6. EXTRACTION SYSTEM AND MONITORING WELL STATUS

The ground water extraction system has been suspended since late February 2002, and, with RWQCB approval (RWQCB, 2003), the air stripper was removed in October 2003. No ground water extraction has occurred from extraction pit AM-EP since March 1992, from well AM1-5E since September 1996, from well AM1-1 since July 1999, and from well AM1-10 since February 2002. Extraction pit well AM-EP and wells AM1-1 and AM1-10 were destroyed in December 2003, leaving AM1-5E as the sole extraction well at the Site. This well is currently used only for ground water quality monitoring.

Well details, measured well depths and current well status are shown on Table 4. All well depths, which are measured yearly as a standard confirmation of well integrity, were within expected ranges.

7. OTHER REPORTING REQUIREMENTS

7.1 Monitoring and Reporting in Accordance with Site Discharge Permits

From 1985 to May 2001, extracted ground water was treated by the air stripper and discharged to surface water under a waste discharge permit, most recently National Pollutant Discharge Elimination System (NPDES) General Permit CAG912003, Order No. 99-051. Since May 2001, extracted ground water was discharged directly to the sanitary sewer, as authorized by San Jose/Santa Clara Water Pollution Control Plant (WPCP) Industrial Wastewater Discharge Permit No. SC-043A (Site Discharge Permit). In July 2001, Applied Materials requested discontinuation of sampling and reporting specified by the Site NPDES permit (Applied Materials, 2001). On September 13, 2001, the RWQCB officially approved discontinuation of NPDES-specified sampling, monitoring, and quarterly reports (RWQCB, 2001). Because Applied Materials no longer extracts, treats, or discharges any ground water at the site, Applied Materials did not submit a Notice of Intent (NOI) for discharge under the new NPDES General Permit, Order No. R2-2004-0055, and therefore this Site is no longer under an NPDES permit, as of July 21, 2004. Monitoring and reporting requirements related to Site Cleanup Orders remain in effect.

With cleanup objectives mostly met at the Site and the removal of the air stripper from the Site, it is unlikely that ground water extraction will be resumed at the Site. However, a contingency plan is in place where, if trigger concentrations are exceeded in select downgradient monitoring wells, ground water extraction may need to be resumed (Weiss, 2003a).

7.2 Projected Use of Applied Materials Building 1

In 2003, the remodeling of Building 1 involved construction on the west side of Building 1. The construction plan included removing the existing equipment pad on the west side of Building 1 and constructing a walkway with a curved architectural feature and planter areas. These construction activities included numerous well destructions (Weiss, 2004b). Construction is now completed and no changes in use are projected for Building 1 during 2005.

7.3 Hydrogeologic Setting

As required by the Site Cleanup Requirements Order, the first status report for each calendar year shall include a site hydrogeologic setting diagram. Figure 9 presents an interpretive geologic cross-section, showing subsurface materials and the water-bearing zones near the source area at the Site. The northeastern end of the section illustrates the interrelationship between the hydrostratigraphic units, as they are defined at the Site and neighboring 3175 Bowers Avenue.

7.4 Natural Attenuation Evaluation

The request for measurements of natural attenuation parameters was first made in September 2000 (Weiss, 2000) and approved by the RWQCB in November 2000 (RWQCB, 2000). The evaluation was conducted from January 2001 to January 2003 to determine whether passive remediation through monitored natural attenuation (MNA) of the Site ground water plume was feasible. The conclusion of the evaluation was that the Site data indicate that destructive natural attenuation processes have previously contributed significantly to the reduction of VOC plume concentrations at the Site, but may not be occurring presently or are occurring at slower rates than in previous years (Weiss, 2003b). Nonetheless, remedial measures to date have resulted in a steady decrease in plume concentrations and no significant downgradient or vertical migration of VOCs has occurred.

Figure 8 shows historical 1,1,1-TCA, 1,1-DCA, and 1,1-DCE concentrations for representative Site wells. The VOC concentration trends indicate that for the five and a half years since A-zone ground water extraction was discontinued, the VOC plume had not migrated and showed steady to decreasing concentrations, indicating that natural physical, biological, and/or chemical processes were controlling and attenuating the plume.

8. PROPOSED REMEDIAL ACTIONS FOR 2005-2006

Site ground water cleanup activities are performed in accordance with RWQCB Site Cleanup Requirements No. 90-134, as amended. The RWQCB has approved two modifications to the Site SMP recently: 1) discontinuing monitoring of wells AV-1A and AV-7A, approved on December 17, 2004 (RWQCB, 2004); and, 2) discontinuing monitoring of wells HP-2, HP-5 and HP-6, approved on February 8, 2005 (RWQCB, 2005). Additionally, Applied Materials has formally requested site closure of the Applied Materials Building 3 area at which monitoring is required by the RWQCB per a 1989 agreement. Pending RWQCB approval of Building 3 site closure, Applied Materials plans to destroy the five remaining wells in the Building 3 area, including the three HP wells that were until recently part of the Building 1 SMP.

According to the approved schedule, all onsite and selected 3175 Bowers Avenue wells are sampled annually each January (Table 1). Ground water elevation and well depth measurements are also scheduled to occur in January of each year. The current cleanup goals for the Site are California MCLs. As part of the CERCLA Five-Year Review prepared for the Site during 2004, Applied Materials proposed criteria for defining "MCL attainment" at the Site (Weiss, 2004a) with the intent of clearly establishing the conditions needed to obtain National Priorities List (NPL) deletion from the USEPA and final Site closure from the RWQCB. Applied Materials will continue to seek feedback from USEPA and the RWQCB with the goal of establishing these criteria during 2005.

9. CONCLUSIONS

VOC concentrations were within historical ranges during this reporting period, and 1,1,1-TCA concentrations in all Site wells remained below the cleanup standard. Concentrations of 1,1-DCA and 1,1-DCE remained stable compared to historical levels. Two wells contained 1,1-DCA concentrations slightly above the MCL of 5 ppb, ranging from 6.1 ppb to 7.2 ppb. Three wells contained 1,1-DCE concentrations slightly above the MCL of 6 ppb, ranging from 6.5 ppb to 11 ppb. Concentrations of other VOCs detected in Site ground water are generally stable.

With the shutdown of extraction well AM1-10 in late February 2002, all ground water extraction has been suspended at the Site. In December 2002, the RWQCB approved of this suspension and supported its decision by noting that the low VOC concentrations at the Site are gradually decreasing to meeting cleanup goals for the Site without ground water extraction. However, ground water monitoring at the Site will continue to be required in the future.

The RWQCB has approved significant reductions in the SMP requirements for the Site based on the very low and generally declining plume concentrations. Currently, monitoring is required in only four A-zone wells (AM1-5E, AM1-6, AM1-7 and AM1-11) and in offsite A2-zone well AV-1B. The Site SMP continues to effectively monitor the VOCs in the subsurface. Given that this VOC plume is not near water supply wells or any other exposure pathway, the threat to human health and the environment from VOCs is not, nor anticipated to become, a hazard to the environment or public health (Weiss, 1989).

In the 2004 Five-Year Review (Weiss, 2004a), Applied Materials proposed “MCL attainment criteria” to clearly establish what data would be required for the Site to achieve NPL deletion and final Site closure from the RWQCB. Applied Materials hopes to gain RWQCB and USEPA approval for these criteria in 2005.

10. REFERENCES

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