%
6014	Myrtle Avenue	Myrtle town	211	1,500	1,342	1,425	89%	95%
6408	F Street	South Eureka	317	1,000	1,319	1,484	132%	148%
6357	Harris Street	Myrtle town	158	1,000	1,180	1,268	118%	127%
2772	Herrick Avenue	South Eureka	950	1,000	1,131	1,306	113%	131%
2769	Humboldt Hill Road	Humboldt Hill	264	700	734	859	105%	123%

GEATM Segment ID	Roadway	USA	Segment Length (feet)	Roadway Capacity	2005 Peak Hour Volume	2030 (Build-out) Peak Hour Volume	2005 Peak Hour V/C Ratio	2030 (Build-out) V/C Ratio
7723	Herrick Road at US 101	South Eureka	264	1,000	1,268	1,528	127%	153%
275	Walnut Drive	South Eureka	528	1,000	923	1,148	92%	115%

2.4.5. Maps of Roadways with Capacity Constraints

The maps included in Appendix A highlight the capacity-constrained roadways from the table above. The maps show both existing (2005; red line) and projected (2030; blue highlight) capacity constraints (where V/C >90 percent, or LOS > D).

2.5. Condition Assessment

Roadway condition and maintenance are critical infrastructure issues for Humboldt County. Maintenance programs must be properly funded and managed to have a lasting beneficial effect on roadway condition and public safety. Maintenance benefits can only be achieved if substantial improvements are made to assure the long-term performance of the County's roadways. The long-term performance of roadway facilities can be judged in terms of the following considerations for roadway maintenance (NCRHP, Highway Maintenance Quality Assurance: Final Report, 1998):

- Safety
- Functionality
- Comfort and Aesthetics
- Preservation of Investment

Whether a roadway maintenance program effectively and economically preserves the investment is not easy to determine, as many factors confound the long-term performance of roadways. Perhaps the most significant factor is the allocation of funds for roadway infrastructure maintenance and construction. Other issues, such as design (types of materials, thicknesses), construction (quality of materials, workmanship, conditions during construction), maintenance and rehabilitation all affect the rate of deterioration for a roadway and thus the amount of funding needed to keep pace with that deterioration.

2.5.1. Pavement Management

Assessing pavement performance and the effects of pavement maintenance programs on performance is challenging for all roadway management agencies. A common practice is to define a critical pavement threshold that is used to identify when maintenance is needed, with roadways below the threshold representing the maintenance backlog. A goal of any pavement maintenance program is to define the maintenance threshold and then to reduce or eliminate the backlog. To facilitate this, it is necessary to track the percentage of pavements in the backlog and the pavement deterioration rate, from one condition range to the next lower range. An increase in the overall condition of the County's roadways would thus be

accompanied by a decrease in the backlog, or the deferred maintenance. A roadway deterioration rate reduction would also reduce the backlog.

In 2000, Humboldt County's arterial and collector roadways were inspected and rated as part of the County's new Pavement Management System (PMS). This system relies on assessments of roadway condition and helps roadway maintenance managers identify thresholds for maintenance measures. The PMS generates pavement distress data for a representative sample of arterial and collector roadways in Humboldt County. This data forms the basis for the creation of an "Overall Condition Index" (OCI), which rates roadway surfaces on a scale from 0-100 as shown in the following table:

Table 2-4. Roadway OCI Estimates, Maintenance Requirements, and Costs

OCI	Condition	Maintenance Typically Required at this Condition Level	Average Cost (\$/ft ²) *
70-100	Very Good	Minor (OCI 70-85)—Variable maintenance.	< \$0.4
50-69	Good	Chip Seal—Pavement sprayed with asphalt, covered with aggregate and rolled.	\$0.4
25-29	Poor	Overlay—An increase in the pavement load carrying capacity by adding additional pavement layers.	\$4.0
< 25	Very Poor	Reconstruction—Complete removal and replacement of the existing pavement structure.	\$10.0

* Cost estimates are based on 2003 CIP estimates escalated to better reflect current material costs.

The OCI can be used to plan for maintenance and to identify priorities for reducing the County's backlog of rehabilitation projects. Deterioration curves, where the OCI is reduced annually as the maintenance requirements for that road segment increase over time, allow for scheduling of maintenance based on the anticipated degradation of roadway surface quality.

2.6. Condition of Humboldt County's Roadways

The 2003 Humboldt County Road and Bridge Capital Improvement Plan (CIP) report notes that, overall, the County's roads are in "poor" condition, with the County's Overall Condition Index (OCI) rated at 40 on a scale of 1-100 (County of Humboldt, 2003). The report notes that, in 2000, there was approximately \$100 million in deferred maintenance on the County's roadways (not including maintenance costs for local streets). The report also notes that if Humboldt County continues to limit spending to around \$1 million a year on road surfaces—the approximate budget for resurfacing County roads for the previous 20 years—the OCI would continue to decline, and absent other maintenance activities, would drop in another 20 years to an overall level of 15 (at which point the average road in Humboldt County would require reconstruction).

In 2003, the CIP stated that it would cost approximately \$7.5 million per year to maintain the County's roadways (i.e., keep them at the same overall OCI) if the OCI was in the "very good" range (OCI 70-100). This number is based on the fact that most roads would only require chip seals at 20 cents per square foot (2003 costs) every 5-7 years, and overlays approximately every 30 years at \$2 per square foot (2003 costs). Information contained in the 2003 CIP suggests that close to \$11 million for annual maintenance expenditures was necessary merely to maintain the roads at OCI 40 (County of Humboldt, 2003). Since 2003, materials costs for roadway maintenance and construction have almost doubled, which suggests that costs merely to maintain County Roads in their current condition could be upwards of \$20 million per year (Whitworth, 2007).

Humboldt County Public Works' adopted 2006-07 budget was \$26.2 million. Road Maintenance and Construction received \$8.9 million out of a total Road Fund budget of \$14.8 million. Of this \$8.9 million, roughly \$6.5 million goes to personnel and equipment. This leaves approximately \$2.5 million for roadway maintenance materials—about 12 percent of what is needed to keep the roads from degrading further.

2.6.1. Modified Overall Condition Index

The Pavement Management System's OCI assessment was conducted for only a sample of Humboldt County arterial and collector roadways. For the analysis conducted for this technical report, a modified OCI (MOCI) rating was developed and applied to the USA roadways. The MOCI is based on OCI quintiles as shown in Table 2.5.

Table 2-5. Modified Overall Condition Index

Modified OCI	Comparable (Average) OCI	Condition Description	Recommended Maintenance	Maintenance Costs (\$/ft ²)
5	90	Very Good	None	< \$0.4
4	70	Good	Chip Seal	\$0.4
3	50	Fair	Chip Seal/Overlay	\$2.0
2	30	Poor	Overlay/Reconstruct	\$6.0
1	10	Failed	Reconstruct	\$10.0

Based on the MOCI assessment conducted for this study, average roadway condition for the USAs is slightly higher than for the county as a whole, with an average MOCI of 3 (corresponding to an OCI of approximately 50, compared to 40 for the County as a whole). This may be explained in part by the larger percentage of roadways in the USAs with higher volumes, higher functional classification, and more frequent maintenance. When roads are allowed to deteriorate below a MOCI of 3, as currently exists in Humboldt County, maintenance costs can escalate significantly.

Calculation of total maintenance requirements and costs is not straightforward. [Precise estimates may not be straight forward, but using the unit costs and in the table above and the MOCI would be easy]. Maintenance is typically prioritized for more heavily traveled roadways, and even then is subject to funding limitations. Costs tend to be roadway- and even segment-specific and subject to the volatile prices of raw material (asphalt, concrete, metals). Often, only first-hand assessment of a roadway can indicate the specific segments that require maintenance.

Because roadway maintenance is ongoing and typically a catch-up process (meeting most urgent maintenance needs first), maintenance expenditures for a given roadway will likely be spread out over time (in addition to being subject to available funds) and applied only to the most-deficient and/or highly-used roadway segments. Traffic engineers use deterioration curves to estimate the time it will take a section of roadway to deteriorate from one condition level to the next and to plan for future maintenance. Very generally, these curves can be summarized as:

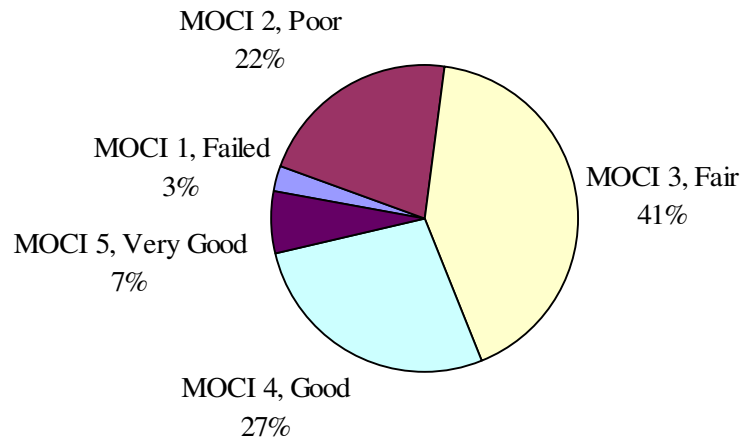
- MOCI 5 to 4: 10 years
- MOCI 4 to 3: 5 years

- MOCI 3 to 2: 5 years
- MOCI 2 to 1: 5 years

For example, a roadway in very good condition (MOCI 5) in 2007 would be expected to deteriorate without maintenance to MOCI 4 in by about 2017 and to MOCI 3 by 2022. Roadways in the USAs are no different from the rest of Humboldt County's roadways in their deterioration rates, and may be subject to more rapid deterioration to the extent that the higher traffic volumes projected for the USAs and the presence of larger vehicles (owing to higher functional classifications) result in more roadway degradation than experienced by other roadways. In general, roadways in poorer condition (< MOCI 3) deteriorate faster than roadways maintained at a higher level (MOCI 4 and 5).

The figure below shows the relative percentages of MOCI for Humboldt County maintained roadways in USAs. As can be seen, two-thirds (66 %) of the County's roadways are at MOCI 3 or below. Only one-third (34 %) are in the good to very good category (MOCI 4 and 5).

Figure 2-19. Percentages of MOCI for USA Roadways



The following tables note the MOCI for specific roadways in Humboldt County's USAs.

Table 2-6. Roadway Condition Estimates by USA

Urban Study Area	Roadway Name	Condition Description	Total Length	USA Length*	Percentage of Roadway within USA
Alderpoint & Garberville	Alderpoint Road	Poor	47.1	2.7	6%
Blue Lake	Blue Lake Boulevard	Very Good	3.3	0.9	28%
	Maple Cr. Road	Poor	28.9	0.2	1%
	Railroad Avenue	Fair	0.2	0.2	100%
	West End Road	Poor	5.7	0.5	9%

Urban Study Area	Roadway Name	Condition Description	Total Length	USA Length*	Percentage of Roadway within USA
Briceland & Redway	Briceland-Thorne Road	Poor	18.1	0.9	5%
Fieldbrook	Fieldbrook Road	Poor	4.9	4.9	100%
Fortuna	Drake Hill Road	Good	1.6	1.3	79%
	Mill Street	Fair	1.1	0.7	65%
	Rohnerville Road	Good	2.0	2.0	100%
Freshwater	Cummings Road	Fair	1.6	0.8	48%
	Freshwater-Kneeland Road	Good	3.1	3.1	100%
	Greenwood Heights Drive	Fair	7.2	2.6	36%
	Westhaven Drive	Poor	3.3	3.3	98%
Garberville	Sprowel Cr. Road	Fair	2.1	0.1	4%
Glendale	Glendale Drive	Fair	3.0	2.3	76%
Humboldt Hill	Humboldt Hill Road	Fair	2.1	1.9	94%
	King Salmon Avenue	Good	0.6	0.6	95%
	Loma Avenue	Poor	0.5	0.5	92%
	Orchard Avenue	Poor	0.1	0.1	92%
	Spring Street	Fair	0.1	0.0	30%
	Tompkins Hill Road (north of Stockton)	Good	8.1	3.4	42%
Indianola	Indianola Cutoff	Poor	0.3	0.3	100%
	Old Arcata Road	Good	2.3	1.6	69%
Jacoby Creek	Jacoby Creek Road	Good	3.3	1.6	48%
Loleta	Summer Street	Fair	0.2	0.2	100%
McKinleyville	Airport Road	Fair	1.0	1.0	100%
	Azalea Avenue	Fair	1.4	1.3	94%
	Central Avenue	Fair	5.1	5.1	100%
	Clam Beach Road	Failed	0.7	0.7	100%
	Dows Prairie Road	Poor	3.8	3.7	98%
	Fischer Avenue	Fair	0.9	0.0	3%
	Gassaway Road	Poor	0.2	0.2	100%

Urban Study Area	Roadway Name	Condition Description	Total Length	USA Length*	Percentage of Roadway within USA
McKinleyville (cont.)	Halfway Avenue	Fair	0.9	0.8	81%
	Hewitt Road	Good	0.2	0.1	33%
	Hiller Road	Fair	1.4	1.4	99%
	McKinleyville Avenue	Good	1.6	1.5	97%
	Murray Road	Fair	5.6	5.1	91%
	Norton Road	Good	0.5	0.3	50%
	Ocean Drive	Poor	0.6	0.6	93%
	Pickett Road	Good	0.4	0.4	90%
	School Road	Good	1.4	1.4	94%
	Sutter Road	Fair	1.2	1.0	85%
	Washington Avenue	Fair	0.4	0.2	41%
Myrtle town	Hall Avenue	Good	0.2	0.2	95%
	Harrison Avenue	Very Good	1.4	1.4	100%
	Lucas Street	Fair	0.3	0.3	100%
	Myrtle Avenue	Very Good	5.7	5.2	92%
	Park Street	Good	0.8	0.5	65%
	Quaker Street	Very Good	0.6	0.6	100%
Orick	Bald Hills Road	Failed	32.2	0.4	1%
Redway	Redway Drive	Very Good	0.8	0.8	100%
Riverside	Port Kenyon Road	Poor	3.2	0.4	12%
Samoa	New Navy Base Road	Good	4.6	1.2	26%
Scotia	Main Street	Fair	1.6	1.6	99%
Shelter Cove	Shelter Cove Road	Fair	9.4	4.0	43%
South Eureka	Allard Avenue	Poor	0.2	0.2	100%
	B Street	Fair	0.5	0.1	16%
	California Street	Fair	0.4	0.4	100%
	Elk River Road	Fair	5.6	4.0	71%
	Eureka Street	Good	0.2	0.2	100%
	F Street	Good	1.0	1.0	100%
	Harris Street	Good	1.7	1.7	100%
	Hemlock Street	Good	0.1	0.1	100%

Urban Study Area	Roadway Name	Condition Description	Total Length	USA Length*	Percentage of Roadway within USA
South Eureka (cont.)	Herrick Avenue	Good	0.9	0.8	91%
	Madison Street	Fair	0.1	0.1	100%
	Meyers Avenue	Fair	0.7	0.7	99%
	Mitchell Road	Fair	1.3	0.7	52%
	Ridgewood Drive	Good	1.8	1.4	79%
	Trinity Street	Fair	0.5	0.3	66%
	Union Street	Poor	0.9	0.8	91%
	Walnut Drive	Good	2.4	2.4	100%
Westhaven	Patrick's Point Drive	Good	5.5	0.5	9%
	Westhaven Drive	Poor	3.3	3.3	98%

* USA Length estimated from Humboldt County Community Development Services GIS data.

2.7. Proposed Improvements

This section briefly discusses both condition- and capacity-related improvements planned by Humboldt County for impaired USA roadways, as well as a list of potential improvements to roadways within the City of Eureka and Caltrans rights of way⁶. This list includes projects that will be further refined based upon additional analysis performed by using the GEATM, and other appropriate traffic analysis methods and tools.

2.7.1. Planned or Completed Roadway Condition Maintenance

The table below notes roadways that have recently or are soon to receive maintenance.

⁶ While this section does not detail Humboldt County Public Works Department's work on pedestrian and bicycle facilities, many County roadway improvement projects include pedestrian and bicycle components. A (partial) list of the bicycle improvements achieved within the last few years includes shoulders with lanes on: Elk River Road, Freshwater Road, Murray Road, Myrtle Avenue (Harrison to Hall), Redwood Drive, Sutter Road, and Walnut Drive. The County is currently designing shoulder lanes for: Central Avenue, Fieldbrook Road, Myrtle Avenue (Hall to Mitchell) and Old Arcata Road. The County has developed pedestrian facilities (sidewalks) on: Blue Lake Boulevard, Briceland-Thorne Road (Redway), McKinleyville Avenue, and Railroad Drive (McKinleyville). The County builds shoulders onto existing roads for pedestrian and bicycle use because these facilities can be maintained by County road crews. At present, the roadway maintenance budget contains insufficient funds for new bicycle/pedestrian projects. The projects listed above are funded through Safe Routes to Schools, Coastal Conservancy, State Transportation Improvement Program (STIP), Transportation Enhancement Act (TEA) and Bicycle Transportation Account funds (among other sources).

Table 2-7. Planned or Completed Roadway Maintenance by USA

Urban Study Area	Roadway Name	Condition Description	Total Length	USA length	Percentage of Roadway within USA	Maintenance
Fortuna	Rohnerville Road	Good	2.0	2.0	100%	Reconstructed recently.
Humboldt Hill	Tompkins Hill Road (north of Stockton)	Good	8.1	3.4	42%	Recently reconstructed
Indianola	Indianola Cutoff	Poor	0.3	0.3	100%	2008 STIP Project
	Old Arcata Road	Good	2.3	1.6	69%	To be reconstructed within two years.
McKinleyville	Azalea Avenue	Fair	1.4	1.3	94%	In Design phase
	McKinleyville Avenue	Good	1.6	1.5	97%	Reconstructed (2007)
	Murray Road	Fair	5.6	5.1	91%	Reconstructed or to be reconstructed within two years.
	Pickett Road	Good	0.4	0.4	90%	Reconstructed (2007)
South Eureka	Elk River Road	Fair	5.6	4.0	71%	Reconstructed Recently
	Herrick Avenue	Good	0.9	0.8	91%	Reconstructed recently.
	Union Street	Poor	0.9	0.8	91%	2009 STIP Project
	Walnut Drive	Good	2.4	2.4	100%	Recently reconstructed

2.7.2. Capacity-Related Roadway Improvements

As indicated in Section 2.4.4 above, most of the roadway segments with capacity constraints are located in the Eureka area (Humboldt Hill, Myrtle town, and South Eureka USAs) and the McKinleyville USA. The community plans for McKinleyville and the Eureka area were completed in 2005 and 1995, respectively. The environmental review for both community plans contained detailed traffic studies and in the case of the Eureka Community Plan, subsequent projects are adding to the analysis and have highlighted requirements for specific Plan related improvements. This section describes the transportation analyses for the McKinleyville and Eureka Community Plans, proposed improvements, and traffic studies associated with subsequent projects.

McKinleyville Community Plan.

The McKinleyville Community Plan EIR traffic analysis identified 20 intersections where operation could diminish over the life of the plan. The McKinleyville Community Plan EIR noted that as of 1999, all of the study intersections identified in the analysis were operating at LOS A or B. At the time of plan area build-out, six of the 20 intersections are expected to experience significant deterioration in operations. Mitigations were adopted as part of the EIR and upon implementation all the six intersections are expected to operate acceptably. As these improvements are not warranted until buildout nears, none of the six projects have been constructed to date. Table 2.8 is a listing of mitigation measures necessary to maintain adequate LOS, based on the McKinleyville Community Plan.

Table 2-8. McKinleyville Community Plan Intersection LOS with Mitigation

Intersection / Mitigation Measure	Delay	LOS
Airport Road/US101 SB Ramps		
All-way Stop-controlled *	35.2	E
Signalized	3.3	A
Murray Road/McKinleyville Avenue		
Signalized (Permissive Left-turns)	7.4	B
Signalized (Protected Left-turns)	9.8	B
Murray Road/Central Avenue		
Signalized (Permissive Left-turns)	8.3	B
Signalized (Protected Left-turns)	13.9	B
Hiller Road/McKinleyville Avenue		
Left-turn Pockets on McKinleyville Avenue	18.4	C
Left-turn Pockets on Hiller Road	17.4	C
School Road/Washington Avenue		
All-way Stop Controls (current lanes) *	20.6	D
All-way stop controls, two lanes on Washington	13.6	C
Central Avenue-US101 North/CA 200		
All-way stop controls *	46.4	F
Signalized	6.0	B

Source: Table 4.7-2: Year 2020 Intersection Levels of Service with Mitigation, Draft Program Environmental Impact Report for the 1999 Revisions to the McKinleyville Community Plan, June 1, 1999.

1995 Eureka Community Plan

A study of existing and future traffic conditions was prepared as part of the 1995 Eureka Community Plan (ECP). The Transportation Chapter of the EIR and the Circulation policies of the ECP made improvement recommendations for roadways in the Myrtle town, South Eureka, and Humboldt Hill USAs based on projected buildout. As of the writing of this report, the recommended improvements, listed in Table 2.9 below, have not yet been completed. Most (if not all) of these projects would require the preparation of a traffic analyses, engineering studies to design the improvement, the identification of appropriate funding sources, and the likely establishment of impact fees to apportion project costs to beneficiaries. Implementation

Measure 4250.2 called for the adoption and periodic review of a traffic impact fee ordinance, or the use of other funds or mechanisms such as assessment districts, to fund proposed improvements. A comprehensive program to fund ECP related improvements has not been established.

Table 2-9 Eureka Community Plan Roadway Improvements

Location	Improvement Description
F Street	Widen to four lanes (through restriping and/or removal of on-street parking, or acquisition of additional rights-of-way)
Herrick Road	Signalize intersection with Elk River Road and provide exclusive left turn pockets and right-turn lane
Walnut Drive	1) provide left-turn pockets at major future intersections, two-way left-turn lanes along sections with numerous driveways (Such as from Campton to Cypress); 2) reroute traffic along Cypress Street, north through the McKay Tract to the end of Harrison Avenue
Union Street	Improve portion from City Limits to Madison Avenue to allow for access from Pine Hill to the City of Eureka; improvements should include a minimum of two driving lanes, pedestrian/bicycle corridor, and improvement of the intersection of Sea Avenue.
Robinson/Dunn Property (Forster-Gill development) [located south of the City of Eureka Lundbar Hills subdivision and north of Ridgewood Drive]	Require a road from Ridgewood to Fairway Drive at least to the North End of the property (planned for ultimate connection to Fairway Drive) Development should have multiple access points onto Walnut Drive and Ridgewood Drive (when feasible should coincide with existing streets, to make four-way intersection)
McKay Tract [Located generally south of Redwood Acres Fairground and north of Home Drive, east of Walnut Drive and west of Ryan Creek]	North McKay: 1) develop a primary through road from Cypress Street to the end of Harrison Avenue; 2) provide at least three access points onto Walnut Drive (incorporating extensions of Redwood, Fern and Arbutus Streets). South McKay: 1) design with a primary access other than Northridge Road (designed to intersect Walnut when possible), with Northridge used as a secondary access; 2) access points should coincide with existing street systems where possible. Mid McKay: A specific circulation system was not recommended for Mid McKay at this time, as it was felt to be more appropriate at the time a development application is filed.

Source: Section 4200, Circulation, Eureka Community Plan, 1995.

Figure 2-4a on page 2-23, Circulation in South Eureka, is a representation of Figure 17, the Circulation Map for the ECP, and identifies future circulation routes that will provide new linkages, congestion relief for existing roadways, and access for areas identified for major future residential development. The Circulation Map shows four routes trending north of Ridgewood Drive/Walnut Drive, two of which connect to Fairway Drive in the City of Eureka. These proposed new routes indicated on Figure 17 interconnect with an east-west trending route that connects to Elk River Road between Westgate Drive and Pine Hill Road. The Circulation Map also shows two new linkages along the eastern edge of the Eureka area, one providing access to new development in the mid-McKay area (near North Ridge Road) and the second connecting Cypress Avenue to Harrison Avenue. These linkages are critical to several planned and proposed projects including the Ridgewood Village project, which is further described below.

Figure 17 contains a notation that the alignments depicted are for graphical purposes only and that the actual location of the routes will be determined at public hearings as development occurs.

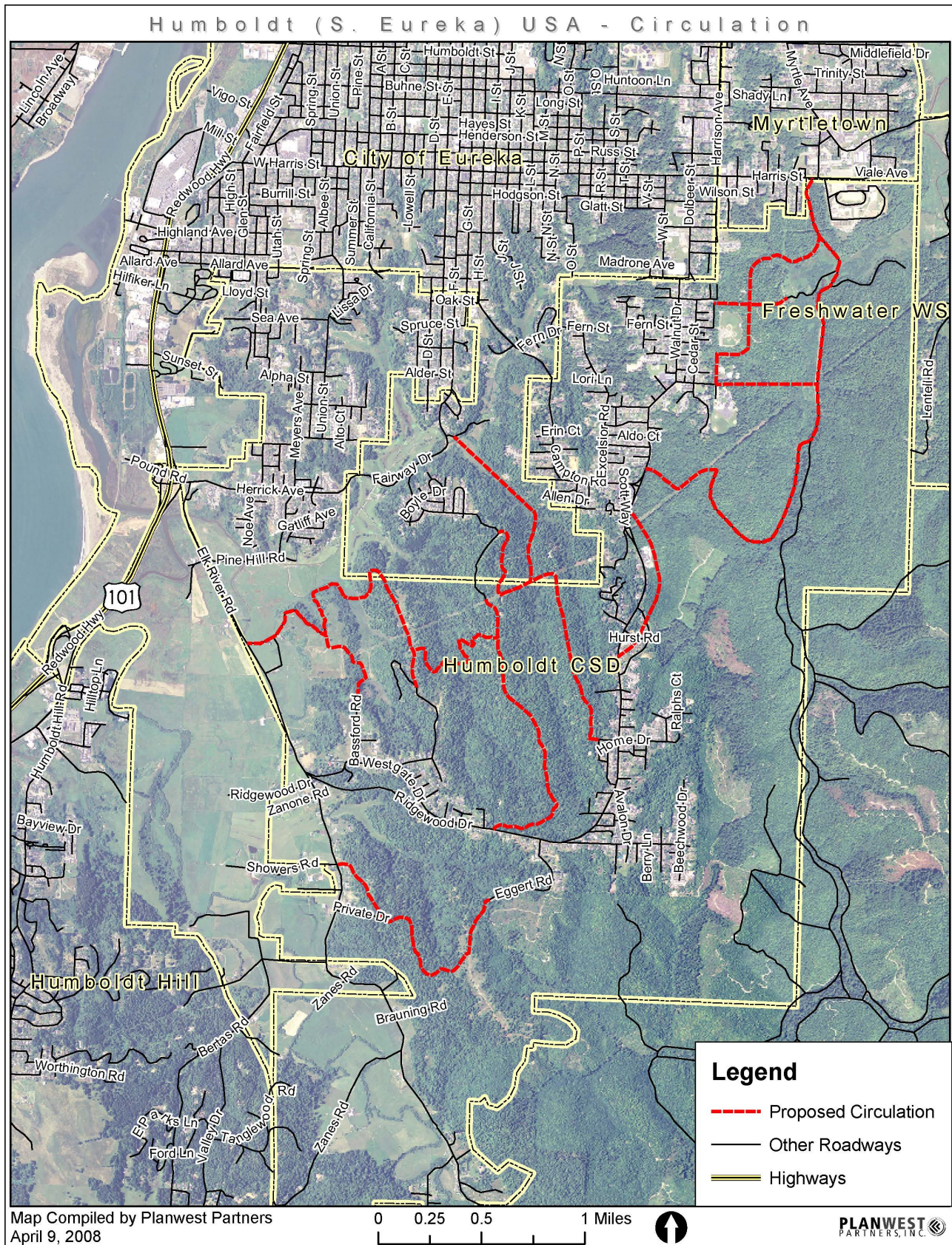
The ECP EIR analyzed traffic impacts at four levels of build-out: 25 percent; 50 percent; 75 percent; and 100 percent of total buildout. The EIR states that the increases in traffic volumes can generally be accommodated by the existing roadway network, with the exception of a few locations (see Table 2-9 above for proposed mitigations). The new roadway linkages are required to be constructed as specific new developments occur. Findings of fact were made as part of the ECP EIR concluding that after the incorporation of mitigation measures, impacts resulting from additional vehicle traffic on two roadways, F Street and Walnut Drive south of Hemlock Street would remain significant after mitigation. The Board of Supervisors adopted a statement of overriding consideration prior to approval of the ECP.

Most of the projects that are listed in Table 2-9, above, are included as candidate long-term roadway projects in the Humboldt Regional Transportation Plan 2006. Long-term projects are defined as those projects that are necessary to maintain service levels and accommodate projected traffic growth over the next twenty years. All of these listed projects are planned for construction between 2016 and 2025. The complete list of long term projects is found in RTP Table IV-2, Long Term Roadway Project Roadway Projects (2006, pages IV-17).

It should be noted that Figure 17, the Circulation Map for the ECP, differs from Figure 3-1, the City of Eureka General Plan Circulation Plan Diagram. The Eureka General Plan Circulation Plan Diagram shows only one north-trending route connecting Ridgewood Drive to Fairway Drive in the City of Eureka. In addition, the functional classification of the north-south connecting route is specified as a minor arterial in the City of Eureka General Plan, whereas it is not specified in the Eureka Community Plan. Humboldt County and the City of Eureka should work together to develop a common circulation plan for the greater Eureka area that contains unified right of way and roadway cross-section standards.

Martin Slough Interceptor Project. The Martin Slough Interceptor (MSI) project is a major wastewater facility that would improve wastewater collection within the Martin Slough basin, which includes portions of the City of Eureka and the ECP area. The intent of the project is to reduce demands on portions of the City's system that are overloaded and from time to time experience sanitary sewer overflows (see Section 7.3 for additional information regarding this project). The MSI project EIR indicated that the current traffic counts (as of May 2004) are not consistent with the levels projected for the current level of buildout in the ECP. For instance, the MSI EIR reports that traffic on Walnut Drive south of Hemlock has already reached levels projected by the ECP EIR to occur after 75 percent of buildout. County staff stated in the January 4th, 2007 staff report regarding the Dunn-Robinson-Forster-Gill General Plan Amendment petition that "staff would concur that...traffic impacts as analyzed in the ECP may not address full congestion in the Highway 101 corridor, in particular that portion within the City of Eureka, and changes in traffic patterns that have and may occur over time."

Figure 2-4a, Circulation in South Eureka



The MSI EIR concluded that the interceptor project would facilitate development allowed by the Eureka Community Plan, indirectly leading to significant traffic effects in the County and the City. The MSI project included mitigation measure 11-3.1, which was designed to limit connections to the MSI pending the development of a memorandum of understanding (MOU) to identify mitigation for cumulative traffic impacts and the implementation of a circulation improvement fund program. The aim of the MOU is to formally identify indirect or cumulative traffic and circulation impacts and the required improvements necessary to offset the impacts, within the areas of the City of Eureka and the unincorporated area served by the MSI project.

Forster-Gill/Ridgewood Village Project. On January 23rd, 2007, the Board of Supervisors accepted a petition from the landowner to submit an application to amend the ECP to remove the density cap of 700 units on the northern portion of the property formerly known as the Robinson-Dunn tract. This project is located in the undeveloped area south of the Lundbar Hills subdivision in the City of Eureka and north of Ridgewood Drive. This project, as submitted, would result in approximately 1,400 dwelling units and 327,000 square feet of commercial development. Pursuant to the ECP, a traffic study that documents the traffic service impacts of removal of density limitations must be prepared (Section 2620, Item 20).

Preparation of an EIR for this project, now referred to as the Ridgewood Village project, has been initiated. The EIR includes a comprehensive traffic analysis. The traffic analysis will determine the operational characteristics of the greater Eureka area circulation system, the circulation system needs associated with future traffic demand, and the probable circulation impacts associated with the development. The consultant preparing the analysis will use the GEATM, described in detail above, for this study. Six scenarios will be used to project future traffic impacts:

1. existing conditions;
2. existing conditions plus the Ridgewood Village project;
3. near term future (horizon year for Phase 1 occupancy) without Ridgewood Village project;
4. near term future (horizon year for Phase 1 occupancy) with Ridgewood Village project;
5. Cumulative traffic without Ridgewood Village project;
6. Cumulative traffic with Ridgewood Village project;

The Ridgewood Village project traffic analysis is being prepared at this time and will not be available for incorporation into this report. However, its results, especially the analysis of cumulative traffic impacts will likely be valuable in the review of General Plan Update land use alternatives.

Marina Project. The proposed Balloon Track mixed-use development, to be named Marina Center, is to be located north of Washington Street and west of Broadway (US Route 101) in the City of Eureka. Waterfront Drive is the north and west boundary of the project site, which is adjacent to Humboldt Bay. The project sponsor proposes to construct approximately 511,200 square feet of commercial/retail mixed use plus 54 dwelling units.

This traffic study evaluated the potential traffic impacts resulting from the development of the proposed project, identified potential roadway and circulation needs and determined potential mitigation measures to offset significant traffic impacts due to the project. The study focused on evaluating conditions at twenty-seven existing intersections and one future study intersection

that may potentially be impacted by the proposed project. The following study intersections were selected for analysis in coordination with City and Caltrans staff:

- | | |
|---|--|
| 1. Broadway and Fourth Street | 15. Wabash and Koster |
| 2. Broadway and Fifth Street | 16. Broadway and Bayshore Mall (north
- Harris) |
| 3. Broadway and Sixth Street | 17. Commercial and Fourth Street |
| 4. Waterfront Drive and Fourth Street
(project access, does not exist now) | 18. Fourth Street and 'C' Street |
| 5. Broadway and Washington | 19. Fourth Street and 'E' Street |
| 6. Broadway and 14th Street | 20. Fourth Street and 'F' Street |
| 7. Broadway and Wabash-Fairfield | 21. Fourth Street and 'H' Street |
| 8. Broadway and Del Norte | 22. Fourth Street and 'I' Street |
| 9. Broadway and Hawthorne | 23. Fifth Street and 'C' Street |
| 10. Broadway and Henderson | 24. Fifth Street and 'E' Street |
| 11. Washington and Waterfront | 25. Fifth Street and 'F' Street |
| 12. Washington and Koster | 26. Fifth Street and 'H' Street |
| 13. Waterfront and Commercial | 27. Fifth Street and 'I' Street |
| 14. Koster and 14th Street | 28. Broadway and Seventh Street |

The intersection operating conditions were evaluated under the following four scenarios:

1. Existing Conditions in 2006
2. Baseline 2010 (Existing volumes factored by 1.06 traffic growth)
3. Baseline 2010 + Project
4. Cumulative + Project 2025 Conditions

All scenarios were simulated using SimTraffic 6.0 to better assess the potential adverse interaction of traffic queues between closely spaced signalized intersections. Therefore, average speeds, queues, and use of special lane storage lengths were also addressed. While there are no minimum performance criteria for these additional factors, the output of the simulation models allows a good comparison of no project with project conditions scenarios.

The GETAM was made available for use in estimating project traffic distribution and assignment to study intersections. An origin-destination study was made of Costco customers prior to the availability of the model, so that estimates of project trip distribution could be made for impact analysis. The Countywide model was calibrated so that it closely estimates the existing turning volumes at the 27 existing study intersections of the study, and it also fairly estimated the trip distribution for customers leaving Costco. The adjustments to enhance and refine the model for the Marina Center Traffic Report resulted in a powerful tool for analyzing project impact. The Model was only used for project trips in 2010, because there was no general agreement on the land uses in the model for cumulative conditions in 2025.

Currently Planned or Proposed Improvements

Currently there is close to \$30 million, in 2007 dollars, in planned or proposed improvements to roadways in Humboldt County USAs (Source: County Public Works). The proposed system upgrades in the unincorporated area were identified primarily based on field work, historic traffic counts, and constituent input. It should be noted that the unincorporated area improvements

listed below are not all inclusive. There are important roadway improvement projects that are high priority for Humboldt County that area located outside Urban Study Areas.

Table 2-10. Cost of Planned or Proposed Improvements by USA

Urban Study Area	Cost of Planned /Proposed Improvements
Briceland & Redway	\$900,000
Freshwater	\$1,800,000
Humboldt Hill	\$4,500,000
McKinleyville	\$1,900,000
Myrtle town	\$7,000,000
South Eureka	\$12,600,000
TOTAL	\$28,700,000

In addition the City of Eureka has developed a list of potential improvements within its jurisdiction that represent potential mitigation for traffic impacts related to Sketch Plan 3. This list, which totals approximately \$44 million dollars, could be refined through additional analysis using the GEATM, as well as other appropriate traffic analysis methods and tools. A portion of the need for these improvements is related to existing populations and some is related to future populations. Some of these are also more regional in nature, particularly the improvements along Broadway, 4th, and 5th Streets. These proposed improvements are presented in Table 2-11 as well.

Cooperation between the City, County, Caltrans and the HCAOG will help prioritize the roadway improvements and planned for the greater Eureka area listed in Table 2-11. Considerable analysis will be required to determine project need, effectiveness, and feasibility. Additional analysis will be required to allocate the share of improvement costs between existing and future development, development within the City of Eureka and outside the City, and between residential and commercial development. Implementation of these projects and the construction schedule will be determined, among other things, by the Martin Slough Interceptor traffic mitigation MOA described above. Implementation of these projects will be largely determined through the use of the GEATM and other appropriate traffic analysis methods.

Table 2-11 below notes the currently proposed and/or scheduled measures to reduce congestion for critical USA roadways and within the City of Eureka. It should be noted that the information contained in Table 2-11 is derived from preliminary planning level analysis and traffic modeling for the EIR may result in changes, revisions, or deletion of the projects on this list. A detailed traffic engineering report will be prepared as part of the general plan update EIR. The traffic engineering report will need to specify:

1. the location of new circulation routes;
2. the type of facility being built (arterial, collector, local) based upon AASHTO standards;
3. the recommended roadway cross section to accommodate all road users;
4. the width of right of way needed; and
5. enhancements to existing facilities (add travel lanes, traffic signals, etc).

Table 2-11. Planned or Proposed System Upgrades by USA and within the City of Eureka

Roadway	Measures to Reduce Congestion	Estimated Cost of Improvements (\$)	Schedule
Humboldt County Projects			
Briceland WSA and Redway USA—\$900,000			
Briceland-Thorne Road	Curve corrections and improvements to the intersection of Ettersburg Road. Shoulders need to be widened for bikes & pedestrians between Briceland and Redway.	The County has a \$900,000 grant for fixing hazardous roads between Ettersburg Junction and Shelter Cove. No plans currently for improvements to roadway from Redway to Briceland.	2009
Freshwater WSA—\$1,800,000			
Freshwater-Kneeland Road	Install roundabout at intersection with Old Arcata Road.	\$1,000,000	2011
	Phase I - Shoulders widened for bikes and pedestrians (Phase I – 2002). Phase II - Stripe and sign roadway from Old Arcata to Henry Lane. Localized widening as necessary.	\$800,000	2010
Humboldt Hill USA—\$4,500,000 +			
Humboldt Hill Road	Roundabout at intersection of Humboldt Hill Road and South Broadway.	TBD	TBD
	Extend Humboldt Hill Road to Tompkins Hill Road.	\$2,000,000	2014
	Create bypass by extending London Drive to Broadway.	\$2,500,000	2011
McKinleyville USA—\$1,900,000			
Central Avenue (Relief)	Create McKinleyville Avenue-School Road connection.	\$600,000	2009

Roadway	Measures to Reduce Congestion	Estimated Cost of Improvements (\$)	Schedule
	Center left turn lane and bicycle and pedestrian improvements to School Road.	\$900,000	2010
Central Avenue	Safe Routes to School improvements are being installed from Bates to Murray.	\$400,000	2007
Myrtleown USA—\$7,000,000			
Harrison Avenue	Volume/Capacity is acceptable, but shoulders should be widened for bikes and pedestrians if possible.	TBD	TBD
Myrtle Avenue	Install shoulders from Hall to Mitchell.	\$1,000,000	2007
	Install 6' shoulders from Indianola to Stephens Lane.	\$6,000,000	2008
South Eureka USA—\$12,600,000			
Elk River Road	Traffic Signal or round about at intersection with Herrick.	\$400,000	2010
	Construction of Reardon Ranch (Reliever Road)	\$2,800,000	TBD
F Street	Remove parking. Center left turn lane and bike lane enhancement.	\$600,000	2010
Harris Street	McKay Tract connector to Harris Street	\$2,900,000	TBD
	Fern Street Connector from V Street to Excelsior Street.	\$1,200,000	TBD
Herrick	Construction of Lunblade Hills Reliever Road.	\$2,800,000	TBD
Walnut	Construction of a roundabout at Walnut and Hemlock.	\$1,500,000	TBD

Roadway	Measures to Reduce Congestion	Estimated Cost of Improvements (\$)	Schedule
	Installation of traffic signal at Fern Street.	\$400,000	2010
City of Eureka Projects			
Route 101, Broadway Corridor, \$25,500,000			
Waterfront Drive	Extend from Del Norte Street to Hilfiker Lane with new signal on Broadway at Hilfiker Lane	\$20,000,000	2009-10*
Highland Ave & Truesdale Ave Intersections	Combine with a new signal at Truesdale Ave	\$1,000,000	TBD
Harris Street and Henderson Street Intersections	Combine with a new signal at Bayshore Way	\$3,000,000	TBD
Wabash Ave to Truesdale St	Remove parking and restripe to add one southbound lane	\$500,000	TBD
Modify the Wabash and Fairfield Intersections	Elimination of northbound Fairfield St access	\$100,000	TBD
	Install new signal at Broadway and Hawthorne St	\$300,00	TBD
	Widen Hawthorne to provide two westbound right turn lanes and one westbound through/left lane	\$300,000	TBD
4th St to McCullens Ave	Install signal interconnect and implement optimized signal coordination timing along the corridor so that all signals are in one system	\$300,000	TBD
Route 101, 4th, and 5th Streets, \$5,600,000			
4 th St at Broadway	Install new signal	\$200,000	TBD
4 th St at Commercial	Install new signal	\$1,000,000	TBD
4 th St at C St	Install new signal	\$3,000,000	TBD
5 th St at C St	Install new signal	\$200,000	TBD
4 th St at L St	Install new signal	\$200,000	TBD
4 th St at N St	Install new signal	\$200,000	TBD

Roadway	Measures to Reduce Congestion	Estimated Cost of Improvements (\$)	Schedule
5 th St at N St	Install new signal	\$200,000	TBD
4 th St at T St	Install new signal	\$200,000	TBD
5 th St at T St	Install new signal	\$200,000	TBD
Waterfront Dr	Connect from G to J Streets	\$3,200,000	2008-09*
4 th and 5 th St from V St to Broadway	Install signal interconnect and implement optimized signal coordination timing along 4 th and 5 th Streets so that all signals are in one system, from V St to Broadway	\$600,000	TBD
North-East Eureka, \$7,000,000			
Route 101 at Airport Road	Install new signal	\$6,000,000	TBD
Waterfront Drive	Extend from T to V Streets	\$1,000,000	TBD
South-East Eureka, \$3,300,000			
Harris Street and Harrison Street	Expand intersection to provide full 8-phase, protected left turns	\$500,000	TBD
Dolbeer Street, Hemlock Street to Harris Street	Traffic Calming for speed only	\$50,000	TBD
W Street, Hemlock Street to Harris Street	Traffic Calming for speed only	\$50,000	TBD
Harrison Street, Harris Street to Myrtle Avenue	Remove parking and restripe with center left-turn and bike lanes	\$1,400,000	TBD
South-Central Eureka, \$1,200,000			
Harris Street at E and F Streets	Provide protected left turns	\$200,000	TBD
Harris Street at H and I Streets	Signal and intersection improvements	\$500,000	TBD
Harrison Avenue, south of Harris Street	Traffic Calming for speed only	\$200,000	TBD
South-West Eureka, \$900,000			
Harris at Central	Install new signal	\$300,000	TBD
Harris at California	Install new signal	\$300,000	TBD
Henderson at Central	Install new signal	\$300,000	TBD
Citywide, \$900,000			

Roadway	Measures to Reduce Congestion	Estimated Cost of Improvements (\$)	Schedule
Traffic Signal Standardization and Coordination	Replace all city signal equipment and interconnect and implement optimized signal coordination timing	\$400,000	TBD
Emergency Vehicle Preempt	Install City and Caltrans signals	\$200,000	TBD

*Dates listed are from the Humboldt County 2006 Regional Transportation Plan, Table IV-1, Shorter Term Roadway Projects, and Table IV-2, Long Term Projects.

2.8. Issues to be Addressed in the General Plan Update

The technical report presents a basis for classifying and assessing the County roadway system. As documented in this report, the County roadway system needs to be significantly upgraded just to carry current volumes efficiently and safely. It will need additional upgrades to carry the vehicle volumes projected in the County General Plan through the year 2030.

The General Plan Update will include goals, policies and programs for the following issues;

Roadway Classifications. There are currently some inconsistencies in certain classifications being used in the County. The General Plan Update will recommend a set of classifications for arterials, collectors and local roads that will be applicable for new development, planned improvements of existing roadways, maintenance, and modeling.

Distinction between Urban and Rural Standards. Travel and roadway criteria, such as that contained in the Transportation Research Board Highway Capacity Manual, distinguish between urban and rural standards. Applying these standards appropriately can result in more urban standards for the USAs, while maintaining more cost-effective rural standards in outlying areas.

Revenue Sources. The report documents a significant backlog in roadway maintenance. There are also more than \$40 million in planned or proposed improvements to roadways in Humboldt County USAs. The Community Infrastructure and Services Element will propose revenue sources including impact fees, development standards, and special assessments and taxes to cover the range of costs to provide a roadway system.

Multimodal Use of County Road Rights of Way. As stated in this report, the County roadways must be able to carry vehicle, truck, bicycle, pedestrian, equestrian, and transit traffic. The General Plan Update will include policy for maximizing the capacity of county rights of way for multimodal travel.

Greater Eureka Area Traffic Model Maintenance and Operation. The GEATM can become an important tool for projecting future travel demand, and coordinating efforts by the County, City of Eureka, and Caltrans, to respond to that demand.

Community Infrastructure and Services Element and Circulation Element Coordination. These two elements must be internally consistent. The Community Infrastructure and Services Element will identify appropriate roadway system funding mechanisms for construction and maintenance. The Circulation Element will set direction for how that system develops to correspond with planned development.

3. Law Enforcement

3.1. Description and Map

3.1.1. Map

A map of the Sheriff's Office Operations, including locations of the main station, substations, and resident deputy posts, is included as Figure 3-1.

3.1.2. Description

The Humboldt County Sheriff's Office provides a variety of public safety services countywide (court services, corrections, emergency operations) and law enforcement services for the unincorporated areas of the County. Law enforcement on unincorporated public lands is provided by the land management agencies (i.e., Forest Service, Bureau of Land Management, National and State parks); on tribal lands law enforcement services are provided by the tribes (i.e., Hoopa, Yurok). The California Highway Patrol is responsible for enforcing traffic laws on state highways and Roadways within the unincorporated area.

The Sheriff's Office Operations Bureau is made up of seven units under the command of the Undersheriff. The most visible of these units is Patrol. These deputies are responsible for responding to emergency calls for service, criminal investigations, and crime prevention through neighborhood and beat patrols. Patrol has one Main Station in Eureka, substations in Garberville, Hoopa and McKinleyville, and six resident deputy posts. Most of the urban study areas (USAs) receive law enforcement services solely from the Humboldt County Sheriff's Office (HCSO). Arcata, Blue Lake, Eureka, Ferndale, Fortuna, Rio Dell and Trinidad each have their own police departments that provide mutual aid to the County.

The Sheriff's Office has mutual aid agreements with cities and the California State Highway Patrol. Mutual aid is an agreement between agencies where the agency of jurisdiction can request manpower or resources from allied agencies or agencies within larger operational areas (such as regional or multi-jurisdictional entities). These agencies could be local or state agencies. The length of the commitment and scope of the request is based upon the resources and availability of contributing agencies.

The sources of revenue for the Sheriff's Office include the County General fund, grant funding and fees. The 2006 Sheriff Department budget is broken out in Table 3-1.

Table 3-1. 2006 Humboldt County Sheriff's Office Budget

Division	Budget (\$ millions)	Percent of Total
Operations	10.90	49.3
Custody Services	8.90	40.3
Animal Control	1.10	5.0
Cal-MMET (Multijurisdictional Methamphetamine Enforcement Team)	.42	1.9
Marijuana Suppression	.29	1.3
Homeland Security	.28	1.3
Boating Safety	.17	.8
Office of Emergency Services (OES)	.14	.6
TOTAL	22.10	

Figure 3-1. Sheriff Office Operations – Main Station, Substations, and Resident Deputy Posts



3.1.3. Sheriff's Office Operations

Main Station Patrol: Eureka. The Main Station Patrol unit currently (as of June 2007) has one Lieutenant, six Sergeants, 18 Deputy Sheriffs and one Community Services Officer (CSO) that provide law enforcement services to the unincorporated areas of Humboldt County from Arcata south to Redcrest. There are two main beats: central and south. The central beat covers the unincorporated areas of Arcata (Bayside, Fickle Hill) and Eureka (Myrtle town, Cutten, Pine Hill, Samoa, Fairhaven) along with the areas of Kneeland and Elk River. The south beat covers the unincorporated areas surrounding the cities of Fortuna, Ferndale and Rio Dell. Additionally the south beat covers the areas of Humboldt Hill, the South Spit/Table Bluff area, Loleta, Hydesville, Scotia and the Redcrest area. USAs covered by the Main Station include Arcata, South Eureka, Myrtle town, Fortuna, Freshwater, Hydesville-Carlotta, Indianola, Jacoby Creek, Loleta, Manila, Rio Dell, Riverside, Samoa, and Scotia.

The Deputy Sheriffs assigned to these beats are responsible for patrolling approximately 800 square miles and providing law enforcement services to the residents and visitors to those regions. Many of the neighborhoods in the beat areas have strong formal neighborhood watch programs in place, while those areas that are rural or isolated, such as Kneeland, Hydesville and Bridgeville, rely on the less formal but equally effective method of "neighbors watching out for neighbors" (Sheriff's Office website).

Northern Substation: McKinleyville. The Humboldt County Sheriff's Northern Substation in McKinleyville provides law enforcement services to the residents of Blue Lake, Fieldbrook, McKinleyville, Orick, Redwood Valley, Westhaven, and to all other unincorporated areas North of Arcata. The Northern Substation includes one Lieutenant, one Sergeant, eight Deputies, one legal office assistant, and one resident Deputy in Orick. All Law Enforcement services for these areas originate in this station. The Northern Substation responds to about 35 percent of the calls for service in Humboldt County. USAs covered by the Northern Substation include Big Lagoon, Blue Lake, Fieldbrook, Glendale, McKinleyville, Orick, Trinidad and Westhaven.

Garberville Substation. The Humboldt County Sheriff's Garberville Substation is located at the southern end of Humboldt County. The Garberville Substation serves the communities of Garberville, Redway, Shelter Cove, Miranda, Phillipsville, Weott, Myers Flat, and Alderpoint. Deputies patrol from the Stafford area south to the Humboldt county line. The correctional officer works at the station processing arrests made in the southern Humboldt area and transports those in custody to the Humboldt County Correctional Facility when necessary. The station is staffed with one Sergeant, five Deputies, one Resident Deputy assigned to Shelter Cove, one Correctional Officer and a Senior Legal Office Assistant. USAs covered by the Garberville Substation would include Alderpoint, Benbow, Briceland, Garberville, Miranda, Myers Flat, Phillipsville, Redway, Shelter Cove, and Weott.

Hoopla Substation. The Hoopa Sheriff's Station is located 55 miles east of Eureka on the Hoopa Valley Indian Reservation (the largest Indian reservation in California). The sub station is currently staffed with one sergeant, five deputies, a correctional officer, a resident deputy in Orleans, and a Legal Office Assistant. Deputies assigned to the Hoopa station provide law enforcement services to the northeastern part of Humboldt County including Willow Creek, Hoopa, Weitchpec, Orleans, Redwood Valley and other surrounding communities and work in cooperation with the Hoopa Valley and Yurok Tribal Police Departments and California Highway Patrol. The Hoopa Stations area of responsibility borders Trinity and Siskiyou Counties. The correctional officer works at the station processing arrests made in the Hoopa and Willow Creek

areas and transports those in custody to the Humboldt County Correctional Facility when necessary. USAs covered by the Hoopa Substation include Orleans and Willow Creek.

Resident Deputy Posts: Bridgeville, Orick, Orleans, Petrolia and Shelter Cove. Deputies live with and patrol residents in these communities. USAs with resident deputy posts include Orick, Orleans and Shelter Cove.

Boating: Eureka Marina. The Boating Program is made up of two full-time deputies, Marine Posse members and Sheriff Citizens on Patrol (SCOP) members. The Boating Program's most common activities include boating and Enforcement Patrol on all waterways in the County and the Pacific Ocean out to three miles, boating safety displays at places like the Bayshore Mall, and with other local organizations.

Other Sheriff's Office Programs/Functions

- The Criminal Investigations Division (CID) is responsible for the investigation of complex criminal investigations and the collection and processing of evidence.
- The Civil/Courts Division is responsible for the process of all civil proceedings and service of the civil documents.
- Court Services is responsible for courtroom security; they are officers of the court maintaining a presence during all criminal and civil court proceedings.
- Special Services is comprised of all the specialty units within the sheriff's office, this including marine patrol, beach patrol, livestock, and drug enforcement; they are responsible for search and rescue operations.
- Dispatch provides 24-hour 911 radio communication for all Sheriff services.
- Office of Emergency Services (OES) provides training, and logistics, and is the county operational component during all declared emergencies.
- Property/Evidence provides secure storage of property.
- Business/Records performs administrative functions necessary for Sheriff operations.
- Storage Yard (Eureka).

3.2. Existing Level of Service

3.2.1. Personnel Recruitment and Retention

Revenue sources used by the County to fund Sheriff's Office operations have not kept pace with service costs. As can be expected, budgetary restrictions limit the resources needed to deliver services efficiently and equitably. One of these basic resources is personnel. The Humboldt County Sheriff has received many public complaints regarding its ability to respond to calls for service in a timely manner, and its community involvement. Department accessibility by the community for walk-in services is also a concern. All of these functions are limited by staff availability.

Wages, work conditions and a full year of academy training all factor in to the difficulty the Sheriff's Office faces in recruitment and retention of qualified personnel. Staff at substations is inadequate. Training (particularly biohazard/biological training) is considered adequate, but could be enhanced (Downey, 2007). Continued advanced officer training is provided by the

State of California's Commission on Peace Officer Standards and Training (POST), and most training is reimbursed by POST.⁷

A 2004 study by the U.S. Department of Justice noted that fiscal and/or recruitment problems have made it difficult for law enforcement agencies to recruit and retain adequate numbers of officers. Recruitment in rural areas is made more difficult because of the higher wages in urban areas and the more limited pool of qualified applicants. Several possible reasons for this trend were noted, many of which are applicable to Humboldt County:

- The screening and training of new officers can take almost one year to complete.
- Economic factors may have lured good candidates and experienced officers into better paying jobs in professions outside of law enforcement.
- Increasing educational requirements for applicants may have restricted the number of recruits, which may be compounded by more alternatives for prospective applicants who have a college education.
- Some departments may be facing unusually high attrition as baby boomers retire.
- Negative publicity over such matters as racial profiling and the excessive use of force may have discouraged some people from wanting to join the profession.
- Increased hiring during the late 1990s may have contributed to recruit shortages by draining the pool of potential police applicants and intensifying competition among police agencies.

3.2.2. Level of Service Measures

The officer-to-population ratio, the number of officers to calls for service ratio and officer response times are standard measures of the level of service for law enforcement operations. Humboldt County Sheriff staff provided anecdotal information on response times, generally concluding that they are acceptable in McKinleyville and Eureka but inadequate elsewhere (particularly in outlying areas). The current number of sworn officers is considered inadequate to respond to the demand for service, and in addition to adequate staffing, the ability to respond effectively to calls for service depends on the call time and type (e.g., early or late, minor or major incident) (Downey, 2007).

Table 3-2. Humboldt County Sheriff's Office Sworn Officers

Sworn Officer	Budgeted Staff
Sheriff	1
Undersheriff	1
Lieutenant	5
Sergeant	12
Detective	4
Field Training Officer	8
Deputy I&II	60
TOTAL	90

Source: Humboldt County Facilities Master Plan (2007); communications with Sheriff's Office.

⁷ The POST program is voluntary and incentive-based. Participating agencies agree to abide by the standards established by POST. The more than 600 agencies in the POST program are eligible to receive the Commission's services and benefits, such as job-related assessment tools, research into improved officer selection standards, management counseling services, the development of new training courses, reimbursement for training, and quality leadership training programs. POST also awards professional certificates to recognize peace officer achievement and proficiency.

3.2.2.1. Officer to Population Ratios

Accepted standards for officer-to-population ratios (OPR) for adequate service range from 1.5-2:1,000. OPRs below this level can impair the ability of patrol officers to respond to calls for service in a timely manner. These recommended OPR figures are based on an International Association of Chiefs of Police Research Center (IACPRC) directive that sets OPR guidelines for different service population estimates; for an area with a population between 100,000 and 200,000, such as Humboldt County, the IACPRC recommends an OPR of 1.9 (IACP, 2007).

In 2007 the Humboldt County Sheriff's Office budgeted for 90 sworn officers, as shown in Table 3.2. Applying 90 sworn officers to Humboldt County's total population of approximately 131,000 produces an officer-to-population ratio of 0.69:1,000⁸; applying 90 sworn officers to Humboldt County's unincorporated population of approximately 70,000 produces an officer-to-population ratio of 1.29:1,000. In both cases, the OPR is below IACPRC recommended levels.

3.2.2.2. Calls for Service to Population and Staff to Calls for Service Ratios

Law enforcement services demand appears to be increasing faster than population; the ratio of calls for service (CFS) to population increased by 38% from 2003 to 2007, from 0.46 in 2003 to 0.64 in 2007. This can be explained in part by advances in record-keeping in addition to added Departmental responsibilities (such as animal control) and increased calls for service (a rise in criminal activity)⁹.

The staff to calls-for-service ratio has dropped from 2.1 in 2003 to 1.5 in 2007—a 29 percent decline and further indication that service standards may be more difficult to achieve as staff are increasingly required to take on more tasks. The table below lists County population estimates, Sheriff's Office staffing numbers and calls for service totals for the Main Station and Northern and Hoopa substations.

Table 3-3. Calls for Service (CFS), Staff to Population and CFS to Population Ratios

	2003	2004	2005	2006	2007
Population	130,021	131,414	132,273	132,602	132,574
Main Station CFS	47,679	57,410	59,111	60,933	65,000
Northern Substation CFS	10,950	14,350	15,960	17,890	18,000
Hoopa CFS	950	1,148	1,182	1,193	1,200
TOTAL CFS	59,579	72,908	76,253	80,016	84,200
CFS to Population Ratio	.46	.55	.58	.60	.64

Source: Humboldt County Facilities Master Plan (2007)

Other law enforcement service providers have indicated similar issues with the level of service. Arcata Police Chief Randy Mendoza has stated that his department is understaffed due to budgetary constraints. An analysis conducted for a proposed development in Arcata pointed to a need for an increase in police staffing to meet the anticipated increase in calls for service (Creekside Homes Fiscal Impact Analysis).

⁸ The responsibilities of the Sheriff's Office include search and rescue, civil procedure and other types of response that include the entire county population, thus the total county population was used to determine the OPR.

⁹ Types of calls the Sheriff's Office responds to include: physical altercations, weapons violations, burglary/theft/grand theft, suspicious deaths, verbal and physical domestic calls, missing persons, runaway juveniles, elder and child abuse cases, animal control issues, livestock calls, controlled substance-related calls, trespass, shots fired, suspicious vehicles and persons, agency assist requests. The Sheriff's Office may not respond to: no suspect/low solvability/misdemeanor calls, abandoned vehicle calls, garbage dump calls, vehicle accidents (CHP responsibility).

Response Times

While specific data on response times can be difficult to determine for a rural or semi-rural county, the Sheriff's Office did provide estimates of response times for service calls originating in USAs. Industry standards recommend 5- to 10-minute response times. The cities of Eureka and Arcata have set a standard of a five-minute response to calls for service. As can be seen in the table below, the Sheriff's Office is capable of responding to calls for service in less than 10 minutes in over half (19/37) of the USAs. In the more rural areas of the County, maximum response times may reach 50 minutes because of longer travel distances, varied topography, available resources, and the location of the Sheriff Deputy on patrol in relation to the incident. A table summarizing sheriff's response times to the various USAs is shown below.

Table 3-4. Sheriff's Office USA Response Times

Station <i>Maximum Response Times</i>	Communities/Area Patrolled	USA Response Times 10 Minutes or Less	USA Response Times Greater than 10 Minutes
Main Station <i>30 Minutes Maximum Response Time</i>	Arcata south to Redcrest	Arcata South Eureka Myrtle town Indianola Jacoby Creek Loleta Manila Samoa	Fortuna Freshwater Hydesville-Carlotta Rio Dell Riverside Scotia
Northern Substation <i>40 Minutes Maximum Response Time</i>	Blue Lake, Fieldbrook, McKinleyville, Orick, Redwood Valley, Westhaven, and all other unincorporated areas North of Arcata	Blue Lake Fieldbrook Glendale McKinleyville Trinidad Westhaven	Big Lagoon Orick
Garberville Substation <i>50 Minutes Maximum Response Time</i>	Garberville, Redway, Shelter Cove, Miranda, Phillipsville, Weott, Myers Flat, and Alderpoint, from the Stafford area south to the Humboldt county line	Garberville Redway	Alderpoint Benbow Briceland Miranda Myers Flat Phillipsville Shelter Cove Weott
Hoopa Substation <i>45 Minutes Maximum Response Time</i>	Northeastern part of Humboldt County including Willow Creek, Hoopa, Orleans, Redwood Valley and other surrounding communities		Orleans Willow Creek
Resident Deputy Posts <i>45 Minutes Maximum Response Time</i>	Bridgeville, Orick, Orleans, Petrolia and Shelter Cove	Orick Orleans Shelter Cove	

3.3. Law Enforcement Facilities and Equipment

The number of sworn staff and vehicles at the Main Station and Substations is shown in the following table.

Table 3-5. Humboldt County Sheriff's Office Facilities, Sworn Staff and Vehicles

Facilities	# Sworn Staff	# Vehicles
Main Station	65	32
Northern Substation	11	8
Garberville Substation	6	6
Hoopla Substation	6	6
Bridgeville RDP	1	1
Orick RDP	1	
Orleans RDP	0	
Shelter Cove RDP	0	
Storage Yard	1	31
Total	90	84

3.4. Condition Assessment

3.4.1. Current Deficiencies in Facilities and Equipment

Sheriff Department staff note that, except for a shortage of vehicles in McKinleyville, existing equipment is in good condition overall and adequate to meet acceptable (if not desired) levels of service. However, for all locations (Courthouse and patrol substations), acreage, parking, and circulation of vehicle and pedestrian access are considered inadequate. Parking is particularly difficult for both employees (95% of who drive to work) and civilians, and common areas are congested due to departmental overlap. Security considerations limit shared space for such areas as public lobbies and counters, interview and conference rooms, photocopy, file storage, and break rooms, and general storage and warehouse space (County of Humboldt, 2007).¹⁰

General deficiencies for all office facilities include: 1) within-building space allocation, 2) workstation size and use of space, 3) public area security, accessibility and size, and 4) size of conference rooms relative to number of staff. In addition, staff note a lack of adequate training areas and a need for back-up power and security for all functions. The table below briefly summarizes specific deficiencies by location.

¹⁰ Humboldt County Facilities Master Plan, 2007.

Table 3-6. Facility Deficiencies by Location

Location	Facility Deficiencies
Main Station, Eureka	Poorly designed layout underutilizes current space. More floor space needed to properly house staff and function (property, records storage, briefing rooms, interview rooms, fingerprinting/permits).
Northern Substation, McKinleyville	Poorly designed layout underutilizes current space. More floor space needed to properly house staff and function (property, records storage, briefing rooms, interview rooms, fingerprinting/permits); 12 people are currently working in a space designed for 7 to 8 people. No locker room, inadequate work space/location, no secured parking.
Garberville Substation	Old building, poor ventilation, non-ADA compliant, too small, poor communications/data links.
Hoopa Substation	Old building, poor ventilation, non-ADA compliant, too small, no locker room, inadequate work space/location, no secured parking.
Storage Yard	Old building, poor ventilation, non ADA, too small, poor communications/data links. Inadequate secured and unsecured space.
OES Areas	Small and antiquated.

3.5. Proposed Improvements

3.5.1. Recruiting and Retaining Personnel

According to the 2004 Department of Justice Study, recruitment and retention of law enforcement personnel can be facilitated by:

- improving officer pay and benefits,
- recruiting officers skilled in community policing,
- changing job roles to enhance officers' satisfaction,
- improving career development opportunities, and
- creating incentives for retirement-eligible officers to remain with the agency.

That study report also noted that departments may need to become more efficient with their existing personnel, working on how officers are used as much as how many are used. Better use of technology and the creative use of civilians were also recommended as ways to free up uniformed officers time.

Innovative ways of providing services have been explored by the Sheriff's Office, with limited implementation. Pay equity has been an issue, with the Sheriff's Office typically within 5 to 10 percent of other allied agencies within the county. Other agencies of comparable size in other counties are anywhere from 10 to 20 percent higher.¹¹

¹¹ Communication with Sheriff's Office, 9/21/07.

3.5.2. Facility Upgrades and Expansion

Proposed improvements to the Sheriff's Office facilities and equipment include short- and long-term projects, including:

Shorter-term Projects

- Create partnership between the Hoopa substation and the Willow Creek CHP.
- Develop an enhanced communication system.
- Pursue other service and facility upgrades and expansions as needed.

Ten- to 20-Year Projects

- Move or expand Main Office and other facilities (Hoopa, Garberville substations).
- Purchase 15-20 new vehicles to accommodate needs of new staff.
- Develop a dedicated training facility (could regionalize with partners).
- Pursue other service and facility upgrades and expansions as needed.

3.5.3. Cost and Schedule of Improvements

The costs of Sheriff's facility improvements at the Main Station, Substations, Resident Posts and ancillary facilities are difficult to estimate owing to the lengthy and uncertain time projections for upgrades, expansion and replacement, which is directly tied to uncertain sources of project funding. Given the general inadequacy of the existing facilities and the anticipated increase in need for personnel and equipment, future costs for upgrades and expansions should be considered as significant.

Based upon technological advances, the Sheriff's Office predicts that its current technology will be outdated within five to 10 years, and upgrades to the communications system, computer system and other relevant technology will thus be required. Estimating costs for such replacements is difficult due to the rate of advance within the technology field, but such costs should be considered significant.

The costs of additional staff and vehicles can be estimated using the following generalized figures:

Average Annual Base Salary Including Benefits

- | | |
|-------------------------|-----------|
| • Deputy Sheriff: | \$69,000 |
| • Sheriff's Sergeant: | \$88,000 |
| • Sheriff's Lieutenant: | \$99,000 |
| • Captain: | \$100,000 |
| • Dispatcher: | \$50,000 |

Average Annual Base Salary including Benefits

- | | |
|----------------------------------|----------|
| • Senior Legal Office Assistant: | \$59,000 |
| • Legal Office Assistant: | \$50,000 |
| • Community Services Officer: | \$55,500 |
| • Administrative Analyst I: | \$55,000 |
| • Fiscal Assistant I: | \$48,000 |

- Evidence Technician: \$64,000
- Property Technician: \$59,000

Each additional Deputy added to the personnel also adds equipment and vehicle costs of approximately \$52,000 to \$56,000, based on:

1. The cost of equipping a Deputy Sheriff for the first year (includes operating cost such as safety equipment (i.e. firearm, vest, duty belt, shotgun, taser, flashlight, portable radio etc.) is \$26,300.
2. The cost for purchase and equipping a patrol vehicle ranges from: \$26,000 to \$30,000.

The Humboldt County Sheriff's Office has projected staffing needs through 2027, as shown in the table below. These estimates form the basis of the cost projections.

Table 3-7. Sheriff's Office Operations Staff - 2007 and Projected (2027)

Position	Sworn Staff Numbers		Percentage Increase (2007 to 2027)
	2007	Projected 2027	
Eureka	65	98	51%
McKinleyville	11	29	164%
Hoopa	6	16	167%
Garberville	6	19	217%
Resident Posts	2	9	350%
Total Current	90	---	---
Total Projected	---	150	67%

Given the staffing projections from earlier and average salaries noted above, payroll for the Sheriff's Office can be expected to increase over \$5 million from approximately \$5.7 million in 2007 to almost \$11 million in 2027 (in 2007 dollars), or approximately \$256,000/year (2007 dollars) all other things being equal. The cost of equipping approximately 60 new deputies (at approximately \$54,000) would be over \$3.24 million (in 2007 dollars), or \$162,000/year. Total additional costs in 2027 would thus be over \$8.1 million for operations staffing and patrol equipment, with average annual increases (for payroll and equipment) of over \$400,000 (2007 dollars). This rudimentary estimate does not include cost estimates for facility expansions and upgrades, and other costs.

Annual costs for upgrades/expansions are difficult to estimate but could conceivably range from \$50,000 to upwards of \$1 million or more depending on the type and scope of the project. Costs for construction of new facilities would be significantly higher. Construction costs for new law enforcement facilities be \$400/square foot or higher (based on current costs). The Sheriff's Office has estimated that a new Main Station would need to be approximately double the size of the current station (14,100 ft²), or close to 30,000 ft², which would cost upwards of \$12 million. Estimates of the costs to construct a new Main Station based on comparable facilities constructed elsewhere suggest that \$15 million (depending on material and labor costs and design considerations at the time of construction) is a reasonable (if not likely) cost estimate.

Table 3-8. Payroll and Equipment Costs, 2007-2027

Cost Area	2007 (million \$)	By 2027 (million \$)	Total Increase 2007-2027 (million \$)	Average Annual Increase 2007-2027 (million \$)
Payroll	5.7	10.8	5.1	0.265
New Equipment		1.4	1.4	0.07
Facilities		1 – 20*	1 – 20	0.05 – 1
Total	5.7	13.2 – 32.2	7.5 – 26.5	0.385 – 1.335

* This range assumes that maintenance and upgrade costs will not exceed \$5 million over the 20-year planning period, and that a new main station would cost \$15 million.

3.6. Future Level of Service

Projections in the Facilities Master Plan for future staffing project a greater increase in sworn officers and staff relative to the population increase. Projected levels of service would become closer to accepted levels of service (1.9:1,000 officers to population ratio).

Table 3-9. Projections to 2027 for Sworn Officer- and Staff-to-Population Ratios

	2007	2017 (est.)	2027 (est.)
Sworn Officers	90	125	150
Sheriff's Office Staff	130	187	240
Humboldt County Population	132,754*	137,572	141,538
Sworn Officer to Population Ratio (:1,000)	0.68	0.91	1.06
Staff to Population Ratio (:1,000)	.93	1.36	1.7

* Population estimates used in the Humboldt County Facilities Master Plan and Financing Study.

Estimates of staffing increases relative to population increases suggest that levels of service for the Sheriff's Office operations will improve between 2007 and 2027, all other things being equal. Uncertainty regarding funding sources for new personnel, facility upgrades and expansions, and purchase of new law enforcement technologies will have a significant impact on the Sheriff's Office ability to provide adequate service.

Issues to be addressed in the General Plan Update

This technical report presents a basis for assessing the County Sheriff's Office operations. As documented in this report, the ability of the Sheriff's Office to provide adequate levels of service is compromised by facility and staffing constraints, which are largely the product of limited funding. As the County population grows there will be need to upgrade, expand and/or replace existing facilities (both the main station and the substations), in addition to maintaining up-to-date equipment and law enforcement technologies. The Community Infrastructure and Services Element will include goals, policies and programs for the following issues:

Levels of Service Measures. The Community Infrastructure and Services Element will help to establish clear standards for officer-to-population ratio, the number of officers to calls for service ratio, and officer response times and develop policies designed to raise the Sheriff's Office to those levels.

Facility and Funding Requirements. The Community Infrastructure and Services Element will establish policies to guide the Sheriff's Office in assessing long-term facility and funding needs. As this report has shown, other than noting long-standing facility deficiencies and developing an informal wish-list of new or upgraded facilities, the Sheriff's Office has not had the available personnel for a critical, detailed review and assessment of long-term facility needs and associated costs. The development of a nexus between an appropriate law enforcement funding mechanism and the costs associated with providing adequate levels of service through 2025 and beyond will require a more critical assessment than has been completed to date.

Revenue sources. A thorough assessment of facility needs and costs will likely indicate the need for a substantial increase in ongoing or one-time funds. Possible sources include impact fees, special taxes, or utility user or sales taxes.

Development impact fees are one-time charges on new development to pay for required public facilities and mitigate impacts created by the development or reasonably related to it. There are a number of approaches to charging developers for the provision of public facilities. In all cases, however, the fees must be clearly related to the costs incurred as a result of the development.

Community Facilities Districts impose special taxes on new development in unincorporated areas to offset the negative impacts of development on the provision of law enforcement (and other) services. A description of the Generalized Mello Roos Community Facilities District Review Process is included in Chapter 8.

The Community Infrastructure and Services Element will propose revenue sources to cover the range of costs associated with the County Sheriff's Office operations to ensure that adequate levels of service can be achieved.

4. Storm Drainage & Flood Control

This section addresses storm drainage and flood control infrastructure within the County. A description of existing infrastructure, discussion of system standards, assessment of existing capacity and condition, and recommendations for future infrastructure upgrades and expansions are included. Funding sources for stormwater systems are described in detail in Section 12.2.4.

4.1. Description

The County is responsible for storm drainage and flood control within all unincorporated areas of the County. Stormwater runoff from all USAs and WSAs in the County eventually ends up in the County's waterways, including its creeks, streams, rivers, and bays. Since stormwater has the potential to contribute significant amounts of sediments, chemicals, and other natural and anthropogenic compounds into our waterways, stormwater management and quality should be an area of concern to the County. Nonpoint source (NPS) or pollution that cannot be traced back to a single origin or source is the leading cause of water quality impairments in California and the nation (County of Humboldt, 2002). This section references and is intended to be compatible with Chapter 11, Flooding of the Humboldt County General Plan as well as the Humboldt County Multi-hazard Mitigation Plan.

4.1.1. Stormwater Conveyance System Description

The majority of the County does not have stormwater conveyance systems, and stormwater therefore follows more of a natural drainage pattern before either infiltrating the soil or entering a waterway. However, portions of the McKinleyville USA, South Eureka USA, Humboldt Hill USA, Myrtle town USA, and Garberville USA do contain stormwater conveyance systems that collect stormwater from roadways and discharge it to waterways with minimal or no filtration or other treatment. Other smaller communities within the County also contain minimal levels of stormwater infrastructure, which is further described below.

The County maintains a significant number (estimated in the thousands) of culverts under County roadways. These culverts are located throughout the County's road system with many acting as conduits for creeks and streams. Many culverts present a barrier to migrating salmon and other fish passage. Culverts were historically designed to channel water under the roadway without concern for fish passage, and so typically culverts either channel water too fast or at too steep a slope for fish to get through to the other side. Culvert outlets were also often poorly designed with respect to fish passage, with inaccessible entries into the culvert. The County is part of the Five Counties Salmonid Restoration Program, established in 1997 to prioritize culvert replacement projects and evaluate options for improving County plans, policies, and practices to provide or improve salmonid habitat. This program identified approximately 60 culverts within the County that were considered significant barriers to fish migration and listed as high priority for repair or replacement. As part of this effort, the County has upgraded over 20 culverts throughout their service area with the help of California Department of Fish and Game, Coastal Conservancy, and NOAA Fisheries grant monies and will continue to do so as time and funding permit.

4.1.2. Flood Control Systems Description

There are 6 principal drainage basins within Humboldt County that include streams that have been studied in detail by state and/or federal agencies. These are the Eel River basin which includes the Van Duzen and south Fork Eel Rivers; the Mad River Basin; the Freshwater Creek basin; the Jacoby Creek basin; and the Trinity River basin [and the Klamath]. Characteristics of these basins are defined as follows:

Eureka Plain (Humboldt Bay) Basin

Eureka Plain is one of the County's flattest planning watersheds. Flood zones on the Eureka Plain are concentrated around Humboldt Bay and Arcata Bay (meeting the Mad River floodplain to the north), also following the lengths of Jacoby Creek, Freshwater Creek, Elk River, and Salmon Creek. Portions of the Arcata, Jacoby Creek, Freshwater, and Eureka Community Planning Areas (CPAs) are crossed by flood zones. The configuration of Humboldt Bay protects the coastal communities of Humboldt County from direct exposure to coastal storm flooding. The Samoa Peninsula and South Spit block the effects of normal storm waves and sea swells. A single channel, defined by jetties and seawalls, provides passage for water into and out of Humboldt Bay. The unincorporated community of King Salmon is located on an artificially constructed peninsula along the eastern margin of Humboldt Bay. Old channel dredgings were stockpiled on the site until 1948, when residential development in the area began. The elevation of the King Salmon vicinity is a few inches higher than the normal maximum high tide. Flooding can occur in this area during unusually high tides accompanied by storm surges. There are portions of Humboldt County that are subject to flooding from storm tides. The estimated highest tidal surge height in Humboldt Bay occurred on February 4, 1958, and was measured at 6.5 feet.

The Eel River Basin

With a drainage area of approximately 3,260 square miles, this basin drains a predominantly mountainous area within the southern portion of the county. The Eel River flows through a narrow canyon from its junction with the Middle Fork downstream to its confluence with the Van Duzen River. Downstream of the confluence with the Van Duzen River, the Eel River meanders through a wide coastal plain between the City of Fortuna and the Pacific Ocean. The second largest tributary within this basin is the South Fork Eel River. The South Fork joins the Eel River at Dryerville and flows through steep-walled canyons for most of its length.

Van Duzen Planning Watershed

The Van Duzen River drains an area of approximately 430 square miles to its confluence with the Eel River. The Van Duzen planning watershed is crossed by narrow flood zones following the Van Duzen River (widening near its confluence with the Eel River), Yager Creek, and Lawrence Creek. The widest floodplain runs through the center of the Hydesville-Carlotta CPA and may cross the community of Bridgeville.

Lower Eel Planning Watershed

The largest single dryland flood zone in Humboldt County is the Eel River delta; a wide swath of floodplain that follows the Lower Eel River from the mouth of Larabee Creek west to its confluence with the Van Duzen River. Larabee Creek and the upper Lower Eel host narrower flood zones. The Fortuna CPA and City of Ferndale sit along the Delta's floodplain (to the north and south, respectively). A wide flood zone passes through the Rio Dell CPA; the Avenues (Stafford-Redcrest) CPA is almost completely within the Lower Eel's floodplain.

Middle Main Eel Planning Watershed

A distinct flood zone winds across the Middle Main Eel planning watershed; tributaries including Dobbyn Creek, Jewett Creek, and Chamise Creek have noticeable flood zones as well. Communities along the Middle Main Eel River (South Fork, McCann, Sequoia, Eel Rock, and Fort Seward) may be in its floodplain; the Alderpoint CPA is bordered by the flood zone on three sides.

South Fork Eel Planning Watershed

The South Fork of the Eel River and its tributaries (Bull Creek, Salmon Creek, Redwood Creek, Dean Creek, Sproul Creek, and the East Branch of the South Fork) have mostly narrow flood zones. These flood zones pass through the Avenues (Weott, Myers Flat, Miranda, and Phillipsville) and Garberville-Redway-Benbow CPAs; Myers Flat CPA is almost completely on floodplain.

Cape Mendocino (Mattole) Planning Watershed

The runs of the Bear River and the Mattole River and its tributaries (Honeydew Creek, Bear Creek, and Mattole Canyon) are designated flood zones. While the community of Ettersburg may be in the Mattole's floodplain, the Shelter Cove CPA and the watershed's other communities are removed from all flood zone areas.

The Mad River Basin

The Mad River drains an area of approximately 500 square miles at its confluence with the Pacific Ocean. The River flows through narrow canyons for the majority of its 100-mile length. The river enters a wide coastal floodplain just north of Arcata, which continues to its confluence with the Pacific Ocean. A narrow flood zone exists along nearly the entire length of the Mad River (and its North Fork), widening to occupy a large plain within the Blue Lake and Fieldbrook-Glendale CPAs. On its final approach to the Pacific, the Mad River's floodplain meets that of Arcata Bay to the south; to the north, the McKinleyville CPA skirts the flood zone. The Mad River has in the past migrated substantially near its mouth, and a recent migration has impacted bluff stability in a portion of the MCSD service area and is jeopardizing a major water line of MCSD's.

The Freshwater Creek Basin

Freshwater Creek drains a small coastal basin of 34 square miles before it enters Ryan Slough. Ryan Slough flows into Eureka Slough, a brackish-water stream, which in turn empties into Arcata Bay just north of Eureka. The characteristics of the floodplain within this basin are a moderately wide floodplain situated between a narrow stream course in the mountains widening as it enters the coastal plain. Flooding is an issue where Freshwater Creek meets the floodplain. All of this area is under County jurisdiction and there are private levees in the area, none of which are the responsibility of the County to maintain.

The Jacoby Creek Basin

Jacoby Creek is a coastal stream just north of Freshwater Creek. Its headwaters originate in the Coast range and flows westerly into Arcata Bay. The Creek drains an area of 16 square miles at its mouth. The majority of this stream meanders through the Arcata Bay coastal plain. This area floods frequently and is in the County jurisdiction. There are private levees in this area; however the County is not responsible for maintaining any flood control structures in this area.

The Trinity River Basin

As the largest tributary to the Klamath River, the Trinity River drains a total area of 2,969 square miles, the majority of which lie within Trinity County. The river flows through a mountainous,

heavily forested area in the eastern portion of Trinity County. Detailed flood insurance studies have been generated in the mountain valley downstream of the confluence with the South Fork Trinity River in the northeastern portion of Humboldt County. The mountainous Lower Trinity planning watershed has one designated flood zone, located entirely within the Willow Creek CPA, at the Trinity River's southern entrance to County land. The Hoopa Valley Indian Reservation, which covers the northern approach of the Trinity River to its confluence with the Klamath River, is not mapped for flood zones. No flood zones are documented within Humboldt County's South Fork Trinity planning watershed.

Trinidad Planning Watershed

Within the Trinidad planning watershed, areas around Big Lagoon, Stone Lagoon, and Freshwater Lagoon are designated as 100-year flood zones. Narrow littoral zones along the lengths of Maple Creek and Little River are also designated as such. The Trinidad-Westhaven CPA is not near a flood zone, though the northernmost part of the McKinleyville CPA overlaps with the Little River flood zone.

Redwood Creek Basin

The Redwood Creek watershed is a narrow, elongated fault-controlled basin that drains an area of approximately 282 square miles, from the center of Humboldt County to its northwestern corner. The creek flows for 65 river miles from its headwaters, located near Board Camp Mountain in central Humboldt County, to the Pacific Ocean near the town of Orick. Redwood National Park occupies the northern half of the watershed. Redwood Creek is fed along its length by a few dozen smaller creeks. Streamflow in Redwood Creek is highly variable from year to year as a result of annual rainfall variations. Streamflow also varies seasonally, owing to the highly seasonal distribution of rainfall. Winter flood flows can be as much as four orders of magnitude higher than summer low flows. Recent large floods occurred in 1953, 1955, 1964, 1972 (two floods), and 1975.

No large floods occurred after 1975, until the recent 11-year return period flood in January of 1997. During January 1997, the relatively small 11-year return period flood initiated debris torrents of mud, boulders, and whole trees directly into Redwood Creek adjacent to Tall Trees Grove. Redwood Creek is currently contained by levees constructed by the Army Corps of Engineers from approximately one mile upstream of the town of Orick to the mouth. Considerable sediment has been deposited in the area contained by the levees, filling in the estuary, impacting the environment and reducing the capacity of the flood channel. The County is responsible for maintaining these levees; however the maintenance and the possible removal or redesigning of the levees has been a source of considerable debate. Redwood Creek has three small flood zones: one along a winding section near the midpoint of the creek's run, one along a tributary near the mouth, and one which overlaps heavily with the Orick CPA.

The Klamath River Basin

The largest river basin in the region is the Klamath River, which originates in Oregon, drains a total of 12,120 square miles. An approximately 50 mile stretch runs through the mountainous forested northern part of Humboldt County, with its mouth draining to the Pacific Ocean in neighboring Del Norte County to the north. The Lower Klamath area is quite mountainous and has little room for floodplains, although there is a substantial littoral region centered on the confluence of the Klamath River and Blue Creek (near the County's northern border) and a smaller pocket at Weitchpec. The Hoopa Valley Indian Reservation, which encompasses much of the river directly south of the designated flood zone, is not mapped for flood zones. No flooding is anticipated in the Orleans CPA.

Existing Flood Protection Measures

Flood prevention measures are not extensive in Humboldt County. Public and private levees protect downstream communities along the Eel River, Mad River, Redwood Creek, Elk River, Arcata Bay and Freshwater Creek. The County is responsible for maintaining the levees on Redwood Creek, from Orick to the mouth; along the Eel at Sandy Prairie near Fortuna; along the Mad River north of the Mad River Bridge at Blue Lake. The various private levees are maintained either by landowners or levee districts, generally made up of surrounding landowners.

R.W. Matthews Dam on the Mad River at Ruth Lake is expected to reduce flood peaks in Arcata between 5-15 percent. The Lewiston and Trinity Dams on the Trinity also serve to control flooding. The Scott Dam is located on the Eel in Lake County. There is a considerable portion of the Eel River watershed located below this dam, so it does not effectively offer any flood protection to Humboldt County. There are several dams on the Klamath that are located in Oregon and Siskiyou Counties, the biggest being the Iron Gate Dam in Siskiyou County. Humboldt County has no jurisdictional responsibilities with regards to the operation or maintenance on any of the above mentioned dams.

No flood protection measures or designated floodways exist on Van Duzen, South Fork Eel, or Jacoby Creek. Several small communities are situated in floodplains and are vulnerable to flooding, including Ferndale, Fortuna, Hydesville, Carlotta, Stafford, Redcrest, Fields Landing, portions of Arcata and Blue Lake.

4.2. Regulatory Framework

4.2.1. Stormwater Standards

Stormwater systems within the County are subject to federal, state, and county standards. At the federal level, the U.S. EPA promulgates standards associated with stormwater pollution. Upon entering a storm drainage system, stormwater may be considered point source pollution and be subject to the EPA's National Pollutant Discharge Elimination System (NPDES) Storm Water permit program. The Clean Water Act was amended by Congress in 1987 to establish the Section 319 Nonpoint Source Management Program, through which grant funding was made available to be used towards nonpoint source abatement activities.

At the state level, the State Water Resources Control Board (SWRCB) and the North Coast Regional Water Quality Control Board (RWQCB) are responsible for the protection of water quality. In 1990, Congress improved and expanded the Coastal Zone Act Reauthorization Amendments, which expanded the SWRCB and RWQCB stormwater management activities to include the California Coastal Commission (CCC). The CCC through the Coastal Act is responsible for reviewing and evaluating Local Coastal Plans (LCPs) to ensure nonpoint source pollution prevention and control activities.

The SWRCB is also responsible for enforcement of the Phase II of the NPDES, which requires operators of a regulated small municipal separate storm sewer system (MS4) to obtain an NPDES permit for stormwater discharges. The U.S. EPA categorizes MS4s as either "small," "medium," or "large." The unincorporated area of McKinleyville is the only community within the County's jurisdiction that qualifies as a "small" MS4, and as such the County was required to prepare a Storm Water Management Program (SWMP) under Phase II of the NPDES. The intent of the SWMP is to reduce the discharge of pollutants to the maximum extent practicable, protect water quality, and satisfy the requirements of the Clean Water Act.

Another state regulation affecting stormwater discharge within the County is the SWRCB's 1978 California Ocean Plan which prohibits stormwater discharge into Areas of Special Biological Significance (ASBS). The Ocean Plan identified 34 ASBS throughout the State, of which three are located within Humboldt County: Redwoods National Park ASBS, the Trinidad Head Kelp Beds ASBS, and the Kings Range National Conservation Area ASBS. Rural areas of the County potentially discharge into all three ASBS. The City of Trinidad has embarked on an effort to develop a management plan to address discharges within the City and adjacent areas to the Trinidad Head Kelp Beds ASBS. The County is in the process of addressing discharges to the Kings Range National Conservation Area ASBS. Stormwater in the Shelter Cove area discharges into the King Range Conservation Area ASBS.

The other major Clean Water Act regulatory process affecting the future of water quality in Humboldt County is the Total Maximum Daily Load (TMDL) program. TMDL standards differ from previous regulatory methods which focused on waste loads from identifiable point sources. Instead, TMDL's consider the totality of pollutant stressors in a watershed basin and allocate responsibility for action among dischargers. Rather than focusing on a single entity for corrective action, TMDL's often require a number of programs and agencies to work together in achieving the desired level of pollution control. In order for TMDL's to be enforceable, they must be incorporated into a Water Quality Control Plan (Basin Plan). California ranks TMDL's as low, medium, or high priority based on the number and severity of the impairments and the importance of the beneficial uses. The RWQCBs are required to determine which waterbodies are "impaired" by certain pollutants limiting beneficial uses of water and then to initiate a public process to assess pollutant sources, determine acceptable levels, allocate allowable pollutant loads to various sources, and establish an implementation program. The following water bodies in Humboldt County have been identified as impaired;

Table 4-1. TMDL Listed Water Bodies in Humboldt County

Water Body	Basin	TMDL Stressor	Size Affected	Priority
South Fork Trinity	Klamath-Trinity	Sedimentation/Siltation/Temperature	1161 miles	Medium
Trinity	Klamath-Trinity	Sedimentation/Siltation	1256 miles	Medium
Klamath River	Klamath-Trinity	Nutrients/ Organic Enrichment/Low Dissolved Oxygen Temperature	609 miles	Medium
Mattole River	Mattole	Sedimentation/Siltation/Temperature	503 miles	High
Redwood Creek	Mad-Redwood	Sedimentation/Siltation/Temperature	332 miles	Medium/Low
Mad River	Mad-Redwood	Sedimentation/Siltation/Temperature/Turbidity	654 miles	Low
Freshwater Creek	Eureka Plain	Sedimentation/Siltation	84 miles	High
Elk River	Eureka Plain	Sedimentation/Siltation	88 miles	High
Eel River Delta	Eel River	Sedimentation/Siltation/Temperature	426 miles	Medium
South Fork Eel	Eel River	Sedimentation/Siltation/Temperature	943 miles	Medium
Upper Main Eel River	Eel River	Sedimentation/Siltation/Temperature	1141 miles	Medium
Middle Fork Eel	Eel River	Sedimentation/Siltation/Temperature	1071 miles	Medium
Middle Main Fork Eel	Eel River	Sedimentation/Siltation/Temperature	674 miles	Medium
North Fork Eel	Eel River	Sedimentation/Siltation/Temperature	382 miles	Medium
Van Duzen River	Eel River	Sedimentation/Siltation	585 miles	Medium
Humboldt Bay	Eureka Plain	PCB's	16075 Acres	Low
Jacoby Creek	Eureka Plain	Sediment	19 miles	Low

Source: Proposed 2006 CWA Section 303(d) List Of Water Quality Limited Segment, North Coast Regional Water Quality Control Board

Sediment impairment affects fifty-nine percent of the area covered by the North Coast Region. Sediment from County roads could potentially become incorporated into TMDLs as well as sedimentation from construction/land development. The removal of riparian vegetation due to construction/land development may also be incorporated into temperature TMDLs. The existing County Grading, Erosion Control and Streamside Management Area ordinances already address many of these issues.

The County, in an effort to comply with all federal and state regulations surrounding stormwater management and control, has set forth a number of policies and standards to apply to stormwater systems within the County. The only two areas with set stormwater quantity discharge limitations are McKinleyville and the Martin Slough drainage. The McKinleyville Community Plan has set a net zero increase in stormwater from development. The County also has applied a standard in place for the Martin Slough drainage (from the City of Eureka General Plan), which only allows for an increase of 1 cfs from pre- to post-development conditions. The 1970 County Roadway Design Manual sets forth stormwater design criteria for roads, including design storm frequencies to be used in the design of roadways.

The County has ordinances for Grading, Erosion Control, Geological Hazards, and Streamside Management Areas. The County's *Grading, Excavation, Erosion, and Sediment Control* ordinance (Title III, Division 3, Section 331-12) regulates "...grading and related activities on private and public property, to control and reduce erosion, to reduce sediment delivery to drainages and streams, and to protect fishery habitat and other biological resources by providing best erosion control and sediment management practices. The ordinance outlines permit and fee requirements, as well as setback requirements, drainage requirements, erosion and sediment control requirements, including plan preparation and standard details for Best Management Practices (BMPs). A portion of the *Geological Hazard* ordinance (Title III Division 3, Chapter 6) has as its purpose to, "...neither create nor contribute significantly to erosion, geological instability or destruction of development sites or surrounding areas or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs." This ordinance outlines when geological reports are required and the contents of such reports. The *Streamside Management Area Ordinance* (Title 3, Division 1, Chapter 6, Section 314-61.1) has as its purpose "...to provide minimum standards pertaining to the use and development of land located within Streamside Management Areas (SMAs) and other wet areas such as: natural ponds, springs, vernal pools, marshes, and wet meadows (exhibiting standing water year-long or riparian vegetation)." This ordinance outlines what development can occur in streamside management areas, mitigation measures, prohibited activities, and mitigation monitoring requirements. Other County standards include the use of oil-water separators in all commercial areas, catch basins and stencils on drainage inlets in McKinleyville, SWPPP and NOI are needed for projects greater than one acre in size, and the use of dissipaters at the outlets of pipes and culverts.

The Subdivision Ordinance contains specific language regarding the design of stormwater conveyance systems associated with new subdivisions throughout the unincorporated area. This section of the ordinance reads:

328.1-9. STORMWATER DISPOSAL RESTRICTION.

Stormwater flowing from a parcel or subdivision in any form or manner shall not be permitted to flow into any sanitary sewer or any other facility not specifically intended for stormwater runoff.

328.1-10. CAPACITY OF CHANNELS AND CONDUITS.

Drainage channels and conduits shall have the following minimum capacities:

1. *Major Drainage Channels. Major drainage channels and conduits shall have sufficient capacity to contain a 100-year frequency or occurrence runoff.*
2. *Secondary Drainage Channels. Secondary drainage channels and conduits shall have sufficient capacity to contain a ten-year frequency of occurrence runoff, as*

well as sufficient additional capacity so that floodwaters escaping therefrom shall not reach an elevation within one foot of any dwelling or commercial structure.

3. *Minor Drainage Channels. Minor drainage channels, conduits, and appurtenant facilities shall have sufficient capacity to contain a ten-year frequency of occurrence runoff, as well as sufficient additional capacity so that floodwaters escaping therefrom shall not reach an elevation within one foot of any dwelling or commercial structure.*

328.1-11. FACILITIES DESIGN CRITERIA.

Drainage systems shall conform to the requirements contained in § 4, "Drainage" of the Humboldt County Roadway Design Manual adopted by the Board of Supervisors on February 1, 1972, as it may be amended from time to time.

4.2.2. Flood Control Regulations

Federal Programs

In 1968, Congress created the National Flood Insurance Program (NFIP) in response to the rising cost of taxpayer-funded disaster relief for flood victims and the increasing amount of damage caused by floods. The NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in communities participating in the program. For most communities participating in NFIP, FEMA has prepared a detailed *Flood Insurance Study (FIS)*. The FIS presents water surface elevations for floods of various magnitudes, including the flood that has a 1-percent probability of being equaled or exceeded in any given year (also called the 100-year flood or base flood) and the flood that has a 0.2-percent probability of being equaled or exceeded in any given year (also called the 500-year flood). The water surface elevation of the 100-year flood event is called the base flood elevation (BFE). BFEs and the boundaries of the 100- and 500-year floodplains are shown on participating communities' Flood Insurance Rate Maps (FIRMs).

A repetitive loss property as defined by FEMA is an NFIP-insured property that, since 1978 and regardless of any changes in ownership during that period, has experienced any of the following:

- Four or more paid losses in excess of \$1,000
- Two paid losses in excess of \$1,000 within any rolling 10-year period
- Three or more paid losses that equal or exceed the current value of the insured property.

Repetitive loss properties make up only 1 to 2 percent of the flood insurance policies currently in force nationally, yet they account for 40 percent of the country's flood insurance claim payments. A report on repetitive loss structures recently completed by the National Wildlife Federation found that 20 percent of these structures are listed as outside the 100-year floodplain. In 1998, FEMA reported that the NFIP's 75,000 repetitive loss structures have already cost \$2.8 billion in flood insurance payments and that numerous other flood-prone structures are in the floodplain and remain at high risk. To address this ongoing issue, the government has instituted several programs that encourage communities to identify and mitigate the causes of their repetitive losses such as the Community Rating system (CRS), the Flood Mitigation Assistance Grant Program (FMA), and the Pre-Disaster Mitigation Grant program (PDM) created under the Disaster Mitigation Act. The County currently is involved in the FMA and PDM programs but not the CRS program.

There are seven communities within Humboldt County participating in the NFIP, with 1062 flood insurance policies in force that provide \$170.2 million in insurance coverage annually. According to FEMA statistics, there have been 179 flood insurance claims paid in the County for a total of \$2.3 million between November 1978 and June 30, 2006.

Properties constructed after a FIRM has been adopted are eligible for reduced flood insurance rates. Such structures are less vulnerable to flooding since they were constructed after regulations and codes were adopted to decrease vulnerability. Properties built before the FIRM are more vulnerable to flooding and related damages because they do not meet code or are located in hazardous areas. The first FIRM's within Humboldt County were available in 1982. Information relevant to reducing the risk to the flood hazard provided by flood insurance statistics is summarized as follows:

- Approximately 19.4% of the at-risk buildings within the County are covered by a flood insurance policy. Based on the approximate number of primary, insurable structures in the floodplain and the insurance coverage in force within the floodplain, insurance coverage as a form of mitigation appears to be well below the national average. According to a study being conducted for the NFIP by the Rand Corporation, nationwide about 49 percent of single-family homes in special flood hazard areas (SFHAs) are covered by flood insurance.
- Approximately 35% of the current policies in force within the planning area are for properties located outside of the 100-year floodplain.
- The total value of insurance coverage in force represents 23.5% of the total building exposure value.
- The total claims paid by flood insurance policies since 1978 represents approximately 17.7% total requests for individual assistance (IA) within the same period.
- Of total claims paid, 27.7% were for properties located outside of an identified 100-year floodplain.

Table 4-2 Flood Insurance Statistics for Humboldt County

Jurisdiction	Date of Entry Initial FIRM Effective Date	Current FIRM Effective Date	# of Flood Insurance Policies as of 06/30/2006	Total Insurance Coverage in Force	Claims, 11/1978 to 6/30/2006	Value of Claims paid, 11/1978 to 6/30/2006
Arcata	05/02/1983	11/05/1997	140	\$23,099,700	16	\$186,652.55
Blue Lake	09/30/1982	05/05/1997	11	\$1,936,100	2	\$7,851.86
Eureka	06/01/1982	06/17/1986	26	\$5,363,900	4	\$30,889.91
Ferndale	12/01/1993	01/07/1998	18	\$3,732,400	2	\$18,364.05
Fortuna	05/03/1982	05/03/1982	43	\$7,123,900	4	\$5,968.84
Humboldt County (Unincorporated)	07/19/1982	02/08/1999	818	\$128,789,500	146	\$2,036,261.51
Rio Dell	05/03/1982	05/03/1982	6	\$166,400	5	\$30,939.89
Total			1062	\$170,211,900	179	\$2,316,928.61

Local Regulations

In the Humboldt County Zoning Code, there are two designations for flood zone areas outside the Coastal Zone: Design Floodway (DF) and Flood Plain (FP).

- DF zoning is intended to be applied to areas that lie in a designated floodway, as defined in Section 8402 of the Water Code of the State of California, and is intended to prohibit such structures in the zone as might endanger life or significantly restrict the carrying capacity of the designated floodway.
- FP zoning is intended to be applied to areas that have been inundated by flood waters in the past and that may reasonably be expected to be inundated by flood waters in the future. The Flood Plain Zone is intended to limit the use of areas subject to such inundation and flooding to protect lives and property from loss, destruction and damage due to flood waters and to the transportation by water of wreckage and debris.

General agriculture, nurseries, animal sales and feed yards are permitted in both zones without a permit. The DF Zone also allows recreational uses not requiring permanent structures, while FP allows recreational uses, roadside stands, and temporary RV parks.

Table 4.3 summarizes uses prohibited in all areas designated “F” on the Zoning Maps and lands located below the 100-year tsunami run-up elevations.

Table 4-3 Prohibited Uses in Flood-Prone Areas

Zoning Type	Uses Allowed Within Coastal Zone	Uses Allowed Outside Coastal Zone
Designated Floodways	Manufactured Home Parks Essential Services Health Care Services Extensive Impact Civic Use Solid Waste Disposal Hazardous Industrial	Mobile Home Parks Health Care Services Extensive Impact Civic Use Solid Waste Disposal Hazardous Industrial
Floodplains	Essential Services Health Care Services Extensive Impact Civic Use Solid Waste Disposal Hazardous Industrial	Health Care Services Extensive Impact Civic Use Solid Waste Disposal Hazardous Industrial

Source: Humboldt County Zoning Regulations, §§ 313-21 and 314-21, 2000.

4.3. Stormwater System & Capacity

The major stormwater systems within the County include McKinleyville, Arcata, Eureka, and Fortuna. All of these systems qualify as MS4s, but McKinleyville is the only system within the County's jurisdiction. The remaining MS4s are all incorporated cities. Aside from McKinleyville's stormwater system, for which the County developed an SWMP in 2005, the County is also responsible for maintaining systems within other unincorporated regions of the County. Major areas with County stormwater infrastructure include the areas surrounding Eureka, such as Cutten, Ridgewood, Pine Hill, and Humboldt Hill, and also Garberville and Shelter Cove. Other areas with minor amounts of drainage infrastructure include Redway, Manila, King Salmon, Fields Landing, Loleta, and Willow Creek. Private and public flood control levees also exist along

Redwood Creek near Orick, around portions of Humboldt Bay, and along the Eel and Van Duzen rivers.

McKinleyville and Manila are the only communities within the County's jurisdiction for which master drainage plans have been completed. McKinleyville's drainage study was finalized in 1982, while Manila's drainage study was completed in 1987. A regional storm drainage study was also prepared for the Mid-Humboldt County Urban Planning Program in 1971. No other master drainage studies have been prepared since then. Few capital improvements identified in these studies have actually been completed.

Shelter Cove's stormwater drains to the King Range ASBS, so this discharge is regulated by the California Ocean Plan. The County has applied for an exemption to the discharge prohibition requirement for this study area, and is in the process of negotiating with the RWQCB on this issue. A likely requirement or condition of the waiver will be development of an MS4 permit and issuance of an NPDES stormwater discharge permit for Shelter Cove.

The County is part of the Five Counties Salmonid Restoration Program, established in 1997 to prioritize culvert replacement projects and evaluate options for improving County plans, policies, and practices to provide or improve salmonid habitat. This program identified approximately 60 culverts within the County that were considered significant barriers to fish migration and listed as high priority. As part of this effort, the County has upgraded approximately 20 culverts throughout their service area with the help of California Department of Fish and Game, Coastal Conservancy, and NOAA Fisheries grant monies and will continue to do so as time and funding permit. A map showing the 20 culvert locations completed to date is attached as Figure 4-1.

4.4. Condition Assessment

4.4.1. Overview

The Army Corps of Engineers has the responsibility to assess the conditions of the flood control levees for which the County has maintenance responsibility, i.e. Redwood Creek at Orick, Eel River at Sandy Prairie, and Mad River at Blue Lake. At this time there are no known deficiencies or planned levee repairs. As with the maintenance of most public works infrastructure, there are insufficient funds for the level of maintenance that is generally required. The levees along Redwood Creek are being evaluated as part of broader watershed evaluation.

The County's stormwater system varies in condition. Much of the infrastructure is very old and beginning to fail. The County does not have sufficient funding to make improvements to this system. The County needs a systematic replacement program to begin upgrading and expanding stormwater infrastructure as needed, but lacks the proper funding to do so. In fact, the majority of capital improvement projects outlined in the 1982 McKinleyville master drainage plan have yet to be completed. It will be important for the County to identify problem areas, carryout the proper studies, and implement projects to ensure areas within the County are properly served by stormwater infrastructure and to prevent future drainage problems. Storm drainage infrastructure will be essential for serving future development within the County. New master drainage plans should be developed by the County to reflect changes in the County's roadways and new standards for development and runoff.

As a result of the 1982 McKinleyville drainage Study, the County began to collect impact fees when building permits were issued. Unfortunately, the ordinance that was adopted did not include an escalation clause (to account for inflation) so that the fees collected today are

insufficient to fund the necessary improvements. At this point in time, the plan is 25 years old and should be updated to confirm if the recommended improvements are still valid or need to be adjusted. Excerpts from the County's subdivision ordinance pertaining to drainage fees are included below.

ARTICLE 3 - DRAINAGE FEES

328.1-13. ESTABLISHMENT OF FEES.

There are hereby established and imposed on each existing parcel and on each new parcel that lies within the "McKinleyville Drainage Area" (excepting therefrom that area shown as "North Bank Road Drainage") drainage fees in the amounts specified in § 328.1-14 of this chapter.

328.1-14. AMOUNT OF FEES.

(a) New Parcels. For each new parcel created pursuant to the Subdivision Map Act and local subdivision ordinance there shall be imposed the following fees:

- 1. An initial fee of \$250.00 per parcel; and*
- 2. If application is made for a building permit, an additional fee calculated in the same manner as the fee for an existing parcel pursuant to subdivision (b) of this section, less the sum paid pursuant to subdivision (a)(1) of this section.*

(b) Existing Parcels. For each existing parcel, there shall be imposed the following fees:

- 1. For the construction of any new dwelling (single or multiple unit), the fee shall be \$250.00 per dwelling unit, up to a maximum of \$2,000.00 per acre.*
- 2. For the construction of all other new structures subject to the permit requirements of Title 3, Division 3 of this Code, the fee shall be \$0.16 per square foot of impervious area created, up to a maximum of \$2,000.00 per acre.*
- 3. For additions to existing structures which will result in additional ground coverage in excess of 100 square feet or, in the case of upper-story additions, an additional floor area in excess of 100 square feet, the fee shall be \$0.16 per square foot. The total fee or cumulative fees paid pursuant to this paragraph shall not exceed \$250.00 per dwelling unit, or \$2,000.00 per acre.*

(c) The fee provided for in subsection (a)(1) of § 328.1-14 shall be collected at the time and in the manner specified in § 328.1-16; and the fees provided for in subsections (a)(2) and (b) of §328.1-14 shall be collected at the time and in the manner specified in § 328.1-15. However, in no event shall the total fee or cumulative fees imposed pursuant to this chapter exceed, in the case of dwellings, \$250.00 per dwelling unit, and in all other cases, \$2,000.00 per acre. For purposes of computing the acreage in a subdivision, the area included in a designated remainder shall be excluded.

328.1-15. PAYMENT OF FEES - CONSTRUCTION ON NEW EXISTING PARCELS.

The County Building Official shall not issue a building permit for construction on a parcel within the McKinleyville Drainage Area, which results in additional ground coverage in excess of 100 square feet or, in the case of upper-story additions, results in additional floor area in excess of 100 square feet, until the fees set forth in this chapter have been paid. The Building Official may accept cash, or other consideration in the form of actual construction of a part of drainage facilities by the applicant or his principal in lieu of the fee, when authorized to do so by the Director of Public Works. The fee shall not be required if the requested permit is to perform one of the following:

1. To replace a structure destroyed or damaged by fire, flood, wind or acts of God. This exception is only to the extent that the resultant structure has the same or less ground floor square footage as the original structure; if the ground floor square footage is increased, the square footage of the additional ground floor area shall be used to determine if the fee is due.
2. To construct a swimming pool, patio, patio cover, or driveway.
3. To construct or modify a single family residence on a parcel greater than five (5) acres in area.
4. To construct or modify any facilities on parcels greater than 20 acres in area, provided less than ten percent (10%) of the parcel is covered by impervious surfaces.
5. To construct, enlarge or modify concrete or asphalt concrete surfaces incidental to land uses other than single family residential. This exemption is only to the extent that the increase in impervious area is less than 500 square feet.

328.1-16. PAYMENT OF FEES - NEW PARCELS.

(a) No parcel map, tentative map, or final map which divides or subdivides property in the McKinleyville drainage area shall be approved unless and until the subdivider complies with the following requirements:

(1) Pays the fees prescribed by Section 328.1-14(a)(1) of this chapter on or before the date of approval of any such map; or

(2) Agrees to pay the per parcel fee referral to in the preceding subsection on or before a building permit is issued for construction on said parcel created by any such map, if a fee would be required for construction on an existing parcel under the provisions of Section 328.1-15 of this Chapter, and furnishes good and sufficient security to ensure performance of such obligation. For purposes of this subsection, the term "good and sufficient security" means any of the following:

a. A bond or bonds by one or more duly authorized corporate sureties.

b. A deposit, either with the County or a responsible escrow company or trust company, at the option of the County, of money or negotiable bonds of the kind approved for securing deposits of public moneys.

c. An instrument of credit from one or more financial institutions subject to regulation by the state or federal government and pledging that the funds necessary to carry out the act or agreement are on deposit and guaranteed for payment.

d. Subject to approval of the Director of Public Works, a lien upon the property to be divided, created by contract between the owner and the County. Any such lien shall be subject to the provisions of § 326-6.3 of the County Code, except that all references in said section to installation or completion of subdivision improvements shall be deemed to refer to payment of the fees required to be paid pursuant to the provisions of Article 3 of this Chapter.

(b) The provisions of subsection (a) of § 328.1-16 shall not apply to a division or subdivision of land which is conveyed to a government agency, public entity, public utility, or abutting property owner, if a new building lot or site is not created as a result of such division or subdivision.

(c) The provisions of subsection (a) of § 328.1-16 shall not apply to a division or subdivision of land which is zoned for single family residential purposes and which results in parcels of land which are all larger than five (5) acres in size.

4.4.2. Current Deficiencies

FLOOD CONTROL

In planning for future development, the County must consider the various policy options for the issues. Key questions help frame the issues for policy options for flood hazards. As background, the existing policies in the General Plan are presented, followed by a discussion of issues and policy options that respond to them.

Existing Policies

The County's General Plan establishes measures to minimize damage from floods. These policies are in Chapter 3, Section 3291.

1. The County shall participate in the Federal Flood Insurance Program to regulate land uses in flood hazard areas in order to minimize loss of life and property, and in order to minimize public flood-related expense.
2. Agricultural lands which are in flood plain areas shall be retained for use in agriculture.

Coastal Zone

California Public Resources Code § 30236: Channelizations, dams, or other substantial alterations of rivers and streams shall incorporate the best mitigation measures feasible, and be limited to (1) necessary water supply projects, (2) flood control projects where no other method for protecting existing structures in the flood plain is feasible and where such protection is necessary for public safety or to protect existing development, or (3) developments where the primary function is the improvement of fish and wildlife habitat.

California Public Resources Code § 30253: New development shall minimize risks to life and property in areas of high geologic, flood, and fire hazard.

Flood Control Issues

- A recent law (Assembly Bill No. 162) requires the Land Use element of the General Plan to identify and annually review those areas covered by the General Plan that are subject to flooding as identified by flood plain mapping prepared by FEMA or the Department of Water Resources. The bill also would require, upon the next revision of the Housing Element, on or after January 1, 2009, the Conservation Element of the General Plan to identify rivers, creeks, streams, flood corridors, riparian habitat, and that may accommodate floodwater for purposes of groundwater recharge and stormwater management. The law would also require, upon the next revision of the Housing element, on or after January 1, 2009, the Safety Element to identify, among other things, information regarding flood hazards and to establish a set of comprehensive goals, policies, and objectives, based on specified information for the protection of the community from, among other things, the unreasonable risks of flooding. The law would also require the planning agency, upon each revision of the Housing Element to review, and if necessary, to identify new information that was not available during the previous revision of the safety element and would provide criteria by which cities and counties that have flood plain management ordinances may comply with the provisions. The bill would provide that the determination of available land suitable for urban development may exclude lands where the flood management infrastructure designed to protect the

jurisdiction is not adequate to avoid the risk of flooding such that the development of housing would be impractical due to cost or other considerations.

- The Land Use element of the General Plan currently identifies the areas subject to flood, but, upon the next revision to the Housing Element after January 1, 2009, the Safety Element and the Conservation Element need to be revised per the bill.

Currently, in the County's zoning ordinance the "F" Flood Hazard zone prohibits mobile home parks within designated floodways and health care services, extensive impact civic uses, solid waste disposal and hazardous industrial uses within both designated floodways and floodplains (see Table 4.3). In the Coastal Zone, essential services also are prohibited. Any other use that is allowed by an underlying residential, commercial, industrial, or agricultural zone is allowed. In other jurisdictions, a much longer list of use restrictions is typically included in flood zone regulations. This ensures that, with changes to the Federal Insurance Administration's Federal Insurance Rate Maps, these restrictions apply and override underlying zoning, which may not have been changed to reflect changes in flood plain mapping.

- Update the flood hazard regulations to restrict development in the floodway and the flood fringe, consistent with federal guidelines and current practice in comparable jurisdictions. Construction standards and review procedures also should be updated to minimize risk. While the County does impose FEMA's restrictions at the building permit stage, integrating these restrictions into zoning will avoid misunderstanding.
 - Update the flood hazard regulations to address the water quality impact of manure storage areas (ponds). Livestock manure can present a hazard to watercourses if not managed properly. Any new policies will need to carefully balance the need to address water quality impacts and the regulatory requirements of other agencies such as FEMA and the Coastal Commission with the benefits of manure capture for use elsewhere and the need to develop solutions which can be safely and efficiently implemented by local farmers.
- Should improvements be made to flood elevation data or gather additional data where it currently does not?

Although the County could pursue a new study of flood elevation data, such a study would not be economically feasible or practical, as it would not be a substitute for the County's required participation in FEMA. As a consequence, no policy options are recommended for this issue. Continued participation in the Federal Flood Insurance Program will provide periodically for updated flood elevation data, and that should be sufficient for planning and zoning purposes.

- Should the County adopt advanced FEMA standards?

The National Flood Insurance Program's (NFIP) Community Rating System (CRS) was implemented in 1990 as a program for recognizing and encouraging community floodplain management activities that exceed the minimum NFIP standards. Under the CRS, flood insurance premium rates are adjusted to reflect the reduced flood risk resulting from community activities that meet the three goals of the CRS: (1) reduce flood losses; (2) facilitate accurate insurance rating; and (3) promote the awareness of flood insurance. Communities are rated on a scale from 1 (highest) to 10 (lowest) based on

their creditable activities in public information, mapping and regulations, flood damage reduction, and flood preparedness.

- Apply for participation in the NFIP's Community Rating System in order to secure lower flood insurance premiums. This may require the implementation of new flood-related programs.

Some other known areas where Flood Control infrastructure improvements are needed include the following:

- Elk River area – problems associated with bedload deposition, logging, and overgrown vegetation. Channel modifications and upgrades are needed to address flooding.
- Ferndale Bottoms area – problems associated with riparian deforestation, urban development, increased sediment deposition and instream vegetation. Efforts are underway to restore Salt River channel conditions by removing sediment within the channel.
- King Salmon area – problems associated with the low lying area and tidal influence. Outdated tidal flap gates are being replaced with new tidal flex gates, which will improve operation and maintenance problems associated with the existing gates.
- Arcata Bottoms – problems with privately owned levees failing.
- Jacoby Creek – problems associated with privately owned dykes and streambed aggradation in channel.
- Redwood Creek – problems associated with regulatory hurdles to maintain the levee and channel.
- Freshwater – problems associated with levies and flood relief measures due to actions or lack of actions by private landowners.
- Salmon Creek - flooding problems associated with low grade on Highway 101.

STORMWATER SYSTEMS

As noted above, most culverts and stormwater infrastructure within the County are very old and are in need of repair or replacement in many places. For example, Shelter Cove's culverts were installed in 1967 and are in serious need of replacement, as are many culverts throughout the County. Historically, these culverts were constructed of either corrugated steel pipe or of concrete. Galvanized steel pipe material can typically last 30 to 40 years, while concrete pipe can last for 50 to 100 years. Many of these pipes were installed during the initial road construction or after being damaged in a flood event and are near the end of their service life.

The County has had difficulty in addressing deficiencies with its stormwater infrastructure, as evidenced by progress made in McKinleyville since completion of its drainage study. The 1982 McKinleyville Drainage Study identified 43 drainage improvements, within the 5 drainage basins. To date, only about four of these 43 drainage improvements have been completed.

There also exists a lack of cohesive development ordinance with respect to stormwater. The Humboldt County Framework Plan Policy 4235 does provide some general stormwater guidance and states that (1) drainage needs of each community shall be studied as part of each community plan; (2) natural drainage ways shall be utilized where possible to convey drainage flows consistent with streamside management policies in the General Plan; and (3) drainage facilities shall be capable of passing a 10 year intensity storm without static head at entrance

and passing a 100 year intensity storm without major damage. However, the County does not have a stormwater conveyance design ordinance for new development and instead refers to the 1997 Eureka General Plan Policy Document, which states that “new development that would increase storm drainage runoff in a 10-year storm event more than one cubic foot per second to provide retention/siltation basins to limit new runoff to prior-to-development flows.” The County should develop and establish their own stormwater conveyance system ordinance, that is compatible with the City or Eureka and other jurisdictional ordinances, but also establishes a specified duration for the design storm and addresses issues specific to the County. A more comprehensive standard the County could employ would be one similar to the County of Riverside, which states “Storms to be studied will include the 1-hour, 3-hour, 6-hour and 24-hour duration events for the 2-year, 5-year, and 10-year return frequencies. Detention basin(s) and outlet(s) sizing will ensure that none of these storm events have a higher peak discharge in the ‘after’ condition than in the ‘before’ condition.” Additionally, the County does have a uniform method for developing a synthetic hydrograph to assess stormwater runoff quantity and detention basin sizing, but this method is generally only applicable to a setting where a single detention basin can capture the entire runoff from a site. The method loses applicability in sites where multiple detention basins are needed either in series or in parallel, and a more robust method for routing multiple detention basin releases and assessing their cumulative impacts is needed.

4.5. Proposed Improvements

A comprehensive evaluation of the County's stormwater infrastructure needs to be performed. Master drainage studies and plans should be developed for all areas served by the County with the goal of identifying inadequacies of the existing infrastructure and proposing infrastructure in areas where it is lacking. While a master drainage study was beyond the scope of this report, this section discusses some of the known problem areas and provides conceptual solutions. However, more detailed, site specific analysis should be performed before designing any improvements.

4.5.1. Service and Facility Upgrades

The County will continue to replace culverts that are fish barriers, as part of its Five Counties Salmonid Restoration Program, contingent on available funding. The County has acquired funding and replaced approximately 20 culverts of the original 60 included in its Program, and hopes to upgrade or replace the remaining 40 culverts under this program as resources and funding permit. However, other than this funding program, the County does not have plans to upgrade stormwater services or facilities. The development of master drainage plans will be a critical step for the County to take in order to improve its role as service provider with respect to stormwater control.

4.5.2. Future Expansion

The burden of stormwater drainage facility improvements and future expansion of stormwater infrastructure into unserved areas that will see future development will largely be the responsibility of developers. The County, through adopted ordinances, could either require developers to install both the necessary on-site and off-site facilities as a condition of development or require developers to pay into a stormwater improvement fund through the levying of drainage fees. Fees mechanisms for ongoing maintenance could/should also be developed.

McKinleyville is currently the only community within the County that has a fund that developers pay into, and capital improvement projects are implemented as monies become available. However, the amount of funds that are currently being collected are insufficient and are not indexed to increase with inflation. The County could promote the use of similar funds in other areas served by the County, especially those areas with significant additional growth potential, such as areas served by Humboldt CSD and Glendale.

Although on-site stormwater facilities used to mitigate increased runoff from development may be applicable in some cases, the County should also allow for off-site facilities. The major problem with on-site facilities is the potential for private land-owners to disrupt the intended functions of these facilities. If the responsibility of maintenance is left up to the landowner, they could either not properly maintain the facilities (not check for clogged drains, remove built-up sediment over time, etc.) or altogether change the intended function of the facilities (fill in a rain garden, modify outlet structures because the rain garden backs up and floods their yard too much, etc.). A mix of regional detention and other stormwater facilities, combined with on site measures may be more appropriate in that the County maintains responsibility over their operation and maintenance.

4.5.3. Cost and Schedule of Improvements

It is estimated the County will need to invest significantly more in stormwater infrastructure improvements over the next twenty years than it has during the last twenty years. The County has not developed a Capital Improvement Program for its stormwater infrastructure to date. Costs and schedule of improvements should be developed in master plan drainage studies. However, it is estimated that the County will have to invest heavily to upgrade its stormwater infrastructure, especially after years of deferred maintenance, on the order of \$20 million over the planning horizon.

4.6. Issues to be Addressed in the General Plan Update

The technical report presents a basis for describing and assessing storm drainage and flood control services being provided in Humboldt County. As documented in this report, these services need to be upgraded. The County needs to complete a county wide master plan that includes a prioritized Capital Improvement Plan and a means for collecting funds to make the necessary improvements and to maintain this system.

This technical report highlights the need for additional storm drainage data. It is important to note that areas where significant development is planned or expected, a storm drain master plan should be prepared to size main line facilities to be compatible with full build-out of the areas for the Q100 storm. The siting of regional storm water detention facilities should be included if down stream areas (outside of the proposed development areas) cannot handle increased flows. Therefore, the Department recommends that a series of master drainage study be prepared as part of the General Plan process. Additionally, standards for storm water detention basin sizing should be developed

The General Plan Update will include goals, policies and programs for the following issues;

- Complete a Countywide Drainage Master Plan. This plan will enable the County to determine the proper sizing for any new improvements, develop a prioritized list of these new improvements and develop the underlying basis for impact fees that can be used for these improvements.

- Develop strategies for providing for the ongoing operation and maintenance of existing and new facilities.
- Develop a stormwater drainage ordinance outlining design guidelines, user fees, etc.
- Encourage the use of alternative and “green” technologies that reduce drainage flows.
- Develop approaches that will allow for the “pooling” of improvements to be done, instead of requiring each parcel to handle its stormwater on site. A good example of this is McKinleyville CSD stormwater marsh at Hiller Park.

5. Fire Protection

5.1. Introduction

Fire protection and emergency medical response services in Humboldt County are provided by a combination of agencies, districts and organizations. They range from federal agencies such as the U.S. Forest Service (USFS) and the Bureau of Land Management (BLM), and a state agency— California Department of Forestry and Fire Protection (CAL FIRE)—to local organizations such as community services districts, cities and volunteer fire districts and departments. The County Urban Study Areas (USAs) are primarily served by local organizations with volunteer firefighters and officers, and the ability of these organizations to provide services are the primary focus of this technical report.

Many of Humboldt County's USAs are located in the Humboldt Bay area. The remainder of the USAs are located along transportation corridors and waterways in the remainder of the County's 2.3 million acres. The more rural areas are in, or adjacent to, the County's 1.9 million acres of forested land, which cover over 80 percent of the County (including State and Federal lands). The rural and forested nature of the landscape contributes to the fire risk in the County (Department of Finance. California County Profile. Humboldt County Profile May 31, 2007). According to the Humboldt County Natural Resource Hazards Report, three-quarters of Humboldt County's land is identified as containing substantial forest-fire risks and hazards.

In Humboldt County, there are 25 local government agencies with responsibility for structural fire protection include one County Service Area (CSA), five Community Service Districts (CSDs), 16 Fire Protection Districts (FPDs), one Resort Improvement District (RID), and two city fire departments. There are also 18 all volunteer fire departments or brigades not associated with local government organizations (see figure 5-1).

Local fire protection districts and volunteer fire departments are formed specifically to provide community fire protection and emergency medical response services within their district boundaries or response area. The County's larger population centers of Eureka and Arcata/McKinleyville have fire departments with paid staff and multiple stations. Smaller communities have established districts and typically one station and an all volunteer staff. The smallest communities have the most limited resources, often relying on community contributions and used equipment to operate.

This report primarily addresses the ability of local organizations to serve communities and respond to structure fires and other emergencies, because these types of preparedness and response are considered the responsibility of local organizations. Most wildland fire protection (nonstructural fire) is the responsibility of Federal and State agencies. CAL FIRE is responsible for wildfires in State Responsibility Areas (SRA). The federal land management agencies are responsible for providing wildland fire protection for federal lands within the county, and the Yurok and Hoopa Valley Tribes provide funding, equipment, and facilities for volunteer fire departments in their respective reservations (Humboldt County Master Fire Protection Plan).

5.2. Existing Level of Service

5.2.1. Local Fire Protection Service Providers

Community fire protection can be divided into two strategic elements: proactive and reactive. The reactive element involves committing resources to an incident after it has started. The proactive element addresses the prevention of incidents, and the minimization of incident impacts, through safety education and code enforcement. Fire Prevention includes administration of specialized services involving fire code enforcement, fire education, fire investigation, and State-mandated code enforcement and inspections. Fire Prevention staff, where available, play a critical part of suppression by providing incident management, project administration, support services, training, and vacancy back-fill. In most local organizations, these roles are filled with the same personnel.

There is a significant difference in the fire response capabilities available to residents living in more populated areas such as Eureka or Arcata, compared to residents living in more remote rural communities. Local departments use formal and informal mutual aid and automatic aid agreement to augment the level of protection provided to the residents that they serve, but level-of-service differences between communities still persist. When preparing the County Master Fire Protection Plan, the County Fire Safe Council acknowledged the importance of establishing a county-wide level-of-service standard so that service gaps can more easily be identified and addressed and residents are aware of the level of protection available to them. This includes:

- Developing level-of-service standards for the provision of all fire protection services (fire, EMS, HazMat, rescue) in the County, and make such standards public.
- Establishing regional fire training facilities in appropriate locations; facilities should include classrooms, a burn tower, and fire and rescue training props.
- Improving communication and coordination between local fire departments, CAL FIRE, and federal agencies during fires and other emergencies.

The table below depicts a comparison of the various organizations that provide fire protection services to communities within the urban study areas of Humboldt County. The organization type, district size in square miles, number of facilities, and urban study areas are identified for each organization below.

Table 5-1. Fire Protection Services within Humboldt County

Name of Organization	Organization Type	District Size*	# of Fire Stations	USA/WSA
Arcata Fire Protection District	Combination Career-Volunteer	62.0	3	Arcata USA McKinleyville USA/WSA
Briceland Volunteer Fire Department	Volunteer (non-agency)	N/A	1	Briceland WSA
Blue Lake Fire Protection District	Volunteer (Career Chief)	13.6	1	Blue Lake USA/WSA Glendale USA/WSA
Carlotta Community Services District	Volunteer	4.4	1	Hydesville USA/WSA
County Service Area No. 4	Career	23.5	1	Big Lagoon WSA & Westhaven WSA

Name of Organization	Organization Type	District Size*	# of Fire Stations	USA/WSA
Eureka City Fire Department ¹²	Career	15.8	3	Works in concert with Humboldt FPD No. 1
Ferndale Fire Protection District	Volunteer	44.2	1	City of Ferndale and Riverside WSA
Fieldbrook Community Services District	Volunteer	9.4	1	Fieldbrook USA
Fortuna Fire Protection District	Volunteer	29.4	3	Fortuna USA Hydesville USA/WSA
Garberville Fire Protection District	Volunteer	1.1	1	Garberville USA/WSA
Humboldt Fire Protection District #1	Career	40	2	Myrtle town USA & Humboldt Hill USA & South Eureka USA
Loleta Fire Protection District	Volunteer	48.9	1	Loleta USA
Miranda Community Services District	Volunteer	0.5	1	Miranda USA
Myers Flat Fire Protection District	Volunteer	0.7	1	Myers Flat WSA
Orick Community Services District	Volunteer	2.3	1	Orick USA/WSA
Orleans Community Services District	Volunteer	1.6	1	Orleans WSA
Phillipsville Community Services District	Volunteer	0.5	1	Phillipsville WSA
Redway Fire Protection District	Volunteer	1.1	1	Redway USA
Resort Improvement District No. 1	Volunteer	4.8	1	Shelter Cove USA/WSA
Rio Dell Fire Protection District	Volunteer	4.6	1	Rio Dell USA/WSA
Samoa Peninsula Fire Protection District	Volunteer	2.8	1	Samoa USA
Weott Community Services District	Volunteer	0.5	1	Weott USA
Westhaven Volunteer Fire Department	Volunteer (non-agency)	N/A	1	Westhaven WSA
Willow Creek Fire Protection District	Volunteer	6.6	1	Willow Creek USAWSA

*In square miles

¹² Shown due to Auto-Aid agreement with Humboldt Fire Protection District No. 1

The following are overviews of each of the local organizations providing fire protection services within Humboldt County USAs. They are listed in alphabetical order.

Arcata FPD

The Arcata FPD (FPD) is responsible for providing fire protection services, to the City of Arcata, the unincorporated communities of McKinleyville, Manila, Jacoby Creek, and the Mad River bottom. The Arcata FPD covers the McKinleyville, Jacoby Creek, Manila, and a small portion of Glendale and Fieldbrook USAs. The Arcata FPD protects some of the most populated areas in Humboldt County including the County's second largest City (Arcata), the growing community of McKinleyville, and Humboldt State University. The Arcata FPD, is one of the few departments in Humboldt County with paid firefighters supplemented by a significant number of volunteer fire fighters, and provides full service fire protection including plan check, building inspection, and fire prevention related public education. There are many large facilities within the Arcata FPD including Humboldt State University, the large commercial downtown core, Mad River Hospital, and the United Indian Health Services Potawot Health Village.

The Arcata FPD's (FPD) district boundary encompasses 62 square miles with a total response area of 67.9 square miles. The Arcata FPD has a total of 75 personnel serving the District, 53 of which are volunteers. The district received 1,768 calls in 2006, 51 percent of which were for medical assistance. There are three fire stations within the district: the headquarters are based at 631 9th street in Arcata, the McKinleyville station at 2149 Central Avenue in McKinleyville, and the Mad River station is located at 3295 Janes Road in Arcata.

Briceland VFD

The Briceland VFD is not associated with a special district. The Briceland VFD provides comprehensive fire protection services to a 58 square mile response area that includes Briceland and the surrounding area. The department raises all of its revenue from fund raising activities.

The Briceland VFD has approximately 15 to 20 volunteers, many of whom are EMTs, and maintains a high standard of training. In addition, the Briceland VFD leads the Southern Humboldt Fire Chief's Association technical rescue team. Most of the Briceland VFD response area is comprised of rural residences within the wildland interface. Other facilities within the response area include the Skyfish Charter School and Briceland Thorne Road.

Blue Lake FPD

The Blue Lake FPD is responsible for providing fire protection services, through the Blue Lake VFD (VFD), to the City of Blue Lake, and unincorporated communities of Glendale, and the West End Road/Hatchery Road area. The Blue Lake FPD boundaries are fairly compact, but the Department responds to calls out of district to the east along Hwy 299 on Lord Ellis Summit and the Redwood Creek area. The largest facilities within the Blue Lake FPD include the Blue Lake Casino, the Ultra Power biomass generator, an industrial area near the Mad River, and a mill and industrial area in Glendale.

The Blue Lake FPD has a district boundary of 13.6 square miles, with a total response area of 121.1 square miles. The Blue Lake fire department only has a paid Chief, and 56 volunteers serving the district, which received 134 calls in 2006. The District's boundary includes Mc Adams and Liscom Hill Roads to the north, and Hatchery road to the south. The district has one facility on 1st Avenue in Blue Lake.

Carlotta Community Services District

The Carlotta Community Services District is responsible for providing fire protection services, through the Carlotta Volunteer Fire Department (VFD), to the unincorporated community of Carlotta located along the Van Duzen River in central Humboldt County. The community of Carlotta is located in the Van Duzen River valley along State Highway 36 and is surrounded by steeply sloped timberlands. The largest facilities within Carlotta are the former Pacific Lumber Mill located on the south side of Hwy 36 and Cuddeback Elementary School located on Wilson Road.

The District boundary is 4.4 square miles, serving a total response area of 50.5 square miles. There is only one fire station in this district, which is located at 61 Johnson Lane in Carlotta. The district received 44 calls in 2002. There are 15 volunteers and no paid staff members.

County Service Area No. 4

County Service Area (CSA) No. 4 is a dependent special district governed by the County Board of Supervisors who serves as its ex-officio Board of Directors. CSAs can be authorized to provide a wide range of municipal services; however, CSA No. 4 provides only fire protection. CSA No. 4 provides fire protection services, through the CAL FIRE Trinidad station, to the coastal communities (south of Orick) of Big Lagoon, Trinidad, Westhaven, and Cranell. CAL FIRE performs this service through a contract with Humboldt County. One engine is staffed year-round to provide service to CSA No. 4 and if this engine is detailed to a fire out of the area another engine is moved to serve the district, if available. Larger facilities within CSA No. 4 include Patricks Point State Park and other coastal recreation areas, U.S. 101, and portions of Westhaven (most of the community of Westhaven and all of the Westhaven WSA is located outside the boundaries of CSA No. 4), Cranell, and Big Lagoon. Westhaven is almost entirely residential, but contains a restaurant and park at Moonstone Beach.

CSA No. 4 FPD has a district boundary and total response area of 23.5 square miles. The District has 6 paid personnel, and no volunteers. This is the longest stretching district boundary, beginning just south of Orick in the north, to Clam Beach in the south, with the exception of Trinidad, which is served by its own City FPD. In Westhaven, the Volunteer Fire Department provides service and has requested back-up support from CSA No. 4. In 2006, CSA No. 4 recorded a total of 252 calls.

Eureka City Fire Department

The Eureka Fire Department is a City department, governed by the Eureka City Council, and protects the area within the boundaries of the City of Eureka. Eureka is the Humboldt County seat and the largest city in the County, with a population of approximately 26,000. The city is bordered on one side by Humboldt Bay and on the other by forested ridges. Eureka is the governmental, commercial, industrial and transportation center of the region. Eureka functions more like a city twice its size due to its regional center status and the fact its service area population is about 50,000. Eureka has numerous commercial and industrial areas including Old Town, the Bayshore Mall/Broadway area, Henderson/Eureka Mall area, and Myrtle Town.

The City of Eureka is located outside any USA or WSA, but provides service within the Myrtle town and South Eureka USAs based on its interoperation agreement with Humboldt FPD No. 1. Through this agreement, the Eureka FD and Humboldt FPD No. 1 cooperatively provide services dividing their respective service areas between their five stations.

The boundary for the Eureka FD is 15.8 square miles, with a total response area of 55.8 square miles. The Eureka FPD also includes the Humboldt Fire No. 1 auto areas. The Department has 41

paid personnel, and 12 volunteers that provide services to the district. The department received 3,139 calls in 2006. There are three stations within the Department: 533 C Street, 2905 Ocean Ave, and 1016 Myrtle Avenue.

Fieldbrook Community Services District

The Fieldbrook Community Services District is responsible for providing fire protection services, through the Fieldbrook VFD, to the unincorporated community of Fieldbrook which is located between McKinleyville and Blue Lake along Fieldbrook Road. The Fieldbrook CSD also provides water and wastewater services. The Fieldbrook area is located in a sheltered valley bounded by ridges covered by thick conifer forests. The largest facilities within Fieldbrook are the Grange, several churches, Community Services District office/Fire Station, Fieldbrook Elementary School, Fieldbrook store and the Fieldbrook Valley Winery.

The District has a district boundary of 9.4 square miles and a total response area of 10.4 square miles. The District is operated by 22 volunteers; there are no paid personnel in the district. In 2006 the district received a total of 71 calls, with over 60 percent of those being medically related.

Ferndale FPD

The Ferndale FPD is responsible for providing fire protection services, through the Ferndale VFD, to the City of Ferndale, and unincorporated communities of Grizzly Bluff, Arlynda Corners, Centerville, Port Kenyon, Wildcat Ridge, and the remainder of the Eel River bottoms south of the Eel River. The City of Ferndale, known as the Victorian Village, is a well known visitor destination and draws thousands of tourists during the summer months. The largest facilities within the Ferndale FPD include the commercial downtown, the Humboldt County Fairgrounds, and Ferndale's Elementary and High Schools. The Ferndale FPD has a district boundary of 44.2 square miles and a total response area of 115.7 miles. The Riverside WSA is located within the Ferndale FPD boundaries. The district is run exclusively by 38 volunteers, as there are no paid personnel. The District received 162 calls in 2006, almost 60 percent of which were medical related.

Fortuna FPD

The Fortuna FPD is a dependent district. It is responsible for providing fire protection services, through the Fortuna VFD, to the City of Fortuna, and unincorporated communities of Fernbridge, Rohnerville, Hydseville, Alton, and Metropolitan. The City of Fortuna is the third largest city in the County and has a large commercial downtown area. The largest facilities within the Fortuna FPD include the Pacific Lumber Mill (currently closed but being considered for new development), Redwood Memorial Hospital, Rohnerville Airport, the Riverwalk area, the community of Rohnerville, and downtown Fortuna. There are 65 volunteer employees serving the District boundary and total response area, which spans 29.4 square miles. The FPD maintains three fire stations. The FPD is not the primary responder on medical calls in the City of Fortuna. That service is currently provided by the Fortuna Police Department.

Garberville FPD

The Garberville FPD is responsible for providing fire protection services, through the Garberville VFD, to the town of Garberville and the old Wallen Ranch area. Garberville is the most southerly town in Humboldt County and is located on a bluff above the South Fork of the Eel River. The largest facilities within the Garberville FPD include the downtown core, Blue Star Gas storage/distribution, and the Garberville California Department of Forestry and Fire Protection station. The Garberville FPD has a boundary of 1.1 square miles, but has a total response area of 35.9 square miles. There are no paid personnel, and there are 17 volunteers.

Humboldt Fire District No. 1

Humboldt Fire District No. 1 is responsible for providing fire protection services to a small portion of the City of Eureka as well as the area south of Eureka to Fields Landing, north of Eureka to Freshwater and Indianola, and east of Eureka to Elk River and Ridgewood Heights. Additionally, the District provides auto-aid to the City of Eureka. Humboldt Fire District No. 1 has both paid staff and volunteer firefighters. Humboldt Fire District No. 1 has an active fire prevention program and all firefighters are trained to at least the level of Emergency Medical Technician I. Major facilities within Humboldt Fire District No. 1 include Redwood Acres Fairgrounds, the PG&E Humboldt Bay Power Plant, College of the Redwoods, and numerous schools and churches. Humboldt Fire Protection District No. 1 traditionally operates a fire protection/safety education program for schools within the district, and also participates in countywide fire education activities as a member of the Humboldt County Fire Prevention Officer's Association.

Humboldt Fire District No. 1 has a district boundary of 40 square miles and a total response area of 48 square miles. Two stations are located within the District; the headquarters are located at 3455 Harris Street, and another station is located at 755 Herrick Avenue in Bayview. The District received 1452 calls in 2006, and almost 60 percent of the calls were for medical service. There are 18 paid personnel, and 9 volunteers that serve the Humboldt No. 1 FPD.

Loleta FPD

Loleta FPD is responsible for providing fire protection services, through the Loleta VFD, to the town of Loleta and surrounding lands. Most of the Loleta FPD is agricultural grass lands with some limited forested areas. The district also includes the Table Bluff area, the Eel River bottoms north of the River, Hookton Slough, the South Spit, and a portion of Fernbridge. The populated areas within the Loleta FPD include the town of Loleta and the Table Bluff Rancheria. Larger facilities within Loleta FPD include Loleta Elementary School, the Table Bluff Rancheria, and a large food warehouse. The Loleta FPD has a district boundary and total response area of 48.9 square miles, which is served by 24 volunteer personnel.

Myers Flat FPD

Myers Flat FPD is responsible for providing fire protection services, through the Myers Flat VFD, to the community of Myers Flat along the Eel River midway between Weott and Miranda on the Avenue of the Giants. The Myers Flat FPD is surrounded by Humboldt Redwoods State Park. Although the District extends across to the south side of the Eel River, most of the District is coterminous with the populated area of Myers Flat. Larger facilities within Myers Flat include the Bear River Casino, Myers Inn, miscellaneous small commercial establishments, and an RV Park.

The Myers Flat FPD has a district boundary of 0.7 square miles and a total response area of 2.2 square miles. There is one station within the district, which is served by 6 volunteer members and no paid personnel.

Miranda Community Services District

The Miranda Community Services District is responsible for providing funding for fire protection services, through the Miranda VFD, to the unincorporated community of Miranda located within the Avenue of the Giants (State route 254) along the South Fork of the Eel River between Myers Flat and Phillipsville. The Miranda area is characterized by Humboldt Redwoods State Park and the surrounding mature redwood forest, steep hillsides, and the Eel River. The largest facilities within Miranda are South Fork High School and Miranda Junior High School. The Miranda Fire Department often responds outside the area.

The Miranda Volunteer Fire Department has a response area of 8.5 square miles and a total response area of 9.0 square miles. In 2006 there were a total of 50 calls, 76 percent of which were for medical services. There are two engines, and a total of 8 personnel that provide services within the district, all of which are volunteers.

Orick Community Services District

The Orick Community Services District is responsible for providing fire protection services, through the Orick VFD, to the unincorporated community of Orick located along U.S. 101 adjacent to the Redwood Creek flood plain as it reaches the Pacific Ocean. The Orick CSD also provides domestic water services. The Orick area is dominated by Redwood National Park and the surrounding old growth stands of redwoods. The largest facilities within Orick are Redwood National Park Operation Center, its downtown commercial strip along U.S. 101, and the Simpson Timber Mill just north of town. The District boundary for Orick CSD is 2.3 square miles, with a total response area of 123.8 miles. The district has two fire engines, one built in 1971, and one from the 1960's.

Orleans Volunteer Fire Department

The Orleans Volunteer Fire Department primarily protects the area in and around the community of Orleans along the Klamath River north of its confluence with the Trinity River. The area around Orleans is known for the rugged Klamath River valley, steeply sloped ridges with dense conifer forests. Orleans contains a school, U.S.F.S District Ranger Station, Karuk Tribal facilities, and small stores and overnight accommodations.

The Orleans district boundary is 1.6 square miles, with a total response area of 120.2 miles. The district has five trucks: two main engines, a big water tender, a brush fire rig (also a vehicle accident response rig), and a rescue vehicle. The district is staffed with 8 volunteers.

Phillipsville Volunteer Fire Department

The Phillipsville Volunteer Fire Department protects community of Phillipsville and is located along the Avenue of the Giants, on the eastern bank of the South Fork of the Eel River. The town is approximately 2 miles south of Miranda. Most of the community is located on a large river flat. Some individual homes also occur on the steep, wooded hillside just east of the flat. Along the Avenue of the giants, there is a small amount of commercial buildings and a mobile home park.

The district boundary for the Phillipsville is approximately .5 square miles, with a total response area of 4.4 square miles. The Department is served by 5 volunteers, and does not have any paid personnel. The fire station, located at 2973 State Highway 254, has one engine and one tender. Most of the calls received in 2006, were medically related.

Redway FPD

Redway FPD is responsible for providing fire protection services, through the Redway VFD, to the community of Redway. The Redway FPD does not extend beyond the developed Redway community which is located on a large bend of the South Fork of the Eel River just north of Garberville. Larger facilities within the Redway FPD include the Mateel Community Center, and the small shops and businesses in the town center.

The Redway FPD has a district boundary of 1.1 square miles and total response area of 3.3 square miles. The District, which receives approximately 80 calls per year, has one fire station, three engines and 24 volunteer personnel.

Resort Improvement District No. 1 - Shelter Cove

Resort Improvement District No. 1 is responsible for providing fire protection services, through the Shelter Cove VFD, to the unincorporated community of Shelter Cove. Shelter Cove is an isolated community located at the southern end of the Kings Range National Conservation Area and the Lost Cost at the end of Shelter Cove Road. Resort Improvement District No. 1 is a multi-purpose special district (differing from a CSD because of its more limited year-round population) and also provides electric, water, and sewer services to the residents of Shelter Cove and manages the Shelter Cove airport and golf course. The Shelter Cove area is surrounded by public lands and has a significantly larger summer population due to second homes and its status as a tourist destination. The largest facilities within Shelter Cove include the airport, golf course, and schools.

Resort Improvement District No. 1 is responsible for providing funding to the Shelter Cove Volunteer Fire Department. The District boundary is 4.8 square miles with a total response area of 7.1 square miles. The District has one station, three engines, and one rescue vehicle. The District is served by one paid staff member and 11 volunteers.

Rio Dell FPD

Rio Dell FPD is responsible for providing fire protection services, through the Rio Dell VFD, to the City of Rio Dell. The City of Rio Dell is located on a bench above the Eel River surrounded by slopes covered by redwoods. The Rio Dell FPD boundary is roughly equivalent with the City of Rio Dell boundaries and extends beyond the City in the Belleview area and up Monument Road. Larger facilities within the Rio Dell FPD include the Rio Dell town center and Eagle Prairie Elementary and Monument Middle Schools. The Rio Dell FPD has a district boundary of 4.6 square miles and total response area of 6.7 square miles, which is served by an all volunteer staff of 22. The District received a total of 295 calls in 2006 and 83 percent of those calls were medically related. Rio Dell has one station, three engines, and one rescue vehicle. The Rio Dell FPD was recently received an ISO (a support services firm for the insurance industry that provides the most comprehensive ratings of fire department operations) rating of "4," which is among the lowest for volunteer fire departments in the County. The FPD has received an application to annex the town of Scotia into the district. This proposed annexation is currently under review by the FPD Board of Directors.

Samoa Peninsula FPD

Samoa Peninsula FPD is responsible for providing fire protection services, through the Samoa Peninsula VFD, to the communities of Fairhaven and Samoa on the Samoa Peninsula. The Samoa Peninsula is a narrow strip of land bounded by the Pacific Ocean on the west and Humboldt Bay on the east. The Samoa Peninsula FPD includes the historic mill town of Samoa which is the subject of a Master Plan development proposal on file with the County, and industrial and residential uses in the Fairhaven area. Larger facilities within the Samoa Peninsula FPD include the Samoa Pulp Mill operated by Evergreen Pulp, Fairhaven biomass power plant, the former mill site industrial land associated with Samoa, and the Redwood Dock which was recently returned to Harbor District control. The Coast Guard Humboldt Bay Life Boat Station at the southern end of the Samoa Peninsula located outside of the district boundaries; the Coast Guard contracts with BLM to provide fire protection services to the station. The FPD has experienced significant revenue reductions due to closed mill site property reassessments

The Samoa Peninsula FPD has a district boundary of 2.8 square miles and a total response area of 3.4 square miles. The District and has one fire station, three engines, and is served by an all volunteer staff of 12 personnel. They maintain a Fire station in Fairhaven, and also keep fire apparatus in the Samoa Block, in the town of Samoa.

Trinidad FPD – City of Trinidad

The Trinidad Volunteer Fire Department is a City department, governed by the Trinidad City Council, and protects the area within the boundaries of the City of Trinidad. Trinidad is located along a coastal bluff near Patrick's Point State Park and forest lands at the northern edge of the urbanized portion of Humboldt County. Trinidad is the smallest City in the County with 310 residents. Trinidad is a tourist attraction and has several restaurants, an active wharf, and a Humboldt State University marine laboratory.

The Trinidad FPD has a district boundary of 0.6 square miles, and a total response area of 2.2 square miles. A total of 58 calls were received in 2006 and most of those calls were medically related. The district served by 11 volunteers; there are no paid personnel.

Weott FPD

The Weott Community Services District is responsible for providing fire protection services, through the Weott VFD, to the unincorporated community of Weott. Weott is located within the Avenue of the Giants along the South Fork of the Eel River near the confluence of the Main Step and South Fork of the Eel. The Weott CSD also provides water, wastewater services. The Weott community is surrounded by Humboldt Redwoods State Park. It is the closest community to the Park visitor center and campground facility. It is a residential community with no industrial uses and limited commercial uses. The largest facilities within Weott include the Agnes Johnson School and a California Department of Forestry and Fire Protection Fire Station.

The Weott Volunteer Fire Department has an all volunteer staff of 9 personnel. The District boundary is only 0.5 square miles, but the total response area is 12.5 square miles. The District received a total of 16 calls in 2006, with about 38 percent of those calls being for medical service. The station has one engine and rescue vehicle.

Westhaven VFD

The Westhaven VFD is not associated with a special district. The Westhaven VFD provides fire protection services to a response area that includes Westhaven and the surrounding area. The department raises all of its revenue from local fund raising activities.

The Westhaven VFD has approximately six volunteers. The Westhaven VFD response area is located within the district boundaries of CSA No. 4. Westhaven VFD and CSA No. 4 are jointly dispatched to calls within the response area of the VFD.

Willow Creek FPD

The Willow Creek FPD is responsible for providing fire protection services, through the Willow Creek VFD, to the residences of the Willow Creek area along the Trinity River between the Friday Ridge area (west side of the Trinity River) in the south and both sides of the Trinity River on the north end of the Willow Creek area. Willow Creek is an active tourist destination in the summer, with many second homes, and motels. Larger facilities within the Willow Creek FPD include Hwy 299 and 96, Trinity Valley School, Big Foot Country Club, community health clinic, and downtown commercial area.

The Willow Creek Fire Protection District is responsible for providing funds to the Willow Creek Volunteer Fire Department. The District boundary is 6.6 square miles with a total response area of 26.6 square miles. There are four engines, one rescue vehicle, and 23 volunteers that serve the district.

5.2.2. Humboldt County Role in Fire Protection

Humboldt County plays a variety of roles in fire planning and protection including:

- Serving as the Governing Board and contracting for fire protection services (CSA No. 4);
- Serving as the Governing Board for certain fire protection services and appointing local commissions to manage the activities of the districts (Fortuna, Loleta, Whitethorn);
- Maintaining current Geographic Information System (GIS) data on fire services, districts, areas of responsibility, and fire history;
- Maintaining public roads;
- Maintaining current fire safe goals and land use planning policies in the General Plan;
- Carrying out the responsibilities of the County Fire Warden;
- Planning for development that receives adequate fire protection through adoption of the County General Plan and Safety Element;
- Adopting Fire Safe Regulations that include the application of fire safe standards for development in unincorporated areas;
- Offering a less expensive workman's compensation insurance option to Fire Districts/Departments through the County's participation in the California State Association of Counties Excess Insurance Authority (CSAC EIA);
- Coordinating emergency services response through the Sheriff's Department and OES; and
- Maintaining and implementing the Humboldt County Master Fire Protection Plan.

With the formation of a County Fire Safe Council and preparation of a County Master Fire Protection Plan the County has broadened its role in fire planning. The Fire Plan focuses on the County's coordination and oversight role, and incorporates new policies that the County can implement through the Humboldt 2025 General Plan.

The County's Office of Emergency Services (OES), part of the Humboldt County Sheriff's Office, is in charge of coordinating emergency response planning for Humboldt County, pursuant to the County Emergency Operations Plan. The California Emergency Services Act (Gov Code § 8550) establishes a mandate for emergency operations planning to "insure that preparations within the state will be adequate to deal with such emergencies."

5.2.3. Wildland Fire Responsibility

There are three basic types of wildland responsibility areas within Humboldt County: Federal Responsibility Areas (FRA), State Responsibility Areas (SRA), and Local Responsibility Areas (LRA). Local government provides wildland fire protection within their jurisdictions, but only to areas outside of State and Federal Responsibility Areas. Federal agencies are responsible for preventing and suppressing wildland fires within FRAs. These lands are generally protected by the Department of Agriculture, Forest Service, and Department of the Interior bureaus: Bureau of Land Management, National Park Service, US Fish and Wildlife Service, and the Bureau of Indian Affairs. FRAs generally include National Forest, National Park Service and Tribal lands, or any federally owned land. Local agencies can respond out of their jurisdictions either through auto-aid or goodwill.

CAL FIRE provides wildland fire protection services to the SRAs and cooperates with local agencies to suppress wildland fires. SRAs include timberlands, rangelands, watersheds, and

privately owned lands, but do not include areas within incorporated cities, federally owned lands, or areas with more than three housing units per acre.

LRAs include areas in which local government has the primary financial responsibility for providing fire protection services. Local government contracts can be made with CAL FIRE to provide fire protection services in LRA lands and the local government agency would pay CAL FIRE for providing those services. Alternatively, local governments can enter agreements to provide fire protection services to SRAs and CAL FIRE would pay the Local government for those services. Local Fire Districts are responsible for responding to structure fires, within their responsibility areas which may include some SRAs. Federal Agencies such as the USFS will not enter structures. The County USAs are primarily located within LRAs. However, agreements such as those described below can be made between local and state or federal agencies to provide fire protection services within USAs.

CAL FIRE Agreements with Local Providers

CAL FIRE cooperates with local governments to provide emergency services under four main types of funding agreements:

1. **“Schedule A” Agreements.** Local governments hire CAL FIRE to provide local fire protection services (structure fire protection, emergency medical response, etc). The state is reimbursed for the costs of the service.
2. **Contract Counties.** The state hires local county governments to provide wildland fire protection in SRA. The state pays local government for those services.
3. **Amador Agreements.** Under these agreements, local governments reimburse the state for the costs of keeping CAL FIRE fire stations open during the non fire season. Service is provided to the residents of CSA No. 4 through an Amador agreement.
4. **Mutual Aid.** The state and local governments have entered into many agreements to provide assistance to one another. For example, there are auto-aid agreements that allow for the closest available resource to respond to the fire or other emergency, without regard to jurisdiction. In general, reimbursements are only paid after 12 or 24 hours of response.

Fire Safe Standards

One of the issues being addressed in the General Plan Update is how new development can be planned to minimize services needs. One effective means is the implementation of uniform fire safe standards, which have proven to be effective in reducing losses to life and property. To be effective the most current fire safe techniques should be incorporated into the planning regulations, and most importantly enforcement measures, of local jurisdictions throughout the County. To this end, Humboldt County adopted versions of the California SRA Fire Safe Regulations (HCC Div 11 of Title III) as the County Fire Safe Regulations. These regulations constitute local alternative standards as authorized by PRC § 4290, and have been approved by CAL FIRE as meeting or exceeding the State regulations. Additionally, the Humboldt County Master Fire Protection Plan makes the recommendation to update these regulations to ensure that the most up-to-date and fire safe techniques are incorporated.

The Humboldt Fire Chief's Association has also begun working to clarify the implementation of State and Federal fire prevention construction and occupancy standards in order to assist contractors, business operators, local government, and local fire agencies to improve fire safety. To that end, they are developing standards for smoke detectors, key boxes, fire department connections, fire sprinkler inspector test and alarm monitoring, fire extinguishers, cooking hoods,

premises identification, roads, burn permits, and gated communities. This work will serve as an effective springboard for additional coordinated fire safe planning and enforcement efforts.

5.3. Condition Assessment

5.3.1. Fire Protection Funding

Fire services in the county are financed through a variety of programs and sources. The most stable sources are property tax apportionments and ongoing assessments. One-time funding (such as grants) can be effective for acquiring a piece of equipment and may be used for establishing a program or service, but must be replaced by an ongoing source for long-term viability. The following are the funding sources most used in the county, but not a comprehensive list:

- Benefit Assessments;
- Special Taxes;
- Property 172 funds;
- Property tax apportionments;
- Grants; and
- Fundraisers.

5.3.1.1. Funding For Local Fire Organizations

Fire protection service providers in Humboldt County operate with limited resources and demonstrate a strong need for additional funding. Expenses for essential budget items such as the maintenance of aging apparatus, worker's compensation, and liability insurance outstrip department revenue. Although local fire organizations have demonstrated that they are very resourceful—using volunteers, surplus and donated equipment, and by working cooperatively to deliver services—most fire departments report that they do not have sufficient funding to support the desired minimum level of service. As a result, fiscal stability is one of the most critical issue facing local fire related organizations.

SB 1207 (Romero – approved by the legislature in 2001 and codified as California Labor Code Section 6303), which took effect on January 1, 2004, revised the Labor Code to define volunteer firefighters as “employees” for the purposes of the California Occupational Safety and Health Act. This law establishes new requirements for volunteer fire departments including:

- A requirement for an Injury and Illness Prevention Plan
- Occupational Safety & Health Administration (OSHA) compliant personal protective equipment (PPE including an annual pulmonary examination and “fit testing”) for all personnel
- Staffing requirements to achieve “two-in/two-out” policies (burning buildings can only be entered by a minimum of two firefighters and at least two firefighters must be available outside and ready to perform a rescue if required)
- Requirements for hazardous materials and confined space rescue training
- Department blood borne pathogen programs
- Hazard labeling; and
- Personal liability for managers and supervisors in the event of serious Labor Code violations

Although some of the County's fire departments may be substantially in compliance with these regulations already, most local fire departments will need to significantly increase training, purchase new equipment, and devote additional time to department administration in order to comply with this law. As described in the previous paragraph, local department budgets are already stretched beyond their limit. Compliance with SB 1207 requirements profoundly affects the fiscal stability of local departments.

Establishing new funding sources to meet the ever-increasing demands on local fire organizations is a difficult undertaking. There is not an easy "one size fits all" solution that can be applied to each fire department for meeting funding shortfalls. Tax revenue is limited by state law and requires voter approval. Grant funds are highly competitive, require considerable time and administrative capacity, and their use is limited. Fund raising is competitive, time consuming, and is limited by the incomes of residents and businesses that receive services from the particular fire department.

The following is a discussion of existing ongoing and one-time funding sources for fire protection in Humboldt County, as well as a partial listing of alternative funding sources. For the purposes of this analysis, on-going funding sources are considered recurring revenues that residents/agencies are obligated to pay such as property taxes, assessments, other government aid, and fees. One-time funding sources are grants, donations, and the like. Portions of this section were excerpted from *Funding Alternatives for Fire and Emergency Services* (FEMA U.S. Fire Administration) and the *Planner's Guide to Financing Public Improvements* (Governor's Office of Planning and Research).

5.3.1.2. Funding By Organization Type

For the purposes of this Fire Plan, local fire organizations are divided into two types: Local Agency Fire Departments (city departments and special districts) and Non-Agency Fire Departments (volunteer fire companies not supported by a city or special district.) Humboldt County and its non-fire related district role in local fire protection funding is discussed separately. For each department type, the most common sources of funding will be described as well as some of the additional funding sources that are authorized by the State Legislature, but may not be currently in use. This analysis may not describe all funding types available to all local agency types or all funding sources utilized by all departments.

Humboldt County

Humboldt County plays various roles in local fire protection. The County Board of Supervisors serves as the ex officio Board of Commissions/Directors of four fire related districts. However, neither County staff nor County funds are used in the administration of those districts.

The County does use some General Fund money for fire protection related activities. CAL FIRE receives approximately \$13,000/year through the Amador contract with the County for dispatch services, as well as approximately \$60,000/year for CSA-4 related contract services. Funding for CSA-4 is derived from a property assessment and the funding for dispatch services is derived from the County General fund. Competition among County programs for General Fund revenue is very tight. Given recent statewide reductions in funding to counties without commensurate reductions in program responsibilities, the likelihood that County General Revenue expenditures for fire protection will increase in the near future is very low.

Non-Agency Fire Departments

Non-agency fire departments are volunteer fire companies established by local communities to protect themselves. In Humboldt County there are three general types of volunteer fire companies: volunteer fire companies protecting Tribal communities that receive at least some portion of their regular ongoing funding from the Tribal government; volunteer fire companies associated with a timber company that protect a mill and other timber company property and receive at least some portion of their ongoing funding from the timber company, and the remaining volunteer fire companies that rely almost exclusively on their own fund raising efforts.

With few exceptions, non-agency fire departments have no certainty as to their funding levels from one year to the next. Fund raising is the primary source of revenue for volunteer fire companies. Additional sources of funding for non-agency volunteer fire departments include event promotion (for example, the Honeydew Volunteer Fire Department organizes the "Roll on the Mattole" each year – a music event in the Honeydew area), wages and equipment rental derived from State and Federal wildfire related work, raffles, and bake sales. Volunteer fire companies are eligible to apply for many fire related grants; however, most grants will not fund recurring expenses such workers compensation, liability insurance, and utilities. Grant funding sources will be discussed generally at the end of this Section.

Many local departments have had regular success as result of their fund raising efforts. Some volunteer fire companies generate more revenue from fund raising than fire related districts do from taxes. Fund raising does provide an opportunity for local departments to meet the community they protect. However, a significant investment of time and energy is required by the volunteer company in order to raise funds. Time and energy are scarce resources for any community volunteer, but especially for volunteer firefighters. Volunteer firefighters, whether associated with a local agency or not, are often expected to perform at the same level as career firefighters who train 20 to 40 hours per month. The time spent fundraising for volunteer firefighters could be better devoted to training or department administration.

Although fund raising is the primary source of revenue, it is not the sole domain of volunteer fire companies. Local agency fire departments also perform a good deal of fund raising to supplement their revenue. Fund raising will always be an important component of non-agency and local agency volunteer fire department revenue and community relations. However, it is clear that fund raising efforts can detract from the time and energy required to be a volunteer firefighter. Table 5-1 lists the primary funding sources available to non-agency fire departments.

Table 5-2. Non-Agency Fire Department Funding Sources

Funding Source	Notes
Federal, State, Local, Foundation Grants	Generally available only for one-time purchases only, not for ongoing expenses such as insurance
Informal Subscriptions/Dues	Program that seeks participant/household fees rather than large service charges if services are provided
Fundraising Solicitations	Door to door or letter writing fund raising campaigns directed towards residents within the service area
Interest / Rent	Revenue from volunteer fire company assets such as investments, real property, or equipment
Wildfire Wages	Payments from responsible Federal and State fire agencies for assisting in wildfire suppression
Events / Promotions	Events and promotions such as raffles, pancake breakfasts, bake sales, and shows

Local Agency Fire Departments

Providing fire protection is not a requirement for counties and not a clear requirement for cities. Counties have no requirement to provide fire protection or dedicate any portion of their revenues to this service. Pursuant to Government Code §'s 38600 and 38601, the legislative body of a city may provide fire engines and all other necessary or proper apparatus for the prevention and extinguishment of fires. However, § 38611 states that cities *shall* establish a fire department, and that the fire department shall be under the charge of a chief who shall have had previous training and experience as a firefighter. But, § 38611 further states that no general law city shall be required to appoint or elect a fire chief or establish a fire department if such city is included within the boundaries of an established fire protection district.

As a result, a range of special districts have been formed to provide fire protection services, including: Fire Protection Districts; Community Services Districts; a County Service Area; and a Resort Improvement District. State law defines the sources of revenue available to each of these local agencies as well as the method of establishing appropriations (or spending) limits. Taxes are a significant source of ongoing revenue for local agency fire departments. Even though its budgetary significance has steadily declined since the passage of Proposition 13, property tax remains one of the primary revenue sources for most local fire related special districts. In addition to the one percent property tax that all property owners are familiar with, some local agency fire departments with actively harvested timber resources within their district boundaries also receive Timber Yield Tax, which is a property tax on the value of timber that has been harvested. Other significant taxes and fees that are collected as part of the property tax bill include special taxes and special assessments approved by voters of the district for fire protection. Special taxes and assessments will be discussed in greater detail in the following Section.

The California State Controller's Office publishes an annual report or fiscal transaction for special districts (most recent edition - *Special District Annual Report, 1999-2000, State Controller*) that lists the revenue and expenditures of each special district. Table A-3 contains revenue and expenditures by Humboldt County fire related district for fiscal year 1999-2000 (the most recently published report.). Table 5-3 lists taxes the primary funding sources available to local agencies providing fire protection services. The following paragraphs describe these and other funding sources in greater detail.

Table 5-3. Local Agency Fire Department Funding Sources

Funding Source	Notes
Property Tax	The portion of the 1% base property tax available to districts formed prior to 1978
Assessments / Special Taxes	Subject to rigorous approval process, including voter approval
Timber Tax	Property tax based on the value of timber harvested within the district
Federal, State, Local, Foundation Grants	Generally available for one-time purchases only, not for ongoing expenses such as insurance
Homeowners Property Tax Relief	Home Owner Property Tax Relief revenues are received from the State as reimbursement for property tax revenues lost due to the \$7,000 Home Owners Exemption.
Interest / Rent	Revenue from district assets such as investments, real property, or equipment
Funding Raising	See Non-Agency Fire Department Funding Sources above
Education Revenue Augmentation Fund (ERAF)	Back-fill payments in an effort to hold fire districts harmless from the effects of ERAF shifts

5.3.2. Current Deficiencies

The conditions of local fire organizations vary widely. Some have dependable revenue sources, paid staff, and up to date equipment that allow them to provide adequate services within their districts. Others are all volunteer organizations, with equipment in fair to poor working order and no source of dependable revenue, other than the goodwill of the communities they serve.

Unlike water and wastewater services, also discussed in this technical report, there is not a set of clear overall standards to apply to fire protection capabilities. Fire protection personnel are expected to be trained, and equipment is expected to meet current Occupational Health and Safety (OSHA) standards and be in good working order.

The County, in its work with the Fire Safe Council, has recognized this as a critical issue and is working on the development of level-of-service standards that, once accepted by the Humboldt County Fire Chiefs' Association, can be applied to local organizations. This is important for the following reasons:

- It will improve the ability of local fire personnel and government officials to inform landowners and residents of the level of fire protection that is available to them;
- It will support fire departments grant requests to local, state, and federal funding sources for purchase of apparatus, equipment, and training to meet standards; and

- Local government can effectively plan for municipal service delivery and population growth.
- Determine individual Fire Department administrative capacity and insurance needs.

It may be a challenge for smaller departments to bring their level of service up to standard but if the standard is utilized appropriately it can be seen as a tool to measure progress toward improved service provision and for communicating the need for grant funds. The first step in the process of developing level-of-service standards is to identify the current levels-of-service within Humboldt county communities. To that end, a level-of-service identification tool could be developed using a combination of the following criteria:

- ISO rating
- Response times (for each of the following service types: residential, commercial and/or vegetation fires, Rescue, Rescue/Extraction, Confined Space, EMS, Hazardous materials (HAZMAT);
- Training;
- Staffing;
- Wildland fire responsibility (Local Responsibility Area or State Responsibility Area)
- Water availability; and
- Fire hazard severity rating.

Minimum service standards for rural, suburban and urban areas could be developed after or concurrent with the process of determining the existing level-of-service. Such standards can provide local fire departments providing insufficient levels of service something to shoot for and facilitate the process of determining the resources required to meet the applicable standards.

In discussions with local fire personnel, administrative capacity has also been identified as a need facing local fire organizations, especially those that are all volunteer. Operating a local fire organization entails record keeping for: calls and activities, equipment maintenance and staffing schedules, accounting records and other fiscal matters. Local organizations are also dependent on grants and other funding sources which require detailed applications, documentation of matching funds, and tracking and reporting of expenditures from the grant. Equipment and services procurement are also important administrative tasks.

Response times are largely dependent on two factors, the ability of appropriate fire personnel to reach the equipment at the fire station and the time it takes appropriate fire personnel and equipment to reach the scene of the incident. Fire station locations are a critical factor, but given response requirements (# of staff per apparatus, and # of staff to enter a building) the ability to get the appropriate number of personnel to the scene can be just as important. One trend that has been occurring is that more volunteers are working in areas other than the ones they serve. This means they are not available to respond to calls during working hours. This trend has been identified as a significant issue with both the Blue Lake and Arcata Fire Chiefs, and is probably an issue with other districts as well.

Training in fire suppression and emergency response are offered locally through individual departments and through group training events provided by the Humboldt County Fire Chiefs Association and the Humboldt County Office of Education Regional Occupation Program. Since many emergency calls are medical, the availability of emergency medical technicians (EMT) at all local organizations is an important capability.

Using the basic criteria described above, the following are condition summaries for the local organizations. Only the district's that are projected to serve USAs are included:

Arcata FPD

The Arcata FPD has three fire stations and paid staff. Its district covers the Arcata, McKinleyville and Manila USAs, and the westernmost portion of the Fieldbrook USA. The District has seen a steady increase in activities receiving seven times more calls per year in 2003 than it did in 1983. The District had an assessment increase approved in 2006 by district voters which has allowed it to increase staff and replace equipment. The district was also successful in receiving Fire Act Grant Funds (Federal Emergency Management Act) for new equipment. The District has a parcel in Arcata where they intend to build a new fire station and regional training facility. No date has been set for construction of these facilities, and they are considering other locations in the City of Arcata for their future facility.

The FPD is currently reconsidering mutual aid agreements, especially the one with the Samoa Peninsula Fire Protection District. Mutual aid is based on shared response to emergency services calls. While Arcata has been successful in securing a sustainable funding source for fire and emergency services, SPFPD has seen a significant decline in their funding. Because this funding reduction, and not having paid staff or an adequate number of volunteers, SPFPD is not able to provide a reciprocal response to mutual aid calls with the Arcata FPD.

Blue Lake FPD

The Blue Lake Fire Protection District has recently been able to add paid staff, due in part to the support of the Blue Lake Rancheria. This staff has allowed the district to increase their administrative capacity. The district maintains a group of trained volunteers and equipment that is able to respond to most incidents in the district. This district serves the Blue Lake USA/WSA, Glendale USA/WSA and the southern portion of the Fieldbrook WSA.

County Service Area No. 4

The area served by CSA 4 is not expected to experience significant growth during the planning period. This CSA will continue to rely on assessments for operating revenues, and is expected to maintain the relationship with CAL FIRE to provide services.

Eureka City Fire Department

Eureka FD provides protection to the College of the Redwoods (CR) through a contract. However, both Eureka FD and Humboldt No. 1 provide services to CR depending upon availability. CR is not within the District boundary of any of the fire districts in the County. The two districts work closely together in responding to calls for service. There have been some discussions of a merger, but no action is being currently considered. The FPD has also noted that the paid staff and City department status has impacted their ability to recruit and retain volunteers.

Fieldbrook Community Services District

This CSD is expected to maintain current fire protection services for the Fieldbrook area. They would continue to provide mutual aid response to the Glendale area.

Fortuna FPD

Fortuna is the largest all volunteer fire district in Humboldt County. They have built a reasonably new headquarters fire station in the city of Fortuna and operate two other stations as well as

maintain an adequate volunteer staff and equipment. The City General Plan update projects growth to a population of 16,500 persons by the year 2030. There are also several annexations being considered by the City, but they are all in the current FPD boundary. There is also the potential for significant retail development in the City. These growth factors would require additional response capabilities from the FPD.

Humboldt Fire District No. 1

This district has multiple locations and paid staff. Its service area includes portions of Cutten and Humboldt Hill which could experience growth. The district is currently assessing potential impacts from a large-scale mixed-use project currently on file with the County.

Loleta FPD

According to the County GIS database, there is a gap in fire protection district boundaries in and around the Humboldt CSD Urban Study Area, which includes College of the Redwoods. This area is located just south of the Humboldt #1 Fire PPD and north of the Loleta FPD boundary. To provide service to this area, it is suggested that either the Humboldt #1 FPD boundary is extended south or the Loleta FPD Boundary is extended north.

Orick CSD

This district currently provides services from a single station located in the community of Orick. Growth in this area is contingent upon a community wastewater system. It is expected that this system would be managed by the CSD.

Rio Dell FPD

This all volunteer District currently provides services from a single station located in the city of Rio Dell. The district is currently in the process of assessing conditions in connection with a request to annex the town of Scotia.

Samoa Peninsula FPD

The district has seen a significant reduction in revenues, associated with the decline in industrial uses on the Samoa Peninsula. This has affected their ability to recruit volunteers, maintain training levels and respond to incidents within their district. One of the largest remaining industrial users in the district, Evergreen Pulp, has started a fire brigade to handle incidents at the pulp mill. The Samoa Town Master Plan would add growth to this district. One of the conditions the County is considering placing on the Town Master Plan is a standard of response coverage study requirement, to determine appropriate staffing and equipment needs. Given these circumstances, this district has one of the greatest needs for improvement.

Willow Creek FPD

This all volunteer fire district will be responding to increased demands for fire services due to projected growth from the Willow Creek USA. Improvements in administrative capacity staffing and equipment will be needed to meet demands from future populations and uses.

As stated above, a deficiency experienced by many local organizations is in administrative capacity. In addition to training and response commitments, local agencies also have to devote time and effort to administrative duties. Other deficiencies experienced by local organizations include lack of training and lack of adequate equipment in good working order. These deficiencies prevent local organizations from providing adequate fire protection services.

5.3.3. Summary of Deficiencies

The following is a summary of local fire agencies deficiencies and needs.

Lack of Revenues

Lack of funding for local fire organizations is a critical deficiency. Personnel related costs such as workman's compensation, even in all volunteer departments, have increased many times faster than the growth of revenue. Proposition 13 and subsequent changes to the State Constitution have made it extremely challenging for local agencies to increase taxes for fire protection, and fund raising by all-volunteer departments is difficult and time-consuming. To maintain capable fire protection, it is important to establish adequate and reliable revenue sources for local fire organization as well as innovative cost-sharing programs to increase the efficiency of service provision.

Regional Training Facility

Another deficiency is the lack of regional training facilities. The development, management and staffing of fire and emergency services training facilities, accessible to local organizations, are critical to the delivery of fire protection services in the County. Ninety percent of firefighters in Humboldt County, many of whom live in outlying areas, are volunteers. They may require multiple training facilities to support countywide training programs. Regional fire training facilities are also essential to local firefighters in meeting an established level-of-service standard. Several local education organizations, such as the Humboldt County Office of Education (HCOE), College of the Redwoods (CR), and Humboldt State University (HSU), may have programs or resources to address this deficiency. To accomplish this task, the County Fire Safe Council is looking into ways to coordinate with local education organizations and survey local organizations to determine the level of department interest in a regional training facility, and resources available for this propose (funding, land, equipment, staff). This type of facility could be available to other agencies (police, Sheriff, ambulance, etc.)

Fire Safety Education

Fire safety education programs can reduce fire risk and minimize loss due to fire. When the public understands fire safe strategies and the associated costs of not utilizing them, the likely result will be less fire related damage in the community.

To address this deficiency, a County wide fire safety education programs would be needed. It would be coordinated and implemented by local fire organizations, but would involve the cooperation of construction and real estate professionals, and home building supply retailers.

These entities could assist local government and fire departments in distributing information regarding fire safe standards. Contractors and real estate agents could be instrumental in the education effort by disclosing information regarding high fire risk areas.

Steps toward correcting this deficiency include: establishing partnerships with construction, real estate, and retail interests; compiling materials regarding local fire safe standards and home fire safety techniques (construction materials, defensible space, rural water supply, road maintenance and signing, etc); disclosing hazard zones and evacuation strategies; and establishing local real estate disclosure requirements for high fire hazard areas.

5.3.4. Underserved Areas

In Table 5 4, Study Area Recommendations, below, areas that have inadequate fire protection services or coverage are identified. The table also addresses fire protection coverage and

funding issues. Recommendations are included to assist the County in pursuing options that would result in appropriate funding and coverage.

Table 5-4. Study Area Recommendations

USA	Responsible Local Agency	Acres Outside District	Comments, Issues and Recommendations
Alderpoint WSA	None	370	CAL FIRE -Alderpoint provides seasonal fire protection for this area. Issue: Assisting Alderpoint community in forming VFD (non-agency VFD) with assistance from So. Humboldt Fire Chiefs Assoc. Recommendation: Encourage the formation of a fire protection district or community services district in Alderpoint, or a countywide county service area formed, with appropriate funding and support the organization of the Alderpoint VFD
Benbow WSA	None	415	CAL FIRE -Garberville and Garberville FPD may respond to calls depending upon availability. Issue: Adequate and timely incident response, Service outside district boundaries. Recommendation: Encourage the annexation of Benbow to Garberville FPD with appropriate funding.
Briceland WSA	None	80	Briceland VFD (non-agency VFD) provides fire protection in Briceland without ongoing funding support. Issue: Ongoing funding support. Recommendation: Encourage the formation of a new district or expansion of a neighboring district, or a countywide county service area formed, to support Briceland VFD
Freshwater WSA	Humboldt FPD #1	130	PALCO Lumber Camp Road area outside Humboldt FPD#1 district boundaries. Issue: Service outside district boundaries Recommendation: Annex developed and unserved areas to Humboldt FPD#1
Garberville USA	Garberville FPD	100	Developed and developable areas within the Garberville USA are outside the GFPD. Issue: Service outside district boundaries limit development potential. Recommendation: See Garberville WSA recommendation

USA	Responsible Local Agency	Acres Outside District	Comments, Issues and Recommendations
Garberville WSA	Garberville FPD	1,515	<p>Considerable land along Sprowel Creek and Camp Kimtu Roads are developed and unserved by fire protection. Lands between Garberville and Alderpoint are also unserved.</p> <p>Issue: Service outside district boundaries.</p> <p>Recommendation: Encourage the annexation of developed and planned development areas surrounding Garberville to GFDP</p>
Humboldt Hill USA	Humboldt FPD #1 Loleta FPD	725	<p>College of the Redwoods area is outside of Humboldt FPD#1 and LFPD boundaries, but is served via contact with Humboldt FPD#1.</p> <p>Issue: Service outside district boundaries: a gap in fire protection service including College of the Redwoods and the surrounding agricultural areas exists in the southern part of the Humboldt Hill USA.</p> <p>Recommendation: Encourage the annexation CR and surrounding unserved lands to Humboldt FPD#1</p>
South Eureka USA	Humboldt FPD #1	760	<p>Mid and south McKay Tracts and south Ridgewood area are outside of the Humboldt FPD #1 service area boundary.</p> <p>Issue: Service outside district boundaries.</p> <p>Recommendation: Encourage the annexation of unserved areas to Humboldt FPD#1 as condition of development approval</p>
South Eureka WSA	Humboldt FPD #1	180	<p>Elk River area is located outside of the Humboldt FPD #1 boundary.</p> <p>Issue: Elk River area outside district boundaries.</p> <p>Recommendation: Encourage the annexation of Elk River area to Humboldt FPD#1</p>
Orick WSA	Orick CSD	280	<p>Simpson-Orick Mill and Redwood Parks Lodge site outside OCSD district boundary.</p> <p>Issue: Service outside district boundaries.</p> <p>Recommendation: Encourage the annexation of developed and unserved areas north of Orick to OCSD</p>
Orleans WSA	Orleans CSD	30	<p>Karuk Tribal Lands are outside of south edge of the Orleans CSD boundary.</p> <p>Issue: Service outside district boundaries.</p> <p>Recommendation: Encourage the annexation of unserved areas to OCSD or enter into contract for service as development occurs</p>

USA	Responsible Local Agency	Acres Outside District	Comments, Issues and Recommendations
Redcrest WSA	None	280	Redcrest, Holmes, Stafford, and Shively are located outside fire related district boundaries. Issue: Service outside district boundaries. Recommendation: Encourage the formation of a new district or expansion of a neighboring district, or a countywide county service area formed, to support Redcrest VFD (currently a non-agency VFD) and to provide service to unserved developed areas
Redway USA	Redway FPD	610	Areas proposed for development between Redway and U.S. 101 are located outside the RFPD. Issue: Service outside district boundaries. Recommendation: Encourage the annexation of unserved areas to RFPD as condition of development approval
Scotia USA	None	464	PALCO-Scotia VFD provides service to Scotia, Issue: Service outside district boundaries, and need for stable funding sources. Recommendation: Encourage the formation of a new district or expansion of a neighboring district, or a countywide county service area formed, to support Scotia VFD and to provide service to unserved developed areas
Shelter Cove USA	RID #1	0	Issue: No service gaps have been identified in Shelter Cove Recommendation: Consider services capabilities with next Municipal Services Review
Samoa USA	Samoa Peninsula FPD	0	Samoa has one of the largest pending planned developments proposed in the County, and it is the only area on Humboldt Bay that does not employ paid firefighters. Issue: Capacity, response, mutual aid. Recommendation: Prepare a Standards of Response Coverage Study and implement study recommendations (mitigation in the Samoa Town Master Plan Draft MEIR)
Willow Creek WSA	Willow Creek FPD	60	The extreme north and south extent of the WCWSA is outside WCFPD district boundary. Issue: Service outside district boundaries. Recommendation: Encourage the annexation of developed and unserved areas to WCFPD
Weott USA	Weott CSD	40	Western extent of USA is outside WCSD district boundary. Issue: Service outside district boundaries. Recommendation: Encourage the annexation of developed and unserved areas to WCSD

USA	Responsible Local Agency	Acres Outside District	Comments, Issues and Recommendations
Westhaven WSA	CSA #4	0	Westhaven WSA is inside the district boundaries of CSA#4, and is served by the Westhaven Volunteer Fire Department, which completely depends on fundraisers for their revenues. Issue: Capacity, response, mutual aid. Recommendation: Encourage the formation of a zone of benefit within County Service Area 4 to support Westhaven VFD

The above table summarized areas within urban study areas that are outside fire related district boundaries. Whether or not an area is within is a strong indicator that an area is underserved. It should be noted that there are many developed areas outside of urban study areas that are also outside fire related district boundaries. These areas should also be included within the boundaries of fire related districts. When updating the boundaries of the fire districts it would be beneficial to undertake a comprehensive analysis to ensure that all areas of the County are adequately served.

Although urban study areas may be completely within the boundaries of a fire related district and not listed in the table above, they may still be underserved. For instance, the Samoa Peninsula Fire Protection District is the only fire district within the Humboldt Bay Area that does not have career firefighters on duty 24 hours a day. Ten to twenty years ago most mills on the Samoa peninsula were operating and the fire department (at this time this area was served by the Fairhaven Fire Protection District and a company funded Samoa Volunteer Fire Department) had the funding to support paid personnel and many times the current number of volunteers. The mill closures and associated decreases in property value have reduced the fire protection district's budget by a factor of ten and the pool of potential volunteers. As a result, the level of service available to residents of the Samoa USA is significantly different than that available to residents of the rest of the Humboldt Bay Area.

The Samoa Peninsula Fire Protection District is not alone in its effort to provide services with limited revenue and a declining number of active volunteers. Although most volunteer fire departments strive to have between 20 and 30 firefighters, many fall short. A volunteer fire department with between five and ten volunteers may be adequate if they all live and work in town and each has received a high level of training. However, a significant percentage of volunteers firefighters work outside the community and the levels of training vary. As a result, many urban study areas may be underserved due to lack of available volunteers; lack of properly trained volunteers needed for the incident; or even lack proper equipment.

5.4. Proposed Improvements

5.4.1. Service and Facility Upgrades

One technique for upgrading fire services and facilities would be the formation of a County Service Area (CSA) covering the entire County to fund fire protection services in areas of the county that are experiencing growth and to provide assistance to where needed to existing districts. Humboldt County has already used a CSA to fund fire protection. CSA 4 provides fire protection to communities between Crannell and Freshwater Lagoon, excluding Trinidad.

Subject to approval of the Humboldt Local Agency Formation Commission (LAFCo) and the voters, a new CSA could be created or CSA 4 expanded to fund expanded fire protection, emergency dispatch services, prevention, and training in other areas of the County. The CSA could “over-lay” existing fire related districts to extend new services (e.g., dispatch or training) or potentially augment existing services. Formation of the CSA must be accompanied by a special tax, assessment, or fee structure to fund the services to be provided.

Another service that should be considered by the County is establishing and funding a full time fire services coordinator. This position could be instrumental in assisting local organizations with building their administrative capacity, pooling resources for group equipment, identifying and pursuing grant funding opportunities, volunteer recruitment and retention, and coordinating training and education programs.

The County provides a valuable service in assisting some organizations with workers compensation insurance. The County can often procure this insurance at less cost than what the individual organizations would pay. This service should be extended.

5.4.2. Future Expansion

The service areas and districts of the local organizations cover most of the USAs identified for the County General Plan Update. Table 5 4, Study Area Recommendations, above identifies the areas into which existing districts should be expanded or new districts formed. It should be an objective of the County and LAFCo for there to be a local agency with a secure long term funding source responsible for providing fire protection to all developed areas within the County. To the extent that districts are not expanded, pursuant to Government Code Section 56133, LAFCo should be consulted regarding the provision of services outside district boundaries.

While not all districts and service areas may need to be expanded, the provision of services within those areas will need to be upgraded to meet future demand. The Community Infrastructure and Services Element will contain policies and programs to carry out these needed upgrades.

District Expansion. LAFCo has the authority to consolidate districts and make determinations on service delivery. If two agencies provide a similar service, LAFCO has the authority to determine who should provide that service.

Pursuant to the Cortese Knox Hertzberg Act of 2000, prior to the adoption by the local agency formation commission of a resolution making determinations, the district may request and the commission shall impose, as a term and condition, a requirement that the legislative body of the city shall enter into a contract with the district. The contract shall require:

- (1) That the affected territory shall remain part of the district for a period of at least 10 years.
- (2) That the city shall pay the cost of services provided by the district. This payment shall be in amounts and on terms specified in the contract.
- (3) Any other conditions to which the city and the district mutually agree.

Service Extension Outside District Boundaries. Pursuant to the Cortese Knox Hertzberg Act Section 56133, a city or district may provide new or extended services by contract or agreement outside its jurisdictional boundaries only if it first requests and receives written approval from the Local Agency Formation Commission in the affected county. The commission may authorize a city or district to provide new or extended services outside its jurisdictional boundaries but within its sphere of influence in anticipation of a later change of organization. See Section 1.5 for additional information regarding LAFCo and district boundaries

5.4.3. Cost and Schedule of Improvements

When addressing the infrastructure and service costs associated with future growth, it is important to understand both the initial costs to local organizations to increase service capacity, and the ongoing costs to maintain the service. Upfront costs are most appropriately addressed with impact fees. In many other areas of California, a onetime impact fee is imposed upon new construction. Currently there are few impact fees in Humboldt County and no fire impact fees. These fees, where collected, are used to purchase equipment and construct facilities in order to provide service to new development. As part of the schedule of improvements for County growth, passage of a fire impact fee ordinance should be considered by the County. It would then be up to the individual organizations to set the fee, based on a nexus study that correlates their individual facility and equipment needs to the service demands of new development.

Mechanism for assessing impacts and imposing appropriate fees.

New fee assessments, or special taxes could be used to extend the existing level of fire protection services or improve the level of service. Prior to approving any development projects or implementing any public facilities projects that could result in additional demand for fire protection services, the County of Humboldt (County) could enter into a Memorandum of Agreement (Agreement) that assures the provision of adequate fire protection services within the project area, including both capital and service needs. The specific potential mitigations that could be implemented through the Agreement include the following programs:

- (1) Construction or financing of necessary publicly owned facilities and improvements by the redevelopment agency;
- (2) Implementation of a capital facilities development impact fee covering the entire project area;
- (3) The creation of a Mello-Roos Community Facilities District that will impose special taxes to be used specifically for fire protection and suppression services; and
- (4) The creation and imposition of other fees, assessments, special taxes, dedications or payments necessary to provide adequate fire protection services.

The agreement could contain a commitment on the part of the Agency and the County to mitigate any potentially significant impacts resulting from an increased demand for fire protection services and it will ensure that any program chosen to mitigate the impacts will be in place before final project approval.

Special Assessments. Most fire districts and community services districts receive special assessments as a part of their budget. These assessments are levied on property owners, and collected by the County assessor. Local organizations that currently rely on fundraising should consider becoming a government agency through formation of a district, and proposing a special assessment to voters in their respective areas.

Proposition 172 Public Safety Sales Tax Revenues. Sharing of state tax revenues is also an important source of operating funds for local organizations. In 1993, the voters of California passed Proposition 172, the Local Public Safety Protection and Improvement Act of 1993 (Art. XIII, Sec 35, California Constitution), which added an additional ½ cent to the Sales and Use tax to fund public safety (including fire protection). This tax was placed on the ballot by the Governor and the Legislature in an attempt to reduce the impact of the shift of property tax funds from local government to schools that resulted from the implementation of the Education Revenue Augmentation Fund (ERAF).

Proposition 172 also created the Public Safety Augmentation Fund. Subsequent laws approved by the Legislature that implemented Proposition 172 (Gov. Code Sec. 30051-30056) did not

specifically mention Special Districts as entities eligible to receive allocations from the Public Safety Augmentation Fund, even though Special Districts were affected by the ERAF shifts. As a result, special districts providing fire protection in Humboldt County did not receive Proposition 172 funds until recently.

In 2005, the Humboldt County Fire Chief's Association negotiated a multi-year agreement to include local fire related districts in the allocation of Proposition 172 funds. This three-year agreement reallocates a small portion of Proposition 172 funds to fire related districts.

An agenda item, an agreement between the County of Humboldt and Orick Community Services for Fiscal 2006-07 went before the Board of Supervisors and described the distribution of funds. Under the agreement, the County would:

- appropriate 1.4 percent of the Proposition 172 revenues to recognized fire protection districts;
- Accept the Humboldt County Fire Chiefs Association's distribution formula;
- Monitor and audit expenditures made with distributed funds;

The agreement also includes provisions that the Orick CSD shall cooperate and supply documentation to the County, utilize funds only for fire protection services, and comply with all other applicable policies.

5.5. Issues to be Addressed in the General Plan Update

Future levels of service will be drawn from efforts by the County Fire Safe Council to determine feasible levels that can be achieved and maintained by local fire service providers.

ISSUES TO BE ADDRESSED IN THE COMMUNITY INFRASTRUCTURE AND SERVICES ELEMENT

The technical report presents a basis for describing and assessing fire services being provided in Humboldt County. As documented in this report, the fire services need to be upgraded just to respond to the current levels of calls for service and districts should be expanded or created, or a countywide county service area created, to cover current development and future developed areas. The service providers will need additional resources and revenues to respond to the volume of calls that could occur from the future population projected in the County General Plan, through the year 2030.

The Community Infrastructure and Services Element will include goals, policies and programs for the following issues;

Fire protection levels of service. The policy document will recommend policies and programs to define and maintain service levels for Administrative capacity; Response times; Staffing; Equipment; and Training.

Distinction between urban and wildland fire standards. Wildland fire typically does not involve structure fire and requires different response and techniques than urban fires, which typically involve structures. The policy document will differentiate between these fire types, and what should be done to minimize their risk and maximize response capabilities.

Revenue sources. The report documents current gaps and deficiencies in existing fire capabilities. Additional services needs are projected for the future. The Community Infrastructure and Services Element will propose revenue sources including impact fees, development

standards, special taxes, and assessments to cover the range of services required of local agencies.

Mutual aid and consolidation of services. The policy document will promote the consolidation of services, where such actions would clearly result in greater efficiency and capacity. There will also be policy for considering mutual aid agreements that pools resources and maximizes use of capital facilities.

Fire Safety Education. Fire safety education programs can reduce fire risk and minimize loss due to fire. Policies will be developed to promote a public understanding of fire safe strategies and the associated costs of not utilizing them.

County Fire Warden. One of the greatest needs identified by fire service providers is the need for administrative capacity. Currently, the CAL FIRE Humboldt/Del Norte Unit Chief serves as the Humboldt County Fire Warden to assist local agencies. The Board of Supervisors created the position of Humboldt County Fire Warden in 2001. The Fire Warden reports to the Board of Supervisors on fire related issues and may also pursue fire related grant opportunities on behalf of the County. An additional responsibility of the CAL FIRE Unit Chief is to serve as the Office of Emergency Services (OES) operational area coordinator for fire and rescue services. In this capacity, the CAL FIRE Unit Chief coordinates the mutual aid system throughout the County.

Duties of the County Fire Warden can include administrative capacity, bookkeeping, grant writing and reporting. It can also be applied to assessing and responding to future needs. The Element will provide policy about the county's role in supporting the Fire Warden as a countywide independent fire services coordinator.

Fire Prevention. Smaller fire related districts in the County do not have the resources to adequately review building permit applications. A part-time fire marshal position could be established through the County Fire Warden and the Fire Prevention Officers of the County Fire Chief's Association and funded with additional building permit fees. The fire marshal could be a position that is filled on a rotating basis by existing fire marshals. The Element will provide policy about supporting the creation of a fire marshal within the Fire Warden's office.

6. Water Systems

6.1. Introduction

Water service in Humboldt County is provided by a variety of suppliers. The major water supplier within the County is Humboldt Bay Municipal Water District (HBMWD), which wholesales water to three cities and four local service Districts. The remainder of the unincorporated area is served by a variety of independent special Districts (Community Services Districts, County Water Districts, and a Sanitary District), private systems (regulated by the state Public Utilities Commission), and mutual water companies (non-profit corporations that provide water at cost only to its shareholders or members), and individual private water systems using wells or surface water diversions.

This Section describes the potential for existing water systems to accommodate future growth within the various USAs and WSAs identified by the County. Existing demand and capacity, proposed and/or planned expansions, and potential constraints are described below. The infrastructure assessment within this Section draws from the information available within Table 1-5 and Table 1-6 in Section 1.

All costs presented herein are order of magnitude cost estimates and should not be interpreted as exact costs. No economies of scale or site-specific factors or constraints were taken into account in developing these cost estimates. However, the costs presented herein for the various service providers within the County are useful in identifying existing deficiencies and the need for better infrastructure planning to sustain these systems into the future. Some service providers have greater administrative capacity and have developed master plans, computer models, capital improvement plans, and rate studies for their water systems. However, many providers have significantly less capacity and therefore less technical, managerial, and financial planning perspective. Infrastructure upgrade recommendations made herein should be used as the basis for developing detailed, site-specific master plans, system models, and capital improvement plans. Detailed rate studies will need to be performed on an individual service provider level to determine the connection fees and usage rates required to generate sufficient revenues to maintain and sustain these systems into the future.

Funding sources for water systems are described in detail in Section 12.2.3.

6.2. System Standards

6.2.1. Water Quality Standards

All public water systems are subject to the requirements of the State of California Health and Safety Code and are required to comply with the regulations established by the California Department of Health Services (DHS). These are detailed in the California Code of Regulations (CCR), Title 17 and Title 22, Division 4 and administered by the DHS, Division of Drinking Water and Environmental Management, District 01. The Drinking Water Program's office is located in Redding, CA. They are responsible for field inspections of water systems, issuance of operating permits, reviewing plans and specifications for new facilities, taking enforcement actions for non-compliance with laws and regulations, reviewing water quality monitoring results, and supporting and promoting water system security. Private water systems that qualify as public utilities are also

subject to California Public Utilities Commission (CPUC) standards for water service including minimum standards for design and construction outlined in CPUC General Order 103.

These same public water system standards apply to private water systems that serve over 25 people for more than 60 days per year. All private water systems within Humboldt County meet this criterion and are therefore subject to the standards described above.

6.2.2. California Waterworks Standards

Source capacity, storage capacity, and distribution system standards are set forth in the Waterworks Standards regulations, outlined in the CCR, Title 22, Chapters 15 and 16, administered by the California DHS. Section 64554 – New and Existing Source Capacity states the following:

- (a) At all times, a public water system's water source(s) shall have the capacity to meet the system's maximum day demand (MDD). MDD shall be determined pursuant to subsection (b).
 - (1) For systems with 1,000 or more service connections, the system shall be able to meet four hours of peak hourly demand (PHD) with source capacity, storage capacity, and/or emergency source connections.
 - (2) For systems with less than 1,000 service connections, the system shall have storage capacity equal to or greater than MDD, unless the system can demonstrate that it has an additional source of supply or has an emergency source connection that can meet the MDD requirement.

These are the minimum standards that have been applied the Department of Health Services to facilities constructed by a water service provider. California Waterworks Standards relating to storage and distribution are principally health related and do not take into consideration fire flows (water that is available to fight a fire). In most instances, fire flow infrastructure requirements are in excess of the basic infrastructure required to provide adequate storage and distribution capacity to a community. When a developer is constructing a new subdivision, both health related and fire related standards would be applied.

6.2.3. California Fire Code

The 2001 California Fire Code (CFC), Section 903, 103.1.3 outlines fire protection water requirements for residential properties. The Code requires fire hydrants be installed within 250 feet of residential homes. Required fire flows for residential homes equal to or less than 3,600 square feet is 1,000 gpm at 20 psi for 2 hours minimum. Minimum acceptable water main size is 6 inches in diameter, if this will provide the required fire flow. The code makes exceptions to the fire hydrant minimum distance for homes with built-in fire sprinkler systems. For these cases, the distance to a fire hydrant may be extended to 500 feet. Should the home be located greater than 500 feet away from the closest hydrant, the situation requires evaluation as to the "practical difficulty" of not meeting CFC regulations. Fire flow requirements for multifamily or commercial development are in excess of the single family requirements summarized above. Further information regarding minimum fire flows and fire hydrant standards are included in Appendix III-A and III-B of the CFC. Fire Code standards would be applied by the fire department at the time of subdivision or building permit review.

6.2.4. Development Standards

All development within both unincorporated and incorporated areas within the County is subject to meeting minimum development standards for infrastructure. These minimum

standards are detailed in the Humboldt County General Plan and the Humboldt County Code Title III Land Use and Development Regulations and standards set forth and adopted by incorporated cities within the County. Generally for annexations to be considered, infrastructure within the potential annexed area must meet the minimum standards of the County. For example, McKinleyville requires all proposed annexations to be up to the District's sewer and water standards and would require improvements where there are deficiencies. Generally, a service provider would impose construction standards on new development either through adopted development standards or those adopted by other local agencies.

Most of the community water systems have been designed to provide fire protection and have some or all of their system components that meet the State requirements. While there are exceptions, these are primarily related to systems that were initially developed under private ownership or ones where the community has expanded beyond the initial service population without sufficient increases in their storage capacity. It should be an objective of the County's to have community water systems meet the State requirements for fire protection.

6.2.5. Methodology for Estimating Costs

Unit Cost Estimates

All infrastructure costs presented herein represent our opinion of the probable construction and soft costs (engineering, legal, administrative, etc.) in September 2007 dollars. The costs are "order of magnitude" costs, and actual costs will be higher or lower due to specific issues related to a particular project/site. For certain items, such as replacement of distribution system piping or finding new water sources, estimated costs are "guesstimates" as the specifics of the project will *dramatically* affect the costs of a particular project. These unit costs are more reflective of those associated with smaller projects and the unit cost will be lower as the size of the project increases. Therefore, costs presented herein are conservative, as no economy of scale is factored into the costs.

A uniform standard was used in making infrastructure upgrade recommendations for all USAs and WSAs. Although some systems within the County were designed to meet California Waterworks Standards, some were not designed with fire protection in mind. This is reflected by the fact that many communities have undersized water mains that do not provide adequate fire flows and generally do not have recommended fire flow storage.

The infrastructure assessment conducted for this General Plan Update uniformly applies recommended fire flow storage in addition to domestic use storage for one day of maximum day demand. All undersized distribution piping is also recommended for replacement. Infrastructure upgrade costs are shown distributed between existing deficiencies and future infrastructure needs to preliminarily differentiate between the two needs.

The following assumptions and methodology were used to estimate and distribute costs:

- **Storage costs** (Unit cost used in this analysis = \$2/gallon)
 - Existing storage must be sufficient to meet one day of domestic maximum day demands (maximum day demand varies according to use within each district) plus minimum recommended fire storage of 120,000 gallons (1,000 gallons per minute for two hours). If not, costs to bring storage to this level of standard are associated with existing development.

- Costs for future domestic storage are related to future development. In many cases, existing storage is sufficient to meet future demands, in which case future storage costs are minimized.
- **Treatment Costs** (Conventional treatment cost used in this analysis = \$5/gpd and Greensand/roughing filtration cost = \$2/gpd)
 - Existing treatment capacity must be sufficient to meet one day of maximum day demands. If not, costs to bring treatment capacity to this level are associated with existing development.
 - Costs for increased future treatment capacity are related to future development.
- **Source Costs** (Due to uncertainties new source costs are estimated broadly on a case by case basis)
 - Existing source capacity must be sufficient to meet one day of maximum day demands. If not, costs to bring source capacity to this level are associated with existing development.
 - Costs to increase source capacity in the future are related to future development.
- **Distribution Costs** (Unit cost used in this analysis = \$100/linear foot)
 - The existing distribution system must be adequate to serve existing development with domestic water and fire flow. The Department of Health Services Annual Inspection Report is used as the basis for distribution condition. Where condition is indicated to be “fair” or worse, or pipe size is indicated to be less than six inches in diameter (the minimum size that can provide adequate fire flow to residential uses), pipes are recommended to be replaced. Costs to bring the distribution system to this level are associated with existing development.
 - Costs for distribution systems related to new development are assumed to be paid at the time of construction and are not considered in this analysis.

Presentation of Estimates

Total costs for correcting existing deficiencies, addressing changes in regulations, and constructing improvements to accommodate the Low and High development projections are estimated using the above methodology and are provided for each urban study area. Estimated costs are presented in table form along with system statistics such as the number of connections, available connections, and current system capacity. Costs are presented in the following manner: total estimated costs, costs per connection (total cost divided by the number of connections), and estimated financing cost per connection per month. The Low and High build-out costs are also added to the existing deficiencies in calculating estimated cost per connection and estimated financing cost per connection.

The estimated costs are based upon assumptions and the actual costs **will be different**. Funding for correcting existing deficiencies would likely come from grants and low interest loans, such as a State Revolving Fund loan which currently has loan terms of 20 years at 2.5 percent interest. In addition, we would expect actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

It should be noted that the estimated cost per connection **does not** represent a proposed connection fee and the estimated financing cost per connection per month **does not** represent a proposed change to rates. *These costs calculations are only provided to indicate the magnitude of the estimated costs in relation to the number of costumers. Future connections*

should buy into the existing infrastructure through connection fees. These connection fees should be determined by the individual provider based on detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

Future rate studies should be conducted to determine the level of connection fees and usage charges needed to generate sufficient revenue to maintain an acceptable level of service and also capture sufficient replacement costs. These studies should also determine the appropriate methodology to allocate costs to future users for existing fire storage and an existing distribution system. These issues are not addressed at this planning level and are typically covered in master plans or project specific facilities plans prepared by each service provider.

6.3. Humboldt Bay Municipal Water District

Humboldt Bay Municipal Water District (HBMWD) was formed in 1956 pursuant to the California Municipal Water District Act of 1911. The District was created to provide a reliable supply of water for both domestic and industrial purposes to customers surrounding the greater Humboldt Bay area.

Current facilities and operations of the District include: 1) the R.W. Matthews Dam which forms Ruth Reservoir in southern Trinity County, 2) the Gosselin hydro-electric power house at Matthews Dam, 3) diversion, pumping, and control facilities adjacent to the Mad River at Essex (at the John R. Winzler Pumping and Control Center), 4) storage and treatment facilities, and 5) two separate and distinct pipeline systems which deliver treated drinking water or untreated raw water to the District's customers.

Today, HBMWD provides treated drinking water on a wholesale basis to seven municipal agencies in the greater Humboldt Bay region. The District's wholesale municipal customers are: the City of Arcata, the City of Eureka, the City of Blue Lake, the Fieldbrook-Glendale CSD, Humboldt CSD, Manila CSD, and McKinleyville CSD. Via this wholesale relationship, the District serves water to a population of approximately 80,000 people, representing 60% of the current Humboldt County population. The District also retails water to approximately 180 customers (located in the West End Road and Fairhaven areas), delivering on average approximately 0.426 MGD. The Town of Samoa, which contains approximately 96 housing units and some commercial structures, is also a retail customer.

The District also supplies untreated, raw water to customer(s) located on the Samoa Peninsula for industrial purposes. Formerly, the District supplied raw water to two pulp mills, which for many years contracted with the District for 60 million gallons per day (MGD) of water (the maximum capability of the District's industrial pumping and delivery system). Today, the District serves only one industrial customer – Evergreen Pulp Inc. They have a contract with the District for 15 MGD, one quarter of the industrial system's current capacity.

Historically, the District has developed a very detailed annual budget plan that has focused very well on planning needs. In 2007, the District developed a new Capital Improvement Plan (CIP) that addresses and defines proposed infrastructure projects over a 20-year planning horizon. The CIP is based on a policy framework, with a ranking methodology to help prioritize project needs. The CIP identifies infrastructure upgrades needed for existing infrastructure ranked on remaining

useful life, importance, and redundancy. Other projects identified by the CIP are either system growth-induced projects or system upgrade projects.

It is anticipated that the demands for domestic water will exceed the currently available capacity within the planning time frame of this document, based on County housing and corresponding population projections. While the District has excess water available in its industrial system, they will require either expansion of or upgrades to the existing Ranney collectors and treatment facilities to increase the capacity of their domestic water system. In addition, improvements to their transmission system, including replacement of the 15-inch and 18-inch Techite pipelines on the Samoa peninsula, will need to be completed to fully serve future development. The District is also currently exploring options to increase the life of the District's infrastructure and to potentially add capacity to continue to provide a reliable, safe source of drinking water to its customers. It is anticipated that the costs for these improvements will be significant and will be better defined over the next year.

6.4. Urban Study Areas

Urban study areas (USAs) are regions within the County either already served by both water and sewer systems or are under consideration for these services. Water study areas (WSAs) are regions within the County that have community water systems or areas where it may be appropriate to expand existing systems, and are covered in more detail in Section 6.5. The County's purpose in defining urban study areas is to identify areas for more detailed planning and analysis, mainly with respect to development capacity and the infrastructure required to service both existing and any further development that may occur within these areas. As a part of this effort, the County is working collaboratively with the special Districts to refine information regarding development potential and allow for more informed development timing policies within the County. See Chapter 1, Introduction, for additional information regarding Urban Study Areas.

The following sections introduce the County's USAs and WSAs and provide a detailed discussion on development potential and water infrastructure assessment for each study area. Water system infrastructure deficiencies will be identified along with plans for timing and financing of needed improvements. Some study areas consist of both an urban study area and water study area. In these instances, the water study area will be described in conjunction with the urban study area in this section.

USAs and WSAs for the most part share the name of the service district that provides water and wastewater service. The Humboldt Community Services District (HCSD) serves a population of approximately 20,000 and has the County's largest and most diverse service area. Because the characteristics of the communities within and adjacent to the boundaries of the HCSD vary considerably, this district has been divided into multiple USAs and WSAs with names reflecting the community and not the name of the service provider. The following USAs and WSAs have been evaluated with respect to HCSD:

- Freshwater WSA
- Humboldt Hill USA
- Indianola WSA
- Myrtle town USA & WSA
- South Eureka USA & WSA

The evaluations of USAs and WSAs in this Chapter and their respective water systems are presented in alphabetical order. To simplify the discussion of the HCSD service area, all of the USAs and WSAs within or adjacent to HCSD are presented together in Section 6.6 of this Chapter. Section 6.6 follows the discussion of the water systems located in the other USAs and WSAs.

All discussions of sewer service in the study areas follows in Chapter 7.

6.4.1. Arcata USA

The County estimates there were 190 housing units within the Arcata USA in 2005. Based on the estimated range of housing growth projections of between 0.5% and 2.5%, the Arcata USA could have between 210 and 311 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the USA, which takes into consideration physical and zoning constraints, is 395 housing units. Therefore, the fair share growth projections for the Arcata USA are within the range of what the land can bear.

The high build-out estimate of 395 total housing units for the USA was used for infrastructure assessment and recommendations. This represents 205 new housing units within the Arcata USA.

6.4.1.1. Summary

Findings

The City of Arcata's water system is in need of infrastructure upgrades for existing development in addition to future development. Lack of storage is the City's main existing deficiency. The City's distribution system also contains pipe in fair condition, including some steel and AC pipe that will likely need replacement in the near future. The Arcata USA is expected to receive approximately 150 additional units within the next ten years with the proposed Creekside Homes annexation, and another 55 units to reach build-out conditions, for a combined increase of 205 units.

Existing Capacity

The City of Arcata's water system is not limited by either source or treatment capacity with respect to its availability of connections. HBMWD has sufficient water supply to meet City demands.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Arcata USA and addresses infrastructure needs for existing development served by the City of Arcata and for build-out conditions. The existing capacity of the system includes connections within the City of Arcata as well.

Table 6-1. Water system infrastructure assessment for the Arcata USA.

WATER SYSTEM STATISTICS	
# of Existing Connections	6,000
# of Available Connections ¹	---
Source Capacity (MGD)	Not limiting (HBMWD)
Storage Capacity (MG)	4.6
Treatment Capacity (MGD)	Not required
Peak Day Use (MGD)	3.405
Usage Rate (gpd/connection)	567.5
CORRECTION OF EXISTING DEFICIENCIES	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Replace distribution piping – 29 miles ²</i>	\$15,312,000
Estimated Cost for Existing Deficiencies (\$)	\$15,312,000
Estimated Cost per Existing Connection (\$)	\$2,552
Estimated Financing Cost per Existing Connection (\$/Month)	\$13.64
LOW BUILD-OUT ESTIMATE	
# of Projected New Connections ³	2
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>None needed ⁴</i>	\$0
Estimated Cost for Build-Out Infrastructure (\$)	\$0
Estimated Cost per New Connection (\$)	\$0
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$15,312,000
Estimated Cost per Connection (\$)	\$2,551
Estimated Financing Cost per Connection (\$/Month)	\$13.64
HIGH BUILD-OUT ESTIMATE	
# of Projected New Connections ³	205
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>None needed ⁴</i>	\$0
Estimated Cost for Build-Out Infrastructure (\$)	\$0
Estimated Cost per New Connection (\$)	\$0
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$15,312,000
Estimated Cost per Connection (\$)	\$2,468
Estimated Financing Cost per Connection (\$/Month)	\$13.19

NOTES: ¹ There is sufficient source supply from HBMWD to serve all development potential within the USA.

² According to the DHS annual inspection report, approximately 38% of the 76.5 miles of distribution system is steel (coated and uncoated) and cast iron pipe in fair condition.

³ New connections shown are in Arcata USA and do not include new connections within the City.

⁴ Existing storage is sufficient to meet both existing and future domestic and fire storage requirements. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$15.3 million loan would amount to approximately \$982,000 per year. With 6,000 existing ratepayers, monthly bills would have to be increased by approximately \$14 per month to fund this loan. In reality, we would expect the City to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing

deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

6.4.1.2. Description of Urban Study Area

A map showing Arcata's USAs is attached as Figure 6-1. There are a total of five areas within the City's sphere of influence that comprise the Arcata USA. These include (from south to north):

1. An area just south of the existing Windsong subdivision near the intersection of State Route 255 and V Street.
2. An area of proposed development known as Creekside Homes.
3. A subdivision known as Pacific Manor just west of Janes Road.
4. A commercial area near Granite gravel yard north of Giuntoli and east of U.S. 101, in the Valley West neighborhood.
5. A light industrial area near Almqvist Lumber along Boyd Road near State Route 299, near the existing Aldergrove Industrial Park.

The Arcata USA has 178 total acres, of which 22 acres are underdeveloped and/or vacant parcels. Of this total acreage, 12 acres within the USA are developable. With respect to development potential, the area south of Windsong and the proposed Creekside Homes development are the only portions of the Arcata USA that may receive residential development. The Pacific Manor subdivision is already built out, and is included as part of the USA because the County would like to see this area serviced by sewer and annexed to the City. The Valley West and Aldergrove USAs represent industrial and commercial development potential only.

The entire Arcata USA is not within the service boundaries of a water or wastewater provider. The area south of Windsong and the commercial area along Giuntoli Lane are located within the coastal zone and subject to the Humboldt Bay Area Local Coastal Program. The other areas are subject to the Arcata Community Plan. To the extent that these areas are annexed to Arcata, the land use guidelines and development potential would be governed by the City of Arcata General Plan, which was updated in 2000 (although the Arcata Local Coastal Program is not yet certified by the California Coastal Commission). Proposed development will be concentrated within the proposed Creekside Homes development and the area south of Windsong Village. The estimated development potential for these areas can only be realized if these parcels are annexed to the City and receive municipal water and wastewater service.

6.4.1.3. Water System Service Area Description

All portions of the Arcata USA are expected to receive water service from the City of Arcata. The City of Arcata's existing service area includes all lands within the City limits as shown in Figure 6-1 and the Jacoby Creek County Water District (see the Jacoby Creek WSA for additional detail).

System Standards

The City of Arcata's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

The City of Arcata has established improvement standards for all City owned infrastructure. For any proposed annexation, new infrastructure development would be subject to these standards and existing infrastructure may be required to be upgraded.

Fiscal Condition/Capital Replacement Program

According to City of Arcata records, they operate their water system on an annual budget of approximately \$3.5 million. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The City's budget indicates that the development of a five-year Capital Improvement Plan is a goal for this budget year.

Water Demand

According to 2005/2006 HBMWD records, the City of Arcata's average daily use was 1.825 MGD and peak daily use was 3.405 MGD. The City delivered over 676 million gallons of HBMWD water in fiscal year 2005/2006. The City has approximately 6,000 existing connections and also supplies water to Jacoby Creek County Water District (City of Arcata, 2005).

Water Supply, Treatment, Distribution and Storage

The City's water supply comes from both water purchases from HBMWD and from a City owned water well known as the Heindon Well, which has a capacity of approximately 350 gpm (0.504 MGD). Approximately 20% of the City's supply comes from this groundwater source. The City is currently contracted with HBMWD to receive a peak water allocation of 3.25 MGD. Water is delivered through 76.5 miles of water distribution mains and storage reservoirs located throughout the community. The City has approximately 4.4 million gallons of storage capacity spread over 17 tanks ranging in size from 15,000 gallons to 1.5 million gallons.

Condition Assessment

Overview. The City of Arcata's water system is in good condition overall. Peak daily use of HBMWD water for the City (3.405 MGD in 2005/2006) currently exceeds their peak rate allocation of 3.25 MGD set in contract with HBMWD on July 1, 2006. However, the City has an additional, approximate 0.5 MGD available from the Heindon well.

Current Deficiencies. The City's main deficiency with respect to its water system is the lack of adequate storage within some pressure zones. Seventy-five percent of Arcata's customers are serviced from Zone I where the City has 2.2 million gallons of storage. This 2.2 million gallons then feeds a series of upper tanks to make up the additional 2.4 million gallons. Because of the low storage to demand ratio, the system calls on HBMWD to fill tanks on a much more frequent basis causing excess wear on pumps, filters and valves and the inability to control energy use (County of Humboldt, 2005). The City's lack of storage requires HBMWD to pump during times of peak power usage, thereby increasing operational costs for the District and its other wholesale customers.

Underserved Areas. The City serves all areas within its service boundaries.

Proposed Improvements

System Upgrades. The City plans on installing additional storage capacity. Plans for approximately one million gallons of storage within the new Sunnybrae tract of the Arcata Community Forest are underway. An additional four million gallons of storage are planned for Zone 1. The City is also looking into a second connection with HBMWD.

Future Expansion. The Arcata General Plan indicates that the Urban Services Boundary is the area where urban development may occur during the General Plan's twenty-year time frame (by 2020). The Arcata USA is located within the Arcata Urban Services Boundary, and it is likely that the areas within the Arcata USA would be annexed and developed within the General Plan period. Because the Pacific Manor subdivision is already built-out, annexation to the City may be more difficult. The City's established development standards may make this annexation more difficult as well.

Cost and Schedule of Improvements. The City has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system. However, the City has the following water system goals for this fiscal year:

- 1) Develop a 5-year capital improvement program for water distribution improvements and maintenance;
- 2) Continue to reduce unaccounted system losses through repair of substandard transmission lines and perform a water audit (ongoing);
- 3) Continue to improve GIS accuracy and implement valve exercise program;
- 4) Continue to train staff to meet State requirements for water distribution system;
- 5) Install Humboldt Bay Municipal Water District tie-in at Aldergrove Road; and
- 6) Locate suitable water storage tank sites in Zone 1.

6.4.2. Blue Lake USA & WSA

The Blue Lake study area contains both a USA and WSA. The County estimates there were 78 and 108 housing units within the Blue Lake USA and WSA, respectively in 2005. Based on the County's range of housing growth projections of between 0.5% and 2.5%, the Blue Lake USA could have between 86 and 128 total housing units by 2025, while the Blue Lake WSA could have between 119 and 177 total housing units by 2025. However, according to Table 1-6, the high build-out estimate for total development potential within the Blue Lake WSA, which takes into consideration physical and zoning constraints, is only 126. Therefore, the growth rate projections for the Blue Lake WSA are in excess of what the land can bear unless some parcels are changed in terms of land use and zoning to allow for higher residential densities. The high build-out estimate for total development potential within the Blue Lake USA, which takes into consideration physical and zoning constraints, is 221 total housing units.

The high build-out estimate for total development potential within the USA and WSA was used for infrastructure assessment and recommendations. This represents a combined 161 new housing units within the Blue Lake USA and WSA.

6.4.2.1. Summary

Findings

The City of Blue Lake's water system is in good condition. There are no major deficiencies associated with the existing system and the existing development they serve. However, the Blue Lake USA is expected to receive an additional 161 units before reaching build-out conditions. The City of Blue Lake will need to expand its water system infrastructure to serve this additional

growth, and also upgrade and replace deteriorating infrastructure as needed since the original water distribution system was installed in 1973.

Existing Capacity

The City of Blue Lake's water system is not limited by either source or treatment capacity with respect to its availability of connections. HBMWD has sufficient water supply to meet City demands.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Blue Lake USA/WSA and addresses infrastructure needs for existing development served by the City of Blue Lake and for build-out conditions. The existing capacity of the system includes connections within the City of Blue Lake as well.

Table 6-2. Water system infrastructure assessment for the Blue Lake USA/WSA.

WATER SYSTEM STATISTICS	
# of Existing Connections	650
# of Available Connections ¹	---
Source Capacity (MGD)	Not limiting (HBMWD)
Storage Capacity (MG)	0.9
Treatment Capacity (MGD)	Not required
Peak Day Use (MGD)	0.378
Usage Rate (gpd/connection)	582
CORRECTION OF EXISTING DEFICIENCIES	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>None needed</i> ^{2,3}	\$0
Estimated Cost for Existing Deficiencies (\$)	\$0
Estimated Cost per Existing Connection (\$)	\$0
Estimated Financing Cost per Existing Connection (\$/Month)	\$0
LOW BUILD-OUT ESTIMATE	
# of Projected New Connections	52
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>None needed</i> ^{2,3}	\$0
Estimated Cost for Build-Out Infrastructure (\$)	\$0
Estimated Cost per New Connection (\$)	\$0
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$0
Estimated Cost per Connection (\$)	\$0
Estimated Financing Cost per Connection (\$/Month)	\$0
HIGH BUILD-OUT ESTIMATE	
# of Projected New Connections	161
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>None needed</i> ^{2,3}	\$0
Estimated Cost for Build-Out Infrastructure (\$)	\$0
Estimated Cost per New Connection (\$)	\$0
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$0
Estimated Cost per Connection (\$)	\$0
Estimated Financing Cost per Connection (\$/Month)	\$0

NOTES: ¹ There is sufficient source supply from HBMWD to serve all development potential within the USA.

² Existing storage is sufficient to meet both existing and future domestic and fire storage requirements.

³ According to the DHS annual inspection report, the distribution system is all in good condition. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).

No financing of infrastructure is needed for existing or future build-out conditions. Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. City specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

6.4.2.2. Description of Urban Study Area

A map showing the Blue Lake USA and WSA is attached as Figure 6-2. The Blue Lake USA comprises two areas within the City's sphere of influence, located on the southeastern and northeastern boundaries of the City. The Blue Lake WSA is also located within the City's sphere of influence and wraps around the eastern and northern boundaries of the City.

The Blue Lake USA has 94 total acres, of which 73 acres are underdeveloped and/or vacant parcels. Of this total acreage, 50 acres within the USA are developable. The Blue Lake WSA has 238 total acres, of which 91 are underdeveloped and/or vacant parcels. Of this acreage, only 85 acres within the WSA are developable. With respect to development potential, the majority of the Blue Lake USA consists of underdeveloped residential parcels, while the WSA contains both underdeveloped and vacant residential parcels.

The City of Blue Lake is the only local service provider. Without annexation, or the extension of City services outside its boundaries, additional residential development would require on-site water and wastewater. Upon annexation, the land use guidelines and development potential are covered in the City of Blue Lake General Plan, which was last updated in 1986.

6.4.2.3. Water System

Service Area Description

Both the Blue Lake USA and WSA will require annexation into the City of Blue Lake in order to receive water services for any proposed development in this area. The City of Blue Lake's existing service area includes all lands within the City limits as shown in Figure 6-2, in addition to some connections outside of the City limits.

System Standards

The City of Blue Lake's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards

Fiscal Condition/Capital Replacement Program

According to City of Blue Lake records, they operate their water system on an annual budget of approximately \$260,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The City has not developed a Capital Improvement Plan to date, and they currently do not have built up reserves.

Water Demand

According to 2005/2006 HBMWD records, the City of Blue Lake's average daily use was 0.223 MGD and peak daily use was 0.378 MGD. The City delivered over 84 million gallons of water in fiscal year 2005/2006. The City has approximately 650 existing connections and does not retail water to any other Districts.

Water Supply, Treatment, Distribution and Storage

The City's receives its water supply through contract with HBMWD. Water is delivered through an unknown length of water distribution mains and storage reservoirs located throughout the community. The City has approximately 0.9 MG of storage capacity spread over two redwood tanks ranging in size from 400,000 gallons to 500,000 gallons.

Condition Assessment

Overview. The City of Blue Lake's water system is in good condition overall. Peak daily use of HBMWD water for the City (0.378 MGD in 2005/2006) is currently less than their peak rate allocation of 0.50 MGD set in contract with HBMWD on July 1, 2006.

Current Deficiencies. There are no significant deficiencies within the City's water system.

Underserved Areas. The City serves all areas within its service boundaries.

Proposed Improvements

System Upgrades. The City has no major upgrades planned other than routine maintenance and has not developed a CIP. The City does hope to loop two portions of the distribution system – one looping Accacia Ct. to Railroad Ave. and one looping the Greenhill area to the main line leading from the booster pump station.

Future Expansion. The City of Blue Lake prepared an annexation plan that would expand the City boundaries to include all of the existing SOI. An initial fiscal analysis indicated that the proposed annexation would result in a net fiscal impact to the City. Until the City can ensure fiscal balance upon annexation, it is not interested in expanding services or City boundaries. However, the City feels it is capable of serving additional growth at the current rate of development.

Cost and Schedule of Improvements. The District has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system.

6.4.3. Fortuna USA

The County estimates there were 640 housing units within the Fortuna USA in 2005. Based on the County's projected housing growth rate of between 0.5% and 2.5%, the Fortuna USA could have between 707 and 1,049 total housing units by 2025. According to Table 1-6, the low and high estimates for total build-out potential within the Fortuna USA, which takes into consideration physical and zoning constraints, there could be between 934 and 1,090 total housing units at build-out. Therefore, the growth projections for the Fortuna USA are within the range of what the land can bear.

The high build-out estimate for total development potential of 1,090 housing units in the USA was used for infrastructure assessment and recommendations. This represents 450 new housing units within the Fortuna USA. It should also be acknowledged that Fortuna plans significant future development within its current City boundaries.

6.4.3.1. Summary

Findings

The City of Fortuna's water system is in good condition. There are no major deficiencies associated with the City's water supply and distribution system. City of Fortuna annual pumping records indicate that current water demand is approximately 94% of permitted capacity, and there are approximately 257 available connections. However, according to Table 6-2, the Fortuna USA could receive up to 450 new housing units before reaching build-out conditions. It is anticipated that the majority of Fortuna growth will occur within the City limits (outside the USA), and that the City will need to expand its water system infrastructure to serve this additional growth as well as growth within the USA. In addition, the City of Fortuna may need to seek permits from DWR for additional source capacity

Existing Capacity

The City of Fortuna's water system is limited by water rights. . According to the City of Fortuna General Plan Draft Environmental Impact Report (State Clearing House No. 2007062106) the maximum permitted diversion of Eel River underflow water is three cubic ft/second and the total annual diversion is 1,642 acre feet. Discussions with the California Department of Public Health, Drinking Water Programs and Section 7.1, Water Supply and Distribution, of the Fortuna General Plan EIR indicate that the volume of water diverted from the Eel River underflow by the City is not determined. Based solely on the Department of Water Resources Division of Water Rights diversion permit, the City is currently extracting approximately 74% of its permitted water rights (based on an average annual total pumping volume over the last five years of 505.6 million gallons, or 1,550 acre feet and a total permitted capacity of 1,642 acre feet per year). Therefore there are approximately 257 available connections before the City would exceed its permitted water rights. The Fortuna General Plan EIR included a mitigation measure that adds a new General Plan policy requiring the city to renew or amend its permit to accommodate existing and projected municipal water usage.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Fortuna USA and addresses infrastructure needs for existing development served by the City of Fortuna and for build-out conditions. Planning for future developments within the USA for the next 10-year horizon is not available and therefore was not assessed. The existing capacity of the system includes connections within the City of Fortuna as well.

Table 6-3. Water system infrastructure assessment for the Fortuna USA.

WATER SYSTEM STATISTICS	
# of Existing Connections	4,331
# of Available Connections ¹	257
Source Capacity (MGD)	3.17
Storage Capacity (MG)	7.3
Treatment Capacity (MGD)	Not required
Peak Day Use (MGD)	2.3
Usage Rate (gpd/connection)	543
CORRECTION OF EXISTING DEFICIENCIES	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>None needed</i> ^{2,3}	\$0
Estimated Cost for Existing Deficiencies (\$)	\$0
Estimated Cost per Existing Connection (\$)	\$0
Estimated Financing Cost per Existing Connection (\$/Month)	\$0
LOW BUILD-OUT ESTIMATE	
# of Projected New Connections	294
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>None needed</i> ^{2,3}	\$Unknown
Estimated Cost for Build-Out Infrastructure (\$)	\$Unknown
Estimated Cost per New Connection (\$)	\$Unknown
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$Unknown
Estimated Cost per Connection (\$)	\$Unknown
Estimated Financing Cost per Connection (\$/Month)	\$Unknown
HIGH BUILD-OUT ESTIMATE	
# of Projected New Connections	450
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>\$Unknown</i>	\$0
Estimated Cost for Build-Out Infrastructure (\$)	\$Unknown
Estimated Cost per New Connection (\$)	\$Unknown
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$Unknown
Estimated Cost per Connection (\$)	\$Unknown
Estimated Financing Cost per Connection (\$/Month)	\$Unknown

NOTES: ¹ The City of Fortuna is estimated to be at 94% of its permitted water rights, derived using an assumed maximum day source capacity of 3.17 MGD, based on the maximum permitted diversion rate of three cubic feet per second (according to DWR permit #12390) over a 24 hour period..

² Existing storage is sufficient to meet both existing and future domestic and fire storage requirements.

³ According to the DHS annual inspection report, the distribution system is all in good condition. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).

Due to uncertainties associated with increasing the City of Fortuna's source capacity, costs for future improvements were not estimated. However, funding for this infrastructure would likely come in the form of a low interest loan, like a State Revolving Fund loan with a loan term of 20 years at 2.5% interest. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. City specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

6.4.3.2. Description of Urban Study Area

A map showing Fortuna's USAs is attached as Figure 6-3. The Fortuna USA contains four separate areas that are located within the City's sphere of influence. These include (from south to north):

1. An area south and east of Rohnerville, which includes the Rohnerville airport.
2. An area on the northeastern edge of Fortuna, just north and east of Nelson Lane.
3. An area north of Fortuna known as Carson Woods, located just north of Rohner Park.
4. An area northwest of Fortuna, stretching from U.S. 101 into the hills north and east of the highway and including areas currently served by Palmer Creek CSD.

The Palmer Creek CSD is the only service provider within the Fortuna USA. The Palmer Creek CSD provides water and wastewater services.

The Fortuna USA has 3,587 total acres, of which 1,414 acres are underdeveloped and/or vacant parcels. Of this total acreage, 888 acres within the USA are developable. With respect to development potential, about 30% of the parcels within the Fortuna USA are considered vacant and underdeveloped parcels that could see further residential development. However, aside from areas served by the Palmer Creek CSD, the Fortuna USA is not within the boundaries of a water or wastewater provider. Development potential would be limited by the requirement to use on-site water and septic disposal systems without annexation to the City of Fortuna and the extension of City water and wastewater services. Upon annexation, the Fortuna USA would be governed by the City of Fortuna General Plan, which is currently in the process of being updated and is expected to be adopted in 2007.

6.4.3.3. Water System

Service Area Description

Aside from the Palmer Creek CSD area, additional residential development within the Fortuna USA would require the construction of on-site water systems or would receive water service from the City of Fortuna upon annexation. The City of Fortuna's existing service area includes all lands within the City limits as shown in Figure 6-3.

System Standards

Both the Palmer Creek CSD and the City of Fortuna's water systems are public water systems, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

The City of Fortuna has established improvement standards for all City owned infrastructure. To the extent that new development areas are annexed to the City, infrastructure development would be subject to these standards. To the extent that existing development is annexed, the City of Fortuna may apply existing development standards and require that all existing infrastructure be upgraded.

Fiscal Condition/Capital Replacement Program

According to City of Fortuna records, they operate their water system on an annual budget of approximately \$1.1 million. The majority of this income is from service charges, but funding also comes from, assessments, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The City's latest Capital Improvement Plan was developed in 2007, and the City's reserves status is unknown. The City is currently preparing a 20-year capital improvement program that will likely address improvements associated with future permit and source capacity expansion and other water system capacity projects.

According to Palmer Creek records, they operate their water system on an annual budget of approximately \$74,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District has not developed a Capital Improvement Plan to date, and they currently have approximately \$127,000 in reserves.

Water Demand

According to the Fortuna General Plan Background Report, the City produced an average of 505.6 million gallons of drinking water per year between 2003 and 2007, and 503.7 million gallons in 2007. Average daily use is therefore estimated at 1.39 MGD. Peak daily use for 2005 was reported as 2.3 MGD in the 2007 DHS annual inspection report. The City has approximately 4,331 existing connections and does not retail water to any other Districts.

Palmer Creek CSD produced more than 11 million gallons of drinking water in 2003. Average daily use is estimated at approximately 0.031 MGD, and peak daily use is reported at approximately 0.084 MGD. The District has approximately 150 service connections, of which 127 are active connections. All active connections are metered.

Water Supply, Treatment, Distribution and Storage

The City's water supply comes entirely from five groundwater wells (four active and one emergency stand-by) located at the City's corrosion control facility. The combined rated capacity of all wells is 2,200 gpm, or 3.17 MGD. Water is chlorinated in the wells as a precautionary measure due to the annular seals being less than 50 feet deep and then pumped from the wells into a 120,000 gallon tank, containing three 100 horsepower booster pumps that pump water into the City's distribution system. The distribution system is divided up into eight pressure zones and contains a series of pumps, water tanks, reservoirs, and hydropneumatic tanks. The combined storage capacity of the system is approximately 7.3 million gallons. Some pressure zones do not have adequate storage, but can be provided water through booster stations with portable generators on site. The City's distribution system consists of approximately 38 miles of PVC, asbestos cement, and cast iron pipe ranging in size from 2 inches to 10 inches and in good condition.

Palmer Creek CSD's water supply consists of two active wells, each capable of pumping 80 gpm. Water pumped from the wells is injected with sodium hypochlorite and then sent to a contact basin prior to filtration through a Loprest package treatment plant designed to remove iron and manganese from the groundwater. The plant consists of a reaction vessel and three pressure filters, after which water is boosted to storage and distribution. The District has one 200,000 gallon storage tank that serves two pressure zones; one has reduced pressures through a PRV. The District's distribution system was installed in 1997 and consists of approximately four

miles of PVC pipe ranging in size from 2 inches to 10 inches. The system has capacity for adequate fire flows.

Condition Assessment

Overview. The City of Fortuna's water system is in good condition overall but does not have sufficient capacity to accommodate growth anticipated in Fortuna's new General Plan currently in the process of being updated, nor the Fortuna USA. The City is assessing whether or not it has sufficient water supply, as set forth by the State of California in its water rights permit, to accommodate anticipated growth. The City is currently allowed by permit to extract slightly over 535.1 million gallons per year, or approximately 6% more water than the 505.6 million gallons per year currently being extracted. Current peak day demands (2.30 MGD) are about 73% of source capacity (3.17 MGD based on three cubic feet/second maximum diversion rate) during peak usage periods. The City is therefore limited by water rights and source capacity, but it appears that water rights are more limiting.

Palmer Creek CSD's water system is in excellent condition as it was constructed in 1997.

Current Deficiencies. The City currently has areas where fire flow capacities need to be improved. Some older sections of the City's distribution system are in need of replacement. Many sections of steel pipe have failed as a result of excessive corrosion problems the City used to have prior to completion of its corrosion control facility. Most of the old, leaking mains have been replaced by past projects.

Palmer Creek CSD's water system has known existing deficiencies, including dead end mains and limited fire flow capacity at the end of Page Way.

Underserved Areas. The City and Palmer Creek CSD both serve all areas within their respective service boundaries.

Proposed Improvements

System Upgrades. The City completed a hydraulic study in 2005 which was updated in 2007, and made recommendations for improvements to the water system. These mainly include upgrades to existing reservoirs and storage tanks and construction of new reservoirs and storage tanks. Some pumps are also in need of replacement, and a new booster station is needed at the Loop Road Development (City of Fortuna, 2005). These are covered in greater detail in Fortuna's General Plan Update.

Palmer Creek CSD has no major system upgrades planned other than upgrades to their computer software.

Future Expansion. The City of Fortuna is looking to annex most of the areas within the USAs within the time frame of this General Plan, with the exception of the portion of the USA currently served by Palmer Creek CSD. The State forced Fortuna to accept Palmer Creek into its sphere of influence and take sewage from Palmer Creek's collection system. Fortuna requires all proposed annexations to be up to Fortuna's sewer/water/roads standards and would require a new assessment district where there are deficiencies.

Palmer Creek CSD has no plans for future expansion although landowners located at the edge of the district have requested water service.

Cost and Schedule of Improvements. The City of Fortuna has a Capital Improvement Plan that covers costs and schedules for improvements to its water system over the next five years and is preparing a 20-year capital improvement program. These include routine maintenance activities in addition to improvements to water distribution and storage. Total costs for the CIP is nearly \$8 million dollars, of which approximately 12% will be covered through reserves built in the water fund and the remaining 88% will be covered through bonds.

Palmer Creek CSD does not have a CIP in effect.

6.4.4. Garberville USA and WSA

The Garberville study area contains both a USA and WSA. The County estimates there were 297 and 147 housing units within the Garberville USA and WSA, respectively in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Garberville USA could have between 328 and 487 total housing units by 2025, while the Garberville WSA could have between 162 and 241 total housing units by 2025. However, according to Table 1-6, the high build-out estimate for total development potential within the Garberville USA and WSA, which takes into consideration physical and zoning constraints, is 405 and 250, respectively. Therefore, although the Garberville WSA can be expected to have between 162 and 241 total housing units by 2025, the high growth rate projection for the Garberville USA is greater than what the land can bear.

The high build-out estimate for total development potential of 405 and 250 housing units in the USA and WSA, respectively, was used for infrastructure assessment and recommendations. This represents 211 new housing units within the Garberville USA and WSA combined.

6.4.4.1. Summary

Findings

Garberville's water system, which until recently was privately owned, is in poor to fair condition. Generally, systems that were originally privately owned and developed are not constructed to the same standards as ones developed by public agencies. Major deficiencies associated with the existing system include lack of storage capacity, standby power, and an aging and undersized distribution system, most of which was installed in the 1930s. Additionally, the Garberville USA and WSA are expected to receive up to 211 new housing units before reaching build-out conditions. Garberville will need to upgrade and expand its water system infrastructure to serve this additional growth.

It is recommended that the District expand its SOI to include the Kimtu area, to the end of Camp Kimtu Road southwest of Garberville, to facilitate the improvement of the health, safety and water quality of the area. It is also recommended that at least those areas currently receiving GSD service within the existing SOI be included within the GSD boundaries to bring district infrastructure into its district boundaries and to allow for future infrastructure improvements. Annexation of the WSA areas within the GSD SOI would be required to facilitate planned development.

Existing Capacity

Garberville's water system is currently limited by both its source and treatment capacity with respect to the number of available connections. However, treatment capacity is currently more limiting. Source capacity is limited by the existing pumps and is approximately 0.46 MGD if the pumps are operated 24 hours per day. The treatment capacity is limited by filtration and is estimated at 0.33 MGD if the filters are operated 22 hours per day (time allowed for backwash cycle). Given existing maximum day demands are 0.31 MGD, the system is operating at

approximately 94% of treatment capacity. Therefore, there are approximately 25 available connections under the existing infrastructure.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Garberville USA/WSA and addresses infrastructure needs for existing development served by the Garberville Sanitary District and for build-out conditions. There are no planned developments within the USA/WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

Table 6-4. Water system infrastructure assessment for the Garberville USA and WSA.

WATER SYSTEM STATISTICS	
# of Existing Connections	394
# of Available Connections ¹	25
Source Capacity (MGD)	0.461
Storage Capacity (MG)	0.270
Treatment Capacity (MGD)	0.330
Peak Day Use (MGD)	0.310
Usage Rate (gpd/connection)	787
CORRECTION OF EXISTING DEFICIENCIES	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.16 MG ²</i>	\$320,000
<i>Upgrade distribution system – 10.5 miles ³</i>	\$5,544,000
<i>Install backup power</i>	\$250,000
Estimated Cost for Existing Deficiencies (\$)	\$6,114,000
Estimated Cost per Existing Connection (\$)	\$15,518
Estimated Financing Cost per Existing Connection (\$/Month)	\$82.95
LOW BUILD-OUT ESTIMATE	
# of Projected New Connections	124
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.098 MG ²</i>	\$196,000
Estimated Cost for Build-Out Infrastructure (\$)	\$196,000
Estimated Cost per New Connection (\$)	\$1,581
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$6,310,000
Estimated Cost per Connection (\$)	\$12,182
Estimated Financing Cost per Connection (\$/Month)	\$65.12
HIGH BUILD-OUT ESTIMATE	
# of Projected New Connections	211
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.166 MG ⁴</i>	\$332,000
Estimated Cost for Build-Out Infrastructure (\$)	\$332,000
Estimated Cost per New Connection (\$)	\$1,574
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$6,446,000
Estimated Cost per Connection (\$)	\$10,655
Estimated Financing Cost per Connection (\$/Month)	\$56.95

NOTES: ¹ The number of available connections in the Garberville study areas was estimated based on the District currently being at 94% of its treatment capacity.

² Additional storage requirements are based on 1 day of existing maximum day use (0.310 MG) plus minimum fire storage of 0.12 MG minus existing storage (0.27 MG).

³ According to the District, approximately 70% of the distribution system is in need of replacement. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).

⁴ Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 787 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$6.1 million loan would amount to approximately \$392,000 per year. With 394 existing ratepayers, monthly bills would have to be increased by \$83 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale, as evidenced by the lower monthly financing costs shown under the low and high build-out scenarios.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

6.4.4.2. Description of Urban Study Area

A map showing the Garberville USA and Garberville WSA is attached as Figure 6-4. The USA encompasses Garberville's commercial downtown area and surrounding residential areas. The WSA extends southwest of the USA and includes residential lands on both sides of the South Fork Eel River.

The Garberville USA has 740 total acres, of which 129 acres are underdeveloped and/or vacant parcels. Of this total acreage, 79 acres within the USA are developable. The Garberville WSA has 1,571 total acres, of which 1,099 acres are underdeveloped and/or vacant parcels. Of this total acreage, 483 acres within the WSA are developable. With respect to development potential, approximately 15% of parcels within the Garberville USA are considered vacant or underdeveloped parcels that could see further residential development. The WSA also contains large vacant and underdeveloped parcels.

The USA boundary generally matches the district boundaries of the Garberville Sanitary District (GSD), extending beyond the district boundaries into the GSD sphere of influence in the Hillcrest Road area in the south and on the west side of Garberville in the area of the GSD wastewater treatment plant and the Caltrans maintenance yard. The GSD treatment plant is located within the district SOI, whereas the Caltrans yard area is located outside the district and SOI.

The WSA boundary generally follows the GSD SOI, which extends southwest from the Garberville downtown area to the Garberville Airport. The WSA extends beyond the GSD SOI to the Kimtu area southwest of Garberville.

The area's land use guidelines and development potential are covered in the Garberville, Redway, Benbow, and Alderpoint Community Plan, which was adopted in June 1987.

6.4.4.3. Water System

Service Area Description

The Garberville USA and portions of the WSA receive water service from GSD, while the remainder of the Garberville WSA relies on private water sources for drinking water. The GSD water system extends beyond the GSD district boundaries southwest of the downtown Garberville area to the Leino Road area. There are also customer-owned water lines supplied by GSD that extend up Connick Creek Road on the west side of the Eel River.

The GSD was formed on April 12, 1932, pursuant to "The Sanitary District Act of 1923" after a majority vote was cast in a general election. The Garberville Sanitary District is an independent special District with a five-member Board of Directors elected to staggered four year terms. The GSD was originally formed to provide sewer service, but purchased the Garberville Water Company in 2006 and now provides water service as well. Although Sanitary Districts are authorized to provide water service, the GSD has indicated that it intends to reorganize as a CSD.

System Standards

GSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. When this system was operated as the private Garberville Water Company, it was subject to most of the same requirements. See Section 6.2 for additional information regarding public and private system standards.

Fiscal Condition/Capital Replacement Program

According to GSD records, they operate their water system on an annual budget of approximately \$225,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District has not developed a Capital Improvement Plan to date, and they currently have \$125,000 in water reserves.

Water Demand

The GSD produced approximately 64 million gallons of drinking water in 2003 according to the latest DHS annual inspection report. Average daily use is estimated at approximately 0.175 MGD, and peak daily use is estimated at approximately 0.310 MGD. The District has approximately 394 existing connections and does not retail water to any other Districts.

Water Supply, Treatment, Distribution and Storage

GSD's water system consists of two sources of water supply, a treatment plant, four water tanks, three booster stations, and a distribution system that serves approximately 394 connections. The main source of water is from an infiltration gallery in the South Fork of the Eel River that was installed in 1940. A secondary groundwater source is also available and is known as the Tobin Well; however, substantial draw down has been known to occur and the well has even been known to stop producing water during dry periods. The District is limited by their appropriate water rights under Permits 003404 and 020789 with the State Water Resources Control Board, which allow for maximum diversions of 0.155 and 0.595 cfs, respectively, for a combined allowable extraction of 336 gpm from the infiltration gallery.

The infiltration gallery pumps water via a 50 horsepower, 320 gpm pump to the water treatment plant about 380 feet above the river. Therefore, the production capacity of the infiltration gallery is approximately 0.46 MGD. The water treatment plant consists of a pressure filter with a

maximum production capacity of 250 gpm (0.33 MGD if operated 22 hours per day), and is therefore more limiting than the source capacity. Filtered water is stored in a 175,000 gallon water storage tank located next to the treatment plant. The District also has three other storage tanks: one 50,000 gallon tank, one 30,000 gallon tank, and one 15,000 gallon tank. Total storage for the District is 270,000 gallons.

The majority of the distribution system was installed prior to 1940. Some of the lines are lead joint, some are copper, and most are either iron or asbestos cement. Only the line in Redwood Drive is 8 inch. Most of the downtown mains are 4-inches in diameter. The water mains in the Wallen and Johnson Subdivision were installed in 1978 and are mostly 6-inch lines. The system contains approximately 15 miles of pipe, of which approximately 70% of the system is in need of replacement, according to discussions with District staff.

Condition Assessment

Overview. Water treatment and storage capacities will need to be increased to accommodate additional demand or to offer fire protection within the District. The storage capacity will service the system for just under 24 hours if the pumps, filters, or treatment equipment cease to operate for any reason. The storage capacity complies with the Waterworks Standards, but will not be capable of providing continuous water service during the summer months if replacement parts or repair labor are required for more than a 24 hour lead time. Having only 1 day (24 hours) of storage to meet the maximum daily demands is considered the minimum and generally it is recommended that a District have at least two or three times that amount in addition to fire suppression storage able to provide 1,000 gpm for two hours minimum.

The entire water distribution system is fed by a single transmission line from the main storage tank. This transmission line has a custom fabricated angle that is leaking. A patch was installed during the past few years but is only a temporary fix for the problem. There is no way to turn this line off or redirect the flow through it. Eventually, this joint will have to be replaced by a newly fabricated custom angle, or the lines will need to be realigned so that a more standard joint may be used.

The distribution system in downtown Garberville is not fed by any of the other three water tanks in the system. Any repairs to the main transmission line will result in a water outage for downtown Garberville. This could be remedied by installing fairly inexpensive flow devices at the Alderpoint Road Tank's fill line that would allow the downtown system to be fed by the upper portion of the system. In addition, most of the main lines are smaller than the 6 inch minimum that is generally needed for adequate fire flows.

Current peak day demands are approximately 67% of source capacity and 86% of treatment capacity.

Current Deficiencies. Many parts of the distribution system are approaching 70 years old. The District needs to replace copper pipes and leaded joints to meet current standards and to facilitate compliance with lead and copper rules for drinking water. According to District staff, the existing treatment plant is being operated beyond capacity, at loading rates of approximately 5 gpm/ft² whereas DHS recommends maximum loading rates of 3 gpm/ft².

In addition, the current status of water supply with regards to fire suppression is inadequate. A minimum of 120,000 gallons of fire storage is recommended, and undersized water mains should also be replaced for adequate fire flows. As a first step, we recommend that a water master plan, including a computerized hydraulic model of the system be completed to more accurately develop and prioritize the necessary improvements.

Underserved Areas. The District serves all areas within its district boundaries and some homes and businesses that are outside its boundaries but within the District's proposed sphere of influence. Areas within the USA/WSA that are not served by the GSD, such as the Kimtu area located along Camp Kimtu Road southwest of Garberville, have expressed interest in annexing to the District and receiving service.

Proposed Improvements

System Upgrades. The District has preliminary plans for a Water System Improvements Project and is actively seeking funding sources for the project including State Revolving Fund loans. The project will consist of two new infiltration gallery pumps, a new treatment plant, emergency backup power for the pumps and treatment plant, a new treated water booster pump station and water main, and additional storage capacity. The District also hopes to see about 70% of its water distribution system replaced. In addition to removing old lead and copper piping, this would also improve fire flows. The District hopes to begin construction around 2010.

Future Expansion. The District is looking at expanding service to the Garberville Airport and approximately twenty homes in the Mitchell Ranch/Kimtu Meadows area in the Garberville WSA, where the existing subdivision has proposed a connection to GSD's water system and is currently seeking Proposition 50 funding. Most of these areas are within the current GSD SOI; however, the SOI would need to be expanded to include the Kimtu area. LAFCo would need to approve an expansion of the GSD's SOI and district boundaries for this service extension to occur.

Cost and Schedule of Improvements. A Preliminary Engineering Report was completed in 2006 by Boyle Engineering for the District's Water System Improvement Project. The report estimated costs for infiltration gallery upgrades, a new package filtration plant, and minor distribution system upgrades at \$2.32 million. However, the District is still exploring funding options and has not committed to a completion date at this time.

6.4.5. Glendale USA & WSA

The Glendale study area contains both a USA and WSA. Both study areas receive water service from Fieldbrook Glendale CSD (FGCSD), who also serves the Fieldbrook WSA, discussed further in Section 6.5.5.

The County estimates there were 165 and 99 housing units within the Glendale USA and WSA, respectively in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Glendale USA could have between 182 and 270 total housing units by 2025, while the Glendale WSA could have between 109 and 162 total housing units by 2025. However, according to Table 1-6, the high build-out estimate for total development potential within the Glendale USA and WSA, which takes into consideration physical and zoning constraints, is 1,354 and 100, respectively. Therefore, although the growth projections for the Glendale USA are well within the range of what the land can bear, the high growth rate projection for the Glendale WSA is in excess of what the land can bear.

The high build-out estimates for total development potential of 1,354 and 100 housing units in the USA and WSA were used for infrastructure assessment and recommendations. This represents a combined 1,190 new housing units within the Glendale USA and WSA.

6.4.5.1. Summary

Findings

Glendale's water system, owned and operated by Fieldbrook Glendale CSD (FGCSD), is in good condition overall. The only major deficiency associated with the existing system and the existing development they serve is lower system pressure within some localized areas. The study area does not have any storage in its service area and normally relies on the HBMWD water reservoirs, although the Fieldbrook reservoir can be used to back feed to this area in an emergency. Additionally, the Glendale USA and WSA are expected to receive up to 1,190 new housing units before reaching build-out conditions. Glendale will need to expand its water system infrastructure to serve this additional growth.

Existing Capacity

The FGCSD's water system is not limited by either source or treatment capacity with respect to its availability of connections. HBMWD has sufficient water supply to meet the District's demands.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for all study areas served by FGCSD, including the Glendale USA and WSA and the Fieldbrook WSA. Due to the interconnectedness of the water system, the study areas could not be assessed individually and were instead assessed collectively. The table addresses the District's infrastructure needs for existing development and for build-out conditions.

Table 6-5. Water system infrastructure assessment for the FGCSD, including the Glendale USA/WSA and Fieldbrook WSA.

WATER SYSTEM STATISTICS	
# of Existing Connections	528
# of Available Connections ¹	---
Source Capacity (MGD)	Not limiting (HBMWD)
Storage Capacity (MG)	0.415
Treatment Capacity (MGD)	Not required
Peak Day Use (MGD)	0.389
Usage Rate (gpd/connection)	737
CORRECTION OF EXISTING DEFICIENCIES	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.094 MG ²</i>	\$188,000
<i>Install booster pump station</i>	\$450,000
Estimated Cost for Existing Deficiencies (\$)	\$638,000
Estimated Cost per Existing Connection (\$)	\$1,208
Estimated Financing Cost per Existing Connection (\$/Month)	\$6.46
LOW BUILD-OUT ESTIMATE	
# of Projected New Connections	159
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.117 MG ³</i>	\$234,000
Estimated Cost for Build-Out Infrastructure (\$)	\$234,000
Estimated Cost per New Connection (\$)	\$1,472
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$872,000
Estimated Cost per Connection (\$)	\$380
Estimated Financing Cost per Connection (\$/Month)	\$2.03
HIGH BUILD-OUT ESTIMATE	
# of Projected New Connections	1,765
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 1.300 MG ³</i>	\$2,600,000
Estimated Cost for Build-Out Infrastructure (\$)	\$2,600,000
Estimated Cost per New Connection (\$)	\$1,474
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$3,238,000
Estimated Cost per Connection (\$)	\$1,412
Estimated Financing Cost per Connection (\$/Month)	\$7.55

NOTES: ¹There is sufficient source supply from HBMWD to serve all development potential within the USA.

² Additional storage requirements are based on 1 day of existing maximum day use (0.389 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.42 MG).

³ Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 737 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$638,000 loan would amount to approximately \$41,000 per year. With 528 existing ratepayers, monthly bills would have to be increased by approximately \$6-7 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing

deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

6.4.5.2. Description of Urban Study Area

A map showing the Glendale USA and Glendale WSA is attached as Figure 6-2. The Glendale USA and WSA are part of a larger planning area that encompasses both the Fieldbrook and Glendale sub-areas. The area's land use guidelines and development potential are covered in the Fieldbrook Glendale Community Plan, for which a draft plan was prepared in May 2006. The draft Fieldbrook Glendale Community Plan is likely to be included in this General Plan Update. Zoning classification within the Glendale USA and WSA is currently Unclassified (U) with a small area of Residential Single-Family (RS).

The Glendale USA has 456 total acres, of which 284 acres are underdeveloped and/or vacant parcels. Of this total acreage, 218 acres within the USA are developable. The Glendale WSA has 400 total acres, of which 59 acres are underdeveloped and/or vacant parcels. Of this total acreage, 47 acres within the WSA are developable. With respect to development potential, the majority of the Glendale USA consists mainly of underdeveloped parcels with some vacant parcels. The Glendale WSA consists of two separate areas and contains both vacant and underdeveloped parcels.

6.4.5.3. Water System Service Area Description

The Glendale USA is served by a community water system owned and operated by Fieldbrook Glendale Community Services District (FGCSD), although portions of the study area rely on private wells, springs or surface water intakes generally of poor quality. Portions of the Glendale WSAs receive water service from FGCSD, while other portions (up Liscomb Hill Road and Hilltop Lane) receive water from the City of Blue Lake. The FGCSD was declared formed in 1973 under the Community Services District Act pursuant to Government Code Section 61000-61936. The governing board is elected and consists of a five (5) member Board of Directors to supervise the business of the District.

System Standards

FGCSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

Fiscal Condition/Capital Replacement Program

According to FGCSD records, they operate their water system on an annual budget of approximately \$250,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District does not currently have a Capital Improvement Plan, and they currently have approximately \$0.5 million in water and wastewater reserves.

Water Demand

According to 2005/2006 HBMWD records, FGCS D's average daily use was 0.166 MGD and peak daily use was 0.389 MGD. The FGCS D retailed approximately 64 million gallons of drinking water in fiscal year 2005/2006. FGCS D services approximately 528 existing connections according to the 2005 DHS annual inspection report.

Water Supply, Treatment, Distribution and Storage

FGCS D purchases treated water from Humboldt Bay Municipal Water District (HBMWD) for delivery to its customers. FGCS D's water system begins at a water meter just north of the intersection of Fieldbrook Road and Glendale Drive. The system contains approximately 13 miles of water mains, two booster pump stations, and one 400,000 and one 20,000 gallon water tank. Water quality is representative of HBMWD's excellent water source and meets or exceeds State standards.

Condition Assessment

Overview. Water service within the Glendale USA is generally very good with the exception of some low pressure areas. Peak daily use of HBMWD water for the District (0.389 MGD in 2005/2006) is currently less than their peak rate allocation of 0.43 MGD set in contract with HBMWD on July 1, 2006.

Current Deficiencies. Some localized low pressure areas exist within the service area; therefore, additional pressure is needed especially before significant additional growth occurs. Additional storage is also needed in either the Glendale or Fieldbrook sub-areas, and emergency backup power is needed at the Lyman Road Pump Station.

Underserved Areas. The FGCS D serves all areas within its service boundaries with the exception of several homes within the Fieldbrook WSA and Glendale WSA who rely on private water sources due to the distance from their homes to existing water mains. Whether these homes connect in the future is dependent on the feasibility of connecting these homes on an individual home basis.

Proposed Improvements

System Upgrades. The District's main problem involves low water pressure within certain regions of its service area. The District's long range plans for improvements include:

- Construction of a new booster pump station at Korblex to improve water pressure within the service area. This will also improve water pressure for HBMWD's customers along Warren Creek and West End Roads and will allow the existing City of Blue Lake water booster pump station to deliver more water.
- Installation of a standby emergency generator at the Lyman Road Pump Station
- Construction of an additional reservoir to provide additional storage capacity.

Future Expansion. There is significant potential for growth in the Glendale sub-area, on the order of 500 – 700 new dwelling units. Although sufficient water is available to service these homes, additional wastewater treatment and disposal infrastructure is needed. FGCS D's existing wastewater contract with the City of Arcata would need to be amended to allow for these additional units, or an alternative solution would need to be developed.

Cost and Schedule of Improvements. The FGCS D has not developed a Capital Improvement Plan that covers costs and schedules for improvements to its water system.

6.4.6. Hydesville USA & WSA

The Hydesville study area contains both a USA and WSA. The County estimates there were 201 and 366 housing units within the Hydesville USA and WSA, respectively in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Hydesville USA could have between 222 and 329 total housing units by 2025, while the Hydesville WSA could have between 404 and 600 total housing units by 2025. According to Table 1-6, the high build-out estimates for total development potential within the USA and WSA, which takes into consideration physical and zoning constraints, are 755 and 612, respectively. Therefore, the growth projections for each study area are within the range of what the land can bear.

The high build-out estimates for total development potential of 755 and 612 housing units in the USA and WSA were used for infrastructure assessment and recommendations. This represents a combined 800 new housing units within the Hydesville USA and WSA.

6.4.6.1. Summary

Findings

Hydesville's water system is in good condition. There are no major infrastructure deficiencies associated with the existing system. Some older asbestos cement pipe in the distribution system piping may require replacement over the next twenty years. The District recently acquired a Grade 2 water distribution operator in 2005, which brought the system into compliance with DHS requirements. Additionally, the Hydesville USA and WSA are expected to receive an additional 800 units before reaching build-out conditions. Hydesville will need to expand its water system infrastructure to serve this additional growth.

Existing Capacity

Hydesville's water system is currently limited by the source capacity of its wells with respect to availability of connections. Source capacity is limited by the existing pumps and is approximately 0.518 MGD if the pumps are operated 24 hours per day. Given existing maximum day demands are estimated at 0.3 MGD, the system is operating at approximately 58% of source capacity. Therefore, there are approximately 326 available connections under the existing infrastructure.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Hydesville USA/WSA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the USA/WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

Table 6-6. Water system infrastructure assessment for the Hydesville USA and WSA.

WATER SYSTEM STATISTICS	
# of Existing Connections	450
# of Available Connections ¹	326
Source Capacity (MGD)	0.518
Storage Capacity (MG)	0.6
Treatment Capacity (MGD)	Not required
Peak Day Use (MGD)	0.28
Usage Rate (gpd/connection)	622
CORRECTION OF EXISTING DEFICIENCIES	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Upgrade distribution system – 2.5 miles ²</i>	\$1,320,000
Estimated Cost for Existing Deficiencies (\$)	\$1,320,000
Estimated Cost per Existing Connection (\$)	\$2,933
Estimated Financing Cost per Existing Connection (\$/Month)	\$15.68
LOW BUILD-OUT ESTIMATE	
# of Projected New Connections	166
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>None needed ³</i>	\$0
Estimated Cost for Build-Out Infrastructure (\$)	\$0
Estimated Cost per New Connection (\$)	\$0
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$1,320,000
Estimated Cost per Connection (\$)	\$2,143
Estimated Financing Cost per Connection (\$/Month)	\$11.45
HIGH BUILD-OUT ESTIMATE	
# of Projected New Connections	800
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.298 MG ⁴</i>	\$596,000
<i>Increase source capacity – drill 2 new wells</i>	\$100,000
Estimated Cost for Build-Out Infrastructure (\$)	\$696,000
Estimated Cost per New Connection (\$)	\$870
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$2,016,000
Estimated Cost per Connection (\$)	\$1,613
Estimated Financing Cost per Connection (\$/Month)	\$8.62

NOTES: ¹ The number of available connections in the Hydesville study areas was estimated based on the District currently being at 58% of its source capacity.

² The estimated length of the pipeline less than 6 inches in diameter, according to County GIS database. Distribution piping smaller than 6 inches in diameter is recommended to be replaced for adequate fire flows. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).

³ Existing storage is sufficient to meet both existing and future domestic and fire storage requirements.

⁴ Additional storage requirements are based on 1 day of estimated future maximum day use (622 gpd/connection x 1,250 connections = 0.778 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.6 MG).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$1.32 million loan would amount to approximately \$85,000 per year. With 450 existing ratepayers, monthly bills would have to be increased by \$16 per month to fund this loan. In reality, we would expect the District to apply for

and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale, as evidenced by the lower monthly financing costs shown under the low and high build-out scenarios..

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

6.4.6.2. Description of Urban Study Area

A map showing the Hydesville USA and WSA is attached as Figure 6-3. The Hydesville USA contains two distinct areas – the Hydesville area and the Carlotta area. It may be appropriate to evaluate the potential for both of these areas to be serviced by the same utility District. The Hydesville WSA surrounds the Hydesville area and also contains the area between the Hydesville area and the Carlotta area of the Hydesville USA.

The Hydesville USA has 579 total acres, of which 243 acres are underdeveloped and/or vacant parcels. Of this total acreage, 178 acres within the USA are developable. The Hydesville WSA has 2,398 total acres, of which 1,044 acres are underdeveloped and/or vacant parcels. Of this total acreage, 588 acres within the WSA are developable. With respect to development potential, the majority of the Hydesville USA consists of underdeveloped parcels with some vacant parcels. Only a few developable lots exist within the Carlotta sub-area. The Hydesville WSA consists of both vacant and underdeveloped parcels. The area's land use guidelines and development potential are covered in the Hydesville-Carlotta Community Plan.

6.4.6.3. Water System Service Area Description

Water service in the Hydesville area is provided by the Hydesville County Water District (HCWD). The Carlotta area has no public water system and depends solely on individual private water sources. The HCWD was originally organized March 26, 1963 under Division 12 of the Water Code of the State of California and by Resolution 1861 of the Humboldt County Board of Supervisors. The five member governing board of the District is elected by the residents of the District to supervise the business of the District. The term of office of the board members is four years. The District was formed for the purpose of providing water services.

System Standards

HCWD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

Fiscal Condition/Capital Replacement Program

The District's water supply and distribution system was constructed with funds obtained through a Davis-Grunsky loan from the Department of Water Resources in fiscal year 1964-65. This loan was in the amount of \$182,500 with an interest rate of 3.1% per annum on the declining principal balance. Under the terms of the agreement with the state, the District is to repay this loan in 47 equal annual payments that began in 1970.

The County Water District Principal Act empowers county water Districts to levy a property tax in lieu of, or in addition to customer service charges. However, the HCWD has not levied a property tax assessment since the 1966-67 fiscal year. The District has relied, instead, on connection fees and water sales to finance their activities. With this financing arrangement, the District has not experienced the revenue reductions imposed by the passage of Proposition 13 in June 1978. The District may not be able to re-establish a property tax levy in the future, if such action becomes necessary or desirable to augment their other revenue sources.

According to HCWD records, they operate their water system on an annual budget of approximately \$161,000. Replacement or depreciation funds are not accumulated through revenues. The District has not developed a Capital Improvement Plan to date, and they currently have \$9,000 in reserves.

Water Demand

HCWD production data is not available from the DHS as of the latest 2005 inspection report, as HCWD had not submitted an Annual Report to the Drinking Water Program (ARDWP). Since 2005, the District has had a change of operators and has begun to submit annual reports as required by the DHS. According to the District, HCWD retails approximately 38 million gallons of drinking water per year. Average daily use for the entire District is therefore estimated at approximately 0.104 MGD, and peak daily use was reported as 0.28 MGD. The latest DHS annual inspection report also reported a maximum day use of 0.28 MGD in 1995. The Hydesville USA has approximately 450 existing connections, of which all are residential connections.

Water Supply, Treatment, Distribution and Storage

The District's water supply is obtained from two (2), twelve inch (12") wells located on District owned land near Yager Creek. These wells are equipped with pumps which have a rated pumping capacity of 360 gpm, or 0.52 MGD. The water is chlorinated at the well site and then pumped to the District's two storage tanks. These storage tanks have a capacity of 200,000 and 400,000 gallons, for a total storage capacity of 0.6 MG. The stored water is distributed by gravity, throughout the District's distribution system. The distribution system consists of approximately 14 miles of 2-inch to 8-inch mains made of steel, AC, and PVC pipe. The District has installed fire hydrants throughout the service area.

Condition Assessment

Overview. Water service within the Hydesville USA is generally good. The District is at approximately 60% of its source capacity during peak usage periods.

Current Deficiencies. In some areas, located in the northern part of the District (Quail Hill subdivision area) the 4-inch mainline is inadequate in size to maintain the fire flow requirements and topography is a constraint on service area expansion utilizing the existing gravity fed system. Outside the District, but within the sphere of influence, Quiggle subdivision adjacent to the west side of the Quail Hill subdivision has a topographic constraint. This subdivision is served by private wells, and the subdivision would need to establish a second pressure zone to provide adequate water flow and pressure. The Carlotta area is also not served by a community water system and expansion of the HCWD is the logical solution to serving this area.

Underserved Areas. The HCWD serves all areas within its service boundaries.

Proposed Improvements

System Upgrades. The District recently completed a Water System Improvement Project which included the following upgrades:

- Seismic upgrade and painting of 200,000 gallon water storage tank.
- Addition of second line from well site to North Fisher Road replacing existing line through slippage area.
- Creating loops in distribution system from North Fisher Road to Creekside Place and from Chuckhole Road to Rohnerville Road.

The District is now planning the following improvements as funds become available:

- Increase size of distribution lines in the Quail Hill subdivision.
- Additional well and additional 500,000 gallons storage.

Future Expansion. The District has no plans for future expansion. However, the County is interested in the prospect of HCWD becoming a community services District and expanding services to include sewer service in addition to water, and expand services to Carlotta as well.

Cost and Schedule of Improvements. The District has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system.

6.4.7. Loleta USA

The County estimates there were 278 housing units within the Loleta USA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Loleta USA could have between 307 and 456 total housing units by 2025. However, according to Table 1-6, the high build-out estimate for total development potential within the USA, which takes into consideration physical and zoning constraints, is only 394. Therefore, the high growth rate projection is in excess of what the land can bear.

The high build-out estimate for total development potential of 394 housing units in the USA was used for infrastructure assessment and recommendations. This represents 116 new housing units within the Loleta USA.

6.4.7.1. Summary

Findings

Loleta's water system is in poor to fair condition. Major deficiencies associated with the existing system are poor water quality and quantity from the wells, undersized distribution mains, and inadequate storage capacity. The existing greensand treatment facility is also undersized and not providing adequate removal of iron and manganese. Additionally, the Loleta USA could receive up to an additional 116 new housing units before reaching build-out conditions. The Loleta CSD will need to upgrade and expand its water system infrastructure to serve this additional growth.

Existing Capacity

Loleta's water system is currently limited by the source capacity of its wells with respect to availability of connections. Source capacity is limited by the existing pumps and is approximately 0.276 MGD if the pumps are operated 24 hours per day. Given existing maximum day demands are estimated at 0.21 MGD, the system is operating at approximately 76% of

source capacity. Therefore, there are approximately 75 available connections under the existing infrastructure. Treatment is not considered limiting as it is designed for iron and manganese removal, two constituents that do not pose health related threats but do cause taste and aesthetic problems.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Loleta USA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the USA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

Table 6-7. Water system infrastructure assessment for the Loleta USA.

WATER SYSTEM STATISTICS	
# of Existing Connections	239
# of Available Connections ¹	75
Source Capacity (MGD)	0.276
Storage Capacity (MG)	0.225
Treatment Capacity (MGD)	0.158
Peak Day Use (MGD)	0.21
Usage Rate (gpd/connection)	879
CORRECTION OF EXISTING DEFICIENCIES	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.105 MG ²</i>	\$210,000
<i>Upgrade distribution system – 0.6 miles ³</i>	\$316,800
<i>Expand greensand filter capacity – 0.052 MGD ⁴</i>	\$260,000
Estimated Cost for Existing Deficiencies (\$)	\$786,800
Estimated Cost per Existing Connection (\$)	\$3,292
Estimated Financing Cost per Existing Connection (\$/Month)	\$17.60
LOW BUILD-OUT ESTIMATE	
# of Projected New Connections	87
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.076 MG ⁵</i>	\$152,000
<i>Additional source capacity – drill 2 new wells</i>	\$100,000
<i>Expand greensand filter capacity – 0.076 MGD ⁴</i>	\$380,000
Estimated Cost for Build-Out Infrastructure (\$)	\$632,000
Estimated Cost per New Connection (\$)	\$7,264
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$1,418,800
Estimated Cost per Connection (\$)	\$4,352
Estimated Financing Cost per Connection (\$/Month)	\$23.26
HIGH BUILD-OUT ESTIMATE	
# of Projected New Connections	116
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.102 MG ⁵</i>	\$204,000
<i>Additional source capacity – drill 2 new wells</i>	\$100,000
<i>Expand greensand filter capacity – 0.102 MGD ⁴</i>	\$510,000
Estimated Cost for Build-Out Infrastructure (\$)	\$814,000
Estimated Cost per New Connection (\$)	\$7,017
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$1,600,800
Estimated Cost per Connection (\$)	\$4,509

Estimated Financing Cost per Connection (\$/Month)	\$24.10
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- NOTES: ¹ The number of available connections within the Loleta area was estimated based on the supply capacity of the wells. Current peak day demands are 76% of supply capacity.
- ² Additional storage requirements are based on 1 day of existing maximum day use (0.21 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.225 MG).
- ³ According to the DHS annual inspection report, approximately 13% of the 4.5 miles of distribution system is galvanized steel pipe in fair condition. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).
- ⁴ Existing treatment capacity is estimated at 0.158 MGD.
- ⁵ Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 879 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$786,800 loan would amount to approximately \$50,000 per year. With 239 existing ratepayers, monthly bills would have to be increased by \$18 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

6.4.7.2. Description of Urban Study Area

A map showing the Loleta USA is attached as Figure 6-6. The Loleta USA is located just south of Humboldt Bay and north of the Eel River floodplain along U.S. Highway 101. The Loleta USA has 119 total acres, of which 34 acres are underdeveloped and/or vacant parcels. Of this total acreage, 31 acres within the USA are developable. With respect to development potential, the Loleta USA consists of both underdeveloped parcels and some larger vacant parcels. The area's land use guidelines and development potential are addressed in the Eel River Area Plan (Local Coastal Program) and the Humboldt County Framework General Plan.

**6.4.7.3. Water System
Service Area Description**

The Loleta USA is provided water service through the Loleta Community Services District (LCSD). The LCSD was originally organized on November 13, 1990 under Government Statute 1923, Statutes 1, Chapter 171. The governing board of the District is the Board of Directors. The registered voters of the District elect the Board of Directors. The District was formed for the purpose of providing water and sewer services.

System Standards

LCSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

Fiscal Condition/Capital Replacement Program

According to LCSD records, the District operates its water system on an annual budget of approximately \$132,000. The majority of this income is from service charges and water sales. Replacement or depreciation funds are not accumulated through revenues. The District last developed a Capital Improvement Plan in 2007, and they do not currently have water fund reserves. In fact, the water fund is in debt to the wastewater fund for approximately \$140,000.

Water Demand

LCSD retailed over 38 million gallons of drinking water in 2005 according to the 2007 DHS annual inspection report. Average daily use is therefore estimated at 0.105 MGD, and peak daily use was reported as unknown but is estimated as twice average daily use, or approximately 0.210 MGD. The Loleta USA has approximately 239 existing connections, of which approximately 226 are residential connections and the remaining 13 connections are non-residential connections serving 11 businesses and 2 industrial connections including the Loleta Cheese Factory and the Humboldt Creamery. Approximately 94% of households within the USA are serviced with water. Roughly 25% of water demands are associated with the commercial and industrial users (Drumm, 2007); therefore residential maximum day usage is estimated at 0.158 MGD (697 gpd/connection).

Water Supply, Treatment, Distribution and Storage

The District has a total of four wells available for use; however, only one is in daily use. Well production ranges from 25 to 80 gpm, for a total production capacity of 276,000 gpd. All wells exceed the secondary DHS limits for iron, manganese, or both. Therefore, the District's main limitation is its capacity to remove iron and manganese from the water through its green sand filter. The green sand filter removes iron and manganese by injecting chlorine and potassium permanganate. Treated water is provided to the service area through approximately 3 miles of pipe from a 225,000 gallon storage tank located just off the freeway. The treatment system runs an average of twelve to thirteen hours a day.

Condition Assessment

Overview. Water service within the Loleta USA is generally fair, although the District does suffer from poor quality groundwater with respect to secondary DHS limits. Current peak water use is at approximately 76% of available production capacity.

Current Deficiencies. The present storage capacity is inadequate for combined emergency and fire storage suggested requirements. The storage tank is also an older redwood tank and will likely need repairs or replacement with this planning period. Some water mains are also undersized with respect to ability to provide fire flows. Water quality is also an issue, and wells in this area are known to have problems with either the quantity or quality (or both) of water produced. The existing greensand treatment system is also undersized (Oscar Larson & Associates, 2006b).

Underserved Areas. The LCSD serves all areas within its service boundaries.

Proposed Improvements

System Upgrades. The District's main well is leased. Therefore, the District plans to purchase or acquire this property through eminent domain. A second well will also be drilled on this property. Additional land will be required to install a treatment facility for these wells. A new treatment plant is planned for completion in 2009.

Present storage is inadequate for combined emergency and fire storage. Therefore, additional storage is planned to be built and the existing storage repaired. Present plans are for construction of a second tank with 155,000 gallons of storage and repair of the existing 225,000 gallon tank. The new storage tank is planned for 2010. Additional water mains are being considered to provide fire flows in all sections of town. Mains may be extended on South Main or Montgomery to service new construction in that area.

Future Expansion. A subdivision has been approved which will increase the water infrastructure to include up to 39 new connections. There are no plans to expand operations beyond existing subdivision and infill plans.

Cost and Schedule of Improvements. The District's latest Capital Improvements Plan was developed in 2007 and identified two major projects – an upgrade to the well sources estimated at \$760,000 and construction of a second storage tank, estimated at \$540,000.

6.4.8. Manila USA

The County estimates there were 389 housing units within the Manila USA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Manila USA could have between 430 and 637 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the USA, which takes into consideration physical and zoning constraints, is 622. Therefore, the high growth rate projection is in excess of what the land can bear.

The high build-out estimate for total development potential of 622 housing units in the USA was used for infrastructure assessment and recommendations. This represents 233 new housing units within the Manila USA.

6.4.8.1. Summary

Findings

Manila's water system is in good condition. The only major deficiencies associated with the existing system are some undersized water mains and inadequate storage capacity. The existing storage tank is of redwood construction and is over 40 years old. It is anticipated that this tank will need either rehabilitation or replacement within the planning period. The District is currently exploring grant funding to increase water storage capacity. Additionally, the Manila USA could receive up to an additional 233 new housing units before reaching build-out conditions. The Manila CSD will need to expand its water system infrastructure to serve this additional growth.

Existing Capacity

Manila's water system is not limited by either source or treatment capacity with respect to its availability of connections. HBMWD has sufficient water supply to meet District demands.

Summary Of Required Improvements

The following table summarizes the infrastructure assessment for the Manila USA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the USA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

Table 6-8. Water system infrastructure assessment for the Manila USA.

WATER SYSTEM STATISTICS	
# of Existing Connections	342
# of Available Connections ¹	---
Source Capacity (MGD)	Not limiting (HBMWD)
Storage Capacity (MG)	0.1
Treatment Capacity (MGD)	Not required
Peak Day Use (MGD)	0.157
Usage Rate (gpd/connection)	459
CORRECTION OF EXISTING DEFICIENCIES	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.177 MG ²</i>	\$354,000
<i>Upgrade distribution system – 2,300 LF ³</i>	\$230,000
Estimated Cost for Existing Deficiencies (\$)	\$584,000
Estimated Cost per Existing Connection (\$)	\$1,708
Estimated Financing Cost per Existing Connection (\$/Month)	\$9.13
LOW BUILD-OUT ESTIMATE	
# of Projected New Connections	142
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.065 MG ⁴</i>	\$130,000
Estimated Cost for Build-Out Infrastructure (\$)	\$130,000
Estimated Cost per New Connection (\$)	\$915
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$714,000
Estimated Cost per Connection (\$)	\$1,475
Estimated Financing Cost per Connection (\$/Month)	\$7.89
HIGH BUILD-OUT ESTIMATE	
# of Projected New Connections	233
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.107 MG ⁴</i>	\$214,000
Estimated Cost for Build-Out Infrastructure (\$)	\$214,000
Estimated Cost per New Connection (\$)	\$918
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$798,000
Estimated Cost per Connection (\$)	\$1,388
Estimated Financing Cost per Connection (\$/Month)	\$7.42

NOTES: ¹ There is sufficient source supply from HBMWD to serve all development potential within the USA.

² Additional storage requirements are based on 1 day of existing maximum day use (0.157 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.1 MG).

³ According to the DHS annual inspection report, some old 2-inch mains remain in the system. These should be replaced to provide more reliable fire flows. District staff report approximately 2,300 LF of 2" pipe. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).

⁴ Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 459 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$584,000 loan would amount to approximately \$37,500 per year. With 342 existing ratepayers, monthly bills would have to be increased by approximately \$9 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In

addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

6.4.8.2. Description of Urban Study Area

A map showing the Manila USA is attached as Figure 6-7. The Manila Urban Study Area is located along the north spit of Humboldt Bay on the Samoa Peninsula, between Humboldt Bay and the beach and dunes of the Pacific Ocean. The Manila USA has 1,455 total acres, of which 172 acres are underdeveloped and/or vacant parcels. Of this total acreage, 131 acres within the USA are developable. With respect to development potential, the Manila USA consists of both underdeveloped parcels and some larger vacant parcels. The area's land use guidelines and development potential are addressed in the Humboldt Bay Area Plan (Local Coastal Program) and the Humboldt County Framework General Plan. Much of the District is in the Tsunami inundation zone.

6.4.8.3. Water System

Service Area Description

The Manila USA is provided water service through the Manila Community Services District (Manila CSD). The Manila CSD was formed on July 20, 1965 by the Humboldt County Board of Supervisors as an independent multi-purpose District organized pursuant to Resolution No. 2130 adopted under the Community Services District Law, pursuant to Title 6, Division 2, of the California Government Code. The five-member Board of Directors is locally elected by the residents of the District. The District employs a General Manager who is responsible for administering and implementing policies set by the Board. The Manila CSD provides water, wastewater, and recreation services.

System Standards

Manila CSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

Fiscal Condition/Capital Replacement Program

According to Manila CSD records, the District operates its water system on an annual budget of approximately \$122,000. The majority of this income is from service charges and water sales. Replacement or depreciation funds are not accumulated through revenues, although the District is beginning a rate increase to accumulate these funds. The District developed a preliminary Capital Improvement Plan in August 2007, and they currently do not have built up reserves.

Water Demand

According to 2005/2006 HBMWD records, Manila CSD's average daily use was 0.119 MGD and peak daily use was 0.157 MGD. The District delivered approximately 45 million gallons of water in fiscal year 2005/2006. The District has approximately 342 active connections, of which 336 are

residential connections (308 single family and 28 multi family). Non-residential connections include Sierra Pacific Industries, Redwood Coast Trucking, Manila Community Center and Park, an RV Park, and formerly Manila Market.

Water Supply, Treatment, Distribution and Storage

The District receives its water supply through contract with HBMWD. Water is delivered from HBMWD's pipeline through a 10-inch DIP or AC pipe leading to the District's distribution system, which consists of approximately 6 miles of distribution mains ranging in size from 2 inches to 8 inches. Approximately 95% of the distribution system is AC pipe, while the remaining 5% is PVC pipe. The District has one main pressure zone served by a 0.1 MG redwood storage tank. The system has a booster pump station to supply system pressure when high demands cause a drop in pressure or to supply the system during outages or for fire flow.

Condition Assessment

Overview. Water service within the Manila USA is generally good. Peak daily use of HBMWD water for the City (0.157 MGD in 2005/2006) is currently less than their peak rate allocation of 0.21 MGD set in contract with HBMWD on July 1, 2006.

Current Deficiencies. The system has several old 2-inch mains, which are not in accordance with Waterworks Standards for distribution systems. Storage capacity is also not in compliance with Waterworks Standards and does not meet minimum fire suppression requirements. However, MCSD reports that all hydrants are on six inch water mains or larger. MCSD further reports that homes built after 2001 meet the requirement for a hydrant to be located within 250 feet of the structure, and that homes built earlier met the then current code. The storage tank is constructed of redwood and will likely need to be rehabilitated or replaced within the planning period.

Underserved Areas. The MCSD serves all areas within its service boundaries.

Proposed Improvements

System Upgrades. The District has no major plans for system upgrades at this time. They are planning on minor upgrades, such as replacing valves, installing new fire hydrants, and replacing the storage tank roof in the near future. The District is also applying for grants to increase water storage capacity.

Future Expansion. The District may expand services south of its current service boundary depending on the status of proposed developments and their willingness to fund such improvements. However, the fact that portions of the District are within the Tsunami inundation zone may impact the extent of future development.

Cost and Schedule of Improvements. The District developed a preliminary Capital Improvement Plan in August 2007 that covers costs and schedules for improvements to its water system.

6.4.9. McKinleyville USA & WSA

The McKinleyville study area contains both a USA and WSA. The County estimates there were 5,940 and 431 housing units within the McKinleyville USA and WSA, respectively in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the McKinleyville USA could have between 6,563 and 9,733 total housing units by 2025, while the McKinleyville WSA could have between 476 and 706 total housing units by 2025. According to Table 1-6, the high build-out estimates for total development potential within the USA and WSA, which takes into

consideration physical and zoning constraints, are 10,052 and 568, respectively. Therefore, the growth projections for the USA are in excess of what the land can bear.

The high build-out estimates for total development potential of 10,052 and 568 housing units in the USA and WSA were used for infrastructure assessment and recommendations. This represents a combined 4,249 new housing units within the McKinleyville USA and WSA.

6.4.9.1. Summary

Findings

McKinleyville's water system is in good condition. There are no major infrastructure deficiencies associated with the existing system, aside from the need for additional storage. Efforts are underway to upgrade the pump station on North Bank Road to improve system pressures when HBMWD's Korblex tank water levels are low. The District has also recently purchased a property for siting of a 6-MG water storage tank and will be beginning design in the near future. Additionally, the McKinleyville USA and WSA are expected to receive up to 4,249 new housing units before reaching build-out conditions. McKinleyville will need to expand its water system infrastructure to serve this additional growth. However, it's been assumed that any costs for new main-line extensions would be borne by developer(s).

Existing Capacity

McKinleyville's water system is not limited by either source or treatment capacity with respect to its availability of connections. HBMWD has sufficient water supply to meet District demands.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the McKinleyville USA/WSA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the USA/WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

Table 6-9. Water system infrastructure assessment for the McKinleyville USA and WSA.

WATER SYSTEM STATISTICS	
# of Existing Connections	5,085
# of Available Connections ¹	---
Source Capacity (MGD)	Not limiting (HBMWD)
Storage Capacity (MG)	5.25
Treatment Capacity (MGD)	Not required
Peak Day Use (MGD)	3,792
Usage Rate (gpd/connection)	746
CORRECTION OF EXISTING DEFICIENCIES	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Upgrade North Bank Rd. booster station</i>	\$250,000
Estimated Cost for Existing Deficiencies (\$)	\$250,000
Estimated Cost per Existing Connection (\$)	\$49
Estimated Financing Cost per Existing Connection (\$/Month)	\$0.26
LOW BUILD-OUT ESTIMATE	
# of Projected New Connections	2,347
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.412 MG ²</i>	\$824,000
Estimated Cost for Build-Out Infrastructure (\$)	\$824,000
Estimated Cost per New Connection (\$)	\$351
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$1,074,000
Estimated Cost per Connection (\$)	\$145
Estimated Financing Cost per Connection (\$/Month)	\$0.77
HIGH BUILD-OUT ESTIMATE	
# of Projected New Connections	4,249
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 1.831 MG ²</i>	\$3,662,000
Estimated Cost for Build-Out Infrastructure (\$)	\$3,662,000
Estimated Cost per New Connection (\$)	\$861
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$3,912,000
Estimated Cost per Connection (\$)	\$419
Estimated Financing Cost per Connection (\$/Month)	\$2.24

NOTES: ¹ There is sufficient source supply from HBMWD to serve all development potential within the USA.

² Additional storage requirements are based on 1 days of estimated maximum day use for new connections (# of total connections x 746 gpd/connection).plus minimum fire storage of 120,000 gallons minus existing storage (5.25 MG).

The above estimated costs are based upon assumptions and the actual costs will be different. McKinleyville CSD has approximately \$1.57 million in reserves that could fund a portion of their future infrastructure needs. Under high build out conditions, approximately \$2.092 million in additional funding will be required. This funding would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$2.092 million loan would amount to approximately \$134,000 per year. With 9,334 potential ratepayers under high build-out, monthly bills would have to be increased by slightly over one dollar.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as

these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

6.4.9.2. Description of Urban Study Area

A map showing the McKinleyville USA and WSA is attached as Figure 6-8. The study areas are located north of Humboldt Bay in mid-Humboldt County, California along the coast. The USA stretches from North Bank Road along the Mad River on the south to Patrick's Creek on the north. The WSA is located mainly northeast of the USA and contains areas such as Dows Prairie. The eastern boundary of the McKinleyville WSA borders the Fieldbrook WSA.

The McKinleyville USA has 5,521 total acres, of which 2,038 acres are underdeveloped and/or vacant parcels. Of this total acreage, 1,683 acres within the USA are developable. The McKinleyville WSA has 2,740 total acres, of which 836 acres are underdeveloped and/or vacant parcels. Of this total acreage, 670 acres within the WSA are developable. With respect to development potential, the McKinleyville USA consists of both underdeveloped parcels and vacant parcels. The area's land use guidelines and development potential are covered in the McKinleyville Community Plan and the McKinleyville Area Plan (Local Coastal Program) for the portion of the USA within the coastal zone.

6.4.9.3. Water System Service Area Description

The McKinleyville USA receives water service from McKinleyville Community Services District (MCSD). The Dows Prairie portion of the McKinleyville WSA and the Patrick's Creek CSD, whose residents are retail customers of MCSD, receives water service from the District, while some of the WSA relies on private water supplies. MCSD was declared formed on April 21, 1970 after a successful special election was held within the area proposed for District formation.

The District was formed as an independent multi-purpose District organized pursuant to Section 61000 et seq. of the California Government Code. Although the District now provides water, wastewater, recreation, and street light services, it was originally formed to provide a community water supply system only. The McKinleyville CSD's area of approximately 19.5 square miles makes it the largest District of its type in Humboldt County. When formed, the District had a land area of 19 square miles or 12,160 acres. The *Azalea Park Annexation* in 1973 (the District's only annexation since formation) added approximately one-half square mile or 320 acres. The District's current boundaries encompass the area from the Pacific Ocean on the west to the ridgeline bordering the Fieldbrook area on the east. The District extends north from the Mad River approximately 5.5 miles. The McKinleyville CSD is governed by a locally elected five-member Board of Directors.

The Patrick's Creek CSD is located in the northern end of the McKinleyville WSA. The Patrick's Creek CSD does not provide domestic water service and the residents of the District are retail water customers of MCSD.

System Standards

MCSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

Fiscal Condition/Capital Replacement Program

According to MCSD records, they operate their water system on an annual budget of approximately \$1.553 million. The majority of this income is from service charges, but funding also comes from connection charges and interest on reserves. Replacement or depreciation funds are accumulated through revenues in general reserves. The District's currently maintains a five and ten year Capital Improvement Plan and they currently have approximately \$1.57 million in reserves.

Water Demand

According to 2005/2006 HBMWD records, MCSD's average daily use was 1.696 MGD and peak daily use was 3.792 MGD. The District delivered over 636 million gallons of water in fiscal year 2005/2006. The District has approximately 5,085 existing connections, of which about 4,785 are residential connections, and retails water to the Patrick's Creek CSD.

Water Supply, Treatment, Distribution and Storage

The District purchases potable water from HBMWD. The District currently has 5.25 million gallons of storage capacity. The existing distribution system has more than sufficient capacity for existing demands and is sized to serve approximately 10,000 homes.

Treated water from HBMWD's Korblex storage tanks is piped under the Mad River to MCSD's Grant A. Ramey Pump Station at the intersection of Azalea and North Bank Roads. The water is then boosted up to four storage tanks located at Cochran and Norton Roads and in-turn to a third higher elevation tank on McCluski Hill. The Cochran and Norton sites each contain a 1.0 and 1.5 MG steel reservoir. The McCluski Hill site contains a 0.1 and 0.15 MG redwood reservoir. This system provides a gravity-flow distribution of water to end users and fire hydrants throughout the water service area. A fourth undeveloped tank site on Murray Road has been purchased by the MCSD to serve future community water needs. The District plans to build a six million gallon storage tank at this site. The delivery system, from storage tanks to individual users, consists of about 70 miles of water mains.

Condition Assessment

Overview. MCSD's water system is in good condition overall. Peak daily use of HBMWD water for the District (3.792 MGD in 2005/2006) currently exceeds their peak rate allocation of 2.80 MGD set in contract with HBMWD on July 1, 2006.

Current Deficiencies. The pump station on North Bank Road is currently limited by the water level at the HBMWD's Essex Hill storage tank at Korblex. Efforts to upgrade the pump station are underway.

Underserved Areas. All areas are served within the McKinleyville USA and WSA.

Proposed Improvements

System Upgrades. The District is investigating an additional 6 million gallons of storage capacity to serve future development in the northern reaches of the District and additional water supply sources to provide additional redundancy in case of emergency. Efforts to upgrade the pump station are also under way. The District is also investigating a connection with the City of Arcata's water system for additional redundancy and for emergency backup purposes.

Future Expansion. Most expected growth will be centered around the area from Central Avenue to McKinleyville Avenue in vacant tracts owned by the Miller and Pierson Families. Infill will

continue to occur by subdividing parcel with the USA to obtain higher density. Pockets of undeveloped large parcels occur in the southwest portion of town west of Highway 101 in some large tracts south of Murray Road and east of Central Avenue. The area from Dows Prairie Road to Central Avenue east of the airport has been considered for inclusion into the USA as infill becomes limited. MCSD foresees the possibility of extending water service to Dows Prairie in the northern reaches of its service area. This area, including the Dows Prairie area that is currently being served could potentially become a new pressure zone and outfitted with new water storage tanks.

Cost and Schedule of Improvements. MCSD has developed a Capital Improvement Plan that covers costs and schedules for improvements to its water system. These include periodic painting of the four steel reservoirs, pump replacements and upgrades of the Ramey Pump Station, planned construction of a new 6.0 million gallon tank on the Murray Road site and development of an emergency inter-tie to the south side of the Mad River. An emergency water supply may include the development of a well to provide supply in the event of an emergency or seismic event damaging the water main transmission line underneath the Mad River in the Hunt Road area.

6.4.10. Miranda USA

The County estimates there were 203 housing units within the Miranda USA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Miranda USA could have between 224 and 333 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the USA, which takes into consideration physical and zoning constraints, is 277. Therefore, the high growth rate projection is in excess of what the land can bear.

The high build-out estimate for total development potential of 277 housing units in the USA was used for infrastructure assessment and recommendations. This represents 74 new housing units within the Miranda USA.

6.4.10.1. Summary

Findings

Miranda's water system is in fair to good condition. The major deficiencies associated with the existing system are some undersized water mains and inadequate storage capacity. Additionally, the Miranda USA could receive up to an additional 74 units before reaching build-out conditions. The Miranda CSD will need to expand its water system infrastructure to serve this additional growth.

Existing Capacity

Miranda's water system is currently limited by the source capacity of its wells with respect to availability of connections. Source capacity is limited by the existing pumps and is estimated at 0.338 MGD if the pumps are operated 24 hours per day. Given existing maximum day demands are estimated at 0.22 MGD, the system is operating at approximately 65% of source capacity. Therefore, there are approximately 77 available connections under the existing infrastructure.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Miranda USA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the USA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

Table 6-10. Water system infrastructure assessment for the Miranda USA.

WATER SYSTEM STATISTICS	
# of Existing Connections	143
# of Available Connections ¹	77
Source Capacity (MGD)	0.338
Storage Capacity (MG)	0.2
Treatment Capacity (MGD)	Not required
Peak Day Use (MGD)	0.220
Usage Rate (gpd/connection)	1,538
CORRECTION OF EXISTING DEFICIENCIES	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.140 MG ²</i>	\$280,000
<i>Upgrade distribution system – 2 miles ³</i>	\$1,056,000
Estimated Cost for Existing Deficiencies (\$)	\$1,336,000
Estimated Cost per Existing Connection (\$)	\$9,343
Estimated Financing Cost per Existing Connection (\$/Month)	\$49.94
LOW BUILD-OUT ESTIMATE	
# of Projected New Connections	48
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.074 MG ⁴</i>	\$148,000
Estimated Cost for Build-Out Infrastructure (\$)	\$148,000
Estimated Cost per New Connection (\$)	\$3,083
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$1,484,000
Estimated Cost per Connection (\$)	\$7,770
Estimated Financing Cost per Connection (\$/Month)	\$41.53
HIGH BUILD-OUT ESTIMATE	
# of Projected New Connections	74
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.114 MG ⁴</i>	\$228,000
Estimated Cost for Build-Out Infrastructure (\$)	\$228,000
Estimated Cost per New Connection (\$)	\$3,081
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$1,564,000
Estimated Cost per Connection (\$)	\$7,207
Estimated Financing Cost per Connection (\$/Month)	\$38.53

NOTES: ¹ The number of available connections within Miranda was estimated based on the supply capacity of the wells. Current peak day demands are 65% of supply capacity.

² Additional storage requirements are based on 1 day of existing maximum day use (0.220 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.2 MG).

³ According to the DHS annual inspection report, approximately 70% of the distribution system is AC pipe in fair condition. High usage rates (1,538 gpd/connection) may also be indicative of extensive leaks in pipes warranting replacement. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).

⁴ Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 1,538 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$1.336 million loan would amount to approximately \$86,000 per year. With 143 existing ratepayers, monthly bills would have to be

increased by \$50 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

6.4.10.2. Description of Urban Study Area

A map showing the Miranda USA is attached as Figure 6-9. The Miranda USA is located in southern Humboldt County along the South Fork of the Eel River and U.S. Highway 101 near the southern entrance of the Avenue of the Giants. It lies between Myers Flat to the north and Phillipsville to the south.

The Miranda USA has 315 total acres, of which 113 acres are underdeveloped and/or vacant parcels. Of this total acreage, 86 acres within the USA are developable. With respect to development potential, the Miranda USA consists of mostly underdeveloped parcels with some vacant parcels. The area's land use guidelines and development potential are covered in the Avenue of the Giants Community Plan, which was last updated on April 11, 2000.

6.4.10.3. Water System

Service Area Description

The Miranda USA is provided water service through the Miranda Community Services District (Miranda CSD). The governing board of the District is the Board of Directors, elected by the citizens of the District. The District was formed for the purpose of providing water, sewer, and fire protection services.

System Standards

Miranda CSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

Fiscal Condition/Capital Replacement Program

According to Miranda CSD records, the District operates its water system on an annual budget of approximately \$70,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District has not developed a Capital Improvement Plan to date, and they currently have no reserves.

Water Demand

Miranda CSD retails approximately 33 million gallons of drinking water per year, according to the 2005 CHS annual inspection report. Average daily use for the entire District is approximately 0.100 MGD and peak daily use is approximately 0.220 MGD. The Miranda USA has approximately 143 existing connections. Approximately 70% of households within the USA are serviced with water.

Water Supply, Treatment, Distribution and Storage

The District's water source comes from two wells with rated capacities of 150 gpm and 85 gpm, for a total capacity of 0.338 MGD. The pumps are operated in a lead lag arrangement, with the larger pump leading during summer months and the smaller pump leading during winter months. There are 6-inch asbestos cement (AC) and ductile iron pipes from the wells to the treatment building. Continuous disinfection is provided through a BIF metering pump that injects calcium hypochlorite into the main line. The meter is switched on by the well pumps. Soda ash is used to raise the pH of the water, which is typically around 6.1. The District has 0.2 MG of total storage in the form of two 100,000 gallon tanks, one redwood and one bolted steel. The redwood tank was installed in 1964, and the bolted steel tank was installed in 1978. Both tanks are in good condition, although the redwood tank will likely need to be rehabilitated or replaced during this planning period.

The distribution system consists of one pressure zone, which is gravity fed by the two tanks. Low pressures are known to occur, especially in the School Road area, due to small diameter (2") mains. This problem is exacerbated when fire hydrants are in use. The District has 20 fire hydrants and approximately 3.5 miles of distribution piping.

The system has had some action level exceedances for copper and lead in the past, but these issues seem to have been resolved by the addition of soda ash feed.

Condition Assessment

Overview. Water service within the Miranda USA is generally good. Current peak water use is at approximately 65% of available production capacity.

Current Deficiencies. The District does not meet several DHS requirements with respect to their water system. According to a 2004 DHS inspection report, the District does not have the ability to collect raw water samples at their larger well, has difficulty maintaining proper chlorine residuals within the system, and needs to improve their monitoring program for bacteria, lead and copper, pH, and asbestos. Some small diameter mains within the distribution system do not meet Waterworks standards.

The District is interested in replacing and/or upgrading main water lines, and is currently exploring grant funding options.

Underserved Areas. Some areas within the Miranda USA suffer from low water pressure.

Proposed Improvements

System Upgrades. The District has no plans for system upgrades at this time. They are interested in replacing/and or upgrading main water lines if grant funding were found.

Future Expansion. The District has no plans for expansion of services or District boundaries.

Cost and Schedule of Improvements. The District has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system.

6.4.11. Orick USA & WSA

The Orick study area contains both a USA and WSA. The County estimates there were 104 and 92 housing units within the Orick USA and WSA, respectively in 2005. Based on the County's housing

growth projections of between 0.5% and 2.5%, the Orick USA could have between 115 and 170 total housing units by 2025, while the Orick WSA could have between 102 and 151 total housing units by 2025. According to Table 1-6, the high build-out estimates for total development potential within the USA and WSA, which takes into consideration physical and zoning constraints, are 134 and 128, respectively. Therefore, the growth projections for each study area are in excess of what the land can bear.

The high build-out estimates for total development potential of 134 and 128 housing units in the USA and WSA were used for infrastructure assessment and recommendations. This represents a combined 66 new housing units within the Orick USA and WSA.

6.4.11.1. Summary

Findings

Orick's water system is in good condition. The only major infrastructure deficiency associated with the existing system is lack of proper storage capacity. The storage tanks are constructed of redwood and will likely need either rehabilitation or replacement within the planning period. The Orick USA and WSA are expected to receive up to 66 new housing units before reaching build-out conditions. Orick will need to expand its water system infrastructure to serve this additional growth.

Existing Capacity

Orick's water system is currently limited by the source capacity of its wells with respect to availability of connections. Source capacity is limited by the existing pumps and is approximately 0.274 MGD if the pumps are operated 24 hours per day. Given existing maximum day demands are estimated at 0.216 MGD, the system is operating at approximately 79% of source capacity. Therefore, there are approximately 37 available connections under the existing infrastructure. Additional source capacity could be achieved through the installation of larger pumps within the existing well.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Orick USA/WSA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the USA/WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

Table 6-11. Water system infrastructure assessment for the Orick USA and WSA.

WATER SYSTEM STATISTICS	
# of Existing Connections	140
# of Available Connections ¹	37
Source Capacity (MGD)	0.274
Storage Capacity (MG)	0.2
Treatment Capacity (MGD)	Not required
Peak Day Use (MGD)	0.216
Usage Rate (gpd/connection)	1,543
CORRECTION OF EXISTING DEFICIENCIES	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.136 MG ²</i>	\$272,000
Estimated Cost for Existing Deficiencies (\$)	\$272,000
Estimated Cost per Existing Connection (\$)	\$1,943
Estimated Financing Cost per Existing Connection (\$/Month)	\$10.39
LOW BUILD-OUT ESTIMATE	
# of Projected New Connections	55
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.085 MG ³</i>	\$170,000
<i>Additional source capacity – larger pump for well</i>	\$20,000
Estimated Cost for Build-Out Infrastructure (\$)	\$190,000
Estimated Cost per New Connection (\$)	\$3,455
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$462,000
Estimated Cost per Connection (\$)	\$2,369
Estimated Financing Cost per Connection (\$/Month)	\$12.66
HIGH BUILD-OUT ESTIMATE	
# of Projected New Connections	66
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.102 MG ³</i>	\$204,000
<i>Additional source capacity – larger pump for well</i>	\$20,000
Estimated Cost for Build-Out Infrastructure (\$)	\$224,000
Estimated Cost per New Connection (\$)	\$3,394
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$496,000
Estimated Cost per Connection (\$)	\$2,408
Estimated Financing Cost per Connection (\$/Month)	\$12.87

NOTES: ¹ The number of available connections in the Orick study areas was estimated based on the District currently being at 79% of its source capacity.

² Additional storage requirements are based on 1 day of existing maximum day use (0.216 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.2 MG).

³ Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 1,543 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$272,000 loan would amount to approximately \$17,500 per year. With 140 existing ratepayers, monthly bills would have to be increased by slightly over \$10 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing

deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

6.4.11.2. Description of Urban Study Area

A map showing the Orick USA and WSA is attached as Figure 6-10. The study area is located in northern Humboldt County along U.S. Highway 101 amongst the Redwood National and State Parks. The Orick USA borders Redwood Creek and surrounds the main community center area. The Orick WSA contains four separate areas surrounding the Orick USA.

The Orick USA has 268 total acres, of which 47 acres are underdeveloped and/or vacant parcels. Of this total acreage, 18 acres within the USA are developable. The Orick WSA has 1,509 total acres, of which 660 acres are underdeveloped and/or vacant parcels. Of this total acreage, 178 acres within the WSA are developable. With respect to development potential, the Orick USA consists mainly of underdeveloped parcels and some smaller vacant parcels, while the Orick WSA contains mostly vacant parcels. The area's land use guidelines and development potential are covered in the Orick Community Plan, last updated on May 7, 1985; and the coastal zone portion of Orick is subject to the North Coast Area Plan, which was last updated on December 14, 1981.

6.4.11.3. Water System

Service Area Description

The Orick Community Services District (OCSD) was originally organized in 1955 pursuant to the Government Code. The governing board of the District is the Board of Directors, elected by the citizens of the District. The District was formed for the purpose of providing water and fire protection services. The downtown Orick portion of the USA is provided water service through the OCSD and the northern portion of the USA (containing the Redwood Parks Lodge Company property) is located outside the OCSD boundaries but within the OCSD SOI. Only the portion of the Orick WSA located south of Orick off of Hilton Road is not within the OCSD's sphere of influence; therefore, this portion of the WSA would need to be included within the SOI and annexed into the District prior to the OCSD extending service.

System Standards

OCSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

Fiscal Condition/Capital Replacement Program

According to OCSD records, the District operates its water system on an annual budget of approximately \$62,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District has not developed a Capital Improvement Plan to date, and they currently have approximately \$100,000 in reserves.

Water Demand

OCSD retailed approximately 17 million gallons of drinking water in 2003 according to the 2007 DHS annual inspection report. The District does not maintain average daily use and maximum daily use statistics. However, from the DHS annual production data, it is estimated that average daily use for the entire District was approximately 0.047 MGD, and the District estimates peak daily use is approximately 0.216 MGD. The Orick USA has approximately 140 existing connections, of which approximately 120 are residential connections. Approximately 73% of households within the USA and WSA are serviced with water. Some homes in the northern region of the USA service area are not served with water as they are outside the OCSD boundaries.

Water Supply, Treatment, Distribution and Storage

The initial Orick water system was built in 1977-1978 with funds obtained from the State of California under the Davis-Grunsky Program and the Farmers Home Administration at a cost of approximately \$400,000. At the time of planning the existing system, the need for water to service the area south of Orick was recognized but funding availability forced the curtailment of the project. Funding for the extension of the system was granted with aid from Redwood National Park in 1983.

The District maintains two active wells. One well has a capacity of 80 gpm, and the other has a capacity of 110 gpm, according to DHS inspection records, for a total production capacity of 0.274 MGD. The wells are operated manually, as well as the chlorination system. Wells are rotated into production manually each week. Continuous disinfection is achieved through a LMI Company positive displacement diaphragm feeder that directly injects chlorine into the well casings. The District maintains one pressure zone in its distribution system, serviced by approximately 6 miles of 4-inch through 8-inch PVC and AC pipe. The District's storage capacity includes two 100,000 gallon redwood storage tanks built in 1977 and 1987. This represents less than one day of storage.

Condition Assessment

Overview. Water service within the Orick USA is generally good. Current peak water use is at approximately 79% of available production capacity.

Current Deficiencies. A significant deficiency of the current water system is its lack of proper storage – less than one day at maximum day demands. Having only 1 day (24 hours) of storage to meet the maximum daily demands is considered the minimum, and generally it is recommended that a District have at least two or three times that amount. Further, the storage tanks are constructed of redwood, are 20 and 30 years old, and will likely need rehabilitation or replacement within the planning period.

The system has also returned positive monitoring results for trihalomethanes and haloacetic acids in the recent past and efforts should be taken to minimize the presence of these disinfection byproducts. There is a leak present in the older of the two redwood storage tanks. The District is also in need of a cross connection control program to address actual and/or avoid potential connections between potable and non-potable water supplies.

Underserved Areas. Areas in the northern region of the USA are not served, as they are outside of District boundaries.

Proposed Improvements

System Upgrades. OCSD does not have current plans for system upgrades or a capital improvement plan in place.

Future Expansion. The District has the capacity to expand water services; however, population numbers in the Orick Community are in decline. In the case that expansion occurs in the community, more water lines and service connections will need to be added. The OCSD would need LAFCo approval to extend service to areas outside the district boundaries and SOI described above.

Cost and Schedule of Improvements. The District has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system.

6.4.12. Redway USA

The County estimates there were 688 housing units within the Redway USA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Redway USA could have between 760 and 1,127 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the USA, which takes into consideration physical and zoning constraints, is 1,277. Therefore, the growth projections for the study area are within the range of what the land can bear.

The high build-out estimate for total development potential of 1,277 housing units in the USA was used for infrastructure assessment and recommendations. This represents 589 new housing units within the Redway USA.

6.4.12.1. Summary

Findings

Redway's water system is in fair to good condition. The main infrastructure deficiency associated with the existing system is lack of proper treatment capacity. Some additional storage is also needed within the system, and some distribution system piping is in need of replacement and/or not of adequate size for proper fire flow protection. The Redway USA could receive up to 589 new housing units before reaching build-out conditions. Redway will need to expand its water system infrastructure to serve this additional growth.

Existing Capacity

Redway's water system is currently limited by the source capacity of its wells with respect to availability of connections. Source capacity is limited by the existing pumps and is approximately 0.838 MGD if the pumps are operated 24 hours per day. Given existing maximum day demands are estimated at 0.475 MGD, the system is operating at approximately 57% of source capacity. However, treatment capacity is limited to 0.46 MGD and therefore cannot meet present day maximum day demands. Therefore, there are no available connections under the existing infrastructure.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Redway USA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the USA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

Table 6-12. Water system infrastructure assessment for the Redway USA.

WATER SYSTEM STATISTICS	
# of Existing Connections	600
# of Available Connections ¹	0
Source Capacity (MGD)	0.838
Storage Capacity (MG)	0.375
Treatment Capacity (MGD)	0.46
Peak Day Use (MGD)	0.475
Usage Rate (gpd/connection)	792
CORRECTION OF EXISTING DEFICIENCIES	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.220 MG ²</i>	\$440,000
<i>Additional treatment capacity – 0.015 MGD ³</i>	\$75,000
<i>Replace distribution piping – 2 miles ⁴</i>	\$1,056,000
Estimated Cost for Existing Deficiencies (\$)	\$1,571,000
Estimated Cost per Existing Connection (\$)	\$2,618
Estimated Financing Cost per Existing Connection (\$/Month)	\$14.00
LOW BUILD-OUT ESTIMATE	
# of Projected New Connections	298
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.236 MG ⁵</i>	\$472,000
<i>Additional treatment capacity – 0.251 MGD ⁶</i>	\$1,255,000
Estimated Cost for Build-Out Infrastructure (\$)	\$1,727,000
Estimated Cost per New Connection (\$)	\$5,795
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$3,298,000
Estimated Cost per Connection (\$)	\$3,673
Estimated Financing Cost per Connection (\$/Month)	\$19.63
HIGH BUILD-OUT ESTIMATE	
# of Projected New Connections	589
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.466 MG ⁵</i>	\$932,000
<i>Additional source capacity – 0.104 MGD</i>	\$200,000
<i>Additional treatment capacity – 0.482 MGD ⁶</i>	\$2,410,000
Estimated Cost for Build-Out Infrastructure (\$)	\$3,542,000
Estimated Cost per New Connection (\$)	\$6,014
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$5,113,000
Estimated Cost per Connection (\$)	\$4,300
Estimated Financing Cost per Connection (\$/Month)	\$22.99

- NOTES: ¹ The number of available connections in the Redway study area was set at zero due to treatment capacity (0.46 MGD) being unable to meet peak day demands (0.475 MGD).
- ² Additional storage requirements are based on 1 day of existing maximum day use (0.475 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.375 MG).
- ³ Existing treatment capacity is 0.46 MGD, and maximum day demand is currently estimated at 0.475 MGD.
- ⁴ According to the DHS annual inspection report, the District has a number of old, undersized water mains. The report cites 4,000 feet of galvanized steel pipe that is mostly 2-inch. Some AC pipes also appear to be undersized for adequate fire flows, according to the County's GIS database. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).
- ⁵ Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 792 gpd/connection).
- ⁶ Future maximum day demands are estimated at 0.942 MGD. Existing source capacity is 0.838 MGD. This is assumed to include upgrades to infiltration gallery and water rights permitting.

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$1.571 million loan would amount to approximately \$101,000 per year. With 600 existing ratepayers, monthly bills would have to be increased by approximately \$14 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

6.4.12.2. Description of Urban Study Area

A map showing the Redway USA is attached as Figure 6-4. The USA encompasses Redway's community center along Redwood Drive and extends eastward to U.S. Highway 101. The Redway USA has 1,288 total acres, of which 850 acres are underdeveloped and/or vacant parcels. Of this total acreage, 469 acres within the USA are developable. With respect to development potential, approximately 30% of parcels within the Redway USA are considered vacant or underdeveloped parcels. The community center area and several vacant parcels in between Redwood Drive and U.S. Highway 101 have the most significant residential development potential.

The area's land use guidelines and development potential are covered in the Garberville, Redway, Benbow, and Alderpoint Community Plan, which was last updated on November 30, 2004.

6.4.12.3. Water System Service Area Description

The Redway USA receives water service from Redway Community Services District (RCSD). It is located within District boundaries and the Sphere of Influence. The RCSD was originally organized in 1965 pursuant to the provisions of Title 6, Division 2 of the Government Code. The Redway CSD is an independent special District with a five member elected Board of Directors. The term of office is four years. The District was formed for the purpose of providing water, sewer, fire protection, collection of garbage, and street lighting service. In 1977 the Redway Sanitary District was dissolved and combined with the Redway Community Services District. However, the Redway CSD provides only water and wastewater services.

System Standards

RCSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

Fiscal Condition/Capital Replacement Program

According to RCSD records, they operate their water system on an annual budget of approximately \$260,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District's latest Capital Improvement Plan was developed in 2006, and they currently have \$171,500 in reserves.

Water Demand

An annual inspection report from the DHS has not been completed since 1997. According to the District, RCSD produces approximately 60 million gallons of drinking water per year. Average daily use was approximately 0.175 MGD, and peak daily use was approximately 0.419 MGD in 2006. Peak daily use was reported in a recent storage analysis performed by Spencer Engineering for the District as 0.475 MGD. The District has approximately 600 existing service connections and does not retail water to any other Districts.

Water Supply, Treatment, Distribution and Storage

RCSD's water system consists of two water sources, a conventional filter water treatment plant, two storage facilities, two pressure reduction vaults, and one booster pump station, as well as the transmission and distribution lines, many of which were installed prior to 1950.

The sources of water are an infiltration gallery in the South Fork of the Eel River and an unnamed spring. The gallery has a reported capacity of 550 gpm, or 0.792 MGD. The maximum production for the spring is historically around 46,000 gallons per day. Total source capacity is estimated at 0.838 MGD. However, the water treatment plant design capacity is only 0.46 MGD, so treatment is limiting.

The total capacity of the two storage tanks is approximately 375,000 gallons. The District has a 275,000 gallon welded steel tank and a 100,000 gallon tank at a higher elevation that provides storage for the Meadows Industrial Park. The District maintains approximately 25 miles of distribution piping ranging in size from 1 ½ inches to 10 inches and consisting of iron, cement, and plastic pipe.

Condition Assessment

Overview. Redway CSD's water system is in overall fair to good condition. However, treatment capacity is currently below maximum day demands. Some storage capacity fortunately exists to provide water during these periods, but storage capacity is insufficient to even meet one day of maximum day demands. Current peak day demands are about 57% of source capacity.

Current Deficiencies. Many parts of the distribution system are approaching 60 years old. The District is focusing on replacing antiquated sections of the current water system as time, funding, and conditions permit. The District also has a lack of proper storage to meet existing and future growth and fire suppression requirements. Treatment capacity is also insufficient to meet current maximum day demands.

We recommend that a water master plan, including a computerized hydraulic model of the system be completed to more accurately develop and prioritize the necessary improvements.

Underserved Areas. The District currently serves all areas within its service boundaries. However, areas north and east of the present community center will provide major challenges in providing services due to topography and existing infrastructure capacity limitations.

Proposed Improvements

System Upgrades. The District is in the process of developing a five to twenty year plan that will address current infrastructure deficiencies as well as a proposal to upgrade the water transmission and distribution lines. The District does not have any other major plans for new infrastructure at this point. Its efforts are focused on replacing antiquated sections of the current water system as time, funding, and conditions permit.

Future Expansion. There are areas within the District that are in the planning stages of subdivision; the developer would have to provide the needed additional storage capacity and infrastructure to enable the District to provide services to these additional customers. LAFCo would also need to approve an expansion of the District SOI and boundaries for this service extension to occur.

Cost and Schedule of Improvements. The District has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system.

6.4.13. Rio Dell USA & WSA

The Rio Dell study area contains both a USA and WSA. The County estimates there were 5 and 31 housing units within the Rio Dell USA and WSA, respectively in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Rio Dell USA could have between 6 and 8 total housing units by 2025, while the Rio Dell WSA could have between 34 and 51 total housing units by 2025. According to Table 1-6, the high build-out estimates for total development potential within the USA and WSA, which takes into consideration physical and zoning constraints, are 13 and 38, respectively. Therefore, the growth projections for the USA are within the range of what the land can bear, but estimates for the WSA are in excess of what the land can bear.

The high build-out estimates for total development potential of 13 and 38 housing units in the USA and WSA were used for infrastructure assessment and recommendations. This represents a combined 15 new housing units within the Rio Dell USA and WSA.

6.4.13.1. Summary

Findings

The City of Rio Dell's water system is in very good condition. The City has made significant improvements to its water system over the past few years. There are currently no major infrastructure deficiencies associated with the existing system. The City has sufficient storage to meet the recommended two days of maximum day usage with fire suppression flows. While much of the original private system has been replaced, there are some portions that still need replacement. The Rio Dell USA and WSA are expected to experience minimal growth in the following twenty years, but the City is expected to experience larger growth. Rio Dell will need to expand its water system infrastructure to serve this additional growth.

Existing Capacity

Rio Dell's water system is currently limited by the source capacity of its infiltration gallery with respect to availability of connections. Source capacity is limited by the existing pumps and is approximately 0.792 MGD if the pumps are operated 24 hours per day. Given existing maximum day demands are estimated at 0.474 MGD, the system is operating at approximately 60% of source capacity. Therefore, there are approximately 786 available connections under the existing infrastructure.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Rio Dell USA/WSA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the USA/WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed. The existing capacity of the system includes connections within the City of Rio Dell as well.

Table 6-13. Water system infrastructure assessment for the Rio Dell USA and WSA.

WATER SYSTEM STATISTICS	
# of Existing Connections	1,179
# of Available Connections ¹	786
Source Capacity (MGD)	0.792
Storage Capacity (MG)	1.1
Treatment Capacity (MGD)	0.924
Peak Day Use (MGD)	0.474
Usage Rate (gpd/connection)	402
CORRECTION OF EXISTING DEFICIENCIES	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Upgrade distribution system - 5 miles ²</i>	\$2,640,000
Estimated Cost for Existing Deficiencies (\$)	\$2,640,000
Estimated Cost per Existing Connection (\$)	\$2,239
Estimated Financing Cost per Existing Connection (\$/Month)	\$11.97
LOW BUILD-OUT ESTIMATE	
# of Projected New Connections	9
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>None needed ³</i>	\$0
Estimated Cost for Build-Out Infrastructure (\$)	\$0
Estimated Cost per New Connection (\$)	\$0
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$2,640,000
Estimated Cost per Connection (\$)	\$2,222
Estimated Financing Cost per Connection (\$/Month)	\$11.88
HIGH BUILD-OUT ESTIMATE	
# of Projected New Connections	15
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>None needed ³</i>	\$0
Estimated Cost for Build-Out Infrastructure (\$)	\$0
Estimated Cost per New Connection (\$)	\$0
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$2,640,000
Estimated Cost per Connection (\$)	\$2,211
Estimated Financing Cost per Connection (\$/Month)	\$11.82

NOTES: ¹ The number of available connections in the Rio Dell study area was estimated based on the City currently being at 60% of its source capacity.

² It is assumed that approximately 5 miles of pipe are still in need of replacement following the City's recent Water System Improvements Project. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).

³ Existing storage is sufficient to meet both existing and future domestic and fire storage requirements. Source and treatment capacity are also sufficient.

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in

the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$2.64 million loan would amount to approximately \$169,000 per year. With 1,179 existing ratepayers, monthly bills would have to be increased by approximately \$12 per month to fund this loan. In reality, we would expect the City to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. City specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

6.4.13.2. Description of Urban Study Area

A map showing the City of Rio Dell's USA and WSA is attached as Figure 6-11. There are two areas within the Rio Dell USA, each located within the City's sphere of influence. These include (from south to north):

1. An area south of the City's boundary near Grayland Heights and located between the Eel River and Dean Creek.
2. A rectangular area on the Dinsmore Plateau surrounded on three sides by the City

The area on the Dinsmore Plateau is within the City's sphere of influence but does not hold much development potential for the County. Most existing residents are not in favor of annexation to the City, except for some who would like to subdivide their parcels. However, annexation of the parcels that have expressed interest in annexing and subdividing would create an "island" of unincorporated land within a City and would therefore not be allowed under current LAFCO guidelines. The area near Grayland Heights offers slightly more development potential. The Rio Dell WSA is located just southeast of the City boundary along Monument Road.

The Rio Dell USA has 87 total acres, of which 6 acres are underdeveloped and/or vacant parcels. Of this total acreage, 4 acres within the USA are developable. The Rio Dell WSA has 166 total acres, of which 46 acres are underdeveloped and/or vacant parcels. Of this total acreage, 40 acres within the WSA are developable. The area's land use guidelines and development potential are covered in the City of Rio Dell General Plan, which was last updated in October 2003.

6.4.13.3. Water System Service Area Description

The City of Rio Dell is the only service provider within the Rio Dell USA or Rio Dell WSA. All proposed study areas would receive water service from the City of Rio Dell.

System Standards

The City of Rio Dell's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

The City of Rio Dell has established improvement standards for all City owned infrastructure. To the extent that new development areas are annexed to the City, infrastructure development would be subject to these standards. To the extent that existing development is annexed, the City may apply existing development standards and require that all existing infrastructure be upgraded.

Fiscal Condition/Capital Replacement Program

According to City of Rio Dell records, they operate their water system on an annual budget of approximately \$575,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The City is developing a new Capital Improvement Plan to date, and they currently have not built up reserves.

Water Demand

According to the 2005 DHS annual inspection report, the City produced 97.5 million gallons of drinking water in 2004. Average daily use is estimated at 0.267 MGD, and peak daily use was reported as 0.474 MGD. However, these demand figures may be slightly high, as they are from 2004, before the City invested heavily into repairing its distribution system to minimize water losses. In 2006, the City only produced 91.1 MG of drinking water, representing approximately 7% decrease as compared to 2005. It is unclear what part of this decrease is attributable to the water system improvements versus natural variability in demands.

The City has approximately 1,179 connections within the system, of which approximately 96% are residential connections. The City also serves 49 commercial connections, two landscape connections, and two agricultural connections.

Water Supply, Treatment, Distribution and Storage

The City's water supply comes from a recently completed infiltration gallery in the South Fork of the Eel River. The production capacity of the gallery is tied to water levels within the river, such that in the winter the pumps can deliver around 700gpm, but in the summer production falls to about 550 gpm (0.792 MGD). Water is pumped to treatment for filtration and disinfection before entering the City's distribution system. The City has two pressure zones served by four tanks ranging in size from 100,000 gallons to 500,000 gallons for a total combined storage capacity of 1.1 million gallons. The distribution system contains approximately 11 miles of pipe, of which 5 miles were replaced with 10" HDPE pipe under the City's infrastructure rehabilitation project. The remaining distribution system ranges in size from 4 inches to 6 inches and consists mainly of AC pipe.

The City has recently invested heavily in upgrading its water system following a declared water emergency in 2001 when the City's water supply began to fail. Since then, they have received \$5.0 million in grant funds to rehabilitate the water distribution system City-wide and \$1.0 million in grant funds and a loan in the amount of \$2.3 million to construct a new infiltration gallery and water treatment plant. The new treatment plant has a design capacity of 700 gpm.

Condition Assessment

Overview. The City of Rio Dell has invested over \$8 million in its water system over the past couple years. The system is in very good condition overall and has sufficient capacity to accommodate growth anticipated in Rio Dell's new General Plan currently in the process of being updated. Current peak day demands are about 60% of source capacity.

Current Deficiencies. There are no current deficiencies associated with Rio Dell's water system.

Underserved Areas. The City serves all areas within its service boundaries.

Proposed Improvements

System Upgrades. The City has made significant improvements to its water system over the past few years. The City does not have any other major plans for new infrastructure at this point, and is now refocusing upgrade efforts to wastewater infrastructure.

Future Expansion. The City of Rio Dell has no major plans for expansion at this time.

Cost and Schedule of Improvements. The City of Rio Dell is in the process of developing a new Capital Improvement Plan since completing its recent Water System Improvements Project.

6.4.14. Samoa USA

The County estimates there were 104 housing units within the Samoa USA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Samoa USA could have between 115 and 170 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the USA, which takes into consideration physical and zoning constraints, is 422. Therefore, the growth projections for the study area are within the range of what the land can bear.

The high build-out estimate for total development potential of 422 housing units in the USA was used for infrastructure assessment and recommendations. This represents 318 new housing units within the Samoa USA.

6.4.14.1. Summary

Findings

Samoa's water system is in poor condition. The existing system has been purchased by Samoa Pacific Group, LLC and will be completely upgraded as part of the Samoa Town Master Plan proposed development. The Samoa USA is expected to receive an additional 318 units in the following twenty years.

Existing Capacity

Samoa's existing water system is not limited by either source or treatment capacity with respect to its availability of connections. HBMWD has sufficient water supply to meet study area demands.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Samoa USA and addresses infrastructure needs for existing development and for build-out conditions. The Samoa Town proposal is a major planned development within the USA still in the planning phases.

Table 6-14. Water system infrastructure assessment for the Samoa USA.

WATER SYSTEM STATISTICS	
# of Existing Connections	104
# of Available Connections ¹	---
Source Capacity (MGD)	Not limiting (HBMWD)
Storage Capacity (MG)	Future development
Treatment Capacity (MGD)	Not required
CORRECTION OF EXISTING DEFICIENCIES	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.172 MG²</i>	\$344,000
Estimated Cost for Existing Deficiencies (\$)	\$344,000
Estimated Cost per Existing Connection (\$)	\$3,308
Estimated Financing Cost per Existing Connection (\$/Month)	\$17.68
LOW BUILD-OUT ESTIMATE	
# of Projected New Connections	0
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>None needed</i>	\$0
Estimated Cost for Build-Out Infrastructure (\$)	\$0
Estimated Cost per New Connection (\$)	\$0
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$344,000
Estimated Cost per Connection (\$)	\$3,308
Estimated Financing Cost per Connection (\$/Month)	\$17.68
HIGH BUILD-OUT ESTIMATE	
# of Projected New Connections	318
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.159 MG³</i>	\$318,000
<i>Additional distribution capacity – 0.5 miles⁴</i>	\$264,000
Estimated Cost for Build-Out Infrastructure (\$)	\$582,000
Estimated Cost per New Connection (\$)	\$1,830
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$926,000
Estimated Cost per Connection (\$)	\$2,194
Estimated Financing Cost per Connection (\$/Month)	\$11.73

NOTES: ¹ There is sufficient source supply from HBMWD to serve all development potential within the USA.

² Additional storage requirements are based on 1 day of estimated maximum day use (500 gpd/connection x 104 connections = 0.211 MG) plus minimum fire storage of 120,000 gallons.

³ Additional storage requirements are based on 1 day of estimated maximum day use for new connections (318 new connections x 500 gpd/connection).

⁴ It is estimated that the Samoa Town Master Plan will require approximately 0.5 miles of new distribution system installation.

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$344,000 loan would amount to approximately \$22,000 per year. With 104 existing ratepayers, monthly bills would have to be increased by approximately \$18 per month to fund this loan. In the case that the Samoa Town development occurs, infrastructure will be constructed to correct existing deficiencies and serve the future development.

Future connections should buy into the existing infrastructure through connection fees in order to ensure replacement costs are collected to replace the infrastructure in the future.

6.4.14.2. Description of Urban Study Area

A map showing the Samoa USA is attached as Figure 6-7. The USA encompasses a small residential and industrial area just north of the LP Samoa pulp mill and south of the intersection of New Navy Base Road and Cookhouse Road. The Samoa USA has 301 total acres, of which 69 acres are underdeveloped and/or vacant parcels. Of this total acreage, 68 acres within the USA are developable. With respect to development potential, the Samoa USA contains a large underdeveloped parcel that borders the Peninsula Elementary School to the west and is situated between New Navy Base Road and Vance Avenue that could see further residential development.

The area's land use guidelines and development potential are covered in the Humboldt Bay Area Plan. The Samoa Town Master Plan is under review by Humboldt County, and if approved will amend the Humboldt Bay Area Plan.

6.4.14.3. Water System Service Area Description

Existing residences within the Samoa USA receive water service from the Samoa Pacific Group, LLC, who is a retail customer of HBMWD. The Samoa Pacific Group, LLC purchased the town of Samoa from the Simpson-Samoa Company in 2001 and has provided water service since then. The Samoa Pacific Group LLC has developed a master plan for the town of Samoa, whose Draft EIR was released in January 2006 and is being recirculated in 2007 to address changes to the master plan. Humboldt County Community Development Services Department is the lead agency for the proposed project. The EIR indicates the Group is interested in forming a management entity to serve the existing and proposed development within the town. However, what from this entity will take on has not been specified.

System Standards

The Samoa Pacific Group, LLC's water system is currently a private water system. However, public water system standards apply to private water systems that serve over 25 people for more than 60 days per year. Therefore, the Group's water system must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

It has not been determined who will serve the future Samoa Town. The condition of approval required by the EIR is that a management entity be formed to provide water service to the Samoa Town.

Fiscal Condition/Capital Replacement Program

There is no fiscal condition to be reported as a service provider has yet to be created for the USA.

Water Demand

According to the Samoa Town Master Plan Draft EIR, the Samoa Pacific Group, LLC has contracted with HBMWD to receive up to 0.450 MGD of treated water. Estimated average day flows for the proposed Samoa Town are approximately 0.175 MGD, while peak day flows are being estimated at around 0.315 MGD. Samoa Town currently has approximately 104 connections, while the proposed development would add approximately 318 more residential connections and several industrial connections.

Water Supply, Treatment, Distribution and Storage

The Samoa Pacific Group, LLC has proposed to completely upgrade the existing domestic distribution system to serve the proposed Samoa Town, including main lines, connections, meters, and fire hydrants. Water supply will continue to be provided through HBMWD, although the District will likely wholesale water to the newly formed service providing entity. The Samoa Pacific Group, LLC has also proposed a new 500,000 gallon storage tank to serve the proposed development. Water quality is representative of HBMWD's excellent water source and meets or exceeds State standards.

Condition Assessment

Overview. The existing distribution system is in poor condition. Water use averages about three to four times higher than would be expected for the existing service population, indicating significant leaks in the system. The system will be reconstructed as part of the Samoa Town Master Plan.

Formation of a management entity to serve the Town of Samoa will require LAFCO approval. However, according to LAFCO's Municipal Service Review guidelines, one of the main factors used in consideration of an entity's formation is whether existing services can be expanded to eliminate duplicate infrastructure construction. The Manila CSD's service boundary is less than one mile north of the proposed development. The Manila CSD has indicated they are interested in serving the development as long as the developer is willing to fund the studies, permits, and required infrastructure.

Current Deficiencies. There are significant losses that occur in the existing water system.

Underserved Areas. There are no underserved areas within the USA.

Proposed Improvements

System Upgrades. The Samoa Pacific Group, LLC has proposed to upgrade the entire domestic distribution system as a part of its development proposal. Water storage will also be provided as part of the project to provide for domestic and fire uses in case of a power outage or catastrophic failure on the Peninsula supply line.

Future Expansion. Approximately 318 residences and several commercial and industrial connections will be added to the existing distribution system as a result of the proposed development.

Cost and Schedule of Improvements. There is no plan to date that covers costs and schedules for improvements to the water system.

6.4.15. Scotia USA

The County estimates there were 270 housing units within the Scotia USA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Scotia USA could have between 298 and 442 total housing units by 2025. However, according to Table 1-6, the high build-out estimate for total development potential within the USA, which takes into consideration physical and zoning constraints, is 270. In addition, Scotia is built out with limited vacant parcels available for development and natural barriers, such as the Eel River further limit development. Therefore, zero growth has been projected for this USA.

The Scotia system is currently owned by the Pacific Lumber Company (PALCO). PALCO currently has filed an application with LAFCO for the formation of a CSD, which includes a Municipal Service Review (SHN 2007). In addition the City of Rio Dell has studied the potential for annexation (Winzler & Kelly, 2006). Those documents provide additional details about this USA.

6.4.15.1. Summary

Findings

Scotia's water system is in fair condition. The distribution system was installed in the 1930's and 1940's and is in need of significant repair and replacement (Winzler & Kelly, 2006). New distribution and service lines, along with individual water meters are needed before this system would meet current City or CSD standards. The treatment system on the other hand is in good condition and has plenty capacity. Storage capacity within the town is also well in excess of recommended storage levels. The Scotia USA is not expected to grow in the following twenty years.

Existing Capacity

Scotia's water system is currently limited by the source capacity of its infiltration gallery with respect to availability of connections. Source capacity is limited by the existing pumps at the domestic booster pump station and is estimated at 1.728 MGD if the pumps are operated 24 hours per day. Given existing maximum day demands are estimated at 0.384 MGD, the system is operating at approximately 22% of source capacity. Therefore, there are approximately 1,117 available connections under the existing infrastructure.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Scotia USA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the USA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

Table 6-15. Water system infrastructure assessment for the Scotia USA.

WATER SYSTEM STATISTICS	
# of Existing Connections	315
# of Available Connections ¹	1,117
Source Capacity (MGD)	1.728
Storage Capacity (MG)	1.488
Treatment Capacity (MGD)	1.8
Peak Day Use (MGD)	0.384
Usage Rate (gpd/connection)	1,219
CORRECTION OF EXISTING DEFICIENCIES	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Replace distribution piping – 3 miles ²</i>	\$1,584,000
Estimated Cost for Existing Deficiencies (\$)	\$1,584,000
Estimated Cost per Existing Connection (\$)	\$5,029
Estimated Financing Cost per Existing Connection (\$/Month)	\$26.88
LOW & HIGH BUILD-OUT ESTIMATE	
# of Projected New Connections	0
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>None needed ³</i>	\$0
Estimated Cost for Build-Out Infrastructure (\$)	\$0
Estimated Cost per New Connection (\$)	\$0

NOTES: ¹ The number of available connections in the Scotia study area was estimated based on the District currently being at 22% of its source capacity.

² According to the Scotia annexation study, a minimum of three miles of pipeline are in need of replacement.

³ Source and treatment capacity and available storage are sufficient.

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$1.584 million loan would amount to approximately \$102,000 per year. With 315 existing ratepayers, monthly bills would have to be increased by approximately \$27 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

6.4.15.2. Description of Urban Study Area

A map showing the Scotia USA is attached as Figure 6-11. The USA encompasses the town of Scotia, including its commercial, residential and industrial areas between the Eel River and U.S. Highway 101. There is currently no development potential in the Scotia USA.

Scotia's commercial town center, industrial activity, and residential areas comprise the Scotia USA. The County has not prepared development estimates for the USA to date, as the town is still

owned by PALCO. In 2003, to make the town's zoning more consistent with the County General Plan, PALCO requested zone changes for some areas. The Humboldt County Board of Supervisors approved the "Scotia Consistency Rezoning Project" which rezoned approximately 257 acres of industrial and commercial areas that were previously zoned Unclassified (U). (The project did not include any changes to the town's existing General Plan land use designations.) Approximately 245 acres of land, having the Industrial General (IG) General Plan land use designation, was changed from Unclassified (U) zone to Heavy Industrial, Qualified (MH/Q) zone under the Humboldt County Code. The remaining 12 acres of land, having the Commercial General (CG) land use designation, were changed from the U zone to Community Commercial, Qualified (C-2/Q) zone. The Qualifying (Q) combining zone was applied to include development restrictions for both zones (MH/Q and C-2/Q) in order to protect historic resources. PALCO is currently in the process of subdividing the town so that individual lots can be sold.

PALCO is in the process of selling its holdings within the town and determining how to serve residential and commercial areas in Scotia with essential services, including water. Options under consideration include either annexation to Rio Dell or formation of a Community Services District (CSD).

The Scotia USA has 464 total acres. No determination has been made by the County as to how much of this land is underdeveloped and/or vacant, or how much is developable. As part of the subdivision review, a California Environmental Quality Act Environmental Review document will be released which assesses current land uses in Scotia, and available land for development. The area's land use guidelines and development potential are covered in the Humboldt County General Plan.

6.4.15.3. Water System Service Area Description

The Scotia USA currently receives water service from PALCO, who owns, operates, and maintains the town's domestic water system. PALCO is interested in divesting its holdings in the town's infrastructure, including its water system. It is unclear at this point in time which option will be the most viable for PALCO and the residents of Scotia.

System Standards

PALCO's water system is a private water system. However, public water system standards apply to private water systems that serve over 25 people for more than 60 days per year. Therefore, the Group's water system must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

Fiscal Condition/Capital Replacement Program

PALCO's is under reorganization as defined by a Chapter 11 bankruptcy, and the strategy for the reorganization is not public at this time. Nonetheless, a functioning water system is part of the core operation for industrial activity and funds are devoted to maintaining and improving the water system.

Water Demand

According to an analysis performed by Winzler & Kelly in 2006, average day production at Scotia's water treatment facility was estimated at 0.412 MGD, with approximately 0.151 MGD used by Scotia's industrial customers and the remaining 0.261 MGD used by the remaining residential and commercial customers. According to the 2005 annual report to DHS, peak day flows in Scotia were estimated at 0.606 MGD. Assuming a similar percentage usage for industrial

uses, the domestic water peak demand is estimated at 0.384 MGD. Scotia currently has approximately 280 residential connections, 15 commercial connections, and 20 industrial connections.

Using PALCO estimates of the current population and percentage of vacant homes in Scotia, Winzler & Kelly (2006) estimated a per capita water usage of 283 gpcd (not including industrial uses). These water use estimates are approximately *two to three times* that expected for a community such as Scotia, with primarily single family homes, indicating significant losses from the distribution system. Water usage in the town of Scotia is also currently unmetered, which creates no financial incentive to conserve water.

Water Supply, Treatment, Distribution and Storage

PALCO's water supply comes from an infiltration gallery in the Eel River that supplies both a domestic water and fire system. The domestic system is fed by a domestic booster pump station with a firm capacity of 1.728 MGD. Water is pumped to a one million gallon raw water storage tank which also serves as a clarifier/settling tank. Raw water then flows by gravity through the water treatment facility for filtration and disinfection prior to entering a 0.488 MG finished water storage tank that serves the City's distribution system. The treatment capacity of the WTF is approximately 1.8 MGD. The distribution system contains approximately seven miles of pipeline ranging in size from 1 inch to 8 inches in diameter and consisting mainly of cast-iron and steel pipe installed in the 1930's and 1940's.

Condition Assessment

Overview. The existing water treatment plant is generally in good condition. However, some improvements are needed at the treatment plant and the distribution system is in poor condition and will require significant upgrading and replacement. Water use averages about two to three times higher than would be expected for the existing service population, indicating significant leaks in the system.

Current peak water use is at approximately 22% of available production capacity.

Current Deficiencies. There are significant losses that occur in the existing water system. The existing water distribution system is combined so that it provides fire flows to both the mill and residential properties. If the town is to be subdivided as is currently being proposed, improvements to the fire protection system will also be required. Currently, none of the residents have water meters.

Underserved Areas. There are no underserved areas within the USA.

Proposed Improvements

System Upgrades. System upgrades will largely depend on which option PALCO chooses to divest itself of the water infrastructure. Under the proposed annexation alternative, PALCO would retain a separate fire protection system to serve their properties, and the domestic water system would be upgraded to provide fire protection to the residential and commercial areas. While some of the existing fire mains can be reused, the vast majority of the distribution system will require new construction. New valves and fire hydrants will also be needed, and the two systems will be tied together to operate as one. New water services with meters would be required for the residential and commercial connections.

The decision on whether this USA is served by a CSD or is annexed to the City of Rio Dell will be determined by LAFCO. A critical issue in this decision will be to determine how the necessary upgrades and the operation and maintenance will be funded.

Future Expansion. There are currently no plans for future expansion.

Cost and Schedule of Improvements. There is no plan to date that covers costs and schedules for improvements to the water system. This will largely depend on the future of water service within the Scotia USA.

6.4.16. Shelter Cove USA & WSA

The Shelter Cove study area contains both a USA and WSA. The County estimates there were 441 and 133 housing units within the Shelter Cove USA and WSA, respectively in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Shelter Cove USA could have between 487 and 723 total housing units by 2025, while the Shelter Cove WSA could have between 117 and 174 total housing units by 2025. According to Table 1-6, the high build-out estimates for total development potential within the USA and WSA, which takes into consideration physical and zoning constraints, are 1,655 and 400, respectively. Therefore, the growth projections for each study area are within the range of what the land can bear. It should be noted that this projection assumes that the Shelter Cove water provider, Resort Improvement District #1 (RID), is able to locate an additional source of water. Without additional water, development potential would be limited to the maximum based on RID permitted capacity, 990 dwelling units.

The high build-out estimates for total development potential of 1,655 and 400 housing units in the USA and WSA were used for infrastructure assessment and recommendations. This represents a combined 1,481 new housing units within the Shelter Cove USA and WSA, subject to the caveat described above.

6.4.16.1. Summary

Findings

Shelter Cove's water system is in good condition. There are no major infrastructure deficiencies associated with the existing system. Some older coal tar coated steel pipe is in need of replacement. The Shelter Cove USA and WSA are expected to receive up to 1,481 new housing units before reaching build-out conditions, based on available developable land. The RID water right only allows for a total of 990 water connections, so new water sources will need to be developed to satisfy future build-out demands for water. Shelter Cove will need to expand its water system infrastructure to serve this additional growth, which was planned as a part of the original subdivision.

Existing Capacity

Spring production is estimated at 0.732 MGD over a 24 hour period for both Telegraph Creek intakes and Rick Spring. Given existing maximum day demands are estimated at 0.331 MGD, the system is operating at approximately 45% of source capacity. Therefore, there are approximately 556 available connections under the existing infrastructure. However, the District's existing water right currently limits connections to 990 total connections.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Shelter Cove USA/WSA and addresses infrastructure needs for existing development and for build-out conditions. There are

no planned developments within the USA/WSA, as the area was completely subdivided under the original plans that created this development.

Table 6-16. Water system infrastructure assessment for the Shelter Cove USA and WSA.

WATER SYSTEM STATISTICS	
# of Existing Connections	455
# of Available Connections ¹	535
Source Capacity (MGD)	0.36
Storage Capacity (MG)	2.1
Treatment Capacity (MGD)	0.462
Peak Day Use (MGD)	0.331
Usage Rate (gpd/connection)	727
CORRECTION OF EXISTING DEFICIENCIES	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Replace distribution piping – 1 mile ²</i>	\$528,000
Estimated Cost for Existing Deficiencies (\$)	\$528,000
Estimated Cost per Existing Connection (\$)	\$1,160
Estimated Financing Cost per Existing Connection (\$/Month)	\$6.20
LOW BUILD-OUT ESTIMATE	
# of Projected New Connections	1,196
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional source capacity – new wells</i>	\$100,000
<i>Additional treatment capacity – 0.739 MGD</i>	\$3,695,000
Estimated Cost for Build-Out Infrastructure (\$)	\$3,795,000
Estimated Cost per New Connection (\$)	\$3,173
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$4,323,000
Estimated Cost per Connection (\$)	\$2,618
Estimated Financing Cost per Connection (\$/Month)	\$14.00
HIGH BUILD-OUT ESTIMATE	
# of Projected New Connections	1,481
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional source capacity – new wells</i>	\$100,000
<i>Additional treatment capacity – 0.946 MGD</i>	\$4,730,000
Estimated Cost for Build-Out Infrastructure (\$)	\$4,830,000
Estimated Cost per New Connection (\$)	\$3,261
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$5,358,000
Estimated Cost per Connection (\$)	\$2,768
Estimated Financing Cost per Connection (\$/Month)	\$14.79

NOTES: ¹ The number of available connections in the Shelter Cove study area was estimated based on the District's limitation of 990 total connections, imposed by the California Department of Health Services.

² According to the latest DHS annual inspection report, 1 mile of coal tar coated steel pipe is in fair condition and is in need of replacement.

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$528,000 loan would amount to approximately \$34,000 per year. With 455 existing ratepayers, monthly bills would have to be increased by approximately \$6 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In

addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

6.4.16.2. Description of Urban Study Area

A map showing the Shelter Cove USA and WSA is attached as Figure 6-12. The Shelter Cove study area is located in Southern Humboldt along the coast approximately 20 miles southwest of Redway. The USA encompasses the lower portions of Shelter Cove's residential areas closest to the town center, while the WSA extends from the east boundary of the USA into the mountains.

The Shelter Cove USA has 873 total acres, of which 160 acres are underdeveloped and/or vacant parcels. Of this total acreage, 155 acres within the USA are developable. The Shelter Cove WSA has 1,899 total acres, of which 230 acres are underdeveloped and/or vacant parcels. Of this total acreage, 87 acres within the WSA are developable. With respect to development potential, the Shelter Cove USA and WSA contain mostly vacant parcels that could see further residential development. The area's land use guidelines and development potential are covered in the South Coast Area Plan and the Shelter Cove Community Plan Area.

6.4.16.3. Water System

Service Area Description

The Shelter Cove USA and WSA either receive or could receive water service from the RID, as both areas are located within the RID sphere of influence. The RID was formed in February 1965 pursuant to the provisions of the Public Resources code. The District was created for the purpose of installing and maintaining facilities and providing services within the Shelter Cove Sea Park Subdivision and is now the only such District remaining in the State.

Resort Improvement Districts were envisioned as a vehicle for installing and maintaining necessary improvements within recreational resort areas. The Shelter Cove Sea Park Subdivision was originally planned as a retirement community and area for second-home, recreational development. The initial subdivision of the area created 4,715 residential lots. Since that time, several additional parcels have been annexed to the District. The total number of parcels has decreased, however, because of consolidations of undevelopable lots. Further reductions are anticipated in the future as additional consolidations occur and as Bureau of Land Management (BLM) acquisitions continue.

System Standards

RID's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

Fiscal Condition/Capital Replacement Program

According to RID records from 2006/2007, they operate their water system on an annual budget of approximately \$528,000. The majority of this income is from service charges, but funding also

comes from property taxes, special taxes, standby assessments, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District's latest Capital Improvement Plan was developed in 2006, and they currently do not have built up reserves.

Water Demand

The RID produced approximately 57.4 million gallons of drinking water in 2004, according to the 2006 DHS annual inspection report. Average daily use is therefore estimated at 0.157 MGD, and peak daily use was reported as 0.331 MGD in 2004. The District has approximately 455 existing connections and does not retail water to any other Districts. The number of water connections available to the RID is limited by its permit to a total of 990. As a result, the RID cannot approve new connections equal to the total development potential identified above until it identifies an additional source of water and expands its permitted water right.

Water Supply, Treatment, Distribution and Storage

RID's water source consists of two active surface water spring intakes, a seasonal standby surface water spring intake, and two standby wells. The two active sources are known as Rick Spring and Upper Telegraph Creek Intake, while the seasonal standby source is Lower Telegraph Creek Intake. During summer months when demands are high, the District is required to maintain environmental flows within Telegraph Creek but are allowed to withdraw at Lower Telegraph Creek at a point prior to the water's infiltration into beach sands. The source capacity of the District is approximately 508 gpm (0.732 MGD), well over existing maximum day demands (230 gpm). Water is gravity fed or pumped to an Eimco package filtration plant with flocculation, sedimentation, dual media filtration, and pre- and post-chlorination. The treatment capacity of the plant is 350 gpm, or 0.504 MGD.

The District maintains approximately 2.1 MG of storage in 12 storage tanks (welded steel and redwood) ranging in size from 0.03 MG to 1 MG. There are multiple pressure zones within the District served by approximately thirteen booster stations and two pressure reducing valves. The distribution system consists of approximately 44 miles of water main of varying size. The majority of the distribution system is AC pipe, but some coal tar coated steel and PVC is also present.

Condition Assessment

Overview. Water service within the RID is generally very good. No major flaws were found with the system according to the latest DHS inspection. The District's DHS permit limits water service connections to 990 connections per a 1997 amendment.

Current peak water use is at approximately 45% of available production capacity. The District is in the process of locating additional source capacity.

Current Deficiencies. Peak water use within the District is very near its source capacity. Additional water sources are needed.

Underserved Areas. The District serves most areas within its service boundaries.

Proposed Improvements

System Upgrades. The City developed a CIP in 2006 which outlines planned upgrades for the next ten years. These include but are not limited to water plant upgrades, water main replacement, and water source capacity design and expansion. Other smaller projects include

adding horizontal bores at Rick Spring to increase flow, replacing several smaller tanks with larger tanks, and painting steel tanks.

Future Expansion. The District is interested in serving any planned development within the USA.

Cost and Schedule of Improvements. The District has developed a Capital Improvement Plan that covers costs and schedules for improvements to its water system. The District has plans to spend over \$3 million over the next ten years to upgrade the water treatment plant and replace water mains. Another \$3 million dollars are set aside for water source capacity expansion, and approximately \$3 million dollars for additional storage capacity.

6.4.17. Weott USA

The County estimates there were 152 housing units within the Weott USA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Weott USA could have between 168 and 249 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the USA, which takes into consideration physical and zoning constraints, is 213. Therefore, the high rate growth projection for the study area is in excess of what the land can bear.

The high build-out estimate for total development potential of 213 housing units in the USA was used for infrastructure assessment and recommendations. This represents 61 new housing units within the Weott USA.

6.4.17.1. Summary

Findings

Weott's water system is in fair condition and suffers supply problems during summer months. A new well of unknown capacity has been developed but has not been placed on line due to poor water quality and lack of treatment at the present time to treat iron and manganese in the well water. Weott's existing treatment system, not designed for iron and manganese removal, is also severely under capacity. Weott's distribution system is all four-inch pipe or smaller diameter, which does not provide sufficient fire flows as set forth by California Fire Code standards.

The Weott USA could receive up to 61 new housing units before reaching build-out conditions. Weott will need to expand its water system infrastructure to serve this additional growth.

Existing Capacity

Weott's water system is currently limited by both its source and treatment capacity with respect to its availability of connections. However, treatment capacity is currently more limiting. Source capacity is limited by the District's spring sources and is estimated at 0.202 MGD if the pumps are operated 24 hours per day. The treatment capacity is limited by filtration and is estimated at 0.113 MGD if the filters are operated 22 hours per day (time allowed for backwash cycle). Given existing maximum day demands are 0.258 MGD, the system is operating in excess of both source and treatment capacity. Therefore, there are no available connections under the existing infrastructure.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Weott USA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned

developments within the USA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

Table 6-17. Water system infrastructure assessment for the Weott USA.

WATER SYSTEM STATISTICS	
# of Existing Connections	140
# of Available Connections ¹	0
Source Capacity (MGD)	0.202
Storage Capacity (MG)	0.169
Treatment Capacity (MGD)	0.113
Peak Day Use (MGD)	0.258
Usage Rate (gpd/connection)	1,843
CORRECTION OF EXISTING DEFICIENCIES	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.209 MG</i> ²	\$418,000
<i>Fe/Mn treatment capacity – 0.258 MGD</i> ³	\$516,000
<i>Conventional treatment capacity – 0.145 MGD</i> ⁴	\$725,000
<i>Replace distribution piping – 1.5 miles</i> ⁵	\$792,000
Estimated Cost for Existing Deficiencies (\$)	\$2,451,000
Estimated Cost per Existing Connection (\$)	\$17,507
Estimated Financing Cost per Existing Connection (\$/Month)	\$93.59
LOW BUILD-OUT ESTIMATE	
# of Projected New Connections	34
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.063 MG</i> ⁶	\$126,000
<i>Fe/Mn treatment capacity – 0.321 MGD</i> ³	\$642,000
<i>Conventional treatment capacity – 0.063 MGD</i> ⁴	\$315,000
Estimated Cost for Build-Out Infrastructure (\$)	\$1,083,000
Estimated Cost per New Connection (\$)	\$31,853
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$3,534,000
Estimated Cost per Connection (\$)	\$20,310
Estimated Financing Cost per Connection (\$/Month)	\$108.57
HIGH BUILD-OUT ESTIMATE	
# of Projected New Connections	61
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.112 MG</i> ⁶	\$224,000
<i>Fe/Mn treatment capacity – 0.371 MGD</i> ³	\$742,000
<i>Conventional treatment capacity – 0.112 MGD</i> ⁴	\$560,000
Estimated Cost for Build-Out Infrastructure (\$)	\$1,526,000
Estimated Cost per New Connection (\$)	\$25,016
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$3,977,000
Estimated Cost per Connection (\$)	\$19,786
Estimated Financing Cost per Connection (\$/Month)	\$105.77

NOTES: ¹ The number of available connections in the Weott USA was set at zero due to source and treatment capacity being currently exceeded.

² Additional storage requirements are based on 1 day of maximum day use (0.258 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.169 MG).

³ Iron and manganese removal is needed for both existing and future maximum day demands of 0.321 MGD under the low build-out scenario and 0.371 for the high build-out scenario.

⁴ Existing treatment facility has an estimated capacity of 0.113 MGD. Future maximum day demands are estimated at 0.321 MGD for low build-out and 0.371 MGD for high build-out.

- ⁵ According to the DHS annual inspection report, approximately 1.5 miles of the distribution system is steel pipe in fair condition. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).
- ⁶ Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 1,843 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$2.451 million loan would amount to approximately \$157,000 per year. With 140 existing ratepayers, monthly bills would have to be increased by approximately \$94 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

6.4.17.2. Description of Urban Study Area

A map showing the Weott USA is attached as Figure 6-13. The USA encompasses Weott's community center located just outside of Humboldt Redwoods State Park along U.S. Highway 101 and Avenue of the Giants. The Weott USA has 340 total acres, of which 31 acres are underdeveloped and/or vacant parcels. Of this total acreage, 26 acres within the USA are developable. With respect to development potential, the Weott USA contains mostly underdeveloped parcels in the community center area with some smaller vacant parcels that could experience residential development.

The area's land use guidelines and development potential are covered in the Avenue of the Giants Community Plan, which was last updated on April 11, 2000.

6.4.17.3. Water System Service Area Description

The Weott USA receives water service from Weott Community Services District (WCSD). The WCSD was originally organized in 1965 pursuant to the provisions of Title 6, Division 2 of the Government Code. The governing board of the District is the Board of Directors, elected by the citizens of the District. The term of office is four years. The District was formed for the purpose of providing water, sewer, and fire protection.

System Standards

WCSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

Fiscal Condition/Capital Replacement Program

According to WCSD records, they operate their water system on an annual budget of approximately \$65,000. The majority of this income is from service charges, but funding also

comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District has not developed a Capital Improvement Plan to date, and they currently do not have built up reserves.

Water Demand

The WCSD produced approximately 47 million gallons of drinking water in 2005, according to the 2006 DHS annual inspection report. Average daily use is estimated at approximately 0.129 MGD. Peak daily use is misreported in the DHS report but is estimated at twice average daily use, or approximately 0.258 MGD. The District reported peak water usage at 0.127 MGD. The District has approximately 140 existing, unmetered service connections and does not retail water to any other Districts.

Water Supply, Treatment, Distribution and Storage

WCSD's water system consists of two surface water sources located across the Eel River and south of Bull Creek. The springs located on Mill Creek are permitted to produce 80 gpm, and the springs located on Corner and Deck Creek are permitted to produce 60 gpm. The springs flow by gravity to two treatment trains – the Mill Creek springs provide water to Line A, while the other springs provide water to Line B. The total rated capacity of these sources is approximately 0.202 MGD.

The springs flow by gravity through two separate treatment and distribution systems – Line A and Line B. Line A has a treatment capacity of 37.7 gpm at the maximum allowable filter loading rate, and Line B has a treatment capacity of 47.7 gpm. Each treatment train has two pressure filters in series. Sodium hypochlorite is injected following filtration. Interties exist between the two systems within the distribution system. Treatment capacity totals approximately 85.4 gpm (0.113 MGD if operated 22 hours per day) and is therefore more limiting than source capacity.

The District operates two pressure zones, each served by separate storage and distribution systems. Water storage consists of two tanks: a 79,000 gallon concrete tank and a new 90,000 bolted steel tank. One booster station is in operation to boost Line A following filtration to storage. The distribution system consists of approximately 4 miles of PVC, steel, and aluminum pipe varying in size from 3 inches to 4 inches.

Condition Assessment

Overview. Weott CSD's water system is in fair condition and has historically suffered supply problems during summer months. Estimated peak daily use is currently greater than available supply from the District's springs. The springs are located in a newly designated wilderness area of Humboldt Redwoods State Park, so the Park is developing a new well to replace the springs. To date, the well has not been placed on line due to high iron, manganese, and arsenic levels and increased treatment requirements. It is unclear at this time what the production capacity of the new well will be or whether an alternative well or source will be developed. Treatment capacity is currently severely undersized, approximately double the DHS mandated maximum filter loading rate.

Currently, overall peak daily use is in excess of the spring's source capacity and the treatment plant's treatment capacity. Peak daily demands are approximately 128% of existing source capacity and 210% of existing treatment capacity.

Current Deficiencies. The District suffers from historic supply problems during low flow summer months. The District exceeds recommended DHS filter loading rates by nearly double, and in

2005 filter performance standards were not met. The system also experiences turbidity problems during winter months. The distribution system is all four-inch diameter pipe or smaller. Although this meets Waterworks Standards for domestic use, these mains would be unable to provide sufficient fire flow as set forth by California Fire Code. The system is also unmetered.

Underserved Areas. The District currently serves all areas within its service boundaries.

Proposed Improvements

System Upgrades. The District is planning to install meters on all service connections as time and funding permits, install additional filter capacity, replace some steel water mains, and replace springs within the next twenty years as the newly constructed Park Service well may not be adequate due to poor water quality.

Future Expansion. The District has no plans for expansion.

Cost and Schedule of Improvements. The District has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system.

6.4.18. Willow Creek USA & WSA

The Willow Creek study area contains both a USA and WSA. The County estimates there were 20 and 1000 housing units within the Willow Creek USA and WSA, respectively in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Willow Creek USA could have between 22 and 33 total housing units by 2025, while the Willow Creek WSA could have between 1,105 and 1,639 total housing units by 2025. According to Table 1-6, the high build-out estimates for total development potential within the USA and WSA, which takes into consideration physical and zoning constraints, are 96 and 1,504, respectively. Therefore, although the growth projections for the WSA are within the range of what the land can bear, the high growth rate estimate for the USA is in excess of what the land can bear.

The high build-out estimates for total development potential of 96 and 1,504 housing units in the USA and WSA were used for infrastructure assessment and recommendations. This represents a combined 580 new housing units within the Willow Creek USA and WSA.

6.4.18.1. Summary

Findings

Willow Creek's water system has historically had problems but is in the process of a large-scale renovation. The community recently received grant and loan monies from Proposition 50 and the State Revolving Fund to complete a new water filtration plant and upgrade their water intake system. There are no major infrastructure deficiencies associated with the existing and new systems, although portions of the distribution system consist of 4-inch mains, which do not provide adequate fire flows. Additional storage capacity is also needed within the system.

Additionally, the Willow Creek USA and WSA are expected to receive up to 580 new housing units before reaching build-out conditions. Willow Creek will need to expand its water system infrastructure to serve this additional growth.

Existing Capacity

Availability of connections within the Willow Creek water system is currently limited by both its source and treatment capacity. However, treatment capacity is currently more limiting. Source

capacity is limited by the District's infiltration gallery and is estimated at 3.76 MGD if the pumps are operated 24 hours per day. The treatment capacity is limited by filtration and is estimated at 2.953 MGD if the filters are operated 23 hours per day (time allowed for backwash cycle). Given existing maximum day demands are 1.8 MGD, the system is operating at approximately 48% of source capacity and 70% of treatment capacity. Based on treatment capacity, there are 618 available connections under the existing infrastructure.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Willow Creek USA/WSA and addresses infrastructure needs for existing development and for build-out conditions. There are several large development projects proposed in Willow Creek including the Walton subdivision and the Jurin Project which will account for approximately 150 new connections.

Table 6-18. Water system infrastructure assessment for the Willow Creek USA and WSA.

WATER SYSTEM STATISTICS	
# of Existing Connections	967
# of Available Connections ¹	618
Source Capacity (MGD)	3.76
Storage Capacity (MG)	1.08
Treatment Capacity (MGD)	2.953
Peak Day Use (MGD)	1.8
Usage Rate (gpd/connection)	1,861
CORRECTION OF EXISTING DEFICIENCIES	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.840 MG ²</i>	\$1,680,000
Estimated Cost for Existing Deficiencies (\$)	\$1,680,000
Estimated Cost per Existing Connection (\$)	\$1,737
Estimated Financing Cost per Existing Connection (\$/Month)	\$9.29
LOW BUILD-OUT ESTIMATE	
# of Projected New Connections	227
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.423 MG ³</i>	\$846,000
Estimated Cost for Build-Out Infrastructure (\$)	\$846,000
Estimated Cost per New Connection (\$)	\$3,727
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$2,526,000
Estimated Cost per Connection (\$)	\$2,116
Estimated Financing Cost per Connection (\$/Month)	\$11.31
HIGH BUILD-OUT ESTIMATE	
# of Projected New Connections	580
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 1.080 MG ³</i>	\$2,160,000
Estimated Cost for Build-Out Infrastructure (\$)	\$2,160,000
Estimated Cost per New Connection (\$)	\$3,724
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$3,840,000
Estimated Cost per Connection (\$)	\$2,482
Estimated Financing Cost per Connection (\$/Month)	\$13.27

NOTES: ¹ The number of available connections in the Willow Creek study area was estimated based on the District currently being at 61% of its treatment capacity.

² Additional storage requirements are based on 1 day of maximum day use (1.8 MG) plus minimum fire storage of 120,000 gallons minus existing storage (1.08 MG).

³ Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 1,861 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$1.68 million loan would amount to approximately \$108,000 per year. With 967 existing ratepayers, monthly bills would have to be increased by approximately \$9 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

6.4.18.2. Description of Urban Study Area

A map showing the Willow Creek USA is attached as Figure 6-14. The USA encompasses Willow Creek's community center and is located approximately 50 miles northeast of Eureka in eastern Humboldt County at the junction of U.S. Highway 299 and U.S. Highway 96. The Willow Creek USA has 340 and the WSA 3,967 total acres, of which 52 acres and 1,454, respectively, are underdeveloped and/or vacant parcels. Of this total acreage, 25 acres within the USA, and 715 acres within the WSA, are developable. With respect to development potential, the Willow Creek USA and WSA contain both underdeveloped and vacant parcels that could experience further residential development.

The area's land use guidelines and development potential are covered in the Willow Creek Community Plan, which was last updated on June 27, 1986.

6.4.18.3. Water System Service Area Description

The Willow Creek USA and WSA receive water service from Willow Creek Community Services District (WCCSD). The Willow Creek Community Services District (CSD) was originally organized in 1965 under Government Code Section 61600. There are five members of the board who supervise the business of the District. The District was formed for the purpose of providing water, recreation, and street lighting, but is now in the process of developing wastewater services as well.

System Standards

WCCSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

Fiscal Condition/Capital Replacement Program

According to WCCSD records, they operate their water system on an annual budget of approximately \$475,000. The majority of this income is from service charges, but funding also

comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District's latest Capital Improvement Plan was developed in 2007, and they currently have approximately \$130,000 in reserves.

Water Demand

The WCCSD produced approximately 244 million gallons of drinking water in 2003, according to the 2004 DHS annual inspection report. Average daily use is estimated at approximately 0.668 MGD, and peak daily use was reported as 1.80 MGD in 2004. The District has approximately 967 existing service connections and does not retail water to any other Districts.

Water Supply, Treatment, Distribution and Storage

The District's source of supply is from Willow Creek. It consists of six wells located in the mouth of Willow Creek. Four wells draw water from infiltration galleries in the Willow Creek flood plain acting as a natural filtration system. These wells are believed to be under the influence of surface water. The District has two wells separate from the infiltration gallery, which may or may not be under the influence of surface water. The water is chlorinated and treated before it placed into the distribution system. The District monitors chlorination and turbidity 24 hours a day. Due to some of their sources being under the influence of surface water, the system was not in compliance with the SWTR until recent construction of a new water treatment plant. The new treatment plant was completed in 2007, and has a design capacity of 2,140 gpm. If run for 23 hours per day, treatment capacity is approximately 2.953 MGD. Total source capacity is 2,610 gpm, or 3.76 MGD.

The system has seven pressure zones, served by various storage tanks throughout the system. In total, the District has six storage tanks with a combined capacity of 1,080,000 gallons. Pump stations are located throughout the system in areas where facilities to be served are higher in elevation than primary tanks. The District maintains approximately 24 miles of main line consisting primarily of asbestos cement pipe with some PVC and ductile iron pipe. The distribution system ranges in size from 4 inch to 12 inch.

Condition Assessment

Overview. Willow Creek CSD's water system is generally in good condition, although per capita demand is very high (1861 gpd/cap) and may be the result of system leaks. The District recently constructed a new water treatment plant to bring the system into compliance with SWTR. Current peak water use is approximately 48% of available production capacity. The new water treatment plant has been designed for 2,140 gpm, approximately 40% greater than existing peak day demands.

Current Deficiencies. The District does not have adequate storage capacity to even provide one day of supply at maximum day demand. Generally, two to three days minimum is recommended. It is unclear if the high per capita demands are due to system leaks or agricultural users. A computer model of the water system would be helpful in making future decisions regarding infrastructure upgrades. The existing surface water source is downstream of the town center's main stormwater discharge point that contains potential contaminating activities. The District is investigating State Revolving Fund projects to address this issue.

Underserved Areas. The District currently serves all areas within its service boundaries. In the Patterson Road corridor near Willow Creek Country Club, there are several areas of service and storage needs. Winnett Vineyard, including the McMurray and Aronson properties, is in need of a storage tank with sufficient elevation for fire and power outage protection. The Gypo Hill

properties above the Early Bird Drive Inn are served by an inadequate, privately owned pressure station. The Triple R Ranch is serviced by a 2 inch line, which is considered severely undersized.

Proposed Improvements

System Upgrades. The District's main improvement involves construction of a new 400,000 gallon storage tank above the new treatment plant and Brannan Mountain Road. The tank is needed to comply with chlorine contact time requirements and will also create a looped system to the Highway 96 corridor. The District is also planning to replace some older redwood storage tanks within the next ten to twenty years. A new pump station is planned to serve the Gypo Hill properties. The Hodgson Subdivision and the Terrace Subdivision both have water infrastructure that predates the District. These areas are in need of new distribution and storage facilities.

Future Expansion. When the Walton subdivision is developed, there will be need for at least a 100,000 gallon water tank to serve this 67 acre development.

Cost and Schedule of Improvements. The District's latest Capital Improvement Goals for 2007 include installation of VFD on the pump motors, new storage and controls for tanks, and improvements to the District's buildings. Total costs are estimated at approximately \$77,000.

6.5. Water Study Areas

Water study areas (WSAs) are regions within the County where water service exists or may be feasible to provide, and planned densities less than one unit per acre are appropriate to consider. As with urban study areas, the County's purpose in defining water study areas is to identify areas for more detailed planning and analysis, mainly with respect to development capacity and the infrastructure required to service both existing and any further development that may occur within these areas. Identification of the study areas and correspondence and dialogue with service providers within these areas will give the County valuable information regarding development potential and allow for more informed development timing policies within the County.

The following sections introduce the County's water study areas and provide a detailed discussion on development potential and water infrastructure assessment for each study area. Any water system infrastructure deficiencies will be identified along with plans for timing and financing of needed improvements. See section 6.4 Urban Study Areas for a detailed description of the assumptions used in the analysis of existing and future capabilities of water providers.

6.5.1. Alderpoint WSA

The County estimates there were 66 housing units within the Alderpoint WSA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Alderpoint WSA could have between 73 and 108 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the WSA, which takes into consideration physical and zoning constraints, is 132. Therefore, the high rate growth projection for the study area is in excess of what the land can bear.

The high build-out estimate for total development potential of 132 housing units in the WSA was used for infrastructure assessment and recommendations. This represents 66 new housing units within the Alderpoint WSA.

6.5.1.1. Summary

Findings

Alderpoint's water system is in poor condition. The system has only chlorination and no form of treatment and is therefore not in compliance with SWTR. The District has been issued a compliance order by the EPA, and is in the process of seeking funding sources for a new treatment system. Alderpoint's distribution system also contains pipe smaller than 6 inches in diameter, which does not provide sufficient fire flows as set forth by California Fire Code standards. Additional storage capacity is needed, as existing storage does not even provide the minimum recommended fire flows. The system also lacks certified operators.

The Alderpoint WSA could receive up to 66 new housing units before reaching build-out conditions. Alderpoint will need to expand its water system infrastructure to serve this additional growth.

Existing Capacity

Availability of connections within the Alderpoint water system is mostly limited by its lack of treatment. Source capacity is limited by the District's infiltration gallery and is estimated at 0.432 MGD if the pumps are operated 24 hours per day. The system is not in compliance with SWTR due to lack of treatment. Therefore, there are no available connections under the existing infrastructure.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Alderpoint WSA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

Table 6-19. Water system infrastructure assessment for the Alderpoint WSA.

WATER SYSTEM STATISTICS	
# of Existing Connections	74
# of Available Connections ¹	0
Source Capacity (MGD)	0.432
Storage Capacity (MG)	0.105
Treatment Capacity (MGD)	0
Peak Day Use (MGD)	0.080
Usage Rate (gpd/connection)	1,081
CORRECTION OF EXISTING DEFICIENCIES	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.095 MGD ²</i>	\$190,000
<i>Conventional treatment capacity – 0.08 MGD ³</i>	\$400,000
<i>Replace distribution piping – 2.5 miles ⁴</i>	\$1,320,000
Estimated Cost for Existing Deficiencies (\$)	\$1,910,000
Estimated Cost per Existing Connection (\$)	\$25,811
Estimated Financing Cost per Existing Connection (\$/Month)	\$137.97
LOW BUILD-OUT ESTIMATE	
# of Projected New Connections	44
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.048 MGD ⁵</i>	\$96,000
<i>Conventional treatment capacity – 0.048 MGD ³</i>	\$240,000
Estimated Cost for Build-Out Infrastructure (\$)	\$336,000
Estimated Cost per New Connection (\$)	\$7,636
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$2,246,000
Estimated Cost per Connection (\$)	\$19,034
Estimated Financing Cost per Connection (\$/Month)	\$101.75
HIGH BUILD-OUT ESTIMATE	
# of Projected New Connections	66
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.071 MGD ⁵</i>	\$142,000
<i>Conventional treatment capacity – 0.071 MGD ³</i>	\$355,000
Estimated Cost for Build-Out Infrastructure (\$)	\$497,000
Estimated Cost per New Connection (\$)	\$7,530
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$2,407,000
Estimated Cost per Connection (\$)	\$17,193
Estimated Financing Cost per Connection (\$/Month)	\$91.91

NOTES: ¹ The number of available connections in the Alderpoint WSA was set at zero due to lack of treatment. A new water treatment facility is being planned.

² Additional storage requirements are based on 1 day of existing maximum day use (0.08 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.105 MG).

³ A new treatment facility is needed to meet existing maximum day demands of 0.08 MGD and future maximum day demands of 0.128 MGD under low build-out and 0.151 MGD under high build-out conditions.

⁴ According to the DHS annual inspection report, the District's 2.5 miles of distribution piping are all in fair condition and will likely need replacement within the planning time frame of this document. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).

⁵ Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 1,081gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$1.91 million loan would amount to approximately \$123,000 per year. With 74 existing ratepayers, monthly bills would have to be increased by approximately \$138 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

6.5.1.2. Description of Water Study Area

A map showing the Alderpoint WSA is attached as Figure 6-15. The WSA encompasses Alderpoint's community center, located approximately 20 miles northeast of Garberville along the Middle Fork of the Eel River. The Alderpoint WSA has 370 total acres, of which 210 acres are underdeveloped and/or vacant parcels. Of this total acreage, 130 acres within the WSA are developable. With respect to development potential, the Alderpoint WSA contains mostly vacant parcels with some underdeveloped parcels that could see further residential development.

The area's land use guidelines and development potential are covered in the Garberville, Redway, Benbow, and Alderpoint Community Plan, which was last updated on November 30, 2004.

6.5.1.3. Water System Service Area Description

The Alderpoint WSA receives water service from Alderpoint County Water District (ACWD). The ACWD was originally established in 1965 with the purpose of providing water services to the surrounding community. Alderpoint CWD is governed by a five member Board of Directors that is responsible for the business of the District. The members of the Board of Directors serve staggered four year terms of office. The District was formed for the purpose of providing water services.

System Standards

ACWD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

Fiscal Condition/Capital Replacement Program

According to ACWD records, they operate their water system on an annual budget of approximately \$35,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District has not

developed a Capital Improvement Plan to date, and they currently do not have built up reserves.

Water Demand

The ACWD produced approximately 14 million gallons of drinking water in 2005, according to the 2007 DHS annual inspection report. Average daily use is estimated at 0.039 MGD, and peak daily use was reported as approximately 0.080 MGD in 2005. The District has approximately 74 existing service connections and does not retail water to any other Districts. Currently, the District provides service to approximately 81% of households within the District.

Water Supply, Treatment, Distribution and Storage

The source of water for the District is an infiltration gallery in the Eel River bed with a rated capacity of 300 gpm, or 0.432 MGD. The infiltration gallery collection pipe is approximately nine feet below the bed of the river. From the infiltration gallery wet well, water is pumped through about 600 feet of six-inch cast iron main to a 5,000-gallon staging tank located 130 feet above the riverbed. The 5,000-gallon tank and its accompanying pump house are located just off River Road. Calcium hypochlorite, a disinfectant, is added to the water in the 5,000-gallon tank. No filtration process is currently employed.

From the 5,000-gallon staging/preliminary distribution tank, water is pumped up another 300-feet, via approximately 500 feet of six inch main, to a 100,000-gallon redwood storage tank. This main storage tank feeds water into the distribution system. The distribution system also has a booster pump station that serves a couple houses.

Water is distributed directly to several households along River Road north and south of the 5,000-gallon tank from the line to the 100,000-gallon tank. The main distribution system contains approximately 2.5 miles of mainline varying in size from two-inch to six-inch in diameter. The distribution piping is either AC or PVC.

According to a Water System Feasibility Study completed for Alderpoint, supply capacity is the range of 216,000 to 320,000 gallons per day, which is well in excess of the current demands and production. ACWD is planning to install new pumps, which would provide about 200 gallons per minute (gpm) or 288,000 gallons per day (gpd) (Oscar Larson & Associates, 2003).

Condition Assessment

Overview. ACWD's water system is not currently operating satisfactorily, according to DHS inspection reports. Source capacity is more than sufficient, as current peak daily use is approximately 19% of existing source capacity. However, the District has no filtration and is therefore not in compliance with SWTR.

Current Deficiencies. The District has been out of compliance with the SWTR since 1986. The Environmental Protection Agency issued a compliance order in 1992. A feasibility study for a facility upgrade was completed in 1993. The Board of Directors decided not to take action at the time. In 2003, a revised feasibility study was completed. A representative from the California Rural Water Association is completing an application to be submitted to the State Revolving Fund for funding. The State has decided to fund the project for design and construction. A new membrane filtration system will likely be installed, and the estimated cost of the water facility was approximately \$433,000 in 2003 dollars.

According to a DHS inspection report from May 2007, the District needs to perform the following:

- The District does not have a licensed operator and is in need of at least a Grade T2/D1 WTO/WDO.
- Maintain at least a 0.7 ppm chlorine residual to achieve adequate disinfection for connections past Main Tank.
- Continue Boil Water Advisory to all service connections located prior to the Main Tank due to inadequate chlorine contact time.
- Comply with Distribution Monitoring Schedule and current WQI3 Eel River untreated water Chemical Monitoring Schedule.
- Adopt a Cross-Connection Control Policy or Ordinance and complete a Cross-Connection Hazard Survey and Assessment.
- Perform repairs to both tanks.
- Obtain compliance with Surface Water Treatment Regulations.

Underserved Areas. The District currently serves all areas within its service boundaries.

Proposed Improvements

System Upgrades. The District has plans to repair their storage tanks and has been in contact with Western Wood Tank. Efforts will also need to be made to address losses within the distribution system.

The District is in the process of trying to obtain SRF loans and/or Proposition 50 funds to install a filtration system that will bring the District into compliance with SWTR. A membrane filtration facility has been proposed to be located across River Road and immediately west of the existing 5,000-gallon storage/booster tank. This positioning will allow the existing tank, pumps, and delivery system to remain in place with minimal system modifications. It is assumed that the proposed water treatment upgrade will meet all current regulations.

Future Expansion. The District does not have plans for expansion.

Cost and Schedule of Improvements. The District has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system.

6.5.2. Benbow WSA

The County estimates there were 114 housing units within the Benbow WSA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Benbow WSA could have between 126 and 187 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the WSA, which takes into consideration physical and zoning constraints, is 170. Therefore, the high rate growth projection for the study area is in excess of what the land can bear.

The high build-out estimate for total development potential of 170 housing units in the WSA was used for infrastructure assessment and recommendations. This represents 56 new housing units within the Benbow WSA.

6.5.2.1. Summary

Findings

Benbow's water system is in fair condition. Major deficiencies include undersized pumping capacity and undersized treatment capacity. Portions of the distribution system are asbestos cement pipe nearing 50 years old and will likely require replacement within the next twenty

years. Benbow's distribution system also contains pipe smaller than 6 inches in diameter, which does not provide sufficient fire flows as set forth by California Fire Code standards.

The Benbow WSA could receive up to 56 new housing units before reaching build-out conditions. Benbow will need to expand its water system infrastructure to serve this additional growth.

Existing Capacity

Availability of connections within the Benbow water system is currently limited by both its source and treatment capacity. However, treatment capacity is currently more limiting. Source capacity is limited by the District's infiltration gallery and is estimated at 0.327 MGD if the pumps are operated 24 hours per day. The treatment capacity is limited by filtration and is estimated at approximately 0.2 MGD. Given existing maximum day demands are 0.382 MGD, the system is operating well in excess of both source and treatment capacity. Therefore, there are no available connections under the existing infrastructure.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Benbow WSA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

Table 6-20. Water system infrastructure assessment for the Benbow WSA.

WATER SYSTEM STATISTICS	
# of Existing Connections	113
# of Available Connections ¹	0
Source Capacity (MGD)	0.327
Storage Capacity (MG)	0.15
Treatment Capacity (MGD)	0.2
Peak Day Use (MGD)	0.382
Usage Rate (gpd/connection)	3,381
CORRECTION OF EXISTING DEFICIENCIES	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.352 MG ²</i>	\$704,000
<i>Additional source capacity – infiltration system upgrades ³</i>	\$200,000
<i>Conventional treatment capacity – 0.182 MGD ⁴</i>	\$910,000
<i>Replace distribution piping – 3 miles ⁵</i>	\$1,584,000
Estimated Cost for Existing Deficiencies (\$)	\$3,398,000
Estimated Cost per Existing Connection (\$)	\$30,071
Estimated Financing Cost per Existing Connection (\$/Month)	\$160.75
LOW BUILD-OUT ESTIMATE	
# of Projected New Connections	55
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.186 MG ⁶</i>	\$372,000
<i>Conventional treatment capacity – 0.186 MGD ⁴</i>	\$930,000
Estimated Cost for Build-Out Infrastructure (\$)	\$1,302,000
Estimated Cost per New Connection (\$)	\$23,673
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$4,700,000
Estimated Cost per Connection (\$)	\$27,976
Estimated Financing Cost per Connection (\$/Month)	\$149.55
HIGH BUILD-OUT ESTIMATE	
# of Projected New Connections	56
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.189 MG ⁶</i>	\$378,000
<i>Conventional treatment capacity – 0.189 MGD ⁴</i>	\$945,000
Estimated Cost for Build-Out Infrastructure (\$)	\$1,323,000
Estimated Cost per New Connection (\$)	\$23,625
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$4,721,000
Estimated Cost per Connection (\$)	\$27,935
Estimated Financing Cost per Connection (\$/Month)	\$149.33

NOTES: ¹ The number of available connections in the Benbow WSA was set at zero due to undersized treatment capacity.

² Additional storage requirements are based on 1 day of existing maximum day use (0.382 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.15 MG).

³ Existing source capacity is insufficient to meet existing or future maximum day demands.

⁴ The existing treatment facility needs to be expanded to meet existing maximum day demands of 0.382 MGD and future maximum day demands of 0.568 MGD under low build-out and 0.571 MGD under high build-out.

⁵ According to the DHS annual inspection report, approximately 65% of the distribution system is AC main originally installed in 1962 and probably warrants replacement within the planning time frame. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).

⁶ Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 3,381 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$3.398 million loan would amount to approximately \$218,000 per year. With 113 existing ratepayers, monthly bills would have to be increased by approximately \$161 per month to fund this loan. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

The BWC is not a local government agency and is therefore not eligible for most local, state, and federal grant sources. The BWC would need to secure funding through company assets or loans to make improvements. The BWC is eligible to petition the CPUC to seek a water rate increase to recover the full cost of the improvements plus a set rate of return on investment.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

6.5.2.2. Description of Water Study Area

A map showing the Benbow WSA is attached as Figure 6-4. The WSA encompasses Benbow's community center, located just south of Garberville along the South Fork of the Eel River. The Benbow WSA has 415 total acres, of which 103 acres are underdeveloped and/or vacant parcels. Of this total acreage, 51 acres within the WSA are developable. With respect to development potential, the Benbow WSA contains mostly vacant parcels with some underdeveloped parcels that could see further residential development.

The area's land use guidelines and development potential are covered in the Garberville, Redway, Benbow, and Alderpoint Community Plan, which was last updated on November 30, 2004.

6.5.2.3. Water System Service Area Description

The Benbow WSA receives water service from the Benbow Water Company (BWC), a private water company. The BWC was originally established in 1965 and was formed for the purpose of providing water services.

System Standards

BWC's water system is a private water system. However, public water system standards apply to private water systems that serve over 25 people for more than 60 days per year. Therefore, the BWC's water system must be operated to meet the requirements of the State of California. The BWC is also a regulated public utility and subject to the requirements of the CPUC. See Section 6.2 for additional information regarding system standards.

Fiscal Condition/Capital Replacement Program

The BWC operating budget is unknown. The BWC has not developed a Capital Improvement Plan to date, and they currently do not have built up reserves.

Water Demand

The BWC produced approximately 31 million gallons of drinking water in 2005, according to the 2006 DHS annual inspection report. Average daily use is estimated at 0.085 MGD, and peak daily use was reported as 0.382 MGD. The BWC has approximately 113 existing service connections, of which 101 are residential connections, and does not retail water to any other Districts.

Water Supply, Treatment, Distribution and Storage

BWC receives its water supply from an infiltration gallery located in the East Branch South Fork of the Eel River. The gallery feeds into a wet well, which houses production pumps with a rated capacity of 0.327 MGD. Water is chlorinated within the wet well using a tablet feeder with a variable water flow running through it based on the production pump output. Water is pumped to a treatment plant where a cationic polymer is fed inline. Coagulation occurs within a 700 gallon coarse sand contact clarifier. The flow then splits and runs through two parallel 700 gallon dual-media pressure filters. The treatment system is severely undersized, and is routinely operating at nearly double the DHS's maximum filter loading rate.

BWC's distribution system consists of three pressure zones serviced by four individual tanks ranging in size between 5,000 gallons and 135,000 gallons. Total storage capacity is 150,000 gallons. Storage capacity per zone is dependent on the number of connections served. All zones are fed by gravity. The distribution system consists of approximately five miles of water mains consisting of 4-inch and 6-inch AC pipe and 8-inch and smaller PVC pipe. The original distribution system was installed by the State in 1962.

Condition Assessment

Overview. BWC's water system is in fair condition and is not currently meeting source capacity standards. Although the actual source capacity is more than adequate, the BWC is currently limited by their pumping capacity. The current pumping capacity of 0.327 MGD is not sufficient to meet current peak day demands of 0.382 MGD. Treatment capacity is also undersized.

Current Deficiencies. Source capacity is a serious problem. Pumping capacity is less than maximum day capacity, and at maximum pumping rates the filters are loaded at nearly double the allowed filter loading rate. The BWC is currently not meeting the requirements of Section 64562 of the regulations which mandates that total available source capacity shall not be less than the needed source capacity. The DHS has asked the BWC to develop a plan to correct the source capacity and filter loading rate issues.

The DHS inspection report from May 2006 did not find any other serious deficiencies aside from regular bacteriological and chemical monitoring that needs to be done.

Underserved Areas. The BWC currently serves all areas within its service boundaries.

Proposed Improvements

System Upgrades. The BWC is currently looking into increasing their permitted water rights and upgrading their pumps to increase source capacity. They have no other plans for significant improvements over the next 20 years, aside from growth related replacement of treatment works and maintenance. If significant growth occurs, an expansion to the existing treatment plant will be needed.

Future Expansion. The BWC does not have plans for expansion.

Cost and Schedule of Improvements. The BWC has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system. However, they have estimated that an expansion to the existing treatment plant would cost approximately \$300,000.

6.5.3. Big Lagoon WSA

The County estimates there were 170 housing units within the Big Lagoon WSA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Big Lagoon WSA could have between 188 and 279 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the WSA, which takes into consideration physical and zoning constraints, is 184. Therefore, both the low and high rate growth projections for the study area are in excess of what the land can bear.

The high build-out estimate for total development potential of 184 housing units in the WSA was used for infrastructure assessment and recommendations. This represents 14 new housing units within the Big Lagoon WSA.

6.5.3.1. Summary

Findings

Big Lagoon's water system is in good condition. No major deficiencies exist with the system, aside from the storage capacity being undersized and the need to relocate a water main due to bluff erosion. Existing storage capacity is inadequate for fire suppression. The Big Lagoon WSA could receive up to 14 new housing units before reaching build-out conditions. Big Lagoon will need to expand its water system infrastructure to serve this additional growth.

Existing Capacity

Availability of connections within the Big Lagoon water system is currently limited by the source capacity of its wells. Well production is estimated at 0.07 MGD over a 24 hour period. Given existing maximum day demands are estimated at 0.012 MGD, the system is operating at approximately 17% of source capacity. Therefore, there are approximately 166 available connections under the existing infrastructure.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Big Lagoon WSA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

Table 6-21. Water system infrastructure assessment for the Big Lagoon WSA.

WATER SYSTEM STATISTICS	
# of Existing Connections	34
# of Available Connections ¹	166
Source Capacity (MGD)	0.070
Storage Capacity (MG)	0.023
Treatment Capacity (MGD)	Not required
Peak Day Use (MGD)	0.012
Usage Rate (gpd/connection)	343
CORRECTION OF EXISTING DEFICIENCIES	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.109 MG ²</i>	\$218,000
<i>Relocate distribution piping – 3,000 feet ³</i>	\$300,000
Estimated Cost for Existing Deficiencies (\$)	\$518,000
Estimated Cost per Existing Connection (\$)	\$15,235
Estimated Financing Cost per Existing Connection (\$/Month)	\$81.44
LOW BUILD-OUT ESTIMATE	
# of Projected New Connections	10
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 3,500 gal. ⁴</i>	\$7,000
Estimated Cost for Build-Out Infrastructure (\$)	\$7,000
Estimated Cost per New Connection (\$)	\$700
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$525,000
Estimated Cost per Connection (\$)	\$11,932
Estimated Financing Cost per Connection (\$/Month)	\$63.78
HIGH BUILD-OUT ESTIMATE	
# of Projected New Connections	14
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 5,000 gal. ⁴</i>	\$10,000
Estimated Cost for Build-Out Infrastructure (\$)	\$10,000
Estimated Cost per New Connection (\$)	\$714
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$528,000
Estimated Cost per Connection (\$)	\$11,000
Estimated Financing Cost per Connection (\$/Month)	\$58.80

NOTES: ¹ The number of available connections in the Big Lagoon study area was estimated based on the District currently being at 17% of its source capacity.

² Additional storage requirements are based on 1 day of existing maximum day use (0.012 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.023 MG).

³ Estimated length of pipeline in coastal bluff zone that needs replacing.

⁴ Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 343 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$518,000 loan would amount to approximately \$33,000 per year. With 34 existing ratepayers, monthly bills would have to be increased by approximately \$81 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing

deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

6.5.3.2. Description of Water Study Area

A map showing the Big Lagoon WSA is attached as Figure 6-16. The WSA encompasses the Big Lagoon residential area, located in northern Humboldt County on the coast just north of Trinidad, CA. The Big Lagoon WSA has 159 total acres, of which 63 acres are underdeveloped and/or vacant parcels. Of this total acreage, 53 acres within the WSA are developable. With respect to development potential, the Big Lagoon WSA contains mostly vacant parcels with some underdeveloped parcels that could see further residential development. Big Lagoon is located within the Coastal Zone, and land use guidelines and development potential are addressed in the North Coastal Area Plan.

6.5.3.3. Water System Service Area Description

The Big Lagoon WSA receives water service from Big Lagoon Community Services District (BLCSD). The BLCSD was formed on July 1, 1998 under Community Services District law pursuant to sections 61000-61934 of the Government Code. The governing board is elected and consists of a five (5) member Board of Directors to supervise the business of the District. The District was formed for the purposes of supplying water to houses in the Big Lagoon subdivision and Big Lagoon School. It is important to note that the District was formed conditional upon a Local Coastal Plan amendment to expand the Urban Limit Line to include all properties within the District.

The District originally provided water service to 40 households and Big Lagoon School. The system now serves 34 homes following an El Nino event in 1998, in which several homes were lost due to a coastal bluff failure. Because the County has had to purchase a number of lots in the area of coastal bluff failure, there are only 13 additional vacant lots that could potentially request service.

System Standards

BLCSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

Fiscal Condition/Capital Replacement Program

According to BLCSD records, they operate their water system on an annual budget of approximately \$23,000. The majority of this income is from service charges interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District has not developed a Capital Improvement Plan to date, and they currently do not have built up reserves.

Water Demand

The BLCSD produces approximately 1.7 million gallons of drinking water in 2005, according to the 2007 DHS annual inspection report. Average daily use is estimated at approximately 4,650 gpd, and peak daily use was reported as 11,650 gpd. The District has approximately 34 existing service connections and does not retail water to any other Districts.

Water Supply, Treatment, Distribution and Storage

The Big Lagoon CSD manages a water system that was installed for the Big Lagoon subdivision in 1962. The Big Lagoon CSD acquired the water system from a private owner in 1999. The water system now consists of 2 wells, a 20,000 gallon redwood storage tank, a 15 horsepower booster pump and a 3,000 gallon hydropneumatic tank with an air compressor. Chlorine is added continuously through a positive displacement diaphragm feeder. Supply issues have never been a problem, even in the driest of years. The maximum system delivery output totals approximately 70,000 gallons per day, well in excess of current maximum demands. The District's distribution system consists of approximately 1.6 miles of six-inch asbestos cement pipe.

Condition Assessment

Overview. BLCSD's water system is operating in good condition and is in need of only minor repairs. Current peak water use is at approximately 17% of available production capacity.

Current Deficiencies. According to the 2007 DHS inspection report, the water system needs to perform the following:

- Install a check valve on the hydropneumatic tank well discharge and the yard well discharge line.
- Install new roof on redwood tank.
- Recoat interior and paint exterior of hydropneumatic tank.
- Repaint exterior of both pumps.
- Develop a cross-connection ordinance.
- Perform well source chemical tests and perform raw water testing for nitrate and Radium-288.

Underserved Areas. The District currently serves all areas within its service boundaries.

Proposed Improvements

System Upgrades. Aside from the above items requested by the DHS, the District also plans to immediately relocate water mains along North Oceanview Drive that are located in eroding coastal bluffs.

Future Expansion. The District does not have plans for expansion.

Cost and Schedule of Improvements. The District has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system.

6.5.4. Briceland WSA

The County estimates there were 36 housing units within the Briceland WSA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Briceland WSA could have between 40 and 59 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the WSA, which takes into consideration physical

and zoning constraints, is 62. Therefore, both the low and high rate growth projections for the study area are within the range of what the land can bear.

The high build-out estimate for total development potential of 62 housing units in the WSA was used for infrastructure assessment and recommendations. This represents 26 new housing units within the Briceland WSA.

6.5.4.1. Summary

Findings

Briceland's water system is in poor condition. Several deficiencies exist with the existing system. Source capacity is unable to meet current maximum day demands, the treatment system is unable to meet turbidity performance standards during winter months, and storage capacity is barely able to meet even one day of maximum day demands. Recommended fire suppression storage is not available. Briceland is currently under a moratorium for new connections.

However, the Briceland WSA could receive up to 26 new housing units before reaching build-out conditions. Briceland will need to find a new source of water and expand its water system infrastructure to serve this additional growth.

Existing Capacity

Availability of connections within the Briceland water system is currently limited by the source capacity of its springs. Spring production, during critical periods, is estimated at 10,080 gpd over a 24 hour period. Given existing maximum day demands are estimated at 40,000 gpd, the system is operating at approximately 397% of source capacity. Therefore, there are no available connections under the existing infrastructure.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Briceland WSA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

Table 6-22. Water system infrastructure assessment for the Briceland WSA.

WATER SYSTEM STATISTICS	
# of Existing Connections	26
# of Available Connections ¹	0
Source Capacity (gpd)	10,080
Storage Capacity (gal)	42,000
Treatment Capacity (MGD)	Unknown but not limiting
Peak Day Use (gpd)	40,000
Usage Rate (gpd/connection)	1,538
CORRECTION OF EXISTING DEFICIENCIES	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.118 MG ²</i>	\$236,000
<i>Additional source capacity – new well</i>	\$50,000
<i>Install roughing filters – 42,000 gpd ³</i>	\$210,000
<i>Replace distribution piping – 0.75 miles ⁴</i>	\$396,000
Estimated Cost for Existing Deficiencies (\$)	\$892,000
Estimated Cost per Existing Connection (\$)	\$34,308
Estimated Financing Cost per Existing Connection (\$/Month)	\$183.39
LOW BUILD-OUT ESTIMATE	
# of Projected New Connections	13
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.02MG ⁵</i>	\$40,000
<i>Additional roughing filter capacity – 20,000 gpd ³</i>	\$100,000
Estimated Cost for Build-Out Infrastructure (\$)	\$140,000
Estimated Cost per New Connection (\$)	\$10,769
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$1,032,000
Estimated Cost per Connection (\$)	\$26,462
Estimated Financing Cost per Connection (\$/Month)	\$141.45
HIGH BUILD-OUT ESTIMATE	
# of Projected New Connections	26
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.04 MG ⁵</i>	\$80,000
<i>Additional roughing filter capacity – 40,000 gpd ³</i>	\$200,000
Estimated Cost for Build-Out Infrastructure (\$)	\$280,000
Estimated Cost per New Connection (\$)	\$10,769
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$1,172,000
Estimated Cost per Connection (\$)	\$22,538
Estimated Financing Cost per Connection (\$/Month)	\$120.48

NOTES: ¹ The number of available connections in the Briceland WSA was set at zero due to undersized source capacity.

² Additional storage requirements are based on 1 day of existing maximum day use (0.04 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.042 MG).

³ Additional filtration capacity is needed in addition to the slow sand filters to meet turbidity standards for existing and future conditions. Future maximum day demands are estimated at 0.06 MGD for low build-out and 0.08 MGD for high build-out.

⁴ According to the DHS annual inspection report, sizes, composition, and condition of distribution piping is unknown. This piping is assumed to need replacement over the planning time frame of this document. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).

⁵ Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 1,538 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$892,000 loan would amount to approximately \$75,000 per year. With 26 existing ratepayers, monthly bills would have to be increased by \$183 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

6.5.4.2. Description of Water Study Area

A map showing the Briceland WSA is attached as Figure 6-17. The WSA encompasses the community of Briceland, located in a remote area of southern Humboldt County between Redway and Shelter Cove. The Briceland WSA has 82 total acres, of which 53 acres are underdeveloped and/or vacant parcels. All 53 acres within the WSA are developable. With respect to development potential, the Briceland WSA contains both vacant and underdeveloped parcels that could see further residential development. However, the CSD currently has placed a moratorium on new water connections due to limited water supply.

The area's land use guidelines and development potential are covered in the Humboldt County General Plan, where Briceland is identified as a Rural Community Center.

6.5.4.3. Water System Service Area Description

The Briceland WSA receives water service from the Briceland Community Services District (BCSD). The BCSD was formed on September 20, 1989 under Community Services District law pursuant to sections 61000-61934 of the Government Code. The governing board is elected and consists of a five (5) member Board of Directors to supervise the business of the District. The District was formed for the purposes of improving the water system that was supplying water to houses in the Briceland area. The water system that was in place at the time was an antiquated system put in by the original settlers in the 1880's.

System Standards

BCSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

Fiscal Condition/Capital Replacement Program

According to BCSD records, they operate their water system on an annual budget of approximately \$6,000. The majority of this income is from service charges, but funding also comes from interest revenue. Replacement or depreciation funds are not accumulated through

revenues. The District has not developed a Capital Improvement Plan to date, and they currently have approximately \$20,000 in reserves.

Water Demand

According to the 2006 DHS inspection report, the BCSD produced approximately 3.88 million gallons of drinking water in 2005. Average daily use is estimated at 10,630 gpd, and peak daily use was reported as 40,000 gpd. The District has approximately 26 existing service connections and does not retail water to any other Districts.

Water Supply, Treatment, Distribution and Storage

The sole water source for the District is a spring on private property. The District, through agreement with the owner and formal deeding, receives 90% of the spring's flow. The spring's flow is variable and dependent on rainfall. However, in the summertime, the spring outputs 5 – 7 gpm, or between 7,200 and 10,080 gpd.

Water from the spring passes through two slow sand filter bays with an intermediate settling basin. Filter loading rates are well below SWTR requirements for slow sand filters. The distribution system consists of two pressure zones that are supplied from a single 42,000 gallon concrete storage tank. Approximately 1,600 feet of AC pipe connect the storage tank to the distribution system. Another 2,300 feet of pipeline of unknown size and composition are within the housing area.

Condition Assessment

Overview. BCSD's water system is operating in marginal condition and currently does not have the source capacity to meet current maximum day demands. Moreover, existing storage capacity provides about one day of storage at peak water demand rates. Existing peak daily use is approximately 400% of available source capacity during dry periods.

Source capacity is a significant problem, but the system has no other options for additional sources of water. Therefore, the District carefully watches storage tank levels during summer months. The District should promote conservation measures, as the current peak water usage of 40,000 gpd is excessive. For a population of 75 people, this represents a water usage of over 533 gallons per capita per day, which is extremely high. Whether the high usage is due to leakage or actual usage is unknown.

According to the 2007 DHS inspection report, the water system received the following appraisal:

- Turbidity performance standards were not met the previous four winters.
- A distribution system pipeline data sheet is required.
- Routine water system monitoring for GM, nitrate, radon, Ra-228, and VOCs is required.
- The District needs to adopt a cross-control ordinance.

The District has since completed its routine water system monitoring and has adopted a cross-control ordinance.

Current Deficiencies. The District experiences limited source capacity, which is currently less than reported average day demands. The spring is capable of producing approximately 100 gallons per capita per day. Efforts should be made to promote conservation and maintain water usage at this available rate.

Underserved Areas. The District currently has a moratorium on new connections. There are currently at least 4 homes within the District that have requested service connections; the oldest application is approximately 16 years old.

Proposed Improvements

System Upgrades. The Briceland CSD anticipates installing a new roughing filter and a solar powered hypo chlorination unit in the near future.

Future Expansion. The Briceland Community services District is focused on maintaining service to existing customers and has no expansion plans at this time. The District currently is under moratorium on new service connections by ordinance, due to water shortages and statutory constraints. There are currently negotiations in place to develop a mutual aid agreement with a number of local CSD's in the vicinity.

Cost and Schedule of Improvements. The District has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system.

6.5.5. Fieldbrook WSA

The Fieldbrook WSA receives water service from the Fieldbrook Glendale CSD (FGCSD), who also serves the Glendale USA and WSA. The Glendale USA and WSA are discussed previously in Section 6.4.5.

The County estimates there were 553 housing units within the Fieldbrook WSA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Fieldbrook WSA could have between 611 and 906 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the Fieldbrook WSA, which takes into consideration physical and zoning constraints, is 1,128. Therefore, the growth rate projections for the Fieldbrook WSA are within the range of what the land can bear.

The high build-out estimate for total development potential of 1,128 housing units in the WSA was used for infrastructure assessment and recommendations. This represents a combined 575 new housing units within the Fieldbrook WSA.

6.5.5.1. Summary

Findings

Fieldbrook's water system, owned and operated by FGCSD, is in good condition overall. The only major deficiency associated with the existing system and the existing development they serve is lower than desirable water pressure within some localized areas. In addition, a stand by generator is needed at the main (Lyman Rd) booster pump station and a new roof is needed on the redwood tank. The Fieldbrook WSA could receive up to 575 new housing units before reaching build-out conditions. The FGCSD will need to expand its water system infrastructure to serve this additional growth.

Existing Capacity

Availability of connections within the FGCSD water system is not limited by either source or treatment capacity. HBMWD has sufficient water supply to meet City demands.

Summary of Required Improvements

The infrastructure assessment for the Fieldbrook WSA was included in a comprehensive analysis of all study areas served by FGCSD (Fieldbrook WSA and Glendale USA and WSA). Due to the

interconnectedness of the water system, the study areas could not be assessed individually and were instead assessed as a whole. Section 6.4.5 contains the table that addresses the District's needs for existing development and for build-out conditions.

6.5.5.2. Description of Water Study Area

A map showing the Fieldbrook WSA is attached as Figure 6-2. The WSA encompasses the community of Fieldbrook, located north of Humboldt Bay in mid Humboldt County approximately five miles from the coast. The Fieldbrook WSA is part of a larger planning area that encompasses both the Fieldbrook and Glendale sub-areas. The Fieldbrook WSA has 6,879 total acres, of which 5,138 acres are underdeveloped and/or vacant parcels. Of this total acreage, 3,755 acres within the WSA are developable. With respect to development potential, the Fieldbrook WSA contains mostly underdeveloped parcels with some vacant parcels that could see further residential development.

The area's land use guidelines and development potential are covered in the Fieldbrook Glendale Community Plan, which was recently updated in May 2006. Although the Fieldbrook Glendale Community Plan is not official due to lack of community planning authority, the Plan is to be included in this Humboldt County General Plan Update.

6.5.5.3. Water System

Service Area Description

The Fieldbrook WSA receives water service mainly from the Fieldbrook Glendale Community Services District (FGCSD), although portions of the study area rely on private wells, springs, or surface water intakes, which can be of poor quantity and/or quality. The FGCSD was formed in 1973 under Community Services District law pursuant to sections 61000-61934 of the Government Code. The governing board is elected and consists of a five (5) member Board of Directors to supervise the business of the District.

System Standards

FGCSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

Fiscal Condition/Capital Replacement Program

According to FGCSD records, they operate their water system on an annual budget of approximately \$250,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District does not currently have a Capital Improvement Plan, and they currently have approximately \$0.5 million in water and wastewater reserves.

Water Demand

According to 2005/2006 HBMWD records, FGCSD's average daily use was 0.166 MGD and peak daily use was 0.389 MGD. The FGCSD retailed approximately 64 million gallons of drinking water in fiscal year 2005/2006. The Fieldbrook WSA has approximately 528 existing connections.

Water Supply, Treatment, Distribution and Storage

FGCSD purchases treated water from Humboldt Bay Municipal Water District (HBMWD) for delivery to its customers. HBMWD also provides operation, maintenance and administrative

support to FGCS. FGCS's water system begins at a water meter just north of the intersection of Fieldbrook Road and Glendale Drive. The system contains more than 10 miles of water mains, two booster pump stations, and one 400,000 redwood and one 20,000 gallon concrete water tank. Water quality is representative of HBMWD's excellent water source and meets or exceeds State standards.

Condition Assessment

Overview. Water service within the Fieldbrook WSA is generally very good with the exception of some low pressure areas. Peak daily use of HBMWD water for the District (0.389 MGD in 2005/2006) is currently about 90% of their peak rate allocation of 0.43 MGD set in contract with HBMWD on July 1, 2006.

Current Deficiencies. Some localized low pressure areas exist within the service area; therefore, additional pressure is needed especially before any additional growth occurs. Emergency backup power is needed at the Lyman Road Pump Station and a new roof is needed on the redwood tank.

Underserved Areas. The FGCS serves all areas within its service boundaries.

Proposed Improvements

System Upgrades. The District's main problem involves low water pressure within certain regions of its service area. The District's long range plans for improvements include:

- Construction of a new booster pump station at Korplex to improve water pressure within the service area.
- Installation of a standby emergency generator at the Lyman Road Pump Station
- Construction of an additional reservoir.
- Install a new roof on the existing redwood tank.

Future Expansion. The District is interested in expanding services to new developments as they occur within the study area.

Cost and Schedule of Improvements. The District has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system.

6.5.6. Jacoby Creek WSA

The County estimates there were 316 housing units within the Jacoby Creek WSA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Jacoby Creek WSA could have between 349 and 518 total housing units by 2025. According to Table 6-2, the high build-out estimate for total development potential within the WSA, which takes into consideration physical and zoning constraints, is 417. Therefore, the high rate growth projection for the study area is in excess of what the land can bear. It is unlikely that the high build-out estimate will be realized unless the State imposed sewer "waiver of prohibition" summarized in the Jacoby Creek Community Plan is dealt with.

The high build-out estimate for total development potential of 417 housing units in the WSA was used for infrastructure assessment and recommendations. This represents 101 new housing units within the Jacoby Creek WSA.

6.5.6.1. Summary

Findings

Jacoby Creek's water system is in good condition. The study area receives its water from the City of Arcata under contract. The biggest deficiency with the existing system is lack of adequate storage capacity. The study area has only about 27% of maximum day demand in storage capacity. In addition, some distribution piping within the system is less than six inches in diameter and unable to provide adequate fire flows. The Jacoby Creek WSA could receive up to 101 new housing units before reaching build-out conditions. Jacoby Creek will need to expand its water system infrastructure to serve this additional growth.

Existing Capacity

Availability of connections within the Jacoby Creek water system is not limited by either source or treatment capacity. HBMWD has sufficient water supply to meet District demands through connections with the City of Arcata.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Jacoby Creek WSA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

Table 6-23. Water system infrastructure assessment for the Jacoby Creek WSA.

WATER SYSTEM STATISTICS	
# of Existing Connections	562
# of Available Connections ¹	---
Source Capacity (MGD)	Not limiting (HBMWD)
Storage Capacity (MG)	0.174
Treatment Capacity (MGD)	Not required
Peak Day Use (MGD)	0.628
Usage Rate (gpd/connection)	1,117
CORRECTION OF EXISTING DEFICIENCIES	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.574 MG ²</i>	\$1,148,000
Estimated Cost for Existing Deficiencies (\$)	\$1,148,000
Estimated Cost per Existing Connection (\$)	\$2,043
Estimated Financing Cost per Existing Connection (\$/Month)	\$10.92
LOW BUILD-OUT ESTIMATE	
# of Projected New Connections	28
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.031 MG ³</i>	\$62,000
Estimated Cost for Build-Out Infrastructure (\$)	\$62,000
Estimated Cost per New Connection (\$)	\$2,214
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$1,210,000
Estimated Cost per Connection (\$)	\$2,051
Estimated Financing Cost per Connection (\$/Month)	\$10.96
HIGH BUILD-OUT ESTIMATE	
# of Projected New Connections	101
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.113 MGD ³</i>	\$226,000
Estimated Cost for Build-Out Infrastructure (\$)	\$226,000
Estimated Cost per New Connection (\$)	\$2,237
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$1,374,000
Estimated Cost per Connection (\$)	\$2,072
Estimated Financing Cost per Connection (\$/Month)	\$11.08

NOTES: ¹ There is sufficient source supply from HBMWD to serve all development potential within the USA.

² Additional storage requirements are based on 1 day of existing maximum day use (0.628 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.174 MG).

³ Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 1,117 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$1.148 million loan would amount to approximately \$74,000 per year. With 562 existing ratepayers, monthly bills would have to be increased by approximately \$11 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

6.5.6.2. Description of Water Study Area

A map showing the Jacoby Creek WSA is attached as Figure 6-1. The WSA encompasses most of the residential community of Jacoby Creek and extends along Old Arcata Road just south of Bayside Cutoff. The Jacoby Creek WSA has 899 total acres, of which 338 acres are underdeveloped and/or vacant parcels. Of this total acreage, 286 acres within the WSA are developable. With respect to development potential, the Jacoby Creek WSA contains mostly underdeveloped parcels with some vacant parcels that could see further residential development. However, portions of the WSA are also in the State imposed sewer "waiver prohibition" area, whose land use guidelines are covered in the Jacoby Creek Community Plan. The Jacoby Creek Community Plan limits density in areas not served by community wastewater to one dwelling unit per five acres.

The area's land use guidelines and development potential are covered in the Jacoby Creek Community Plan, which was last updated in December 1982.

6.5.6.3. Water System

Service Area Description

The Jacoby Creek WSA receives water service from the Jacoby Creek County Water District (JCWD), although portions of the study area rely on private wells, springs, or surface water intakes generally of poor quality. The JCWD receives its water from the City of Arcata under contract. The JCWD was formed in 1970 pursuant to Section 30000 et seq of the California Water Code to provide water only service within its boundaries. The City of Arcata operates and maintains the water system pursuant to their contract.

System Standards

JCWD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

Fiscal Condition/Capital Replacement Program

According to JCWD records, they operate their water system on an annual budget of approximately \$133,000. The majority of this income is from service charges, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District does not currently have a Capital Improvement Plan, and they currently do not have built up reserves.

Water Demand

According to the City of Arcata, JCWD purchased approximately 38 million gallons of drinking water in 2005 (City of Arcata, 2005). However, the 2007 DHS annual inspection report indicates Jacoby Creek purchased 114.6 MG of water in 2006. Average daily use is therefore estimated as 0.314 MGD. Peak daily use statistics are not available as the meter is only read every other month, but is estimated as twice the average daily use, or 0.628 MGD. The District has approximately 562 existing service connections and does not retail water to any other Districts.

Water Supply, Treatment, Distribution and Storage

JCWD purchases treated water from the City of Arcata who receives water from HBMWD. JCWD's water system begins at a water meter located near Jacoby Creek School along Old Arcata Road. The system contains approximately 4 miles of water mains, three booster stations, and four water tanks. The distribution system contains approximately 75% 6-inch asbestos cement pipe, and approximately 25% two to six inch PVC pipe. The water tanks range in size from 10,000 gallons to 100,000 gallons, for a total storage capacity of 174,000 gallons. Water quality is representative of HBMWD's excellent water source and meets or exceeds State standards.

Condition Assessment

Overview. Water service within the Jacoby Creek WSA is generally very good. Jacoby Creek's overall source capacity is tied to the City of Arcata. See Section 6.4.1 for further details.

Current Deficiencies. No significant deficiencies exist within the Jacoby Creek WSA other than those associated with the City of Arcata's overalls system. The study area has only about 27% of maximum day demand in storage capacity.

Underserved Areas. There are portions of the WSA outside of the City's sphere of influence and outside of the JCWD service boundaries.

Proposed Improvements

System Upgrades. There are currently no plans for system upgrades in the Jacoby Creek WSA.

Future Expansion. There is some potential for growth within the Jacoby Creek WSA, and also the potential to serve existing residents within the WSA that are not currently served with water.

Cost and Schedule of Improvements. JCWD has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system.

6.5.7. Myers Flat WSA

The County estimates there were 85 housing units within the Myers Flat WSA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Myers Flat WSA could have between 94 and 139 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the WSA, which takes into consideration physical and zoning constraints, is 89. Therefore, both the low and high rate growth projections for the study area are in excess of what the land can bear.

The high build-out estimate for total development potential of 89 housing units in the WSA was used for infrastructure assessment and recommendations. This represents 4 new housing units within the Myers Flat WSA.

6.5.7.1. Summary

Findings

Myers Flat's water system is in poor condition. The MFMWS is under Court Order to find a new source of water. The existing well is limited in capacity, barely capable of meeting summertime demands. The Pete's Creek surface water source is in need of treatment in order to be compliant with SWTR. The system is in need of a D1 certified operator. In addition, some PVC piping within the distribution system is under six inches in diameter and unable to provide

adequate fire flows. Some 8-inch galvanized steel pipe is also in poor condition and in need of replacement. The Myers Flat WSA is expected to receive only 4 new housing units before reaching build-out conditions. Myers Flat will not need any major expansions to the system to serve this additional growth, aside from what is needed to bring the existing system into compliance with standards.

Existing Capacity

Availability of connections within the Myers Flat water system is currently limited by both source capacity and lack of treatment. Source capacity is limited by the District's well, which is reportedly barely able to meet summertime demands. The District is under Court Order to find an alternative water source. The District's spring source is out of compliance with SWTR due to lack of treatment. Therefore, there are no available connections under the existing infrastructure.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Myers Flat WSA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

Table 6-24. Water system infrastructure assessment for the Myers Flat WSA.

WATER SYSTEM STATISTICS	
# of Existing Connections	103
# of Available Connections ¹	0
Source Capacity (MGD)	Unknown but limiting
Storage Capacity (MG)	0.3
Treatment Capacity (MGD)	0
Peak Day Use (MGD)	0.138
Usage Rate (gpd/connection)	1,340
EXISTING CONDITIONS	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional source capacity – new well</i>	\$50,000
<i>Upgrade distribution system – 2 miles ²</i>	\$1,056,000
Estimated Cost for Existing Deficiencies (\$)	\$1,106,000
Estimated Cost per Existing Connection (\$)	\$10,738
Estimated Financing Cost per Existing Connection (\$/Month)	\$57.40
LOW & HIGH BUILD-OUT ESTIMATE	
# of Projected New Connections	4
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>None needed ³</i>	\$0
Estimated Cost for Build-Out Infrastructure (\$)	\$0
Estimated Cost per New Connection (\$)	\$0
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$1,106,000
Estimated Cost per Connection (\$)	\$10,336
Estimated Financing Cost per Connection (\$/Month)	\$55.25

NOTES: ¹ The number of available connections in the Myers Flat WSA was set at zero due to undersized source capacity and lack of treatment capacity.

² According to DHS annual inspection report, the distribution system contains galvanized steel pipe in poor condition. Personal communication with MFMWS staff indicates approximately 2 miles of GSP are in need of replacement. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).

³ Existing storage is sufficient to meet future maximum day demands and provide adequate fire flow storage. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$1.106 million loan would amount to approximately \$71,000 per year. With 103 existing ratepayers, monthly bills would have to be increased by approximately \$57 per month to fund this loan. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

The MFMWS is not a local government agency and is therefore not eligible for most local, state, and federal grant sources. The MFMWS would need to secure funding through company assets or loans to make improvements. The MFMWS is eligible to petition the CPUC to seek a water rate increase to recover the full cost of the improvements plus a set rate of return on investment.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

6.5.7.2. Description of Water Study Area

A map showing the Myers Flat WSA is attached as Figure 6-9. The Myers Flat WSA is located in southern Humboldt County along the South Fork of the Eel River and U.S. Highway 101, approximately 50 miles south of Eureka. It lies between Weott to the north and Miranda to the south. The Myers Flat WSA has 165 total acres, of which 13 acres are underdeveloped and/or vacant parcels. Of this total acreage, 8 acres within the WSA are developable. With respect to development potential, the Myers Flat WSA consists of some vacant parcels that could see further development.

The area's land use guidelines and development potential are covered in the Avenue of the Giants Community Plan, which was last updated on April 11, 2000.

6.5.7.3. Water System

Service Area Description

The Myers Flat WSA is provided water service through the Myers Flat Mutual Water System (MFMWS).

System Standards

MFMWS's water system is a private water system. However, public water system standards apply to private water systems that serve over 25 people for more than 60 days per year. Therefore, the water system must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

Fiscal Condition/Capital Replacement Program

According to MFMWS records, the system operates its water system on an annual budget of approximately \$45,000. System funding is provided through service charges and connection fees. Replacement or depreciation funds are not accumulated through revenues. The District has not developed a Capital Improvement Plan to date, and they currently do not have accumulated reserves.

Water Demand

MFMWS produced approximately 25.2 million gallons of drinking water in 2005, according to the 2007 DHS annual inspection report. Average daily use for the entire District is estimated at 0.069 MGD. The inspection report failed to report peak daily use, but according to the Avenue of the Giants Community Plan, average daily demand is 100,000 gallons per day on summer week days and 130,000 per day on weekends. For the purposes of this report, maximum daily demand is estimated as twice average day usage, or approximately 138,000 gallons per day. This is representative of the large summer influx of residents in the community. The Myers Flat WSA has approximately 103 existing connections, all of which are metered. Approximately 16 of the connections are commercial.

Water Supply, Treatment, Distribution and Storage

MFMWS's water supply consists of a well of unknown capacity and a surface water source on Pete's Creek. The latter source was the primary source of drinking water prior to 1998, but is no longer an approved source due to lack of treatment. MFMWS also has an emergency connection to a State Park well in Hidden Springs State Park.

According to the 2007 DHS inspection report, the existing well has unknown capacity but is barely able to meet peak summertime demands. Sodium hypochlorite is pumped into the well discharge line, which discharges to storage. The system contains a 300,000 gallon concrete storage tank that is balanced on distribution, and therefore does not receive chlorine contact time credit based on SWTR. There is one pressure zone within the WSA, all gravity fed by this storage tank. The system contains approximately six miles of distribution piping, consisting of PVC and galvanized steel pipe varying in size between 4 inches and 8 inches in diameter.

Condition Assessment

Overview. Water service within the Myers Flat WSA is poor. The system is under a court order to find a new source of water and other parts of the system are in significant need of repair and/or replacement. Unfortunately, it is extremely difficult to find funding for the existing system for two main reasons: the majority of the WSA is under the 100-year floodplain, and it is difficult to obtain funding as a mutual water system. Efforts are underway to convert into a community services district.

The existing well source is of unknown capacity and reportedly barely meets peak summertime demands. Therefore, it is assumed that current peak water use is at approximately 100% of available production capacity.

Current Deficiencies. The MFMWS is under Court Order to find a new source of water. The existing well is limited in capacity, barely capable of meeting summertime demands. The surface water source is in need of treatment in order to be compliant with SWTR. The storage tank roof is in disrepair and no longer provides a barrier to entry of rainwater or vermin. The system is also in need of a D1 certified operator.

Underserved Areas. All areas within the WSA are serviced with water.

Proposed Improvements

System Upgrades. The District has no plans for system upgrades at this time.

Future Expansion. The District has no plans for expansion of services or District boundaries.

Cost and Schedule of Improvements. An infrastructure assessment for the District was recently completed by W&K in 2006. Identified improvement projects include upgrades to the distribution system, development of a new well, and upgrades to storage. Total costs were estimated at approximately \$2.2 million.

6.5.8. Orleans WSA

The County estimates there were 196 housing units within the Orleans WSA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Orleans WSA could have between 217 and 321 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the WSA, which takes into consideration physical and zoning constraints, is 416. Therefore, the growth projections for the study area are within the range of what the land can bear.

The high build-out estimate for total development potential of 416 housing units in the WSA was used for infrastructure assessment and recommendations. This represents 220 new housing units within the Orleans WSA.

6.5.8.1. Summary

Findings

Orleans' water system is in good condition overall but does not have adequate storage. Source capacity from an infiltration gallery in Peach Creek is unknown, but reportedly more than enough to satisfy maximum day demands. Additional treatment capacity is also available. Water usage rates are some of the highest in the County, in excess of 3,000 gallons per day per connection, even after subtracting out water usage for the vineyards and orchards. The Orleans WSA is expected to receive 220 new housing units before reaching build-out conditions. Orleans will need to expand its water system infrastructure to serve this additional growth.

Existing Capacity

Availability of connections within the Orleans water system is currently limited by the treatment capacity. Source capacity is reportedly not an issue. Treatment capacity is estimated at 0.495 MGD if the filters are operated 22 hours per day (time allowed for backwash cycle). Given existing maximum day demands are estimated at 0.513 MGD, the system is operating at approximately 104% of treatment capacity. However, these filters have a combined recommended capacity of 375 gpm, but DHS has indicated that they could be loaded at a combined rate of 450 gpm while still meeting all applicable standards. Therefore, current peak water use is estimated at approximately 79% of available treatment capacity. Therefore, there are no available connections under the existing infrastructure.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Orleans WSA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

Table 6-25. Water system infrastructure assessment for the Orleans WSA.

WATER SYSTEM STATISTICS	
# of Existing Connections	149
# of Available Connections ¹	0
Source Capacity (MGD)	Unknown but sufficient
Storage Capacity (MG)	0.1
Treatment Capacity (MGD)	0.495
Peak Day Use (MGD)	0.513
Usage Rate (gpd/connection)	3,443
CORRECTION OF EXISTING DEFICIENCIES	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.533 MG ²</i>	\$1,066,000
<i>Additional treatment capacity – 0.018 MGD ³</i>	\$90,000
Estimated Cost for Existing Deficiencies (\$)	\$1,156,000
Estimated Cost per Existing Connection (\$)	\$7,758
Estimated Financing Cost per Existing Connection (\$/Month)	\$41.47
LOW BUILD-OUT ESTIMATE	
# of Projected New Connections	50
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.172 MG ⁴</i>	\$344,000
<i>Additional treatment capacity – 0.172 MGD ³</i>	\$860,000
Estimated Cost for Build-Out Infrastructure (\$)	\$1,204,000
Estimated Cost per New Connection (\$)	\$24,080
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$2,360,000
Estimated Cost per Connection (\$)	\$11,859
Estimated Financing Cost per Connection (\$/Month)	\$63.39
HIGH BUILD-OUT ESTIMATE	
# of Projected New Connections	220
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.757 MG ⁴</i>	\$1,514,000
<i>Additional treatment capacity – 0.757 MGD ³</i>	\$3,785,000
Estimated Cost for Build-Out Infrastructure (\$)	\$5,299,000
Estimated Cost per New Connection (\$)	\$24,086
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$6,455,000
Estimated Cost per Connection (\$)	\$17,493
Estimated Financing Cost per Connection (\$/Month)	\$93.51

NOTES: ¹ The number of available connections in the Orleans study area was estimated based on the District currently being at 104% of its treatment capacity. Source capacity is not an issue.

² Additional storage requirements are based on 1 day of existing maximum day use (0.513 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.1 MG).

³ Future maximum day demands are estimated at 0.685 for low build-out and 1.27 MGD for high build-out. Existing treatment capacity is estimated at 0.495 MGD.

⁴ Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 3,443 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$1.156 million loan would amount to approximately \$74,000 per year. With 149 existing ratepayers, monthly bills would have to be increased by \$41 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

6.5.8.2. Description of Water Study Area

A map showing the Orleans WSA is attached as Figure 6-19. The Orleans WSA is located in northeastern Humboldt County along the Klamath River and U.S. Highway 96. It lies between Weitchpec to the southwest and Somes Bar to the northeast. The Orleans WSA has 1,057 total acres, of which 428 acres are underdeveloped and/or vacant parcels. Of this total acreage, 273 acres within the WSA are developable. With respect to development potential, the Orleans WSA consists of both vacant and underdeveloped parcels that could see further residential development.

The area's land use guidelines and development potential are covered in the Humboldt County General Plan.

6.5.8.3. Water System Service Area Description

The Orleans WSA is provided water service through the Orleans Community Services District (OCSD). The OCSD was originally organized in 1973 pursuant to Community Services District Law. The governing board of the District is the Board of Directors. The registered voters of the District elect the Board of Directors. The District was formed for the purpose of providing water, sewer, and fire protection services, but currently provides only water and fire protection services.

System Standards

OCSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

Fiscal Condition/Capital Replacement Program

According to OCSD records, the District operates its water system on an annual budget of approximately \$95,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District developed a Capital Improvement Plan in 2007, and they currently do not have built up reserves.

Water Demand

According to the 2005 DHS annual inspection report, OCSD retailed approximately 26 million gallons of drinking water in 2005. Average daily use for the entire District is estimated at 0.071 MGD, and peak daily use is estimated at approximately 0.513 MGD. The Orleans WSA has approximately 149 active connections and 15 inactive connections. Only one connection used by the volunteer fire department is unmetered.

Peak daily use corresponds to usage rates of approximately 3,443 gpd/connection. There are some large water users, such as orchards, vineyards, and the Forest Service, within the system, but their usage rates amount to only approximately 60,000 gpd during summer months. Therefore, water use is still extremely high for the remaining connections.

Water Supply, Treatment, Distribution and Storage

OCSD's water supply consists of an infiltration gallery within Peach Creek with unknown but adequate capacity. Water flows by gravity to treatment, where it is prechlorinated and then filtered through three parallel Permutit automatic backwash filters, each with a rated capacity of 125 gpm. Total treatment capacity is therefore estimated at approximately 0.495 MGD, if run for 22 hours per day allowing time for backwash cycling. The District recently began feeding polymer or other coagulant. Water is then stored in a 100,000 gallon redwood tank and fed to distribution. Two pressure zones exist within the system, with one zone served by the redwood storage tank and a second zone served by a booster pump. The distribution system consists of ten to twelve miles of mostly asbestos cement pipe with some ductile iron, PVC, and steel, all ranging in size between 2 inches and 8 inches in diameter. The distribution system was installed in 1977 and 1997.

Condition Assessment

Overview. Water service within the Orleans WSA is generally very good. Peak water demands are approximately 356 gpm. The filters have a combined recommended capacity of 375 gpm, but DHS has indicated that they could be loaded at a combined rate of 450 gpm while still meeting all applicable standards. Therefore, current peak water use is estimated at approximately 79% of available treatment capacity if DHS loading rates are used but 104% using the manufacturers' recommended maximum loading rate. Source capacity is not an issue.

Current Deficiencies. The only major deficiency with the system is lack of adequate storage capacity. The DHS 2007 annual report did not recognize any other deficiencies aside from the need for a cross-connection ordinance and routine monitoring.

Underserved Areas. All areas within the WSA are serviced with water.

Proposed Improvements

System Upgrades. The District has plans to install additional storage, increase treatment capacity, upgrade the infiltration gallery, and expand the main water line on Highway 96 with installation of several fire hydrants in an active brush fire area.

Future Expansion. The District has no plans for expansion of services or District boundaries

Cost and Schedule of Improvements. The District has developed a five to twenty year Capital Improvement Plan that covers costs and schedules for improvements to its water system. These

include additional storage, an increase in treatment capacity, upgrades to the infiltration gallery, and future expansion of the main water line on Highway 96.

6.5.9. Phillippsville WSA

The County estimates there were 97 housing units within the Phillippsville WSA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Phillippsville WSA could have between 107 and 159 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the WSA, which takes into consideration physical and zoning constraints, is 108. Therefore, the high growth rate projection for the study area is in excess of what the land can bear.

The high build-out estimate for total development potential of 108 housing units in the WSA was used for infrastructure assessment and recommendations. This represents 11 new housing units within the Phillippsville WSA.

6.5.9.1. Summary

Findings

Phillippsville's water system is in poor condition. The system relies on two water sources to meet maximum day demands – an untreated surface water spring that is not in compliance with SWTR and a groundwater well high in iron and manganese. Storage capacity is currently inadequate to even meet one day of maximum day demands. The distribution system consists of non-standard materials, such as electrical conduit, and the sizing and type of piping in the rest of the system is unknown. The District is seeking Proposition 50 funding to upgrade its water infrastructure. The Phillippsville WSA is expected to receive 11 new housing units before reaching build-out conditions. Phillippsville will need to expand its water system infrastructure to serve this additional growth.

Existing Capacity

Availability of connections within the Phillippsville water system is currently limited by both its source capacity and lack of treatment. The District relies on two sources of water, as the existing spring is unable to meet summertime demands. The spring is also out of compliance with SWTR due to lack of treatment. It is unclear whether the well would be able to meet demands on its own, but the distribution system is not set up to allow this and the well also suffers from high levels of iron and manganese. Therefore, there are no available connections under the existing infrastructure.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Phillippsville WSA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

Table 6-26. Water system infrastructure assessment for the Phillipsville WSA.

WATER SYSTEM STATISTICS	
# of Existing Connections	65
# of Available Connections ¹	0
Source Capacity (MGD)	Unknown but sufficient
Storage Capacity (MG)	0.075
Treatment Capacity (MGD)	0
Peak Day Use (MGD)	0.085
Usage Rate (gpd/connection)	1,308
EXISTING CONDITIONS	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.130 MG ²</i>	\$260,000
<i>Install treatment system – 0.085 MG ³</i>	\$425,000
<i>Replace distribution piping – 1 mile ⁴</i>	\$528,000
Estimated Cost for Existing Deficiencies (\$)	\$1,213,000
Estimated Cost per Existing Connection (\$)	\$18,662
Estimated Financing Cost per Existing Connection (\$/Month)	\$99.76
LOW & HIGH BUILD-OUT ESTIMATE	
# of Projected New Connections	11
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.14 MG ⁵</i>	\$28,000
<i>Additional treatment capacity – 0.14 MG ³</i>	\$70,000
Estimated Cost for Build-Out Infrastructure (\$)	\$98,000
Estimated Cost per New Connection (\$)	\$8,909
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$1,311,000
Estimated Cost per Connection (\$)	\$17,250
Estimated Financing Cost per Connection (\$/Month)	\$92.21

NOTES: ¹ The number of available connections in the Phillipsville study area was set at zero due to problems with water supply sources and non-compliance with SWTR.

² Additional storage requirements are based on 1 day of existing maximum day use (0.085 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.075 MG).

³ A new treatment plant is needed to meet both existing and future maximum day demands of 0.1 MG.

⁴ According to the DHS annual inspection report, the exact amounts of any particular piping are unknown. However, electrical conduit is known to be used within the system along with undersized water mains. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).

⁵ Additional storage requirements are based on 1 day of estimated maximum day use for new connections (11 new connections x 1,308 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$1.213 million loan would amount to approximately \$78,000 per year. With 65 existing ratepayers, monthly bills would have to be increased by approximately \$100 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown

under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

6.5.9.2. Description of Water Study Area

A map showing the Phillippsville WSA is attached as Figure 6-20. The Phillippsville WSA is located in southern Humboldt County along the South Fork of the Eel River and U.S. Highway 101, approximately 60 miles south of Eureka. It lies between Miranda to the north and Redway to the south. The Phillippsville WSA has 326 total acres, of which 114 acres are underdeveloped and/or vacant parcels. Of this total acreage, 34 acres within the WSA are developable. With respect to development potential, the Phillippsville WSA consists of some vacant parcels that could see further development.

The area's land use guidelines and development potential are covered in the Avenue of the Giants Community Plan, which was last updated on April 11, 2000.

6.5.9.3. Water System Service Area Description

The Phillippsville WSA is provided water service through the Phillippsville Community Services District (PCSD). The PCSD was declared formed in August of 1989 after a successful special election was held in order to assume responsibility for the Phillippsville Mutual Water Association water facilities. The District was established for the purpose of supplying potable water and fire protection services. The governing board is a five member Board of Directors.

System Standards

PCSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

Fiscal Condition/Capital Replacement Program

According to PCSD records, the District operates its water system on an annual budget of approximately \$35,000. The majority of this income is from service charges, but funding also comes from interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District has not developed a Capital Improvement Plan to date, and they currently do not have built up reserves.

Water Demand

According to the 2004 DHS annual inspection report, PCSD retailed an estimated 8.75 million gallons of drinking water in 2003. Average daily use for the entire District is estimated at 0.024 MGD, and peak daily use is estimated at approximately 0.085 MGD. The Phillippsville WSA has approximately 65 active service connections. The system does not have a master meter to monitor production.

Water Supply, Treatment, Distribution and Storage

PCSD's water supply consists of a groundwater well of unknown capacity and a surface water spring source with variable capacity. The spring source is unable to meet summertime demands, and therefore only serves the upper portion of the system during low flows while the well supplies water to the rest of the system. The well is primarily used during dry months. The spring is believed

to be under the influence of surface water, is not filtered, and is not continuously chlorinated with a reliable method (chlorine tablets). It is therefore not in compliance with SWTR. The well is continuously disinfected with a chlorination feed system located in the well housing. The well has high levels of iron and manganese and suffers from low pH, which causes problems with coloration and corrosion of the distribution system.

The system has a total of eight storage tanks ranging in size from 250 gallons to 60,000 gallons for a total combined capacity of 74,850 gallons. The system has numerous small pressure zones with anywhere between two and four connections. The distribution system consists of approximately two miles of a variety of piping, not all of which meet standards. The exact amounts of any particular piping are unknown. Some electrical conduit is currently being used for water piping. The system has replaced approximately 2,050 feet of piping since 2000 with PVC piping.

Condition Assessment

Overview. The system has a long history of mismanagement and problems. The water system is in poor condition and in significant need for repairs and upgrades. The District hopes to reconfigure the system and is in the process of researching funds in order to bring the system into compliance. The system is currently not in compliance with SWTR due to an untreated spring source.

Source capacity is unknown. Therefore, it is unclear how current peak water use compares to overall source capacity. The spring is reportedly unable to meet summertime demands, and the well is used to supplement supply.

Current Deficiencies. The existing spring source is not in compliance with SWTR, and parts of the distribution system do not meet DHS standards. The system has other deficiencies as noted above.

Underserved Areas. All areas within the WSA are serviced with water.

Proposed Improvements

System Upgrades. The District is seeking Proposition 50 funds to upgrade the water system infrastructure.

Future Expansion. The District has no plans for expansion of services or District boundaries.

Cost and Schedule of Improvements. The District has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system.

6.5.10. Redcrest WSA

The County estimates there were 33 housing units within the Redcrest WSA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Redcrest WSA could have between 36 and 54 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the WSA, which takes into consideration physical and zoning constraints, is 49. Therefore, the high growth rate projection for the study area is in excess of what the land can bear.

The high build-out estimate for total development potential of 49 housing units in the WSA was used for infrastructure assessment and recommendations. This represents 16 new housing units within the Redcrest WSA.

6.5.10.1. Summary

Findings

Redcrest's water system is in poor condition. The system is not in compliance with SWTR due to high turbidity levels following filtration. The system failed to meet turbidity requirements for six of twelve months in 2006. The system also currently does not meet Waterworks Standards for storage and distribution due to inadequate storage and small diameter water mains. The system has also been delinquent on raw water chemical and distribution system monitoring that needs to be regularly performed.

The Redcrest WSA is expected to receive 16 new housing units before reaching build-out conditions. In addition to bringing the existing system into compliance, Redcrest will need to expand its water system infrastructure to serve this additional growth.

Existing Capacity

Availability of connections within the Redcrest water system is currently limited by source capacity and noncompliance with SWTR. Source capacity is limited by the District's infiltration gallery and is estimated at 0.057 MGD if the pumps are operated 24 hours per day. Although maximum day demands are only 0.048 MGD, the treatment system is currently not able to meet turbidity requirements and is therefore not in compliance with SWTR. Therefore, there are no available connections under the existing infrastructure.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Redcrest WSA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

Table 6-27. Water system infrastructure assessment for the Redcrest WSA.

WATER SYSTEM STATISTICS	
# of Existing Connections	33
# of Available Connections ¹	0
Source Capacity (MGD)	0.057
Storage Capacity (MG)	0.027
Treatment Capacity (MGD)	0
Peak Day Use (MGD)	0.048
Usage Rate (gpd/connection)	1,455
CORRECTION OF EXISTING DEFICIENCIES	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.142 MG ²</i>	\$284,000
<i>Install roughing filters – 0.048 MGD ³</i>	\$330,000
<i>Replace distribution piping – 0.5 miles ⁴</i>	\$264,000
Estimated Cost for Existing Deficiencies (\$)	\$878,000
Estimated Cost per Existing Connection (\$)	\$26,606
Estimated Financing Cost per Existing Connection (\$/Month)	\$142.23
LOW BUILD-OUT ESTIMATE	
# of Projected New Connections	12
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.017 MG ⁵</i>	\$34,000
<i>Additional source capacity – new well</i>	\$50,000
<i>Additional roughing filter capacity – 0.017 MGD ³</i>	\$85,000
Estimated Cost for Build-Out Infrastructure (\$)	\$169,000
Estimated Cost per New Connection (\$)	\$14,083
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$1,047,000
Estimated Cost per Connection (\$)	\$23,267
Estimated Financing Cost per Connection (\$/Month)	\$124.37
HIGH BUILD-OUT ESTIMATE	
# of Projected New Connections	16
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.023 MG ⁵</i>	\$46,000
<i>Additional source capacity – new well</i>	\$50,000
<i>Additional roughing filter capacity – 0.023 MGD ³</i>	\$115,000
Estimated Cost for Build-Out Infrastructure (\$)	\$211,000
Estimated Cost per New Connection (\$)	\$13,188
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$1,089,000
Estimated Cost per Connection (\$)	\$22,224
Estimated Financing Cost per Connection (\$/Month)	\$118.80

NOTES: ¹ The number of available connections in the Redcrest study area was set at zero due to the system being in noncompliance with the SWTR.

² Additional storage requirements are based on 1 day of existing maximum day use (0.048 MG) plus minimum fire storage of 120,000 gallons minus existing storage (26,500 gallons).

³ Roughing filters are needed to improve treatment, as the system does not currently meet SWTR requirements for turbidity. Maximum day demands are estimated at 0.065 MGD for low build-out and 0.071 MGD for high build-out.

⁴ According to the DHS annual inspection report, the District has a number of old, undersized water mains in poor to fair condition that will likely need replacement during the planning time frame. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).

⁵ Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 1,455 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$878,000 loan would amount to approximately \$56,000 per year. With 33 existing ratepayers, monthly bills would have to be increased by approximately \$142 per month to fund this loan. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

The RWW is not a local government agency and is therefore not eligible for most local, state, and federal grant sources. The RWW would need to secure funding through company assets or loans to make improvements. The RWW is eligible to petition the CPUC to seek a water rate increase to recover the full cost of the improvements plus a set rate of return on investment.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

6.5.10.2. Description of Water Study Area

A map showing the Redcrest WSA is attached as Figure 6-21. The Redcrest WSA is located in southern Humboldt County along the South Fork Eel River and U.S. Highway 101, approximately 40 miles south of Eureka. It lies between Holmes to the north and Englewood to the south. The Redcrest WSA has 280 total acres, of which 23 acres are underdeveloped and/or vacant parcels. Of this total acreage, 20 acres within the WSA are developable. With respect to development potential, the Redcrest WSA consists of some vacant parcels that could see further development.

The area's land use guidelines and development potential are covered in the Avenue of the Giants Community Plan, which was last updated on April 11, 2000.

6.5.10.3. Water System Service Area Description

The Redcrest WSA receives water service from a privately owned system owned and operated by Redcrest Water Works (RWW), which is equivalent to a mutual water association. RWW was formed for the purpose of providing water service to the community.

System Standards

RWW's water system is a private water system. However, public water system standards apply to private water systems that serve over 25 people for more than 60 days per year. Therefore, the water system must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

Fiscal Condition/Capital Replacement Program

The RWW operating budget is unknown. Income is from service charges, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through

revenues. The District does not currently have a Capital Improvement Plan, and they currently do not have built up reserves.

Water Demand

According to the DHS 2007 inspection report, RWW produced 8.535 million gallons of drinking water in 2005. Average daily use is therefore estimated at approximately 0.023 MGD, and peak daily use was reported as 0.048 MGD. The District currently provides water service to 33 residential connections, none of which are metered.

Water Supply, Treatment, Distribution and Storage

RWW's water source consists of an infiltration gallery located in Chadd Creek behind a dam and not in the live channel, with an estimated capacity of 40 – 50 gpm (0.057 – 0.072 MGD). The gallery has historically been rebuilt every year due to winter storms. The RWW also has a spring source on emergency standby during winter storms; the source has lower turbidity to reduce load on the filters during storms. Water from the infiltration gallery enters a 6 foot diameter grit tank followed by six filter tanks, each 9.5 feet in diameter and filled with 3 feet of sand. The flow is distributed evenly to each filter at a loading rate of approximately 0.09 gpm/ft². However, the system consistently fails to meet DHS turbidity requirements.

Water is chlorinated prior to storage, which consists of four tanks ranging in size from 3,500 gallons to 10,000 gallons for a total storage capacity of 26,500 gallons. The system does not currently meet DHS storage requirements. The distribution system consists of approximately 0.7 miles of transite, PVC, GSP and PE pipe. The GSP and PE pipes do not meet distribution system standards due to inadequate size (2-inch).

Condition Assessment

Overview. Water service within the Redcrest WSA is poor. The system is currently not in compliance with SWTR. Current peak water use is at approximately 84% of available production capacity.

Current Deficiencies. The system is not in compliance with SWTR due to high turbidity levels following filtration. The system failed to meet turbidity requirements for six of twelve months in 2006. The system also currently does not meet Waterworks Standards or fire flow standards for storage and distribution due to inadequate storage and small diameter water mains. The system has also been delinquent on raw water chemical and distribution system monitoring that needs to be regularly performed.

Underserved Areas. The RWW serves all areas within its service boundaries.

Proposed Improvements

System Upgrades. The RWW is considering a roughing filter to reduce load on the slow sand filters and improve turbidity reduction. They also have plans to add 10,000 gallons of raw water storage, but this is still insufficient to meet the required minimum storage per Waterworks Standards. Storage and distribution for fire flow should also be considered.

Future Expansion. The District has no plans for expansion at this time.

Cost and Schedule of Improvements. RWW has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system.

6.5.11. Riverside WSA

The County estimates there were 116 housing units within the Riverside WSA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Riverside WSA could have between 128 and 190 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the WSA, which takes into consideration physical and zoning constraints, is 121. Therefore, both the low and high growth rate projections for the study area are in excess of what the land can bear.

The high build-out estimate for total development potential of 121 housing units in the WSA was used for infrastructure assessment and recommendations. This represents only 5 new housing units within the Riverside WSA.

6.5.11.1. Summary

Findings

Riverside's water system is in good condition overall. The District does not currently have a licensed water distribution operator. The only other deficiencies include lack of fire hydrants, distribution system with small diameter mains, and lack of fire suppression storage. The Riverside WSA is expected to receive only 5 new housing units before reaching build-out conditions. Riverside will need only minor expansions to its water system infrastructure to serve this additional growth.

Existing Capacity

Availability of connections within the Riverside water system is currently limited by the source capacity of its wells. Well production is estimated at 0.074 MGD over a 24 hour period. Given existing maximum day demands are estimated at 0.046 MGD, the system is operating at approximately 62% of source capacity. Therefore, there are approximately 60 available connections under the existing infrastructure.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Riverside WSA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

Table 6-28. Water system infrastructure assessment for the Riverside WSA.

WATER SYSTEM STATISTICS	
# of Existing Connections	98
# of Available Connections ¹	60
Source Capacity (MGD)	0.074
Storage Capacity (MG)	0.066
Treatment Capacity (MGD)	Not required
Peak Day Use (MGD)	0.046
Usage Rate (gpd/connection)	469
EXISTING CONDITIONS	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.100 MG</i> ²	\$200,000
<i>Upgrade distribution system – 4 miles</i> ³	\$2,112,000
Estimated Cost for Existing Deficiencies (\$)	\$2,312,000
Estimated Cost per Existing Connection (\$)	\$23,592
Estimated Financing Cost per Existing Connection (\$/Month)	\$126.11
LOW & HIGH BUILD-OUT ESTIMATE	
# of Projected New Connections	5
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 2,500 gal.</i> ⁴	\$5,000
Estimated Cost for Build-Out Infrastructure (\$)	\$5,000
Estimated Cost per New Connection (\$)	\$1,000
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$2,317,000
Estimated Cost per Connection (\$)	\$22,495
Estimated Financing Cost per Connection (\$/Month)	\$120.25

NOTES: ¹ The number of available connections in the Riverside study area was estimated based on the system currently being at 62% of its source capacity.

² Additional storage requirements are based on 1 day of existing maximum day use (0.046 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.066 MG).

³ Existing distribution system is 4-inch or smaller diameter pipe unable to provide adequate fire flows.

⁴ Additional storage requirements are based on 1 day of estimated maximum day use for new connections (5 new connections x 469 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$2.312 million loan would amount to approximately \$148,000 per year. With 98 existing ratepayers, monthly bills would have to be increased by approximately \$126 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

6.5.11.2. Description of Water Study Area

A map showing the Riverside WSA is attached as Figure 6-22. The WSA is comprised of mostly farmlands and the community of Port Kenyon, a small residential cluster located on the Salt River just northwest of the City of Ferndale, as well as a cluster of homes along Centerville and Meridian Roads. The majority of the District is located in the coastal zone within the Eel River Area Plan. The southern tip of the District is located outside the coastal zone within the County Framework Plan. Because the majority of the District includes properties in the Ferndale Bottoms, the Eel River Area Plan designates the area as Agriculture Exclusive, with the Port Kenyon and Meridian Road areas designated Residential Exurban. The Residential Exurban designation "reflects the communities' desires to maintain the existing densities and levels of development while protecting adjacent agricultural areas."

The Riverside WSA has 1,977 total acres, of which 56 acres are underdeveloped and/or vacant parcels. Of this total acreage, 34 acres within the WSA are developable. With respect to development potential, the Riverside WSA contains mostly underdeveloped parcels with some vacant parcels that could see further residential development.

6.5.11.3. Water System

Service Area Description

The Riverside WSA receives water service from the Riverside Community Services District (RCSD). The RCSD was formed on June 25, 1991 under Community Services District law pursuant to sections 61000-61934 of the Government Code. The governing board is elected and consists of a five (5) member Board of Directors to supervise the business of the District. The District was formed for the purposes of securing a state grant to bring an existing water system into compliance with state water quality requirements. The District provides water services for both domestic and agricultural purposes.

System Standards

RCSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

Fiscal Condition/Capital Replacement Program

According to RCSD records, they operate their water system on an annual budget of approximately \$52,000. The majority of this income is from service charges, but funding also comes from interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District does not currently have a Capital Improvement Plan, and they currently have \$53,000 in reserves.

Water Demand

According to the DHS 2005 inspection report, RCSD produced 12.5 million gallons of drinking water in 2005. Average daily use was approximately 0.034 MGD, and peak daily use was approximately 0.046 MGD. The District currently provides water service to 74 residential customers and 24 agricultural operations (dairies on the Ferndale bottoms).

Water Supply, Treatment, Distribution and Storage

RCSD's water source consists of two gravity fed artesian wells and one deep well with a maximum production capacity of approximately 74,000 gallons of water a day. The artesian wells are capable of producing approximately 22 gpm, and the deep well produces about 30

gpm. The artesian wells are the primary sources of water, and water from these runs by gravity to a booster pump clear well which pumps water to the main 60,000 gallon reinforced concrete storage tank and then to distribution via gravity flow. The deep well is only used to supplement the artesian wells, mostly in summer. This well pumps to a 6,200 gallon storage tank that then flows to the booster pump clear well. The distribution system consist of approximately 5 miles of mainly of PVC pipe (2-inch to 4-inch) with very little AC pipe and some galvanized steel pipe used to cross the Salt Creek Bridge at Dillon Creek.

Condition Assessment

Overview. Water service within the Riverside WSA is generally good. Current peak water use is at approximately 62% of available production capacity.

Current Deficiencies. The District's deep well can only be used as an auxiliary well due to high manganese content. The District does not currently have any fire hydrants. Due to small main size and low pressure, the system is not capable of supporting fire suppression uses.

Underserved Areas. The RCSD serves all areas within its service boundaries.

Proposed Improvements

System Upgrades. The District has no planned system upgrades.

Future Expansion. There is very little potential for growth within the Riverside WSA, and also the potential to serve existing residents within the WSA that are not currently served with water. The remainder of the District is in the Eel River floodplain and is under Coastal Commission jurisdiction, so further development is unlikely.

Cost and Schedule of Improvements. RCSD has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system.

6.5.12. Westhaven WSA

The County estimates there were 617 housing units within the Westhaven WSA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Westhaven WSA could have between 682 and 1,011 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the WSA, which takes into consideration physical and zoning constraints, is 1,041. Therefore, both the growth rate projections for the study area are within the range of what the land can bear.

The high build-out estimate for total development potential of 1,041 housing units in the WSA was used for infrastructure assessment and recommendations. This represents 424 new housing units within the Westhaven WSA.

6.5.12.1. Summary

Findings

The Westhaven CSD's water system is in fair condition overall. Recent efforts have focused on conservation – installing meters throughout the system and repairing leaks. This CSD suffers from limited source capacity. Additional sources have been sought but none identified. Without an additional source of water, development within the area will be severely limited.

The Westhaven WSA is expected to receive only 424 new housing units before reaching build-out conditions. In addition to finding additional source capacity, Westhaven will need to expand its water system infrastructure to serve this additional growth.

Existing Capacity

Availability of connections within the Westhaven water system is currently limited by the source capacity of its springs and well. Total source capacity varies between 0.057 and 0.086 MGD over a 24 hour period. Given existing maximum day demands are estimated at 0.066 MGD, the system operates in excess of summertime source capacity. Therefore, there are no available connections under the existing infrastructure.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Westhaven WSA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

Table 6-29. Water system infrastructure assessment for the Westhaven WSA.

WATER SYSTEM STATISTICS	
# of Existing Connections	233
# of Available Connections ¹	0
Source Capacity (MGD)	0.058
Storage Capacity (MG)	0.1
Treatment Capacity (MGD)	0.115
Peak Day Use (MGD)	0.066
Usage Rate (gpd/connection)	283
CORRECTION OF EXISTING DEFICIENCIES	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.086 MG ²</i>	\$172,000
<i>Additional source capacity – new well</i>	\$50,000
<i>Upgrade distribution system – 4 miles ³</i>	\$2,112,000
Estimated Cost for Existing Deficiencies (\$)	\$2,334,000
Estimated Cost per Existing Connection (\$)	\$10,017
Estimated Financing Cost per Existing Connection (\$/Month)	\$53.55
LOW BUILD-OUT ESTIMATE	
# of Projected New Connections	79
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.022 MG ⁴</i>	\$44,000
Estimated Cost for Build-Out Infrastructure (\$)	\$44,000
Estimated Cost per New Connection (\$)	\$557
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$2,378,000
Estimated Cost per Connection (\$)	\$7,622
Estimated Financing Cost per Connection (\$/Month)	\$40.74
HIGH BUILD-OUT ESTIMATE	
# of Projected New Connections	424
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.120 MG ⁴</i>	\$240,000
Estimated Cost for Build-Out Infrastructure (\$)	\$240,000
Estimated Cost per New Connection (\$)	\$566
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$2,574,000
Estimated Cost per Connection (\$)	\$3,918
Estimated Financing Cost per Connection (\$/Month)	\$20.94

NOTES: ¹ The number of available connections in the Westhaven study area was set at zero due to inadequate source capacity.

² Additional storage requirements are based on 1 day of existing maximum day use (0.066 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.1 MG).

³ Estimated by District staff. Mostly PE pipe over 40 years old and prone to failure but some other undersized mains. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).

⁴ Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 283 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$2.334 million loan would amount to approximately \$150,000 per year. With 233 existing ratepayers, monthly bills would have to be increased by approximately \$54 per month to fund this loan. In reality, we would expect the District to apply for and hopefully

obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

6.5.12.2. Description of Water Study Area

A map showing the Westhaven WSA is attached as Figure 6-23. The WSA encompasses a small area outside of the City of Trinidad City boundary but within its sphere of influence, but the majority of the WSA covers the Westhaven and Moonstone residential areas outside of the City's sphere of influence. The WSA encompasses roughly the coastal area from Little River on its southern border up to Trinidad on its north. The area's land use guidelines and development potential are covered in both the Humboldt County Framework General Plan and North Coastal Area Plan.

The Westhaven WSA has 2,072 total acres, of which 668 acres are underdeveloped and/or vacant parcels. Of this total acreage, 541 acres within the WSA are developable. With respect to development potential, the Westhaven WSA contains both underdeveloped and vacant parcels that could see further residential development subject to the North Coastal Area Plan.

6.5.12.3. Water System Service Area Description

Approximately 15% of the Westhaven WSA receives water service from the Westhaven Community Services District (WCSD). The remainder is outside any water related special district SOI or boundaries. The Certificate of Completion was filed for the WCSD on May 17, and the first CSD Board was appointed by the Board of Supervisors on October 27, 1987. The governing board is elected and consists of a five (5) member Board of Directors to supervise the business of the District. The District was formed under increasing pressure from the State Department of Health Services to install new storage and treatment facilities. Previously the Westhaven Mutual Water Company (WMWC), incorporated in 1968 and consisting of up to 186 shareholders, the District was formed in hopes to better be able to make needed improvements as a public entity. After the District was formed, it assumed ownership and operation of all facilities then owned and operated by WMWC. Portions of the WSA (approximately 15 connections within WCSD service boundaries) receive water service from the Moonstone Heights Mutual Water Association. The northern portions of the service area also receive water from the City of Trinidad

System Standards

WCSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

Fiscal Condition/Capital Replacement Program

According to WCSD records, they operate their water system on an annual budget of approximately \$170,000. The District's income is entirely from service charges. Replacement or depreciation funds are accumulated through water service revenues. The District does not currently have a Capital Improvement Plan, and they currently have \$80,000 in capital reserves.

Water Demand

According to the DHS 2005 inspection report, WCSD produced 14.3 million gallons of drinking water in 2004. Average daily use was approximately 0.039 MGD, and peak daily use was approximately 0.066 MGD. The District currently provides water service to 233 residential customers.

Water Supply, Treatment, Distribution and Storage

The system is supplied by three small, spring-fed tributaries of Two Creek at the eastern edge of the community and a 100-foot deep well within the residential area. The creek source represents approximately 75% of the total source capacity, with the well accounting for the remaining 25%. Source capacity varies between 40 – 60 gpm (0.058 – 0.086 MGD). During the system-upgrading project in the early 1990s, the District expended considerable resources in efforts to locate additional local water sources. Except for the well, no additional sources that could be developed in an economically feasible manner were located within the District. During this same time, an attempt by the District to develop a municipal well just outside the northeast boundary failed due to local political impasse. The District has installed meters on all residential connections recently, which has facilitated the District in identifying leaks and distribution system problems. The District also recently installed a calcite filter at the well to raise pH of the well water.

Source water is directed to a sedimentation chamber followed by slow sand filtration. The filters have a capacity of 115,200 gpd. After filtration, water is chlorinated prior to storage in a 100,000 gallon concrete storage tank. Three pressure zones exist within the WCSD: the main zone served by the storage tank, a high pressure zone serviced by a booster station at the chlorination building, and a low pressure zone (pressure reduced from main zone) on the west side of U.S. Highway 101. 35% of the distribution system consists of 6-inch or 4-inch C-900 PVC, 20% is 4-inch or 3-inch AC, 10% is schedule 40 PVC and the remaining 35% is 2-inch or smaller 40-year-old polyethylene. The distribution system contains approximately 7.5 miles of piping overall, 50% of which is less than 4 inches in diameter.

Condition Assessment

Overview. Water service within the Westhaven CSD is generally fair. However, source capacity continues to be a problem. Source capacity currently varies between 40 – 60 gpm, compared to a maximum day demand of 0.66 MGD, or approximately 46 gpm.

Current Deficiencies. No serious deficiencies were identified in the most recent DHS inspection, aside from the source capacity issue stated above. Recommendation were made to vent the well, submit a cross connection control plan, replace roof on storage tank, and maintain monitoring (chemical monitoring of the well, asbestos sampling, and bacteriological sampling). WCSD water storage does not meet fire flow requirements, and 50% of the water mains are smaller than the 4-inch minimum set forth in ISO standards. None of the distribution system could provide the 1,000 gpm fire flow in the State Fire Code.

Underserved Areas. The WCSD serves all areas within its service boundaries.

Proposed Improvements

System Upgrades. The District plans on replacing the storage tank roof. Plans are also underway to upgrade the distribution system's undersized water mains, increase storage capacity, and further explore additional sources of water.

Future Expansion. The District has no plans for future expansion, and is quite limited by source capacity. Additional source capacity would need to be located for WCSD, or another water related special district, to provide water service to other portions of the Westhaven WSA. In addition, LAFCo would need to approve any changes to local agencies boundaries or SOI.

Cost and Schedule of Improvements. WCSD has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system.

6.6. Humboldt Community Services District USAs & WSAs

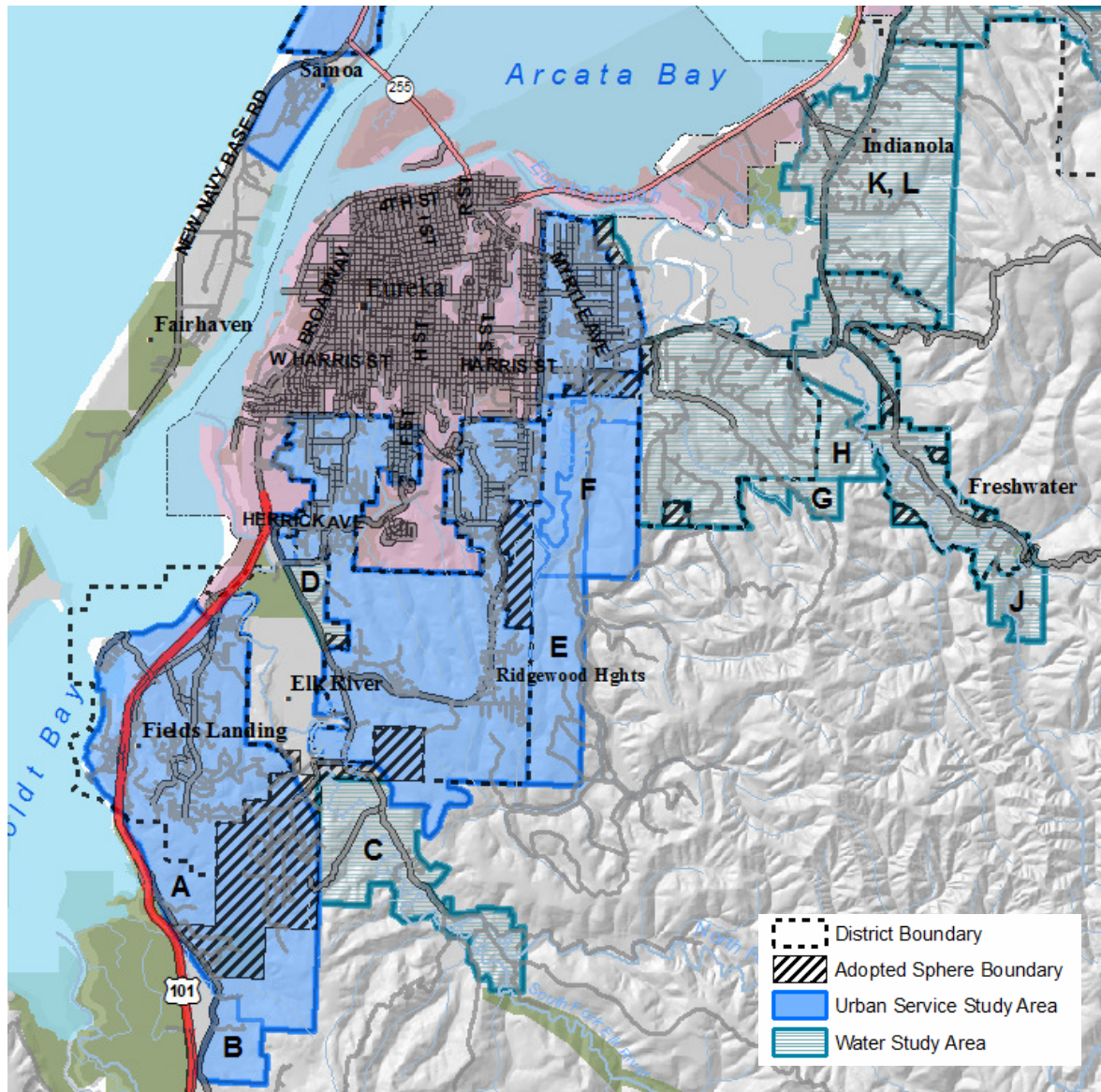
HCSD was declared formed in September of 1952 after a successful special election was held. The District is an independent multi-purpose special district organized to provide water, wastewater, and streetlight services pursuant to Section 61000 and following of the California Government Code. Formation of the District was prompted by an unmet need for urban type services in the rapidly growing "suburban" areas surrounding the City of Eureka. Because the desired services could not be obtained from the City, district formation was the only means available for providing those services necessary for the maintenance of existing and developing residential and commercial areas.

HCSD is located in the Humboldt Bay area and serves the unincorporated areas of the County surrounding the City of Eureka. The District extends from the Freshwater Valley in the north nearly to College of the Redwoods in the south. Humboldt Bay and the City of Eureka form the districts western boundary and the eastern edge of the Freshwater Creek valley forms the eastern boundary. Included within or adjacent to the boundaries of the district are the following USAs and WSAs, each of which will be analyzed in detail below:

- Freshwater WSA
- Humboldt Hill USA
- Indianola WSA
- Myrtle town USA & WSA
- South Eureka USA & WSA

HCSD has requested that this General Plan Update support its request for expansion of the district SOI and boundaries (collectively referred to SOI expansion areas). The County has agreed to evaluate these areas as part of the General Plan Update. These SOI expansion areas are referred to as areas A through L (see Figure 6 30. HCSD Proposed Sphere of Influence Expansion Areas on page 6-131). This report includes information regarding the SOI expansion areas in each of the HCSD Urban Study Areas. Additional information regarding district boundaries and spheres of influence can be found in Section 1.5, LAFCo and Service Provider Boundaries.

Figure 6-24. HCSD Proposed Sphere of Influence Expansion Areas.



HCSD has stated that its request for SOI expansion is based on specific and varying reasons. HCSD water infrastructure is located within some of the SOI expansion areas, and in some cases homes outside the district are provided HCSD water service. The inclusion of Areas A, D, G, and H would eliminate pockets adjacent to HCSD, or what HCSD refers to as “island” areas, and result in a contiguous service area with logical SOI boundaries, as recommended by LAFCO law. These SOI expansion areas are adjacent to both existing district boundaries and the HCSD SOI. Upon SOI expansion and annexation, Area H would connect the HCSD Freshwater service area and the rest of the district and eliminate a large island area.

Areas C, J, and L have water quality problems and its residents have requested public water service. Areas E and F are adjacent to both the HCSD service area and urban service boundary, currently contain HCSD facilities and could support additional long term development. Area B has been withdrawn for SOI consideration per County request.

The following is a brief description of the proposed HCSD SOI expansion areas:

Table 6-30. HCSD Proposed Sphere of Influence Expansion Areas.

Area	Name	Description	Existing HCSD Service in Area	HCSD Reason for Request
A	CR North	Pocket area between CR (existing SOI) and southern HCSD boundary near Fields Landing	Contains HCSD water main serving CR.	HCSD refers to area as "island"
B	CR South	Withdrawn by HCSD		
C	Elk River	Areas along Elk River Road south of Berta Road to Headwaters trailhead	No existing facilities within area	HCSD indicates that landowners have requested municipal water due to public health concerns
D	Myers Avenue	Pocket area along east side of Elk River Road between Herrick Avenue and Westgate Road	Contains HCSD water mains located within area	HCSD refers to area as "island"
E	Ryan Slough South	Timberland area east of Mid McKay Tract	Contains HCSD water tank and supply mains	To allow for long-term infrastructure planning
F	Ryan Slough North	Timberland area east of North McKay Tract		To allow for long-term infrastructure planning and a proposed HCSD lift station and collection facilities serving existing SOI area
G	Cummings Road	Area containing Cummins Road Landfill	Contains HCSD water mains and tanks located within area and homes receiving service	HCSD refers to area as "island"
H	Pigeon Point Road	Area adjacent to existing HCSD boundaries surrounding Felt Road	Contains HCSD water mains located within area and homes receiving service	HCSD refers to area as "island"
J	Pacific Lumber Camp Road	Area adjacent to existing HCSD, south of Freshwater Valley		HCSD indicates that landowners have requested public water

Area	Name	Description	Existing HCSD Service in Area	HCSD Reason for Request
K. L	Indianola	Area primarily on the east side of Myrtle Avenue between the northern edge of the HCSD SOI (Redmond Road) and the Indianola Cutoff	No existing HCSD facilities within area (City of Eureka facilities within area)	HCSD indicates that landowners have requested municipal water due to public health concerns

6.6.1. Freshwater WSA

The Freshwater Valley was originally served water by private, individual wells and several private water companies. In 1992, the residents requested that HCSD annex this area and create the Freshwater Assessment District to provide high quality public water to correct a long-standing water quality problem. A map showing the Freshwater WSA is attached as Figure 6-18. The Freshwater WSA is located within a valley east of Humboldt Bay. The Freshwater WSA also includes the Mitchell Heights and Redmond Road areas. The Freshwater WSA has 3,568 total acres, of which 1,008 acres are underdeveloped and/or vacant parcels. Of this total acreage, 1,024 acres within the WSA are developable. With respect to development potential, the Freshwater WSA has both underdeveloped and vacant parcels that may be appropriate for further development and subject to the Freshwater Community Plan, which was last updated in May 1985. The Coastal Zone portions of the WSA are subject to the Humboldt Bay Area Plan. Existing zoning restrictions and lack of sewer service restrict the development potential of this area. HCSD reports that fewer County building permits have been issued since receiving public water than previous to the Assessment District Formation.

The County estimates there were 803 housing units within the Freshwater WSA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Freshwater WSA could have between 887 and 1,316 total housing units by 2025. According to **Table 1-6**, the high projected total build-out estimate for total development potential within the Freshwater WSA, which takes into consideration physical and zoning constraints, is 1,138. Therefore, the high growth rate projection for the WSA is in excess of what the land can bear.

The high estimate for total development potential of 1,138 housing units in the WSA was used for infrastructure assessment and recommendations. This represents 335 new housing units within the Freshwater WSA or 2.9% of the total new housing units in the District.

Most of the Freshwater WSA is within the boundaries or SOI of the HCSD, with the following exceptions:

Cummins Road (Areas G). HCSD has requested that the Cummins Road landfill area be incorporated into the district SOI and boundaries. HCSD currently operates and maintains distribution and storage facilities in this area that were installed to correct public health problems caused by the landfill.

Pigeon Point Road (Areas H). HCSD has requested that the Pigeon Point Road area be included within the HCSD SOI and considered for annexation. The ultimate annexation of this area would connect the island area formed by the Freshwater Valley area and provide for more logical boundaries. HCSD operates and maintains a distribution system in this area that serves several properties. In addition, the annexation of this area would allow HCSD to plan for and install a

looped water distribution system serving the Freshwater area improving fire flow capacity and providing system redundancy.

Pacific Lumber Camp Road (Area J) - The Pacific Lumber Camp Road area is outside the current district SOI and boundaries, and residents have requested that the HCSD SOI and boundaries, as well as the Freshwater Assessment District be extended to include this area because of water quality problems similar to Freshwater.

Findings

HCSD's water system in Freshwater is in good condition overall. There are no major infrastructure deficiencies associated with the existing system, as it was constructed in 1992. The Freshwater WSA could receive up to 335 new housing units before reaching build-out conditions. To the extent that development occurs where existing service is provided, no major improvements will be needed. However, where development is not adjacent to an existing water main, an extension of service will be needed.

The District has received requests from some residents on Pacific Lumber Camp Road to extend water service to their residences, which are located in the WSA. It is recommended that the District be allowed to expand its SOI to include the Lumber Camp area to improve the health, safety and water quality in this area.

HCSD operates water system infrastructure within the Cummings Road (Area G) and Pigeon Point Road (Area H) areas. It is recommended that HCSD be allowed to expand its SOI to incorporate these areas so that all HCSD facilities are located within its SOI.

6.6.2. Humboldt Hill USA

Most of the Humboldt Hill USA was added to HCSD boundaries in the 1980's with the purchase of the Pialorsi Private Water System and of the consolidation with County Service Area 3 (CSA 3) Sewer System, which was established in 1972 through the merger of three sanitation districts serving Fields Landing, King Salmon, and Humboldt Hill.

A map showing the Humboldt Hill USA is attached as Figure 6-5. The Humboldt Hill USA represents some of the greatest development potential within unincorporated Humboldt County. The Humboldt Hill USA has 3,967 total acres, of which 1,937 acres are underdeveloped and/or vacant parcels. Of this total acreage, 1,224 acres within the USA are developable. With respect to development potential, the majority of the Humboldt Hill USA has a significant amount of both underdeveloped and vacant parcels. The area's land use guidelines and development potential are covered in the Eureka Community Plan, and the Humboldt Bay Area Plan, both last updated in April 1995.

The County estimates there were 1,791 housing units within the Humboldt Hill USA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Humboldt Hill USA could have between 1,979 and 2,935 total housing units by 2025. According to **Table 1-6**, The high projected build-out estimate for total development potential within the Humboldt Hill USA, which takes into consideration physical and zoning constraints, is 3,861. Therefore, the growth estimates are within the range of what the land can bear, and the Humboldt Hill USA has additional development potential beyond the 20-year planning horizon.

The high build-out estimate for total development potential of 3,861 housing units in the USA was used for infrastructure assessment and recommendations. This represents 2,070 new housing units within the Humboldt Hill USA or 18% of the total potential new housing units in the District.

Overall, there is potential for an estimated 11,602 new housing units within the Humboldt CSD service area.

Following the purchase of the Pialorsi Water System, the District drilled three municipal water wells to further serve the Humboldt Hill USA. Reservoirs serving Humboldt Hill include the 1.0 MG Blue Spruce tank and the 0.5 MG Donna Drive tank, for a total storage capacity of 1.5 MG.

Water service within the Humboldt Hill USA is generally very good. The District has an ongoing program for upsizing undersized water mains installed by the Pialorsi Water Company to improve fire protection. The Humboldt Hill study area's main water source is the District's wells. Current peak day demands within the study area are estimated at 40% of the well's total capacity.

Most of the Humboldt Hill USA is within the boundaries of HCSD. Two areas, identified by the HCSD as Area A (CR North) and the Area B (CR South), are not located within the HCSD SOI. The district has requested that LAFCO consider adding Area A upon adoption of the General Plan Update, and has withdrawn Area B from consideration.

College of the Redwoods (Area A). College of the Redwoods is within the HCSD SOI and currently receives public water. The area to the north of College of the Redwoods has requested public water. Area A is an "island," or pocket, area north of the CR campus and bordering the existing water main.

Findings

HCSD's water system in Humboldt Hill area is in fair to good condition. The only major deficiency associated with the existing system serving the existing development on Humboldt Hill is an aging distribution system that was purchased from a private water system and is in need of repair. HCSD anticipates adding an additional 1.0 Million gallons of water storage to support planned development, to provide fire protection and to serve the higher elevation zones in the Humboldt Hill area. Additionally, the Humboldt Hill USA could receive up to an additional 2,070 units before reaching build-out conditions. Humboldt CSD will need to expand its water system infrastructure to serve this additional growth. Humboldt CSD has made improvements to the system wells and reservoirs since it purchased this system in the early 1980's.

The District has received a request from some residents within Area A to extend water service to their residences, and the water main providing service to CR passes through this area. It is recommended that this SOI expansion be allowed to improve the health, safety and water quality of this area.

6.6.3. Indianola WSA

The Indianola WSA (Area K & L) is primarily served by individual wells. A portion of the Indianola WSA (the Walker Point subdivision) is located within the City of Eureka SOI. Aside from the City of Eureka SOI area described above, the Indianola WSA is not within the City of Eureka, Arcata, or HCSD boundaries or SOI.

A map showing the Indianola WSA is attached as Figure 6-18. The WSA encompasses the community of Indianola, located just east of Humboldt Bay along Old Arcata Road between Arcata and Eureka, CA. The Indianola WSA has 1,916 total acres, of which 1,269 acres are underdeveloped and/or vacant parcels. Of this total acreage, 835 acres within the WSA are developable. With respect to development potential, the Indianola WSA contains mostly underdeveloped parcels with some vacant parcels that could see further residential

development. The area's land use guidelines and development potential are covered in the Humboldt Bay Area Plan.

There is currently no authorized provider of municipal drinking water in the Indianola area. The study area relies almost exclusively on private water sources with poor water quality and quantity. The City of Eureka water transmission line from HBMWD passes by the Indianola area and the City boundaries extend north east along US 101 to the edge of the Indianola WSA boundary. The City of Eureka has a number of retail water customers in this area including the Humboldt Area Foundation and provides a limited network of fire hydrants. Residents in Indianola have stated that existing private wells provide poor water quality and have requested that HCSD or the City of Eureka extend service to the study area.

The Indianola area is located outside the urban limit line established in the HBAP. An amendment to the Humboldt Bay Area Plan (HBAP) to extend the urban limit line may be required for this to occur. The urban limit line will have to be extended to include the Indianola WSA if either HCSD or the City of Eureka is to serve the area. Since Indianola WSA is a rural residential area, modifications to the urban limit line may only be made in conformance with Section 3.22 B of the HBAP. It is recommended that this extension of service be allowed to improve water service within the study area.

The Indianola WSA could receive up to 162 new housing units before reaching build-out conditions. Therefore, in addition to extending service to serve existing housing units, the new system would have to be expanded to serve this additional growth.

Summary of Required Improvements

Because the Indianola WSA is not located within the boundaries of either the City of Eureka or HCSD and limited infrastructure is located within the WSA, a separate assessment of required infrastructure to provide service to this area was made. The following table summarizes the infrastructure assessment for the Indianola WSA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

Findings

New infrastructure would need to be installed to provide service to the Indianola WSA. See Table 6-32 below for an estimate of probable cost for extending service. It is recommended that an SOI expansion and extension of service to the Indianola Area's K & L be allowed to improve the health, safety, and water quality service within the study area.

Table 6-31. Water system infrastructure assessment for the Indianola WSA.

WATER SYSTEM STATISTICS	
# of Existing Houses Needing Service	516
Storage Capacity	0
Estimated Usage Rate (gpd/connection)	629 (HCSD)
CORRECTION OF EXISTING DEFICIENCIES	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Install storage – 0.444 MGD ¹</i>	\$888,000
<i>Install distribution piping – 3 miles ²</i>	\$1,584,000
Estimated Cost for Existing Deficiencies (\$)	\$2,472,000
Estimated Cost per Existing Connection (\$)	\$4,791
Estimated Financing Cost per Existing Connection (\$/Month)	\$25.61
LOW BUILD-OUT ESTIMATE	
# of Projected New Connections	99
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Install storage – 0.062 MGD ³</i>	\$124,000
Estimated Cost for Build-Out Infrastructure (\$)	\$124,000
Estimated Cost per New Connection (\$)	\$1,253
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$2,596,000
Estimated Cost per Connection (\$)	\$4,221
Estimated Financing Cost per Connection (\$/Month)	\$22.56
HIGH BUILD-OUT ESTIMATE	
# of Projected New Connections	162
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Install storage – 0.102 MGD ³</i>	\$204,000
Estimated Cost for Build-Out Infrastructure (\$)	\$204,000
Estimated Cost per New Connection (\$)	\$1,259
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$2,676,000
Estimated Cost per Connection (\$)	\$3,947
Estimated Financing Cost per Connection (\$/Month)	\$21.10

NOTES: ¹ Additional storage requirements are based on 1 day of estimated maximum day use using existing HCSD usage rates (629 gpd/connection x 516 connections = 0.324 MG) plus minimum fire storage of 120,000 gallons.

² Estimated length of distribution system required to serve existing residences. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).

³ Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 629gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$2.472 million loan would amount to approximately \$159,000 per year. With 516 potential existing ratepayers, monthly bills to cover the above infrastructure would be approximately \$26 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

6.6.4. Myrtle town USA & WSA

A map showing the Myrtle town USA and WSA is attached as Figure 6-5. The Myrtle town USA represents one of the larger development potentials within the County. The Myrtle town USA is located just east of the City of Eureka along Myrtle Avenue. The WSA is located on the northeastern corner of the USA and borders the Eureka Slough on the north.

The Myrtle town USA has 830 total acres, of which 278 acres are underdeveloped and/or vacant parcels. Of this total acreage, 249 acres within the USA are developable. The Myrtle town WSA has 61 total acres, of which 18 acres are underdeveloped and/or vacant parcels. Of this total acreage, 16 acres within the WSA are developable. With respect to development potential, the majority of the Myrtle town USA has a significant amount of both underdeveloped and vacant parcels. The Myrtle town WSA consists of mainly underdeveloped parcels. The area's land use guidelines and development potential are covered in the Eureka Community Plan, which was last updated on April 25, 1995.

The Myrtle town study area contains both a USA and WSA. The County estimates there were 1,760 and 4 housing units within the Myrtle town USA and WSA, respectively in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Myrtle town USA could have between 1,945 and 2,884 total housing units by 2025, while the Myrtle town WSA could have between 4 and 7 total housing units by 2025. According to **Table 1-6**, the high projected build-out estimates for total development potential within the Myrtle town USA and WSA, which takes into consideration physical and zoning constraints, are 2,781 and 85, respectively. Therefore, the growth projections for each study area are within the range of what the land can bear.

The high build-out estimates for total development potential of 2,781 and 85 housing units in the USA and WSA were used for infrastructure assessment and recommendations. This represents a combined 1,102 new housing units within the Myrtle town USA or 9.5% of total new housing units in the District.

Findings

Myrtle town's water system is in good condition overall. There are no major infrastructure deficiencies associated with the existing system. HCSD is currently replacing some older steel pipe in the distribution system. The Myrtle town USA and WSA could receive up to 1,102 new housing units before reaching build-out conditions. Humboldt CSD will need to expand its water system infrastructure to serve this additional growth.

6.6.5. South Eureka USA & WSA

A map showing the South Eureka USA and WSA is attached as Figure 6-5. The South Eureka USA, containing both the Cutten and Ridgewood areas, represents one of the greatest development potentials within the County. The South Eureka WSA is located south of the South Eureka USA and east of the Humboldt Hill USA, along Elk River Road.

The South Eureka USA has 6,030 total acres, of which 3,207 acres are underdeveloped and/or vacant parcels. Of this total acreage, 2,279 acres within the USA are developable. The South Eureka WSA has 1,199 total acres, of which 651 acres are underdeveloped and/or vacant parcels. Of this total acreage, 175 acres within the WSA are developable. With respect to development potential, both the South Eureka USA and WSA have a significant amount of both underdeveloped and vacant parcels. The South Eureka USA and WSA represented approximately 49% of total housing units within the HCSD service area. The area's land use

guidelines and development potential are covered in the Eureka Community Plan, which was last updated on April 25, 1995.

The County estimates there were 4,254 and 106 housing units within the South Eureka USA and WSA, respectively in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the South Eureka USA could have between 4,700 and 6,971 total housing units by 2025, while the South Eureka WSA could have between 117 and 174 total housing units by 2025. According to **Table 1-6**, the high projected build-out estimates for total development potential within the USA and WSA, which takes into consideration physical and zoning constraints, are 12,302 and 153, respectively. Therefore, although the growth projections for the South Eureka USA are within the range of what the land can bear, the high growth rate projections for the WSA are in excess of what the land can bear. The WSA would reach build-out conditions at a slower growth rate of 1.85% over the next twenty years.

The high estimates for total development potential of 12,302 and 153 housing units in the USA and WSA were used for infrastructure assessment and recommendations. This represents a combined 8,095 new housing units within the South Eureka USA or 70% of the total new housing units in the District.

Most of the South Eureka WSA is within the boundaries or SOI of the HCSD, with the following exceptions:

Elk River Valley (Area C) Similar to the Freshwater Valley, the Elk River Valley includes an enclave of homes that experience poor water quality and that have requested public water. Currently the Elk River residents rely on sub-standard private wells or have their storage tanks filled by trucks hauling potable water. This area is also considered an "island" area by HCSD, separating the non-contiguous District areas of Humboldt Hill and Ridgewood.

Meyers Avenue (Area D) Residents along Elk River Road, near Meyers Avenue, are adjacent to but not within the HCSD SOI or boundary but currently receive public water for agricultural and domestic purposes from HCSD. In addition, HCSD water supply mains are located within this area.

Ryan Slough South (Area E) The Ryan Slough South area is located along the eastern edge of the district and SOI boundary between the Ridgewood Drive area and the HCSD district office. This area contains an HCSD water tank and other infrastructure and HCSD intends to include this area in future infrastructure planning.

Ryan Slough North (Area F) The Ryan Slough North area is located along the eastern edge of the district between the HCSD district office and the SOI area adjacent to the Redwood Acres Fairgrounds, of the McKay Tract. HCSD plans to install HCSD lift stations and collection facilities in this area to serve the existing SOI and HCSD intends to include this area in future infrastructure planning.

Findings

HCSD's South Eureka's water system is in good condition overall. There are no major infrastructure deficiencies associated with the existing system. Some older steel pipe in the distribution system is currently being replaced and additional water capacity storage added to support planned growth and improve fire protection. The South Eureka USA and WSA could receive up to 8,095 new housing units before reaching build-out conditions. HCSD will need to expand its water system infrastructure to serve this additional growth.

It is recommended that the District expand its SOI to include the Elk River Valley (Area C) to improve the health, safety and water quality of the area. In addition, it is recommended that HCSD expand its SOI to include Meyers Avenue (Area D) which is currently receiving public water, to eliminate "island" or pocket areas and to establish logical boundaries.

Areas E and F may not be required to support planned growth during this planning period. However, it is recommended that the Ryan Slough North (Area F) and South (Area E) area be included within the HCSD SOI to allow for future infrastructure planning and to bring district infrastructure into its SOI.

6.6.6. Humboldt Community Services District Infrastructure Assessment

Existing Capacity

The HCSD's water system is not limited by either source or treatment capacity with respect to its availability of connections. HBMWD has sufficient water supply to meet District demands, and the District has extensive available capacity within District wells.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for all study areas served by Humboldt CSD, including the Humboldt Hill USA, Myrtle town USA and WSA, South Eureka USA and WSA, and Freshwater WSA. As noted above, the Indianola WSA is located outside the HCSD service area and its infrastructure assessment is presented above. Due to the interconnectedness of the water system, the study areas could not be assessed individually and were instead assessed collectively. The following table addresses the District's infrastructure needs for existing development and for build-out conditions.

Table 6-32. Water system infrastructure assessment for the HCSD service area, including Humboldt Hill, Myrtle town, South Eureka, and Freshwater.

WATER SYSTEM STATISTICS	
# of Existing Connections ¹	7,494
# of Available Connections ²	---
Source Capacity (MGD)	Not limiting (HBMWD + wells)
Storage Capacity (MG)	4.785
Treatment Capacity (MGD)	Not required
Peak Day Use (MGD)	4.71
Usage Rate (gpd/connection)	629
CORRECTION OF EXISTING DEFICIENCIES	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage –1.095 MG ³</i>	\$2,190,000
<i>Upgrade distribution system –2 miles ⁴</i>	\$1,056,000
Estimated Cost for Existing Deficiencies (\$)	\$3,246,000
Estimated Cost per Existing Connection (\$)	\$433
Estimated Financing Cost per Existing Connection (\$/Month)⁷	\$2.32
LOW BUILD-OUT ESTIMATE	
# of Projected New Connections	4,314
Proposed Infrastructure Upgrades ⁶	Estimated Cost (\$)
<i>Additional storage – 2.711 MG ⁵</i>	\$5,422,000
Estimated Cost for Build-Out Infrastructure (\$)	\$5,422,000
Estimated Cost per New Connection (\$)	\$1,257
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$8,668,000
Estimated Cost per Connection (\$)	\$734
Estimated Financing Cost per Connection (\$/Month)⁷	\$3.92
HIGH BUILD-OUT ESTIMATE	
# of Projected New Connections	11,602
Proposed Infrastructure Upgrades ⁶	Estimated Cost (\$)
<i>Additional storage – 7.292 MG ⁵</i>	\$14,584,000
Estimated Cost for Build-Out Infrastructure (\$)	\$14,584,000
Estimated Cost per New Connection (\$)	\$1,257
Combined Cost for Build-Out and Existing Deficiencies (\$)	\$17,830,000
Estimated Cost per Connection (\$)	\$934
Estimated Financing Cost per Connection (\$/Month)⁷	\$4.99

NOTES: ¹ The number of connections shown is for the entire Humboldt CSD service area and includes Humboldt Hill USA, Myrtle town USA and WSA, South Eureka USA and WSA, and Freshwater WSA.

² There is sufficient source supply from HBMWD and the wells to serve all development potential within the study areas.

³ Additional storage requirements are based on information provided by HCSD.

⁴ distribution system upgrade specifications based on information provided by HCSD.

⁵ Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 629 gpd/connection).

⁶ Above costs do not include improvements associated with fluoridation, HBMWD Somoa Peninsula Techite Line Replacement or City of Eureka Martin Slough project, nor Elk River Wastewater Treatment Plant expansion.

⁷ Costs and connection fees shown are provided for planning purposes and do not constitute a basis for HCSD connection fee implementation.

Humboldt CSD has approximately \$1.5 million in water reserves that could contribute to correcting existing deficiencies in the water system. According to the above table, approximately \$1.75 million in additional funding will be required to address existing deficiencies.

This funding would likely come in the form of a low interest loan, like a State Revolving Fund loan, which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$1.75 million loan would amount to approximately \$112,000 per year. With 7,494 existing ratepayers, monthly bills would have to be increased by approximately \$1.25. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

System Standards

HCSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

Fiscal Condition/Capital Replacement Program

According to HCSD records, the water system is operated on an annual budget of approximately \$2.8 million. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, loans, and other sources. Replacement or depreciation funds are not accumulated through revenues. The District's latest Capital Improvement Plan was developed in 2007, and they currently have approximately \$3 million in water and wastewater reserves.

Water Demand

According to 2005/2006 HBMWD records, HCSD's average daily use was 1.253 MGD and peak daily use was 2.32 MGD. The District purchased over 479 million gallons of HBMWD water in fiscal year 2005/2006 direct from HBMWD. However, HBMWD water represents only part of HCSD's water supply.

According to the 2007 HCSD records, they produced approximately 914 million gallons of water for customers in 2006 (257.2 MG from wells, and 659.9 from HBMWD either direct from HBMWD or through the City of Eureka). Therefore, average daily use is estimated at 2.53 MGD, and peak daily use estimated at 4.71 MGD (utilizing the HBMWD peaking factor from above – 1.86). The District has approximately 7,494 existing connections, of which 97% are residential connections, and does not retail water to any other Districts.

Water Supply, Treatment, Distribution and Storage

HCSD receives approximately 75% of their water from HBMWD and the City of Eureka. HCSD also maintains three water supply wells (two active and one active backup) that supplement their water supply, with a rated capacity of 1,580 gpm (2.28 MGD). HCSD's active connection with the City of Eureka has a capacity of 800 gpm, or 1.15 MGD. Their contract with the HBMWD allows for a peak rate allocation of 2.9 MGD. Therefore, the combined source capacity is estimated at 6.33 MGD.

Unlike the other USAs and WSAs within the HCSD service area, the Humboldt Hill USA's water system is served almost exclusively by HCSD well water sources, although HBMWD water can also be supplied to this part of the system. Reservoirs serving Humboldt Hill include the 1.0 MG Blue Spruce tank and the 0.5 MG Donne Drive tank, for a total storage capacity of 1.5 MG.

HCSD's distribution system extends from Freshwater in the north to College of the Redwoods in the south and contains approximately 125 miles of pipe. The District has approximately 5.0 MG of storage capacity within ten storage tanks ranging in size between 0.12 MG and 1.0 MG. The District serves over fourteen pressure zones. Water quality is representative of HBMWD's excellent water source and meets or exceeds State standards.

Condition Assessment

Overview. Water service within HCSD is generally very good. The District has an ongoing program for replacing some old steel water line of various sizes and anticipates that all of it will be replaced by 2012. Peak daily use of HBMWD water for the District (2.32 MGD in 2005/2006) was below their peak rate allocation of 2.90 MGD set in contract with HBMWD on July 1, 2006. Overall peak daily use is at approximately 71% of existing source capacity. The Humboldt Hill study area's main water source is the District's wells. Current peak day demands within the Humboldt Hill Urban Study Area are estimated at 40% of total capacity HCSD's well's serving that area.

Current Deficiencies. There are no significant deficiencies within HCSD's water system although some storage and fire flow improvements are anticipated.

Underserved Areas. Areas within the boundaries of HCSD receive water service or are authorized to be served. Several areas (Areas A, D, G & H) currently receive HCSD public water or have HCSD facilities within them, but are outside of the HCSD SOI or service boundary. These areas should be included within an expanded SOI. Portions of the HCSD USAs or WSAs within or adjacent to the HCSD SOI do not currently receive service. Such areas that are currently developed with residential uses include Lumber Camp Road in Freshwater, the Indianola area (portions of the Indianola area receive service from the City of Eureka), and the Elk River area. Other new development areas such as Green Diamond timber land (also known as the Ryan Slough (Areas E & F both within the Martin Slough and Ryan Slough drainages) are located within or adjacent to the HCSD SOI and currently do not receive water service.

Proposed Improvements

System Upgrades. No major system upgrades are planned for HCSD service area in the near future aside from routine maintenance, the ongoing steel water line replacement project or water storage tank additions to support planned development. Replacement of HBMWD's Techite transmission line on the Peninsula will ultimately need replacement to ensure a reliable water supply not subject to seismic failure. As future development occurs, the District is prepared to install additional storage and fire flow improvements.

Future Expansion. The District is interested in expanding services to new developments as they occur. HCSD has requested that the areas identified above as College of the Redwoods (Area A), Elk River Valley (Area C), Meyers Avenue (Area D), Ryan Slough (Area E & F), Cummings Road (Area G), Pigeon Point Road (Area H), Pacific Lumber Camp Road (Area J), and Indianola (Area K & L) be included within its SOI upon completion of the General Plan Update. It is recommended that HCSD expand its SOI to be able to plan for and supply public service to these areas based on health, safety and fire protection requirements, and consistent with the General Plan as approved by the Board of Supervisors.

Cost and Schedule of Improvements. The District developed a five-year Capital Improvement Plan in 2007 that covers costs and schedules for improvements to its water system. The majority of the CIP focuses on steel water main replacement, but also focuses on pumping facility upgrades. Proposed improvements are estimated to cost approximately \$3 million over the next five years.

6.7. Policy Recommendations

This technical report presents a basis for describing and assessing water services being provided in Humboldt County. As documented in this report, in many cases, service providers need to make considerable improvements to their water infrastructure to provide acceptable levels of service. The service providers will need significant resources and revenue to appropriately respond to this need, and the County may need to provide a supporting role to ensure these service providers succeed in accomplishing this.

This technical report will be used to guide development of the Community Infrastructure and Services Element and the recommended policies therein.

ISSUES TO BE ADDRESSED IN THE COMMUNITY INFRASTRUCTURE AND SERVICES ELEMENT

The Community Infrastructure and Services Element will include goals, policies and programs for the following issues;

Ability to Function. Many of the service providers within the County lack the technical, managerial, and financial capacity to continue providing acceptable levels of service given aging infrastructure, population growth, and an increasingly complex regulatory environment. The policy document will recommend policies and programs the County can implement to assist and enable these service providers.

Rates. Most service providers within the County have historically charged low rates that generally do not adequately cover the costs of providing water service. This practice has led to degraded systems, deteriorating levels of service, and a lack of reserves to address and improve the situation. The Element will recommend policies and programs the County can implement to get the service providers to conduct rate studies and reduce costs of providing services to reduce "rate shock" within the County.

Funding of Infrastructure. The most significant obstacle when planning capital improvements for both rehabilitation and construction of new infrastructure is funding. Many of the providers serve small communities with limited resources. Assistance from the County would likely help the agencies secure the needed funding. The Element will recommend policies and programs the County can implement to secure funding and assist service providers in developing competitive grant and loan applications.

7. Wastewater Systems

7.1. Introduction

Wastewater service in Humboldt County is provided by a variety of local agencies including City departments, Community Services Districts, and Sanitation Districts. There are two private wastewater service providers, the Pacific Lumber Company in Scotia and the Samoa Pacific Group in Samoa. Most rural areas within the County have on-site septic systems, which are regulated by the County through its Environmental Health Department. In areas of higher density where on-site septic systems are not feasible, services must be provided to collect, treat, and dispose of wastewater. Regulations governing both on-site disposal systems and community sewer systems are becoming more restrictive and complex with time.

This Section describes the potential for existing wastewater systems to accommodate future growth within the various USAs identified by the County. Existing demand and capacity, proposed and/or planned expansions, and potential constraints are described below. The infrastructure assessment within this Section draws from the information available within Table 1-5 and Table 1-6 in Section 1. Funding sources for wastewater systems are described in detail in Section 12.2.5.

7.2. System Standards

7.2.1. Sewage Treatment and Disposal Standards

Regulations surrounding disposal from publicly owned treatment works (POTWs) are becoming increasingly stringent in Humboldt County, as they are throughout the State of California. POTW's must be operated to meet the requirements of the Federal Clean Water Act and Amendments, and the Porter-Cologne Water Quality Control Act (California Water Code, Division 7). Treatment and discharge requirements are set forth in the National Pollutant Discharge Elimination System (NPDES), developed by the U.S. EPA and enforced in Humboldt County by the North Coast Regional Water Quality Control Board (RWQCB). The RWQCB has adopted the North Coast Basin Plan which provides specific guidance on how the federal and state laws will be applied in Humboldt County. The goal of the Basin Plan is to provide a definitive program of actions designed to preserve and enhance water quality and to protect beneficial uses of water in the North Coast Region. The initial plan was adopted in 1971 and has been amended numerous times, with the most recent amendment in 1996.

Unfortunately, sewage treatment and disposal standards seem to change quite frequently, becoming more stringent and covering more constituents with each change. It is impossible to predict all of the changes in regulations that will occur during the next 20 years. Even when we know about proposed changes, we can only speculate as to how the regulations will be interpreted and their impacts on a particular POTW. With that framework, we think it is important to understand some of the main issues facing service providers and potential impacts. We are hopeful that this discussion will lead to a better understanding of these issues by the public and governing officials.

All dischargers with average daily flows greater than 1500 gallons per day must obtain a permit from the RWQCB. If the discharge is to a body of water, like a river, lake or ocean, then the permit falls under the NPDES program. If the discharge is solely to land then waste discharge

requirements (WDR) are issued. Both of these permits are effective for 5 years, after which time they must be renewed. Due to staffing constraints and other issues, a permit renewal may be delayed and the existing permit will remain in effect until a new permit is adopted. The permit renewal process can take a year or more and it is during this process that the RWQCB will often raise new issues that need to be addressed. Sometimes the request is simply to gather data that will then serve as a basis for new requirements that will be incorporated during the next renewal. The practical effect of this is that at any given point in time one discharger may have to deal with an issue while another one doesn't because its permit has not come up for renewal. In addition, the RWQCB will tend to focus on the larger dischargers before addressing the smaller ones.

The effective collection and treatment of wastewater is challenging, but the year-round disposal of treated effluent is really the major issue facing most POTWs. Many POTWs in the County are out of compliance with waste discharge requirements as set forth in the North Coast Basin Plan. Discharge requirements from the RWQCB to water bodies (to rivers, estuaries, or ocean outfall) during winter months specify a "dilution ratio," which requires a minimum ratio of flow in the receiving water body to discharge flow (usually 100 parts receiving water to one part treated effluent discharge). During summertime, when discharge is prohibited, treated effluent must be stored for future wintertime discharge, re-used for agricultural irrigation or other purposes, or discharged to a percolation pond that has no connection to streams or other water bodies.

The Mad and Eel River basins both have a discharge prohibition period from May 15 through September 30 each year, in which no disposal to these water bodies is allowed. Discharges to the Trinity River are currently prohibited year round and there are (currently) no discharges to either the Van Duzen or Klamath rivers or to Redwood Creek. Humboldt Bay and all estuaries within the County are also protected from any further discharges. What this means is that it will be very difficult, if not impossible to obtain approval for a future discharge to any of these bodies of water. Summertime disposal is also a major issue facing most dischargers in the County.

In addition to the difficulties posed by summertime disposal and the wintertime dilution ratio, discharge requirements, relating to the level of treatment and the constituents that are treated, during regular discharge periods are also becoming increasingly stringent. Nitrate and ammonia regulations will likely be the most difficult upcoming regulation for POTWs to comply with. The RWQCB expects to begin imposing nitrate and ammonia effluent limitations on discharge permits during the next round of permit renewals. Dischargers will likely be required to make significant changes to their treatment processes in order to comply with these new limitations. Nitrate and ammonia removal is difficult because additional treatment processes must be done that were not a part of existing designs, requiring additional energy costs or additional chemical costs. Currently, there is a movement by some of the dischargers in the southern portion of the region to fund a position at the RWQCB to develop an amendment to the Basin plan that would remove the nitrate issue. However, the outcome of this effort is unknown at this time.

Inflow and infiltration, I&I, is the flow of rainwater into a wastewater system from the surface (Inflow), through manholes covers and rainwater downspouts, or below the surface (infiltration) through cracks in the collection pipe or faulty joints. The degree to which a collection system is affected by I&I is depicted in its "peaking factor." The peaking factor is a comparison between the volume of flow in the wastewater collection system during average dry weather conditions and the volume of flow during peak wet weather conditions. Well performing collection systems have a peaking factor of three or less (peak wet weather flows are at most three times average dry weather flows). In Humboldt County, the McKinleyville Community Services District collection system has a peaking factor of approximately 2.1 (this peaking factor is based on data provided

by the McKinleyville CSD and is not directly correlated with peak event storm recurrence intervals or the duration) and many other systems in the County have peaking factors approaching 10. Aside from the collection system capacity system problems posed by I&I and the increased likelihood of sanitary sewer overflows (untreated wastewater reaching surface waters through manholes or overflowing wet wells at pump stations), the wastewater treatment plant will be required to treat rainwater to wastewater standards.

Another significant issue for systems that have an above average amount of I&I is the requirement that the POTW remove 85 percent of the biochemical oxygen demand (BOD) and total suspended solids (TSS). As I&I increases, the wastewater flowing into the plant becomes diluted and the treatment process needs to be more effective in order to remove 85 percent of BOD and TSS. Typically, the influent BOD and TSS is around 200 milligrams per liter (mg/l) in raw sewage and the treatment plant is designed to remove 85 percent, resulting in an effluent strength of 30 mg/l. When I&I is high, the influent BOD and TSS can be reduced to between 50 and 100 mg/l. So while the treatment plant should be able to meet the effluent limitation of 30 mg/l, the 85 percent removal criteria would require the effluent to be between 7.5 and 15 mg/l. To achieve these levels typically requires tertiary, instead of secondary treatment.

It should be noted that the requirement to maintain effluent quality by removing 85% of BOD and TSS is based on a 30-day average, rather than on a daily records where peak storm events would significantly affect a WWTP's ability to achieve removal requirements. However, average wet weather wastewater flows can be significantly higher than average dry weather flows and can cause dischargers to violate percent removal requirements.

With the exception of McKinleyville, Manila, Glendale and a few other systems, most collection systems have levels of I&I that can cause their POTWs to not be able to meet this limitation with their current WWTP. This chapter also provides more detailed information on each individual system.

Many of the POTWs also may have issues with meeting rules established by the US EPA and contained in the Code of Federal Regulations called "Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California," and known as the California Toxics Rule (CTR). A very limited amount of sampling has been done, and the RWQCB has performed reasonable potential analyses for most POTWs that have identified constituents in the wastewater that have a reasonable potential to exceed the limits set in the CTR. USEPA regulations require that water quality-based effluent limitations be established for constituents that cause or have a reasonable potential to cause or contribute to violations of a water quality objective. This determination must be made for priority pollutants for which water quality standards have been adopted in the CTR. In general, these are constituents that are not typically removed by a POTW, and the service providers will have to develop individual strategies for compliance. This can include, but is limited to, the use of source controls (limiting the toxin at the source, such as household or commercial use of chemicals, etc.) or applying for use of a mixing zone (getting credit for the dilution of toxins that occurs when the wastewater is discharged to the receiving water body). While compliance with the CTR is required by 2010, significant questions currently exist and it is unclear how many dischargers will comply with this unfunded mandate.

On-site sewage disposal regulations are set forth in Humboldt County's Sewage Disposal Regulations; last updated January 30, 1984. Although a minimum lot size requirement is not specified in the Sewage Disposal Regulations, minimum setback requirements are in effect and vary depending on whether the lot is on a public water system or an individual water system. The primary limitations in Humboldt County for siting of on-site disposal systems are restrictions relating

to poorly draining soils and high groundwater situations. Minimum depth requirements between the bottom of the leaching trench and the anticipated highest level of groundwater are determined according to the North Coast Regional Water Quality Control Board Policy on the Control of Water Quality with Respect to Individual Waste Treatment and Disposal Practices located in the North Coast Basin Plan. Minimum depth requirements are a function of silt and clay percentages within the soils; generally, a minimum of five feet separation is required. For soils having greater than 15 percent silt and clay, lesser depths to groundwater, to a minimum depth of two feet below the leaching trench, may be granted with a waiver or for alternative systems. Upcoming regulations based on AB 885, approved in August 2000, may do away with the two foot exception, requiring five foot minimum depth regardless of soil content. This would pose significant difficulties to siting on-site disposal systems in Humboldt County due to high groundwater levels prevalent throughout the county. Development in areas of the County not served by public water or sewer systems is often constrained by the individual sites ability to provide sufficient water and to properly treat and dispose of its sewage.

7.2.2. Development Standards

All development within both unincorporated and incorporated areas within the County is subject to meeting minimum development standards for infrastructure. These minimum standards are detailed in the Humboldt County General Plan and standards set forth and adopted by the incorporated cities and many of the districts within the County. Most of the special districts have their own standards that must be met by any new development. Generally for annexations to be considered, infrastructure within the potential annexed area must meet the minimum standards of the City. For example, the Humboldt Community Services District requires all proposed service laterals and facilities that are to be dedicated to the district upon completion to meet the HCSD Water and Sewer Design and Construction Standards, as adopted by the District pursuant to Resolution 98-10. All service providers, whether they have adopted development standards or use the best available standards, will require that designs be submitted for approval prior to construction and that an inspection and acceptance by service provider staff occur.

7.2.3. Methodology for Estimating Costs

Unit Cost Estimates

All infrastructure costs presented herein represent our opinion of the probable construction and soft costs (engineering, legal, administrative, etc.) in September 2007 dollars. The costs are "order of magnitude" costs, and actual costs will be higher or lower due to specific issues related to a particular project/site. Wastewater system infrastructure costs are unique to each study area and highly speculative depending on the outcomes of some regulatory changes looming large on the horizon, and therefore unit costs were not able to be applied as they were in the water system infrastructure assessments. For example, wastewater treatment costs will vary from study area to study area depending on what constituents are included in waste discharge requirements. Summertime disposal costs will vary largely depending on site-specific variables such as land availability, topography, soil characteristics, and potential for irrigation. For these reasons, wastewater infrastructure costs were not estimated on a unit-basis as was done in the water infrastructure assessment. Instead, background knowledge of the systems and engineering judgment regarding forthcoming and anticipated regulations were used to "guesstimate" as accurately as possible.

Costs related to existing deficiencies were also more difficult to separate out from costs associated with necessary future upgrades. Since collection system upgrades and treatment upgrades will be required by law as regulations change, these upgrades will benefit both existing and future development. Therefore, unit costs were developed based on total existing

and future units. Again, further studies will need to be performed by service providers to determine how to appropriate and distribute these costs over their existing and future ratepayer base in order to develop more accurate connection fees and rates needed to maintain and sustain systems well into the future.

Presentation of Estimates

Total costs for correcting existing deficiencies, addressing changes in regulations, and constructing improvements to accommodate the Low and High development projections are estimated using the above methodology and are provided for each urban study area. Estimated costs are presented in table form along with system statistics such as the number of connections, available connections, and current system capacity. Costs are presented in the following manner: total estimated costs, costs per connection (total cost divided by the number of connections), and estimated financing cost per connection per month. The Low and High build-out costs are also added to the existing deficiencies in calculating estimated cost per connection and estimated financing cost per connection.

The estimated costs are based upon assumptions and the actual costs will be different. Funding for correcting existing deficiencies would likely come from grants and low interest loans, such as a State Revolving Fund loan which currently has loan terms of 20 years at 2.5 percent interest. In addition, we would expect actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

It should be noted that the estimated cost per connection does not represent a proposed connection fee and the estimated financing cost per connection per month does not represent a proposed change to rates. These costs calculations are only provided to indicate the magnitude of the estimated costs in relation to number of costumers. *Future connections should buy into the existing infrastructure through connection fees. These connection fees should be determined by the individual provider based on detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.*

Future rate studies should be conducted to determine the level of connection fees and usage charges needed to generate sufficient revenue to maintain an acceptable level of service and also capture sufficient replacement costs. These studies should also determine the appropriate methodology to allocate costs to future users for existing fire storage and an existing distribution system. These issues are not addressed at this planning level and are typically covered in master plans or project specific facilities plans prepared by each service provider.

7.3. HCSD and Eureka

Areas served by HCSD have the greatest development potential within the county. Although these areas have the most potential with respect to vacant and underdeveloped parcels, some major infrastructure limitations exist to developing some of these areas with respect to water, sewer, and transportation. The following discussion addresses issues surrounding sewer limitations.

HCSD's ability to serve new connections with sewer is contingent upon the City of Eureka's treatment and disposal capacity and in some cases their sewer collection capacity as well. The

City and HCSD are under a contractual agreement to share capacity at the Elk River Wastewater Treatment Plant (WWTP) and to convey wastewater through several points of interconnection between HCSD's and Eureka's collection system in multiple locations. Unfortunately, portions of both HCSD's and Eureka's collection systems experience significant inflow and infiltration (I&I) and are near or at capacity in a number of locations during significant rain events. High levels of I&I at the Elk River WWTP result in reduced short-term BOD and TSS removal efficiency. Although extreme wet weather flows approach the design capacity of the WWTP, the plant is designed to treat all flows that the collection system conveys in its current configuration and with the current peaking factor.

According to the National Pollutant Discharge Elimination System (NPDES) permit issued by the North Coast Regional Water Quality Control Board (RWQCB), the facility is permitted for an average dry weather flow (ADWF) of 5.24 MGD, peak dry weather flow of 8.6 MGD, and a peak wet weather flow of 32 MGD. The City has indicated that the design capacity of the Elk River WWTP is 6.0 MGD ADWF. Average dry weather flows for the month of August has varied from 4.5 MGD (2002) to 4.8 MGD (2005), while winter maximum day flows totaled approximately 18 MGD (City of Eureka, 2006). However, historically peak wet weather flows have exceeded 30 MGD. The City is currently evaluating their WWTP and anticipates the WWTP infrastructure study being completed in 2008, at which time they will also begin their NPDES permit renewal process (Knight, 2007).

It should be noted that each unit process (pumps, pipes, tanks, etc.) within the Elk River WWTP may operate at different capacity levels. The Elk River WWTP is approaching capacity limitations in some of its unit processes. The Elk River WWTP infrastructure study is intended to identify hydraulic and process "bottlenecks" and propose cost effective improvements to increase capacity, rather than construct a total plant expansion. The City expects that this strategy will allow step-wise increases in WWTP capacity that keep pace with development over the next 20 years.

The City of Eureka is also working on reducing the levels of I&I in their collection system. The City of Eureka and HCSD are also cooperatively working on the Martin Slough Interceptor Project. The Martin Slough project is multi-purpose in function; reducing sewer overflows that degrade the environment, eliminate existing city and HCSD sewage lift stations (by conversion to gravity service), improve energy conservation, and provide capacity for planned development.

In conclusion, significant challenges exist for both the City of Eureka and HCSD related to their collection, treatment and disposal systems. Both agencies are actively working to correct current deficiencies and to provide capacity for future growth. These improvements will take time and additional funding to be completed and will need to be completed prior to any significant development occurring in areas served by HCSD. Areas such as Myrtle town, Ridgewood, and Cutten are limited by the City of Eureka's collection system capacity and the Elk River WWTP's capacity. Development in Humboldt Hill, when aggregated with the development potential of other HCSD USAs, is mainly limited by the Elk River WWTP's ability to handle increased flows.

7.3.1. Martin Slough Interceptor

The City of Eureka is currently in the process of finalizing designs for its Martin Slough Interceptor (MSI) Project, which is aimed at improving wastewater collection within the Martin Slough basin. The intent of the project is to reduce demands on portions of the City's system that are overloaded and from time to time experience sanitary sewer overflows. The project will also greatly improve efficiencies within both the City's and HCSD's collection systems by eliminating as many as 16 existing lift stations, with associated energy and cost savings.

The MSI project boundaries incorporate areas within the City of Eureka that will gravity flow into the proposed interceptor, and portions of the unincorporated area surrounding Eureka that can utilize the interceptor based on proximity and topography and that are within the urban limit line established by the Eureka Community Plan and the Humboldt Bay Area Plan. The /Pinehill area and a portion of the Cutten area of the South Eureka USA are not within the MSI project boundaries. Wastewater within these areas drains to portions of the City of Eureka collection system other than the proposed MSI. Other portions of the South Eureka USA are located outside the Eureka Community Plan and the Humboldt Bay Area Plan urban limit line

MSI Project Development Estimates. The future housing units that can be accommodated by the MSI were projected by the City of Eureka as part of the MSI design (Project Boundary and Population Density Technical Memorandum, amended April 23, 2003). The City of Eureka based its development projections on the 1995 Eureka Community Plan land use designations (including specific policies regarding allowable density, density limitations, and urban expansion).

The City of Eureka assumed that 15 percent of total HCSD primary dwelling units would have 2nd dwelling units and that 20 percent of total City of Eureka primary dwelling units would have 2nd dwelling units. The City of Eureka also assumed that 2nd dwelling units would have fewer total occupants and would contribute 60 percent of the wastewater flow of primary dwelling units. Primary dwelling units are considered equivalent dwelling units (EDU) and 2nd dwelling units are assumed to equal 0.6 EDUs. The City of Eureka estimated that there are 94 non-residential EDUs in the HCSD portion of the Martin Slough basin and assumed that there would be no additional non-residential development.

The City of Eureka projected that the MSI would serve the following based on the Proposed Project:

Table 7-1. Dwelling units associated with the proposed MSI project.

Source	City of Eureka	HCSD	Total
Existing Residential Dwelling Units	1,345	2,839	4,184
Existing Non-residential Units	0	94	94
<i>Subtotal Existing Units</i>	<i>1,345</i>	<i>2,933</i>	<i>4,278</i>
Future New Primary Dwelling Units	440	3,900	4,340
Future New Secondary Dwelling Units	357	1,011	1,368
Future New Secondary Dwelling Units EDUs	214	606	820
Future Non-residential Units	0	0	0
<i>Subtotal New Units</i>	<i>797</i>	<i>4,911</i>	<i>5,708</i>
Total Units Served	2,142	7,844	9,986
Total EDUs	1,999	7,440	9,439

Source: Table 9-3, Martin Slough Interceptor Project Draft EIR, May, 2004 with EDUs added.

MSI Project Comparison to South Eureka USA. The High unit development projection for the South Eureka USA includes lands that are outside the Eureka Community Plan and Humboldt Bay Area Plan urban limit line and assumes that the residential development density of certain parcels in the South Eureka USA would be increased beyond current levels. As a result, total High unit development potential for the South Eureka USA will likely exceed the planned capacity of the proposed interceptor. As previously explained, the proposed MSI Project was designed for a

unit capacity based on the adopted in the County's 1995 Eureka Community Plan and the Humboldt Bay Area Plan. This design requirement fulfilled the criteria that the interceptor not be growth inducing. The MSI design capacity was based on typical existing wastewater flow volumes. Therefore, sewage capacity is not based on a specific number of housing units, but is limited to the MSI allocated flow volume. This flow volume limitation is stated in and made a part of all HCSD conditions of approval for major developments. HCSD wastewater flows into the City of Eureka collection system are measured by sewage flow metering stations. When each individual development reaches its allocated capacity volume, no further units are allowed. Conversely, if capacity still exists in the MSI, additional sewage connections may be allowed based on an evaluation by HCSD and the City of Eureka that additional development will not increase the incidence of sanitary sewer overflows.

The South Eureka USA includes developable areas that are not within the HCSD Boundary or SOI, primarily HCSD SOI expansion areas E and F. All other SOI requested expansion areas are not within the MSI service area and are considered Water Service Areas (WSA) only. To the extent that these areas are planned for development and wastewater flows from this area are beyond the capacity of the MSI, HCSD proposes the following infrastructure improvements:

1. The sewage lift station servicing the current proposed McKay Tract developments would be expanded.
2. A new pressure force main would be constructed from the McKay Tract Lift Station to the proposed Martin Slough Sewage Pump Station.
3. The Martin Slough Sewage Pump Station would be expanded in capacity.
4. A new (parallel) pressure sewer would be constructed from the MSI Pump Station to the Elk River WWTP.
5. The Elk River WWTP would be upgraded as required. The above improvements would be made part of each developments environmental approval process.
6. Areas E and F infrastructure improvements would be financed by the developer(s) requesting the service.

In summary, the MSI provides sewer service to areas currently planned for development, with provision for additional housing units if capacity exists. Development not part of the MSI Project and outside the present HCSD SOI can be served by a combination of separate MSI Lift Station upgrades and parallel sewer infrastructure improvements paid for by the new development that benefits.

7.4. Community Wastewater Systems

The following sections introduce the County's USAs that either have existing community wastewater systems in place to serve their communities or have plans to develop community wastewater systems within the planning period considered herein. The sections provide a detailed discussion on development potential and wastewater infrastructure assessment for each study area. Any wastewater system infrastructure deficiencies will be identified along with plans for timing and financing of needed improvements.

Similar to the discussion of HCSD in Chapter 6, Water Systems, the USAs within or adjacent to HCSD are presented together in Section 7.5 of this Chapter, following the discussion of the wastewater systems located in the other USAs. The following USAs have been evaluated with respect to HCSD:

- Humboldt Hill USA

- Myrtle town USA
- South Eureka USA

7.4.1. Arcata USA

There are a total of five areas within the City's sphere of influence that comprise the Arcata USA. A high build-out estimate for total development potential of 205 new housing units in the USA was used for infrastructure assessment and recommendations. See Section 6.4.1 for a more detailed description of the USA and its development potential.

7.4.1.1. Summary

Findings

The City of Arcata's wastewater system is in fair condition overall, but has had increasing difficulties meeting its discharge requirements as set forth by the NCRWQCB in recent years. The City has been issued both an Administrative Civil Liability Order (ACLO) in 2006 and an Administrative Civil Liability Complaint (ACLC) in 2007 for effluent limit violations from its treatment and disposal system and for sanitary sewer overflows from its collection system. These legislations implementing minimum mandatory penalties have resulted in enforcement actions that have required the City to request changes in the NPDES permit and encourage the City to continue to implement system upgrades.

Peak wet weather flows of around 12 to 14 MGD have occurred in recent years, and the City is preparing to embark on a CIP to rehabilitate sewerlines, and manholes identified as structurally unsound or subject to inflow and infiltration (I&I). We anticipate that this will be an ongoing program and will need to be expanded to include replacement or rehabilitation of the sewer laterals that exist on private property.

The City's wastewater facilities are permitted to treat up to 2.3 MGD mean daily dry weather flow averaged over a period of one calendar month. Existing dry weather flows are currently 1.35 MGD. Therefore, the treatment facility is operating at approximately 59% of capacity and could accommodate approximately 4,439 additional residential connections based on dry weather flows.

Existing Capacity

Availability of connections within the City of Arcata wastewater system is not as straightforward as with the water system. According to the City's discharge permit, the system has an average dry weather design flow of 2.3 MGD. Considering the City's average dry weather flows are currently around 1.3 MGD, this would indicate the City is operating at 59% of capacity.

However, the City is currently having difficulty meeting their discharge requirements as evidenced by a recent ACLC and ACLO, which indicates the facilities' treatment capacity is being exceeded. Therefore, available capacity is estimated to be near zero until these problems are resolved. With improvements to the treatment system and reduction in I&I, the City's wastewater system could likely realize its full dry weather capacity, allowing for 4,439 additional connections.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Arcata USA and addresses infrastructure needs for existing development served by the City of Arcata and for build-out

conditions. The existing capacity of the system includes connections within the City of Arcata as well.

Table 7-2. Wastewater system infrastructure assessment for the Arcata USA.

WASTEWATER SYSTEM STATISTICS	
# of Existing Connections	6,388
# of Available Connections ¹	4,439
Permitted Dry Weather Treatment Capacity (MGD)	2.3
Existing Dry Weather Flows (MGD)	1.3
Existing Peak Wet Weather Flows (MGD)	14
I&I Peaking Factor	10 – 11
LOW AND HIGH BUILD-OUT ESTIMATES	
# of Projected New Connections	2 – 205
# of Total Future Connections ²	6,390 – 6,593
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Modifications to treatment system to improve short-circuiting ³</i>	\$2,000,000
<i>Flow control structure upgrades ³</i>	\$2,000,000
<i>Collection system I&I upgrades ³</i>	\$15,000,000
Estimated Cost for Build-Out Infrastructure (\$)	\$19,000,000
Est. Cost per Existing Connection (\$)	\$2,974
Est. Financing Cost per Existing Connection (\$/Month)	\$15.90
Est. Range of Costs per Total Future Connection (\$)	\$2,882 - \$2,973
Est. Financing Cost per Total Future Connection (\$/Month)	\$15.41 - \$15.89

NOTES: ¹ The number of available connections was estimated based on the City's current ADWF being 59% of capacity as set forth in their NPDES permit. However, improvements to the system are needed, as the system is currently not meeting discharge requirements.

² This number does not include development within City limits.

³ The City is in the process of completing a Capital Improvement Program. Infrastructure upgrades and expansion will be further detailed through this process.

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for infrastructure would likely come in the form of a low interest loan, like a State Revolving Fund loan with a loan term of 20 years at 2.5% interest. At this rate, annual payments for a \$19,000,000 loan would amount to approximately \$1.22 million per year. With 6,388 existing connections, monthly bills would have to be increased by approximately \$16 per month to fund this loan. New development in the USA would not affect these monthly payments much since the development potential is not high, but future development within the City could further reduce this amount. In reality, we would expect the City to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections will also need to buy into the existing infrastructure through connection fees in order to build sufficient reserves for infrastructure replacement in the future. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. City specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

7.4.1.2. Wastewater System

Service Area Description

Upon annexation, the Arcata USA is expected to receive wastewater service from the City of Arcata. The City also provides wastewater services to Fieldbrook Glendale Community Services District through contract.

System Standards

The City of Arcata's wastewater system is a public system, including publicly owned treatment works (POTW), and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

The City's current waste discharge requirements are contained in RWQCB Order No. R1-2004-0036, NPDES Permit No. CA0022713. The City is currently under Administrative Civil Liability Order (ACLO) No. R1-2006-0054 and Administrative Civil Liability Complaint (ACLC) No. R1-2007-0064 (see the Condition Assessment section below for a description of the ACLO and ACLC).

Fiscal Condition/Capital Replacement Program

According to City records, they operate their wastewater system on an annual budget of approximately \$2.9 million. The majority of this income is from service charges, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The City will be developing a Capital Improvement Plan in 2008, and they currently have approximately \$230,000 in built-up reserves.

Wastewater Flows

Approximately 6,000 connections receive wastewater service within the City of Arcata, and the City additionally receives and treats wastewater from approximately 165 residential connections in Glendale. Average dry weather flows totaled approximately 1.35 MGD in 2006. Peak wet weather flows totaled approximately 12 MGD in 2006 but have been known to reach as high as 14 MGD. This represents a system wide peaking factor of approximately ten.

Wastewater Collection, Treatment, and Disposal

Wastewater is collected from individual sources through the City's collection system. Wastewater flows by gravity to the City's wastewater treatment plant, where conventional primary treatment occurs in a series of clarifiers. Primary treatment is limited to 5 MGD. Any flows in excess of this bypass clarification and are routed straight to the oxidation ponds. Effluent from the clarifiers flows through a series of oxidation ponds and into the Arcata Marsh and Wildlife Sanctuary (AMWS) where the wastewater is further treated to post-secondary standards and re-used for wetlands, ponds, and related wildlife habitat.

The City's wastewater facilities are permitted to treat up to 2.3 MGD mean daily dry weather flow averaged over a period of one calendar month.

Condition Assessment

Overview. Significant portions of the City's collection system are in severe need of repair and/or replacement due to inflow and infiltration (I&I). The City is aware of the problem and in the process of finalizing a Capital Improvement Plan (CIP) for its wastewater system. A good portion of the plan will focus on the collection system.

The City is currently under an ACLO for not meeting treatment requirements within the AMWS during wet weather conditions. The cited reason for the ACLO is due to the City's failure to meet 85% removal requirements included in their discharge permit during wet weather conditions in the past. The City's I&I problem contributes to this problem. A good portion of the violations were under a discharge permit that expired in 2004. The new discharge permit adopted since then has better incorporated wet weather flows into the permit. The City has appealed the ACLO, as they do not believe the infractions are water quality related but more technical violations of permit parameters.

The City also received an ACLC in July 2007 for effluent limit violations and sanitary sewer overflows between June 2004 and March 2007. The effluent limit violations mostly involved failure to meet 85% removal of TSS and TSS loading (lbs/day) in excess of permitted amounts. However, cyanide and copper limits were also exceeded a number of times. Sanitary sewer overflows (raw sewage spilling out of the sewer system) occur during winter months as a result of excessive I&I. The City has prepared a CIP focused on increasing treatment efficiencies within the AMWS by reducing short-circuiting, installing solar mixers, and improving vegetation cover. The CIP will also focus on reducing I&I within the collection system.

Current Deficiencies. The City's collection system experiences significant I&I during winter months. Older neighborhoods, such as Sunnybrae, contribute the most I&I.

Underserved Areas. All areas within the City receive wastewater service.

Proposed Improvements

System Upgrades. As described above, the City is in the process of developing a CIP to address shortfalls within their wastewater collection and treatment systems. The City is poised to invest significant effort and resources to reduce I&I within their collection system and improve efficiencies within the treatment system.

Future Expansion. The Arcata USA is within the Urban Services Boundary set forth in the Arcata General Plan. Therefore, it is likely that these areas will be annexed and services extended to these areas. The Pacific Manor subdivision is already built-out, so annexation to the City may be more difficult. These homes would likely be better served by the City's wastewater system rather than the existing on-site septic systems. However, individual homeowners or the developers would be responsible for installing service laterals and certain portions of the collection system in order to connect to the City wastewater system. Additional improvements to ensure adequate capacity would also be required by the City.

Cost and Schedule of Improvements. The City's CIP will be completed in 2008 and will cover costs and schedules of improvements to its wastewater system. At this time, the City estimates \$2 million will be invested in its collection system and \$1 million will be invested in its treatment system over the next five years.

7.4.2. Blue Lake USA

There are a total of two areas within the City's sphere of influence that comprise the Blue Lake USA. A high build-out estimate for total development potential of 143 new housing units in the USA was used for infrastructure assessment and recommendations. See Section 6.4.2 for a more detailed description of the USA and its development potential.

7.4.2.1. Summary

Findings

The City of Blue Lake's wastewater system is in fair condition overall. The collection system has significant I&I and it appears the treatment facility is not meeting its waste discharge requirements related to organic loading. The WWTF is currently processing on average 400 lbs BOD/day, thereby exceeding its permitted loading of 300 lbs/day. The City will need to expand and upgrade its treatment capacity, as well as reduce I&I within its collection system.

The City is operating under a waste discharge permit (WDR) that was adopted in 1994 and does not reflect some of the current issues discussed in Section 7.2. Any improvements to this facility should be made so that it will be in compliance with the requirements that will be contained in a current permit.

The City's wastewater facilities are permitted to treat up to 0.25 MGD mean daily dry weather flow averaged over a period of one calendar month. Existing dry weather flows are currently 0.15 MGD, and peak wet weather flows are around 1 MGD. Therefore, the treatment facility is operating at approximately 60% of hydraulic capacity and could therefore accommodate the forecast development potential, as long as treatment capacity is expanded and I&I is controlled.

Existing Capacity

Availability of connections within the City of Blue Lake wastewater system is not as straightforward as with the water system. According to the City's discharge permit, the system has an average dry weather design flow of 0.25 MGD. Considering the City's average dry weather flows are currently around 0.15 MGD, this would indicate the City is operating at 60% of capacity. Although organic loading to the facility appears to be in excess of its design and the City has significant I&I, the facility has not had any orders imposed by the RWQCB. Therefore, it is assumed that the City has a limited, but unknown number of additional connections, without making improvements to the treatment plant or addressing the I&I issue.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Blue Lake USA and addresses infrastructure needs for existing development served by the City of Blue Lake and for build-out conditions. There are no planned developments within the USA, and therefore infrastructure for the next 10-year planning horizon was not assessed. The existing capacity of the system also includes connections within the City of Blue Lake as well.

The existing discharge permit is 13 years old and it is likely that additional requirements will be contained in the new permit that will require significant improvements to their system. The estimated cost for these improvements represents an "order of magnitude" cost and should be refined in a detailed facilities plan.

Table 7-3. Wastewater system infrastructure assessment for the Blue Lake USA.

WASTEWATER SYSTEM STATISTICS	
# of Existing Connections	515
# of Available Connections ¹	343
Permitted Dry Weather Treatment Capacity (MGD)	0.25
Existing Dry Weather Flows (MGD)	0.15
Existing Peak Wet Weather Flows (MGD)	1.0
I&I Peaking Factor	6 – 7
LOW & HIGH BUILD-OUT ESTIMATES	
# of Projected New Connections	46 – 143
# of Total Future Connections ²	561 – 658
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Upgrade POTW to meet current regulations ¹</i>	\$5,000,000
<i>Collection System I&I Upgrades</i>	\$4,000,000
<i>New summer disposal alternative</i>	\$2,000,000
Estimated Cost for Build-Out Infrastructure (\$)	\$11,000,000
Est. Cost per Existing Connection (\$)	\$21,359
Est. Financing Cost per Existing Connection (\$/Month)	\$114.18
Est. Range of Costs per Total Future Connection (\$)	\$16,717 - \$19,608
Est. Financing Cost per Total Future Connection (\$/Month)	\$89.36 - \$104.82

NOTES: ¹ The number of available connections was estimated based on the City's current ADWF being at 60% of capacity as set forth in their NPDES permit.

² This number does not include development within City limits.

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for infrastructure would likely come in the form of a low interest loan, like a State Revolving Fund loan with a loan term of 20 years at 2.5% interest. At this rate, annual payments for a \$11,000,000 loan would amount to approximately \$706,000 per year. With 515 existing connections, monthly bills would have to be increased by approximately \$115 per month to fund this loan. If the loan were to be spread out over high future build-out as well, monthly bills would have to be increased by over \$89 per month to fund this loan. Therefore, monthly bills would have to increase between \$89 and \$115 per month to fund these wastewater improvements. In reality, we would expect the City to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections will also need to buy into the existing infrastructure through connection fees in order to build sufficient reserves for infrastructure replacement in the future. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. City specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

7.4.2.2. Wastewater System

Service Area Description

The City of Blue Lake currently provides wastewater services to residents within the City and 17 parcels outside the City, most of which are within the Blue Lake WSA. The entire USA would be

expected to receive wastewater service from the City of Blue Lake, upon annexation. The City also provides wastewater services to the Blue Lake Rancheria through contract.

System Standards

The City of Blue Lake's wastewater system is a public system, including publicly owned treatment works (POTW), and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

The City's current waste discharge requirements are contained in RWQCB Order No. 94-28. The City no longer has an NPDES portion of their permit since discharges to the Mad River were discontinued.

Fiscal Condition/Capital Replacement Program

According to City records, they operate their wastewater system on an annual budget of approximately \$230,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The City has not developed a Capital Improvement Plan to date, and their reserves status is currently unknown.

Wastewater Flows

There are approximately 515 wastewater connections within the City of Blue Lake USA. Average dry weather flows are approximately 0.15 MGD, while peak wet weather flows are approximately 1.0 MGD. This represents a system wide peaking factor of approximately six to seven (Winzler & Kelly, 2006b).

Wastewater Collection, Treatment, and Disposal

The City of Blue Lake uses a gravity collection system that serves the residential community, industrial park, and commercial Districts in the City. In addition, sewer service is provided to a few residences outside the City limits. Blue Lake's collection system is composed of vitrified clay, asbestos cement, polyethylene, and PVC pipe. The system collects domestic, commercial, and industrial wastewaters and terminates at the Chartin Road Pump Station where wastewater is pumped through force mains to the headworks at the treatment plant. Two additional lift stations are located in and serve the Industrial Park.

The Blue Lake wastewater treatment plant (WWTP) is located in the northwest corner of the City near the flood plain of the Mad River. The treatment plant is a domestic municipal treatment system that consists of headworks, four treatment ponds, a chlorine disinfection system, and three rapid infiltration basins. The infiltration basins are located near the bank of the Mad River. The City recently constructed a rock filter to try and improve their effluent quality.

The WWTP is designed to handle an average hydraulic loading of 0.25 MGD and a BOD loading of 300 lbs/day. The plant is likely exceeding its treatment capacity. Average flows are currently 0.15 MGD with an average BOD concentration of 325 mg/L, which results in a BOD loading of over 400 lbs/day. Maximum month influent loadings of 1,400 mg/L BOD and 1,700 mg/L TSS have been experienced at the plant (Winzler & Kelly, 2006b).

Condition Assessment

Overview. Significant portions of the City's collection system are in severe need of repair and/or replacement due to excessive inflow and infiltration (I&I). In 1984, selected sections of the collection system and laterals with the worst I&I were replaced through the Clean Water Grant Project to help reduce hydraulic loads on the wastewater treatment plant. The City has continued the effort to reduce I&I problems by replacing deteriorated and leaking sections of pipe as funds become available.

The number of violations to the City's WDR have been relatively few. However, their permit is over 13 years old and these permits are generally renewed every 5 years. Based upon our understanding of the issues and the direction of the RWQCB, we envision that significant improvements will be needed to meet the City's future WDR.

Current Deficiencies. The City's collection system experiences significant I&I during winter months, and the WWTP is operating in excess of its designed treatment capacity.

Underserved Areas. All areas within the City receive wastewater service.

Proposed Improvements

System Upgrades. As described above, the City continues to address shortfalls within their wastewater collection and treatment systems. The City will need to invest significant effort and resources to reduce I&I within their collection system and to make improvements to the treatment and disposal system.

Future Expansion. All areas within the Blue Lake USA are within the Urban Services Boundary set forth in the Blue Lake General Plan. Therefore, it is likely that these areas will be annexed and services extended to these areas. Studies have also been conducted to assess the feasibility of accepting wastewater flows from the Glendale USA.

Cost and Schedule of Improvements. The City's CIP will be completed in 2008 and will cover costs and schedules of improvements to its wastewater system. At this time, the City estimates \$2 million will be invested in its collection system and \$9 million will be invested in its treatment and disposal systems over the next ten years. However, we believe that these estimates may be low and have presented order of magnitude costs in Table 7-3 to reflect the potential costs associated with meeting their new WDR.

7.4.3. Fortuna USA

There are a total of four areas within the City's sphere of influence that comprise the Fortuna USA. A high build-out estimate for total development potential of 450 new housing units in the USA was used for infrastructure assessment and recommendations. See Section 6.4.3 for a more detailed description of the USA and its development potential.

7.4.3.1. Summary

Findings

The City of Fortuna's wastewater system is in good condition overall, and was recently expanded in 2006 to improve capacity and performance. The City's wastewater facilities are permitted to treat up to 1.5 MGD mean daily dry weather flow averaged over a period of one calendar month. Existing dry weather flows are currently 0.95 MGD. Therefore, the treatment facility is operating at approximately 63% of its dry weather flow capacity. However, wet weather flows continue to pose a problem for the City.

The facility has a design peak wet weather flow of 4.5 MGD, although it has experienced flows of around 7 MGD. Any flows in excess of this amount are directed to holding ponds with a storage capacity of 7 MG, so any wet weather flows in excess of this storage are discharged to Strong's Creek with disinfection being the only treatment provided. It is questionable whether this process will continue to be allowed, as these flows do not receive secondary treatment as mandated by the Clean Water Act (this is similar to the problem the City of Eureka faces with its existing blending process). The EPA strongly discourages reliance on peak wet weather flow diversions around secondary treatment units. The City and WWTP would greatly benefit from further reduction of I&I within the collection system and/or expansion of the WWTP's wet weather flow capacity.

Further, the City's WDR is currently up for renewal and it is expected that the issues outlined in Section 7.2 will require additional upgrades to their facility.

Existing Capacity

Availability of connections within the City of Fortuna wastewater system is not as straightforward as with the water system. According to the City's discharge permit, the system has an average dry weather design flow of 1.5 MGD and a peak wet weather design flow of 4.5 MGD. Considering the City's average dry weather flows are currently around 0.95 MGD, this would indicate the City is operating at 63% of capacity. The City's peak wet weather flows are currently around 7 MGD but with the use of holding ponds, the facility operates at 4.5 MGD. Therefore, the City is operating at 100% of wet weather capacity and it is difficult to estimate how many, if any, connections are available. With improvements to the collection system and a reduction in I&I, the City could reduce its peak wet weather flows and allow for more connections.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Fortuna USA and addresses infrastructure needs for existing development served by the City of Fortuna and for build-out conditions. There are no planned developments within the USA, and therefore infrastructure for the next 10-year planning horizon was not assessed. The existing capacity of the system includes connections within the Palmer Creek CSD as well.

Table 7-4. Wastewater system infrastructure assessment for the Fortuna USA.

WASTEWATER SYSTEM STATISTICS	
# of Existing Connections ¹	5,382
# of Available Connections ²	0
Permitted Dry Weather Treatment Capacity (MGD)	1.5
Permitted Wet Weather Treatment Capacity (MGD)	4.5
Existing Dry Weather Flows (MGD)	0.95
Existing Peak Wet Weather Flows (MGD)	7.0
I&I Peaking Factor	7 – 8
LOW & HIGH BUILD-OUT ESTIMATES	
# of Projected New Connections	294 – 450
# of Total Future Connections ³	5,676 – 5,832
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Upgrade POTW to meet current regulations</i>	\$10,000,000
<i>Collection system I&I upgrades</i>	\$5,000,000
Estimated Cost for Build-Out Infrastructure (\$)	\$15,000,000
Est. Cost per Existing Connection (\$)	\$2,787
Est. Financing Cost per Existing Connection (\$/Month)	\$14.90
Est. Range of Costs per Total Future Connection (\$)	\$2,572 – \$2,643
Est. Financing Cost per Total Future Connection (\$/Month)	\$13.75 - \$14.13

NOTES: ¹ 5,229 connections in City of Fortuna plus 153 connections in Palmer Creek CSD.

² The facility currently operates at peak wet weather design capacity.

³ This number does not include development within City limits.

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for infrastructure would likely come in the form of a low interest loan, like a State Revolving Fund loan with a loan term of 20 years at 2.5% interest. At this rate, annual payments for a \$15,000,000 loan would amount to approximately \$962,000 per year. With 5,382 existing connections, monthly bills would have to be increased by approximately \$15 per month to fund this loan. If the loan were to be spread out over high future build-out as well, monthly bills would have to be increased by \$14 per month to fund this loan. Therefore, monthly bills would have to increase between \$14 and \$15 per month to fund these wastewater improvements. In reality, we would expect the City to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections will also need to buy into the existing infrastructure through connection fees in order to build sufficient reserves for infrastructure replacement in the future. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. City specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

7.4.3.2. Wastewater System

Service Area Description

The Palmer Creek CSD provides wastewater collection services to its residents and contracts with the City of Fortuna for wastewater treatment and disposal. Areas within the Fortuna USA, outside the Palmer Creek CSD, do not receive municipal wastewater service and must install individual

on-site septic systems. To realize full development potential, areas within the Fortuna USA would need to be annexed to the City of Fortuna. If the area currently served by Palmer Creek CSD were to be annexed, the existing collection system would likely come under the control of the City following any required upgrades to meet the City's development standards for annexations.

The City currently receives and treats wastewater from Palmer Creek CSD.

System Standards

The City of Fortuna's wastewater system is a public system, including publicly owned treatment works (POTW), and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards. The City's current waste discharge requirements are contained in RWQCB Order No. R1-2001-0041, NPDES Permit No. CA0022730.

Palmer Creek CSD's wastewater collection system is subject to the California Sanitary Sewer System Overflow (SSO) program and must develop a sanitary sewer management plan and report regularly to the State Water Resources Control Board. Public agencies, such as CSD's, that contain more than one mile of sewer lines are subject to the SSO program.

Fiscal Condition/Capital Replacement Program

According to City records, Fortuna operates their wastewater system on an annual budget of approximately \$325,000 (City of Fortuna Fiscal Year 2007-08 budget). The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. It is unknown when the City's latest Capital Improvement Plan was developed, and their reserves status is currently unknown.

Palmer Creek CSD operates their wastewater collection system on an annual budget of approximately \$100,000. The majority of this income is from service charges, but funding also comes from property taxes, assessments, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District has not developed a Capital Improvement Plan to date, and they currently have approximately \$60,000 in reserves.

Wastewater Flows

Approximately 5,229 units receive wastewater service within the City of Fortuna (City of Fortuna, 2007). Approximately 90% of these connections are residential, while the remaining 10% are commercial. Average dry weather flows totaled approximately 0.95 MGD in 2006. Peak wet weather flows reached approximately 7 MGD in 2006 (Gehrke, 2007). This represents a system wide peaking factor of approximately seven.

There are 153 existing residential wastewater connections within the Palmer Creek CSD generating an average dry weather flow of 20,000 gpd and wet weather flows of 30,000 gpd (Palmer Creek CSD, 2007). The Palmer Creek CSD reports that it is currently at its contracted limit with the City of Fortuna for wastewater flows. This contract would need to be amended to allow additional development within the District.

Wastewater Collection, Treatment, and Disposal

Wastewater is collected throughout the City's collection system. Two main lines enter the WWTP: one is a gravity line and the other is a force main that pumps from the California Conservation

Corps wet well pump station on Alamar Way. There is one other pump station in the system (Strong's Creek Pump Station).

The City's WWTP has undergone several upgrades, the most recent of which was completed in 2006. The plant consists of headworks, primary clarification, activated sludge basins, secondary clarification, and anaerobic sludge digestion. The new facility has a dry weather capacity of 1.5 MGD, and a wet weather capacity of 4.5 MGD (Oscar Larson & Associates, 2006). Any wet weather flows in excess of this are stored in storage ponds. However, the storage ponds only have a one- to two-day capacity during wet weather and they need approximately one week of dry weather to recover. In extreme wet weather conditions, wastewater in the ponds is treated to meet effluent standards for waste stabilization ponds and is disinfected prior to overflow to Strong's Creek. Generally, treated effluent is disinfected prior to discharge to Strong's Creek at its confluence with the Eel River. During the discharge prohibition period, wastewater is discharged to a percolation pond on an exposed gravel bar.

Palmer Creek's wastewater collection system joins the City of Fortuna's collection system by the northern boundary of Fortuna.

Condition Assessment

Overview. Portions of the City's collection system are in need of repair and/or replacement due to inflow and infiltration (I&I). The City will likely have to find an alternative for summertime disposal during the discharge prohibition period to the Eel River. In addition, the City will have to deal with CTR and disinfection by-products issues.

Current Deficiencies. The City's collection system experiences significant I&I during winter months. The storage ponds do not have sufficient capacity to hold excess flows during prolonged periods of wet weather flows.

Underserved Areas. All areas within the City receive wastewater service.

Proposed Improvements

System Upgrades. As described above, the City has developed a CIP to address shortfalls within their wastewater collection system. The City has invested and remains poised to invest significant effort and resources to reduce I&I within their collection system. The City will also have to address many of the issues outlined in Section 7.2

Future Expansion. The City of Fortuna is looking to annex the USAs within the time frame of this General Plan, with the exception of the USA currently served by Palmer Creek CSD. The State forced Fortuna to accept Palmer Creek into its sphere of influence and take sewage from Palmer Creek's collection system. Fortuna requires all proposed annexations to be up to Fortuna's sewer/water/roads standards and would require a new assessment District where there are deficiencies. The City is currently in the process of updating its general plan, and that document should be referred to for additional information.

Cost and Schedule of Improvements. The City of Fortuna recently developed a five year Capital Improvement Plan in 2006 that covers costs and schedules for improvements to its wastewater collection and treatment system. These include routine maintenance activities in addition to improvements to both systems. Total project costs included in the CIP are nearly \$10.5 million dollars, of which approximately 10% will be covered through reserves built in the wastewater fund and the remaining 90% will be covered through bonds.

7.4.4. Garberville USA

Garberville's commercial downtown area and surrounding residential areas comprise the Garberville USA. A high build-out estimate for total development potential of 108 new housing units in the USA was used for infrastructure assessment and recommendations. See Section 6.4.4 for a more detailed description of the USA and its development potential.

7.4.4.1. Summary

Findings

Garberville's wastewater system is generally in poor condition overall, and is currently operating under a Cease and Desist Order for hydraulic loading in excess of design capacity and chronic effluent limit violations. The District is currently under a self imposed moratorium for new development. Feasibility studies have been prepared outlining alternatives for treatment and disposal improvements, and the improvements must be completed by November 2009. It appears that a constructed wetlands alternative has been selected as the preferred alternative. I&I continues to be a significant problem and requires attention.

The City's wastewater facilities are permitted to treat up to 0.06 MGD mean daily dry weather flow averaged over a period of one calendar month. Existing dry weather flows are currently 0.14 MGD, or over twice the permitted amount. The treatment facility is operating at approximately 233% of its dry weather capacity. The facility is also exceeding its permitted wet weather capacity.

Existing Capacity

There are no available connections within Garberville's wastewater system. Average dry weather flows and peak wet weather flows currently exceed permitted amounts.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Garberville USA and addresses infrastructure needs for existing development served by Garberville and for build-out conditions. There are no planned developments within the USA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

Table 7-5. Wastewater system infrastructure assessment for the Garberville USA.

WASTEWATER SYSTEM STATISTICS	
# of Existing Connections	420
# of Available Connections ¹	0
Permitted Dry Weather Treatment Capacity (MGD)	0.06
Permitted Wet Weather Treatment Capacity (MGD)	0.3
Existing Dry Weather Flows (MGD)	0.14
Existing Peak Wet Weather Flows (MGD)	0.55
I&I Peaking Factor	4
LOW & HIGH BUILD-OUT ESTIMATES	
# of Projected New Connections	63 – 108
# of Total Future Connections	483 – 528
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>WWTP Upgrades (Treatment & Disposal)</i>	\$10,000,000
<i>Collection System I&I Upgrades</i>	\$5,000,000
Estimated Cost for Build-Out Infrastructure (\$)	\$15,000,000
Est. Cost per Existing Connection (\$)	\$35,714
Est. Financing Cost per Existing Connection (\$/Month)	\$190.91
Est. Range of Costs per Total Future Connection (\$)	\$28,409 - \$31,056
Est. Financing Cost per Total Future Connection (\$/Month)	\$151.86 - \$166.01

NOTES: ¹ The facility currently operates in excess of both average dry weather and peak wet weather design capacity.

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for infrastructure would likely come in the form of a low interest loan, like a State Revolving Fund loan with a loan term of 20 years at 2.5% interest. At this rate, annual payments for a \$15,000,000 loan would amount to approximately \$962,000 per year. With 420 existing connections, monthly bills would have to be increased by approximately \$191 per month to fund this loan. If the loan were to be spread out over high future build-out as well, monthly bills would have to be increased by nearly \$152 per month to fund this loan. Therefore, monthly bills would have to increase between \$152 and \$191 per month to fund these wastewater improvements. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections will also need to buy into the existing infrastructure through connection fees in order to build sufficient reserves for infrastructure replacement in the future. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

7.4.4.2. Wastewater System Service Area Description

All potential development within the Garberville USA would receive wastewater service from the Garberville Sanitary District (GSD).

System Standards

The District's wastewater system is a public system, including publicly owned treatment works (POTW), and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

The District's current waste discharge requirements are contained in RWQCB Order No. R1-2000-0058. The District does not have an NPDES permit as they do not directly discharge to the Eel River, but rather discharge year-round to percolation ponds. Standards for percolation ponds are currently changing, and this type of discharge will likely not be allowed during the discharge prohibition period (May 15th to September 30th) in the very near future. The District is currently under a Cease and Desist Order (Order No. R1-2004-0097) for discharging effluent in violation of its waste discharge requirements.

Fiscal Condition/Capital Replacement Program

According to District records, they operate their wastewater system on an annual budget of approximately \$225,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District has not developed a Capital Improvement Plan to date, and they currently have \$125,000 in wastewater reserves.

Wastewater Flows

Approximately 420 units receive wastewater service within the Garberville USA (Garberville Sanitary District, 2007). Average dry weather flows consistently exceed the permitted 0.06 MGD of the WWTP and averaged 0.14 MGD in 2003/2004. Peak wet weather flows have also exceeded the permitted 0.3 MGD of the WWTP, and were as high as 0.55 MGD during 2003/2004 (LACO Associates, 2005). This represents a system wide peaking factor of approximately four.

Wastewater Collection, Treatment, and Disposal

The District's collection system consists of original portions of the system constructed by the CCC in the 1930s, portions that were reconstructed after the 1964 flood, and portions reconstructed more recently. The collection system flows by gravity with the aid of lift stations to convey the wastewater to the treatment facility. Treatment works consist of headworks, three treatment ponds designed to work in series, disinfection, and two percolation ponds used for year-round disposal. The treatment plant was constructed in 1984, and the design capacity of the system is for a peak wet weather flow of 0.3 MGD.

Condition Assessment

Overview. The District is under a Cease and Desist Order (Order No. R1-2004-0097) for discharging effluent in violation of its waste discharge requirements due to increased population growth and summertime tourism activity. Violations cited in the Order include hydraulic loading in excess of design capacity and chronic effluent limit violations. In addition, the GSD imposed a development moratorium that prohibits new connections until treatment plant improvements are complete. The District has prepared a draft report analyzing viable alternatives to increase its treatment capacity and has decided on a constructed wetlands alternative as well as new locations for the summertime disposal of treated effluent. The Order has set forth a completion date for the new facility of November 2009.

The District currently relies on percolation ponds for disposal. This form of disposal is becoming increasingly difficult to permit due to stringent regulations governing disposal to the Eel River during the discharge prohibition period. Percolation ponds adjacent to the Eel River have been considered direct discharges. Other communities downstream such as Rio Dell and Ferndale are being required by the RWQCB at this time to find alternative methods of disposal.

Current Deficiencies. The District's collection system experiences significant I&I during winter months. Treatment capacity is currently exceeded during wet weather conditions.

Underserved Areas. All areas within the District receive wastewater service.

Proposed Improvements

System Upgrades. As described above, the District is in the process of planning additional treatment and disposal capacity. A future reclamation project and collection system upgrades are also being planned at this time.

Future Expansion. The District is under a moratorium for additional connections until additional capacity is constructed and the WWTP is operating within its waste discharge requirements. Once the District completes planned treatment and disposal upgrades, the moratorium would be lifted allowing for additional development.

Cost and Schedule of Improvements. The District does not have a CIP in place at this time. Preliminary cost estimates for the treatment plant upgrades are approximately \$3 million. If a new disposal alternative is required, this could likely cost the District upward of \$10 million.

7.4.5. Glendale USA

The Glendale USA is served by a collection system owned and operated by the FGCS, who contracts with the City of Arcata for treatment and disposal. A high build-out estimate for total development potential of 1,189 new housing units in the USA was used for infrastructure assessment and recommendations. See Section 6.4.5 for a more detailed description of the USA and its development potential.

7.4.5.1. Summary

Findings

Glendale's wastewater system is in very good condition overall. The collection system was installed in 1990, and raw wastewater is currently pumped to the City of Arcata for treatment and disposal. The system currently has approximately 165 connections, and flows currently range between 37,000 gpd during dry weather and 75,000 gpd during wet weather. The District's existing contract with the City allows for up to 71,200 gpd average dry weather flow, and therefore the system has capacity for approximately 80 to 100 more connections. The low buildout estimate can likely be accommodated through the existing contract with the City of Arcata. Alternative solutions to treatment and disposal must be found to accommodate any development in excess of this.

Existing Capacity

Availability of connections within Glendale's wastewater system is limited by contractual amount with the City of Arcata. The District engineer estimates there are approximately 80 to 100 available connections.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Glendale USA and addresses infrastructure needs for existing development served by the FGCS D, for planned developments in the USA within the next 10-year planning horizon and for build-out conditions. There are some planned developments within the Glendale USA, so an infrastructure assessment for the next 10-year planning horizon is also presented.

Table 7-6. Wastewater system infrastructure assessment for the Glendale USA.

WASTEWATER SYSTEM STATISTICS	
# of Existing Connections	165
# of Available Connections ¹	100
Permitted Dry Weather Treatment Capacity (MGD) ²	---
Existing Dry Weather Flows (MGD)	0.037
Existing Peak Wet Weather Flows (MGD)	0.075
I&I Peaking Factor	2
LOW & HIGH BUILD-OUT ESTIMATES	
# of Projected New Connections	20 – 1,189
# of Total Future Connections	185 – 1,354
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>New treatment and disposal facility</i>	\$5,000,000
Estimated Cost for Build-Out Infrastructure (\$)	\$5,000,000
Est. Cost per Existing Connection (\$)	\$30,303
Est. Financing Cost per Existing Connection (\$/Month)	\$161.99
Est. Range of Costs per Total Future Connection (\$)	\$3,693 - \$27,027
Est. Financing Cost per Total Future Connection (\$/Month)	\$19.74 - \$144.48

NOTES: ¹ According to the District engineer, there are approximately 100 connections worth of capacity remaining in the existing contract with the City of Arcata.

² The FGCS D contracts with the City of Arcata for treatment and disposal.

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for infrastructure would likely come in the form of a low interest loan, like a State Revolving Fund loan with a loan term of 20 years at 2.5% interest. At this rate, annual payments for a \$5,000,000 loan would amount to approximately \$321,000 per year. With 165 existing connections, monthly bills would have to be increased by \$162 per month to fund this loan. If the loan were to be spread out over high future build-out as well, monthly bills would have to be increased by approximately \$20 per month to fund this loan. Therefore, monthly bills would have to increase between \$20 and \$162 per month to fund these wastewater improvements. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections will also need to buy into the existing infrastructure through connection fees in order to build sufficient reserves for infrastructure replacement in the future. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

7.4.5.2. Wastewater System

Service Area Description

All potential development within the Glendale USA would receive wastewater service from the Fieldbrook Glendale Community Services District (FGCSD). The District maintains a collection system and is under contract with the City of Arcata for treatment and disposal of wastewater, which is pumped into the City's collection system.

System Standards

The District's wastewater system is a public system and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

Fiscal Condition/Capital Replacement Program

According to District records, they operate their wastewater system on an annual budget of approximately \$180,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District has not developed a Capital Improvement Plan to date, and they currently have approximately \$80,000 in wastewater reserves.

Wastewater Flows

Approximately 165 units receive wastewater service within the Glendale USA, of which all are residential connections. Average dry weather flows were approximately 37,000 gpd in 2006. Peak wet weather flows were approximately 75,000 gpd during 2006. This represents a system wide peaking factor of approximately two, representative of the new collection system (Carnam, 2007).

Wastewater Collection, Treatment, and Disposal

The District's collection system was installed in 1990. Wastewater is pumped through a force main to a connection point with the City of Arcata's collection system located near Giuntoli Rd. Wastewater is then treated and disposed of by the City.

Condition Assessment

Overview. The District's contract with the City of Arcata allows for discharge of up to 71,200 gallons during average dry weather conditions. It is estimated an additional 80 to 100 single family homes could be added to the system under this contracted amount. The City has indicated it is not interested at this time to increase the District's contract amount and has recommended the District consider other alternatives. The District has approached the City of Blue Lake and will participate in other studies to evaluate alternatives and costs for potential interconnection.

Current Deficiencies. No deficiencies exist with the District's existing collection system. The District has two pump stations and only one (mobile) stand by generator that currently is transferred between the two stations during a power outage. Over the long term it would be beneficial to install a second stand by generator at the smaller of the two pump stations.

Underserved Areas. Some areas within the USA do not receive wastewater service.

Proposed Improvements

System Upgrades. The District does not have plans for any system upgrades at this time.

Future Expansion. The District is interested in extending service to unserved areas within the USA and to any new development within the USA.

Cost and Schedule of Improvements. The District does not have a CIP in place at this time.

7.4.6. Loleta USA

The Loleta USA is served by a community sewer system owned and operated by the Loleta Community Services District (LCSD). A high build-out estimate for total development potential of 116 new housing units in the USA was used for infrastructure assessment and recommendations. See Section 6.4.7 for a more detailed description of the Loleta USA and its development potential.

7.4.6.1. Summary

Findings

Loleta's wastewater system is in marginal to fair condition overall. The treatment facilities have received a Cease and Desist Order (CDO), a Cleanup and Abatement Order (CAO), and an Administrative Civil Liability Order (ACLO) within the past three years. In 2004, the facility did not have a licensed operator on staff, and the CSD threatened to not staff the facility on a daily basis, which led to issuance of the Cleanup and Abatement Order. The facilities are quite old and regularly violate effluent limits as set forth in their waste discharge requirements. The facility is currently operated by the City of Fortuna as Loleta CSD does not have qualified personnel.

The system currently has approximately 240 connections, and flows range between .06 MGD during dry weather and 0.6 MGD during wet weather. The facility has an average dry weather flow design capacity of 0.1 MGD, and is therefore operating at approximately 60% of its dry weather capacity. However, wet weather flows are probably in excess of the facility's treatment capacity. The current method of disposal is discharge to percolation ponds aside the Eel River. This form of disposal is coming under increasing scrutiny within the Eel River basin, and other dischargers utilizing similar disposal methods are being forced to find alternative methods of disposal.

Existing Capacity

Availability of connections within the Loleta wastewater system is not as straightforward as with the water system. According to the City's discharge permit, the facility has an average dry weather flow design capacity of 0.1 MGD. Considering average dry weather flows are currently around 0.06 MGD, this would indicate the District is operating at 60% of capacity.

However, the District is currently having difficulty meeting their discharge requirements as evidenced by a recent CDO, CAO, and ACLO, which indicate the facilities' treatment capacity is being exceeded. Flows of up to 600% of the treatment plant design capacity are experienced during wet weather. Therefore, available capacity is estimated to be zero until these problems are resolved. With improvements to the treatment system and reduction in I&I, the District's wastewater system could likely realize its full dry weather capacity, allowing for an additional 160 connections.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Loleta USA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the USA, and therefore infrastructure for the next 10-year planning horizon was not assessed. The estimated cost for these improvements represents an “order of magnitude” cost, assuming the issues discussed in section 7.2 are applied to this system and should be refined in a detailed facilities plan.

Table 7-7. Wastewater system infrastructure assessment for the Loleta USA.

WASTEWATER SYSTEM STATISTICS	
# of Existing Connections	240
# of Available Connections ¹	0
Permitted Dry Weather Treatment Capacity (MGD)	0.1
Existing Dry Weather Flows (MGD)	0.06
Existing Peak Wet Weather Flows (MGD)	0.6
I&I Peaking Factor	10
LOW & HIGH BUILD OUT ESTIMATES	
# of Projected New Connections	87 – 116
# of Total Future Connections	327 – 356
Needed Infrastructure Upgrades	Estimated Cost (\$)
<i>Treatment facility upgrades</i>	\$5,000,000
<i>Collection System Upgrades</i>	\$4,000,000
<i>Alternative Disposal Method</i>	\$1,000,000
Estimated Cost for Build-Out Infrastructure (\$)	\$10,000,000
Est. Cost per Existing Connection (\$)	\$41,667
Est. Financing Cost per Existing Connection (\$/Month)	\$222.73
Est. Range of Costs per Total Future Connection (\$)	\$28,090 - \$30,581
Est. Financing Cost per Total Future Connection (\$/Month)	\$150.16 - \$163.47

NOTES: ¹ The number of available connections was estimated at zero given the District is failing to meet current discharge requirements.

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for infrastructure would likely come in the form of a low interest loan, like a State Revolving Fund loan with a loan term of 20 years at 2.5% interest. At this rate, annual payments for a \$10,000,000 loan would amount to approximately \$641,000 per year. With 240 existing connections, monthly bills would have to be increased by approximately \$223 per month to fund this loan. If the loan were to be spread out over high future build-out as well, monthly bills would have to be increased by over \$150 per month to fund this loan. Therefore, monthly bills would have to increase between \$150 and \$223 per month to fund these wastewater improvements. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections will also need to buy into the existing infrastructure through connection fees in order to build sufficient reserves for infrastructure replacement in the future. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific

studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

7.4.6.2. Wastewater System

Service Area Description

All proposed development within the Loleta USA would receive wastewater service from the LCSD. The District operates and maintains a wastewater collection, treatment, and disposal system.

System Standards

The District's wastewater system is a public system and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

The District's current waste discharge requirements are contained in RWQCB Order No. R1-2001-0059 and NPDES Permit No. CA0023671.

Fiscal Condition/Capital Replacement Program

According to District records, they operate their wastewater system on an annual budget of approximately \$185,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District has not developed a Capital Improvement Plan to date, and they currently have \$220,000 in reserves.

Wastewater Flows

Approximately 240 connections currently receive wastewater service within the Loleta USA, of which all are residential connections except for two industrial connections serving the Loleta Cheese Factory and the Humboldt Creamery Association facility. 100% of homes within the USA are serviced. Average dry weather flows are estimated at approximately 60,000 gpd. Peak wet weather flows are estimated at approximately 600,000 gpd. This represents a system wide peaking factor of approximately ten.

Wastewater Collection, Treatment, and Disposal

The District's collection system consists of approximately 2.0 miles of pipe. Wastewater is collected from residences throughout the USA and flows by gravity to the Loleta WWTP. Treatment consists of an aeration basin, clarifier, sludge storage vault, chlorine contact chamber, chlorine and sulfur flow-proportioning equipment, and an evaporation/ percolation pond. According to the District's waste discharge requirements, the pond overflows to an unnamed slough, which is tributary to the Eel River, during periods of high rainfall. The treatment plant has a design capacity of 100,000 gpd.

Condition Assessment

Overview. The District is currently under a Cease and Desist Order No. R1-2004-0096 for chronic effluent limit violations, excessive I&I which during the winter of 2004 caused the clarifier to overflow within the WWTP, and lack of control systems and auxiliary power at the WWTP to power the activated sludge process and chlorination/dechlorination equipment in the event of a power outage.

The District was also served a Cleanup and Abatement Order in 2004 for not having a Grade II licensed operator on staff, for continued violations to the NPDES permit, and for threatening to not staff the facility on a daily basis. A rescission of the order was issued approximately five months later upon compliance with the order.

The District was also served Administrative Civil Liability Order No. R1-2007-0003 in February 2007 for 91 exceedances of effluent limitations between 2000 and 2005. A compliance project has been initiated. Projects completed to date include improvements to the disinfection system, modifications to the chlorine contact basin, and installation of a new alarm system and an emergency generator. The remaining planned expenditures include improvements to reduce I&I.

The District is under contract with a licensed operator to supervise operations at the Loleta WWTP.

Current Deficiencies. The District has significant problems with I&I within their collection system. The District currently relies on percolation ponds for disposal. This form of disposal is becoming increasingly difficult to permit due to stringent regulations governing disposal to the Eel River during the discharge prohibition period. Other communities such as Rio Dell and Ferndale are being required by the RWQCB at this time to find alternative methods of disposal.

Underserved Areas. All areas within the USA receive wastewater service from the District.

Proposed Improvements

System Upgrades. The District does not have plans for any system upgrades at this time aside from scheduled improvements to the collection system as mandated by Administrative Civil Liability Order No. R1-2007-0003.

Future Expansion. The District is not interested in extending service to any new development within the USA aside from existing subdivision and infill plans.

Cost and Schedule of Improvements. The District does not have a CIP in place at this time but plans on spending approximately \$80,000 through the 2009/2010 budget year on collection system analysis and repair.

7.4.7. Manila USA

The Manila USA is served by a community sewer system owned and operated by the Manila Community Services District (MCSD). A high build-out estimate for total development potential of 233 new housing units in the USA was used for infrastructure assessment and recommendations. See Section 6.4.8 for a more detailed description of the Manila USA and its development potential.

7.4.7.1. Summary

Findings

Manila's wastewater system is in good condition overall. The community relies on a STEP system that pumps liquid effluent from resident's septic tanks into a force main to treatment. The treatment system consists of three free surface wetlands, two surface aerated facultative ponds, and four percolation ponds (rapid infiltration basins) for disposal.

The system currently has approximately 444 connections, and flows currently range between .066 MGD during dry weather and 0.21 MGD during wet weather. The facility has an average dry

weather flow design capacity of 0.14 MGD, and is therefore operating at approximately 47% capacity.

This system is currently in compliance with its WDR and has sufficient capacity to serve forecasted potential future development without major improvements, other than extensions that might be needed to serve a particular parcel.

Existing Capacity

Manila's wastewater system is currently operating at approximately 47% of its average dry weather design capacity. The facility has not had any problems meeting its discharge requirements. Therefore, it is assumed the facility could realize its full average dry weather capacity, allowing for an additional 500 connections.

Summary of Required Improvements

This system has sufficient capacity to meet the needs of future development over the planning period without needing major improvements.

Table 7-8. Wastewater system infrastructure assessment for the Manila USA.

WASTEWATER SYSTEM STATISTICS	
# of Existing Connections	444
# of Available Connections ¹	500
Permitted Dry Weather Treatment Capacity (MGD)	0.14
Existing Dry Weather Flows (MGD)	0.066
Existing Peak Wet Weather Flows (MGD)	0.21
I&I Peaking Factor	3
LOW & HIGH BUILD-OUT ESTIMATES	
# of Projected New Connections	233
Needed Infrastructure Upgrades	Estimated Cost (\$)
<i>None needed</i>	\$0
Estimated Cost for Build-Out Infrastructure (\$)	\$0
Est. Cost per Existing Connection (\$)	\$0
Est. Financing Cost per Existing Connection (\$/Month)	\$0
Est. Range of Costs per Total Future Connection (\$)	\$0
Est. Financing Cost per Total Future Connection (\$/Month)	\$0

NOTES: ¹ The number of available connections was estimated based on the District's current ADWF being at 47% of capacity as set forth in their NPDES permit.

Fortunately, Manila has no major existing deficiencies related to their wastewater infrastructure, and can serve future build-out estimates with this infrastructure. Future connections will need to buy into the existing infrastructure through connection fees in order to build sufficient reserves for infrastructure replacement in the future. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

7.4.7.2. Wastewater System

Service Area Description

All proposed development within the Manila USA would receive wastewater service from the MCSD. The District operates and maintains a wastewater collection, treatment, and disposal system.

System Standards

The District's wastewater system is a public system and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

The District's current waste discharge requirements are contained in RWQCB Order No. R1-1995-0002. The District does not have an NPDES permit as they do not directly discharge to a surface water body.

Fiscal Condition/Capital Replacement Program

According to District records, they operate their wastewater system on an annual budget of approximately \$385,000. The majority of this income is from service charges, but funding also comes from interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues, but the District is implementing a rate increase to begin accumulating these funds. The District developed a preliminary Capital Improvement Plan in August 2007, and they currently do not have built up reserves.

Wastewater Flows

Approximately 444 parcels currently receive wastewater service within the Manila USA, of which 309 are single family connections, 72 are multi family connections, and 7 are non-residential connections. Approximately 99% of homes within the USA are serviced. Average dry weather flows are estimated at approximately 66,000 gpd. Peak wet weather flows are estimated at approximately 210,000 gpd (Manila CSD, 2007). This represents a system wide peaking factor of approximately three.

Wastewater Collection, Treatment, and Disposal

Historically, the residences within the District were served by on-site septic systems. Septic systems surveys performed by the Regional Water Quality Control Board (RWQCB) and the Humboldt County Health Department in the mid 1970s identified a high rate of failing on-site leachfield systems in the Manila community. These failing systems were ascertained to present a significant public health hazard in 1977. Consequently, a septic tank effluent pumping and leach bed disposal system was installed in 1978 by the District as an interim disposal system to be used until construction of a centralized municipal wastewater treatment plant by the Humboldt Bay Wastewater Authority. The concept of a centralized treatment plant was abandoned shortly thereafter (the City of Arcata opted for its own solution), and Manila was required to construct a long-range solution for its wastewater treatment and disposal.

In 1988, a dual pressure distribution leachfield disposal system was completed, consisting of approximately 20,000 feet of pressurized distribution and piping and occupying approximately six acres. A little over a year after construction and operation, the field showed signs of failing. In 1991, the leachfield system was certified as "failed" by the State Water Resources Control Board, which resulted in Manila's eligibility to receive modification/replacement grant funding for wastewater treatment and disposal remediation.

In 1994 the District adopted plans for a proposed treatment plant consisting of a surface aerated facultative pond followed by constructed wetlands and rapid infiltration in percolation ponds. The system was designed for an average daily flow of 140,000 gpd. This treatment plant became operational in 1995.

Wastewater is collected from throughout the District's sewer system through a series of septic tank effluent pumps (STEP). The District has pumps installed in septic tanks throughout the service area that pump raw wastewater into a force main to treatment. The treatment works are located on a large parcel, with four percolation ponds (rapid infiltration basins), three free surface wetlands, and two surface aerated facultative ponds. The treatment plant has a design capacity of 140,000 gpd.

Condition Assessment

Overview. The District's collection system and treatment system are in overall good condition. The District estimates the treatment system is currently operating at approximately 47% of its design capacity.

Current Deficiencies. The District does not have any significant deficiencies at this time.

Underserved Areas. All areas within the USA receive wastewater service from the District.

Proposed Improvements

System Upgrades. The District does not have plans for any system upgrades at this time aside from scheduled improvements to the collection system as may be needed to serve new parcels.

Future Expansion. The District is interested in expanding services one or two miles south of current service boundary depending on potential development. However, the District currently feels it is not economical to expand services due to permitting fees, rights of way, and costs associated with extending water and sewer mains. The District would be interested in expanding if a major developer were willing to finance the studies, permits, and pipeline extensions.

Cost and Schedule of Improvements. The District developed a preliminary CIP in August 2007.

7.4.8. McKinleyville USA

The McKinleyville USA is served by a community sewer system owned and operated by the McKinleyville Community Services District (MCSD). A high build-out estimate for total development potential of 4,112 new housing units in the USA was used for infrastructure assessment and recommendations. See Section 6.4.9 for a more detailed description of the McKinleyville USA and its development potential.

7.4.8.1. Summary

Findings

McKinleyville's wastewater system is in very good condition overall and experiences some of the lowest I&I in the County. The District's collection system was installed in the mid 1980's and has been well maintained over the years. The District conducts smoke testing and manhole inspections every winter. The treatment system consists of two primary oxidation ponds, three secondary oxidation ponds, a new constructed wetland completed in 2005, and disinfection facilities. Disposal to the Mad River occurs during winter months, and treated wastewater is used for land application during the discharge prohibition period (May 15th to September 30th).

The system currently has approximately 4,600 connections, and flows currently range between .9 MGD during dry weather and 2 MGD during wet weather. The facility has a biological treatment capacity of 1.18 MGD, and is therefore operating at approximately 76% capacity.

Existing Capacity

McKinleyville's wastewater system is currently operating at approximately 76% of its design capacity. Therefore, it is assumed the facility could realize its full average dry weather capacity, allowing for an additional 1,453 connections before upgrades would be needed.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the McKinleyville USA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the USA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

Table 7-9. Wastewater system infrastructure assessment for the McKinleyville USA.

WASTEWATER SYSTEM STATISTICS	
# of Existing Connections	4,600
# of Available Connections ¹	1,453
Permitted Dry Weather Treatment Capacity (MGD)	1.18
Existing Dry Weather Flows (MGD)	0.9
Existing Peak Wet Weather Flows (MGD)	2
I&I Peaking Factor	2
LOW & HIGH BUILD-OUT ESTIMATES	
# of Projected New Connections	2,224 – 4,112
# of Total Future Connections ²	6,824 – 8,712
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Improvements to collection system</i>	\$1,000,000
<i>CTR compliance</i>	\$2,000,000
<i>Expand treatment facilities</i>	\$5,000,000
<i>Additional disposal capacity</i>	\$2,000,000
Estimated Cost for Build-Out Infrastructure (\$)	\$10,000,000
Est. Cost per Existing Connection (\$)	\$2,173
Est. Financing Cost per Existing Connection (\$/Month)	\$11.62
Est. Range of Costs per Total Future Connection (\$)	\$1,148 - \$1,465
Est. Financing Cost per Total Future Connection (\$/Month)	\$6.14 - \$7.83

NOTES: ¹ The number of available connections was estimated based on the City's current ADWF (0.9 MGD) being 76% of capacity as set forth in their waste discharge requirements (1.18 MGD).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for infrastructure would likely come in the form of a low interest loan, like a State Revolving Fund loan with a loan term of 20 years at 2.5% interest. At this rate, annual payments for a \$10,000,000 loan would amount to approximately \$641,000 per year. With 4,600 existing connections, monthly bills would have to be increased by approximately \$12 per month to fund this loan. If the loan were to be spread out over high future build-out as well, monthly bills would have to be increased by approximately \$6 per month to fund this loan. Therefore, monthly bills would have to increase between \$6 and \$12 per month to fund these wastewater improvements. In reality, we would expect the District to use built up reserves and apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and

have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections will also need to buy into the existing infrastructure through connection fees in order to build sufficient reserves for infrastructure replacement in the future. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

7.4.8.2. Wastewater System

Service Area Description

The McKinleyville USA receives wastewater service from McKinleyville Community Services District (MCSD). The urban service area extends from North Bank Road in the South to the Arcata-Eureka Airport.

System Standards

MCSD's wastewater system is a public system, including publicly owned treatment works (POTW), and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

MCSD's current waste discharge requirements are contained in RWQCB Order No. R1-2001-60, NPDES Permit No. CA0024490. The District is currently under Administrative Civil Liability Order No. R1-2007-0018, which sets a compliance schedule for improving the performance of their new constructed wetland. To date, the wetlands seem to be performing as designed.

Fiscal Condition/Capital Replacement Program

According to MCSD records, they operate their wastewater system on an annual budget of approximately \$1.6 million. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are accumulated through revenues. The City's latest Capital Improvement Plan was developed in 2007, and they currently have approximately \$2.4 million in wastewater reserves.

Wastewater Flows

Approximately 4,600 connections receive wastewater service within the McKinleyville USA. This represents approximately 80% of those who receive water service, and 95% of homes within the USA. Average dry weather flows totaled approximately 0.9 MGD, and peak wet weather flows totaled approximately 2.4 MGD in 2006. This represents a system wide peaking factor of slightly over two – one of the lowest in the County.

Wastewater Collection, Treatment, and Disposal

The District's wastewater facilities consist of a collection system, a treatment facility, and a disposal system. Wastewater is collected from individual sources throughout the District's service area, and the collection system converges at the Fischer Road Pump Station where it is pumped to the McKinleyville wastewater treatment facilities at Hiller Park. The treatment facilities originally consisted of two primary oxidation ponds with a total area of 11.2 acres (Ponds 1A and 1B), three secondary oxidation ponds with a total area of 8.1 acres (Ponds 2, 3, and 4), a chlorine disinfection system, and an effluent pumping system. The facility was originally designed as a

facultative lagoon system. Twelve 5 HP aerators, five each in Ponds 1A and 1B and two in Pond 2 provide additional oxygen for treatment and odor control. In general, the aerators are only used during summer months, when temperatures are warmer, to keep the surface of the primary ponds aerobic; hours are reduced for winter periods.

The facility was upgraded in 2005 as part of a compliance project in response to a series of effluent violations as outlined in Administrative Civil Liability Order No. R1-2006-0034. One of the secondary oxidation ponds was converted into a constructed wetland, and a new constructed wetland pond was added to the treatment train. Full maturity of the wetland plants and maximum treatment levels are not expected to be attained until 2008. Biological treatment capacity of the facility is 1.18 MGD, and the hydraulic capacity of the disinfection facilities (chlorine contact chamber) is estimated at 3.3 MGD, about 2,300 gallon per minute peak flow (the present NPDES permit limits chlorine contact chamber peak flows to 2,236 gpm).

Treated wastewater is discharged to the Mad River during winter months when the river flow rate surpasses 200 cfs (cubic feet per second). During summer months (May 15th through September 30th) and low flow periods of the Mad River, treated wastewater is discharged into either of two percolation ponds located adjacent to the river, flood irrigated to several rapid infiltration basins, or is irrigated on dairy pastures southwest of McKinleyville and in the Arcata bottoms. The irrigated areas include 105 acres of the Fisher Ranch property, 40 acres of the Pialorsi Ranch adjacent to the District property, 40 acres of the Rylander property adjacent to Hiller Park and 103 acres of the Homen Ranch south of the Mad River is also available.

Condition Assessment

Overview. MCSD's wastewater system is in overall very good condition. The District has experienced dry weather wastewater disposal problems in the recent past during low flow periods in the Mad River when the District relies solely on land application for disposal. The District has also been involved in extensive efforts to reduce inflow and infiltration during wet weather and experiences some of the lowest I&I rates in the County. No surcharging currently occurs within the collection system. MCSD is presently at about 76% of permitted through-flow/discharge quantities at its treatment facilities.

Current Deficiencies. Some of the District's main trunk lines, such as the Thiel Avenue line under Hiller Park and the Widow White Creek line under the freeway, are nearing capacity. The District is considering adding additional capacity, either by addition of parallel lines or pulling and replacing the existing lines. Some lines are also being considered for pipe bursting.

Underserved Areas. All areas within the USA receive wastewater service.

Proposed Improvements

System Upgrades. As described above, the District is currently investigating improvements to some main trunk lines to increase capacity and reduce inflow and infiltration. Pump station upgrades are also being planned. The Letz Lane pump station is in need of additional pumping capacity. The pump station at the existing WWTF is not currently having problems, but if flows from the Letz Lane pump station increase, then pumping capacity at the WWTF will also have to be increased. The District is also interested in upgrading their wastewater computer model to better understand tradeoffs associated with various proposed improvements.

Future Expansion. The area immediately north of the Norton and Airport Road intersection, as addressed in the McKinleyville Community Plan is an area of eventual expansion for sewer service. This would include a sewer collection system extending north up to Grange Road on

Central Avenue and Dows Prairie Road. Sewer flows would be south toward Murray Road. A sewer force main and pump station in the Murray Road area would be constructed to pump flow toward the treatment plant via the Letz pump station or construct a new crossing under Highway 101 in the Murray Road area. The preferred alignment will be determined by engineering and cost analysis. The wastewater treatment plant would need to be expanded to accommodate this new capacity requirement.

This Assessment Zone would need to be voted upon by the residents of the area to provide the capital to construct the needed improvements.

Cost and Schedule of Improvements. The District updates its ten-year CIP every year and last did so in 2007. Planned and scheduled improvements include expansion of the Collection system in the Thiel Road area and highway under-crossing. The Hiller sewer lift station will add pumping capacity as growth requires. The wastewater treatment plant will be expanded as conditions require and modification will be required to meet the California Toxic Rule implementation date of May 2010. These projects will be designed and engineered in response to growth and the regulatory environment.

7.4.9. Miranda USA

The Miranda USA is served by a community sewer system owned and operated by the Miranda Community Services District (MCSD). A high build-out estimate for total development potential of 74 new housing units in the USA was used for infrastructure assessment and recommendations. See Section 6.4.10 for a more detailed description of the Miranda USA and its development potential.

7.4.9.1. Summary

Findings

Miranda's wastewater system is in good condition but will likely face increasing regulatory difficulties over its method of summertime disposal. The wastewater system consists of small diameter gravity sewer mains that collect effluent from septic tanks in the community and direct flows to a recirculating sand filter, followed by disinfection. Disposal consists of percolation ponds on the South Fork Eel River, which will likely not be allowed in the near future during the discharge prohibition period. Miranda will likely have to find alternative methods of summertime disposal, as will all communities in the Eel River Basin that currently rely on this form of disposal. This could prove difficult (and expensive) as much of the nearby land is unsuitable for disposal and suitable land is likely a good distance from the treatment plant.

Existing Capacity

The system currently has approximately 110 connections, and flows currently range between 0.03 MGD during dry weather and 0.10 MGD during wet weather. The facility has a permitted treatment capacity of 0.046 MGD, and is therefore operating at approximately 65% capacity. Therefore, it is assumed the facility could realize its full average dry weather capacity, allowing for an additional 59 connections.

Summary of Required Improvements

This facility does not require any major improvements and could serve some of the future development except for the issue of being able to continue to use the percolation ponds during the discharge prohibition period (summer). These improvements would serve both existing and future development.

The following table summarizes the infrastructure assessment for the Miranda USA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the USA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

Table 7-10. Wastewater system infrastructure assessment for the Miranda USA.

WASTEWATER SYSTEM STATISTICS	
# of Existing Connections	110
# of Available Connections ¹	59
Permitted Dry Weather Treatment Capacity (MGD)	0.046
Existing Dry Weather Flows (MGD)	0.03
Existing Peak Wet Weather Flows (MGD)	0.10
I&I Peaking Factor	3 – 4
LOW & HIGH BUILD-OUT ESTIMATES	
# of Projected New Connections ¹	48 – 74
# of Total Future Connections	158 – 184
Needed Infrastructure Upgrades	Estimated Cost (\$)
<i>Collection System I&I Upgrades</i>	\$1,000,000
<i>Alternative (Summer) Disposal Method</i>	\$3,000,000
Estimated Cost for Build-Out Infrastructure (\$)	
\$4,000,000	
Est. Cost per Existing Connection (\$)	
\$36,364	
Est. Financing Cost per Existing Connection (\$/Month)	
\$194.39	
Est. Range of Costs per Total Future Connection (\$)	
\$21,739 - \$25,317	
Est. Financing Cost per Total Future Connection (\$/Month)	
\$116.21 - \$135.33	

NOTES: ¹ The number of available connections was estimated based on the District's current ADWF being at 65% of capacity as set forth in their NPDES permit.

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for infrastructure would likely come in the form of a low interest loan, like a State Revolving Fund loan with a loan term of 20 years at 2.5% interest. At this rate, annual payments for a \$4,000,000 loan would amount to approximately \$257,000 per year. With 110 existing connections, monthly bills would have to be increased by \$194 per month to fund this loan. If the loan were to be spread out over high future build-out as well, monthly bills would have to be increased by over \$116 per month to fund this loan. Therefore, monthly bills would have to increase between \$116 and \$194 per month to fund these wastewater improvements. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections will also need to buy into the existing infrastructure through connection fees in order to build sufficient reserves for infrastructure replacement in the future. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

7.4.9.2. Wastewater System

Service Area Description

All proposed development within the Miranda USA would receive wastewater service from the MCSD. The District operates and maintains a collection, treatment, and disposal system.

System Standards

The District's wastewater system is a public system and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

The District's current waste discharge requirements are contained in RWQCB Order No. R1-2003-0008. The District does not have an NPDES permit as they do not directly discharge to the Eel River, but rather discharge year-round to percolation ponds. Standards for percolation ponds are currently changing, and this type of discharge will likely not be allowed during the discharge prohibition period in the very near future.

Fiscal Condition/Capital Replacement Program

According to District records, they operate their wastewater system on an annual budget of approximately \$57,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District has not developed a Capital Improvement Plan to date, and they currently do not have built up reserves.

Wastewater Flows

Approximately 110 connections currently receive wastewater service within the Miranda USA, all of which are residential connections. Approximately 50% of homes within the USA are serviced. Average dry weather flows are estimated at approximately 30,000 gpd (Miranda CSD, 2007). Peak wet weather flows are estimated at approximately 100,000 gpd (Ristow, 2007). This represents a system wide peaking factor of approximately three.

Wastewater Collection, Treatment, and Disposal

Miranda CSD's collection system consists of small diameter, gravity sewers that collect effluent from individual septic tanks in the community. The system is a combined septic tank effluent gravity and pump system (STEG/STEP). Approximately ten septic tanks within the community are outfitted with pumps. The treatment and disposal system consists of a recirculating sand filter, disinfection, and a percolation pond located approximately 100 yards from the South Fork Eel River.

The treatment plant has a dry weather design capacity of 46,000 gpd, as set forth in their waste discharge requirements.

Condition Assessment

Overview. The District's collection system and treatment system are in generally good condition. The District estimates the treatment system is currently operating at approximately 65% of its design capacity.

The District currently relies on percolation ponds for disposal. This form of disposal is becoming increasingly difficult to permit due to stringent regulations governing disposal to the South Fork

Eel River during the discharge prohibition period. Other communities such as Rio Dell and Ferndale are being required by the RWQCB at this time to find alternative methods of disposal.

Current Deficiencies. The District does not have any significant deficiencies at this time. I&I within the collection system will need to be addressed. In addition, summertime disposal through their percolation ponds will likely become increasingly difficult to permit in the near future.

Underserved Areas. All areas within the USA receive wastewater service from the District.

Proposed Improvements

System Upgrades. The District does not have plans for any system upgrades at this time aside from scheduled improvements to the collection and treatment systems.

Future Expansion. The District is not interested in expanding services or District boundaries but feels capable of serving additional growth at the current rate of development.

Cost and Schedule of Improvements. The District does not have a CIP in place at this time.

7.4.10. Orick USA

Orick's commercial center and surrounding residential areas comprise the Orick USA. Although the USA does not currently have a community wastewater system, the community has expressed interest in developing such a system. A high build-out estimate for total development potential of 30 new housing units in the USA was used for infrastructure assessment and recommendations. See Section 6.4.11 for a more detailed description of the USA and its development potential.

7.4.10.1. Summary

Findings

Orick has been in the process of evaluating alternatives for a community wastewater system for a number of years now. Pollution from failing septic tanks has been found to be widespread and contaminating local groundwater sources. A report titled Feasibility Study – Wastewater Collection, Treatment and Disposal was completed in September 2004 by SHN Consulting Engineers & Geologists, Inc. as part of a Housing and Community Development Block Grant. However, Orick is still investigating collection, treatment, and disposal alternatives for the community. The community has received Proposition 50 funding to assist with the project.

The system is forecast to have approximately 144 connections (245 EDUs), and flows are expected to range between an average dry weather flow of 29,400 gpd to a peak day average flow of 102,532 gpd (SHN, 2004).

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Orick USA and addresses infrastructure needs for existing development and for build-out conditions. It is assumed that a new wastewater collection, treatment and disposal system will be sized to accommodate both existing and all future development.

Table 7-11. Wastewater system infrastructure assessment for the Orick USA.

WASTEWATER SYSTEM STATISTICS	
# of Existing Connections	0
# of Available Connections ¹	According to design
LOW & HIGH BUILD-OUT ESTIMATES	
# of Projected Connections ¹	144
Needed Infrastructure Upgrades	Estimated Cost (\$)
<i>New Collection System</i>	\$4,000,000
<i>New Treatment System</i>	\$2,000,000
<i>New Disposal System</i>	\$1,000,000
Secured Grant Funding (\$)	\$2,500,000
Estimated Cost for Build-Out Infrastructure (\$)	\$4,500,000
Est. Cost per Total Future Connection (\$)	\$31,250
Est. Financing Cost per Total Future Connection (\$/Month)	\$167.05

NOTES: ¹ The wastewater treatment plant is being designed to serve an estimated 144 connections.

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for infrastructure would likely come in the form of a low interest loan, like a State Revolving Fund loan with a loan term of 20 years at 2.5% interest. At this rate, annual payments for a \$4,500,000 loan would amount to approximately \$289,000 per year. With 144 potential connections, monthly bills would have to be approximately \$167 per month to fund this loan. In reality, this is clearly unaffordable and the District would have to obtain additional grant funding to reduce the local cost.

Future connections will also need to buy into the existing infrastructure through connection fees in order to build sufficient reserves for infrastructure replacement in the future. These should be determined by detailed rate studies and financial analyses. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

7.4.10.2. Wastewater System

Service Area Description

All existing development within the USA currently relies on on-site septic systems for wastewater treatment and disposal. However, the community has recently expressed interest in developing a community-wide system to collect, treat, and dispose of wastewater. The community has received Proposition 50 funding for the system, and is in the process of identifying a preferred consultant to prepare studies and identify an alternative best suited for the community. They are evaluating several alternatives, including a wetland system and a STEP system. Under the new system, all potential development within the downtown portion of the Orick USA would receive wastewater service from the Orick Community Services District (OCSD). Extension of services to the northern portion of the Orick USA would require additional planning and consideration by the OCSD. The construction of a community system would also foster growth and development within the USA.

System Standards

The District's proposed wastewater system would be a public system, including publicly owned treatment works (POTW), and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

Fiscal Condition/Capital Replacement Program

The District should investigate grant funding for a community wastewater system. Potential grant funding sources are summarized in Section 12.2.5

Wastewater Flows

The community system would likely serve approximately 140 connections within the Orick USA, of which approximately 85% would be residential connections. It is estimated that average dry weather flows would amount to approximately 29,400 gpd, and peak day average flows would be approximately 102,532 gpd. I&I would be low for such a new collection system (SHN, 2004).

Wastewater Collection, Treatment, and Disposal

The District will soon be completing a supplemental facilities plan and will be selecting a wastewater collection, treatment and disposal system. Following completion of the facilities plan and a CEQA review, a Report of Waste Discharge will need to be filed with the RWQCB prior to permit approval. It is expected the process will take five to ten years.

Proposed Improvements

System Upgrades. The District is proposing a community wastewater system for the Orick USA.

Future Expansion. A community system would facilitate growth and development in the future. The OCSD is proposing to provide service the households and businesses currently served by its domestic water system. Extension of wastewater service to the northern portion of the Orick USA would require additional planning and consideration by the OCSD.

Cost and Schedule of Improvements. It is estimated that the collection, treatment, and disposal facilities would cost approximately \$7 million.

7.4.11. Redway USA

Redway's commercial downtown area and surrounding residential areas comprise the Redway USA. The Redway USA is served by a community sewer system owned and operated by the Redway Community Services District (RCSD). A high build-out estimate for total development potential of 589 new housing units in the USA was used for infrastructure assessment and recommendations. See Section 6.4.12 for a more detailed description of the USA and its development potential.

7.4.11.1. Summary

Findings

Redway's wastewater system is in fair condition overall but is currently under an ACLO for effluent limit violations. The treatment capacity of the facility is likely being exceeded, as most of the violations entailed suspended solids and total coliform exceedance of the maximum permitted value and not deficiencies in percent removal generally related to wet weather flows and excessive dilution. The District's compliance project involves converting a clarifier to a sludge thickener with the hopes of improving suspended solids removal and general performance at the plant. The District's collection system also experiences moderate I&I, which is proposed to be addressed over the coming years.

Existing Capacity

The system currently has approximately 524 connections, and flows currently range between 0.14 MGD during dry weather and 0.43 MGD during wet weather. The facility has a permitted dry weather capacity of 0.186 MGD and wet weather capacity of 0.64 MGD, and is therefore operating at approximately 75% capacity with respect to both dry weather and wet weather capacities. Therefore, the facility has capacity for an additional 175 connections.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Redway USA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the USA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

Table 7-12. Wastewater system infrastructure assessment for the Redway USA.

WASTEWATER SYSTEM STATISTICS	
# of Existing Connections	524
# of Available Connections ¹	175
Permitted Dry Weather Treatment Capacity (MGD)	0.186
Permitted Wet Weather Treatment Capacity (MGD)	0.64
Existing Dry Weather Flows (MGD)	0.14
Existing Peak Wet Weather Flows (MGD)	0.43
I&I Peaking Factor	3
FULL BUILD OUT	
# of Projected New Connections	298 – 589
# of Total Future Connections	822 – 1,113
Proposed Infrastructure Upgrades	Estimated Cost (\$)
Upgrade treatment facility	\$3,000,000
Collection System I&I Upgrades	\$2,000,000
Estimated Cost for Build-Out Infrastructure (\$)	\$5,000,000
Est. Cost per Existing Connection (\$)	\$9,542
Est. Financing Cost per Existing Connection (\$/Month)	\$51.01
Est. Range of Costs per Total Future Connection (\$)	\$4,492 - \$6,083
Est. Financing Cost per Total Future Connection (\$/Month)	\$24.01 - \$32.52

NOTES: ¹ The number of available connections was estimated based on the District's current ADWF being at 75% of capacity as set forth in their NPDES permit.

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for infrastructure would likely come in the form of a low interest loan, like a State Revolving Fund loan with a loan term of 20 years at 2.5% interest. At this rate, annual payments for a \$5,000,000 loan would amount to approximately \$321,000 per year. With 524 existing connections, monthly bills would have to be increased by approximately \$51 per month to fund this loan. If the loan were to be spread out over high future build-out as well, monthly bills would have to be increased by approximately \$24 per month to fund this loan. Therefore, monthly bills would have to increase between \$24 and \$51 per month to fund these wastewater improvements. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections will also need to buy into the existing infrastructure through connection fees in order to build sufficient reserves for infrastructure replacement in the future. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

7.4.11.2. Wastewater System

Service Area Description

All potential development within the Redway USA would receive wastewater service from the Redway Community Services District (RCSD).

System Standards

The District's wastewater system is a public system, including publicly owned treatment works (POTW), and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

The District's current waste discharge requirements are contained in RWQCB Order No. R1-2006-0022 and NPDES Permit No. CA0022978. The District is under Administrative Civil Liability Order No. R1-2007-0010 for BOD and TSS effluent limit violations.

Fiscal Condition/Capital Replacement Program

According to District records, they operate their wastewater system on an annual budget of approximately \$286,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District's latest Capital Improvement Plan was developed in 2006, and they currently have \$281,500 in reserves.

Wastewater Flows

Approximately 524 connections receive wastewater service within the Redway USA, of which approximately 80% are residential connections (Humboldt County LAFCO, 2004). This represents approximately 82% of those who receive water service, and 93% of homes within the District. Average dry weather flows currently amount to approximately 140,000 gpd (Redway CSD, 2007). Peak wet weather flows are estimated at approximately 470,000 gpd (Harrington-Dean, 2007).

Wastewater Collection, Treatment, and Disposal

The Redway CSD's collection system incorporates both gravity mains and five lift stations, and one aerial crossing to connect the Eel River Conservation Camp to the Redway WWTP. The WWTP includes a 300,000 gallon oxidation ditch, clarification, and a chlorination/dechlorination system. Effluent is primarily discharged to upland percolation ponds located on land owned by the District, but flows to these ponds are limited by transmission capacity. Therefore, when wintertime flows exceed 0.350 MGD, effluent flows are diverted to the Eel River for disposal. Dried sludge is buried on land near the plant that is also owned and controlled by the District.

The District's NPDES Permit states that the WWTP has a dry weather design flow of 0.186 MGD and a peak wet weather design flow of 0.615 MGD.

Condition Assessment

Overview. The District is very near capacity at its WWTP. They are currently under an ACLO for effluent limit violations, indicating that loading at the WWTP is currently exceeding its treatment capacity. The facility is currently operating at approximately 75% of its hydraulic capacity with respect to both dry and wet weather flows.

Current Deficiencies. The District's collection system experiences significant I&I during winter months. The District plans on improving its collection system over the next five years to reduce I&I in the system.

Underserved Areas. Not all areas within the District receive wastewater service.

Proposed Improvements

System Upgrades. The District is in the process of planning improvements to the WWTP as part of a compliance project for its current ACLO. The project will entail converting an old clarifier into a sludge thickener which is intended to reduce or eliminate effluent limit violations. The project must be completed by November 2007. The District also plans on reviewing and improving the collection system to reduce I&I.

Future Expansion. The District has no major plans for expansion other than servicing additional growth at existing rates of development. The entire USA is within the Redway CSD boundaries or SOI. Proponents of new development within the SOI would need to seek LAFCo approval to annex to the Redway CSD.

Cost and Schedule of Improvements. The District does not have a CIP in place at this time.

7.4.12. Rio Dell USA

There are two areas within the City's sphere of influence that comprise the Rio Dell USA. A high build-out estimate for total development potential of only 8 new housing units in the USA was used for infrastructure assessment and recommendations. See Section 6.4.13 for a more detailed description of the USA and its development potential.

7.4.12.1. Summary

Findings

Rio Dell's wastewater system is in fair condition overall and is currently under both a CDO for summertime disposal and an ACLO for effluent violations. The City is actively exploring options for summertime disposal and is currently completing a Wastewater Effluent Disposal Facilities Plan to in hopes of securing funding for alternative disposal methods. The City is also upgrading its treatment plant as part of a compliance project of the ACLO. The City's collection system also experiences significant I&I, which they will be addressing over the coming years.

Existing Capacity

Availability of connections within the City of Rio Dell's wastewater system is not as straightforward as with the water system. The system currently has approximately 1,310 connections, and flows currently range between 0.43 MGD during dry weather and 2.82 MGD during wet weather conditions. The facility has a permitted dry weather capacity of 0.9 MGD, and is therefore operating at approximately 48% capacity with respect to its dry weather capacity. However, wet weather flows (I&I) are excessive and need to be addressed. Therefore, available capacity is estimated to be near zero until these problems are resolved. With

improvements to the treatment system and reduction in I&I, the City's wastewater system could likely realize its full dry weather capacity, allowing for 1,419 additional connections.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Rio Dell USA and addresses infrastructure needs for existing development and for build-out conditions. The planned improvements are assumed to be able to handle both existing and future development.

Table 7-13. Wastewater system infrastructure assessment for the Rio Dell USA.

WASTEWATER SYSTEM STATISTICS	
# of Existing Connections	1,310
# of Available Connections ¹	0
Permitted Dry Weather Treatment Capacity (MGD)	0.9
Existing Dry Weather Flows (MGD)	0.43
Existing Peak Wet Weather Flows (MGD)	2.82
I&I Peaking Factor	6 – 7
EXISTING CAPACITY & FULL BUILD OUT	
# of Projected New Connections	2 – 8
# of Total Future Connections ²	1,312 – 1,318
Needed Infrastructure Upgrades	Estimated Cost (\$)
<i>Collection system upgrades to reduce I&I</i>	\$5,000,000
<i>New disposal facilities</i>	\$15,000,000
Estimated Cost for Build-Out Infrastructure (\$)	\$20,000,000
Est. Cost per Existing Connection (\$)	\$15,267
Est. Financing Cost per Existing Connection (\$/Month)	\$81.61
Est. Range of Costs per Total Future Connection (\$)	\$15,174 - \$15,244
Est. Financing Cost per Total Future Connection (\$/Month)	\$81.12 - \$81.49

NOTES: ¹ The number of available connections was estimated at zero based on the fact that the City is currently under a Cease and Desist Order.

² This number does not include development within City limits.

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for infrastructure would likely come in the form of a low interest loan, like a State Revolving Fund loan with a loan term of 20 years at 2.5% interest. At this rate, annual payments for a \$20 million loan would amount to approximately \$1.283 million per year. With 1310 existing connections, monthly bills would have to be increased by approximately \$82 per month to fund this loan. Monthly financing would not be lowered significantly due to high build-out estimates in the Rio Dell USA but would be due to additional growth within the City itself. In reality, we would expect the City to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections will also need to buy into the existing infrastructure through connection fees in order to build sufficient reserves for infrastructure replacement in the future. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. City specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

7.4.12.2. Wastewater System

Service Area Description

All potential development within the Rio Dell USA would receive wastewater service from the City of Rio Dell upon annexation. The City's existing service area includes all lands within the City limits.

System Standards

The City of Rio Dell's wastewater system is a public system, including publicly owned treatment works (POTW), and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

The City's current waste discharge requirements are contained in RWQCB Order No. R1-2006-0021, NPDES Permit No. CA0022748. The City is currently under Cease and Desist Order No. R1-2005-0034, and was more recently issued Administrative Civil Liability Order No. R1-2007-0042.

Fiscal Condition/Capital Replacement Program

According to City records, they operate their wastewater system on an annual budget of approximately \$575,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are accumulated through revenues for vehicles and other specialty equipment but not for water infrastructure. The City has not developed a CIP to date, and they currently have not built up reserves.

Wastewater Flows

Approximately 1,310 units receive wastewater service within the City of Rio Dell (Winzler & Kelly, 2007). Approximately 94% of these connections are residential and the remaining 10% are commercial and institutional. Average dry weather flows totaled approximately 0.430 MGD, while peak wet weather flows totaled approximately 2.820 MGD in 2005 (Winzler & Kelly, 2006). This represents a system wide peaking factor of approximately six to seven.

Wastewater Collection, Treatment, and Disposal

Wastewater is collected throughout the City's collection system and flows to the WWTP. The City's WWTP consists of a flow-metering flume, primary clarification, secondary treatment by rotating biological contactors, secondary clarification, and chlorination/dechlorination. Sludge is digested aerobically and dried on sludge drying beds before being land applied. Treated wastewater is discharged to the South Fork Eel River between October 1 and May 15 of each year, and to percolation ponds during the discharge prohibition period. The City's facility has a design flow of 0.9 MGD.

The City is currently exploring irrigation options for summertime discharge as part of a Wastewater Effluent Disposal Facilities Plan being prepared to meet the SWRCB's Small Community Wastewater Grant Guidelines.

Condition Assessment

Overview. The City has made significant improvements to its water system in recent years, and is now focusing to improve its wastewater collection, treatment and disposal systems. Overall, the wastewater system is in fair condition and requires significant upgrades to address existing and near term future regulations.

The City is currently under a Cease and Desist Order for its use of percolation ponds as a summertime disposal method. The City is in the process of actively exploring alternative disposal methods and funding mechanisms. The City is also considering the construction of a new WWTP as a part of their evaluation of disposal alternatives.

The City is also under Administrative Civil Liability Order for effluent violations to the discharge requirements. A compliance project has been agreed upon, which includes automation of the City's chlorination and dechlorination facilities. The project must be completed by February 2008.

Current Deficiencies. The City's summertime disposal method will become increasingly difficult to permit. Therefore, the City has been exploring other disposal options including land irrigation. The City has also had trouble meeting its effluent discharge requirements and is completing a compliance project to improve performance of the treatment plant.

Underserved Areas. All areas within the City receive wastewater service.

Proposed Improvements

System Upgrades. As described above, the City is currently developing a Wastewater Effluent Disposal Facilities Plan to meet the City's long-term wastewater treatment and disposal needs and the requirements of the RWQCB. The City is currently pursuing the reuse of treated effluent for irrigation of pastureland in Metropolitan (preferred alternative), although irrigation in Scotia is also being considered. The City is also investigating both upgrading the existing treatment system and construction of a new treatment system. The plan is being prepared to meet the SWRCB's Small Community Wastewater Grant (SCWG) Guidelines.

The City has developed a CIP to address shortfalls within their wastewater collection system. The City is poised to invest significant effort and resources to reduce I&I within their collection system.

Future Expansion. The City of Rio Dell is looking to annex the USAs within the time frame of this General Plan. Rio Dell requires all proposed annexations to be up to the City's sewer/water/roads standards and would require a new assessment District where there are deficiencies.

Cost and Schedule of Improvements. The City of Rio Dell recently developed a five year Capital Improvement Plan in 2006 that covers costs and schedules for improvements to its wastewater collection and treatment system. Scheduled improvements include automatic solids removal at the head works, refurbishing the rotating biological contactors, disinfection of pumps, replacing stand by generator switching equipment, a fuel storage system, and alarm and control panels. These improvements are estimated at approximately \$256,500. Other collection system improvements have been identified by staff as less critical.

7.4.13. Samoa USA

The small residential and industrial area just north of the LP Samoa pulp mill and south of the intersection of New Navy Base Road and Cookhouse Road comprise the Samoa USA. The proposed Samoa Town Master Plan developed by Samoa Pacific Group LLC comprises the Samoa USA. A high build-out estimate for total development potential of 318 new housing units in the USA was used for infrastructure assessment and recommendations. See Section 6.4.14 for a more detailed description of the USA and the proposed Samoa Town development.

7.4.13.1. Summary

Findings

Samoa's existing wastewater facilities are in poor condition. The entire system will be upgraded and expanded as part of the Samoa Town Master Plan proposed development. The existing collection system will be upgraded, and a new collection system installed for any new development. New treatment and disposal facilities will also be constructed. Treatment will likely consist of some mechanical treatment technology, such as a Sequencing Batch Reactor. Disposal will likely consist of discharge to leaky wetlands.

The system is forecast to serve approximately 350 new connections in addition to the approximately 104 existing connections. Flows are expected to range between an average dry weather flow of 0.2 MGD to a peak hourly flow of 1.0 MGD (Winzler & Kelly, 2003).

Existing Capacity

Availability of connections within the Town of Samoa wastewater system is not as straightforward as with the water system. The system currently has approximately 104 connections. Flows are currently not metered and it has been estimated that they are around 0.02 MGD during dry weather. Samoa Pacific Group, LLC recognizes that the existing wastewater collection, treatment and disposal system will need significant replacement and upgrades to support their future development plan. We estimate that there is a limited amount of capacity in the existing system. A more detailed analysis, which is beyond the scope of this effort, would be needed to quantify how much existing capacity currently exists.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Samoa USA and addresses infrastructure needs for existing development, for planned developments in the USA within the next 10-year planning horizon, and for build-out conditions.

Table 7-14. Wastewater system infrastructure assessment for the Samoa USA.

HIGH BUILD-OUT ESTIMATE ¹	
# of Existing Connections	104
# of Projected New Connections	318
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>New Collection System</i>	<i>\$Unknown</i>
<i>New Treatment System</i>	<i>\$1,200,000</i>
<i>New Disposal System</i>	<i>\$1,200,000</i>
Estimated Cost for Build-Out Infrastructure (\$)	
Est. Cost per Existing Connection (\$)	
Est. Financing Cost per Existing Connection (\$/Month)	
Est. Range of Costs per Total Future Connection (\$)	
Est. Financing Cost per Total Future Connection (\$/Month)	

NOTES: ¹ Existing wastewater system statistics are not shown because under the proposed development, all wastewater facilities (collection, treatment, and disposal) will be new.

It is uncertain at this point what new wastewater infrastructure for the Samoa USA will cost. However, most likely these costs will be borne by the developer. All connections will need to buy into the infrastructure through connection fees in order to build sufficient reserves for infrastructure replacement in the future. These should be determined by detailed rate studies and financial analyses. Specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

7.4.13.2. Wastewater System

Service Area Description

There are currently two permitted wastewater treatment and disposal facilities serving the town of Samoa. The north system serves about 25 residences and consists of a 15,000 gallon septic tank and leachfield. The south system serves about 75 residences, the Samoa Block, Hostelry, and the Samoa Cookhouse through a series of septic tanks, bark filters, a treatment pond/wetland, and approximately 2.5 acres of infiltration area.

All existing and potential development within the Samoa USA would receive wastewater service from a proposed management entity formed by the Samoa Pacific Group, LLC. The entity's proposed service area would include both existing and proposed residences within the USA.

System Standards

The future wastewater system would be a public system, including publicly owned treatment works (POTW), and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

Fiscal Condition/Capital Replacement Program

The wastewater system will be constructed as part of the Samoa Town development.

Wastewater Flows

The community system would serve approximately 454 connections within the Samoa USA, of which approximately 99% would be residential connections. It is estimated that average dry weather flows would amount to approximately 0.2 MGD. Peak hourly flowrates are estimated at 1 MGD, using a peaking factor of 5 (Winzler & Kelly, 2003). I&I would be low for such a new collection system.

Wastewater Collection, Treatment, and Disposal

Winzler & Kelly investigated treatment and disposal options for the Samoa Town Master Plan in 2003. The study recommended use of a mechanical treatment system, such as a sequencing batch reactor, to treat the wastewater and remove nutrients to the maximum extent practicable for land disposal. Due to the small size of the development and low flows, a packaged treatment plant could likely be found. The recommended disposal method was discharge to leaky wetlands (Winzler & Kelly, 2003). This form of disposal is not expected will be considered a prohibited direct discharge during summer months due to the discharge location's distance from the Bay.

Condition Assessment

Overview. The Samoa Pacific Group will be responsible for construction of the collection, treatment, and disposal facilities. At this point, it is unclear what type of entity will operate and maintain these systems.

Current Deficiencies. The existing collection system experiences significant I&I during winter months. The system will be upgraded as part of the proposed development.

Underserved Areas. All areas within the USA will receive wastewater service from a newly formed management entity.

Proposed Improvements

System Upgrades. As described above, the Samoa Pacific Group will be responsible for upgrading and expanding the collection system and construction of new collection, treatment and disposal facilities as part of the development proposal.

Future Expansion. The Samoa Town Master Plan is the only expansion planned for the USA.

Cost and Schedule of Improvements. There is no plan to date that covers costs and schedules for improvements to the wastewater system. It is unclear at this time how much the town's wastewater system will cost to construct.

7.4.14. Scotia USA

Scotia's town center and surrounding residential areas comprise the Scotia USA. The County has not prepared development estimates for the USA to date, as the town is still owned by PALCO and not zoned. However, PALCO is currently in the process of subdividing the town so that individual lots can be sold. See Section 6.4.15 for a more detailed description of the USA.

7.4.14.1. Summary

Findings

Scotia's wastewater system is in poor condition. The WWTP is located within the 100-year floodplain. The treatment capacities of multiple unit processes within the facility are exceeded even by average day maximum month flows (Winzler & Kelly, 2006). However, under current conditions the three treatment ponds at the WWTP provide the necessary treatment to meet current permit conditions (SHN, 2007). Since October 2006 the facility has been operating under a new NPDES permit and to date has met the WWTP permit treatment requirements. Prior to the permit going into effect however there was concern that the facility would not meet the secondary treatment standards for 85% removal of BOD and TSS. PALCO requested the facility be placed under a Cease and Desist Order (CDO) that set forth a time schedule for compliance with the BOD and TSS percent removal permit requirements. The Scotia WWTP currently discharges to percolation ponds adjacent to the Eel River during the summertime discharge prohibition period. The town will likely have to find alternative methods for summertime disposal, as percolation ponds on the Eel River are becoming more difficult to permit with time.

Existing Capacity

The system currently has approximately 295 connections, and flows currently range between 0.178 MGD during dry weather and 0.287 during wet weather conditions, with peak flows up to 1.4 MGD. The facility does not currently have a permitted design capacity as part of its waste discharge requirements, but has been ordered to evaluate the hydraulic and biological treatment capacities of the facility by 2010 as part of the CDO. According to a capacity evaluation performed as part of the annexation study, the facility was found to not have sufficient capacity to meet maximum month average flows. Although the annexation study found the facility did not have sufficient capacity, it is important to note that there are also three treatment ponds that are currently functioning as part of the permitted wastewater treatment system. With the inclusion of the treatment ponds, the WWTP system has sufficient capacity under existing conditions and has consistently met secondary treatment requirements as outlined in the current NPDES permit. However, all of these improvements are located within the 100 year flood plain.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Scotia USA and addresses infrastructure needs for existing development and for build-out conditions. PALCO has indicated that it has no interest in developing new residential housing, although they are interested in converting Mill A to other light industrial and commercial uses.

Table 7-15. Wastewater system infrastructure assessment for the Scotia USA.

WASTEWATER SYSTEM STATISTICS	
# of Existing Connections	295
# of Available Connections ¹	0
Permitted Dry Weather Treatment Capacity (MGD) ¹	None available
Existing Dry Weather Flows (MGD)	0.178
Existing Peak Wet Weather Flows (MGD)	1.4
I&I Peaking Factor	7 – 8
EXISTING CAPACITY & FULL BUILD OUT	
# of Projected New Connections ²	0
Needed Infrastructure Upgrades	Estimated Cost (\$)
Collection System Upgrades	\$4,000,000
WWTP Upgrades (Primary & Secondary Clarifiers/Trickling Filters)	\$7,000,000
New disposal facilities	\$5,000,000
Estimated Cost for Build-Out Infrastructure (\$)	\$16,000,000
Est. Cost per Existing Connection (\$)	\$54,237
Est. Financing Cost per Existing Connection (\$/Month)	\$289.93

NOTES: ¹ The number of available connections was estimated at zero until waste discharge requirements are established for the facility.

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for infrastructure would likely come in the form of a low interest loan, like a State Revolving Fund loan with a loan term of 20 years at 2.5% interest. At this rate, annual payments for a \$16 million loan would amount to approximately \$1.026 million per year. With only 295 existing connections, monthly bills would have to be increased by approximately \$290 per month to fund this loan. In reality, we would expect the Owner to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale. Additional development in the area would be another method for spreading these costs over a larger ratepayer base.

Future connections will also need to buy into the existing infrastructure through connection fees in order to build sufficient reserves for infrastructure replacement in the future. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. Site specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

7.4.14.2. Wastewater System

Service Area Description

It is unclear at this time what management entity would serve existing and potential development within the Scotia USA with wastewater service. PALCO currently serves Scotia's industrial operations, commercial businesses, and residences and is interested in selling the commercial and residential buildings within the town, including the wastewater collection and treatment systems. Options for the management of the wastewater system include annexation to the City of Rio Dell and formation of a new Community Services District (CSD), as well as a Home Owners Association and private utilities. This issue is currently under review by LAFCO.

System Standards

PALCO's wastewater system currently is a private system but must still be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

PALCO's current waste discharge requirements are contained in RWQCB Order No. R1-2006-0020 and NPDES Permit No. CA0006017. PALCO's WWTP is also currently under Cease and Desist Order No. R1-2006-0073, which sets forth a time schedule for compliance with BOD and TSS percent removal regulations.

Fiscal Condition/Capital Replacement Program

This will be a critical issue for the subdivision of the town to proceed so that the owners of the new parcels will have sufficient income to fund on-going operations, maintenance and the building of a capital reserve fund to meet future needs. Currently, this issue, along with the other issues related to the subdivision of the town is before LAFCO.

Wastewater Flows

Approximately 295 connections currently receive wastewater service within the Scotia USA, of which approximately 92% are residential connections. This represents 100% of those who receive water service, and 100% of homes within the service area. Average dry weather flows currently amount to approximately 0.178 MGD, while peak wet weather flows are estimated at approximately 1.4 MGD (Winzler & Kelly, 2006). This represents a system wide peaking factor of approximately eight.

Wastewater Collection, Treatment, and Disposal

Scotia's collection system consists of approximately five miles of gravity sewer mains and two lift stations. The WWTP is currently located within the 100 year flood plain of the South Fork Eel River and consists of headworks (screening, grinding, and grit removal), a primary clarifier, a redwood media trickling filter, a secondary clarifier, a chlorine contact chamber, three treatment/polishing ponds, and an anaerobic sludge digester. Disposal to the Eel River occurs between October 1st and May 14th. The facility discharges to a percolation pond located on the river bar during the summer discharge prohibition period, from October 1st to May 15th.

The design capacity of the facility is currently not known, and as part of the facility's existing Cease and Desist Order, PALCO is to perform a special study to evaluate the hydraulic and biological treatment design capacity of the facility. These studies are not expected to be finalized until 2010. However, a capacity analysis was performed as part of the annexation study. This study found that a number of unit processes' treatment capacity are exceeded even under average day maximum month flows (Winzler & Kelly, 2006). The study estimated the treatment

capacity at between 0.30 and 0.35 MGD, and the hydraulic capacity between 1.0 MGD and 1.5 MGD.

Condition Assessment

Overview. Based on the annexation study results Scotia exceeds the treatment capacity of its WWTP quite regularly. However the use of the 3 treatment ponds, which are also located in the 100 year flood plain, is enabling this facility to meet the NPDES permit discharge limitations at the permitted discharge point (SHN, 2007). Since October 2006 the facility has been operating under a new NPDES permit and to date has met the WWTP permit treatment requirements. Prior to the permit going into effect however there was concern that the facility would not meet the secondary treatment standards for 85% removal of BOD and TSS. PALCO requested the facility be placed under a CDO that set forth a time schedule for compliance with the BOD and TSS percent removal permit requirements.

According to the annexation study, the hydraulic capacity of the primary clarifier, the trickling filters, and the secondary clarifier are all currently exceeded by average day maximum month flow (Winzler & Kelly, 2006).

Current Deficiencies. Scotia's collection system experiences significant I&I during winter months. The WWTP is located in the 100-year flood plain, which poses significant problems with respect to flooding but also makes funding for improvements more difficult to obtain. Several unit processes at the WWTP are undersized and in need of additional capacity. Scotia's summertime disposal methods will face increasing regulatory scrutiny, and will likely not be allowed in the near future. The current NPDES permit requires completion of a study for an alternative summertime disposal method by 2011.

Underserved Areas. All areas within Scotia receive wastewater service.

Proposed Improvements

System Upgrades. System upgrades will largely depend on which option PALCO chooses to divest itself of its wastewater infrastructure. Under the proposed annexation alternative, PALCO would be required to upgrade the collection system and WWTP to City standards prior to annexation. Under the CSD alternative, PALCO has proposed making significantly less improvements to their system, as outlined in the MSR. As this issue is still being evaluated by LAFCO, it is unclear at this time what upgrades would be required of PALCO and how they would be funded.

Future Expansion. There are no major plans for expansion within the Scotia USA. However, additional development could partially fund some of the required improvements that are needed.

Cost and Schedule of Improvements. The Scotia WWTP does not have a formal CIP in place at this time, It is anticipated that this will be developed as the subdivision application moves through the LAFCO approval process.

7.4.15. Shelter Cove USA

Shelter Cove's town center and surrounding residential areas comprise the Shelter Cove USA. The Shelter Cove USA is served by a community sewer system owned and operated by the Resort Improvement District #1 (RID). A high build-out estimate for total development potential of 1,214 new housing units in the USA was used for infrastructure assessment and

recommendations. See Section 6.4.16 for a more detailed description of the USA and its development potential.

7.4.15.1. Summary

Findings

Shelter Cove's wastewater system is in fair condition overall but is currently under an ACLO for effluent violations. The violations are related to deficiencies in percent removal generally related to wet weather flows and excessive dilution. The District's compliance project involves converting a clarifier to a sludge thickener with the hopes of improving suspended solids removal and general performance at the plant. The District's collection system also experiences significant I&I, which was recently addressed through an ACLO compliance project completed in early 2007.

Existing Capacity

The system currently has approximately 415 connections, and flows currently range between 0.1 MGD during dry weather and 0.5 MGD during wet weather. The facility has a permitted dry weather capacity of 0.17 MGD, and is therefore operating at approximately 59% capacity with respect to dry weather capacity. The facility recently completed an ACLO compliance project to address I&I issues within the collection system. If these projects were successful in reducing the I&I sufficiently, the facility could realize its full average dry weather capacity, allowing for an additional 288 connections.

Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Shelter Cove USA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the USA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

Table 7-16. Wastewater system infrastructure assessment for the Shelter Cove USA.

WASTEWATER SYSTEM STATISTICS	
# of Existing Connections	415
# of Available Connections ¹	288
Permitted Dry Weather Treatment Capacity (MGD)	0.17
Existing Dry Weather Flows (MGD)	0.1
Existing Peak Wet Weather Flows (MGD)	0.5
I&I Peaking Factor	5
EXISTING CAPACITY & FULL BUILD OUT	
# of Projected New Connections	1,088 – 1,214
# of Total Future Connections	1,503 – 1,629
Needed Infrastructure Upgrades	Estimated Cost (\$)
<i>Treatment plant upgrades</i>	\$ Unknown
<i>Collection system upgrades</i>	\$ Unknown
Estimated Cost for Build-Out Infrastructure (\$)	
Est. Cost per Existing Connection (\$)	
Est. Financing Cost per Existing Connection (\$/Month)	
Est. Range of Costs per Total Future Connection (\$)	
Est. Financing Cost per Total Future Connection (\$/Month)	

NOTES: ¹ The number of available connections was estimated based on the District's current ADWF being at 59% of capacity as set forth in their NPDES permit.

Due to uncertainties involving Shelter Cove's treatment plant and collection system, costs for future improvements were not estimated. However, funding for this infrastructure would likely come in the form of a low interest loan, like a State Revolving Fund loan with a loan term of 20 years at 2.5% interest. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections will also need to buy into the existing infrastructure through connection fees in order to build sufficient reserves for infrastructure replacement in the future. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

7.4.15.2. Wastewater System

Service Area Description

All potential development within the Shelter Cove USA would receive wastewater service from the Resort Improvement District #1 (RID).

System Standards

The District's wastewater system is a public system, including publicly owned treatment works (POTW), and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

The District's current waste discharge requirements are contained in RWQCB Order No. R1-2003-0044 and NPDES Permit No. CA0023027. The District is currently under Administrative Civil Liability Order No. R1-2007-0009 for BOD and TSS effluent limit violations, primarily related to excessive I&I during winter storms.

Fiscal Condition/Capital Replacement Program

According to District records, they operate their wastewater system on an annual budget of approximately \$465,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District recently developed a ten year Capital Improvement Plan in 2006, and they currently have not built up reserves.

Wastewater Flows

Approximately 393 residential connections and 22 commercial connections receive wastewater service within the Shelter Cove USA (Resort Improvement District #1, 2007). This represents approximately 91% of those who receive water service, and 89% of homes within the USA. Average dry weather flows currently amount to approximately 0.1 MGD, while peak wet weather flows are estimated at approximately 0.5 MGD (Luce, 2007). This represents a system wide peaking factor of approximately five.

Wastewater Collection, Treatment, and Disposal

RID's collection system incorporates both gravity mains and five lift stations. The WWTP consists of coarse screening, two oxidation ditches, two clarifiers, and chlorination/dechlorination facilities. During fall and winter months, the District discharges treated effluent into the surf zone of the Pacific Ocean within the King Range National Conservation Area. During spring and summer months, some or all of the treated effluent receives additional filtration and disinfection prior to being discharged to a storage pond that supplies a spray irrigation system on the District's nine-hole golf course. Sludge is dewatered and transported to the Humboldt County solid waste transfer station for landfill disposal.

According to the District's discharge permit, the WWTP is designed for an average dry weather flow of 0.17 MGD, an average wet weather flow of 0.27 MGD, and a peak wet weather flow of 0.77 MGD.

Condition Assessment

Overview. The District is currently under an Administrative Civil Liability Order due to the District's inability to meet percent removal requirements for BOD and TSS. In essence, the influent to the treatment plant is so diluted, it is virtually impossible to meet these requirements. A mandatory compliance project to reduce I&I has been developed with the RWQCB and was recently completed in early 2007. Based on existing flows, the District is approximately at 59% of dry weather treatment capacity and approximately 78% wet weather capacity at its WWTP.

The District last developed a Master Plan Update for its wastewater treatment and disposal facilities in 1997, which outlines necessary improvements to meet different forecasted growth scenarios. The District also developed a ten-year CIP in 2007 to address required maintenance and upgrades to their wastewater system.

Current Deficiencies. The District's collection system experiences significant I&I during winter months. The District recently completed a compliance project in early 2007 to reduce I&I in its collection system through manhole inspections and spot repairs.

Underserved Areas. All areas within the District receive wastewater service with the exception of those on septic systems.

Proposed Improvements

System Upgrades. As described above, the District is in the process of upgrading its collection system to reduce I&I as part of a compliance project for its current ACLO. The project is forecast to be complete by summer 2007. Other CIP projects include investigation into chlorine alternatives and upgrades to existing sewer lift stations.

Future Expansion. The District has no major plans for expansion other than servicing additional growth at existing rates of development.

Cost and Schedule of Improvements. The District has budgeted approximately \$2.2 million in its CIP for sewer over the next ten years.

7.4.16. Weott USA

Weott's town center and surrounding residential areas comprise the Weott USA. The Weott USA is served by a community sewer system owned and operated by the Weott Community Services

District (WCSD). A high build-out estimate for total development potential of 61 new housing units in the USA was used for infrastructure assessment and recommendations. See Section 6.4.17 for a more detailed description of the USA and its development potential.

7.4.16.1. Summary

Findings

Weott's wastewater system is in good condition overall. The operation of the facility is occurring well within its design capacity. No orders have been leveled against the District, indicating the facility is meeting its waste discharge requirements. The community has two discharge alternatives available, including direct discharge to the Eel River which is permitted between October 1st and May 15th and a community leachfield which can be operated year-round. However, since the POTW began operation it has only discharged to the community leachfield.

Existing Capacity

The system currently has approximately 134 connections, and flows currently range between 0.014 MGD during dry weather and 0.03 MGD during wet weather. The facility has a permitted dry weather capacity of 0.03 MGD, and is therefore operating at approximately 47% capacity. Therefore, the system has capacity for an additional 151 connections.

Summary of Required Improvements

The system currently is operating without any problems and no improvements are planned. Future development within the service area can be served by the existing facilities.

7.4.16.2. Wastewater System

Service Area Description

All potential development within the Weott USA would receive wastewater service from the Weott Community Services District (WCSD).

System Standards

The District's wastewater system is a public system, including publicly owned treatment works (POTW), and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

The District's current waste discharge requirements are contained in RWQCB Order No. R1-1994-0032.

Fiscal Condition/Capital Replacement Program

According to District records, they operate their wastewater system on an annual budget of approximately \$70,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District does not have a Capital Improvement Plan to date, and they currently have not built up reserves.

Wastewater Flows

Approximately 134 connections receive wastewater service within the Weott USA, of which all are residential connections (Dyett & Bhatia, 2002). This represents approximately 96% of those who receive water service, and 88% of homes within the District. Average dry weather flows

currently amount to approximately 14,000 gpd (Weott CSD, 2007), while peak wet weather flows are estimated at approximately 30,000 gpd. This represents a system wide peaking factor of approximately two.

Wastewater Collection, Treatment, and Disposal

Weott CSD's collection system incorporates gravity mains and one lift station that direct wastewater to a community septic tank where preliminary treatment occurs. From here, raw wastewater flows through a recirculation tank and pea gravel filter, a chlorine contact basin, and dechlorination facilities. Disposal facilities consist of both a community leachfield and direct discharge to the South Fork Eel River, although the direct discharge disposal is not currently used. Sludge is dewatered and transported to the Humboldt County solid waste transfer station for landfill disposal. The original facilities were constructed in 1989 – 1991 and have a permitted capacity of 30,000 gpd.

Improvements to the WWTP were made in 2000 under a USDA grant and included improvements to the lift station, chlorination/dechlorination equipment, and the gravel filter distribution piping. The WWTP is currently operating at approximately 47% of design capacity.

Condition Assessment

Overview. Wastewater service within the Weott USA is generally very good. It is uncertain at this point whether the District's disposal methods will face increased opposition in the future due to AB 885.

Current Deficiencies. There are no significant deficiencies with the District's wastewater collection, treatment, or disposal systems. Groundwater levels often reach within five feet of the bottom of the leachfield trenches, which could pose problems if AB 885 legislation is passed.

Underserved Areas. All areas within the District receive wastewater service with the exception of those on septic systems.

Proposed Improvements

System Upgrades. The District has no plans for system upgrades other than typical maintenance of the system.

Future Expansion. The District has no plans for expansion other than servicing additional growth at existing rates of development.

Cost and Schedule of Improvements. The District does not have a CIP in place at this time. If AB 885 is passed and affects operation of the District's existing leachfield, this could likely cost the District upward of \$2 million to find an alternative summertime disposal method.

7.4.17. Willow Creek USA

Willow Creek's commercial center and surrounding residential areas comprise the Willow Creek USA. Although the USA does not currently have a community wastewater system, the community has expressed interest in developing such a system. A high build-out estimate for total development potential of 76 new housing units in the USA was used for infrastructure assessment and recommendations. See Section 6.4.18 for a more detailed description of the USA and its development potential.

7.4.17.1. Summary

Findings

Willow Creek has been in the process of evaluating alternatives for a community wastewater system for a number of years now. Willow Creek's business center along Highway 299 is in need of a centralized wastewater system due to existing disposal field problems which currently limit development. The Jurin Project will need to address wastewater issues and is the site for the proposed wastewater treatment and disposal. A preliminary engineering report is being completed for the system. Current levels of service are still being determined and are therefore unknown at this time.

Summary of Required Improvements

No summary of improvements is included as the preliminary engineering report is still being completed. Based upon past experience we estimate that the total costs for a community wastewater collection, treatment and disposal system will cost between \$5 and \$15 million. We would expect that a portion of the project will receive grant funding so that the local share is affordable.

7.4.17.2. Wastewater System

Service Area Description

All existing development within the USA currently relies on on-site septic systems for wastewater treatment and disposal. However, the community and the Willow Creek CSD have recently expressed interest in developing a community-wide system to collect, treat, and dispose of wastewater. Under such a system, all potential development within the Willow Creek USA would receive wastewater service from the Willow Creek CSD. The construction of a community wastewater system would foster growth and development within the USA and would support the County's goals for redevelopment within the Willow Creek study area.

System Standards

The District's proposed wastewater system would be a public system, including publicly owned treatment works (POTW), and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

Fiscal Condition/Capital Replacement Program

The District should investigate grant funding for a community wastewater system. Potential grant funding sources are summarized in Section 12.2.5.

Wastewater Flows

The community system would likely serve approximately 220 connections within the Willow Creek USA, of which approximately 80% would be residential connections. Potential flows have not been estimated. I&I would be low for such a new collection system.

Wastewater Collection, Treatment, and Disposal

Plans for development of wastewater services in the central business district of Willow Creek are underway. The District is currently preparing feasibility studies to identify preferred methods of treatment. The District has identified a site for the treatment plant at 130 Flower-McNeil Road, formerly known as the Rochlin Mill. The preferred method of disposal is subsurface disposal.

Proposed Improvements

System Upgrades. The District is proposing a community wastewater system for the Willow Creek USA. Construction is expected to begin in 2010.

Future Expansion. There are three phases to the proposed wastewater system. A community system would facilitate growth and development in the future.

Cost and Schedule of Improvements. It is estimated that the collection, treatment, and disposal facilities will cost approximately \$5 million.

7.5. Humboldt Community Services District USAs

See Section 6.6 for a general discussion of HCSD USAs and WSAs and Section 7.3 for a detailed discussion of issues affecting the HCSD and City of Eureka collection systems and the Elk River WWTP. Each of the USAs that receive HCSD wastewater collection services are analyzed below.

7.5.1. Humboldt Hill USA

A high build-out estimate for total development potential of 2,070 new housing units in the Humboldt Hill USA was used for infrastructure assessment and recommendations. See Section **Error! Reference source not found.**2 for a more detailed description of the Humboldt Hill USA and its development potential.

All proposed development within the Humboldt Hill USA would receive wastewater service from the HCSD. Humboldt Hill's collection system was originally part of the now dissolved CSA No. 3, and was taken over by HCSD in 1982. The District maintains a collection system and is under contract with the City of Eureka for treatment and disposal of wastewater. Development in the Humboldt Hill USA, when considered in aggregate with the other HCSD USAs, is mainly constrained by the City's treatment system.

Wastewater is collected from residences throughout the USA and flows by gravity to the South Broadway pump station, where it is then pumped through a 14-inch force main to the Elk River WWTP.

Findings

Humboldt Hill's wastewater system is in generally good condition overall. Wastewater from the study area flows by gravity to the South Broadway Pump Station. High build-out development will require an upgrade to this station's pumping capacity. Efforts to reduce I&I within the collection system will continue. Development potential in the Humboldt Hill USA, when aggregated with development potential in the other HCSD USAs, is mainly limited by the City of Eureka's treatment capacity at its Elk River WWTP.

The Humboldt Hill USA could receive up to an additional 2,070 units before reaching build-out conditions. Humboldt CSD will need to expand its wastewater infrastructure, and coordinate closely with the City of Eureka regarding the Elk River WWTP, to serve this additional growth.

Development within the Humboldt Hill USA is not as constrained by capacity limitations in the City's collection system as are other areas served by HCSD. However, development is still constrained by the City's treatment and disposal capacity at their Elk River WWTP (see Section 7.3 for a full discussion of the Elk River WWTP), as the facility is nearing its permitted capacity

especially during wet weather conditions. The South Broadway pump station will also require increased pump capacity to serve additional growth.

7.5.2. Myrtle town USA

A high build-out estimate for total development potential of 1,021 new housing units in the Myrtle town USA was used for infrastructure assessment and recommendations. See Section 6.6.2 for a more detailed description of the Myrtle town USA.

Findings

Myrtle town's wastewater system is generally in good condition overall, although some efforts are needed to reduce I&I. Development within the study area is dependent upon the City of Eureka's collection, treatment, and disposal systems.

All proposed development within the Myrtle town USA would receive wastewater service from HCSD. The District maintains a collection system and is under contract with the City of Eureka for treatment and disposal of wastewater. The District's collection system within the Myrtle town USA was installed in 1965. Myrtle town's collection system enters the City's collection system at the Hill St. Pump Station after being pumped from the HCSD Hoover St. Pump Station. Wastewater is then pumped from Hill St. Pump Station to the Elk River Treatment Plant.

Development within the Myrtle town USA is constrained by the capacity of both HCSD's and the City's collection system as well as the City's treatment and disposal capacity, in aggregate with other HCSD USAs. Myrtle town development is constrained by the City's pressure sewer capacity from the City's Hill Street pump station to the Elk River WWTP. The District and City are currently evaluating the limited pressure sewer capacity and options available to resolve these capacity limitations and provide sewer service for anticipated development build-out. Issues related to wet weather flows (I&I) continue to be addressed to reduce I&I and improve capacity as part of the City and HCSD's ongoing I&I reduction program.

7.5.3. South Eureka USA

A high build-out estimate for total development potential of 8,048 new housing units in the South Eureka USA was used for infrastructure assessment and recommendations. There is potential for over 11,602 new housing units within the study areas provided sewer service by HCSD. See Section 6.6.3 for a more detailed description of the South Eureka USA and its development potential.

Findings

South Eureka's collection system services the Ridgewood, Cutten, and Pine Hill areas, which are served by a number of pump stations that pump to the City's collection system. South Eureka's wastewater system is in fair condition overall. Further development within the study area is dependent on both HCSD's and the City of Eureka's collection system and the City's treatment and disposal capacity. Development within the Pine Hill and Cutten sub-areas is mostly built-out. The majority of development potential lies within the Ridgewood sub-area, including large-scale developments described in the 1995 Eureka Community Plan as the Robinson Dunn, and Eggert North and Eggert South projects. These developments will largely depend on either the Martin Slough Interceptor project or other alternatives for collecting and transporting wastewater from these areas to the Elk River WWTP.

As discussed previously, HCSD has requested that its Sphere of Influence be expanded to include areas to the adjacent East of its boundary in an area known as Ryan Slough (areas E and F). See Section 7.3 for a discussion of proposed HCSD sewer service to these areas.

7.5.4. Humboldt Community Services District Infrastructure Assessment

The following table summarizes the infrastructure assessment for all study areas served by Humboldt CSD, including the Humboldt Hill USA, Myrtle town USA, and South Eureka USA. Due to the interconnectedness of the wastewater system, the study areas could not be assessed individually and were instead assessed collectively. The following table addresses the District's infrastructure needs for existing development and for build-out conditions.

Table 7-17. Wastewater system infrastructure assessment for the Humboldt CSD service area.

WASTEWATER SYSTEM STATISTICS	
# of Existing Connections	6,285
# of Available Connections ¹	4,980
Permitted Dry Weather Treatment Capacity (MGD) ²	----
Existing Dry Weather Flows (MGD)	0.97
Existing Peak Wet Weather Flows (MGD)	Estimated at 6 – 9
I&I Peaking Factor	3.3 – 10
LOW & HIGH BUILD-OUT ESTIMATES	
# of Projected New Connections	4,314 – 11,602
# of Total Future Connections	10,599 – 17,887
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Pumping System Upgrades</i>	<i>\$ Unknown</i>
<i>Collection System I&I Upgrades</i>	<i>\$4,000,000</i>
<i>Martin Slough Interceptor Share</i>	<i>\$ Unknown</i>
<i>Additional treatment capacity at Elk River WWTF</i>	<i>\$ Unknown</i>
Estimated Cost for Build-Out Infrastructure (\$)	<i>\$ Unknown</i>
Est. Cost per Existing Connection (\$)	<i>\$ Unknown</i>
Est. Financing Cost per Existing Connection (\$/Month)	<i>\$ Unknown</i>
Est. Range of Costs per Total Future Connection (\$)	<i>\$ Unknown</i>
Est. Financing Cost per Total Future Connection (\$/Month)	<i>\$ Unknown</i>

NOTES: ¹ The number of available connections was estimated based on the District being at 60% of its contracted allotment for average dry weather flows.

² The District contracts with the City of Eureka for treatment at its Elk River WWTP.

Due to uncertainties involving the Elk River treatment plant and the Martin Slough Interceptor, costs for future improvements were not estimated. However, funding for this infrastructure would likely come in the form of a low interest loan, like a State Revolving Fund loan with a loan term of 20 years at 2.5% interest. It is expected that the City and District would apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, actual improvements are expected to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections will also need to buy into the existing infrastructure through connection fees in order to build sufficient reserves for infrastructure replacement in the future. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. City and District

specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

Wastewater System

System Standards

The District's wastewater system is a public system and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

Fiscal Condition/Capital Replacement Program

According to District records, they operate their wastewater system on an annual budget of approximately \$2.6 million. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are accumulated through revenues for vehicles and other specialty equipment but not for water infrastructure. The District's latest Capital Improvement Plan was developed in 2007, and they currently have \$2.84 million in water and wastewater reserves.

Wastewater Flows

Wastewater is collected from approximately 6,285 connections throughout HCSD's service areas. Average dry weather flows for the District were approximately 0.97 MGD in 2006. Flow data is collected on a daily basis. The maximum month flow for 2006 occurred in January and totaled approximately 97 MG, which yields an average day maximum month flow of slightly over 3 MGD. Peak wet weather flows are likely two to three times this amount. The peaking factor for the system is estimated to be around six.

Wastewater Collection, Treatment, and Disposal

HCSD is contracted with the City of Eureka for treatment and disposal, whose Elk River WWTP is operated under waste discharge requirements set forth in Order No. R1-2004-0013 and NPDES Permit No. CA0024449.

Condition Assessment

Overview. HCSD's contract with the City of Eureka allows for average August flows of up to 30.5% of the permitted capacity of the Elk River WWTP, which is 5.24 MGD. Therefore, based on data provided by HCSD, its share is approximately 1.6 MGD, so the District's existing flows are approximately 60% of its contracted allotment.

Current Deficiencies. No significant deficiencies exist with the District's existing collection system. Although I&I has historically been a problem, the District has been making progress in addressing problem areas in its collection system. The District is only limited by treatment and disposal capacity at the Elk River WWTP.

Underserved Areas. All district areas can receive wastewater service from the District; however, significant additional development will require the completion of the Martin Slough Interceptor Project. Areas outside the district could receive wastewater service upon annexation.

Proposed Improvements

System Upgrades. The District has no major plans for system collection system upgrades, aside from regular maintenance efforts. The District has been very proactive in implementing an

intensive maintenance program throughout its system. The District and City of Eureka are currently evaluating the existing capacity of and anticipating expansion of the City's Elk River Wastewater Treatment Plant, and evaluating pressure sewer capacity limitations from the City's Hill Street pump station to the Elk River WWTP.

Future Expansion. The District is interested in extending its SOI and boundaries in order to provide service to any new development within the current or proposed expanded SOI and district boundary.

Cost and Schedule of Improvements. The District has an intensive CIP program that is updated annually and projects out five years. The latest was developed in 2006 and has planned the following improvements to its system:

- 1) Convert obsolete, antiquated dry well lift stations to submersible pump operation (ongoing).
- 2) Replace electrical control panels (completed).
- 3) Add emergency transfer switches to all control panels (completed).
- 4) Implement a video inspection program to determine the condition of the underground sewer pipeline system (ongoing).
- 5) Implement an I&I program to identify and reduce surface and groundwater from entering the sewer system (ongoing).
- 6) Finalize a Sewer Capital Improvement Program based on the above findings analysis (ongoing).

7.6. On-Site Systems

Many communities within the County rely strictly on on-site septic systems for wastewater treatment. Examples include the communities of Carlotta and Hydesville. Both communities are part of the County identified Hydesville USA, which indicates the County would like to see a community sewer system in place. However, neither community is interested in a community system or the development that would be facilitated by such a system. In addition, all development that occurs outside of USA's utilizes on site wastewater systems for treatment and disposal.

If AB 885 (as currently drafted) gets approved at the State level, this could potentially have a significant negative effect for these and other on-site systems spread throughout the County. This bill would require a minimum depth of five feet between the bottom of leaching trenches and the anticipated highest level of groundwater. Many areas within the County would not meet these new criteria making future development difficult if not impossible. While existing systems are typically exempt from these new regulations, it will affect future development. In addition the law allows the use of bottom area only when computing leachfield loading and does not allow one to also use the sidewall area. This will require significantly larger areas for disposal.

There are a number of areas that are a "waiver prohibition" area. These areas, which include Jacoby Creek, Fieldbrook, Indianola and Elk River, are locations where high groundwater normally occurs during the winter. This condition is a result of poorly draining soils so that a perched water table develops that will severely limit the potential for new development to occur in these areas.

Another area of concern is in Fairhaven and other locations on the Humboldt Bay peninsula that utilize on site systems. In these locations the soils are beach sand and the current regulations require a 40 foot separation to groundwater due to the lack of fines. New development in this area will not occur unless the regulations are changed to reduce the separation requirement. This should be feasible as there is significant data available that shows that 2 feet of sand, similar to what is used in the design of Wisconsin mound systems provide adequate separation for effective treatment.

The other critical issue facing the use of on-site wastewater systems is the effluent nitrate concentration. Standard septic tank and leachfield systems are not designed to achieve nitrate removal to the levels set for drinking water (10 mg/l). While there are advanced treatment systems that can reduce nitrate levels, these add significantly to the capital and operational costs for these systems. That said, these systems are very suitable for locations where there is high ground water or poor soils so that the soils are only used for disposal and not for treatment. Essentially, by providing all of the necessary treatment in a specially designed facility, like a recirculating filter, the effluent can be treated to a tertiary level such that it does not impact groundwater.

7.7. Policy Recommendations

This technical report presents a basis for describing and assessing wastewater services being provided in Humboldt County. As documented in this report and as was similar with the water infrastructure, in many cases, service providers need to make considerable improvements to their wastewater infrastructure to provide acceptable levels of service. The service providers will need significant resources and revenue to appropriately respond to this need, and the County may need to provide a supporting role to ensure these service providers succeed in accomplishing this.

This technical report will be used to guide development of the Community Infrastructure and Services Element and the recommended policies therein.

ISSUES TO BE ADDRESSED IN THE COMMUNITY INFRASTRUCTURE AND SERVICES ELEMENT

The Community Infrastructure and Services Element will include goals, policies and programs for the following issues;

Ability to Function. Many of the service providers within the County lack the technical, managerial, and financial capacity to continue providing acceptable levels of service given aging infrastructure, population growth, and an increasingly complex regulatory environment. The policy document will recommend policies and programs the County can implement to assist and enable these service providers.

Rates. Most service providers within the County have historically charged low rates that generally do not adequately cover the costs of providing water service. This practice has led to degraded systems, deteriorating levels of service, and a lack of reserves to address and improve the situation. The Element will recommend policies and programs the County can implement to get the service providers to conduct rate studies and reduce costs of providing services to reduce "rate shock" within the County.

Funding of Infrastructure. The most significant obstacle when planning capital improvements for both rehabilitation and construction of new infrastructure is funding. Many of the providers serve

small communities with limited resources. Assistance from the County would likely help the agencies secure the needed funding. The Element will recommend policies and programs the County can implement to secure funding and assist service providers in developing competitive grant and loan applications.

8. Street Lights

This section addresses street lighting services within the County. Included in the section are a description of existing service providers, a discussion of system standards, an assessment of both level of service and unserved areas, and recommendations for future service delivery.

8.1. Description

Street lights are a rarely noticed municipal service intended to improve public safety and nighttime travel. There is evidence that in urban and suburban areas, where there are intersections and concentrations of pedestrians, fixed-source lighting (street lights) tends to reduce crashes (AASHTO, 2004). In addition to its traffic safety benefits, lighting may serve as a crime deterrent, may aid law enforcement agencies, and contribute to user comfort and community pride. The need for street lighting in areas with frequent inclement weather should also be considered. However, such needs must be balanced with the need to minimize sky glow and light trespass (commonly referred to as light pollution), especially in more rural areas. Sky glow is defined as the added sky brightness caused by the scattering of light into the atmosphere. The term light trespass describes light that strays from its intended target and illuminates adjacent properties.

8.1.1. Street Light System Description

Street lights can be provided by counties, cities, or by special districts. Lighting services can be funded through a portion of the one-percent property tax revenue; through a special assessment, or special tax levied by districts, cities, or a county; as service charges through utility billing; or through other general fund revenue. Local agencies often use special assessment districts, such as Landscaping and Lighting Districts (Streets and Highways Code Sections 22000 to 22679) to fund street lighting services. Homeowners associations can also provide privately owned street lighting through association fees.

Public agencies that utilize special assessments and service charges to fund street lighting services sometimes differentiate between street light types. Lights located at intersections that provide broad traffic safety benefit to travelers in all directions could be defined as "safety lights"; "street lights" could be those that are located along streets providing direct benefit only to adjacent property owners. This distinction may be important when apportioning the benefit and cost of operating and maintaining the street lights through the special assessment. When property tax or other general funds are used to support the operation and maintenance of street lighting, discretely apportioning benefit is not as critical.

8.1.2. Humboldt County Street Lighting Providers

In Humboldt County, street lighting is provided by each of the seven incorporated cities; the Humboldt, McKinleyville, and Willow Creek community services districts; and eight street lighting districts formed by Humboldt County and governed by the Board of Supervisors. The following is a description of each of the local agencies or maintenance/assessment districts providing street lighting services in Humboldt County (other than cities).

Garberville Lighting District

The Garberville Lighting District is approximately 180 acres in area and covers the downtown Garberville portion of the Garberville Urban Study Area (USA). The district is governed by the

Board of Supervisors and receives funding through a portion of the one percent property tax and a special assessment. District revenue is used to pay Pacific Gas and Electric Company (PG&E) to own, operate, and maintain streetlights within the district.

Humboldt Community Services District

The Humboldt Community Services District is authorized to provide street lighting services within the boundaries of its district. The Freshwater, Myrtle town, South Eureka, and Humboldt Hill USAs are contained within the district boundary thus making street lighting available throughout these study areas. The Humboldt Community Services District funds street lighting through direct charges collected through the monthly utility bill or through the district general fund.

Hydesville Lighting District

Most of the Hydesville/Carlotta USA does not receive tax or assessment funded street lighting services. Only a portion of the Hydesville community is within the Hydesville Street Lighting District. The district comprises about 90 acres of the downtown Hydesville area, containing parcels along Rohnerville Road and State Route 36 from A Street to Johnson Road. The remaining parcels within Hydesville are not included within the district. The Hydesville Lighting District was formed pursuant to the Street Lighting Act of 1919 to collect a portion of the one percent property tax and assessments to pay for street lighting services within its boundaries. There is no street lighting in Carlotta.

Loleta Lighting District

The Loleta Lighting District is approximately 60 acres in area and covers most of the developed area of the community of Loleta. The district is governed by the Board of Supervisors and receives funding through a portion of the one percent property tax and a special assessment. District revenue is used to pay PG&E to own, operate, and maintain streetlights within the district. The Shadowbrook subdivision, one of the newer Loleta subdivisions, and the portions of the Loleta USA east and south of Shadowbrook Street are not located within the Loleta Lighting District.

McKinleyville Community Services District

The McKinleyville Community Services District provides street lighting services within its district that includes the McKinleyville Water Study Area (WSA) and USA. The McKinleyville Community Services District is authorized to provide street lighting throughout the district, which indicates that where street lighting is currently not present, but warranted, it could be provided. The McKinleyville Community Services District funds street lighting through direct charges collected through the monthly utility bill or through the district general fund.

Myers Flat Lighting District

The Myers Flat WSA is located entirely within the Myers Flat Lighting District. The Myers Flat Lighting District extends beyond the WSA to include some larger parcels surrounding Myers Flat. Like the previously described lighting districts, the Myers Flat Lighting District is governed by the Board of Supervisors and funded through a portion of the one percent property tax.

Pacific Manor Street Lighting District

The Pacific Manor Street Lighting District is on the northwest edge of the City of Arcata and was formed pursuant to the Street Lighting Act of 1919 to collect a portion of the one percent property tax and assessments to pay for street lighting services within its boundaries. The district is approximately 10 acres in area and is comprised of about one-third of the parcels within the

Pacific Manor subdivision (Pacific Manor Subdivision No. 4). The parcels within the district are located along the entire frontage of Brian Court and portions of the Ernest Way and Janes Road frontages. The remaining parcels within the Pacific Manor are not included in the district. The Pacific Manor subdivision is within the Arcata USA. None of the other portions of the Arcata USA receive public street lighting services.

Redcrest Lighting District

The Redcrest Lighting District is approximately 25 acres in area and located entirely within the Redcrest WSA. The Redcrest Lighting District contains the core area of Redcrest, including most of the businesses and homes. The remaining 90 percent of the Redcrest WSA is outside the boundaries of an agency providing lighting services. The Redcrest Lighting District is governed by the Board of Supervisors and funded through a portion of the one percent property tax. Unlike many of the other similar districts governed by the Board of Supervisors, the Redcrest Lighting District does not receive revenue from a special assessment.

Rohnerville Lighting District

The Rohnerville Lighting District comprises approximately 110 acres of the Fortuna USA and is located north of the Rohnerville Airport and along the west side of Rohnerville Road. The Rohnerville Lighting District contains large lot residential development. The remainder of the Fortuna USA is outside the boundaries of a local agency providing lighting services. The Rohnerville Lighting District is governed by the Board of Supervisors and funded through a portion of the one percent property tax. However, the Rohnerville Lighting District does not receive revenue from a special assessment.

Weott Lighting Maintenance District

The Weott Lighting Maintenance District is approximately 550 acres in area and includes the community of Weott. The district is governed by the Board of Supervisors and receives funding through a portion of the one percent property tax and a special assessment. District revenue is used to pay PG&E to own, operate, and maintain streetlights within the district. The entire Weott USA is located within the Weott Lighting Maintenance District. The district extends beyond the Weott USA to include properties on either side of State Route 254 to a distance of approximately one mile beyond the Weott CSD boundary and approximately 0.5 miles south of Newton Road.

Willow Creek Community Services District

The Willow Creek Community Services District provides street lighting services within its district, which includes the Willow Creek WSA and USA. Currently, street lights are installed in the downtown Willow Creek business area. However, the Willow Creek Community Services District is authorized to provide street lighting throughout the district, which indicates that where street lighting is currently not present, but warranted, it could be provided. The Willow Creek Community Services District funds street lighting through direct charges collected through the monthly utility bill or through the district general fund.

8.2. Regulatory Framework

8.2.1. Street Light Standards

Most public agencies in Humboldt County that provide street lighting services do not operate or maintain the street lights and in most instances do not own street lights. Most streetlights in

Humboldt County are owned and maintained by PG&E. Street lighting operation and maintenance costs are charged by PG&E to the appropriate local agency pursuant to Tariff Rate Schedule LS-1 (PG&E-Owned Street and Highway Lighting) or LS-2 (Customer-Owned Street and Highway Lighting).

Street lighting system standards are established by the local agency responsible for the service and PG&E, the public utility that provides electric service to most of Humboldt County. Humboldt County does not have specific street lighting standards in the design document used for roadway construction, the "Humboldt Department of Public Works Roadway Design Standards Manual." As a result, the Public Works Land Use Section relies on standards contained in the American Association of State Highway and Transportation Officials (AASHTO) "A Policy on Geometric Design of Highways and Streets, 2004" for policy guidance on street lighting, as well as the Roadway Lighting Design Guide (AASHTO GL-6) that contains additional design detail.

Some of the factors that trigger the need for lighting of streets and highways are traffic volumes (both vehicles and pedestrians), at-grade intersections, turning movements, and signalization. Lighting standards often specify whether streetlights are required based on intersection type, functional classification (functional classification is a hierarchical ranking based on the degree of mobility and access that a street provides) or other characteristics of the street; the type of light; wattage of lights; and the spacing of lights. Lighting standards often differ between urban and rural settings. Specific lighting standards are also developed for pedestrian and bicycle facilities. The following is a brief description of the street lighting standards and the roadway conditions that might warrant street lights:

Intersection/Street Type

Whether or not a streetlight is warranted depends upon the type of intersection or road segment, traffic volumes, and turning movements. Table 8-1 below, City of Flagstaff Street Light Standards, shows how street functional classification is utilized to determine if streetlights are warranted and the type of light to be installed.

Type of Light

There is considerable variation in street lighting in terms of type of lamp, wattage, luminance (light-output rating of a lamp), shielding, and mounting. The most common lamp types are mercury vapor; high and low pressure sodium; and metal halide. The type of lamp is chosen by the local agency or utility based on the lamp efficiency, cost, and lamp life. The efficiency of the lamp type (mercury vapor, etc.) varies according to the wattages and luminance.

To reduce sky glow and light trespass, local agency often require lights be shielded. Shielding, or cutoff, refers to light designs that limit the pattern of light from the fixture. The following is a description of cutoff lights from the Illuminating Engineering Society of American (IESNA):

Semi-Cutoff. Designation for luminaire light distribution when the candlepower per 1000 lamp lumens does not numerically exceed 50 (5 percent) at an angle of 90 degrees above the horizontal, and 200 (20 percent) at a vertical angle of 80 degrees above the horizontal. This applies to any lateral angle around the luminaire.

Full-Cutoff. Designation for luminaire light distribution when zero candlepower occurs at or above an angle of 90 degrees above the horizontal, and a maximum of 10 percent at a vertical angle of 80 degrees above the horizontal.

In some instances, local agencies choose to install “decorative lights” rather than what is often referred to as “cobra” style or “shoe box” style lights. Decorative lights may be selected to conform to historic districts or to match the theme of a design district. Decorative lights are usually installed on local agency owned poles or posts and not on PG&E distribution facilities.

Light Spacing

Light spacing is the distance between light poles. The distance between street lights in areas that experience greater traffic volumes or where pedestrians are present would be less than in areas with few intersections and less traffic.

Street Light Standards Example

The following excerpt from the City of Flagstaff Engineering Standards is provided as an example of street lighting standards:

Streetlights at Non-Signalized Intersections

A streetlight shall be installed at each non-signalized public street intersection with the following exceptions:

- 1. Street Width.** At intersections where the width of one or more of the approaches is greater than or equal to fifty feet (50') as measured to the back of curb (on urban street sections) or edge of pavement (on rural street sections), two streetlights shall be installed on diagonally opposite corners.
- 2. Urban Local Streets.** At the intersection of two Urban Local Streets, a street light may be omitted if its installation would violate the spacing and uniformity criteria along either street.
- 3. Rural local and rural collector streets.** Streetlights are not required at intersections involving only rural local or rural collector streets. Should a designer choose to install streetlights on streets with these classifications, then the respective urban local or urban minor collector street criteria for intersections and spacing along the streets shall apply. Streetlights are required at all intersections on rural arterial streets.

Table 8-1. City of Flagstaff Street Light Standards

FUNCTIONAL CLASSIFICATION		THROUGH LANES	PED. CONFLICT	LPS WATTAGE	LUMENS	SPACING (FT)
URBAN	MAJOR ARTERIAL	4/2	HIGH	180/135	33000/ 22500	225/225
			LOW	135/90	22500/ 13500	300/275
	MINOR ARTERIAL	4/2	HIGH	180/135	33000/ 22500	225/225
			LOW	135/90	22500/ 13500	300/275
	MAJOR COLLECTOR	4/2	HIGH	135/90	22500/ 13500	250/225
			LOW	90/55	22500/ 8000	300/275
	MINOR COLLECTOR	2	LOW	55	8000	350
	COMM. LOCAL	2	HIGH	55	8000	350
LOCAL	2	LOW	55	8000	350	
URBAN Comm. Center	MAJOR ARTERIAL	4/2	HIGH	180/135	33000/ 22500	200/175
	MINOR ARTERIAL	4/2	HIGH	180/135	33000/ 22500	200/175
	MAJOR COLLECTOR	4/2	HIGH	135/90	22500/ 13500	225/175
	MINOR COLLECTOR	2	HIGH	90	22500	175
	COMM. LOCAL	2	HIGH	55	8000	150
RURAL	ARTERIAL	2	LOW			
	COLLECTOR	2	LOW			
	LOCAL	2	LOW			

Source: City of Flagstaff Engineering Standards, Title 12 Street Lighting

8.3. Street Light System & Capacity

The following table summarizes the distribution of street lighting within USAs and WSAs and provides an indication as to whether or not street lighting would be available if requested by existing residents or required as a condition of project approval. The column with the heading "Authorized Agency for Remainder" refers primarily to those instances where street lights are available to only a portion of the USA, and indicates whether or not there is a local agency authorized to provide street lights to the remainder of the USA. Where the table indicates that there is no authorized agency for the remainder of the USA, the existing lighting maintenance district would need to be expanded or another agency would need to be created or authorized to provide this service. Where the table indicates either "Only Upon Annexation" or "With LAFCo Approval," the unserved portion of the USA would need to annex to an adjacent city or district or the existing district providing water or wastewater service (if it is a CSD with latent power to provide street lighting services) would need to petition LAFCo for authorization to provide street lighting.

Table 8-2. Summary of Street Lighting by Urban Study Area

USA/WSA	Street Lights ¹	Authorized Agency for Remainder
Alderpoint WSA	○	None
Arcata USA	◉	Only Upon Annexation (City of Arcata)
Big Lagoon WSA	○	W/LAFCo Approval (Big Lagoon CSD)
Blue Lake USA/ WSA	○	Only Upon Annexation (City of Blue Lake)
Benbow WSA	○	None
Briceland WSA	○	W/LAFCo Approval (Briceland CSD)
Fieldbrook WSA	○	W/LAFCo Approval (Fieldbrook CSD)
Fortuna USA	◉	Only Upon Annexation (City of Fortuna)
Freshwater WSA	◉	Yes (Humboldt CSD)
Garberville USA/WSA	◉	W/Board of Supervisors Approval (Garberville Lighting)
Glendale USA/WSA	○	W/LAFCo Approval (Fieldbrook CSD)
Humboldt Hill USA	◉	Yes (Humboldt CSD)
South Eureka USA/WSA	◉	Yes (Humboldt CSD)
Hydesville USA/WSA	◉	None
Indianola WSA	◉	None
Jacoby Creek WSA	○	None
Loleta USA	◉	W/Board of Supervisors Approval (Loleta Lighting)
Manila USA	○	W/LAFCo Approval (Manila CSD)
McKinleyville USA/WSA	●	Yes (McKinleyville CSD)
Miranda USA	○	W/LAFCo Approval (Miranda CSD)
Myrtle town USA/WSA	●	Yes (Humboldt CSD)
Myers Flat WSA	●	Yes (Myers Flat Lighting)
Orick USA/WSA	○	W/LAFCo Approval (Orick CSD)
Orleans WSA	○	W/LAFCo Approval (Orleans CSD)
Phillipsville WSA	○	W/LAFCo Approval (Phillipsville CSD)
Redcrest WSA	◉	W/Board of Supervisors Approval (Redcrest Lighting)
Rio Dell USA/WSA	○	Only Upon Annexation (City of Rio Dell)
Redway USA	○	W/LAFCo Approval (Redway CSD)
Riverside WSA	○	W/LAFCo Approval (Riverside CSD)
Scotia USA	●	See note
Shelter Cove USA/WSA	○	W/LAFCo Approval (Resort Improvement Dist. #1)
Samoa USA	●	See note
Willow Creek USA/WSA	●	Yes (Willow Creek CSD)
Weott USA	●	Yes (Weott Lighting)
Westhaven WSA	○	W/LAFCo Approval (Westhaven CSD)
¹ ○ = Not available ◉ = Available to portion of USA ● = Available throughout USA		

Source: LAFCo Sphere of Influence Reports; Humboldt County Community Development Services, 2007.

Note: Scotia and Samoa are privately owned towns that are treated as a "campus" by utility companies; where utility service is delivered to a minimum point of entry and distributed using a landowner operated system. The landowner (Palco or the Samoa Pacific Group) may install, operate, and maintain street lights at their own cost and discretion. If a special district is created to manage the infrastructure and utility systems in either Samoa or Scotia, street lighting should be enumerated as an authorized district power and a revenue source (such as a direct charge on customer's utility bill or special assessment or tax) established.

8.4. System Expansion

8.4.1. Overview

As new urban development is planned within Humboldt County, policies should be considered that guide the installation and maintenance of new street lights. The AASHTO Roadway Lighting Design Guide and street light standards from other jurisdictions, such as those excerpted from the City of Flagstaff, should be used to develop Humboldt County street lighting standards. Policies encouraging special districts serving urban areas to provide street lighting services, where appropriate, should also be considered.

8.4.2. Policy Considerations

As new development occurs and the need for additional street lighting is identified, services can be provided in several ways. The following is a discussion of how street lights could be provided to new development.

1. An existing special district that is authorized to provide street lighting services can provide the service and require that a special assessment or other funding mechanism be imposed to support the service.

In the case where new development is proposed in an area where an existing local agency provides street lighting services, the review, approval, and installation of new street lights would be carried out in the same manner as other infrastructure systems.

2. New development can annex to an existing street lighting district, if appropriate.

The Street Lighting Act of 1919, and most other street lighting laws, allows for the annexation of new territory to existing districts, whether or not the new territory is contiguous with the current district boundaries. Annexation proceedings are not subject to LAFCo authority and would be conducted by the Board of Supervisors. As described above, funding for ongoing street lighting services would be subject to Proposition 218 provisions relating to extending an existing or establishing a new direct charge or special assessment. At least 50 percent of property owners submitting ballots must vote in favor of a special assessment.

3. A new district can be formed, or an existing district expanded (or street lighting authorized as a new service) and a new assessment imposed.

Forming a new district, expanding an existing street lighting district, or authorizing an existing district to provide street lighting services would require Board of Supervisors or LAFCo approval. Most local agencies that are authorized to provide street lighting currently provide such services. Annexation of new territory to an existing street lighting district is carried out by the Board of Supervisors in the same manner as establishing a new district.

Street lighting is a power that is enumerated in Community Services District Law (California Government Code Section 61000 to 61126); however, community services districts can only provide this service if authorized to do so by LAFCo. As indicated in the table above, there are many community services districts that could provide street lighting services if authorized to do so by LAFCo. In order to provide this service, a district must submit a resolution of application and a plan for providing new services to LAFCo that contains the following:

1. The total estimated cost to provide the new or different function or class of services within the special district's jurisdictional boundaries.
2. The estimated cost of the new or different function or class of services to customers within the special district's jurisdictional boundaries. The estimated costs may be identified by customer class. An identification of existing providers, if any, of the new or different function or class of services proposed to be provided and the potential fiscal impact to the customers of those existing providers.
3. A plan for financing the establishment of the new or different function or class of services within the special district's jurisdictional boundaries.
4. Alternatives for the establishment of the new or different functions or class of services within the special district's jurisdictional boundaries.

Ongoing funding for street lighting services would be subject to Proposition 13 requirements and Proposition 218 proceedings. Proposition 218 is the "Right to Vote on Taxes Act" that was approved as part of the November 1996 statewide ballot. Proposition 218 added Article XIII D to the California Constitution requiring that a parcel's assessment or a property related fee or charge may not exceed the reasonable cost for the proportional special benefit conferred on that property. Article XIII D provides that only special benefits are assessable, and the City or District must separate the general benefits from the special benefits. It also requires that publicly owned properties, which benefit from the improvements, also be assessed.

9. Parks and Recreation

This section addresses neighborhood and community parks and recreation infrastructure and services within the County. Included in this section are a description of existing service providers, a discussion of system standards, an assessment of level of service and unserved areas, and recommendations for future service delivery.

9.1. Description

Parks and open space areas are important elements of the urban environment. As a rural county, Humboldt County has a wealth of outdoor recreational opportunities. More than twenty percent of the county's 2.3 million acres are protected open space, forests, and recreation areas. Within the county boundaries, there are four federal parks and beaches, ten state parks (three of which are encompassed by Redwood National Park), 16 county parks and beaches, recreational areas and reserves, and National Parkland and National Forest land. These areas contribute to the quality of life in Humboldt County and provide needed recreation opportunities for residents of neighboring counties and visitors from all over the world. However, most parks in Humboldt County are regional in scope. Outside the seven Humboldt County incorporated cities, there are few local community or neighborhood parks.

Regional parks are addressed in the Conservation and Open Space Element, Humboldt County Trails Plan and other regional park planning documents. To date, there has not been comprehensive planning for community and neighborhood park facilities. This report will focus on the expansion and development of community and neighborhood park facilities.

9.1.1. Humboldt County Parks and Recreation

Humboldt County Parks is a Division of the Public Works Department and operates sixteen regional park facilities around the County comprising approximately 850 acres. All of the county parks are regional parks, providing natural areas and access to rivers and the ocean. The County does not operate community or neighborhood parks.

Table 9-1. Humboldt County Park Facilities

Park Name	Size in Acres
Arthur W. Way County Memorial Park (Honeydew)	20
Big Lagoon County Park (Big Lagoon)	52
Centerville Beach County Park (Ferndale)	2
Clam Beach County Park (McKinleyville)	370
Crab County Park (Loleta)	10.5
Fields Landing County Park (Fields Landing)	1.5
Freshwater County Park (Freshwater)	7
Hammond Trail (McKinleyville)	5
Luffenholtz Beach County Park (Westhaven)	7.5
Mad River County Park (Arcata)	95.5
Margarite Lockwood Park (Miranda)	20

Park Name	Size in Acres
Moonstone Beach County Park (Westhaven)	8
Pedrazzini County Park (Loleta)	1
Samoa County Park (Samoa)	8
Table Bluff County Park (Loleta)	34
Van Duzen County Park (Carlotta)	200
TOTAL	842

9.1.2. Parks Provided by Other Agencies

The Humboldt County Public Works Department is not the only agency that provides parks and recreation in Humboldt County. Each of the seven incorporated cities provides parks and recreation services to a certain degree. Cities, since they serve an urban area often provide neighborhood and community parks and emphasize active recreation including recreational programming (recreation classes). County residents may use city parks typically at no fee. In addition, County residents can often use city recreation programs (recreation classes and league play) for a small, additional fee. Within the unincorporated areas of the County, some Community Services Districts (CSDs) provide parks and recreation services. For example, the McKinleyville, Willow Creek, and Manila CSDs provide parks and recreation services in their respective areas.

Parks are also provided by state and federal agencies. These parks tend to be passive in nature, and thus do not provide facilities such as soccer fields or tennis courts, but they do provide important areas for coastal access and nature appreciation. State agencies such as the California Department of Parks and Recreation (State Parks) provide large, typically passive parks. These parks include items such as trails, camping, access to historic facilities, and/or nature appreciation throughout California as well as Humboldt County. Examples of State Parks facilities within Humboldt County include Fort Humboldt State Historical Monument, Humboldt Redwoods State Park, and Grizzly Creek State Park.

The federal government also provides access to passive parkland. Agencies such as the National Park Service, United States Forest Services, Bureau of Land Management, and the U.S. Fish and Wildlife Service, often provide trail corridors, camping, nature appreciation and in some cases preservation of historic facilities. Examples of federal parks in this area include the Redwood National and State Parks, the Six Rivers National Forest, Humboldt Bay National Wildlife Refuge, and the King Range National Conservation Area.

Parks and recreation are not only provided by public agencies, but also by private individuals and groups that provide these services. For example, most communities have a health club that offers items such as weight lifting and fitness classes, and the Pacific Lumber Company provides various parks and recreation facilities in Scotia, such as Carpenter's Field. In addition, there are parks provided by private non-profit groups such as the Redwood Fields in Cutten and Tooby Park in Garberville.

The following is a description of the park and recreation services offered by incorporated cities and local agencies within Humboldt County:

City of Arcata

The City of Arcata operates and maintains a broad range of park and recreation facilities and programs. The following is a list of park and recreation facilities operated by the City of Arcata:

Table 9-2. City of Arcata Recreation & Park Facilities

Park Names	Size in Acres
Arcata Ball Park, 888 F Street	4.95
Arcata Community Park, 321 Community Park Way	33
Arcata Plaza, 801 G Street	1.4
Arcata Skate Park, 900 Sunset Boulevard	0.65
Bayside Park, Samoa Boulevard	3
Bloomfield, 1835 - 1845 Zehnder Avenue	0.2
Cahill Park, 1300 Stromberg Avenue	0.3
California Park, California Street	1
Chevret-Vaissade Park, 1760 Felix Avenue	1.5
D Street Linear Park, 1301 D Street (9th-14th)	1
Ennes Park, 1851 Stewart Avenue	0.2
Ennes Park Expansion, Wyatt Lane	4
Greenview, 1116 Lewis Court	0.3
Larson Park, 901 Grant Avenue	2.3
Mountain View Park, 2117 Sandra Court	3
Pacific Union Park , Spear Avenue	4
Redwood Park, 490 - 199 E. Park Road	25.8
Rotary Park, 101 F Street	0.2
Shay Park, 1385 Foster Avenue	5
Stewart Park, 1090 15 th Street	1.25
Sunny Brae Park, Virginia Way. and Marilyn Street	2.7
Valley West Park, 1340 Hallen Drive	3.4
Vinum Park, 1450 F Street	0.1
Westwood Manor Park, 2175 Wisteria Way	0.7
Windsong Park, Maria Court	1.75
Woodland Heights, Diamond Drive	0.6
TOTAL	102.3

Source: Arcata Economic Development Strategic Plan, Appendix E, October 2004.

City of Eureka

The City of Eureka operates and maintains a broad range of park and recreation facilities and programs. The following is a list of park and recreation facilities operated by the City of Eureka:

Table 9-3. City of Eureka Recreation & Park Facilities

Park Name	Size in Acres
Carson Park and Playground, Carson/Buhne/"H"/"I" Streets	3.2
Clara Mae Berry Park and Playground, 3 rd & "O" Streets	0.5

Park Name	Size in Acres
Cooper Gulch Park and Playground, 8 th & Myrtle Streets	33.0
Del Norte Street Public Pier, Del Norte Street/Humboldt Bay	1.0
Hammond Park & Playground, 14 th & "E" Streets	1.4
Halvorsen Park, 1201 Waterfront Drive	3.0
Hartman/Kennedy Ball Fields, 3555 "W" Street	5.1
Highland Park and Playground, Highland & Glen Streets	2.6
Jacob-Haney Ball Field, 2605 Union Street	1.5
Lundbar Hills Park, 4708 Frederick street	1.3
Ross Park and Playground, 12 th and "M" Streets	1.3
Sequoia Park, Garden, Playground, Zoo, 3400 "W" Street	67.0
20/30 Park and Playground, 2605 Pine Street	3.2
TOTAL	124.1

Source: City of Eureka Parks and Playgrounds Brochure.

City of Eureka parkland also includes the Eureka Public Marina, Myrtle Grove Cemetery, PALCO Marsh, Sacco Amphitheater, the Adorni Center, and the Warfinger Building. The City operates a variety of recreation programs for youth and adults at the Adorni Center and other park facilities.

City of Fortuna

The City of Fortuna operates and maintains the following park and recreation facilities:

Table 9-4. City of Fortuna Recreation & Park Facilities

Park Name	Size in Acres
Rohner Park, Park Street	55
Newburg Park, Rohnverville Road @ Newburg Road	20
River Lodge Meeting & Conference Center, 1800 Riverwalk Drive	--
Monday Club Building, 610 Main Street	--
TOTAL	75

Source: City of Fortuna General Plan Update Background Report, 2007.

City of Rio Dell

The City of Rio Dell does not own parkland and does not operate recreation facilities and programs. Within the City of Rio Dell, the Rio Dell School and Rio Dell Fire Protection District have facilities that are used as parks by the community. The Rio Dell School District grounds contain tennis courts and a baseball field that was constructed using grant funds secured by the City of Rio Dell. There is a playground, picnic area, and bocce court within property owned by the Rio Del Fire Protection District. The following is a list of park facilities within the City of Rio Dell:

Table 9-5. City of Rio Dell Recreation & Park Facilities

Park Name	Size in Acres
Fireman's Park, 50 West Center Street	3
Rio Dell School District, Davis Street @ 4 th Avenue	3
TOTAL	6

Source: Humboldt County Community Development Services, 2007.

City of Ferndale

The City of Ferndale operates and maintains several park facilities. The following is a list of park and recreation facilities operated by the City of Ferndale:

Table 9-6. City of Ferndale Recreation & Park Facilities

Park Name	Size in Acres
Fireman's Park, Berding Street	4.2
Russ Park, Bluff Street	97
TOTAL	101.2

Source: Humboldt County Community Development Services, 2007.

City of Ferndale parkland also includes Firemen's Pavilion located at Firemen's Park.

City of Blue Lake

The City of Blue Lake operates and maintains the following park and recreation facilities:

Table 9-7. City of Blue Lake Recreation & Park Facilities

Park Name	Size in Acres
Gymkhana Field, 210 Chartin Road	2.8
Perigot Park, 312 South Railroad Ave	5.6
Tot Lot, 4th and I Streets	0.25
TOTAL	8.65

Source: City of Blue Lake web page, <http://bluelake.ca.gov>, 2007.

City of Blue Lake parkland also includes the Victor Prasch Community Center located at Perigot Park.

City of Trinidad

The City of Trinidad operates and maintains a tennis court adjacent to City Hall as well as trails connecting the downtown area with the beach. The Trinidad School is also used by residents of the City as a park.

Table 9-8. City of Trinidad Recreation & Park Facilities

Park Name	Size in Acres
Tennis Courts, 409 Trinity Street	N/A
TOTAL	N/A

Source: City of Trinidad web page, www.trinidad.ca.gov, 2007.

Manila Community Services District

The Manila Community Services District provides park and recreation services and operates Manila Park, the Manila Dunes Community Center as well as the Manila Dunes Recreation Area comprised of beach and dune lands within the district that are used for hiking and beachcombing. The Manila Community Services District also operates recreation programs within the Manila Dunes Community Center.

Table 9-9. Manila CSD Recreation & Park Facilities

Park Name	Size in Acres
Manila Dunes Rec. Area & Community Center, 1901 Park Street	154.0
Manila Park, Lupin Avenue and Peninsula Drive	12
TOTAL	166.0

Source: Humboldt County Community Development Services, 2007.

McKinleyville Community Services District

The McKinleyville Community Services District operates and maintains several park facilities including Hiller Park, which contains ball fields, trails, and playground facilities, Pierson Park, the McKinleyville Activity Center, Azalea Hall, Larissa Park and playground area, and the Hiller and School Road trails. The McKinleyville Community Services District also operates a recreation program.

Table 9-10. McKinleyville CSD Recreation & Park Facilities

Park Name	Size in Acres
Hiller Sports, 795 Hiller Road	58.0
Pierson Park, 1608 Pickett Road	5.0
Larissa Park, Larissa Circle	0.3
TOTAL	63.3

Source: McKinleyville CSD web page, <http://mckinleyvillecsd.com/mcsdparks.htm>, 2007.

Resort Improvement District No. 1

The Resort Improvement District No. 1 operates and maintains a golf course facility and playground adjacent to the District office. The District owns a parcel of undeveloped land near the airport that may be developed with additional recreational uses in the future.

Table 9-11. Resort Improvement District No.1 Recreation & Park Facilities

Park Name	Size in Acres
Shelter Cove Golf Course, 1555 Upper Pacific Drive	35.0
Playground, 9126 Shelter Cove Road	0.25
TOTAL	35.25

Source: Resort Improvement District No. 1, 2007.

Willow Creek Community Services District

The Willow Creek Community Services District operates and maintains several park facilities including the Veterans Park which has a ball field, playgrounds, and picnic areas; Camp Kimtu campground and Kimtu Beach along the Trinity River; Creekside Park with disc golf, playgrounds, and a loop trail; Community Commons with a museum and farmer's market area, and the river trail network.

Table 9-12. Willow Creek CSD Recreation & Park Facilities

Park Name	Size in Acres
Kimtu Beach & Camp Kimtu, Kimtu Road	17.0
Veteran's Park, Kimtu Road	16.0
Creek Side Park, Willow Road	3.6
Community Commons, 38919 Hwy 299	1.2
TOTAL	37.8

Source: Willow Creek CSD, 2007.

North Humboldt Recreation and Park District

The North Humboldt Recreation and Park District (NHR&PD) was formed in 1968 to oversee planning, acquisition, and construction of a community swimming pool. The NHR&PD boundaries include the City of Arcata and extend east along West End Road to the Mad River Fish Hatchery, south to Jacoby Creek and Indianola, and west to Manila. The district operates the Arcata Community Pool facility, located on 16th Street adjacent to Arcata High School, which offers a variety of swimming related programs in cooperation with Humboldt State University - Center Activities. HSU has managed the pool facility since 1994. Prior to that time, the City of Arcata managed the pool.

The NHR&PD collects a portion of the one percent property tax as well as user fees to support its facilities and programs. The NHR&PD had an operating budget of approximately \$600,000 in 2005 (State Controller, 2005 Special Districts Annual Report).

Recreation and Park Districts are formed and operate pursuant to Section 5780 of the Public Resources Code and can provide community recreation services and acquire, construct and operate recreation, parks and open space facilities, both inside and beyond the district's boundaries. The NHR&PD has elected to limit the scope of its activities to acquiring and operating a community swimming pool (1973 SOI Report). Recreation and Park Districts are subject to the authority of the Humboldt LAFCo.

Rohner Community Recreation and Park District

The Rohner Recreation and Park District (RCR&PD) was formed in 1968 to oversee planning, acquisition, and construction of a community swimming pool. The district is governed by a five member Board of Directors, with two members appointed by the Fortuna City Council and three members appointed by the County Board of Supervisors. The district contains approximately 15 square miles, covering most of the Fortuna and Rohnerville Union School District boundaries. The RCR&PD received \$9,362 in property tax revenue and made \$12,651 in expenditures in 2004 (California Controller's Special Districts Annual Report, 2005). The district made several attempts to obtain grant funding in the 1970s to construct a community pool. Currently, the RCR&PD provides limited recreation services through the City of Fortuna Parks and Recreation Department.

9.2. Regulatory Framework

9.2.1. Park Classification and Land Requirements

The National Recreation and Park Association (NRPA) established standards and classifications for recreational facilities that are utilized by local agencies across the nation. NRPA classifications separate parks according to intended use and service area. The NRPA park classifications are often modified by the local agency to reflect local characteristics or community preferences. The following is a summary of NRPA park classifications:

Table 9-13. 1983 National Recreation and Park Association Standards

Classification	Acres/1,000 People	Size Range	Population Served	Service Area
Neighborhood Parks	1-2	15+ acres	A Neighborhood Approx. 5,000	1/4 – 1/2 mile
Community Parks	5-8	25+ acres	Several Neighborhoods	1 – 2 miles
Regional Metropolitan Parks	5-10	200+ acres	Several Communities	1 hour driving time
Special Areas	No Applicable Standard	Includes linear parks, trails, beaches, golf courses, historical sites, flood plains, coastal access ways, etc. No standard is applicable.		
Conservancy (Natural Areas)	No Applicable Standard	Protection and management of the natural/cultural environment with recreational use as a secondary objective.		

9.2.2. Quimby Act

The Quimby Act (Government Code Section 66477) was enacted by the California Legislature in 1965 to preserve open space and parkland in rapidly urbanizing areas of the state. The Quimby Act allows cities and counties to establish requirements for new development to dedicate land for parks, pay an in-lieu fee, or a combination of the two. The Quimby Act requires a city or county to adopt standards for recreational facilities in its general plan recreation element if it is to adopt a parkland dedication/fee ordinance.

It should be noted that the Quimby Act applies only to the acquisition of new parkland; it does not apply to the physical development of new park facilities or associated operations and maintenance costs. The Quimby Act preserves open space needed to develop park and recreation facilities, but it does not ensure the development of the land or the provision of park

and recreation services to county residents. In addition, the Quimby Act applies only to residential subdivisions.

Humboldt County Quimby Act park dedication requirements are contained in the Humboldt County Zoning Code Section 314-110.1 (Parkland Dedication). The Parkland Dedication requirements use the following standards "public parkland and/or recreation facilities shall be provided at the rate of three (3) acres for each 1,000 persons, equal to a standard of 130 square feet per person." The Quimby Act establishes the standard of three acres of park area per 1,000 persons residing within a subdivision subject to this section. The Quimby Act further states that a standard of up to five acres per 1,000 persons could be established if the amount of existing neighborhood and community park area exceeds three acres of per 1,000 existing resident.

9.2.3. Humboldt County General Plan

Humboldt County Park policies and standards are contained in the Framework General Plan, Community Plans, and Zoning Ordinance (as described above). The Framework General Plan also includes by reference the Humboldt County Recreation Element (1976). The Recreation Element is subtitled "A Master Plan for the Development of County Parks and Recreation Areas." The Recreation Element contains goals, policies, and implementation measures, information and maps of County operated and other parks, and narratives describing how the element is to be used in guiding the planning and development of new parks. This element does not provide policies and standards regarding non-County parks.

In 1979, the Board of Supervisors adopted the Humboldt County Trails Plan, in response to the growing popularity of bicycling, horseback riding, jogging, and hiking. The Trails Plan was prepared to provide guidelines for establishing a safe, efficient, and enjoyable County trails program for the transportation and recreation needs of bicyclists, equestrians, hikers, and joggers and to increase participation in bicycling, horseback riding, and hiking activities which can provide physical, social, environmental, and economic benefits for County residents and tourists. Policies and standards contained in the Trails Plan were incorporated into the Framework General Plan Section 4300.

Parks and recreation policies in the Framework General Plan relate to trails and County parks. County trails related policies are contained in the Conservation and Open Space Element of the General Plan Update. The Framework Plan defers specific policies and standards to Community Plans with the following: "policies addressing community recreational needs shall be prepared as part of each community plan" (Policy 4430.7). As part of the General Plan Update, it may be appropriate to centralize parks and recreation policies and standards.

Framework General Plan parks and recreation policies are focused primarily on County parks; acquisition of facilities, supporting the needs of County residents; long-term feasibility; encouraging the development of park facilities by private entities and coordination with other agencies; pursuing feasible sources of funding; and land planning coordination by County Parks Division. The Framework Plan does not identify levels of park service or how community and neighborhood park services are to be provided.

An example of detailed parks and recreation background information, policies and standards can be found in the Eureka Community Plan. The following is excerpted from the Eureka Community Plan:

4400 Parks and Recreation (Eureka Community Plan)

4410 Goal

1. To provide a well balanced system of park and recreation facilities offering a variety of active, passive and cultural recreational opportunities to all residents, and adequate to meet changing recreational needs of Planning Area residents.

4420 Policies

1. The County should encourage a Parkland Dedication fee to fund development of new parkland. The County is encouraged to accept dedication of parkland when a means of securing funding for maintenance, administration and operation of the parkland is created or available.

2. The County shall not exercise the option of accepting in-lieu fees for development of parkland on the McKay Tract South, Robinson/Dunn and Barry properties. At least 5 acres of usable land shall be dedicated for parkland on each of these three tracts during the subdivision phase (the land dedication shall be required when at least 51 lots are created through subdivision). While the dedication of parkland shall not be required until 51 lots are created, no subdivision of land shall occur without a determination being made as to where the park will be located in the future plan.

3. The terrain of park sites should be suitable to accommodate both active and passive recreational activities. The terrain for each 5 acre park shall consist of relatively flat, stable land usable for softball/soccer fields and basketball courts. A small portion of the land may be wooded and sloped to allow for passive recreation uses.

4. Parks should be located and sized and should contain appropriate facilities to serve both the existing and projected population within each service radius.

5. Park sites should be provided with adequate water supply, sewer, police and fire protection services, and should be accessible by foot, bicycle, and automobile.

6. Neighborhood and community park and recreation facilities should, to the extent possible, be located in predominantly residential areas.

7. To the extent possible, all parklands should be dedicated and held inviolate in perpetuity, protected by law against diversion to non- recreational purposes and against invasion by inappropriate uses.

8. The County shall explore funding to develop future recreational programs for each of the proposed parkland areas. This may involve the creation of a County Service Area or other improvement district.

9. The County shall attempt to utilize one of the proposed park sites for youth programs such as those provided by Eureka Babe Ruth Baseball, Redwood Empire Little League, Connie Mack and American Legion, and the Youth Football and Soccer organizations. The County shall be encouraged to develop any facilities for structured recreational activities when such structured activities can be developed, operated and managed by a qualified organization willing and able to accept such responsibility on a long-term basis.

The McKinleyville Community Plan (2002) contains even more specific policies and standards. The following is an excerpt from the McKinleyville Community Plan:

4322 Policies

1. As new development is approved, the goal of this Plan is to ensure that the combined amount of Humboldt County and MCSD park land meet the following minimum standards:

A. Community park land at 3 acres per 1,000 population.

B. Neighborhood and mini park/tot lots at 2 acres per 1,000 population.

C. 50-70% of community and neighborhood parklands should be designated as “natural parks,” as defined herein. For purposes of achieving this policy, state and federal lands do not count toward the community standards set forth above, nor do riparian/wetland open spaces not designated for public access otherwise required in the Community Plan.

2. Humboldt County shall require all new residential development to offer to dedicate land or pay a park fee for public parks sufficient to achieve the above standards.

3. For purposes of compliance with the Quimby Act, the facilities identified in the MCSD Recreation Plan as summarized in Tables I and II of this section are hereby recognized for acquisition and development.

4. The development of private sector recreation facilities shall be encouraged in addition to the above, but shall not substitute for them.

5. Joint public-private development of recreation facilities shall be encouraged.

4323 Standards

1. As development occurs, public neighborhood parks/open space/greenways augmenting the width of trails shall be provided within one-half mile or less for residents living within the urban limit zone of McKinleyville, without pedestrians/bicyclists having to cross major physical or heavy traffic barriers.

2. In the design and maintenance of parks, consideration should be given to impacts on wildlife and impacts on surrounding residential neighborhoods. In particular, it should be recognized that native plant species may be best suited for providing wildlife cover and food sources, and that herbicides, pesticides, and fungicides may be damaging to native plants, wildlife, and people.

3. The design and location of parks shall include features to promote the security of park users, including the incorporation of “safewalk,” “neighborhood watch,” and community-based policing principles and techniques.

4. The County shall develop a schedule for the use of land and fees collected under parkland dedication provisions, including mechanisms for tracking the expenditure of funds for a five-year period in coordination with the MCSD on implementation of their Recreation Plan (i.e., develop a Memorandum of Agreement).

The Freshwater and Jacoby Creek Community Plans also have policies relating to parks and recreation; however, most other Community Plans have only trails related policies.

The policies and standards contained in the McKinleyville and Eureka Community Plans should be used as a guide in developing Countywide parks and recreation policies. Policies should be considered that encourage special districts serving urban areas to provide parks and recreation services, where appropriate.

9.3. Parks and Recreation System & Capacity

The following table summarizes the availability of park and recreation facilities from an authorized local agency within USAs and WSAs and provides an indication as to whether or not such facilities would be available if requested by existing residents or required as a condition of project approval. Reference is also made to park facilities provided by school districts. The column with the heading “Authorized Local Agency” provides the name of the local agencies authorized to provide park and recreation services within the USA. The “Note” column describes other park facilities within the USA and/or indicates whether or not there are park facilities outside that USA that are within one mile of portions of the USA, and the steps that may be required for an existing local agency to become authorized to provide parks and recreation services to the USA.

Table 9-14. Summary of Parks and Recreation Facilities by Urban Study Area

USA	Community Park & Rec. Facilities ¹	Authorized Local Agency	Note
Alderpoint WSA	○	None	There are no neighborhood park facilities within one mile of the WSA. Pursuant to Water Code Section 31130, the Alderpoint County Water District may construct, maintain, and operate any works or facilities appropriate or ancillary to such recreational use with LAFCo approval. Alderpoint however, may not have a sufficient population base to support the development and maintenance of new park facilities.
City of Arcata	●	City of Arcata Northern Humboldt Rec. & Park District	See above list of City of Arcata park and recreation facilities
Arcata USA	○	None	The City of Arcata would be the most appropriate provider upon annexation. There are numerous neighborhood park facilities within one mile of the USA.
Big Lagoon WSA	⊙	None	With LAFCo approval the Big Lagoon CSD could provide park and recreation services; however, Big Lagoon may not have a sufficient population base to support the development and maintenance of new park facilities. Big Lagoon School and Big Lagoon County Park may provide a sufficient level of park

USA	Community Park & Rec. Facilities ¹	Authorized Local Agency	Note
			services for portions of this WSA
City of Blue Lake	●	City of Blue Lake	See above list of City of Blue Lake park and recreation facilities. There are numerous neighborhood park facilities within one mile of the USA.
Blue Lake USA/WSA	○	None	The City of Blue Lake would be the most appropriate provider upon annexation. There are numerous neighborhood park facilities within one mile of the USA.
Benbow WSA	⊙	None	If a local agency is formed to operate the local private water system, enabling park and recreation powers should be considered. Only regional level facilities (Benbow Golf Course and Benbow State Park) are available within one mile.
Briceland WSA	⊙	None	With LAFCo approval the Briceland CSD could provide park and recreation services; however, Briceland may not have a sufficient population base to support the development and maintenance of new park facilities. Skyfish Charter School may provide a sufficient level of park services for this WSA
City of Eureka	●	City of Eureka	See above list of City of Eureka park and recreation facilities. There are numerous City of Eureka neighborhood park facilities within one mile of the Myrtle town and South Eureka USA.
City of Ferndale	●	City of Ferndale	See above list of City of Ferndale park and recreation facilities
Fieldbrook WSA	○	None	With LAFCo approval the Fieldbrook CSD could provide park and recreation services; however, Fieldbrook may not have a sufficient population base to support the development and maintenance of new park facilities. Fieldbrook School may provide a sufficient level of park services for portions of this WSA.
City of Fortuna	●	City of Fortuna, Rohner Rec. & Park District	See above list of City of Fortuna park and recreation facilities. There are numerous City of Eureka neighborhood park facilities within one mile of the Fortuna USA.
Fortuna USA	●	Rohner Rec. & Park District	The City of Fortuna would be the most appropriate provider upon annexation. There are neighborhood park facilities within one mile of portions of the USA.
Freshwater WSA	⊙	None	With LAFCo approval the Humboldt CSD could provide park and recreation services. Freshwater County Park and

USA	Community Park & Rec. Facilities ¹	Authorized Local Agency	Note
			Garfield and Freshwater Schools may provide a sufficient level of service for portions of this WSA.
Garberville USA/WSA	⊙	None	The Garberville SD has expressed interest in reorganizing as a CSD. With LAFCo approval a reorganized Garberville CSD could provide park and recreation services. Tooby Memorial Park operated by the Southern Humboldt Community Park Association may provide an adequate level of park services for this USA/WSA.
Glendale USA/WSA	○	None	With LAFCo approval the Fieldbrook CSD could provide park and recreation services.
Humboldt Hill USA	⊙	None	With LAFCo approval the Humboldt CSD could provide park and recreation services. South Bay Elementary School may provide a sufficient level of service for portions of this USA.
South Eureka USA/WSA	⊙	None	With LAFCo approval the Humboldt CSD could provide park and recreation services. Cutten Elementary, Ridgewood Elementary, Pine Hill Elementary, and Winship Middle School and Redwood Fields (described above) may provide a sufficient level of park services for portions of this WSA.
Hydesville USA/WSA	⊙	None	The Hydesville County Water District may construct, maintain, and operate any works or facilities appropriate or ancillary to such recreational use with LAFCo approval. Hydesville School may provide a sufficient level of park services for portions of this WSA.
Indianola WSA	⊙	Northern Humboldt Rec. & Park District	The northern portion of the Indianola WSA is within the Northern Humboldt Rec. & Park District; however this district only provides one service at a regional level. There are no neighborhood park facilities within one mile of the WSA.
Jacoby Creek WSA	⊙	Northern Humboldt Rec. & Park District	The Jacoby Creek County Water District may construct, maintain, and operate any works or facilities appropriate or ancillary to such recreational use with LAFCo approval. Jacoby Creek School may provide a sufficient level of service for portions of this WSA.
Loleta USA	⊙	None	With LAFCo approval the Loleta CSD could provide park and recreation services; however, Loleta may not have a sufficient population base to support the

USA	Community Park & Rec. Facilities ¹	Authorized Local Agency	Note
			development and maintenance of new park facilities. Loleta School may provide a sufficient level of service for this WSA.
Manila USA	●	Manila CSD Northern Humboldt Rec. & Park District	See above list of Manila CSD park and recreation facilities
McKinleyville USA/WSA	●	McKinleyville CSD	See above list of McKinleyville CSD park and recreation facilities
Miranda USA	⊙	None	With LAFCo approval the Miranda CSD could provide park and recreation services; however, Loleta may not have a sufficient population base to support the development and maintenance of new park facilities. South Fork High School may provide a sufficient level of service for portions of this USA.
Myrtle town USA/WSA	⊙	None	With LAFCo approval the Humboldt CSD could provide park and recreation services. Lafayette Elementary School and Redwood Acres Fairground may provide a sufficient level of service for portions of this USA/WSA.
Myers Flat WSA	○	None	There are no special districts serving Redcrest and there are no neighborhood park facilities within one mile of the WSA.
Orick USA	⊙	None	With LAFCo approval the Orick CSD could provide park and recreation services. Orick Elementary School may provide a sufficient level of service for portions of this USA/WSA.
Orleans WSA	⊙	None	With LAFCo approval the Orleans CSD could provide park and recreation services. Orleans Elementary School may provide a sufficient level of service for portions of this USA/WSA.
Phillipsville WSA	○	None	With LAFCo approval the Phillipsville CSD could provide park and recreation services. There are no neighborhood park facilities within one mile of the WSA.
Redcrest WSA	○	None	There are no special districts serving Redcrest and there are no neighborhood park facilities within one mile of the WSA.
City of Rio Dell	●	City of Rio Dell	See above list of recreation facilities in the City of Dell.
Rio Dell USA/WSA	○	None	Although the city does not directly provide parks and recreation it is authorized to do so. The City of Rio Dell would be the most appropriate provider upon annexation. See above list of recreation facilities in the City of Dell. There are several neighborhood park facilities within

USA	Community Park & Rec. Facilities ¹	Authorized Local Agency	Note
			one mile of the USA.
Redway USA	⊙	None	With LAFCo approval the Redway CSD could provide park and recreation services. Redway Elementary School may provide a sufficient level of service for portions of this USA/WSA.
Riverside WSA	○	None	With LAFCo approval the Riverside CSD could provide park and recreation services however, Riverside may not have a sufficient population base to support the development and maintenance of new park facilities. There are no neighborhood park facilities within one mile of the WSA.
Scotia USA	●	None	PALCO is pursuing the formation of a CSD that would operate the existing company owned park and recreation facilities in Scotia.
Shelter Cove USA/WSA	⊙	Resort Improvement District No. 1	See above list of recreation facilities in Shelter Cove.
Samoa USA	●	None	The Samoa Pacific Group is processing a Local Coastal Plan amendment for the Samoa Townsite which contains existing parks and recreation facilities. It is not known at this time how these facilities will be operated in the future. Peninsula School may also contribute to the level of service for portions of this USA.
City of Trinidad	●	City of Trinidad	See above list of recreation facilities in the Trinidad.
Willow Creek USA/WSA	●	Willow Creek CSD	See above list of recreation facilities in Willow Creek. Trinity Valley School may also contribute to the level of service for portions of this USA/WSA.
Weott USA	⊙	None	With LAFCo approval the Weott CSD could provide park and recreation services. Agnes J. Johnson School may provide a sufficient level of service for portions of this USA.
Westhaven WSA	○	None	With LAFCo approval the Westhaven CSD could provide park and recreation services. There are no neighborhood park facilities within one mile of the WSA.

¹ ○ = Not available ⊙ = Some services available ● = Available throughout USA

9.4. System Expansion

9.4.1. Overview

As new urban development is planned within Humboldt County, policies should be added to the General Plan that guide the development and maintenance of new park and recreation facilities. As described above, several of the existing community plans contain clear park policies and standards that, with modification to reflect the differences between rural and urban areas, could be applied Countywide. Policies should be included requiring the establishment of assessment or special tax districts, or other adequate mechanisms, to fund the ongoing operation and maintenance of facilities. Because parks would be available to existing and new development alike, policies should also encourage the establishment of funding mechanisms that reach all potential park and recreation beneficiaries. In addition, there should be policies encouraging existing community services districts to seek LAFCo approval to provide parks and recreation services within their districts.

Section 12.2..10 (Parks and Recreation) describes many of the actions that would be required to create and maintain new park and recreation facilities in the urban areas of the County. The following is a brief summary of actions that may be required to provide park and recreation services in urban areas.

9.4.2. Policy Considerations

The Eureka and McKinleyville Community Plans could serve as a solid foundation for the development of Countywide policies and standards.

Organization

Outside of the jurisdictions identified above as having the authority to provide parks and recreation services, LAFCo action would be required to either: (1) extend the boundaries of an authorized district, (2) authorize an existing district, or (3) create a new district to provide services. It may also be necessary to establish special policies and standards to reflect the requirements of specific districts or policies that defer to local district standards.

Funding

Adequate and feasible funding mechanisms will be critical to the success of any program to improve opportunities for parks and recreation in the unincorporated areas of the County. The three essential elements will be (1) finding a way to appropriately distribute costs between existing and new development; (2) establishing varied funding mechanisms for new construction and ongoing maintenance such as fees, assessments, and special taxes; (3) adopting plans, in cooperation with local providers, to prioritize neighborhood park improvements Countywide.

10. Schools

This section addresses school district capacity and facilities within the County. Included in this section are a description of current enrollment, future enrollment, and service capacity.

10.1. Description

Humboldt County communities are served by 32 public school districts, private schools, and schools operated by the Humboldt County Office of Education. The largest district in the County in terms of enrollment is the Eureka City Unified School District, which has almost 4,500 students. There are four other districts with enrollments over 1,000 students. Average district enrollment in Humboldt County is approximately 550 students.

10.1.1. Current Enrollment

The following is a listing of school districts and total district enrollment:

District	Enrollment			Average Annual Growth Rate
	1990	2000	2007	
Arcata Elementary	910	899	924	0.09%
Big Lagoon Union Elementary	57	65	49	-0.89%
Blue Lake Union Elementary	355	217	155	-4.76%
Bridgeville Elementary	120	68	48	-5.25%
Cuddeback Union Elementary	132	137	116	-0.76%
Cutten Elementary	576	513	578	0.02%
Eureka City Unified	6,121	5,701	4,426	-1.89%
Ferndale Unified	515	524	472	-0.51%
Fieldbrook Elementary	183	104	107	-3.11%
Fortuna Union Elementary	703	783	734	0.25%
Fortuna Union High	864	1,231	1,218	2.04%
Freshwater Elementary	333	300	315	-0.33%
Garfield Elementary	34	61	59	3.30%
Green Point Elementary	21	18	12	-3.24%
Hydesville Elementary	215	157	150	-2.10%
Jacoby Creek Elementary	408	401	391	-0.25%
Klamath-Trinity Joint Unified	1,257	1,153	1,043	-1.09%
Kneeland Elementary	51	32	20	-5.36%
Loleta Union Elementary	170	326	313	3.66%
Maple Creek Elementary	16	18	11	-2.18%
Mattole Unified	126	610	771	11.24%
McKinleyville Union Elementary	1,511	1,408	1,175	-1.47%
Northern Humboldt Union High	1,544	2,050	1,872	1.14%
Orick Elementary	105	57	45	-4.86%
Pacific Union Elementary	650	609	517	-1.34%
Peninsula Union Elementary	104	88	36	-6.05%
Rio Dell Elementary	377	313	280	-1.73%
Rohnerville Elementary	553	594	673	1.16%

District	Enrollment			Average Annual Growth Rate
	1990	2000	2007	
Scotia Union Elementary	267	356	210	-1.40%
South Bay Union Elementary	638	526	533	-1.05%
Southern Humboldt Joint Unified	1,589	1,277	762	-4.23%
Trinidad Union Elementary	254	120	144	-3.28%
Humboldt County Schools	313		438	2.00%
TOTAL	21,072	20,716	18,597	-0.48%

Source: California Department of Education, Humboldt County Office of Education, 2007.

Although some schools have experienced growth, public school enrollment in the County has declined at an average annual rate of approximately 0.5 percent per year since 1990. The County's largest schools have experienced the most significant enrollment changes:

- Eureka City Unified (Eureka elementary and high schools unified in 1998) saw a decline in enrollment of almost 28 percent between 1990 and 2007, while during the same period the City's population grew at a rate of approximately 0.7 percent. The Eureka Unified School District also includes portions of the South Eureka and Myrtle town USAs, which grew at a faster rate than the City during this period.
- Southern Humboldt Joint Unified declined by 52 percent during this period. Between the 1990 and 2000 Census, the Garberville Census County Division (roughly similar in area to the school district) experienced a nominal growth rate of 0.02 percent.
- Fortuna Union High grew by 41 percent during this period. Fortuna Union High grew at an annual average growth rate of two percent, which is greater than the growth of the Fortuna Census County division between the last two Censuses, or 1.25 percent.

There have also been significant enrollment changes in the smaller school districts. The Orick and Bridgeville School Districts lost approximately 60 percent of total enrollment between 1990 and 2007, dropping from 105 to 45 and 120 to 48 students, respectively. The Peninsula Union Elementary, which services Samoa and Fairhaven, declined by 74 percent, from 104 to 36 students during the same period.

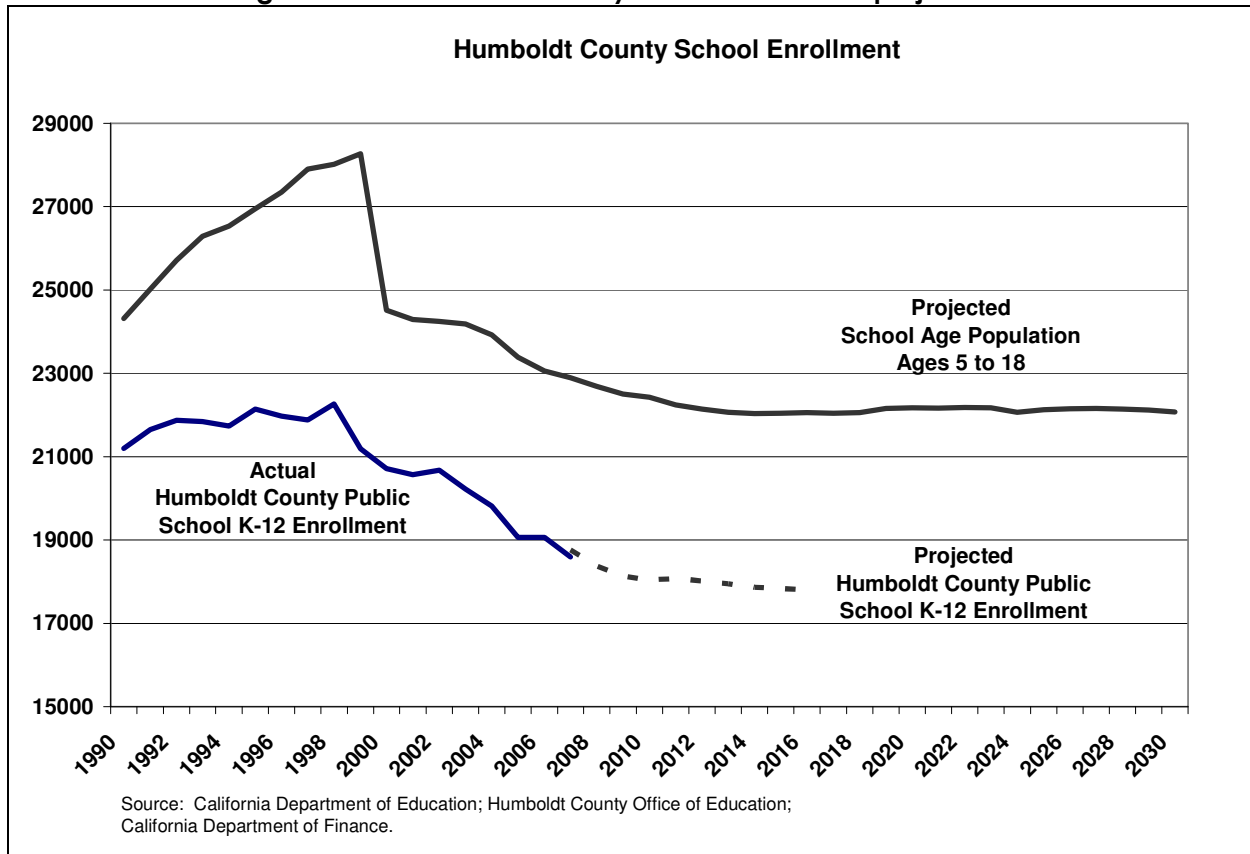
Declines in enrollment have contributed to decisions by districts to close school sites over the last ten to fifteen years. Within the Eureka Unified School District, Marshall Elementary School closed in 2001 and is currently used as part of the high school campus; Worthington Elementary School closed in 2003 and is used for adult education services; and Jefferson Elementary closed in 2006. The Osprey Learning Center in Garberville was closed and moved to the South Fork High School campus in Miranda.

10.2. System Expansion

The decline in Humboldt County school enrollment is expected to continue. Figure 10-1 shows the change in actual enrollment between 1990 and the present as well as projected enrollment between 2007 and 2016 (California Department of Finance School Enrollment Projections by County, 2007). During this period, enrollment is expected to decrease at an annual average rate of 0.6 percent per year, or a total of -5.1 percent. This figure also shows school-age population projections from the Department of Finance school-age population (total persons in Humboldt County between the ages of five and 18) is expected to continue to decline at an

annual average rate of 0.16 percent per year between 2007 and 2030 (California Department of Finance Population Projections with Age Detail, 2000–2050, 2004 and 2007).

Figure 10-1. Humboldt County school enrollment projections.



The differences between school-age population projections and school enrollment projections that are visible on the preceding graph likely reflect the fact that a proportion of Humboldt County children enroll in private schools, are home schooled, or not enrolled in school.

Based on Department of Finance demographic projections, the school-age population is expected to increase slightly between 2015 and 2030. Given how closely enrollment moves with changes in school-aged population, it is likely that total County school enrollment will increase slightly or remain constant during the planning period. However, projected changes in County-wide school-age population or enrollment are not good indicators of enrollment changes in individual districts. Instead, expected community growth rates, based either on past growth rates or the knowledge of local real estate experts may be a better indicator of changes in enrollment of a specific district.

USAs that are likely to grow over the planning period are concentrated in and around the Humboldt Bay area and include: the McKinleyville USA and WSA; the USAs and WSAs served by the Humboldt Community Services District (Humboldt Hill, Myrtle town, and South Eureka); the Glendale USA and WSA; and the Samoa USA. The following table shows the estimate of potential dwelling units (potential development or the full build-out of residential land based on a likely density, not relating to a rate of growth or time period) for each of the USA/WSAs listed above and the school districts that serve the areas.

Table 10-1. Humboldt County school districts expected to grow over the planning period.

Urban Study Area	Estimates of Potential Development (Housing Units)		School Districts	
	Low	High	Elementary	High School
McKinleyville USA/WSA	2,347	4,249	McKinleyville Unified	Northern Humboldt Union High
Humboldt Hill USA	963	2,070	South Bay Union Elementary	Eureka Unified
Myrtle town USA/WSA	521	1,102	Eureka Unified	Eureka Unified
South Eureka USA/WSA	2,700	8,095	Cutten Elementary, South Bay Union Elementary	Eureka Unified
Glendale USA/WSA	21	1,190	Arcata Elementary, Blue Lake Union Elementary	Northern Humboldt Union High
Samoa USA	0	319	Peninsula Union Elementary	Eureka Unified

Other areas of particular interest include the Fortuna and Samoa USAs. The City of Fortuna is experiencing higher levels of growth than the County as a whole and is currently in the process of updating its General Plan. Based on the City's General Plan background information, between 1,514 and 2,893 new housing units could be developed within the City in the next 20 years. This development would occur within the Fortuna Union, Rohnerville, Hydesville, and Fortuna Union High districts. With the exception of Hydesville, all of these school districts have experienced enrollment growth over the last 15 years. The Fortuna General Plan Update background report indicates that all schools (with the exception of continuation and community day schools) are currently below capacity.

The Samoa Town Master Plan is proposed within the Samoa USA and would result in approximately 300 new housing units during the planning period. New students in the Samoa USA would attend schools in Peninsula Union Elementary and Northern Humboldt Union High School Districts. Enrollment in Peninsula Union Elementary District declined by 65 percent between 1990 and the present, and Northern Humboldt Union High School District grew by over 20 percent during the same period. The Samoa Town Master Plan Master EIR concluded that the new enrollment resulting from the proposed project would not, in an of itself, exceed the capacity of schools within the districts, as both districts are well below capacity.

In estimating the potential impact of development on schools, future enrollment is often projected using student yield factors published by the State of California Office of Public School Construction. The Office of Public School Construction assumes that 0.5 elementary school students and 0.2 high school students (or 0.7 unified school district students) are expected from each new dwelling unit (Form SAB-50-01). As new subdivisions in each USA are proposed, these factors, or other factors established by the respective school district, should be applied to evaluate potential effects on the local district.

10.2.1. Policy Considerations

There is a connection between Humboldt County General Plan and school planning and operations. It is important that Humboldt County land use planning decisions be closely coordinated with school districts to ensure that school capacity is available when student

enrollment increases. Planning decisions should also include funding consideration for school facility related impacts. In addition, Section 9, Parks and Recreation, indicates that school facilities are often utilized as community neighborhood park facilities. As such, school districts should be included in park and recreation related planning.

10.2.2. Funding

Ongoing school funding is determined by the California Legislature. Approximately 40 to 50 percent of local property tax revenue is transferred to the State to fund schools, in conjunction with other State general fund revenue. Proposition 98, passed by the voters in 1988, amended the State Constitution to guarantee a minimum level of funding for K-12 schools, based on overall state revenue levels. K-12 education remains the single largest State budget program area, accounting for almost a third of total spending.

School Facilities Funding

Unlike funding for ongoing education services, property owners and developers often fund a portion of the cost of new school facilities. The State of California School Facility Program allows K-12 school districts to apply for funding to buy land, construct new buildings, and modernize or renovate existing buildings. The amount of funding available to a school district is based on a formula that considers the number of students a district expects to enroll that cannot be served in existing facility space. This program requires the state and school districts to share the cost of facilities. For new construction projects, the cost is shared equally by the state and school districts. For modernization projects, the state pays 60 percent and school districts pay 40 percent of the cost. If a school district faces unusual circumstances, it may apply for "hardship" funding from the state to offset its local share of costs.

There are only a few sources that local school districts can draw from to fund their share of the cost of new construction or modernization projects: (1) school general funds or donations; (2) local general obligation bonds; (3) impact fees; or (4) Mello Roos Community Facilities District bond funds. Aside from school funds and donations, Humboldt County schools use general obligation bonds and impact fees to fund the local share of school facility projects.

There are six school districts that have implemented fee programs. Impact fees are imposed on new development within the district and are collected at the city and County building permit counters, on behalf of the school district. The McKinleyville Union Elementary implemented the first school impact fee program in the early 1990's. The following is a listing of school impact fees in Humboldt County:

Table 10-2. Summary of school impact fees in Humboldt County

School District	Land Use Type	Fee Amount (\$/Square Foot)
Ferndale	Residential	\$0.28
	Commercial	\$0.005
	Rental Storage	\$0.003
Fortuna	Residential	\$1.92
Hydesville	Residential	\$0.25
McKinleyville	Residential	\$0.75
Union	Commercial	\$0.26
Pacific Union	Residential	\$2.05
	Commercial	\$0.33
Rohnerville	Residential	\$2.24
	Commercial	\$0.036
	Mini Storage	\$0.001
	Lodging	\$0.018
	Industrial	\$0.027
	Shopping Center	\$0.028

Source: Humboldt County Building Inspection Division, 2007.

11. Public Utilities

This section addresses public utility services within the County. Public utilities include electricity, natural gas, and telecommunications. Included in the section are a description of existing service providers, a discussion of system standards, an assessment of both level of service and unserved areas and recommendations for future service delivery.

11.1. Description

11.1.1. Electricity

Electricity service for most of the unincorporated area is provided by Pacific Gas & Electric Company (PG&E). Other providers of electricity in Humboldt County are as follows: in the Shelter Cove area electricity is provided by Resort Improvement District No. 1, in the Town of Scotia by the Pacific Lumber Company, and in the Town of Samoa by the Samoa Pacific Group. However, as the Towns of Samoa and Scotia develop, or property within the towns is sold, PG&E will likely assume ownership of the electric distribution systems.

Power in Humboldt County comes from PG&E statewide power transmission facilities, the PG&E Humboldt Bay power plant, and several local power generators. PG&E is regulated by the California Public Utilities Commission (CPUC), which establishes rules for operation, customer rates, and PG&E's rate of return. PG&E operates transmission and distribution lines throughout the County and approximately 35 electric substations to serve local communities. The PG&E electric distribution system serving the urban study areas is largely in place, and PG&E is obligated to provide service to users within its service area. New service requests, or requests for additional service, are generally governed by CPUC approved Rule 15 (Distribution Line Extensions) and Rule 16 (Service Extensions). Among other things, the line extension rules specify the allocation of construction cost between PG&E and the customer.

The Resort Improvement District No. 1 is the other entity that establishes rates and provides electric service to multiple privately owned properties. Unlike PG&E, Resort Improvement District No. 1 is a government entity and is not subject to regulation by the CPUC. The Resort Improvement District No. 1 is regulated by the locally elected district Board of Directors, who establish rates, charges, and standards for service. PG&E transmission facilities extend to a substation in Shelter Cove. Resort Improvement District No. 1 operates and maintains the substation as well as its own distribution facilities that serve the residents of the district. Resort Improvement District No. 1 also maintains three 500 kW diesel generators that provide backup service within the district when there are problems with PG&E service.

11.1.2. Natural Gas

Natural gas service within Humboldt County is also provided by PG&E and regulated in a manner similar to electric service. Although natural gas is produced in Humboldt County (Tompkins Hill and Grizzly Bluff gas fields), most natural gas consumed in the County comes from the PG&E natural gas transmission facility that runs from Red Bluff in the Central Valley and ends in Alton.

Natural gas is generally available to residents of the broader Humboldt Bay area communities and as far south as Scotia. As with electricity, PG&E is obligated to provide service to users

proximate to its natural gas facilities. New service requests or requests for additional service are generally governed by Rule 15 (Gas Main Extensions) and Rule 16 (Gas Service Extensions). Where natural gas is not available, residents can purchase propane for cooking and heating, from a variety of suppliers.

11.1.3. Telecommunications

According to "Living in a Networked World: Humboldt County Telecommunications Infrastructure and Usage Assessment" (Neratech, 2004) there are several telephone service providers (local exchange carriers) in Humboldt County: AT&T (formerly Pacific Bell or SBC Communications), Verizon (formerly GTE), and Frontier Communications (formerly Citizens Communications). AT&T provides service to the Humboldt Bay area, and north along U.S. 101 to Big Lagoon and south to the Avenue of the Giants. Verizon provides service to the east County area (Willow Creek, Hoopa, Orleans), Orick, and Southern Humboldt (Garberville/Redway, Alderpoint, and Shelter Cove). Frontier Communications provides service to the Ferndale and Petrolia areas. Like electricity and natural gas service, the CPUC establishes rules for telephone service operations, customer rates, and rates of return.

Not all areas within Humboldt County receive telephone service. Assembly member Patti Berg, and her predecessor Virginia Strom Martin, sponsored Assembly Bills to establish grant funds to extend telephone service to unserved areas. Humboldt County is one of several rural counties across the state that contains communities that do not receive telephone service and due to local income levels cannot afford the line extension costs. The Rural Telecommunications Infrastructure Bill provides grant funds from the CPUC to extend local exchange carrier service to previously unserved areas. Areas without telephone service include portions of the upper Yurok Reservation and the Mad River area.

In addition to the local exchange carriers that provide "plain old telephone service", or POTS, as well as other services to Humboldt County communities, there are wireless telephone companies and cable providers that also provide a range of telecommunications services. Suddenlink (formerly Cox Communications) provides cable television, broadband internet, and telephone service to households in or near the urbanized areas. Starstream Communications provides cable television and broadband internet to the Garberville and Redway area, and Almega Cable provides cable television service to Orick and Willow Creek. In addition, there are a number of cell, or wireless, telecommunications companies that provide telephone, text messaging, and other data services throughout most of the County.

Braodband

It should be noted that Humboldt County can be isolated by outages in the AT&T optical fiber line that carries broadband communications from Humboldt County to the rest of the world through a southern alignment along the U.S. 101 right of way. Prior to the installation of the AT&T optical fiber line, Humboldt County broadband communications followed a microwave link east across the mountains to the optical fiber network. There have been three notable broadband outages due to cuts in the optical AT&T fiber line. The microwave link, which is still operational, is not capable of carrying the same volume of traffic. As a result, Humboldt County will periodically be isolated by outages until a second optical fiber link is established. Policies regarding broadband communications are contained in the Economic Development Element.

11.2.Regulatory Framework

As described above, electricity, natural gas, and telephone providers are regulated by the CPUC. The rules relating to service delivery and rates and charges associated with providing and extending service are set forth in the respective public utilities tariff book. The CPUC adopts General Orders that establish rules for all utilities or a class of utilities, as opposed to decisions rendered in a particular case for a particular utility. As a result, the County has little involvement in the operations of public utilities. Examples of General Orders relating to the utilities analyzed in this section include:

- **General Order 95**, Overhead Electric Line Construction, establishes uniform requirements for overhead electrical line construction to ensure adequate service, and overhead electrical line construction, maintenance, and operation safety.
- **General Order 128**, Construction of Underground Electric Supply and Communication Systems, establishes uniform requirements for underground electrical supply and communication systems to ensure adequate service and safety in construction, maintenance, operation or use.
- **General Order 159**, Construction of Cellular Radiotelephone Facilities in California, establishing procedures for the siting, design, and construction of cell sites and providing and deferring to local government to regulate location and design.
- **General Order 112**, Rules Governing Design, Construction, Testing, Operation, and Maintenance of Gas Gathering, Transmission, and Distribution Piping Systems.

The County's interaction with public utilities is confined to franchise agreements, referrals regarding development applications, and activities within the County rights of way, and land use approvals. The Humboldt County Framework General Plan contains two policies regarding transmission and pipelines that encourage the avoidance of tourist and recreation areas and agricultural lands when siting electric transmission lines. Other local jurisdictions often have public utilities related land use policies and standards regarding the undergrounding of utilities, coordination in service planning, energy conservation, and facilities siting.

11.3.Public Utilities System Capacity

Public utilities are reasonably adequate in Humboldt County with the following exceptions: (1) lack of telecommunications in certain rural Humboldt County communities; and (2) lack of redundancy in Humboldt County's connection to the fiber optics network. Humboldt County should closely coordinate with public utility providers to ensure that services are available to all areas where development is occurring and where additional utility needs affect existing development.

11.4.Public Utilities System Expansion

11.4.1. Policy Considerations

There is a connection between Humboldt County General Plan and public utility planning and operations. It is important that Humboldt County land use planning decisions be closely coordinated with public utilities to ensure that service capacity is available when new development occurs. In addition, policies regarding reliable broadband internet infrastructure and accessible broadband services for rural communities are included within the Economic Development Element.

12. Implementation

The focus of this Chapter is the identification of potential capacity building and funding opportunities for infrastructure and service providers in Humboldt County. A considerable portion of facilities and systems serving the area are in poor condition. Improving local infrastructure is fundamental to the implementation of the General Plan.

If requested by the service providers, the County could take a more prominent role in assisting and facilitating infrastructure maintenance and development, especially in more rural areas. Historically, the County has provided water and sewer services through several County Service Areas. To be successful the County needs to take a more active role in these services. Currently, the County is responsible for land use planning and infrastructure, such as roads, storm drainage and community services such as law enforcement, and governance of one Fire District. For other services, communities rely on a multitude of individual special districts to provide water, sewer and fire protection.

The following sections summarize capacity building and funding opportunities for each report topic area, with a focus on funding eligibility, program requirements, and financing terms. In addition, more information on infrastructure funding programs is provided in the attached appendices. Appendix B contains a summary of infrastructure funding opportunities, for community facility projects, roadways, wastewater, and water projects produced by the California Financing Coordinating Committee. Appendix C provides information on roadway and transportation programs. Appendix D contains a summary of infrastructure programs for rural communities, compiled by the United States Department of Agriculture.

12.1. Capacity Building

12.1.1. Water and Wastewater

This report finds that service providers are not setting fees and charges at a level sufficient to adequately invest in existing systems. While the rates may be sufficient to cover cash needs they generally do not cover enough of the depreciation expense. These funds should be accumulating as reserves so that the agencies can replace the existing facilities when that becomes necessary.

Rates and Charges. The majority of this report is an analysis of the current condition of water and water systems and improvements required for these systems to serve new development. This report finds that monthly rates and new connection fees are generally inadequate to cover the full cost of providing services. Very few service providers have an up to date capital improvement plan, which should be one of the basic tools used in rate setting. Rate payers are very suspicious of local agencies and tend to resist proposed rate increases without a comprehensive public information campaign. In addition, the protest procedures in Proposition 218 have added a new hurdle to rate increases. Because the process is often contentious and rarely pleases constituents, rates are infrequently updated and rarely include a component for capital replacement or operating reserve funds.

Local agencies operating water and wastewater systems must complete the planning required to establish adequate rates and connection fees. An important component of this effort will be the completion of long range facilities planning and the identification of loan and grant programs

that can provide assistance in improving facilities and infrastructure. In certain instances, voter approved special assessments or taxes may be appropriate to fund the improvement or rehabilitation of existing systems, in addition to rate increases.

Implementation: Establish monthly rates and connection fees to reflect the full cost of providing utility service.

Recommendations:

- **Support Grant and Loan Funding Requests.** Support requests for grant and low interest loan funds to reduce the local cost to fund major infrastructure improvements (a listing of grant and loan programs is included at the end of this section)
- **Capital Improvement Plans.** Facilitate the development of capital improvement plans
- **Pooled Costs/Shared Resources.** Identify opportunities for districts to reduce operating costs (similar to County Risk Management reducing district workman's compensation costs)
- **Fees and Charges.** Assist in the update of fees and service charges (public information, land use and demographic information, etc)
- **Assessments and Special Taxes.** Support the establishment of assessment or special tax districts to fund major infrastructure improvements

Infrastructure to Support New Development. There may be additional programs that can support major public improvements relating to new development. Impact fees, assessment and special tax districts may be established to finance the construction of public improvements to serve new development, such as water tanks, water distribution systems, and wastewater collection facilities and lift stations, etc. In such cases, projects are often funded through bond proceeds and assessments or special taxes are established to repay the debt. Fees are often used to reimburse agency or developer expenditures or accumulate funds for pay-as-you go projects.

Implementation: Coordinate with utility providers to implement the most appropriate programs.

Recommendations: Coordinate closely with utility providers and implement the appropriate infrastructure financing tools depending upon type, size, and location of development.

- **Coordinated Development Review.** Closely coordinate with local service providers in the evaluation of development proposals
- **Development Agreements.** As appropriate, involve service providers development agreement negotiations
- **Impact Fees.** Support the establishment of impact fees in addition to connection fees, where appropriate, to recover the full cost of development related impacts to utility systems.
- **Assessments and Special Taxes.** Support the establishment of assessment and special tax districts to fund the construction of major public improvements relating to new development

12.1.1.1. Association of Water and Wastewater Service Providers

Water and wastewater service providers in Humboldt County are confronted with serious operational challenges and few resources with which to address them. Challenges facing service providers include aging infrastructure, ever more stringent environmental regulations and accounting requirements, increasing personnel costs, difficulty recruiting qualified operators, and lack of funding. Although there is no simple solution, one way to begin to address these

challenges would be for service providers to come together cooperatively and share experience, resources, and ideas. Upon request, the County could be available to provide assistance.

A first step may be to establish an association of local water agencies. The following is a general description of a potential water resource association.

Purpose. To improve water quality and the capacity and level of service of all water and wastewater services providers in Humboldt County

Membership. Local government agencies and private/mutual water/wastewater companies involved in the provision of domestic water and wastewater services to Humboldt County communities and other allied agencies

Organization. A cooperative agreement or joint powers authority could be used to ensure clear understanding of benefits and responsibilities and to communicate the level of commitment from each member. All providers of water and wastewater services and appropriate allied agencies such as Humboldt County would be parties to the agreement.

Objective. To regularly meet to accomplish the following:

- **Exchange experience and information**
 - Share information regarding cost- or time-saving administrative and management strategies
 - Identify grant funds and loan programs
 - Share successful grant applications
 - Share rates and rate setting documentation
 - Share technical reports regarding new regulations and system improvements
- **Pool resources**
 - Share qualified operators (on a cost share basis or at no cost) with other agencies
 - Make available (on a cost share basis or at no cost) specialized tools and equipment
 - Cooperatively arrange for specialized consultants or technology as a group to achieve price breaks
 - Purchase costly equipment together and rotate use
- **Establish working groups to address specific issues affecting all members**
 - Regulatory or technology working group
- **Develop training programs**
 - Larger agencies could mentor operators from smaller agencies
 - Pool resources to bring in specialized trainers
- **Develop standardized procedures and programs**
 - With the assistance of organizations such as the Rural Community Assistance Corporation, Humboldt State University, College of the Redwoods, establish standardized models for:
 - permit renewal
 - facilities planning
 - projecting future service demands
 - sampling and data management procedures
 - establishing/updating rates/connection fees
 - capital improvement programs
 - annual reporting
- **Coordinate with Humboldt County**

- **Use the association as a forum for the following:**
 - close coordination with statewide funding programs
 - collaboration regarding evaluation of the effects of proposed regulations and suggested changes in existing regulations
 - assistance in development of grant applications
 - make possible watershed based source water and water quality planning
 - establish framework for early and regular consultation in land use development application and building permit review
 - distribute General Plan, Zoning maps, base mapping information, and facility maps (in all forms)
 - collaborate on land use planning
 - cooperate regarding development and regular update of growth projections
 - distribute information regarding service population by land use type
 - coordinate land use planning and capital improvement plans to ensure adequate phasing and provision of services,
 - exchange information such as annual reports pursuant to RWQCB wastewater permits (Waste Discharge Requirements and National Pollution Discharge Elimination System permits), Department of Water Resources water rights and Public Water System Statistics (PWSS) and Department of Health Services annual inspection reports and orders (Sanitary Sewer Overflows, Administrative Civil Liability Order, and Cease and Desist Orders)

12.1.2. Fire Protection

This report and other recent reports find that (1) funding for fire protection in Humboldt County is inadequate; (2) fire districts lack proper facilities, equipment, training, and administrative capacity; (3) fire district boundaries do not include all existing developed areas within USAs or the County as a whole; and (4) significantly different levels of fire protection are available throughout the County. The Humboldt County Fire Chiefs Association and Humboldt County Fire Safe Council, as well as Humboldt County are working to address some of the above findings; however, additional action is required.

District Boundaries. Significant portions of the County are outside the boundaries of fire protection districts. Most of this land is federal and state parkland, which may not need to be within the boundaries of a local agency, but numerous communities are not served by a fire related district. The USAs outside fire related district boundaries include Alderpoint, Benbow, Briceland, Scotia, Redcrest, Westhaven, and portions of numerous others. There are many other communities and developed areas outside USAs that are also outside district boundaries. Current boundaries were drawn to just include the developed area of the community that the district was formed to serve. As a result there are vast expanses of "no man's land" between districts. Districts regularly serve these areas with or without the LAFCo approval required by Government Code Section 56133.

Recommendations:

- **Expand District Boundaries.** All developed and developable land within the County should be within the boundaries of a fire related district. This objective may be difficult to achieve all at once. The following steps could be taken to accomplish this over time:
 - Encourage the inclusion of all developed land within the County in the boundaries of fire related districts.

- As a condition of discretionary project approval require that new development annex to fire related districts
- If annexation is not possible, establish a County Service Area(s) to provide fire protection services to unserved areas

Funding. Ongoing funding sources for the provision of fire protection services is limited to property tax (if the special district was formed prior to 1978); special taxes (approved by 2/3rds majority of registered voters); special assessments (approved by a majority of property owners submitting ballots); and less significant sources such as Timber Yield Tax or revenue from the use of buildings, or Proposition 172 sales tax funds. Many fire departments conduct fund raising efforts, or receive grants; however, these sources are limited and on not reliable on a year-to-year basis.

Due to voting requirements, it is difficult from fire related districts to secure special tax or assessment funding. However, there are very few alternatives to special taxes or assessments for reliable ongoing funding. Arcata Fire Protection District has recently demonstrated that with proper public education a significant new special assessment can be approved by the voters. Based on the experience of Arcata Fire and Humboldt Fire Protection District No. 1, the Humboldt County Fire Chiefs Association is preparing a tool kit to assist other department in their efforts to pursue a new special tax or assessment.

Recommendations:

- **Assistance with Assessments and Special Taxes.** Support the development of the HCFCFA special assessment toolkit and provide additional support (such as assistance from the Auditor-Controller or Assessor) to facilitate the development of new assessments and special taxes to fund fire protection services.
- **Community Facilities Districts.** Support the development of levels of service for fire related districts or other mechanisms to facilitate the establishment of Community Facilities Districts in new development areas (see the generalized description of Mello Roos Community Facilities District Review Process below):
 - Use fire protection levels of service to establish zones that can be used for differential special tax rates for a countywide fire protection services Mello Roos Community Facilities District to which all new discretionary development is required to annex.
- **Impact Fees.** Facilitate the development of capital improvement programs or other similar reports for each fire related district that can be used to establish fire protection impact fees payable by all new development
 - Develop boiler plate documents to facilitate the development of impact fees (methodology for establishing fee amounts, fire impact fee ordinance, agreement between fire related districts and the County, etc.)
- **Pooled Costs/Shared Resources.** Identify opportunities for fire related districts to reduce operating costs (similar to County Risk Management reducing district workman's compensation costs).

12.2. Infrastructure Financing

Funding related implementation measures or programs are required to address two issues: (1) current funding gaps and (2) funding expanded infrastructure, facilities, and services relating to new growth. Developing funding programs to address growth related services and infrastructure impacts is somewhat more straight forward than finding ways to fill current funding gaps.

Infrastructure financing is a critical issue if the County and the other service providers are to be successful in completing the improvements described herein. Historically, jurisdictions within Humboldt County have been successful in obtaining a proper combination of grant and loan funding to feasibly carry out infrastructure projects. Most recently, Humboldt County led a multi-county effort to secure over \$10 million in Proposition 50 grant funds. During the last decade or two many of the grant programs have converted to loan programs and funding in general has become more limited and competitive. While it is impossible to develop specific funding strategies in this report, these should be an element of any project related studies. Funding agencies consider a number of factors including: the median income of the community, current level of rates and indebtedness and how well the proposed project fits the goals of the program. While there are no easy answers, the projects that are more likely to be successful are those that have a well thought out plan that provides clear benefits to their community and then educates the public about those benefits.

Infrastructure funding is evaluated under the following categories:

- Generalize Mello Roos Community Facilities District Review Process
- General
- Potable Water
- Storm Water
- Wastewater
- Transportation
- Hazard Mitigation
- Funding Alternatives

12.2.1. Generalized Mello Roos Community Facilities District Review Process

1. Identify major public facilities or services appropriate for funding through a Mello Roos Community Facilities District and the appropriate service area to be served (initial and future boundaries)

Examples of Eligible Facilities (Area Serving Public Facilities or In-Tract Public Facilities)

- Water (treatment, distribution, storage)
- Wastewater (collection, treatment, use of reclaimed water)
- Storm Drainage (collection, detention, treatment, wetland/riparian restoration)
- Transportation (road, curb, gutter, sidewalk, streetlight, stoplights, landscaping, transit stops)
- Parks and Open Space (land acquisition, construction)
- Municipal Structures (police, fire, or administrative)

(Estimate cost, capacity, and area of benefit)

Examples of Eligible Services

- Law enforcement (Sheriff and other law and justice functions)
- Fire protection and emergency medical services
- Park and recreation maintenance
- Drainage and flood maintenance
- Street lighting, road maintenance

(Estimate cost, level of service, and area of benefit)

Examples of Service Area

- Areas benefiting from specific roadway improvements
- Martin Slough Interceptor area
- Area benefiting from new fire station or Sheriff sub-station or modified patrol beat
- South Eureka development area
- New development county-wide

2. Determine appropriate Level of Service

For non-maintenance related service costs, it may be appropriate to establish a level of service (officers per 1,000 residents, response time or other standard of fire coverage -such as Eureka Standard of Coverage Study, acres of park per 1,000 residents). The level of service will be useful in evaluating existing services and distributing service costs to existing new residents.

3. Evaluate existing service and infrastructure capacity

For those facilities or services to be funded through a CFD, evaluate the capacity of existing service providers/infrastructure and the ability or methods to expand service to accommodate new development.

4. Prepare development program (estimate of total acres/sf of new development by use type)

Prepare a development program consisting of gross project acres and net acres devoted to each use type, total dwelling units by type, total square feet of non-residential uses by type, total acres devoted to roads and public facilities, total acres devoted to parks and open space.

Areas outside of the project area that would benefit from proposed facilities and services and that are likely to develop in the near term should be considered as well.

5. Estimate timing of improvements, development absorption, and ultimate project assessed value

Based on the development program from 5 above, as well as past county-wide or community development trends and the best available growth projections, prepare a market absorption study to identify the expected rate of new unit construction, the timing of infrastructure improvements, and the assessed value of the project area over time and at build out. The market absorption study will provide a good indicator of the feasibility of bonding for infrastructure improvements and of a special tax for supporting the desired levels of service.

6. Prepare preliminary design, estimate of facilities cost, and sources and uses of construction funds

Prepare preliminary designs for infrastructure and facility improvements. Estimate the cost of improvements and the expected sources of construction funding for each improvement type.

7. Prepare Fiscal Impact Analysis

Prepare a fiscal impact analysis of the impact (the net cost of providing the levels of service identified above to each new residential unit or unit of non residential development) of the

new development based on the services identified above. The fiscal impact analysis will identify the funding gap for providing services to new development and establish the basis for the special tax formula.

8. Initiate proceedings to form CFD

POLICY ISSUES TO BE CONSIDERED

1. Identify "eligible public facilities" for the use of bond proceeds
2. Selected services for special tax funding
3. Determine appropriate types and level of security
4. Establish a value to lien ratio
5. Establish a maximum special tax

12.2.2. General

The general funding category captures funding sources that can be applied to two or more infrastructure categories, which may include, but are not limited to, transportation, the environment, water and wastewater, and community development. The primary sources applicable to general infrastructure projects are as follows:

- The Infrastructure State Revolving Fund
- Community Development Block Grants

These funding sources are described below.

Infrastructure State Revolving Fund

The California Infrastructure and Economic Development Bank (I-Bank) oversees the distribution of loans through a state revolving fund program (ISRF). This program provides financing for public infrastructure such as public transit, environmental mitigation, port facilities, solid waste collection and disposal, defense conversion, military infrastructure, power transmission, power distribution facilities, and communications projects.

Eligibility

Eligible applicants are local municipal entities, with projects meeting tax-exempt financing criteria. Projects must comply with California Environmental Quality Act (CEQA) requirements. Acceptable projects include acquiring land and constructing or acquiring facilities. However, funding for privately owned or operated infrastructure or refinancing existing debt is not available through the ISRF.

Funding Terms

Limits for ISRF loans are a maximum of \$10 million per project, except for environmental mitigation projects which are limited to \$2 million. The loan term is up to 30 year terms. Applications for this program are accepted on a continuous basis.

ISRF Program contact information follows:

California Infrastructure and Economic Development Bank
Diane Cummings, Manager
1001 I Street, 19th Floor
Sacramento, CA 95814
Sacramento, CA 95814

(916) 324-4805 (phone)
 (916) 322-6314 (fax)
<http://www.ibank.ca.gov> (email)

Community Development Block Grants

Community Development Block Grants (CDBG) are Federal funds from the U.S. Department of Housing and Urban Development. These grants are administered by the State. The funding programs most applicable to infrastructure are the Planning and Technical Assistance, the General Allocation, and the Over the Counter Component. Programs eligibility and funding terms are discussed below.

Eligibility

In general, CDBG funds would be available to Incorporated Cities and Humboldt County public improvement projects. Projects must principally benefit low-income households defined as those with incomes at or below 80% of the county media income, also called the Targeted Income Groups (TIG).

The Planning and Technical Assistance Allocation (PTA) may be used for planning, evaluation, and design studies related to eligible activities, including housing studies, public works, community facilities and economic development activities. Projects must meet one of two national objectives: either 1) benefit at least 51% TIG or 2) prevent slums and blight.

The General Allocation provides funding for housing activities, public works, community facilities, and public service projects. Eligible activities include the costs of acquisition, construction, or installation of public works projects and site or other improvements. Grant applications are evaluated based on several assessments. The current rating system evaluates seven categories as follows:

1. Poverty Index: Percentage of population with incomes below the poverty level;
2. Target Income: Project beneficiaries who earn 80 percent or less of the county's median income;
3. Need for Activity: Documented need for the proposed project;
4. Prior Performance Operating CDBG Grants: Performance administering past CDBG Grants; criteria include timeliness of expenditures, reporting, closeout submittals, resolving outstanding audit issues, and the amount of income in hand;
5. Capacity: Ability to administer the proposed activities, based on experience on past grants and readiness to proceed;
6. Leverage: Documented commitments of additional (non-Federal or state) funding;
7. State Objectives: Additional credit for grants addressing one or more state objectives.

In addition, an Over the Counter Component may be used as grants for publicly owned infrastructure, loans to businesses for construction, onsite improvements, equipment purchases, working capital, and site acquisition.

Funding Terms

PTA Allocation funds two programs, the General Allocation, and the Economic Development Allocation. Currently, the total PTA Allocation provides up to \$140,000 per year per jurisdiction. The PTA General Allocation funds projects on housing, public works, and community facilities. The PTA Economic Development Allocation focuses on job creation and retention through business expansion and retention projects. The projects funded must principally benefit a TIG, which is based on the most recent U.S. Census data.

The General Allocation grant program typically provides between \$500,000 and \$1,500,000 per year to eligible projects based on Federal funding availability. CDBG money is frequently combined with funding from other State and Federal programs to finance the construction of public facilities and other improvement projects.

The Program's California State office may be contacted at:

State of California
 Division of Financial Assistance
 1800 3rd Street, Suite #330
 North Building - Suite 190 or
 Sacramento, CA 95833
 (916) 552-9398 (phone)
 (916) 319-8848 (fax)
cstevens@waterboards.ca.gov (email)

Paula Mushrush
 Humboldt County CBDG Contact

Additional information may be obtained online at:

<http://www.hcd.ca.gov/ca/>

12.2.3. Potable Water

This section identifies funding for municipal water system treatment, storage and distribution. Currently, the primary funding sources for potable water infrastructure are Clean Water State Revolving Fund and Proposition 84, the Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006.

Safe Drinking Water State Revolving Fund (SDWSRF)

The California Department of Public Health (DPH), recently formed from the Department of Health Services (DHS), administers the program to improve water quality in California through the Federal Safe Drinking Water Act (SDWA). The revolving fund program serves public water systems as follows:

- Administration of the SDWSRF financial assistance program
- Technical assistance to small public water systems
- Source water assessment and protection
- Water system capacity development

Eligibility

The funding system utilizes a multi-year Project Priority List, where some projects receive higher funding priority than other public water service projects. Higher priority projects include projects as follows:

- Addressing public health risk problems
- Complying with the SDWA
- Assisting systems in most need on a per household affordability basis

Funding Terms

Generally, the interest rate is half the general obligation rate. However, disadvantaged systems may obtain a zero interest loans and partial grant funding. Additionally, funding caps for the Department of Public Health SDWSRF are as follows:

- Planning studies may not exceed \$100,000

- Projects may not exceed \$20,000,000
- Each entity may obtain a maximum grant of \$30,000,000

DPH SRF Loan Program state and regional offices may be contacted at:

California Department of Public Health
 Division of Drinking Water and Environmental Management
 Steve Woods
 P.O. Box 997377, MS 7408
 Sacramento, CA 95899-7377
 (916) 449-5624 (phone)
steve.woods@cdph.ca.gov (email)

Additional information may be obtained online at:
<http://www.dhs.ca.gov/ps/ddwem/funding/default.htm>

Proposition 84 Funding for Safe Drinking Water

The DPH also administers funds from Proposition 84 Sections 75021, 75022, and 75025 to provide safe drinking water to California residents by providing access to potable water during emergencies, improving infrastructure and preventing groundwater contamination.

Section 75021: Safe Drinking Water Emergency Funding

Section 75021 of Proposition 84 provides grants and direct expenditures that fund emergency and urgent actions providing access to safe drinking water for California residents.

Eligibility

Eligible applicants are public water systems, local Health Officers, and local Directors of Environmental Health. Eligible water improvement projects are as follows:

- Improving existing water systems
- Establishing connections into adjacent water systems
- Implementing a temporary water treatment system
- Consulting on water system operational problems
- Developing an alternate water supply
- Providing a bottled water supply
- Designing, purchasing, installing and initially operating water treatment equipment and systems

Criteria to assess project eligibility are as follows:

- Degree of contamination
- Nature of contaminants
- Chronic or acute nature of health hazard
- Time of exposure to contaminants
- Amount of actual or suspected illnesses
- Actions taken by the local Health Officer or Director of Environmental Health
- Availability of alternative funding
- Extent and duration of water outages resulting from an emergency
- Extent and duration power outages resulting from an emergency

Funding Terms

A total of \$10 million will be made available to the DPH, and all requests meeting eligibility criteria will be awarded until funds are exhausted. Grants and expenditures may not exceed \$250,000 per project.

Section 75022: Small Community Infrastructure Improvements for Chemical and Nitrate Contaminants

Section 75022 of Proposition 84 provides grants for small community drinking water system infrastructure improvements and related actions to meet safe drinking water standards.

Eligibility

Eligible recipients include public agencies, incorporated mutual water companies and public schools serving disadvantaged communities. Eligible water systems must be in noncompliance with a primary drinking water standard or notification level. Applicable projects may require feasibility studies, technical assistance, and construction to meet applicable drinking water standards.

Priority projects affect small, disadvantaged communities by addressing chemical and nitrate contamination, and/or other health hazards, in drinking water. Criteria to assess project eligibility are as follows:

- Regulatory status of the contaminant in drinking water with the highest health risk, or principal contaminant
- Health risks of the principal contaminant
- Number of contaminates
- Applicant Median Household Income (MHI)
- Water system interconnectivity
- Number of regional drinking water projects

Funding Terms

The maximum grant for a project shall be limited to \$5 million per project, including feasibility and eligibility costs, and not more than twenty five percent of a grant may be awarded in advance of actual expenditures. The maximum amount for a feasibility study is \$500,000. In addition, the total maximum grant awarded for regional projects, with multiple applicants, under Proposition 84 Sections 75022 and 75025 may not exceed \$15 million.

Section 75025: Prevent or Reduce Contamination of Groundwater that Serves as a Source of Drinking Water

Section 75025 of Proposition 84 provides grants and loans for projects to prevent or reduce contamination of groundwater that serves as a source of drinking water. The DPH will require payment for costs that are subsequently recovered from parties responsible for the contamination.

Eligibility

Eligible applicants are community water systems that hold or have applied for a domestic water permit pursuant to Health and Safety Code section 116525, public agencies, and non-profit organizations. Eligible projects are as follows:

- Local and regional remediation projects
- Construction of replacement drinking water wells avoiding contaminated strata

- Refurbishment of existing wells to seal off contaminated zones
- Aquifer storage and recovery
- Appropriate contaminated water blending operations
- Prevention of groundwater contaminant migration
- Proper decommissioning of abandoned wells
- Prevention of contaminated discharges into drinking water aquifers
- Water distribution system improvements for some consolidation projects

Criteria to assess project eligibility are as follows:

- Regulatory status of the contaminant in groundwater with the highest health risk, or principal contaminant
- Health risk of principal contaminant
- Number of contaminants in a drinking water supply exceeding a primary Maximum Contaminant Level (MCL)
- Applicant Median Household Income
- Water system interconnectivity
- Number of Regional Groundwater Projects
- Additional project benefits
- Impact on downstream groundwater sources

Funding Terms

The maximum grant for a project is \$5 million, including feasibility and construction costs. The maximum amount for a feasibility study is \$500,000. For regional projects, with multiple applicants, each applicant is allowed \$5 million up to a total maximum \$15 million, which also includes any grants awarded under Section 75022. This program cannot be used to match funds for Proposition 50 projects.

Proposition 84 Sections 75021, 75022, and 75025 funding inquiries may be directed to:

California Department of Public Health
 Division of Drinking Water and Environmental Management
 P.O. Box 997413, MS 7408
 Sacramento, CA 95899-7413
 (916) 449-5600 (phone)
Prop84@dhs.ca.gov

Additional information may be obtained online at:

<http://www.cdph.ca.gov/programservices/funding/Pages/Prop84.aspx> or
<http://www.dhs.ca.gov/ps/ddwem/Prop84/>

12.2.4. Stormwater

This section discusses funding stormwater system construction and maintenance to improve environmental health of public waters receiving storm water from municipal drainage systems and non-point sources. The addressed programs are as follows:

- Clean Beaches Initiative Grant Program
- Non-Point Source Implementation Grant Program
- Urban Streams Restoration Program
- California Coastal Conservancy Programs
- Proposition 84 Storm Water Grant Program

These programs are presented below.

Clean Beaches Initiative Grant Program

The SWRCB Clean Beaches Initiative (CBI) Grant Program provides grants to help local, state and Federal agencies, Indian tribes, and non-profit organizations implement projects to meet current bacterial standards and improve the water quality of California's coastal waters. The program goal is to reduce or eliminate public beach closures in California. Proposition 84 provides \$37 million to be administered through the Clean Beaches Initiative Grant Program.

Eligibility

Applicants are required to provide public use records and proof that a beach was closed during the year. Eligibility is determined by the following equation:

(Public user days per year) * (Number of days beach was closed by health dept.)

Projects are submitted to the Clean Beaches Task Force (CBTF) for review. The CBTF reviews all project proposals and make recommendations to the SWRCB for funding under the Clean Beaches Program. Eligible projects are placed on a Priority List and ranked according to the potential public health risk, whether the project addresses a specific pollution problem at a coastal beach, and the project location relative to the Coastal Zone.

Funding Terms

The CBI Program requires 20% matching funds for projects ranging from \$1,000,000 and \$5,000,000 and 15% for projects costing less than a million dollars. However, the funding match requirement may be waived for projects within disadvantaged communities upon request. The CBI Program indicates disadvantaged communities as receiving less than or equal to 80% of the statewide annual median income, per the California Water Code Section 79505.5a. These grants generally range from \$125,000 to \$5,000,000.

The CBI Grant Program office may be contacted at:

State Water Resources Control Board
Laura Peters, Senior Water Resources Control Engineer
1001 I Street, 16th Floor
Sacramento, CA 95814
(916) 341-5854 (phone)
lpeters@waterboards.ca.gov

Additional information may be obtained online at:

<http://www.swrcb.ca.gov/cwphome/beaches/>

The Non-Point Source Implementation Grant Program

The Non-Point Source (NPS) Implementation Grant Program (319 Program), is funded through the Clean Water Act Section 319(h). The 319 Program is a federally funded program administered by the SWRCB. Program goals are to reduce, eliminate, or prevent water pollution from polluted runoff and to enhance water quality in impaired waters.

Eligibility

Projects must show the potential to reduce non-point source loading to Section 303(d) listed impaired water bodies. The Section 303(d) list depicts bodies of water that do not fully support beneficial uses or are not meeting water quality objectives. The list also describes pollutants that

limit or prevent attainment of water quality objectives for each water body. Eligible projects should also be characterized in a local watershed plan.

Eligible 319 Program applicants are nonprofit organizations, local government agencies including special districts, Indian Tribes, and educational institutions.

Funding Terms

Approximately \$4.5 to \$5.5 million in grant funds may be available for NPS implementation projects in California for each state fiscal year, and the amount is dependent on the funds available from USEPA. The California State 319 Grant Program office may be contacted at:

State Water Resources Control Board
Lauma Jurkevics, Chief
1001 I Street, 16th Floor
Sacramento, CA 95814
(916) 341-5498 (phone)
lpeters@waterboards.ca.gov

Additional information may be obtained online at:
<http://www.swrcb.ca.gov/funding/319h.html>

Urban Streams Restoration Program

The California Department of Water Resources (DWR) Urban Streams Restoration Program assists communities in reducing damage from stream bank and watershed instability and from floods while restoring the environmental and aesthetic values of streams, and to encourage stewardship and maintenance of streams by the community.

Eligibility

All projects require a local agency and a community group consisting of a public agency and a non-governmental entity, private citizen's group or organization. In addition, all grants must have flood management or erosion control as a primary objective and promote public awareness and local stewardship of streams.

Funding Terms

Urban Streams Restoration assistance is in the form of grants. Approximately \$18 million in Proposition 84 funding will be made available for stream restoration projects for the 2007 funding cycle. DWR anticipates that two application cycles will be held in mid 2007.

The Urban Streams Restoration Program office may be contacted at:

Department of Water Resources
Margie Graham, North District
2440 Main Street or
Red Bluff, CA 96080
(530) 529-7330 (phone)
margieg@water.ca.gov

Department of Water Resources
Sara Denzler, Program Coordinator
P.O. Box 942836
Sacramento, CA 94236
(916) 651-9625 (phone)
sarad@water.ca.gov

Periodically check the following website for further details:
<http://www.watershedrestoration.water.ca.gov/urbanstreams/>

California Coastal Conservancy Programs

The California Coastal Conservancy, established in 1976, is a state agency that uses entrepreneurial techniques to purchase, protect, restore, and enhance coastal resources, and to provide access to the shore. The Coastal Conservancy's Public Access, Resource Enhancement, Agricultural Perseveration, Site Reservation and Urban Waterfronts Programs may be potential sources of grant funding for Humboldt County.

The Coastal Conservancy may be contacted at:

California Coastal Conservancy
Karyn Gear, North Coast Regional Manager
1330 Broadway, 11th Floor
Oakland, CA 94612
(510) 286-1015 (Phone)
(510) 286-0470 (Fax)
kgear@scc.ca.gov

Additional information may be obtained online at:
<http://www.coastalconservancy.ca.gov/>

Flood Protection Corridor Grant Program

The purpose of the California Department of Water Resources (DWR) Flood Protection Corridor Program is reimbursing local agencies with the non-federal share of capital costs associated with federally authorized flood control projects.

Eligibility

Local public agencies, nonprofit organizations, or an organization representing more than one local public agency or nonprofit are eligible applicants. Appropriate projects provide restoration, enhancement, and flood protection in acquired property. Additionally, the California Conservation Corps or community conservation corps takes part when feasible. In addition, sites that are partially located in FEMA Special Flood Hazard Areas are preferable.

Funding Terms

No minimum or maximum funding value is set for projects under this program. DWR is currently developing cost-sharing formulas, which will be dependent on project type and/or component.

Additional information may be obtained online at:
<http://www.floodsafe.water.ca.gov/>

Proposition 84 Storm Water Grant Program

Proposition 84 Storm Water Grant Program funds provide matching grants to local public agencies for the reduction and prevention of storm water contamination of rivers, lakes, and streams. Approximately \$84,000,000 will be available through this program. The California Legislature is currently determining how the funds will be allocated and eligibility requirements. Legislation will further define this emerging grant program. Currently, applications are not being accepted and no projects have been awarded or funded. In addition, to date, neither funding terms nor schedule have been established.

The contact for Proposition 84 Storm Water Grant Program follows:

Division of Financial Assistance
 Ms. Erin Ragazzi
 Project Development Section 1A
 Sacramento, CA 95833
 (916) 341-5733 (phone)
enragazzi@waterboards.ca.gov

Additional information may be obtained online at:

<http://www.swrcb.ca.gov/funding/prop84.html>

12.2.5. Wastewater

Some of the more common grant and loan funding sources used for wastewater projects are as follows:

- State Regional Water Quality Control Board State Revolving Fund
- Small Community Wastewater Grant Program
- Rural Utilities Service Grant and Loan Program

These programs are discussed in more detail below.

State Revolving Fund

The State Water Resources Control Board (SWRCB) oversees the distribution of the funds through the State Revolving Fund (SRF) authorized through the Clean Water Act. This program provides low interest loans to address water quality problems associated with discharges from wastewater and water reclamation facilities for estuary enhancement for the construction of publicly owned wastewater treatment plants.

Eligibility

SWRCB SRF projects include, but are not limited to, constructing or upgrading publicly-owned wastewater treatment facilities, local sewers, sewer interceptors, water reclamation facilities, and non-point source pollution control projects. Eligible SRF Loan applicants are public agencies and nonprofit organizations.

Funding Terms

The maximum SRF loan amount is \$25 million per municipality per year. Loans have a 20-year payback period, and an interest rate of one-half of the interest rate paid on the sale of the State's latest general obligation bonds at about 2.5% to 3.5%. A zero percent interest rate may be given with 16.67% matching funds. This program does not provide grants.

The SWRCB contact for wastewater SRF loans follows:

State Water Resources Control Board
 Christopher Stevens, Chief
 1001 I Street, 16th Floor or
 Sacramento, CA 95814
 (916) 341-5698 (phone)
cstevens@waterboards.ca.gov

State Water Resources Control Board
 North Coast Region (1)
 5550 Skylane Blvd., Suite A
 Santa Rosa, CA 95403
 (707) 576-2220 (phone)
 (707) 523-0135 (fax)

Additional information may be obtained online at:

http://www.swrcb.ca.gov/funding/index.html#funding_programs

Small Community Wastewater Grant Program

The SWRCB also oversees the Small Community Wastewater Grant Program, funded by Proposition 40 and 50 for construction of improvements to publicly owned wastewater collection and treatment facilities.

Eligibility

Grants are available to local public agencies with populations under 20,000 people and a maximum annual Median Household Income (MHI) of \$37,994. Three project classifications may qualify for funding: Class A, Existing or Potential Public Health Problems; Class B, Pollution Problems; and Class C, Other Projects. Project pre-applications are submitted to the program. Projects are then ranked and must be included on the Statewide Competitive Project List (CPL) before funds can be made available.

Funding Terms

The SCWG Program provides up to \$2 million per project. Grant funding for communities with a MHI of \$28,495 or less will be up to 90 percent of the eligible project cost. The funding level for communities with a MHI between \$28,495 and \$37,994 will be determined by the following formula:

$$\text{Percentage of Grant Funding} = (\$37,994 - \text{MHI}) \times (0.00003158) + 0.6$$

Communities must find other sources of funds for the portion not covered by the grant.

The SWRCB contact for wastewater Small Community Grants follows:

State Water Resources Control Board
David Kern, Regional Board Grant Coordinator
1001 I Street, 16th Floor
Sacramento, CA 95814
(916) 341-5720 (phone)
dkirn@waterboards.ca.gov (email)

Additional information may be obtained online at:

<http://www.waterboards.ca.gov/cwphome/scwg/index.html>

Rural Utilities Service Grant and Loan Program

The U.S. Department of Agriculture Rural Utilities Service (USDA/RUS) administers the Water and Waste Disposal Grant/Loan Program. The goal of the program is to provide financial assistance to promote rural economic development, develop and improve public health, safety, and overall quality of life in rural areas.

Eligibility

The RUS Water and Waste Disposal Program is intended to provide financing to develop water and waste disposal including wastewater, solid waste and storm water systems in rural areas and towns with a population not in excess of 10,000. Funds are available to public entities such as municipalities, counties, special purpose districts, Indian tribes and corporations not for profit.

To reduce water and waste disposal costs to a reasonable level for rural users, grants may be made for up to 75% of eligible project cost. Due to reduced federal funding for this program typical grant amounts do not exceed 20% of eligible project costs.

Funding Terms

The RUS Program allows a maximum loan repayment period of 40 years. However, the repayment period cannot exceed the useful life of facilities financed. Loan interested rates are set periodically based on an index of current market yields for municipal obligation.

RUS typical interest rates vary from 4% to 7% and vary based on the area income.

The USDA Rural Utilities Service may be contacted at:

USDA, California Rural Development	Dave Hartwell
Debbie Coggins	
Humboldt County or	State of California
(707) 443-6714	(530) 792-5817

Additional information may be obtained online at:

<http://www.usda.gov/rus/water/programs.htm>

12.2.6. Hazard Mitigation

The Office of Emergency Services (OES) administers two main grant programs for the prevention of and response to natural disasters via the Federal Emergency Management Agency (FEMA). Pre-Disaster Mitigation (PDM) and Hazard Mitigation Grant Program (HMGP) grants are available for planning, projects and technical assistance.

Pre-Disaster Mitigation Grants

The focus of the Pre-Disaster Mitigation (PDM) program funds hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. This program was authorized by the Stafford Act, 42 USC, as amended by the Disaster Mitigation Act of 2000.

Eligibility

Eligible applicants are states, territories, Indian tribal governments, communities, and universities. Funding these plans and projects should reduce overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations.

Eligible program funding is available for implementing cost-effective hazard mitigation activities that complement comprehensive mitigation programs, reduce injuries, loss of life, and damage and destruction of property.

A Local Hazard Mitigation Plan (LHMP) and a State or Tribal Standard, or Enhanced hazard mitigation plan in accordance with 44 CFR Part 201, approved by FEMA, are required to receive PDM funding.

Funding Terms

PDM grants are awarded on a competitive basis, without reference to state allocations, quotas, or other formula-based allocation of funds. FEMA may fund up to 75% of the eligible costs for disaster related projects. The grantee must provide a 25% match, which can consist of cash

and/or in-kind sources. Funding from other Federal sources cannot be used for the 25% share with one exception. CDBG funds can be used to meet the match requirement.

In addition, the Federal share shall not exceed \$1 million over three years for mitigation planning; and shall not exceed \$3 million over 3 years for mitigation projects.

Additional information may be obtained online at:
<http://www.fema.gov/government/grant/pdm/>

Hazard Mitigation Grant Program

The Hazard Mitigation Grant Program (HMGP) provides grants to States and local governments to implement long-term hazard mitigation measures after a major disaster declaration. Section 404 of the Stafford Act authorizes the HMGP, which is administered by the Federal Emergency Management Agency (FEMA). The purpose of the program is to reduce the loss of life and property due to natural disaster and to enable implementation of mitigation measures immediately after a disaster.

Eligibility

Eligible applicants are state and local governments, Indian tribes and other tribal organizations, and certain non-profit organizations that reside in a Presidentially declared disaster area. Projects must provide a long term solution to a problem, which reduces or eliminates losses from future disasters. Potential saving from the project must exceed the implementation costs. The project must also conform to the State Hazard Mitigation Plan.

Funding Terms

FEMA may fund up to 75% of the eligible costs for disaster related projects. The grantee must provide a 25% match, which can consist of cash and/or in-kind sources. Funding from other Federal sources cannot be used for the 25% share with one exception. CDBG funds can be used to meet the match requirement.

FEMA may be contacted at:

Federal Emergency Management Agency
Disaster Assistance
P.O. Box 10055
Hyattsville, MD 20782-7055
(800) 621-3362 (phone)
(800) 827-8112 (fax)
FEMA-Correspondence-Unit@dhs.gov (Email)

Additional information may be obtained online at:
<http://www.fema.gov/government/grant/hmgrp/>

12.2.7. Transportation

This report finds that, due to deferred maintenance, roads within the County are in substantial need of repair. In addition, the annual County budget alone, which is largely comprised of State Gas Taxes, Property Taxes, Proposition 42 funds, Transportation Development Act (TDA) Funds, Regional Surface Transportation Program (RSTP) Exchange Funds, is not sufficient to fund the rehabilitation of County roads. Programs, such as the establishment of additional Permanent Road Divisions or other special assessment or tax program, and development impact fees should be used to generate additional funds for road maintenance and construction.

- **Permanent Road Divisions.** A permanent road division is a geographic area formed pursuant to California Streets and Highways Code, Section 1160, et. Seq. to provide road improvements and road maintenance. Permanent Road Divisions require the preparation of an engineer's report that calculates and apportions the special benefit to each property within the division. Owners of properties that benefit would vote, pursuant to the provisions of Proposition 218, whether or not to approve the establishment of a division.
- **Community Facilities District.** AB 373 amended state law to include road and street light maintenance as services that can be provided through Community Facilities Districts. A generalized description of Mello Roos Community Facilities District Review Process is provided below.
- **Impact Fees.** Develop a basis for the collection of impact fees to fund new improvements.

Numerous transportation funding programs are available to Humboldt County jurisdictions. These programs are discussed in detail in the Humboldt County 2006 Regional Transportation Plan Update (HCAOG, 2006). A summary of transportation funding programs applicable to Humboldt County is provided in Appendix B. Transportation legislation and funding sources are described below.

Transportation Legislation

Two legislative acts provide the transportation funding for Humboldt County projects:

- Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)
- Transportation Infrastructure Finance and Innovation Act. (TIFIA)

These Acts are described in the following sections.

Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)

On August 10, 2005, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) was initiated. SAFETEA-LU guarantees a total of \$244.1 billion Federal dollars for highways, highway safety, and public transportation through 2009. This represents a 42 percent increase in average annual funding over the previous program, the Transportation Equity Act for the 21st Century (TEA-21).

The structure of SAFETEA-LU is similar to TEA-21. SAFETEA-LU encourages private investments and partnerships in constructing transportation facilities and provides opportunities for environmental streamlining, design-build contracting, and private toll projects.

Additional information may be obtained online at:

<http://www.fhwa.dot.gov/safetealu/index.htm>

Transportation Infrastructure Finance and Innovation Act

The Transportation Infrastructure Finance and Innovation Act of 1998 (TIFIA) established a Federal credit program for eligible transportation projects under the U.S. Department of Transportation (DOT). TIFIA provides three forms of credit assistance: secured (direct) loans; loan guarantees; and standby lines of credit. The primary TIFIA Program goal is to leverage Federal funds by attracting substantial private and other non-Federal investment in critical improvements to the surface transportation system of the nation. The DOT awards assistance to eligible applicants,

which include state departments of transportation, transit operators, special authorities, local governments, and private entities.

Additional information may be obtained online at:
<http://tiffia.fhwa.dot.gov/>

For more information on Federal and state transportation funding, visit the following sites, respectively:

1. <http://www.fhwa.dot.gov/federalaid/projects.cfm?progProj=curr>
2. <http://www.dot.ca.gov/hq/LocalPrograms/>

12.2.8. Law Enforcement

The County is in the process of preparing a facilities master plan that evaluates current and future facilities for County staff, including the Sheriff's Office. This document is expected to be complete by the end of 2007. When complete, this report will likely identify additional facilities needs for the Sheriff's Office relating to the service demands of current and future residents. In addition, this report finds that the Sheriff's Office currently lacks adequate staffing based on generally accepted measures. The most commonly used methods of generating revenue for expansion of facilities to accommodate growth is impact fees (see descriptions of impact fees above). The most commonly used method of generating revenue for expanded law enforcement services are Mello Roos Community Facilities Districts (see the generalized description of Mello Roos Community Facilities District review process above).

12.2.9. Street Lights

This report finds that there are numerous local agencies that provide street lights and that there are many locations within USAs and WSAs outside the boundaries of such agencies. Policies should also be considered that encourage special districts serving urban areas to seek LAFCo approval to provide street lighting services, where appropriate. This report also recommends that development standards be prepared that differentiate between urban and rural settings and that specify when street lights are required based on intersection type and functional classification as well as specify the type of light, wattage of lights, and the spacing of lights. Development standards should specify that certain project approvals be conditioned upon the installation of street lights and the acceptance of a mechanism to fund the operation and maintenance of lights, such as direct charges, special assessments, or special taxes. Such street light direct charges (or fees), special assessments, or special taxes would be developed in conjunction with and in the same manner as those supporting the operation and maintenance of other new facilities such as roads and storm drainage.

12.2.10. Parks and Recreation

This report finds that parks and recreation facilities and services are an important part of the urban setting and that there are locations within USAs and WSAs where such facilities and services are not available. This report also finds that policies should be considered that encourage special districts serving urban areas to provide parks and recreation services, where appropriate. Parks and recreation policies contained in the Eureka and McKinleyville community plans should be made to apply Countywide, and development standards should be prepared that specify the service area and types of parks to which new development should contribute. New policies should encourage that existing development also participate in the operation and maintenance of new park and recreation facilities and services to which they benefit. Funding mechanisms for parks and recreation are similar to those described above.

12.2.11. Funding Alternatives

Although grants and loans can provide for infrastructure funding, other options can be implemented to support needed public systems and facilities. Impact fees and development mitigation measures and agreements are other funding options, discussed in more detail below.

Developer Impact Fees

Developer impact fees are one-time charges for infrastructure projects that pay for required expansion of public facilities needed for new development. Many feasible approaches to charging for the provision of public facilities exist. However, in all cases the fees must be clearly related to the costs incurred as a result of the development. Additionally, fees cannot be used to correct existing problems or pay for improvements needed for existing development.

Development Mitigation Measures/Agreements

Establishment of mitigation measures may be required when developments have a significant impact on existing infrastructure. Generally, mitigation measures are imposed as conditions on tentative maps. These measures reflect required on and off site project mitigations to reduce impacts to existing development. Development agreements are also used to gain cooperation of developers in constructing off-site infrastructure improvements or dedicating rights-of-way needed as a result of the proposed development.

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Appendix A: Figures

Appendix B: Humboldt County Funding Opportunities

Appendix C: Transportation Funding

Appendix D: USDA Rural Development Funding