County of Santa Cruz 183

COUNTY ADMINISTRATIVE OFFICE

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SUSAN A. MAURIELLO, J.D., COUNTY ADMINISTRATIVE OFFICER

January 15, 1999 Agenda: January 26, 1999

BOARD OF SUPERVISORS
County of Santa Cruz
701 Ocean Street
Santa Cruz, CA 95060

WATER RESOURCES MANAGEMENT

Dear Members of the Board:

On September 15, 1998 your Board received a status report on the County's Water Resources Management efforts and directed that a further report be presented on this date.

In conjunction with the last report, your Board also directed that the Personnel Department complete the classification process for three approved water resources-related positions including the new Water Resources Manager, that the positions be filled as soon as possible and that County staff continue to participate in the Water Resources Agency Working Group.

Since that time, all three positions have been classified. An Environmental Health Aid position was classified and filled within Environmental Health Services. The staff person is now working to update the County's water quality/quantity data base and is reviewing private well water usage. A Resource Planner III (RP Ill) position and a Water Resources Manager (WRM) position have been classified in the Planning Department. The RP III recruitment is now underway and the position is anticipated to be filled in mid-February. The WRM position has been classified, the recruitment and interviews completed and the position is anticipated to be filled by early February.

Staff has continued meetings with the water districts through the Water Resources Agency Working Group. Consensus has been reached on both the Water Resources Management Issues Fact Sheet, as well as the Goals, Objectives and Strategies. Copies of these documents are attached in both underline and strike out (showing

changes from the May, 1998 version originally presented to your Board) **and in finished** form. Importantly, consensus has also been reached among participating agencies that the County's major water resources problems can best be addressed through regional solutions with the participation of all local water agencies. The focus of the working group is now on identifying the various agencies' water augmentation efforts as well as working toward a regional water conservation plan.

More details on these efforts and the overall Water Resources Management Program, together with specific action oriented recommendations will be provided to your Board once the Water Resources Manager position has been filled.

It is therefore RECOMMENDED that your Board accept and file this report and direct the Planning Department in consultation with Environmental Health Services and the County Administrative Office to report back on March 23, 1999.

Very truly yours,

for SUSAN A. MAURIELLO
County Administrative Officer

SAM/PCR/ts:s/waterrep

cc: Planning Department
Environmental Health
Water Resources Agency Working Group

Water Resources Management in Santa Cruz County

Goals, Objectives, and Strategies

Reviewed by the Interagency Water Resources Working Group.

Goals:

1. Through water conservation, maximizing and sharing existing supplies, and developing new sources, balance available water supply and demand (so that the amount of groundwater pumping is sustainable and there is adequate supply for existing and planned uses, including fisheries, riparian, and other instream uses, minimizing adverse impacts).
2. In the next 5-10 years, maintain existing summer stream baseflows at current levels; in the next 10-20 years implement strategies to maximize summer baseflows.
3. Within the next 10 years, stabilize or reduce seawater intrusion rates; within the next 20 years stabilize seawater intrusion fronts.
4. Prevent any further degradation of water quality by pollution of surface water, groundwater, or marine waters; within the next 10 years, eliminate sources of pollution so that all water quality standards are met.
5. Increase water conservation for all water uses and establish consistent programs for reducing demand by all users (including agriculture and domestic) within a common basin.

Countywide Objectives

Water Quantity

1. Increase management and oversight of water users under direct county jurisdiction:.
   a. By 1999, prepare and maintain an inventory of major non-district water users (more than four single-family dwellings), including location of water sources and estimated volume of pumpage and consumptive use. Prepare this information first for basins in overdraft. Build on information already developed by water agencies.
   b. Prepare well ordinance amendments, and other ordinances to require meters on new wells and large existing wells, including water systems under county jurisdiction.
   c. Develop criteria and standard conditions for approval of new and supplemental wells in areas of the county subject to overdraft. Require these conditions in lieu of CEQA review of individual wells.
   d. Encourage cities to adopt companion ordinances with similar provisions.
2. Monitor summer streamflows in streams that are likely to be diminished by stream diversions and/or groundwater withdrawal.
3. Ensure that water supply issues are thoroughly addressed as part of the review of development proposals and EIR's within the county and other jurisdictions.
4. Review adequacy of current policies, ordinances, and practices for protection and enhancement of groundwater recharge.
5. Work with water purveyors to coordinate countywide water conservation and drought response programs.
6. Promote opportunities for' regional approaches and interagency cooperation when planning to correct water deficiencies in individual subbasins.

7. Consider opportunities to reduce summer stream diversions and increase summer streamflows when evaluating future water supply options.
8. Review water rights and monitor streamflow and diversion rates to be sure instream uses and downstream users are adequately protected.

Water Quality, Fisheries, and Channel Conditions

1. Implement a comprehensive erosion control program to coordinate existing efforts and fill critical gaps.
   a. Prepare and maintain an inventory of specific erosion problems which can be used for grant funded projects and targeting specific efforts.
   b. Commence monitoring of stream bed conditions in order to identify the worst problem areas and to measure effectiveness of erosion control efforts.
   c. Implement programs for education and outreach, technical assistance, cost-sharing incentives, funding, permitting, enforcement, improvement of public and private road development and maintenance, and coordination of efforts. Focus initial efforts in a particular subbasin so that effectiveness can be better measured.
   d. Work to strengthen forest practice rules and timber harvest review and inspection procedures, and redistribute some of the staff resources currently devoted to timber harvesting to address other more significant sediment sources.
2. Continue to monitor nitrogen and bacteria in streams as necessary to identify and correct contamination from septic systems, livestock, and small agricultural operations.
3. Update design criteria and general plan policies and prepare to implement an urban runoff control program consistent with Phase II of the federal stormwater regulations.
4. Work with other agencies and stakeholders to develop and implement a program for protection and restoration of salmon and steelhead.
5. Actively participate in the Department of Health Services (DHS) watershed protection and wellhead protection projects in coordination with the water agencies; seek funding assistance as available.
6. Provide staffing and organization to provide oversight and evaluation of water resource protection efforts using a watershed management approach.
   a. Work with other agencies and stakeholder groups (CRMPS) to coordinate implementation of key water resource protection measures.
   b. Provide for review and coordination of activities of County departments which affect water resources.
7. Support efforts to reduce the potential severity of a major wildfire.
8. Serve as a regional clearinghouse for water quality data, geographic information and other water resource information.
9. Promote discussions and workshop approaches to promote collaborative problem solutions and inform the public and decision makers regarding the nature of water resource issues in the County.
10. Seek grants and other funding sources to support increase water resources and watershed management.

Specific Objectives for San Lorenzo Watershed/ Santa Margarita Groundwater Basin

Water Quantitv

1. Form a workable management structure, with adequate funding to develop and implement a comprehensive water supply plan for the watershed within 5 years which addresses both surface and ground water use, and optimizes the efficient use of resources, including maintaining and enhancing stream baseflows. Elements of the plan should include:
   a. Coordination, funding, and direction of plan development and implementation by agencies through a JPA, MOU, or comprehensive water agency.
   b. Confirmation of estimates of current consumptive use and safe yield.
   c. Augmentation of supply through reclamation, recharge enhancement, or development of new supplies.
   d. Optimization of resource use through inter-ties, conjunctive management, and modeling of groundwater, surface water, and water delivery.
   e. Management of demand through coordinated water conservation and timing of new development.
   f. Groundwatet and streamflow monitoring as needed to fill gaps in the models and plans.
2. If meaningful progress is not being made toward development and implementation of a comprehensive water supply plan, pursue alternative approaches, such as consolidation of water agencies by LAFCO, formation of a water management agency, and/or declaration of a groundwater emergency, with limitations on new water connections, pending implementation of a plan.
3. Assist in securing additional users and maximizing use of reclaimed wastewater from Scotts Valley.

Water Quality. Fisheries, and Channel Conditions

1. Implement an erosion control program specific to the San Lorenzo Watershed.
2. Continue implementation of the San Lorenzo Wastewater Management and Nitrate Management Plans.
3. Promote cleanup and remediation of groundwater contamination; maintain programs to prevent new spills/leaks.
4. Complete the update of the San Lorenzo Watershed Management Plan in 1999 and implement additional measures as needed.

Specific Objectives for the North Coast/Bonny Doon Area

Water Quantitv

1. Work with the City of Santa Cruz and other water users on long term water supply planning and fisheries protection.
2. Seek ways to enhance natural recharge for coastal areas and/or provide alternative water sources for agricultural users to reduce dry season dependency on City water.

Water Quality

1. Implement erosion control programs.
2. Coordinate water quality monitoring to evaluate sources of current contamination, ensure protection of supplies, fill any gaps as needed.
3. Work with quarries for water quality and water supply protection.
4. Improve the sewage disposal system for Davenport to eliminate spills and overflows.

Specific Objectives for Soquel/Aptos Area

Water Quantity

1. Work with Soquel Creek Water District to complete their water supply planning process, including protection and/or restoration of stream baseflows in Soquel Creek.
2. Review and maintain efforts to estimate pumpage and manage data from private wells and small water companies.
3. Work with the water districts to provide outreach to private pumpers to inform them of the status of the groundwater basin and corrective actions being taken to bring it into balance.
4. Work with Soquel Creek and Central Water District to evaluate trends in water levels and chloride concentrations in coastal wells.

Water Quality

1. Monitor water quality in streams as necessary to identify and correct contamination from septic systems, livestock, small agricultural operations, and other sources.
2. Develop and implement appropriate urban runoff management measures, consistent with Phase 2 of federal Stormwater Regulations, which will likely be required in 1999.
3. Upgrade sewage collection systems in urban areas to reduce sewer leaks and overflows.
4. Monitor storm drains and lagoons to identify and eliminate any specific sources of bacterial contamination.

Specific Objectives for the South County/Pajaro Area

Water Quantity

1. Support and promote efforts of PVWMA to implement the Agency's Basin Management Plan to bring the groundwater basin into balance.
2. If Basin Management efforts are not making meaningful progress toward balancing the groundwater basin, work with PVWMA to control and to reduce pumping until an alternate plan is put in place.
3. Develop a master plan to provide alternative supplies for small water companies along San Andreas Road which may experience seawater intrusion.

Water Quality

1. Support and implement programs for agricultural erosion control, including EQIP cost-sharing program, increased NRCS technical assistance, tenant and owner education, and enforcement of county ordinances.
2. Support efforts of the Farm Bureaus, PVWMA, the Sanctuary Water Quality Protection Program, and other agencies to implement practices that will reduce contamination of surface and groundwater from agricultural runoff and percolation, including nitrate contamination of wells.
3. Increase management and oversight of the Slough drainage systems to maximize protection of resource values consistent with flood management and groundwater recharge needs.
4. Support efforts to acquire and restore land in Slough areas.
5. Support efforts to eventually develop a Slough Water Resources Master Plan.
6. Work with Soquel Creek Water District and PVWMA to evaluate trends in chloride levels in coastal wells.
7. Monitor water quality in streams as necessary to identify and correct contamination from septic systems, livestock, small agricultural operations, and other sources .

January 12, 1999

Water Resources Management in Santa Cruz County

Issues Fact Sheet

Reviewed by the Interagency Water Resources Working Group

Countywide Issues

1. Current water needs exceed presently available supplies in significant parts of each of the four basins of Santa Cruz County. Water is supplied by many different agencies within the county. The effects of overdraft within the jurisdiction of one agency significantly affect the available supply of neighboring agencies. Potential solutions involve water sharing among agencies and basins and coordinated, conjunctive management of both surface water and groundwater resources in all basins.

2. Excessive erosion, sedimentation, and turbidity have severely degraded fish habitat for the threatened coho salmon and steelhead, reduced availability of winter flows for water supply, and caused extensive public and private property damage. Excessive sedimentation is the primary reason for the estimated 70-90% reduction in salmon and steelhead populations that have occurred since the 1960's (SCCPD, 1979).

3. Septic systems, livestock, and small agricultural operations in mountain areas of the county have the potential to contribute bacteria and nitrate to groundwater and creeks. Current impacts are generally low to moderate.

4. Streams throughout the county are subject to direct diversions by individual water users. The cumulative impacts of these diversions have not been quantified. Groundwater overdraft has diminished streamflows in at least two of the county's four basins (South County and San Lorenzo) .

5. Groundwater occurs only in hard rock fractures in parts of Bonny Doon, Glen Canyon, and the Summit and Skyline areas north of the Zayante Fault. Groundwater in those areas is limited, unpredictable, and not well-suited for management. It is not uncommon for wells to dry up during dry periods and residents must haul in water by truck. Portions of the Summit area now are supplied with water from Santa Clara County.

6. Urban runoff in developed areas has caused low to moderate levels of water quality degradation to streams and lagoons through contribution of bacteria and nutrients. Most urban lagoons are posted as unsafe for swimming year round due to bacteria levels. Other contaminants such as heavy metals are elevated at times, but do not appear to be causing adverse impacts.

7. Sewer leaks and overflows in urban areas cause significant bacterial (pathogenic) contamination to streams and the ocean during storm events, resulting in threats to public health and designation of beaches as being unsafe for swimming during and after storm periods.

8. With the minor exceptions listed above, water quality in Monterey Bay is very good with little to no observed degradation.

Issues Specific to the North Coast Watershed Area

1. Streams in the North Coast Watershed Area provide supply for agricultural users, the town of Davenport and of the City of Santa Cruz water supply (2530% of the total City supply). Groundwater in the area also supplies individual wells and small water companies for rural residents in Bonny Doon and other areas of the basin.

2. City of Santa Cruz year 2020 demand will exceed the safe yield of their system by 1.8 billion gallons (about 5500 acre-feet). The safe yield of their system in a severe drought is 3.3 billion gallons. Present use is about 4.4 billion gallons. Projected growth is 1% a year in demand, and projected demand is about 5.2 billion gallons. Conservation programs are targeted to achieve a 5-10% reduction in use per connection over the long term and between 10 and 15% reduction in short-term use. (SCC, 1996)

3. The amount of water available for use by the City of Santa Cruz from Liddell Spring has been increasingly diminished in recent years by periods of high turbidity and sedimentation. Elevated nitrate is also a concern. The source of these problems may be Bonny Doon Quarry or movement of water through the quarry from sources of contamination above the quarry.

4. The geologic structure of basement rock at the Bonny Doon Quarry, Liddell Spring, parts of Bonny Doon and into UCSC includes a karst limestone system. This geologic system is complex, the pathways of water movement are not easily understood, it is difficult to trace sources of contamination, and water supplies are difficult to predict and manage.

5. Although the elevation of groundwater is significantly below sea level (-100 feet) in the agricultural region along Hwy 1, seawater intrusion has not yet been observed in this basin (Webber-Hayes, 1998). Groundwater alone cannot meet all the agricultural water use demands because quantity and quality constraints. Agricultural water demand includes use of about 250 acre-feet per year of City water at a subsidized rate (SCC, 1996). Both raw water and treated drinking water is conveyed by the City to agricultural users on the North Coast. Raw water for agricultural accounts is delivered at a unit cost which is 1/4 of what city residents pay.

6. Stream baseflows available for fish and other downstream uses have been reduced by water diversions from Scott, San Vicente, Liddell, Majors, and Laguna Creeks.

Issues Specific to the San Lorenzo Watershed and Santa Margarita Groundwater Basin

1. The San Lorenzo River Watershed provides surface water supply for the City of Santa Cruz system (60-80% of its supply) and for the communities of the San Lorenzo Valley. Groundwater from the Santa Margarita Groundwater Basin (Santa Margarita Sandstone and Lompico Sandstone aquifers) maintains stream baseflows and provides the entire water supply for the Scotts Valley Water District and approximately half of the supply for the San Lorenzo Valley Water District. Groundwater also supplies an estimated 2200 private wells in the San Lorenzo Watershed (projected from SCCPD, 1979 (Hydro. Tech. Section, p 59)). The Santa Margarita Groundwater Basin (including the Lompico Sandstone Aquifer) is federally designated as a Sole Source Aquifer or principle source of drinking water for the Scotts Valley area.

2. Since 1986, groundwater levels have declined by up to 150 ft., significantly reducing water levels in the Santa Margarita Sandstone Aquifer (in the Pasatiempo Unit, and Camp Evers areas), reducing baseflow in Bean Creek, Carbonera Creek, and the San Lorenzo River; and reducing available water supplies for San Lorenzo Water District, Scotts Valley Water District, Mt Hermon, and the City of Santa Cruz. (Todd Engineers, various years; Watkins-Johnson, 1993)

3. With a reduction of water levels in the Santa Margarita Sandstone aquifer, pumping has been shifted deeper to the Lompico Sandstone aquifer. The Lompico Sandstone aquifer is the last known developable aquifer in the Santa Margarita Groundwater Basin. Developed groundwater supplies in the Lompico Sandstone aquifer, Pasatiempo Unit, are not sustainable at the present gross pumpage of approximately 800 acre feet per year.

4. Gross groundwater pumpage from the Santa Margarita Groundwater Basin (Santa Margarita Sandstone and Lompico Sandstone aquifers) is equivalent to the previously estimated safe yield for the area's aquifers (4200 acre-feet). (Note: the actual consumptive use, which is the net amount of water extracted from the groundwater basin, will be less than the amount of gross pumpage since some of the water returns to the basin through septic system discharge and percolation of some of applied irrigation water.) Declining groundwater levels and reduction of streamflow suggests that the actual safe yield may be less than amounts currently withdrawn. The safe yield and the amount of total groundwater withdrawal (consumptive use) are currently under reevaluation, with estimates available in early 1999. Proposals for new development projected in Scotts Valley and at Mount Hermon may be out of balance with available supplies.

5. It is estimated that coverage by impervious surfaces of primary recharge areas has reduced groundwater recharge by at least 33% in the city of Scotts Valley and 11% in other parts of the San Lorenzo River Watershed (SCCPD, 1979 (Hydro. Tech. Section, p. 53)).

6. Summer stream flows have been further reduced by 15-90% (depending on location) through direct stream diversions for water supply (SCCPD, 1979(Hydro. Tech. Section, pp. 59-74)).

7. Localized groundwater contamination by toxic compounds from leaking underground storage tanks and other sources has degraded groundwater quality, requiring the use of advanced treatment systems, and limitinged the use of some wells. Options for enhanced recharge projects in the Camp Evers and El Pueblo areas of the Santa Margarita groundwater basin may be limited by groundwater contamination. Current plans and activities relative to groundwater cleanup have been addressed in some areas, i.e., Watkins-Johnson, however, additional, ongoing efforts are required.

8. Septic systems, livestock and nonpoint urban contamination have increased bacteria levels by 20-50 times and nitrate levels by 5-7 times, threatening the City of Santa Cruz water supply and recreational opportunities in the San Lorenzo River (SCCHSA, 1995).

Issues Specific to the Soquel/Aptos Area

1. The Soquel/Aptos area includes the watersheds of Soquel and Aptos Creeks along with the coastal urban areas of Live Oak, Soquel, Capitola, Aptos, Seascape and La Selva Beach. Water supply is provided primarily by the Soquel Creek Water District, Central Water District, small water companies and individual wells. Most of the water supply is provided by groundwater

from the Purisima formation. In the eastern part of the area, groundwater is supplied by the Aromas formation. The Aromas formation extends ~~on~~ into the Pajaro basin and groundwater levels are affected by pumping in both basins. Current pumping amounts have apparently resulted in some inland movement of a seawater wedge in the La Selva Beach and San Andreas Road areas (SCWD, 1998).

2. Soquel Creek Water District current groundwater production is approximately 5480 acre-feet/year. It is projected to increase to about 6700-7400 acre-feet by the year 2030. The District needs to develop 1000 to 1500 acre feet of new supply plus an additional amount to correct the current overdraft (SCWD, 1998). Central Water District produced about 600 acre-feet in fiscal year 1997.

3. Coastal groundwater levels in mid-County (Purisima formation) have declined significantly since 1987. Although levels have been consistently below sea level along the coast between New Brighton Beach and the eastern end of Seacliff Beach, creating the potential for seawater flow into the basin, signs of intrusion have not yet been detected in the Purisima formation.(SCWD, 1998, figures 6,7).

4. Private wells extract a significant percentage of the total groundwater use from the Purisima formation: estimated private and mutual well production is approximately 1,800 acre-feet/year. However, little data on actual usage and groundwater levels are available for private wells. Total annual production from the Purisima formation by all well operators is estimated at 6,800 acre-feet. This amount is believed to be in excess of sustainable yield.

5. Soquel Creek appears to be drying up more often now during summer and fall than measured or observed in previous years, but there has not been a determination of the cause(s) (USGS, 1952-1996).

Issues Specific to the South County/Pajaro Area

1. The South County/Pajaro Basin includes the watersheds of Corralitos, Coward, and other creeks that drain into the Pajaro River, as well as the Watsonville Slough system and the coastal terrace along San Andreas Road. Most of the water use is groundwater with the vast majority of pumped by individual private agricultural users. The city of Watsonville uses groundwater and two surface diversions from Corralitos and Browns Valley Creeks. Groundwater use is managed by the Pajaro Valley Water Management Agency (PVWMA), which maintains meters on larger wells, charges usage fees, and is responsible for developing and implementing an overall Basin Management Plan.

2. Annual pumpage in the Pajaro basin is 68,000 acre-feet/year and is projected to increase to 78,000 acre-feet/year by 2040. The safe yield of the basin is cited in the Basin Management Plan as 3 1,000 acre-feet/year under current pumping patterns. Estimates in the Basin Management plan indicate that the safe yield may be increased to 50,000 acre-feet/year if pumping is shifted away from the coast. The PVWMA is planning to shift pumping away from the coastal area and develop an additional 28,000 acre-feet/year of supplemental supply to meet demands through the year 2040 (Montgomery-Watson, 1993).

3. The rate of seawater intrusion currently averages about 10,000 acre-feet during a normal year, ranging up to 15,000 acre-feet during a critically dry year (Montgomery-Watson, 1993).

4. The Pajaro area has the largest water supply imbalance in the County. In 1990 the State raised the possibility of initiating a groundwater adjudication which would potentially mean reducing groundwater use to match safe yield. Since that time, the PVWMA Basin Management Plan has been developed to address the situation, but there are currently challenges which may delay or limit its implementation.

5. Nitrate exceeds drinking water standards in approximately 25% of wells monitored. This has been observed primarily in shallow agricultural wells and it does not currently affect municipal water supply wells. There are currently no programs in place to address this situation.

6. The Watsonville Slough system has been significantly modified through channelization and drainage. Slough sediment and biota regularly exhibit toxic levels of the banned but persistent pesticide DDT that enters the sloughs from erosion of nearby fields (Questa, 1995). Other contaminants such as heavy metals are present at times, but do not generally occur at toxic levels.

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Goals, Objectives, and Strategies

Reviewed and Revised by Interagency Water Resources Working Group

Goals:

1. Through water conservation. maximizing and sharing existing supplies, and developing new sources, balance available water supply and demand (so that the amount of groundwater pumping is sustainable and there is adequate supply for existing and planned uses, including fisheries, riparian, and other instream uses, ~~without causing~~ minimizing adverse impacts).
2. In the next 5-10 years, maintain existing summer stream baseflows at current levels; in the next 10-20 years ~~increase~~ implement strategies to maximize summer baseflows. ~~by 10-25% (to approximate historical levels).~~
3. Within the next 10 years, stabilize or reduce seawater intrusion rates; within the next 20 years stabilize seawater intrusion fronts.
4. Prevent any further degradation of water quality by pollution of ~~in~~ surface water, groundwater, or marine waters; within the next ~~5~~ 10 years eliminate sources of ~~degradation~~ pollution so that all water quality standards are met.
5. Increase water conservation for all water uses and establish consistent programs for reducing ~~per capita~~ demand by ~~10% over the next 10 years~~ all users (including agriculture and domestic) within a common basin.

Countywide Objectives

(Alphanumeric references in bold refer to items in the Table of Recommendations)

Water Quantity

1. Increase management and oversight of water users under direct county jurisdiction (A.5):
   a. By 1999, prepare and maintain an inventory of major non-district water users (more than four single-family dwellings), including location of water sources and estimated volume of ~~water~~ pumpage and consumptive use. Prepare this information first for basins in overdraft. Build on information already developed by water agencies.
   b. Prepare well ordinance amendments, and other ordinances to require meters on new wells and large existing wells, including water systems under county jurisdiction.
   c. Develop criteria and standard conditions for approval of new and supplemental wells in areas of the county subject to overdraft. Require these conditions in lieu of CEQA review of individual wells.
   d. Encourage cities to adopt companion ordinances with similar provisions.
2. Monitor summer streamflows in streams that are likely to be diminished by stream diversions and/or groundwater withdrawal (B.5, B.6).
3. Ensure that water supply issues are thoroughly addressed as part of the review of development proposals and EIR's within the county and other jurisdictions. (A.6). ~~Provide an adequate~~

~~level of review of development proposals and EIR's within the county and other jurisdictions to ensure that water supply issues are thoroughly addressed (A.6).~~

4. Review adequacy of current policies, ordinances, and practices for protection and enhancement of groundwater recharge.
5. Work with water purveyors to ~~develop procedures for~~ coordinate countywide water conservation and drought response programs (A.3).
6. Promote opportunities for regional approaches and interagency cooperation when planning to correct water deficiencies in individual sub-basins (A.2).
   ~~a. Joint management of surface water resources in the North Coast and San Lorenzo basin already occurs through management of the City of Santa Cruz system.~~
   ~~b. Conjunctive use of Santa Cruz surface water and Soquel groundwater is being considered.~~
   ~~c. The Soquel/Aptos area would benefit from a reduction of overdraft in the Pajaro area, which is already inducing some seawater intrusion in the La Selva Beach area. Benefits to the Soquel area could free up resources and have further benefits for the Santa Cruz system.~~
7. Consider opportunities to reduce summer stream diversions and increase summer streamflows when evaluating future water supply options.
8. Review water rights and monitor streamflow and diversion rates to be sure instream uses and downstream users are adequately protected (B.3, B.5).

Water Quality, Fisheries, and Channel Conditions

1. Implement a comprehensive erosion control program to coordinate existing efforts and fill critical gaps (D.l).
   a. Prepare and maintain an inventory of specific erosion problems which can be used for grant funded projects and targeting specific efforts.
   b. Commence monitoring of streambed conditions in order to identify the worst problem areas and to measure effectiveness of erosion control efforts (D.3).
   c. Implement programs for education and outreach, technical assistance, cost-sharing incentives, funding, permitting, enforcement, improvement of public and private road development and maintenance (**D.2**), and coordination of efforts. Focus initial efforts in a particular sub-basin so that effectiveness can be better measured.
   d. Work to strengthen forest practice rules and timber harvest review and inspection procedures, and redistribute some of the staff resources currently devoted to timber harvesting to address other more significant sediment sources.
2. Continue to monitor nitrogen and bacteria in streams as necessary to identify and correct contamination from septic systems, livestock, and small agricultural operations (**G.1, G.3**).
3. Update design criteria and general plan policies and prepare to implement an urban runoff control program consistent with Phase II of the Federal Stormwater Regulations (G.9).
4. Work with other agencies and stakeholders to develop and implement a program for protection and restoration of salmon and steelhead (F.2, F.3).
5. Actively participate in the Department of Health Services (DHS) watershed protection and wellhead protection projects in coordination with the water agencies; seek funding assistance as available (E.l).

6. Provide staffing and organization to provide oversight and evaluation of water resource protection efforts using a watershed management approach (E.l, E.2).
   a. Work with other agencies and stakeholder groups (CRMPS) to coordinate implementation of key water resource protection measures.
   b. Provide for review and coordination of activities of County ~~agencies~~ departments which affect water resources.
7. Support efforts to reduce the potential severity of a major wildfire.
8. Serve as a regional clearinghouse for water quality data, geographic information, and other water resource information (H).
9. Promote discussions and workshop approaches to promote collaborative problem solutions and inform the public and decision-makers regarding the nature of water resource issues in the County (E.3).
10. Seek grants and other funding sources to support increased water resources and watershed management (E.4).

Specific Objectives for San Lorenzo Watershed/v Santa Margarita Groundwater Basin

Water Quantity

1. Form a workable management structure. with adequate funding to develop and implement a comprehensive water supply plan for the basin watershed within 3 5 years which addresses both surface and ground water use, and optimizes the efficient use of resources, including maintaining and enhancing stream baseflows (A.l). Elements of the plan should include:
   a. Coordination, funding, and direction of plan development and implementation by agencies through a JPA, MOU, or comprehensive water agency.
   b. Confirmation of estimates of current consumptive use and safe yield.
   c. Augmentation of supply through reclamation, recharge enhancement, or development of new supplies.
   d. Optimization of resource use through interties, conjunctive management, and modeling of groundwater, surface water, and water delivery.
   e. Management of demand through coordinated water conservation and timing of new development.
   f. Groundwater and streamflow monitoring as needed to fill gaps in the models and plans.
2. If meaningful progress is not made toward development and implementation of a comprehensive water supply plan, ~~If existing agencies are unable to form a workable management structure within 1 ye~~ar~~,~~ pursue alternative approaches, ~~including~~ such as consolidation of water agencies by LAFCO, formation of a water management agency, and/or declaration of a groundwater emergency, with limitations on new water connections, pending implementation of a plan (A.4).
3. Assist in securing additional users and maximizing use of reclaimed wastewater from Scotts Valley (A.7).

Water Quality, Fisheries, and Channel Conditions

1. Implement an erosion control program specific to the San Lorenzo Watershed (D.l).
2. Continue implementation of the San Lorenzo Wastewater Management and Nitrate Management Plans.
3. Promote cleanup and remediation of groundwater contamination; maintain programs to prevent new spills/leaks.
4. Complete the update of the San Lorenzo Watershed Management Plan in 1999 and implement additional measures as needed (E.l).

Specific Objectives for the North Coast/Bonny Doon Area

Water Quantity

1. Work with the City of Santa Cruz and other water users on long term water supply planning and fisheries protection (A.l).
2. Seek ways to enhance natural recharge for coastal areas and/or provide alternative water sources for agricultural users to reduce dry season dependency on City water.

Water Quality

1. Implement erosion control programs (D.l).
2. Coordinate water quality monitoring to evaluate sources of current contamination, ensure protection of supplies, fill any gaps as needed (G.2, G.3)
3. Work with quarries for water quality and water supply protection (C.3).
4. Improve the sewage disposal system for Davenport to eliminate spills and overflows (G.8).

Specific Objectives for Soquel/Aptos Area

Water Quantity

1. Work with Soquel Creek Water District to complete their water supply planning process, including protection and/or restoration of stream baseflows in Soquel Creek (A.1).
2. ~~Initiate~~ Review and maintain efforts to ~~quantify~~ estimate pumpage and manage data from private wells and small water companies (A.5, C.1).
3. Work with the water districts to provide outreach to private pumpers to inform them of the status of the groundwater basin and corrective actions being taken to bring it into balance.
4. Work with Soquel Creek and Central Water District to evaluate trends in water levels and chloride concentrations in coastal wells. (G.2, H.2, H.3).

Water Quality

1. Monitor water quality in streams as necessary to identify and correct contamination from septic systems, livestock, ~~and~~ small agricultural operations, and other sources. (G.3).
2. Develop and implement appropriate urban runoff management measures, consistent with Phase 2 of Federal Stormwater Regulations, which will likely be required in 1999 (G.9).
3. Upgrade sewage collection systems in urban areas to reduce sewer leaks and overflows (G.8).

4. Monitor storm drains and lagoons to identify and eliminate any specific sources of bacterial contamination (6.4, G.5, G.6, G.7).

Specific Objectives for the South **County/Pajaro** Area

Water Quantity

1. Support and promote efforts of PVWMA to ~~develop and~~ implement ~~a workable~~ the Agency's Basin Management Plan to ~~that will~~ bring the groundwater basin into balance (A.l).
2. If Basin Management efforts are not making meaningful progress toward balancing the groundwater basin. work with PVWMA to control and ~~management efforts stall, consider declaration of a groundwater emergency or other measures necessary~~ to reduce pumping until an alternate plan is put in place.
3. Develop a master plan ~~for annexation to Soquel Creek Water District of~~ to provide alternative supplies for small water companies along San Andreas Road which may experience seawater intrusion.

Water Quality

1. Support and implement programs for agricultural erosion control, including EQIP cost-sharing program, increased NRCS technical assistance, tenant and owner education, and enforcement of county ordinances (**D.1**).
2. Support efforts of the Farm Bureaus, PVWMA, and the Sanctuary Water Quality Protection Program, and other agencies to implement practices that will reduce contamination of surface and groundwater from agricultural runoff and percolation, including nitrate contamination of wells (G.2, G.lO).
3. Increase management and oversight of the Slough drainage systems to maximize protection of resource values consistent with flood management and moundwater recharge needs.
4. Support efforts to acquire and restore land in Slough areas.
5. Support efforts to eventually develop a Slough Water Resources Master Plan.
6. Work with Soquel Creek Water District and PVWMA to evaluate trends in chloride levels in coastal wells (**G.2,** H.2, **H.3**).
7. Monitor water quality in streams as necessary to identify and correct contamination from septic systems, livestock. small agricultural operations, and other sources (G.3).

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January 12, 199
~~December 1, 1998~~

Water Resources Management in Santa Cruz County

Issues Fact Sheet

Reviewed and Revised by the Interagency Water Resources Working Group

Countywide Issues

1. Current water needs exceed presently available supplies in significant parts of each of the four basins in Santa Cruz County. Water is supplied by many different agencies within the county. The effects of overdraft within the jurisdiction of one agency significantly affect the available supply of neighboring agencies. Potential solutions involve water sharing among agencies and basins and coordinated, conjunctive management of both surface water and groundwater resources in all basins.

2. Excessive erosive, sedimentation, and turbidity have severely degraded fish habitat for the threatened coho salmon and steelhead, reduced availability of winter flows for water supply, and caused extensive public and private property damage. Excessive sedimentation is the primary reason for the estimated 70-90% reduction in salmon and steelhead populations that have occurred since the 1960's (SCCPD, 1979).

3. ~~Although current impacts are generally low to moderate,~~ Septic systems, livestock, and small agricultural operations in mountain areas of the county have the potential to contribute bacteria and nitrate to groundwater and creeks. Current impacts are generally low to moderate.

4. Streams throughout the county are subject to direct diversions by individual water users. The cumulative impacts of these diversions have not been quantified. Groundwater overdraft has diminished streamflows in at least two of the county's four basins (South County and San Lorenzo).

5. Groundwater occurs only in hard rock fractures in parts of Bonny Doon, Glen Canyon, and the Summit and Skyline areas north of the Zayante Fault. Groundwater in those areas is limited, unpredictable, and not well-suited for management. It is not uncommon for wells to dry up during dry periods and residents must haul in water by truck. Portions of the Summit area now are supplied with water from ~~the~~ Santa Clara County system.

6. Urban runoff in developed areas has caused low to moderate levels of water quality degradation to streams and lagoons through contribution of bacteria and nutrients. Most urban lagoons are posted as unsafe for swimming year-round due to bacteria levels. Other contaminants such as heavy metals are elevated at times, but do not appear to be causing adverse impacts.

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7. Sewer leaks and overflows in urban areas cause significant bacterial (pathogenic) contamination to streams and the ocean during storm events, resulting in threats to public health and designation of beaches as being ~~designated as~~ unsafe for swimming during and after storm periods.

8. With the minor exceptions listed above, water quality in Monterey Bay is very good with little to no observed degradation.

Issues Specific to the North Coast Basin

1. Streams in the North Coast Basin Watershed Area provide supply for agricultural users, the town of Davenport and ~~25-30% of~~ the City of Santa Cruz water supply (25-30% of the total City supply). Groundwater in the area also supplies individual wells and small water companies for rural residents in Bonny Doon and other areas of the basin.

2. City of Santa Cruz year 2020 demand will exceed the safe yield of their system by ~~1790 million~~ 1.8 billion gallons (about 5500 acre-feet). The safe yield of their system in a severe drought is ~~3.28~~ 3.3 billion gallons. Present use is about 4.4 billion gallons. Projected growth is 1% a year in demand, and projected demand is about 5.2 billion gallons. Conservation programs are targeted to achieve a 5-10% reduction in use per connection over the long term and between 10 and 15% reduction in short-term use. (SCC, 1996)

3. The amount of water available for use by the City of Santa Cruz from Liddell Spring has been increasingly diminished in recent years by periods of high turbidity and sedimentation. ~~and elevated nitrate~~. Elevated nitrate is also a concern. The source of these problems may be Bonny Doon Quarry or movement of water through the quarry from ~~above.~~ sources of contamination above the quarry.

4. The geologic structure of basement rock at the Bonny Doon Quarry, Liddell Spring, parts of Bonny Doon and into UCSC includes a karst limestone system. This geologic system is complex, the pathways of water movement are not easily understood. It is difficult to trace sources of contamination, and water supplies are difficult to predict and manage.

5. Although the elevation of groundwater is significantly below sea level (-100 feet) in the agricultural region along Hwy. 1, seawater intrusion has not yet been observed in this basin (Webber-Hayes, 1998). Groundwater alone cannot meet all the agricultural water use demands because of quantity and quality constraints. Agricultural water demand includes use of about 250 acre-feet per year of City water at a subsidized rate (SCC, 1996'). Both raw water and treated drinking water are conveyed by the City to agricultural users on the North Coast. Raw water for agricultural accounts is delivered at a unit cost which is ¼ of what city residents pay.

6. Stream baseflows available for fish and other downstream uses have been reduced by water diversions in Scott, San Vicente, Liddell, Majors, and Laguna Creeks.

Issues Specific to the San Lorenzo Watershed and **Santa** Margarita Groundwater Basin

1. The San Lorenzo River Watershed provides surface water supply for the City of Santa Cruz system (60-80% of its supply) and for the communities of the San Lorenzo Valley. Groundwater from the ~~Scotts Valley~~ Santa Margarita Groundwater Basin (Santa Margarita Sandstone and Lompico Sandstone aquifers) maintains stream baseflows and ~~supplies the City of Scotts Valley and parts of San Lorenzo Valley~~ provides the entire water supply for the Scotts Valley Water District and approximately half of the supply for the San Lorenzo Valley Water District. Groundwater also supplies an estimated 2200 private wells in the basin San Lorenzo Watershed (projected from SCCPD. 1979 (Hydro. Tech. Section, p 59)). The Santa hlargarita ~~Aquifer~~ Groundwater Basin (including the Lompico ~~formation~~ Sandstone Aquifer) is federally designated as a Sole Source Aquifer or principle source of drinking water for ~~a large portion of this region~~ the Scotts Valley area.

2. Since 1986, groundwater levels have declined by up to 150 ft., ~~locally drying~~ significantly reducing water levels in the Santa Margarita Sandstone Aquifer (in the Pasatiempo Unit, and Camp Evers areas), ~~and other parts of the Scotts Valley Groundwater basin~~ reducing baseflow in Bean Creek, Carbonera Creek, and the San Lorenzo River; and reducing available water supplies for San Lorenzo Water District, Scotts Valley Water District, Mt. Hermon, and the City of Santa Cruz. (Todd Engineers. various years; Watkins-Johnson, 19931,

3. With ~~the depletion~~ a reduction of water levels in the Santa Margarita Sandstone aquifer, pumping has been shifted deeper to the Lompico Sandstone ~~formation~~ aquifer. Lompico ~~formation~~ Sandstone aquifer is the last known developable aquifer ~~under the Pasatiempo, Camp Evers, El Pueblo, and North Scotts Valley area~~ in the Santa Margarita Groundwater Basin. Developed groundwater supplies ~~using current pumping locations in the Lompico formation are not sustainable at present demands (4200 acre feet)~~ in the Lompico Sandstone aquifer. Pasatiempo Unit. are not sustainable at the present gross pumpage of approximately 800 acre feet per vear.

4. Gross groundwater pumpage ~~in the Pasatiempo, Camp Evers and El Pueblo areas~~ from the Santa Margarita Groundwater Basin (Santa Margarita Sandstone and Lompico Sandstone aquifers) is equivalent to the previously estimated safe yield for the area's aquifers (4200 acre-feet). (Note: the actual consumptive use. which is the net amount of water extracted from the groundwater basin. will be less than the amount of gross pumpage since some of the water returns to the basin through septic system discharge and percolation of some of applied irrigation water.) ~~Proposals for new development projected in Scotts Valley and at Mount Hermon are out of balance with available supplies. Furthermore.~~ Declining groundwater levels and reduction of streamflow suggests that the actual safe yield may be less **than** amounts currently withdrawn. The safe yield and the amount of total groundwater withdrawal

(consumptive use) are currently under reevaluation, with estimates available in early 1999. Proposals for new development projected in Scotts Valley and at Mount Hermon may be out of balance with available supplies.

5. ~~Groundwater recharge and supply has been further reduced by an estimated 15-30% as a result of coverage with impervious surfaces of primary recharge areas in Scotts Valley and the San Lorenzo Valley.~~ It is estimated that coverage by impervious surfaces of primary recharge areas has reduced groundwater recharge by at least 33% in the city of Scotts Valley and 11% in other parts of the San Lorenzo River Watershed (SCCPD, 1979 (Hydro. Tech. Section, p. 53)).

6. ~~Stream baseflows~~ Summer stream flows have been further reduced by ~~at least 25%~~ 15-90% {depending on location) through direct stream diversions for water supply (SCCPD, 1979 (Hydro. Tech. Section. pp. 59-74)).

7. Localized groundwater contamination by toxic compounds from leaking underground storage tanks and other sources has degraded ~~water supplies~~ groundwater quality, ~~required expensive~~ requiring the use of advanced treatment systems, and limiting ~~limited~~ the use of some wells. ~~and limited~~ Options for enhanced recharge projects in the Camp Evers and El Pueblo areas of the ~~Scotts Valley~~ Santa Margarita groundwater basin may be limited by groundwater contamination. ~~There are currently no plans in place to cleanup the contamination.~~ Current plans and activities relative to groundwater cleanup have been addressed in some areas, i.e., Watkins-Johnson, however, additional ongoing efforts are required.

8. Septic systems, livestock and nonpoint urban contamination have increased bacteria levels by 20-50 times and nitrate levels by 5-7 times, threatening the City of Santa Cruz water supply and recreational opportunities in the San Lorenzo River (SCCHSA, 1995).

Issues Specific to the **Soquel/Aptos** Area

1. The Soquel/Aptos area includes the watershed of Soquel and Aptos Creeks along with the coastal urban areas of Live Oak, Soquel, Capitola, Aptos, Seascape and La Selva Beach. Water supply is provided primarily by the Soquel Creek Water District, Central Water District, small water companies, and individual wells. Most of the water supply is provided by groundwater ~~in~~ from the Purisima formation. In the eastern part of the area, groundwater is supplied by the Aromas formation. The Aromas formation extends ~~on~~ into the Pajaro basin and groundwater levels ~~in the eastern part of the Soquel-Aptos basin are strongly influenced by groundwater withdrawal in Pajaro.~~ are affected by pumping in both basins. Current pumping amounts have apparently resulted in some inland movement of a seawater wedge in the La Selva Beach and San Andreas Road areas (SCWD, 1998).

2. Soquel Creek Water District's current groundwater production is approximately ~~4800~~ 5480 acre-feet/year. It is projected to increase to about ~~8200~~ 6700-7400 acre-feet by the year ~~2020~~

2030. The District needs to develop ~~between 500 and~~ 1000 to 1500 acre-feet of new supply ~~(up to 1/3 of total production).~~ plus an additional amount to correct the current overdraft (SCWD, 1998). Central Water District produced about 600 acre-feet in fiscal year 1997.

3. Coastal groundwater levels in mid-county (Purisima formation) have declined significantly since 1987. Although levels ~~are~~ have been consistently below sea level along; the coast between New Brighton Beach and the eastern end of Seacliff Beach, creating the potential for seawater flow into the basin, ~~from along the Coast~~, signs of intrusion have not yet been detected in the Purisima formation. (SCWD, 1998, figures 6.7). ~~The zero elevation contour (where groundwater elevation equals sea level) is located approximately one mile inland of Soquel Drive from 41st Avenue east and beyond Aptos Creek, a distance greater than four miles.~~

4. Private ~~well extractors~~ wells extract ~~have~~ a significant percentage of the total groundwater use from the Purisima formation: ~~estimates for their use ranges from 1500 to 3000 acre-feet/year~~. estimated private and mutual well production is approximately ~~2,600~~ 1800 acre-feet/year. However, little data on actual usage and groundwater levels are available for private wells. Total annual production from the Purisima formation by all well operators is estimated at ~~7600~~ 6800 acre-feet. This amount is believed to be in excess of sustainable yield. (1/12/99; JAR)

5. Soquel Creek ~~streamflow is~~ appears to be drying up more often now during summer and fall than measured or observed in previous years, but there has not been a determination of the cause(s) (USGS, 1952-1996).

Issues Specific to South County/Pajaro

1. The South County/Pajaro Basin includes the watersheds of 'Corralitos, Coward, and other creeks that drain into the Pajaro River, as well as the Watsonville Slough system and the coastal terrace along San Andreas Road. Most of the water use is groundwater with the vast majority of it pumped by individual private agricultural users. The city of Watsonville ~~also~~ uses groundwater and two surface diversions from Corralitos and Browns Valley Creeks. Groundwater use is managed by the Pajaro Valley Water Management Agency (PVWMA), which maintains meters on larger wells, charges usage fees, and is responsible for developing and implementing an overall Basin Management Plan.

2. Annual pumpage in the Pajaro basin is 68,000 acre-feet/year and is projected to increase to 78.000 acre-feet&ear by 2040. The safe yield of the basin is cited in the Basin Management Plan as 3 1,000 acre-feet/year under current pumping patterns. Estimates in the Basin Management plan indicate that the safe yield may be increased to 50,000 acre-feet/year if pumping is shifted away from the coast. ~~Overdraft is approximately half of demand.~~ The PVWMA is planning to shift pumping away from the coastal area and develop an additional 28,000 acre-feet/year of supplemental supply to meet demands through the year 2040 (Montgomery-Watson, 1993).

3. The rate of seawater intrusion ~~ranges from~~ currently averages about 10,000 acre-feet during a normal year. ranging up to 15,000 acre-fee- during a critically dry year (Montgomery-Watson. 1993). ~~This volume of annual seawater intrusion is greater than water use in mid-County, San Lorenzo Valley, and Scotts Valley.~~

4. ~~This~~ The Paiaro area ~~is the most significant~~ has the largest water supply imbalance in the County. ~~The~~ In 1990 the State ~~has threatened~~ raised the possibility of initiating a groundwater adjudication which would potentially mean reducing groundwater use to match safe yield. Since that time, the PVWMA Basin Management Plan has been developed to address the situation. but there are currently challenges which may delay or limit its implementation. ~~Mechanisms to address the problem are in the planning stages but are not presently in place. There exists a lack of local consensus on problem solutions.~~

5. Nitrate exceeds drinking water standards in approximately 25% of wells monitored. This has been observed primarily in shallow agricultural wells and it does not currently affect municipal water supply wells. There are currently no programs in place to address this situation.

6. The Watsonville Slough system has been significantly modified through channelization and drainage. Slough sediment and biota regularly exhibit toxic levels of the banned but persistent pesticide DDT that enters the sloughs from erosion of nearby fields (Questa, 1995'). Other contaminants such as heavy metals are present at times, but do not generally occur at toxic levels.