6. EXTRACTION SYSTEM AND MONITORING WELL STATUS

The ground water extraction system has been suspended since late February 2002. Well details and measured well depths are shown on Table 4. All well depth measurements, which are monitored yearly as a standard confirmation of well integrity, were within expected ranges.

6.1 Air Stripper

Due to the construction at the site and the fact that ground water is no longer extracted, the RWQCB approved removal of the air stripper from the Site on November 6, 2003 (RWQCB, 2003).

6.2 A-Zone Extraction Wells AM1-1 and AM1-5E

The pump for extraction well AM1-1 has been off since July 30, 1999. The pump for extraction well AM1-5E has been off since September 11, 1996.

Extraction well AM1-1 was destroyed on December 8, 2003, leaving AM1-5E to be the sole extraction well at the Site.

6.3 A2-Zone Extraction Well AM1-10

As discussed in Section 5, no ground water has been extracted from the well since February 20, 2002.

Extraction well AM1-10 was destroyed on December 8, 2003.

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 NPDES General Permit CAG912003, Order No. 99-051. Since May 2001, extracted ground water has 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). Monitoring and reporting requirements related to Site Cleanup Orders remain in effect.

During the past two years, no system sampling had been performed because the extraction system was off. 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 that 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 the December 8, 2003 well destructions described earlier in this report, and are expected to be ongoing for at least one year.

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 11 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.

Figures 9 and 10 show 1,1,1-TCA, 1,1-DCA, and 1,1-DCE concentrations from 1997 to the present for eight representative Site wells, including source area well AM1-1. The VOC concentration trends indicate that the source for well AM1-1 was limited and had been effectively removed (Figure 9). The VOC concentration trends also indicate that for the four 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 2004-2005

Site ground water cleanup activities are performed in accordance with RWQCB Site Cleanup Requirements No. 90-134. Additionally, ground water monitoring at Applied Materials Building 3 (consisting of sampling wells HP-2 and HP-5) is required by the RWQCB per a 1989 agreement. Applied materials has proposed destruction of well HP-5, in addition to several other wells at Building 3 (Weiss, 2004). Therefore, only Building 3 data from well HP-2 will be reported in future Site reports.

According to the approved schedule, all onsite and 3175 Bowers Avenue wells are sampled annually each January (Table 1). Ground water elevation measurements currently occur bi-annually in January and July of each year. Due to the abundance of water level data on the Site, Applied Materials proposes reducing water level measurements to annually. Water level measurements would be collected in January of each year.

The current cleanup goals for the Site are DHS MCLs. If these goals change before MCLs are met at the Site, the Site SMP will be re-evaluated and may be modified.

9. CONCLUSIONS

On October 21, 2003, Applied requested permission from the RWQCB to destroy eight extraction and monitoring wells, and to remove the equipment pad and the air stripper from the Site. Applied made this request because most of the wells, equipment pad, and air stripper would have obstructed ongoing remodeling activities on the west side of Building 1 at the Site. On November 6, 2003, RWQCB approved Applied's request after concluding that cleanup goals have mostly been met, destruction of the wells should not impair efforts to adequately monitor ground water, and air stripping is no longer necessary at the Site.

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. Three wells contained 1,1-DCA concentrations slightly above the MCL of 5 ppb, ranging from 5.4 ppb to 6.0 ppb. Three wells contained 1,1-DCE concentrations slightly above the MCL of 6 ppb, ranging from 6.7 ppb to 12 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 Site SMP continues to effectively monitor the VOCs in the subsurface. Given that this VOC plume is not near water supply wells nor 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).

10. REFERENCES

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Weiss, 2004, Ground Water Monitoring Annual Report, November 2002 – October 2003 for Applied Materials Building 3, 3300 Scott Boulevard, Santa Clara, California, March 8, 2004, 4 pp, 6 figures, 3 tables, 2 appendices.