Taking Stock of the Water Supply

By Robin Meadows

Water. It flows out of the tap every time we want, cool, clear, and clean. We take it for granted even now, three years into one of California’s driest stretches on record. But we can’t go on like this for much longer — the Bay Area’s water could start to run short in just two decades.

“Population growth will increase demand, and climate change will reduce the supply and increase demand,” said Heather Cooley, director of the Water Program at the Pacific Institute, an Oakland-based nonprofit dedicated to sustainable resource research.

The Bay Area’s population is projected to rise about 25 percent in the next two decades, from 7 million people today to 9 million in 2035. And without preparation there won’t always be enough water for us all. Our expected water demand will exceed the supply by nearly 7 percent in a dry year, and by more than 11 percent in the worst case scenario of multiple dry years, according to the 2013 San Francisco Bay Area Integrated Regional Water Management Plan, which was developed by representatives from local water supply and treatment agencies, local and state government, and nonprofit organizations.

Our future is likely to be drier, partly due to warming from climate change. “Increased evaporation off watersheds could decrease water supplies by 5 to 10 percent,” said Jay Lund, director of the UC Davis Center for Watershed Sciences. In addition, when it’s hot out, water demand rises because people use more for their landscaping.

Moreover, climate patterns going back thousands of years raise the possibility that upcoming droughts could be worse than any we’ve experienced lately. “California has seen much bigger, longer droughts,” Lund said. “In medieval times, there were a couple of droughts in Southern California and the Eastern Sierras that lasted about 100 years.” This conclusion was reached by UC Berkeley paleoclimatologist Lynn Ingram, who used indicators like tree rings, which are wide during wet years and narrow during dry ones, forming a record of the past.

While the future may be daunting, it isn’t here yet and California cities are using almost as much water as usual despite the extreme drought. In January of this year, Governor Jerry Brown requested a 20 percent voluntary reduction in urban water use. But we were only using 5 percent less at the end of May, revealed a June 2014 survey by the State Water Resources Control Board, which divvies up state water.

That said, the Bay Area’s water use is already relatively low. About half of California’s urban water goes to landscaping, and the Bay Area uses less water outdoors because much of our land is urban with a cool climate. Daily use per person is less than 100 gallons in San Francisco compared to 200-300 gallons in the Central Valley, according to the 2013 report continued on page 2
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In addition, while supplies are down in much of California — reservoirs were at 54 percent of the average volume statewide in July — water remains sufficient in much of the Bay Area. “It’s not dire there yet,” Lund said.

The San Francisco Bay Area hydrologic region, a major drainage basin that is smaller than the nine-county region, gets nearly 40 percent of its water from Sierra Nevada-fed reservoirs that are close to full. Much of the East Bay’s water is from the Pardee Reservoir in the Sierra foothills, which was at 87 percent capacity in mid-July. Likewise, much of San Francisco’s water is from the Hetch Hetchy Reservoir in Yosemite, which was at 97 percent capacity in mid-July. Hetch Hetchy also supplies considerable amounts of water to Alameda, Santa Clara, and San Mateo counties.

The rest of the Bay Area’s water comes from local sources and government water projects. Local surface waters and groundwater account for about 30 percent of our water, and another nearly 30 percent is delivered by the federal Central Valley Project (CVP) and the State Water Project (SWP). These projects, which funnel water through the Sacramento-San Joaquin Delta, have curtailed water deliveries sharply this year. The CVP is giving the Contra Costa Water District only half of its historic supply, and SWP allocations are down to just 5 percent of usual.

For now, water conservation is voluntary in most of the Bay Area, with water agencies asking us to use 10-20 percent less. The few exceptions where mandatory restrictions have passed are primarily in hotter, more suburban areas, according to the Association of California Water Agencies. These include Cloverdale, Healdsburg, the Santa Clara Valley, Fremont, Newark, Union City, Pleasanton, Dublin, and part of San Ramon, which have mandated 20-25 percent cuts, and Livermore, which has mandated cutting outdoor use in half.

“Our water problems are solvable,” said David Sedlak, co-director of the Berkeley Water Center at UC Berkeley. “The worst thing would be being caught unprepared — we don’t want to respond to a water shortage in panic mode.” Citing Australia’s recent decade-long drought, Sedlak explained that when Brisbane’s reservoir was down to just a year or so of water, major cities there built costly desalination plants that for the most part are little-used today.

We can save a lot of water with technologically simple fixes such as repairing the leaks that waste 11 gallons per person per day in California, switching to the front-loading washing machines that use a third as much water as top-loaders, and replacing lawns with drought-tolerant plants. Such efficiency measures could decrease the Bay Area’s water use by 40 percent, according to the 2014 report *The Untapped Potential of California’s Water Supply* by the Pacific Institute and the Natural Resources Defense Council.

We can also create new supplies by capturing the stormwater that now runs off into the sea, and by recycling graywater — from sinks, bathtubs, showers, and washing machines — for use in toilets and on landscaping. Together, these sources could provide more than 30 percent of the Bay Area’s water, the report stated. Recycling can also turn wastewater into drinking water. Orange County has replenished groundwater with ultrapurified wastewater since 2008.

Updates to our water supply will take time to finance, design, and put in place. “Cities are usually insulated from the worst of droughts but our water systems are not designed for megadroughts or climate change,” Sedlak said. “We need to start planning today — we’ll be lucky if our new systems are built in 20 years.”

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Created by the League of Women Voters of the Bay Area Education Fund to promote better understanding of regional water issues, the initiative is underwritten by the Association of Bay Area Governments, Bay Area Biosolids to Energy, the East Bay Municipal Utility District, the League of Women Voters of Marin County, Louise Anderson, the Marin Municipal Water District, Marion Taylor, the San Francisco Public Utilities Commission, the Santa Clara Valley Water District, and the Sonoma County Water Agency.
A Highly Flammable Situation: Crude Oil Rolls into the Region

By Leslie Stewart

On May 31, 2014, some 60 people gathered at the gates of a rail yard on Richmond’s industrial edge, protesting “bomb trains.” Trains handled there by energy company Kinder Morgan hold crude oil, not TNT, but their contents may still be both physically and politically explosive. Stretching over a mile, a train of 100 tank cars carries 600-700 barrels of crude oil, or up to 3 million gallons. These trains represent a controversial change in both the type of crude oil supplying the region’s refineries, and the way it gets here.

Crude-by-rail is a shipping trend that has grown exponentially across the country as more oil becomes available from North Dakota’s Bakken oilfields and Canada’s tar sands. Bay Area refineries appear intent on capitalizing on the trend. Historically, most have relied on heavy, sour crude, piped from the San Joaquin Valley and then blended with lighter crudes from Alaska and the Mideast, which arrive by ship or barge. As production in the San Joaquin oilfields drops, replacement sources may include light, sweet Bakken crude or heavy Canadian crude, as well as oil from Utah, Wyoming, and West Texas.

Although pipelines are the safest and usually the most economical transport mode, the only pipeline to the West Coast is Canadian, from Alberta to Vancouver, B.C., where oil can be transferred to ships or barges, some headed to California. For a number of reasons, rail shipment is now quite price-competitive and is likely to remain so. The California Energy Commission has predicted that in 2016 the state could be receiving more than 156 million barrels of crude oil by rail, representing 25 percent of all crude oil imports. In 2012, a mere one million barrels arrived via rail — just 0.3 percent of total imports.

No Bay Area refinery can currently handle the lengthy, single-commodity “unit trains” used for transporting high collective volume, although some can accommodate a few tank cars. Tesoro Corporation has been receiving Bakken crude-by-rail, but not directly at its refinery in Martinez. Instead, oil from unit trains has been off-loaded into tanker trucks at Kinder Morgan’s Richmond rail yard, the site of the May 31 protest. The facility was previously used for unloading ethanol unit trains, but in February it obtained a permit to transfer crude oil. Environmental groups responded with a lawsuit to suspend the permit and halt further crude oil operations.

Not surprisingly, however, other new crude-by-rail facilities are under development that would have an impact in the region. Valero’s Benicia refinery is going through environmental permitting to add facilities for two 50-car trains per day. In Pittsburg, the energy company WesPac is seeking to include a facility at the BNSF rail yard as part of a broader proposal to re-open a marine oil terminal that would move crude into an existing pipeline to local refineries. And a proposed rail facility in Southern California at the Phillips 66 Santa Maria refinery could bring shipments of crude through the heart of the Bay Area on Union Pacific tracks. Moreover, crude-by-rail reaches this region indirectly, arriving via ship, barge, and pipeline from various train terminals along the West Coast.

The prospect of crude-by-rail’s rapid growth has met with considerable opposition locally. In addition to joining...
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the Kinder Morgan lawsuit, the environmental justice nonprofit Communities for a Better Environment has come out against the Valero and WesPac proposals, and more broadly condemns the technologies responsible for the oil import boom — hydraulic fracturing in North Dakota, and strip mining or steam injection in the Canadian tar sands. The organization’s Andrés Soto explained, “As a group, we’re against fracking, against strip mining the tar sands — but because of federal common carrier regulations, we can’t really say, ‘You can’t bring in Bakken, you can’t bring in the tar sands’.”

What can be addressed is that both are more hazardous to transport and handle. Worries over potential spills or fires from accidents have heightened with the prospect of such large volumes of fuel traveling so close to local communities. While railroads point out that accident rates involving oil trains have been quite low, U.S. Department of Transportation figures show they are increasing as crude-by-rail grows.

Additionally, when crude-related accidents do occur, they can place extraordinary burdens on emergency responders. Rail accidents involving Bakken crude have caused several major fires and explosions over the past year. Retired refinery fire chief Tony Semenza, who now serves as executive director of Contra Costa Community Awareness and Emergency Response, told a recent meeting of the group that “Bakken crude has higher vapor pressure and a lower flash point than other crudes,” contributing to its greater volatility. Compounding the situation, this volatile substance often gets transported in older DOT-111 tank cars, which have a high rate of failure during accidents.

Of some encouragement, Semenza pointed out that the Bay Area constitutes one of California’s five “high-threat urban areas,” which translates into greater resources for dealing with possible derailments and rollovers. A Petrochemical Mutual Aid Organization of firefighters from industrial facilities and fire districts stands at the ready. However, questions remain over whether emergency responders can react fast enough to the demands of a unit train disaster.

A different problem is presented by Canadian tar sands oil, or bitumen, currently reaching the West Coast only by pipeline. It is so dense that it typically won’t burn easily; however, if it reaches water, it can’t be skimmed off, but instead sinks to the bottom and sticks there. This could pose a risk if tar sands oil started arriving here by train, for as the California Interagency Rail Safety Working Group noted in a recent report, “rail lines frequently operate near or over rivers and other sensitive waterways in the state.”

Government entities are responding at all levels, but local resolutions protesting crude-by-rail can only put pressure on federal regulators to act. Oil transfer terminals, such as the Valero refinery or the proposed WesPac facility in Pittsburg, may require local land use and regional air quality permits, but when crude is in transit, it is controlled only by federal railroad regulations.

Federal regulators are moving to require safer tank cars and more careful classification of their contents. Meanwhile, the rail industry is voluntarily shifting to a tank car with more safety features, and has also retrofitted some of the problematic DOT-111 tank cars while the safer ones are being built. However, even retrofits did not prevent a fire during a derailment in Lynchburg, Virginia this past April.

The rail safety working group made specific suggestions for increasing safety for crude-by-rail throughout the state, including increased rail inspections, emergency response improvements, and more information for local communities. Some of the suggestions are already being implemented. State legislation, Senate Bill 1319 (Pavley), would increase crude handling fees and use cleanup funds for land as well as water spills. Federal regulation now requires railroads to notify the state’s emergency response agency when moving more than 1 million gallons of Bakken crude-by-rail. However, railroads insist that the state agencies notify only local emergency responders, not the public, to avoid potentially dangerous terrorist or protest actions.

Rail operators have implemented voluntary safety measures, such as speed restrictions in urban areas. An even more cautious step would be to re-route crude-by-rail to avoid populated areas, but Contra Costa County Chief Environmental Health and Hazardous Materials Officer Randy Sawyer expressed doubts about the feasibility of such a move, because “they can’t route it around Contra Costa and still serve local refineries.” In any case, the rail safety working group concluded, “The state should press both the federal government and the railroad industry to take additional safety measures.” Soto also wondered, “Who’s going to hold the bag for economic damage, not to mention environmental?”

Learn More About Crude-by-Rail Online

The California Interagency Rail Safety Working Group report Oil by Rail Safety in California — as well as relevant links and a mapping tool that identifies areas with potential higher vulnerability to crude-by-rail accidents — may be found at the California Governor’s Office of Emergency Services’ website (www.caloes.ca.gov/HazardousMaterials/Pages/Oil-By-Rail.aspx).
Budgetary Boost: Cap-and-Trade Revenue Tabbed for Transit

By Cecily O’Connor

Fed up with a lack of affordable housing options near public transit, or long bus headways during commutes? Your frustrations may soon ease, thanks to new investments in California’s aging transportation system.

The state’s recently signed budget for fiscal year 2014-15 earmarks $630 million of a total $872 million in cap-and-trade program funds for transportation-related projects. Accompanying legislation stipulates that, in future years, 60 percent of cap-and-trade funds will go to such projects. As a result of these developments, bus and rail operators will receive a chance to move forward with expansion plans that have been on the backburner.

Funding from the program — which collects fees from businesses that produce greenhouse gas emissions above a certain cap — is expected to strengthen and better connect the Bay Area’s transit network, while also providing the region with environmental and economic benefits.

However, there are a few concerns to be addressed. One is the potential for cap-and-trade to push gas prices higher. Another relates to the distribution of the program’s funds, as well as a need to fine-tune criteria for identifying disadvantaged communities ripe for transit projects.

“The one hand, we are disappointed about the funding provided to transportation in the budget year, and we have some reservations about the structure, particularly the fact that the state has full discretion over which projects get funded,” said Rebecca Long, senior legislative analyst at the Metropolitan Transportation Commission. On the other hand, she noted that “over the long-term we are very happy transportation received as large a share of future year funding as it did, and we think it’s really important and terrific that the legislature did ultimately adopt a long-term framework.”

Overall, transit officials said they are encouraged by the prospect for change, and preliminary work is underway. Agencies in charge of administering and selecting projects for funding are establishing guidelines and timelines. Transit operators are planning upgrades, offering a glimpse into how the region’s transportation landscape will change over time.

The 2014-15 budget shifts cap-and-trade funds into five transit categories:

- $250 million to the High-Speed Rail Authority for the initial construction segment in the Central Valley, as well as environmental and design work on the overall system.
- $200 million to the Air Resources Board to speed up the transition to low-carbon freight

Refining newer crudes could also affect the region’s air quality. Emissions changes from a different crude oil mix, or “slate,” can be either positive or negative. The Bay Area Air Quality Management District is currently proposing a new rule on dealing with refinery air emissions “to enhance our understanding of what the refineries’ total emissions are,” according to Health and Science Officer Brian Bateman. It will do this with community fenceline monitoring and air emissions inventories from refineries; Bateman contended that “any changes — which would be mostly VOCs [volatile organic compounds] — are something that could be controlled by existing equipment at the refineries.”

The Bay Area may be wary of the changes, but short of the goal advocated by environmental groups — to switch away from fossil fuels — there is no way to totally reject crude-by-rail. Pipeline construction is expensive and controversial, and obtaining right-of-way is time-consuming; Kinder Morgan recently abandoned a pipeline plan to bring West Texas oil to the West Coast. “Moving pipelines” of oil trains are a flexible and attractive alternative. Community awareness and governmental preparedness will be essential in adapting to the new challenges. Semenza’s recipe? “Better tank cars, better maintenance and inspection, keep tank cars on the rails, keep the oil in the tank cars.”

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and passenger transportation. This investment also supports the goal of deploying 1.5 million zero-emission vehicles in California by 2025.

- $25 million to low-carbon transit operations that enable local agencies to support new or expanded bus and rail services.
- $25 million for transit and intercity rail capital expenses. Caltrans will manage a competitive grant program for rail and bus operators planning improvements that link state and local rail with other systems. The state agency will prepare a list of recommended projects for funding, and then submit that to the California Transportation Commission for programming and allocation.
- $130 million for affordable housing and sustainable communities (divided equally between the two). In addition to benefiting disadvantaged communities, projects will reduce greenhouse gas emissions several ways: increasing transit ridership, promoting walking and biking, providing affordable housing near transit stations, preserving agricultural land, and emphasizing local planning that promotes infill development and reduces the number of vehicle miles traveled.

The state’s Strategic Growth Council will coordinate allocations within the fifth category. “The overarching philosophy is that we really want to look toward the implementation of projects that can have a major impact and that are ready to move quickly,” said Mike McCoy, executive director at the council, which in July laid out a proposed timeframe that begins with public meetings on guideline development in August and ends with awards announced in June 2015.

Overall, the five transit categories will focus a percentage of funds on projects in disadvantaged communities, which are determined by the California Environmental Protection Agency’s CalEnviroScreen, a tool that pinpoints zip codes vulnerable to pollution. However, several sources such as MTC’s Long said they recommend the screen be revisited to take into account other income-related factors and establish a more comprehensive picture.

Long also emphasized that the biggest transportation investments have yet to come. Consider the low-carbon transit program, for example, which receives $25 million statewide in the fiscal 2014-15 budget year. That pot of funding will become more meaningful in future years, when it’s estimated to increase to $125 million or more.

For the cap-and-trade program as a whole, the legislature’s long-term spending plan begins in fiscal year 2015-16. At that point, about 25 percent of cap-and-trade proceeds are targeted to high-speed rail, while another 35 percent will be directed toward transit, affordable housing, and sustainable communities planning. The final 40 percent remains uncommitted, to be appropriated annually.

Specific dollar amounts for future years are hard to predict. This January, transportation fuels become subject to cap-and-trade, which would increase program revenue dramatically. Some legislators, however, have concerns about drivers getting pinched at the pump, and have amended Assembly Bill 69 (Perea) to postpone fuels inclusion until 2018, citing the potential for higher prices. Some analysts forecast an increase of 10 to 20 cents per gallon when the program is applied to vehicle fuels.

While the added cost will surely frustrate people, Long emphasized that the money the state collects is meant to be spent carefully. “The public will feel better knowing there is a plan and an investment strategy for how to use those funds,” she said.

Moreover, the per-gallon increase could be offset by improved public transportation options down the line, said Ryan Wiggins, state cap-and-trade campaign manager at TransForm, an Oakland-based transportation advocacy group. “While the price of gas will rise, projections are that people will use less fuel overall as a result of having more transit and housing options,” Wiggins said.

Regardless, Bay Area transit operators are keen to drive improvements forward. Several have recently announced projects, or their intention to compete for future funding. For example, Caltrain, which counts more than 50,000 weekday riders between San Francisco, San Jose, and South Santa Clara County, will use the money to upgrade to an electrified rail system. This will help accommodate an anticipated doubling of daily riders, as well as pave the way for the state’s planned high-speed rail system.

“The resources allocated to the Peninsula will be used
Data-Driven: Regulators Monitor Air Quality Near Roadways

By Alec MacDonald

A seemingly endless network of asphalt offers drivers the mobility to roam all across the Bay Area. But that freedom comes at the expense of others — residents stuck choking on the noxious fumes spewed out by so many passing vehicles.

Living alongside a steady stream of traffic exposes people to a variety of hazardous substances, such as particulate matter, carbon monoxide, nitrogen dioxide, benzene, and formaldehyde. Epidemiological studies connect this exposure to asthma exacerbation, impaired lung function, and cardiovascular morbidity, among other alarming ailments. In a comprehensive survey of relevant scientific research, the nonprofit Health Effects Institute determined that these circumstances “are likely to be of public health concern and deserve public attention,” especially given that, in large North American cities, 30 to 45 percent of the population dwells within a potentially hazardous 300 to 500 meter proximity of major roads.

For decades, the Environmental Protection Agency has attempted to ameliorate the problem by enacting stricter vehicle emission standards and cleaner fuel requirements. More recently, the agency has also sought to better quantify the situation, instructing state and local authorities to begin monitoring air quality close to certain traffic hot spots. This effort will fill a critical need, because for all the epidemiological evidence proving that living alongside congested corridors carries negative health implications, “there’s no long-term air monitoring data on a wide-scale basis for policy makers to determine what might be the cause,” according to Eric Stevenson, director of technical services for the Bay Area Air Quality Management District.

The Santa Clara Valley Transportation Authority said Phase II of its BART Silicon Valley extension is “well positioned” to compete for funding because the project contributes to a reduction in car trips and greenhouse gas emissions, according to a statement. The extension also integrates into the overall local, regional, and state transit network.

Meanwhile, Capitol Corridor, which operates a rail line between Placer County and San Jose, is in the midst of environmental studies as part of a planned $200 million track construction project intended to increase passenger service between Roseville and Sacramento.

“We have a source of funds that we can actually apply for [to fund] these capital projects that have been waiting in the wings,” said Jim Allison, manager of planning with the Capitol Corridor Joint Powers Authority.

Overall, it’s expected that more project proposals will follow, especially among those operators needing to accommodate swelling ridership. Since cap-and-trade funds are intended for projects that reduce greenhouse gases, as well as contribute to health improvements and job creation, it’s likely to result in “more ambitious, competitive, and high-value” transportation plans and proposals, Wiggins said.

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but its sophisticated instrumentation remains ever busy, taking continuous measurements of ambient air coming off the lanes just 20 meters away. The station collects data on soot, carbon monoxide, nitric oxide, nitrogen dioxide, fine particulate matter, and various toxic hydrocarbons. After a little number-crunching to generate hourly readings in almost all of these categories, the Air District publishes the results on its website for anyone to see.

Although the station has gathered reams of information thus far, Stevenson contended it’s still too early to declare anything definitive about the findings, noting that “usually we like to collect a year’s worth of data before we start drawing conclusions.” When that time approaches, air quality experts everywhere may want to take heed, since the Oakland station and its two counterparts stand as frontrunners for yielding insights in the broader EPA roadway monitoring investigation.

“A lot of these stations haven’t been deployed yet, so there’s only a few throughout the nation that have come online,” Stevenson said. “We’re actually kind of ahead of the game.”

Alec MacDonald is the editor of the Bay Area Monitor.