

Ocean Wastewater Discharge in the State of California Report and Inventory Prepared by Heal the Ocean

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<http://www.healtheocean.org/>

Additional References, Summaries, and Sources

Water Reclamation and Salinity

Abdul-Wahab, S.A. and M.A. Al-Weshahi. Brine Management: Substituting Chlorine with On-Site Produced Sodium Hypochlorite for Environmentally Improved Desalination Processes. *Water Resources Management*, 23(12): 2437-2454, Sept. 2009.

This work addresses the problem of brine or wastewater generated from desalination production process. The work was conducted with the objective of shedding light on the business opportunities associated with brine wastes by using the brine for on-site generation of sodium hypochlorite. Sodium hypochlorite is a useful and valuable chemical product. It is the most widely used active chlorine compound in disinfection. In general, the suggested experimental process was aimed at the dual benefit of on-site generation of sodium hypochlorite and reducing the concentration of the brine. Therefore, the process will not only generate the sodium hypochlorite, but also will protect the environment.

<http://www.springerlink.com/content/1082200923v36422/>

Atwater, Richard. Salinity Management Issues Facing Southern California. *Southwest Hydrology*, March/April 2008.

Inland Empire Utilities Agency looks at salt accumulation in the environment, methods to control salinity, and problems associated with excess salt in water.

http://www.swhydro.arizona.edu/archive/V7_N2/feature1.pdf

California Poised to Pass Softener Ban. Report on RedOrbit online news service, 8 July 2008 (Accessed October 2009).

According to a New Mexico State University study, water heaters can require up to 30 percent more power to operate with hard water. Large appliances wear out faster when forced to operate with hard water. Clothing and household linens are harmed by hard water. The minerals in hard water act as an abrasive on clothing, causing fibers to break. Hard water can cut the life of clothing by as much as one third and linens can wear out twice the normal rate, depending on how hard the water is.

http://www.redorbit.com/news/science/1468313/california_poised_to_pass_softener_ban/

Calleguas Regional Salinity Management Project /Hueneme Outfall Replacement, Watersheds Coalition of Ventura County.

The Calleguas Regional Salinity Management Pipeline (SMP) is being constructed by the Calleguas Municipal Water District and consists of a pipeline to collect concentrate from demineralization of brackish groundwater for municipal, industrial, and agricultural purposes; concentrate from demineralization of potable water for high-tech industrial purposes; and excess high quality recycled water from municipal wastewater treatment plants. The SMP will convey the flows to other areas for beneficial reuse or, when there are insufficient demands for reuse, ocean discharge.

<http://portal.countyofventura.org/pls/portal/docs/PAGE/CEO/DIVISIONS/IRA/WC/PROP50MAP/C-1/C-1.PDF>

Ghaly, A.E.; Verma, M, Desalination of Saline Sludges Using Ion-Exchange Column with Zeolite. *American Journal of Environmental Sciences* 4 (4): 388-396, 2008

A flushing process followed by a zeolite based ion-exchange process were developed for the treatment of saline sludges from oil and gas exploration sites. The particle size distribution of sludge sample indicated the presence of very fine sand and clay. The electrical conductivity of the sludge was 42.2 dS m⁻¹ indicating very saline sludge and the Cation Exchange Capacity (CEC) was 40 cmol kg⁻¹ which was very suitable for ion-exchange process. A

<http://www.scipub.org/fulltext/ajes/ajes44388-396.pdf>

Introduction to Salinity, City of Phoenix website (accessed September 2009).

Introduction to Salinity

<http://www.phoenix.gov/WATER/salinity.html>

Lifsher, Marc, Culligan lobbies for its life as water softeners become a drought issue. *LA Times*, June 26, 2009.

The company is fighting a state Assembly bill AB 13668 that would let regulators ban devices that discharge salt into municipal sewer lines, rendering water difficult to recycle. AB 1366 Water softening is a \$500-million annual business in California. Units can cost about \$2,300 plus periodic servicing. One in 10 Golden State homes, or an estimated 1 million households, have them.
<http://articles.latimes.com/2009/jun/26/business/fi-culligan26?pg=2>

Livingston, E., Water desalination and Reuse Strategies for New Mexico. Presentation transcript, September 2004, New Mexico Water Research Institute website (accessed October 2009).

First water system in New Mexico to use desalination in their drinking water supply: the White Cliffs Mutual Domestic Water Users Association (MDWUA). The White Cliffs MDWUA is a small water association just east of Gallup. They have about 40 connections, about 40 families, and serve 150 residents. It is a low-income Navajo community and their demand is about 15,000 gallons per day. Before the desalination facility was put into use, the majority of the residents purchased bottled water for drinking and cooking because of the poor quality of their water supply. Also, most residents have water softeners at the same time to treat the water for use within their households.
wri.nmsu.edu/publish/watcon/proc49/livingston.pdf

Martínez Beltrán, J. and Koo-Oshima, S., Water desalination for agricultural applications. Proceedings of the Food & Agriculture Organization of the UN Expert Consultation on Water Desalination for Agricultural Applications 26–27 April 2004, Rome.

With worldwide concerns about water scarcity, agriculture is under pressure to improve water management and explore available options to match supply and demand. Desalination is a technical option to increase the availability of freshwater both in coastal areas with limited resources and in areas where brackish waters – such as saline groundwater, drainage water and treated wastewater – are available. Desalinated water can also be crucial in emergency situations where water sources have been polluted by saline incursions. However, desalinated water produced worldwide, estimated at 7 500 million m³/annum, equals only 0.2 percent of total water use.
ftp://ftp.fao.org/agl/aglw/docs/lwdp5_e.pdf

Melbourne Water and City West Water, Australia, Western Treatment Plant Salinity Management Plan. December 2004 (Accessed October 2009)

The Victorian Government White Paper: Our Water Our Future states in Action 5.32: Melbourne Water and City West Water will develop a salinity reduction strategy for the Western Treatment Plant this year. A key outcome will be fit-for-purpose water for the Werribee Irrigation District Recycled Water Scheme...opportunities are constrained by the current level of salinity in the water available for recycling from Western Treatment Plant. It is therefore appropriate to develop a salinity reduction strategy. Investigation has demonstrated that for the most appropriate uses of recycled water, the salinity of delivered water should be approximately 550 mg/l TDS for sustainable use. This target has been adopted as part of the strategy, it better the 40 per cent reduction target published in the Government's White Paper and will provide a 'fit-for-purpose' supply for the Werribee Irrigation District. It should be noted however, that higher salinity levels in recycled water may be adequate for some purposes.
http://74.125.155.132/search?q=cache:Qcqlp_f58LAJ:https://www.citywestwater.com.au/business/docs/Western_Treatment_Plant_Salinity_Management_Plan_-_FINAL_Dec_2004.doc+wastewater+treatment+salinity+reduction&cd=1&hl=en&ct=clnk&gl=us

2008 - 2009 NWRI Fellowship Program Progress Reports. National Water Research Institute, June 2009.

Short progress reports on the status of membrane and desalination research projects funded under the US National Water Research Institute's graduate fellowship scheme for 2008-2009
<http://www.nwri-usa.org/pdfs/2009NWRIFellowshipProgressReportsAug09.pdf>

Program of the Multi-State Salinity Coalition Water Supply, Agriculture & Salinity Management Workshop, September 2009.

Multi-State Salinity Coalition Water Supply: presentations on various relevant topics
http://multi-statesalinitycoalition.com/contrib/docs/AgWorkshop2009_final.pdf

RMC Water & Environment, Sunnyslope County Water District Long-Term Wastewater Management Plan Executive Summary, January 2006.

California water district piping project to capture brine wastes in order to increase water recycling.
<http://www.sscwd.org/LongTermWastewaterManagementPlan.pdf>

Salinity Management Guide website. (Accessed October 2009).

To conserve our water resources, the State of California encourages the use of recycled water in place of potable water for applications such as landscape irrigation. However, irrigators are concerned that salinity in recycled water can affect the growth and health of plants. This brochure shows that recycled water can be safely used for landscape irrigation and that salinity can be addressed through proper management strategies.
<http://www.salinitymanagement.org/Salinity%20Brochure.pdf>

Southern California Salinity Coalition (SCSC) website, (Accessed October 2009).

SCSC is a coalition of water and wastewater agencies in Southern California dedicated to managing salinity in our water supplies. The Southern California Salinity Coalition (SCSC) was formed in 2002 to address the critical need to remove salt from water supplies and to preserve water resources in California.

<http://www.socalsalinity.org/>

Schwarzenegger vetoes AB 2270. Report on Salt Institute website, 10/01/2008 (Accessed October 2009).

CA Gov. Arnold Schwarzenegger vetoed AB 2270 , a bill to remove procedural hurdles and make it easier for the state's water districts to ban ion-exchange water softeners.

<http://www.saltinstitute.org/News-events-media/Salt-Sensibility/Water-Softening/Schwarzenegger-vetoes-AB-2270>

Water and Wastewater Salinity Management Project, Eastern Municipal Water District

\$1,000,000 for the Water and Wastewater Salinity Management Project.

The project will provide for the disposal of non-recyclable waste brine from industry within EMWD's service area and from EMWD's Desalination Program by building up to four brine disposal pipelines that will connect to existing brine management facilities. The project will help protect existing groundwater supplies in these communities and reduce the salinity of recycled water, both of which will reduce the need for additional imported water into Southern California.

www.emwd.org/news/grant-docs/salinity-mgmt.pdf