

Hollingsworth Solderless Terminal

700 Northwest 57th Place

Ft. Lauderdale, Florida

County: Broward

District: Southeast

Site Lead: EPA

Placed on National Priorities List: September 8, 1983

HWC # 016

ERIC ID # 3789

Site Description and History

The Hollingsworth site is located at 700 NW 57th Place in northwest Fort Lauderdale in Township 49S, Range 42E, Section 10 at 26° 11' 56.3656" N, 80° 09' 08.4871" W, in an area predominantly consisting of light to medium industry. The Hollingsworth Company operated at this site from approximately 1968 until 1982.

The plant manufactured small, solderless electrical connectors that were cut and formed out of copper sheets, annealed, degreased, and electroplated with tin or nickel. The wastes generated during the manufacturing process were spent trichloroethene (TCE) and its daughter products, primarily *cis*-1,2-dichloroethene (CIS) and vinyl chloride (VC), copper, nickel, tin, oil, and grease. Over the years, Hollingsworth disposed of its wastes in onsite drain fields, and via an injection well.

Hollingsworth filed for reorganizational bankruptcy under the provisions of Chapter 11 of the Federal Bankruptcy Code in November 1981. Hollingsworth has since stopped operations at the site, and has dismantled and sold its plant equipment.

Threat

Groundwater at the site exceeds state and federal criteria for volatile organic compounds including TCE, CIS, and VC. These contaminants are also found in site soils at levels that may act as a continuing source to groundwater, primarily in drain fields adjacent to the site building. The potential for site related contamination to diminish the water quality of the area's sole source aquifer, the Biscayne Aquifer, remains a concern. The vulnerability of the aquifer is evidenced by the City of Ft. Lauderdale's Executive Well field, where several wells have been abandoned due to contamination by volatile organic compounds, evidently from a variety of sources unrelated to the Hollingsworth site.

Response Strategy and Status (December 2016)

Upon discovery of improper disposal practices in 1981, the Broward County Environmental Quality Control Board took legal action against the Hollingsworth Company resulting in a fine of \$19,000. The Hollingsworth site was placed on the Superfund National Priorities List in September 1983. The Hollingsworth Company continued to operate under a re-organizational bankruptcy status, and completed a limited Remedial Investigation/Feasibility Study (RI/FS) in February 1984. These studies were limited in scope, and were determined inadequate by the environmental agencies. EPA completed a separate RI/FS to determine the extent of

contamination and evaluate possible cleanup strategies. A public meeting was held in August 1985 to receive comments on the report.

The EPA signed a Record of Decision (ROD) with Florida Department of Environmental Regulation (FDER, now DEP) concurrence in April 1986. The selected remedy for soils was in situ vacuum extraction of chlorinated hydrocarbons over a limited area. The remedy for groundwater was extraction, treatment by air stripping, and reinjection of the treated groundwater into the surficial aquifer. Remedial design was initiated in November 1986 and completed in March 1988. The EPA and DEP entered into a state Superfund State Contract (SSC) for construction in September 1988. Construction was initiated in December 1989 with soil cleanup completed in October 1991. Construction for groundwater remediation was substantially complete in September 1992. The final inspection by DEP and EPA was in March 1993, and the Remedial Action Report was received by DEP in May 1993.

Groundwater data indicated in early 1994 that groundwater cleanup criteria were being met in all monitoring wells except one. Groundwater recovery and treatment was discontinued in October 1994, and the air stripping equipment was removed from the site. The original SSC was closed out since all work identified in the Scope of Work (SOW) had been completed.

Groundwater monitoring following demobilization of the remedial system indicates that groundwater contaminant levels have increased, suggesting a continuing contaminant source. Existing monitoring wells were resampled and analyzed in January 1997. The results indicate one onsite well with VC at a concentration of 1,500 µg/L, exceeding the State drinking water standard of 1 µg/L. Elevated concentrations of VC were confirmed in additional groundwater samples taken in August 1998 with the highest levels found in shallow 20 foot wells. VC contamination was not observed in groundwater samples at 100 feet below land surface. Additional soil and groundwater sampling data collected between June 1999 and August 2000 confirmed that soil and groundwater contamination remains at the site.

EPA signed an Explanation of Significant Differences in August 2001 with DEP concurrence, which authorized additional soil removal from the area of the south drain field and removal of a septic tank located to the west of the site building. A second SSC was signed in December 1991 with the State agreeing to share in 10 percent of the removal cost. The source removal action was completed in February 2002.

EPA completed a pilot study using the injection of lactate in areas of remaining groundwater contamination in April 2005. Results of groundwater sampling indicate a possible continuing contamination source located underneath the building. Groundwater samples collected in February 2006 indicated continued contamination. Additional lactate was injected in May and June 2006. Groundwater sampling was completed in September 2006, February 2007, and August 2007 to determine the effectiveness of the lactate injection. Two monitoring wells at the site remained above the natural attenuation default concentrations for VC. However, groundwater quality sampling indicated favorable conditions for bioremediation at this site as significant decreases in contaminant concentrations were noted.

An Amended Record of Decision was signed by EPA in November 2008, changing the groundwater remedy to “enhanced bioremediation” for the remediation of contaminants in groundwater at concentrations above groundwater cleanup target levels. Semi-annual groundwater monitoring would also be conducted to confirm the effectiveness of the remedy.

Design of the bio-injection plan was completed in 2009. After the pre-injection baseline sampling indicated an ongoing decline in contaminant concentrations without injection of the amendment, EPA and DEP decided to postpone implementation of the injection plan. Based on subsequent monitoring, a 3-D micro-emulsion injection was completed in April 2011 as a polishing action to enhance biodegradation of contaminants.

Following the April 2011 injections, the Site groundwater was monitored in January 2012, January 2015 and, most recently, in May 2016. In September 2016, prompted by the residual VC present in the South Drain Field, select wells (IW-1, PMW-1, PMW-2, PMW-6, RW-1 and RW-2) were sampled. Samples were sent to Microbial Insights, Inc. analysis.

Results of the September 2016 sampling and analysis for *Dehalococcoides ethenogenes* (DHE) and functional genes indicate the presence of the appropriate bacteria with genomic markers and indicates that removal of the VC will continue. However, the length of time required for the dechlorination is based directly on the population of the *Dehalococcoides* bacteria (DHC). An additional injection of 3DMe™ or similar product was believed to be beneficial in accelerating the dechlorination of the remaining VC in well RW-2 by promoting the growth of the existing DHC population. Because wells RW-2 and PMW-6 were found to contain relatively low counts of functional genes *vcrA* (19.3 and 16.3 cells/mL, respectively) and *bvcA* (2.4 and 11 cells/mL, respectively), BDI Plus Inoculum will also be injected to ensure that complete dechlorination of the VC occurs in the South Drainfield area.

Schedule

Annual groundwater monitoring is ongoing to evaluate the trend in decreasing contaminant concentrations and determine the need for further injection of amendments. Only CIS and VC remain at the site at concentrations above State and Federal groundwater standards. Based on the May 2016 results, it is recommended that groundwater monitoring continue until cleanup goals have been met in all wells.

EPA has initiated the 5th Five Year Review at the site to evaluate the progress of site remediation. The draft Five Year Review has been submitted to DEP for review and comments. It is anticipated that this review will be finalized in fall 2016.

The Five Year Review was reviewed and it was determined the remedy currently protects human health and the environment because contaminated soils have been removed such that no land use restrictions are needed, groundwater contamination remains on site and institutional controls are in place that restrict the use of groundwater at the Site. In order for the remedy to be protective in the long term, site monitoring wells need to be repaired and monitored on a regular basis. The next FYR will be due within five years of August 31, 2016.