

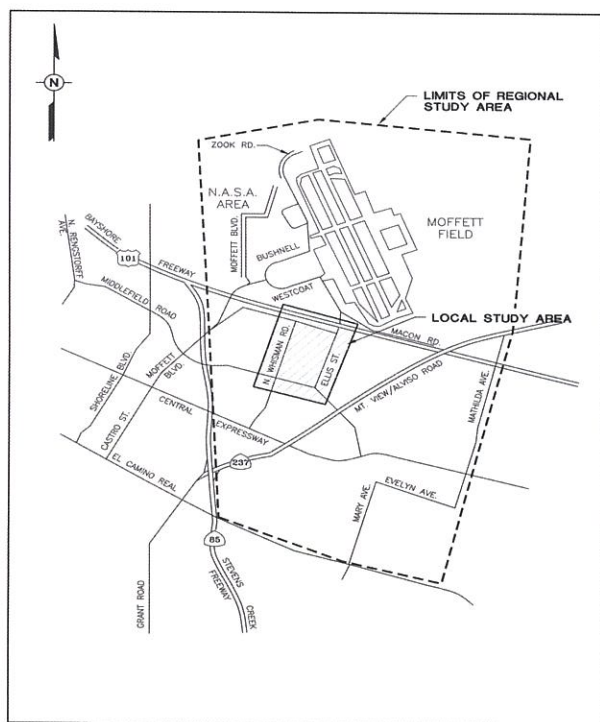
GENERAL INFORMATION

MIDDLEFIELD-ELLIS-WHISMAN (MEW) SITE

History

The area around Middlefield Road, Ellis Street, Whisman Road, and U.S. Highway 101 in Mountain View includes locations of several current and former semiconductor and other manufacturing and industrial facilities.

The former U.S. Naval Air Station Moffett Field is located just north of U.S. Highway 101.



Until 1959, the area south of U.S. Highway 101 was used for agricultural purposes, at which time the area began to be commercially developed with light-industrial facilities. Operations in this area have included semiconductor and electronics

manufacturing, metal finishing, and other activities that used chemicals. While in operation, these facilities required the storage, handling, and use of a variety of chemicals, including solvent. Some of the chemicals leaked or were otherwise released to the ground.

MEW Hydrogeology

Groundwater aquifers within the MEW Site consist of shallow and deep aquifer systems, which are separated by a laterally extensive aquitard approximately 40 feet thick. The shallow aquifer system is generally less than 160 feet below ground surface (bgs) south of U.S. Highway 101 and generally less than 100 feet bgs north of U.S. Highway 101. Subdivisions within the shallow aquifer have been designated the "A/A1", "B1/A2", "B2" and "B3" aquifers. The regional aquitard is designated the "B/C" aquitard. The zones below the "B/C" aquitard are termed the "C" aquifer and the Deep aquifers.

Aquifer	Depth Below Ground Surface
"A" [or "A/A1"]	0 to 45 feet
"B1" [or "B1/A2"]	50 to 75 feet
"B2"	75 to 110 feet
"B3"	120 to 160 feet
"C"	200 to 240 feet
"Deep"	> 200 feet

Groundwater flow in the shallow aquifer zone is generally to the north, while flows in the "C" and Deep aquifers are generally to the northeast. The

shallow and deep aquifer systems at the MEW Site are not used for drinking water.

Remedial Investigations

Remedial investigations were initiated at the MEW Site south of U.S. Highway 101 in 1981. Since then, a substantial amount of groundwater and soil monitoring and remediation has been completed at the Site. This work has produced a large database containing information regarding the local geology, the local hydrogeology, and the distribution of chemicals in the soil and groundwater. Remedial investigation efforts have included over one thousand soil borings, several soil gas collection programs, and thousands of soil and water samples. More than 600 monitoring wells have been installed at the site.

Remedial Investigations

- More than 600 Monitoring Wells to define the extent of the plume
- More than 1,000 exploratory logs to define the geology to 550 feet below ground surface
- Several soil gas sampling programs
- Thousands of groundwater samples to analyze water quality

The extensive data set collected at the MEW Site since 1981 has made possible the identification of potential source areas of chemicals and the delineation of the extent of chemicals in soil and groundwater. Chemicals have been observed above cleanup standards in groundwater at the MEW Site, primarily in the "A", "B1", and "B2" aquifers and, to a far lesser extent, in the "B3" and "C" and Deep aquifers. The EPA identified the MEW chemicals of concern to be trichloroethene (TCE), cis- and trans-1,2-dichloroethene (cis-1,2-DCE and trans-1,2-DCE), 1,1,1-trichloroethane (1,1,1-TCA), 1,1-

dichloroethane (1,1-DCA), 1,2-dichloroethane (1,2-DCA), 1,1-dichloroethene (1,1-DCE), trichlorotrifluoroethane (Freon 113), chloroform, tetrachloroethene (PCE), 1,2-dichlorobenzene (1,2-DCB), and vinyl chloride. These chemicals are collectively referred to as volatile organic compounds (VOCs).

Remedial Measures Implemented by the MEW Companies

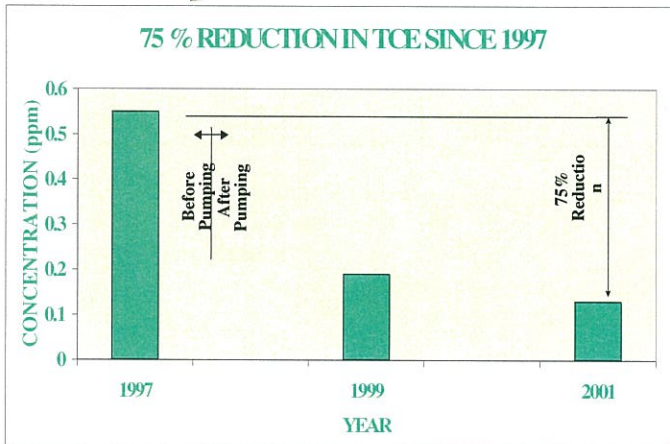
Based on the extensive remedial investigation studies, the MEW Companies have implemented soil and groundwater remediation programs that have including the following:

1. Soil excavation and treatment
2. Installation of four underground containment walls to isolate chemicals
3. Installation of five soil vapor extraction (SVE) systems
4. Installation of more than 95 groundwater extraction wells and ten groundwater treatment systems.

By implementing these remedial measures, the MEW companies have removed more than 55,000 lbs of chemicals from the subsurface.

Remedial Measures

- Installed four underground containment walls to isolate chemicals
- Installed soil vapor extraction systems to remediate soils
- Excavated and treated shallow soils
- Installed more than 95 groundwater extraction wells and ten groundwater treatment systems
- Removed more than 55,000 lbs of chemicals
- Stabilized the plume
- Achieved soil cleanup standards
- Reduced groundwater concentrations by 75%
- Spent more than \$100,000,000 on cleanup activities



Starting as early as 1982, the MEW Companies constructed and operated groundwater extraction and treatment systems to control source areas and remove VOCs from the aquifers. Soil cleanup at the site has been completed and remedial actions have reduced the groundwater concentrations of TCE and other VOCs by 75%. To date, the MEW Companies have spent more than \$100,000,000 on cleanup activities at the site.

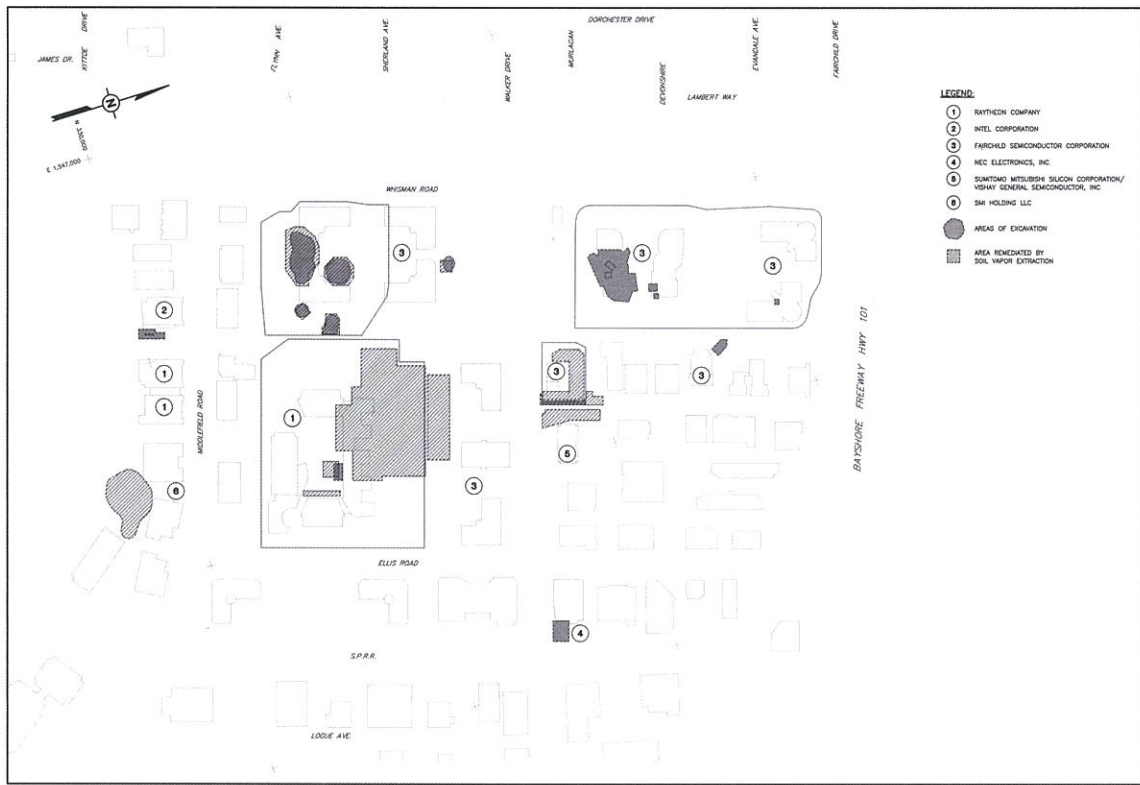
MEW Site Redevelopment

Since the MEW Site investigations were initiated, many changes have occurred in the Site's land use. Many of the industrial facilities that once were occupied by the MEW Companies have been demolished, the land has been sold to new owners, and new office building complexes have been constructed on the sites. Most of the new construction has taken place since 1990. As part of the development process, several individual developers designed and constructed building foundations, base slabs, and heating, ventilation, and air conditioning (HVAC) systems to minimize vapor migration potential. In addition, risk assessments were performed to quantify the potential risk to building occupants of the groundwater-to-indoor air pathway. These risk assessments all showed insignificant risks.

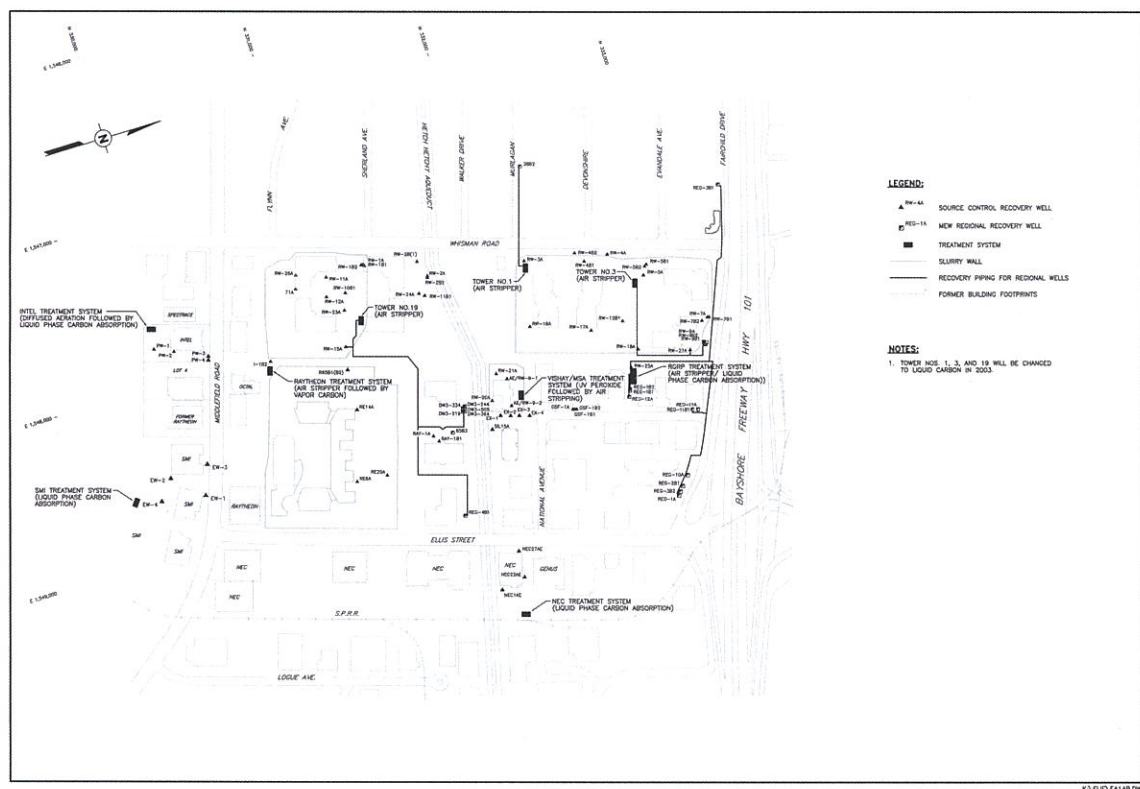
The majority of the newer buildings were designed with modern HVAC systems; some were designed with vapor barriers below the foundation slab to prevent potentially vaporized chemicals from entering the buildings.

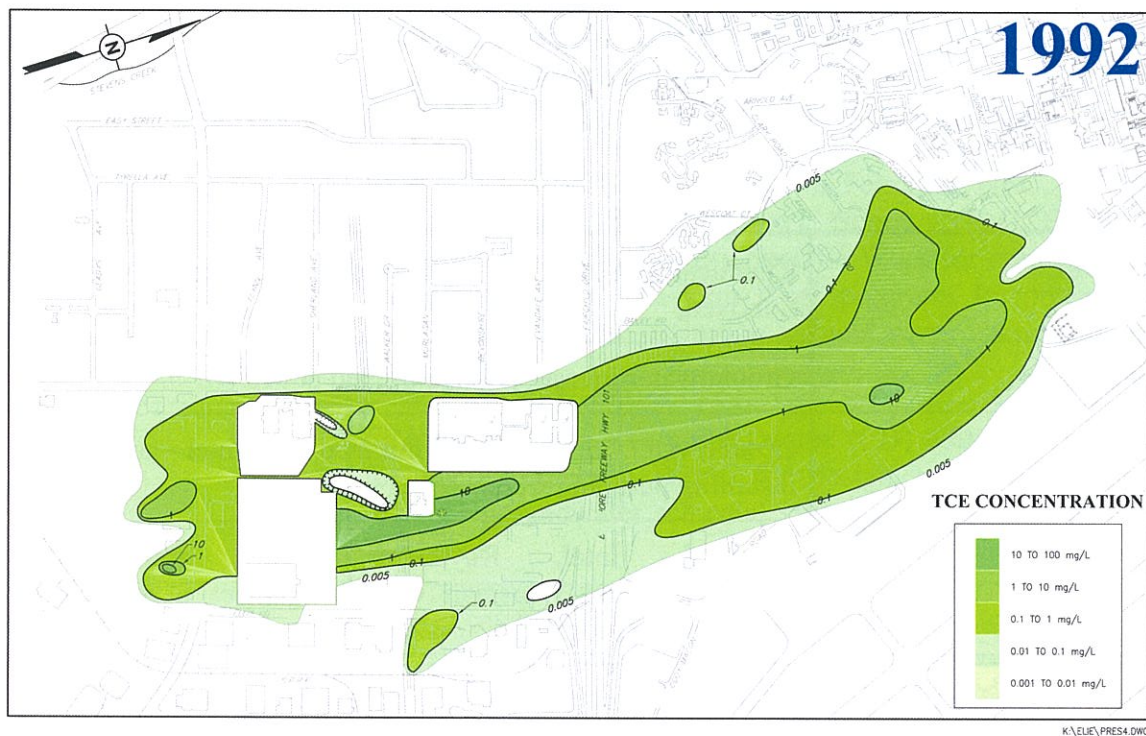
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For more information please call Matt Eales, MEW Representative, (281) 285-8782.



REMEDIAL MEASURES IMPLEMENTED AT MEW SITE SOUTH OF 101





COMPARISON OF TCE CONCENTRATIONS IN 1992 AND 2001



CHRONOLOGY OF EVENTS

MIDDLEFIELD-ELLIS-WHISMAN (MEW) AREA

November 1981	Chemical leak identified at Intel in an underground vault. Vault was removed.
December 1982	Groundwater investigations initiated at MEW.
February 1982	Groundwater remediation initiated at Intel and Fairchild by installing pumping wells.
Spring 1984	Fairchild, Intel, Raytheon, NEC, and Siltec (the Middlefield-Ellis-Whisman Group) conduct a joint groundwater investigation program.
October 1984 – July 1985	Intel excavates 4,000 yd ³ of soils near the former vaults.
August 1985	Fairchild, Intel, and Raytheon entered into an Administrative Order on Consent to jointly perform a Remedial Investigation/Feasibility Study (RI/FS) program for EPA.
1986 - 1987	Fairchild installed several pumping wells and three air stripping ground water treatment systems to control chemical concentrations along Whisman Road and Fairchild Drive.
October 1986	Fairchild installed underground slurry walls around three of its former properties to physically contain on-site chemical residues in the "A" aquifer.
1987	Raytheon installed slurry wall around its former facility at 350 Ellis St. to physically contain on-site chemical residues in three aquifer formations.
July 1987	Remedial Investigation report was submitted to EPA. Since 1985, more than 600 monitoring wells were installed and sampled to investigate chemical concentrations in 8 aquifer zones to 550 feet below the ground surface.
November 1988	Feasibility Study report was submitted to EPA. Pump-and-treat was proposed as the remedial technique for the regional groundwater. Soil vapor extraction and/or soil excavation was proposed as the remedial technique for shallow soils.

December 1988	Bioremediation system installed at Bldg. 9 to treat acetone.
June 1989	EPA issued the Record of Decision (ROD) for the MEW Site, establishing the remedial program proposed in the Feasibility Study report.
November 1990	EPA issued a Section 106 Order to Fairchild, NEC, Siltec/General Instrument (now Sumco/Vishay), Sobrato (SMI Holdings), and Spectrace specifying Facility-Specific Work for remediation of soils and ground water, and Joint Work programs for potential conduit wells sealing, plume definition, ground water chemistry, and water reuse programs.
April 1991	EPA entered into a Consent Decree (CD) with Intel and Raytheon for Facility-Specific Work, for design and construction of the regional groundwater remedial system, and to remediate the Silva Well area.
December 1991	NEC excavated 210 yd ³ of shallow soils.
March 1992 – July 1994	Potential Conduit Program was implemented, which included investigation and sealing of 16 old agricultural wells.
November 1991 – April 1995	Preliminary and final design documents and drawings for source control measures (design of pump-and-treat, soil excavation, soil vapor extraction, and air sparging systems) were developed and submitted to EPA.
December 1991	Soil vapor extraction pilot study started with a real field application on 369 N. Whisman Road to evaluate the feasibility of the technology.
December 1992	Plume Definition Program completed. The program included sampling of more than 200 monitoring wells to further define the vertical and horizontal extent of the plume.
September 1993 – February 1997	Preliminary and final design documents and drawings for the two groundwater regional treatment systems south and north of Hwy 101 were developed and submitted to EPA.
November 1994	Fairchild excavated and treated 6,000 yd ³ of soils at 369 N. Whisman Road.
1985	Raytheon installed and started operations of SVE system at its former facility on 350 Ellis street.
June 1995	Fairchild excavated and treated 3,000 yd ³ of soils at 401 National Avenue.

June 1995-March 1997	Fairchild installed and operated an SVE system at 369 N. Whisman Road to remediate shallow soils.
June 1996 - March 1997	Fairchild operates SVE system for shallow soils at 401 National Avenue.
August 1996	Fairchild excavated and treated 15,000 yd ³ of soils at 515/545 N. Whisman Road.
Winter 1997-Fall 1998	Several MEW Companies expanded groundwater extraction systems as source control measures. Systems continue to operate.
1997-2000	Redevelopment of MEW site, including construction of new AOL/Netscape, Nokia, Veritas, and Verisign campuses.
July 1997 - March 1999	Vishay/Sumco operate an SVE system at 405 National Avenue.
July 1997 – May 2000	SMI Holdings operates SVE/Air Sparging system on 487 E. Middlefield Rd.
January 1998	Construction of the RGRP South of 101 is complete. The treatment system is operational on January 6, 1998.
October 1998	Construction of the RGRD North of 101 is complete. The treatment system is operational on October 15, 1998.
July 2000	Submittal to EPA of the two-year evaluation for the RGRP South of 101.
April 2001	Submittal to EPA of the two-year evaluation for the RGRP North of 101.
December 2002	Work plan for air sampling at MEW site was submitted to EPA.
February 2003	EPA approves revised work plan for air sampling.
May 2003	MEW Companies implement air-sampling program.