DEPARTMENT OF NATURAL RESOURCE PROTECTION

TECHNICAL REPORT SERIES

TR:98-07

MONITORING VOLATILE ORGANIC COMPOUNDS IN GROUND WATER OF NORTHEASTERN POMPANO BEACH, FLORIDA

ENVIRONMENTAL MONITORING DIVISION

NOVEMBER 1998

EXECUTIVE SUMMARY

Samples of ground water were collected from 8 residentital irrigation wells in northeastern Pompano Beach on August 5, 1998. The area studied is in the vicinity of the former Plastiline, Inc. facility. The purpose of this work was to determine whether there was any evidence of ground water contamination by volatile organic compounds (VOC) in the vicinity of the facility. At least one VOC was detected in 7 of the 8 well samples collected. A total of six different volatile organic compounds were detected at very low levels, however, 3 of the VOCs detected were believed to originate from the laboratory atmosphere and were not actually present in the ground water. None of the detections exceeded ground water or drinking water standards.

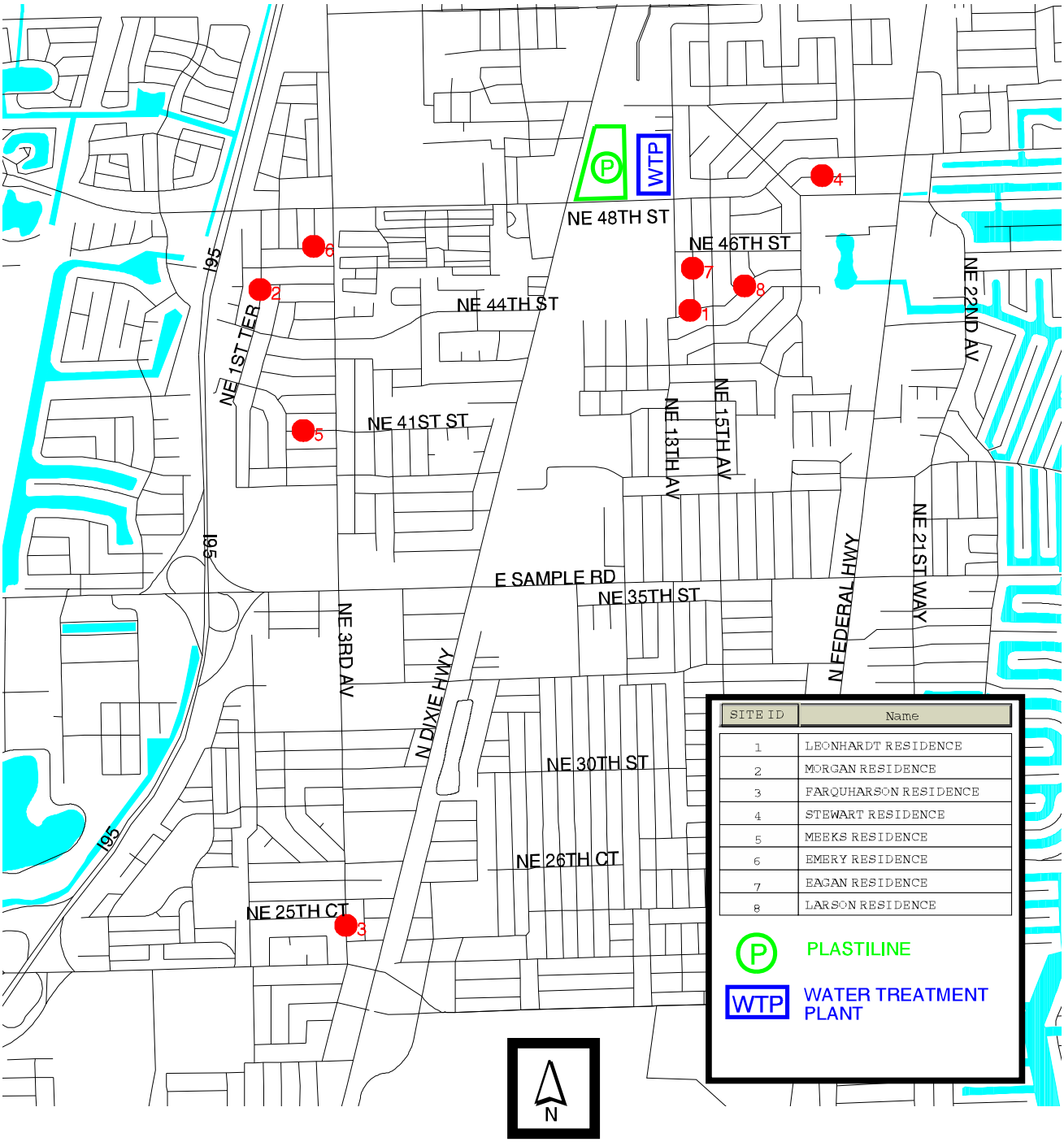
On August 5, 1998, Department of Natural Resource Protection (DNRP) personnel collected water samples from 8 residential irrigation systems in the general vicinity of the former Plastiline, Inc. facility located at Dixie Highway and NE 48th Street in northeastern Pompano Beach, Florida. Four samples were collected to the east of the facility in the Pompano Beach Highlands neighborhood and four to the west of the facility. Three of the samples to the west were from the Tedder neighborhood, and the fourth, approximately 2 miles southwest of the facility. The purpose of this work was to determine whether there was any evidence of groundwater contamination in the vicinity of the facility. Although volatile organic compounds were detected at very low levels, none of the detections exceeded groundwater or drinking water standards.

Most of the wells were located in an area roughly bounded by Federal Highway on the east, Sample Road on the south, I-95 on the west and NE 48th Street on the north. The samples were collected from residential irrigation systems of unknown well depths. Four wells were sampled in the area west of the Plastiline facility and four to the east. The study area is located within zone 3 of the Office of Environmental Services 2A wellfield. Due to withdrawal of groundwater by very large pumps near the water treatment plant (WTP), groundwater water flow would be expected to be in the general direction of the plant. Stagnant water was purged from the irrigation system by activating the sprinkler pump for at least 2 minutes before collecting the samples.

The samples were analyzed using EPA method 624 which is a gas chromatographic-mass spectrometric technique for volatile organic compounds (VOCs). The method is calibrated for 31 VOCs.

Three of the VOCs detected in the well water samples were also detected in “blanks”. Blanks are laboratory water samples processed along with the well water samples to check for contamination that may occur during sampling and analysis. VOCs detected in samples at levels similar to the blank should be discounted. The table below illustrates the VOCs that were detected along with the range of sample detections, blank detections, and standards. Although these irrigation wells are not used for drinking water, federal drinking water standards are provided for comparison.

PLASTILINE VOC SAMPLING LOCATIONS



SITE ID	Name
1	LEONHARDT RESIDENCE
2	MORGAN RESIDENCE
3	FARQUHARSON RESIDENCE
4	STEWART RESIDENCE
5	MEEKS RESIDENCE
6	EMERY RESIDENCE
7	EAGAN RESIDENCE
8	LARSON RESIDENCE

P PLASTILINE

WTP WATER TREATMENT PLANT

Broward County
Department of Natural Resource Protection
Geographic Information Systems

0.25 0 0.25 0.5 0.75 1 Miles

VOLATILE ORGANIC COMPOUNDS DETECTED IN GROUNDWATER SAMPLES

Volatile Organic Compound	# of detections	Range of Detections, ug/l	Blank, ug/l	Groundwater Standard, ug/l	Drinking Water Standard, ug/l
1,1-dichloroethane	2	0.10-1.09	none	3	no standard
chloroform	4	0.02-0.36	0.02-0.05	no standard	100 (as ttm*)
methylene chloride	3	0.23-0.33	0.22-0.33	5	no standard
tetrachloroethylene	1	0.04	none	3	5
toluene	2	0.05	0.05	40	1
trichloroethylene	3	0.04-0.32	none	3	5

*ttm= total trihalomethanes

The methylene chloride and toluene detections occurred at levels similar to that of the blank and should be discounted. One of the four chloroform detections was also similar to the blank and should also be discounted. These compounds are common laboratory solvents and likely were absorbed from the laboratory atmosphere.

Overall, seven of the eight sprinkler systems contained detectable levels of VOCs. After discounting for blanks, the ratio drops to six of eight. The two wells from which VOCs were not detected (Stewart & Larson) were both located to the east of the Plastiline facility. The greatest number of detections in a single well, four, occurred to the west of the Plastiline facility (Emery).

After discounting for blank detections, the only VOC detections of note were chloroform, 1,1-dichloroethane, tetrachloroethylene and trichloroethylene.

Chloroform was detected at a level well above the blank in 3 wells (Meeks, Emery, & Farquharson); all to the west. The chloroform levels in these three wells were similar (0.27-0.36 ug/l). Chloroform is a common by-product of the chlorination of potable water.

1,1-dichloroethane was detected in 2 wells; one to the east (Leonhardt) and the other to the west (Morgan). The level in the western well was an order of magnitude greater than the eastern well (1.09 ug/l versus 0.095 ug/l). The highest level detected is approximately one-third the groundwater standard.

Tetrachloroethylene was detected in one well (Emery) west of the Plastiline facility. The detected level, 0.04 ug/l, is one seventy-fifth the groundwater standard. Tetrachloroethylene is a common dry cleaning solvent.

Trichloroethylene was detected in three wells; one to the west (Emery) and two to the east (Eagan and Leonhardt). The lowest level (0.040 ug/l) was to the east (Leonhardt). The wells to the west ranged from 0.10-0.32 ug/l. The higher of these two levels is approximately one-tenth the groundwater standard. Trichloroethylene is a common solvent for degreasing and dry cleaning.

The finding of very low levels of VOCs in the shallow groundwater in this area is not surprising. The fact that groundwater in southeast Florida is unconfined by any impermeable subsurface structures makes it extremely susceptible to contamination. Such contamination has been documented in other areas of the county where obvious sources of the contaminants are not apparent. Furthermore, sprinkler systems themselves may be a source of very low levels of VOCs as a result of the water being in contact with assorted pipes, sealants and lubricants.

It is unlikely that any health risk is associated with irrigation using water containing low levels of the VOCs detected in this study. As was noted, there were no violations of drinking water standards for the VOCs tested in these irrigation wells. Since the drinking water standards are set at levels that are considered safe to consume, physical contact with groundwater containing the low level VOCs that were found in this study would not present a health risk.

In summary, very low levels of VOCs were detected in the irrigation wells, however, none of the detections were in excess of DNRP groundwater standards nor EPA primary drinking water standards. The detection of low levels of VOCs in shallow groundwater is not unusual. In fact, the urban character of Broward County and the existence of the unconfined aquifer as close to the surface as it is, has resulted in low level contamination in other areas of the county. The levels detected in this study, however, do not suggest any unreasonable risk would be associated with contact with this groundwater.

1. TITLE AND SUBTITLE *MONITORING VOLATILE ORGANIC COMPOUNDS IN GROUND WATER OF NORTHEASTERN POMPANO BEACH, FLORIDA*		2. REPORT DATE *NOVEMBER 1998*
3. CONTRIBUTORS *MARIA FERNANDEZ, REANN SOODEEN, RICK WILKINS, NICK KONTAX AND GEORGE F. RILEY*		4. PERFORMING ORGANIZATION REPORT NO. *TECHNICAL REPORT SERIES TR:98-07*
5. RESPONSIBLE DEPARTMENT AND DIVISION *BROWARD COUNTY DEPARTMENT OF NATURAL RESOURCE PROTECTION* *218 SW 1ST AVENUE* *FORT LAUDERDALE, FL 33301*		6. STRATEGIC ASSESSMENT PROGRAM ELEMENT NO. 7. CONTRACT/GRANT NO.
8. SPONSORING AGENCY NAME AND ADDRESS *BROWARD COUNTY DEPARTMENT OF NATURAL RESOURCE PROTECTION* *218 SW 1ST AVENUE* *FORT LAUDERDALE, FL 33301*		9. TYPE OF REPORT AND PERIOD COVERED *TECHNICAL*
10. SUPPLEMENTARY NOTES		
11. ABSTRACT SAMPLES OF GROUND WATER WERE COLLECTED FROM 8 RESIDENTITAL IRRIGATION WELLS IN NORTHEASTERN POMPANO BEACH ON AUGUST 5, 1998. THE AREA STUDIED IS IN THE VICINITY OF THE FORMER PLASTILINE, INC. FACILITY. THE PURPOSE OF THIS WORK WAS TO DETERMINE WHETHER THERE WAS ANY EVIDENCE OF GROUND WATER CONTAMINATION BY VOLATILE ORGANIC COMPOUNDS (VOC) IN THE VICINITY OF THE FACILITY. AT LEAST ONE VOC WAS DETECTED IN 7 OF THE 8 WELL SAMPLES COLLECTED. A TOTAL OF SIX DIFFERENT VOLATILE ORGANIC COMPOUNDS WERE DETECTED AT VERY LOW LEVELS, HOWEVER, 3 OF THE VOCS DETECTED WERE BELIEVED TO ORIGINATE FROM THE LABORATORY ATMOSPHERE AND WERE NOT ACTUALLY PRESENT IN THE GROUND WATER. NONE OF THE DETECTIONS EXCEEDED GROUND WATER OR DRINKING WATER STANDARDS.		
12. KEY WORDS *VOLATILE ORGANIC COMPOUNDS* *GROUNDWATER CONTAMINATION* *PLASTILINE, INC.*		
13. DISTRIBUTION STATEMENT *UNLIMITED*	14. NO. COPIES IN FIRST PRINTING	15. NO. OF PAGES *6* 16. COST PER UNIT