

PSC 2003



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January 27, 2003

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**RE: REQUEST FOR SUPPLEMENTAL INFORMATION: RCRA FACILITY
INVESTIGATION REPORT FOR CORRECTIVE ACTION UNIT #8 (FORMER
CORONADO MUNICIPAL LANDFILL)
PHILIPS SEMICONDUCTOR; EPA ID# NMD00070982
HWB-FACILITY-03-001**

Dear Mr. Welter:

The New Mexico Environment Department (NMED) has reviewed the subject report dated December 2002. Based on staff review, NMED has determined that the following supplemental information is required.

1. P. 2-27 1st paragraph and Figure 2-7 – soil sampling locations are not shown as described in the text. Please make the necessary corrections.
2. Table 2-9 – heading should note that that the table is continued from previous page. Also, this part of the table is confusing: the reader cannot determine which monitoring well the data are for. Please clarify/correct.
3. Methane Monitoring (p. 2-19, 1st paragraph) – the total number of methane gas vents (35) does not agree with the total of “no longer operational vents” (13) and “operational vents” (23). Please clarify/correct.
4. Figure 2-8 – there is no explanation for the triangular shaped sampling points. Please provide an explanation.
5. Figure 2-8 -- SG-92 is not shown as a “PCE>2µg/L” location as described in the text. Please correct the figure.

**RESPONSE TO NEW MEXICO ENVIRONMENT DEPARTMENT'S 27 JANUARY 2003 REQUEST FOR SUPPLEMENTAL INFORMATION ON RCRA FACILITY INVESTIGATION REPORT FOR CORRECTIVE ACTION UNIT #8 (FORMER CORONADO MUNICIPAL LANDFILL)
PHILIPS SEMICONDUCTOR; EPA ID#NMD00070982
HWB-FACILITY-03-001**

The below table provides Philips Semiconductors' responses to the NMED's request for additional information regarding RCRA facility investigation report for Corrective Action Unit #8 (former Coronado Municipal Landfill) in January 2003. In general, Philips Semiconductors concurs with the NMED's comments and will implement the suggested changes to the investigation. Specific responses to each NMED comment are provided below.

COMMENT NO.	RESPONSE
Comment	
1.	The text was changed to read "Figure 2-6 shows the samples locations and Table 2-8 summarizes the analytical results..."
2.	The table title was changed to read "Table 2-9 (continued)." The table headings MW-1, MW-2, MW-3 and MW-4 headings were omitted.
3.	The text was corrected to read "Twelve of the methane vents are no longer operational due to construction activities..."
4.	Figure 2-8 was changed to contain only circular shaped sampling points. Originally, the figure included the triangular shaped sampling points to indicate sampling points located outside of the original proposed grid. For the purposes of this report, the triangular shaped points are not needed.
5.	Figure 2-8 was corrected to show SG-92 as a "PCE>2µg/L" location.
6.	The two bulleted items were corrected to read "In 27 samples the chlorinated compound PCE was detected..." and "Only two of the 27 samples that contained PCE also contained one or more of its degradation products..."
7.	Figure 2-10 which shows the soil sample locations was omitted from the original document and the document incorrectly referenced Figure 2-9. Figure 2-10 has been inserted as page 2-48, and the text reference has been corrected. Due to the insertion of Figure 2-10 all pages following page 2-48 are being re-issued as replacement pages because the page numbers have changed due to the figure insertion. Additionally, Figure 2-5 was originally omitted from the Table of Contents and figures 2-6 through 2-10 were described incorrectly. Corrections have been made to the Table of Contents' list of figures.

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Methane Monitoring

Methane gas and landfill material were discovered during a 1980 geotechnical investigation of the area selected for construction of the Philips facility. Thirty-five methane gas vents were initially installed along the north edge of the southern section of the former CML, just south and southwest of the Philips facility (ERCO, 1981). Twelve of the methane vents are no longer operational due to construction activities; locations of the remaining 23 vents are shown on Figure 2-6.

During initial excavation activities at the site, the concentration of methane in the soil ranged from 0 to 80 percent of the lower explosive limit (LEL) (ERCO, 1981). During the excavation and removal of landfill material, one detection event reached 100 percent of the LEL (ERCO, 1981). From 1981 to 1993, methane gas detections at the vents ranged from 500 parts per million (ppm) (1 percent of LEL) to 28,500 ppm (57 percent of LEL). (Historical reports from the methane monitoring program are provided as Appendix A). Thirteen monitoring points within the Philips facility never detected methane above 500 ppm (1 percent of the LEL). The methane monitoring program was discontinued in 1993 after several months of nondetect readings.

Conclusions

Conclusions drawn from the 1980 and 1981 initial site investigations are summarized below:

- The contents of the landfill materials for the most part include "typical" residential garbage. There is a potential that the former CML may have accepted oils, paint, and inks in limited quantities as it occurred in typical domestic waste.
- Extraction procedure toxicity testing was conducted on composited samples of landfill material and all analytical results indicated levels below the MCLs established for the characteristic of toxicity.
- Methane gas was detected in the installed methane monitoring wells and during landfill excavation activities. However, methane monitoring was discontinued in 1993 due to a series of nondetects for methane.

The original report and data from the 1980 and 1981 ERCO investigations are not available at this time to be appended to this report.

1981 Subsurface Investigation

In 1981, Sergeant, Hauskins & Beckwith performed a deep subsurface investigation on the Philips property. They concluded that the soil underlying the site consists predominantly of interbedded silty sand and sandy silt, which extend to depths ranging from 64 to 99 feet below existing grade. These unconsolidated sediments inferred to have been generally deposited by flash floods originating in the western flanks of the Sandia Mountains east of the site. Landfill materials were encountered at the surface in three of the borings with some areas containing considerable trash and debris. The fill material extended from 3 to 20 feet below existing grade at the time at the various boring locations (Sergeant, Hauskins & Beckwith, 1981). The original report and data from the 1981 investigation are not available at this time to be appended to this report.

locations adjacent to the Philips parking lot area. Figure 2-6 shows the sample locations and Table 2-8 summarizes the analytical results for the target compound list of organics and target analyte list metals. As indicated previously, the original report and data from the 1992 investigation are not available at this time to be appended to this report.

No VOCs were detected in any of the collected surface soil samples (Flour Daniel, 1993). No SVOCs were detected in the selected background surface soil sample (SS09) and sample SS06. In surface soil samples SS07 and SS08 (duplicate), 19 SVOCs were detected at concentrations greater than the analytical MDLs. At the time of the investigation and in subsequent reports and work plans, various polyaromatic hydrocarbons have been reported as exceeding EPA residential and/or industrial screening levels in effect at the time of the writing. In this report all concentrations have been compared to the current NMED soil screening levels (NMED, 2000).

Comparison to the NMED soil screening levels indicates that the reported SVOC sample results for samples SS07 and SS08 indicate that as many as five polyaromatic hydrocarbons exceeded the residential NMED soil screening levels, with some concentrations also exceeding the industrial levels. The type of polyaromatic hydrocarbon SVOC compounds detected in the surface soils at the Philips site are often associated with oil products and asphalt products. Therefore, the proximity of the 1992 soil sampling locations to the Philips parking lot suggests that the elevated SVOCs may have been due to surface soil impacts from parking lot materials and runoff as opposed to representing contamination associated with former landfill materials. This is further supported by the fact that the sampled top 8 inches of soil was very unlikely to be indicative of original landfill material or surface cover. The almost 30 years of time since the landfill had been in use, during which the site was developed and the Philips facility and parking areas were all constructed, suggests that the upper 8 inches of soil in the sampled areas was likely fill or at minimum highly reworked material from throughout the site.

Seven pesticides were detected in the soil samples, with all samples containing concentrations of at least one or more of the seven compounds. As with the SVOCs the pesticide results have been reported as exceeding various EPA residential and/or industrial screening levels that were in effect at the time different documents were written. However, in this report all concentrations have been compared to the current NMED soil screening levels (NMED, 2000). Reported concentrations for one of the identified pesticides (dieldrin) exceeded the residential NMED screening level in the diluted run of surface soil sample SS07. Prior to analysis of the diluted samples, none of the surface soil sample results indicated concentrations of any of the seven pesticides that exceeded the residential or industrial screening levels. The sample dilutions were conducted to quantify the SVOC concentrations that exceeded the instrument detection limits. The diluted sample results were all flagged as estimated concentrations and were also noted as having more than a 25 percent discrepancy between chromatograph readings. These laboratory flags indicate that the concentrations should be considered as estimated and likely do not represent true soil results.

Concentrations of chromium, lead, and mercury were detected in investigatory samples at concentrations greater than those detected at the background boring location (SS09). However, all metals concentrations were significantly below NMED residential and industrial screening levels.

Table 2-9 (continued). Summary of Tetrachloroethene Concentrations from Philips Wells MW-1, MW-2, MW-3, and MW-4 1988 through 2001

Sample Date	Parameter	Sample Location		Trip Blank	Reporting Limit (µg/L)
		MW-5 (µg/L)	MW-6 (µg/L)		
July 2001 ^c	Tetrachloroethene	< 1	< 1	-	-
October 2001 ^c	Tetrachloroethene	< 1	< 1	-	-

^a The static water level in well MW-3 dropped below the screen interval in 1998 and the well went dry. Therefore, sampling was unable to be continued.

^b Beginning in 2000 for wells that had more than 8 quarters of sampling data available the sampling frequency was reduced to annually. The annual event occurs in the second quarter of each year (April).

^c The new Philips wells MW-5 and MW-6 were installed during 2001 and were sampled in the 3rd and 4th quarters (July and October) of 2001. Results for both wells during both quarters were non detect.

Notes: 1. Analyses performed using EPA Method 601, 8010, or 8260.
 2. NA = Results not available. NS = Well not sampled. ND = Analyte not detected.

Sources: September 1988 through January 1993 data obtained from Table 6-2, PRC Environmental Management, Inc. (PRC), 1992, "RCRA Facility Assessment Report, Signetics Corporation, Albuquerque, New Mexico, NMD000709782," PRC Environmental Management, Inc., Dallas, Texas. January 1993 through November 1995 data obtained from Philips Semiconductors central files. April 1996 data obtained from Table 3, Daniel B. Stephens and Associates, Inc., May 1996, "North American Philips Company Quarterly Ground-Water Monitoring Report," Daniel B. Stephens and Associates, Inc., Albuquerque, New Mexico. 1997 through 1999 data obtained from Philips Semiconductors.

Table 2-10. Summary of Tetrachloroethene Concentrations from NCLF Wells 1997 through 2001

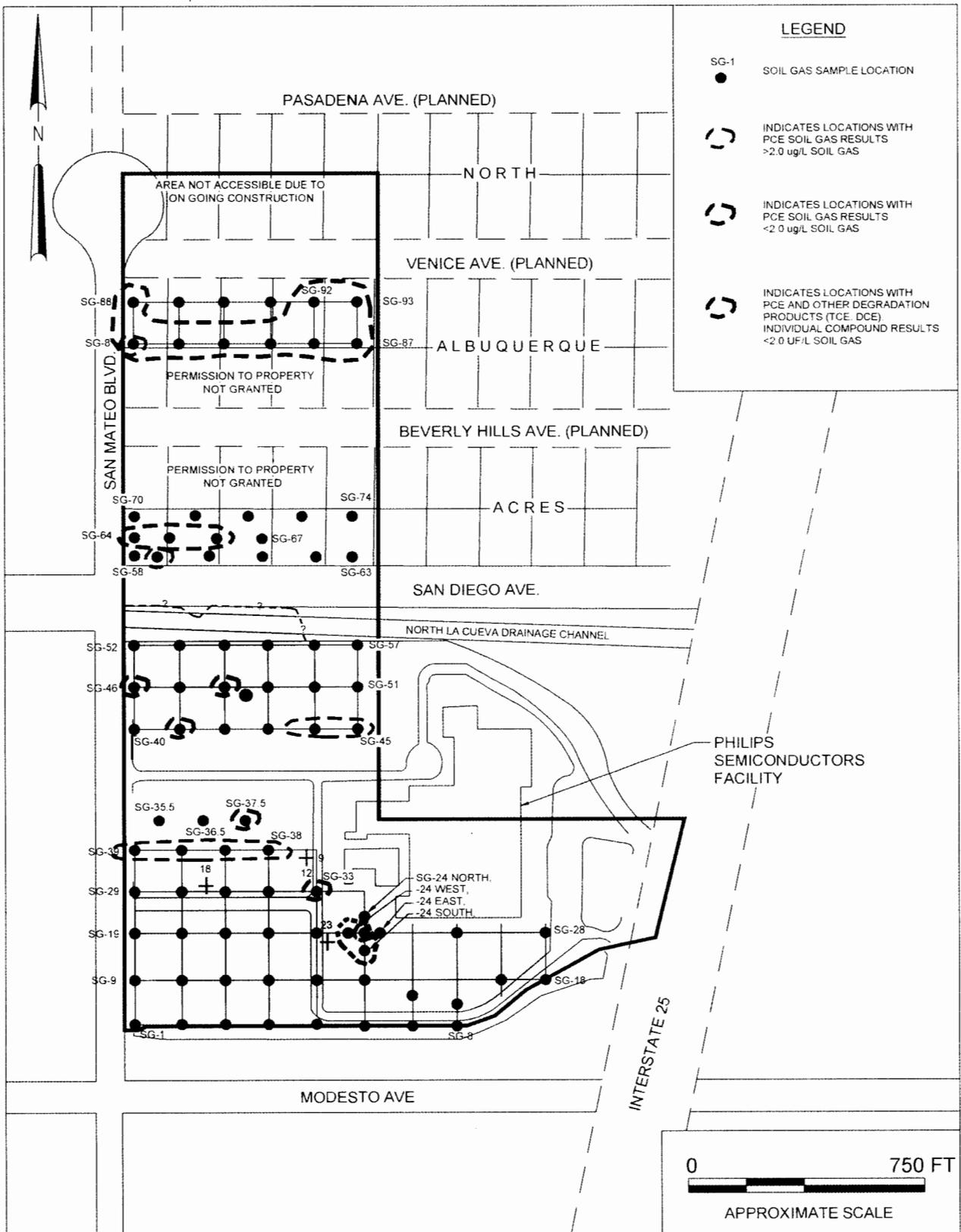
Sample Date	Sample Location							
	NCLF-2	NCLF-3	NCLF-4	NCLF-5	NCLF-6	NCLF-7	NCLF-8	NCLF-9
January 1997	8.2	7.2	4	^a				
April 1997	6.2	7.2	5.6					
July 1997	3.6	3.6	2.4					
October 1997	7.4	7.8	4.8					
January 1998	8.5	12.0	7.1					
April 1998	10	11.0	7.1					
July 1998	10	11	7.3	ND	1.8			
October 1998	8.4	7.8	4.7	ND	1.7			
January 1999	9.4	9.2	5.7	ND	1.7			
April 1999	10	9.4	4.7	ND	1.8			
July 1999	7	9.6	4.1	ND	1.9			
October 1999	7.8	7.6	2.7	ND	1.7			
January 2000	- ^b	-	-	ND	1.7	1.6	3.6	1.9
April 2000	11	9.7	3.7	ND	2.2	1.7	3.9	<1
July 2000	-	-	-	ND	1.4	1.1	3.4	1.1
October 2000	-	-	-	ND	1.9	1.5	3.8	<1
January 2001	-	-	-	-	-	1.3	2.6	1.1
April 2001	7.6	6.9	3.4	ND	2.5	1.7	3.7	<1
July 2001	-	-	-	-	-	<1	3.0	<1
October 2001	-	-	-	-	-	1.8	3.6	<1

^a A blank indicates that the well was not yet installed during that quarter.

^b Beginning in 2000 for wells that had more than 8 quarters of sampling data available the sampling frequency was reduced to annually. The annual event occurs in the second quarter of each year (April).

ND = Analyte not detected

Source: Data obtained from Philips Semiconductors central files.



Sample locations shown outlined with a dashed colored contour line are locations that had detectable soil gas concentrations of PCE, TCE, and/or DCE. The key at the upper right explains the meaning of the different contours colors. The contour lines on the figure are dashed because the locations of a given concentration contour is only estimated based on available data points and does not necessary occur as depicted on the figure.

Figure 2-8. Soil Gas Survey Sample Locations and PCE Concentration Contours Philips Semiconductors Facility

Two main 150- by 150-foot cell sampling grids were laid out on the Philips property, one grid on the southern property edge and the second along the northern property edge. Soil gas samples were collected from a total of 61 points on the Philips property, 54 samples from the predetermined gridded nodes, 4 additional samples around the first sample location that showed a detection of PCE in the soil gas (SG-24), and 3 additional locations in the area between the southern and northern grids to provide data from that area. The remaining samples were collected from sampling grids presumed to overlie northern portions of the CML located on the private properties adjacent to the Philips site, north of San Diego Ave. In some areas the sampling grid is truncated to include only those areas where the land owner was willing to grant Philips access.

Each soil gas sample was collected by advancing 1-½-inch-diameter steel sampling rods into the soil to depths of approximately 8 to 10 feet belowground surface, evacuating the sampling rods with a vacuum pump, and then collecting samples directly from the advanced sampling rods into Tedlar bags. The sample collection bags were then taken to the onsite mobile laboratory for immediate analysis.

The results of the December 1999 soil gas survey indicated the presence of low levels of multiple compounds in soil gas in several areas of the Philips property and the private properties. Compounds detected in the soil gas included benzene, toluene, ethylbenzene, m&p- and o-xylenes, PCE, trans- and cis-1,2-dichloroethene (DCE), and trichloroethene (TCE). Results are summarized in the bullets below:

- At 37 of the 87 soil gas sample locations, no volatile halogenated or aromatic hydrocarbon compounds were detected at all (the detection levels were 0.25 µg/L).
- At 24 locations, only detections of one or more of the compounds benzene, toluene, ethylbenzene, and m&p- or o-xylenes (BTEX compounds) occurred.
- In 27 samples, the chlorinated compound PCE was detected, both with and without companion concentrations of BTEX compounds.
- Only two of the 27 samples that contained concentrations of PCE and also contained one or more of its degradation products (TCE and DCE).

The highest detected soil gas concentration for any compound was a concentration of 4.26 µg/L PCE detected in sample SG-82, which was located on one of the northern private properties. Soil gas concentrations of PCE between 2.0 and 3.0 µg/L were detected at three sample locations, SG-24, SG-59, and SG-92. Location SG-24 is located on the Philips property and locations SG-59 and SG-92 are located on the privately-owned properties north of San Diego Avenue. All remaining detected soil gas concentrations of PCE were between 1.0 and 2.0 µg/L. Thirteen of the <2.0-µg/L PCE detections were from sample locations on the Philips property and the other nine detections were from locations on the privately-owned properties north of San Diego Avenue.

Methane was detected at 35 soil gas sample locations with concentrations ranging from 1.1 to 26.2 percent. There was no clear correlation between the presence of methane in a given sample and the occurrence of other chlorinated or petroleum hydrocarbon compounds.

The presence of BTEX compounds in samples from the December 1999 soil gas survey is not unusual considering that the materials disposed of in the landfill most likely included various

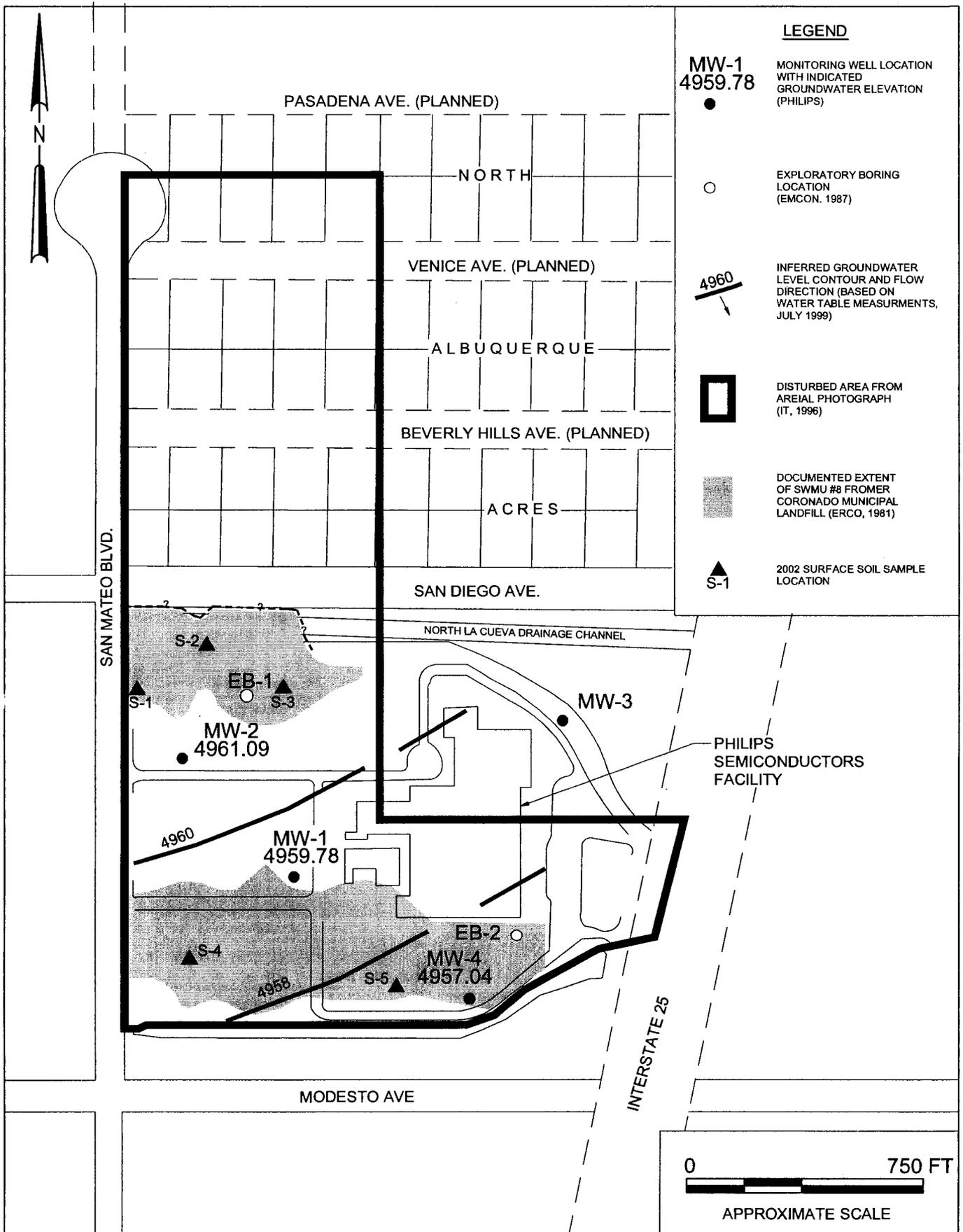


Figure 2-10. 2002 Surface Soil Sample Locations Philips Semiconductors Facility

lots and in a landscaped area. The small shrubs and vegetation in the area indicated that the site had not been as recently disturbed as the other locations in recent years. The Site 4 (S-4) sample location was moved slightly east of the area depicted in the RFI Work Plan to an area that had some small vegetation and appeared minimally disturbed in recent years. Site 5 (S-5) was in a restricted area and located between buildings and heavy equipment in a recently disturbed area. Sample locations are shown on Figure 2-10.

Seven SVOCs, di-n-butylphthalate, benzo(b)fluoranthene, chrysene, fluoranthene, pyrene, benzo(a)pyrene, and benzo(k)fluoranthene, were detected, all at concentrations well below the NMED screening levels. Positive detection results are summarized in Table 2-15. Practical quantitation limits for compounds are given for each sample to demonstrate the nondetections represent concentrations below the screening levels. The full analytical report is provided in Appendix D. The SVOC concentrations detected could potentially be associated with materials from the asphalt parking lot and/or surface water runoff impacts from the asphalt parking areas. No pesticide concentrations were detected in any of the surface soil samples. The issue of detected concentrations of pesticides in diluted samples from a 1992 EPA site investigation had previously been an issue of concern.

**Table 2-15. Surface Soil Sampling Results
July 2002**
(Concentrations in mg/kg)

Detected Compound ^a	Sample Location											
	NMED Residential Screening Level	S-1	PQLs for S-1	S-2	PQLs for S-2	S-3	PQLs for S-3	S-4	S-4 Dup	PQLs for S-4, S-4 DUP	S-5	PQLs for S-5
Di-n-butyl phthalate	6,100	ND	1.0	ND	ND	ND	ND	0.13	0.3	0.1	ND	0.1
Benzo(b) fluoranthene	6.2	1.2	1.0	0.42	0.2	0.21	0.2	ND	ND	0.1	ND	0.1
Chrysene	610	1	1.0	0.32	0.2			ND	ND	0.1	ND	0.1
Fluoranthene	2,300	1.4	1.0	0.42	0.2	0.27	0.2	ND	ND	0.1	ND	0.1
Pyrene	1,800	1	1.0	0.38	0.2	0.22	0.2	ND	ND	0.1	ND	0.1
Benzo(a) pyrene	0.62	ND	1.0	0.25	0.2	ND	ND	ND	ND	0.1	ND	0.1
Benzo(k) fluoranthene	62	ND	1.0	0.21	0.2	ND	ND	ND	ND	0.1	ND	0.1

^a Only those compounds with positive detections above the MDL are presented in the table. The full analytical results are provided in the Appendix D.

2.3.4.4 Subsurface Soil Sampling

As previously discussed, during advancement of the boreholes for new monitoring wells MW-5 and MW-6, split spoon samples were collected for general lithologic observation and samples for laboratory analysis were additionally collected from select intervals, as specified in the RFI Work Plan. At location MW-5 samples were submitted to Hall Environmental Analysis Laboratories from the 30-foot bgs and 200-foot bgs intervals for analysis for VOCs via EPA Method 8260, SVOCs via EPA Method 8270, organochlorine pesticides via EPA Method 8081, and RCRA metals via EPA Methods 6010B and 7471. No VOCs, SVOCs, or organochlorine pesticides were detected. Four RCRA metals (arsenic, barium, chromium, and lead) were

detected at concentrations consistent with typical background levels in Rio Grande Basin sediments. Full analytical results are contained in Appendix D.

At location MW-6 samples were submitted to Hall Environmental Analysis Laboratories from the 30-foot bgs and 220-foot bgs intervals for analysis for the same parameters. As at the MW-5 location no significant levels of VOCs, SVOCs, or organochlorine pesticides were detected. A single detection of toluene (0.052 mg/kg) occurred in the 30-foot bgs sample at the MW-6 location. Also, low levels of di-n-butylphthalate (2.5 mg/kg at 30 feet bgs and 0.4 mg/kg at 220 feet bgs) were present in the MW-6 samples. The concentrations of both toluene and di-n-butylphthalate were all well below the applicable NMED soil screening levels. Toluene is a common petroleum hydrocarbon-related compound and it would not be unexpected for low levels to occur in landfill materials or in near landfill soils. Di-n-butylphthalate is a pervasive compound associated with plastics and therefore would not be unexpected in landfill materials and/or could be associated with contamination from the sampler's or lab technician's nitrile gloves. No organochlorine pesticides were detected. Five RCRA metals (arsenic, barium, cadmium, chromium, lead) were detected at levels consistent with typical background levels in Rio Grande Basin sediments. Full analytical results are contained in Appendix D.

2.3.4.5 Hydrogeologic Data Evaluation

The RFI Work Plan indicated that slug testing activities would be performed as part of the RFI with the goal of generating site-specific hydrogeologic data on the hydraulic properties of the aquifer at the site. Based on discussions with the NMED in 2002, it was determined that the aquifer at the Philips facility is generally consistent in characteristic with other known portions of the Albuquerque Basin regional aquifer. The NMED agreed that sufficient regional data on aquifer characteristics exists such that site-specific slug testing at the Philips site was not required.

Based on previous investigations by Thorn, McAda, and Kernodle of the USGS (1993,1995), the hydrogeologic unit that exists in the area of the Philips site is the Upper Santa Fe Formation coarse axial channel deposits. Hydraulic conductivity in the area of the Philips site is estimated to be roughly 30 ft/day as cited in *Simulation of Ground-Water Flow in the Albuquerque Basin, Central New Mexico 1910-1994, with Projections to 2020* (Kernodle, McAda, Thorn, 1995). In this publication, the elevation of the base of Model Layer 1 is roughly 4960 feet above msl, and the hydraulic conductivities for both layers 1 and 2 is cited as roughly 30 ft/day. The elevation of the static water table in most of the Philips and COA NCLF wells ranges from 4950 to 4965 feet above msl, indicating that correlation with the hydraulic conductivity of layers 1 and 2 of the regional model in this area is appropriate. Additionally, regional city groundwater production wells in the area are indicated as having transmissivity values ranging between 19,970 square feet per day (ft²/day) to 65,260 ft²/day in that same reference. A citation from the 1981 ERCO report for the Philips site also cited a hydraulic conductivity range for the sediments at the site of 10⁻³ to 10⁻⁶ centimeter per second (cm/sec) or approximately 28 to 0.028 ft/day. The upper end of this range is consistent with the 30 ft/day value indicated in the Albuquerque Basin regional model.

Hydrogeologic properties from COA production wells in the general area are summarized in Table 2-16 to provide an overview of basic hydraulic characteristics of the aquifer.

Table 2-16. Regional Hydrogeologic Data Applicable to Philips Site Hydrogeology

General Value for Geologic Formation in Area				
Upper Santa Fe Axial Channel Deposits		Hydraulic Conductivity – 30 ft/day		
COA Well	Transmissivity (ft ² /day)	Depth to Water (ft)	Elevation of Static Water (ft)	Well Total Depth (ft)
Vol Andia 1	55,610	243	4901	972
Vol Andia 2	65,260	317	4891	852
Vol Andia 5	40,470	208	4904	900
Vol Andia 6	51,320	275	4903	984
Webster 1	42,080	512	4924	1484
Webster 2	19,970	465	4922	1450
Philips MW-5	-	265	4900	301.5
Philips MW-6	-	234	4956	262

Source: *Simulation of Ground-Water Flow in the Albuquerque Basin, Central New Mexico 1910-1994, with Projections to 2020* (Kernodle, McAda, Thorn, 1995)

2.3.5 Conceptual Model

2.3.5.1 Nature and Extent of Contamination

The final conceptual model is generally consistent with the preliminary model that had been developed based on the historic investigations and data collection. Horizontal delineation of PCE in the groundwater remains complete with the installation of MW-6 to reestablish the eastern delineation point of groundwater contamination after MW-3 went dry. Continued groundwater sampling of all monitoring wells has confirmed the overall decrease in PCE concentrations in all wells and continues to indicate the occurrence of PCE in wells located considerably upgradient from the Philips site property boundary.

With the installation of Philips well MW-5, a deeper monitoring well adjacent to the historically most contaminated water table well MW-1, the vertical extent of groundwater contamination has been delineated in the central portion of the Philips property. Concentrations of PCE in well MW-5 have been less than 1 µg/L, considerably less than the EPA MCL. Overall, the concentrations of PCE in the groundwater beneath the Philips site and the adjacent properties is the only significant contaminant of concern that could present a risk to human health or the environment.

The nature and extent of surface and subsurface soil contamination at the Philips site has essentially been delineated. Surface soil sampling in July 2002 to reevaluate the issues of elevated SVOCs and pesticide concentrations in previously collected samples has indicated that only low levels of SVOCs, all well below the NMED soil screening levels, exist in these areas and no pesticides were detected. Previously collected subsurface soil samples from the former CML site had never indicated the presence of any anthropogenic contamination and the additional data collected during the recent RFI activities further confirmed this conclusion. The conceptual model regarding surface and subsurface contamination at the Philips site is that there is no significant anthropogenic contamination related to the activities at the former CML.

The nature and extent of landfill-related gases such as methane and/or subsurface gases related to waste that had been disposed of in the former CML has been delineated. A 12-year methane monitoring program, terminated in 1993, led Philips to conclude that methane does not continue to be a concern at the former CML after methane ceased to be detected at the various monitoring points. It would not be unexpected for methane generation in a former municipal landfill to reduce with time as decomposable materials were consumed and/or drainage improvements or changes reduced the wastes contact with infiltrating water which is necessary for decomposition and methane generation to occur. The soil gas investigation conducted as part of the current RFI indicated that the levels of contaminants of concern (i.e., chlorinated solvents) that may be acting as a transport mechanism for PCE to the groundwater are limited in magnitude and extent throughout the former CML cells both on and off the Philips site. Low levels of PCE were detected in scattered sample locations across the Philips site and on the private properties located north of San Diego Avenue that overlie the northern cells of the former CML. The low concentrations and the absence of a consistent pattern of detections suggested the detections were related to very minor sources of solvents that would be expected to exist in a domestic waste landfill and did not depict a conceptual model of a vast subsurface soil gas plume that may be transporting contaminant mass laterally in all directions and over 200 feet vertically to the groundwater table.

2.3.5.2 Fate and Transport

Fate and Transport of Primary COC — PCE

As indicated in the discussion of the nature and extent of contamination the primary contaminant of concern related to the former CML at the Philips site is the presence of PCE in the groundwater at levels in excess of the EPA MCL. Therefore, only the potential fate and transport and risk to human health and the environment of the PCE in groundwater is considered here. The concentrations of PCE in the regional aquifer groundwater that have been identified beneath the Philips site and adjacent properties are being and will continue to be transported through the aquifer with the regional groundwater flow. However, the decrease and stabilization of PCE concentrations on and around the Philips site to fairly low levels, with only a few locations now displaying levels in excess of the EPA MCL, suggest that with continued migration and transport in the aquifer, natural degradation and dilution of these low concentrations may result in downgradient concentrations that are very low to essentially nondetect. This is confirmed by the downgradient delineation of the plume at well NCLF-9, where very low PCE concentrations are observed and have been stable for 3 years, suggesting that at and beyond this point the plume is adequately diluted to simply attenuate to nondetect. Additionally, the presence of PCE detections in COA monitoring wells located upgradient of the Philips site suggests that the former CML cells and waste materials located at the Philips site may not be the only source of PCE contamination in the groundwater and/or perhaps not a source at all. Therefore, the fate and transport of otherwise existing regional groundwater contamination may be unrelated to Philips site.

2.4 Screening Assessments

As indicated previously the only contaminant of concern related to the former CML at the Philips site that has been carried through to the screening assessment phase is the presence of PCE in the groundwater at levels in excess of the EPA MCL. The nature and extent and fate and transport of minor concentrations of soil contaminants, methane, and/or landfill soil gases have been investigated by this and previous investigation and found to be either nonoccurring, no

longer occurring, or of such insignificant levels that they are not attributable to anthropogenic effects related to the former CML operations at the Philips site. Therefore, only the concentrations of PCE in groundwater have been considered here as possibly presenting a threat to human health or the environment.

2.4.1 Human Health

The depth of groundwater (roughly 200 feet bgs) does not provide a mechanism for direct exposure of human receptors to the PCE. However, since the PCE does occur in the regional aquifer that is the source of local municipal drinking water exposure may occur through pumping and distribution of degraded groundwater.

Concentrations of PCE in the groundwater in excess of the EPA MCL of 5 µg/L continue to persist in monitoring wells located at the Philips site and in COA monitoring wells located on properties in the area of the Philips site. The EPA MCL represents the threshold above which there is considered risk to human health. And while concentrations above the MCL do exist in the area of the Philips site concentrations further downgradient, in the areas where human receptor exposure may occur, are less than the MCL.

Water supply wells that occur within a 1-mile radius of the former CML site were identified by conducting searches of the New Mexico State Engineer Office well records during the Work Plan phase. Thirty-nine wells were identified within a 1-mile radius of the portions of the former CML on the Philips site including residential, community, commercial, irrigation, and exploration wells. A table presented in Appendix E lists the nonmonitoring wells identified within a 1-mile radius of the former CML and the associated Figure E-1 shows the approximate well locations.

The nearest residential well that has been identified is approximately 0.5 mile downgradient and southeast of the site (33, Figure E-1). Five additional residential wells are downgradient and within a 1-mile radius of the site. Several other residential wells are located transgradient or upgradient wells of the site. The nearest municipal wells are outside the 1-mile radius in the COA Coronado wellfield, approximately 1.5 mile southeast of the former CML areas on the Philips site. The nearest commercial or irrigation well is approximately 0.5 mile upgradient and west of the site (29, Figure E-1). There are six additional irrigation and commercial wells within a 1-mile radius of the site: three upgradient and three downgradient. Two irrigation wells listed in the table are not shown on Figure E-1 because they lack a detailed location reference. There are two exploration wells approximately 0.25 mile downgradient and east of the site (12 and 13, Figure E-1), and there are three wells for which no use is identified (9, 10 and 11, Figure E-1).

The most distal detection of PCE occur in COA monitoring wells NCLF-7 and NCLF-9 at concentrations of roughly 1.6 and 0.7 µg/L, respectively (July 2002 sampling event). The well locations are roughly 1,500 to 2,000 feet downgradient of the Philips site to the south and southeast and the detected concentrations are well below the EPA MCL. Therefore, the nearest residential wells, approximately 2,500 feet downgradient, are even beyond these downgradient monitoring wells and therefore would not be expected to be impacted by PCE concentrations in excess of the MCL. Furthermore, the wells NCLF-7 and NCLF-9 will continue to act as sentinel wells monitoring the downgradient propagation of any higher PCE concentrations that might adversely impact the closest domestic wells. The same rationale applies to the even further downgradient location of the COA Coronado wellfield municipal wells. Also, the various

commercial and irrigation wells in the area are also located even further from and/or upgradient of the Philips site and likewise do not represent a likely source of exposure to human receptors.

Therefore, a likely pathway for exposure of human receptors to PCE concentrations in the groundwater in excess of the EPA MCL does not exist and therefore the screening assessment indicates the risk posed to human health by contamination associated with the former CML on the Philips property is low.

2.4.2 Ecological Receptors

As with the human health assessment, the depth of groundwater (roughly 200 feet bgs) does not provide a mechanism for direct exposure of ecological receptors to the PCE. The only potential pathway for these contaminants to reach ecological receptors would be via exposure to groundwater pumped and distributed by humans. However, as discussed in the human health assessment, the distance to apparent well locations where humans may pump and distribute or irrigate with groundwater is sufficient enough that PCE concentrations would be expected to be essentially absent. Therefore, there is no pathway for exposure to ecological receptors and there is no risk presented by the PCE in groundwater to such receptors.

2.4.3 Risk Assessments

Since the human health and ecological screening assessments did not indicate any likely pathways for exposure to the PCE contaminant of concern in the groundwater, it was felt that there is no need to conduct in-depth human health or ecological risk assessments.

2.5 Conclusions and Recommendations

The recent RFI activities that have been performed during 1999 through 2002, along with the vast amount of other data that have been collected during past and ongoing investigations indicate that the only significant contaminant of concern related to the operation of the former CML cells on the now Philips site is the presence of elevated levels of PCE in the regional groundwater. However, ongoing monitoring of the PCE concentrations in Philips and COA installed wells has delineated the horizontal and vertical extent of the PCE. The delineation indicates that PCE concentrations in excess of the EPA MCL are unlikely to impact distally located domestic or municipal wells and therefore a complete pathway for exposure to unacceptable PCE levels does not exist for human or ecological receptors. Therefore, No Further Action (NFA) regarding additional investigation or remediation at CAU #8, the former CML cells located on the Philips Semiconductors property is proposed.

2.6 No Further Action Proposal

Evaluation of CAU #8 for no further action has been additionally considered using the *HSWA/CA-Related Permit Modifications, No Further Action Proposals* guidance provided by the NMED (Section II.B.4.a (4) (a), Page 1, March 3, 1998). An NFA proposal is based upon one of the five NFA criteria provided by NMED (Section II.B.4.a (4) (b), Page 1, March 3, 1998). These criteria are:

1. The CAU cannot be located, does not exist, or is a duplicate CAU.

2. The CAU has never been used for the management (i.e., generation, treatment, storage, and/or disposal) of RCRA solid waste or hazardous wastes and/or constituents or other Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) hazardous substances.
3. No release to the environment has occurred or is likely to occur in the future from the CAU.
4. A release from the CAU to the environment occurred, but the CAU was characterized and/or remediated under another authority (such as the NMED's Underground Storage Tank [UST] or Groundwater Quality Bureaus), which adequately addressed RCRA corrective action, and documentation, such as a closure letter, is available.
5. The CAU has been characterized or remediated in accordance with current applicable State or Federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

2.6.1 NFA Rationale

As presented in this report, a number of historical investigations have occurred at CAU #8, former CML located on the Philips Semiconductors site in addition to the most recent RFI activities presented here. These investigations have determined that there has not been a significant release of contaminants from this CAU to the surface or subsurface soils. Likewise there is no significant source of landfill gases or landfill waste that pose any type of unacceptable risk to human health or the environment. The only specific contaminant of concern that presents a potential risk to human health or the environment is the presence of PCE in the groundwater underlying the Philips site and other area properties. The PCE concentrations in the groundwater have been adequately characterized in accordance applicable regulations, and the available data indicate that the contaminant poses an acceptable level of risk under current and projected future land use.

2.6.2 NFA Criterion

This proposal for NFA for the CAU #8, former CML at the Philips Semiconductors site is based upon NMED's NFA Criterion 5: The CAU has been characterized or remediated in accordance with current applicable State or Federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.