ROHNERT PARK GENERAL PLAN

REVISED DRAFT ENVIRONMENTAL IMPACT REPORT

SCH NO. 99062114

Prepared for the

City of Rohnert Park
Department of Planning and Community Development

by

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Mitigation Measures

There are no additional mitigation measures required.

Significance After Mitigation

This impact is less than significant.

4.10 WATER RESOURCES

This section addresses groundwater resources in the vicinity of Rohnert Park and water supply systems that serve the City, as well as water conservation measures and programs.

ENVIRONMENTAL SETTING

Groundwater Resources – Hydrogeology

The City of Rohnert Park is situated within the southern portion of the Santa Rosa Plain Groundwater Basin (Cardwell, 1958), which occupies a northwest-trending structural depression in the southern part of the Coast Range geomorphic province of Northern California. The Santa Rosa Plain is an asymmetrical shaped basin, with the lowest area present along the course of the Laguna de Santa Rosa, a swampy intermittent stream that flows northward along the western edge of the basin. The ground surface in the vicinity of Rohnert Park ranges from approximately 200 feet above mean sea level (msl) in the east, to approximately 90 feet in the vicinity of the Laguna de Santa Rosa.

The basin is bounded by the Sonoma Mountains to the east and hills of the Mendocino Range to the west. The Sonoma Mountains are principally composed of flows from the Sonoma Volcanics, which have been uplifted along the Healdsburg-Rogers Creek Fault Zone, and range in elevation from approximately 200 feet msl at their base to maximum elevations of approximately 1,400 feet msl. The hills of the Mendocino Range to the west of Rohnert Park consist of structurally controlled occurrences of the Petaluma Formation and Sonoma Volcanics, and range in elevation from approximately 100 feet msl at their base to maximum elevations of approximately 400 feet msl. The Santa Rosa Plain Groundwater Basin is separated from the Petaluma Valley to the south by hills comprised of structurally controlled (uplifted) occurrences of the Petaluma Formation and Sonoma Volcanics. Surface water enters the basin through streams originating in the highlands east and west of the basin, and discharges to the Laguna de Santa Rosa.

Principal Water-Bearing Deposits

The primary water-bearing units which comprise the southern portion of the basin in the vicinity of Rohnert Park consist of: (1) unconsolidated alluvial deposits of Recent and Pleistocene age; and (2) the Pleistocene and Pliocene-aged Glen Ellen and Wilson Grove (formerly Merced) Formations. Other water-bearing units present within the basin include

the Pliocene-aged Sonoma Volcanics and Miocene-aged Petaluma Formation. While appreciable amounts of groundwater can be obtained from portions of the Sonoma

Volcanics, it is generally of poor chemical quality and therefore the volcanics are not considered a primary source of drinking water in the area. The Petaluma Formation is primarily comprised of tightly folded continental and brackish water clay-rich sediments. Due to the fine-grained and deformed nature of these deposits and reported low groundwater yields, the Petaluma Formation is not considered a significant water-bearing unit within the basin (CDWR, 1979).

The following summary provides a description of the principal water-bearing deposits that comprise the basin within the vicinity of Rohnert Park.

- The unconsolidated alluvial deposits consist of alluvial fan, stream channel, and stream terrace deposits. The alluvial fan sediments originated from erosion of the Sonoma Mountains to the east of the basin and generally thicken towards the west. The alluvial deposits are typically comprised of lenticular beds of well-graded sands, gravels, and clays.
- The Pleistocene-aged Glen Ellen Formation is primarily composed of stratified, but poorly sorted alluvial fan and floodplain deposits consisting of sands, clays and gravels of continental origin. The deposits vary widely in extent and thickness and grade over short distances (both laterally and vertically) into one another. The formation is generally weakly to moderately consolidated and locally cemented (Cardwell, 1958). The lithology of the Glen Ellen Formation is similar to that of the overlying alluvial fan deposits and the two units are often grouped together as a single water-bearing unit. The combined thickness of the alluvial deposits and the Glen Ellen Formation in the vicinity of Rohnert Park ranges from approximately 200 to 400 feet. The specific yield of the two units has been estimated to range from 8 to 17 percent and many of the City of Rohnert Park municipal wells are completed in these deposits (CDWR, 1982). The lower portions of the Glen Ellen Formation were likely deposited contemporaneously with the Pliocene-Pleistocene-aged Wilson Grove Formation and the two formations are locally interbedded.
- The Wilson Grove Formation is composed primarily of fine- to medium-grained fossiliferous marine sand and sandstone containing sandy clay, pebbly beds, and sparse gravel lenses. Strata are generally compact but unconsolidated in the upper part of the formation, and weakly consolidated in the basal part. The thickness of the Wilson Grove Formation in the vicinity of Rohnert Park ranges from approximately 100 to 400 feet. The specific yield of the unit has been estimated to range from 10 to 50 percent and many of the City of Rohnert Park municipal wells are completed within this formation (CDWR, 1982).

Groundwater Conditions

Groundwater within the principal water-bearing deposits is generally present under unconfined conditions, except locally in the vicinity of clay or silt horizons where conditions may be semi-confined. Recharge to the basin occurs primarily through infiltration of precipitation along the boundaries and through infiltration from streams draining from the

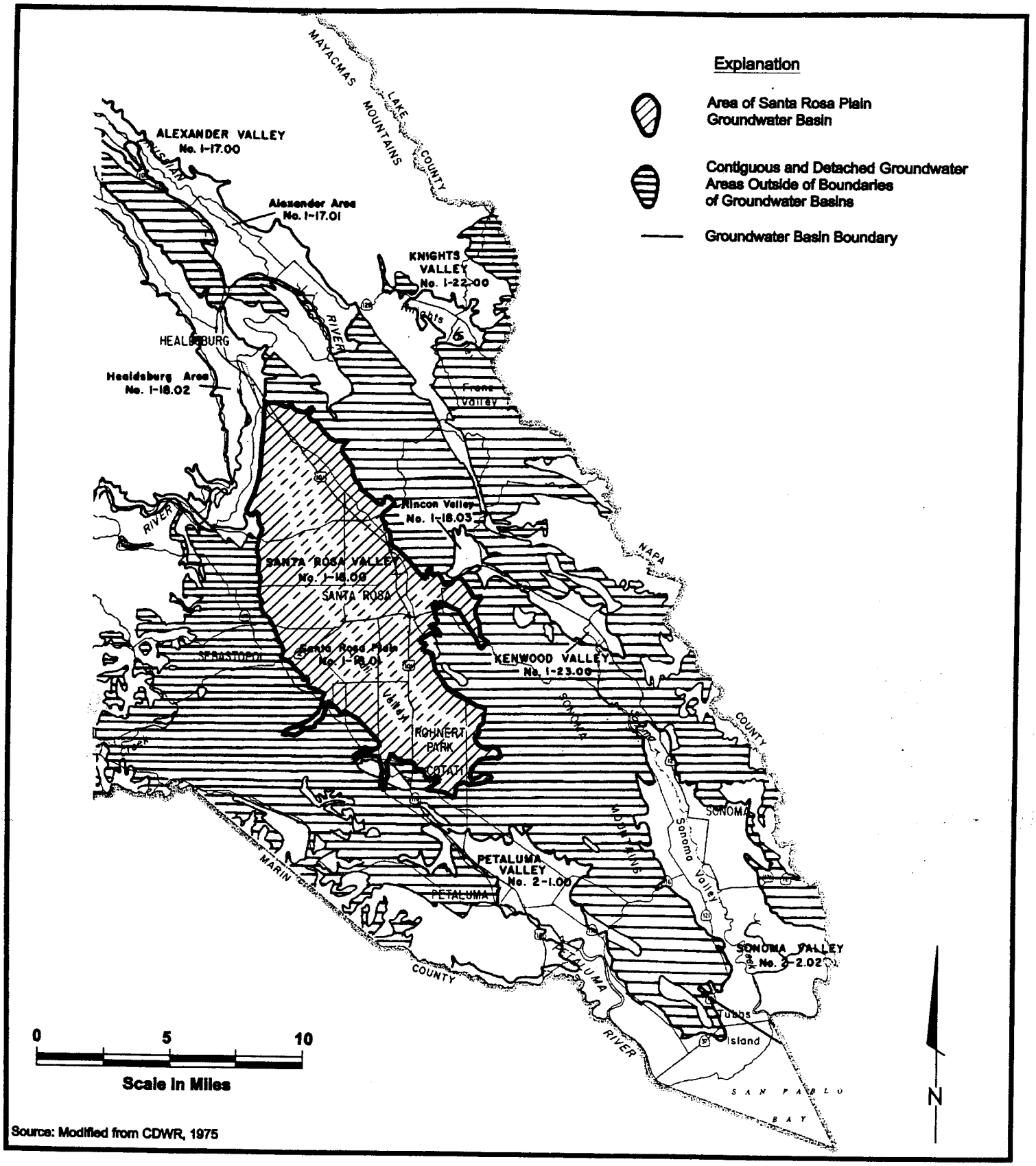
surrounding highlands. A lesser amount of recharge also occurs from infiltration of precipitation through alluvial fan deposits. Recharge in the immediate vicinity of Rohnert Park is limited by fine-grained deposits that are present to depths of up to 240 feet below ground surface (CDWR, 1979). Groundwater is extracted from the basin through wells and leaves the basin as both subsurface outflow and groundwater discharge to the Laguna de Santa Rosa.

Groundwater Levels

Groundwater level monitoring performed by the U.S. Geological Survey from 1949 to 1952 indicates that under natural conditions, prior to extensive pumping of groundwater for agricultural and municipal uses: (1) groundwater was generally present at depths ranging from 5 to 20 feet below ground surface (bgs); and (2) groundwater flowed in a general northwest direction across the basin and discharged to the Laguna de Santa Rosa (Cardwell, 1958). Cardwell noted that a relatively flat hydraulic gradient was present across the southern portion of the basin and likely reflected (1) the flat topography, and (2) a relative increase in the water-transmitting capacity of the deposits in this area of the basin.

The California Department of Water Resources (CDWR) performed groundwater studies of the Santa Rosa Plain in 1975 through 1984, which included a focused study of the City of Rohnert Park's municipal well system. Based on their study, the CDWR concluded: (1) groundwater levels beneath the City of Rohnert Park were gradually lowering over time; and (2) at the time of their study (1979) City water wells did not appear to have an effect on groundwater levels in domestic wells outside the City limits, except for in the vicinity of Wilfred Avenue.

Hydrographs of non-pumping groundwater levels were constructed by PES from selected City of Rohnert Park municipal wells from 1974 through 1999. In general, the hydrographs indicate groundwater levels beneath the existing City limits continued to decline in response to municipal pumping from the time of the CDWR studies, until 1988, when groundwater levels tended to stabilize. City wells that continued to exhibit a downward trend in groundwater levels through 1999 are primarily located along the eastern boundary of the City where the thickness of the primary water-bearing deposits is the thinnest. Groundwater derived from the Santa Rosa Plain Groundwater Basin is also used as a source of water for municipal, domestic, industrial and agricultural purposes in the surrounding areas of Rohnert Park including Cotati, Sonoma State University, Penngrove, Santa Rosa, and rural communities.



Source: Modified from CDWR, 1975

PES Environmental, Inc.
Engineering & Environmental Services

Figure 4.10-1

Location Map Santa Rosa Plain Groundwater Basin

Groundwater Quality

The chemical quality of groundwater pumped from the City of Rohnert Park municipal wells is generally considered good to excellent (CDWR, 1979), although the water is considered moderately hard and may have objectionably high iron and manganese content. The chemical composition is predominantly calcium-magnesium bicarbonate, with reduced amounts of sodium and chloride. Hydrogen sulfide and elevated concentrations of boron may also be present in groundwater from wells completed within the Sonoma Volcanics. To minimize the presence of hydrogen sulfide and/or boron, the City of Rohnert Park has taken measures to seal off these zones penetrated by municipal wells.

Water Supply

City of Rohnert Park

The City of Rohnert Park currently derives its drinking-water supply from a wellfield consisting of 42 municipal supply wells, 31 of which were active in 1999, and eight active connections to the Sonoma County Water Agency (SCWA) Petaluma Aqueduct, which supplies water from the Russian River. Table 4.10-1 presents the amount of water supplied by each source. The total amount of water pumped from the 31 operational wells in 1999 was approximately 1.5 billion gallons. The wells range from approximately 280 to 1,500 feet in depth. The majority of the wells pump from water-bearing zones present within the alluvial fan deposits, Glen Ellen Formation, and Wilson Grove Formation located from 200 to 1,200 feet bgs. Of the 11 inactive municipal supply wells located in the City of Rohnert Park wellfield, five were never developed and are used for static water-level measurements only. The remaining six inactive wells were not used in 1999 due to decreases in well production and/or well maintenance. Sources of water for agricultural purposes in the vicinity of Rohnert Park also include groundwater from private wells and water from reclaimed-water projects.

Table 4.10-1:
Water Sources and Consumption, 1999

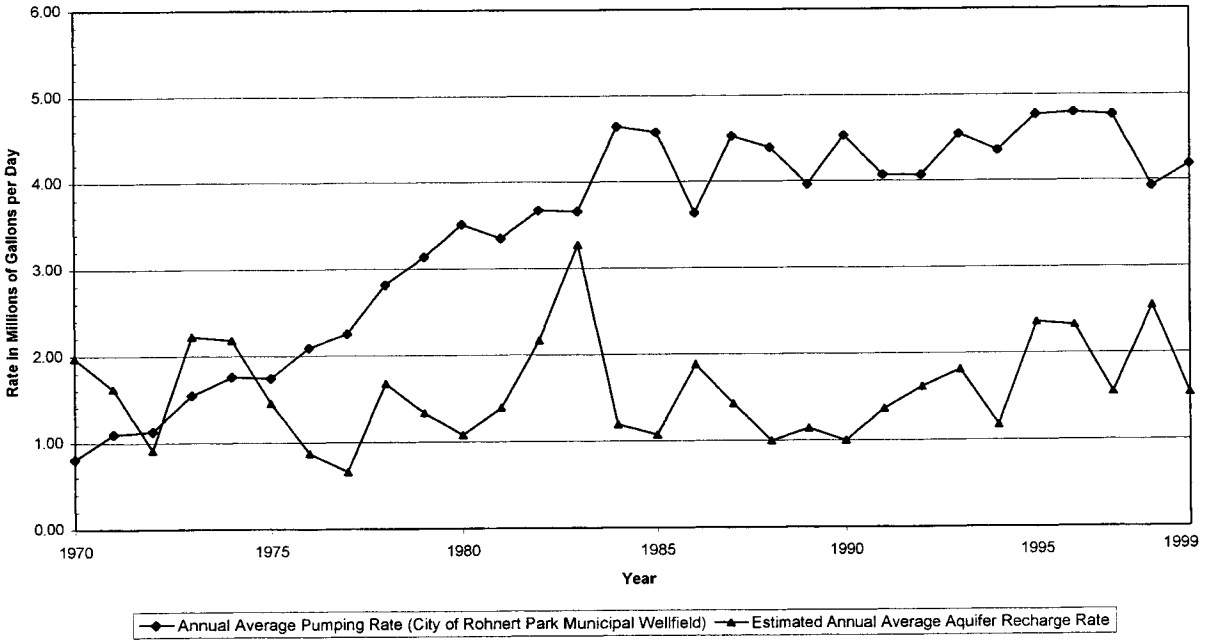
	Water Provision (mgd)	*Percent of Total*
Municipal Wells	4.19	61
SCWA Petaluma Aqueduct	2.68	39
Total	6.87	100

Source: City of Rohnert Park

No sites within the existing City limits use private wells for drinking-water supply, although many sites outside the City limits do, including Canon Manor and Sonoma State University. The private wells in the Canon Manor area are usually less than 200 feet in depth. Sonoma State University maintains and operates their own municipal well field that consists of three municipal supply wells. In 1999, two wells were operated by SSU which produced a total of approximately 13 million gallons of water for the year (0.04 mgd).

Since at least 1966, it was less expensive for the City to pump groundwater as a source to supplement water-supply requirements, than to purchase water from the SCWA. However, over time, purchasing water from the SCWA became less expensive due to increased energy costs and capital and operation costs associated with maintaining a wellfield. Also, groundwater pumping has been affected by increasing well maintenance requirements. Hence, since the mid-1990s, the City has used additional SCWA water and relied less on their municipal wellfield; the excess well capacity serves as a back-up system in case of emergency situations or drought conditions. The annual average production rates for the City's municipal wellfield from 1970 through 1999 are shown graphically on Figure 4.10-2. The production rates range from an annual average of approximately 0.8 mgd in 1970 to 4.8 mgd in 1994.

Figure 4.10-2. Annual Average Rates of Recharge and Pumping
MODFLOW Groundwater Simulations
1970 through 1999



Sonoma County Water Agency

SCWA provides potable water to more than 500,000 people in Sonoma and Marin counties. Rohnert Park receives SCWA water from the Petaluma Aqueduct. The source of the aqueduct water is the Dry Creek watershed. Dry Creek water is captured behind Warm Springs Dam in Lake Sonoma. This water is released, and conveyed down Dry Creek to the Russian River, where it is then diverted into the SCWA basins.

In 1999, Rohnert Park's entitlement to SCWA water was 1.0 mgd, but the City was able to purchase additional water beyond its entitlement. In 1998, the City used 2.62 mgd (annual average) of SCWA water; Rohnert Park was provided additional water from the unused allocation of another SCWA member, the North Marin Water District (NMWD). In 1991, the City of Petaluma entered into an agreement with the NMWD that allows NMWD to take excess water from Petaluma's allocation in exchange for granting the City of Petaluma permission to connect to the NMWD aqueduct. Since then, Rohnert Park has continued to use NMWD's excess allocation.

To continue to provide a safe, economical, and reliable water supply to meet the future needs of SCWA's service area, SCWA proposed the Water Supply and Transmission System Project (WSTSP) in 1998. When fully constructed and operational, the WSTSP will increase the amount of water that can safely be, and increase SCWA's delivery capacity to its service area. The capacity has been allocated via the Eleventh Amended Agreement For Water Supply, which will result in an allocation of 15 mgd to Rohnert Park.

However, due to delays in implementation resulting from litigation and regulatory constraints, all facilities associated with the WSTSP have not been constructed. As a result of SCWA's ongoing Federal Endangered Species Act compliance efforts for listed salmonid species and current litigation on the WSTSP Environmental Impact Report, SCWA estimates that their new water facilities will not be constructed for ten years. Consequently, current limitations exist in the Transmission System primarily due to temporary impairment during summertime water production and new development within the service area.

As of 2000, a Memorandum of Understanding (MOU) Regarding Water Transmission System Capacity Allocation During Temporary Impairment has been established between the SCWA and the eight public parties to whom the SCWA provides water supply. The purpose of the MOU is to establish a procedure to optimize allocation of the available supply of SCWA water among the eight public parties during the projected period of temporary impairment of Transmissions System capacity. As part of the MOU, a temporary delivery capacity allocation (that remains in effect until September 2010) was developed which includes the schedule presented in Table 4.10-2 for the City of Rohnert Park. The delivery rates are based on historic maximum monthly demand plus 2% per year population growth.

Table 4.10-2:
Temporary Delivery Capacity Allocation – Rohnert Park
SCWA Average Day Maximum Month Delivery Rate

	Rates in mgd
2000	4.8
2001	4.8
2002	4.8
2003	5.2
2004	5.3
2005 – 2010	5.3

As previously stated, following completion of SCWA's WSTSP and commencing not later than 2010, thje City of Rohnert Park's entitlement to water provided by the SCWA is planned to increase to the average rate of 15 mgd.

State Requirements on Water Studies

The following California state agencies are responsible for approving the following aspects of the WSTSP:

- The Department of Fish and Game prepares streambed alteration agreements for all projects involving work in streams. The Department of Fish and Game also oversees the Endangered Species Act and is responsible for protecting plant and wildlife populations.
- The State Water Resources Control Board is responsible for approving new water rights and any changes in water rights permits.
- The Regional Water Quality Control Board (North Coast and San Francisco Bay Regions) is responsible for approving projects that may affect the water quality of waterways in the project area.
- The State Lands Commission issues permits for work within state lands that are navigable waterways and areas below high water marks.
- The State Department of Health Services issues permits for public water supply systems.

Water Conservation

The City of Santa Rosa has a National Pollution Discharge Elimination System (NPDES) permit to release treated wastewater from the Laguna Water Reclamation Treatment Plant and use it as a source of water primarily for agricultural and urban irrigation uses. On March 1, 2000, the State Board approved an incremental capacity increase for the Subregional System, increasing the permitted amount of released water from 18 mgd to 19.2 mgd. The allocation of this increased capacity has yet to be negotiated. On March 15, 2000, the State

Board approved the Geysers Recharge Project, which will increase the treatment plant's capacity further to 21.2 mgd, contingent on completion of the project. [17] More information regarding the Geysers Recharge Project may be found in Section 4.11.

Discharge Reduction

Discharge reduction programs are used to limit wastewater discharge, and reuse of reclaimed water, rather than discharge, is the primary method of wastewater disposal. Discharge reduction programs include the use of water-efficient devices and water-efficient use patterns for both residential and non-residential uses. Strategies used by Rohnert Park include:

- Distribution of information and conservation devices;
- Required low flush toilets and low flow showers for new residential development (required by State law);
- Toilet and shower replacement program, which includes give-aways, rebates, and direct installation; and
- Water metering of all new residential uses (although all single-family homes continue to pay a flat rate).

The City's Water Shortage Contingency Plan establishes water supply thresholds that trigger automatic restrictions on water use, regardless of precipitation rates.

Reclaimed Water

Rohnert Park uses approximately 10 million gallons of reclaimed water per month in summer months and is one of the largest users of reclaimed water in the county. Approximately 270 acres in Rohnert Park and on the SSU campus use reclaimed water, out of 570 "urban" acres countywide[18]. Rohnert Park uses reclaimed water for irrigation of trees and landscaping throughout the city. Sites in Rohnert Park that use reclaimed water include all parks and school grounds south of Golf Course Drive, the North and South Rohnert Park Municipal Golf Courses, Roberts Lake, and various commercial and industrial sites, including Hewlett Packard, State Farm, Press Democrat, Compumotor, and Fresh Choice.

County Water Management

The Sonoma County *Urban Water Management Plan (1996)* outlines long-term policies for water supply and conservation for cities in the county. The plan includes policies for water conservation and best management practices for efficient water use, expansion of the water supply and transmission system, water shortage contingency plans, and use of recycled water. Rohnert Park has implemented many of these strategies in the Plan, including:

- Provision of low-flow toilet retrofit devices;

[17] Email correspondence with Scott Stinebaugh, Deputy Director of Utilities Operations, City of Santa Rosa, April 20, 2000..

[18] Letter from Scott Stinebaugh, Deputy Director of Utilities Operations, City of Santa Rosa, Subregional Water Reclamation System, to Joseph Ferrucci, Dyett & Bhatia, July 27, 1999.

- Provision of coupons for efficient showerheads, faucet aerators, and toilet dye-tabs;
- Requirements of efficient plumbing fixtures and low-flow toilets in new construction;
- Leak monitoring and notification;
- Metering of new construction and retrofit of single-family homes with meters;
- Landscape irrigation audits;
- Water-efficient landscape guidelines;
- Distribution of water conservation information;
- Education programs about pollution and groundwater concepts for students;
- Use of reclaimed wastewater for irrigation of turf and landscaped areas;
- Review of new commercial and industrial construction for water and wastewater conservation;
- Maintaining a full-time Water Conservation Specialist as part of City staff; and
- Ultra low-flush toilet replacement.

IMPACTS AND MITIGATION MEASURES

Water Supply and Conveyance System Requirements

In 1999, average annual water use in Rohnert Park was 6.87 mgd (Table 4.10-1); an annual average of 4.19 mgd of water was derived from the City of Rohnert Park's municipal well system and an annual average of 2.68 mgd of water was obtained from SCWA water allocations to Rohnert Park (1.0 mgd entitlement) and an unused portion of NMWD's allocation (1.68 mgd). As of 1999/2000, Rohnert Park's population is approximately 41,000. Applying the 1999 average annual water use of 6.9 mgd and a population of 41,000, it is projected that the City's water supply requirement to meet the year 2020 buildout at a population of 50,400 is estimated to be an annual average of 8.5 mgd.

On the basis of SCWA's allocation schedule developed for Rohnert Park as presented in Table 4.10-2, and the planned increase for an entitlement of 15 mgd by 2010, the City's reliance on groundwater from their municipal wellfield to meet future demands through the 2020 buildout is summarized below in Table 4.10-3. As indicated, the planned SCWA entitlement of 15.0 mgd by 2010 would fulfill future growth demands from 2010 through 2020, and allow the City to reserve municipal wellfield production for backup and emergency supply purposes. However, during the interim, the City will continue to rely on their municipal wellfield as a source of water to supplement the SCWA allocation schedule. Production requirements from the municipal wellfield are estimated to range from 1.9 mgd in 2004, to 2.3 mgd in 2009.

Table 4.10-3:
Schedule and Sources for Projected Water Supply Requirements
Average Annual Estimates

	Water Supply Requirement (mgd)	*Allocation from SCWA (mgd)*	*City of Rohnert Park Municipal Wellfield (mgd)*
2000	6.89	4.8	2.09
2001	6.97	4.8	2.17
2002	7.05	4.8	2.25
2003	7.12	5.2	1.92
2004	7.20	5.3	1.90
2005	7.28	5.3	1.98
2006	7.36	5.3	2.06
2007	7.44	5.3	2.14
2008	7.52	5.3	2.22
2009	7.60	5.3	2.30
2010	7.68	15.0	Backup & Emergency Supply
2020	8.47	15.0	Backup & Emergency Supply

Although the infrastructure associated with the current water distribution system is adequate to serve areas within the existing City limits, new development extending to the 2020 Urban Growth boundary would necessitate the installation of additional distribution lines to serve the new areas.

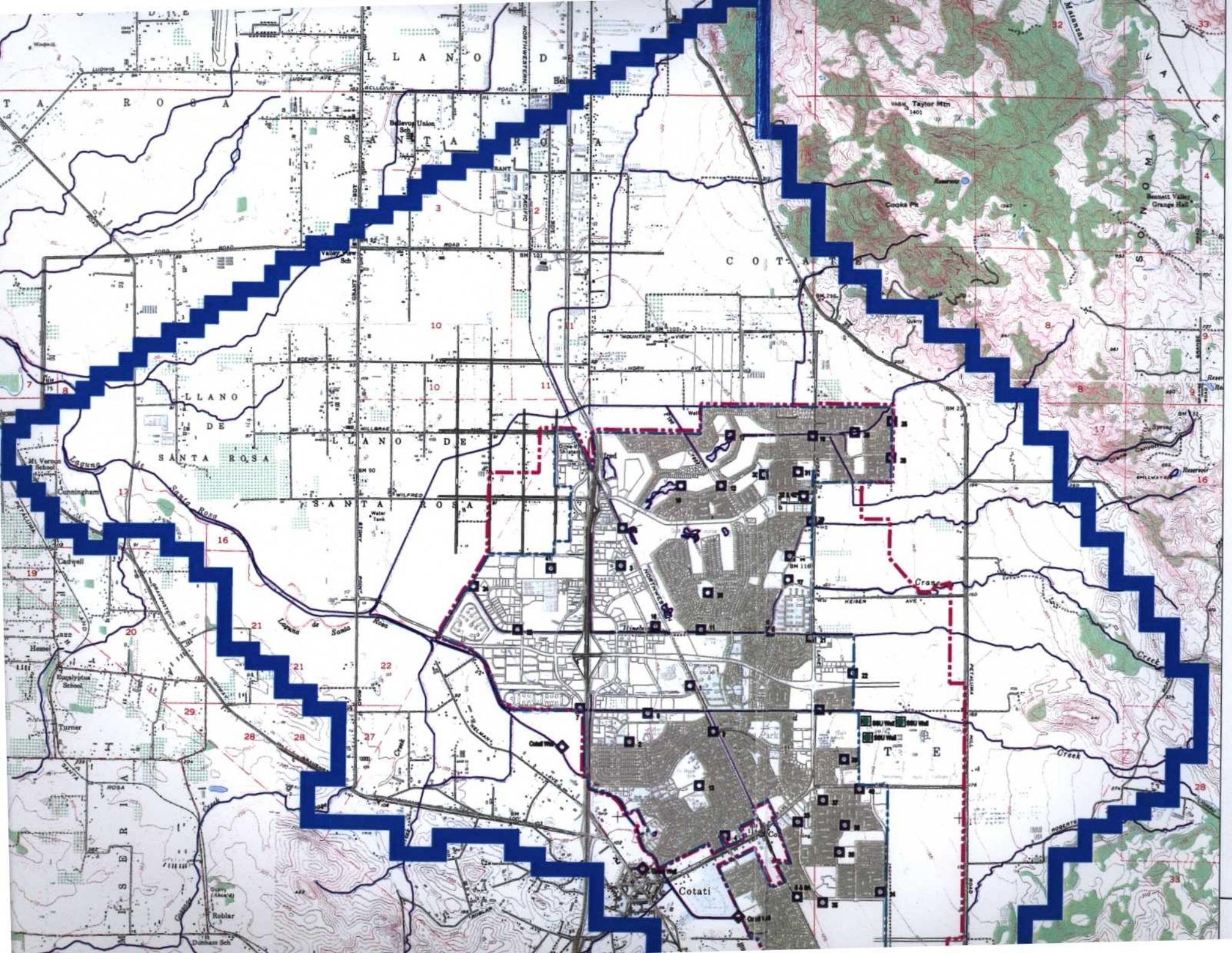
Thresholds of Significance

A significant impact would occur with full implementation of the Rohnert Park General Plan in the event:

- Operation of the municipal wellfield at rates in accordance with the above schedule results in substantial lowering of groundwater levels in the vicinity of the proposed Urban Growth Boundary.

Impact Analysis Methodology

A groundwater flow model was developed and calibrated to assist in the analysis of groundwater pumping influences resulting from operation of Rohnert Park's municipal wellfield. The groundwater model used for this analysis was MODFLOW, a three-dimensional numerical computer code developed by the U.S. Geological Survey (McDonald and Harbaugh, 1988). In addition to use of the groundwater model, actual groundwater elevation measurements obtained from the City's municipal wells were used to assess trends in groundwater levels as part of the impact analysis.


LLANO DE SANTA ROSA
SANTA ROSA
COTATI
Cotati
Taylor Mtn
Cooks Pk
Bennett Valley Grange Hall
Mt Vernon School
Cunningham
Cadwell
Hessel
Eucalyptus School
Turner
Roblar
Dunham Sch
Valley View Sch
Bellevue Union Sch
Laguna de Santa Rosa
Santa Rosa Creek
Petaluma River
Keiser Creek
Roberts Creek
Sources:

Data obtained for development of the groundwater model were derived from a number of published and unpublished reports and files from the California Department of Water Resources, U.S. Geological Survey, City of Rohnert Park, City of Cotati, Sonoma State University, and City of Santa Rosa. Quarterly and/or monthly groundwater elevation data; precipitation; and pumping data from 48 municipal supply wells in the vicinity of the proposed Urban Growth Boundary and within the approximate 4½-mile wide by 6½-mile long model domain were collected for a 29-year period from 1970 through 1999. Figure 4.10-3 shows the model domain, grid, and location of municipal supply wells. Of the 47 wells; 42 belong to Rohnert Park and are located within the existing City limits, 3 are located at Sonoma State University (outside the existing City limits and within the proposed Urban Growth Boundary), and 3 wells belong to the City of Cotati.

MODFLOW uses a block-centered finite-difference grid, in which nodes are located at the center of each finite-difference block. A uniform grid size of 500 feet by 500 feet was used resulting in 105 columns and 82 rows. The model consists of one layer used to simulate groundwater flow in the primary water-bearing units (Recent alluvium, and Glen Ellen and Wilson Grove Formations) from which the vast majority of groundwater is produced within the model domain. The combined thickness of these formations ranges from approximately 100 feet near the perimeter of the model, to 1,200 feet at the center. The groundwater model was simulated as an unconfined aquifer.

The initial objective of the groundwater flow simulations was to evaluate and calibrate historical responses of groundwater elevations to steady-state and transient conditions. Steady-state simulations were performed and calibrated to observed groundwater elevations for 1952 and 1970. The transient model was then constructed to simulate and calibrate to historical groundwater fluctuations in response to pumping conditions for various time periods from 1970 through 1989. Historical matching, sensitivity analyses, and model calibration were performed to assess the uncertainty in selected input parameters, such as hydraulic conductivity and areal recharge from precipitation. Acceptability of model results was determined by comparing simulated and observed groundwater elevations. During the calibration process, changes were made to input parameters over an associated group of grid blocks rather than on a grid-by-grid basis and made within a reasonable range of parameter values.

Once calibrated, the groundwater model was used to simulate groundwater elevations in response to groundwater pumping, and estimate annual average recharge rates within the model domain from 1970 through 1999. For the purpose of performing the subject impact analysis, modeling results were used to:

- Estimate the range of annual average recharge rates for simulations performed in 1952, and 1970 through 1999. The annual average recharge rates calculated for the model domain were used to estimate rates at which the City's municipal wellfield could be operated without adversely affecting groundwater elevations within the model domain. The annual average rates of recharge and pumping for the model simulations performed from 1970 through 1999 are shown graphically on Figure 4.10-2; and

- Compare estimated annual average recharge rates with requirements of the City's municipal wellfield in accordance with the schedule for the General Plan presented in Table 4.10-3.

Analysis of Impacts

Impact 4.10-a: Production of groundwater resources may result in the lowering of groundwater levels in the vicinity of the proposed Urban Growth Boundary. (Significant)

Results of modeling simulations performed for 1952 and 1970 through 1999 indicate estimated annual average recharge rates within the model domain ranged from 0.66 mgd during the drought in 1977, to 3.28 mgd during a year of above average annual precipitation in 1983. Comparison of the range of estimated annual average recharge rates (0.66 to 3.28 mgd) with the City's municipal wellfield requirements during implementation of the General Plan (1.9 to 2.3 mgd as indicated in Table 4.10-3), indicates the potential for short-term impacts to occur during years of implementation from 2000 through 2009 if annual average recharge is less than 1.9 to 2.3 mgd. Annual average recharge would be less than 1.9 to 2.3 mgd if annual precipitation is less than 36 to 44 inches. The magnitude of the impact, if any, depends on the amount of precipitation in years 2000 through 2009. Any potential impact would cease commencing in the year 2010 when Rohnert Park's entitlement to water provided by the SCWA is planned to increase to the average rate of 15 mgd.

Comparison of the City's municipal wellfield requirements in accordance with Table 4.10-3 and the estimated average annual recharge rate (1.60 mgd) based on modeling simulations performed for 1952 and 1970 through 1999 indicates production requirements would exceed the average annual recharge rate by a range of 0.30 mgd in 2004, to 0.70 mgd in 2009. In comparison, historical production from the City's municipal wellfield has exceeded the estimated average annual recharge rate (1.60 mgd) by a range of 0.15 mgd in 1975, to 3.20 mgd in 1996. Historical production rates from the City's municipal wellfield over the past decade (1989 through 1999), have exceeded the estimated average annual recharge rate by a range of 2.36 mgd in 1989, to 3.20 mgd in 1996. Hence, although the impact of "groundwater overdraft" from the model domain area is potentially significant during the General Plan, the magnitude of the impact is substantially less in comparison to the past decade.

Further analysis of groundwater conditions within the proposed Urban Growth Boundary were performed based on comparison of historical groundwater elevations obtained from 1970 through 1999. In general, observed groundwater levels from 1970 to 1999 indicate the decline of groundwater levels ranges from approximately 35 feet in the northwest perimeter of the proposed Urban Growth Boundary, to approximately 100 to 150 feet along the eastern boundary. Under a reasonable worst case scenario of the City's municipal wellfield requirements in accordance with Table 4.10-3 and the estimated average annual recharge rate (1.60 mgd), the recovery of groundwater levels within the proposed Urban Growth Boundary is expected to begin during the year 2000 due to an increased interim SCWA allocation (as described above and listed in Table 4.10-3). With the increased allocation, wellfield production demand will decrease in comparison to the past decade. On the basis of demand

requirements presented in Table 4.10-3, the potential impact to groundwater conditions will be eliminated or substantially reduced beginning in the year 2010, when Rohnert Park's production demand from their municipal wellfield can be reserved primarily for backup and emergency supply.

Policies Proposed by the General Plan That Reduce the Impact

The following mitigation measures will minimize potential short-term impacts to a less-than-significant level, by securing additional allocations of SCWA water to meet projected demand and implementing water conservation strategies to help reduce demand:

PF-11 Based upon the groundwater study prepared for the City in May, 2000 entitled City of Rohnert Park Groundwater Study, monitor the operation of the municipal well field on a monthly basis to ensure that production does not exceed the recharge rates quantified in the study so as to result in a substantial lowering of groundwater levels in the vicinity of the Urban Growth Boundary.

PF-11A Develop a monthly municipal wellfield monitoring program that (i) identifies points of compliance; (ii) establishes the factors to be considered in determining when production which exceeds the recharge rates will result in a substantial lowering of groundwater levels; and (iii) includes any other information necessary to implement PF 11.

PF-11B In the event that the monthly municipal wellfield monitoring program concludes that a substantial lowering of groundwater levels in the vicinity of the Urban Growth Boundary will occur because development proposed in the area outside the existing City limits as of July 1, 2000 requires production that exceeds the appropriate recharge rates, the City shall either disapprove such development or deny such development connection to the water system until such time that the program concludes that the City is in compliance with the standard established in PF-11.

PF-12 Work with the Sonoma County Water Agency and other water contractors who rely on the Petaluma Aqueduct System to ensure adequate water deliveries for all the contractors' needs.

PF-13 Continue to collect and analyze monthly groundwater level data to assist in management and operation of Rohnert Park's municipal wellfield.

PF-15 Continue to require water-conserving devices for all new development.

PF-16 Require non-residential uses to implement water conservation practices as a condition of development.

PF-17 Develop a comprehensive wastewater flow reduction program for existing and new non-residential uses.

PF-18 Work with SCWA to offer rebates on water bills for non-residential uses that reduce water usage.

PF-19 In cooperation with the business community, develop best management practices for water conservation for Rohnert Park business, and then make the information available to the public.

PF-21 Continue to use reclaimed wastewater to irrigate parks, recreational facilities, and landscaping.

PF-22 Adopt and implement a comprehensive water conservation program to encourage efficient water use by City employees and other users of City facilities.

Mitigation Measures

In addition to the above General Plan policies, the following mitigation measures should be adopted as City policy:

1. Commit to implement Best Management Practices (BMPs) of water conservation. Such measures include:

    - Requiring meters for all new connections and billing by volume of use
    - Establishing a program for retrofitting existing unmetered connections and billing by volume of use.
    - Identifying intra- and inter-agency disincentives or barriers to retrofitting mixed use commercial accounts with dedicated landscape meters, and conducting a feasibility study to assess the merits of a program to provide incentives to switch mixed use accounts to dedicated landscape meters.

2. Implement applicable large landscape conservation programs and incentives, as identified in the proposed MOU Regarding Water Transmission System Capacity Allocation During Temporary Impairment (4/24/00).

3. Adopt a water conservation rate schedule that: increases as the quantity of water used increases (i.e., a tiered rate schedule); and/or provides seasonal rates or excess-use surcharges to reduce peak demands during summer months.

Significance after Mitigation

Policies in the General Plan and above recommended mitigation measures would minimize potential short-term impacts resulting from operation of the City's municipal wellfield during implementation of the buildout of the General Plan. The potential short-term impacts of the General Plan, if any, would very likely be reduced to a less-than-significant level. Any potential impact would cease commencing in the year 2010 when Rohnert Park's entitlement to water provided by the SCWA is planned to increase to the average rate of 15 mgd.