Mountain View, California's Mystery TCE Hotspots

By Lenny Siegel

November 18, 2013

In the mid-1970s I was part of a group of people working to publicize and limit the exposure of workers to toxic chemicals in semiconductor production. In May, 1978 I spotted (and saved) a news article about toxic releases by Fairchild Semiconductor, the granddaddy in the Silicon Valley "family tree" of chipmakers, into the storm drain and sanitary sewer line emanating from its plants near Whisman Road. It was that article that got me asking questions about environmental exposures to chemicals used by the semiconductor industry. Evidence being collected today by the U.S. EPA and the City of Mountain View suggests that such past releases may be responsible for the spread of trichloroethylene (TCE) across the North Whisman residential neighborhood.

—PALO ALTO TIMES, Tuesday, May 9, 1978

Scores of fish killed by chemical spill in creek

Deputy Bill Hoffman discusses the high-alkaline substance found in Stevens Creek that is apparently killing fish. (Photos by Ken Yimm.)

By EVELYN RICHARDS

Nearly 100 poisoned fish have been pulled from Stevens Creek, killed by a chemical spill that may have come from Fairchild Semiconductor in Mountain View.

A half mile of the shallow creek from Moffett Field to just south of Bayshore freeway remained polluted today with a murky white substance which could be up to three days old.

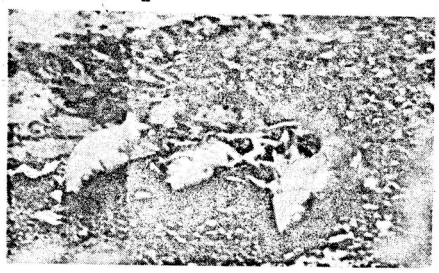
The dead fish, primarily carp and sticklebacks, were reported to the California Department of Fish and Game Monday by a Moffett Field resident who lives near where the creek flows into the bay, according to Game Warden Bill Hoffman.

City officials said this morning they cannot remember a chemical spill of this magnitude.

Hoffman was preparing today to ask the district attorney's office to file charges against Fairchild, which could mean $1,250 in fines and could require the firm to clean up the stream and flush the storm drains.

The matter was still being investigated late this morning by Fairchild and it was not yet determined if the chemical was indeed from the plant, John Hatch, company news director, said.

However, Hoffman said the high-alkaline substance can be traced through perhaps up to a mile of storm drains to a Fairchild Semiconductor building at 401 National Ave.



Some of the poisoned fish in Stevens Creek.

A metal building there which is not surrounded by berms is used to store chemicals, and a puddle of liquid having an alkaline level of 11 was found between the building and the storm drain, Hoffman said.

Hoffman said it is possible the material could have dripped from pipes and flowed under the building wall into the storm drain. The 81-inch sewer enters Stevens Creek near Bayshore Highway.

Alkaline readings in the stream measured between 9.5 and 10.5, Hoffman said. A reading of 7 is neutral.

Today the murky water was being pumped by city crews from the stream into the sanitary sewers for treatment at the tri-city plant in Palo Alto.

There has been no circulation in the creek for about a week since flow was cut off by the Santa Clara Valley Water District.

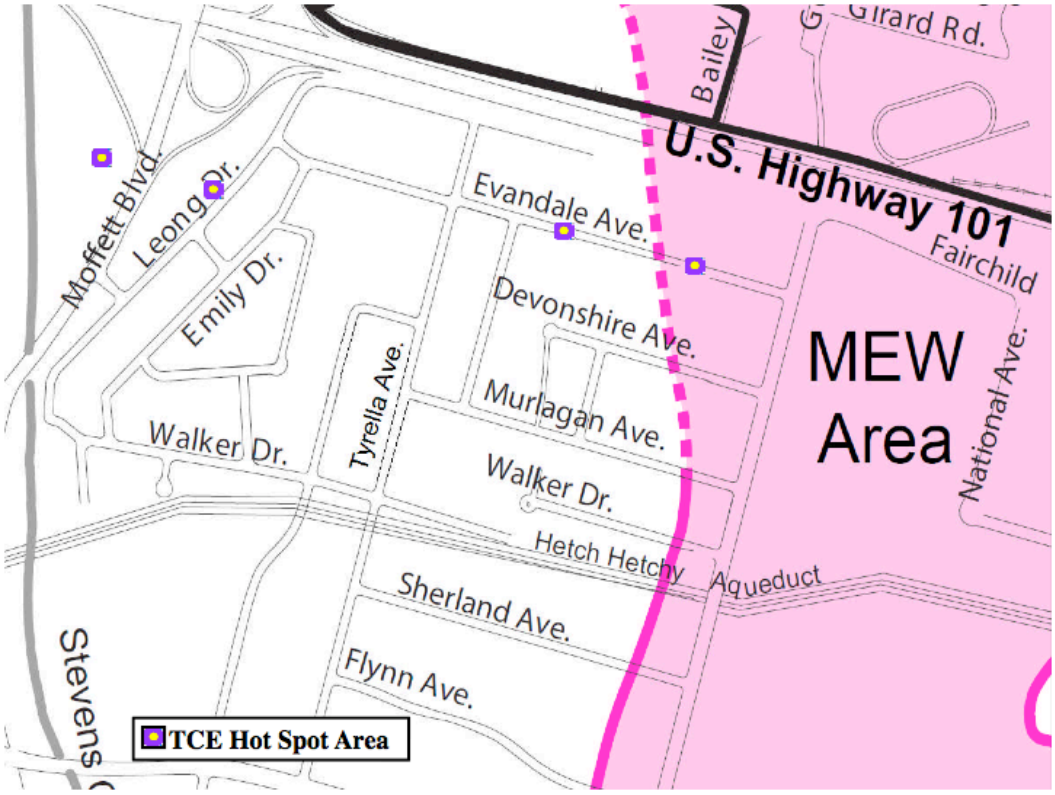
All the water in the shallow stream is from storm drains and runoff.

In a separate Fairchild accident this morning, as much as 2,500 gallons of hydrochloric acid was dumped into the sanitary sewer system, according to Norm Lougee, Mountain View water division engineer.

The acid is expected to be diluted by the time it reaches the treatment plant, he said.

In the early 1980s, my initial questions were answered. Most of the semiconductor companies in the area disclosed that their leaking underground storage tanks had released a witch's brew of toxic substances into local groundwater. Activists joined the City of Mountain View in insisting, successfully, that the birthplace of the commercial semiconductor industry be placed on the "Superfund" National Priorities List (NPL). EPA mapped a 1½-mile-long plume of TCE and its breakdown products in multiple underground aquifers, naming the study area "Middlefield-Ellis-Whisman (MEW)" for the streets that join U.S. 101 in generally defining the Mountain View portion of the plume. In the late 1980s EPA also placed Moffett Naval Air Station, which contributed more volatile organic compounds (VOCs) such as TCE to the plume north of 101, on the NPL. For background, see http://www.cpeo.org/pubs/RegionalPlume.pdf .

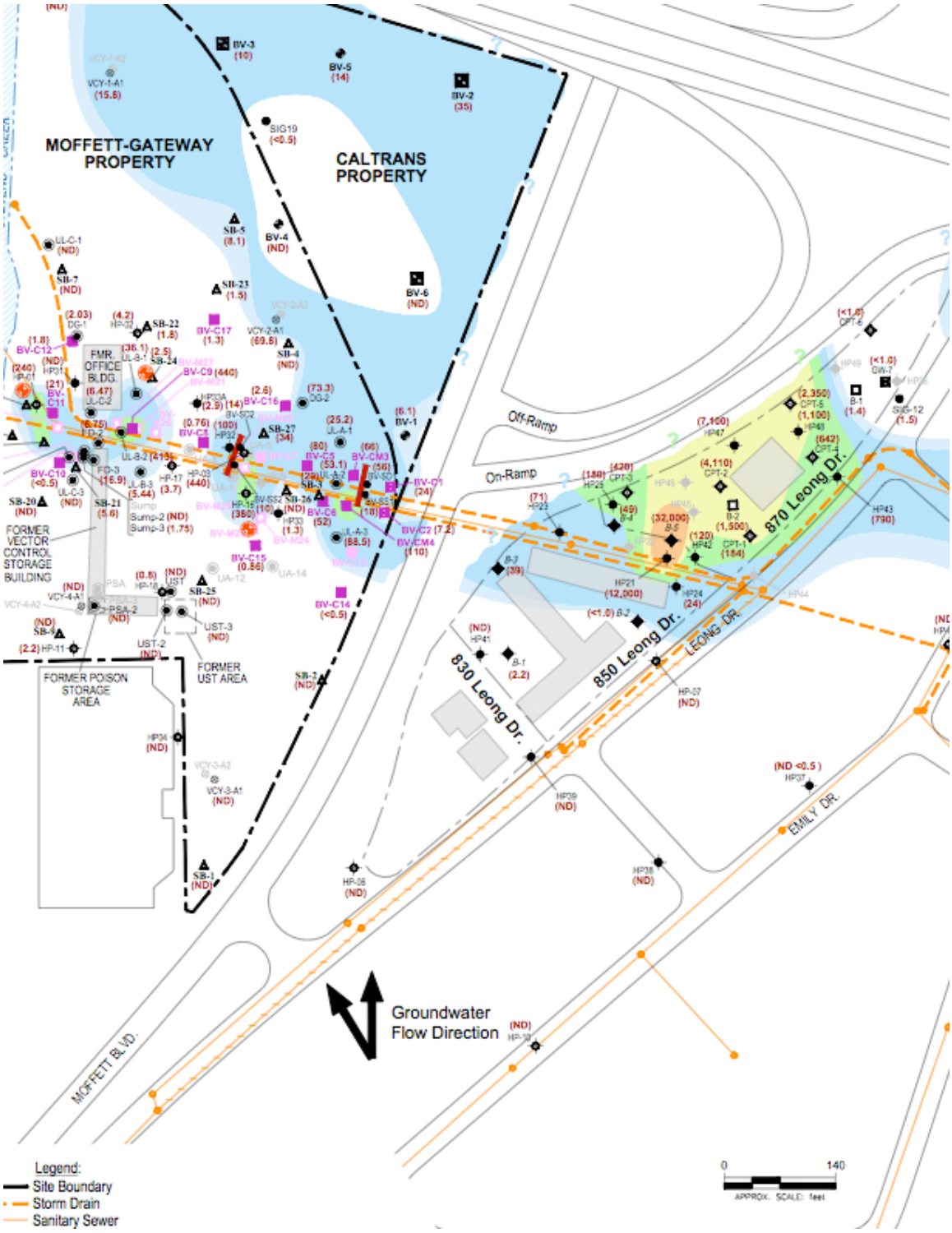
The electronics companies and the Navy all pointed fingers at each other, but backed by community activists EPA gradually got the responsible parties—polluters and their legal descendants—to conduct a comprehensive cleanup. With groundwater flowing northward, the contamination appeared to only scratch the edge of the North Whisman residential neighborhood to the West. Furthermore, before vapor intrusion was fully understood, there was no known pathway through which residents might be affected.



In 2003, the Bay Area Regional Water Quality Control and U.S. EPA began a series of studies to determine if volatile organic compounds from the area south of 101 near Moffett Blvd. were a source of contamination found in the Orion Park Military Housing Area, just north of 101 but at a distance from the Regional Plume. They found TCE, tetrachloroethylene (PCE), and their breakdown products near Leong Drive. Although a local dry-cleaner seemed to be a source of PCE there was no obvious source of TCE, which was found in greater concentrations.

In 2007 consultants studying Santa Clara County-owned property, since acquired by the City of Mountain View, between Moffett Blvd. and Stevens Creek concluded that TCE found there came from off site through a utility corridor containing storm drains and a sanitary sewer line. However, the study was not circulated publicly. In October 2013, consultants for Mountain View reported finding TCE at 440 parts per billion (ppb) in the shallow aquifer and 16,000 ppb a little deeper. They asserted, "The direct correlation between distinct areas of high concentration of TCE in groundwater along the sanitary sewer line in areas of no known historical TCE use strongly suggests that historical

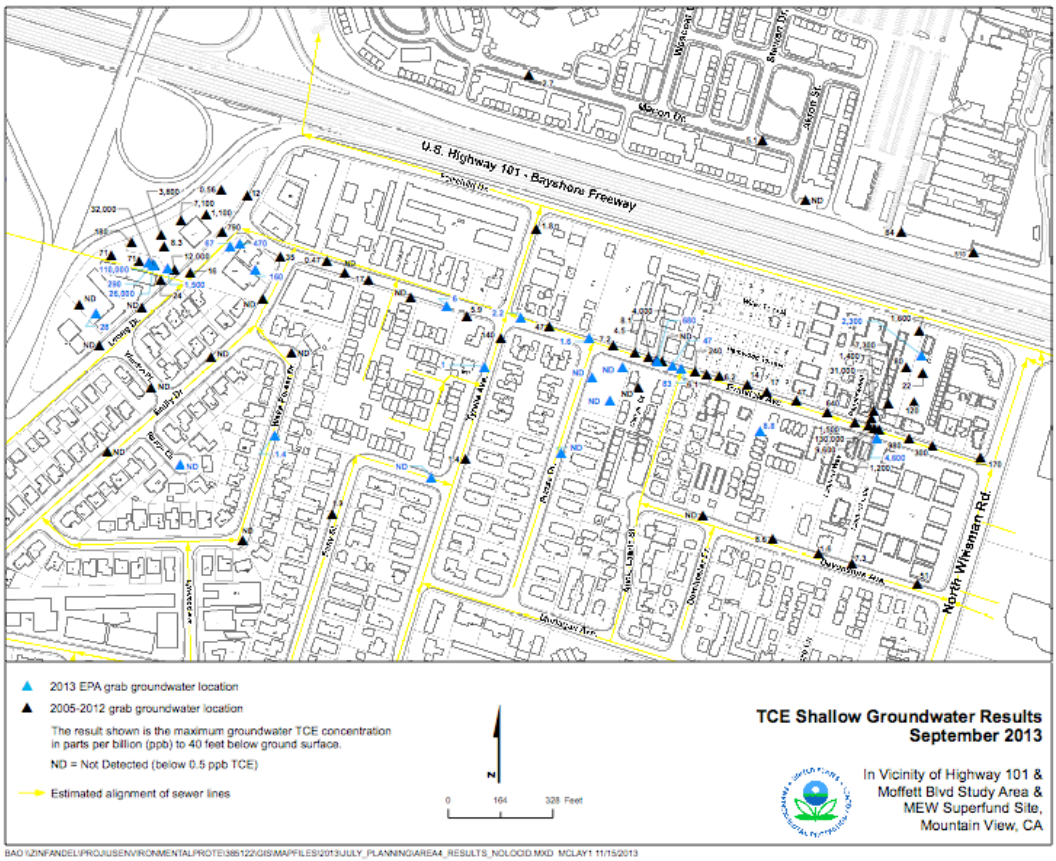
discharges of TCE-containing wastes into the sanitary sewer may have occurred and then leaked at various locations both on the Site and offsite resulting in impacts to groundwater." However, none of the studies of the site, now known as the Moffett Gateway, attempted to trace the TCE upgradient through the sewer lines to a source known to have used or stored TCE.



Meanwhile, in 2012 EPA conducted groundwater studies at Evandale Ave. to complete the delineation of the Regional Plume. To everyone's surprise it found two significant TCE hotspots along Evandale Ave., triggering concern throughout the neighborhood. Near Whisman Road the highest reading in shallow groundwater was 130,000 ppb, while further west a hotspot registered 4,000 ppb. EPA has sampled the indoor air in about 100 homes, but only two exceeded its Indoor Air Action Level of 1 microgram per cubic meter ($\mu g/m^3$). It installed sub-structure depressurization systems in those homes to prevent vapor intrusion, and a small number of other residents with levels just below the action levels are requesting vapor mitigation as well.

Though the MEW Responsible Parties agreed to pay for the Evandale investigation and initial groundwater remediation, they told EPA that "they are not responsible." They wrote, "Both the location and characteristics of the unanticipated concentrations found along Evandale Avenue indicate that those concentrations are the result of independent sources that do not appear to be associated with the historical operations of the semiconductor companies named as responsible parties (RPs) in the MEW Area."

I found their assertion plausible, but EPA never accepted it. Last week EPA reported that soil gas tests at the Evandale hotspots suggested that no releases had taken place at the surface. And it released maps showing that a sewer line emanating from the area once occupied by Fairchild and other semiconductor firms not only followed



Evandale Ave. down to its terminus at Leong Drive, but that it zig-zagged and passed through a motel parking lot, across Moffett Blvd., and through the Moffett Gateway property. Furthermore, EPA reports finding TCE at 110,000 ppb in the parking-lot shallow groundwater and 1.6 million $\mu g/m^3$ in the soil gas. It sampled the indoor air in the adjacent ground-floor motel units, but it found nothing above its action level.

EPA plans to continue investigating before reaching a definitive conclusion, but releases through the sewer line seems to be the best explanation of the TCE found in the four hotspots with no known direct sources. In the era before environmental regulation, semiconductor companies routinely released acids and solvents into storm drains and sewers. The acids ate through the pipes, and the solvents leaked out and spread. The Navy is investigating a similar situation at Moffett Field, where a sewer-line rupture near the foot of Hangar One led to the spread of PCE from a nearby Navy dry-cleaning facility.

Site of Leong Drive Hot Spot

If additional data confirms this hypothesis, the consequences will be significant. The MEW companies, already slated to spend a few hundred million dollars addressing the Regional Plume, will be held accountable for the hotspot cleanup, not only along Evandale, but also at Leong Drive and the Moffett Gateway. Furthermore, they may be held partially responsible for the contamination at Orion Park, now home to an Armed Forces Reserve Center, as well as the TCE that is migrating onto NASA property from Orion Park.

Finally, people in the neighborhood are wondering if there are other leaking sewer lines under their streets. EPA has found TCE on the order of one or two parts per billion, below the drinking water standard that serves as the remedial action objective, in areas separated from the Regional Plume by monitoring points showing no detection of TCE. Residents are asking for additional sampling just in case those findings are the tip of another surprise "iceberg," a TCE hotspot, in their midst.