

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 90-042

REVISED SITE CLEANUP REQUIREMENTS FOR:

AVANTEK, INC.
3175 BOWERS AVENUE FACILITY
SANTA CLARA, SANTA CLARA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter called the Board), finds that:

1. Avantek, Inc., hereinafter called the discharger, owns and operates a research, development, and production facility for small microwave electronic products located at 3175 Bowers Avenue in Santa Clara, Santa Clara County (Figure 1), but does not own the property on which the facility is located. Soil and groundwater have been polluted by incursions of volatile organic chemicals (VOCs) at this site.

The landowners for this site are The Prudential Insurance Company of America, and Kihong and Won Mi Kwon. None of these entities is named as a discharger in this Order. The Board reserves the right to amend this Order at a future date to name these entities as waste dischargers.

In addition to the party named in this Order, other parties may have contributed to pollution on the property. If additional information comes to light showing that any party not currently named as a discharger caused or permitted any waste to be discharged or deposited on the 3175 Bowers Avenue site where it entered or could have entered into the waters of the State, the Board will consider adding that party's name to this Order.

2. In 1983 industrial solvents including chlorinated hydrocarbons, aromatics, ketones, and alcohols were detected in soil and groundwater in the vicinity of an underground waste solvent tank. The tank was removed, an extraction sump was installed to control and cleanup groundwater pollution, and subsurface investigations were initiated. On February 19, 1986 the RWQCB, by Order No. 86-2, adopted site cleanup requirements for this facility.

The discharger has been conducting monitoring activities and submitting required reports to the RWQCB. No violations or instances of non-compliance have been noted as a result of compliance inspections conducted by RWQCB personnel.

March 22, 1990

3. Revisions to the existing site cleanup requirements are considered appropriate at this time in order to ascertain that cleanup activities are keeping pace with activities at nearby sites.
4. Groundwater cleanup is being accomplished through the operation of three extraction wells. Water levels have dropped below the intake of the original extraction sump (Well AV-E1). It has been replaced with a new deeper extraction well (AV-E4) installed in March of 1989. Presently, extraction wells AV-E2 and AV-E4 remove polluted groundwater at depths of about 15-20 feet and Well AV-E3 removes water from a depth of about 30 feet.

Extracted groundwater is treated by passing through two activated carbon canisters in series; the treated water is used as make-up water for two nearby scrubbers and then discharged to the sanitary sewer system.

5. In addition to the three active extraction wells, there are 14 active monitoring wells at this site; 11 are completed in the A zone aquifer and three are in the B zone (Figure 2) as defined at the Avantek site. Groundwater samples are collected for analyses on a quarterly schedule. The most recent analysis (October 1989) shows the onsite presence of 1,1,1-Trichloroethane (TCA) to 250 ppb, 1,2-Dichloroethylene (1,2-DCE) to 270 ppb, 1,1-Dichloroethane (1,1-DCA) to 59 ppb, Trichloroethylene (TCE) to 1200 ppb, Tetrachloroethylene (PCE) to 38 ppb, 1,1-Dichloroethylene (1,1-DCE) to 21 ppb, vinyl chloride to 140 ppb, and chloroform to 5.5 ppb.
6. Shallow groundwater is found at a depth of about ten feet below the surface, and moves in a northward direction with a hydraulic gradient of about 0.01 ft/ft. The A and B aquifers (as defined) are not everywhere separate, distinct geologic units in this part of the Santa Clara Valley Water Basin, and may locally be hydrogeologically interconnected.
7. The highest concentrations of VOC pollutants are found at the location of the exhumed underground tank, between Building 1 and Building 2. When originally detected in the groundwater, concentrations of identified VOCs were reported to have ranged from 1,000 to 100,000 parts per billion (ppb). Since extraction began in late 1985, concentrations have declined and were reported to range from less than 10 to 1,200 ppb during 1989.

Pollutants are also found north of Building 2, in a downgradient direction, and at the southwest corner of Building 1, which is in an upgradient direction (Figure 2).

8. Avantek believes the origin of the pollution north of Building 2 is an offsite source as yet unidentified, because the chemicals detected in groundwater samples from Well AV-9 are different from those detected in samples from the exhumed-tank area. The source of the pollution in Well AV-9 apparently has not been identified, but Avantek intends to initiate an investigation to determine the origin of this pollution.
9. The Board finds that additional site characterization work is required in order to determine the origin of the groundwater pollution in the northeast sector of the site, and may be required to determine the vertical extent of pollution at specific site locations elsewhere.
10. The presence of groundwater pollution at the southwest corner of Avantek Building 1 and upgradient of the identified source at Avantek has been detected in Wells AV-1A and AV-1B. Avantek believes this pollution originated from the release of VOCs at the Applied Materials, Inc. Building 1 site on the other side of Bowers Avenue and upgradient of the Avantek site. The VOCs detected in Wells AV-1A and AV-1B are also found in upgradient Applied Materials' wells.
11. The Board finds that, prior to the implementation of extraction pumping on the west side of Bowers Avenue at the Applied Materials' Building 1 site, the Applied Materials VOC plume in shallow groundwater probably migrated beneath Bowers Avenue downgradient onto the Avantek site, into the vicinity of Wells AV-1A and AV-1B (Figures 3 and 4). The Applied Materials' extraction pumping has not removed these VOCs from the Avantek property; these VOCs continue to be detected by Avantek's monitoring activities. (The Applied Materials plume of pollutants may have coalesced with the upgradient edge of Avantek's plume.)
12. The Board finds that the reduction of the VOC pollution in groundwater to acceptable levels in the vicinity of Wells AV-1A and AV-1B requires a coordinated effort between Avantek and Applied Materials, and may require further investigation.
13. The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Region (Basin Plan) on December 17, 1986. The Basin Plan contains water quality objectives for South San Francisco Bay and contiguous surface waters and groundwater.
14. The existing and potential beneficial uses of the groundwater underlying and adjacent to the property include:
 - a. Industrial process water supply
 - b. Industrial service supply
 - c. Municipal and domestic supply
 - d. Agricultural supply

15. The discharger has caused or permitted, and threatens to cause or permit waste to be discharged or deposited where it is or probably will be discharged to waters of the State and creates or threatens to create a condition of pollution or nuisance.
16. This action is an Order to enforce the laws and regulations administered by the Board. This action is categorically exempt from the provisions of the CEQA pursuant to Section 15321 of the Resources Agency Guidelines.
17. Further interim containment and cleanup measures need to be implemented in the northeast sector of the site to alleviate the threat to the environment posed by the continued migration of the groundwater plume of organic solvents and to provide a substantive technical basis for designing and evaluating the effectiveness of final cleanup alternatives.
18. The Board has notified the discharger and interested agencies and persons of its intent under California Water Code Section 13304 to prescribe Site Cleanup Requirements for the discharge and has provided them with the opportunity for a public hearing and an opportunity to submit their written views and recommendations.
19. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED, pursuant to Section 13304 of the California Water Code, that the dischargers shall cleanup and abate the effects described in the above Findings as follows:

A. PROHIBITIONS

1. The discharge of wastes or hazardous materials in a manner which will degrade water quality or adversely affect the beneficial uses of the waters of the State is prohibited.
2. Further significant migration of pollutants through subsurface transport to waters of the State is prohibited.
3. Activities associated with the subsurface investigation and cleanup which will cause significant adverse migration of pollutants are prohibited.

B. SPECIFICATIONS

1. The storage, handling, treatment or disposal of polluted soil or groundwater shall not create a nuisance as defined in Section 13050(m) of the California Water Code.

2. Avantek, Inc. shall conduct further reporting, site investigation and monitoring activities as needed and as described in this Order. Results of such monitoring activities shall be submitted to the Board. Should monitoring results show evidence of plume migration, additional plume characterization may be required.
3. Final cleanup goals for polluted groundwater, onsite and offsite, shall be in accordance with State Water Resources Control Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California". Proposed final cleanup levels shall be based on a feasibility study of remedial alternatives that compare cost, effectiveness, time to achieve cleanup goals, and an assessment of risk to determine effect on beneficial uses, human health and the environment. Cleanup levels shall also have the goal of reducing the mobility, toxicity, and volume of pollutants. Final cleanup levels shall be approved by the Board.

If it is determined by the Executive Officer that polluted soils need to be remediated, the cleanup goal is 1 ppm for total VOCs. This goal may be modified by the Executive Officer if the dischargers demonstrate with site specific data that higher levels of VOCs in the soil will not threaten the quality of waters of the State or that cleanup to this level is infeasible and human health and the environment are protected.

The discharger shall optimize, with a goal of 100%, the reclamation or reuse of groundwater extracted as a result of cleanup activities. The discharger shall not be found in violation of this Order if documented factors beyond the discharger's control prevent the discharger from attaining this goal, provided the discharger has made a good faith effort to attain this goal.

4. The discharger shall implement a cleanup plan acceptable to the Executive Officer.

C. PROVISIONS

1. Avantek, Inc. shall perform all investigation and remedial work in accordance with the requirements of this Order.
2. The discharger shall submit to the Board acceptable monitoring program reports containing results of work performed according to a program prescribed by the Board's Executive Officer.
3. The discharger shall comply with all Prohibitions and Specifications of this Order, in accordance with the following time schedule and tasks:

COMPLETION DATE/TASK:

a. SITE CHARACTERIZATION

1) COMPLETION DATE: June 15, 1990

TASK 1: SUMMARY OF PREVIOUS WORK AND PROPOSAL FOR ADDITIONAL WORK. Submit a technical report acceptable to the Executive Officer which contains:

- (a) a summary of the geology of the site showing correlations with other sites in the area and specifically the Applied Materials Building 1 site at 3050 Bowers Avenue. The summary should include
 - (1) cross-sections, isoconcentration maps and potentiometric maps of the site and adjoining areas;
 - (2) a discussion of the relationship of pollution in the shallow water-bearing zone to the intermediate and deeper zones;
 - (3) a discussion of possible pollution migration through natural conduits and man-made conduits including utility passageways and fill material on the site and beneath Bowers Avenue;
- (b) a section documenting that all extraction and monitoring wells are in good repair and adequate for purposes intended, and a proposal for well repair where necessary; and including the results of the detailed site inspection made by Avantek following the Loma Prieta Earthquake of October 17, 1989;
- (c) copies of all available historical records of site groundwater quality, including influent/effluent records of extracted water, not previously provided the RWQCB;
- (d) a summary of the natural background quality of the shallow groundwater including records of actual measurements of concentrations of inorganic constituents, and a summary of what is known about site soil and groundwater pollution which resulted from releases of inorganic chemicals or compounds;

- (e) a section on the status of dormant well AV-E1: results of Avantek's evaluation of the feasibility of converting this well into a vapor extraction well, and/or a proposal for making the conversion;
- (f) conclusions, recommendations and a proposal for completing the site characterization. The proposal should consider, at a minimum, the following elements:
 - (1) determination of the origins and lateral and vertical extent of site groundwater pollution;
 - (2) evaluation of the need to conduct soil investigations to determine the lateral and vertical extent of pollution;
 - (3) evaluation of the threat or potential threat to human health and the environment including the identification of each detected VOC as a carcinogen (by category) or non-carcinogen, and possible offsite migration of pollutants into existing water sources and wells;
 - (4) evaluation of the existing sampling program including the installation of additional monitoring wells.

2) COMPLETION DATE: December 1, 1990

TASK 2: COMPLETION OF SITE CHARACTERIZATION. Submit a technical report acceptable to the Executive Officer documenting completion of the necessary work to accomplish Task 1 above, and presenting findings and results.

3) COMPLETION DATE: June 15, 1990

TASK 3: REVISIONS TO THE SAMPLING PLAN, SITE SAFETY PLAN, AND QUALITY ASSURANCE PROJECT PLAN. Submit technical reports acceptable to the Executive Officer, considering format and content of CERCLA regulations and guidance documents, which will make the previously submitted tri-part document (dated August 1, 1987) and the addendum (dated October 26, 1987) appropriate for current site conditions and requirements:

- (a) Sampling Plan which includes a quarterly schedule for sampling groundwater and soil, for organic and/or inorganic constituents.
- (b) Site Safety Plan.
- (c) Quality Assurance Project Plan.

b. INTERIM REMEDIAL ACTIONS

- 1) COMPLETION DATE: June 1, 1991

TASK 4: ADDITIONAL RECOMMENDED INTERIM REMEDIAL ACTION. Submit a technical report acceptable to the Executive Officer which contains an evaluation of additional or supplemental interim remedial action, recommendations for implementation, and a time schedule. This report shall acknowledge the existing interim remedial action which is groundwater extraction, and shall consider other additional/supplemental action such as soil remediation, soil vapor extraction, expansion of the existing groundwater extraction alternative, and the reclamation and/or disposal of treated groundwater; and shall evaluate remediation of polluted soil and control systems to contain and initiate cleanup of polluted groundwater; and shall include any necessary permit application(s) which may be an essential element of the plan.

This report should include recommendations concerning documented offsite origins of VOCs detected at the Avantek site and include plans for coordinated cleanup efforts if such is recommended by Avantek.

- 2) COMPLETION DATE: December 1, 1991

TASK 5: COMPLETION OF ADDITIONAL OR SUPPLEMENTAL INTERIM REMEDIAL ACTIONS. Submit a technical report acceptable to the Executive Officer documenting completion of the necessary work identified in the technical report submitted for Task 4 above.

c. EVALUATION AND MODIFICATION OF INTERIM REMEDIAL ACTIONS

- 1) COMPLETION DATE: March 1, 1992

TASK 6: EVALUATE INTERIM REMEDIAL ACTIONS. Submit a technical report acceptable to the Executive Officer which evaluates the effectiveness of the interim remedial actions. The evaluation for a system using extraction wells shall include but not be limited to an estimation of the flow capture zone, establishment of cones of depression by field measurements, and presentation of

chemical analyses data. This report shall also evaluate and document the removal and/or cleanup of polluted soil, if such is an element of the remedial measures. If necessary, the report shall include a separate section containing a proposal for modifications: in the event that the groundwater containment system is demonstrated not to be effective in containing and removing onsite pollutants, specific modifications to the system and an implementation time schedule shall be proposed.

2) COMPLETION DATE: June 1, 1992

TASK 7: COMPLETION OF MODIFICATIONS TO INTERIM REMEDIAL ACTIONS. Submit a technical report acceptable to the Executive Officer documenting completion of the necessary work identified in the report submitted for Task 6 above.

d. FINAL REMEDIAL ACTION

1) COMPLETION DATE: July 1, 1992

TASK 8: PROPOSED FINAL REMEDIAL ACTION PLAN. Submit a technical report acceptable to the Executive Officer containing the result of the remedial investigation, an evaluation of the installed interim remedial measures, a feasibility study evaluating alternative final remedial measures, the recommended measures necessary to achieve final cleanup objectives, and the tasks and time schedule necessary to implement the recommended final remedial measures.

e. STATUS REPORT

1) COMPLETION DATE: March 21, 1995

TASK 9: STATUS REPORT AND EFFECTIVENESS EVALUATION. Submit a technical report acceptable to the Executive Officer containing the following: (1) results of any additional investigation including a soil remediation study; (2) an evaluation of the effectiveness of installed final cleanup measures and cleanup costs; (3) additional recommended measures to achieve final cleanup objectives and goals, if necessary; (4) a comparison of previous expected costs with the costs incurred and projected costs necessary to achieve cleanup objectives and goals; (5) the tasks and time schedule necessary to implement any additional final cleanup measures; and (6) recommended measures for reducing Board oversight. This report shall also describe the reuse of extracted groundwater, evaluate and document the removal and/or cleanup of polluted soil. If safe drinking water levels have not been achieved and are not expected to be

achieved through continued groundwater extraction and/or soil remediation, this report shall also contain an evaluation of the feasibility of achieving drinking water quality with the implemented remedial measures and a proposal for alternative measures if required to achieve drinking water quality.

4. The submittal of technical reports evaluating proposed interim and final remedial measures will include a projection of the cost, effectiveness, benefits and impact on public health, welfare and environment of each alternative measure. A remedial investigation and feasibility study shall consider guidance provided by Subpart F of the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR Part 300); CERCLA guidance documents with reference to Remedial Investigations, Feasibility Studies and Removal Actions; and the State Water Resources Control Board's Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California".
5. Any proposal for the discharge of extracted groundwater included in the technical report required in Tasks 4, 7, and 9 must initially consider the feasibility of reclamation or discharge to a publicly owned treatment works (POTW), as specified in Board Resolution No. 88-160. If it can be demonstrated that reclamation or discharge to a POTW is technically and economically infeasible, a proposal for discharge to surface water shall be considered. Such proposal for discharge to surface water shall include a completed application for an NPDES permit.
6. If the dischargers are delayed, interrupted or prevented from meeting one or more of the completion dates specified in this Order, the dischargers shall promptly notify the Executive Officer. In the event of such delays, the Board may consider modification of the task completion dates established in this Order.
7. Technical reports on compliance with the Prohibitions, Specifications, and Provisions of this Order shall be submitted monthly to the Board commencing with the April 1990 report due May 15, 1990 and for a period of two months thereafter, then quarterly beginning with the report for the July-September 1990 quarter due November 1, 1990. These reports shall consist of a brief letter report that (a) summarizes work completed since submittal of the previous report, and work projected to be completed by the time of the next report, (b) identifies any obstacles which may threaten compliance with the schedule of this Order and what actions are being taken to overcome these obstacles, and (c) includes, in the event of non-compliance with Provisions of this Order, written notification which clarifies the reasons for non-

compliance and which proposes specific measures and a schedule to achieve compliance. This written notification shall identify work not completed that was projected for completion, and shall identify the impact of non-compliance on achieving compliance with the remaining requirements of this Order.

8. In addition to the report required in Provision 7 the dischargers shall submit a quarterly monitoring report commencing with the April through June 1990 quarterly report due August 1, 1990. The quarterly monitoring report shall include, but need not be limited to, updated water table/piezometric surface contour maps, pollutant concentration contour maps for all affected water-bearing zones, geologic cross-sections describing the hydrogeologic setting of the site, and appropriately scaled and detailed base maps showing the locations of all monitoring and extraction wells, and identifying adjacent facilities and structures. The above information will be generated on a quarterly basis. The report required in Provision 7 may be combined with this report when due dates coincide.

On an annual basis, technical reports on the progress of compliance with all requirements of this Order shall be submitted, commencing with the report for 1990, due February 1, 1991. The annual report may be combined with other technical report(s) which are due to be submitted on February 1, 1991. The progress reports shall include, but need not be limited to, an evaluation of the effectiveness of the cleanup actions/systems and the feasibility of attaining groundwater and soil cleanup goals.

9. All hydrogeological plans, specifications, reports and documents shall be signed by or stamped with the seal of a registered geologist, registered civil engineer, or certified engineering geologist.
10. All samples shall be analyzed by State certified laboratories or laboratories accepted by the Board using approved EPA methods for the type of analysis to be performed. All laboratories shall maintain quality assurance/quality control records for Board review.
11. The dischargers shall maintain in good working order, and operate as efficiently as possible, any facility or control system installed to achieve compliance with the requirements of this Order.
12. Copies of all correspondence, reports, and documents pertaining to compliance with the Prohibitions, Specifications, and Provisions of this Order shall be provided to the following agencies:

- a. Santa Clara Valley Water District
- b. Santa Clara County Health Department
- c. City of Santa Clara
- d. State Department of Health Services/TSCD

The Executive Officer shall receive one complete copy of all correspondence, reports, and documents pertaining to compliance with the Prohibitions, Specifications, and Provisions of this Order, and may require additional copies be provided to the U.S. Environmental Protection Agency, Region IX, and to a local repository for public use.

13. The dischargers shall permit the Board or its authorized representative, in accordance with Section 13267 (c) of the California Water Code:
 - a. Entry upon dischargers' premises in which any pollution sources exist, or may potentially exist, or in which any required records are kept, which are relevant to this Order.
 - b. Access to copy any records required to be kept under the terms and conditions of this Order.
 - c. Inspection of any monitoring equipment or methodology implemented in response to this Order.
 - d. Sampling of any groundwater or soil which is accessible, or may become accessible, as part of any investigation or remedial action program undertaken by the discharger.
14. The dischargers shall file a report on any changes in site occupancy and ownership associated with the facility described in this Order.
15. If any hazardous substance is discharged in or on any waters of the State, or discharged and deposited where it is, or probably will be discharged in or on any waters of the State, the dischargers shall report such a discharge to this Board, at (415) 464-1255 on weekdays during office hours from 8 a.m. to 5 p.m., and to the Office of Emergency Services at (800) 852-7550 during non-office hours. A written report shall be filed with the Board within five (5) working days and shall contain information relative to: the nature of the waste or pollutant, quantity involved, duration of incident, cause of spill, Spill Prevention, Control and Countermeasure Plan (SPCC) in effect, if any, estimated size of affected area, nature of effects, corrective measures that have been taken or planned, and a schedule of these activities, and persons notified.

16. The Board will review this Order periodically and may revise the requirements when necessary.

I, Steven R. Ritchie, Executive Officer, do hereby certify that the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on March 21, 1990.

A handwritten signature in cursive script, appearing to read "Steven R. Ritchie", is written above a solid horizontal line.

Steven R. Ritchie
Executive Officer

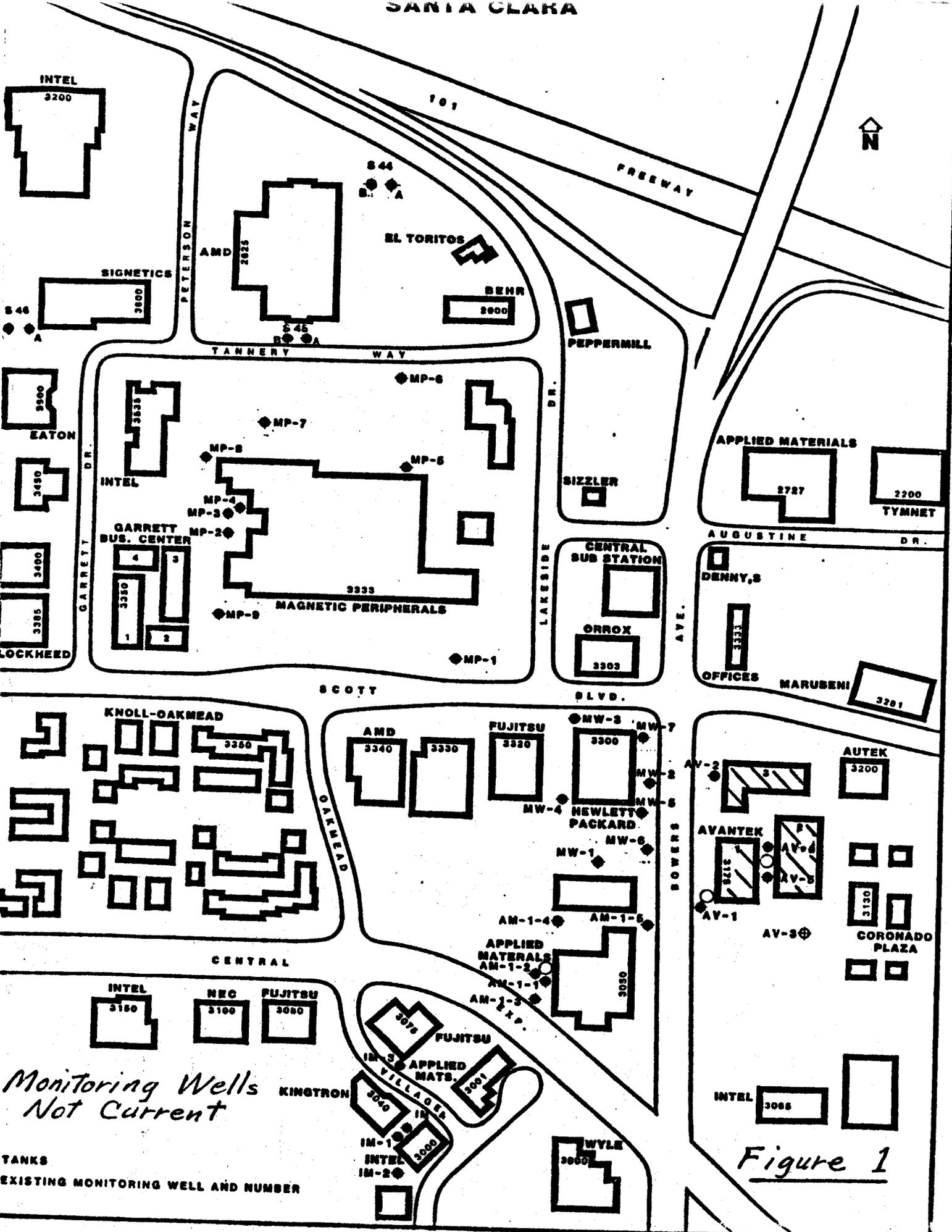


Figure 1

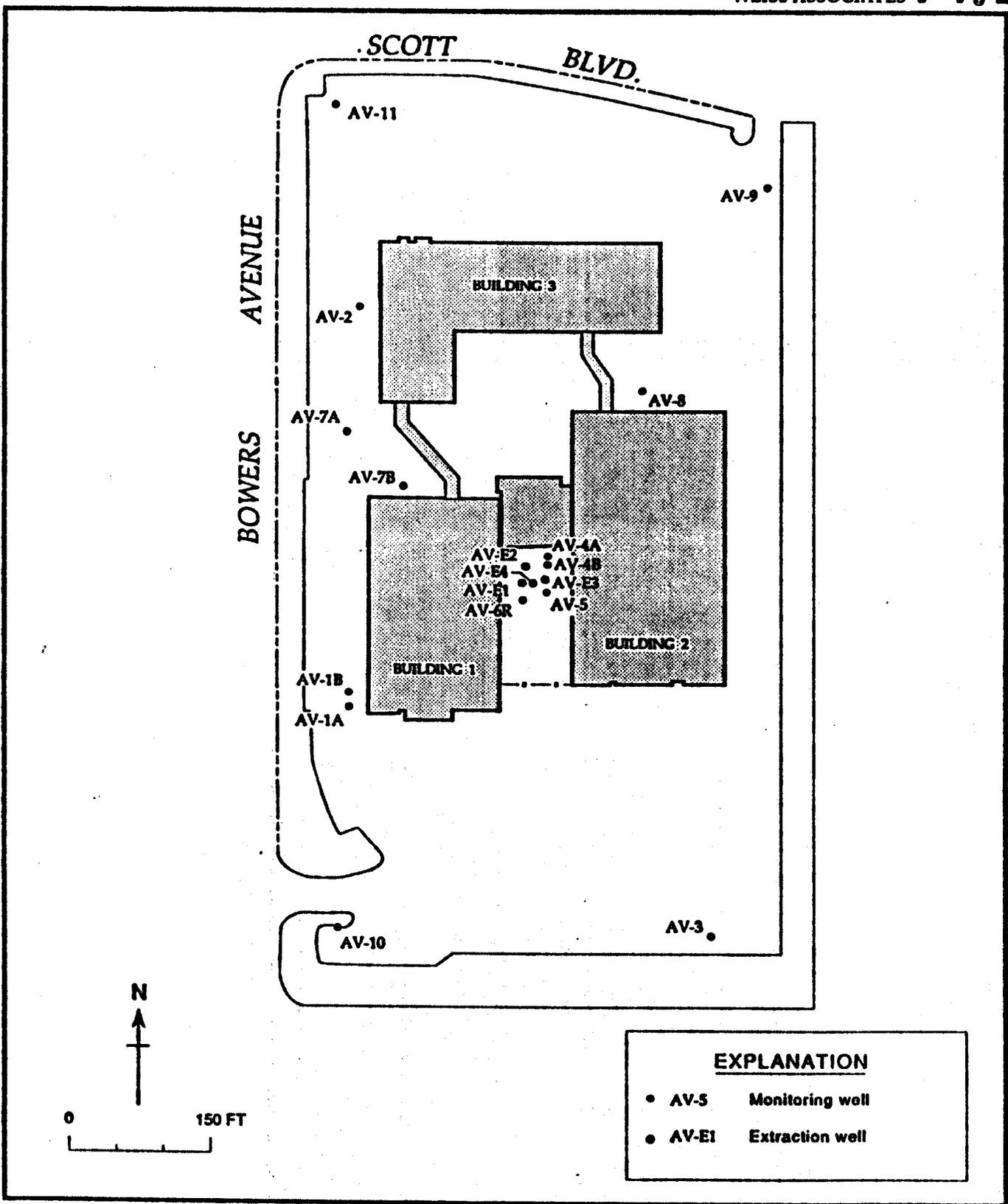
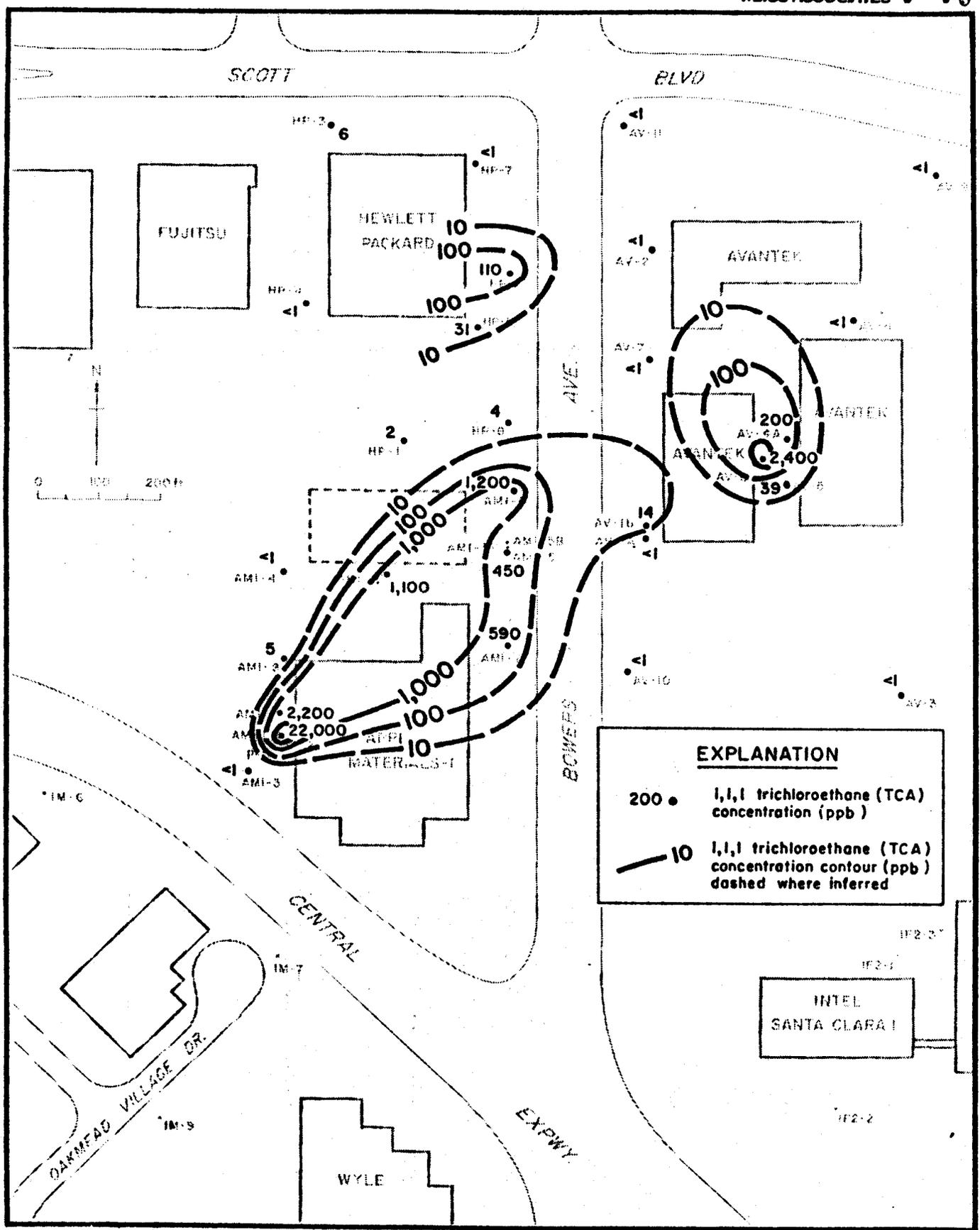


Figure 2. Well Locations - AvanteK, Santa Clara, California



EXPLANATION

- 200 • 1,1,1 trichloroethane (TCA) concentration (ppb)
- 10 1,1,1 trichloroethane (TCA) concentration contour (ppb) dashed where inferred

Figure 3. Distribution of 1,1,1-TCA in the A Water-Bearing Zone, May-June 1985

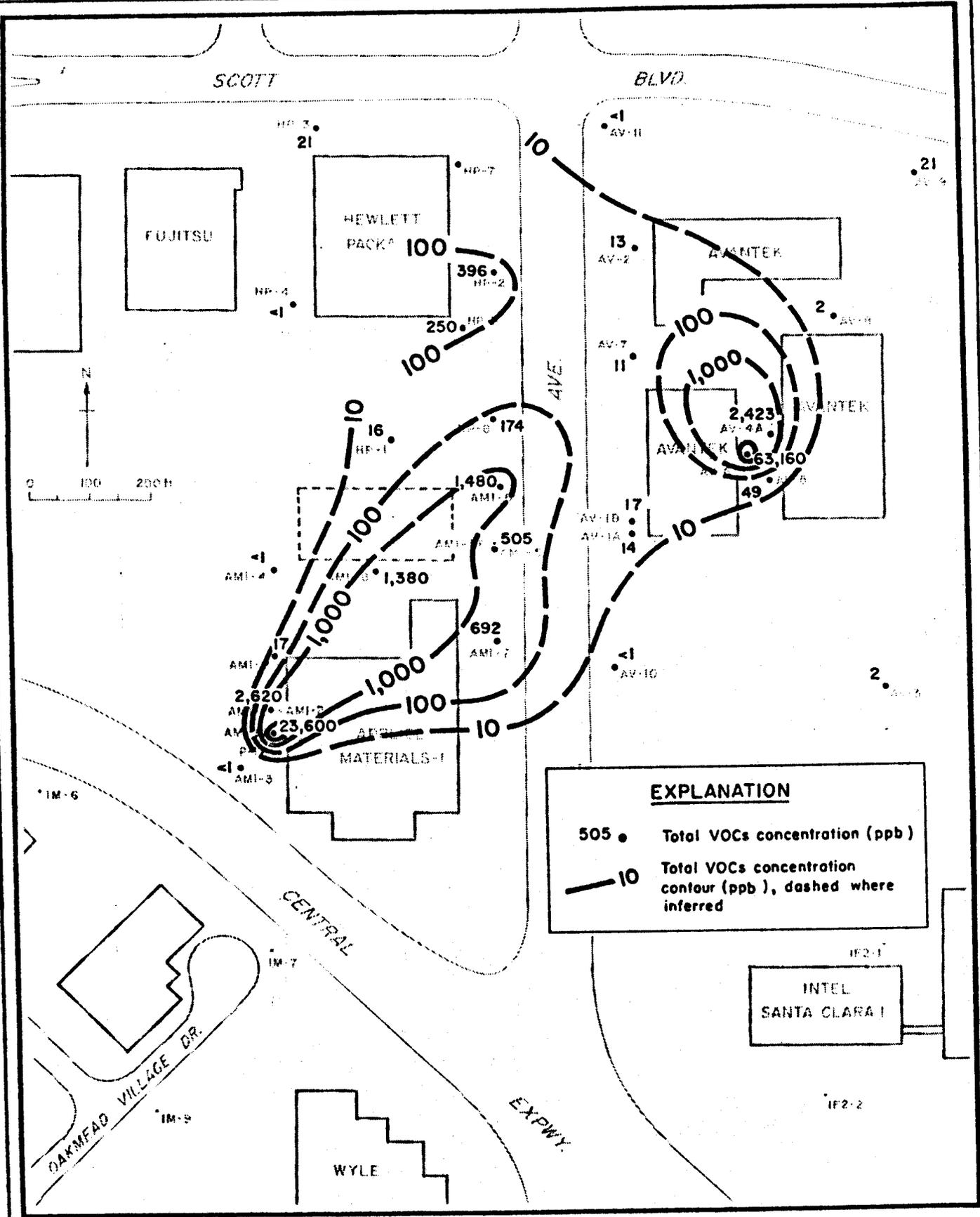


Figure 4 Distribution of Total VOCs in the A Water-Bearing Zone, May-June 1985