

Tower Chemical Company
County Road 455 and Montverde Road
Clermont, Florida
County: Lake
District: Central
Lead: EPA

Placed on National Priorities List: October 23, 1981
ERIC ID # 3808
HWC # 035

Site Description and History

The Tower Chemical Company site is located near Clermont on County Road 455 in Lake County approximately 20 miles west of Orlando in Township 22S, Range 26E, Section 23 at 28° 33' 05.0000" N, 81° 41' 05.0000" W. The 14-acre site contained a chemical plant, which was used to manufacture pesticides and agricultural chemicals. Technical grade DDT was used as an intermediate in the manufacturing process. During the period of operation (1957 – 1981), highly acidic wastewater was discharged to an unlined percolation pond, which occasionally overflowed into an adjoining swamp. Water from this area drains to Lake Apopka, the state's fourth largest freshwater lake. Analysis of water and sediment from the percolation pond showed high concentrations of various pesticides and heavy metals. The facility also excavated a burn pit into the water table, which served as a dumping and burning site for solid chemical wastes. Soil analyses at the burn/burial area revealed high concentrations of pesticides.

For approximately two days, Tower Chemical sprayed its pond water over an adjoining 20-acre spray field, destroying much of the native vegetation. Soil sampling indicated that only those soils in close proximity to the spray nozzles were contaminated. These soils were subsequently removed.

Threat

The primary environmental concern at the site is the potential for contamination of the Floridan Aquifer. The Floridan Aquifer is only partially confined in this area and sinkholes may permit downward leakage of contaminated surficial waters. The potential for contamination of local surface streams is also of concern since bioconcentration of pesticides in the food chain could result in an exposure through consumption of fish and waterfowl.

Response Strategy and Status (December 2020)

In June 1982, the Florida Department of Environmental Regulation (FDER, now DEP) entered into a final judgment with Tower Chemical and its president, Mr. Ralph Roane. The defendant agreed to compensate FDER for damages, however, to date; DEP has not received any compensation.

In July 1983, the EPA Region IV Emergency Response Branch and the FDER performed an emergency removal operation at the site to mitigate the immediate threat to human health and the environment. Approximately one million gallons of contaminated water were removed from the

wastewater pond and decontaminated by passing it through an activated carbon filtration system until the effluent met state standards for discharge to a nearby stream. Approximately 130 cubic yards of pond sediments, 2,370 cubic yards of contaminated soils in the burn burial area, and 150 empty drums were excavated, determined to be hazardous waste, and shipped to Emelle, Alabama for disposal. The excavated pond area was backfilled with clean fill and capped with a protective clay layer eight to twelve inches thick to impede further downward migration of residual contaminants into the groundwater. The burn/burial area was also backfilled and clay-capped. The two areas were contoured to control surface water runoff and then enclosed within a chain link fence to prevent public access.

An EPA-lead Remedial Investigation/Feasibility Study (RI/FS) began in August 1984 and was completed in May 1986. A public meeting to discuss the RI and FS reports was held in September 1986. The Record of Decision (ROD) was completed in September 1987. The selected remedial action included onsite incineration of contaminated soils and recovery, treatment, and discharge of contaminated groundwater. EPA initiated a Remedial Design in December 1987.

Since there was no responsible party to continue with activities at the site, EPA and FDER signed a Superfund State Contract (SSC) in 1989 to share costs for preliminary remedial activities including drum removal, well abandonment, and replacement of residential water well. On completion of the design in August 1990, a second SSC was signed for construction of the water treatment system and incineration of on-site contaminated soils.

Additional site sampling was performed in March and August 1991 to estimate the volume of soil requiring incineration prior to the construction bid process. The soil data showed that the original contaminants had biodegraded to low levels comprised primarily of 4,4-dichlorobenzophenone (DCBP), which had not been previously observed. EPA resampled the groundwater at the site in June and July 1992 to confirm the extent of ground water contamination. The results indicated that site related pesticides in groundwater had decreased further in concentration. EPA conducted a five-year review of the site in July 1994 and determined that a supplemental groundwater investigation was necessary to delineate fully any existing groundwater plume. EPA performed the supplemental groundwater investigation in November 1994. The results suggested that the pesticide dicofol still existed at elevated levels in the surficial aquifer.

EPA conducted site sampling in January 1997 and March 1998 which confirmed that both soil and groundwater at the site were still contaminated with DCBP along with lower concentrations of other pesticides. DCBP is a metabolite of dicofol and appears to be the primary remaining contaminant of concern for both soils and groundwater. Difocol does not appear to remain at significant levels.

Private well monitoring between 1993 and 1999 has shown infrequent occurrences of low levels of DCBP in 2 of the 7 nearby private wells. There is not adequate toxicological data to characterize the risk posed by DCBP in these wells. However, due to the presence of DCBP in the Floridan Aquifer, EPA decided that filters would be provided for potable wells in the immediate vicinity of the site. In August 2000, EPA signed an Interim Action Record of Decision (IROD), with DEP concurrence, specifying installation of filters on the 7 drinking water wells as an interim remedy

until a final remedy can be identified and implemented. Installation of filters was completed in November 2002.

The EPA submitted a draft Supplemental Remedial Investigation Report and a draft Baseline Risk Assessment for DEP review in October 2000. The EPA reports concluded that characterization of the risk posed by contaminated soils and groundwater at the site was not feasible at this time due to the lack of conclusive toxicity information for DCBP and the presence of a large number of unidentified organic contaminants. DEP indicated that EPA should provide additional efforts to identify the site contaminants and to also determine the health risk posed by those contaminants so that selection and implementation of a final site remedy could be accomplished.

EPA and DEP subsequently agreed on site target cleanup goals for DCBP in soils. EPA took additional soil samples in August 2004 to fill in data gaps to determine the area and volume of contaminated soil which would require cleanup. EPA released a draft Supplemental Feasibility Study Report (SFSR) in April 2005. The report examined a number of alternatives for soil ranging from excavation with offsite disposal, in situ desorption and bioaugmentation; and for groundwater including in situ and ex-situ chemical and biological treatment.

A Final Supplementary Feasibility Study was received in November 2005. The proposed remedy consists primarily of excavation and offsite disposal of contaminated soils, bioaugmentation for organic contaminants in underlying soils and groundwater, replacement of temporary carbon filter systems on nearby water wells with permanent connections to public water, and the implementation of temporary institutional controls. A public meeting was held in May 2006 to discuss the proposed remedy.

The ROD for the third Operable Unit (OU 3) was issued on September 14, 2006 and called for excavation, bioaugmentation, and permanent connections of residents to public water. Additional soil and groundwater sampling was completed in November 2007 to facilitate the remedial design including design and performance of a groundwater treatability study.

In February 2010, the connection to the public water supply was completed with water supply lines brought to those residences affected by the groundwater contamination.

The first phase of excavation activities started in April 2010 and is now complete. This included replacement of asphalt and fencing that was removed for the remedial action and wetland restoration. Monitoring of the new vegetation of this wetland has begun.

Additional assessment activities in the Western Wetland, to determine the extent and locations of contamination, have been completed. It has been determined that there is no need to excavate this area. Excavation of the drum burn/burial area was completed in June 2011. This excavation extended to a depth of approximately 12 ft. below land surface.

In June 2011, a groundwater sampling event was conducted soon after the excavation was completed. It is thought that this sampling was affected by the dewatering and excavation activities that were conducted at this site, since the results were very inconsistent. The information that was

gathered is believed to not be representative of the post-excavation steady-state conditions in the groundwater. The EPA has completed the in-situ groundwater treatability testing and will incorporate the results into the next phase of groundwater remedial design.

Wetland restoration monitoring is ongoing. Maintenance to control invasive species has occurred and will continue until the invasive species have been controlled. Erosion control structures have been implemented to control erosion that occurred along the northern creek and appear to be working sufficiently.

The December 2014 In Situ Chemical Oxidation Pilot Test Summary Report for Injection Event 1 provides details on the first pilot test results. The report provides information on the results of groundwater monitoring, results of soil performance monitoring, results of the zone of discharge monitoring, and the results of the post-injection treatability study.

The 2014 pilot test conclusions and recommendations stated that the site has a high oxidant demand and high base demand. The Klorur® caustic, and Klorur® sodium persulfate injections were elevating pH levels in the soil for less than a week at most of the monitored locations. It was recommended that the Klorur® caustic, and Klorur® sodium persulfate injections be stopped and that another treatment material be used at this site. No proposal for the next treatment was stated in this report.

The Remedial Design Data Evaluation Report for activities conducted April 2015 at the Tower Chemical Co., for groundwater, detailed the groundwater sampling methods and analyses that were implemented. Some of the submitted samples did not meet the handling protocol but were further evaluated and determined to fall within the acceptable requirements.

In December 2016, Geosyntec, in collaboration with Black & Veatch, submitted a Remedial Design Investigation Work Plan and the In-Situ Solidification/Stabilization Treatability Study Work Plan.

The Remedial Design Investigation (RDI) Work Plan's purpose is to present the planned scope for the RDI, including the geophysical survey, direct push technology (DPT) groundwater and soil sampling, and monitoring well sampling. The objective of the RDI is to obtain information to support development of a remedial design to address organochlorine pesticide (OCP) impacts in groundwater at the Tower Chemical Company Superfund Site (TCC) "Site", Operable Unit 03 (OU3).

This *In Situ* Solidification/Stabilization (ISS) Treatability Study Work Plan (Work Plan), presents the proposed bench-scale treatability study which has the objective to evaluate the potential use of ISS as a remedial alternative and identify a solidification/stabilization treatment mix design capable of substantially reducing the mobility of 4,4'-DCBP (contaminant of concern (COC)) by substantially reducing the permeability of the contaminated soil while improving the physical soil strength. The study will be performed on homogenized composite soil samples collected from the contaminated area of the TCC Site.

A pilot test injection for the groundwater remedy was implemented in 2016 and early 2017. Results from this injection found that ISS was the most viable source area containment/treatment alternative in combination with limited treatment. Concentrations of many contaminants within the entire site have increased since the April 2012 sampling report. The Wetland restoration monitoring will also continue annually. Corrective actions for plant re-establishment and invasive/exotic species management will occur on an as needed basis.

The EPA plans to end its maintenance of the well filters because residences have been connected to the public water system. The EPA completed the last Five-Year Review (Third Five-Year Review) in April 2018. A groundwater cleanup approach is being designed for the site. The revised Focused Feasibility Study was submitted in July 2018 with the recommended remedial approach being ISS, groundwater pump and treat, O&M and compliance sampling, and annual groundwater monitoring.

An Interim Action-Record of Decision (IA-ROD) Amendment was written in April 2019 to address the soils that are in the 4,4'-dichlorobenzophenone (DCBP) 5,000 µg/kg isopleth contour and the groundwater contamination up to the 1,000 µg/L isopleth contour. The remedy will require long term performance monitoring. DEP gave comments to EPA on the report in May 2019. A final report was submitted in September 2019. A public meeting was held on July 30, 2019 in Clermont, FL to explain the Proposed Plan for the recommended interim remedial action. DEP concurred with the IA-ROD Amendment on February 5, 2020. A Basis of Design has been submitted for the IA-ROD Amendment and was reviewed by FDEP on September 11, 2020.

Schedule

The next step will be to have a Remedial Design submitted and reviewed.