



Winter 2009

Integrated Water Plan Update

Santa Cruz Water Department and Soquel Creek Water District



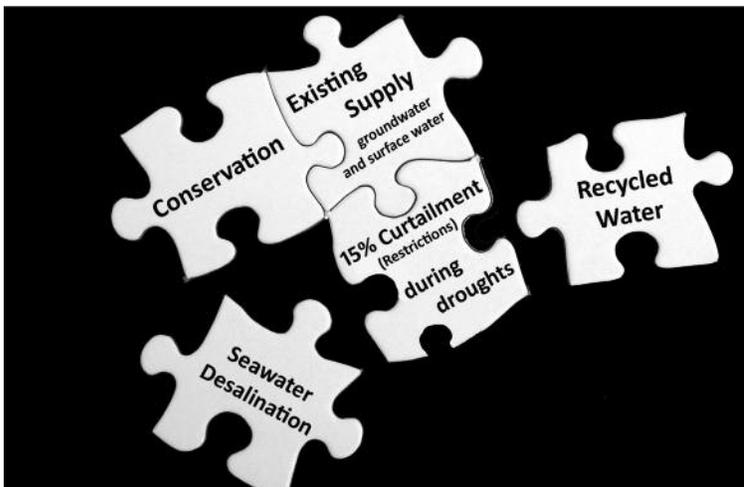
Can Desalination Provide Supplemental Water Supply?

Water is essential to life. Our communities, businesses and families cannot survive without it.

The current water supply for customers served by the City of Santa Cruz Water Department (SCWD) and Soquel Creek Water District (SqCWD) is solely provided by local sources and comes from either surface water (North Coast Diversions, San Lorenzo River, and Loch Lomond Reservoir) or groundwater aquifers in the Soquel/Aptos area, which store water underground.

meeting today's water demand. And, despite good efforts by SqCWD customers to conserve water, coastal groundwater levels remain too low to protect against seawater intrusion (which is virtually impossible to reverse).

In response to three years of below-average rainfall, both agencies instituted 15 percent rationing from May through October 2009 and continue to diligently pursue programs to extend existing water supplies while developing supplemental resources.



Both surface and groundwater resources are limited and threatened. Without a comprehensive water supply portfolio that includes conservation, rationing during droughts, and development of new water supplies to supplement existing resources, the communities served by these two water agencies will face a serious water supply shortage. For example, during severe droughts, the City of Santa Cruz Water Department could be as much as 45 percent short of

that, in addition to conservation, rationing, and recycled water use (where feasible), a small, collaborative seawater desalination project may be the best solution for providing a reliable, additional source of water to complement our existing water supply portfolios. Since the agencies share the same initials, this joint venture is referred to as **scwd**².

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Environmental Review Process Begins Winter 09

This winter, the environmental review process will begin for the proposed desalination facility. The basic purposes of the environmental review process as required by the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA) are to:

- inform the public so they are knowledgeable about the proposed project and to provide them an opportunity to comment on what should be studied in the EIR
- inform governmental decision-makers and the public about potential environmental effects, if any, of the proposed project
- identify ways to reduce or avoid environmental damage
- require changes in a project through the use of alternatives or mitigation measures

A project-level environmental impact report (EIR) will be required for the proposed facility and, in addition to intake issues, the EIR will address:

- safe disposal of concentrated salty water produced from the desalination process
- prevention of marine life being trapped or injured by seawater intake system
- using energy-efficient technologies to minimize energy use
- preventing growth-inducing impacts that could occur by creating a new water source

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Conservation Update: May-October 2009 Water Restrictions



Three consecutive years of below-normal rainfall and runoff has reduced the amount of water available this year. As a result, the Santa Cruz City Council

declared a Stage 2 Water Shortage for 2009 and adopted mandatory restrictions on water use effective May 1 through the end of October. The mandatory restrictions affected primarily outdoor water use. Over 250 million gallons of water were saved from May-September for the City of Santa Cruz which will enable SCWD to maximize water reserves if faced with another dry year.

Soquel Creek Water District issued a Precautionary Drought Curtailment and implemented a program to reduce water use with the goal of achieving a 15 percent reduction from May through October. SqCWD saved 110 million gallons from May-September which will help reduce SqCWD's pumping of the overdrafted aquifers.

As always, conservation continues to be a top priority in maximizing our existing surface and groundwater supplies. Both SCWD and SqCWD offer a variety of conservation programs, rebates and incentives for customers to become more water efficient.

*"Environmental Review Process..."
continued from page 1*

As part of the process, a series of public meetings will be held. The public is encouraged to participate in these meetings by providing input, discussing concerns, and learning more about the project. For more information on public meetings and when they are scheduled to occur, visit www.scwd2desal.org/Page-Public_Meetings.php.

Seawater Reverse Osmosis Pilot Program: Results and Recommendations

From March 2008 to April 2009, the City of Santa Cruz and Soquel Creek Water District conducted a Seawater Reverse Osmosis (SWRO) Pilot Test Program at UC Santa Cruz Long Marine Laboratory. SWRO is advanced technology that would be used at the proposed facility to turn salt water into drinking water.

The pilot test program gathered operational data to establish optimal design/operating parameters for the proposed desalination facility.

During the year-long pilot study, four different pretreatment systems were tested and all consistently produced filtered water that met the goals for

pretreated water quality. Additionally, the reverse osmosis membrane technology tested at the pilot plant effectively produced potable water that meets all federal (Environmental Protection Agency, EPA) and state (California Department of Public Health, CDPH) drinking water standards.

The final report for the SWRO Pilot Test Program is scheduled to be completed in winter 2009. The report will include design recommendations for the proposed facility and various estimates in terms of capital, operations, maintenance, and life-cycle costs.

How To Stay Informed

scwd² is committed to informing the community about our need for a supplemental source of water and the evaluation of the proposed desalination facility. scwd² will ensure that the community will have ample opportunities for public input during the approval process.

To stay informed:

- sign up to receive monthly email updates
- visit our website
- attend a Public Meeting or an scwd² Task Force meeting

Visit www.scwd2desal.org or call 831.475.8501 x153 for information.

What Are CEQA & NEPA?

The California Environmental Quality Act (CEQA) parallels NEPA for state and local agency actions. It is an environmental review process that requires agencies considering project approval to also analyze and take action to protect California's environment. It applies to any project requiring state or local agency action that may have a significant effect on the environment.

The National Environmental Policy Act (NEPA) applies when federal agencies propose to take action or fund or approve the actions of others if environmental impacts are likely to result. Similar to CEQA, NEPA opens federal agency planning and decision-making to the public and promotes decisions with better environmental values.

Key Project Steps and Proposed Schedule

Winter 2009	Final Report of SWRO Desalination Pilot Plant Project
Winter 2009-2012	Environmental Review (including numerous environmental and engineering studies)
2009-2010	Complete Operational Plan discussions between City of Santa Cruz and Soquel Creek Water District
2010-2012	Desalination Facility Design
2012-2015	Desalination Facility Construction
2015	Operation

Intake Studies Underway

There are a number of studies and investigations being conducted as part of the **scwd²** Desalination Program in order to minimize any adverse environmental impacts from the proposed 2.5 million gallon per day (MGD) facility.

Two of these studies focus on the most effective seawater intake system to provide a reliable, cost-effective supply of seawater to the proposed desalination facility while protecting marine life and the environment. Key considerations include construction impacts, operational impacts to marine organisms, capital and maintenance costs, and regulatory permitting.

Seawater intakes can be broadly categorized as subsurface (where water is collected beneath the seabed) or open-water (above the seabed).

Subsurface Study: The offshore geophysical study, which began in July 2009, will determine if an alluvial basin at the mouth of the San Lorenzo River is a viable location to further evaluate the use of slant wells or an engineered infiltration gallery as an intake system.

Open-water Intake Study: The proposed open-water intake system would be located off of Mitchell's Cove.

A 13-month sampling program, which began in May 2009, will collect ocean data on the concentrations and diversity of marine organisms in order to begin the evaluation of the potential impacts of operating such a system. The study is also evaluating the ability of a narrow-slot screen to minimize entrainment of marine organisms in the proposed intake.

Results from the open-water intake study will aid in designing a properly-sized screen system, which will allow marine organisms to "float by" the intake as water is drawn through the pipe to a desalination facility.

For details on these and other studies, visit www.scwd2desal.org

What do impingement and entrainment mean?

Impingement: Pinning of larger marine organisms on the screen mesh as water is drawn into the intake system.

Entrainment: Passage of smaller marine organisms through the screen mesh of an intake system.

Intake System Comparison

Subsurface Intake Advantages:

- potential for natural filtration pre-treatment
- minimizes impacts on marine life during operation (see impingement and entrainment at left)
- minimizes growth of marine life on the inside of the intake pipeline

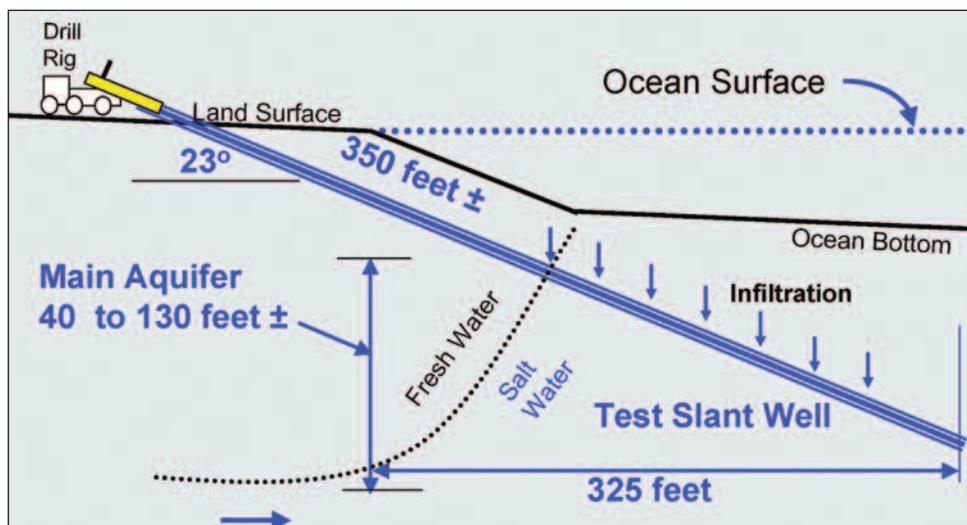
Screened Open-water Intake Advantages:

- not dependent on local coastal and ocean floor geology
- can provide larger volumes of water at lower cost
- could utilize existing outfall pipeline to minimize construction impacts

"Can Desalination Provide..." continued from page 1

Desalination is now used in over 120 countries and is a proven drought-proof technology that can provide high-quality drinking water. SCWD and SqCWD have recently completed a 13-month pilot study to locally evaluate various treatment processes and ensure that the proposed 2.5 MGD facility could meet environmental and water-quality requirements. **scwd²** is currently conducting several studies to evaluate the intake, discharge and energy associated with the proposed facility. Next steps include the environmental review process, permitting, and design of the proposed project.

Desalination would not replace existing water supply sources already serving SCWD and SqCWD. Instead, it would be used to complement and diversify the agencies' water portfolios. It would enable us to provide a reliable supply of water during droughts, preserve our coastal aquifers from saltwater intrusion, and contribute to the protection of public health and safety.



The feasibility of slant wells (above) is being studied as a possible subsurface intake for the proposed desalination facility.



Innovative technology, such as energy recovery devices (above), reduce the amount of energy needed for the desalination process.

Addressing Energy and Greenhouse Gas Emissions

Energy use at the proposed desalination facility will be one of the most important issues to address for both environmental review and permitting purposes. The proposed 2.5 MGD facility would incorporate as much advanced technology as practical to improve energy efficiency and reduce energy requirements and operating costs.

SCWD and SqCWD are committed to thoroughly evaluating the energy issues associated with the proposed project. The two agencies launched an Energy Minimization and Greenhouse Gas Reduction Study in May 2009. This study will:

- establish expected energy required to operate the proposed desalination facility for both agencies
- incorporate energy-efficient components (energy recovery devices, etc.) that will be specified in the design of the proposed facility
- incorporate existing energy offset projects (e.g. solar projects)
- recommend additional offsetting projects and/or programs to mitigate energy and greenhouse gas impacts

SCWD currently uses solar energy at the Graham Hill Water Treatment Plant



How Would the Desalination Facility Be Shared?

The operation of the proposed desalination facility would be shared between the City of Santa Cruz and Soquel Creek Water District. This partnership allows each agency to use desalinated water during different times to serve their different needs and objectives for a supplemental water source.

SCWD would use the desalination facility during a drought (estimated as once every 6 years from May-October) at 2.5 MGD. It is estimated this could reduce the water deficit during drought conditions from 45 percent to a more manageable 15 percent.

During non-drought conditions, SqCWD would operate the facility at approximately half capacity (1.25 MGD) to reduce overdraft of the groundwater basin and prevent salt-water intrusion.

The **scwd²** Task Force (comprised of two Santa Cruz City Council Members and two Soquel Creek Water District Board Members) is currently discussing items associated with collaborative operation of the proposed facility including shared usage, allocation of costs, and governance.



Location of proposed project and existing facilities.

About the Proposed Project

The proposed Seawater Reverse Osmosis (SWRO) Desalination Project could produce up to 2.5 million gallons of drinking water per day (MGD). **scwd²** is in the evaluation phase of this project and findings from various engineering and environmental studies will shape the design of the proposed facility. Currently, the conceptual plan for the desalination facility includes:

- **Intake:** open-water or subsurface
- **Location:** facility would be located within the City of Santa Cruz
- **Size:** 2.5 MGD (normal operation between 1-2.5 MGD, depending on agency)
- **Brine* Disposal:** through the existing City of Santa Cruz Wastewater Treatment Facility outfall

**Brine is a concentrated salty solution resulting from the desalination process.*

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For More Information, Contact:

Melanie Mow Schumacher
Public Outreach Coordinator
Soquel Creek Water District
5180 Soquel Drive, Soquel, CA 95073
(831) 475-8501 ext. 153
melanies@soquelcreekwater.org