Annual Self-Monitoring Report
January 1 through December 31, 2014

Site Cleanup Requirements—Order No. 90-119
Intersil/Siemens Site
Cupertino, California

Prepared for:

General Electric Company and **SMI Holding LLC**
King of Prussia, Pennsylvania — Iselin, New Jersey

Prepared by:

Amec Foster Wheeler Environment & Infrastructure, Inc.
Oakland, California 94612

and

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January 2015

Project No. OD11161050

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January 30, 2015

Project OD11161050.15A.002

Mr. Roger Papler
Water Resources Control Engineer
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, California 94612

Subject: Annual Self-Monitoring Report, January 1 through December 31, 2014, Intersil/Siemens Site, Cupertino, California, Site Cleanup Requirements Order No. 90-119

Dear Mr. Papler:

Enclosed is a copy of the report titled "Revised Annual Self-Monitoring Report, January 1 through December 31, 2014, Intersil/Siemens Site, Cupertino, California," dated January 30, 2015, and prepared by Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler) and ERM, on the joint behalf of General Electric Company (GE; formerly Intersil, Inc.) and SMI Holding, LLC (SMI; formerly Siemens).

This self-monitoring report presents results of groundwater sampling activities conducted from January 1 through December 31, 2014 at the Intersil/Siemens Site, which is located in Cupertino, California. This annual report is for the following three areas: the former Intersil facility, the former Siemens facility, and the Off-Site Study Area. This report is submitted pursuant to the requirements of the California Regional Water Quality Control Board, San Francisco Bay Region (Water Board), Site Cleanup Requirements (SCR) Order No. 90-119, dated August 15, 1990, and amended by the Water Board on December 28, 1993. SMI performs sampling at the former Siemens facility; GE performs sampling at the former Intersil facility; and SMI and GE jointly perform monitoring activities conducted in the Off-Site Study Area.

Pursuant to the requirements of Section G.4 (a) of the SCR Self-Monitoring Program, GE and SMI note that no violations of the SCR occurred this reporting period. Throughout the reporting period, the groundwater treatment systems were shut down for periods of less than five days. These shutdowns were necessary to perform equipment adjustments and modifications to improve the efficiency and operation of the systems.

We certify under penalty of law that this document and all attachments are prepared under our direction or supervision in accordance with a system designed to ensure that qualified personnel properly gathered and evaluated the information submitted. Based on our inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of our knowledge and belief, true, accurate, and complete. We are aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,

Lance M. Hauer, PE
Remedial Project Manager
General Electric Company

LMH//dc

Enclosure

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SIEMENS

January 30, 2015

Project OD11161050.15A.002

Mr. Roger Papler
Water Resources Control Engineer
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, California 94612

Subject: Annual Self-Monitoring Report, January 1 through December 31, 2014, Intersil/Siemens Site, Cupertino, California, Site Cleanup Requirements Order No. 90-119

Dear Mr. Papler:

Enclosed is a copy of the report titled "Annual Self-Monitoring Report, January 1 through December 31, 2014, Intersil/Siemens Site, Cupertino, California," dated January 30, 2015, and prepared by Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler) and ERM-West, Inc, on the joint behalf of General Electric Company (GE; formerly Intersil, Inc.) and SMI Holding LLC (SMI; formerly Siemens).

This self-monitoring report presents results of groundwater sampling activities conducted from January 1 through December 31, 2014 at the Intersil/Siemens Site, which is located in Cupertino, California. This annual report is for the following three areas: the former Intersil facility, the former Siemens facility, and the Off-Site Study Area. This report is submitted pursuant to the requirements of the California Regional Water Quality Control Board, San Francisco Bay Region (Water Board), Site Cleanup Requirements (SCR) Order No. 90-119, dated August 15, 1990, and amended by the Water Board on December 28, 1993. SMI performs sampling at the former Siemens facility; GE performs sampling at the former Intersil facility; and SMI and GE jointly perform monitoring activities conducted in the Off-Site Study Area.

Pursuant to the requirements of Section G.4 (a) of the SCR Self-Monitoring Program, GE and SMI note that no violations of the SCR occurred this reporting period. Throughout the reporting period, the groundwater treatment systems were shut down for periods of less than five days. These shutdowns were necessary to perform equipment adjustments and modifications to improve the efficiency and operation of the systems.

We certify under penalty of law that this document and all attachments are prepared under our direction or supervision in accordance with a system designed to ensure that qualified personnel properly gathered and evaluated the information submitted. Based on our inquiry of the person or persons who managed the system, or those persons directly responsible for

Siemens Corporation

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gathering the information, the information submitted is, to the best of our knowledge and belief, true, accurate, and complete. We are aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,

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CERTIFICATIONS

Hydrogeologic and geologic information, conclusions, and recommendations in Section 3.0 of this document have been prepared under the supervision of and reviewed by an ERM California Professional Geologist and Professional Engineer.

Kit Soo, PG
Program Director
Hydrogeologist
California Professional Geologist (8957)

Date: 1/12/15

Heather D. Balfour, PE
Project Manager
California Professional Engineer (64854)

Date: 1/12/15

The hydrogeologic and geologic information, conclusions, and recommendations in Sections 2.0 and 4.0 of this document have been prepared by the staff of Amec Foster Wheeler Environment & Infrastructure, Inc. under the supervision of an Amec Foster Wheeler Environment & Infrastructure, Inc., Professional Engineer registered in the State of California whose seal and signature appears hereon. The findings, recommendations, specifications, or professional opinions are presented within the limits described by the client, in accordance with generally accepted professional engineering and geologic practice. No warranty is expressed or implied.

Frank S. Szerdy, Ph.D., PE
Principal Engineer
Amec Foster Wheeler Environment & Infrastructure, Inc.
California Professional Engineer (43037)

Date: 1/27/15

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APPENDIX

LIST OF ACRONYMS

µg/l	micrograms per liter
µg/m3	micrograms per cubic meter
1,1,1-TCA	1,1,1-trichloroethane
1,1-DCA	1,1-dichloroethane
1,1-DCE	1,1-dichloroethene
AMEC	AMEC Environment & Infrastructure, Inc.
Amec Foster Wheeler	Amec Foster Wheeler Environment & Infrastructure, Inc.
bgs	below ground surface
cis-1,2-DCE	cis-1,2-dichloroethene
DO	dissolved oxygen
ECD	Electron Capture Detector
EPA	U.S. Environmental Protection Agency
ERD	enhanced reductive dechlorination
ESLs	environmental screening levels
FID	Flame Ionization Detector
GE	General Electric Company
Geomatrix	Geomatrix Consultants, Inc.
gpm	gallons per minute
GWETS	SMI's groundwater extraction and treatment system
Intersil	Intersil, Inc.
Kabis™ technique	Kabis™ groundwater sampling technique
LFR	LFR, Inc.
mg/kg	milligrams per kilogram
mg/l	milligrams per liter
MIP	membrane interface probe
NPDES	National Pollutant Discharge Elimination System
PCE	Tetrachloroethene
PID	Photoionization Detector
QA/QC	quality assurance/quality control
QAPP	Quality Assurance Project Plan
RPD	relative percent difference
SAP	Sampling and Analysis Plan
SCR	Site Cleanup Requirements
SCVWD	Santa Clara Valley Water District
Siemens	Siemens Components, Inc.
Site	Intersil/Siemens Site located in Cupertino, California
SMI	SMI Holding, LLC
SVE / SVES	Soil-vapor extraction system
TCE	Trichloroethene
trans-1,2-DCE	trans-1,2-dichloroethene
VOCs	volatile organic compounds
Water Board	California Regional Water Quality Control Board, San Francisco Bay Region

ANNUAL SELF-MONITORING REPORT
JANUARY 1 THROUGH DECEMBER 31, 2014
Intersil/Siemens Site
Cupertino, California

1.0 INTRODUCTION

This Annual Self-Monitoring Report has been prepared for the Intersil/Siemens Site (the Site) by Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler), and ERM-West, Inc. (ERM), on behalf of General Electric Company (GE) and SMI Holding LLC (SMI). This annual report is for the following three areas, which are located in Cupertino, California (Figure 1):

- the former Intersil facility (Figure 2), located at 10900 North Tantau Avenue, Cupertino;
- the former Siemens facility (Figure 3), located at 1900 Homestead Road, Cupertino; and
- the Off-Site Study Area (Figure 4), located north of and hydraulically downgradient from the two former facilities.

This report presents annual self-monitoring results for January 1 through December 31, 2014 (the annual reporting period) in accordance with the Site Cleanup Requirements (SCR) Order No. 90-119 issued by the California Regional Water Quality Control Board, San Francisco Bay Region (Water Board) to Siemens Components, Inc. (now SMI), Intersil (now GE), and Vallco Park, Ltd., on August 15, 1990, and amended by Order R2-2013-0002 on January 9, 2013. Order 90-119 as amended by Order R2-2013-002 is referred to herein as the SCR.

The current sampling schedule, which is shown in Table 1, was approved by the Water Board in a letter dated December 20, 2000 (2000b), and subsequently modified, with Water Board approval, to include off-site extraction wells LQ-2B and LR-1B in the semiannual sampling event conducted in April of each year and the deletion of wells W2A, W3A, W13A, and W6B at the former Intersil facility after they were destroyed. Included in Table 1 are the ten new monitoring wells installed in the Off-Site Study Area in August 2014. These wells will be sampled semi-annually the first year (October 2014 and April 2015) and the future monitoring frequency of these wells will be assessed following the second sampling event.

As required by the SCR, this report contains the following information for this annual sampling period:

- summary of the activities performed to comply with the SCR;
- quarterly groundwater-level data for wells on the former Intersil (Section 2.0) and Siemens (Section 3.0) facilities, and the Intersil/Siemens Off-Site Study Area (Section 4.0);
- sampling and chemical analysis data from groundwater monitoring wells designated for sampling at the former Intersil (Section 2.0) and Siemens (Section 3.0) facilities, and the Intersil/Siemens Off-Site Study Area (Section 4.0);
- summary of treatment system quarterly groundwater extraction rate, total volume extracted, and mass removed for the former Intersil (Section 2.0) and Siemens (Section 3.0) facilities, and the Intersil/Siemens Off-Site Study Area (Section 4.0);
- annual compliance summaries for the former Intersil (Section 2.0) and Siemens (Section 3.0) facilities, and the Intersil/Siemens Off-Site Study Area (Section 4.0); and
- quarterly potentiometric surface maps of the A1, A3 and A4 depth intervals, B zone, and C zone.

Historically, the shallow saturated sediments at the Site were divided into three water-yielding zones: the A zone (from the top of the groundwater table to 120 feet bgs), the B zone (from approximately 130 to 150 feet bgs), and the C zone (from approximately 180 to 210 feet bgs). Regional groundwater elevations rose approximately 50 to 55 feet between 1993 and 1998 from a historic depth of approximately 100 feet bgs. Based on recent water level measurements in monitoring wells screened across the water table, groundwater is first encountered beneath the Site at depths ranging from approximately 35 to 50 feet bgs.

The A zone has been further subdivided into A1, A2, A3, and A4 depth intervals. Former vadose-zone wells that became saturated are now designated as A1, A2 or A3 depth interval wells based on the depths of their screened intervals. The depth ranges for the A1, A2, A3, and A4 depth intervals at the former Intersil and Siemens facilities are shown below:

Depth Interval	Former Intersil Facility Approximate Depth (feet bgs)	Former Siemens Facility Approximate Depth (feet bgs)
A1 depth interval	38 to 56	40 to 60
A2 depth interval	58 or 60 to 69	58 or 60 to 70
A3 depth interval	69 or 74 to 80 or 90	70 or 74 to 90
A4 depth interval	80 or 90–125	90–125

1.1 SAMPLING METHODOLOGY

Previously, the low-flow sampling method was used to collect groundwater samples from monitoring wells at the former Intersil facility and the Off-Site Study Area and the Kabis Sampler™ was used to collect groundwater quality samples from monitoring wells at the former Siemens facility. The Water Board approved use of the HydraSleeve for the Site in an email dated March 24, 2014. In the approval to change to the HydraSleeve, the Water Board requested a comparison of the results from the 2014 sampling with previous data. This section presents the sampling methodology.

At the former Intersil facility and Off-Site Study Area, HydraSleeve samplers were installed at a fixed depth within the well on a rope using a re-useable stainless steel clip, and hung in the middle of the well screen with the top of the sampler deployed at the bottom of the interval to be sampled, which is the same depth at which low-flow samples were collected in the past. The rope used to deploy the HydraSleeves was clean, new polypropylene from a sealed package, and was clean and free of obvious debris or contamination. The top of the rope was marked with the well ID to avoid sample mislabeling at the surface. HydraSleeves were installed at least two weeks prior to sampling to allow ambient conditions to stabilize within the well.

Groundwater sample recovery followed the precautions outlined in Section 3.6.4 of the Technical and Regulatory Guidance, Protocol for Use of Five Passive Samplers to Sample for a Variety of Contaminants in Groundwater (Technical and Regulatory Guidance, ITRC, 2007). Groundwater samples were recovered, allowing sufficient time for restabilization of the wells. To fill the HydraSleeve, samplers were pulled up on the rope at a constant rate of approximately 1 to 2 feet per second to open the check valve on the sampler. Once recovered from the well, the sampler was emptied into a suitable lab container within minutes of recovery to minimize changes in chemistry. The sampler was gently tilted to drain water sitting on the closed valve. The discharge straw remained in the sealed or otherwise clean package between deployment and sample collection to prevent contamination. To remove any potential contamination from the interior of the straw, a small amount of sample water was discharged to waste before capturing a sample for the laboratory. Sample vials for VOCs were filled from the bottom up to minimize loss of volatiles.

At the former Siemens facility, the groundwater samples were collected using the HydraSleeve™ sampling method. These activities were performed consistent with the methodologies presented in SOP 2 – Groundwater Sampling (Appendix B).

1.2 DATA COMPARISON METHODOLOGY

In the approval to change to the HydraSleeve, the Water Board requested a comparison of the results from the 2014 sampling with previous data. To address this request, TCE concentrations in groundwater samples collected from monitoring wells from 2010 through 2013 using low-flow sampling or the Kabis Sampler™ were compared to samples collected in 2014 using the HydraSleeve.

The mean and standard deviation were calculated using detected values only. For results that were non-detect, a range of detection limits are given but no additional summary statistics are provided. The standard deviation measures the spread of data points away from the mean and gives an idea of the variation in sample data. However, small standard deviations may be an artifact of low sample concentrations, which are common in groundwater samples. The relative standard deviation presents the standard deviation as a percentage of the mean, which normalizes the standard deviation to show the true comparison to the mean. A small relative standard deviation indicates that data points are closer to the mean, and a large standard deviation indicates that data points have a broader “spread,” or are farther away from the mean. Because it is normalized, the relative standard deviation is useful when comparing different sample groups. Some change in concentration would be expected in samples collected annually, so direct comparison between data from different years can be misleading.

The data comparison is discussed in the following sections: former Intersil (Section 2.1.2) and Siemens (Section 3.1.2) facilities, and the Intersil/Siemens Off-Site Study Area (Section 4.1.2).

2.0 FORMER INTERSIL FACILITY

Tantau Investments, LLC, a California Limited Liability Company, purchased the former Intersil facility property on September 27, 2007, and sold the property on August 12, 2010, to Cupertino Crossing, LLC, a subsidiary of Union Property Capital. On December 21, 2011, the property was sold to Alecta Real Estate USA LLC. GE retains responsibility for operation and maintenance of the groundwater extraction and treatment system.

A soil-vapor extraction system operated at the former Intersil facility from May 1988 to August 1993. Following the review of soil data collected to confirm that the system had achieved remedial objectives, the Water Board approved shutdown. The system consisted of seven vapor extraction wells and eight vent wells. The soil vapor extraction system removed approximately 3,000 pounds of VOCs from the vadose zone, which at that time extended to approximately 100 feet bgs.

2.1 GROUNDWATER MONITORING

Amec Foster Wheeler performed the annual groundwater sampling on October 7, 8 and, 13, 2014. Groundwater levels were measured on October 7, 2014. Locations of monitoring and extraction wells at 10900 North Tantau Avenue are shown on Figure 2.

2.1.1 Groundwater-Level Measurements

Groundwater levels were measured with an electric sounder on January 13, April 14, July 14, and October 7 (Table 2), in wells at the former Intersil facility (Figure 2), in accordance with the Sampling Plan (Geomatrix Consultants Inc. [Geomatrix], 1994a).

Figures 5, 8, 11, and 16 show the groundwater potentiometric surface of the A4 depth interval, for January, April, July, and October, respectively. These figures also illustrate the estimated extent of hydraulic containment (capture zone) in the A4 depth interval provided by on-site extraction wells. Figures 6, 9, 12, and 17 show the groundwater potentiometric surface of the

B zone beneath the former Intersil facility for January, April, July, and October, respectively. Groundwater potentiometric contours were drawn based on interpolation of groundwater levels in the 24 on-site wells and piezometers and incorporate judgment based on the hydrogeologic setting. The groundwater potentiometric surfaces, contours, and capture zones in the A4 depth interval and B zone are consistent with historical observations.

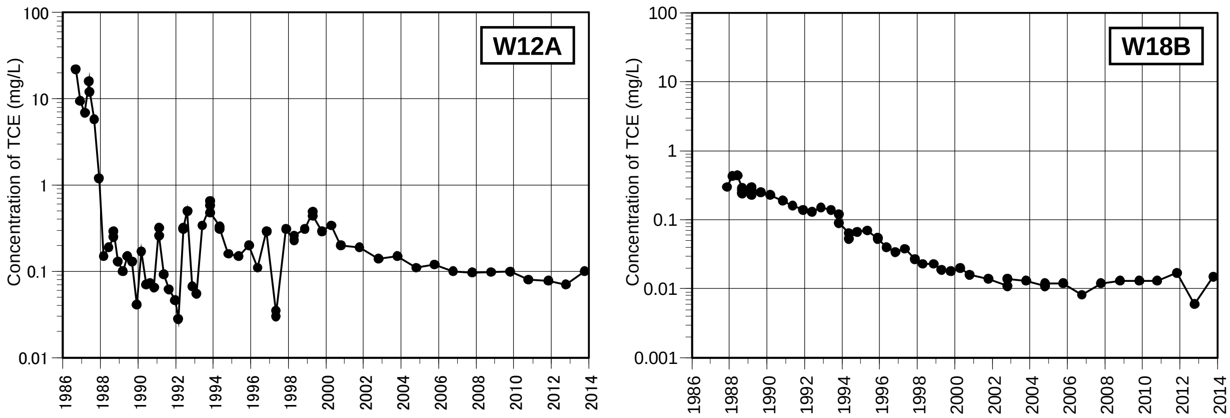
2.1.2 Groundwater Sampling and Analysis

Sampling and Analysis. Annual samples shown in Table 3a were collected on October 7, 8 and 13, 2014 using a HydraSleeve (see Section 2.3) in accordance with the Sampling Plan and the Technical and Regulatory Guidance. The Water Board approved use of the HydraSleeve in an email dated March 24, 2014, subject to verifying data comparability and following the sample recovery precautions outlined in Section 3.6.4 of the Technical and Regulatory Guidance. HydraSleeves were installed in monitoring wells on September 4, 2014. Data comparability is discussed in the following section and HydraSleeve installation and recovery is discussed in Section 1.1.

Test America of Pleasanton, California, a state-certified laboratory, performed the analyses of groundwater samples in accordance with the specifications in the Quality Assurance Project Plan (QAPP; Geomatrix, 1994b) prepared for the former Intersil facility. Test America analyzed samples, blanks, and spikes in accordance with EPA Method 8260B (8010 list) for purgeable volatile organic compounds (VOCs).

Analytical Results. Table 3a presents results of the chemical analyses performed on the annual groundwater samples collected during October. The primary VOC detected is trichloroethene (TCE). This year, the highest TCE concentrations detected in the A4 depth interval wells were 0.073 milligrams per liter (mg/l) in extraction well W12A (a 99.5% reduction since extraction began) and 0.04 mg/l in extraction well W10A and 0.041 in its duplicate sample (a 99.8% reduction). TCE was detected at 0.016 mg/l in well W18B; extraction was curtailed in former extraction well W18B in September 2006 with Water Board approval (2006). Analytical results from these sampling rounds are consistent with historical trends, as shown below for wells W18B and W12A. Laboratory analytical reports are maintained with the project files.

TCE Concentration over Time in Wells W12A and W18B



TCE concentrations for the Site are also shown on Figures 19 through 23 for the A1, A3, and A4 depth intervals and B- and C-zone groundwater. Isoconcentration contours are not shown for the C zone because there are insufficient Site-wide data to draw contours.

Data Comparison. As discussed in Section 1.2, Table 3b presents TCE concentrations in groundwater samples collected from monitoring wells from 2010 through 2013 using low-flow sampling and samples collected in 2014 using the HydraSleeve. Table 3b also presents general statistical information for the data. As shown in Table 3b, the relative standard deviation for all the monitoring wells at the former Intersil facility are less than 100%, with the highest being 81%. The low relative standard deviation indicates low variance in the data.

Of the seven monitoring wells sampled with the HydraSleeve method in October of 2014, only one well had a detected TCE concentration outside of the historical range of detected values from 2011 through 2013. Well W19MA was installed in 2011 in an area where 9 mg/L TCE was detected in a grab groundwater sample collected at MIP location A6. Although the TCE concentration has increased in the last two years, it is still significantly below the TCE concentration present in the area prior to initiation of pumping from well W18MA.

Overall, results for samples collected using the HydraSleeve compare favorably with the historical low-flow sample results. The wells in the sampling program will continue to be monitored and evaluated closely during the next sampling event for variability and trends.

Quality Assurance/Quality Control. Amec Foster Wheeler follows established procedures for quality assurance and quality control (QA/QC) at the former Intersil facility. Protocols followed by Amec Foster Wheeler, as well as by the analytical laboratory, are detailed in the former Intersil facility's Sampling Plan and QAPP (Geomatrix, 1994a, b). These procedures are part of Amec Foster Wheeler's standard practice during hydrogeologic investigations and remedial action activities, and are followed to obtain data that are representative of field conditions. During the sampling event, equipment and trip blanks and duplicate samples were collected for QA/QC purposes.

Tables 4 and 5 summarize sampling and analytical QA/QC, respectively. The data generated meet the requirements of precision, accuracy, and completeness as described in the QAPP. No VOCs were detected in the field equipment and trip blanks for the sampling events. A detailed description of the protocol followed by the analytical laboratory to achieve the precision, accuracy, and completeness goals for analysis of samples collected by Amec Foster Wheeler is presented in the former Intersil facility's QAPP.

Data precision is estimated by comparing analytical results from duplicate samples and calculating the relative percent difference (RPD). Duplicate samples were generated by the laboratory and by Amec Foster Wheeler during the annual reporting period. The RPDs for all constituents meet the QA goal of plus or minus 25 percent.

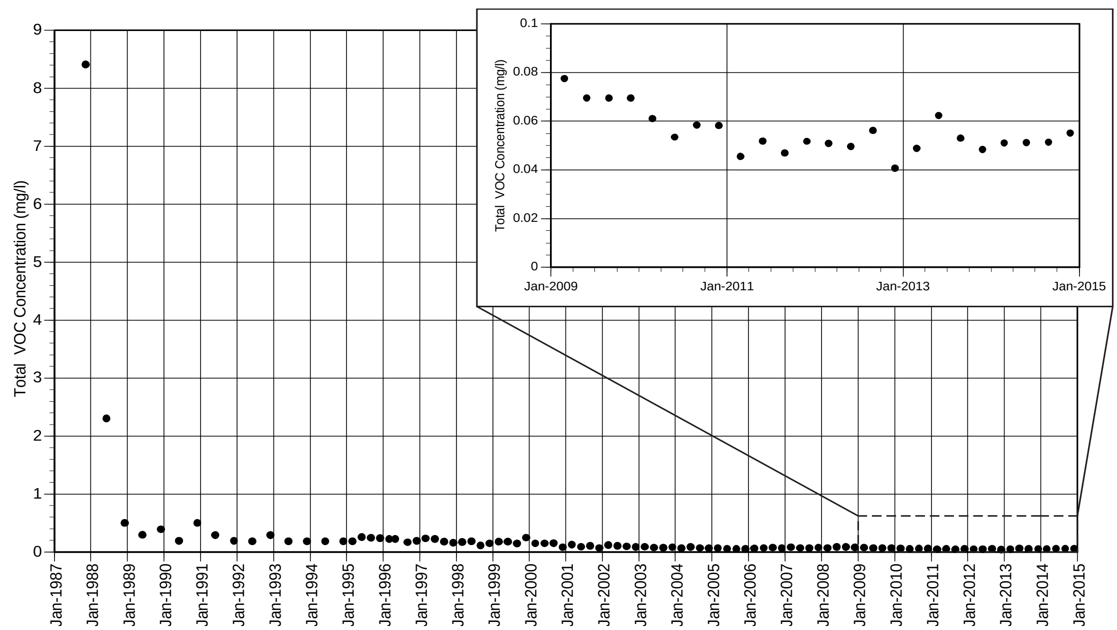
Data accuracy is evaluated based on recoveries, expressed as the percent of the true or known concentration. Recoveries may be calculated from laboratory matrix spikes, matrix spike duplicates, and calibration standards generated as QA/QC samples by the analytical laboratory. The equation for calculating percent recovery is presented in the QAPP. The average percent recoveries from analyses of spiked samples, using EPA Method 8260B, for this annual period meet the current QA goal.

2.2 GROUNDWATER EXTRACTION AND TREATMENT SYSTEM OPERATION

The groundwater extraction and treatment system at the former Intersil facility has been operating since November 1987. The system currently includes extraction wells E9AR, W10A, W12A, and W18MA. A granular activated carbon (GAC) treatment system replaced the former air stripping treatment system in 2007.

Average quarterly flow rates, total volume extracted, and estimates of chemical mass removed are presented in Table 6. During the annual reporting period, the total volume of groundwater pumped was approximately 18.9 million gallons (the average pumping rate was 35.7 gallons per minute [gpm]), and a total of approximately 8.19 pounds of VOCs were removed. As shown in the following graph, VOC influent concentrations have generally reached asymptotic conditions.

Total VOCs over Time in Treatment Plant Influent



During this annual reporting period, occasional shutdowns occurred for periods of less than 24 hours to perform equipment adjustments and design modifications to improve or maintain the efficiency and operation of the system. Detailed information on the operation of the groundwater extraction system is presented in the quarterly National Pollutant Discharge Elimination System (NPDES) reports for the facility.

2.3 ADDITIONAL WORK CONDUCTED DURING THE ANNUAL REPORTING PERIOD

During this reporting period the groundwater sampling method was changed from low-flow sampling to using the no-purge HydraSleeve, as discussed in Section 1.1. In addition, the Five-Year Status Report for the period July 2009 through June 2014 (AMEC and ERM, 2014) was submitted to the Water Board on December 17, 2014. The report included activities performed at the former Intersil facility during the reporting period.

3.0 FORMER SIEMENS FACILITY

SMI, as successor by merger to Siemens Microelectronics, Inc. sold the property to Tantau Investments, LLC, Partners in 2000. The property has been through multiple acquisitions since 2000. MOF II Tantau Holdings, Inc. (Tantau) is the current owner of the property and it is leased to Kaiser Permanente. SMI holds the responsibility of implementing remedial actions at the former Siemens facility.

SMI operated a soil-vapor extraction system at the former Siemens facility beginning in 1983. The system was shut down on December 16, 2005 after removing approximately 17,310 pounds of VOCs from the vadose zone. A VOC rebound study conducted in 2006 showed no significant rebound in the VOC concentrations compared to the baseline samples.

With Water Board approval (Water Board, 2005), the system was permanently shut off in August 2006 following the sampling for the rebound study (AMEC and LFR, 2010).

3.1 GROUNDWATER MONITORING

During the annual reporting period, SMI measured groundwater elevations and collected groundwater samples at the former Siemens facility, in compliance with the SCR and the schedule approved by the Water Board in a letter dated December 20, 2000 (Water Board 2000b; Table 1). Although not required by the December 20, 2000 Water Board letter, additional groundwater samples were collected from selected A1 through A3 depth interval wells, in accordance with the schedule proposed in the Annual Self-Monitoring Report, January 1 through December 31, 2000 (LFR 2001).

3.1.1 Groundwater-Level Measurements

Groundwater elevation levels in the extraction and monitoring wells and piezometers were measured with an electric water-level sounder quarterly on January 13, April 14, July 14, and October 7, 2014 (Table 2) as part of the self-monitoring program. Locations of former Siemens facility groundwater monitoring wells and piezometers are shown on Figure 3.

From these data, a groundwater potentiometric surface map of the A1, A3, and A4 depth intervals and B and C zones was constructed for each calendar quarter of 2014, as illustrated on Figures 5 through 18. Groundwater potentiometric contours were drawn by interpolating the groundwater levels between groundwater measurement locations and incorporated judgment that was based upon knowledge of the local hydrogeologic setting.

Figures 5 (January), 8 (April), 11 (July), and 16 (October) present the groundwater potentiometric surface for the A4 depth interval and the estimated zone of capture induced by extraction from on-site extraction well in the A4 depth interval well, LF-6A and from on-site extraction wells in the A3 depth interval, LF-12A and H-1A. Figures 6 (January), 9 (April), 12 (July), and 17 (October) show the groundwater potentiometric surface for the B zone and estimated zone of capture induced by the extraction from the on-site B-zone extraction well, H-5B. Figures 7 (January), 10 (April), 13 (July), and 18 (October) show the groundwater potentiometric surface for the C zone. Figure 14 (October) presents the groundwater potentiometric surface for the A1 depth interval. Figure 15 (October) presents the groundwater potentiometric surface for the A3 depth interval and the estimated zone of capture induced by the extraction from on-site extraction wells in the A3 depth interval: 2EPa, LF-12A, SW-7, EX-1-RL and H-1A.

3.1.2 Groundwater Sampling and Analysis

Sampling and Analysis. Between October 7 and 9, 2014, groundwater samples from wells presented in Table 3 were collected from 32 wells that are located at the former Siemens facility, in accordance with the current sampling and analysis schedule. No groundwater samples were collected from the following wells, which were dry: IP-1, LF-13A, MW-1-RU and VM-2S. During this annual groundwater-sampling event, groundwater samples from the on-site monitoring wells were collected using the HydraSleeve. The HydraSleeves were deployed into the monitoring wells on October 2, 2014. Groundwater samples from the extraction wells were collected from the sampling port located at each wellhead, and samples from the 1-inch piezometer (IP-1 through -3) were collected using a disposable bailer. All groundwater samples and QA/QC samples were submitted to Test America of Pleasanton, California for purgeable VOC analyses, using EPA Method 8260B (8010 list).

Analytical Results. Table 3a presents the results of VOC analysis of samples from groundwater monitoring wells at the former Siemens facility for the annual reporting period. The primary VOC detected in all groundwater zones at the former Siemens facility is TCE. Other VOCs detected during the annual reporting period include 1,1,1-trichloroethane (1,1,1-TCA), 1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113)), 1,1-dichloroethane (1,1-DCA), 1,1-dichloroethene (1,1-DCE), cis-1,2-dichloroethene (cis-1,2-DCE), tetrachloroethene (PCE), trans 1,2-dichloroethene (trans-1,2-DCE), and vinyl chloride (VC).

Groundwater analytical results for the annual reporting period are generally similar to historic or slightly lower results within the A3 depth interval, A4 depth interval, and B zone. The concentrations within the A1 depth interval show a decrease in TCE and cis-1,2-DCE concentrations at 2EP (low-yielding A1 depth interval extraction well) and 2EPa, 2006/2007 Pilot Study injection/monitoring wells (IP-2 and IP-3) and property boundary monitoring wells (VM-5S, and MV-6S). VM-5S, VM-6S, IP-2, and IP-3 are not part of the approved sampling schedule; however, these are additional wells that are sampled as part of ERD Pilot Study and to assess concentrations at the northeast corner of the property. Further discussion regarding these wells is provided in Section 3.3. TCE concentrations for the Site are shown on Figures 19 through 23 for the A1, A3, and A4 depth intervals and B- and C-zone groundwater.

Data Comparison. As discussed in Section 1.2, Table 3b compares TCE concentrations in groundwater samples collected in 2010 through 2013 using the Kabis Sampler™, and samples collected in 2014 using the HydraSleeve. Table 3b also presents general statistical information for the data.

Because it is normalized, the relative standard deviation is useful when comparing different sample groups. As shown in Table 3b, the relative standard deviation for all the wells are less than 100% of the mean with the exception of monitoring well SW-5S, which has a relative standard deviation of 101.8%. The low relative standard deviation for each location indicates low variance in the data.

It should be noted that variability and fluctuations in concentrations within the same well for a given period of time, with no apparent significant trends are typically noted at quite a few wells.

As a result, it is useful to evaluate the detected concentrations for 2014 and where it falls within the historical range at each respective well. Out of 24 wells sampled with the HydraSleeve method in October of 2014, 14 of the wells had detected concentrations within the historical range of detected values from 2010 through 2013. Of the ten detected concentrations that were not within the range of the previous four years, six wells had higher concentrations and four wells had lower concentrations. Also, of the ten wells mentioned, five wells had relative percent differences of less than 35%. The remaining five wells, VM-5S, SW-5S, H-2A-S and LF-5B generally have low concentrations which tend to show more variable fluctuations. In addition, the increases at each location are less than a magnitude (less than 10-fold). These wells will be closely monitored during the next sampling events for variability and trends.

Overall, results for samples collected using the HydraSleeve in the wells at the former Siemens facility wells compared favorably with the historical sample results. The above-mentioned wells in this sampling program will continue to be monitored and evaluated closely during the next sampling event for variability and trends.

Quality Assurance/Quality Control. The quality of the data was assessed following the *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review,* October 1999. Tables 7 and 8 present a Quality Assurance/Quality Control (QA/QC) review of former Siemens facility groundwater sampling and analytical results, and are provided in lieu of raw data such as field data sheets, laboratory data sheets, QA/QC data, and chain-of-custody forms. In accordance with the Water Board’s letter dated December 20, 2000 (Water Board, 2000b), this report does not include such raw data; however, these data are kept on file at ERM’s office in Walnut Creek, California.

QA/QC measures were implemented for the purpose of maintaining data quality, documenting data precision and accuracy. QA/QC procedures included collecting trip blank and sampling equipment rinsate blank samples. No data required rejection. The quality of the data generated during this investigation is acceptable for the preparation of technically defensible documents.

3.2 GROUNDWATER EXTRACTION AND TREATMENT SYSTEM OPERATION

SMI has operated a GWETS at the former Siemens facility since July 1986. The GWETS treats groundwater from extraction wells located at the former Siemens facility. Since July 20, 1990, the GWETS has also treated groundwater from extraction wells in the Intersil/Siemens Off-Site Study Area, which are the joint responsibility of SMI and GE. The operation of Off-Site Study Area groundwater extraction wells is also discussed in Section 4.2. Between 1986 and 2002, the primary treatment method was air stripping with two towers in series. In March 2002, four 2,000-pound carbon vessels were installed in place of the air stripping towers. The GWETS was upgraded in February 2004 to replace the existing carbon vessels with two 5,000-pound carbon vessels in series.

Figure 3 shows locations of former Siemens facility groundwater extraction wells and groundwater treatment facilities. The operational groundwater extraction wells located at the former Siemens facility are wells 2EP, 2EPa, LF-6A, H-5B, LF-12A, SW-7, EX-1-RL, and H-1A, with the following issues to note:

- 2EP was taken offline on September 23, 2014 due to a decrease in water elevation causing the well to be dry and in accordance with the Phase II ERD Pilot Study Work Plan
- H-1A and 2EPa were offline on October 8 and November 25, 2014, respectively, to facilitate the Phase II ERD pilot study;
- LF-6A was shut down from June 23 to September 4, 2014 and December 23 to 31, 2014, for pump maintenance and replacement; and for additional pump maintenance;
- H5B was shut down from August 19 to September 4, 2014 for pump maintenance and replacement; SW-7 was shut down from November 13 to December 8, 2014 for pump maintenance and replacement.

During this annual reporting period, occasional shutdowns occurred for periods of less than 24 hours to perform equipment maintenance with the following exceptions:

- December 12, 2014 to December 18, 2014 – to facilitate the replacement of the lead GAC vessel.
- December 18 to December 23, 2014 - due to failure of the variable frequency drive controlling the transfer pump. The drive was replaced and the system was restarted on December 23, 2014.

Detailed information on the operation of the groundwater extraction system is presented in the quarterly NPDES reports for the facility.

During the annual reporting period, the GWETS removed an estimated 47 pounds of VOCs and extracted a total of approximately 62.2 million gallons of groundwater from the former Siemens facility and the Intersil/Siemens Off-Site Study Area (Table 6). Of this, approximately 34 pounds of VOCs and 38.6 million gallons of groundwater were extracted from the former Siemens facility. Sampling and analytical results for the groundwater treatment system are included in separate Self-Monitoring Reports, as required by Order No. R2-2009-0059, NPDES No. CAG912003, which was adopted by the RWQCB on 1 October 2009 and rescinded on 10 September 2014, and Order No. R2-2012-0012, NPDES No. CAG912002 (VOC and Fuel General Permit), which was adopted by the RWQCB on 25 August 2014.

3.3 Additional Work Completed During the Annual Reporting Period

Additional work conducted during the reporting period included a vapor intrusion evaluation of the former Siemens building; enhanced reductive dechlorination (ERD) pilot study activities, and submittal of the Five-Year Status Report.

3.3.1 Vapor Intrusion Evaluation

In a letter dated December 11, 2013, the Water Board and U.S EPA requested additional vapor intrusion studies to be conducted at the buildings located at the former Siemens facility to evaluate the following items:

- Commercial indoor air sampling with the heating, ventilation, and air conditioning (HVAC) system turned off; and
- Comparison of indoor air sampling results to the TCE short-term removal action levels and USEPA's updated long-term TCE screening levels.

In response to this request, SMI submitted *Revised Third Addendum to Work Plan to Evaluate Potential Vapor Intrusion* (ERM, 2014a) on February 14, 2014.

Sampling was conducted in February 2014 in accordance with the Third Addendum Work Plan, which was approved by the Water Board and U.S. EPA on February 14, 2014. The vapor intrusion evaluation included the collection and analysis 23 indoor air and two ambient outdoor air samples with the HVAC system shut down during sampling and 24 hours prior. The results of the sampling were presented in *Report of Results – Potential Vapor Intrusion Evaluation at the Former Siemens Facility* (ERM, 2014b) submitted on April 22, 2014.

The analytical data from the February 2014 event as well as four previous vapor intrusion evaluation results were evaluated using a tiered approach, as defined below:

- Tier 1: Indoor air sample results were compared to outdoor air concentrations to evaluate whether indoor air quality may be affected by ambient sources.
- Tier 2: Indoor air sample results were compared to short-term health-risk-based screening criteria, including method reporting limits or Interim Short-Term Response Action Levels for TCE provided by USEPA.
- Tier 3: Indoor air sample results were compared to long-term health-risk-based screening criteria Regional Screening Levels.

Results from indoor air sampling conducted in 2002, 2007, and 2014 consistently report no COC detections in excess of Tier 2 or Tier 3 screening levels. These data confirm there is no unacceptable risk to indoor workers associated with COCs reported in subsurface soil or groundwater. For these reasons, no further vapor intrusion assessment was recommended at the former Siemens facility. The Water Board and U.S. EPA issued a No Further Action (NFA) letter on November 19, 2014 (Water Board, 2014).

Although there is no unacceptable risk to indoor workers, USEPA recommended preemptive mitigation in locations where the building slab is penetrated. As such and for additional precaution, vapor sealant was applied around the slab penetrations for the fire suppression system at the former Siemens facility in December 2014. A letter documenting these activities will be submitted to the Water Board and U.S. EPA in January 2015.

3.3.2 Enhanced Reductive Dechlorination Pilot Study Activities

In 2006 and 2007, LFR conducted a pilot test to evaluate the effectiveness of ERD in the upper resaturated zone (A1 and A2 depth intervals) (Phase I ERD Pilot Study). During the annual groundwater sampling program, groundwater monitoring wells VM-5S, VM-6S, IP-2 and IP-3 were sampled to assess VOC concentrations in the northwest area of the former Siemens facility, where the Phase I ERD Pilot Study was implemented in 2006 and 2007. The groundwater samples were submitted to Test America of Pleasanton for VOC analyses, using EPA Method 8260B (8010 compound list). Groundwater analytical results for the ERD evaluation are provided in Appendix A. The results of the Phase II ERD Pilot Study will be evaluated to determine future work in this area.

ERM proposed a Phase II ERD Pilot Study to enhance dechlorination of groundwater at the former Siemens facility (*Revised Phase II Enhanced Reductive Dechlorination Pilot Study Work Plan*; ERM, 2014c). The Water Board approved the work plan on July 24, 2014. The Phase II pilot study proposed utilizing a suite of technologies to enhance mass removal from the original pilot study including:

- Hydraulic fracturing and pulse injecting to increase the volume of substrate introduced to the aquifer;
- Use of a slower release substrate (emulsified vegetable oil);
- Combine the substrate with zero valent iron to provide a long-term reactive zone; and
- Bioaugment the existing microbial population to enhance dechlorination (ERM, 2014c)

The Phase II ERD Pilot Study was initiated with the following activities:

- Installation of additional wells for groundwater performance monitoring from 19 to 24 August 2014. Specifically, five monitoring wells, two in the A1 depth interval and three in the A3 depth interval, were installed downgradient of the pilot study area (see Figure 1 in Appendix A);
- Baseline sampling of groundwater monitoring wells and soil vapor monitoring points on August 28 and September 3 in accordance with the Phase II Pilot Study Work Plan (ERM, 2014c). The analytical results of the baseline sampling event are included in Appendix A;
- Advancement of test boring EB-1 on October 13, 2014, to a depth of 75 feet below ground surface (bgs) in the vicinity of the pilot study area prior to injection and fracturing activities;
- Implementation of the pilot study between October 6 and 23 included the following:
    - October 6 through 10, 2014 – Performed preliminary field activities including anaerobic water preparation and utility clearance ;
    - October 14 through 16, 2014 – Emplaced EHC® ISCR (in situ chemical reduction) reagent at five locations, IP-04 through IP-08 utilizing hydraulic

fracturing. Approximately 14,000 pounds of EHC® mixed as a slurry with water were emplaced at intervals ranging from 56 to 69 feet bgs;

    - October 17 and 20 through 23, 2014 – Emplaced Newman Zone emulsified vegetable oil, which was injected at six locations, IP-09 through IP-14 using pulse injection. Approximately 3,300 pounds of Newman Zone emulsified vegetable oil and approximately 3 gallons of bioaugmentation cultures (KB-1) were mixed with water and emplaced at intervals ranging from 50 to 55 feet bgs, 65-70 feet bgs, 70-75 feet bgs, 75 to 80 feet bgs and 80 to 85 feet bgs.

- Advancement of six confirmation borings, SB-1 through SB-3, and SB-5 through SB-7 to depths ranging from 63 to 75 feet bgs to assess the extent and effectiveness of the injection and fracturing activities;
- Conducting the first performance monitoring event on select monitoring wells and soil vapor monitoring points on November 25 and 26 in accordance with the Phase II Pilot Study Work Plan (ERM, 2014c). The analytical results of the Baseline and first performance sampling event are included in Appendix A.

The analytical and field parameters data from the baseline and first performance monitoring event indicate generation of more reducing conditions within the Phase II Pilot Study treatment area. In addition, the analytical results indicate a reduction of the parent product concentration in certain areas within the treatment area were achieved since the implementation of the pilot study. However, based on the limited data collected to date, it is still premature to make any conclusions to the effectiveness and performance of the pilot study.

Following the second round of performance monitoring, a completion report will be prepared and will present the following information: summary of field activities, deviations from the work plan, details and finding from the pilot study implementation activities and summary of the performance monitoring program and a discussion of the results. Subsequent performance monitoring will be included within the annual self-monitoring reports for the site.

3.3.3 Five-Year Status Report

The Five-Year Status for the period July 2009 through June 2014 (AMEC and ERM, 2014) was submitted to the Water Board on December 17, 2014. The report included activities performed at the Site during the reporting period, in addition to the completion of the indoor air evaluation, which was outside of the reporting period.

4.0 OFF-SITE STUDY AREA

4.1 GROUNDWATER MONITORING

Amec Foster Wheeler performed semiannual groundwater sampling on April 14 in accordance with the December 20, 2000 and October 15, 2004 Water Board letters (2000b; 2004), and annual groundwater sampling on October 7 and 8.

4.1.1 Groundwater-Level Measurements

During the annual reporting period, groundwater levels were measured on January 13, April 14, July 14, and October 7, in wells and piezometers in the Off-Site Study Area, using an electric well sounder. Locations of off-site monitoring and extraction wells are shown on Figure 4. Groundwater level data for the annual monitoring period are presented in Table 2.

Figures 5, 8, 11, and 16 show the groundwater potentiometric surface of the A4 depth interval. Figures 6, 9, 12, and 17 show the groundwater potentiometric surface of the B zone, and illustrate the estimated extent of hydraulic containment (capture zone) provided by the off-site B-zone extraction wells, LQ-2B and LR-1B. Figures 7, 10, 13, and 18 show the groundwater potentiometric surface of the C zone. Groundwater potentiometric contours were drawn using interpolation of groundwater levels between measured groundwater levels and judgment based on the hydrogeologic setting. The groundwater potentiometric surfaces are generally consistent with historical observations.

4.1.2 Groundwater Sampling and Analysis

Sampling and Analysis. During this groundwater monitoring period, semiannual samples were collected from wells IQ-1B, LQ-2B, and LR-1B in April and annual samples were collected in October in accordance with the sampling schedule in Table 1. Semiannual samples shown in Table 3a were collected on April 14, 2014 in accordance with the Sampling Plan, as modified by a letter to the Water Board (Geomatrix, 2000). Annual samples collected on October 7 and 8, 2014 were collected using a HydraSleeve (see Section 2.3) in accordance with the Sampling Plan and the Technical and Regulatory Guidance. The Water Board approved use of the HydraSleeve in an email dated March 24, 2014, subject to verifying data comparability and following the precautions outlined in Section 3.6.4 of the Technical and Regulatory Guidance. Data comparability is discussed in the following section and HydraSleeve installation and recovery is discussed in Section 1.1.

Groundwater samples were analyzed using EPA Method 8260B (8010 list). As specified in the SCR, samples from two monitoring wells (S-3B and LR-3C) also were analyzed for aromatic VOCs using EPA Method 8260B. Test America analyzed groundwater samples, blanks, and spikes in accordance with the specifications in the QAPP (Geomatrix, 1994b) prepared for the former Intersil facility.

Analytical Results. Table 3a presents the results of chemical analyses performed on groundwater samples collected during the semiannual and annual monitoring events. Groundwater analytical results were similar to those obtained in previous sampling events, with a few exceptions. TCE concentrations for the Site are shown on Figures 19 through 23 for the A1, A3, and A4 depth intervals and B- and C-zone groundwater.

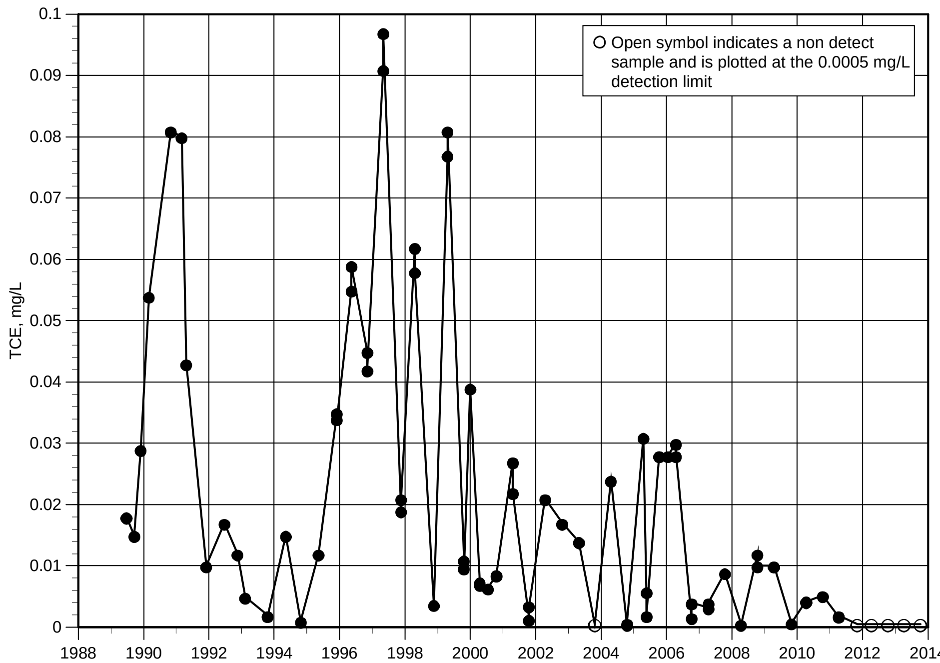
As discussed in Section 4.3.2, ten new monitoring wells were installed in the A1, A3 and A4 depth intervals (MW-OS-A1, MW-OS-2A1, MW-OS-3A1, MW-OS-2A3, MW-OS-3A3, MW-OS-4A3, MW-OS-5A3, MW-OS-2A4, MW-OS-3A4 and MW-OS-4A4). Analytical results for groundwater samples collected from nine of these wells in August 2014 (baseline event following well installation) and October 2014 (annual groundwater sampling event) were similar and consistent in concentrations, as seen in Table 3a. MW-OS-A1 has been dry since the baseline sampling event in August 2014. Concentration trends will be evaluated as new data are collected.

Historically, concentrations of TCE in well S-1A, located at the northwestern corner of the intersection of Lorne Way and Ringwood Avenue, were below the laboratory detection limit of 0.0005 mg/L. However, the concentration of TCE in well S-1A increased from 0.0027 mg/L in October 1999 to 0.058 mg/l in October 2005. Although the groundwater near well S-1A is within the calculated extent of containment provided by pumping from off-site extraction wells LR-1B and LQ-2B, SMI increased pumping by a total of approximately 7 to 9 gpm in November 2005 from its on-site wells LF-6A, LF-12A, and H-1A. These wells are now pumping at their maximum pump capacity. TCE concentrations in well S-1A have remained similar for the past few years, ranging from 0.036 mg/L to 0.061 mg/L between 2006 and 2013; the TCE concentration decreased to 0.0089 mg/L in 2014.

As noted in previous annual reports, TCE concentrations in well IQ-1B appear to be influenced by seasonally fluctuating groundwater levels. In April 2005, the TCE concentration increased to 0.031 mg/l. Because this concentration appeared to be an outlier based on recent trends, the well was re-sampled on May 24, 2005. TCE concentrations in this sample and a duplicate sample were 0.0058 mg/l and 0.0018 mg/l, respectively. In October 2005, the TCE concentration was 0.028 mg/l with the duplicate sample reporting the same concentration.

Because the TCE concentration exceeded 0.020 mg/l in downgradient well IQ-1B for two consecutive semiannual monitoring events, in accordance with the Water Board October 15, 2004 letter, pumping was increased on October 25, 2005 in well LQ-2B from approximately 17 gpm to 40 gpm, which was the average pumping rate before flow rates were reduced in December 2004. TCE has not been detected in well IQ-1B since 2012. A time-series graph of TCE concentrations in well IQ-1B, shown below, illustrates the fluctuating TCE concentrations but with a deceasing trend over the last ten years and non-detect results since 2012.

TCE Concentration over Time in Well IQ-1B



Concentrations of TCE in groundwater in the C zone in the Off-Site Study Area are consistent with historical trends.

Data Comparison. Table 3b compares TCE concentrations in groundwater samples collected from monitoring wells in 2010 through 2013 using low-flow sampling and samples collected in 2014 using the HydraSleeve. Table 3b also presents general statistical information for the data. Some change in concentration would be expected in samples collected annually, so direct comparison between data from different years can be misleading.

As shown in Table 3b, the relative standard deviation for all the wells are less than 100%, with the highest being 73% for well RK-2C where TCE concentrations are very low. The low relative standard deviation indicates low variance in the data. Of the 15 monitoring wells sampled (plus one duplicate sample) with the HydraSleeve method in October of 2014, five wells had a detected TCE concentration outside of the historical range of detected values from 2010 through 2013. Of these five wells, one had a higher TCE concentration and four had lower concentrations; however, four of the wells had low relative percent differences and the one well (LF-8A) with a high relative percent difference (151%) contains a very low TCE concentration (0.0013 mg/L).

Overall, results for samples collected using the HydraSleeve compare favorably with the historical low-flow sample results. The wells in the sampling program will continue to be monitored and evaluated closely during the next sampling event for variability and trends.

Quality Assurance/Quality Control. Amec Foster Wheeler followed the same procedures for QA/QC in the Off-Site Study Area as those for work at the former Intersil facility. During the sampling event, equipment, field, and trip blanks and duplicate samples were collected for QA/QC purposes.

Tables 9 and 10 summarize sampling and analytical QA/QC, respectively. The data generated meet the requirements of precision, accuracy, and completeness as described in the QAPP. No VOCs were detected in the field, equipment or trip blanks.

Data precision is estimated by comparing analytical results from duplicate samples and calculating the RPD. Duplicate samples were generated by the laboratory and by Amec Foster Wheeler during the annual reporting period. The RPDs for all constituents meet the QA goal of plus or minus 25 percent, with the exception of 1,1-dichloroethene (1,1-DCE), TCE, and cis-1,2-dichloroethene (cis-1,2-DCE) in primary and duplicate samples collected from LS-2B. TCE and 1,1-DCE had RPDs of 61 percent and 64 percent, respectively. RPDs are not applicable when the sample results are less than two times the reporting limit and the absolute difference between primary and duplicate results for cis-1,2-DCE (0.00053 mg/L in LS-2B) was used and compared to the reporting limit of 0.0005 mg/L. In accordance with the National Functional Guidelines (EPA, 1999), the detected results for 1,1-DCE, cis-1,2-DCE, and TCE in sample LS-2B and its duplicate sample were flagged with a “J,” indicating that the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

Data accuracy is evaluated based on recoveries, expressed as the percent of the true or known concentration. Recoveries may be calculated from laboratory matrix spikes, matrix spike duplicates, and calibration standards generated as QA/QC samples by the analytical laboratory. The average percent recoveries from analyses of spiked samples using EPA Method 8260B for this annual period meet the current QA goal.

4.2 GROUNDWATER EXTRACTION AND TREATMENT SYSTEM OPERATION

As discussed in Section 3.2, the groundwater extracted from B-zone wells located in the Intersil/Siemens Off-Site Study Area (wells LR-1B and LQ-2B) is piped to the former Siemens facility treatment system.

During this annual reporting period, occasional shutdowns occurred for periods of less than 24 hours to perform equipment maintenance with the following exceptions:

- December 12, 2014 to December 18, 2014 – to facilitate the replacement of the lead GAC vessel.
- December 18 to December 23, 2014 - due to failure of the variable frequency drive controlling the transfer pump. The drive was replaced and the system was restarted on December 23, 2014.

Detailed information on the operation of the groundwater extraction system is presented in the quarterly NPDES reports for the facility.

LQ-2B has been shut down since December 24, 2014 for pump maintenance.

During the annual reporting period, the system removed an estimated 13 pounds of VOCs and extracted a total of approximately 23.6 million gallons of groundwater from the Intersil/Siemens Off-Site Study Area (Table 6)). The extraction system is operating as designed in remediating VOCs in B-zone groundwater in the Off-Site Study Area. Sampling and analytical results for the groundwater treatment system are included in separate quarterly NPDES reports.

4.3 ADDITIONAL WORK CONDUCTED DURING THE ANNUAL REPORTING PERIOD

Additional work performed during this annual reporting period included the continuation of the indoor air evaluation, installation and sampling of ten monitoring wells in the A1, A3, and A4 depth intervals, and removal of all remaining dedicated QED pumps from the wells to accommodate the change of the groundwater sampling method from low-flow sampling to using the no-purge HydraSleeve, and submittal of the Five-Year Status Report.

4.3.1 Indoor Air Evaluation

The Indoor Air Study Area was originally identified based on the locations of grab groundwater samples collected along Homestead Road from the A1 groundwater depth interval where concentrations of TCE exceeded 0.05 mg/L. In December 2013, the Water Board issued a letter requiring additional sampling during the cold weather season and at residences where TCE in shallow groundwater is greater than 0.005 mg/L. The requirements were based on a December 2013 EPA guidelines letter that was attached to the Water Board letter. The EPA letter stated that research studies indicate that the highest indoor air concentrations usually occur when outdoor air temperatures are significantly lower than indoor air temperatures and that TCE indoor air concentrations from vapor intrusion are up to two-to-three times higher during the colder months. As a result, the Indoor Air Study Area was expanded to include eight additional residences on the north side of Lorne Way. A Second Addendum to Work Plan to Evaluate Potential Vapor Intrusion (AMEC, 2014a) and Revised Second Addendum to Work Plan to Evaluate Potential Vapor Intrusion (AMEC, 2014b) were submitted to the Water Board and EPA in January and February 2014.

In February/March 2014, samples were collected at six of the previously sampled residences (RB1 through RB6) and two additional residences (RB8 and RB9). One residence (RB9) was located within the expanded Indoor Air Study Area. RB7 declined additional sampling. Based on the December 2013 EPA letter, the samples were collected using passive samplers over a two week time period. In response to Water Board and U.S. EPA request for at least two sample events, RB8 and RB9 were resampled using the passive samplers in August 2014. The 2014 sampling activities were documented in the Addendum to the Report of Results – Evaluation of Potential Vapor Intrusion Report, October, 2014 (Addendum Report, AMEC, 2014c).

The Addendum Report summarized the background, described the sampling approach and methodology, presented the screening criteria, and presented and discussed the analytical results. Key points from the Addendum Report are summarized below.

The analytical data were evaluated against the following screening criteria:

- Tier 1: Indoor air sample results were compared to outdoor air concentrations to evaluate whether indoor air quality may be affected by ambient sources.
- Tier 2: Indoor air sample results were compared to short-term health-risk-based screening criteria, including Minimal Risk Levels (MRLs) (ASTDR, 2013) and the Interim TCE Indoor Air Response Action Levels (EPA, 2014).
- Tier 3: Indoor air sample results were compared to long-term health-risk-based screening criteria (Regional Screening Levels [RSLs]) and the California-modified indoor air screening level for PCE).

While some residential results exceeded Tier 1 screening criteria, the concentrations of detected VOCs in indoor and outdoor air are generally similar, as described in the Addendum Report (AMEC, 2014c). No VOCs were detected above Tier 2 (short term) screening criteria. PCE was detected in one residence (RB4) and TCE was detected in another residence (RB7) at concentrations slighter greater than the Tier 3 (long term) screening criteria. The following discusses TCE and PCE in the residential samples collected from 2012 through 2014:

- TCE, the primary COC at the Site, was only detected in one of the nine residences sampled. Concentrations at this residence ranged from 0.44 to 0.53 micrograms per cubic meter (µg/m^3), well below the Tier 2 screening level of 2 µg/m^3 and only slightly above the Tier 3 screening level of 0.43 µg/m^3. The detections are anomalous compared with the other residences in the study area, where TCE was not detected. At this residence, indoor air concentrations are 50% higher than in the crawl space sample, and there are potential indoor air sources (recent carpet cleaning and a hobby area in the garage).
- PCE was detected in one residence at a maximum of 0.42 µg/m^3, slightly above the Tier 3 screening criterion of 0.4 µg/m^3. Dry cleaning brought into the residence during the sampling period is likely the source of the detections. PCE was detected in three other residences at concentrations well below the Tier 3 screening level; however, PCE was not detected in crawl space air in these residences, which strongly indicates an indoor source.

Based on the groundwater, soil gas, and indoor air lines of evidence discussed in the Addendum Report, the detections of these chemicals in indoor air are not likely related to vapor intrusion. Therefore, the Addendum Report (AMEC, 2014c) recommended no further action with regard to the potential for vapor intrusion at the residences in the Indoor Air Study Area. The Water Board issued a No Further Action letter for the Site, including off-site residential area and the commercial building, dated November 19, 2014.

4.3.2 Monitoring Well Installation

Because elevated concentrations of VOCs were detected in grab groundwater samples during the investigation conducted in 2011 and there were no monitoring wells in the A1 through A3 depth intervals, a Monitoring Well Installation Work Plan (ERM, 2014a) and Addendum (ERM, 2014b) were submitted to the Water Board in January and February 2014. The Water Board approved the work plan in March 2014. In July 2014, ten monitoring wells were installed, three in the A1 depth interval, four in the A3 depth interval, and three in the A4 depth interval. The new monitoring wells were sampled in August 2014 and during the annual sampling event in October 2014. Well installation, construction, and August sampling activities are described in Off-Site Study Area, Monitoring Well Installation Completion Report by ERM (ERM, 2014d). Concentrations of VOCs detected in the wells in August and October 2014 are shown in Table 3a.

Based on the groundwater results presented in Table 3a and on Figures 19, 20 and 21, and as discussed in Section 4.1.2, the future monitoring frequency of these wells will be assessed following collection of a consistent and repeatable dataset. The newly installed monitoring wells are integrated into the current monitoring program as shown on Table 1. No additional wells are required at this time.

4.3.3 QED Pump Removal and HydraSleeve Installation

To accommodate the different hardware needed for the sampling method change from low-flow to HydraSleeves, QED pumps were removed from the wells prior to installing the HydraSleeves. Dedicated QED bladder pumps and associated hardware were removed from 17 monitoring wells in the Off-Site Study Area from August 26 to 28, 2014. These wells were resurveyed by CalVada after pump removal in compliance with GeoTracker requirements. Following removal from the well, pumps were decontaminated using distilled water and Liquinox - a phosphate-free soap. Equipment blank samples were collected from select pumps that were installed in wells with detectable concentrations of TCE. Pending sample results, pumps were temporarily stored within the groundwater extraction treatment system. Test America analyzed the equipment blanks in accordance with EPA Method 8260B (8010 list) for purgeable VOCs. Results from the blank samples indicated no detections of VOCs, and all QED pumps were recycled.

HydraSleeves were installed in monitoring wells on September 4, 2014 and sampled October 7 and 8, 2014 using the methodology described in Section 2.3. For some wells with screens that are 5 feet or shorter (LF-8A, LS-1A, KP-1B), and wells screened within the A1 depth interval where the entire screen interval may not be saturated (MW-OS-1A1 and MW-OS-3A1), top weights were installed with the HydraSleeve to ensure that samples were collected within the screen interval or within the saturated portion of the screen interval. HydraSleeves installed with top weights are pushed down to within a foot of the bottom of the well.

4.3.4 Five-Year Status Report

The Five-Year Status for the period July 2009 through June 2014 (AMEC and ERM, 2014) was submitted to the Water Board on December 17, 2014. The report included activities performed at the Site during the reporting period, in addition to the completion of the indoor air evaluation, which was outside of the reporting period.

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TABLES

TABLE 1

APPROVED SCHEDULE FOR SAMPLING
GROUNDWATER [1] AND SOIL-VAPOR MONITORING WELLS
Intersil/Siemens Site
Cupertino, California

Well Number	Notes	Zone/Depth Interval	Sampling Frequency [2,3]	EPA Method
Former Intersil Facility [4]				
E17A		A4 Depth Interval	Annual	8010
E9AR		A4 Depth Interval	Annual	8010
W10A		A4 Depth Interval	Annual	8010
W11B		A4 Depth Interval	Annual	8010
W12A		A4 Depth Interval	Annual	8010
W13A	(5)	A4 Depth Interval	Destroyed	8010
W14A		A4 Depth Interval	Every 2 Years	8010
W2A	(5)	A4 Depth Interval	Destroyed	8010
W3A	(5)	A4 Depth Interval	Destroyed	8010
W4A		A4 Depth Interval	Annual	8010
W5A		A4 Depth Interval	Annual	8010
W7A		A4 Depth Interval	Every 2 Years	8010
W8B		B Zone	Annual	8010
W14B		B Zone	Every 2 Years	8010
W18B		B Zone	Annual	8010
W6B	(5)	B Zone	Destroyed	8010
Former Siemens Facility [6]				
2-EP		A1 Depth Interval	Annual	8010
4BP		A1 Depth Interval	Annual	8010
LF-13A	(8)	A1 Depth Interval	Annual	8010
VM-2S	(1)	A1 Depth Interval	Annual	8010
VM-8S	(1)	A1 Depth Interval	Annual	8010
2-EPA	(1)	A3 Depth Interval	Annual	8010
EX-1-RL	(7)	A3 Depth Interval	Annual	8010
G-1A		A3 Depth Interval	Annual	8010
H-1A		A3 Depth Interval	Annual	8010
LF-12A	(8)	A3 Depth Interval	Annual	8010
SW-5S	(1)	A3 Depth Interval	Annual	8010
SW-6S	(1)	A3 Depth Interval	Annual	8010
SW-7	(7)	A3 Depth Interval	Annual	8010
VM-2D	(1)	A3 Depth Interval	Annual	8010
VM-8D	(1)	A3 Depth Interval	Annual	8010
3-XA		A4 Depth Interval	Annual	8010
F-1A		A4 Depth Interval	Annual	8010
H-2A-S		A4 Depth Interval	Annual	8010
H-XA-S		A4 Depth Interval	Annual	8010
LF-10A		A4 Depth Interval	Every 2 Years	8010
LF-11A		A4 Depth Interval	Every 2 Years	8010

TABLE 1

APPROVED SCHEDULE FOR SAMPLING
GROUNDWATER [1] AND SOIL-VAPOR MONITORING WELLS

Intersil/Siemens Site
Cupertino, California

Well Number	Notes	Zone/Depth Interval	Sampling Frequency [2,3]	EPA Method
LF-2A		A4 Depth Interval	Every 4 Years	8010
LF-6A		A4 Depth Interval	Annual	8010
LF-9A		A4 Depth Interval	Annual	8010
P-1A	(9)	A4 Depth Interval	Annual	8010
T-2A		A4 Depth Interval	Every 2 Years	8010
W21A		A4 Depth Interval	Annual	8010
W22A		A4 Depth Interval	Annual	8010
3-EB		B Zone	Every 4 Years	8010
H-3B		B Zone	Annual	8010
H-5B		B Zone	Annual	8010
LF-1B		B Zone	Every 2 Years	8010
LF-3B		B Zone	Annual	8010
LF-5B		B Zone	Annual	8010
LF-7B		B Zone	Every 4 Years	8010
W19B		B Zone	Annual	8010
W20B		B Zone	Annual	8010
H-4C		C Zone	Every 4 Years	8010
Intersil/Siemens Off Study Area [3]				
MW-OS-2A1	(10)	A1 Depth Interval	Semiannual	8010
MW-OS-3A1	(10)	A1 Depth Interval	Semiannual	8010
MW-OS-2A3	(10)	A3 Depth Interval	Semiannual	8010
MW-OS-3A3	(10)	A3 Depth Interval	Semiannual	8010
MW-OS-4A3	(10)	A3 Depth Interval	Semiannual	8010
MW-OS-5A3	(10)	A3 Depth Interval	Semiannual	8010
MW-OS-2A4	(10)	A4 Depth Interval	Semiannual	8010
MW-OS-3A4	(10)	A4 Depth Interval	Semiannual	8010
MW-OS-4A4	(10)	A4 Depth Interval	Semiannual	8010
LF-8A		A4 Depth Interval	Annual	8010
LS-1A		A4 Depth Interval	Annual	8010
QH-1A		A4 Depth Interval	Annual	8010
S-1A		A4 Depth Interval	Annual	8010
IQ-1B		B Zone	Semiannual	8010
KB-2B		B Zone	Every 2 Years	8010
KR-1B		B Zone	Annual	8010
LQ-1B	(11)	B Zone	None	8010
LQ-2B		B Zone	Semiannual	8010
LR-1B		B Zone	Semiannual	8010
LS-2B		B Zone	Annual	8010
PG-1B		B Zone	Annual	8010

TABLE 1

APPROVED SCHEDULE FOR SAMPLING
GROUNDWATER [1] AND SOIL-VAPOR MONITORING WELLS

Intersil/Siemens Site
Cupertino, California

Well Number	Notes	Zone/Depth Interval	Sampling Frequency [2,3]	EPA Method
PH-1B		B Zone	Every 4 Years	8010
PL-1B		B Zone	Annual	8010
RK-1B		B Zone	Annual	8010
S-3B		B Zone	Annual	8010/8020
S-5B		B Zone	Annual	8010
LH-1C		C Zone	Every 4 Years	8010/8020
LR-3C		C Zone	Annual	8010/8020
PL-2C		C Zone	Every 4 Years	8010
RK-2C		C Zone	Annual	8010
S-4C		C Zone	Annual	8010
S-6C		C Zone	Every 2 Years	8010

Notes

1. Schedule approved by the Water Board in letters dated December 20, 2000, October 15, 2004, and July 26, 2007. Selected A2 and A3 depth interval wells located at the former Siemens facility are monitored in accordance with the schedule schedule proposed in the Annual Report for the reporting year 2000 for the former Siemens facility (LFR, 2001).
2. Water-level measurements will be collected quarterly, in January, April, July, and October.
3. Annual groundwater samples are collected in October.
4. Wells maintained and monitored by AMEC Geomatrix, Inc.
5. Wells W2A, W3A, W13A and W6B were destroyed in September and October 2007 with the Water Board's July 27, 2007 approval.
6. Wells maintained and monitored by ERM. A-zone groundwater monitoring wells located at the former Siemens facility are further classified as A1 depth interval (approximately 45 to 60 feet below ground surface [bgs]), A3 depth interval (approximately 60 to 90 feet bgs), and A4 depth interval (approximately 90 to 120 feet bgs).
7. Wells EX-1-RL and SW-7 were added to the GWETS on May 2, 2006.
8. Wells installed in April 2002.
9. Former groundwater monitoring Well 1-1D was abandoned in July 2001 because this former extraction well was screened in multiple groundwater zones. This well was replaced with Well P-1A on the sampling schedule. Groundwater quality in the downgradient vicinity of this well is assessed by monitoring groundwater extraction Well LF-6A and Well P-1A.
10. The future monitoring frequency of these wells will be assessed following collection of a consistent and repeatable dataset.
11. This well is not sampled with Water Board approval dated March 22, 2005.

TABLE 2

GROUNDWATER ELEVATION DATA[1]
JANUARY THROUGH DECEMBER 2014
Intersil/Siemens Site
Cupertino, California

Well	Well Elevation	Water Level Elevations			
		1/13/2014	4/14/2014	7/14/2014	10/7/2014
Former Intersil Facility					
A3 Depth Interval (Approximately 69 or 74 to 80 feet bgs)					
W18MA*	146.94	82.43	81.93	77.96	73.25
W19MA	146.94	85.73	85.67	82.02	76.70
A4 Depth Interval (Approximately 90 to 120 feet bgs)					
E-17A	148.25	85.94	85.77	82.04	77.28
E-9AR*	146.10	81.84	81.39	79.45	72.61
P-23A	147.83	89.26	88.67	84.40	80.38
P-24A	147.45	85.92	85.76	82.02	77.26
P-25A	147.46	85.86	85.69	81.99	77.21
P-26A	147.85	85.84	85.64	81.89	77.06
P-27A	145.90	85.76	85.64	81.97	77.13
P-28A	148.72	86.40	86.24	82.48	77.65
P-29A	149.33	86.62	86.42	82.63	77.87
W-10A*	147.25	56.41	54.42	50.27	57.93
W-12A*	146.64	62.00	61.08	56.19	56.71
W-14A	150.74	88.51	87.18	80.78	76.30
W-4A	148.35	86.82	86.74	82.95	77.98
W-5A	148.61	86.32	86.07	82.25	77.53
W-7A	151.52	91.36	88.41	84.34	79.63
W-9A	146.55	85.72	85.52	81.87	77.01
B Zone					
W-11B	148.15	87.24	85.68	79.00	74.67
W-14B	150.74	87.85	86.31	79.57	75.23
W-14P	150.65	--	--	--	--
W-18B	147.79	87.34	85.78	79.08	74.77
W-8B	145.94	87.45	85.95	79.18	74.84
Former Siemens Facility					
A1 Depth Interval (Approximately 40 to 60 feet bgs)					
1D	143.14	--	--	--	--
1L	143.69	85.69	85.44	82.89	79.32
2-EP*	139.84	87.66	87.83	89.26	88.66
4BP	141.92	86.01	86.09	83.88	83.07
IP-1	142.73	90.66	90.05	91.54	89.01
IP-2	143.55	90.83	90.26	89.53	85.76
IP-3	143.58	91.07	90.61	90.23	89.10
LF-13A	141.60	89.90	88.98	86.35	85.24
MW-01A1[4]	141.46	--	--	--	88.54
MW-02A1[4]	142.58	--	--	--	88.80
MW-1-RU	141.18	86.02	85.92	84.09	--

TABLE 2

GROUNDWATER ELEVATION DATA[1]
JANUARY THROUGH DECEMBER 2014
Intersil/Siemens Site
Cupertino, California

Well	Well Elevation	Water Level Elevations			
		1/13/2014	4/14/2014	7/14/2014	10/7/2014
A1 Depth Interval (Approximately 40 to 60 feet bgs [cont'd])					
VM-1S	144.16	90.96	90.45	89.47	--
VM-2S	142.22	88.55	87.81	85.51	--
VM-3S	143.07	90.99	90.69	90.17	89.59
VM-4S	142.26	90.35	89.86	89.39	88.94
VM-5S	141.49	90.37	89.69	89.12	88.45
VM-6S	141.59	89.37	89.03	88.71	88.28
VM-7S	141.44	89.46	89.23	88.86	88.53
VM-8S	141.14	85.68	85.83	84.10	83.97
A2 Depth Interval (Approximately 58 or 60 to 70 feet bgs)					
SW-3	143.98	86.17	85.58	82.17	78.25
1K	142.93	85.61	85.38	82.08	77.54
HMSA-1S	143.48	86.47	86.49	83.12	79.34
2D	141.77	85.13	84.97	84.83	77.27
A3 Depth Interval (Approximately 70 or 74 to 90 feet bgs)					
1H-S	143.80	85.73	85.52	82.11	77.60
2-EPA*	139.87	83.66	83.27	80.05	75.59
EX-1-RL*	144.84	83.88	83.03	79.75	63.15
G-1A	143.40	84.42	84.21	81.59	76.38
H-1A*	141.64	83.46	83.07	80.79	75.36
HMSA-2S	143.35	85.88	85.85	82.99	77.87
LF-12A*	141.36	84.65	84.23	84.42	76.50
MW-01A3[4]	141.57	--	--	--	77.25
MW-03A3[4]	142.99	--	--	--	77.32
MW-04A3[4]	142.75	--	--	--	77.29
SW-5S	144.47	86.19	86.07	82.78	77.79
SW-6S	146.08	86.12	85.91	86.26	77.72
SW-7*	143.28	85.78	85.64	78.19	77.67
VM-1D	144.25	85.72	85.51	81.69	77.59
VM-2D	141.96	85.52	85.31	80.09	77.46
VM-3D	143.00	85.38	85.19	82.07	77.37
VM-4D	142.28	85.29	85.13	81.79	77.48
VM-5D	141.65	85.28	85.14	79.67	77.39
VM-6D	141.24	85.00	84.97	77.56	77.51
VM-7D	141.48	85.14	85.11	80.96	77.42
VM-8D	141.90	85.49	85.33	80.79	77.47
A4 Depth Interval (Approximately 90 to 120 feet bgs)					
2B-S	142.48	81.52	84.75	82.58	77.14
3-DD	142.54	80.63	80.40	81.42	72.45
3-XA	145.09	85.22	84.78	82.13	76.41
F-1A	146.86	85.76	85.61	82.26	77.07

TABLE 2

GROUNDWATER ELEVATION DATA[1]
JANUARY THROUGH DECEMBER 2014
Intersil/Siemens Site
Cupertino, California

Well	Well Elevation	Water Level Elevations			
		1/13/2014	4/14/2014	7/14/2014	10/7/2014
A4 Depth Interval (Approximately 90 to 120 feet bgs [cont'd])					
H-2A-S	140.87	84.38	83.98	80.91	75.68
H-XA-S	141.31	85.10	84.72	81.35	76.35
LF-10A	140.75	83.43	83.01	79.66	74.59
LF-11A	142.95	84.04	82.44	78.77	72.92
LF-2A	140.75	85.67	85.03	80.53	75.87
LF-4A	142.95	85.73	85.12	80.77	76.15
LF-6A*	140.75	70.01	68.00	80.81	61.87
LF-9A	142.95	85.66	85.09	80.71	76.06
P-1A	142.57	82.08	81.36	77.17	72.05
P-2A	143.28	82.28	81.49	77.41	72.27
P-3A	141.76	82.96	82.48	80.68	74.05
P-4A	142.25	83.97	83.54	80.67	75.03
T-2A	146.23	85.72	85.51	81.99	76.97
W21A	143.20	85.35	84.93	81.17	76.31
W22A	145.02	85.48	85.33	81.75	76.92
B Zone					
3-EB	143.53	84.65	--	76.30	72.03
H-3B	140.39	84.78	83.44	76.98	72.95
H-5B*	140.95	27.73	21.47	42.44	56.72
LF-1B	143.10	84.96	83.52	76.15	73.02
B Zone (cont'd)					
LF-3B	143.87	84.89	83.56	77.14	73.11
LF-5B	142.46	82.61	81.45	75.09	71.25
LF-7B	143.20	82.76	81.85	75.39	71.67
P-5B	143.41	84.42	82.13	83.58	70.62
P-6B	142.00	85.13	83.63	77.21	73.08
W-19B	145.22	87.39	85.76	79.19	74.79
W-20B	144.14	87.10	85.19	77.91	73.41
C Zone					
H-4C	141.57	82.43	79.68	71.16	67.56
Intersil/Siemens Off-Site Study Area					
A1 Depth Interval (Approximately 40 to 60 feet bgs [cont'd])					
MW-OS-1A1[4]	141.24	--	--	--	--
MW-OS-2A1[4]	140.69	--	--	--	97.4
MW-OS-3A1[4]	136.38	--	--	--	78.82
A3 Depth Interval (Approximately 70 or 74 to 90 feet bgs)					
MW-OS-2A3[4]	140.53	--	--	--	77.47
MW-OS-3A3[4]	136.42	--	--	--	77.39
MW-OS-4A3[4]	134.87	--	--	--	76.25
MW-OS-5A3[4]	132.93	--	--	--	76.97

TABLE 2

GROUNDWATER ELEVATION DATA[1]
JANUARY THROUGH DECEMBER 2014
Intersil/Siemens Site
Cupertino, California

Well	Well Elevation	Water Level Elevations			
		1/13/2014	4/14/2014	7/14/2014	10/7/2014
A4 Depth Interval					
LF-8A	141.54	86.13	85.31	80.57	75.95
LS-1A	135.84	84.81	83.33	76.76	72.93
MW-OS-2A4[4]	140.52	--	--	--	75.74
MW-OS-3A4[4]	136.35	--	--	--	75.62
MW-OS-4A4[4]	134.52	--	--	--	75.86
QH-1A	139.91	83.70	82.93	78.56	74.00
S-1A	137.39	83.99	83.29	79.94	75.44
T-3A	143.97	84.53	83.59	78.46	74.23
W-15AR[5]	146.39	91.48	91.35	87.64	77.64
W-16A	146.71	88.32	88.32	84.21	79.91
B Zone					
BM-1B	128.10	82.44	80.49	73.40	69.73
HN-1B	150.39	--	--	74.98	71.59
IP-1B	139.62	81.64	79.03	71.97	68.72
IQ-1B	133.99	80.41	78.01	70.81	67.52
KB-1B	129.02	83.47	81.77	75.06	71.31
KB-2B	129.19	82.03	80.10	73.28	69.71
KL-1B	147.26	83.69	81.27	74.65	71.43
KP-1B	140.50	82.10	79.63	72.56	69.22
KR-1B	133.13	80.11	77.87	70.64	67.21
LQ-1B	132.56	79.00	76.78	68.39 [2]	66.12
LQ-2B*	132.55	73.51	71.14	63.05 [2]	60.82
LR-1B*	136.55	54.84	50.66	47.85	44.23
LS-2B	135.72	84.92	83.40	76.78	72.74
PG-1B	132.67	80.44	77.81	70.71	67.47
PH-1B	140.52	81.90	79.53	72.57	69.18
PL-1B	139.70	81.82	79.41	72.36	69.09
RK-1B	130.92	80.42	78.12	71.13	67.76
S-2B	137.21	81.19	79.52	73.05	69.24
S-3B	129.75	80.00	77.57	70.37	67.08
S-5B	130.45	83.80	82.19	75.40	71.35
VM-1B	129.06	83.51	81.74	75.03	73.39

TABLE 2

GROUNDWATER ELEVATION DATA[1]
JANUARY THROUGH DECEMBER 2014
Intersil/Siemens Site
Cupertino, California

Well	Well Elevation	Water Level Elevations 1/13/2014	4/14/2014	7/14/2014	10/7/2014
C Zone					
KR-2CP	133.02	80.79	--	69.71	66.45
LH-1C	127.73	79.70	76.88	67.88	64.55
LQ-3CP	133.72	81.38	78.22	69.75	66.53
LR-3C	136.70	81.58	78.76	70.48	66.99
PL-2C	139.77	81.72	78.73	70.69	67.72
RK-2C	130.98	80.47	77.43	69.06	65.70
S-4C	130.10	79.30	76.22	67.95	64.68
S-6C	130.47	80.15	76.95	68.01	64.61

Notes
1. Elevations in feet, National Geodetic Vertical Datum (NGVD). Water levels for the former Siemens facility were measured by ERM, unless otherwise noted. Water levels for the former Intersil facility and Intersil/Siemens Off-Site Study Area were measured by AMEC, unless otherwise noted.
2. Water level measured by ERM.
3. Water level measured by Shaw Environmental on behalf of AMI.
4. A Zone wells installed in July 2014.
5. Well W15A replaced by well W15AR in September 2013.

Abbreviations
* indicates groundwater extraction well
-- = no measurement available
bgs = below ground surface
NA = not available; well was not accessible

TABLE 3a

SUMMARY OF VOC CONCENTRATIONS IN GROUNDWATER MONITORING WELLS [1]
JANUARY THROUGH DECEMBER 2014

Intersil/Siemens Site
Cupertino, California

All results in milligrams per liter (mg/L)

Well No.		Date Sampled	1,1-DCE	1,2-DCE (cis/trans)	1,1,1-TCA	TCE	PCE	Freon 113	Chloroform	Toluene
Former Intersil Facility										
A3 Depth Interval (69 or 74 to 80 feet bgs)										
W18MA*		10/7/2014	<0.00050	<0.00050	<0.00050	0.064	<0.00050	<0.0020	<0.00050	NA
W19MA		10/8/2014	<0.00050	<0.00050	<0.00050	0.28	0.00061	<0.0020	<0.00050	NA
A4 Depth Interval (90 to 125 feet bgs)										
E9AR*		10/7/2014	<0.00050	<0.00050	<0.00050	0.014	<0.00050	0.0084	<0.00050	NA
E17A		10/8/2014	<0.00050	0.0081	<0.00050	0.033	<0.00050	0.0062	<0.00050	NA
W4A		10/8/2014	<0.00050	<0.00050	<0.00050	0.0046	<0.00050	<0.0020	<0.00050	NA
W5A		10/13/2014	<0.00050	<0.00050	<0.00050	0.0033	<0.00050	0.0087	<0.0010	NA
W10A*		10/7/2014	<0.00050	<0.00050	<0.00050	0.04	<0.00050	0.0075	<0.00050	NA
W10A*	Dup	10/7/2014	<0.00050	<0.00050	<0.00050	0.041	<0.00050	0.0079	<0.00050	NA
W12A*		10/7/2014	0.00079	<0.00050	0.001	0.1	<0.00050	0.013	<0.00050	NA
B Zone										
W8B		10/8/2014	<0.00050	<0.00050	<0.00050	0.002	<0.00050	<0.0020	<0.00050	NA
W11B		10/8/2014	<0.00050	<0.00050	<0.00050	0.0087	<0.00050	0.0074	<0.00050	NA
W18B		10/8/2014	<0.00050	<0.00050	<0.00050	0.016	<0.00050	0.0034	<0.00050	NA
Former Siemens Facility										
A1 Depth Interval (Approximately 40 to 60 feet bgs)										
2EP		10/9/2014	< 0.01	0.41 / < 0.01	< 0.01	0.26	< 0.01	< 0.01	< 0.02	NA
4BP		10/8/2014	0.07	3.3 / 0.013	< 0.0050	0.42	< 0.0050	0.0080	< 0.01	NA
IP-2		10/9/2014	< 0.0025	0.017 / 0.0036	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0050	NA
IP-3		10/9/2014	< 0.00050	0.015 / 0.0076	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.0010	NA
VM-5S		10/9/2014	< 0.00050	0.18 / 0.00067	< 0.00050	0.099	< 0.00050	0.00072	< 0.0010	NA
VM-5S	Dup	10/9/2014	< 0.00050	0.18 / 0.00073	< 0.00050	0.099	< 0.00050	0.00074	< 0.0010	NA
VM-6S		10/9/2014	< 0.0050	0.59 / 0.0090	< 0.0050	0.83	< 0.0050	0.0085	< 0.01	NA
VM-8S		10/8/2014	0.04	0.21 / 0.0034	0.022	0.24	0.0015	0.0013	< 0.0010	NA
A3 Depth Interval (Approximately 70 or 74 to 90 feet bgs)										
2EPa		10/8/2014	0.0030	0.012 / < 0.0025	< 0.0025	0.13	< 0.0025	< 0.0025	< 0.0050	NA
EX-1-RL		10/8/2014	0.0017	< 0.00050 / < 0.00050	0.00099	0.17	< 0.00050	0.0024	< 0.0010	NA
SW-7		10/7/2014	< 0.00050	< 0.00050 / < 0.00050	< 0.00050	0.052	< 0.00050	0.00065	< 0.0010	NA
G-1A		10/9/2014	< 0.0050	0.39 / < 0.0050	< 0.0050	0.34	< 0.0050	0.0061	< 0.01	NA
H-1A		10/9/2014	0.0025	0.0017 / < 0.00050	0.0019	0.16	< 0.00050	0.0077	< 0.0010	NA
LF-12A		10/8/2014	< 0.00050	0.0016 / < 0.00050	< 0.00050	0.0069	< 0.00050	0.00065	< 0.0010	NA
SW-5S		10/9/2014	< 0.00050	< 0.00050 / < 0.00050	< 0.00050	0.074	< 0.00050	0.00081	< 0.0010	NA
SW-6S		10/9/2014	< 0.01	< 0.01 / < 0.01	< 0.01	0.63	< 0.01	< 0.01	< 0.02	NA
VM-2D		10/9/2014	< 0.50	5.7 / < 0.50	< 0.50	15	< 0.50	0.94	< 1.0	NA
VM-8D		10/8/2014	0.0016	< 0.00050 / < 0.00050	0.00090	0.13	< 0.00050	0.0016	< 0.0010	NA

TABLE 3a

SUMMARY OF VOC CONCENTRATIONS IN GROUNDWATER MONITORING WELLS [1]
JANUARY THROUGH DECEMBER 2014

Intersil/Siemens Site
Cupertino, California

All results in milligrams per liter (mg/L)

Well No.		Date Sampled	1,1-DCE	1,2-DCE (cis/trans)	1,1,1-TCA	TCE	PCE	Freon 113	Chloroform	Toluene
VM-8D	Dup	10/8/2014	0.00090	< 0.00050 / < 0.00050	0.00091	0.097	< 0.00050	0.0012	< 0.0010	NA
A4 Depth Interval (Approximately 90 to 120 feet bgs)										
3-XA		10/9/2014	0.0030	0.00051 / < 0.00050	< 0.00050	0.09	< 0.00050	0.0039	< 0.0010	NA
F-1A		10/8/2014	< 0.0050	< 0.0050 / < 0.0050	< 0.0050	0.32	< 0.0050	< 0.0050	< 0.01	NA
F-1A	Dup	10/8/2014	< 0.00050	< 0.00050 / < 0.00050	< 0.00050	0.41	0.00064	0.0018	< 0.0010	NA
H-2A-S		10/8/2014	0.02	0.00097 / < 0.00050	0.013	0.15	< 0.00050	0.0061	< 0.0010	NA
H-XA-S		10/8/2014	0.017	0.00072 / < 0.00050	0.013	0.2	< 0.00050	0.0095	< 0.0010	NA
LF-6A		10/9/2014	< 0.0050	0.0054 / < 0.0050	< 0.0050	0.18	< 0.0050	0.0058	< 0.01	NA
LF-9A		10/8/2014	0.00067	< 0.00050 / < 0.00050	0.0012	0.068	< 0.00050	0.015	< 0.0010	NA
P-1A		10/8/2014	< 0.00050	0.00077 / < 0.00050	< 0.00050	0.0071	< 0.00050	0.00071	< 0.0010	NA
W21A		10/7/2014	0.0046	< 0.00050 / < 0.00050	< 0.00050	0.037	< 0.00050	0.0045	< 0.0010	NA
W22A		10/8/2014	0.00075	0.0045 / < 0.00050	0.00062	0.6	< 0.00050	0.00081	< 0.0010	NA
B Zone (Approximately 130-150 feet bgs)										
H-3B		10/8/2014	< 0.00050	< 0.00050 / < 0.00050	0.00062	0.049	< 0.00050	0.0080	< 0.0010	NA
H-5B		10/8/2014	< 0.00050	< 0.00050 / < 0.00050	< 0.00050	0.11	< 0.00050	0.0025	< 0.0010	NA
LF-3B		10/8/2014	< 0.00050	< 0.00050 / < 0.00050	< 0.00050	0.0022	< 0.00050	< 0.00050	< 0.0010	NA
LF-5B		10/9/2014	< 0.00050	0.0013 / < 0.00050	< 0.00050	0.035	< 0.00050	0.00075	< 0.0010	NA
W19B		10/8/2014	< 0.00050	< 0.00050 / < 0.00050	< 0.00050	0.033	< 0.00050	0.0019	< 0.0010	NA
W20B		10/9/2014	0.0023	< 0.00050 / < 0.00050	< 0.00050	0.035	< 0.00050	0.0046	< 0.0010	NA
W20B	Dup	10/9/2014	0.0015	< 0.00050 / < 0.00050	0.00071	0.036	< 0.00050	0.0056	< 0.0010	NA
Blanks										
EB-100914	EB	10/9/2014	< 0.00050	< 0.00050 / < 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.0010	< 0.00050	NA
TB1-100714	TB	10/7/2014	< 0.00050	< 0.00050 / < 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.0010	< 0.00050	NA
TB2-101814	TB	10/8/2014	< 0.00050	< 0.00050 / < 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.0010	< 0.00050	NA
TB3-100914	TB	10/9/2014	< 0.00050	< 0.00050 / < 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.0010	< 0.00050	NA
Intersil/Siemens Off-Site Study Area										
A1 Depth Interval										
MW-OS-2A1		8/13/2014	0.00053	0.560/0.0018	<0.0005	1	0.001	0.0051	0.0051	NA
MW-OS-2A1		10/7/2014	<0.010	0.870	<0.010	1.5	<0.010	<0.04	<0.010	NA
MW-OS-3A1		8/13/2014	0.003	0.0046/<0.0005	0.0047	0.026	<0.00050	0.0018	<0.001	NA
MW-OS-3A1		10/7/2014	0.0042	0.0056	0.0047	0.025	<0.00050	<0.002	<0.00050	NA
A3 Depth Interval										
MW-OS-2A3		8/13/2014	0.0046	0.0033/<0.0005	0.0026	0.084	<0.00050	0.002	<0.001	NA
MW-OS-2A3		10/7/2014	0.0034	0.0016	0.0028	0.091	<0.00050	0.0031	<0.00050	NA
MW-OS-3A3		8/13/2014	0.0016	0.002/<0.0005	0.0022	0.120	<0.00050	0.0013	<0.001	NA
MW-OS-3A3		10/7/2014	0.0015	0.0024	0.0019	0.086	<0.00050	<0.0020	<0.00050	NA
MW-OS-4A3		8/13/2014	<0.0005	<0.0005/<0.0005	<0.0005	<0.00050	<0.00050	<0.00050	<0.001	NA
MW-OS-4A3		10/7/2014	<0.0005	<0.0005	<0.0005	<0.00050	<0.00050	<0.0020	<0.00050	NA

TABLE 3a

SUMMARY OF VOC CONCENTRATIONS IN GROUNDWATER MONITORING WELLS [1]
JANUARY THROUGH DECEMBER 2014
Intersil/Siemens Site
Cupertino, California

All results in milligrams per liter (mg/L)

Well No.		Date Sampled	1,1-DCE	1,2-DCE (cis/trans)	1,1,1-TCA	TCE	PCE	Freon 113	Chloroform	Toluene
MW-OS-5A3		8/13/2014	0.00057	0.0012/<0.0005	0.00086	0.011	<0.00050	0.00071	<0.001	NA
MW-OS-5A3	Dup	8/13/2014	0.00052	0.0012/<0.0005	0.00087	0.011	<0.00050	0.00065	<0.001	NA
MW-OS-5A3		10/7/2014	0.00062	0.0017	0.0013	0.015	<0.00050	<0.002	<0.00050	NA
A4 Depth Interval										
MW-OS-2A4		8/13/2014	0.010	0.0011/<0.0005	0.0083	0.046	<0.00050	0.0042	<0.001	NA
MW-OS-2A4		10/7/2014	0.011	0.001	0.0086	0.047	<0.00050	0.0046	<0.00050	NA
MW-OS-3A4		8/13/2014	0.0067	0.00068/<0.0005	0.006	0.029	<0.00050	0.0059	<0.001	NA
MW-OS-3A4		10/7/2014	0.0085	0.00065	0.0073	0.028	<0.00050	0.0077	<0.00050	NA
MW-OS-4A4		8/13/2014	0.00088	<0.00050/<0.00050	0.0013	0.019	<0.00050	0.002	<0.001	NA
MW-OS-4A4		10/8/2014	0.00059	<0.00050	0.0012	0.012	<0.00050	<0.0020	<0.00050	NA
LF-8A		10/8/2014	0.0019	<0.00050	<0.00050	0.0013	<0.00050	<0.0020	<0.00050	NA
LS-1A		10/8/2014	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	NA
QH-1A		10/8/2014	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	NA
S-1A		10/8/2014	<0.00050	<0.00050	0.00065	0.0089	<0.00050	0.0027	<0.00050	NA
B Zone										
IQ-1B		4/14/2014	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	<0.00050
IQ-1B	Dup	4/14/2014	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	<0.00050
IQ-1B		10/8/2014	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	NA
IQ-1B	Dup	10/8/2014	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	NA
KR-1B		10/8/2014	<0.00050	<0.00050	0.00057	0.019	<0.00050	0.0029	<0.00050	NA
LQ-2B*		4/14/2014	<0.00050	<0.00050	<0.00050	0.067	<0.00050	0.0016	<0.0010	<0.00050
LQ-2B*		10/8/2014	<0.00050	<0.00050	<0.00050	0.07	<0.00050	0.0022	<0.00050	NA
LR-1B*		4/14/2014	0.00063	<0.00050	0.00055	0.09	<0.00050	0.0067	<0.0010	<0.00050
LR-1B*		10/8/2014	0.0007	<0.00050	0.0011	0.09	<0.00050	0.0081	<0.00050	NA
LR-1B*	Dup	10/8/2014	0.00069	<0.00050	0.0011	0.09	<0.00050	0.0075	<0.00050	NA
LS-2B		10/8/2014	0.0035	0.0011 J	<0.00050	0.0045	<0.00050	<0.0020	<0.00050	NA
LS-2B	Dup	10/8/2014	0.0018	0.00057 J	<0.00050	0.0024	<0.00050	<0.0020	<0.00050	NA
PG-1B		10/8/2014	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	NA
PL-1B		10/8/2014	<0.00050	<0.00050	<0.00050	0.014	<0.00050	<0.0020	<0.00050	NA
RK-1B		10/8/2014	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	NA
S-3B		10/7/2014	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050
S-5B		10/8/2014	<0.00050	<0.00050	0.0012	<0.00050	<0.00050	0.0052	<0.00050	NA
C Zone										
LR-3C		10/8/2014	<0.00050	<0.00050	<0.00050	0.0017	<0.00050	<0.0020	<0.00050	<0.00050
RK-2C		10/8/2014	<0.00050	<0.00050	<0.00050	0.0019	<0.00050	<0.0020	<0.00050	NA
S-4C		10/7/2014	<0.00050	<0.00050	<0.00050	0.0012	<0.00050	<0.0020	<0.00050	NA

TABLE 3a

SUMMARY OF VOC CONCENTRATIONS IN GROUNDWATER MONITORING WELLS [1]
JANUARY THROUGH DECEMBER 2014

Intersil/Siemens Site
Cupertino, California

All results in milligrams per liter (mg/L)

Well No.		Date Sampled	1,1-DCE	1,2-DCE (cis/trans)	1,1,1-TCA	TCE	PCE	Freon 113	Chloroform	Toluene
Blanks										
EB	EB	4/14/2014	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	<0.00050
FB-1	FB	10/7/2014	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	NA
FB-2	FB	10/7/2014	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	NA
FB-3	FB	10/8/2014	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	NA
TB	TB	4/14/2014	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
TB-1	TB	10/7/2014	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	NA
TB-2	TB	10/7/2014	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	NA
TB-3	TB	10/8/2014	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	NA

Notes
1. Samples were analyzed by TestAmerica of Pleasanton, California, unless otherwise noted.
   Samples were analyzed using EPA Method 8260B for EPA 8010 analyte list compounds.

Abbreviations
"<" indicates not detected above indicated detection limit
* = Active groundwater extraction well
1,1-DCE = 1,1-Dichloroethene
1,2-DCE = 1,2-Dichloroethene
1,1,1-TCA = 1,1,1-Trichloroethane
bgs = below ground surface
Dup = Duplicate sample
EB = Equipment Blank
FB = Field Blank
J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample. Results are J-flagged due the laboratory reporting the results between the reporting limit and the method detection limit
NA = Not Analyzed
PCE = Tetrachloroethene
TB = Trip Blank
TCE = Trichloroethene

TABLE 3B

COMPARISON OF TCE CONCENTRATIONS IN OCTOBER, 2010 THROUGH 2014 [1,2]

Intersil/Siemens Site

Cupertino, California

All results in milligrams per liter (mg/L)

Well No.	Oct-10	Oct-11	Oct-12	Oct-13	Oct-14	Number of Detects	Minimum Detection	Maximum Detection	Average[1] (Detects)	Standard Deviation[1] (Detects)	Relative Standard Deviation[1] (Detects)	Range of Detection Limits (Non-Detects)	October 2014 Within 2010-2013 Range?	Reason if Not Within Range	Relative Percent Difference (RPD) if Out of Range[2]
Former Intersil Facility															
A3 Depth Interval (69 or 74 to 80 feet bgs)															
W19MA	NA	0.084	0.037	0.12	0.28	4	0.037	0.28	0.13025	0.105	81%	NA	No	Higher	233%
A4 Depth Interval (90 to 125 feet bgs)															
E17A	0.051	0.025	0.015	0.021	0.033	5	0.015	0.051	0.029	0.014	48%	NA	Yes	--	--
W4A	0.0031	0.012	0.0021	0.0046	0.0046	5	0.0021	0.012	0.005	0.004	74%	NA	Yes	--	--
W5A	0.0035	0.003	0.0016	0.0030	0.0033	5	0.0016	0.0035	0.003	0.001	26%	NA	Yes	--	--
B Zone															
W8B	0.0011	0.0011	0.00062	0.00067	0.002	5	0.00062	0.002	0.0011	0.001	50%	NA	Yes	--	--
W11B	0.0050	0.0038	0.0022	0.0018	0.0087	5	0.0018	0.0087	0.0043	0.003	64%	NA	Yes	--	--
W18B	0.013	0.017	0.006	0.015	0.016	5	0.006	0.017	0.013	0.004	33%	NA	Yes	--	--
Former Siemens Facility															
A1 Depth Interval (Approximately 40 to 60 feet bgs)															
4-BP	0.2	0.22	0.2	0.53	0.42	5	0.2	0.53	0.314	0.152	48%	NA	Yes	--	--
IP-2	NA	<0.01	<0.005	0.011	< 0.0025	2	0.0051	0.011	0.00805	0.004	52%	0.0025 - 0.01	Yes, sample is ND	--	--
IP-3	NA	<0.01	0.00059	0.0054	< 0.00050	3	0.00059	0.0054	0.0032	0.002	76%	0.0005 - 0.01	Yes, sample is ND	--	--
VM-5S	NA	0.034	0.0048	0.016	0.099	5	0.0048	0.099	0.04136	0.037	90%	NA	No	Higher	191.2%
VM-6S	NA	0.64	0.88	1.4	0.83	6	0.6	1.4	0.852	0.289	34%	NA	Yes	--	--
VM-8S	0.25	0.26	0.27	0.26	0.24	6	0.24	0.27	0.258	0.012	5%	NA	No	Lower	< 35%
A3 Depth Interval (Approximately 70 or 74 to 90 feet bgs)															
G-1A	0.61	0.42	0.37	0.65	0.34	6	0.34	0.65	0.49	0.131	27%	NA	No	Lower	84%
SW-5S	0.0034	0.0008	0.031	0.037	0.074	5	0.0008	0.074	0.0292	0.030	102%	NA	No	Higher	100%
SW-6S	0.74	0.25	0.78	1.1	0.63	5	0.25	1.1	0.7	0.306	44%	NA	Yes	--	--
VM-2D	0.019	0.013	0.013	0.023	0.015	5	0.013	0.023	0.017	0.004	26%	NA	Yes	--	--
VM-8D	0.16	0.11	0.1	0.077	0.13	6	0.077	0.16	0.115	0.028	25%	NA	Yes	--	--
A4 Depth Interval (Approximately 90 to 120 feet bgs)															
3-XA	0.063	0.073	0.082	0.066	0.09	5	0.063	0.09	0.0748	0.011	15%	NA	No	Higher	< 35%
F-1A	0.13	0.21	0.38	0.11	0.32	5	0.11	0.38	0.23	0.118	51%	NA	Yes	--	--
H-2A-S	0.061	0.057	0.082	0.077	0.15	5	0.057	0.15	0.085	0.038	44%	NA	No	Lower	119%
H-XA-S	0.17	0.17	0.17	0.17	0.2	5	0.17	0.2	0.176	0.013	8%	NA	No	Higher	< 35%
LF-9A	0.08	0.074	0.077	0.072	0.068	5	0.068	0.08	0.0742	0.005	6%	NA	No	Lower	< 35%
A4 Depth Interval (Approximately 90 to 120 feet bgs)															
P-1A	0.0031	0.0074	0.0037	0.023	0.0071	4	0.0031	0.023	0.0102	0.009	87%	NA	Yes	--	--
W-21A	0.017	0.0069	0.038	0.039	0.037	5	0.0069	0.039	0.0276	0.015	53%	NA	Yes	--	--
W-22A	0.23	0.0038	0.33	0.52	0.6	5	0.0038	0.6	0.3368	0.237	70%	NA	No	Higher	< 35%
B Zone (Approximately 130-150 feet bgs)															
H-3B	0.0096	0.06	0.062	0.053	0.049	5	0.0096	0.062	0.0467	0.021	46%	NA	Yes	--	--
LF-3B	0.0015	0.0026	0.0026	0.0025	0.0022	5	0.0015	0.0026	0.0023	0.000	20%	NA	Yes	--	--
LF-5B	0.015	0.0021	0.021	0.023	0.035	5	0.0021	0.035	0.0192	0.012	63%	NA	No	Higher	52%
W-19B	0.032	0.03	0.048	0.051	0.033	5	0.022	0.051	0.037	0.012	32%	NA	Yes	--	--
W-20B	0.048	0.006	0.039	0.03	0.035	5	0.006	0.048	0.032	0.016	50%	NA	Yes	--	--

TABLE 3B

COMPARISON OF TCE CONCENTRATIONS IN OCTOBER, 2010 THROUGH 2014 [1,2]
Intersil/Siemens Site
Cupertino, California

All results in milligrams per liter (mg/L)

Well No.		Oct-10	Oct-11	Oct-12	Oct-13	Oct-14	Number of Detects	Minimum Detection	Maximum Detection	Average[1] (Detects)	Standard Deviation[1] (Detects)	Relative Standard Deviation[1] (Detects)	Range of Detection Limits (Non-Detects)	October 2014 Within 2010-2013 Range?	Reason if Not Within Range	Relative Percent Difference (RPD) if Out of Range[2]
Intersil/Siemens Off-Site Study Area																
A1 Depth Interval																
MW-OS-2A1		NA	NA	NA	NA	1.5	--	--	--	--	--	--	--	--	--	--
MW-OS-3A1		NA	NA	NA	NA	0.025	--	--	--	--	--	--	--	--	--	--
A3 Depth Interval																
MW-OS-2A3		NA	NA	NA	NA	0.091	--	--	--	--	--	--	--	--	--	--
MW-OS-3A3		NA	NA	NA	NA	0.086	--	--	--	--	--	--	--	--	--	--
MW-OS-4A3		NA	NA	NA	NA	<0.00050	--	--	--	--	--	--	--	--	--	--
MW-OS-5A3		NA	NA	NA	NA	0.015	--	--	--	--	--	--	--	--	--	--
A4 Depth Interval																
MW-OS-2A4		NA	NA	NA	NA	0.047	--	--	--	--	--	--	--	--	--	--
MW-OS-3A4		NA	NA	NA	NA	0.028	--	--	--	--	--	--	--	--	--	--
MW-OS-4A4		NA	NA	NA	NA	0.012	--	--	--	--	--	--	--	--	--	--
LF-8A		<0.0005	0.00077	<0.0005	0.00086	0.0013	3	0.00077	0.0013	0.0010	0.0003	29%	NA	No	Higher	151%
LS-1A		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0	<0.0005	<0.0005	<0.0005	--	--	<0.0005	Yes	--	--
QH-1A		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0	<0.0005	<0.0005	<0.0005	--	--	<0.0005	Yes	--	--
S-1A		0.060	0.049	0.036	0.049	0.0089	5	0.0089	0.06	0.04058	0.020	48%	NA	No	Lower	18%
B Zone																
IQ-1B		0.0052	<0.0005	<0.0005	<0.0005	<0.0005	1	0.0052	0.0052	0.0052	--	--	<0.0005	Yes	--	--
KR-1B		0.062	0.052	0.047	0.050	0.019	5	0.019	0.062	0.046	0.016	35%	NA	No	Lower	31%
LS-2B		0.0047	0.0043	0.0029	0.0034	0.0045	5	0.0029	0.0047	0.0040	0.001	20%	NA	Yes	--	--
LS-2B	Dup	0.0049	0.0045	0.0028	0.0033	0.0024	5	0.0024	0.0049	0.0036	0.001	30%	NA	No	Lower	49%
PG-1B		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0	<0.0005	<0.0005	<0.0005	--	--	<0.0005	Yes	--	--
PL-1B		0.017	0.020	0.017	0.016	0.014	5	0.014	0.02	0.0168	0.002	13%	NA	Yes	--	--
RK-1B		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0	<0.0005	<0.0005	<0.0005	--	--	<0.0005	Yes	--	--
S-3B		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0	<0.0005	<0.0005	<0.0005	--	--	<0.0005	Yes	--	--
S-5B		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0	<0.0005	<0.0005	<0.0005	--	--	<0.0005	No	--	--
C Zone																
LR-3C		0.006	0.0065	0.0056	0.0052	0.0017	5	0.0017	0.0065	0.005	0.002	38%	NA	No	Lower	26%
RK-2C		0.0037	0.0007	0.00062	0.0016	0.0019	5	0.00062	0.0037	0.0017	0.001	73%	NA	Yes	--	--
S-4C		0.0012	0.0011	0.00072	0.00093	0.0012	5	0.00072	0.0012	0.0010	0.0002	20%	NA	Yes	--	--

Notes

1. Samples were analyzed by TestAmerica of Pleasanton, California, unless otherwise noted. Samples were analyzed using EPA Method 8260B for EPA 8010 analyte list compounds.
2. Samples were collected using the following methods: low-flow method in 2012 and 2013 and HydraSleeve in 2014 at the Former Intersil Facility and Off-Site Study Area; Kabis in 2010 and 2013 and HydraSleeve in 2014 at the former Siemens facility.
3. Samples were collected at IP-1, -2 and -3 (1" piezometers) using a bailer; and from the extraction wells via the groundwater sampling port at each wellhead.

[1] Average, standard deviation and coefficient of variation were calculated using detects only.

[2] Relative percent difference of October 2014 detected value to maximum detected value in 2010-2013

Abbreviations

"<" indicates not detected above indicated detection limit
* = Active groundwater extraction well
bgs = below ground surface
Dup = Duplicate sample
NA = Not analyzed or not applicable
RPD = Relative percent difference
TCE = Trichloroethene

TABLE 4

SUMMARY OF SAMPLING QA/QC
JANUARY THROUGH DECEMBER 2014
Former Intersil Facility
Cupertino, California

QA/QC Criterion	Criterion Met?
Chain-of-custody forms completed for all samples?	Yes
Field parameters stabilize prior to taking sample?	NA
Zero headspace in sample containers?	Yes
Samples preserved according to analytical method?	Yes
Required field QA/QC samples collected?	Yes

Notes
QA/QC = Quality Assurance/Quality Control
NA = Not applicable

TABLE 5

SUMMARY OF ANALYTICAL QA/QC
JANUARY THROUGH DECEMBER 2014

Former Intersil Facility
Cupertino, California

Laboratory Information	April and October 2013
Lab Name:	TestAmerica
Lab Address:	1220 Quarry Lane Pleasanton, California 94566-4756
Lab Contact:	Afsaneh Salimpour
Lab Phone Number:	(925) 484-1919
Analytical Method:	U.S. EPA Method 8260B

QA/QC Criterion	Criterion Met?
Is lab state-certified for above analytical methods?	Yes
Analyses performed according to standard methods?	Yes
Sample holding times met?	Yes
Analytical results reported for all values above MDL?	Yes
QA/QC analyses run consistent with analytical methods?	Yes
Samples preserved according to analytical method?	Yes
QA/QC results meet all acceptance criteria?	Yes
QA/QC results and acceptance criteria on file?	Yes

Notes
QA/QC = Quality Assurance/Quality Control
MDL = Maximum Detectable Limit

TABLE 6

SUMMARY OF SYSTEM FLOW RATES, VOLUME EXTRACTED, AND VOC MASS REMOVED

Intersil/Siemens Site
Cupertino, California

	January–March	April–June	July–September	October–December
Former Intersil Facility Groundwater Extraction and Treatment System[1]				
Average Quarterly Flow Rate (gallons per minute)	39.0	38.9	34.6	30.4
Total Volume Extracted (gallons)	5,392,800	5,092,300	4,354,400	4,038,700
Estimated VOC Mass Removed (pounds)	2.29	2.17	1.86	1.86
Former Siemens Facility Groundwater Extraction and Treatment System[2]				
Average Quarterly Flow Rate (gallons per minute)	99	87	85	59
Total Volume Extracted (gallons)	12,886,875	10,430,437	9,210,928	6,071,273
Estimated VOC Mass Removed (pounds)[4]	11.7	9.5	7.0	5.6
Off-Site Study Area Groundwater Extraction and Treatment System[3]				
Average Quarterly Flow Rate (gallons per minute)	57	50	56	41
Total Volume Extracted (gallons)	7,334,125	5,967,821	6,042,651	4,269,671
Estimated VOC Mass Removed (pounds)[5]	4.4	3.7	3.3	2.0

Notes

1. Former Intersil facility groundwater extraction and treatment system included extraction wells E9AR, W10A, W12A, and W18MA.
2. Former Siemens facility groundwater extraction and treatment system includes on-site extraction wells 2EP, 2EPa, H-1A, H-5B, LF-6A, LF-12A, EX-1-RL, and SW-7.
3. Off-Site Study Area groundwater extraction system includes wells LR-1B and LQ-2B.
4. VOC mass removed from the former Siemens facility is calculated by subtracting the VOC mass removed from the Off-Site Study Area from the total mass removed by the treatment system. The total mass removed by the treatment system is calculated using the influent VOC concentrations and the total combined volume of groundwater extracted from the on-site and off-site extraction wells.
5. VOC mass removed from the Off-site Study Area is calculated by using VOC concentrations and groundwater extraction volume for the individual off-site wells.

Abbreviations

VOC = volatile organic compounds

TABLE 7

SUMMARY OF SAMPLING QA/QC
JANUARY THROUGH DECEMBER 2014

Former Siemens Facility
Cupertino, California

Site Name:	Site Address:	Monitoring Period Covered:
Former Siemens Facility	19000 E. Homestead Road, Cupertino, California	January through December 2014
Sampling performed by: Daniel Allen Firm name: Blaine Tech Services, Inc. on behalf of ERM West Firm address: 1277 Treat Blvd., Ste. 500, Walnut Creek, CA 94597 Firm contact: Kit Soo Firm phone number: (925) 482-3260		
Were chain-of-custody forms completed for all samples?		☑ Yes ☐ No
Were field parameters stabilized prior to taking sample?		☑ Yes ☐ No
For VOC samples, was there zero head space in sample containers?		☑ Yes ☐ No
Were samples preserved according to analytical method?		☑ Yes ☐ No
For any questions above answered with "No", please provide an explanation:		

Data entered by AS. QA/QC by KS.

TABLE 8

SUMMARY OF ANALYTICAL QA/QC
JANUARY THROUGH DECEMBER 2014
Former Siemens Facility
Cupertino, California

Site Name:	Site Address:	Monitoring Period Covered:
Former Siemens Facility	19000 E. Homestead Road, Cupertino, California	January to December, 2014

Lab name: Test America
Lab address: 1220 Quarry Lane, Pleasanton, California 94566
Lab contact: Micah Smith
Lab phone number: (925) 484-1919

Analytical method used: (check applicable methods)

- ☐ Total Dissolved Solids by EPA Method 360.1
- ☐ Bioassay 96-hr % survival by Standard Method
- ☐ Turbidity (NTU)
- ☐ Dissolved Oxygen (mg/l and % saturation) by Standard Method
- ☐ Ammonia as Nitrogen by EPA 350.2/.3
- ☐ Unionized Ammonia as Nitrogen
- ☐ Hardness (mg/l CaCO3) by EPA Method SM 2340B
- ☐ Arsenic by EPA Method 6010B
- ☐ Cadmium by EPA Method 6010B
- ☐ Chromium (total) by EPA Method 6010B
- ☐ Chromium (hexavalent) EPA Method __________
- ☐ Copper by EPA Method 6010B
- ☐ Lead by EPA Method 6010B
- ☐ Mercury by EPA Method 7470A
- ☐ Nickel by EPA Method 6010B
- ☐ Selenium by EPA Method 6010B
- ☐ Silver by EPA Method 6010B
- ☐ Zinc by EPA Method 6010B
- ☐ Halogenated Volatile Organics by EPA Method 601 or 8010 or H8021 or 8260
- ☐ Aromatic and Unsaturated Volatile Organics by EPA 602
- ☑ Volatile Organics by EPA Method 8260B
- ☐ Semivolatile Organics by EPA Method 625 or 8270
- ☐ EDB and DBCP by EPA Method 504
- ☐ Alcohols and Glycols by EPA Method 8015 modified
- ☐ TPH gasoline by EPA Method 8015 modified
- ☐ TPH diesel by EPA Method 8015 modified
- ☐ Chlorinated Hydrocarbons by EPA Method 8260A
- ☐ Methanol, IPA, and ethylene glycol by EPA Method 8015 modified Ethylene Glycol Only

Question	Yes	No
Is the lab state-certified for the above analytical method(s)?	☑ Yes	☐ No
Was analysis performed according to standard methods?	☑ Yes	☐ No
Were sample holding times met?	☑ Yes	☐ No
Were all reported analytical results values above MDLs?	☑ Yes	☐ No
Were QA/QC samples (i.e. blanks, field replicates, spikes, and surrogates) analyzed in accordance and consistent with the analytical method?	☑ Yes	☐ No
Did QA/QC results meet all acceptance criteria?	☑ Yes	☐ No
Are QA/QC results and acceptance criteria on file?	☑ Yes	☐ No

For any questions above answered with "No", please provide an explanation: *

Data entered by AS. QA/QC by IL/KS

*The explanation should describe any modifications to standard methods and whether approved by RWQCB staff, and describe corrective actions taken in response to any QA/QC results that fall outside acceptance criteria.

TABLE 9

SUMMARY OF SAMPLING QA/QC
JANUARY THROUGH DECEMBER 2014
Intersil/Siemens Off-Site Study Area
Cupertino, California

QA/QC Criterion	Criterion Met?
Chain-of-custody forms completed for all samples?	Yes
Field parameters stabilize prior to taking sample?	NA
Zero headspace in sample containers?	Yes
Samples preserved according to analytical method?	Yes
Required field QA/QC samples taken?	Yes

Notes
QA/QC = Quality Assurance/Quality Control
NA = Not applicable

TABLE 10

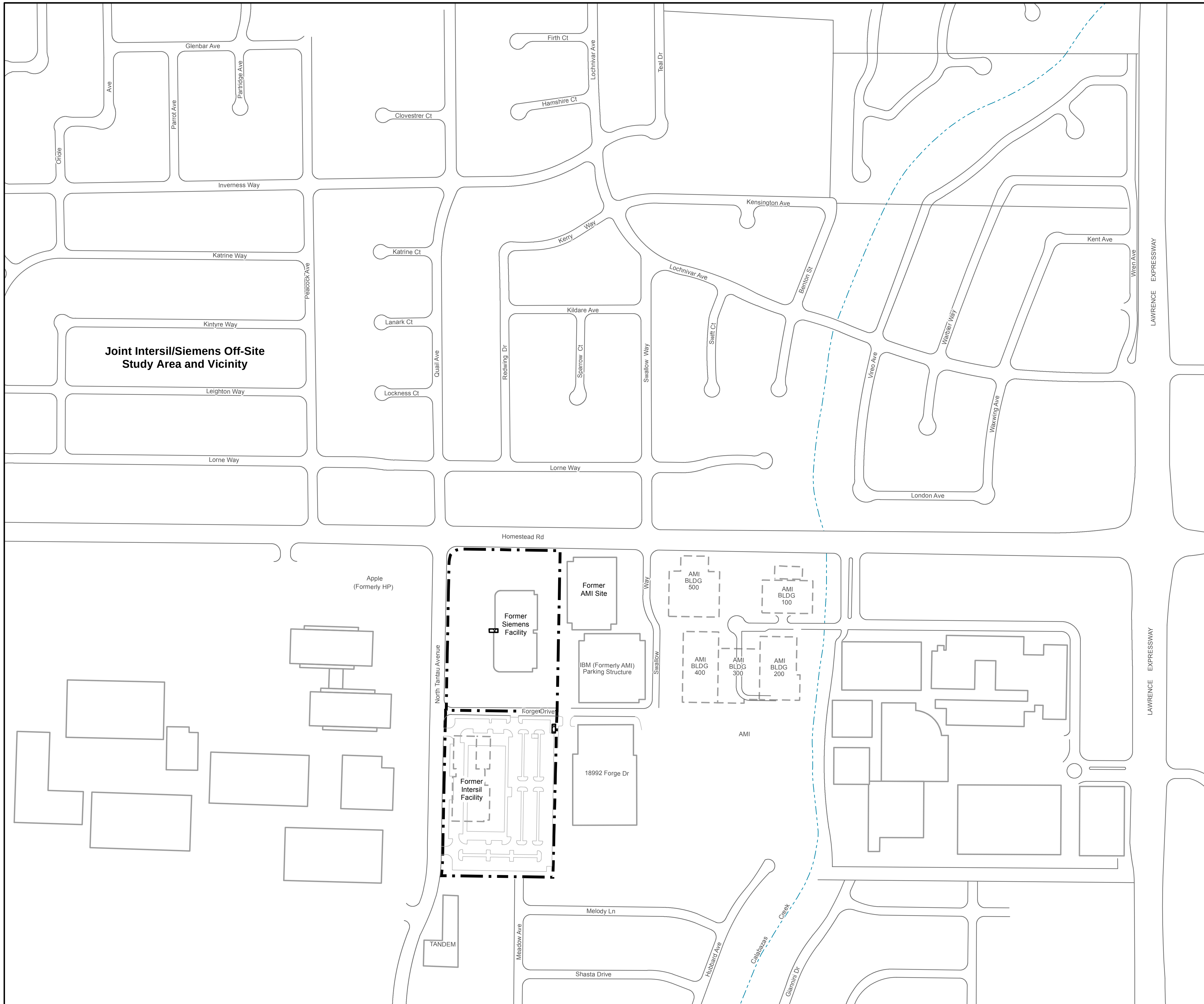
SUMMARY OF ANALYTICAL QA/QC
JANUARY THROUGH DECEMBER 2014
Intersil/Siemens Off-Site Study Area
Cupertino, California

Laboratory Information	April and October 2014
Lab Name:	TestAmerica
Lab Address:	1220 Quarry Lane Pleasanton, California 94566-4756
Lab Contact:	Afsaneh Salimpour
Lab Phone Number:	(925) 484-1919
Analytical Method:	U.S. EPA Method 8260B/8010

QA/QC Criterion	Criterion Met?
Is lab state-certified for above analytical methods?	Yes
Analyses performed according to standard methods?	Yes
Sample holding times met?	Yes
Analytical results reported for all values above MDL?	Yes
QA/QC analyses run consistent with analytical methods?	Yes
Samples preserved according to analytical method?	Yes
QA/QC results meet all acceptance criteria?	Yes
QA/QC results and acceptance criteria on file?	Yes

Notes
QA/QC = Quality Assurance/Quality Control
MDL = Maximum Detectable Limit

FIGURES



EXPLANATION

- Groundwater treatment system
- Property boundary
- Existing building
- Demolished building

N

0 400

APPROXIMATE SCALE IN FEET

SITE LOCATION
Intersil/Siemens Site
Cupertino, California

amec foster wheeler

Figure 1

Date: 01/12/2015 | Project No. OD11161050.14B

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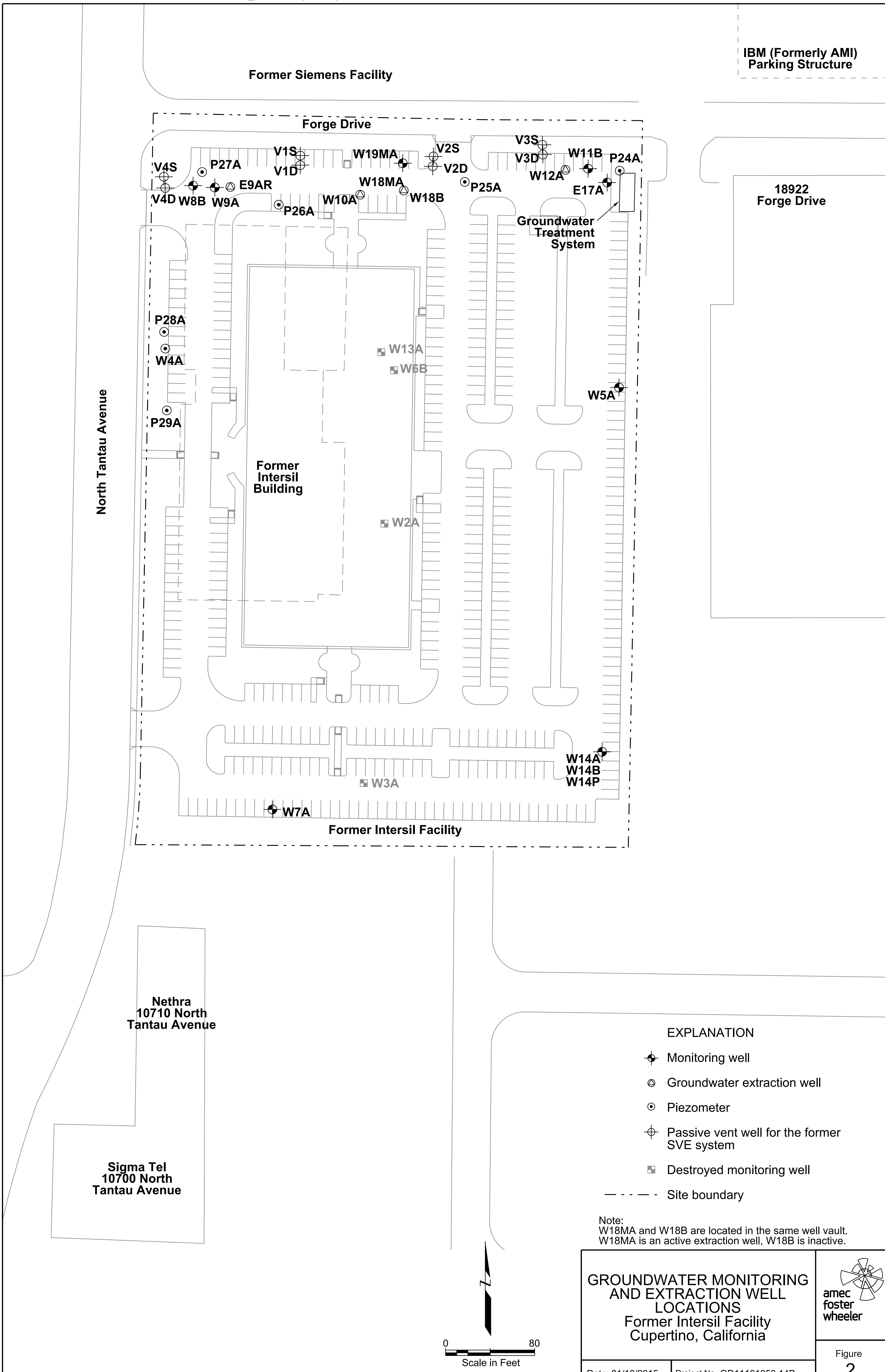

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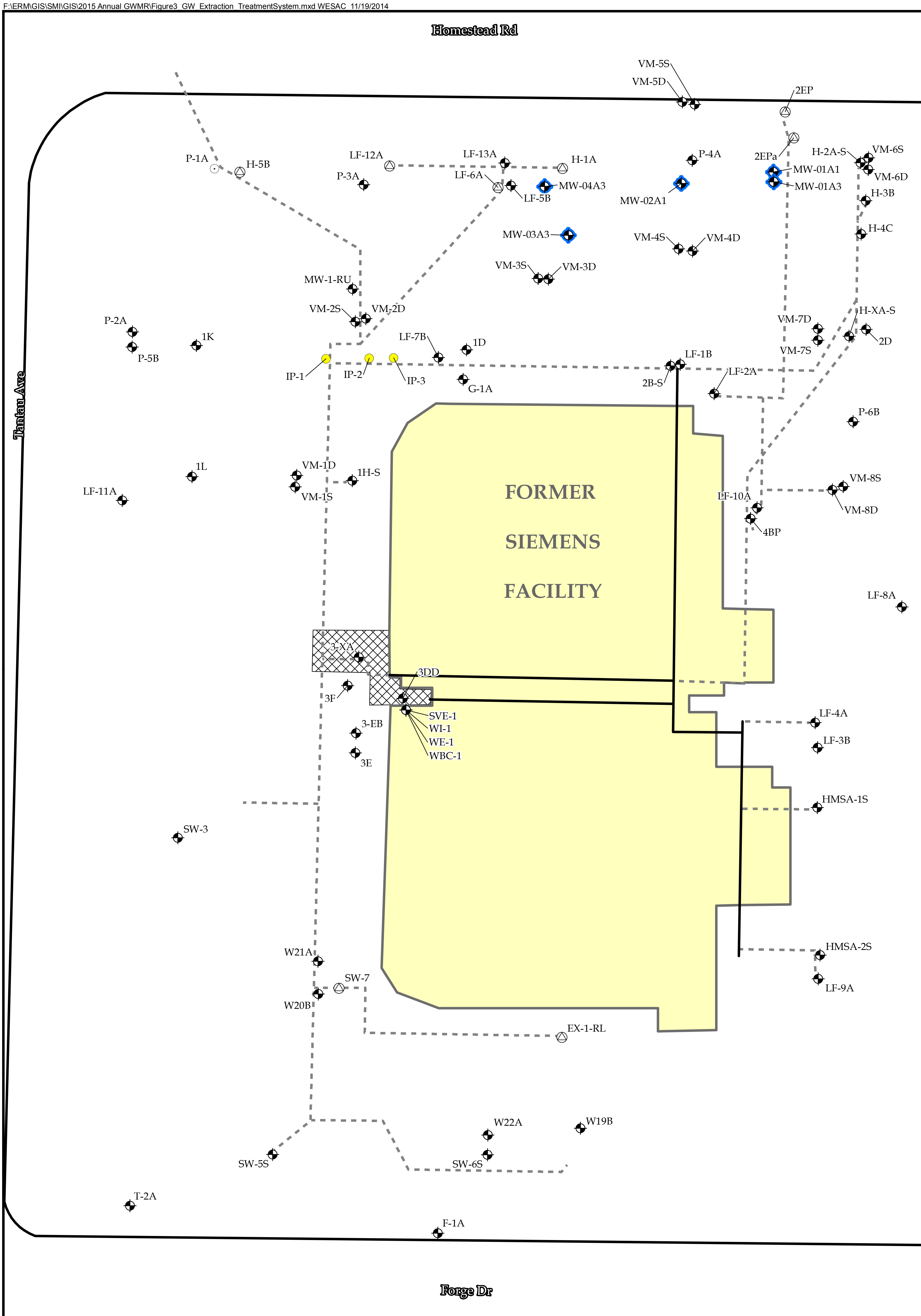


Legend

- Monitoring Well Installed August 2014
- Groundwater Extraction Well
- Injection Point
- Monitoring Well
- Piezometer
- Existing Buildings
- Groundwater Remediation Facility
- Approximate Location of Aboveground Utility
- Approximate Location of Underground Utility
- City Block

Source: ARCADIS, Former Siemens Facility
2006 Annual Report: Figure 3 (dated 1/7/2010).

N

0 25 50

Scale in Feet

SMI Holding, LLC
Cupertino, CA

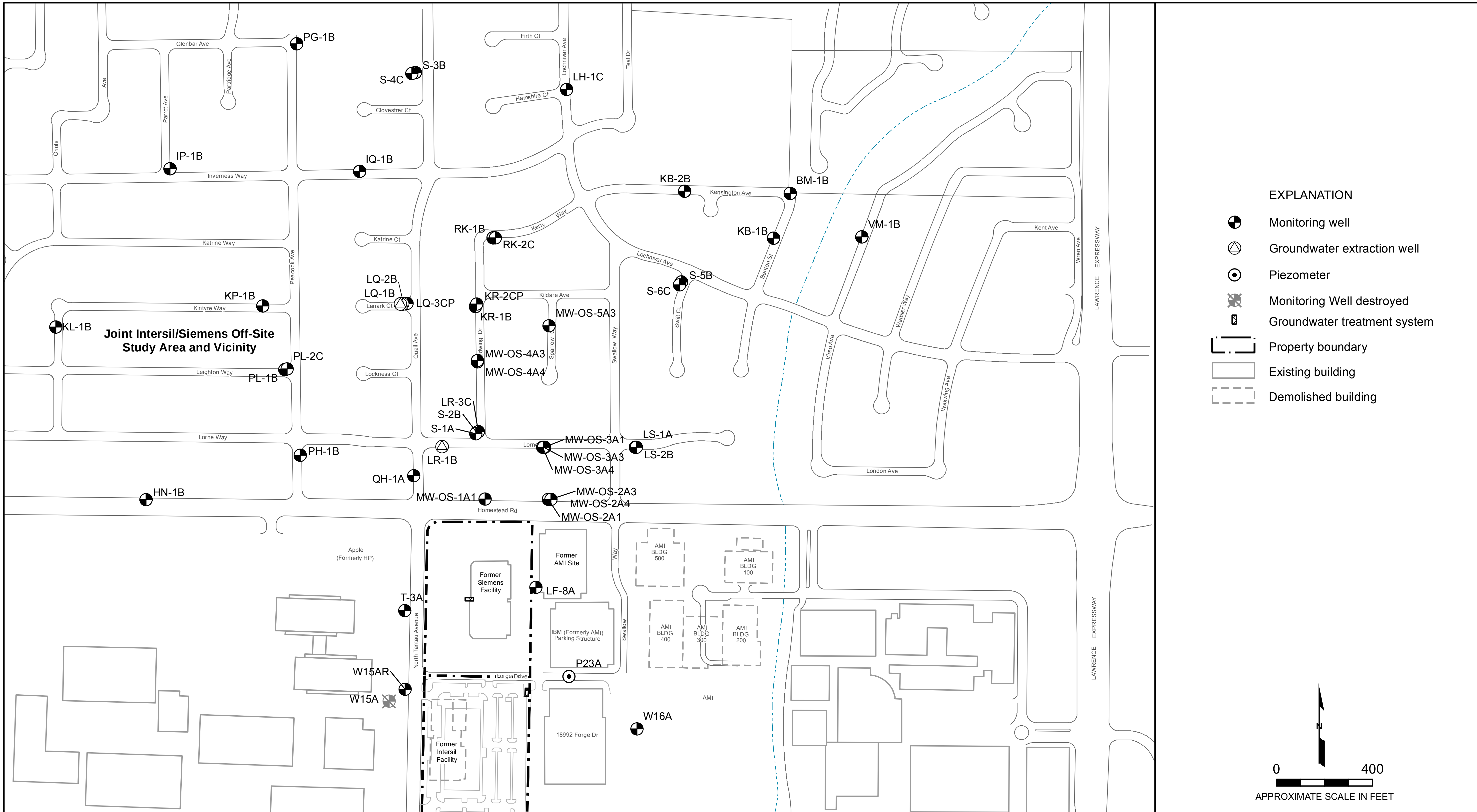
FIGURE 3

GROUNDWATER MONITORING
WELLS, EXTRACTION WELLS, AND
TREATMENT SYSTEM LOCATIONS

ERM

PREPARED BY:
austin.phelps

JOB NO. 0201040.04SB
FILE: Figure3_GW_Extraction_TreatmentSystem



GROUNDWATER MONITORING AND EXTRACTION WELL LOCATIONS, OFF-SITE STUDY AREA
Intersil/Siemens Site
Cupertino, California

amec foster wheeler

Figure 4

Date: 01/12/2015 | Project No. OD11161050.14B

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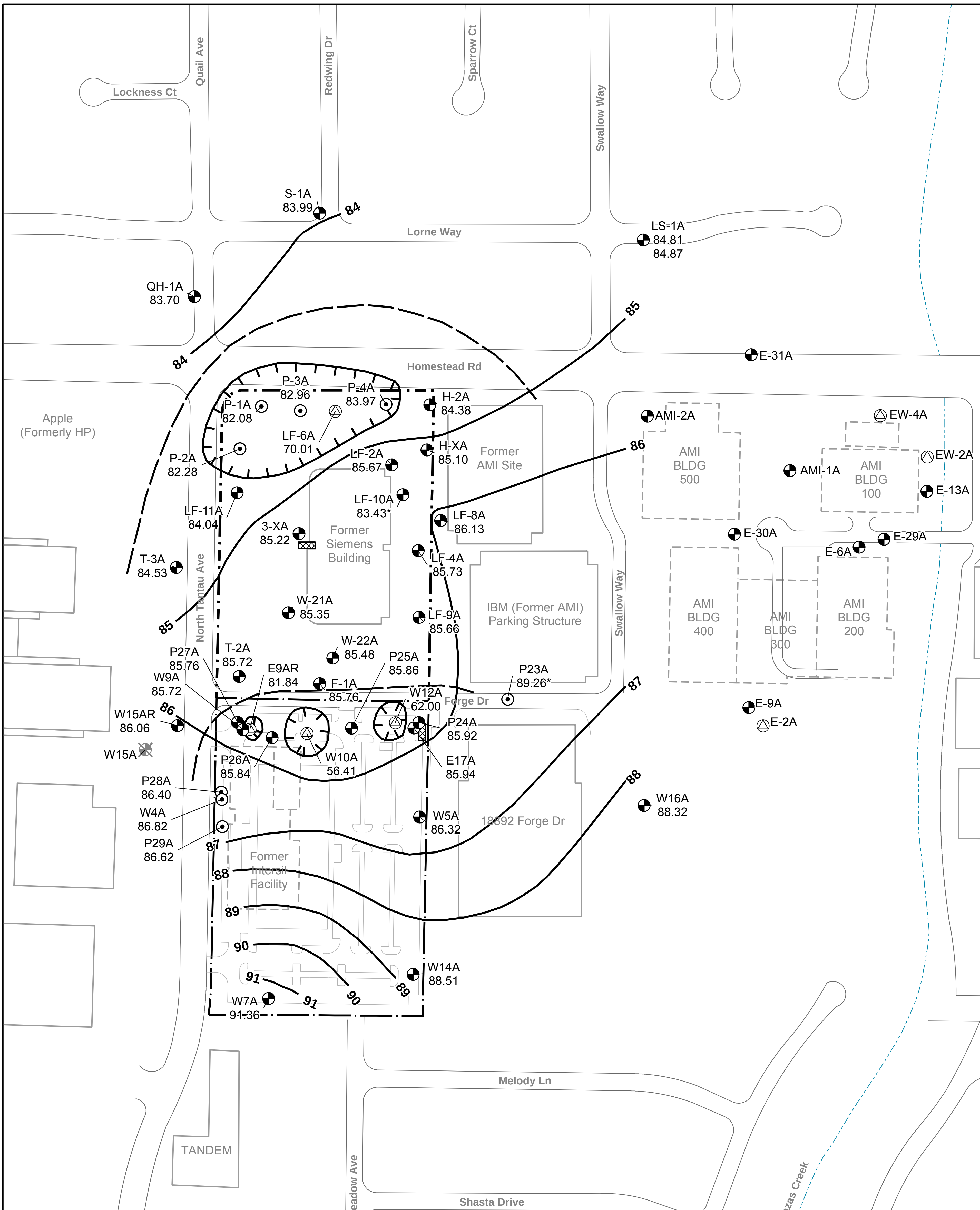


EXPLANATION

- 84 — Groundwater elevation contour (dashed where uncertain)
- Depression in groundwater surface
- Estimated capture zone
- 83.70 — Groundwater elevation (feet relative to mean sea level)
- Monitoring well
- Monitoring well destroyed
- Groundwater extraction well
- Piezometer
- Groundwater treatment system
- Property boundary
- Existing building
- Demolished building

Notes:

NM Not measured

* Data not used in contouring

1. Groundwater elevation contours for the A4 depth interval are based only on wells screened in the lower interval (approximately 90 to 120 feet below ground surface).
2. Groundwater elevation data for the American Microsystems, Inc. (AMI) site wells (shown on this figure without data) are presented in AMI's respective self-monitoring report.
3. Data Sources: Wells located at the former Siemens facility measured by ERM, and wells located at the off-site study area and the former Intersil facility measured by AMEC.

N

0 200

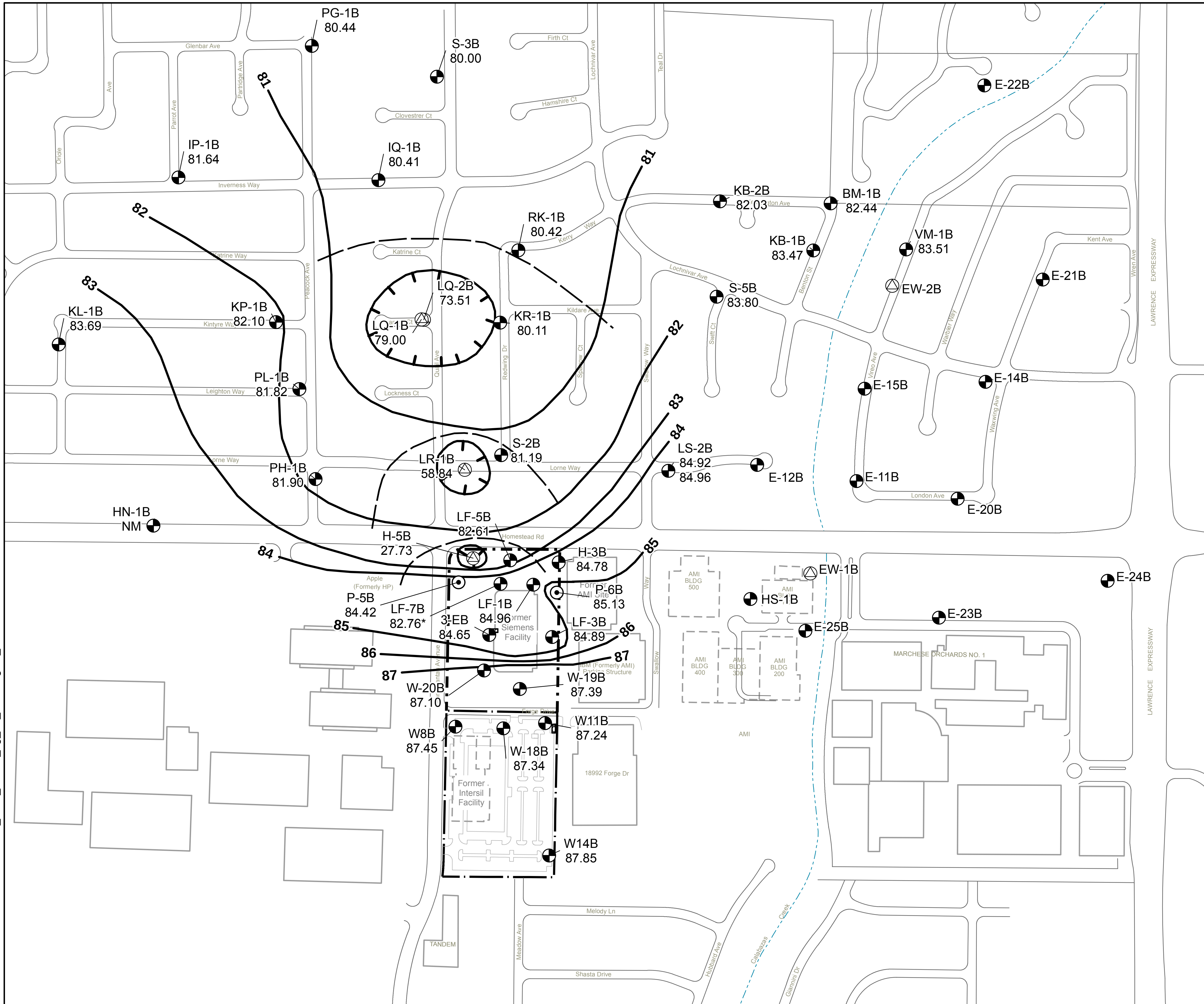
APPROXIMATE SCALE IN FEET

A4 DEPTH INTERVAL
GROUNDWATER ELEVATION
CONTOURS, JANUARY 13, 2014
Intersil/Siemens Site
Cupertino, California

amec foster wheeler

Date: 01/12/2015 | Project No. OD11161050.14B

Figure 5



EXPLANATION

- **80** Groundwater elevation contour
- Depression in groundwater surface
- Estimated capture zone
- 82.44 Groundwater elevation (feet relative to mean sea level)
- Monitoring well
- Groundwater extraction well
- Piezometer
- Groundwater treatment system
- Property boundary
- Existing building
- Demolished building

Notes:

NM Not measured

* Data not used in contouring

1. Groundwater elevation data for the American Microsystems, Inc. (AMI) site wells (shown on this figure without data) are presented in AMI's respective self-monitoring report.
2. Data Sources: Wells located at the former Siemens facility measured by ERM, and wells located at the off-site study area and the former Intersil facility measured by AMEC.

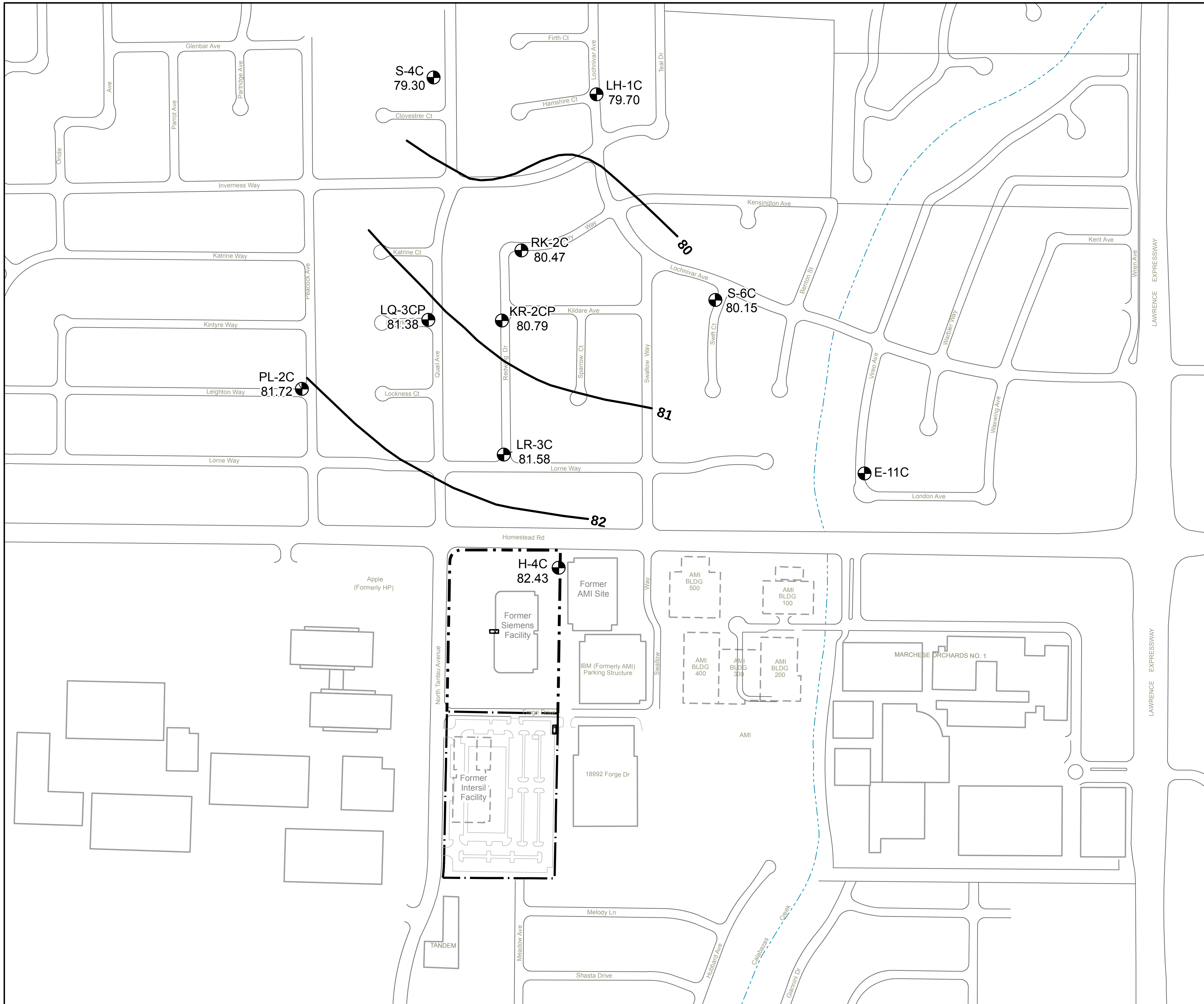
B-ZONE AQUIFER
GROUNDWATER ELEVATION
CONTOURS, JANUARY 13, 2014
Intersil/Siemens Site
Cupertino, California

amec foster wheeler

Figure 6

Date: 01/12/2015 | Project No. OD11161050.14B

S:\OD11161050\161050.14B.00\114_1114_AR14_fig_06_Bzone-gwe_Jan2014.mxd



EXPLANATION

- 80 — Groundwater elevation contour
- Depression in groundwater surface
- Estimated capture zone
- 79.30 — Groundwater elevation (feet relative to mean sea level)
- Monitoring well
- Groundwater treatment system
- Property boundary
- Existing building
- Demolished building

Notes:

1. Groundwater elevation data for the American Microsystems, Inc. (AMI) site wells (shown on this figure without data) are presented in AMI's respective self-monitoring report.
2. Data Sources: Wells located at the former Siemens facility measured by ERM, and wells located at the off-site study area and the former Intersil facility measured by AMEC.

0 400
APPROXIMATE SCALE IN FEET

C-ZONE AQUIFER
GROUNDWATER ELEVATION
CONTOURS, JANUARY 13, 2014
Intersil/Siemens Site
Cupertino, California

amec foster wheeler

Figure 7

Date: 01/12/2015 | Project No. OD11161050.14B

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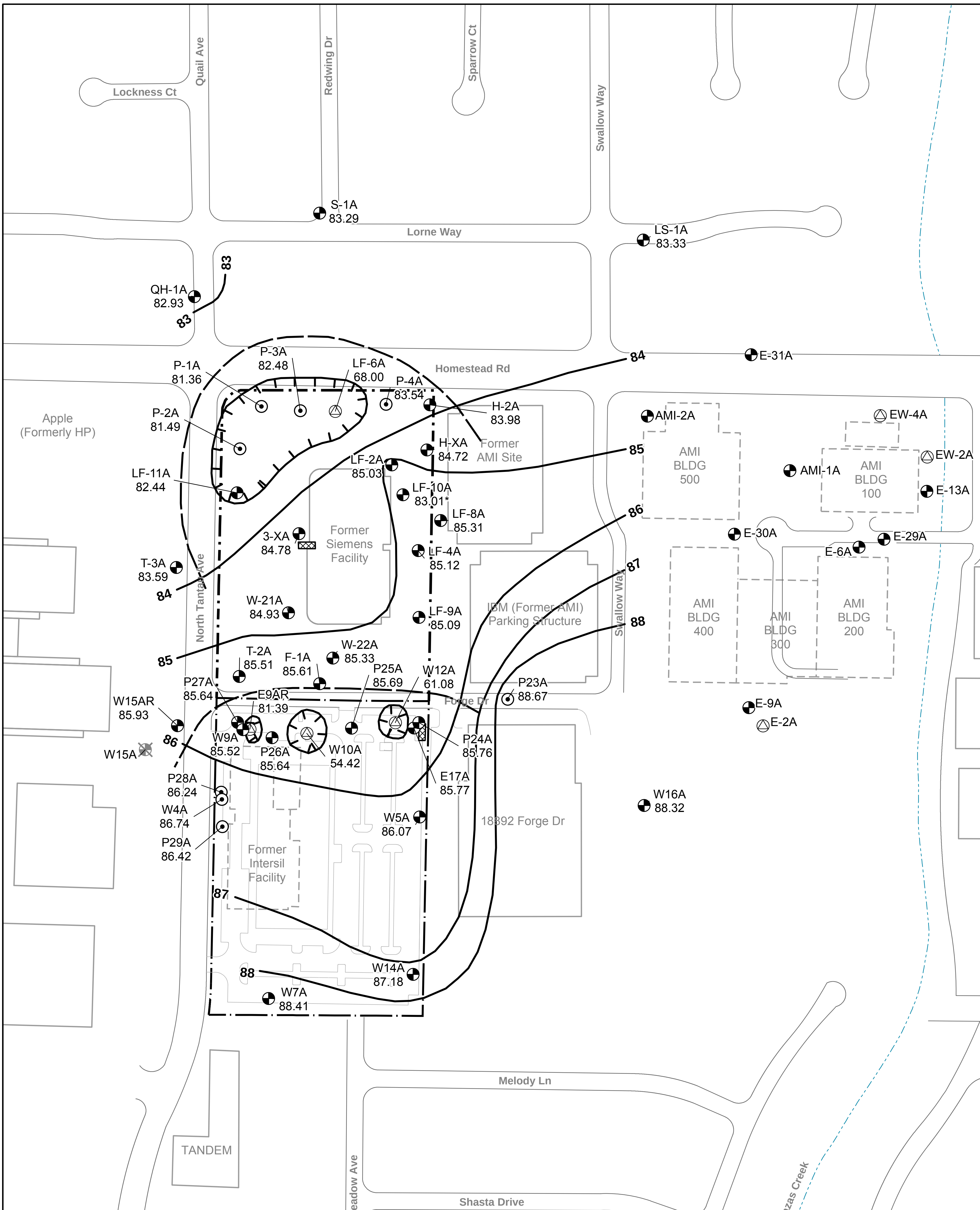
S:\OD11\161050\161050.14B.001\14_1114_AR14_fig_08_A4zone-gwe_Apr2014.mxd



EXPLANATION

88 — Groundwater elevation contour (dashed where uncertain)

Depression in groundwater surface

Estimated capture zone

88.41 Groundwater elevation (feet relative to mean sea level)

Monitoring well

Monitoring well destroyed

Groundwater extraction well

Piezometer

Groundwater treatment system

Property boundary

Existing building

Demolished building

Notes:

NM Not measured

* Data not used in contouring

1. Groundwater elevation contours for the A4 depth interval are based only on wells screened in the lower interval (approximately 90 to 120 feet below ground surface).

2. Groundwater elevation data for the American Microsystems, Inc. (AMI) site wells (shown on this figure without data) are presented in AMI's respective self-monitoring report.

3. Data Sources: Wells located at the former Siemens facility measured by ERM, and wells located at the off-site study area and the former Intersil facility measured by AMEC.

N

0 200

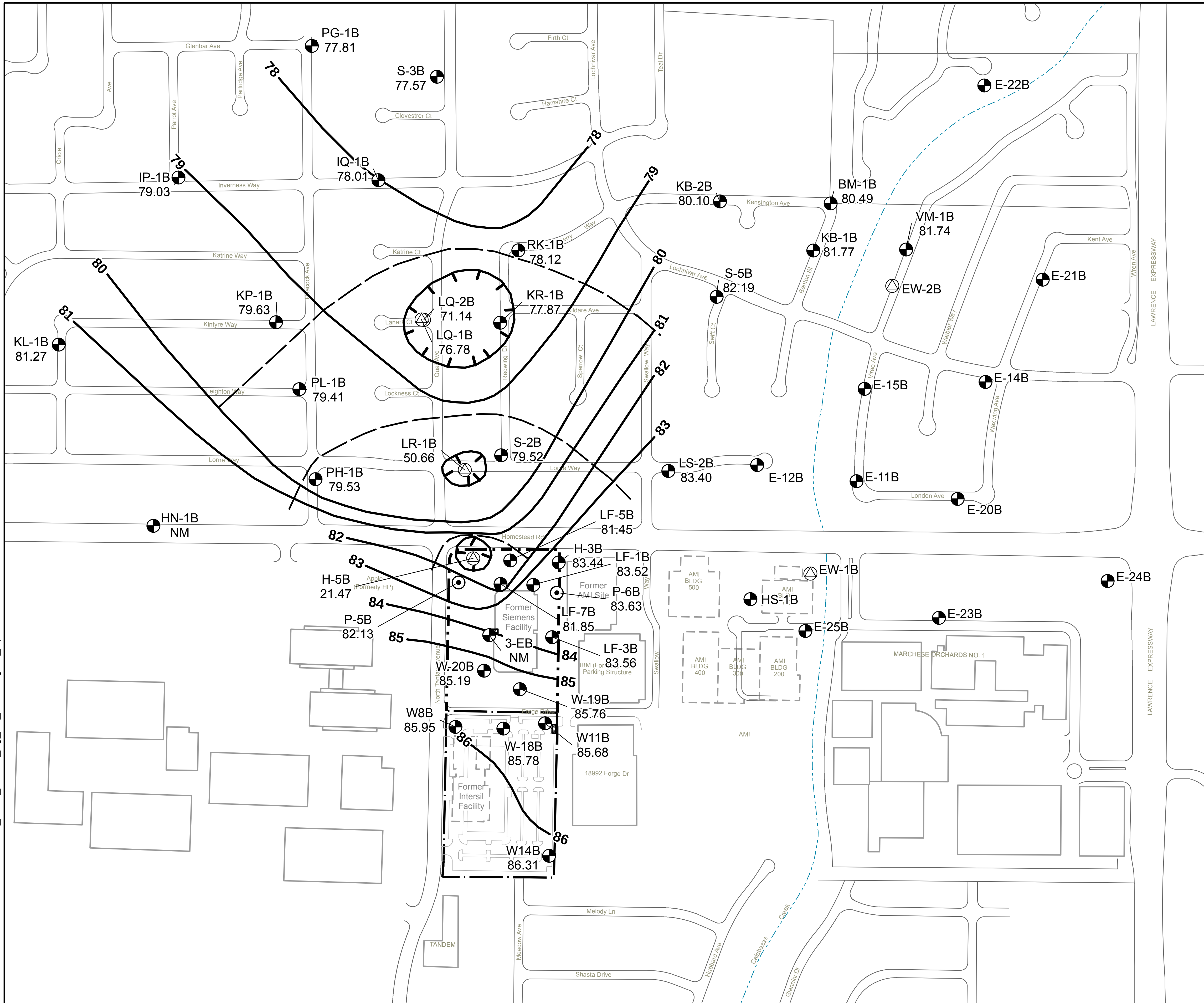
APPROXIMATE SCALE IN FEET

A4 DEPTH INTERVAL GROUNDWATER ELEVATION CONTOURS, APRIL 14, 2014
Intersil/Siemens Site
Cupertino, California

amec foster wheeler

Date: 01/12/2015 | Project No. OD11161050.14B

Figure 8



EXPLANATION

- **86** — Groundwater elevation contour
- Depression in groundwater surface
- Estimated capture zone
- 86.31 — Groundwater elevation (feet relative to mean sea level)
- Monitoring well
- Groundwater extraction well
- Piezometer
- Groundwater treatment system
- Property boundary
- Existing building
- Demolished building

Notes:

NM Not measured

1. Groundwater elevation data for the American Microsystems, Inc. (AMI) site wells (shown on this figure without data) are presented in AMI's respective self-monitoring report.
2. Data Sources: Wells located at the former Siemens facility measured by ERM, and wells located at the off-site study area and the former Intersil facility measured by AMEC.

0 400
APPROXIMATE SCALE IN FEET

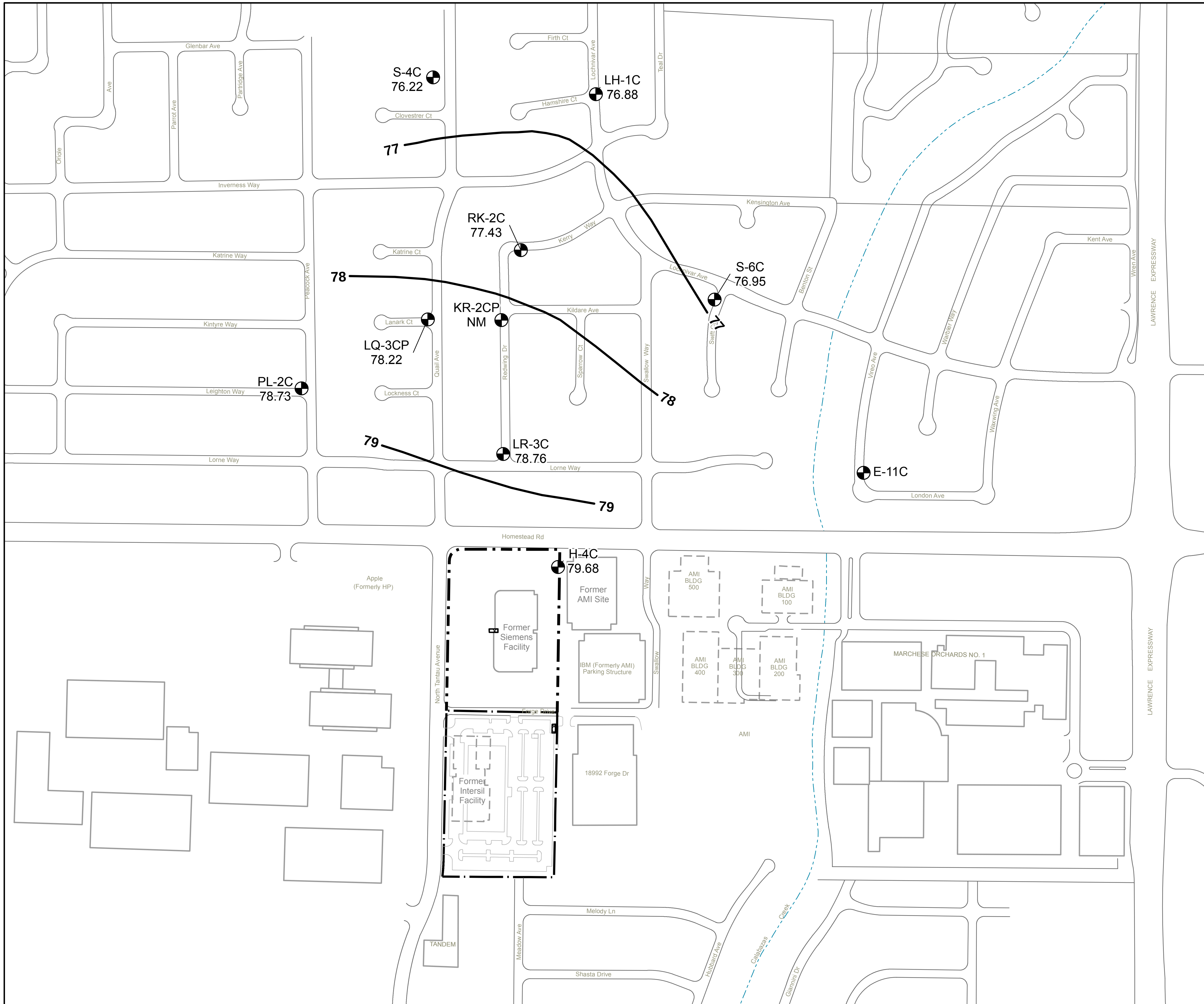
B-ZONE AQUIFER
GROUNDWATER ELEVATION
CONTOURS, APRIL 14, 2014
Intersil/Siemens Site
Cupertino, California

amec foster wheeler

Figure 9

Date: 01/12/2015 | Project No. OD11161050.14B

S:\OD11161050\161050.14B.00114_1114_AR14_fig_09_Bzone-gwe_Apr2014.mxd



EXPLANATION

77 — Groundwater elevation contour

Depression in groundwater surface

Estimated capture zone

77.43 Groundwater elevation (feet relative to mean sea level)

Monitoring well

Groundwater treatment system

Property boundary

Existing building

Demolished building

Notes:

NM Not measured

1. Groundwater elevation data for the American Microsystems, Inc. (AMI) site wells (shown on this figure without data) are presented in AMI's respective self-monitoring report.
2. Data Sources: Wells located at the former Siemens facility measured by ERM, and wells located at the off-site study area and the former Intersil facility measured by AMEC.

0 400

APPROXIMATE SCALE IN FEET

C-ZONE AQUIFER
GROUNDWATER ELEVATION
CONTOURS, APRIL 14, 2014
Intersil/Siemens Site
Cupertino, California

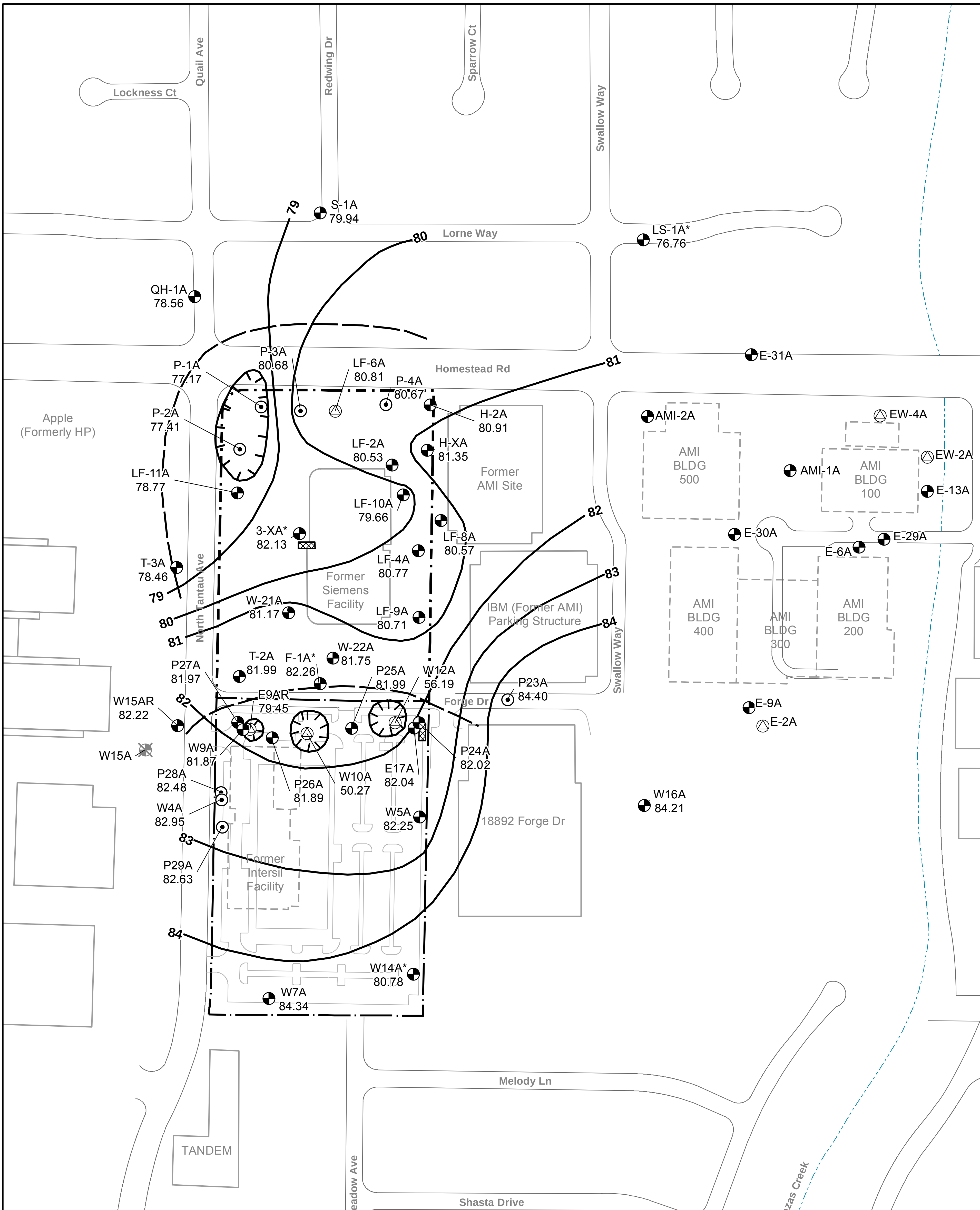
amec foster wheeler

Figure 10

Date: 01/12/2015 | Project No. OD11161050.14B

S:\OD11\161050\161050.14B.00114_1114_AR14_fig_10_Czone-gwe_Apr2014.mxd

S:\OD11\161050\161050.14B.001\14_1114_AR14_fig_11_A4zone-gwe_July2014.mxd



EXPLANATION

82 — Groundwater elevation contour (dashed where uncertain)

Depression in groundwater surface

Estimated capture zone

82.95 Groundwater elevation (feet relative to mean sea level)

Monitoring well

Monitoring well destroyed

Groundwater extraction well

Piezometer

Groundwater treatment system

Property boundary

Existing building

Demolished building

Notes:

* Data not used in contouring

1. Groundwater elevation contours for the A4 depth interval are based only on wells screened in the lower interval (approximately 90 to 120 feet below ground surface).

2. Groundwater elevation data for the American Microsystems, Inc. (AMI) site wells (shown on this figure without data) are presented in AMI's respective self-monitoring report.

3. Data Sources: Wells located at the former Siemens facility measured by ERM, and wells located at the off-site study area and the former Intersil facility measured by AMEC.

4. LF-6A was off-line during measurement of water levels, due to pump maintenance activities. As a result, the capture zone depicted on this figure is not consistent with typical site conditions when LF-6A is pumping.

N

0 200

APPROXIMATE SCALE IN FEET

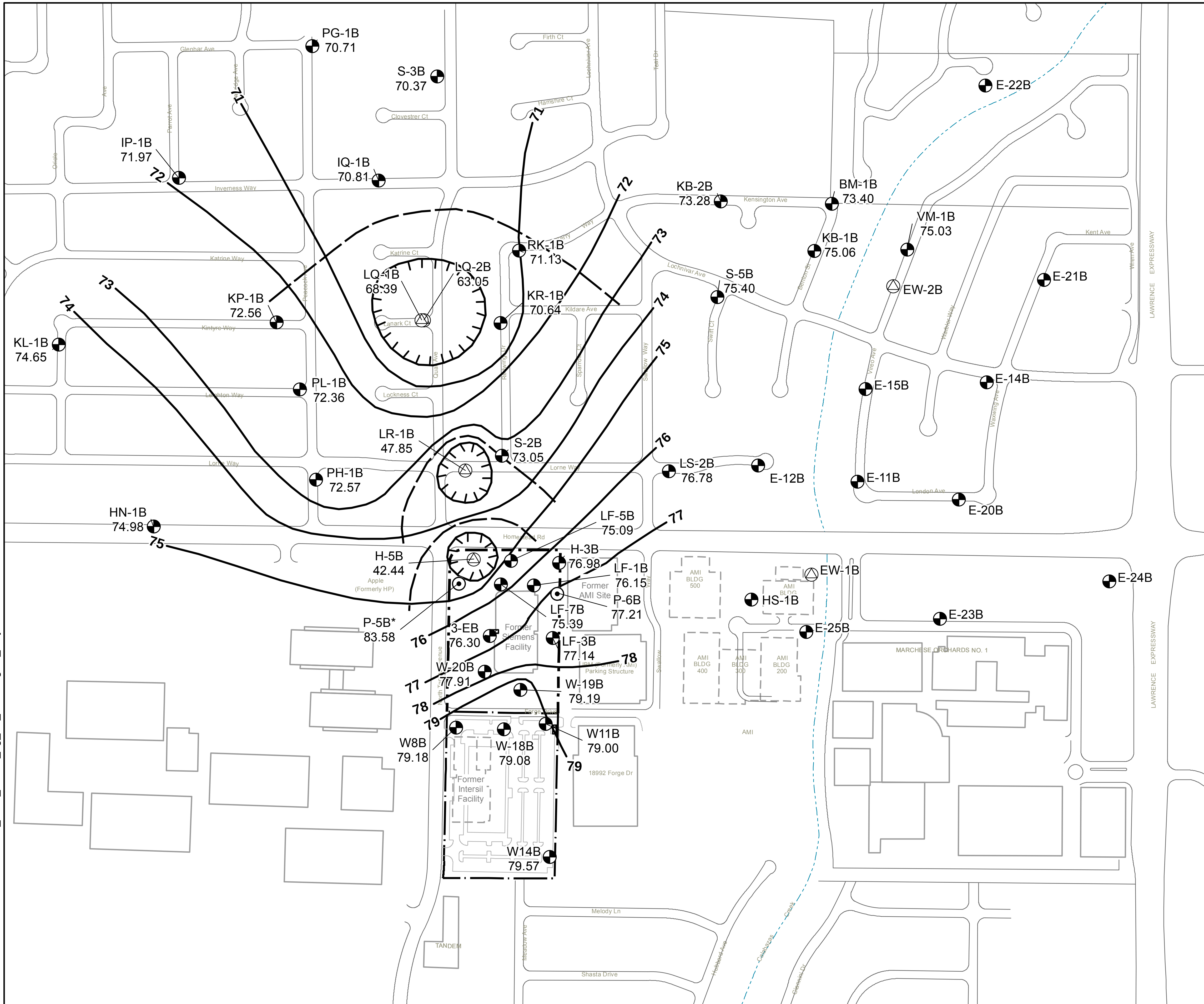
A4 DEPTH INTERVAL
GROUNDWATER ELEVATION
CONTOURS, JULY 14, 2014
Intersil/Siemens Site
Cupertino, California

amec foster wheeler

Date: 01/12/2015

Project No. OD11161050.14B

Figure 11



EXPLANATION

77 — Groundwater elevation contour

Depression in groundwater surface

Estimated capture zone

77.14 Groundwater elevation (feet relative to mean sea level)

Monitoring well

Groundwater extraction well

Piezometer

Groundwater treatment system

Property boundary

Existing building

Demolished building

Notes:

* Data not used in contouring

1. Groundwater elevation data for the American Microsystems, Inc. (AMI) site wells (shown on this figure without data) are presented in AMI's respective self-monitoring report.
2. Data Sources: Wells located at the former Siemens facility measured by ERM, and wells located at the off-site study area and the former Intersil facility measured by AMEC.
3. LQ-1B and LQ-2B were measured on October 1, 2014 due to an electronic water level meter malfunction on July 14, 2014.

0 400

APPROXIMATE SCALE IN FEET

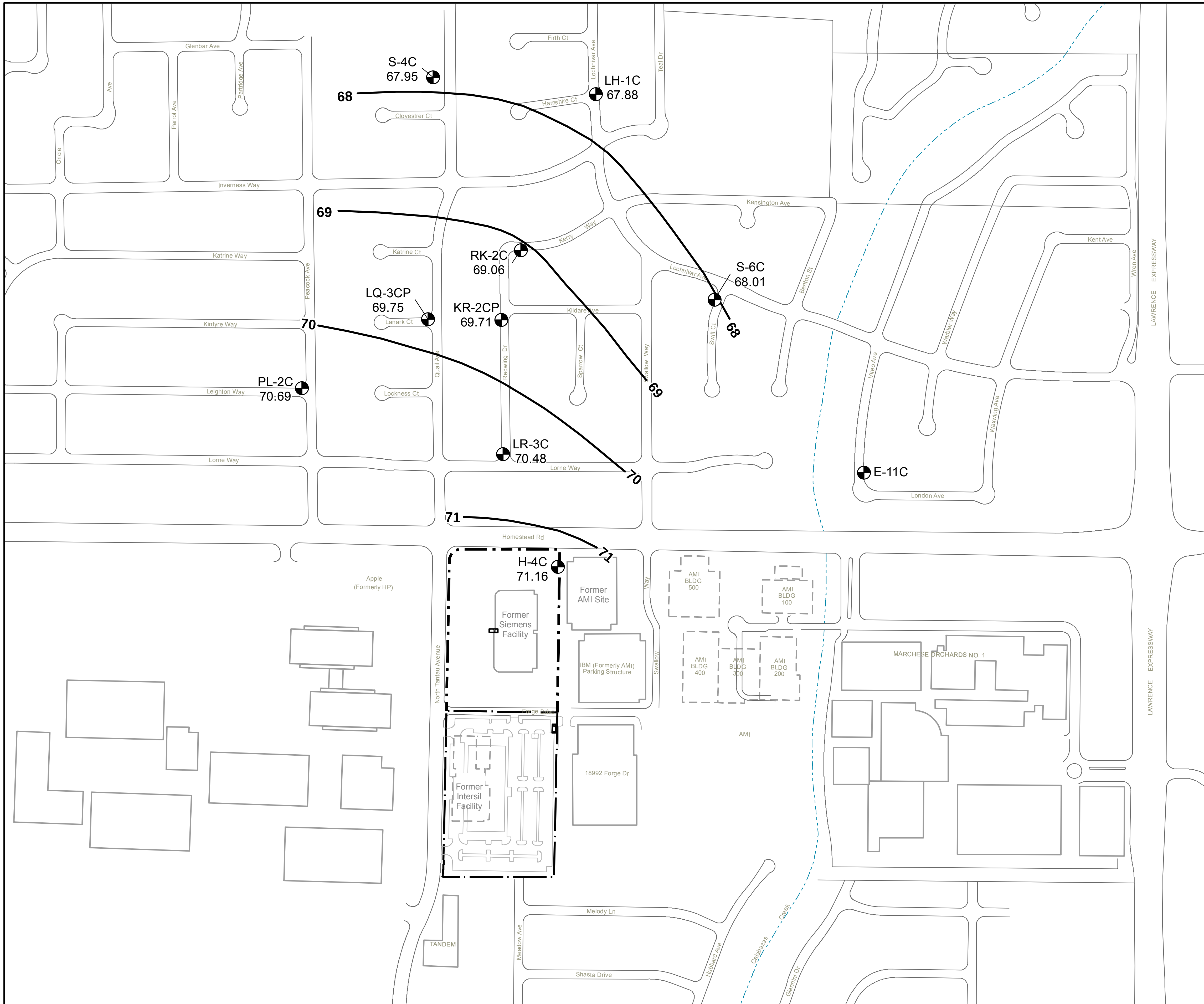
B-ZONE AQUIFER
GROUNDWATER ELEVATION
CONTOURS, JULY 14, 2014
Intersil/Siemens Site
Cupertino, California

amec foster wheeler

Date: 01/12/2015 | Project No. OD11161050.14B

Figure 12

S:\OD11161050\161050.14B.001\14_1114_AR14_fig_12_Bzone-gwe_July2014.mxd



EXPLANATION

- 71 — Groundwater elevation contour
- Depression in groundwater surface
- Estimated capture zone
- 70.48 — Groundwater elevation (feet relative to mean sea level)
- Monitoring well
- Groundwater treatment system
- Property boundary
- Existing building
- Demolished building

Notes:

NM Not measured

1. Groundwater elevation data for the American Microsystems, Inc. (AMI) site wells (shown on this figure without data) are presented in AMI's respective self-monitoring report.

2. Data Sources: Wells located at the former Siemens facility measured by ERM, and wells located at the off-site study area and the former Intersil facility measured by AMEC.

0 400

APPROXIMATE SCALE IN FEET

C-ZONE AQUIFER
GROUNDWATER ELEVATION
CONTOURS, JULY 14, 2014
Intersil/Siemens Site
Cupertino, California

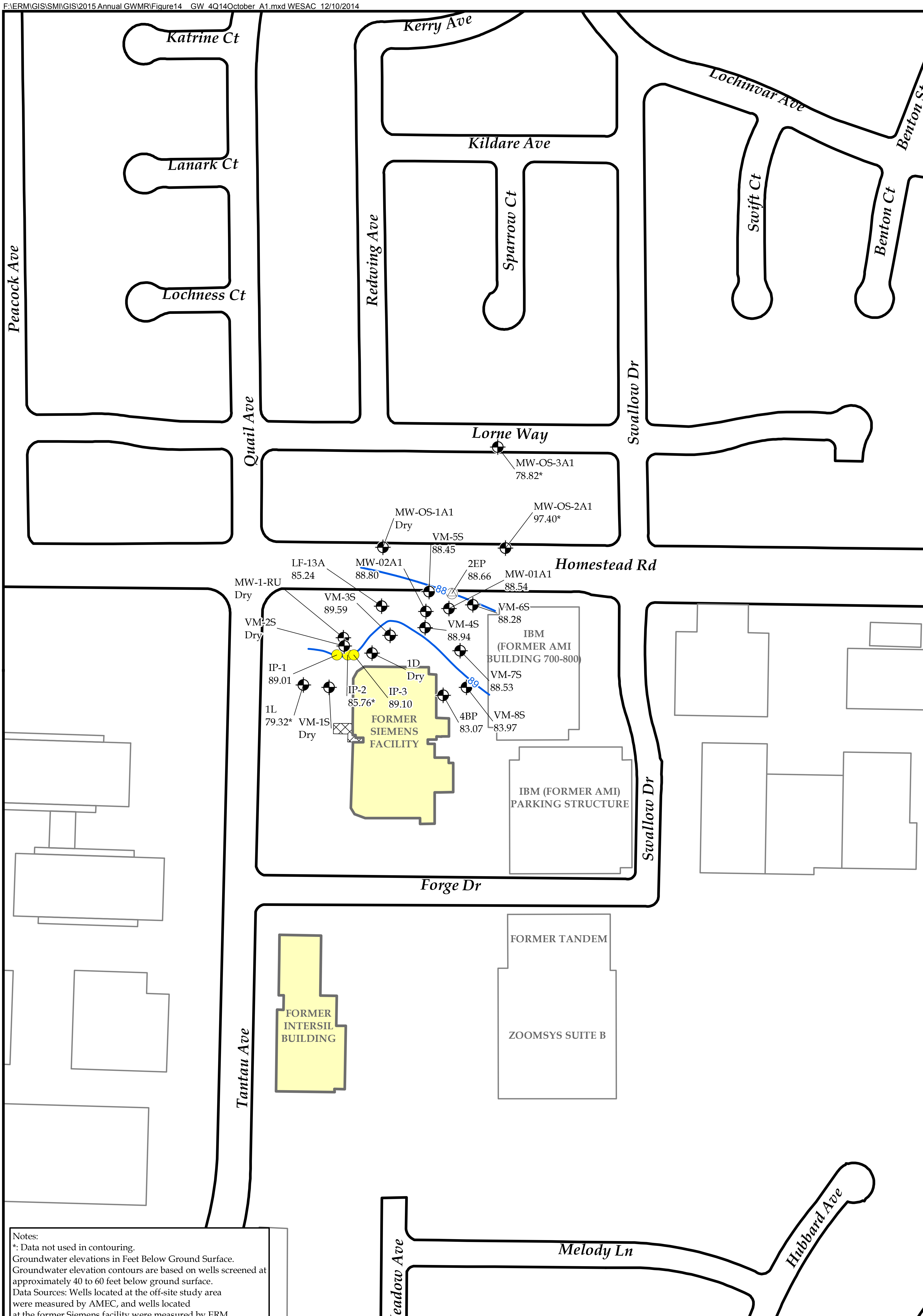
amec foster wheeler

Figure 13

Date: 01/12/2015 | Project No. OD11161050.14B

S:\OD11\161050\161050.14B.001\14_1114_AR14_fig_13_Czone-gwe_July2014.mxd

F:\ERM\GIS\SMI\GIS\2015 Annual GWMR\Figure14 GW_4Q14October_A1.mxd WESAC 12/10/2014



Notes:
*: Data not used in contouring.
Groundwater elevations in Feet Below Ground Surface.
Groundwater elevation contours are based on wells screened at approximately 40 to 60 feet below ground surface.
Data Sources: Wells located at the off-site study area were measured by AMEC, and wells located at the former Siemens facility were measured by ERM.

Legend

- Groundwater Extraction Well
- Injection Point
- Monitoring Well
- Existing Buildings
- Groundwater Remediation Facility
- City Block
- Groundwater Elevation Contour (1.0 ft)
- 77.67 Groundwater Elevation (feet relative to mean sea level)

Source: ARCADIS, Former Siemens Facility 2006 Annual Report: Figure 3 (dated 1/7/2010).

N

0 100 200

Scale in Feet

Intersil/Siemens Site
Cupertino, California

FIGURE 14

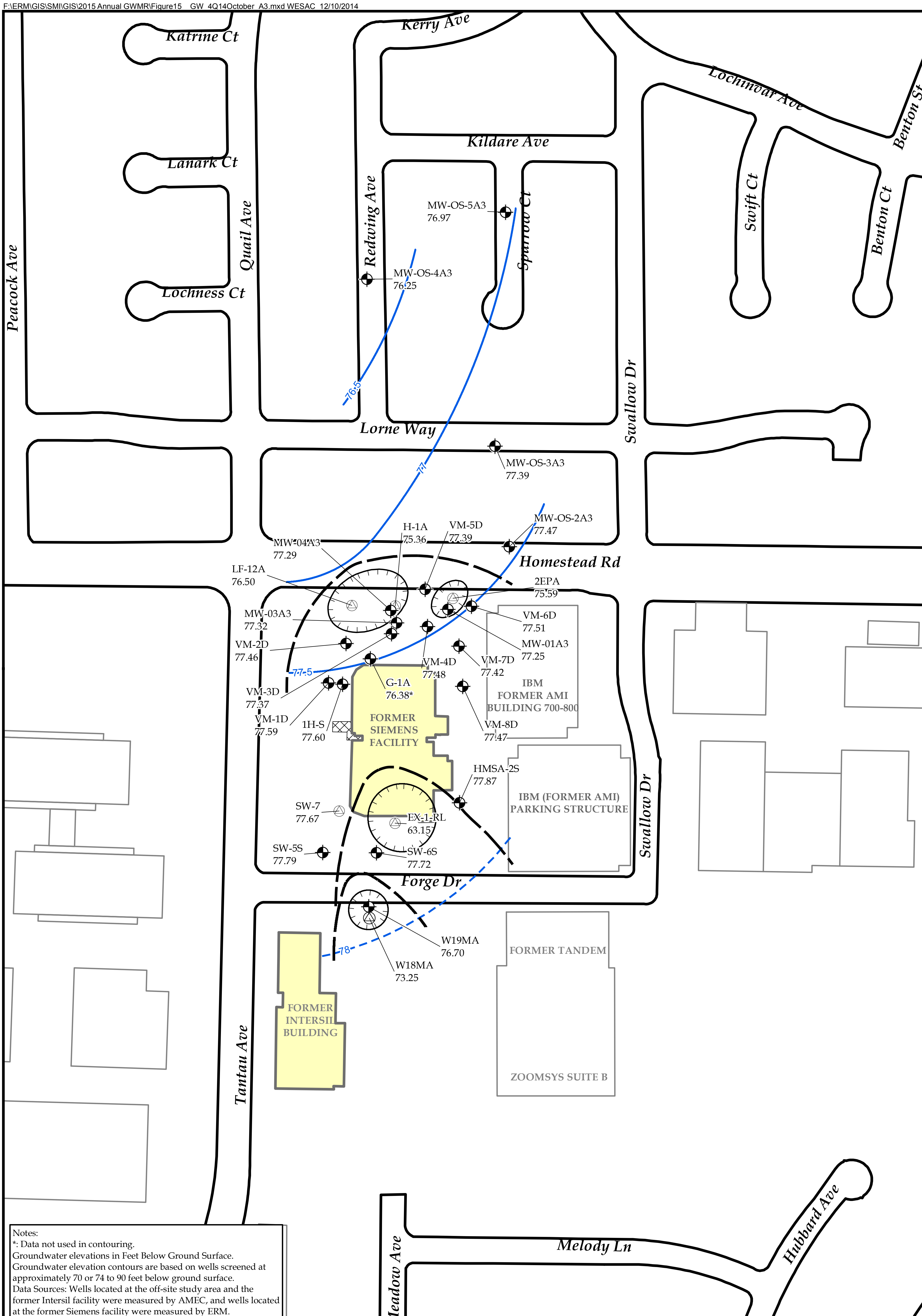
A1 DEPTH INTERVAL
GROUNDWATER ELEVATION CONTOURS
OCTOBER 7, 2014

ERM

PREPARED BY:
austin.phelps

JOB NO. 0201040.04SB
FILE: Figure14__GW_4Q14October_A1

F:\ERM\GIS\SMI\GIS\2015 Annual GWMR\Figure15__GW_4Q14October_A3.mxd WESAC 12/10/2014



Notes:
*: Data not used in contouring.
Groundwater elevations in Feet Below Ground Surface.
Groundwater elevation contours are based on wells screened at approximately 70 or 74 to 90 feet below ground surface.
Data Sources: Wells located at the off-site study area and the former Intersil facility were measured by AMEC, and wells located at the former Siemens facility were measured by ERM.

Legend

- Groundwater Extraction Well
- Monitoring Well
- Existing Buildings
- Groundwater Remediation Facility
- City Block
- Depression in Groundwater Surface
- Groundwater Elevation Contour (0.5 ft) (Dashed Where Inferred)
- Estimated Capture Zone
- 77.67 Groundwater Elevation (feet relative to mean sea level)

Source: ARCADIS, Former Siemens Facility 2006 Annual Report: Figure 3 (dated 1/7/2010).

N

0 100 200

Scale in Feet

Intersil/Siemens Site
Cupertino, California

FIGURE 15

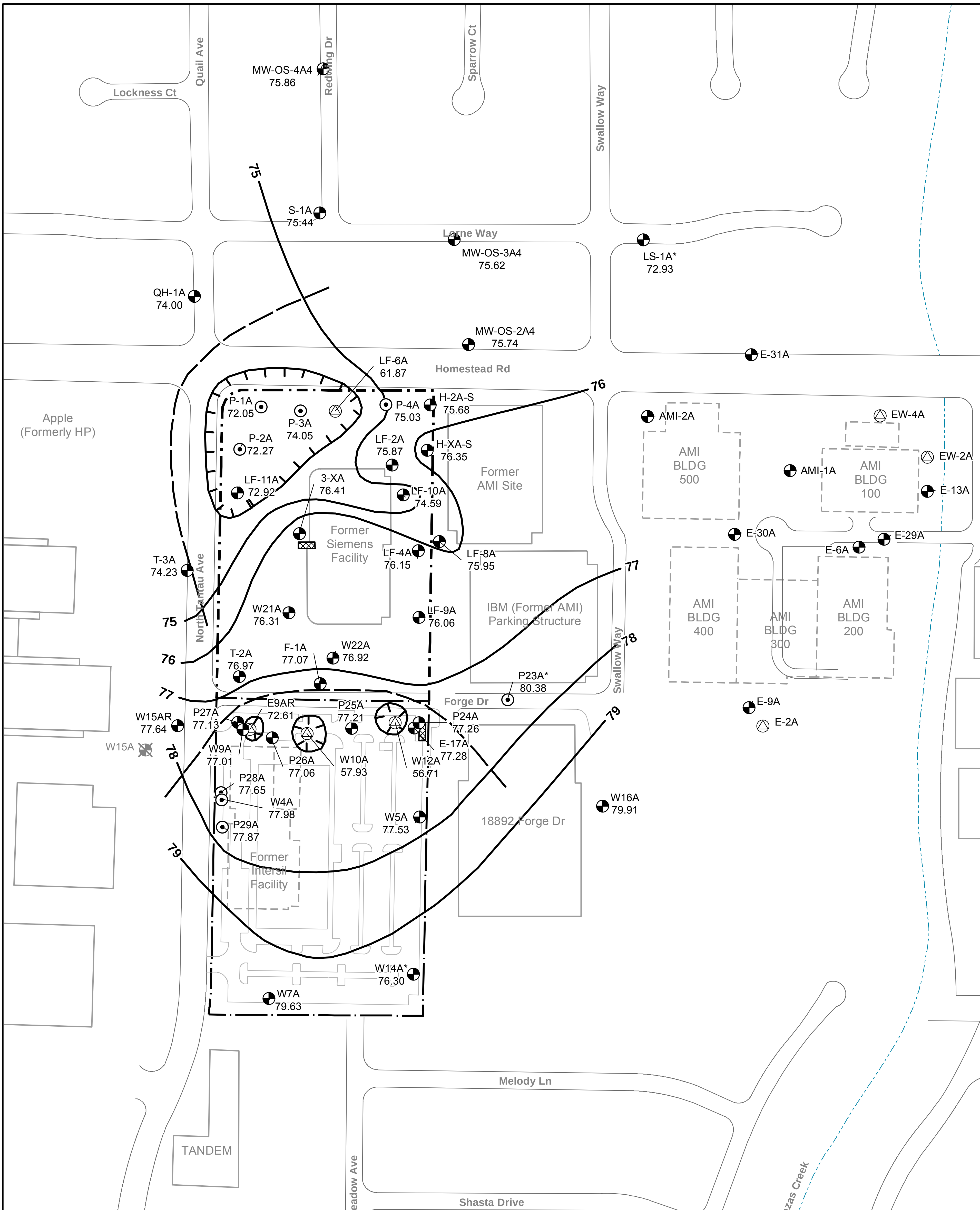
A3 DEPTH INTERVAL
GROUNDWATER ELEVATION CONTOURS
OCTOBER 7, 2014

ERM

PREPARED BY:
austin.phelps

JOB NO. 0201040.04SB
FILE: Figure15__GW_4Q14October_A3

S:\OD11\161050\161050.14B.001\14_1114_AR14_fig_16_A4zone-gwe_4q2014.mxd



EXPLANATION

76	Groundwater elevation contour
	Depression in groundwater surface
	Estimated capture zone
76.31	Groundwater elevation (feet relative to mean sea level)
	Monitoring well
	Monitoring well destroyed
	Groundwater extraction well
	Piezometer
	Groundwater treatment system
	Property boundary
	Existing building
	Demolished building

Notes:

* Data not used in contouring

1. Groundwater elevation contours for the A4 depth interval are based only on wells screened in the lower interval (approximately 90 to 120 feet below ground surface).
2. Groundwater elevation data for the American Microsystems, Inc. (AMI) site wells (shown on this figure without data) are presented in AMI's respective self-monitoring report.
3. Data Sources: Wells located at the former Siemens facility measured by ERM, and wells located at the off-site study area and the former Intersil facility measured by AMEC.

N

0 200

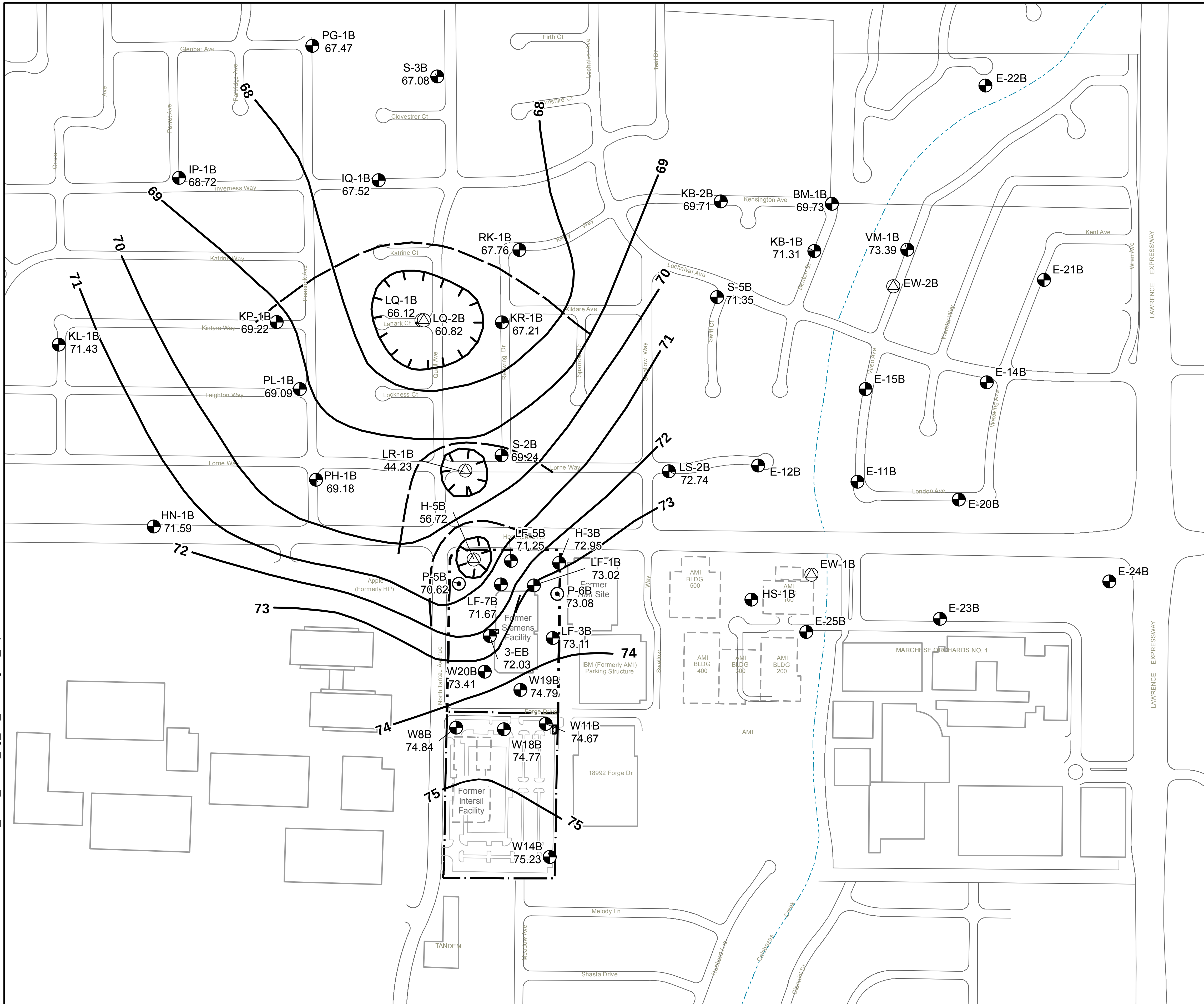
APPROXIMATE SCALE IN FEET

A4 DEPTH INTERVAL
GROUNDWATER ELEVATION
CONTOURS, OCTOBER 7-14, 2014
Intersil/Siemens Site
Cupertino, California

amec foster wheeler

Date: 01/12/2015 Project No. OD11161050.14B

Figure 16



EXPLANATION

72 — Groundwater elevation contour

Depression in groundwater surface

Estimated capture zone

71.59 Groundwater elevation (feet relative to mean sea level)

Monitoring well

Groundwater extraction well

Piezometer

Groundwater treatment system

Property boundary

Existing building

Demolished building

Notes:

1. Groundwater elevation data for the American Microsystems, Inc. (AMI) site wells (shown on this figure without data) are presented in AMI's respective self-monitoring report.
2. Data Sources: Wells located at the former Siemens facility measured by ERM, and wells located at the off-site study area and the former Intersil facility measured by AMEC.

0 400

APPROXIMATE SCALE IN FEET

B-ZONE AQUIFER
GROUNDWATER ELEVATION
CONTOURS, OCTOBER 7, 2014
Intersil/Siemens Site
Cupertino, California

amec foster wheeler

Date: 01/12/2015 | Project No. OD11161050.14B

Figure 17

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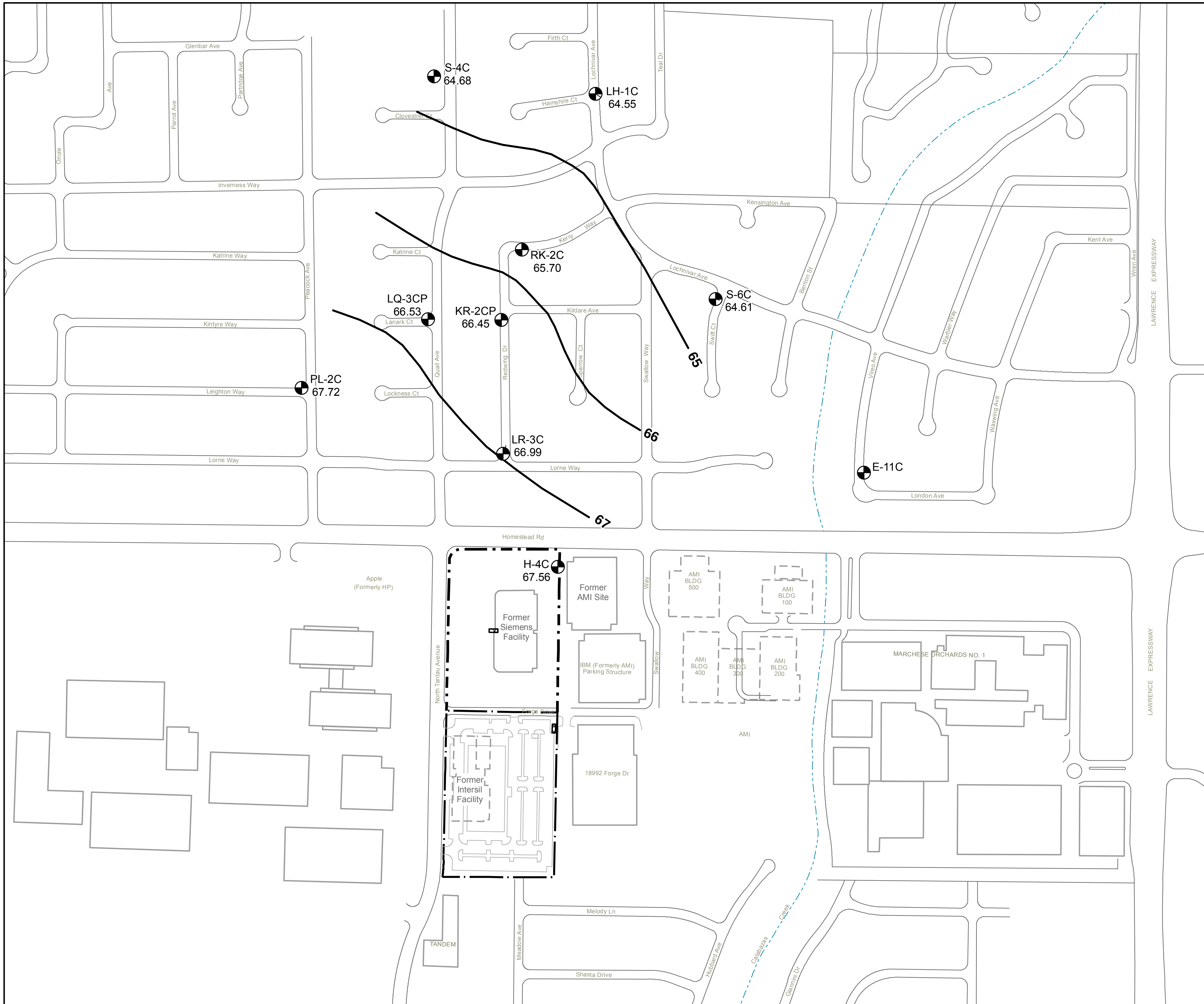

EXPLANATION

- 65 — Groundwater elevation contour
- Depression in groundwater surface
- Estimated capture zone
- 65.70 — Groundwater elevation (feet relative to mean sea level)
- Monitoring well
- Groundwater treatment system
- Property boundary
- Existing building
- Demolished building

Notes:

1. Groundwater elevation data for the American Microsystems, Inc. (AMI) site wells (shown on this figure without data) are presented in AMI's respective self-monitoring report.
2. Data Sources: Wells located at the former Siemens facility measured by ERM, and wells located at the off-site study area and the former Intersil facility measured by AMEC.

0 400

APPROXIMATE SCALE IN FEET

C-ZONE AQUIFER GROUNDWATER ELEVATION CONTOURS, October 7-8, 2014
Intersil/Siemens Site
Cupertino, California

amec foster wheeler

Figure 18

Date: 01/12/2015 Project No. OD11161050.14B

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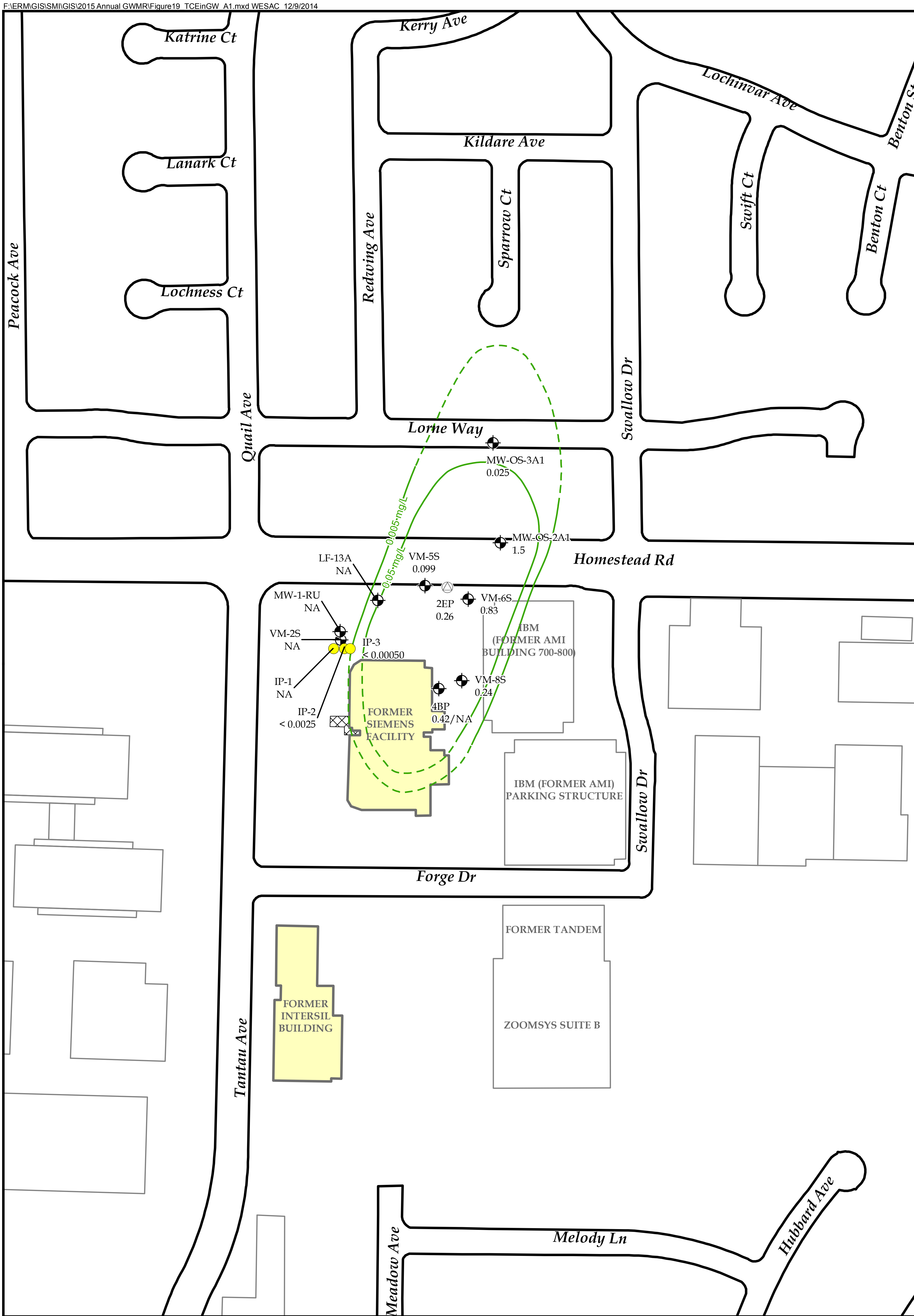
F:\ERM\GIS\SMI\GIS\2015 Annual GWMR\Figure19_TCEinGW_A1.mxd WESAC 12/9/2014



Legend

- Groundwater Extraction Well
- Injection Point
- Monitoring Well
- Existing Buildings
- Groundwater Remediation Facility
- City Block
- TCE Contour (Dashed where Inferred)

Source: ARCADIS, Former Siemens Facility 2006 Annual Report: Figure 3 (dated 1/7/2010).

Notes:
NA : Not Analyzed because well was dry or insufficient water available for sampling
1.23/0.24 : Primay Result/Duplicate Result
0.12 : Concentration of Trichloroethene (TCE) in milligrams per liter (mg/L)
< : Concentration detected below the Method Reporting Limit

N

0 100 200

Scale in Feet

Intersil/Siemens Site
Cupertino, California

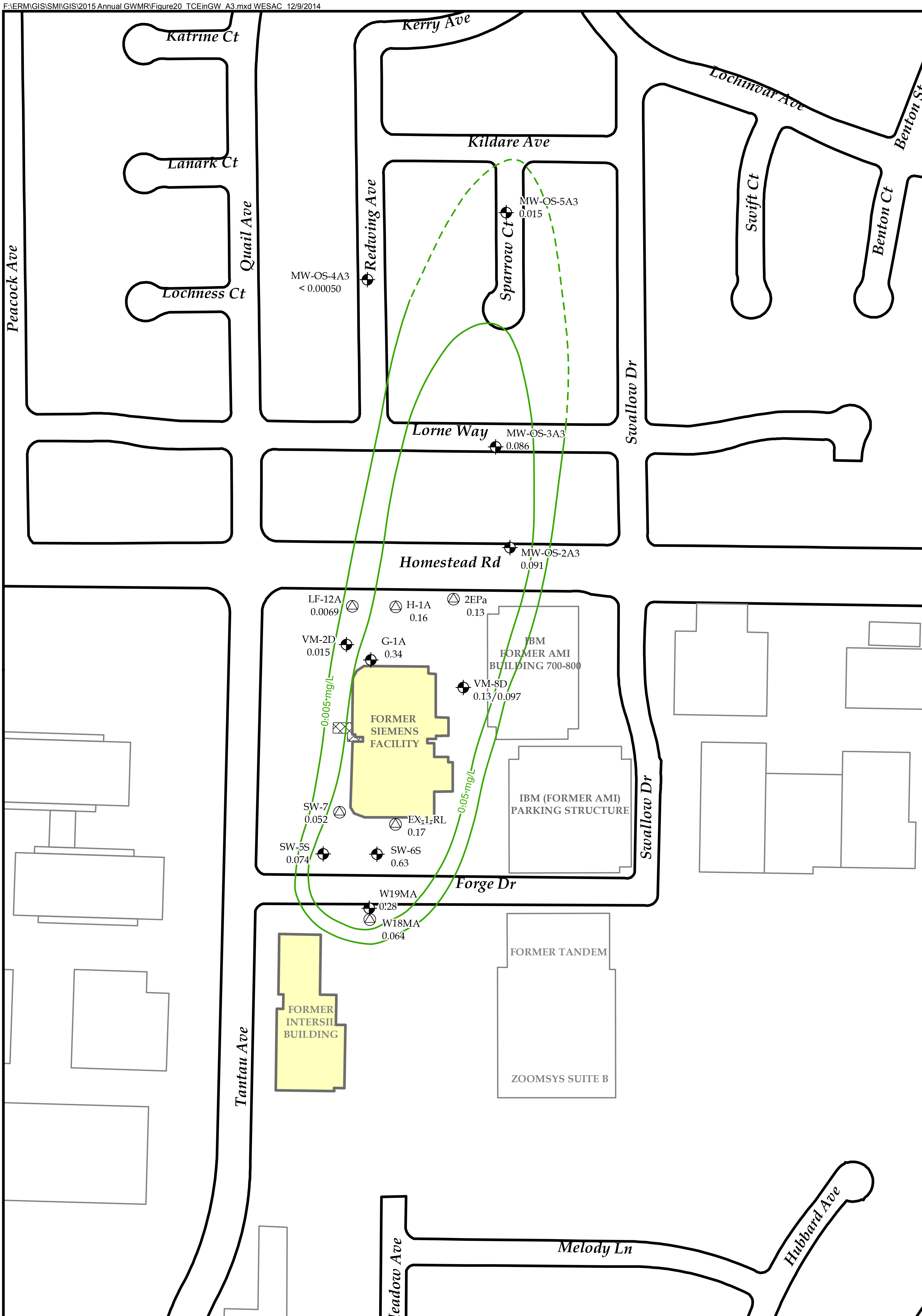
FIGURE 19

TCE ISOCONCENTRATION MAP
OCTOBER 2014
A1 DEPTH INTERVAL

ERM

PREPARED BY: alex.kirk	JOB NO. 0201040.04SB FILE: Figure19_TCEinGW_A1

F:\ERM\GIS\SMI\GIS\2015 Annual GWMR\Figure20_TCEinGW_A3.mxd WESAC 12/9/2014



Legend

- Groundwater Extraction Well
- Monitoring Well
- Existing Buildings
- Groundwater Remediation Facility
- City Block
- TCE Contour (Dashed where Inferred)

Source: ARCADIS, Former Siemens Facility 2006 Annual Report: Figure 3 (dated 1/7/2010).

Notes:
1.23/0.24 : Primary Result/Duplicate Result
0.14 : Concentration of Trichloroethene (TCE) in milligrams per liter (mg/L)
< : Concentration detected below the Method Reporting Limit

N

0 100 200

Scale in Feet

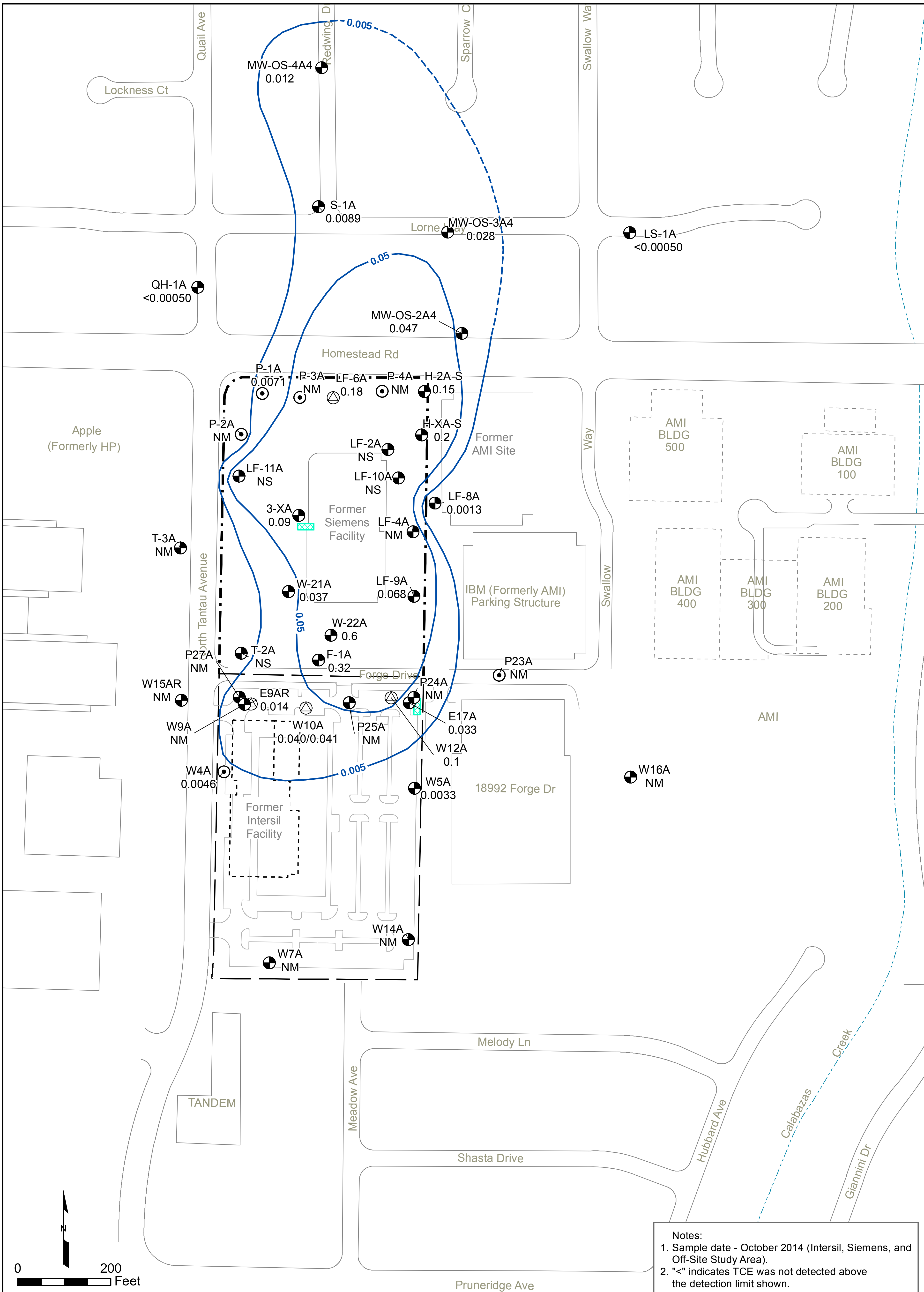
Intersil/Siemens Site
Cupertino, California

FIGURE 20

TCE ISOCONCENTRATION MAP
OCTOBER 2014
A3 DEPTH INTERVAL

ERM

PREPARED BY: austin.phelps	JOB NO. 0201040.04SB FILE: Figure20_TCEinGW_A3



Notes:
1. Sample date - October 2014 (Intersil, Siemens, and Off-Site Study Area).
2. "<" indicates TCE was not detected above the detection limit shown.

Explanation

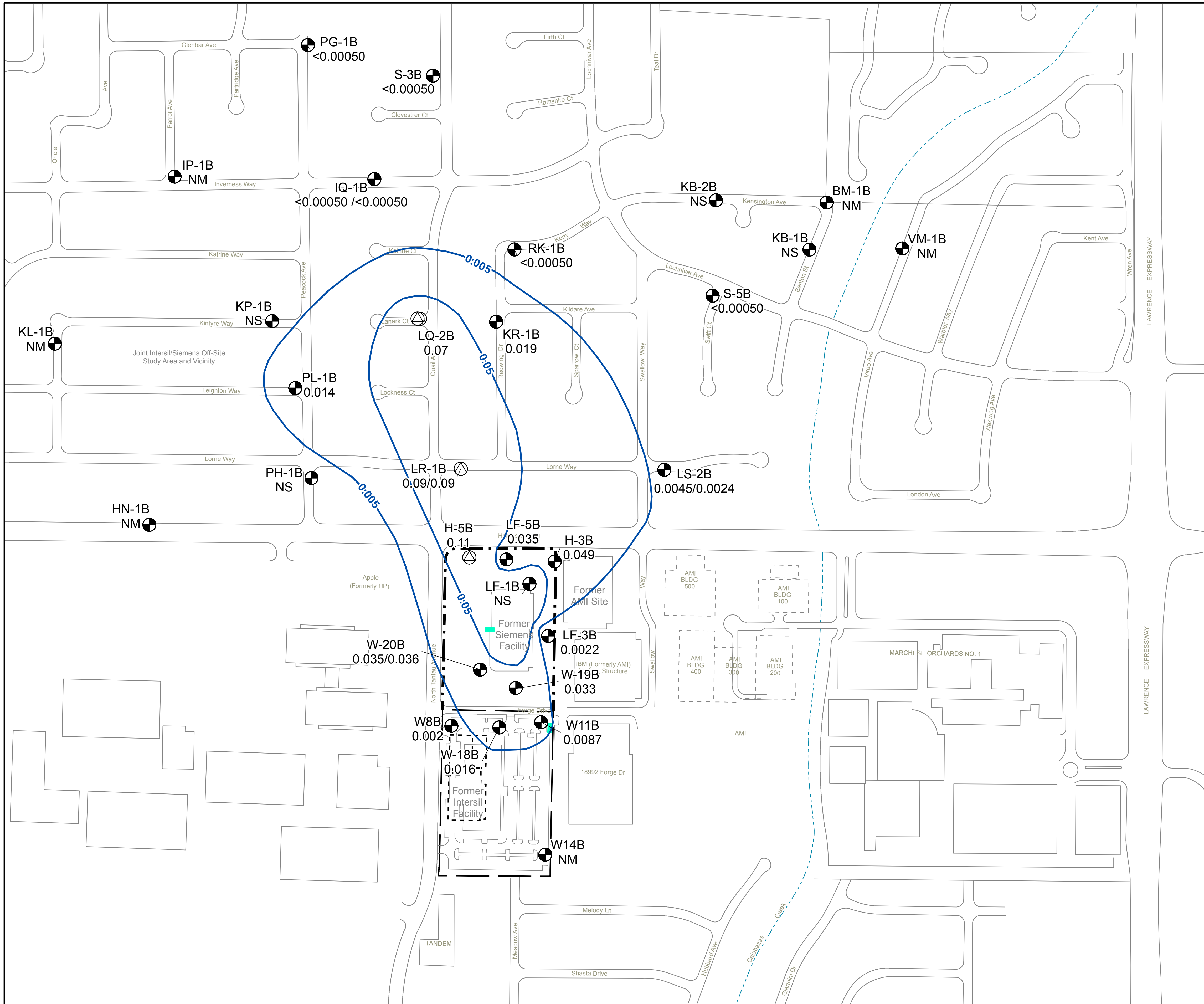
- Groundwater Treatment System
- Monitoring Well Destroyed
- Monitoring Well
- Groundwater Extraction Well
- Piezometer
- Approximate line of equal concentration in mg/L
- 0.0089 Concentration of trichloroethene (TCE) in mg/L
- 0.040/0.041 Duplicate sample
- NS Not sampled in 2014
- NM No longer sampled as part of monitoring program
- Property boundary

TCE ISOCONCENTRATION MAP
OCTOBER 2014
A4 DEPTH INTERVAL
Intersil/Siemens Site
Cupertino, California

amec foster wheeler

Date: 01/12/2015 | Project No. OD11161050.14B

Figure
21



Explanation

- Monitoring Well
- Groundwater Extraction Well
- Piezometer
- Groundwater Treatment System
- Approximate line of equal concentration in mg/L
- 0.0087 Concentration of trichloroethene (TCE) in mg/L
- 0.0045/0.0024 Duplicate sample
- NS Not sampled in 2014
- NM No longer sampled as part of monitoring program
- Property boundary

Notes:
1. Sample date - October 2014 (Intersil, Siemens, and Off-Site Study Area).
2. "<" indicates TCE was not detected above the detection limit shown.

0 400 Feet

TCE ISOCONCENTRATION MAP
OCTOBER 2014
B-ZONE GROUNDWATER
Intersil/Siemens Site
Cupertino, California

amec foster wheeler

Figure 22

Date: 01/12/2015 | Project No. OD11161050.14B

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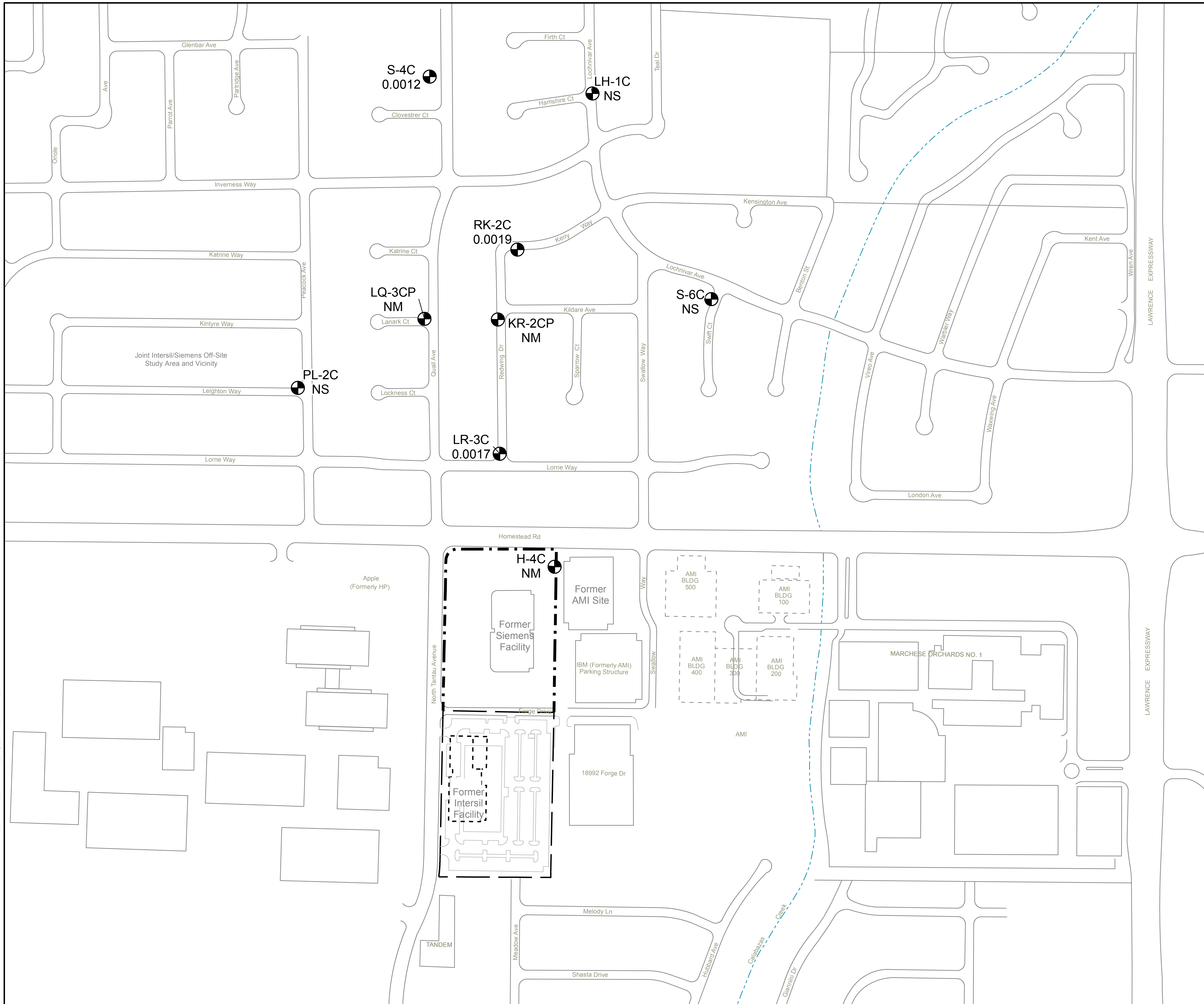

Explanation

Monitoring Well

0.0017 Concentration of trichloroethene (TCE) in mg/L

NM No longer sampled as part of monitoring program

NS Not sampled in 2014

Property boundary

Notes:
1. Sample date - October 2014 (Intersil, Siemens, and Off-Site Study Area).
2. "<" indicates TCE was not detected above the detection limit shown.

TCE CONCENTRATIONS
OCTOBER 2014
C-ZONE GROUNDWATER
Intersil/Siemens Site
Cupertino, California

amec foster wheeler

Figure 23

Date: 01/12/2015 | Project No. OD11161050.14B

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APPENDIX A

Groundwater Analytical Data, ERD Pilot Study, Former Siemens Facility

Appendix A - Table 1
Distribution of Volatile Organic Compounds in Groundwater
Intersil/Siemens Superfund Site
Cupertino, California

Location ID	Location with Respect to Pilot Study Area	Sample Date	Sample Type	1,1,1-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	Bromoform	Chloroform	cis-1,2-Dichloroethene	Dibromochloromethane	Freon 113	Tetrachloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
			CA MCL	200	5.0	6.0	NS	NS	6.0	NS	150	5.0	10	5.0	0.50
2EPa	downgradient	8/28/2014	N	**1.2**	< 1.0	**1.2**	< 2.0	< 2.0	**22**	< 1.0	**1.1**	< 1.0	< 1.0	**160**	< 1.0
G-1A	upgradient	8/28/2014	N	< 5.0	< 5.0	< 5.0	< 10	< 10	**590**	< 5.0	**12**	< 5.0	< 5.0	**550**	< 5.0
H-1A	downgradient	9/3/2014	N	**1.0**	< 0.50	**1.9**	< 1.0	< 1.0	**22**	< 0.50	**1.3**	< 0.50	< 0.50	**54**	< 0.50
LF-13A	downgradient	8/28/2014	N	< 2.5	< 2.5	< 2.5	< 5.0	< 5.0	**260**	< 2.5	**49**	< 2.5	< 2.5	**140**	< 2.5
MW-01A1	downgradient	8/28/2014	N	< 0.50	**0.56**	**0.79**	**1.0**	**1.1**	**480**	**1.2**	**1.9**	**0.82**	**2.3**	**510**	< 0.50
MW-01A1		11/25/2014	N	< 5.0	< 5.0	< 5.0	< 10	< 10	**1,300**	< 5.0	**19**	< 5.0	< 5.0	**850**	< 5.0
MW-01A3	downgradient	8/28/2014	N	**0.73**	< 0.50	**0.5**	< 1.0	< 1.0	**0.51**	< 0.50	**1.1**	< 0.50	< 0.50	**150**	< 0.50
MW-01A3		11/25/2014	N	< 2.5	< 2.5	< 2.5	< 5.0	< 5.0	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	**230**	< 2.5
MW-02A1	downgradient	8/28/2014	N	< 10	< 10	< 10	< 20	< 20	**800**	< 10	**29**	< 10	< 10	**640**	< 10
MW-02A1		11/25/2014	N	< 10	< 10	< 10	< 20	< 20	**1,200**	< 10	**36**	< 10	< 10	**890**	< 10
MW-03A3	within	8/28/2014	N	**0.54**	< 0.50	**0.87**	< 1.0	< 1.0	**1.0**	< 0.50	**0.67**	< 0.50	< 0.50	**74**	< 0.50
MW-03A3		11/26/2014	N	< 5.0	< 5.0	< 5.0	< 10	< 10	**45**	< 5.0	< 5.0	< 5.0	< 5.0	**57**	< 5.0
MW-04A3	downgradient	8/28/2014	N	**0.95**	< 0.50	**2.5**	< 1.0	< 1.0	**11**	< 0.50	**1.0**	< 0.50	< 0.50	**44**	< 0.50
MW-04A3		11/25/2014	N	**1.1**	< 0.50	**1.7**	< 1.0	< 1.0	**8.9**	< 0.50	**1.1**	< 0.50	< 0.50	**40**	< 0.50
VM-3D	within	8/28/2014	N	**1.1**	< 0.50	**5.5**	< 1.0	< 1.0	**290**	< 0.50	**3.9**	< 0.50	**3.7**	**87**	< 0.50
VM-3D		8/28/2014	FD	**1.1**	< 0.50	**5.4**	< 1.0	< 1.0	**320**	< 0.50	**4.0**	< 0.50	**4.8**	**90**	< 0.50
VM-3D		11/25/2014	N	< 2.5	< 2.5	< 2.5	< 5.0	< 5.0	**180**	< 2.5	< 2.5	< 2.5	< 2.5	**21**	**7.6**
VM-3S	within	8/28/2014	N	<0.50	<0.50	<0.50	<1.0	<1.0	**69**	< 0.50	<0.50	<0.50	**0.81**	**26**	**180**
VM-3S		11/25/2014	N	<0.50	< 0.50	< 0.50	< 1.0	< 1.0	**15**	< 0.50	<0.50	<0.50	**2.1**	<5.0	**390**
VM-4D	within	8/28/2014	N	**5.6**	< 0.50	**6.9**	< 1.0	< 1.0	**12**	< 0.50	**1.8**	< 0.50	< 0.50	**150**	< 0.50
VM-4D		11/25/2014	N	**11**	**0.63**	**13**	< 1.0	< 1.0	**15**	< 0.50	**2.5**	< 0.50	< 0.50	**190**	< 0.50
VM-4S	within	8/28/2014	N	**1.3**	**1.3**	**8.1**	< 1.0	**1.5**	**2,700**	< 0.50	**46**	< 0.50	**7.6**	**230**	< 0.50
VM-4S		11/25/2014	N	< 25	< 25	< 25	< 50	< 50	**2,900**	< 25	**59**	< 25	< 25	**370**	< 25
VM-5D	downgradient	8/28/2014	N	**4.7**	< 0.50	**5.8**	< 1.0	< 1.0	**3.3**	< 0.50	**2.0**	**0.50**	< 0.50	**160**	< 0.50
VM-5S	downgradient	8/28/2014	N	< 0.50	< 0.50	< 0.50	< 1.0	< 1.0	**78**	< 0.50	< 0.50	< 0.50	< 0.50	**53**	**4.5**
VM-6D	downgradient	8/28/2014	N	**0.75**	< 0.50	< 0.50	< 1.0	< 1.0	**8.6**	< 0.50	**2.3**	< 0.50	< 0.50	**120**	< 0.50
VM-6D		11/25/2014	N	**0.81**	< 0.50	**0.64**	< 1.0	< 1.0	**12**	< 0.50	**2.5**	< 0.50	< 0.50	**120**	< 0.50
VM-6S	downgradient	8/28/2014	N	< 5.0	< 5.0	< 5.0	< 10	< 10	**520**	< 5.0	< 5.0	< 5.0	< 5.0	**760**	< 5.0
VM-6S		11/25/2014	N	< 5.0	< 5.0	< 5.0	< 10	< 10	**580**	< 5.0	**5.2**	< 5.0	< 5.0	**600**	< 5.0
VM-7D	crossgradient	8/28/2014	N	**0.63**	< 0.50	**0.69**	< 1.0	< 1.0	< 0.50	< 0.50	**0.92**	< 0.50	< 0.50	**100**	< 0.50
VM-7D		11/25/2014	N	< 0.50	< 0.50	< 0.50	< 1.0	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	**11**	< 0.50
VM-7S	crossgradient	8/28/2014	N	**7.4**	**3.6**	**13**	< 1.0	< 1.0	**290**	< 0.50	**13**	< 0.50	**2.0**	**51**	< 0.50
VM-7S		11/25/2014	N	**7.5**	**2.5**	**9.3**	< 5.0	< 5.0	**130**	< 2.5	**6.7**	< 2.5	< 2.5	**34**	< 2.5
VM-8D	upgradient	8/28/2014	N	**0.74**	< 0.50	**0.84**	< 1.0	< 1.0	< 0.50	< 0.50	**1.3**	< 0.50	< 0.50	**110**	< 0.50
VM-8S	upgradient	8/28/2014	N	**15**	**7.5**	**33**	< 5.0	< 5.0	**240**	< 2.5	< 2.5	< 2.5	**5.1**	**270**	< 2.5
VM-8S		8/28/2014	FD	**15**	**7.9**	**35**	< 5.0	< 5.0	**260**	< 2.5	< 2.5	< 2.5	**5.0**	**270**	< 2.5
MW-OS-2A1	offsite	8/13/2014	N	< 0.50	< 0.50	**0.53**	< 1.0	**5.1**	**560**	< 0.50	**5.1**	**1.0**	**1.8**	**1,000**	< 0.50
MW-OS-2A3	offsite	8/13/2014	N	**2.6**	< 0.50	**4.6**	< 1.0	< 1.0	**3.3**	< 0.50	**2.0**	< 0.50	< 0.50	**84**	< 0.50
MW-OS-2A4	offsite	8/13/2014	N	**8.3**	< 0.50	**10**	< 1.0	< 1.0	**1.1**	< 0.50	**4.2**	< 0.50	< 0.50	**46**	< 0.50
MW-OS-3A1	offsite	8/13/2014	N	**4.7**	< 0.50	**3.0**	< 1.0	< 1.0	**4.6**	< 0.50	**1.8**	< 0.50	< 0.50	**26**	< 0.50
MW-OS-3A3	offsite	8/13/2014	N	**2.2**	< 0.50	**1.6**	< 1.0	< 1.0	**2.0**	< 0.50	**1.3**	< 0.50	< 0.50	**120**	< 0.50
MW-OS-3A4	offsite	8/13/2014	N	**6.0**	< 0.50	**6.7**	< 1.0	< 1.0	**0.68**	< 0.50	**5.9**	< 0.50	< 0.50	**29**	< 0.50
MW-OS-4A3	offsite	8/13/2014	N	< 0.50	< 0.50	< 0.50	< 1.0	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
MW-OS-4A4	offsite	8/13/2014	N	**1.3**	< 0.50	**0.88**	< 1.0	< 1.0	< 0.50	< 0.50	**2.0**	< 0.50	< 0.50	**19**	< 0.50
MW-OS-5A3	offsite	8/13/2014	N	**0.86**	< 0.50	**0.57**	< 1.0	< 1.0	**1.2**	< 0.50	**0.71**	< 0.50	< 0.50	**11**	< 0.50
MW-OS-5A3		8/13/2014	FD	**0.87**	< 0.50	**0.52**	< 1.0	< 1.0	**1.2**	< 0.50	**0.65**	< 0.50	< 0.50	**11**	< 0.50

Notes and Abbreviations:

Units are in µg/L = micrograms per liter
Samples with results detected above the Reportable Detection Limit are shown
Bolded values indicate concentrations above the Reportable Detection Limit.
Shaded values indicate concentrations above the standard.
< = Compound not detected. Reportable detection limit shown.
CA MCL = California Maximum Contaminant Level, updated 1 May 2014 by the California Regional Water Quality Control Board.
FD = Field Duplicate Sample
N = Primary or Normal Sample
NS = No Standard

Location ID	Location with Respect to Pilot Study Area	Sample Date	Chloride	Nitrate as N	Sulfate	Methane	Ethane	Ethene	Iron	Manganese	Total Organic Carbon
2EPa	downgradient	8/28/2014	**78**	**2.4**	**49**	< 0.00099	< 0.0020	< 0.0028	< 0.50	**0.0057**	< 1.0
G-1A	upgradient	8/28/2014	**75**	**1.4**	**45**	**0.0005**	< 0.0020	< 0.0028	< 0.50	< 0.020	**0.32**
H-1A	downgradient	9/3/2014	**80**	**2.6**	**52**	< 0.00099	< 0.0020	< 0.0028	< 0.50	< 0.020	< 1.0
LF-13A	downgradient	8/28/2014	**49**	**2.6**	**42**	< 0.00099	< 0.0020	< 0.0028	< 0.50	**0.0033**	**1.1**
LF-6A	downgradient	9/3/2014	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0
LF-6A		11/26/2014	NA	NA	NA	NA	NA	NA	NA	NA	**0.50**
MW-01A1	downgradient	8/28/2014	**870**	**0.59**	**220**	**0.00081**	< 0.0020	< 0.0028	< 0.50	**0.56**	**3.2**
MW-01A1		11/25/2014	**230**	**1.2**	**130**	< 0.00099	< 0.0020	< 0.0028	< 0.50	**0.40**	**1.6**
MW-01A3	downgradient	8/28/2014	**77**	**2.2**	**47**	< 0.00099	< 0.0020	< 0.0028	< 0.50	**0.056**	**0.48 J**
MW-01A3		11/25/2014	**75**	< 0.23	**18**	< 0.00099	**0.0011**	< 0.0028	**0.21**	**0.60**	**360**
MW-02A1	downgradient	8/28/2014	**250**	**5.4**	**100**	NA	NA	NA	< 0.50	**0.091**	NA
MW-02A1		11/25/2014	**140**	**7.6**	**100**	< 0.00099	< 0.0020	< 0.0028	< 0.50	**0.037**	**0.91**
MW-03A3	within	8/28/2014	**75**	**1.4**	**47**	< 0.00099	< 0.0020	< 0.0028	< 0.50	**0.077**	**1.0**
MW-03A3		11/26/2014	**78**	< 0.23	**13**	**0.0016**	**0.0011**	< 0.0028	< 0.50	**1.4**	**210**
MW-04A3	downgradient	8/28/2014	**83**	**2.5**	**58**	< 0.00099	< 0.0020	< 0.0028	< 0.50	**0.059**	**0.55**
MW-04A3		11/25/2014	**77**	**1.8**	**49**	< 0.00099	< 0.0020	< 0.0028	< 0.50	**0.0049**	**0.27**
VM-3D	within	8/28/2014	**74**	**2.2**	**48**	**0.0056**	< 0.0020	< 0.0028	< 0.50	< 0.020	< 1.0
VM-3D		11/25/2014	NA	NA	NA	**0.19**	< 0.0020	< 0.0028	NA	NA	**160**
VM-3D		11/26/2014	**100**	< 0.23	< 1.0	NA	NA	NA	**1.6**	**5.6**	NA
VM-3S	within	8/28/2014	**140**	<0.23	**82**	**2.8**	< 0.0020	< 0.0028	<0.50	**4.0**	**3.7**
VM-3S		11/25/2014	**240**	<0.23	5.3	**0.88**	< 0.0020	< 0.0028	<0.50	**8.8**	**200**
VM-4D	within	8/28/2014	**83**	**4.2**	**61**	< 0.00099	< 0.0020	< 0.0028	< 0.50	< 0.020	**0.26**
VM-4D		11/25/2014	**110**	**0.23**	**89**	< 0.00099	< 0.0020	< 0.0028	< 0.50	**8.7**	**1.1**
VM-4S	downgradient	8/28/2014	**110**	**6.5**	**88**	**0.00063**	< 0.0020	< 0.0028	< 0.50	**0.38**	**1.6**
VM-4S		11/25/2014	NA	NA	NA	**0.00047**	< 0.0020	< 0.0028	NA	NA	**2.6**
VM-4S		11/26/2014	**120**	< 0.23	**93**	NA	NA	NA	< 0.50	**2.1**	NA
VM-5D	downgradient	8/28/2014	**91**	**3.8**	**57**	< 0.00099	< 0.0020	< 0.0028	< 0.50	< 0.020	**1.0**
VM-5S	downgradient	8/28/2014	**350**	< 0.23	**260**	**0.13**	< 0.0020	< 0.0028	< 0.50	**0.71**	**4.3**
VM-6D	downgradient	8/28/2014	**77**	**3.3**	**43**	**0.00048**	< 0.0020	< 0.0028	< 0.50	< 0.020	**0.77**
VM-6D		11/25/2014	**84**	**5.8**	**44**	< 0.00099	< 0.0020	< 0.0028	< 0.50	< 0.020	**0.44**
VM-6S	downgradient	8/28/2014	**120**	**10**	**110**	**0.023**	< 0.0020	< 0.0028	< 0.50	**0.24**	**0.92**
VM-6S		11/25/2014	**130**	**10**	**110**	< 0.00099	< 0.0020	< 0.0028	< 0.50	**0.094**	**0.63**
VM-7D	crossgradient	8/28/2014	**73**	**5.9**	**36**	< 0.00099	< 0.0020	< 0.0028	< 0.50	< 0.020	**0.62**
VM-7D		11/25/2014	**77**	**9.6**	**21**	< 0.00099	< 0.0020	< 0.0028	< 0.50	**0.15**	**2.4**
VM-7S	crossgradient	8/28/2014	**110**	**6.4**	**91**	< 0.00099	< 0.0020	< 0.0028	< 0.50	< 0.020	**0.85**
VM-7S		11/25/2014	**63**	< 0.23	**42**	< 0.00099	< 0.0020	< 0.0028	**0.45**	**0.95**	**29**
VM-8D	upgradient	8/28/2014	**73**	**3.0**	**32**	< 0.00099	< 0.0020	< 0.0028	< 0.50	< 0.020	< 1.0
VM-8S	upgradient	8/28/2014	**140**	**6.2**	**74**	< 0.00099	< 0.0020	< 0.0028	< 0.50	< 0.020	**0.88**

Notes and Abbreviations:

Units are in mg/L = milligrams per liter
Bolded values indicate concentrations above the Reportable Detection Limit.
< = Compound not detected. Reportable detection limit shown.
NA = Not analyzed.

Qualifiers - Organic:
J = The analyte was positively identified; associated numerical value is the approximate concentration of the analyte in the sample.

Appendix A - Table 3
Field Parameters Measured in Groundwater
Intersil/Siemens Superfund Site
Cupertino, California

Location ID	Location with Respect to Pilot	Sample Date	Dissolved Oxygen	Oxidation-Reduction Potential	pH (units)	Specific Conductance	Temperature (°C)	Turbidity (NTU)
2EP	downgradient	10/9/2014	**2.62**	**10**	**7.08**	**1.402**	**21.1**	**151**
2EPa	downgradient	8/28/2014	**2.52**	**216**	**6.61**	**0.732**	**23**	**7.0**
2EPa		10/8/2014	**3.78**	**134**	**8.45**	**0.748**	**20.8**	**8.0**
G-1A	upgradient	8/28/2014	**2.53**	**115**	**7.13**	**0.654**	**20.4**	**184**
G-1A		10/9/2014	**3.24**	**50**	**7.80**	**0.686**	**17.8**	**156**
H-1A	downgradient	10/9/2014	**3.34**	**95**	**7.74**	**0.678**	**29.2**	**19**
LF-13A	downgradient	8/28/2014	NM	NM	NM	NM	NM	NM
LF-6A	downgradient	10/9/2014	**3.75**	**112**	**7.74**	**0.662**	**22.7**	**34**
MW-01A1	downgradient	8/28/2014	NM	NM	NM	NM	NM	NM
MW-01A1		10/9/2014	**1.59**	**136**	**7.70**	**1.514**	**20.4**	**34**
MW-01A1		11/25/2014	**0.62**	**13**	**7.37**	**1.445**	**17.6**	NM
MW-01A3	downgradient	8/28/2014	**2.88**	**49**	**7.92**	**0.732**	**20.9**	**728**
MW-01A3		11/25/2014	**1.73**	**-113**	**6.98**	**0.823**	**15.19**	**119**
MW-02A1	downgradient	8/28/2014	**Not enough water for parameter measurements**					
MW-02A1		11/25/2014	**Not enough water for parameter measurements**					
MW-03A3	within	8/28/2014	**2.97**	**140**	**7.56**	**0.712**	**21.2**	**84**
MW-03A3		11/26/2014	**1.16**	**-114**	**6.83**	**0.779**	**18**	**>1000**
MW-04A3	downgradient	8/28/2014	**2.55**	**71**	**7.34**	**0.818**	**20.2**	**1,000**
MW-04A3		11/25/2014	**0.76**	**123**	**7.30**	**0.969**	**16.4**	**72**
VM-3D	within	8/28/2014	**3.69**	**89**	**7.30**	**0.71**	**18.9**	**123**
VM-3D		11/25/2014	**0.78**	**-70**	**6.76**	**1.214**	**19.6**	**179**
VM-3S	within	8/28/2014	**0.54**	**-107**	**6.92**	**1.693**	**18.9**	**>1000**
VM-3S		11/25/2014	**0.68**	**-10**	**7.18**	**0.925**	**15.2**	**>1000**
VM-4D	within	8/28/2014	**3.71**	**152**	**6.92**	**0.904**	**18.9**	**73**
VM-4D		11/25/2014	**0.89**	**-74**	**7.26**	**1.166**	**19.2**	**89**
VM-4S	within	8/28/2014	**2.64**	**133**	**6.87**	**1.165**	**18.9**	**337**
VM-4S		11/25/2014	**0.49**	**7.0**	**6.87**	**0.97**	**15.1**	NM
VM-5D	downgradient	8/28/2014	**2.84**	**132**	**7.36**	**0.844**	**21**	**58**
VM-5S	downgradient	8/28/2014	**2.08**	**-31**	**7.00**	**2.488**	**21.9**	**100**
VM-5S		10/9/2014	**1.79**	**-74**	**7.10**	**2.821**	**22**	NM
VM-6D	downgradient	8/28/2014	**2.47**	**111**	**7.57**	**0.714**	**19**	**128**
VM-6S	downgradient	8/28/2014	**3.24**	**24**	**7.12**	**1.157**	**20.6**	**138**
VM-6S		10/9/2014	**3.09**	**63**	**7.25**	**1.124**	**22.4**	**61**
VM-7D	crossgradient	8/28/2014	**2.37**	**139**	**7.72**	**0.735**	**19.9**	**236**
VM-7D		8/28/2014	**2.37**	**139**	**7.72**	**0.735**	**19.9**	**236**
VM-7S	crossgradient	8/28/2014	**3.26**	**145**	**7.19**	**1.106**	**21**	**127**
VM-7S		11/25/2014	**Not enough water for parameter measurements**					
VM-8D	upgradient	8/28/2014	**3.44**	**137**	**7.69**	**0.707**	**19.9**	**142**
VM-8D		10/8/2014	**2.51**	**143**	**7.36**	**0.672**	**19.8**	**178**
VM-8S	upgradient	8/28/2014	**4.52**	**138**	**6.83**	**1.237**	**20**	**167**
VM-8S		10/8/2014	**2.54**	**156**	**6.91**	**1.293**	**22.6**	**194**

Notes and Abbreviations:

Bolded values indicate concentrations above the Reportable Detection Limit.
< = Compound not detected. Reportable detection limit shown.
°C = degrees Celsius
mg/L = milligrams per liter
mS/cm = milliSiemens per centimeter
mV = millivolts
NM = Not measured
NTU = nephelometric turbidity units
units = pH units

Location ID	Location with Respect to Pilot Study Area	Sample ID	Sample Date	Sample Type	Dehalococcoides spp.	Vinyl Chloride Reductase
MW-01A1	downgradient	MW-01A1-082814	28-Aug-14	N	< 20,000	NA
MW-01A1		MW-01A1-112514	25-Nov-14	N	< 30,000	NA
MW-01A3	downgradient	MW-01A3-082814	28-Aug-14	N	< 20,000	NA
MW-01A3		MW-01A3-112514	25-Nov-14	N	< 30,000	NA
VM-3D	within	VM-3D-082814	28-Aug-14	N	**1,000 J**	< 20,000
VM-3D		VM-3D-112514	25-Nov-14	N	**50,000**	**80,000 C**
VM-3S	within	VM-3S-082814	28-Aug-14	N	**20,000,000**	< 20,000
VM-3S		VM-3S-112514	25-Nov-14	N	**200,000,000**	**100,000**
VM-4D	within	VM-4D-082814	28-Aug-14	N	< 20,000	NA
VM-4D		VM-4D-112514	25-Nov-14	N	**2,000 J**	<300,000
VM-4S	within	VM-4S-082814	28-Aug-14	N	< 20,000	NA
VM-4S		VM-4S-112514	25-Nov-14	N	**3,000,000**	**300,000**
VM-5S	downgradient	VM-5S-082814	28-Aug-14	N	**400,000**	< 20,000
VM-6S	downgradient	VM-6S-082814	28-Aug-14	N	**30,000**	< 20,000

Notes and Abbreviations:

Units are in gene copies/L = Gene Copies per liter
Bolded values indicate concentrations above the Reportable Detection Limit.
< = Compound not detected. Reportable detection limit shown.
NA = Not analyzed

Qualifiers :

C = correction factor applied to correct for non-specific PCR amplification products, value is an estimated quantity
J = The analyte was positively identified; associated numerical value is the approximate concentration of the analyte in the sample.

APPENDIX B

Standard Operating Procedure No. 2 – Groundwater Sampling, Former Siemens Facility

Standard Operating Procedure No. 2
Groundwater Sampling

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1.0 INTRODUCTION

This standard operation procedure (SOP) has been developed for the former Siemens facility to direct field personnel in the sampling of monitoring wells during groundwater investigation activities and groundwater remediation activities at the site.

1.2 OVERVIEW

This SOP will be implemented in accordance with the following documents:

- 15 August 1990, California Regional Water Quality Control Board, San Francisco Bay Region (Water Board) Site Cleanup Requirements (SCR) Order No. 90-119 Order 90-119 as amended by the 9 January 2013 Order R2-2013-002.
- Health and Safety Plan (HASP) which will identify risks to human health and the environment associated with known and potential chemical impacts at the site and the applicable technologies presented herein.

Investigation and remedial design rational, scope of work, boring, well and/or injection point locations and sampling frequency will be submitted to Siemens for approval in a separate document.

The relevant operational documents that cover the use of substrate are:

- Work Plan, Sampling and Analysis Plan (SAP) or equivalent; and
- Health and Safety Plan (HASP).

1.3 PURPOSE AND OBJECTIVES

The purpose of this SOP is to present the methodologies for sampling and collection of groundwater samples from site monitoring and remediation wells. The objective of the SOP is to provide procedures, methods, and considerations to be used and observed by field personnel to obtain groundwater samples that meet acceptable standards of accuracy, precision, comparability, representativeness, and completeness.

This SOP describes equipment, field procedures, sample containers, decontamination, documentation, storage, holding times, and field quality assurance/quality control (QA/QC) procedures necessary to develop existing ground water monitoring wells and to collect water samples from the site wells.

2.0 *EQUIPMENT AND SUPPLIES*

Sample bottles will be obtained from the analytical laboratory for collecting and testing. Trip blanks for volatile organic compounds will also be obtained from the analytical laboratory.

Typical equipment and forms list for well evacuation and sampling:

- Personal protective equipment, including nitrile or powderless surgical gloves and safety glasses;
- Water level meter;
- pH meter;
- Specific conductivity meter;
- Thermometer;
- Ground Water Sample Collection Data Forms (Figure 1);
- Data recording sheets;
- Field notebook;
- Chain-of-Custody (COC) forms (Figure 2);
- Labels (Figure 3);
- Appropriate sample containers;
- Self-sealing plastic bags;
- Ice chest or cooler;
- Ice or frozen ice packs;
- Spray bottle for deionized water;
- Deionized water; and
- 55-gallon drums or other type of portable storage container.

Equipment used during decontamination:

- Liquinox, Alconox detergent (or equivalent);
- Deionized water; and
- Containers, brushes, paper towels, plastic sheeting.

3.0 GROUNDWATER MONITORING PROCEDURE

3.1 WATER LEVEL MEASUREMENT

Water level measurements will be collected at one time (over the course of a day or two) using a hand-held, electronic water level indicator graduated to 0.01-foot increments and recorded on field data sheets. The depth to water will be measured from the top of the well casing.

3.2 SAMPLE COLLECTION

All wells will be sampled using the HydraSleeve™ sampler. The HydraSleeve™ sampler will be deployed/lowered to the mid-point of the screened interval immediately following water level measurement. The sampler is slim and displaces very little water during deployment; therefore, it does not disturb the water column to the point at which long equilibration times are necessary to ensure recovery of a representative sample. The HydraSleeve™ SOP (GeoInsight Inc., 2010), included in Attachment A, contains diagrams illustrating the steps required for HydraSleeve™ sampler deployment, retrieval, and sample recovery.

3.2.1 Sampler Assembly/Deployment

The following steps will be taken when using the HydraSleeve™ deployment:

1. Remove the sampler from the packaging and crease the reinforced fins outward to open the top of the sampler.
2. Attach a calibrated tether to one of the holes at the top of the sampler.
3. Fold the bottom of the sampler, aligning the two holes, and attach the weight using the stainless steel clip.
4. Lower the weighted sampler to the desired depth of the boring or well screen interval.
5. Secure the sampler at the top of the well by attaching the tether to the well cap. Once the sampler is secure at the surface, the well will be given a minimum of 24 hours to equilibrate before the sample is collected.

3.2.2 *Sampler Retrieval / Sample Collection*

The following steps will be taken when using the HydraSleeve® collection:

1. The sampler will fill as it is pulled upward (out of the well) at a rate of 1 to 2 feet per second.
2. Once the sampler is at the surface, it will be grabbed just below the top to expel water resting on top of the check valve.
3. Using the appropriate tubing, the sampler will be punctured approximately 3 to 4 inches below the white reinforcing strips located at the top of the sampler.
4. Water will be decanted from the sampler through the discharge tube into the appropriate containers for desired laboratory analysis.
5. Any excess water from the HydraSleeve will be collected from designated areas, properly characterized, and either shipped off-site or treated through the existing system in accordance with all regulatory requirements.

3.2.3 *Field Parameter Monitoring*

During purging and collection of groundwater monitoring protocol samples, the following field parameters will be measured and recorded for each well sampled:

- Dissolved oxygen (DO) in milligrams per liter (mg/L);
- Oxidation-reduction potential (ORP) in millivolts (mV);
- pH;
- Temperature in degrees Celsius (°C);
- Specific conductivity in microsiemens per centimeter (µs/cm); and
- Turbidity in naphelometric turbidity units (NTU).

4.0 SAMPLING INSTRUCTIONS

4.1 CONTAINERS, PRESERVATION AND HOLDING TIMES

Certified clean sample containers and trip blanks will be obtained from the contract analytical laboratory. The bottles will be labeled to indicate the type of analysis to be performed, and necessary preservatives will be present in the bottles when received from the laboratory.

Table 1 summarizes the sampling containers, preservation, and holding times for the various types of analyses.

4.2 SAMPLE TRACKING

Documents for tracking the samples are generated in the field. This documentation includes field notes, sample labeling, and chain of custody (COC) forms.

4.2.1 Sample Labeling

Each sample will be labeled prior to collection. The sample label (Figure 3) will be filled out with waterproof ink. Each sample label contains the following information:

- Project number;
- Company name;
- Site/project name;
- Sample number (well location);
- Parameters for analysis;
- Date and time of collection;
- Preservative; and
- Sampler's signature (or initials).

Information pertinent to field survey measurements (Section 3.2.3) and sampling will be recorded on the field forms and/or in the field notebook.

4.2.2 Chain-of-Custody Forms

A COC form will be filled out in the field and will accompany every shipment of samples to the analytical laboratory. The purpose of the COC form is to document possession of a sample from the time of collection in the field to its final disposal by the laboratory.

The laboratory will enter the following information on the form:

- Name of persons receiving the sample;
- Date of sample receipt; and
- Sample condition.

All corrections to the COC record will be initialed and dated by the person making the corrections.

Each COC form will include signatures of the appropriate individuals indicated on the form.

4.3 SAMPLES FOR ASSESSING QA/QC

To identify potential errors, four types of QC samples may be included for analysis. All QC samples are labeled and sent to the laboratory along with the actual samples for analysis. QC sample frequencies are summarized below. The three types of QC samples are as follows:

4.3.1 Trip Blanks

Trip blanks check for contamination due to handling, transport, contact with other samples during storage, or laboratory error. A VOA bottle set is filled with deionized water by the laboratory. This set is taken to the field, labeled with company name, date, and cooler ID, and stored with the other samples until they are delivered for analysis to the laboratory. Trip blanks are opened by laboratory personnel only. One trip blank set is sent per cooler of samples for volatiles analysis per day.

4.3.2 Field Duplicates

Sometimes referred to as a split or replicate, a field duplicate is a check on field and laboratory precision. Two samples from a single bailer or consecutive samples collected by means of a bladder pump are filled at the same sampling location. One is labeled as the actual well sample and the other is labeled as a duplicate sample. Preservation and shipping of samples and their duplicates is identical. One duplicate will be submitted per 10 samples, or one per sampling event if fewer than 10 samples are collected.

4.3.3 *Rinsate Samples*

Bailer or sampling equipment rinsate blanks verify that chemicals are not being carried from one sample to the next via the Teflon sampling bailer or other equipment used in the transfer of water samples. Rinsate field blanks will be taken after sampling the wells known to historically contain the highest chemical concentrations for the group of wells sampled. The sampling bailer and/or other equipment are first decontaminated with deionized water. Deionized water is then poured from the bailer (and/or other equipment) into sample bottles labeled with a QC number. One rinsate sample will be submitted per 20 samples collected with a bailer.

Rinsate samples will not be collected for wells to which specific or disposable sampling equipment (bailer or pump) has been dedicated, as no likelihood of transferring chemicals to other samples exists.

5.0 EQUIPMENT DECONTAMINATION

Decontamination will be performed on all non-dedicated sampling equipment that may contact potentially contaminated water including water level meters and other sampling equipment. Clean nitrile gloves or powderless surgical gloves are to be worn during decontamination.

An equipment decontamination station will be centrally located on site. Each piece of sampling equipment will be decontaminated before each sampling period and between each well. Plastic sheeting will be laid down around each well during sampling to protect decontaminated equipment from contact with the ground. The decontamination procedure for most equipment will be as follows:

- Wash equipment in an Alconox (or equivalent) and water solution using a brush or clean cloth to ensure removal of all contaminants;
- Rinse equipment in fresh tap water;
- Rinse again with deionized water; and
- Dry equipment with paper towel and place in clean plastic, if appropriate.

The effectiveness of these decontamination procedures will be verified by vigorous QA/QC protocols, including blanks and duplicates.

Decontamination water will be collected from designated areas, properly characterized and either shipped off-site or treated through the existing system in accordance with all regulatory requirements.

6.0 DOCUMENTATION

Thorough documentation in the field is required to ensure proper labeling and tracking of samples, identify potential sources of error, and maintain accountability among field personnel.

6.1 FIELD NOTES AND DATA COLLECTION FORMS

Field notes shall be kept in a bound notebook. The following information will be included in the field notes and/or on data collection forms:

General Information:

- Names of personnel;
- Weather;
- Date and time of sampling;
- Location and well number;
- Condition of the well;
- Times that procedures and measurements are completed;
- Calibration of meters at start of day;
- Decontamination times; and
- Initial static water level and total well depth.

Sampling Information:

- Volume of water evacuated before sampling;
- General description of sample procedures, or reference the SOP;
- Time of sample collection;
- Number of samples collected;
- Sample identification numbers;
- Preservation and storage of samples;
- Record of any QC samples from site;
- Any irregularities or problems that may have a bearing on sampling quality; and
- Type of sampling equipment.

Figures

Former SMI Site
10950 North Tantau, Cupertino, CA
QUARTERLY GROUNDWATER SAMPLING
FIELD NOTES / ERM 0201040

Date:
Set up time:
Weather:
Samplers:

WELL

Location: ERP
Construction:
Groundwater Zone:
Screened Interval:

Construction Depth:
Measured Depth:
Depth to Packer:
Pump Intake:

Purge Setting: Discharge: / Refill:
Sample Setting: Discharge:

Depth to Water:
Height of Water Column:
Volume of one casing:

Packer Pressure:
Purge Start Time:
Discharge Rate:
Purge End Time:

Purge calculations
__________ ft. x gals ___ / ft. x 3 =
_________ gallons

Time	Purge Volume (Gallons)	Temp. (°C)	pH		ORP	DO (mg/L)	Turbidity

ANALYSES REQUIRED	SAMPLE TIME	CONTAINER TYPE	FILTRATION?

FIELD OBSERVATIONS (Well condition, repairs needed)

Disposal method of purge water:

Decontamination procedure:

Other notes:

Sampler Signature(s) :

Figure 1
Groundwater Sampling Form
Standard Operating Procedure No. 2
Groundwater Sampling
Former Siemens Facility
Cupertino, California

Environmental Resources Management

CHAIN OF CUSTODY RECORD

NO: 07889

1277 Treat Boulevard, Suite 500 • Walnut Creek, CA • 94597 • (925) 946-0455 • FAX (925) 946-9968

Page ________ of ________

PROJECT #	PROJECT NAME

SAMPLER: **(PRINT NAME)**	**(SIGNATURE)**

RECEIVING LABORATORY

SAMPLE I.D.	DATE	TIME	COMP	GRAB	SAMPLING METHOD	PRESER-VATIVE	ICE (Y/N)	SAMPLING VOLUME	# OF CONTAINERS	MATRIX: SOIL	MATRIX: WATER	MATRIX: GAS	REQUESTED PARAMETERS										

RELINQUISHED BY *(SIGNATURE)*	DATE	TIME	RECEIVED BY	DATE	TIME
RELINQUISHED BY *(SIGNATURE)*	DATE	TIME	RECEIVED BY	DATE	TIME
RELINQUISHED BY *(SIGNATURE)*	DATE	TIME	RECEIVED BY	DATE	TIME

FIELD REMARKS

Figure 2
Chain of Custody Form
Standard Operating Procedure No. 2
Groundwater Sampling
Former Siemens Facility
Cupertino, California

REMARKS ON SAMPLE RECEIPT	ERM REMARKS
☐ BOTTLE INTACT ☐ CUSTODY SEALS ☐ CHILLED ☐ PRESERVED ☐ SEALS INTACT ☐ SEE REMARKS	

SEND REPORT TO:

WHITE – LABORATORY COPY   CANARY – FIELD COPY   PINK – DATABASE   GOLD – PROJECT FILE

ENVIRONMENTAL SAMPLING SUPPLY

LOT#

SAMPLE ID

SAMPLED BY	DATE
	TIME
LOCATION	PRESERVATIVE
ANALYSIS	CLIENT

Oakland, CA • Houston, TX • Chicago, IL • Richmond, VA
(510) 562-4988 www.essvial.com (800) 233-8425

Figure 3
Sample Label
Standard Operating Procedure No. 2
Groundwater Sampling
Former Siemens Facility
Cupertino, California

Table

Table 1 Sample Containers, Preservatives, and Holding Times for Test Parameters

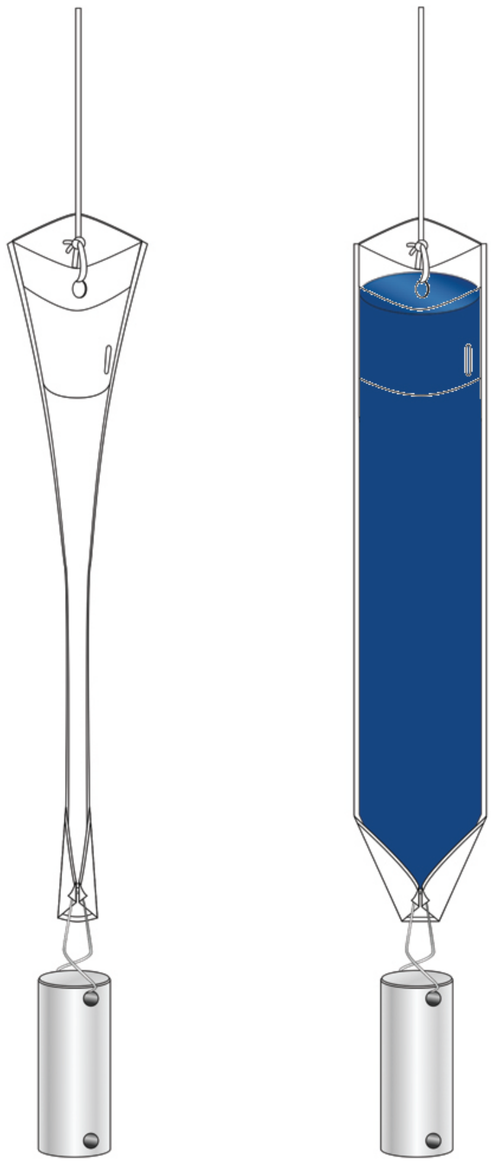
Parameter	Container	Preservative	Lab Holding Times
Volatile organic compounds	3 x 40 mL vial with Teflon faced septa cap	Acidity to pH of <2 with hydrochloric acid. Refrigerate at 4° ±2ºC	Analysis performed within 14 days from sample collection date
Methane, ethane, and ethene	2 x 40 mL vial with Teflon faced septa cap	Acidity to pH of <2 with hydrochloric acid. Refrigerate at 4° ±2ºC	Analysis performed within 14 days from sample collection date
Chloride, nitrate, and sulfate	250 mL polyethylene vial	Refrigerate at 4° ±2ºC	Analysis performed within 28 days from sample collection date
Total organic carbon	50 mL polyethylene vial	Acidity to pH of <2 with hydrochloric acid. Refrigerate at 4° ±2ºC	Analysis performed within 28 days from sample collection date
Dehalobacter and dehalococcoides	1L polyethylene vial	Refrigerate at 4° ±2ºC	Analysis performed within 10 days from sample collection date

Attachment A
The HydraSleeve™
Standard Operating Procedure

HYDRASleeve™

Simple by Design US Patent No. 6,481,300; No. 6,837,120 others pending

Standard Operating Procedure:
Sampling Ground Water with a HydraSleeve



This Guide should be used in addition to field manuals appropriate to sampling device (i.e., HydraSleeve or Super Sleeve).

Find the appropriate field manual on the HydraSleeve website at http://www.hydrasleeve.com.

For more information about the HydraSleeve, or if you have questions, contact: GeoInsight, 2007 Glass Road, Las Cruces, NM 88005, 1-800-996-2225, info@hydrasleeve.com.

Table of Contents

Introduction

The HydraSleeve is classified as a no-purge (passive) grab sampling device, meaning that it is used to collect ground-water samples directly from the screened interval of a well without having to purge the well prior to sample collection. When it is used as described in this Standard Operating Procedure (SOP), the HydraSleeve causes no drawdown in the well (until the sample is withdrawn from the water column) and only minimal disturbance of the water column, because it has a very thin cross section and it displaces very little water (<100 ml) during deployment in the well. The HydraSleeve collects a sample from within the screen only, and it excludes water from any other part of the water column in the well through the use of a self-sealing check valve at the top of the sampler. It is a single-use (disposable) sampler that is not intended for reuse, so there are no decontamination requirements for the sampler itself.

The use of no-purge sampling as a means of collecting representative ground-water samples depends on the natural movement of ground water (under ambient hydraulic head) from the formation adjacent to the well screen through the screen. Robin and Gillham (1987) demonstrated the existence of a dynamic equilibrium between the water in a formation and the water in a well screen installed in that formation, which results in formation-quality water being available in the well screen for sampling at all times. No-purge sampling devices like the HydraSleeve collect this formation-quality water as the sample, under undisturbed (non-pumping) natural flow conditions. Samples collected in this manner generally provide more conservative (i.e., higher concentration) values than samples collected using well-volume purging, and values equivalent to samples collected using low-flow purging and sampling (Parsons, 2005).

Applications of the HydraSleeve

The HydraSleeve can be used to collect representative samples of ground water for all analytes (volatile organic compounds [VOCs], semi-volatile organic compounds [SVOCs], common metals, trace metals, major cations and anions, dissolved gases, total dissolved solids, radionuclides, pesticides, PCBs, explosive compounds, and all other analytical parameters). Designs are available to collect samples from wells from 1” inside diameter and larger. The HydraSleeve can collect samples from wells of any yield, but it is especially well-suited to collecting samples from low-yield wells, where other sampling methods can’t be used reliably because their use results in dewatering of the well screen and alteration of sample chemistry (McAlary and Barker, 1987).

The HydraSleeve can collect samples from wells of any depth, and it can be used for single-event sampling or long-term ground-water monitoring programs. Because of its thin cross section and flexible construction, it can be used in narrow, constricted or damaged wells where rigid sampling devices may not fit. Using multiple HydraSleeves deployed in series along a single suspension line or tether, it is also possible to conduct in-well vertical profiling in wells in which contaminant concentrations are thought to be stratified.

As with all groundwater sampling devices, HydraSleeves should not be used to collect ground-water samples from wells in which separate (non-aqueous) phase hydrocarbons (i.e., gasoline, diesel fuel or jet fuel) are present because of the possibility of incorporating some of the separate-phase hydrocarbon into the sample.

Description of the HydraSleeve

The HydraSleeve (Figure 1) consists of the following basic components:

- A suspension line or tether (A.), attached to the spring clip or directly to the top of the sleeve to deploy the device into and recover the device from the well. Tethers with depth indicators marked in 1-foot intervals are available from the manufacturer.
- A long, flexible, 4-mil thick lay-flat polyethylene sample sleeve (C.) sealed at the bottom (this is the sample chamber), which comes in different sizes, as discussed below with a self-sealing reed-type flexible polyethylene check valve built into the top of the sleeve (B.) to prevent water from entering or exiting the sampler except during sample acquisition.
- A reusable stainless-steel weight with clip (D.), which is attached to the bottom of the sleeve to carry it down the well to its intended depth in the water column. Bottom weights available from the manufacturer are 0.75” OD and are available in three sizes: 5 oz. (2.5” long); 8 oz. (4” long); and 16 oz. (8” long). In lieu of a bottom weight, an optional top weight may be attached to the top of the HydraSleeve to carry it to depth and to compress it at the bottom of the well (not shown in Figure 1);
- A discharge tube that is used to puncture the HydraSleeve after it is recovered from the well so the sample can be decanted into sample bottles (not shown).
- Just above the self-sealing check valve at the top of the sleeve are two holes which provide attachment points for the spring clip and/or suspension line or tether. At the bottom of the sample sleeve are two holes which provide attachment points for the weight clip and weight.

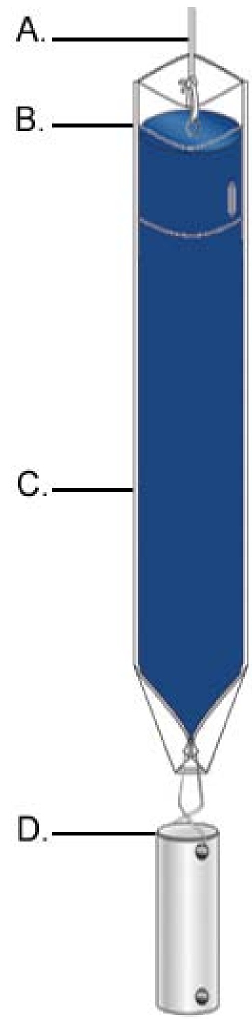


Figure 1. HydraSleeve components.

> **Note:** The sample sleeve and the discharge tube are designed for one-time use and are disposable. The spring clip, weight and weight clip may be reused after thorough cleaning. Suspension cord is generally disposed after one use although, if it is dedicated to the well, it may be reused at the discretion of the sampling personnel.

Selecting the HydraSleeve Size to Meet Site-Specific Sampling Objectives

It is important to understand that each HydraSleeve is able to collect a finite volume of sample because, after the HydraSleeve is deployed, you only get one chance to collect an undisturbed sample. Thus, the volume of sample required to meet your site-specific sampling and analytical requirements will dictate the size of HydraSleeve you need to meet these requirements.

The volume of sample collected by the HydraSleeve varies with the diameter and length of the HydraSleeve. Dimensions and volumes of available HydraSleeve models are detailed in Table 1.

Table 1. Dimensions and volumes of HydraSleeve models.

Diameter	Volume	Length	Lay-Flat Width	Filled Dia.
2-Inch HydraSleeves				
Standard 625-ml HydraSleeve	625 ml	< 30”	2.5”	1.4”
Standard 1-Liter HydraSleeve	1 Liter	38”	3”	1.9”
1-Liter HydraSleeve SS	1 Liter	36”	3”	1.9”
2-Liter HydraSleeve SS	2 Liters	60”	3”	1.9”
4-Inch HydraSleeves				
Standard 1.6-Liter HydraSleeve	1.6 Liters	30”	3.8”	2.3”
Custom 2-Liter HydraSleeve	2 Liters	36”	4”	2.7”

HydraSleeves can be custom-fabricated by the manufacturer in varying diameters and lengths to meet specific volume requirements. HydraSleeves can also be deployed in series (i.e., multiple HydraSleeves attached to one tether) to collect additional sample to meet specific volume requirements, as described below.

If you have questions regarding the availability of sufficient volume of sample to satisfy laboratory requirements for analysis, it is recommended that you contact the laboratory to discuss the minimum volumes needed for each suite of analytes. Laboratories often require only 10% to 25% of the volume they specify to complete analysis for specific suites of analytes, so they can often work with much smaller sample volumes that can easily be supplied by a HydraSleeve.

HydraSleeve Deployment

Information Required Before Deploying a HydraSleeve

Before installing a HydraSleeve in any well, you will need to know the following:

- The inside diameter of the well
- The length of the well screen
- The water level in the well
- The position of the well screen in the well
- The total depth of the well

The inside diameter of the well is used to determine the appropriate HydraSleeve diameter for use in the well. The other information is used to determine the proper placement of the HydraSleeve in the well to collect a representative sample from the screen (see HydraSleeve Placement, below), and to determine the appropriate length of tether to attach to the HydraSleeve to deploy it at the appropriate position in the well.

Most of this information (with the exception of the water level) should be available from the well log; if not, it will have to be collected by some other means. The inside diameter of the well can be measured at the top of the well casing, and the total depth of the well can be measured by sounding the bottom of the well with a weighted tape. The position and length of the well screen may have to be determined using a down-hole camera if a well log is not available. The water level in the well can be measured using any commonly available water-level gauge.

HydraSleeve Placement

The HydraSleeve is designed to collect a sample directly from the well screen, and it fills by pulling it up through the screen a distance equivalent to 1 to 1.5 times its length. This upward motion causes the top check valve to open, which allows the device to fill. To optimize sample recovery, it is recommended that the HydraSleeve be placed in the well so that the bottom weight rests on the bottom of the well and the top of the HydraSleeve is as close to the bottom of the well screen as possible. This should allow the sampler to fill before the top of the device reaches the top of the screen as it is pulled up through the water column, and ensure that only water from the screen is collected as the sample. In short-screen wells, or wells with a short water column, it may be necessary to use a top-weight on the HydraSleeve to compress it in the bottom of the well so that, when it is recovered, it has room to fill before it reaches the top of the screen.

Example

2” ID PVC well, 50’ total depth, 10’ screen at the bottom of the well, with water level above the screen (the entire screen contains water).

Correct Placement (figure 2): Using a standard HydraSleeve for a 2” well (2.6” flat width/1.5” filled OD x 30” long, 650 ml volume), deploy the sampler so the weight (an 8 oz., 4”-long weight with a 2”-long clip) rests at the bottom of the well. The top of the sleeve is thus set at about 36” above the bottom of the well. When the sampler is recovered, it will be pulled upward approximately 30” to 45” before it is filled; therefore, it is full (and the top check valve closes) at approximately 66” (5 ½ feet) to 81” (6 ¾ feet) above the bottom of the well, which is well before the sampler reaches the top of the screen. In this example, only water from the screen is collected as a sample.

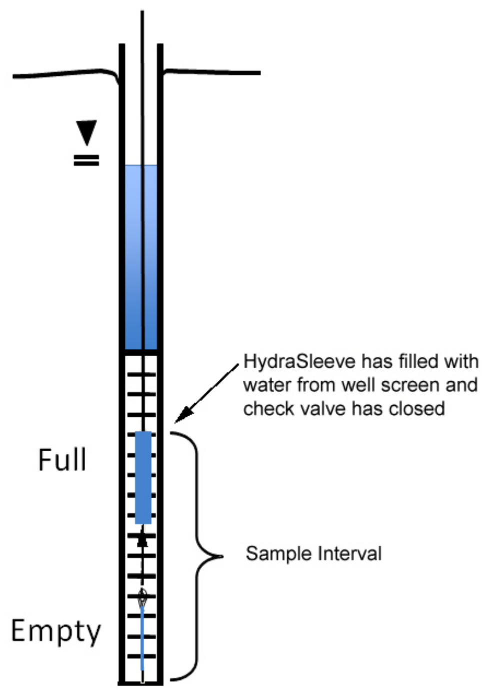


Figure 2. Correct placement of HydraSleeve.

Incorrect Placement (figure 3): If the well screen in this example was only 5' long, and the HydraSleeve was placed as above, it would not fill before the top of the device reached the top of the well screen, so the sample would include water from above the screen, which may not have the same chemistry.

The solution? Deploy the HydraSleeve with a top weight, so that it is collapsed to within 6" to 9" of the bottom of the well. When the HydraSleeve is recovered, it will fill within 39" (3 ¼ feet) to 54" (4 ½ feet) above the bottom of the well, or just before the sampler reaches the top of the screen, so it collects only water from the screen as the sample.

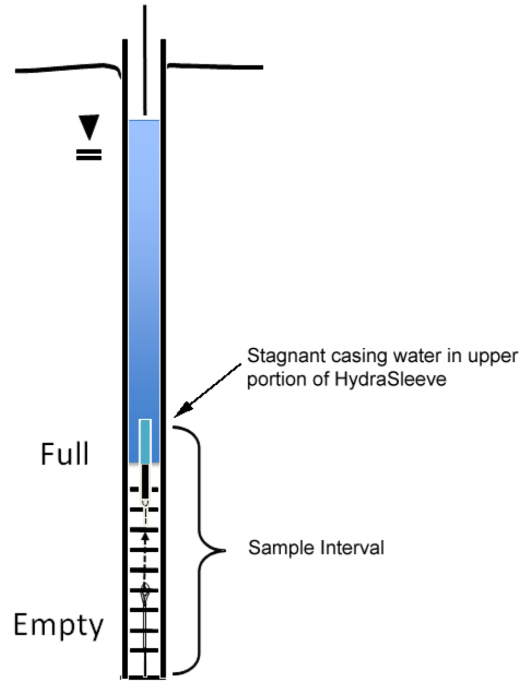


Figure 3. Incorrect placement of HydraSleeve.

This example illustrates one of many types of HydraSleeve placements. More complex placements are discussed in a later section.

Procedures for Sampling with the HydraSleeve

Collecting a ground-water sample with a HydraSleeve is a simple one-person operation.

> **Note:** Before deploying the HydraSleeve in the well, collect the depth-to-water measurement that you will use to determine the preferred position of the HydraSleeve in the well. This measurement may also be used with measurements from other wells to create a ground-water contour map. If necessary, also measure the depth to the bottom of the well to verify actual well depth to confirm your decision on placement of the HydraSleeve in the water column.
>
> Measure the correct amount of tether needed to suspend the HydraSleeve in the well so that the weight will rest on the bottom of the well (or at your preferred position in the well). Make sure to account for the need to leave a few feet of tether at the top of the well to allow recovery of the sleeve

> **Note:** Always wear sterile gloves when handling and discharging the HydraSleeve.

I. Assembling the HydraSleeve

1. Remove the HydraSleeve from its packaging, unfold it, and hold it by its top.
2. Crimp the top of the HydraSleeve by folding the hard polyethylene reinforcing strips at the holes.
3. Attach the spring clip to the holes to ensure that the top will remain open until the sampler is retrieved.
4. Attach the tether to the spring clip by tying a knot in the tether.

> **Note:** Alternatively, attach the tether to one (NOT both) of the holes at the top of the Hydrasleeve by tying a knot in the tether.

5. Fold the flaps with the two holes at the bottom of the HydraSleeve together and slide the weight clip through the holes.
6. Attach a weight to the bottom of the weight clip to ensure that the HydraSleeve will descend to the bottom of the well.

II. Deploying the HydraSleeve

1. Using the tether, carefully lower the HydraSleeve to the bottom of the well, or to your preferred depth in the water column

   During installation, hydrostatic pressure in the water column will keep the self-sealing check valve at the top of the HydraSleeve closed, and ensure that it retains its flat, empty profile for an indefinite period prior to recovery.

Note: Make sure that it is not pulled upward at any time during its descent. If the HydraSleeve is pulled upward at a rate greater than 0.5'/second at any time prior to recovery, the top check valve will open and water will enter the HydraSleeve prematurely.

2. Secure the tether at the top of the well by placing the well cap on the top of the well casing and over the tether.

Note: Alternatively, you can tie the tether to a hook on the bottom of the well cap (you will need to leave a few inches of slack in the line to avoid pulling the sampler up as the cap is removed at the next sampling event).

III. Equilibrating the Well

The equilibration time is the time it takes for conditions in the water column (primarily flow dynamics and contaminant distribution) to restabilize after vertical mixing occurs (caused by installation of a sampling device in the well).

- Situation: The HydraSleeve is deployed for the first time or for only one time in a well

  The HydraSleeve is very thin in cross section and displaces very little water (<100 ml) during deployment so, unlike most other sampling devices, it does not disturb the water column to the point at which long equilibration times are necessary to ensure recovery of a representative sample.

  In most cases, the HydraSleeve can be recovered immediately (with no equilibration time) or within a few hours. In regulatory jurisdictions that impose specific requirements for equilibration times prior to recovery of no-purge sampling devices, these requirements should be followed.

- Situation: The HydraSleeve is being deployed for recovery during a future sampling event

  In periodic (i.e., quarterly or semi-annual) sampling programs, the sampler for the current sampling event can be recovered and a new sampler (for the next sampling event) deployed immediately thereafter, so the new sampler remains in the well until the next sampling event.

Thus, a long equilibration time is ensured and, at the next sampling event, the sampler can be recovered immediately. This means that separate mobilizations, to deploy and then to recover the sampler, are not required. HydraSleeves can be left in a well for an indefinite period of time without concern.

IV. HydraSleeve Recovery and Sample Collection

1. Hold on to the tether while removing the well cap.

2. Secure the tether at the top of the well while maintaining tension on the tether (but without pulling the tether upwards)

3. Measure the water level in the well.

4. In one smooth motion, pull the tether up between 30" to 45" (36" to 54" for the longer HydraSleeve) at a rate of about 1' per second (or faster).

   The motion will open the top check valve and allow the HydraSleeve to fill (it should fill in about 1 to 1.5 times the length of the HydraSleeve). This is analogous to coring the water column in the well from the bottom up.

   When the HydraSleeve is full, the top check valve will close. You should begin to feel the weight of the HydraSleeve on the tether and it will begin to displace water. The closed check valve prevents loss of sample and entry of water from zones above the well screen as the HydraSleeve is recovered.

5. Continue pulling the tether upward until the HydraSleeve is at the top of the well.

6. Decant and discard the small volume of water trapped in the Hydrasleeve above the check valve by turning the sleeve over.

V. Sample Collection

Note: Sample collection should be done immediately after the HydraSleeve has been brought to the surface to preserve sample integrity.

1. Remove the discharge tube from its sleeve.

2. Hold the HydraSleeve at the check valve.

3. Puncture the HydraSleeve just below the check valve with the pointed end of the discharge tube

4. Discharge water from the HydraSleeve into your sample containers.

Control the discharge from the HydraSleeve by either raising the bottom of the sleeve, by squeezing it like a tube of toothpaste, or both.

5. Continue filling sample containers until all are full.

Measurement of Field Indicator Parameters

Field indicator parameter measurement is generally done during well purging and sampling to confirm when parameters are stable and sampling can begin. Because no-purge sampling does not require purging, field indicator parameter measurement is not necessary for the purpose of confirming when purging is complete.

If field indicator parameter measurement is required to meet a specific non-purging regulatory requirement, it can be done by taking measurements from water within a HydraSleeve that is not used for collecting a sample to submit for laboratory analysis (i.e., a second HydraSleeve installed in conjunction with the primary sample collection HydraSleeve [see Multiple Sampler Deployment below]).

Alternate Deployment Strategies

Deployment in Wells with Limited Water Columns

For wells in which only a limited water column exists to be sampled, the HydraSleeve can be deployed with an optional top weight instead of a bottom weight, which collapses the HydraSleeve to a very short (approximately 6” to 9”) length, and allows the HydraSleeve to fill in a water column only 36” to 45” in height.

Multiple Sampler Deployment

Multiple sampler deployment in a single well screen can accomplish two purposes:

- It can collect additional sample volume to satisfy site or laboratory-specific sample volume requirements.
- It can accommodate the need for collecting field indicator parameter measurements.
- It can be used to collect samples from multiple intervals in the screen to allow identification of possible contaminant stratification.

It is possible to use up to 3 standard 30" HydraSleeves deployed in series along a single tether to collect samples from a 10' long well screen without collecting water from the interval above the screen.

The samplers must be attached to the tether at both the top and bottom of the sleeve. Attach the tether at the top with a stainless-steel clip (available from the manufacturer). Attach the tether at the bottom using a cable tie. The samplers must be attached as follows (figure 4):

- The first (attached to the tether as described above, with the weight at the bottom) at the bottom of the screen
- The second attached immediately above the first
- The third (attached the same as the second) immediately above the second

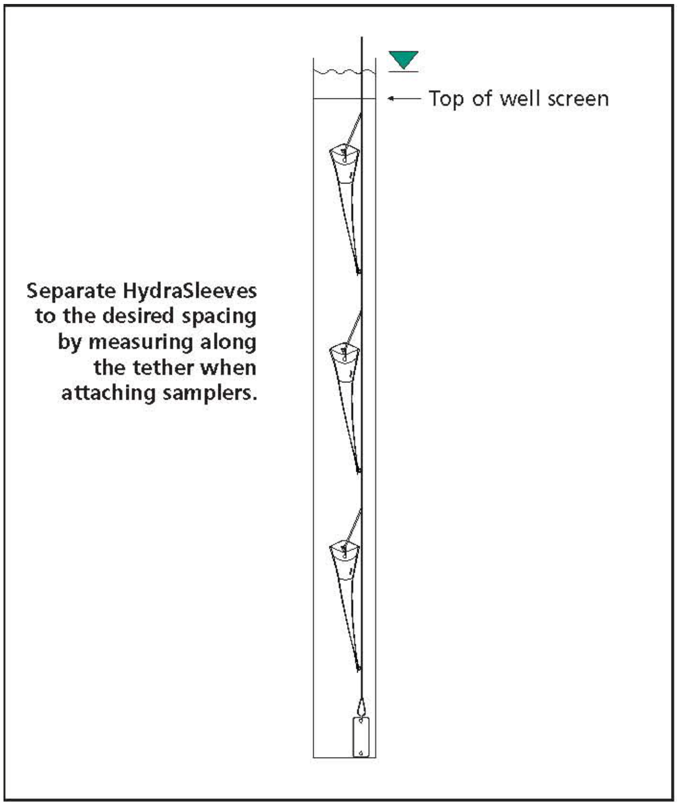


Figure 4. Multiple HydraSleeve deployment.

Alternately, the first sampler can be attached to the tether as described above, a second attached to the bottom of the first using a short length of tether (in place of the weight), and the third attached to the bottom of the second in the same manner, with the weight attached to the bottom of the third sampler (figure 5).

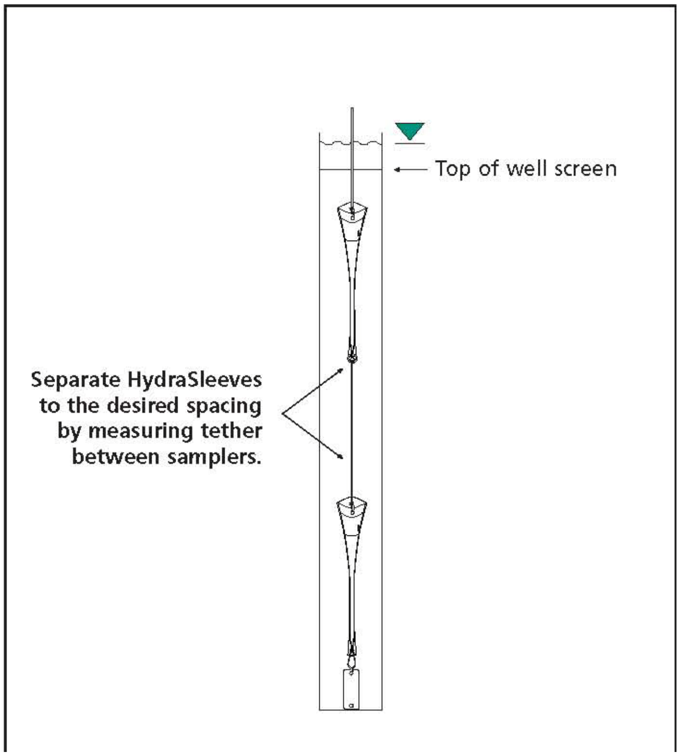


Figure 5. Alternative method for deploying multiple HydraSleeves.

In either case, when attaching multiple HydraSleeves in series, more weight may be required to hold the samplers in place in the well than would be required with a single sampler. Recovery of multiple samplers and collection of samples is done in the same manner as for single sampler deployments.

Post-Sampling Activities

The recovered HydraSleeve and the sample discharge tubing should be disposed as per the solid waste management plan for the site. To prepare for the next sampling event, a new HydraSleeve can be deployed in the well (as described previously) and left in the well until the next sampling event, at which time it can be recovered.

The weight and weight clip can be reused on this sampler after they have been thoroughly cleaned as per the site equipment decontamination plan. The tether may be dedicated to the well and reused or discarded at the discretion of sampling personnel.

References

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