

**SOURCE WATER ASSESSMENT AND PROTECTION PROGRAM
FDEP GRANT NUMBER G0023**

COMPREHENSIVE FINAL REPORT



PREPARED FOR:

**STATE OF FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION
3900 COMMONWEALTH BOULEVARD
TALLAHASSEE, FLORIDA 32399**

PREPARED BY:

**BROWARD COUNTY ENVIRONMENTAL
PROTECTION DEPARTMENT
POLLUTION PREVENTION AND REMEDIATION
DIVISION**

**TELEPHONE (954) 519-1439
FAX (954) 765-4804**

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- 4 Percentage of Supply Wells with FLUWID Number
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- 1 Broward County Public Wellfields
- 2 Number of Inspection Forms Completed Per Wellfield
- 3 Number of Discovered Facilities Per Wellfield Resulting in a New License
- 4 Number of Public Supply Wells With a FLUWID Number
- 5 Chemical Type and Quantity

INTRODUCTION

On October 22, 2002 the Broward County Board of County Commissioners entered into DEP Agreement No. G0023 with the Florida Department of Environmental Protection. The Agreement specified that Broward County would be funded to perform investigations of their forty-one public wellfields (aka source water assessment areas). The public wellfields are shown in Figure 1 and listed in Table 1. Prior to initiating this project Broward County identified all public water system intakes and delineated a source water assessment area for each public water system.

Groundwater is Broward County's sole source of potable water. Most of the potable water is pumped from the Biscayne Aquifer. Several public supply wells pump water from the Floridan Aquifer. Due to the Biscayne Aquifer's high transmissivity it was agreed by Broward County and the State of Florida that the 210 travel time isopleths would define the source water assessment areas for the purpose of this project in lieu of the five year travel time specified in the State of Florida's Source Water Assessment and Protection Program.

The investigations of Broward County's forty-one source water assessment areas were done to complete the inventory of potential contaminant sources portion of the Source Water Assessment and Protection Program requirements under the 1996 Amendments to the Federal Safe Drinking Water Act and the State of Florida's Source Water Assessment and Protection Program.

This project and the preparation of this report were funded by a Source Water Assessment and Protection Program grant from the U.S. Environmental Protection Agency through a contract with the Bureau of Watershed Management of the Florida Department of Environmental Protection. The total cost of the project was \$377,000 of which 100% was provided by the U.S. Environmental Protection Agency. We also acknowledge the support provided by Allan Stodghill and Donnie McClaugherty of the Florida Department of Environmental Protection and Mr. Jeffery Halsey of the Broward County Environmental Protection Department.

SCOPE OF WORK

An investigation was completed for each of the forty-one wellfields in Broward County. The investigations consisted of the following elements.

Office Preparation

All existing Broward County GIS layers and paper files were searched for information within the forty-one source water assessment areas for public supply well locations, surface water locations, ambient surface water sample locations, ambient groundwater sample locations, future land use, current land use,

contaminated sites, hazardous material facilities and storage tank facilities, SARA Title III facilities, solid waste facilities, landfills, POTW/ septic tank areas, salt water intrusion boundaries, monitoring well analyses and raw water supply well analyses. This information was summarized and included in the final report for each public wellfield investigation. Wall maps were printed showing the most recent aerial photograph and boundaries of each source water assessment area.

Field Work

From the start of the DEP Agreement in October 2002 through the end of November 2007, the Wellfield Protection Team visited every building, business and parcel within the source water assessment areas. They used the aerial photograph wall maps with delineated wellfield zones as their base maps. All customers received a brochure describing the wellfield protection program and were educated about the need to properly store, handle, use and dispose of hazardous chemicals. Inspection forms were prepared for businesses that stored, handled, used and produced hazardous materials and regulated substances as defined in the Broward County Natural Resource Protection Code Articles XII and XIII. Inspection forms included information about the general business, wellfield name and protected zone, licenses, operating requirements, secondary containment, handling and storage, record keeping and manifests and wastes generated. A chemical inventory was prepared for each facility. The inventory included the name of each chemical stored at the facility, the container sizes, the number of each container and the ingredients. Inspection reports prepared for facilities within 500 feet from a public supply well also included a map showing the aerial photograph, outline of the facility's boundary and chemical storage areas. Some inspection forms also included photographs of violations. During the field work phase each supply well was checked to see whether it was tagged with the Florida Department of Environmental Protection's FLUWID Number.

Report Preparation

Information collected during the office preparation phase and field work phase was included a report. A report was prepared for each of the forty-one wellfield investigations. Each report included the following information from within the boundaries of the source water assessment area.

- An introduction including the purpose of the report, limitations and expectations and the scope of work.
- A site description including information about the supply wells, current land use and future land use.
- A description of the local geology including soils, hydrogeology, saltwater intrusion.
- A description of which areas are sewered.
- A description of landfills and solid waste facilities.

- A description of SARA Title III facilities.
- A table of licensed hazardous material and storage tank facilities and the chemicals stored at each facility.
- A table of unlicensed hazardous material and storage tank facilities that were discovered during the investigation to require a license. The table included the chemicals stored at each facility.
- A summary of the contaminated sites located within the source water assessment areas.
- A table of all the facilities where inspection forms were completed. The table included the chemicals stored there.
- A summary of historic water analyses for ambient surface water monitoring, ambient groundwater monitoring, monitoring wells, irrigation wells and raw water from public supply wells.
- A table identifying which public supply wells have a FLUWID Number, the FLUWID Number and the well's casing material.
- A table identifying all point and non-point sources of contaminants. This included facilities that have a hazardous material and/or storage tank license and facilities that needed to apply for a hazardous material and/or storage tank license. The table included the hazardous materials containing regulated substances stored at each facility.
- A statement acknowledging the EPA as the funding source.
- Figures identifying the source water assessment area and public supply wells, an aerial photograph of the source water assessment area, the planned future land use through 2015 and the potential contaminant sources.
- A table showing location, construction details and pump rate for each public water supply well.

PROJECT EXPENSES

The total funding for this project was \$377,000. The vast majority of the funding was used to pay salaries. Two computers and monitors were also purchased. In order to support the team, Broward County purchased one additional computer and monitor, three scanners, two vehicles, cellular phones and provided office space, office equipment and office supplies.

INSPECTIONS

During the five year contract term the Wellfield Protection Team used aerial photographs to identify all buildings and activities in the source water assessment areas. Then they visited every building and business to determine whether hazardous materials were stored, handled, used or produced there. Inspection forms were completed for those businesses that stored, handled, used and produced hazardous materials. Nearly 2000 hazardous material facility inspections and inspections forms were completed. Approximately 630 of those inspections were for facilities that had a current Hazardous Material Wellfield

License or Hazardous Material Facility License and approximately 1370 inspection forms were completed for facilities that did not have a license. Of the total inspections that were performed throughout the 41 wellfields, 143 were licensed storage tank facilities, 489 were licensed hazardous material facilities, and 352 of the facilities inspected resulted in new Hazardous Material Facility Licenses. The number of inspection forms completed for each wellfield investigation are shown in Figure 2 and listed in Table 2. Figure 6 shows the percentage of new and existing Hazardous Material and Storage Tank Licenses.

UNLICENSED FACILITIES

One of the main focuses of the field work was to identify all facilities that required a Hazardous Material Wellfield License or Hazardous Material Facility License. This effort would bring all the appropriate facilities under regulatory oversight so that they will be inspected and required to comply with county environmental regulations. During the field work 352 unlicensed facilities were discovered and required to apply for a Hazardous Material Wellfield License or Hazardous Material Facility License. The number of unlicensed facilities found in each wellfield investigation are shown in Figure 3 and listed in Table 3.

FLUWID NUMBERS

FDEP Agreement No. G0023 required that each public supply well be checked to determine whether it was tagged with a State FLUWID Number. This is a unique identifying number that the state assigns to each public supply well. The Wellfield Protection Team checked 342 public supply wells for FLUWID Numbers. Of those 82 public supply wells had a FLUWID number and 260 public supply wells did not have a FLUWID number. The percentage of public supply wells that had a FLUWID number and the number of public supply wells that did not have a FLUWID number are shown in Figure 4. The number of public supply wells that had a FLUWID number and the number of public supply wells that did not have a FLUWID number are shown in Table 4.

ENFORCEMENT ACTIONS

During the contract a number of facilities were found to be out of compliance with the county environmental code. The most common violations were failure to store hazardous materials in secondary containment, failure to label containers, failure to maintain hazardous waste manifest records and failure to maintain Material Safety Data Sheets. Facilities were also discovered that were discharging untreated waste to the POTW, had releases of hazardous materials to the ground, had unlicensed storage tanks and were storing, handling and using regulated materials within zone 1 of the wellfield, where these types of chemicals are prohibited. Two hundred and fifty-two (252) enforcement actions were issued including 237 warning notices, 11 citations and 4 notices of violation. The enforcement actions listed a total of 513 violations. The warning notices did not

entail fines. The citations did have associated fines. The notices of violations had substantial associated fines and included an appearance of the facility owner/operator before an environmental hearing examiner.

HAZARDOUS MATERIAL INVENTORY

During the investigations a chemical inventory was prepared for each facility. The inventory included the name of each chemical stored at the facility, the container sizes, the number of each container size and the chemical's ingredients. The information was compiled for each source water assessment area and for Broward County to understand the types and quantities of chemicals most prevalent in Broward County.

Within the forty-one public wellfields 4,260,589 gallons and 1,023 tons of chemicals were inventoried.

Gasoline was the prevalent liquid chemical (40.1%) followed by diesel (21.2%), automotive, aircraft fluids and oils (11.2%), cleaning solutions/chlorine (7.2%), acids (2.6%) and motor oil and used motor oil (2.5%). More than 19,077 gallons of solvents were inventoried which included solvents from drycleaner use to alcohol. Solvents accounted for 0.45 % of the total liquids. Ten percent of the liquid chemicals were classified as miscellaneous because the use was not known. The most prevalent solid chemicals were fertilizer and batteries. Forty-two percent of the solid chemicals were classified as miscellaneous because the use was not known. Figure 5 and Table 5 shows the total quantity of various chemical groups inventoried arranged by gallons, pounds and gallons equivalent (gallons + pounds/10).

ACCOMPLISHMENTS

Broward County's Wellfield Protection Program was started in 1983. However, the program attained little importance and credibility until 2002 when the contract to complete the wellfield investigations gave the team an identity and legitimacy. Prior to the contract the Team consisted on two permanent positions. Inspections were performed by another group of employees. Today the Team has three permanent positions and performs all hazardous material inspections within the source water assessment areas. Storage tank inspections are performed by another team under an FDEP contract.

The team has mentored a number of people since 2002. Darci Mayer was a part-time college student studying Geography/GIS who was hired as a part-time college intern. She completed her degree and obtained a full-time job with the Wellfield Protection Team as a Natural Resource Specialist I. She is currently working for the City of Las Vegas, Nevada. Cherona Levy and James Stankowicz were high school students mentored by our team members. Cherona went on to win an environmental award at the State level. James went on to study physics at

the University of Florida. Laura Tellez and Leigh Ammon were two college graduates who did not have the work experience to be hired as a Natural Resource Specialist. They were hired as College Interns. After six months they were promoted to Natural Resource Specialists I. Leigh is currently working with the Broward County Licensing Team and planning to attend graduate school. Laura is currently working with the Wellfield Protection Team and is planning to attend graduate school.

During the contract the Team developed a brochure describing the Team's mission and the Wellfield Protection Program. More than 4,500 brochures were mailed along with letters to private residences within 500 feet from public supply wells. The purpose of this was to educate the residents about their proximity to public supply wells and their responsibilities regarding chemical storage and use. The Team also created a website where policies, the ordinance and wellfield related information are available for public viewing. The website address is <http://www.broward.org/pprd/wellfield.htm>.

When the contract began in 2002 inspection forms were filled out using paper forms. Then Broward County purchased three laptop computers for the team and the form was converted to PDF writable format. Now the inspection form is completed on the laptop and signed in the field by the facility's representative. Then a chemical inventory is prepared in the office along with a site map. The inspection form, chemical inventory, map and photographs are combined into a PDF document that is downloaded into Broward County's POSSE database.

In August 2006 the Team presented a talk at the Florida Local Environmental Resource Agencies (FLERA) conference in Sarasota Florida. The presentation allowed us to showcase the many improvements that we made to Broward County's Wellfield Protection Program.

Broward County's Wellfield Protection Team was a 2006 National Association of Counties (NACO) Achievement Award Winner in recognition of an innovative program which contributes to and enhances county government in the United States.

EXAMPLES OF SUCCESSES

This portion of the Comprehensive Final Report will provide six case summaries showcasing improvements the Wellfield Protection Team has made to Broward County's environment during this contract. Refer to Figure 6 for the specific locations of the facilities.

Advance Auto Parts #9481, 303 N. University Drive, Pembroke Pines

Advance Auto Parts #9481 is located at 303 N. University Drive, Pembroke Pines, FL 33024 within zone 2 of the City of Pembroke Pines West Wellfield.

During an inspection performed on September 18, 2006 oil staining and odors were observed on the concrete surface and on the soil. Automotive maintenance and repairs were observed being performed outside and on-site by an employee who was not using drip pans. Subsequently, a complaint (CMP0906-087) was called into the Environmental Protection Department (EPD) Environmental Response Team who responded to the soil staining and issued a Warning Notice WRN06-0667 for the discharge, cleanup and proper disposal of the petroleum impacted soils. To investigate the release, soil samples were collected by EPD and submitted to the department's certified laboratory for analysis. The sample results indicated that petroleum contamination was present at this facility.

During an inspection performed on September 29, 2006 by the Wellfield Protection Team several violations were documented and a warning notice was issued. The violations cited in the warning notice included discharge of a hazardous material (petroleum product) to the ground, failing to keep one monitoring well locked, storing used batteries and automotive fluids outside secondary containment, failing to perform automotive repair activities in a manner which prevented unauthorized releases to the environment and failing to make available hazardous waste manifests showing the proper disposal of hazardous materials.

By December 4, 2006, this facility made appropriate operational changes and made records available to show compliance with the warning notice. The contaminated soils had been excavated, hazardous waste manifests for the disposal of the contaminated soils and for the used oil were provided to EPD, all hazardous material were relocated into secondary containment and the facility's management prohibited automotive repairs on-site. This facility also complied with their license conditions by submitting a complete Spill Prevention and Control Plan and installing a secondary monitoring well in accordance to the Hazardous Material Wellfield License WHM-02825-05. The monitoring well is being sampled for volatile organic compounds, Lead and petroleum product. Recent groundwater analyses detected petroleum product and Lead at concentrations that were below the Florida Groundwater Clean-up Target Levels. Groundwater monitoring will continue on a quarterly basis.

Before



View of used oil staining observed on the concrete surface and on the soil during the September 18, 2006 morning inspection.



Used batteries located to the east of the southeast corner of the building observed outside secondary containment.



Pre-packaged containers of automotive fluids located to the east of the building observed outside secondary containment.

After



View of the same area with no oil staining.



View of the same area with no batteries located outside secondary containment.



View of the same area with no automotive fluids located outside secondary containment.

BH Cars, Inc., 1750 S. State Road 7, North Lauderdale

BH Cars, Inc. is located at 1750 S. State Road 7, North Lauderdale, FL 33068 within zone 2 of the City of Fort Lauderdale Prospect Wellfield. This facility was discovered during the investigation of the City of Fort Lauderdale Prospect Wellfield.

Prior to the initial inspection on October 14, 2005 this facility did not have a Hazardous Material Wellfield License. The initial inspection documented numerous violations including operating without a license, unlabeled containers, hazardous materials stored outside secondary containment, failing to maintain hazardous waste manifests and failing to maintain material safety data sheets. After the initial inspection, a warning notice was issued to this facility. The facility applied for and was issued a Hazardous Material Wellfield License. The facility is currently in compliance. The license requires the facility to perform quarterly groundwater sampling of one monitoring well for volatile organic compounds, Lead, Copper and petroleum product. Recent groundwater analyses indicate levels of Tetrachloroethylene that exceeded the Florida Primary Drinking Water Standards. This was first detected in the sample collected during the second quarter of 2007. The high Tetrachloroethylene concentration was reported to the Broward County Environmental Assessment and Remediation Team who will perform an investigation to determine the potential source of the contaminant. This facility will continue to submit quarterly groundwater analyses.

Site pictures taken during the initial October 14, 2005 inspection and site pictures taken during a re-inspection on July 13, 2006 are depicted below.



K & B Development I LLC, 1413 NW 33rd Drive, Pompano Beach

K & B Development I LLC is located at 1413 NW 33rd Drive, Pompano Beach FL 33069 within zone 3 of the City of Pompano Beach West Wellfield. This facility was discovered as a part of the investigation of the City of Pompano Beach West Wellfield.

During, the initial inspection on June 29, 2007 violations were observed for failing to label chemical containers, failing to store hazardous materials in secondary containment, failing to prevent the release of hazardous materials, failing to maintain material safety data sheets on-site, failing to verify that procedures are in place to ensure the safe handling of chemicals, failing to provide access to all areas and businesses occupying the property and the presence of soil staining on the property that indicated a chemical release had occurred. In response to these violations Warning Notice WRN07-0413 was issued to the facility.

The Wellfield Protection Team reported the area of soil staining to the EPD Environmental Response Team who responded and issued Warning Notice WRN07-0557 for the discharge, cleanup and proper disposal of hazardous materials at the property. To investigate the release, soil samples were collected and submitted to the department's certified laboratory for analysis. The sample results indicated that petroleum products were detected at concentrations of 1410 mg/kg, 2230 mg/kg and 174,000 mg/kg. These concentrations exceeded the FDEP Soil Clean-up Target Level (340 mg/kg) for TRPH (Total Recoverable Petroleum Hydrocarbon) for residential uses and one sample exceeded the FDEP Soil Clean-up Target Level (2500 mg/kg) for TRPH for commercial/industrial uses.

On August 24, 2007 another inspection was performed by the Wellfield Protection Team at the K & B Development I LLC property. During this inspection access was provided to all areas of the property, and it was confirmed that all abandoned chemicals and open vehicle cavities had been disposed of in accordance with Broward County's Code. It was also determined during the inspection that three businesses renting space at this property continued to be in violation for failing to label chemical containers, failing to maintain material safety data sheets on-site, and failing to store, use or handle hazardous materials within secondary containment. A third inspection was performed by the Wellfield Protection Program Team on October 5, 2007. At the time of that inspection, all violations noted in WRN07-0413 were found to be resolved.

As a result of the warning notice three businesses renting space on the K & B Development I LLC property store, handle and use more than 25 gallons of hazardous materials and have been requested to obtain a Hazardous Material Wellfield License and to implement best management practices for their chemicals.



Before: View of hazardous materials that are not situated within secondary containment.



After: View of same area with no hazardous materials storage outside secondary containment.

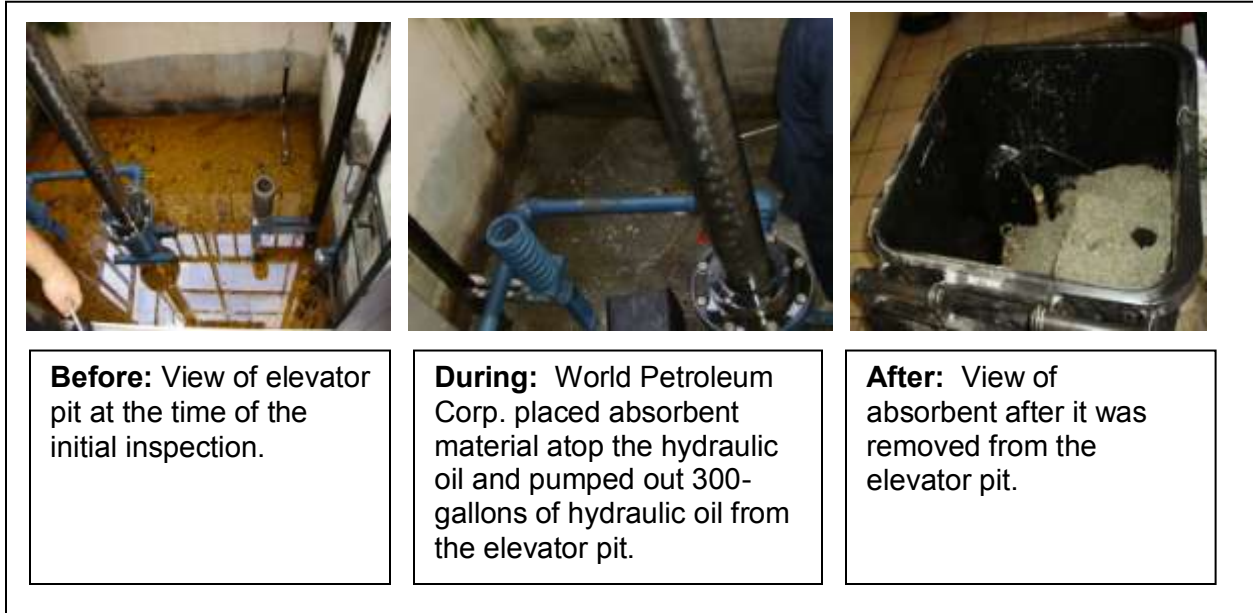
Oakland Crown Plaza LLC, 8358 W Oakland Park Blvd., Sunrise

Oakland Crown Plaza LLC is located at 8358 W Oakland Park Blvd., Sunrise, FL 33351 within zone 3 of the City of Sunrise Springtree Wellfield. This facility was discovered as a part of the investigation of the City of Sunrise Springtree Wellfield.

During the initial site visit on September 19, 2006 a release of hydraulic oil in the elevator pit from the elevator reservoir was discovered. The release was reported to the EPD Environmental Response Team.

On September 20, 2006 it was determined by facility's contractor and the EPD Environmental Response Team that the hydraulic oil discharge was caused by a broken piston seal and a leak in the hydraulic reservoir. The elevator pit was drained and the absorbents were removed from the bottom of the pit by the contractor. Warning Notice WRN06-0793 was issued to the facility jointly by the EPD Wellfield Protection Team and the Environmental Response Team. The warning notice counts included an unauthorized release of hazardous material, failing to store one (1) 55-gallon drum of hydraulic oil within secondary containment, operating without a Hazardous Material Facility License, failing to maintain hazardous material disposal manifests, and failing to maintain material safety data sheets on-site. Furthermore, the hydraulic oil discharge exceeded the 10 gallon Reportable Spill Limit and this required the facility to apply for a Hazardous Material Wellfield License, submit a Spill Prevention and Control Plan and construct one monitoring well and have it sampled quarterly for petroleum product.

Since this facility was discovered, the elevator leak has been repaired and all petroleum products were disposed of by the environmental contractor. The facility received a Hazardous Material Wellfield License and is in the process of constructing the shallow monitoring well which will be sampled quarterly for petroleum products.



Pompano Beach, Sand & Spurs Horse Stables, 1600 NE 5th Avenue, Pompano Beach

The Pompano Beach, Sand & Spurs Horse Stables is located at 1600 NE 5th Avenue, Pompano Beach, FL 33060 within the source water assessment area (zones 1, 2 and 3), and outside of the source water assessment area of the City of Pompano Beach East Wellfield.

An initial wellfield inspection, dated November 2, 2006, documented several violations at this facility. The violations included failing to maintain hazardous materials (i.e. used oil), horse manure, and used horse bedding within proper secondary containment. Furthermore, groundwater data reviewed for this facility consistently showed detections of inorganic chemicals and microbiological chemicals (including Total/Fecal Coliform) and Phosphorous. Nitrate was also detected during historical sampling events. All of the chemical detections at this facility were attributed to the improper handling, use, and storage of the horse manure and bedding.

A follow-up inspection, performed on March 12, 2007, found that all of the non-compliance issues were corrected. For example, leaking horse manure dumpsters were replaced with others that were sealed and that contained lids to manage the horse waste manure properly. Signage was added to notify the stall owners to keep the dumpster lids closed. The City of Pompano Beach also sent a letter to all stall owners educating them about the wellfield protection program and advised them that the dumpsters must be covered at all times and that chemical storage at this facility is prohibited. This facility is currently submitting groundwater analyses for one monitoring well in accordance with the Hazardous Material Wellfield License for Nitrate, Phosphate, Fecal Coliform, and Total Coliform. During the most recent quarter

reviewed (3rd quarter of 2007) there were detections of Nitrate and Phosphorous that did not exceed the Florida Groundwater Cleanup Target Levels for those chemicals.



Before: View of manure and horse bedding scattered on ground. The lid of the dumpster is open.



After: View of closed container and proper disposal. An additional sign was posted indicating that the lid should be closed at all times.



Before: View of horse manure and bedding located on the soil.



After: View after the horse manure and bedding were removed.

Roofs by Cherry, Inc., 3901 SW 40th Avenue, Hollywood

Roofs by Cherry, Inc. at 3901 SW 40th Avenue, Hollywood, FL 33023 is located in zone 2 of the Broward County 3B Wellfield. This facility was discovered during the wellfield investigation of the Broward County 3B Wellfield. An initial inspection on May 14, 2004 revealed that the facility was storing chemicals with regulated substances in zone 2 without a Hazardous Material Wellfield License. The facility then notified the inspector that they had removed the chemicals from the facility. Subsequent inspections found the chemicals were not removed and that additional chemicals associated with automotive repairs were discharged to the soil by the current facility owner. The unregistered used oil underground storage tank from when the facility was a former gasoline service station was also discovered. The discharges were reported to the EPD Environmental Response Team.

Several violations were documented during the inspections performed between May 14, 2005 and June 29, 2005 by EPD inspectors. Some of them include failing to install a monitoring well and file analytical results for the chemicals with regulated substances, failing to register a storage tank facility with EPD, failing to properly mark a fillbox manway cover, failing to replace a missing fill cap on a used oil underground storage tank, failing to document in writing the proper disposal of used oil, failing to store roof paints and hazardous material within secondary containment, failing to maintain material safety data sheets, failing to create and maintain a spill contingency plan, and failing to close an unmaintained underground storage tank.

Warning notices were issued jointly by the Wellfield Protection Team and the Environmental Response Team. When compliance was not achieved, on July 21, 2005, this facility was issued a Notice of Violation which mandated them to correct and resolve all violations pertaining to wellfield protection and associated underground storage tank activities, including soil and groundwater sampling. After more than \$14,630 in penalty fines were ordered by the Broward County Hearing Examiner, this facility demonstrated corrective actions including the cleanup and proper disposal of petroleum impacted soils, submittal of groundwater analyses, cessation of automotive repairs and discharges related to those repairs and the removal of chemicals containing regulated substances from the facility. A recent inspection indicated that the facility is currently in compliance with their Hazardous Material Facility License. Moreover, the property owner submitted a letter to the EPD Licensing Team on August 14, 2006, which states indicates that this facility no longer stores, handles, and/ or uses chemicals at this location. Regular hazardous material facility inspections will continue at this facility.

CONCLUSIONS

On October 22, 2002 the Broward County Board of County Commissioners entered into DEP Agreement No. G0023 with the Florida Department of Environmental Protection. The Agreement specified that Broward County would be funded to perform investigations of each of the forty-one public wellfields which comprise their sole source of potable water.

The investigations of Broward County's forty-one source water assessment areas were done to complete the inventory of potential contaminant sources portion of the Source Water Assessment and Protection Program requirements under the 1996 Amendments to the Federal Safe Drinking Water Act and the State of Florida's Source Water Assessment and Protection Program.

The wellfield investigations were performed in three steps. The first step was office preparation where all existing Broward County GIS layers and paper files were searched for information about public supply well locations, surface water

locations, ambient surface water sample locations, ambient groundwater sample locations, future land use, current land use, contaminated sites, hazardous material facilities and storage tank facilities, SARA Title III facilities, solid waste facilities, landfills, POTW/ septic tank areas, salt water intrusion boundaries, monitoring well analyses and raw water supply well analyses. The second step was field work where the Wellfield Protection Team visited every building, business and parcel within the source water assessment areas to educate the business owner/operator and inspect the facility for proper storage, handling, use and disposal of hazardous chemicals. Inspection forms were completed and included a chemical inventory and in some cases a map and photographs. Potable wells were checked for the presence of a Florida Department of Environmental Protection FLUWID number tag. The third step was to prepare a report for each wellfield incorporating all information collected during the office preparation and field work steps.

A number of key accomplishments occurred during the contract term. The number of permanent positions was increased from two to three. The team is now responsible for inspecting all facilities in the source water assessment areas. The team developed and distributed more than 10,000 brochures describing the program and also developed a web site. Overall, more than 10,000 residents, businesses, government employees, and city municipalities were educated about the purpose and mission of the Wellfield Protection Program during this contract. The team was able to upgrade the technology implemented including electronic inspections, transportation to reach numerous citizens and the update and creation of GIS layers. They also were awarded a national award for innovation.

During the contract term the Wellfield Protection Team visited thousands of businesses and completed nearly 2000 inspection forms. As a result of the inspections, many facilities were required to install a monitoring well and perform groundwater analyses for the chemicals located on-site. Chemical releases to the groundwater might be detected through groundwater analysis. The team has a better understanding of potential pollutants, as well as an updated raw water sampling plan to accurately sample for those chemicals with regulated substances that are used, stored, and/or handled as a result of our studies. They discovered 352 facilities that required but did not have a Hazardous Material Wellfield License or a Hazardous Material Facility License, which represent 36% of all Storage Tank/Hazardous Material Facility Licenses found in the public wellfields. They discovered that 76% of the 342 potable supply wells in Broward County did not have a FDEP FLUWID number. They found 252 facilities that were out of compliance with Broward County's environmental code. Many of these facilities are now in compliance or are working toward compliance. The most common violations observed were for failure to store hazardous materials in secondary containment, failure to label containers, failure to maintain hazardous waste manifest records and failure to maintain material safety data sheets. They also discovered facilities discharging untreated waste to the POTW, releasing hazardous materials to the ground, using unlicensed storage tanks and storing,

handling and using regulated materials within zone 1 of the wellfield, where these chemicals are prohibited. They also prepared chemical inventories of the 2000 facilities where hazardous materials were stored and where an inspection form was prepared. A total of 4,260,589 gallons and 1,023 tons of chemicals were inventoried in the forty-one wellfields. Gasoline and diesel was found to be the most prevalent liquid chemicals. Lead in batteries and fertilizers were found to be the most prevalent solid chemicals

The information collected during the Source Water Assessment and Protection Program Studies will allow the team to update maps to include new and abandoned wells, plot monitoring well data, enhance public education and meet with local utilities to promote further interaction and protection of the drinking water supply. The most important accomplishment that occurred during the contract was the collection of information that will assist us in the understanding of the types of chemicals found in Broward County and in the revision of our Risk Ranking Rule and Wellfield Protection Ordinance.