Sherwood Medical Industries

2010 New Daytona Road
Deland, Florida
County: Volusia
District: Central
Site Lead: EPA
Placed on National Priorities List: December 20, 1982
ERIC ID # 3804

Site Description and History

Sherwood Medical Industries is an operating facility located on a 40-acre site at 2010 New Daytona Road on U.S. Highway 92 just east of Deland in Township 16S, Range 30E, Section 35 at 29° 03′ 38.9394″ N, 81° 15′ 52.8964″ W. This facility manufactures stainless steel and aluminum parts used in disposable hypodermic syringes. The resulting waste streams have included acidic wastewater containing solvents and detergents, and metal laden sludges that were historically deposited in unlined settling ponds.

Onsite septic tanks, septic tank drain fields and retention or holding ponds were historically used for disposal of liquid wastes. Between 1971 and 1980, the company disposed of approximately two tons of liquid and sludge containing sodium dichromate and nitrate-bearing wastes into two unlined percolation ponds. The sludges were later removed, analyzed, and disposed of at a local landfill.

In July 1983, Sherwood Medical Industries installed an industrial wastewater treatment facility that ensures that the effluent will meet Florida Drinking Water Standards for chromium. The treated effluent is discharged to the waste water treatment plant. An air stripper was installed in late-1985 to pre-treat the production water used in the facility's operations. The air stripper removes chlorinated solvents from the groundwater recovered from the onsite Floridan Aquifer wells.

Threat

Groundwater in the onsite surficial aquifer is contaminated and poses a threat to the underlying Floridan Aquifer. Sampling of Sherwood's onsite deep wells in October 1986, August 1987, and February 1988 detected chlorinated solvents above drinking water standards in the Floridan Aquifer. Chlorinated solvents were also detected slightly above Drinking Water Standards in one private offsite well. A faulty well casing evidently had allowed contamination in the shallow aquifer to migrate into the Floridan Aquifer. The well was plugged and replaced. Samples collected from the new well have not been contaminated. Semi-annual sampling of other private wells in the vicinity is continuing.

January 2007, EPA held a public advisory meeting to discuss the health concerns from citizens who live nearby the site and to answer questions on the extent of contamination from the site.

The Department of Health (DOH) began a public health assessment in February 2007 to address the concerns of the citizens. The health assessment included sampling 59 private wells that were

located within the vicinity of the site. In October 2007, DOH and the Volusia County Health Department held a public meeting to discuss the results of the private well sampling. The results indicated that although there were contaminants detected in some wells, there were no detections above drinking water standards.

Onsite groundwater recovery required by the Sherwood operation appears effective in limiting offsite migration of contaminated groundwater. However, the threat to water quality in the Floridan Aquifer is still a concern and continues to be monitored. Chromium concentrations in Lake Miller have decreased. Semi-annual sampling of the sediments and surface water in Lake Miller is ongoing to monitor the potential threat to that ecosystem.

Response Strategy and Status (December 2020)

In August 1983, the Florida Department of Environmental Regulation (FDER, now DEP) made a formal request to EPA to remove Sherwood Medical Industries from the National Priorities List (NPL). The request was based on groundwater monitoring data supplied by Sherwood indicating that the original contaminants of concern were no longer detected above drinking water standards.

In January 1985, EPA and FDER determined that a modified remedial investigation (RI) was necessary. The modified RI was designed to assess the adequacy of remedial actions taken by the company. In October 1985, Sherwood Medical Industries notified EPA that it would perform the modified RI.

During EPA's negotiations with Sherwood on a final Consent Order, FDER received health-related complaints on private wells from nearby residents. Water samples were taken by HRS in September 1986 from two offsite private wells and Sherwood's onsite domestic water supply well. No violations of drinking water standards were detected in the offsite private well samples although chlorinated solvents were detected in samples from the Sherwood supply well. Samples taken in October 1986 confirmed onsite groundwater contamination of the Floridan Aquifer. In light of this new data, Sherwood Medical under a Consent Order with EPA conducted a full-scale remedial investigation/feasibility study (RI/FS).

In August 1987, at FDER's request, Sherwood sampled the onsite Floridan wells and downgradient residential well to assess the extent of contamination and evaluate the need to implement an IRM to control and treat the Floridan contamination. Sherwood subsequently developed a Floridan Aquifer investigation plan to evaluate the vertical extent of contamination. The investigation included the sampling and analysis of multiple zones within the Floridan Aquifer through an on-site production well. Field testing was completed in April 1989, and the Floridan Aquifer Contamination Assessment Report was submitted in June 1989. In September 1989, a pump test was conducted to facilitate the design of an Interim Remedial Measure (IRM) for groundwater recovery and treatment.

Onsite Floridan wells showing faulty well construction were remedied in June 1989 and bi- annual monitoring was implemented to demonstrate the effectiveness of the remedy. In October 1989, an

IRM Design Work Plan was provided to FDER, which outlined the additional proposed IRM activities. The final IRM Design Work Plan was approved in September 1990.

The US EPA took over as lead agency for management of the IRM project in December 1990. An IRM Record of Decision (ROD) for Operable Unit 1 (OU 1) was signed by EPA in March 1990, documenting that interim surficial aquifer groundwater recovery and treatment would be designed and implemented to prevent offsite contaminant migration in the shallow aquifer prior to selecting a final site cleanup method. Use of the onsite Floridan Aquifer supply well as part of the Sherwood facility operations would continue in order to capture groundwater contamination that had migrated vertically into the Floridan Aquifer.

The IRM preliminary design report was submitted in April 1991. Additional sampling of Lake Miller was conducted to aid in the development of surface water discharge criteria as part of design. The final IRM design was approved in April 1992 and included a surficial aquifer recovery system with treatment by an air stripper capable of treating up to 260 gallons per minute (gpm) of contaminated groundwater. Construction of the remedial system was completed, and the IRM operation began in July 1992. Rehabilitation of the onsite Floridan supply well was completed to assure that vertical movement of contaminants into the Floridan aquifer along the outside well casing would not continue to occur.

The final RI/FS Work Plan was submitted in May 1988; Surficial and Floridan aquifer monitoring wells were installed in September 1990. A draft RI report was received in April 1991. Additional site sampling of both surface water and lake sediments and installation of additional monitoring wells were performed to further evaluate the extent of contamination. The final RI was approved in July 1992. The final FS was submitted in July 1992. EPA held a public meeting in July 1992 to present the proposed remedial alternative for site cleanup.

The EPA signed the OU 2 ROD in October 1992, with FDER concurrence, documenting the final site remedy. Site cleanup consisted of continued operation of the IRM surficial aquifer recovery and treatment system along with continued recovery and treatment of the Floridan Aquifer groundwater, as part of plant operations. Groundwater remediation would continue until monitoring confirms that the site meets drinking water standards. No soil cleanup was determined to be necessary.

Sediment samples taken from Lake Miller in 1990 and 1993 indicated elevated levels of chromium in lake sediments. Subsequent sediment studies in 1994 showed much lower levels, including areas previously showing high chromium levels. No definite correlation between toxicity and site-related contaminants in sediments was indicated by toxicity tests. Chromium concentrations were not increasing in organisms higher on the food chain due to bio-magnification. Consequently, EPA selected No Action with Monitoring as the remedy for Lake Miller sediments. The OU 3 ROD was signed by EPA in September 1997 with DEP concurrence. The OU 3 ROD requires that the Operation and Maintenance activities associated with groundwater cleanup be revised to incorporate semi-annual sampling of Lake Miller sediment and surface water along with fish tissue sampling in Lake Miller and adjoining lakes to confirm the effectiveness of the remedy.

The 1999 Five Year Review of the Sherwood Site indicated the need for additional delineation of groundwater contamination in the surficial and Floridan aquifers. A Groundwater Sampling Report was completed by the PRPs in June 2003 and a Remedy Re-evaluation Report completed in February 2004. The second Five Year Review was received in September 2004. These reports indicate continued soil and groundwater contamination with contamination extending onto private properties to the East of the site.

Results of fish tissue sampling from Lake Miller received in July 2004 indicate no fish tissue elevated for cadmium. In August 2005 additional soil and groundwater sampling was completed to characterize the area near the septic tanks and former waste retention/percolation ponds as potential sources for continued groundwater contamination.

Samples taken in June 2006 and December 2006, as part of the ongoing semi-annual groundwater monitoring program at the site, showed continued groundwater contamination in excess of groundwater standards in the surficial and Floridan aquifers onsite. Groundwater contamination was in excess of standards in the surficial monitoring wells located onsite and offsite to the south and east of the property. Groundwater contamination was not detected above standards in offsite Floridan aquifer wells.

Additional groundwater monitoring wells were installed in May 2007 to further characterize contamination concentrations and groundwater flow within the shallow aquifer and evaluate the effectiveness of the ongoing remedy. Groundwater data from the newly installed monitoring wells and semi-annual sampling data was summarized in the Semi-Annual Sampling Report submitted in July 2007. A bioremediation pilot study was conducted in 2008 to determine if this technology would be a useful tool in the cleanup of the surficial aquifer and to address potential source areas. The December 2008 Bioremediation Pilot Test Report has been reviewed by DEP and was approved. It is anticipated that a supplemental remedial action will be recommended to enhance cleanup of contaminants that remain above the groundwater cleanup target levels in the surficial aquifer.

Recommendations have been made for conducting a Soil Vapor Extraction (SVE) pilot test study, as well as saturated soil sampling, to remedy soil contaminants.

The groundwater monitoring scope of work has been decreased with the agreement of the EPA and the DEP. This decrease in scope was based on the years of groundwater data that have shown a decrease in the plume size and contaminant concentrations. A Supplemental Site Assessment Report for the Septic System area and a Groundwater Flow Model Work Plan were recently reviewed by DEP and EPA. The April 2019 Preliminary Design Investigation Report summarized multiple phases of investigative activities conducted between December 2017 and March 2019. The study concluded that chlorinated volatile organic chemicals (CVOCs) are not migrating from the Site to areas east of Kepler Road based on direct push technology samples. The Design Report also confirmed the presence of localized areas of dense non-aqueous phase liquid (DNAPL) at the two suspected sources.

The Fifth Five-Year Review Report was released in April of 2020. The Department has reviewed the Draft Five-Year Report issued in July of 2019 which does not differ technically from the finalized report.

Schedule

Operation and maintenance of the groundwater recovery system is ongoing, along with semi-annual groundwater sampling to monitor plume conditions on- and offsite. Implementation of source-focused remedial actions to address remaining source areas is anticipated to start in late 2019 or early 2020. Remedial actions are anticipated to include a combination of bioremediation and emulsified zero valent iron injections at both source areas, and SVE (near Building B in former septic tank source area). The Fifth Five-Year Review Report makes no mention of source-focused remedial actions beginning yet.