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Soils ruined by chemical, report says

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A long-delayed U.S. Geological Survey report released this week suggests that the sodium sulfate base of farm drainage waters is ruining the soils of the Grassland Water District, a key winter habitat for migratory birds.

The report also says that even irrigation water imported from Northern California through the Delta-Mendota Canal has a sodium sulfate base, which creates major difficulties for western San Joaquin Valley farmers. West side soils also have a sodium sulfate base and are commonly known as alkali.

The study by USGS scientists T.S. Presser and Ivan Barnes is the first detailed look at the complex chemistry of the Northern California irrigation supplies imported through the Delta-Mendota Canal and the resulting drain waters that leach through west side fields

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picking up selenium and other trace elements.

Selenium, a micronutrient that is toxic in larger amounts, is being blamed for bird deaths and deformities at the Kesterson National Wildlife Refuge and also is affecting birds and wildlife in the Grassland of western Merced County.

Barnes said that in their studies, conducted from August 1983 to December 1984, they discovered that all waters on the west side, when evaporated, reveal a sodium sulfate base that is damaging to marshlands or farmlands and can produce "sterile" soil by displacing calcium and other essential elements. Farmers must replace those elements with expensive soil amendments.

"That's really bad news," Barnes said. "What it's really showing is that there is no water out there that doesn't yield a sodium sulfate when it evaporates. When you put that fact together with the fact that there is up to 100 inches of evaporation a year [in the western San Joaquin Valley] I think you can reach that conclusion."

The report also reconfirmed the relationship between sodium sulfate and selenium levels in the drain waters. The higher the sodium sulfate, the higher the selenium level.

Sodium levels in the drain waters ranged from 55 percent to 92 percent, while sulfate levels ranged from 54 percent to 85 percent. The highest sodium sulfate concentration in the drain water was measured at 22,500 parts per million.

Their results also noted drain water flows into the south end of the Grassland averaged 50 parts per billion selenium during the study period, peaking during the summer months when irrigation is occurring and subsurface drains are flowing heaviest.

Wildlife biologists say selenium levels above two to five parts per billion may cause negative effects to an ecosystem as the selenium concentrates in animals while moving up the food chain.

The report has major implications for continued irrigation of the western valley. Barnes said that because the area's soils are sodium sulfate based and selenium laden and because the imported irrigation water is also sodium sulfate, farming can only continue if huge amounts of water are used to leach out the salts and the drain water can be economically and safely removed. The drain water disposal problem has been unsolved for decades.

Western Merced County farmers gave up their San Joaquin River rights 40 years ago in exchange for greater quantities of lower-quality Northern California water plus recycled drain water from the lower San Joaquin River.

The upper San Joaquin River water stored behind Friant Dam and diverted along the east side of the valley to Kern County is calcium-bicarbonate-based and is considered excellent for irrigation.

Release of the USGS report, which Barnes said was reviewed by three leading world authorities, was held up for seven weeks by USGS officials in Reston, Va., and Interior officials in Washington, D.C.

Barnes said it was specifically stalled by "two incompetents" in agency headquarters "whose review comments were rejected because they were stupid." He did not identify them.

He did say he believed a standard news release which should have accompanied the report was not issued because of political reasons.

The Department of Interior is faced with a growing crisis over the farm drainage problem and growing deficits from selling water to irrigation districts at far below true delivery costs. U.S. Fish and Wildlife officials have said the Grassland ecosystem is in danger of going "toxic" because of damage caused from farm drainage waters.

Many of the Grasslands duck clubs have used farm drainage waters for the past two decades because fresh water supplies were unavailable. But most of the clubs halted use of the drain water this year because of the dangers.

Interior officials have not yet indicated if they will provide fresh water to the duck clubs and area state and federal refuges even though migratory birds have begun arriving in the area.

Kesterson manager Gary Zahm has predicted severe overcrowding problems for millions of ducks and geese if the refuges, now dry, are not supplied with good water in the next few weeks.

The USGS report also stated that one drain water sump on Nees Avenue in the Westlands was measured in June 1984 at 4,200 parts per billion selenium.

"This sump was reported by the USGS as a toxic waste hazard to the State Water Resources Control Board and other agencies on July 5, 1984," the report said.

However, Barnes said Thursday no action was ever taken.

The Presser-Barnes report also noted that June 1984 tests of the Main Canal, a fresh water ditch which originates at the Mendota Pool on the San Joaquin River, confirmed poor quality drainage water was being illegally dumped into the canal from an unknown source.

"The Main Canal is also a drinking water source for Dos Palos," the report said.

Environmentalists long have contended that farmers unable to dispose of their tainted drain waters are dumping them into fresh water ditches to get rid of them, thereby degrading the quality of the fresh supplies and creating more problems for other farmers downstream.

The report also said one 1,089-foot-deep irrigation well in the Westlands, 12½ miles south of Mendota, measured 61 parts per billion selenium during a November 1984 test. Barnes said results were inconclusive but did indicate some mixing of polluted shallow ground waters may be occurring with higher quality waters at deeper levels.

Government scientists have expressed concern that the lower aquifer which provides much of the drinking water for the San Joaquin Valley could be contaminated by ground water polluted with salts or pesticides.

The USGS report also noted 1,000 irrigation wells exist in the Mendota area, which is plagued by high selenium levels in the soil. Barnes said many of these old wells have gravel casings and because of changes in hydraulic pressures created by irrigation these casings provide a direct conduit to the lower aquifers for polluted shallow ground waters.