

pumping conditions, respectively. Groundwater flow at the LPABS is generally to the south toward the Waycross Canal under non-pumping conditions.

6.5 Groundwater Withdrawal and Treatment System Effectiveness

As part of the groundwater corrective action program, a horizontal well hydraulic containment and groundwater recovery system was constructed and began operation on December 21, 2001. The horizontal well (HWW-1) was installed parallel and to the north of the Waycross Canal to intercept the groundwater containing the LPABS GWCCs. The system recovers impacted groundwater from the horizontal well via an electrical submersible pump and treats the water through a low-profile, shallow tray air stripper.

Groundwater pumped from the LPABS horizontal well was sampled during the September 2004 sampling event. The September 2004 groundwater sample from the LPABS withdrawal system had 5,000 $\mu\text{g}/\ell$ of trichloroethylene and 2,500 $\mu\text{g}/\ell$ of cis-1,2-dichloroethylene. All other analyzed constituents were below the reported laboratory detection limits. Table 4 summarizes the LPABS groundwater withdrawal system analytical data. Appendix B includes the laboratory analytical data and chain-of-custody records.

Table 5 summarizes the semiannual groundwater withdrawal volumes for the LPABS. During this semiannual period, approximately 6,336,900 gallons of groundwater were recovered by the LPABS horizontal well (HWW-1) for subsequent treatment. The total volume of groundwater recovered for treatment from the ODSA, ASB, LSA, and LPABS groundwater withdrawal systems during this semiannual monitoring period was approximately 17,149,600 gallons.

Comparing the September 2004 groundwater flow under non-pumping conditions (Drawing 5) and pumping conditions (Drawing 6) indicates a significant cone of depression associated



with the operation of the LPABS horizontal well (HWW-1) system. The LPABS horizontal well (HWW-1) operated at an average recovery rate of 24.0 gpm during this semiannual period.

The absence of any chlorinated constituents in the surface water samples collected at sample locations W-15 and W-33, and the elimination and/or significant reductions in trichloroethylene concentrations detected in the downgradient LPABS monitoring wells south of the Waycross Canal demonstrate the effectiveness of the horizontal well system in hydraulically controlling the LPABS groundwater constituents.

Approximately 41,988,100 gallons of impacted groundwater have been recovered for treatment by the LPABS withdrawal system since December 2001 at trichloroethylene concentrations ranging up to 64,000 $\mu\text{g}/\ell$, cis-1,2-dichloroethylene concentrations ranging up to 9,700 $\mu\text{g}/\ell$, and 1,1-dichloroethylene concentrations ranging up to 500 $\mu\text{g}/\ell$. From October 1993 through this semiannual period, the total volume of groundwater recovered for treatment from the ODSA, ASB, ALSA, LSA, and LPABS groundwater withdrawal systems was approximately 225,290,666 gallons, as summarized in Table 5.

The highest total chlorinated hydrocarbon concentration detected during the March 2004/September 2004 sampling period was 112,400 $\mu\text{g}/\ell$ in monitoring well MW-96 (48' - 58'), which is significantly reduced from the highest total chlorinated hydrocarbon concentration detected at the LPABS of 280,000 $\mu\text{g}/\ell$ in monitoring well MW-96 (28' - 38') in September 1999. This demonstrates the effectiveness of the LPABS groundwater withdrawal system in reducing GWCC concentrations in this area.

During the March 2004/September 2004 sampling period, only one LPABS monitoring well south of the Waycross Canal, MW-112 (30' - 50'), contained a trace level of trichloroethylene at 1.4 $\mu\text{g}/\ell$, which demonstrates the effectiveness of the LPABS horizontal well (HWW-1) in pulling the GWCCs back onto CSXT's property north of the canal toward



the horizontal well. In September 2001, monitoring well MW-112 (30' - 50') contained trichloroethylene at 13,000 (duplicate - 15,000) $\mu\text{g}/\ell$.

6.6 Groundwater Monitoring System Inspection

An inspection of the LPABS groundwater monitoring system was conducted on September 9, 2004. The groundwater monitoring system was inspected for the following items:

- well casing broken, bent, or damaged;
- well cap locked;
- well casing clear of obstructions;
- well number legible; and
- other comments on condition of wells.

The inspection report form for the LPABS groundwater monitoring system is provided in Appendix F.

The only exception noted during the September 2004 inspection of the LPABS groundwater monitoring system was that a CSXT demolition crew had inadvertently struck and bent one protective bollard and the cap on monitoring well MW-96. The cap was subsequently straightened enough to allow closure.

