

NITRATE CONTAMINATION IN THE OXNARD PLAIN GROUNDWATER

INTRODUCTION

The Grand Jury conducted an investigation into groundwater contamination in the Oxnard Forebay and Oxnard groundwater basin. This area is within the Fox Canyon Groundwater Management Agency (GMA) jurisdiction.

Committee members were first alerted to groundwater contamination in the City of Oxnard's main water supply wells through news media reports and a presentation to the Grand Jury panel by a member of the Ventura County Board of Supervisors.

SCOPE

The purpose of the investigation was to determine the cause(s) of nitrate contamination within the boundaries of the GMA, which manages extraction's from all of the water aquifers within its jurisdiction.

INQUIRY

We toured various water agency sites, a commercial water quality testing laboratory, and interviewed state and local agency water quality officials.

The investigation was conducted over a period of seven months and included the following site visits and agencies:

- Ventura County Regional Sanitation District (VCRSD)
- Santa Paula Wastewater Treatment Plant
- Fox Canyon Groundwater Management Agency (GMA)
- United Water Conservation District (UWCD)
- Fruit Growers Laboratory (FGL)
- Santa Clara River Freeman Diversion Dam
- City Of Oxnard
- Calleguas Municipal Water District (CMWD)
- Ventura Co. Economic Development Association, Environmental Affairs Div.
- Ventura County Farm Bureau
- State of California Department of Health Services, Drinking Water Field Operations Branch
- California Regional Water Quality Control Board (CRWQCB)
- CALMAT and Southern Pacific Milling Company (SP Milling)
- Camrosa Wastewater Treatment Plant

BACKGROUND

Following is a brief description of the governmental agencies and their responsibilities regarding water quality issues:

- State of California Department of Health Services, Drinking Water Operations, is the agency responsible for overseeing compliance with the 1996 Safe Drinking Water Act. The original 1974 act signaled a change in attitude toward the public drinking water supply. Congress authorized the federal government to establish national drinking water regulations, which were adopted and promulgated by the states. California Code of Regulation Titles 17 and 22 provide the statutory provisions relating to drinking water to protect public health in the State.
- The CRWQCB is responsible for implementing regional water quality control policies and plans and issuing National Pollutant Discharge Elimination Permits, which control the quality of wastewater discharges to surface waters and issue requirements to control the quality of discharges to groundwater. CRWQCB, Los Angeles Region, has jurisdiction over the coastal drainage between Rincon Point (West Ventura County) and the Eastern Los Angeles County line. The nine member board holds regular meetings at different sites throughout the region at which the public may address them on certain issues.
- GMA was created in 1982 by the California Legislature to manage the groundwater resources within its boundaries, which includes the Oxnard Plain. Its authority is limited to the planning, managing, controlling, preserving, and regulating the extraction and use of groundwater. GMA is also authorized to implement groundwater management activities to improve and protect the quantity and quality of groundwater supplies within any groundwater basins or aquifers under its jurisdiction.
- VCRSD was created in 1970 when the county and cities came together to consolidate their wastewater needs. The district owns and/or operates half of the sewage plants in the county, treating more than 4,000,000 gallons of sewage per day. In addition to the ten wastewater treatment plants and pump stations, the district operates four potable water distribution systems serving 3,500 customers.
- UWCD was reorganized in 1950 to continue maintaining the quantity and quality of underground water in the Oxnard Plain. The process was initiated by the issuance of bonds for the construction of Santa Felicia Dam, three water spreading grounds and distribution facilities, which were needed to repel seawater intrusion. The Freeman Diversion Dam, completed in 1991, has diverted over 500,000 acre feet of Santa Clara River water to spreading ponds for recharging groundwater aquifers.
- FGL provides chemical analysis for drinking water districts, mutual water companies, irrigation water districts, and county, cities and state agencies throughout California. FGL also offers services to agriculture business in addition to drinking water purveyors, wastewater and hazardous waste generators. They perform services for UWCD, Calleguas and other Ventura County water purveyors. FGL is a state certified laboratory used to analyze the content of drinking water and wastewater.

FINDINGS

- The City of Oxnard was required to temporarily shut down five of its seven main water supply wells (1,3,4,22 & 23) due to increased levels of nitrates, total dissolved solids (TDS) and sulfates, which leaves two deep aquifer water wells available for use.
- In order to maintain an adequate potable water supply to residents, Oxnard was forced to proceed with higher cost water blending, which consists of 50% CMWD and 50% UWCD water. This was due to nitrate (NO₃) levels exceeding the State standard for drinking water, which is 45 milligrams per liter or its equivalent of 10 milligrams per liter nitrate-nitrite (NO₃-N). Excessive levels of nitrates can cause serious illness (Blue Baby Syndrome) in infants under the age of 6 months.
- Based on interviews with State, City and private water purveyor officials, we learned that the most prominent sources for nitrate contamination seemed to be caused from:
 - Septic Tanks
 - Fertilizers containing a high percentage of nitrogen compounds
 - Agriculture irrigation runoff
 - Leaking abandoned water wells
 - Santa Clara River water during low flow conditions
- Bacteria may be monitored by water purveyors pursuant to Total Coliform Rule. Viruses and microbial pathogens, such as giardia and cryptosporidium, have not been monitored in the Oxnard Plain. All surface waters with human or animal contact will have bacteria and coliforms present. However, groundwater contamination can occur when contaminated surface water or sewage comes in contact with groundwater. The 1997 Federal Information Collection Rule requires water districts serving more than 100,000 connections to begin monitoring for cryptosporidium oocysts. Chlorine, the most widely used disinfectant of water, does not fully inactivate cryptosporidium, but the use of ozone gas appears to disinfect the water and kill any cryptosporidium oocysts.
- Prior to the formation of GMA, over pumping of groundwater from the Oxnard Plain Aquifers caused water levels to drop below sea level, resulting in seawater intrusion. The Freeman Diversion Dam was built to divert river water for groundwater recharge. The Forebay Basin is unique in that underground sand and gravel reach the surface and allow diverted water to penetrate and recharge the aquifers. Spreading grounds in Saticoy and El Rio receive the diverted water from the dam where percolation through filtering sand recharges the aquifers, reverses the intrusion of seawater, and supplies the Oxnard Plain with drinking water.
- The majority of residences on septic tanks, situated in the Oxnard Forebay area, are located within the unincorporated community of El Rio. Septic tanks contaminate shallow aquifers due to the high nitrogen and pathogen content. The California Water Resources Control Board has made grant funds available for sewers in small communities with a low median household income of \$32,000 per year. Initially, El Rio qualified under this provision and the grant application was supported by CRWQCB as their number one priority. Subse-

quently, the California Water Resources Control Board proposed an additional requirement for grant eligibility based on a sliding scale. This new requirement will cause an economic hardship on El Rio residents since only 50% of the project cost would be funded. The County has plans to request reconsideration of the new requirement.

- Nitrogen based fertilizers are widely used for inducing crop growth throughout the Oxnard Plain and other county areas. Discussions with the Ventura County Farm Bureau revealed that there is no alternative substitute in the foreseeable future. However, use of best management practices for fertilizer application may help reduce nitrate loading.
- Agriculture irrigation runoff within the Oxnard Forebay area is a contamination source of the Oxnard Plain aquifers. This is due to the direct seepage of surface water runoff into the upper aquifer system.
- According to county records it is estimated there are at least 1,000 existing abandoned water wells in the Oxnard Plain. Cross contamination of aquifers by leakage of near surface waters through abandoned wells is a suspected source of contamination. A priority list for the destruction of those abandoned wells is being compiled by GMA. Grant money (\$255,000 from the Environmental Protection Agency) and \$170,000 in matching funds from GMA is earmarked for that project to be administered by CRWQCB. The total funds of \$425,000 are estimated to be sufficient to destroy 100 abandoned wells. Additional funding is being sought from the State, County, UWCD and the City of Oxnard to continue this program.
- The Santa Clara River contains poor quality water during low flow conditions, (less than 200 cubic feet per second). Under these flow conditions TDS are at or above the secondary standards maximum contaminant level for drinking water (1000 milligrams per liter).
- Long term projections of groundwater quality have not been made.
- Amendments to the Federal Safe Drinking Water Act include provisions for providing grants to states to establish a State Revolving Fund program. This program will provide low interest loans and other assistance for improvements to public drinking water systems. Based on current estimates the state expects to receive \$80-100 million per year in federal grants through 2003 if the legislature approves the establishment of this program and can provide the required 20 percent matching funds. These funds will be derived from a state bond measure that will be placed on the June 9, 1998 ballot.
- The exposed groundwater in the three open pits at the S.P. Milling mining site could present a possible source of contamination of the upper groundwater aquifer.

CONCLUSIONS

1. There is a consensus that a lack of resources stymied adequate oversight of field operations by state and county officials.
2. There is a lack of open dialogue involving water quality issues among the various water agencies.
3. The City of Oxnard would benefit from construction of a water treatment and

RECOMMENDATIONS

disinfectant facility due to the current contaminated condition of its well water supply.

4. Wastewater treatment facilities along the Santa Clara River with secondary level filtration are a source of contamination within the Oxnard Plain groundwater aquifers.
5. The county has been lax in its administrative oversight responsibilities regarding enforcement of the provisions contained in the Conditional Use Permit 1942, issued to S.P. Milling in 1979.

1. Ventura County water purveyors must collectively initiate a dialogue to address water quality issues.
2. Due to the potential public health problems related to pathogens, viruses and bacteria in drinking water, monitoring of these substances must be performed by the various affected water agencies.
3. Public water purveyors should make available raw data as part of any comprehensive report that is issued regarding water quality.
4. The county must aggressively enforce provisions of current and future Conditional Use Permits issued to firms engaged in operations which could have an adverse affect on groundwater quality.
5. Septic tanks situated in the Oxnard Forebay Basin area must be replaced with a modern sewage disposal system at the earliest possible time.
6. The City of Oxnard should apply for state funds that may become available from the proposed State Revolving Fund for constructing future water treatment and disinfectant facilities.
7. Wastewater treatment facilities along the Santa Clara River that have a significant impact on water quality during low flow conditions must be modernized to tertiary level filtration.
8. UWCD should request the State Water Resources Board to eliminate the requirement of diverting Santa Clara River water during low flow, non-drought conditions.
9. GMA should place more emphasis on improving water quality within their jurisdiction.
10. State agencies responsible for the quality of groundwater within the Oxnard Plain should assume a leadership role in developing a comprehensive water management plan.
11. The county must make every effort to take monthly samples and tests of the groundwater contained in the pits at S.P. Milling mining site.

RESPONSE REQUIRED

Listed below are the recommendation numbers and agencies required to respond.

1. United Water Conservation District, City of Oxnard, Calleguas Municipal Water District.
2. United Water Conservation District.

3. United Water Conservation District, Calleguas Municipal Water District.
4. Ventura County Board of Supervisors, Chief Administrative Officer, Public Works Agency.
5. Board of Supervisors, Chief Administrative Officer, Public Works Agency.
6. City Of Oxnard.
7. Ventura County Regional Sanitation District.
8. United Water Conservation District.
9. Fox Canyon Groundwater Management Agency, Public Works Agency.
10. State of California Department of Health Services-Drinking Water Field Operations Branch, California Regional Water Quality Control Board.
11. Board of Supervisors, Chief Administrative Officer, Public Works Agency