INTERSEX MICE DISCOVERED AT KESTERSON yield further evidence that the presence of toxics in the environment can screw around with the wildlife, according to a June 17 article in the *Sacramento Bee*. Monitoring conducted by CH2M Hill found that 29 of 87 mice and voles at the former Kesterson National Wildlife Refuge — once a collection point for selenium and pesticide-laced agricultural drainage from the San Joaquin Valley — had both male and female sex organs. Researchers will now try to home in on the culprit — possibly the locally high levels of selenium, possibly something else — as well as to determine if this is a Kesterson-unique phenomena. Gruesome deformities and deaths in waterfowl eggs and embryos linked to selenium led to the closure of Kesterson back in 1986. Contact: gsantalo@ch2m.com

DREDGED MATERIAL DUMPING IN THE BAY will decrease by 75% over the next 50 years under a regional dredging and disposal strategy signed by five government agencies on July 16. This record of decision is the product of ten years of collaborative effort on the part of regional government, shippers and environmentalists to break out of the mudlock of the 1980s, when concerns about the ecological impacts of the then Bay-centered-disposal program blocked efforts to expand local shipping. The new plan is to divvy up the dredge spoils in a more balanced manner, with only 20% going back into the Bay, 40% going out to an ocean disposal site, and the remainder going to wetland restoration, levee repair and landfill cover projects. Contact: (415)744-2201

WHERE DIOXINS COME FROM depends on whom you ask, according a June 24 article in the *Contra Costa Times*. U.S. EPA, for example, says only 9% of this man-made carcinogenic chemical comes from cars, trucks, buses and other mobile sources, as well as wood burning stoves, whereas the local air district puts the figure at 66% and the regional water quality board at 84%. Similar disparities appear in estimates of industry's share. Scientists say it's time to stop the finger-pointing and focus instead on which sources are the most controllable.

A BAY AREA MASTER PLAN FOR WATER RECYCLING released this July by 13 local and regional agencies suggests that cost-effective use of recycled water could reach 125,000 acre feet by the year 2010 and grow to up to 500,000 acre feet by 2040. Planners zeroed in on the least costly means of connecting potential users of recycled water with the treatment plants that produce the supply, with a goal of offsetting water shortages projected for dry years. The Master Plan also identifies 18 potential wetland sites and 13 streams where recycled water could be used to swell the quantity, and sweeten the quality, of the water. Contact: www.rmcengr.com

AN ORDINANCE REQUIRING MID-OCEAN BALLAST WATER EXCHANGE for vessels calling at the Port of Oakland was passed by the Board of Port Commissioners this June and went into effect August 1. The ordinance aims to protect the Bay from further invasions of non-native marine life via ballast water from foreign ports. Contact: (510)272-1179

YOUR INDEPENDENT SOURCE FOR BAY-DELTA NEWS & VIEWS

ESTUARY

Fever Breaks on Mercury

Shoes that light up, greeting cards that play music, orange paint and crematoria... These are just a few of the surprising items harboring mercury — a heavy metal very much at large in the Bay-Delta environment and fast accumulating in the food chain. Efforts to thwart this contamination are heating up, as government and stakeholders up and down the Estuary wrangle over objectives, science and regulations.

"It's nasty stuff," says Phil Bobel of the Palo Alto Water Quality Plant. "It's a water pollution problem that people respond to more strongly because of the human contact hazards."

Mercury as a deadly pollutant made its most dramatic appearance back in the 1960s in Minamata, Japan, where enough got into the local food chain that it actually poisoned the populace and caused frightful birth defects and symptoms like those of MS. More recently, mercury has been found in Bay fish at levels high enough to lead the state to issue health warnings for consumers.

Where is it coming from? Not only is it hidden in household items like lap top switches and thermometers, but also in our dental fillings and wrinkle creams. Regulators guesstimate that over 1,700 kilograms per year enter the Bay watershed (see table p.6). One big chunk comes sewage, urban runoff and atmospheric fallout from furnaces, crematoria and cement manufacturing. Another chunk flows downstream from decommissioned mines in the watershed while a third chunk lurks in Bay bottom deposits of old hydraulic mining debris (miners used mercury to extract gold and silver from their ores).

Scientists say at least 400 million cubic meters of this debris ended up in San Pablo Bay. According to bathymetric models crafted by the U.S. Geological Survey's Bruce Jaffe and Richard Smith, underwater erosion is fast exposing about 100 square kilometers of the debris up to five meters thick. "We're talking hundreds of tons of mercury at or near the surface of the Bay floor and in contact with the ecosystem," says Jaffe.

Most of this was introduced into the environment as what's called elemental mercury, one of four kinds absorbed into the ecosystem in differing degrees. Elemental and reactive divalent mercury (Hg^{2+}) both convert into the most dangerous and "bioavailable" form, known as methyl mercury, at a faster rate than cinnabar — the mercury sulfide in mine runoff. What kinds of environments and conditions promote mercury methylation are questions scientists now wish to explore. But one thing they do know is that bacteria in marshes along rivers and bayshores spur methylation.

"With some pollution problems the best thing to do is let natural processes remove it, but not in this case," says Jaffe. "Mercury is a moving target."

With the marsh-ringed, debris-strewn shallows of the North Bay such a potential breeding ground for the bad stuff, it's no wonder that environmentalists have been raising Cain about mercury in local sewage discharges. To date, BayKeeper has appealed four North Bay discharge permits, both on mercury and other contaminant issues.

The latest of these permit wars flared this May, when the S.F. Regional Water Quality Control Board re-issued Novato's NPDES permit but temporarily increased the amount of dissolved mercury the treatment plant is allowed to discharge from 0.03 to 0.052 parts per billion. The Board then gave Novato seven years to comply with a tougher 0.025 final limit.

Reasons for allowing the increase, according to the Board, were that the old limit was based on since invalidated state

continued page 2

MERCURY CONTINUED

objectives rather than on the region's current Basin Plan, and that within the next five years the Board would have a new improved regulatory approach to plug into the equation.

In the meantime, the limits currently in the permit include a new mass mercury limit based on prior performance. Keeping a growing bedroom community to existing performance and giving them a monthly cap is a disturbing idea to many dischargers. "It's a new concept, and one that has our industry very worried, because if you set the mass limit low enough, it's a growth control, which should be the purview of regional land use planning not water quality regulation," says Novato's Tom Selfridge. "We can live with the mass limit in our permit, but we don't like the precedent."

Environmentalists, meanwhile, don't think the North Bay permits go far enough and have accused the Board of backsliding from tougher limits and allowing potential increases in the area's mercury load. "The old myth is that mercury is just a historic legacy of Gold Rush days, and that there's nothing we can do about," says Mike Belliveau of Just Economics for Environmental Health. "But having so much in the system already means we have to crack down harder on what's ongoing. We're long past due to get rid of mercury containing products, especially where alternatives already exist for them."

Palo Alto's sewage plant has proved this can be done. Last year it invited its community to turn in their old mercury thermometers for a coupon good for a digital fever detector. The plant's Phil Bobel says that while the actual reductions in load may be small — only 1,000 thermometers turned in within 18 months — the public awareness value has been great. "It's a way to communicate with the public about something they can understand, and give them something they can do. People come in actually excited to be turning in their thermometer." (Ironically, the recycled thermometers are made into new ones.)

Palo Alto has also asked hospitals and labs to come up with strategies to find substitute equipment for pressure-sensing and other devices containing the offending metal, and found them eager to try. Breaking one mercury thermometer in the wrong place can mean a $500-$1000 hazardous waste clean up, he says. Palo Alto has also conducted a thorough review of sources of mercury to the wastewater entering its treatment plant, and also discovered that the unregulated smoke produced by crematoria may contribute on the order of 100 pounds of mercury per year (via the volatilization of dental fillings). Contemplating possible control strategies — since there's no real technology yet to filter out mercury "smoke" — boggles the mind, if not the soul.

But a certain amount of soul searching may be required if traditionally at-odds dischargers, environmentalists and regulators are to come to agreement on a regional strategy for reducing mercury. To this end, the S.F. Regional Board began work to set a total maximum daily acceptable mercury load (TMDL) for the entire region last year, which is scheduled to complete by 2004. The Central Valley Regional Board is on a similar TMDL track.

"The TMDL is the answer to everyone's questions," says the S.F. Board's Shin Roei Lee. "When it's done, everyone will get their fair share of the waste load."

"The Novato permit continues our trend over the past year of reissuing permits that focus less on compliance with a 'number' and more on ensuring that dischargers take the responsibility to reduce loadings of critical constituents to the maximum extent possible," adds another Board staffer, Bruce Wolfe. "We want them to quit operating in a vacuum and work with other dischargers to coordinate monitoring, and with us to develop an understanding of what their discharge means in their watershed."

Such an understanding should come from the newly-formed, 50-member, stakeholder-based Mercury Watershed Council launched by

continued page 6

BURNNG ISSUE

SUMMER NO VACATION FOR SMELT

Nature, California's relentless thirst and human error conspired to make the early summer of 1999 a particularly deadly one for Delta smelt, creating a textbook example of the hazards facing efforts to protect wildlife and simultaneously supply water to farms and cities.

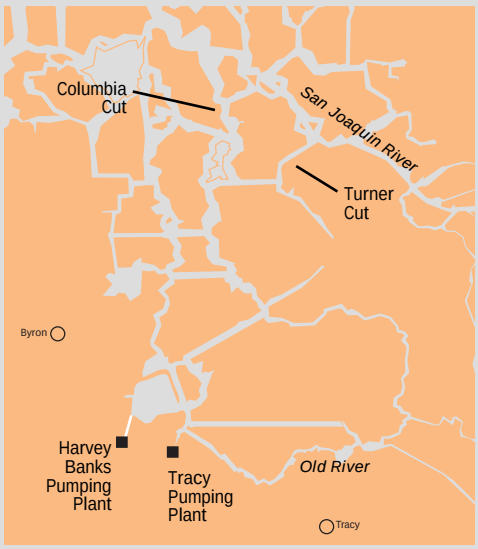
Cal Fish & Game scientists are reviewing their data, trying to find out why so many of the threatened fish lingered for so long within reach of the state and federal pumps in May, June and July, leading to high entrainment levels and a month-long slowdown at the pumps that had water officials and farmers biting their nails and environmentalists calling for a complete shutdown.

According to Fish & Game's Heather McIntire, there have been large takes at the pumps before, although they usually occurred in dry years, when the smelt's spawning habitat in fresh water areas of the Estuary is limited to the Delta and upstream areas. "They may have stayed because the Delta water was cooler than normal this year, or their preferred food was more abundant here," she says.

The pumps hit the take limit in late May, leading U.S. Fish & Wildlife to restrict pumping to less than 3,500 cfs (from the usual 6,000 to 8,000 cfs). As a result of the cutbacks San Luis Reservoir, where heavy spring flows would normally have been stockpiled during this period, had to be drawn down to supply San Joaquin Valley farmers and Silicon Valley industries, raising the specter of water shortages later this summer. And despite the cutbacks, "more than six times the legal allowable take was entrained at the facilities in May and June, and twice the legal take in July," says McIntire.

In late June, as calls from water users grew increasingly frantic, "the smelt began moving away in the right direction," says U.S. Fish & Wildlife's Pat Foulk, and the agency granted permission to ramp up pumping. But a clean getaway for the little fish was not in the cards: three weeks later wildlife agencies discovered that a temporary barrier at Grant Line, required by permit to remain open while Delta smelt salvage is high, had been inadvertently closed. With the barrier closed, explains McIntire "the hydrodynamics of the south Delta reverse direction and pull fish toward the pumps from Turner and Columbia cuts." McIntire says the specific impact of the barrier closure is unknown, as is the overall effect of the summer's events on the total smelt population. Contact Heather McIntire (209)948-7087 **CH**

SOUTH DELTA PUMPS AND WATERWAYS



ENVIRONMENT

BAY HISTORY BY THE MOUND

The fact that shopping malls and parking lots may soon bury two of the Estuary's historic shellmounds heightened the already palpable level of interest in these environmental artifacts at a July 25 symposium sponsored by the Berkeley Architectural Heritage Association, News for Native California, and the UC Berkeley Archaeological Facility.

The 200 people attending the Emeryville conference heard speakers discuss such shellmound-related topics as the environmental history of the Bay, new, less invasive techniques of archaeological examination, and how to best preserve what is left of the mounds. Once thought of as little more than garbage dumps, an attitude perpetuated by early anthropologists, according to U.C. archaeology professor Kent Lightfoot, the mounds are now considered important artifacts that offer a glimpse of what the Bay and its earliest human inhabitants were like.

As many as 425 of these prehistoric structures once ringed the Estuary wherever freshwater streams entered the Bay, says Lightfoot. From around 500 BC to AD 900, the early Native American inhabitants of the Estuary's shores began making mounds full of the shells of Bay mussels, Pacific oysters, and bent-nosed clams; the bones of seals, sea otters, sea lions, sturgeon, bat rays, leopard sharks, salmon and birds; and their own beads, tools and arrowheads. But the mounds were more than refuse heaps, says Lightfoot. Whole families, household groups, and even some of the architectural features of their dwellings — doors and ovens, for example — were also deposited in the mounds. Lightfoot says villages were often situated right on top of the mounds, perhaps in an attempt to connect the living with their ancestors.

Several speakers debated possible reasons why the largest shellmounds seem to have been deserted sometime between AD 700 to AD 1100. Although there is evidence the mounds were reused after AD 1100, that use "does not appear to be as intense as before," says Lightfoot. U.C. Berkeley's Peter Schweikhardt presented colleague Lynn Ingram's work radiocarbon-dating shells cored from San Pablo Bay, which indicates that for a period lasting at least 150 years, the Estuary experienced very dry conditions relative to the present (Ingram's work also

shows that much wetter periods occurred as well). Ingram has also used shells from the West Berkeley mound as an indicator of upwellings off the coast, which correspond with high pressure systems and low precipitation in the Bay Area. Schweikhardt says the tops of the large shellmounds correspond with dry periods and speculates that the Native Americans may have moved on during extended droughts to find better food resources. Another explanation offered by archaeologist John Holson is that a new population of Native Americans moved in from another site and instituted a different method of burial.

Most of the speakers stressed the need to research and preserve what is left of the mounds, while Jackie Kehl, an Ohlone descendent, reminded the audience that the shellmounds are sacred and should be left untouched whenever possible. But this isn't the plan of developers who want to build a shopping mall on top of Emeryville's mound, and a parking garage on the mound in West Berkeley. Emeryville's Pat O'Keefe says the city has set up a committee to advise it on commemorating the mound. Some of their ideas so far include depicting its footprint and shape, incorporating some of the shell material into the mall structure, and creating an educational room with replicas of the mound and its artifacts, as well as a website about the history of the mound.

Other commemorative ideas include planting native riparian vegetation next to the concrete-lined Temescal Creek, at the mouth of which the mound was built. "After all, the creek is the reason the site is here," says Friends of Temescal Creek founder Bruce Douglas. The creek group's hope is that the development will feature the creek and a quiet, contemplative greenspace envisioned by the Ohlone descendants, that would, in a sense, connect the Estuary's current residents with those who were here a mere 900 years ago. **LOV**

SPECIESSPOT

LITTLE BUNNY BLUES

Even with the recent discovery of a new population in the upper Delta, the tiny riparian brush rabbit (*sylvilagus bachmani riparius*) remains the most endangered mammal in the state, say experts on the species. Once numbering in the tens of thousands (possibly hundreds of thousands at highs in its population cycles), the rabbit inhabited riparian thickets along the main northern valley rivers — the Merced, San Joaquin, Stanislaus, and Tuolumne — as well as along major channels in the San Joaquin River delta. Now, most of the remaining rabbits (less than a few dozen), are restricted to the Stanislaus River in Caswell Memorial Park, says BurRec's Rosalie Faubian. Flooding of the park in 1997 probably reduced the number of rabbits living there as well, she says. To protect the newly found upper Delta population, officials refused to disclose its location.

The riparian subspecies, smaller and with lighter coloration than ordinary brush rabbits, weighs only 1.5 pounds, and has evolved in wet areas supporting riparian vegetation like blackberry brambles, willows, and wild roses, says Faubian. Because the rivers have been channelized, flood levels are higher than they would normally be, says Daniel Williams of California State University Stanislaus, and cultivated farmland extends to and often within the levees. "This means the animals have no refuge from floodwater and are forced onto the levees or adjacent farmland where there is no cover from predators or adverse weather," says Williams. Ordinarily, the rabbits will not leave the riparian thickets, another characteristic that differentiates them from other brush rabbits.

The rabbits were proposed for federal listing almost two years ago, but the decision to list has been stalled over an internal dispute about whether or not to designate critical habitat. The rabbit has been listed as endangered by the state since 1994. Contact: Rosalie Faubian (559)487-5138 or Daniel Williams (209)667-3477

LOV

LEGAL BRIEF

RETHINKING WATER RIGHTS

While seemingly endless hearings continue before the State Board to determine who must give up how much water to meet environmental needs, the San Francisco Estuary Project is planning a forum on November 2 to explore how California's water rights system itself could be modified to help slake the state's bottomless thirst (see Calendar).

Entitled "Water Rights, Water Wrongs: Learning From the Past; Looking to the Future," the forum will include a review of existing water rights law and explore ways to foster more efficient water use. "There seems to be an imbalance in the way water is allocated," says Friends of the Estuary's Jean Auer. "This is an opportunity to evaluate how it is being done."

The forum will also revisit the findings of the Governor's Commission to Review California Water Rights Law, convened by then-Governor Jerry Brown in the 1970s. "That Commission was the first effort to review water rights law since 1912, and there hasn't been another attempt since," says Auer. The Commission's findings were released in 1978, but "the Legislature did very little with them except in the area of water marketing," says U.C. Davis' Hap Dunning, who headed the Commission's staff. Among the Commission's recommendations were improvements to the statutory adjudication system that has historically been used to determine water rights on streams and stream systems, increased incentives for efficient water use and greater State Board power to enforce existing water rights.

Among the most contentious issues the Commission addressed was groundwater management. California is one of only two states with no regulation of groundwater extraction and the Commission recommended several measures to integrate groundwater into comprehensive water resources management programs and prevent overpumping. The recommendations drew heavy political fire from pumpers, according to Dunning. "They thought the answer to groundwater overdraft was more imports," he recalls. Despite the subject's sensitive history, the November forum will explore what changes are needed in water rights law and adjudication systems to allow groundwater basins to be managed for conjunctive use. **CH**

BUSINESS

NO MORE WHOLE HOG HYDRO?

Most of the state's hydropower projects were licensed 30-50 years ago, before their impacts on fish and flows became so apparent. Now that at least 50 projects are coming up for relicensing in the next few years, removing dams — or at least operating them for better instream flows — has environmentalists, whitewater enthusiasts, and anglers dreaming of fast-flowing, fish-friendly rivers again.

One strategy some river advocates have adopted to have a voice in the future of the state's rivers is to "intervene" in the relicensing process by filing a formal motion. "In the past, we weren't as accepted as stakeholders," says Friends of the River's Jen Carville. But things are changing, and now the group sits at the negotiating table with the Federal Energy Regulatory Commission (FERC) and P.G.& E. The payoff, hopes Carville, will be more flexible river management plans that will improve conditions for fish and whitewater enthusiasts.

While any increase in instream flows is beneficial, says Friends of the River's Steve Evans, it will take more than minimal increases to truly restore a river. "We've seen incremental improvements in flows with most of the relicensing projects to date," says Evans. "But to call that restoration isn't quite accurate." Increasing flows from 5 cubic feet per second to 50 cfs while historical flows were closer to 300 cfs, isn't going to do the job, says Evans.

Others are frustrated with the bureaucracy of the relicensing process: relicensing of the Mokelumne's Salt Springs Dam has been going on for 25 years, for example. "As long as a utility is 'diligently' pursuing a new license, FERC will continue to grant annual licenses," says CalTrout's Jim Edmundson. After attending 20 meetings over the last 18 months, Edmundson is skeptical: "The utilities' ability to stay at the table is endless." Still, he cites several rivers that have been rehabilitated through the relicensing process. "The third stretch of the Pit River was a classic example of 'pig' hydro," he says. "FERC allowed P.G.&E to completely dry up the river, which once had flows of 2,000 cfs. The river was devoid of wildlife and fish. After a 1986 relicensing, which required continual releases of 150 cfs, the eagles came back, the native fish are in balance with the trout, and there's an economic payoff for the county as well."

FERC also has the authority to decommission dams, as it recently did to the Edwards Dam on the Kennebec River in Maine. There is no question that some dams just need to be removed, says Evans, like smaller, "run-of-the-river"-type dams such as the KR-3 on the north fork Kern. "The economic value of whitewater rafting on the Kern is greater than the value of the electricity that dam produces," says Evans. Edmundson suggests the Potter Valley Project on the Eel River, which "lights up three lightbulbs in Oakland," as another good candidate.

By law FERC is supposed to give the same consideration to fish, wildlife, and recreational interests as it does to hydropower, but in its cost-benefit analyses, the environmental benefits get short shrift, says Edmundson. While state and federal wildlife agencies recommend instream flows to FERC, the latter is not required to abide by those recommendations. "The FERC relicensing process is so unbalanced it's ripe for a redistribution of power — that may have to be done through a federal lawsuit," says Edmundson.

Meanwhile, three bills before the state legislature could also have an impact on dam operations. A bill by Senator Deborah Bowen proposes that the state acquire P.G.&E's facilities, which would give California's fish and game and recreation departments more leverage during the FERC relicensing process. One competing bill would allow the utilities to sell their facilities to any willing buyer while the other would give local agencies first dibs. According to *California Energy Markets'* J.A. Savage, P.G.&E would like to transfer 68 hydro facilities to its unregulated affiliate, U.S. Generating (now P.G.&E Generating), along with 136,000 acres of watershed lands. From there, PG & E Generating could sell the land to whomever it pleases — including timber companies.

Edmundson predicts that many hydropower projects will end up being jointly owned by the state, federal government and private utilities. Evans says that if the state ends up as a partial owner, another venue for restoring rivers could be the State Water Resources Control Board, since its 401 permits under the Clean Water Act must ensure beneficial use of a watershed: "That would give the state an *in*." Contacts: Steve Evans (916)442-3155) or Jim Edmundson (805) 584-9248 **LOV**

RIVERS

EBMUD VS. SACRAMENTO ET AL NO END IN SIGHT

"The more things seem to change, the more they stay the same." That could be the motto of East Bay MUD's latest attempts to take water from the American River. Negotiations between EBMUD, Sacramento area water agencies and environmentalists have fallen apart, leaving bruised feelings all around and raising the prospect of yet another round of court battles.

The dispute dates back almost three decades. In 1970, EBMUD, anticipating huge increases in water demand, signed a contract with BurRec to divert 150,000 acre feet annually from above the Nimbus Dam on the upper American River. The contract would have allowed EBMUD to take up to 20% of the river's summer flows, and environmental groups, along with the Sacramento agencies, sued. Finally, in 1990, Judge Richard Hodge let the district take water, but severely limited the amounts it could divert in dry years.

Policy and political arguments went back and forth over the years, and in 1995 EBMUD began talking with Sacramento city and county water officials about a joint project to divert the water from a spot lower down the American, near the confluence with the Sacramento River. EBMUD also renegotiated its contract with BurRec. Environmentalists suspected that EBMUD's real motive was to be able to supply huge new housing projects in the parched East Bay hills — but they went along, mainly because the lower diversion point would leave critical fish spawning and recreational areas intact.

The Sacramento/EBMUD talks were complex, difficult and often acrimonious, and were suspended in the spring. Sacramento offered to come back to the table, provided that EBMUD would give up the idea of the upstream diversion, and limit the size of the pipeline it would use. On June 8, EBMUD's board unanimously rejected the proposal.

EBMUD director Katy Foulkes calls the offer "untenable." The district estimates that it would cost EBMUD an additional $155 million, and reduce the amount of water it could receive below the amount allowed by Judge Hodge's ruling. EBMUD is urging BurRec to officially certify its EIS for the amended contract, which would allow the district to move ahead with its own plans.

These could involve a diversion at the Nimbus Dam, a prospect that upsets Sacramento officials and enviros. Foulkes says without the additional water, the district's

rate payers could face massive water cutbacks the next time there's a drought. "It's a huge problem." EBMUD also claims that using water from the Delta could present a health risk, unless the district made a major investment in new treatment facilities.

Environmentalists say the district is exaggerating its plight. They believe that the district could undertake a more extensive reclamation/conservation effort, and they resent EBMUD's insistence on taking water from the upstream site. "EBMUD has continued to set themselves above everybody else," says Jim Jones of the Save the American River Association. If EBMUD needs water so badly, "They should take their water like over half the people in California do — from the Delta."

Ed Schnabel, general manager of the Sacramento Metropolitan Water Authority, says that if EBMUD tries to go ahead on its own, it would not only be endangering the environment, but it would also threaten a six year long planning process that has involved some seventeen different county water authorities. "The whole region will fight them." Schnabel says EBMUD would be better off negotiating an agreement with Sacramento — otherwise it will end up back in court, where it could lose everything. "Part of something is better than all of nothing."

Actually, the whole process may be moving back to the courtroom. Almost ten years after his original decision, Judge Hodge has become involved in the case again. In a letter to both parties, he cited the "somewhat dismal turn of events" in the negotiations, and said that he will consider scheduling a new hearing if the opposing factions can't work things out on their own. **O'B**

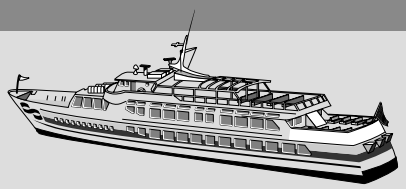
TRADEOFF

FERRY BROWN-OUT

Is that solo driver stuck in rush hour traffic on the Golden Gate Bridge actually causing less air pollution than the commuter enjoying the breeze as he skims across the waves in a high speed ferry? A report issued by environmentalists says that plans to create a huge new ferry system could actually result in worse air quality in the Bay Area, and while its conclusions are in dispute, the report is causing environmental groups to rethink their support for the ferries.

The Bluewater Network analyzed existing EPA data for marine diesel engines and concluded that on a passenger/miles traveled basis the ferries generated 10 times more hydrocarbons, oxides of nitrogen, and particulate matter than automobiles, and 23 times as much as diesel buses. The report says that two factors play a major role. Ferries need huge engines — up to 5000 hp — to move through the waves, and, unlike automobiles, the boats aren't subject to federal or state emission controls.

Ferry supporters say the Bluewater Network didn't take the latest ferry technology into account and that many of the boats in the proposed 120 boat fleet will be water taxis and other small vessels, not the behemoths currently in use. They also note that a full EIR will be needed before a new ferry system is put in place.



"We think the numbers will pencil out," says Russell Hancock of the Bay Area Council, a business sponsored think tank that strongly backs the ferries. The council says that the proposed system would also relieve freeway congestion by taking 25 to 30 million commuters off the road annually.

Legislation to create a Bay Area Water Transit Authority has passed the State Senate, but environmental groups including the Golden Gate Audubon Society, Save San Francisco Bay, Baykeeper, and Clean Water Action support the Bluewater report. They say that the state's Air Resources Board should do a full analysis of ferry pollution before the Transit Authority is created. The Board's Greg Harper says that wouldn't be easy. "You're talking about a really significant study to do it right."

Still, Bluewater's Russell Long thinks the study should be done before the state commits millions of dollars to ferry planing efforts. "Why spend all that money when the environmental problems may be insurmountable?" Contact: Bluewater Network (415) 788-3666 or Bay Area Council (415) 981-6000 **O'B**

MERCURY CONTINUED

the Regional Board this March, if everyone stays at the table. The Council's job is to advise on the TMDL proposal, to study options for trading loads among dischargers, and to explore the realities of "virtual elimination" of mercury from the system. To date, the Council has produced a slim ream of research — most notably a list of mercury sources and pollution prevention methods, and a survey of how trading programs work in other states.

"It makes sense for everyone to work on sources they can do something about, using the low-hanging fruit principal — namely, do the things that are easiest and most inexpensive first," says Palo Alto's Bobel.

Many dischargers think that more treatment, where the mercury reduced may measure in the nanograms, is much less cost-effective than reducing the pounds and pounds coming out of the mines, or the tons lying on the Bay bottom. Public education, meanwhile, remains an important option but one whose impacts in terms of mercury reduction are hard to quantify.

Measuring gains and losses could be equally tough in the arena of runoff pouring into our rivers and bays from cities and towns. "If a lot the mercury we're seeing is from urban stormwater, then municipalities are going to have to get aggressive about finding sources," says veteran stormwater manager and consultant Roger James. "But what if the biggest sources turn out to be global, third world aerial emissions? Should reducing that ultimately become the responsibility of the discharger, since its coming out of their pipe?"

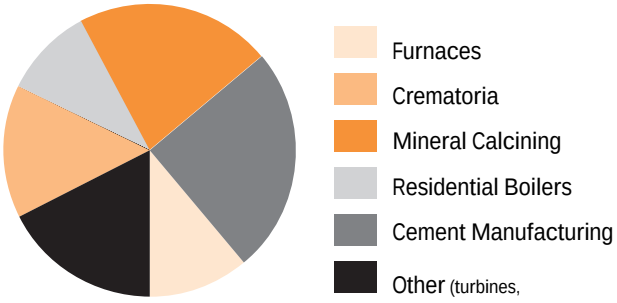
Some of these issues may be resolved via a proposed banking system that would give mercury credits and debits to dischargers who've exhausted their own local ability to reduce mercury but might be able to pay for reductions elsewhere. To this end, the Council is trying to develop a mass load trading system to complement the TMDL. Key issues for any such program are who can participate, how big will the trading area be (can Bay dischargers trade with Central Valley ones?), when does it kick in (after discharge levels exceed permit requirements? Or only when all local reduction efforts are exhausted?), how to measure gains, and how to make sure ecological impacts aren't just shifted elsewhere.

"If North Bay dischargers buy credits to clean up Cache Creek, it provides no benefit for the immediate Napa River environment, and for those Latino farmworkers fishing in the river," says Mike Belliveau. Yolo County's Cache Creek is a known mercury hot spot in the Delta watershed.

How have other states dealt with pollutant trading questions? Council intern Katy Chamberlain recently investigated ten existing programs in Colorado, Florida, North Carolina and the Great Lakes. Most were focused on nutrients rather than toxics, and very few have been established long enough to evaluate their effectiveness. But Chamberlain did glean some wisdom. According to a memo she wrote to the Council: "The truly successful programs are not only clearly outlined and strictly regulated by the government, but also have a baseline from which emissions must not increase. If a discharger's emissions are over loadings allocated by their NPDES permits, the discharger may buy credits generated through the regulatory agency *before* the transfer of credit. This reduction in pollutant loadings before the trade is integral to successful trading, otherwise load reductions can be uncertain. To prevent hot spots and high concentrations, trading must only be performed within smaller watersheds."

Despite all the data collected, lists made, and policy drafted, the Board's Lila Tang says "no one is shaking hands and hugging yet." Things could get more painful soon, if similar conflict-ridden efforts to build South Bay consensus on copper and nickel reduction strategies are any indication.

SOURCES OF AIR EMISSIONS OF MERCURY IN THE SAN FRANCISCO BAY REGION



The following sources also contribute, but quantities are unknown: paint use, abandoned mines, contaminated soils and geothermal power.

MERCURY LOADS TO SAN FRANCISCO BAY

Bay sediment deposited	410 kg/yr
Bay sediment eroded	190 kg/yr
Local stream input	2.5 - 8 kg/yr
(to) Ocean dissolved	60 kg/yr
(to) Ocean particles	430 kg/yr
POTWs	10.7 kg/yr
Industrial	20 kg/yr
Mudflats & wetlands	18 kg/yr
Urban non-point runoff	470 kg/yr
Direct atmospheric deposition	3-8 kg/yr
Net influx from watershed	175-208 kg/yr

Source: San Francisco Regional Water Quality Control Board, 1998

Part of the problem for would-be consensus builders is the current regulatory vacuum on mercury. "Regulations are behind the times on mercury, partly because it's an arena that's so litigious. It's easy for dischargers to retard the regulatory process," says U.S. Fish & Wildlife's Steve Schwarzbach, whose agency recently issued a biological opinion on the proposed California Toxics Rule.

The rule — to be released in draft form by U.S. EPA this fall — will apply everywhere there aren't already regional numbers in place (the Central Valley, for example), and become a default when local objectives are challenged. But the rule's 50 parts per trillion mercury criteria is "orders of magnitude" off the 2 ppt Schwarzbach would like to see to protect fish and wildlife from reproductive and health effects.

"The mercury objective should be the guiding light, the regulatory end point, which says this is where we need to be," he says. "If you've got the wrong destination from the start, it doesn't help."

No statewide numbers are in place either — California's water quality standards were remanded by a lawsuit in 1994 and never reinstated. Exacerbating this regulatory vacuum, meanwhile, are pending changes in how the feds want mercury levels measured and risks assessed.

Amid all this regulatory uncertainty, however, are two signs of movement on mercury. First, EPA has suddenly cracked down on discharges to water bodies officially listed as "impaired" under the Clean Water Act due to the presence of mercury, copper, dioxin and other contaminants. Both the North and South Bays are officially "impaired."

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PLACES TO GO & THINGS TO DO

WORKSHOPS & SEMINARS

SEPT TUES 14 — THUR 16

PESTICIDE SYMPOSIUM
Topic: The chemistry and fate of modern pesticides
Sponsor: University of Kansas
Location: Lawrence, Kansas
(785)864-4790

SEPT THUR 23

S.F. BAY DECISIONMAKERS CONFERENCE
Topic: Does the environmental regulatory process serve the public interest?
8:00 AM — 5:00 PM
Sponsor: Bay Planning Coalition
Location: San Francisco
(415)397-2293

SEPT THUR 23 THRU SAT 25

SOCIETY FOR ECOLOGICAL RESTORATION 11TH ANNUAL CONFERENCE
Topic: Reweaving the World
Sponsors: SER, CALFED, National Park Service, more.
Location: San Francisco
(608)262-9547
www.ser.org/ser99.htm

SEPT SAT 25 THRU THUR 30

INTERNATIONAL ESTUARINE RESEARCH FEDERATION CONFERENCE
Sponsor: Estuarine Research Federation
Location: New Orleans
(504)280-7395

OCT FRI 8

WATER SUPPLY AND FISH IN THE SACRAMENTO-SAN JOAQUIN DELTA
Topic: One-day short course presenting the latest information on Delta resource issues and solutions.
8:00 AM — 4:30 PM
Sponsor: U.C. Extension
Location: Berkeley
Cost: $295
(510) 642-4111

OCT WED 20

WATER ISSUES BRIEFING
Topic: Bay-Delta and Beyond
Sponsor: ACWA
Location: Oakland
(916) 441-4545

NOV TUES 2

WATER RIGHTS, WATER WRONGS FORUM
Topic: Rethinking California's water rights system and laws.
All Day
Sponsor: S.F. Estuary Project
State Building, 1515 Clay Street, Oakland
(510)622-2465

MEETINGS & HEARINGS

AUG TUES & THURS 18 THRU SEPT 22

CALFED BAY-DELTA PROGRAM
Topic: Hearings on CALFED draft plan.
6:00 — 9:00 PM
Location: Various
(800) 900-3587

SEPT WED 15 & OCT 22

FRIENDS OF SAUSAL CREEK
Topic: New action plan
7:00 — 9:00 PM
Sponsor: Aquatic Outreach Institute
Location: Dimond Library, Oakland
(5100 231-9556

HANDS ON

SEPT SUN 12

CALIFORNIA ENVIRONMENTAL FAIR
Topic: Water quality, river and fishery restoration, endangered species and habitat preservation, agricultural land protection.
Noon — 5:00 PM
Sponsor: Oakland Museum
Location: Oakland
(888)625-6873

SEPT SATURDAYS 25 & OCT 2

KIDS IN CREEKS
Topic: Interdisciplinary creek exploration and restoration program for educators
9:00 AM — 4:30 PM
Sponsor: Aquatic Outreach Institute
Location: Sunol Regional Wilderness
(510)231-9507

OCT SAT & SUN 2 THRU 3

COSUMNES RIVER PRESERVE WEEKEND
Topic: Results of Point Reyes Bird Observatory's five-year monitoring project.
Sponsor: Point Reyes Bird Observatory
Location: Cosumnes River Preserve
(415)868-1221, ext 780

OCT SATURDAYS 16 23 & NOV 6 13

CREEKS, WETLANDS AND WATERSHEDS CONFERENCE
Topics: A series of 12 field trips on topics ranging from water quality and aquatic insect monitoring to nature-based art.
Sponsor: Aquatic Outreach Institute
Location: Various
(510)231-5778

MERCURY CONTINUED

For years, deepwater dischargers such as Tosco have enjoyed what's called a "dilution credit" which allows them to assume a certain amount of dilution of problem contaminants at the end of the pipe by the receiving waters. For years, organizations like BayKeeper have been challenging such credits.

As of now, EPA is sending out the first warning letters that such dilution credits will soon no longer be given for mercury and other offenders. This isn't new law, just proper implementation of existing law, says EPA's Terry Oda. "If the water body itself is already exceeding the limit, we can't give them a credit for dilution. It flies in the face of the whole Clean Water Act concept of not contributing to further impairment." he says. "We won't sock them right between the eyes, we know they need time to come into compliance. In the interim they can still operate within current conditions but in the end they'll have to meet either the metal criteria or TMDLs without the dilution credit."

The second new regulatory move on mercury came this July, when the S.F. Board amended stormwater discharge permits for Contra Costa and San Mateo counties to improve mercury control and mandate more pollution prevention. "Stormwater permits usually only require BMPs (best management practices), but for the first time these permits say the counties have to monitor and assess mercury loadings," says the Board's Shin Roei Lee "It's putting stormwater people in a point source category."

BayKeeper doesn't think the permits go far enough, however, and is appealing them for, among other things, their failure to control increases in mercury discharges from new developments.

Another source that may need to moved into the point source category are the mines upstream, where Bay fingers have long pointed when it comes to mercury. Preliminary results of some new science confirm the importance of these mines, and reveal likely hot spots upstream of the Delta.

The three-year U.C. Davis study is investigating Delta tracts flooded inadvertently by storm events over the past 75 years to determine if methyl mercury distribution and bioaccumulation varied with watershed source, salinity, time since flooding, vegetation and other factors.

continued back page

MERCURY CONTINUED

"We were afraid we'd end up with a dull project, and find mercury concentrations uniform everywhere in the Delta," says co-author Darell Slotton."But the news is we found real low spots and real high spots, and the most dramatic high spots so far correlate with Cosumnes River and Yolo Bypass inflows."

It's ironic that one of the Estuary's last remaining wild and undammed rivers, the Cosumnes, should have some of the highest mercury concentrations for the very same reason (dams trap and contain mercury-laced sediments), says Slotton. The Cosumnes' small flows and gentle gradient also play a role is encouraging the mercury to hang around, he adds. The Yolo Bypass, meanwhile, conveys flows from that known mercury bad guy: Cache Creek.

One surprise, says Slotton, was to find higher levels of mercury upstream of the city of Stockton than below it on the San Joaquin River: "We thought we'd see a signal from the city, especially with all its organic matter (sewage) and low oxygen level problems. All these factors should contribute to mercury methylation, but go figure. It looks like more is coming from the mines upstream on the Merced and Stanislaus than from the city."

The study's authors conclude that regions demonstrating enhanced bioavailability may not be the most desirable locations for large-scale wetland restoration (too bad the Cosumnes is the Miss America of the restoration universe). Further research on upstream mercury sources and methylation is planned courtesy of a $3.8 million CALFED grant, part of the biggest mercury research project undertaken nationwide since similar projects in the Great Lakes and Everglades.

The conclusions of the U.C. Davis study are echoed by Jaffe's and Smith's mapping of North Bay mining debris, spots planners should be beware of when restoring wetlands or dredging. Either activity could increase the ecosystem's exposure to mercury and mercury methylation. "If you flood dry soils to make a wetland, we know that there's an instant pulse of methyl mercury that can last up to a decade," says the Geological Survey's Sam Luoma.

So with mercury in our air, water and land, with little regulatory guidance in place, and with only fledgling science at our fingertips, there seem to be more questions than answers available to those trying to purge our small estuarine universe of this slippery silver poison.

"Science may not give us all the answers and our environmental community won't wait," says the Board's Lila Tang. "So our strategy's going to have to be based on our best judgment, and the work of our stakeholder Council. Luckily mercury has a lot of potential in the pollution prevention arena, unlike dioxin which is a by-product of many processes and used less purposefully. If we start reducing mercury use now, our grandchildren may see some benefit." **ARO**

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