TN&A T N & Associates, Inc.
Engineering and Science

September 21, 2001

Ms. Barbara Dick
Remedial Project Manager
U.S. Environmental Protection Agency
61 Forsyth Street, SW 11th Floor
Atlanta, Georgia 30303

Subject: Draft Reassessment Report
London Platers, Inc.
EPA ID No. FLD004125514
EPA Contract No. 68-S4-01-01 (STAT 4)
Task Order No. 0002

Dear Ms. Dick:

The TN & Associates, Inc. (TN&A) Superfund Technical Assessment Team (STAT) is submitting the draft reassessment report, score sheets, and confidential pages for the London Platers, Inc. site in Hialeah, Dade County, Florida. The CERCLA Eligibility form, all references cited, and the original topographic maps are also enclosed. Please review the draft report and provide comments to be included in the final report.

Please contact me or Greg Kowalski at (678) 355-5550 if you have any questions regarding this report.

Sincerely,

Matt Ellender
STAT Project Manager

Enclosure

CC: Jeff Napier, EPA Contracting Officer (w/o enclosure)
Cindy Gurley, EPA Task Order Project Officer (w/o enclosure)
Stacy Hill, EPA Contract Specialist (w/o enclosure)

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DRAFT REASSESSMENT REPORT

LONDON PLATERS, INC.
HIALEAH, DADE COUNTY, FLORIDA

U.S. EPA ID No. FLD004125514

Prepared for:

U.S. ENVIRONMENTAL PROTECTION AGENCY

Region 4
61 Forsyth Street
Atlanta, Georgia 30303

Prepared by:

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Contract No.	:	68-S4-01-01
Task Order No.	:	0002
Date Submitted	:	September 21, 2001
EPA Task Monitor	:	Barbara Dick
Telephone No.	:	404-562-8923
Prepared by	:	Nancy Ellen Keene
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CERCLA Eligibility Form

Site Name: London Platers, Inc.

City/County/State: Hialeah, Dade County, Florida

EPA ID Number: FLD004125514

Type of Facility: X Generator ____ Transporter ____ Disposal
____ Treatment ____ Storage (> 90 days)

	Yes	No
Has this facility treated, stored, or disposed of a RCRA hazardous waste since Nov. 19, 1980?	X	
Has a RCRA Facility Assessment (RFA) been performed on this site?		X
Does the facility have a RCRA operating or post-closure permit? If so, date issued:		X
Did the facility file a RCRA Part A application?		X
If so:		
1) Does the facility currently have interim status?		
2) Did the facility withdraw its interim status?		
3) Is the facility a known or possible protective filer?		
Is the facility a late (after Nov. 19, 1980) or non-filer that has been identified by EPA or the State?		X
Is the site a Federal Facility?		X
Is there at least one source on site, which is not covered by CERCLA Petroleum Exclusion Legislation?	X	
Is the facility owned by an entity that has filed for bankruptcy under Federal or State laws?		X
Has the facility lost authorization to operate or had its interim status revoked?		X
Has the facility been involved in any other RCRA enforcement action?		X

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1.0 INTRODUCTION

The U.S. Environmental Protection Agency (EPA) has tasked T N & Associates, Inc. (TN&A) Superfund Technical Assessment Team (STAT) to perform site reassessments under Contract Number (No.) 68-S4-01-01. Reassessments are conducted to evaluate a site's current Hazard Ranking System (HRS) status, document what is contained within the site files, update target information, generate a new site score, and summarize all the information in a report submitted to EPA. This Reassessment Report has been prepared in accordance with the scope of work requirements of Task Order No. 0002 for the London Platers, Inc., (London Platers) site, EPA Identification No. FLD004125514, located in Hialeah, Dade County, Florida. This Reassessment Report evaluates London Platers based on site files provided by EPA and the Florida Department of Environmental Protection (FDEP).

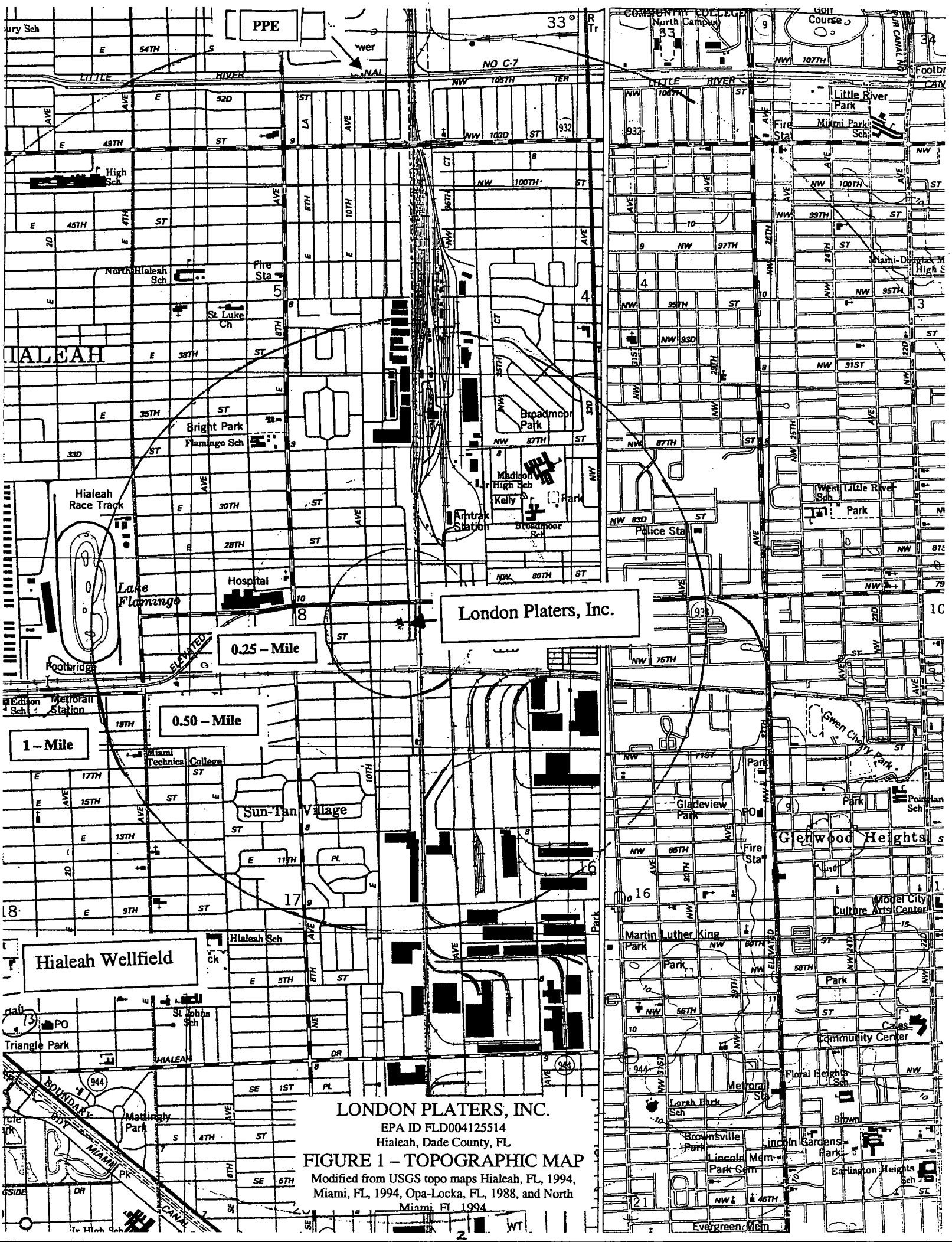
2.0 SITE BACKGROUND

This section describes the site and its present and past operations (including waste disposal practices and regulatory history), the environmental setting and geology, previous releases and investigations, and the source areas located at the facility.

2.1 SITE DESCRIPTION

London Platers consists of a 7,902-square foot (sq. ft.) building, located in an industrial park lot (10,540 sq. ft.) in Hialeah, Dade County, Florida (Refs. 1, 2). The geographic coordinates of the facility are 25° 50' 40" north latitude and 80° 15' 38" west longitude (see Figure 1). London Platers is located at 1080 East 24th Street, on the south side of 24th Street. The site is not fenced, and a dirt alleyway was located at the southern side of the building (Ref. 3). Doors are unlocked during business hours, and locked at all other times. Gravel covers the majority of the remaining site property with the exception of a grassy area (yard) on the eastern side. The closest residential area is located less than 0.25 miles to the west of site (Refs. 3, 4).

London Platers is an active custom metal plating facility for antiques, heirlooms, and other valuable pieces. Copper, silver, gold, nickel, brass, and chrome are the primary electroplating metals used at this site. Current structures at the site consist primarily of the main building and plating area. The plating



LONDON PLATERS, INC.
EPA ID FLD004125514
Hialeah, Dade County, FL

FIGURE 1 – TOPOGRAPHIC MAP

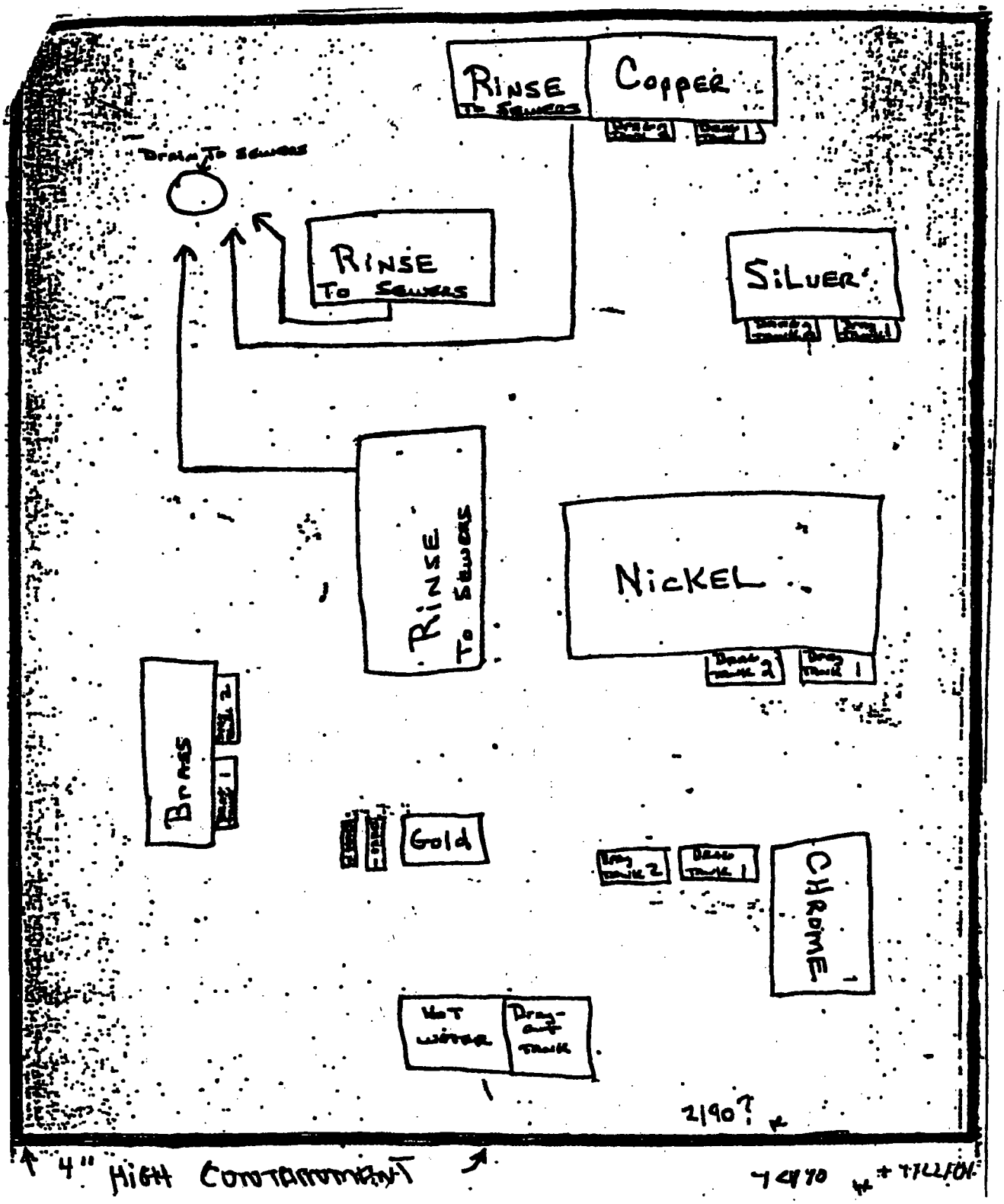
Modified from USGS topo maps Hialeah, FL, 1994, Miami, FL, 1994, Opa-Locka, FL, 1988, and North Miami, FL, 1994

area contains six plating tanks and two drag-out tanks for each of the six plating tanks (see Figure 2). The largest tank is 8 feet long, holds up to 11,000 gallons of plating solution, and is used for nickel plating. The smallest tank is 2 feet long, holds up to 50 gallons of plating solution, and is used for gold. A hot water tank with drag-out tank, and three rinse-out tanks that empty into an on-site drain connected to the Dade County Municipal Sewer System, are also on site. The floor of the plating area is concrete, and the entire plating area and associated tanks are encircled by a 4-inch-high concrete berm (Refs. 5, 6).

2.1.1 Site History

No specific information is available concerning previous operations at the site prior to its operation as London Platers. According to Mike and David London, the owners until 1998, London Platers was started in 1952 by their father, and was sold in 1998 (Refs. 3, 7). Mr. Augusto Casamayor is currently listed by Miami-Dade County Environmental Resources Management (DERM) as the owner (Refs. 2, 7).

Plating at the site is accomplished by submerging the item to be plated in a tank containing plating solution. This tank is then charged with an electrical current. After submersion, the item is placed in a succession of two drag-out tanks and a final rinse tank. The primary electroplating metals used in the plating process are copper, silver, gold, nickel, brass, and chrome. The first drag-out tank eliminates approximately 95 percent of the plating chemicals. The second drag-out tank eliminates the remainder. Because electric currents heat the plating tanks, they experience a large water loss through evaporation. To replenish water loss through evaporation, water is taken from the first drag-out tank. This water is replenished by water from the second drag-out tank, which is refilled with fresh water. This movement of water "upstream" creates a back-flushing situation (Refs. 3, 5). After removal from the second drag-out tank, the item is placed in a final rinse tank. A sulfuric acid rinse tank, which is replenished with acid as necessary, is also part of the plating line. The water from the final rinse tank is discharged to the Dade County Municipal Sewer System. An average of 200–300 gallons of effluent per day was recorded as being discharged to the sewer system for years 1989 and 1990 (Ref. 3). No changes have been documented in the facility or operation since that time. The effluent in 1990 was reported to have a pH range from 6.6-9.2. Past DERM reports indicate that wastes were discharged into the alley prior to connection to the Dade County Sewer System on July 21, 1983. Potential contaminants include solvents and heavy metals (Refs. 3, 5).



LONDON PLATERS, INC.
EPA ID FLD004125514
Hialeah, Dade County, FL

FIGURE 2 – SITE DIAGRAM

Copied from Site Inspection Prioritization Report, 1995

2.1.2 Regulatory History

The Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) listed site discovery for London Platers as August 1, 1981. A Preliminary Assessment (PA) and a Site Screening Investigation (SSI) were also listed as having been completed on November 1, 1984, and March 21, 1990, respectively (Ref. 8). A Site Inspection Prioritization (SIP) was prepared for FDEP on September 27, 1995 (Ref. 3). Records in FDEP files indicate that London Platers has never held a Resource Conservation and Recovery Act (RCRA) permit. According to the FDEP RCRA program, London Platers is considered to be a waste accumulator and not a waste generator; therefore, the facility does not need a RCRA permit (Ref. 7). London Platers currently holds a wastewater discharge permit and a General Title V Air Permit (Refs. 9, 10).

DERM performs on-site Hazardous Waste Compliance Inspections on a biannual basis. London Platers monitors effluent discharge monthly and results are sent to DERM (Ref. 3). In October of 1985, an analysis of effluent showed cyanide concentrations of 0.07 mg/l, and no formal enforcement action or warning notice followed (Ref. 5). On December 18, 1987, a Warning Notice was given for nickel concentrations of 3.13 mg/L, effluent range of 0.01–3000 mg/L, (MCL of 0.100 mg/L) found in the effluent discharge to the Dade County Municipal Sewer System (Ref. 5). A second Warning Notice was issued in April 2001for elevated levels of nickel; however, no data was available for concentration levels (Ref. 10).

2.2 ENVIRONMENTAL SETTING AND GEOLOGY

The climate in Dade County is subtropical marine characterized by warm, rainy summers and mild, dry winters. The average winter temperature is 68° F with average lows near 60° F. The lowest recorded temperature was 26° F in 1934. During the summer months, the average temperature is 82°F with an average daily maximum of 89° F. The average annual rainfall for the area is 58.17 inches with 82 percent occurring between April and October (Refs. 11, 12). The mean annual lake evaporation in this area is 52 inches, yielding an annual net precipitation of 14.61 inches (Ref. 13). The 2-year, 24-hour rainfall event for the area is approximately 6 inches (Ref. 14).

The area surrounding the facility is relatively flat, with a few low ridges along the eastern coast. Surface elevation is approximately 5–10 feet above mean sea level (MSL) (Ref. 1). London Platers is located on

the western edge of an industrial area approximately 3 miles long and four blocks wide. An Amtrak station is located four blocks northeast of the facility in an area of numerous railroad spurs (Refs. 1, 3). Highly populated residential areas surround the industrial area. The nearest schools are Broadmoor Elementary, Madison High School, Miami Technical College, and Flamingo Elementary, all located within 1mile of the site (Ref. 15). Two recreational parks, Broadmoor Park and Bright Park, are also located within 1 mile (Refs. 1, 3).

The Little River Canal was considered the most likely surface water route for the surface water pathway, due to its proximity to railroad tracks that lead to the canal (Ref. 1). The Little River Canal serves as the probable point of entry for surface water, since potentially contaminated surface water could travel along railroad drainage ditches.

Dade County is located in the Gold Coast-Florida Bay District of the Coastal Plain physiographic province of Florida. The Gold Coast-Florida Bay District is uniformly low-lying and includes the area of the sluggish south and southeastward drainage from Lake Okeechobee, together with coastal ridges, mangrove swamps, and the Florida Keys. Rocks are Pleistocene and largely limestones (e.g., Miami Oolite limestone). The overlying materials are predominantly sand, marl, organic material, and limestone (Ref. 16).

Geologic units that underlie the Miami area include, in descending stratigraphic order: the Pamlico Sand, the Miami Oolite, the Fort Thompson Formation, the Anastasia Formation, the Key Largo Limestone, the Tamiami Formation, and the Hawthorne Group. The Pamlico Sand may or may not be present in the vicinity of the site, as the thickness of this unit is quite variable, and site-specific data were unavailable. The Miami Oolite is composed of oolitic limestone that is approximately 2–12 feet thick. The Fort Thompson Formation consists of marine and freshwater limestones and is approximately 12–80 feet thick in the facility area. The Anastasia Formation is composed of approximately 20–70 feet of sandy limestone, calcareous sandstone, shelly marl, coquina, and sand. The Key Largo Limestone consists of cemented reef detritus and precipitated limestone surrounding old reef material approximately 10–20 feet thick. The upper Tamiami Formation is composed of sand, shell, fine-grained limestone, and silt. The lower section forms an impermeable layer with the Hawthorne Group containing clays, silts, and marl (Refs. 17, 18).

Dade County is underlain by the highly permeable, unconfined Biscayne aquifer. The EPA designates the Biscayne aquifer as a "sole-source aquifer". The Biscayne aquifer underlies an approximately

4,000-square-mile area in southeastern Florida and is the principal source of water for all of Dade and Broward Counties as well as the southeastern part of Palm Beach County. Major population centers that depend on the Biscayne aquifer for water supplies include Boca Raton, Pompano Beach, Fort Lauderdale, Hollywood, Hialeah, Miami, Miami Beach, Homestead, and the Florida Keys. Virtually all the water requirements for more than 3 million residents are supplied by the Biscayne aquifer (Refs. 19, 20). Under the Biscayne is the Hawthorne Group, which acts as a confining layer for the upper Floridan aquifer. The Floridan aquifer is not used as a potable water source in southern Florida due to high concentrations of total dissolved solids (Refs. 17, 18).

Groundwater in the Biscayne aquifer occurs primarily in solution channels in carbonate deposits and pore spaces in sand deposits. These solution openings are often completely or partially filled with sand in the Biscayne aquifer. The absence of surface karst features and evidence of sand deposited within solution cavities indicates that the Biscayne aquifer limestone is not characterized as a karst setting (Refs. 17, 18).

The principal source of recharge for the Biscayne aquifer is local precipitation. During periods of low rainfall, an extensive canal system in Dade County and other areas of the South Florida Water Management District (SFWMD) provides a significant source of recharge. SFWMD uses a system of canals, levees, control structures, pumping stations, and water conservation (storage) areas to manage the freshwater resources in southern Florida. There is a direct hydraulic connection between the Biscayne aquifer and the canals that cross it. Water passes freely from one to the other, resulting in both benefits and risks. The most obvious benefit is the ability of the canals to rapidly remove excess surface and groundwater, thereby preventing flooding in low-lying areas. Another benefit is the ability to channel water to coastal areas, allowing groundwater levels to remain high enough to retard saltwater encroachment during periods of low precipitation. The major problem posed by the canal aquifer interconnection is that any contamination of pollutants can be both rapid and widespread (Ref. 21).

2.3 PREVIOUS RELEASES AND INVESTIGATIONS

The first documented FDEP compliance inspection was conducted on September 9, 1983. No hazardous waste violations were observed, and no follow-up inspection was recommended (Ref. 5). FDEP records from the mid 1980s show no violations and no other inspections (Ref. 7). A PA Report was submitted by E.C. Jordon Co. to the Florida Department of Environmental Regulation (FDER) on September 5, 1984. This report recommended no further action for this site (Ref. 22).

DERM performed an on-site compliance inspection and soil sampling event on March 30, 1989. Soil samples were taken from beneath the top of a 2 x 2 ft. drain within the plating area, and analyzed for total metals (Ref. 3). It was reported that the drain was contained by a closed system consisting of a metal box (Ref. 5). An Extraction Procedure Toxicity analysis (EP-Toxic) was completed to determine the leaching rate of contaminants. The EP-Toxic analysis of the soil sample indicated concentration levels of 1.2 milligrams per kilogram (mg/kg) for zinc and levels below the test's minimum detection level for lead, chromium, cadmium, copper, and nickel. Soil from the drain analyzed for total metals indicated elevated levels of nickel (8,300 mg/kg), chromium (3,000 mg/kg), lead (1,800 mg/kg), copper (19,800 mg/kg), and zinc (12,000 mg/kg) (Ref. 3).

A follow-up sampling event was conducted March 2, 1990. Soil was taken from beneath the metal plate of the on site drain to a depth of approximately 12–24 inches. Analysis for total metals and EP-Toxic indicated the following concentrations, respectively: nickel (10.0 mg/kg and <0.1 mg/L); chromium (14.0 mg/kg and <0.1 mg/L); lead (51.0 mg/kg and <0.01 mg/L); copper (40.0 mg/kg and <0.1 mg/L); cadmium (10.0 mg/kg and <0.1 mg/L); and zinc (101.0 mg/kg and <1.5 mg/L). No violations were found, and no enforcement actions were taken as a result of this sampling.

The 1984 PA, the 1990 SSI, and the 1995 SIP found that the only waste generated on site was a mineral oil-based parts cleaner and nickel sludge in the form of nickel sulfate, a reportedly non hazardous by-product. The 1995 SIP indicated that the quantity generated was less than a drum full and was properly disposed of by a hazardous waste carrier (Ref. 3). The parts cleaner solution is leased from Safety-Kleen Corporation. This cleaning fluid consists of 9 gallons of mineral oil, which is picked up every two months and replaced with clean fluid (Refs. 5, 23).

No soil or groundwater samples have been taken by DERM since 1990, and no samples have been collected from the alleyway where historic discharges occurred. DERM records for air permitting show a minor violation in March 2001 when London Platers failed to submit an annual compliance form. This was subsequently corrected (Ref. 9).

2.4 SOURCE AREAS

The absence of documentation prohibits the consideration of historical wastewater discharge into the alleyway (Tier B -Wastestream Quantity). Although additional sources of contamination are on site (plating solutions), the initial potential source of contamination was the 2,638 sq. ft. alley where plating

wastes were discharged from 1952 to 1983. Due to the containment and regulation of the active plating materials, they are not considered in the site scoring. Only the potentially contaminated soil from the alley was considered as a source of on-site contamination. Potential on-site contaminants include nickel, chromium, lead, copper, and zinc (Refs. 3, 5).

3.0 PATHWAYS

This section discusses the groundwater migration, surface water migration, soil exposure, and air migration pathways. This section also discusses the targets associated with each pathway and draws pathway-specific conclusions.

3.1 GROUNDWATER MIGRATION PATHWAY

The groundwater migration pathway is of primary concern because all drinking water in the study area is from groundwater sources. The Biscayne aquifer is the sole source of water for the Miami-Dade Water and Sewer Department (MDWSD).

The MDWSD is comprised of two distribution systems: one main system that serves 1,852,198 in the heavily populated areas of Dade county, and a smaller system that serves the southern, unincorporated portion of the county. The main distribution system is comprised of three regional water treatment plants: Hialeah, John E. Preston, and Alexander Orr, Jr. Though the system is a blended system (looped), in practice, the Hialeah and Preston plants primarily serve residents north of State Highway 836 (East-West Expressway, Dolphin Expressway), and the Orr plant serves residents south of State Highway 836 (south to approximately 248th Street) (Refs. 25, 26, 27, 28). Differences in distribution vary according to season, time of day, number and location of wells in service, and pressure (Ref. 26).

Several wellfields totaling 76 wells, supply the MDWSD water treatment plants. Public supply wells are an average of 80 feet below ground surface (bgs) (Refs. 1, 24). Those supplying the main distribution system are the Miami Springs Upper (12 wells) and Lower Wellfields (8 wells), Hialeah Wellfield (3 wells), Preston Wellfield (7 wells), Northwest Wellfield (15 wells), Orr Wellfield (10 wells), Snapper Creek Wellfield (4 wells), West Wellfield (3 wells), and Southwest Wellfield (14 wells) (Ref. 29). The Hialeah and Preston plants are served by the Hialeah, Preston, Upper and Lower Miami Springs, and Northwest Wellfields. The Orr plant is served by the Orr, Snapper Creek, West, and Southwest Wellfields. Most of the time, water distribution from the three plants is as previously discussed; however, due to the blended nature of

the distribution system, on any given day water from any wellfield within the main system may reach any location in the area served (Ref. 26). An average of 24,371 people is served by each well within the main MDWSD system (1,852,198 / 76). The water supply wells are all located in Wellfield Protection Areas (Ref. 29).

The South Dade Water Supply System, separate from the main system, is comprised of five smaller water treatment plants that pump treated water into a common distribution system serving residents south of 248th Street [6 million gallons per day (gpd)]. The boundaries of the area served are approximately 248th Street (northern boundary), SW 320th Street (southern boundary), SW 137th Avenue (eastern boundary), and SW 192nd Street (southern boundary) (Refs. 27, 29). Municipal water is not used for irrigation of commercial crops or water commercial livestock. There is some use of municipal water for commercial food processing (Ref. 27).

The Biscayne aquifer is also the source of water for North Miami Public Works. The North Miami Water Treatment Plant and Wellfield contains eight municipal wells that serve 80,000 people and are part of a wellhead protected area (Refs. 29, 30). The system is blended with 40 percent of the water bought from the Miami-Dade Water and Sewer well field districts in South Miami. The blended system consists of 60 percent water from the North Miami Water Treatment Plant and 40 percent from the other plants in South Miami. Because 40 percent of the water is purchased from other sources, each of the eight wells that make up the North Miami Water Treatment Plant provides water to an average 6,000 people (60 percent of 80,000 = 48,000 / 8 = 6,000) (Ref. 30).

The groundwater migration pathway is of main concern at the London Platers facility since numerous municipal water wells are found within 4 miles of the site and the facility disposed of wastewater in an alley until 1983. Table 1 lists the potential groundwater receptors identified based on a review of municipal water coverage, topographical maps, and 1990 census data (Refs. 1, 29, 31).

TABLE 1

Potential Groundwater Receptors

Distance/Radius Ring (mile)	Wellfields	Number of Active Wells	Population per Well	Total Population Served per Radial Distance
0–0.25 mile	NA	0	0	0
0.25–0.5 mile	NA	0	0	0
0.5–1 mile	NA	0	0	0
1–2 mile	Preston Hialeah	6 3	24,371 24,371	219,229
2–3 mile	Preston Upper Miami Sprgs Lower Miami Sprgs	1 12 7	24,371 24,371 24,371	487,420
3–4 mile	Lower Miami Sprgs North Miami	1 8	24,371 6,000	72,371

NA = Not Applicable

3.2 SURFACE WATER MIGRATION PATHWAY

The surface water migration pathway is of some concern at London Platers because there may be off-site migration from the gravel-covered area around the facility and from the dirt alleyway as a result of historical discharge into the alleyway (Refs. 3, 6). Migration from inside the facility is not of concern due to the presence of a 4-inch concrete berm and the impermeable nature of the concrete floor. The Probable Point of Entry (PPE) is the Little River Canal located approximately 1.8 miles to the north (Ref. 1). The Little River Canal serves as the probable point of entry for surface water, since potentially contaminated surface water could travel along railroad drainage ditches.

From the PPE, the Little River Canal flows due east for approximately 1.9 miles, then flows southeast for 1.1 miles, then again flows easterly for 1.4 miles where it becomes the Little River. The Little River flows 1.5 miles before splitting into two branches. The upper branch flows for 0.4 miles before entering Biscayne Bay, and the lower branch flows for approximately 0.5 miles before entering Biscayne Bay. The Target Distance Limit (TDL) for surface flow extends approximately 7.9 miles beyond where the Little River enters Biscayne Bay into the Atlantic Ocean (Ref. 1). Historical stream-flow annual values from U.S. Geological Survey (USGS) gauging stations indicate that the canal qualifies as a moderate to large stream with an average flow rate from 100–1,000 cubic feet per second (cfs) (Refs. 1, 32). The

London Platers site is in the 100-year floodplain of the Little River Canal (Ref. 33). Wetland frontage was not located within the site's 15-mile TDL (Ref. 34).

Coastal southeastern Florida's man-made canals are used for recreational purposes including fishing. Species of fish caught in the canals and Miami River include largemouth bass, snook, butterfly peacock, and tarpon (Ref. 35). Due to the interconnective nature of Dade County's aquifer and canal system, it is possible that contamination could migrate back and forth between surface and groundwater (Refs. 17, 18, 19, 35).

All waterways in Dade County have been designated as critical habitat for the manatee (Ref. 38). Critical habitat has also been designated in Dade County for the American alligator, American crocodile, the Cape Sable seaside sparrow, and Everglade snail kite (Ref. 36). The exact locations of these additional critical habitats and T&E species habitats in relationship to the site are unknown. The occurrence of T&E species habitat on the site is unlikely as it is located in an industrial area that is bordered by densely populated residential areas.

Twenty-four federally listed threatened or endangered (T&E) species have been documented as inhabiting Miami-Dade County. Mammals on the list include the Florida panther (*Puma concolor coryi),* mountain lion (*Puma concolor*), and the manatee (*Trichechus manatus*). The bald eagle (*Haliaeetus leucocephalus*), Cape Sable seaside sparrow (*Ammodramus maritimus mirabilis*), Everglade snail kite (*Rostrhamus sociabilis plumbeus*), roseate tern (*Sterna dougallii dougallii*), and wood stork (*Mycteria americana*) are the listed birds in Dade County. Listed reptiles include the American alligator (*Alligator mississippiensis*), American crocodile (*Crocodylus acutus*), eastern indigo snake (*Drymarchon corais couperi*), green sea turtle (*Chelonia mydas*), hawksbill sea turtle (*Eretmochelys imbricata*), leatherback sea turtle (*Dermochelys coriacea*), and the loggerhead sea turtle (*Caretta caretta*). One insect, the Schaus swallowtail butterfly (*Heraclides aristodemus ponceanus*), and eight plants are listed. Plants listed include the beach jacquemontia (*Jacquemontia reclinata*), crenulate lead-plant (*Amorpha crenulata*), deltoid spurge (*Chamaesyce deltoidea ssp. Deltoidea*), Garber's spurge (*Chamaesyce garberi*), Johnson's seagrass (*Halophila johnsonii*), scrub lupine (*Lupinus aridorum*), Small's milkpea (*Galactia smallii*), and tiny polygala (*Polygala smallii*) (Ref. 36).

Four additional bird species and three mammal species are listed as threatened or endangered at the state level (Ref. 37). Birds listed include the white-crowned pigeon (*Columba leucocephala*), southeastern American kestrel (*Falco sparverius paulus*), Florida sandhill crane (*Grus canadensis pratensis*), and the

least tern (*Sterna antillarum*). Mammals listed at the state level are the Florida mastiff bat (*Eupomps glaucinus floridanus*), southern mink (*Mustela vision mink*), and the Florida black bear (*Ursus americanus floridanus*). One reptile, the rim rock crowned snake (*Tantilla oolitica)*, is listed as threatened at the state level. There are more than 100 plants listed as threatened or endangered at the state level (Ref. 37).

3.3 SOIL EXPOSURE PATHWAY

The soil pathway is also of some concern due to wastewater discharge prior to 1983 into the alleyway behind the facility. Although no soil samples have been analyzed from the alley nor the gravel area around the site, EP-Toxic analyses have been done on samples collected March 30, 1989 at a depth of 6 inches beneath a 2 x 2 foot metal drain plate. Heavy metals tested for were lead, chromium, copper, cadmium, nickel, and zinc. EP-Toxic analysis for all trace metal concentrations tested at the same location on March 2, 1990 found levels within acceptable guidance concentrations (Ref. 3). It is assumed that the materials detected in the drain are similar in composition to the waste discharged in the alley prior to 1983. Approximately 2,638-sq. ft. of contaminated soil may exist on site.

Land within 4 miles of the site is primarily industrial and residential (Refs. 1, 3). The alleyway is not secured, but the facility is locked at night and on the weekends (Ref. 3). A population of 20,044 persons was determined within a 1-mile of the facility (Ref. 31). Two elementary schools, a high school, and a technical college are located within 1 mile of the site (Refs. 1, 15). Two recreational parks are located within 1 mile (Refs. 1, 3). London Platers is active and has 4-5 employees working on site (Ref. 39).

3.4 AIR MIGRATION PATHWAY

The air migration pathway is of minimal concern at London Platers, and was not evaluated. No emissions violations have been documented, no environmental air samples have been collected, and no evidence exists to suggest any type of threat (Refs. 3, 9).

4.0 CONCLUSIONS AND RECOMMENDATIONS

London Platers, Inc., has been in operation at the current site since 1952. The site occupies one city block and consists of one 7,902 sq. ft. building in an industrial area. There are no residential areas immediately surround the site; however, several schools are located within 1 mile (Refs. 1, 2).

The plant currently generates plating wastewater that is released to the Dade County Sewer System. This wastewater is analyzed on a monthly basis and the results monitored by DERM. No contamination has been documented in the alleyway as no samples have been collected from this area. High concentrations of nickel, iron, chromium, cadmium, zinc, copper, and lead have been documented in soil samples collected from within an on-site drain. The only other hazardous waste violations identified were for a high level of cyanide on one occasion in the effluent, and high levels of nickel in the effluent on two separate occasions (Ref. 3).

A large population is served by the wellfields in the area. The wastewater effluent is currently monitored on a monthly basis and regular inspections are conducted by DERM. Records indicate that wastewater was discharged directly to the ground before connection to the sewer system. There are no records of groundwater samples or soil samples having been collected from the alleyway.

Three pathways were evaluated for the London Platers site. The groundwater migration pathway was the main contributor to the overall site score. The surface water migration and soil exposure pathways were also evaluated; however, both pathways are of less concern. A 55-gallon drum of nickel sludge, and approximately 2,638-sq. ft. of contaminated soil are considered as on-site sources (Refs. 3, 5). Although other sources likely exist on site, they have proper containment and are regulated and inspected. It is recommended that further investigation involving sampling in the alleyway be conducted to determine if remedial action is needed as a consequence historical discharges.

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U.S. EPA REGION IV

SDMS

Unscannable Material Target Sheet

DocID: 10756512 Site ID: FLD004125514

Site Name: London Platers Inc.

Nature of Material:

Map:	☒	Computer Disks:	☐
Photos:	☐	CD-ROM:	☐
Blueprints:	☐	Oversized Report:	☐
Slides:	☐	Log Book:	☐

Other (describe): Radius Map (Ref. 1)

Amount of material: _____

* Please contact the appropriate Records Center to view the material *

ADDRESS:
1080 E 24TH ST

Use scroll bar to view complete information.

FOLIO NUMBER: 04-3108-002-2780
ADDRESS: 1080 E 24 ST
MAILING ADDRESS:
1080 E 24 ST CORP
1080 E 24 ST
HIALEAH FL
33013-4324
CLUC: 0032 LIGHT MANUFACTURING
PRIMARY ZONE: 7100 INDUSTRIAL
BEDROOMS: 0
BATHS: 0
FLOORS: 1
LIVING UNITS: 0
ADJ SQUARE FOOTAGE: 7,902
LOT SIZE: 10,540 SQ FT
YEAR BUILT: 1955
LEGAL DESCRIPTION:
HIALEAH 13TH ADD AMD PL REV
PB 34-26
LOTS 12 & 13 BLK 102-B
LOT SIZE 10540 SQUARE FEET
OR 18696-4191 1298 1
SALE O/R: 18696-4191
SALE MONTH: 12
SALE YEAR: 1998
SALE AMOUNT: $ 250,000
ASSESSMENT YEAR: 2000
LAND VALUE: $ 52,700
BUILDING VALUE: $ 88,762
MARKET VALUE: $ 141,462
ASSESSED VALUE: $ 141,462
HOMESTEAD EXEMPTION: $ 0
WIDOW EXEMPTION: $ 0
TOTAL EXEMPTIONS: $ 0
TAXABLE VALUE: $ 141,462
ASSESSMENT YEAR: 1999
LAND VALUE: $ 52,700
BUILDING VALUE: $ 88,048
MARKET VALUE: $ 140,748
ASSESSED VALUE: $ 140,748
HOMESTEAD EXEMPTION: $ 0
WIDOW EXEMPTION: $ 0
TOTAL EXEMPTIONS: $ 0
TAXABLE VALUE: $ 140,748

Back

Reference 3

SITE INSPECTION PRIORITIZATION REPORT

FOR

LONDON PLATERS, INC.

1080 E. 24TH STREET
HIALEAH, FLORIDA 33010

FLD# 004125514

DADE COUNTY, FLORIDA

DATE REPORT ACCEPTED 11/29/95
DISPOSITION Low ESI
SAM SIGNATURE [signature]

Prepared by:

Florida Department of Environmental Protection
Division of Waste Management
Bureau of Waste Clean-up
Technical Review Section
Site Screening Superfund Subsection

September 27, 1995

LONDON PLATERS, INC.

I. INTRODUCTION AND PURPOSE

This Site Inspection Prioritization (SIP) Report was prepared by the Florida Department of Environmental Protection (FDEP) using information provided in the February 28, 1990 Site Screening Investigation (SSI)- Phase I report (Preliminary Assessment Reassessment) [1], the July 17, 1987 Site Screening Summary [6], the September 5, 1984 Preliminary Assessment (PA) [2], and the site file. The purpose of this SIP is to obtain information necessary for a site specific draft Hazard Ranking System (HRS) evaluation and to determine if further work is warranted pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Superfund Amendments and Reauthorization Act of 1986 (SARA), and/or Chapter 403, Florida Statutes. The recommendations and conclusions advanced by the present SIP are subject to modification pending receipt of subsequent information and/or quality assurance review by EPA.

II. SITE BACKGROUND/HISTORY

A. Site Description

London Plating is an operable custom metal plating facility for antiques,heirlooms, and other valuable pieces. Copper, Silver, Gold, Nickel, Brass, and Chrome are the primary electroplating metals used at this site. The facility is located at 1080 E. 24th Street, Hialeah, Dade County, Florida, on the south side of 24th St East of 10th Avenue. Site coordinates are North 25 50' 39" Latitude and West 80 15' 43" Longitude, Section 8, Township 53 South, Range 41 East. The EPA CERCLA ID Number is FLD 004125514. [1,2,31]

London Platers, Inc. consists of one 8,000 sq. ft. building and occupies one city lot. There is no fencing surrounding the site, and an alley way is located at the rear (south side) of the building. During business hours, M-F 8:00 A.M. to 4:00 P.M. the doors are unlocked. At all other times the building is kept locked. The majority of the site property is covered by gravel. On the east side of the building is a grassy area (yard). The remaining portion of the site includes industrial buildings. Located across from the site on the north side of 24th Street is Tempo Lighting Division, and aChevron gas station lies one·block to the northwest. Metrorail is located one block to the North trending east-west. There are no residential areas in the immediate vicinity [36, 37].

Current structures at the site consist primarily of the main building and plating area. Within this plating area are six (6) plating tanks along with two (2) drag out tanks for each of the six plating tanks. The largest tank is for Nickel, is eight (8) feet long, and holds up to eleven-thousand (11,000) gallons. The smallest tank is for gold, is two (2) feet long,

and holds up to fifty (50) gallons. The remaining portion of the site include a hot water tank with drag out tank, and three (3) rinse out tanks which empty into an on-site drain thatconnects to the Dade County Municipal Sewer System. The entire plating area and associated above-groundtanks are contained by a four inch high concrete berm for further containment [1,3,4,37].

Site topography is low and flat, with a few low ridges along the east coast, with elevations ranging from sea level to 25 feet above sea level, averaging 5-10 feet above sea level . Regionally, land surface slopes gently off the Atlantic Coastal Ridge, both southeastward toward the Biscayne Bay and southwestward toward the Everglades. Soils in the area are chiefly fine sands, of the sandy pinelands, and sandy praries. The Pamlico Sands often overlie the land surface. Surface drainage varies from slow to rapid, with internal drainage at a rapid infiltration rate. Due to the many canals dug the water table has been lowered and most of the soils are now well drained to excessively drained. Beneath these well-drained soils lie the highly permeable limestone rocks of the Miami Oolite, and upper Tamiami Formation. No evidence of karst topography is known within two (2) miles of the site [Fig. 2,9,13,14,24,45].

The principal source of freshwater in Dade County is the Biscayne Aquifer, of the surficial aquifer system. This system exists under water table conditions with rainfall providing the primary source of recharge. The surficial aquifer is generallly found within 4-10 feet of the land surface. Regional groundwater flow is to the east or southeastward from the site, toward the Atlantic Ocean. Locally, alterations in local groundwater flow patterns are common in response to the complex relationships between pumping wellfields, recharge and discharge areas, (surface water) canal control structures, and tidal fluctuations [5,9,13-15,24,25].

2. Surrounding Areas

London Plating is surrounded by both industrial businesses, residential developments, and lakes/canals. The site lies on the west edge of an industrial strip of buildings approximately three miles long North-South and four blocks wide (~ 4000 feet). The Amtrak Station lies about four blocks to the northeast, and the hospital about three blocks to the west. The nearest school is the Broadmoor School at Kelly Park, located approximately 3,200 feet northeast of the site. Several other schools and parks are located within a mile of the site; Flamingo School and Bright Park to the NW, Madison High School and Broadmoor Park to the NE, and the Miami Technical College to the SW. The Miami International Airport, the Sewage Disposal Plant, and several lakes and golf courses lie within 4-5 miles to the south-southwest [2,5].

Lake Flamingo (Hialeah Race Tracks) is the only water body within one mile of the site, situated approximately 4,837 feet (0.92 miles) west from the site. The Miami Canal and the Little River Canal are situated southwest about 10,107 feet (1.91 miles), and north to

TABLE 1.

LONDON PLATERS, INC.

Distance Interval	Name of System	# of Wells	Population
0 - 1/4 mile	N/A	0	N/A
1/4 - 1/2 mile	N/A	0	N/A
1/2 - 1 mile	N/A	0	N/A
1 - 2 miles	* MDWSA Main System Hialeah/ Preston wellfields	10	236,151
2 - 3 miles	* MDWSA Main System (Upper) North & (Lower) South Miami Springs Wellfield	19	448,688**
3 - 4 miles	* MDWSA Main System (Lower) South Miami Springs Wellfield	1	23,615
	City of North Miami Wellfield	8	68,300

** Note: This portion (59 % of system production from a collective service population of **1,801,156** persons [1,705,156 + 96,000 (City of Miami Beach)] of the MDWSA Main System consists of a series of interconnected water distibution lines with a total of 45 wells from the **Northwest, Hialeah, Preston, and Miami Upper and Lower Wellfields.** Therefore, the service population from the above Main System is 1,801,156 x 59% = 1,062,682 persons, with each well supporting an estimated service population of 23,615 , ie. (1,801,156/45 [35].*

** .59 x 19wells/45 wells x 1,801,156 total pop. = 448,688 persons served.

3. Climatology

The climate of Dade County is humid sub-tropical. At the Homestead Experiment Station the average annual temperature and rainfall is 73.7 F and 64.69 inches, respectively. Temperatures are kept moderate as sea breezes enter the area from the Atlantic Ocean and the Gulf of Mexico. The coldest months are January and February, averaging 66 F. Winters are short, mild, and sunny with little or no frost for successive years. The average annual rainfall in Dade County is 60- 64.69 inches, with higher averages for the coastal Ridge and lower ones for the Everglades. About 75 % of the total yearly rainfall falls between the months of May through October, commonly as heavy thunderstorms. Also adding to the rainfall is the occasional hurricane which may occur from August through November. The Net Precipitation is 4-5 inches/year. The 2-year, 24 hour rainfall for the Hialeah area is 5.5 inches. The London Plater's site is situated in an area of minimal flooding (outside 500-year floodplain), and bordered on the southwest by areas of a 500-year flood [9,11,12,13,24,30].

B. Ownership History

London Platers, Inc. began operation of London Plating in 1952. The first record of discharge to the Dade County Municipal Sewer System was not until 7/21/83 [1,15,37]. The site facility is still occupied by London Plating under private ownership by David London, and his brother Mike London. The mailing address is 1080 E. 24th Street, Hialeah, Fl., 33010; telephone (305) 691-3472 [2,37].

C. Operational History

1. Previous Operations-General

There is no specific information relating to previous operations at the site prior to operation as London Plating. According to the present owner David London, his father started London Plating in 1952, and the operation has remained unchanged since then. Nickel sulfate, a nickel sludge by-product was found to be stored on-site in a fifty-five gallon drum, approximately half full. Management was in the process of locating a buyer for this nickel,and meanwhile this waste was properly disposed of through hazardous waste carriers. Past reports from DERM have indicated that prior to connection with the Dade County Sewer on July 21, 1983, wastes from the plating facility were discharged into the alleys behind the plant [1,3,31,37,38].

D. Regulatory/Permitting History

1. Applicable Construction, Operation or Monitoring Permits

As London Plating Co. is not considered to be a generator of hazardous wastes, no RCRA permits are required [2,3,16]. However, effluent is monitored monthly by DERM since the facilitys' first discharge on July 21, 1983 [1,2]. DERM has not taken any soil or groundwater samples since 1990 [38].

2. Regulatory Inspections (non-sampling)

The first documented FDEP compliance inspection at the facility, initiated by a complaint,was conducted on September 9, 1983 [2,3]. No hazardous waste violations were observed, and it was recommended that no follow-up inspection be performed [2,3]. DERM also periodically performs on-site Hazardous Waste Compliance Inspections [1,16].

3. Enforcement

The only enforcement action initiated was for effluent discharges to the Dade County Municipal Sewer System . The action taken was a December 18, 1987 Warning Notice for excessive Nickel concentration levels of 3.13 mg/l (3130 ug/l), (MCL @ 100 ug/l) [1,18]. There have been no other violations reported in the site file since 1987 [22,38].

E. Investigative History

1. Previous site investigations

DERM performs on-site Hazardous Waste Compliance Inspections on a quarterly basis (about every 3 months), and most recently periodically [1,16]. In the 9/9/83 compliance inspection as described above, no hazardous waste violations were observed, and it was recommended that no follow-up inspection be performed [2,3]. The 9/5/84 Preliminary Assessment Report submitted by E.C. Jordon Co., consulting engineers also indicates no further action for this site [2].

As previously mentioned, wastewater is discharged to the Dade County Municipal Sewer System [1,3,4,16]. Enviropact, Inc. performs monthly wastewater analyses on this effluent, and a copy of the results are submitted to Dade County Environmental Resource Management (DERM) for their monthly monitoring [1,3,16,22].

An initial on-site inspection and soil sampling event was performed in the area of the sewer drain on March 30, 1989 by DERM , with a follow-up sediment sampling conducted on March 2, 1990 [1,18, 20]. No violations or enforcement actions were noted.

Custom plating involves the use of various types of metals, cleaning solvents, and associated by-products/wastes. Metals used at this facility were copper, gold, silver, brass,nickel, and chrome. Mineral spirits were used as as a cleaning fluid since 3/1/80 [17]. Sulfuric acid is utilized as a rinse in the plating line. In addition to the plating metals, contaminants detected in the wastewater include zinc, cyanide, lead, and cadmium [1].

2. Present Operations

At the London Plating facility antiques, heirlooms, and other valuable pieces are custom plated on-site [1,2,3]. The metals utilized as plating material are copper, gold, silver, brass, nickel, and chrome [1,3,4]. Potential contaminants include solvents, acids, and heavy metals [2]. Management claims that the only waste generated on-site is by a parts cleaner, and that all sludge generated in the plating operations is reused [1,16,18]. As reported in a September 9, 1983 compliance report, the nickel sludge is accumulated on-site in the form of nickel sulfate, a non-hazardous by-product [2,3]. London Platers was unable to find a buyer for this nickel sulfate sludge, as they had hoped to reuse the nickel collected after the refining process. The quantity generated is still less than a drum full, and it is properly disposed of by a hazardous waste carrier. The parts cleaner is still leased from and serviced by Safety Kleen Corporation, and has been in operation since March 1, 1980 . The cleaning fluid used is (9) nine gallons of mineral spirits which is picked up, and replaced every six weeks with new cleaning fluid.[1,16,17,43].

The plating operations and system design are such that no metal is wasted (minimal sludge produced), and that the wastewater discharge is "chemical free" in that contaminants (metals, etc.) are remixed with fresh water, and continually reused within the system. The operation begins with each metal plating tank being followed by a series of two drag-out tanks. Each plating tank is heated (by electric currents) resulting in a great loss of water by evaporation. Sequentially the water in the first drag-out tank replenishes the water lost in the plating tank resulting in maximum conservation of the metal and eliminating approximately 95% of the plating chemicals for discharge. Water from the second drag-out tank is then used to replenish the water transferred out of the first drag-out tank, and then this second drag-out tank is refilled with clean water. Now, virtually all the plating chemicals have been removed from the second drag-out tank. The item being plated is then placed into a final rinse tank. Also, on the plating line is a sulfuric acid rinse tank which is replenished with acid as necessary [1,3,4,16].

From the site drawing there are three (3) final rinse tanks which empty into a 2'x2' drain (closed metal sump) situated within the 4" high cement berm containment surrounding the entire system of tanks This berm may serve as containment for any accidental spills. All wastewater is ultimately discharged into the Dade County Municipal Sewer System through this on-site drain [1,2,3,4,16]. The effluent has been determined to have a pH of 7.7 and is non-hazardous [2,3]. Effluent discharge rates from January 1989 to January 1990 range between 200 to 300 gallons per day , with a pH range of 6.6 - 9.2 [1,22].

III. FIELD INVESTIGATIONS, REPORTS, AND FINDINGS

A. Results of Non-Sampling Investigations

1. Hydrologic Assessment

There is no documentation in the site files pertaining to watyer table elevations, however the average depth to groundwater in the area has been found at five (5) to ten (10) feet below the ground surface General topography and geomorphology indicate regional groundwater flow direction to the East - Southeast toward the Biscayne Bay. Deviations in groundwater flow direction may occur sporadically in response to well pumping, rainfall, and location of drainage canals [14,24].

2. Soil Borings/Field Observations

A windshield survey was performed at this site on July 25, 1995. In 1989 and 1990 sediment soil samples were collected by DERM from a sewer drain inside the plating area at the facility [1,18,20]. There is no information within the site file to indicate any other soil/ sediment sampling was performed.

B. Results of Sampling Investigations

1. Groundwater

The site file does not contain any information pertaining to sampling of the groundwater at the site or in surrounding areas. However, wastewater discharges from the facility are monitored on a monthly basis by DERM [1,22].

2. Soils

On March 30, 1989, during a DERM compliance inspection, approximately six inches (6") of soil was excavated beneath the top of an on-site 2'x2' sewer drain situated within the containment area of the plating and rinse tanks. The **EP-Toxic** analysis of this soil sample indicated concentration levels at 1.2 mg/l for Zinc, while Lead, Chromium, Cadmium, Copper, and Nickel tested below the 0.1 mg/l minimum detection level for this test. All of these concentration levels are below both the Probable Effect Levels for DEP Sediment Quality Assessment Guidelines, and the Phototoxically Excessive Levels in Surface Soils. A surface soil was also taken from this drain and analyzed for **total metals**. These results in mg/kg (ppm) are Nickel 8,300 ; Chromium 3,000 ; Lead 1,800 ; Copper 19,800 and Zinc 12.,000 [1,18,21,Table 2].

On March 2, 1990 a follow-up soil sample was collected from beneath the metal plate of the on-site sewer drain to an excavation depth of approximately twelve to twenty-four inches (1'-2'). Lab analysis results of this sample for **total metals** (mg/kg) and **EP-Toxic** (mg/l) indicated the following concentrations, respectively: Nickel 10.0 / < 0.1; Chromium 14.0/ < 0.1; Lead 51.0 / < .01; Copper 40.0/ < 0.1; Cadmium <10.0/ < 0.1; and Zinc 101.0/ 1.5. Only Cadmium (<10.0 ppm) indicated total trace metal concentrations near excessive limits (3-8 ppm) of phytotoxically levels in surface soils. Please note however, that the detection limit was at 0.1 mg/l. All tested trace metal concentrations from the EP-Toxic analysis are within acceptable guidance concentration levels [1,18,20,33, Table 2].

The following Table summarizes the lab analysis results for the above referenced soil sampling investigations [18,20,21]:

TABLE 2.
London Platers, Inc.
Soil/Sediment Laboratory Anlyses for Trace Metals

	3/30/89 (6" depth)		3/2/90 (12"-24" depth)		*MCL's			
	Total Metals (mg/kg)	EP Toxic (mg/l)	Total Metals (mg/kg)	EP Toxic (mg/l)	PT (ppm)	CS (mg/kg)	DW (mg/l)	NOEL (mg/kg)
Nickel	8,300	< 0.1	10	< 0.1	100	N/A	.100	N/A
Lead	1,800	< 0.1	51	< 0.1	400	108	.015	21.0
Chromium	3,000	< 0.1	14	< 0.1	100	50	.100	33.0
Copper	19,800	< 0.1	40	< 0.1	125	N/A	1.0	28.0
Zinc	12,000	< 0.1	101	1.5	400	N/A	5.0	68.0
Cadmium	N/A	< 0.1	< 10.0	< 0.1	8	37	.005	1.0

PT = Phototoxicity levels
CS = Clean soil criteria (Florida DEP)
DW= Federal Drinking water standards
NOEL = No observed effect level

[21,33 - S.M Roberts UOF Center for Environmental & Human Toxicology 7/23/92, FDEP FAC Ch. 17-775- 11/30/92, Proposed Superfund Trigger Levels 4/93]

In reference to the soil contamination at the on-site sewer drain, the owner stated that his father believed it was dust and build-up during their years of operation on the surface, and that the drain was a closed metal sump [16]. The detection of higher trace metal concentrations in the surface soil sample in comparison to the at depth samples may be attributable to this apparent closed or contained system. Based on all of the soil sampling analyses any leaching effects appear to be minimal [1].

3. Effluent Discharges

Since January 1985 London Plating has had two violations for their sewer discharges to the Dade County Municipal Sewer System. The first one was noted in October 1985 for Cyanide concentration levels of 0.07 mg/l (effluent range of 0.01 - 150 mg/l), however a Warning Notice was not issued (MCL @ .200 mg/l) [1,18]. On December 18, 1987 a Warning Notice was issued for Nickel concentration levels of 3.13 mg/l (MCL @ .100 mg/l) (efluent range of 0.01 - 3000 mg/l). There are t no other violations in the file [1,18,22,32,33].

4. Surface Water

No documentation was found within the site files to indicate that surface water samples were ever collected at this site, nor that any previous contamination was observed or detected.

5. Sediment Samples

No documentation was found within the site files to indicate that sediment samples from any of the nearby ponds/lakes were ever collected at this site, nor that any previous contamination was observed or detected.

IV. HYDROGEOLOGY

1. Regional

This site is situated on the Atlantic Coastal Ridge geomorphologic feature, near the eastern edge of the Everglades, within the Southern or Distal Geomorphologic Province of Florida. Three major hydrogeologic units are present in Dade County. These units include the surficial aquifer system, intermediate aquifer system/confining unit and the Floridan aquifer system [23,24].

The principal source of freshwater in Dade County is the surficial aquifer system. The Biscayne aquifer is the most productive unit of this system. The surficial aquifer system is composed of upper Cenozoic sediments, that are hydraulically connected. The surficial aquifer system includes, in ascending order, the Tamiami Formation (Fm), Caloosahatchee Fm, Fort Thompson Fm, Key Largo Limestone, Anastasia Fm, Miami Limestone and the Pamlico Sand (undifferentiated Pleistocene-Holocene sediments). The surficial aquifer system exists under water-table conditions and is found generally within 5 feet of land surface. It is overlain by a thin veneer of peat, muck (a mixture of silt and very fine-grained decomposed organic matter) or sand. The surficial aquifer system is composed of limestone, sandstone, sand, shell, lime mud, silt, clay, claystone siltstone and an admixture of these materials. The non-artesian, Biscayne Aquifer underlies an area of approximately 3,000 square miles in Dade, Broward and southern Palm Beach counties. The thickness of this aquifer ranges in thickness from 100 to 400 feet thick in coastal Dade and Broward counties thinning to a few feet near the western boundary of the counties [14,15,23,24,25].

The Tamiami Fm consists of sediments of upper Pliocene age ranging in composition from pure quartz sand to nearly pure limestone. The limestone is generally white to gray in color. The Tamiami Fm consists of the Pinecrest Sand, Ochopee Limestone and the Buckingham Limestone Members. These facies of the Tamiami Fm occur over a wide area of southern Florida. The lower part of the formation in Dade County is composed of gray to green, very coarse to fine grained, shelly sand and sandstone to cream, white and greenish-gray clayey marl, silty and shelly sands and shell marl, locally hardened to limestone. The lower part of this formation forms the upper portion of the intermediate aquifer system/confining unit [14b,23,24,25].

The Pleistocene age Caloosahatchee Fm consists of fossiliferous quartz sand with variable amounts of carbonate matrix interbedded with variably sandy, shelly limestones. The sediments show a wide range of induration (nonindurated to well indurated). This unit also contains fresh water limestones. However, this unit is not often encountered while drilling in Dade County [14b,23,24,25].

The Fort Thompson Fm consists of interbedded shell beds and limestones. The shell beds are generally variably sandy and slightly indurated to nonindurated. The sandy limestones within the Fort Thompson Fm were deposited under both fresh water and marine conditions. The Fort Thompson Fm. is a major component of the highly permeable Biscayne aquifer in Dade County [14b,23,24,25].

The Anastasia Fm consists of interbedded quartz sands and coquinoid limestones of Pleistocene age. The sand beds are composed of fine to medium grained, variably fossiliferous, calcareous, quartz sand. The limestone beds (coquina) are composed of mostly broken/abraided mollusk shell fragments, scattered whole shells and quartz sand enclosed in a calcareous matrix. This matrix usually consists of sparry calcite cement. [14b,23,24,25].

The Miami Limestone (Pleistocene age) consists of an oolitic facies and bryozoan facies. The oolitic facies underlies the Atlantic Coastal Ridge southward from southern most Palm Beach County to southern Dade County. The oolitic facies consists of variably sandy limestone composed primarily of oolites with scattered concentrations of fossils. The bryozoan facies underlies and extends west of the western boundary of the oolitic facies. The bryozoan facies consists of calcareous bryozoan colonies imbedded in a matrix of ooids, pellets and skeletal sand. It is commonly found as a variably sandy, recrystallized, fossiliferous limestone [14b,23,24,25].

The Key Largo Limestone of Pleistocene age consists of a coralline limestone composed of coral heads in a calcarenite matrix. This formation outcrops from Soldier Key in Biscayne Bay to Bahia Honda.[14b,23,24].

The undifferentiated sediments (Pamlico Sand) are a late Pleistocene age terrace deposit of marine origin. These sediments are composed of white to black or red, very fine to coarse, mostly medium grained quartz sand with varying amounts of iron oxide. This deposit mantles large areas underlain by the Miami Limestone and Anastasia Fm. [14b,23,24].

The Intermediate aquifer system/confining unit consists of the relatively impermeable marl; greenish-gray, sandy clay and silt units located in the lower part of the Tamiami Fm (Pliocene age) and Hawthorn Group (Miocene age). Well sorted medium grained sands interbedded with claystones or siltstones yield low to moderate quantities of water. This intermediate confining unit underlies the surficial aquifer system to a depth 975 feet in eastern Dade County and forms the upper confining unit for the Floridan aquifer system [14b,23,24,25,26].

The Miocene age Hawthorn Group consists of the (upper) Peace River Formation and (lower) Arcadia Formation in southern Florida. The Peace River Fm (with Bone Valley member) is composed of gray to green interbedded quartz sands, clays and carbonates. The carbonates consist of variably sandy, clayey phosphatic limestones and micro to very fine crystalline, variably sandy phosphatic dolostones. However, the siliciclastic portion of the formation predominates. The Arcadia Fm. (undifferentiated) consists of predominantly limestone and dolostone with varying amounts of quartz sand, clay and phosphate grains. Dolomite is the most abundant carbonate component of the Arcadia Fm., although as we move eastward this section increases in percentage of siliciclastic beds present in the lower portion. The Hawthorn Group is found approximately 150 feet below land surface (bls) and is approximately 750 feet thick in the site area [14b,23,26].

The artesian Floridan aquifer system is composed of carbonate and evaporite units ranging from Eocene to Oligocene age. The Floridan aquifer system consists of, in descending order, the Suwannee Limestone, Ocala Limestone, Avon Park Fm, and the Oldsmar. The

top of the Floridan aquifer system is found approximately 1,000 feet bls and the aquifer is about 2,600 feet thick in northeastern Dade County. Water from the Floridan aquifer system is highly mineralized and unsuitable for potable water supplies in Dade County [23,25,31].

The Suwannee Limestone of Oligocene age consists primarily of variably vuggy and muddy (carbonate) limestone (grainstone to packstone) in southern Florida [23].

The upper Eocene age Ocala Limestone consists of muddy (carbonate) to finely pelletal limestone in southern Florida. However, the Ocala Limestone may be absent in portions of southeast Florida [23]. The Avon Park Fm is composed primarily of middle Eocene age fossiliferous limestone interbedded with vuggy dolostone [23]. The Eocene age Oldsmar Fm consists of primarily limestone interbedded with vuggy dolostone. The lower part of the section is usually more dolomitized than the upper part. Gypsum may occur as thin beds and within pores in some places of the formation [23].

2. Site Specific

The Biscayne aquifer consists of a wedge shaped set of water-bearing rocks, aged Miocene to Pleistocene, ranging in thickness from 140 feet (southeast Dade County) to more than 280 feet (northeast Dade County) in eastern Dade County. The average water saturated thickness is approximately 72 feet [24]. The boundaries of this water-table aquifer are determined by the hydrologic properties of the sediments, rather than formational contact boundaries. In the northeastern part of Dade County, the upper part of the Tamiami formation (limestone, or shelly calcareous sandstone) forms the lower portion of the Biscayne aquifer, underlain by a relatively impermeable greenish marl of the Tamiami Formation. The uppermost portion (4' BSL) of the Biscayne aquifer consists most predominately of the Miami Oolite, typically a white to yellowish massive crossbedded oolitic limestone [24]. The Pamlico Sand, a late Pleistocene terrace deposit of marine origin unconformably overlies and fills in solution cavities of the Miami Oolite [15,24].

The Biscayne aquifer is the primary source of potable drinking water in the site area. This unconfined aquifer is highly productive everywhere along the coastal ridge, and is protected from upward intrusion of saline water from the Floridan aquifer by relatively impermeable beds of marl and clay. Overdrainage of canals however has resulted lateral encroachment of sea water in some areas. The groundwater from the uncontaminated zones of the Biscayne aquifer are fairly uniform in quality, although often colored with organic material or iron, especially in the upper parts of the aquifer. Hardness generally ranges from 200 to 300 mg/l with chloride at 15 to 30 mg/l. [14,15,23,24,25].

Wells of up to 36" in diameter have been developed, and productivity varies considerably from one area to another. Large capacity (500-7,000 gpm) public/municipal supply wells are generally completed in the cavernous part of the aquifer, generally 40' to 150' below ground level (BGL) [13,14,15]. Shallow, sand-point wells completed in the Pamlico sand are used for domestic supply in areas not serviced by municipal systems . Water for agricultural irrigation is preferably pumped from the canals, and ponds, and then from rotary drilled wells 25-35 feet BGL, pumping at rates of 500 to 1000 gpm [14,24]. However, thousands of smaller diameter (2") wells, completed at depths of 20-50 feet BGL, are pumped at rates of 25 to 40 gpm for irrigation of residential lawn and shrubs [14]. The depth to groundwater, ie the water table fluctuates from average depths of 2 - 8 feet above mean sea level (msl), and/or approximately 2-4 feet BGL [1, 24].

Porosity varies from 10% to 35%, averaging about 20%. Permeability averages between 50,000 and 70,000 gpd/sq.ft. The average transmissivity of the Biscayne aquifer unit ranges from 3 to 5 million gpd/ft, to as high as 15 million gpd/ft in East Dade County. The storage coefificient ranges from 0.10 to 0.35. Average yields from a typical 6 inch well range from 1,000 to 1,500 gallons/minute, with less than four feet of drawdown. However, pumping tests have been performed at 3,500 gpm . Specific capacities derived from pump tests in Dade County are about 1,000 gal/min/ft of drawdown . The rate of groundwater movement is approximately 10 feet/day [1,13,14,15,24]..

The principal source of recharge for the surficial aquifer system is local rainfall [14,15,24,25]. Drainage canals and ditches were excavated through marl into the permeable Miami Oolite (Upper Biscayne Aquifer), from about one (1) to six (6) feet in thickness [9]. Where the canals are controlled by dams, during periods of low rainfall, and in areas where groundwater levels are lowered by the pumping of wells, these canals provide recharge to the Biscayne aquifer. Discharge from the aquifer occurs by evapotranspiration, pumping from wells, and ground water flow into the Biscayne Bay, Atlantic Ocean, and canals during the wet season (May - October). Of benefit from potential contamination is that this canal discharge and seasonal heavy rainfall can accelerate groundwater circulation, thereby increasing dilution and flushing the upper zones of the aquifer. Although the regional ground water flow in Dade County is generally east or southeast toward the Atlantic Ocean (Biscayne Bay), the presence of active well fields, surface water control canals and tidal fluctuations commonly cause local deviations in the regional flow pattern [13,14,15,24,25].

V. EXPOSURE ROUTES / MIGRATION PATHWAYS

A. Groundwater Migration Pathway

The groundwater migration pathway, although previously of major concern, appears now to be a less significant pathway of concern at the London Plater's site. The source for

potable water is the unconfined Biscayne Aquifer, lying approximately within four (4) to ten (10) feet below ground surface [24]. The City of Hialeah water supply system is served by the Miami Dade County Water and Sewer Authority (MDWSA). Although the site encompasses a large surrounding population, the threat of contamination of the MDWSA wellfields have been reduced by the installation of air strippers [8]. Furthermore, the London Plater's site is immediately situated within an industrial area, and other more significant sites have been documented in the area [5].

A total of (30 wells) situated approximately within 1.7 - 2.5 miles southwest (SW) of the London Platers site comprise the John E. Preston, the Hialeah, and the Upper and Lower Miami Springs Wellfields [7,10]. The nearest community potable water well is the John E. Preston Well No. 6, located approximately 1.7 miles SW from the site [1,5].

During normal or average production from the Biscayne Aquifer, the MDWSA system supplies approximately 1,801,156 people in Dade County with potable drinking water within a (3) three mile radius of the site [1, 35]. This population figure includes the City of Miami Beach (96,000) located within 3-4 miles of the site, who purchases potable water from MDWSA. The City of North Miami (North Miami Wellfield) supplies potable water from 8 wells to a population of 68,300 persons No private or non-community wells are known to exist in the area [35]. A breakdown of water wells within four (4) miles of the site utilizing the Biscayne Aquifer System is provided in Table 1.

Monthly wastewater analyses have been performed by Enviropact, Inc, and monitored by DERM since September 9, 1983. During that time one (1) Warning Notice was issued, on December 12, 1987 when Nickel concentrations in excess of MCL's for drinking water were detected at 3.13 mg/l (.100 MCL). Yet, this concentration level is within the typical range of organic chemical quality expected for electroplating wastewater. There was no record of any on-site groundwater sampling. Therefore, it is unknown whether additional contaminants exist in the groundwater at the site because no other parameters have been tested [1,18,22,32,33].

On-site soils containing excessive concentrations of toxic metals, as excavated from beneath the 2x2 foot drain (3/30/89) appear to be of a very small quantity. Nickel sludge (nickel sulfate) is stored on-site in a 55-gallon drum waiting for a buyer. Nine (9) gallons of mineral spirits, used as a parts cleaner, is picked up and replaced every six weeks. These on-site hazardous wastes are minimal, and properly contained to prevent spillages. The site is currently operating in a responsible manner utilizing safe operational practices, and is inspected regularly by DERM [1,3,4,16,17,18].

In summary, although a large population exists the potential for contamination of hazardous substances from the London Plater's site appears minimal. There has been no documented evidence of continued or recent contamination on site since 1990. Also, safe operating practices continue to be utilized at the site. Wastewater and potable water

sources are monitored and treated by Dade County. However, due to the absence of groundwater analysis at the site, further CERCLA evaluation of the groundwater pathway may be warranted [1,2,3,18,22].

B. Surface Water Migration Pathway

The surface water migration pathway does not appear to be of concern at the London Platers, Inc. site. The 4" high concrete berm surrounding the plating area provides adequate physical containment from surface water overflow by on- site contaminants. No overland flow pathway exists off site and drainage is internal. With the area's generally flat topography, and sandy, well-drained soils site related contaminants are not expected to impact Lake Flamingo, the Little River Canal, or Miami Canal, the nearest surface water bodies [14, 23,24,25]

C. Soil Exposure Pathway

The soil exposure pathway does not appear to be of concern at the London Platers, Inc. site. The on-site soils containing hazardous substances of toxic metals appear to be of a small quantity, confined to a specific on-site area. Soil samples were collected on 3/30/89, at a depth of 6 inches beneath a 2x2 foot metal drain plate. EP-Toxic analyses for lead, chromium, zinc, copper, cadmium, nickel, and zinc were all within maximum contaminat levels. It has been noted in the February 28, 1990 SSI that lead and cadmium were in exceess of MCL's, however no documentation or lab anlalyses results were found to substantiate this. A subsequent sediment sample collected 3/2/90, at a depth of one (1) to two (2) feet below the surface, and at the same location also indicated safe levels (EPT) for all the above metals [1,18,20]. The plating area is properly contained by a 4" cement berm, and a concrete floor. The nickel sludge is stored in a 55-gallon drum.[4] Providing safe operational practices are continued and no excavation takes place, the potential for exposure through the soil migration pathway appears minimal.

D. Air Migration Pathway

The air migration pathway does not appear to be of concern at the London Platers, Inc. site. There are no uncovered drums, or uncovered soil piles. However, the possibility of migration of particulates through the air pathway may increase during periods of soil disturbances at times of future excavations.

VI. CONCLUSIONS AND RECOMMENDATIONS

The available file information and previous monitoring results indicate that the London Platers site does not pose a significant threat to public health or the environment.

Although there is a large population served by the MDWSA wellfields, the potable water supplies are monitored and equipped with groundwater treatment systems. The DERM periodically conducts inspections at the site and continues to monitor wastewater effluent discharges. Also, DERM has reported in previous inspection reports, and the owners have stated such themselves, that the facility has operated and managed waste generated at the site in a responsible manner. Although, file information indicates that potentially contaminated rinsewater may have been discharged directly into the ground prior to connection with the Dade County Sewer System, no groundwater samples were ever collected on-site. Due to the lack of this data, and the large population served by municipal wells in the area, further CERCLA assessment of the London Platers site is warranted. However, because the facility is connected to a central sewer system and levels of contaminants detected during previous monitoring episodes were below risk levels, it is recommended that future CERCLA Site Assessment activities be initiated on a low priority basis.

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Fig. 1. Site Location Map. 1995. City Street Map, Hialeah.

Fig. 2. U.S. Geological Survey, 7.5 minute series Topographic Quadrangle Maps of Florida: Hialeah,1988. (site specicific for contour elevations). Scale 1:24,000 .

Table 1. Wells and Population Data within a 4-mile radius of the London Platers site.

Table 2. Summary of 1989 and 1990 Soil Sampling Lab Analysis Results.

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msn COM

HomeAdvisor

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Buy | Finance | Sell | Rent | Move Garden | Food | Decorate | Improve | Shop Search Help

TerraServer Find go Advanced Find About Famous Places

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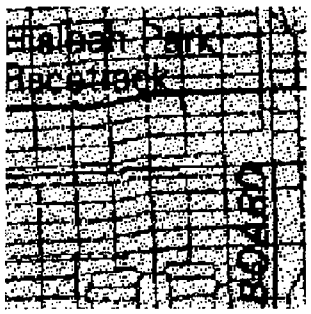
Locator



Other Imagery:

USGS Topo Map
01 Jul 1979

HomeAdvisor Links:

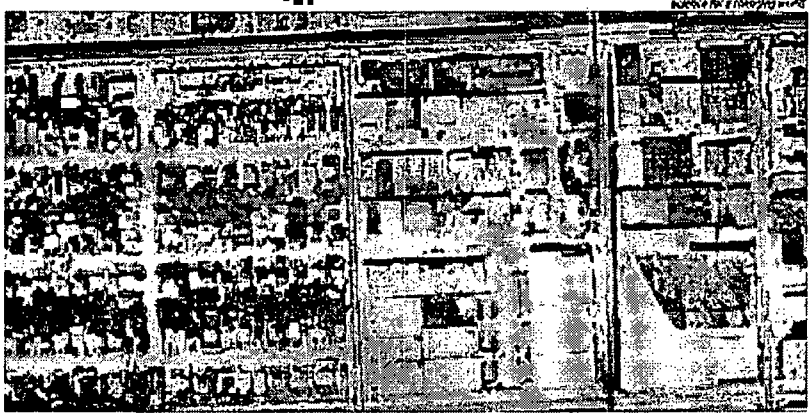
- Homes for sale in 33010
- Homes for sale in 33013
- Homes for sale in 33147
- Schools, Crime and Demographics for 33010
- Schools, Crime and Demographics for 33013
- Schools, Crime and Demographics for 33147

Encarta Articles:

- Carol City
- Coral Gables
- Hallandale
- Hialeah
- Miami
- Miami Beach
- North Miami
- North Miami Beach

Hialeah, Florida, United States 15 Jan 1994

Zoom 2m



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Reference 5

Florida Department of Environmental Regulation

Twin Towers Office Bldg. ● 2600 Blair Stone Road ● Tallahassee, Florida 32399-2400

Bob Martinez, Governor Dale Twachtmann, Secretary John Shearer, Assistant Secretary

Addl data forthcoming. Also, HRS score looks incorrect and low. HOLD for possible SSI. BDT 3/21/90

February 28, 1990

Ms. Dorothy Rayfield
United States Environmental
Protection Agency
Region IV
Superfund Branch
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Re: Site Screening Investigation - Phase I
(Preliminary Assessment Reassessment)
London Platers, Inc.
Hialeah, Dade County, Florida
FLD004125514

Dear Dorothy:

London Platers, Inc. is located at 1080 E. 24th Street in Hialeah, Dade County, Florida. The Section/Township/Range and Latitude/Longitude for the site are 8/41E/53S and 25,50,38/080,15,38, respectively [1,2].

London Plating is a custom plating facility that plates antiques, heirlooms, and other valuable pieces. Copper, Silver, Nickel, Brass, Chrome, and gold plating are done at the site. Due to the custom work done and the design of the plating operations, management claims that the only waste generated on-site is by a parts cleaner [4,7]. A parts cleaner is leased from and serviced by Safety Kleen Corporation. Mineral spirits (9 gallons) are used as the cleaning fluid and are replaced every 6 weeks [8,12]. The plating area is contained by a 4" high concrete berm and the plating system works as follows: After each plating tank are two drag-out tanks in series. The first drag-out tank eliminates approximately 95% of the plating chemicals. The second drag-out tank removes the balance of plating chemicals. The item being plated then proceeds to the final rinse tank. Because the plating tanks are heated (by electric currents), there is a great loss of water due to evaporation. Therefore, water from the first drag-out tank is used to replenish the water in the plating tank. Water from the second drag-out tank is used to replenish the water in the first drag-out tank and is filled with fresh water. The system utilizes back-flushing principles in that contaminants (metals, etc.) and fresh water are continually going upstream. Water from the final

rinse tanks is discharged to the Dade County Municipal Sewer System. Sulfuric acid is utilized as a rinse in the plating line [4,5,7,14]. The average amount of effluent being discharged to the sewers for the year 1989 is between 200 and 300 gallons per day [9].

The first record of London Platers, Inc. is an analysis report of waste water being discharge to the Dade County sewer system on 7/21/83 [3]. Monthly waste water analyses have been performed by Enviropact, Inc. to insure that contaminant free effluent is being discharged to the sewers. These analysis reports are submitted to Dade County Environmental Resource Management (DERM) for monitoring [4,9]. Dade County Environmental Resource Management also performs an on-site Hazardous Waste Compliance inspection approximately every 3 months [4,10,11]. Our records show that the first Hazardous Waste Compliance Report is dated 9/9/83 [4]. The report, which followed a site inspection resulting from an unfounded complaint, reported London Platers, Inc. as a non-handler of hazardous waste, no hazardous waste violations, and recommended no follow-up inspection [4]. A Preliminary Assess- ment (PA) Report on 9/5/84 for the site indicated no further action [5]. This assessment was assigned to the site based on the Hazardous Waste Compliance Report dated 9/9/84 [4,5]. A Site Screening Summary on 7/17/87 indicated that the site did not present a potential hazardous risk to the environment by on-site contaminants [6]. **As previously stated, monthly analysis of** effluent, random site inspections, and periodic servicing of an on-site parts cleaner have existed while London Platers, Inc. has been in operation [3,4,8,9,10,11,12]. In October of 1985, an analysis of effluent showed Cyanide concentrations of 0.07 mg/1, and no formal enforcement action or warning notice followed [11]. On 12/18/87, a Warning Notice was issued to London Platers, Inc. for an analysis report showing high concentrations (3.13 mg/1) of Nickel [11]. Other than these two instances, no others have been reported concerning sewer discharges. On 3/30/89, during an on-site inspection by DERM, a surface soil sample was taken at a 2'X2' open drain approximately 10' inside the building. An analysis of this sample (not E.P. Toxic) reported Nickel, Chromium, Lead, Copper and Zinc at concentration levels of 8,300, 3,000, 1,800, 19,800, and 12,000 ppm [11,13]. Approximately 1/2' of soil from the 2'X2' drain (15 gallons) was excavated. An E.P. Toxic analysis of the excavated soil detected concentrations of Lead (0.40 mg/1) and Cadmium (2.0 mg/1) [11,14]. An E.P. Toxic analysis of a soil sample at the excavation point (1/2' BLS) detected only Zinc, at 1.2 mg/1, It should be noted that the minimum detection limit for this test was 0.1 mg/1. It has been reported, not documented, that the drain is

Now?

contained by a closed system consisting of a metal box [10]. This would account for the sharp difference in metals detected over a 1/2' interval, which is not indicative of leaching effects or principles concerning metals [10,11]. An on-site inspection is scheduled for the latter part of 2/90 at which time an in-depth sampling and sample analysis will be conducted by DERM [11].

The Biscayne aquifer is unconfined and is the primary source of potable drinking water in the vicinity of the site. The aquifer is characterized by rapid, extensive, interaction between the local water table and surface waters making it very susceptible to contamination. Although the geology, hydrology, and demography of the region are highly variable, their geographical distributions exhibit very definite trends, some of which are obvious. These trends are aquifer thickness, water table depth, sand content, permeability, direction of ground water flow, rainfall, pumping of wellfields, area canals, saltwater intrusion, industrial impoundments, and population. The Biscayne aquifer is the only hydrologic unit capable of supplying large quantities of potable ground water in the area. The Biscayne aquifer at the site, inferred from the correlation of offset well data and information, probably consists of the Miami Limestone and Tamiami Formations, in descending order. The Miami Limestone is overlain by sand, and the water table lies at approximately 4' (BLS). The Biscayne aquifer is considered the most productive shallow non-artesian aquifer in Florida and one of the most permeable aquifers in the world. Porocity in the Biscayne aquifer varies from 10% to 35% and average about 20%. The rate of ground water movement is approximately 10 feet per day. The principle source of recharge to the Biscayne aquifer is from rainfall entering vertically over the entire area. In addition, the canals in this area intersect the water table, so they become rain water storage and recharge sources [16,17,18].

The net precipitation for the area of the site is approximately 10 inches [21,23]. The John E. Preston, Hialeah and Miami Springs wellfields lie within 3 miles of the site [17,18,19]. Large volumes of potable water being pumped from these wells create a depression or coning effect which causes water to flow radially towards the wells. The site lies between the maximum and average day protection areas or cone of influence contours [17]. These cone of influence contours are due to water production from the John E. Preston, Hialeah, Upper Miami Springs, and Lower Miami Springs Wellfields [17]. Approximately 258,000 to 1,200,000 people are provided potable drinking water from the Biscayne aquifer within a three (3) mile radius of the site during normal or average production periods [20]. At this time,

production rates are minimal while "Air Strippers" are being installed at the John E. Preston Water Treatment Facility [18,19]. The closest community potable water well is the John E. Preston Well No. 6 which is 9057.6844 feet (1.7155 miles) from the site [1,17,19,21]. Lake Flamingo (Hialeah Race Tracks) and the Miami Canal lie approximately 4,837 feet (0.92 miles) and 10,107 feet (1.91 miles) from the site, respectively [1,2].

A quanitative potential hazard to ground water and a large population have been documented at the site [10,11,14,16,17,20,21,23]. Reviewing the available file information indicates that the site has been operated in a responsible manner and that the on-site hazardous wastes are contained [1 thru 23]. Compliance and sample analyses at the site have been maintained in a responsible manner [3,4,5,6,8,9,-10,11]. The on-site soils containing hazardous substances, as excavated from the 2'X2' drain, appears to be a very small quantity (15 gal.) and is verbally reported to be contained. This would eliminate a hazardous potential of contamination to ground waters and surface waters [10,11].

Therefore, the site is recommended for No Further Action, pending subsequent sampling and sample analyses by the Dade County Department of Environmental Resource Management (DERM). An addendum letter to this PAR will follow with the results of DERM's sample analyses, which should be completed by the end of March 1990.

Respectively,

Charles S. Logan
Engineer I
Site Screening Superfund Subsection
Bureau of Waste Cleanup

CSL/mlr

Enclosure

15. Hazardous Chemicals Desk Reference, N.I. Sax/ R.J. Lewis, Sr., Van nostrand Reinhold, 1987.

16. Contaminant Behavior in the Biscayne Aquifer, Prepared by: Technos, Inc. for FDER, 2/83.

17. Wellfield Cones of Influence, Metropolitan. Dade County, Department of Environmental Resource Management, J.E. Preston & Hialeah Water Treatment Facilities, 12/80.

18. Recommendation to Clean-up and Protect the Biscayne Aquifer in Southeast Florida, Prepared for U.S.E.P.S. by Meridian Communications, Rifkin & Assoc., & CH_2M Hill, 11/85.

19. Conversation Record, Dade County Wellfields & Closest Community Potable Water Well, C. Logan (FDER) to P. Hernandez (DERM), 2/22/90.

20. Population, Potable Water System, Drinking Water Program, Lat./Long. Range Look-up (3 mile), Prepared by: C.S. Logan, 2/22/90.

21. Inverse Ellipsoid Program, Distance to Closest Community Well, Prepared by: C.S. Logan, 2/22/90.

22. 1 Year/24-Hour Rainfall Map, D.M. Hershfield (U.S. Dept. of Agriculture), Technical Paper No. 40.

23. Hazardous Ranking System, Data Colleciton and Documentation Techniques for HRS Scoring of Hazardous Waste Sites, NUS Corp., 3/87.

HAZARD RANKING SYSTEM SCORING SUMMARY

FOR

LONDON PLATERS, INC.
EPA SITE NUMBER FLD004125514
HIALEAH
DADE COUNTY, FL
EPA REGION: 4

SCORE STATUS: IN PREPARATION

SCORED BY CHARLES LOGAN
OF FDER/BWC
ON 02/21/90

DATE OF THIS REPORT: 02/21/90
DATE OF LAST MODIFICATION: 02/21/90

GROUND WATER ROUTE SCORE	:	38.78
SURFACE WATER ROUTE SCORE	:	0.00
AIR ROUTE SCORE	:	0.00
MIGRATION SCORE	:	22.42

HRS GROUND WATER ROUTE SCORE

CATEGORY/FACTOR	RAW DATA	ASN. VALUE	SCORE
1. OBSERVED RELEASE	NO	0	0
2. ROUTE CHARACTERISTICS			
DEPTH TO WATER TABLE	5 FEET		
DEPTH TO BOTTOM OF WASTE	1 FEET		
DEPTH TO AQUIFER OF CONCERN	4 FEET	3	6
PRECIPITATION	62.0 INCHES		
EVAPORATION	52.0 INCHES		
NET PRECIPITATION	10.0 INCHES	2	2
PERMEABILITY	0.0X10-3 CM/SEC	0	0
PHYSICAL STATE		2	2
TOTAL ROUTE CHARACTERISTICS SCORE:			10
3. CONTAINMENT		3	3
4. WASTE CHARACTERISTICS			
TOXICITY/PERSISTENCE:LEAD			18
WASTE QUANTITY CUBIC YDS	0		
DRUMS	1		
GALLONS	0		
TONS	0		
TOTAL	0 CU. YDS	1	1
TOTAL WASTE CHARACTERISTICS SCORE:			19
5. TARGETS			
GROUND WATER USE		3	9
DISTANCE TO NEAREST WELL	9058 FEET		
AND	MATRIX VALUE	30	30
TOTAL POPULATION SERVED	999999 PERSONS		
NUMBER OF HOUSES	0		
NUMBER OF PERSONS	999999		
NUMBER OF CONNECTIONS	0		
NUMBER OF IRRIGATED ACRES	0		
TOTAL TARGETS SCORE:			39

GROUND WATER ROUTE SCORE (Sgw) = 38.78

HRS SURFACE WATER ROUTE SCORE

CATEGORY/FACTOR	RAW DATA	ASN. VALUE	SCORE
1. OBSERVED RELEASE	NO	0	0
2. ROUTE CHARACTERISTICS			
SITE LOCATED IN SURFACE WATER	NO		
SITE WITHIN CLOSED BASIN	NO		
FACILITY SLOPE	0.0 %		
INTERVENING SLOPE	0.0 %	0	0
24-HOUR RAINFALL	4.5 INCHES	3	3
DISTANCE TO DOWN-SLOPE WATER	4837 FEET	2	4
PHYSICAL STATE	2		2
TOTAL ROUTE CHARACTERISTICS SCORE:			9
3. CONTAINMENT	3		3
4. WASTE CHARACTERISTICS			
TOXICITY/PERSISTENCE:LEAD			18
WASTE QUANTITY CUBIC YDS	0		
DRUMS	1		
GALLONS	0		
TONS	0		
TOTAL	0 CU. YDS	1	1
TOTAL WASTE CHARACTERISTICS SCORE:			19
5. TARGETS			
SURFACE WATER USE		0	0
DISTANCE TO SENSITIVE ENVIRONMENTS		0	0
COASTAL WETLANDS	NONE		
FRESH-WATER WETLANDS	NONE		
CRITICAL HABITAT	NONE		
DISTANCE TO STATIC WATER	4837 FEET		
DISTANCE TO WATER SUPPLY INTAKE	> 1 MILE		
AND	MATRIX VALUE	0	0
TOTAL POPULATION SERVED	999999		
NUMBER OF HOUSES	0		
NUMBER OF PERSONS	999999		
NUMBER OF CONNECTIONS	0		
NUMBER OF IRRIGATED ACRES	0		
TOTAL TARGETS SCORE:			0

SURFACE WATER ROUTE SCORE (Ssw) = 0.00

HRS AIR ROUTE SCORE

CATEGORY/FACTOR	RAW DATA	ASN. VALUE	SCORE
1. OBSERVED RELEASE	NO	0	0

2. WASTE CHARACTERISTICS

REACTIVITY:		MATRIX VALUE
INCOMPATIBILITY		
TOXICITY		
WASTE QUANTITY	CUBIC YARDS	
	DRUMS	
	GALLONS	
	TONS	
	TOTAL	

TOTAL WASTE CHARACTERISTICS SCORE: N/A

3. TARGETS

POPULATION WITHIN 4-MILE RADIUS
- 0 to 0.25 mile
- 0 to 0.50 mile
- 0 to 1.0 mile
- 0 to 4.0 miles

DISTANCE TO SENSITIVE ENVIRONMENTS
- COASTAL WETLANDS
- FRESH-WATER WETLANDS
- CRITICAL HABITAT

DISTANCE TO LAND USES
- COMMERCIAL/INDUSTRIAL
- PARK/FOREST/RESIDENTIAL
- AGRICULTURAL LAND
- PRIME FARMLAND
- HISTORIC SITE WITHIN VIEW?

TOTAL TARGETS SCORE: N/A

AIR ROUTE SCORE (Sa) = 0.00

REMEDIAL SITE ASSESSMENT DECISION - EPA REGION IV

Site Name: London Platers, Inc. **EPA ID#:** FLD004125514

Alias Site Names: ___

City: Hialeah **County or Parish:** Dade **State:** Florida

Refer to Report Dated: September 27, 1995 **Report type:** SIP

Report developed by: Florida Department of Environmental Protection

DECISION:

| | **1. Further Remedial Site Assessment under CERCLA (Superfund) is not required because:**

| | 1a. Site does not qualify for further remedial site assessment under CERCLA (Site Evaluation Accomplished - SEA)

| | 1b. Site may qualify for further action, but is deferred to: | | RCRA | | NRC

|X| **2. Further Assessment Needed Under CERCLA:** 2a. (optional) Priority: | | Higher |X| Lower

2b. Activity Type: | | PA |X| ESI | | SI | | HRS evaluation

| | Other: _____

DISCUSSION/RATIONALE:

London Platers is an active custom metal plating facility for antiques, heirlooms, and other valuable pieces. The facility is located at 1080 E. 24th Street, Hialeah, Dade County. The site consist of a 8,000 sq. ft. building. Copper, silver, gold, nickel, brass and chrome are the primary electroplating metals used at the site. Current structure at the site are the main building and the plating area. The plating area consist of six plating tanks and two drag-out tanks for each plating tank. The plating area is contained by a 4" high cement berm, serving as a containment for any accidental spill.

The facility began operations on 1952. The first record of discharge to the Dade County Municipal Sewer System was on July, 1983. Prior to the connection with the County Sewer, wastes from the plating operation were discharged into the alleys behind the plant. Operation as designed now no metal is wasted and wastewater discharge is continually reused within the system. The DERM periodically conducts inspections at the site and continues to monitor wastewater effluent discharges. On March, 1990 approximately 6 inches of soil were removed from the top of an on-site 2' x 2' sewer drain that was found to have metal contamination. Per conversation with Pamela Reynolds, from FDEP, the alley is believed to be capped.

Since the facility is connected to the County Sewer and the process is designed for the reuse of metals, and the discharges are being monitored by DERM, a low priority for CERCLA action will be recommended.

Report Reviewed and Approved by: Carmen J. Santiago-Ocasio Signature: Carmen J. Santiago-Ocasio Date: 11/29/95

Site Decision Made by: Carmen J. Santiago-Ocasio Signature: Carmen J. Santiago-Ocasio Date: 11/29/95

EPA Form # 9100-31

Record of Telephone Conversation

Reference 6

Date: 7-13-01 Time: 9:00	London Platers, Inc. EPA ID Number: FLD004125514
Organization: T N & Assoc., Inc. Reg. 4 EPA STAT Contract Name: Nancy Ellen Keene Signature: Nancy Ellen Keene	Contacted: Fernando Desdard Supervisor Waste Water Section DERM 33 Southwest 2nd Ave. Miami, Fl 33130 305-372-6510

Subject: Condition of alley and plating room floor.

Asked Mr. Desdard if the alley behind the London Platers site was paved. He said that it was more of an easement although you could drive down it and it was dirt. Also asked Mr. Desdard what the plating room floor was composed of and he replied that the floor was totally concrete.

RESPONSE REQUIRED

(x) None ( ) Phone call ( ) Memo ( ) Letter ( ) Report

cc: (x) File (x) Project Manager ( ) Principal Investigator ( ) Other (specify) _____

Record of Telephone Conversation

Reference 7

Date: 6-27-2001 Time: 1:00 p.m.	London Platers, Inc. EPA ID Number: FLD004125514
Organization: T N & Assoc., Inc. Reg. 4 EPA STAT Contract Name: Nancy Ellen Keene Signature: Nancy Ellen Keene	Contacted: Jeff Smith Environmental Manager RCRA Program FDEP P.O. Box 15425 West Palm Beach, FL 33416-5425 561-681-6600 Ext. 6670

Subject: RCRA Permit

Spoke to Mr. Smith about RCRA permit for London Platers. He said that there was no record of one ever being issued. Mr. Smith also stated that records for London Platers start in the mid 1980's and that there is no record of a site inspection since that time.

According to Mr. Smith, London Platers is a hazardous waste accumulator not a generator and therefore does not need a permit. His records show that the current owner is Augusto G. Casamayor and that there are two people working on the site.

RESPONSE REQUIRED

(x) None ( ) Phone call ( ) Memo ( ) Letter ( ) Report

cc: (x) File (x) Project Manager ( ) Principal Investigator ( ) Other (specify) _____

Reference 8

EPA United States Environmental Protection Agency

Envirofacts Warehouse | Superfund | Report Error

Overview | Law | EXIT EPA | Query | Model | Feedback | EF Home

CERCLIS Query Results

SITE ID: Equal To: **0400552**
Results are based on data extracted on MAY-11-2001
Note: Click on the underlined CORPORATE LINK value for links to that company's environmental web pages. Click on the underlined MAPPING INFO value to obtain mapping information for the facility. Click on the underlined RECORD OF DECISION value for a RODS Site Report. Click on the underlined FACILITY_ID to view EPA Facility Information for this site.

Go To Bottom Of The Page

SUPERFUND SITE ID:	0400552	**SITE NAME:**	LONDON PLATERS INC
STREET ADDRESS:	1080 E 24TH ST	**EPA FACILITY ID:**	FLD004125514
CITY NAME:	HIALEAH	**OWNERSHIP STATUS:**	Other
STATE ABBR:	FL	**FEDERAL FACILITY:**	N
ZIP CODE:	33013	**NPL STATUS:**	Not on the NPL
COUNTY NAME:	MIAMI-DADE	**SITE INCIDENT TYPE:**	
CORPORATE LINK:	No	**RECORD OF DECISION (ROD) INFO:**	No
LATITUDE:		**EPA REGIONAL LINK:**	No
LONGITUDE:		**MAPPING INFO:**	MAP
SITE SMSA:	5000		

Enforcement and Cleanup Actions

Action	Action ID	Planned Start Date	Planned End Date	Actual Start Date	Actual End Date	Responsibility	Planned Outcome	Urgency
SITE INSPECTION	001				03/21/1990	State, Fund Financed	Low	
PRELIMINARY ASSESSMENT	001				11/01/1984	State, Fund Financed	Low	
DISCOVERY	001				08/01/1981	EPA Fund-Financed		

Site Description

There were no Site Descriptions reported for this site.

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Total Number of Facilities Displayed: 1

Record of Telephone Conversation

Reference 9

Date: 6-21-01 Time: 4:00	London Platers, Inc. EPA ID Number: FLD004125514
Organization: T N & Assoc., Inc. Reg. 4 EPA STAT Contract Name: Nancy Ellen Keene Signature: Nancy Ellen Keene	Contacted: Marcello Barrows Air Permitting DERM 33 Southwest 2nd Ave Miami, FL 33130 305-372-6944

Subject: Air Permitting for London Platers, Inc.

I spoke with Mr. Barrows concerning any air permits held by London Platers. Mr. Barrow said that London Platers had a General Title 5 air permit. The original application for the permit was signed by David London in 1986. A second request and form were signed by Mr. Augusto Casamayor on 3 November 2000.

Mr. Barrow also stated that London Platers had a minor violation on 19 March 2001 because they did not submit an annual compliance form showing records of surface tension. This form was submitted on 11 April 2001. No other violations have been reported.

RESPONSE REQUIRED

(x) None ( ) Phone call ( ) Memo ( ) Letter ( ) Report

cc: (x) File (x) Project Manager ( ) Principal Investigator ( ) Other (specify) _____

Record of Telephone Conversation

Reference 10

Date: 6-22-01 Time: 2:00 p.m.	London Platers, Inc. EPA ID Number: FLD004125514
Organization: T N & Assoc., Inc. Reg. 4 EPA STAT Contract Name: Nancy Ellen Keene Signature: Nancy Ellen Keene	Contacted: Fernando Desdard Supervisor Waste Water Section DERM 33 Southwest 2nd Ave. Miami, Fl 33130 305-372-6510

Subject: Waste Water Permits and Violations

Spoke to Mr. Desdard concerning London Platers. He said that they have a current wastewater discharge permit. Mr. Desdard said that they were a small quantity waste generator and should have a RCRA permit and that I should contact Jeff Smith at FDEP for confirmation. According to Mr. Desdard, London Platers still has their waste stream analyzed on a monthly basis and DERM still does a minimum of biannual site visits, testing and analysis. Results from the monthly analysis are sent to DERM. He was not sure who does that now but does know it is not Enviropact, which has been bought out.

Mr. Desdard said that he is a supervisor and does not go to the site on a regular basis and that the site inspector has gone on a 3 week vacation. He did say that all the area he has seen around the building is paved and that there are no barrels stored outside.

No records were available for the period from 95 to 99 because of a computer problem but he did look up the 99 to present records and found only one violation. This violation occurred in April 2001 when it was found that nickel in the wastewater exceeded the allowed limit. This has not occurred since then.

RESPONSE REQUIRED

(x) None ( ) Phone call ( ) Memo ( ) Letter ( ) Report

cc: (x) File (x) Project Manager ( ) Principal Investigator ( ) Other (specify) _____

Reference 11

Miami Precipitation Data

Miami, Florida Precipitation													
	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	An
1900	*5.25*	*1.85*	*5.20*	*6.45*									
1901		0.00	1.67	1.97	10.42	21.72	8.18	10.85	15.30	4.92		1.55	
1902	0.00	5.91	0.00	1.85	0.94	6.01	3.28	5.33	7.81	4.17	7.12	1.86	4
1903	4.99	4.70	4.82		1.35	10.48			12.54	4.48	3.70	0.00	
1904	1.70	1.65	3.10	2.04	12.28	6.16	2.94	9.15	8.76	10.08	5.21	0.40	6
1905	2.65	0.64	1.69	1.32	3.93	7.61	3.63	13.71	11.99		3.65	12.08	
1906	3.20	3.78	4.38	2.33	7.89	8.60	9.26	8.94	2.39	13.68	7.56	0.00	7
1907	1.48	0.16	0.72	0.73	3.41	8.47	3.78	3.60	3.76	2.77	3.08	1.19	3
1908	3.46	0.97	1.66	2.63	8.53	13.75	5.21	7.76	11.02	27.86	1.65	0.86	8
1909	5.45	0.00	0.83	8.29	7.97	3.61	4.38	9.44	13.93	21.08	0.60	1.20	7
1910	1.46	0.70	0.67	1.16	3.06	6.78	5.12	6.90	3.67	21.45	0.45	0.55	5
1911	1.82	0.00	1.10	10.11	12.12	2.83	4.08	6.27	4.42	3.53	5.94	1.90	5
1912	4.26	2.08	3.76	5.61	11.17	14.63	5.99	2.93	2.08	3.29	10.67	1.90	6
1913	4.42	1.86	4.39	3.78	8.42	4.07	2.98	5.67	6.46	4.51	4.39	0.32	5
1914	1.35	1.21	0.99	5.24	1.82	2.57	4.52	3.77	6.68	6.92	7.06	4.43	4
1915	3.64	3.01	1.57	1.32	3.32	12.53	6.54	1.37	5.47	11.65	2.54	2.00	5
1916	1.44	3.69	0.28	0.39	5.99	6.36	2.49	10.10	4.81	5.03	1.85	0.25	4
1917	0.11	0.45	3.03	3.74	4.62	6.71	2.48	4.32	18.55	2.11	0.24	1.46	4
1918	0.85	2.51	1.48	4.49	2.80	6.17	4.01	1.43	10.06	4.82	0.60	4.11	4
1919	1.07	3.20	9.74	3.07	13.31	7.26	5.90	3.73	3.72	3.73	3.48	1.83	6
1920	0.41	1.60	0.06	3.15	10.33	3.90	6.61	4.12	6.94	5.04	3.73	1.72	4
1921	0.73	1.15	5.15	2.63	5.60	1.14	3.09	3.14	2.81	18.20	0.50	0.23	4
1922	0.55	3.14	0.13	0.54	9.06	4.50	8.16	7.97	11.04	15.85	5.44	1.19	6
1923	0.21	0.24	0.58	2.15	11.48	5.94	5.20	6.34	6.21	2.77	0.27	0.46	4
1924	2.80	1.69	0.46	3.40	7.45	4.22	8.31	3.40	7.41	25.02	1.06	0.32	6
1925	4.78	1.27	2.74	3.02	18.66	5.70	2.56	8.95	2.73	1.12	17.72	2.68	7
1926	7.93	0.29	0.28	2.29	4.63	3.24	15.22	9.69	12.10	6.92	1.84	0.23	6
1927	1.60	2.52	0.88	2.23	0.68	2.40	5.00	4.40	8.83	3.73	0.90	0.52	3
1928	0.42	2.02	0.45	0.42	10.67	6.14	3.65	9.75	17.00	3.63	0.42	0.74	5
1929	1.03	0.44	5.31	3.24	6.96	5.61	9.36	5.51	16.82	20.18	0.89	9.03	8
1930	2.72	3.86	3.76	5.98	8.85	25.34	3.58	4.72	5.05	5.09	3.18	1.38	7

1931	6.27	2.62	3.70	6.60	2.43	0.58	1.51	7.29	11.57	3.99	1.64	0.53	4
1932	3.59	1.36	0.94	1.31	13.22	9.41	3.62	9.78	4.17	12.57	4.38	0.50	6
1933	1.23	0.35	3.17	6.86	4.49	3.30	5.60	8.03	2.70	13.92	1.57	0.06	5
1934	2.52	2.95	2.45	3.39	15.81	6.37	5.81	3.57	8.47	1.67	1.20	1.24	5
1935	0.30	0.47	0.18	4.95	1.63	7.93	2.81	5.94	11.33	8.59	6.40	0.29	5
1936	3.57	4.01	5.95	2.79	6.78	23.52	10.03	7.61	5.65	4.83	2.89	1.46	7
1937	1.72	2.71	10.60	1.50	3.83	4.57	5.36	6.46	12.14	5.41	0.42	0.44	5
1938	2.53	1.41	0.18	0.35	6.72	7.73	8.36	1.95	6.62	8.29	1.73	0.83	4
1939	0.69	1.13	1.29	0.91	4.15	2.90	4.79	5.94	5.38	14.80	3.67	3.38	4
1940	1.89	1.73	2.28	0.44	3.38	10.93	2.57	4.78	16.93	3.69	0.92	2.42	5
1941	4.40	3.98	2.79	4.61	2.79	4.47	10.02	1.37	8.33	2.58	4.10	1.74	5
1942	1.86	2.36	0.55	10.83	5.29	10.85	1.10	2.84	9.52	3.75	2.19	1.80	5
1943	1.49	0.33	1.25	1.69	6.16	7.51	6.27	10.71	4.74	6.01	3.71	0.48	5
1944	2.60	0.02	0.98	0.64	6.81	6.07	9.15	4.44	3.21	7.32	0.01	0.70	4
1945	3.33	0.14	0.97	1.74	1.16	2.34	10.42	4.91	14.00	13.72	1.38	1.04	5
1946	1.38	0.52	3.40	0.81	11.44	5.46	7.72	9.15	8.14	4.70	7.66	2.26	6
1947	1.58	2.10	0.72	10.51	5.44	13.26	14.37	6.71	12.23	13.84	4.10	2.65	8
1948	4.64	0.28	2.55	5.31	5.43	7.17	6.89	9.45	23.82	10.58	0.96	1.76	7
1949	0.11	0.37	7.22	5.72	6.07	10.37	3.96	7.57	9.07	7.15	1.23	3.30	6
1950	0.50	1.85	0.63	2.57	3.27	3.82	7.99	8.65	3.85	12.48	2.66	1.20	4
1951	0.04	2.09	0.47	4.42	1.66	5.08	8.64	5.13	2.63	6.54	0.54	1.06	3
1952	0.59	2.30	2.01	1.44	0.68	2.05	7.14	4.93	4.48	21.08	0.25	1.99	4
1953	6.08	1.63	0.81	4.17	3.15	5.40	6.66	9.07	13.10	10.26	2.44	2.38	6
1954	0.49	2.18	1.96	5.45	13.43	10.14	9.21	1.65	8.28	4.24	4.77	0.46	6
1955	0.71	0.76	0.23	1.36	3.74	9.69	7.89	4.27	5.52	4.36	0.98	1.84	4
1956	1.74	0.91	0.02	2.28	5.44	3.93	2.34	4.64	9.59	5.56	0.34	0.26	3
1957	0.08	4.68	2.68	5.04	10.11	5.82	9.54	16.58	3.32	7.64	2.54	2.84	7
1958	5.67	1.54	5.16	0.85	18.14	6.54	6.58	8.40	4.82	4.15	3.68	6.39	7
1959	2.21	2.32	4.85	2.00	6.16	20.56	8.20	8.18	12.98	7.62	13.15	1.10	8
1960	0.19	2.20	0.67	10.21	3.30	6.31	5.27	4.15	24.40	10.54	2.36	0.50	7
1961	5.12	0.63	1.91	0.56	6.81	10.48	1.91	4.68	3.40	3.92	2.15	0.13	4
1962	1.46	0.13	2.78	1.19	0.92	10.36	3.74	8.02	7.82	1.50	4.15	0.20	4
1963	0.65	3.45	0.73	0.33	6.34	6.80	1.77	4.77	11.12	4.43	1.43	4.26	4
1964	0.45	2.21	0.50	3.31	4.67	10.48	5.51	9.84	4.22	9.77	3.00	6.24	6
1965	1.98	2.98	3.97	1.20	0.44	6.55	6.56	4.97	11.38	16.79	0.96	0.62	5
1966	3.97	6.56	3.25	1.80	5.53	21.37	8.50	7.62	8.00	10.88	3.84	0.74	8
1967	2.75	1.14	3.60	0.15	1.68	15.98	5.55	8.13	9.18	12.88	3.81	1.37	6
1968	1.92	2.77	0.88	1.27	18.54	22.36	6.15	8.34	11.11	8.71	1.21	0.13	8

1969	6.66	2.02	1.98	4.63	8.02	11.42	8.48	4.31	8.24	13.57	1.01	1.15	7
1970	2.64	1.77	2.61	0.95	10.98	5.53	4.48	3.60	8.89	3.01	0.09	0.17	4
1971	0.51	0.80	0.40	0.07	4.13	11.65	4.72	6.02	9.63	7.48	0.98	4.33	5
1972	1.60	2.71	3.01	2.67	13.71	10.90	7.13	6.49	5.08	2.86	2.77	4.18	6
1973	3.41	2.21	1.76	2.24	1.08	8.93	6.14	14.60	6.59	3.36	0.46	2.46	5
1974	2.54	0.10	2.27	2.11	2.63	8.12	6.09	9.29	6.38	3.68	4.62	1.17	4
1975	1.39	0.90	0.61	0.53	4.94	6.37	4.99	5.19	4.69	6.25	2.80	0.44	3
1976	0.95	3.54	0.23	4.17	10.45	6.81	3.83	9.45	7.75	4.42	2.69	1.61	5
1977	1.44	2.10	0.91	1.97	15.82	12.42	5.23	8.28	7.04	1.25	5.94	2.55	6
1978	2.07	3.44	2.92	3.50	5.66	5.29	2.69	3.93	3.42	7.68	3.17	2.06	4
1979	1.28	0.57	0.30	17.29	5.29	4.06	5.06	4.81	13.36	3.63	1.62	2.84	6
1980	1.89	0.88	3.17	10.20	2.14	3.02	9.40	11.32	5.60	6.05	3.47	0.20	5
1981	0.61	4.66	1.32	0.05	4.94	5.49	2.78	12.25	14.79	1.62	2.14	0.14	5
1982	0.44	1.22	4.22	9.27	8.80	10.82	3.84	5.79	7.62	7.12	7.09	1.18	6
1983	5.36	8.07	2.82	1.79	1.44	8.66	6.20	5.88	7.48	3.52	2.01	4.19	5
1984	0.18	0.70	6.12	4.51	10.91	7.24	7.38	5.44	10.45	2.35	4.04	0.70	6
1985	0.35	0.06	1.35	3.27	3.19	6.33	11.23	11.88	8.59	5.17	1.37	3.47	5
1986	5.04	1.72	10.57	0.71	8.24	9.06	7.81	7.67	4.38	3.96	4.75	2.21	6
1987	0.87	2.62	3.82	0.38	4.99	5.48	5.17	3.24	10.17	4.33	4.92	4.28	5
1988	1.88	0.61	0.39	1.82	5.28	10.36	10.90	7.89	3.09	1.49	0.76	0.12	4
1989	0.67	0.71	0.89	2.14	0.99	10.83	3.53	12.78	5.83	2.65	0.99	0.62	4
1990	0.24	1.19	2.28	6.96	7.79	6.84	4.31	11.06	3.52	4.82	1.67	1.03	5
1991	1.59	2.04	2.32	5.16	2.50	7.51	7.29	8.84	11.17	21.64	1.18	0.18	7
1992	1.80	1.49	2.67	2.43	0.55	13.17	4.21	7.22	6.48	2.02	13.84	1.94	5
1993	5.04	2.14	5.98	3.08	4.13	3.64	7.28	5.13	12.59	7.23	6.06	0.49	6
1994	3.59	5.66	1.94	2.14	4.72	4.97	3.03	16.64	13.50	9.50	8.92	4.95	7
1995	3.13	1.41	4.60	3.73	2.94	20.33	6.36	13.13	10.37	9.91	2.53	0.86	7
1996	2.33	0.80	1.40	3.37	8.30	11.67	5.25	5.55	7.21	10.10	0.69	1.04	5
1997	1.71	1.57	2.06	5.16	9.80	13.18	7.62	6.28	12.47	2.60	2.89	5.27	7
1998	1.04	6.62	5.97	0.66	3.45	6.67	5.41	12.48	14.41	5.70	6.66	1.98	7
1999	2.99	0.27	0.25	1.46	4.89	11.08	3.60	13.87	7.01	14.55	1.45	2.68	6
2000	0.52	1.24	0.35	3.36	1.80	5.19	5.29	7.42	10.58	18.65	0.50		

Last Updated on 04/27/01
By Melissa Griffin

Soil Survey of Dade County Area, Florida

By Chris V. Noble, Robert W. Drew, and James D. Slabaugh, Natural Resources Conservation Service

United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with
University of Florida, Institute of Food and Agricultural Sciences, Agricultural Experiment Stations, and Soil Science Department; Florida Department of Agriculture and Consumer Services; and Florida Department of Transportation

This survey area is in the extreme southeast part of Florida. It is bordered on the north by Broward County, on the west mainly by the Everglades National Park, on the east by the Atlantic Ocean, and on the south by Biscayne Bay.

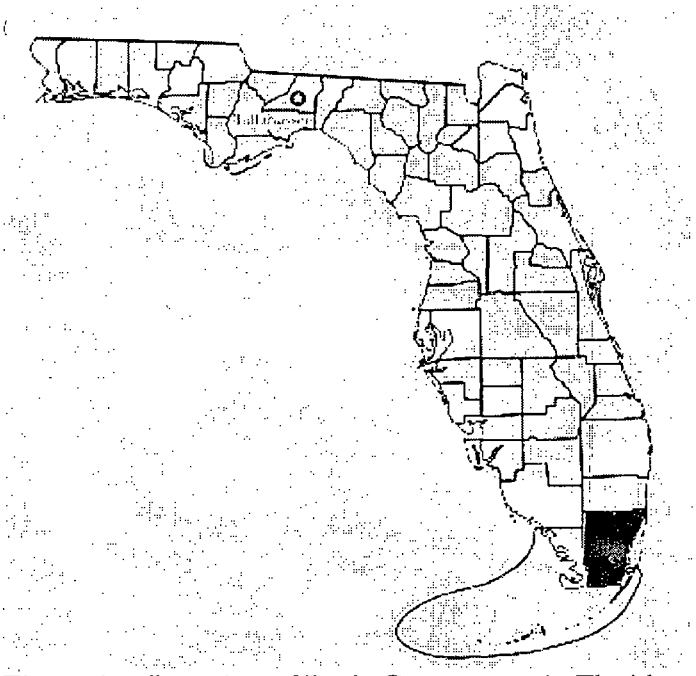


Figure 1.—Location of Dade County area in Florida.

The survey area makes up 621,080 acres, or about 970 square miles. Miami, the county seat, is in the north-eastern part of the survey area, on the west shore of Biscayne Bay.

The economy of the survey area is fairly well diversified. Because of the money generated by tourism and retirement living, the Miami area and adjacent coastal areas are known as the "Gold Coast." The leading industries or economic activities include construction, real state, housing, recreation, the service trades, sports events, motion picture and television filming, transportation, manufacturing, limestone mining, and cement production.

Miami is one of Florida's principal deep-water ports. Commercial and sport fishing and agricultural crops, including such major cash crops as citrus, vegetables, and special tropical fruits and vegetables, are important to the economy. Ornamental nursery plants, for indoor and outdoor landscaping, have surpassed citrus and surgarcane as the major cash crops in Florida.

General Nature of the Survey Area

This section describes the environmental and cultural factors that affect the use and management of soils in the survey area. These factors are climate, history and development, geomorphology, geology, hydrogeology, and transportation facilities.

Climate

This survey area has a subtropical marine climate characterized by long, warm, rainy summers and mild, dry winters. Temperatures are moderated by the Atlantic Ocean and Gulf Stream, but the moderating effects quickly diminish inland. Table 1 gives data on temperature and precipitation for the survey area as recorded at the Miami International Airport. In winter, the average temperature is 68 degrees F and the average daily minimum temperature is 60 degrees. The lowest temperature on record, which occurred in December 1934, is 26 degrees. In summer, the average temperature is 82 degrees and the average daily maximum temperature is 89 degrees. The highest recorded temperature, which occurred in July 1942, is 100 degrees.

Frosts occur about once a year. Killing frosts occurred in February 1917, December and January 1917 and 1918, January 1928, December 1934, January 1940, January and February 1958, December 1962, and January 1970, 1977, and 1981 *(23)*.

Rainfall varies greatly from place to place during the year and on a yearly basis. The total annual precipitation is approximately 57.6 inches. Of this, 10.6 inches, or about 18 percent, usually falls in the period November through March. The growing season for most vegetable crops is included in this period. The heaviest one-day rainfall during the period of record was 16 inches in April 1979. Thunderstorms occur about 74 days each year, and most occur in late afternoon *(22)*.

Hurricanes occasionally strike the survey area, especially in September and October. Damaging hurricanes occurred in October 1906, September 1926, November 1935, September 1945 and 1947, October 1950, September 1960, August 1964, and September 1965 *(22)*.

The average relative humidity in midafternoon is about 74 percent. Humidity is higher at dawn, when the average is about 84 percent. The sun shines 78 percent of the time possible in summer and 66 percent in winter. The prevailing wind is from the east-southeast.

History and Development

Tekesta Indians were the first known permanent settlers in the survey area. They were encountered by Ponce de Leon in 1513. They were nonagricultural and lived by hunting, fishing, and trading with other tribes and later with the Spanish. Their numbers were greatly reduced by disease and by warfare

with the Creek Indians. The final 80 families moved to Cuba with the Spanish in 1763. The survey area evidently was completely depopulated *(9)*. It came under the control of England in 1763. In that year, Spain again was given control of Florida. The Creek Indians, who later became the Seminoles of north Florida, were known to hunt in the Everglades and make raids as far south as Key West, but they were not permanent settlers until after the Tekesta Indians moved to Cuba. By 1830, the Seminoles had taken over and absorbed any remaining tribes. Florida became part of the United States in 1821.

In 1808, the Spanish Government granted John Egan 100 acres of land along the Miami River, in an where Miami is now located. Richard Fitzpatrick established a cotton plantation along the Miami River. Early settlers grew oranges, lemons, limes, bananas, coconuts, and grapes *(4)*.

On July 2, 1838, Congress granted one township near present-day Cutler to Dr. Henry Perrine for the purpose of introducing purely tropical plants and trees to south Florida. In 1847, Dr. Perrine was killed by Seminole Indians before his project was implemented *(4)*.

Dade County was established on February 4, 1836. The present boundaries were established after the formation of Palm Beach County in 1909 and Broward County in 1915. The first county seat was on Indian Key, which was the most important settlement. In 1844, the county seat was moved to Miami. In 1889, it was moved to June. In 1900, it was moved back to Miami. The county was named in honor of Major Francis L. Dade, who along with his troops was killed by Seminoles near what is now Bushnell, Florida, in 1835 *(4)*.

The population of the county began to grow after the Homestead Act of 1866. By 1870, small settlements were established in Biscayne, Lemon City, Ft. Dallas (Miami), Coconut Grove, and Cutler. The settlers supported themselves through hunting, fishing, farming, and making starch from Florida arrowroot. Development was hindered because the only way in or out was by boat. In 1896, Henry Flagler extended a railroad into Miami. By 1900, the population had grown to 5,000. In 1915, Dixie Highway, which linked Miami with the rest of the country, was completed.

Construction of water-control structures, which began in 1906 and continues to the present, has allowed farming and urban development in areas in the Everglades that originally were too wet for these uses. A period of large-scale land development and increasing population occurred in the county from 1920 through 1926. The takeover of Cuba by Fidel Castro in 1959 triggered the migration of 500,000 people to the county. The addition of the Mariel Refugees in 1980 also increased the population of the county.

Geomorphology

Richard A. Johnson, Florida Geological Survey, Bureau of Geology, Department of Natural Resources, helped prepare this section and the sections "Geology" and "Hydrogeology".

This survey area is on the southeastern peninsula of Florida, in the southern or distal zone. The area is divided into the Everglades Trough, the Atlantic Coastal Ridge (Miami Ridge), the Southern Slope, and the Gulf Coastal Lagoons (fig. 2).

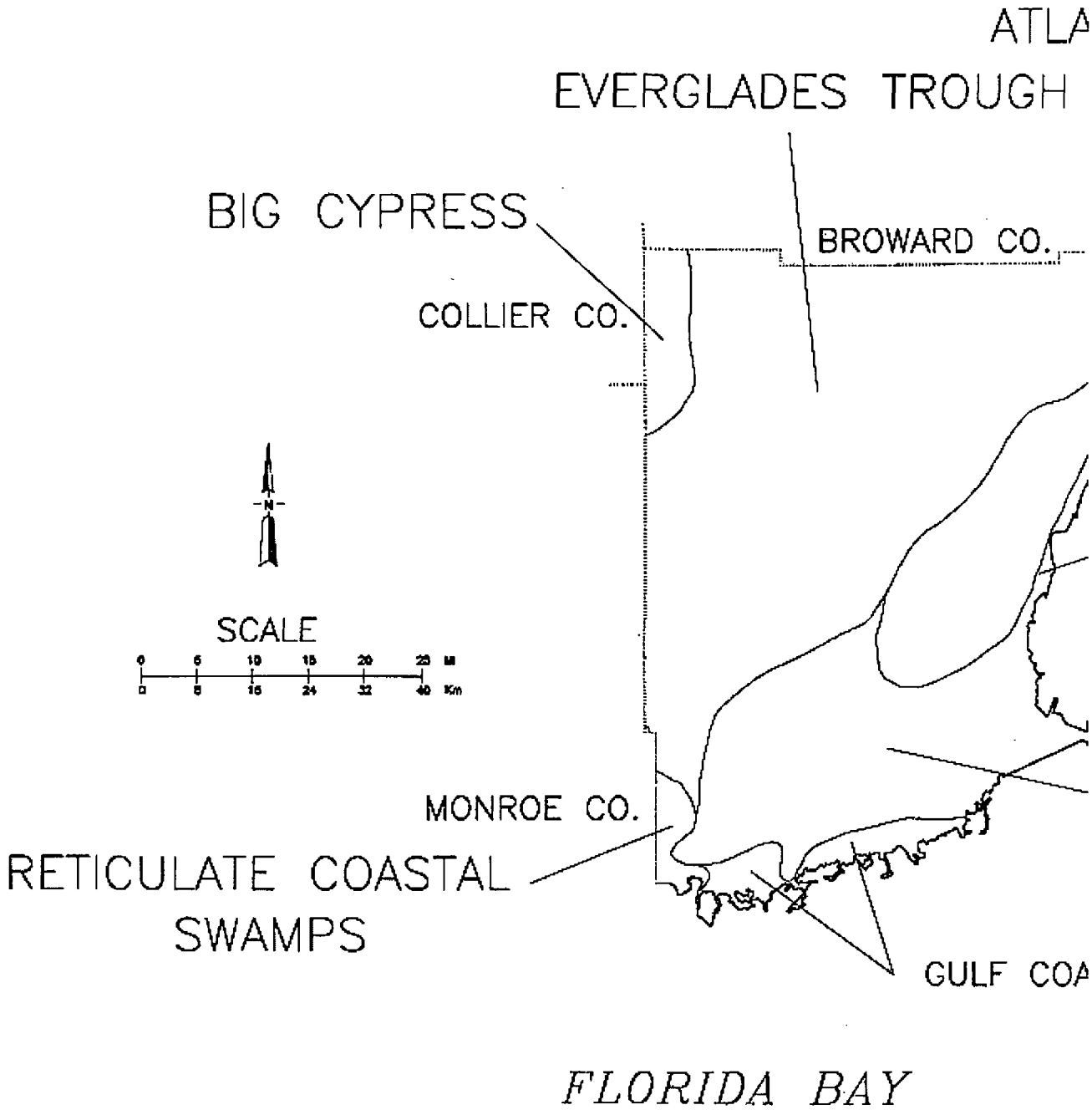


Figure 2.—Geomorphological areas of Dade County.

Most of the northern and western parts of the survey area are made up of the Everglades Trough. This trough formed when dissolution of the underlying limestone lowered the land surface to below the water table.

The Miami Ridge is the southern extension of the Atlantic Coastal Ridge, which extends along the eastern Atlantic shore of Florida south from the vicinity of Jacksonville. The Miami Ridge is along most of the eastern coast of the survey area. In this area, it is made up of oolitic limestone, which formed as a broad, low shoal under warm, shallow marine water during a period of higher Pleistocene

sea level, beginning about 2 million years ago. Because of tidal action, swales cut into the top of the ridge generally have a northwest-southwest orientation. A wave-cut cliff, or scarp, formed along the southeast edge of the ridge during a period of higher sea level. This cliff has been called the Silver Bluff Scarp *(12)*.

On aerial photographs the Southern Slope shows a parallel pattern of drainage within an area that generally is covered by water. The apparent parallelism is caused by the coalescence of small islands of trees into linear strings of vegetation. Two small areas of Gulf Coastal Lagoons are between the Southern Slope and Florida Bay to the south. These lagoons are more typical of the southwest coast of Florida and barely extend into the survey area at this location.

Geology

The sediments of south Florida are dominated by limestone and dolostone. The survey area is underlain by at least 11,800 feet of these carbonate sediments *(3)*. Only the section of rocks normally encountered when water wells are drilled, generally to a depth of less than 200 feet, is considered in the following discussion of geology. A geological cross section of the survey area is shown in figure 3.

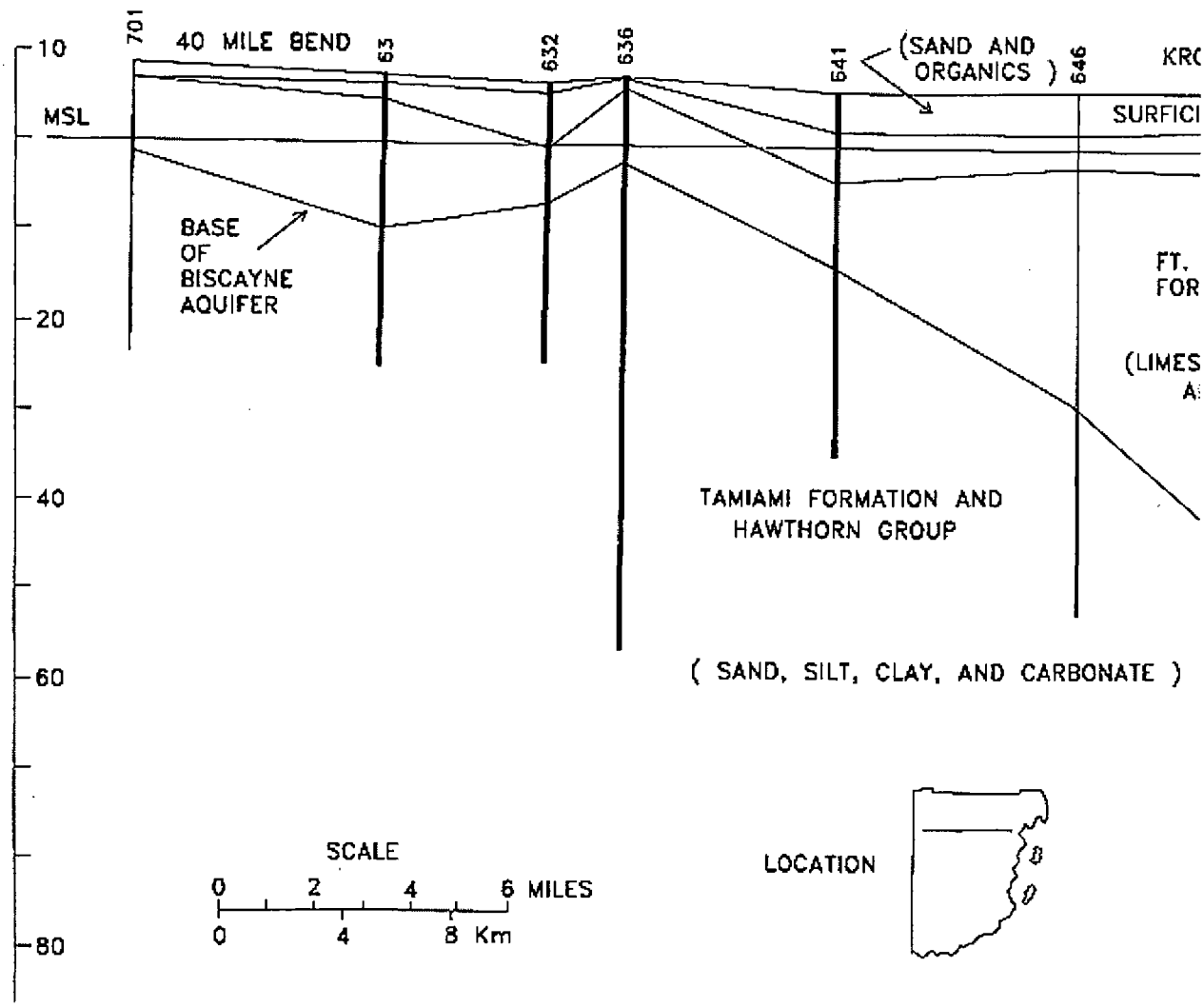


Figure 3.—A geological cross section of Dade County area.

The Hawthorn Group (undifferentiated) consists of interbedded sand, silt, clay, dolostone, and limestone. All of the lithological components are interbedded and intermixed. This group is intermixed throughout with phosphate, generally in the form of sand-sized grains. In this survey area the top of the group consists of sand and clay *(13)* and forms the base of the Biscayne aquifer. The lower part of the group consists of soft or hard, sandy, phosphatic dolostone or limestone. The group attains a thickness of more than 900 feet in the survey area *(14)*. The upper part of the group acts as a confining unit for the Floridan aquifer system, which yields water to flowing wells in the survey area but is not used because the water is saline.

In some areas the Hawthorn Group is overlain by a thin layer of limy sand containing scattered phosphate grains and small quantities of shell material. This bed is probably equivalent to the Tamiami Formation, but not much information is available concerning this formation in this survey area. Where it occurs in the survey area, it probably forms the base of the Biscayne aquifer.

The Caloosahatchee Formation may occur as scattered remnants as much as 25 feet thick in the survey area, but little definite information is available concerning the occurrence of this formation in the area. The formation consists of shells, sand, and some limestone and sandstone.

The Fort Thompson Formation, which consists of interbedded limestone, sand, and shells, is one of the most productive units within the Biscayne aquifer. It averages 50 to 70 feet in thickness and thickens to the east, as shown in figure 3 *(13)*. It typically consists of alternating freshwater and marine sediments, which generally are permeable. The limestone beds in the Fort Thompson Formation can be cavernous and interconnected, thus providing channels through which water can flow.

The Anastasia Formation, a sandy, shelly limestone unit, extends along the Atlantic coast more 150 miles to the north of this survey area. Although it does not occur at the surface anywhere in the survey area, it forms a major part of the Biscayne aquifer in coastal areas, where it is much as 120 feet thick *(13)*. This unit typically has beds of marine limestone, consisting mainly of cemented whole and broken shells (coquina). These beds are extremely permeable. Because they are relatively close to the surface and in close proximity to the ocean, however, the water contained in them can be saline *(10)*.

Key Largo Limestone merges laterally with the Anastasia Formation and with Miami Limestone in the southern and east-central parts of the survey area *(13)*. This formation is at the surface throughout the upper keys, but in this survey area it is generally below the surface. It consists of hard limestone derived from coral, algae, and some shells. It is as much as 60 feet thick in the survey area *(13)*. It is essentially a fossil reef, which formed during a period of higher Pleistocene sea level. It typically is very porous and is a very prolific water-producing part of the Biscayne aquifer *(13)*.

Miami Limestone is at or near the surface in almost all of the survey area. This formation is a soft,

oolitic limestone that is generally less than 40 feet thick *(12)*. It characteristically contains large quantities of ooliths, which are small, spherical particles formed when calcite or aragonite was deposited in concentric layers around a nucleus of some type. Miami Limestone is considered to be a part of the Biscayne aquifer. It is a good source of water, although it yields less water than the underlying formations and does so less easily.

Limestone is the primary mineral resource in the survey area. It is mined from below water level by draglines in at least 31 pits *(5)*. Most of the pits are mined for Miami Limestone. Some of the pits in the north-central part of the survey area, however, are mined for material similar to Tamiami Limestone, which is at the surface in Collier County, along the Tamiami Trail. The limestone is used as a source of base material for roads, in the manufacture of cement products, and in a variety of other ways.

Hydrogeology

The Biscayne aquifer of the surficial aquifer system provides copious quantities of water to wells in the survey area. It extends from the surficial material near or at the surface to a depth of almost 200 feet in the northeast corner of the county *(13)*. The base of the aquifer is generally considered to be the deepest porous limestone bed in the section above the relatively impermeable sand, silt, and clay of the Hawthorn Group or "tight" sand in the Tamiami Formation *(13)*. The water in the aquifer begins as rainfall, which percolates into the sand or limestone at the surface and flows by gravity below the water table, where it can be tapped by wells. Most wells that are not municipal or commercial are less than 100 feet deep and have casing that extends from the surface to below the water table. Many commercial or municipal wells are 100 to 200 feet deep. The lower part of all the wells is left uncased in the limestone or shell beds. The water is derived from these beds. The formations that make up the Biscayne aquifer are identified in the section "Geology."

Because of relatively low elevations throughout the survey area and a close proximity to the ocean, salty ocean water moving into canals toward the west can infiltrate the Biscayne aquifer during dry periods, when the amount of rainfall is low. The upward flow of saline water toward the surface and evaporation at the surface can cause contamination of the soil by salt in agricultural areas and elsewhere *(10)*.

Transportation Facilities

This survey area is served by several major highways. U.S. Highway 1 runs in a north-south direction in the eastern part of the survey area. It is the only highway that runs the entire length of the county. Highway A1A connects the barrier islands. U.S. Interstate 95 runs in a north-south direction, merging with U.S. Highway 1 in Miami. The Homestead Extension of the Florida Turnpike runs in a north-south direction near the center of the survey area. It connects with U.S. Highway 1 near Florida City. Okeechobee Road (U.S. Highway 27) runs in a northwest-southeast direction, connecting Miami with the Homestead Extension and with Krome Avenue (County Road 997). Krome Avenue runs in a north-south direction from the Homestead Extension to near the north end of the county. It is the westernmost through road. Tamiami Trail (U.S. Highway 41) runs in an east-west direction. It is the only road that runs across the entire width of the county. State Road 9 extends from U.S. Highway 1 north into Broward County. U.S. Highway 441 parallels U.S. Interstate 95 north into Broward County.

Miami is served by a complex urban loop highway system, a commuter rail, and a bus system. Seven

Miami is served by a complex urban loop highway system, a commuter rail, and a bus system. Seven bridges connect the barrier islands with the mainland. The Port of Miami receives goods from and ships them to areas throughout the world. The port also serves as a point of departure for many cruise ships.

Two railroad lines serve the survey area. Amtrack service is available from Miami. Access to the Intracoastal Waterway and the Atlantic Ocean is readily available. Miami International Airport is a major metropolitan airport. It provides direct flights to many parts of the world. Other commercial airports include Homestead General Aviation Airport, New Tamiami Airport, Opa-Locka Airport, and Opa-Locka West Airport. The survey area has many private landing fields.

How This Survey Was Made

This soil survey updates the survey of Dade County published in 1958 *(18)*. It describes the soils to a greater depth than the previous survey. Many of the soil and map unit names have been changed because of new information. Though some soil boundaries have been readjusted, most are essentially the same as those in the original survey.

Soil scientists made this survey to learn what soils are in the survey area, where they are, and how they can be used. They observed the steepness, length, and shape of slopes; the size of streams and the general pattern of drainage; and the kinds of native plants or crops. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the parent material, which has been changed very little by leaching or by plant roots.

The soil scientists recorded the characteristics of the profiles that they studied and compared those profiles with others in nearby counties and in more distant places. They classified and named the soils according to uniform nationwide procedures. They drew the boundaries of the soils on aerial photographs. These photographs show trees, buildings, fields, roads, and other details that help in drawing boundaries accurately. The soil maps at the back of this publication were prepared from aerial photographs.

The areas shown on a soil map are called map units. Most map units are made up of one kind of soil. Some are made up of two or more kinds. The map units in this survey area are described under the headings "General Soil Map Units" and "Detailed Soil Map Units."

While a soil survey is in progress, samples of some soils are taken for laboratory measurements and for engineering tests. The characteristics of all the soils are determined through field tests. Interpretations of those characteristics may be modified during the survey. Data are assembled from other sources, such as test results, records, field experience, and State and local specialists. For example, data on crop yields under defined management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Only part of a soil survey is done when the soils have been named, described, interpreted, and delineated on aerial photographs and when the laboratory data and other data have been assembled. The mass of detailed information then should be organized so that it can be used by farmers, woodland managers, engineers, planners, developers and builders, home buyers, and others.

Soil Classification and Soil Mapping

After describing the soils in a survey area and measuring or characterizing their properties, soil scientists systematically classify the soils into taxonomic classes that have a specified range of characteristics. The system of taxonomic classification used for soils in the United States, described in "Soil Taxonomy" *(19)*, has categories that are based mainly on the kind and character of soil properties and the arrangement of soil horizons within the profile. Once the individual soils in a survey area are classified, they can be compared and correlated with similar soils in the same taxonomic class that have been recognized in other areas.

Soils occur on the landscape in an orderly pattern that is related to the geology, the landforms, and the vegetation. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils in the survey area and relating their position to specific segments of the landscape, the soil scientists can evolve a concept, or model, of how the soils formed. During mapping, this model enables the soil scientists to predict with a considerable degree of accuracy the location of specific soils on the landscape.

Individual soils on the landscape commonly merge into one another as their characteristics gradually change. To construct an accurate soil map, the soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Compared to the whole three-dimensional soil volume, the areas examined are little more than points. These few observations, however, supplemented by an understanding of the soil-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries. The delineated map units are based on inferences derived from this small sample.

A ground-penetrating radar (GPR) system and hand transects were used to document the type and variability of the soils occurring in the map units *(7, 8, 11, 15)*. The GPR system was used successfully on all soils to measure the depth to and determine the variability of major soil horizons or other soil features. In this survey area 133 random transects were made by GPR or by hand. Information from notes and ground-truth observations made in the field were as used, along with radar data, to classify the soils and to determine the composition of map units. The map units described in the section "Detailed Soil Map Units" are based on these data and on data in the survey published in 1958.

Soil Variability and Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area dominated by two or three kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. These areas of differing soils are called inclusions.

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are referred to as similar

inclusions. Their properties are noted in the description of the dominant soil or soils. Some inclusions have properties and behavior different enough to affect use or require different management. They genarally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The dissimilar inclusions are mentioned in the map unit descriptions. A few inclusions may not have been observed and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soil on the landscape.

The presence of inclusions in a map unit in no way diminishes the usefulness or accuracy of the soil data. The objective of soil mapping is not to delineate pure taxonomic classes of soils but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but onsite investigation is needed to plan for intensive uses in small areas.

Confidence Limits of Soil Survey Information

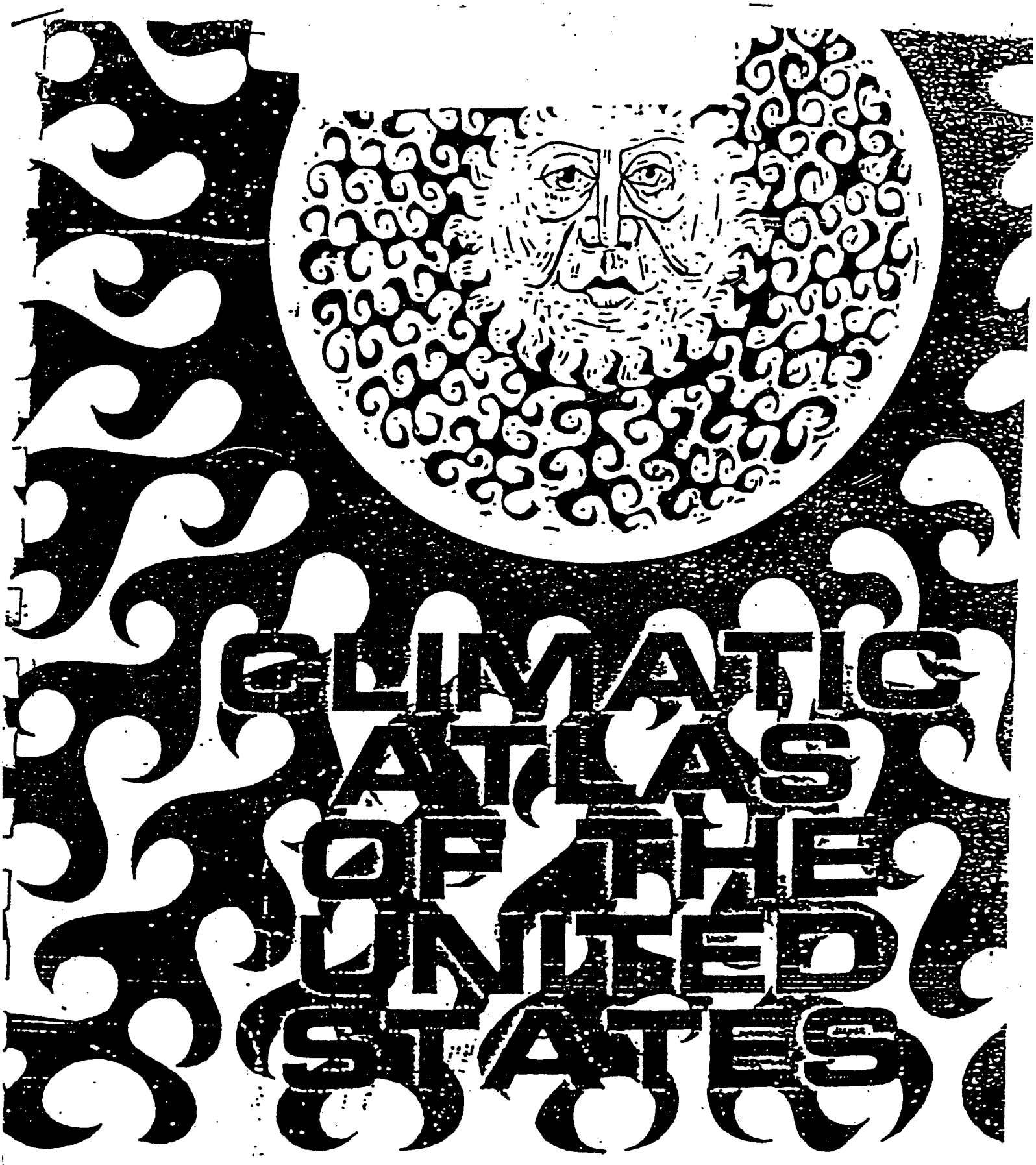
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods, but they are not so predictable from year to year. For example, soil scientists can predict with a fairy high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot assure that a high water table will always be at a specific level in the soil on a specific date.

Confidence limits in soil surveys are statistical expressions of the probability that a soil property or the composition of a map unit will vary within prescribed limits. These limits can be assigned numerical values based on a random sample. In the absence of specific data for determining confidence limits, the natural variability of soils and the way soil surveys are made must be considered. The composition of map units and other information are derived largely from extrapolations made from a small sample. Also, information about the soils does not extend below a depth of about 6 feet. The information in the soil survey is not meant to be used as a substitute for onsite investigation. Soil survey information can be used to select from among alternative practices or general designs that may be needed to minimize the possibility of soil-related failures. It cannot be used to interpret specific points on the landscape.

Specific confidence limits for the composition of map units in this survey area were determined by random transects made by ground-penetrating radar or by hand across mapped areas. The data are given in the description of each soil under the heading "Detailed Soil Map Units." Soil scientists made enough transects and took enough samples to characterize each map unit at a specific confidence level. For example, map unit 40 was characterized at a 95 percent confidence level based on transect data. The composition is described as follows: "On 95 percent of the acreage mapped as Pomello sand, Pomello and similar soils make up 98 to 99 percent of the mapped areas." On the other 5 percent of the acreage, the percentage of Pomello and similar soils may be higher than 99 percent or lower than 98 percent.

The composition of some map of the units in this survey area, such as Urban land and other miscellaneous areas, was determined on the basis of the judgment of the soil scientist rather than by a statistical procedure.

Reference 13



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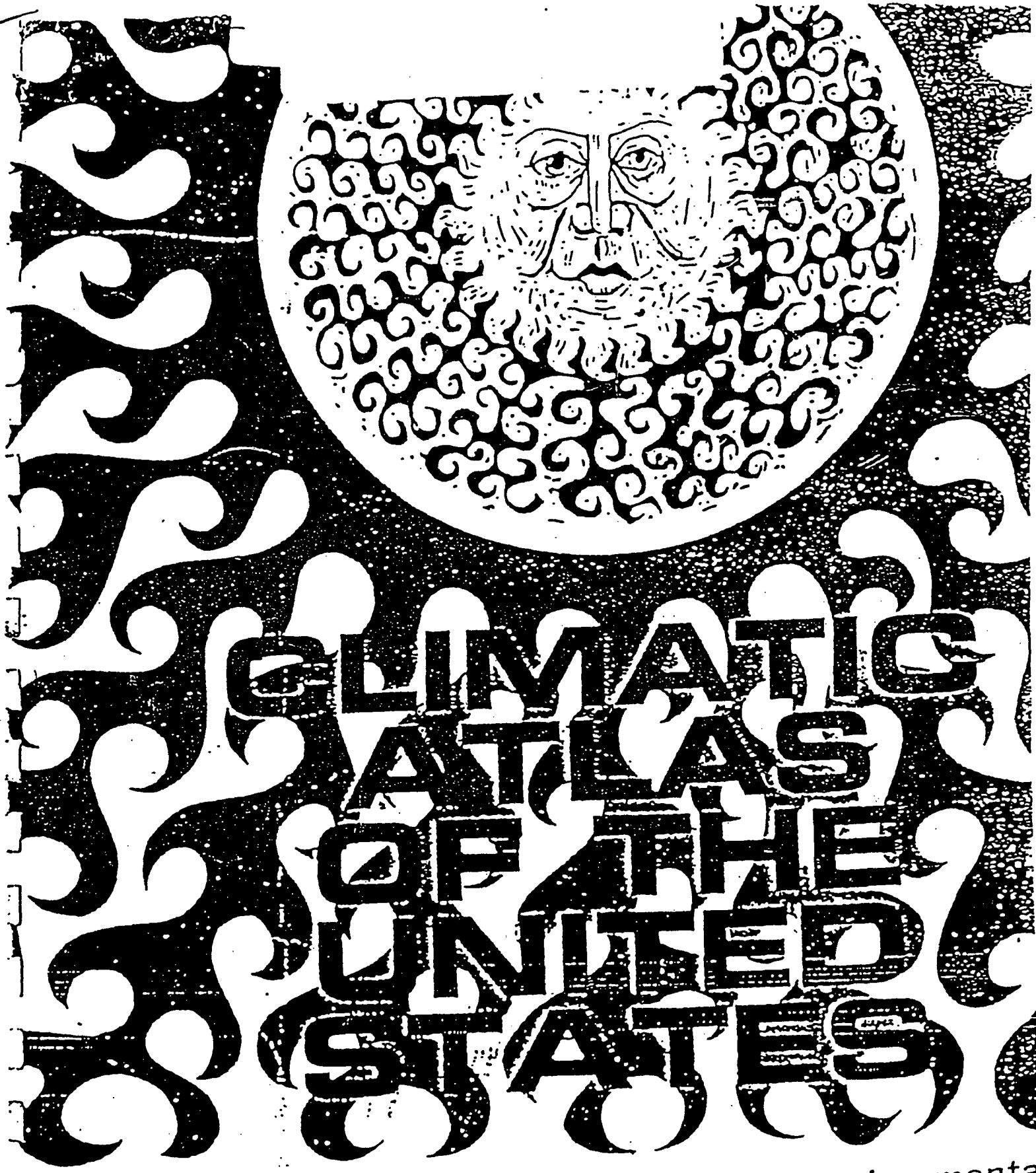

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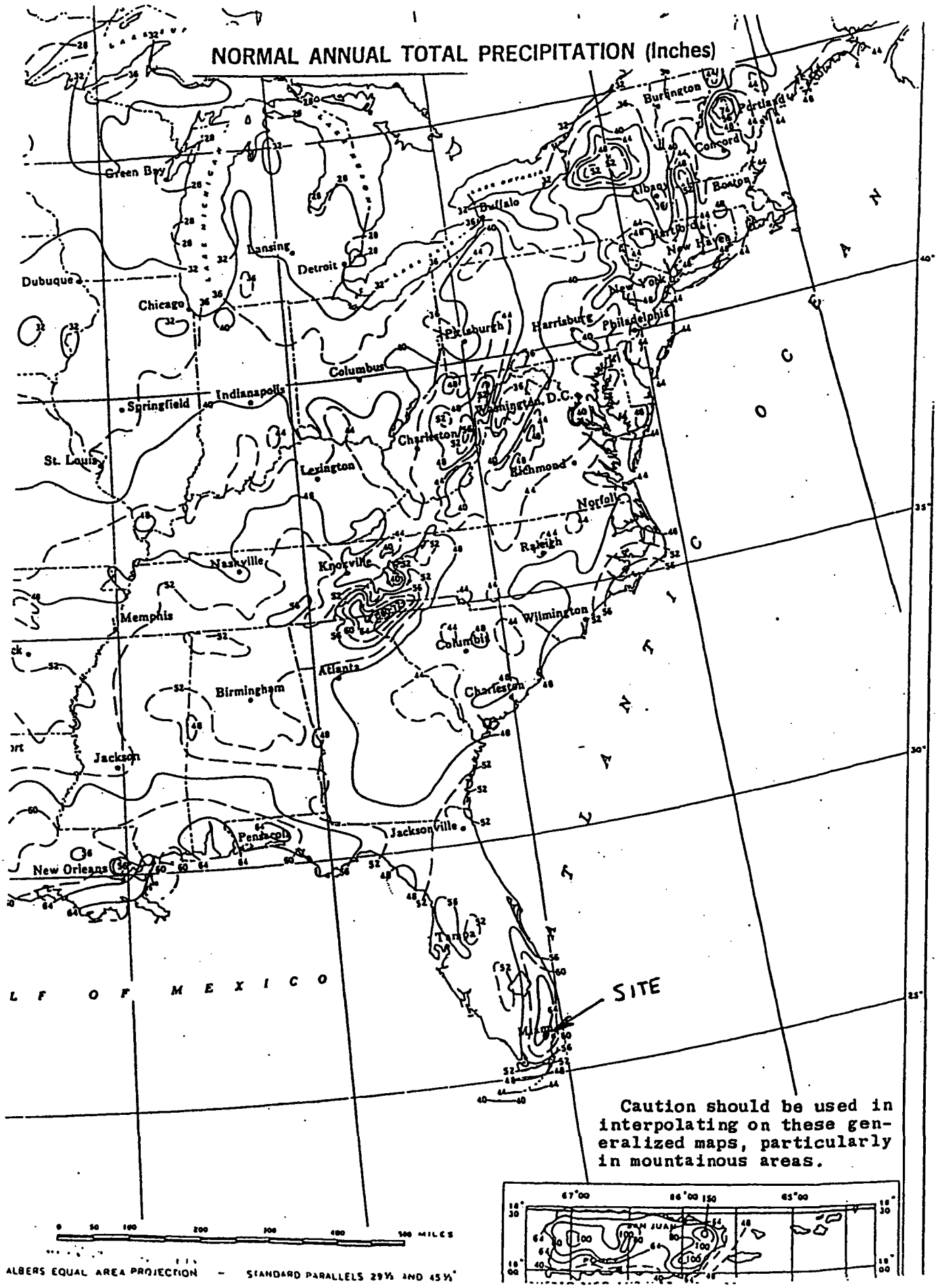

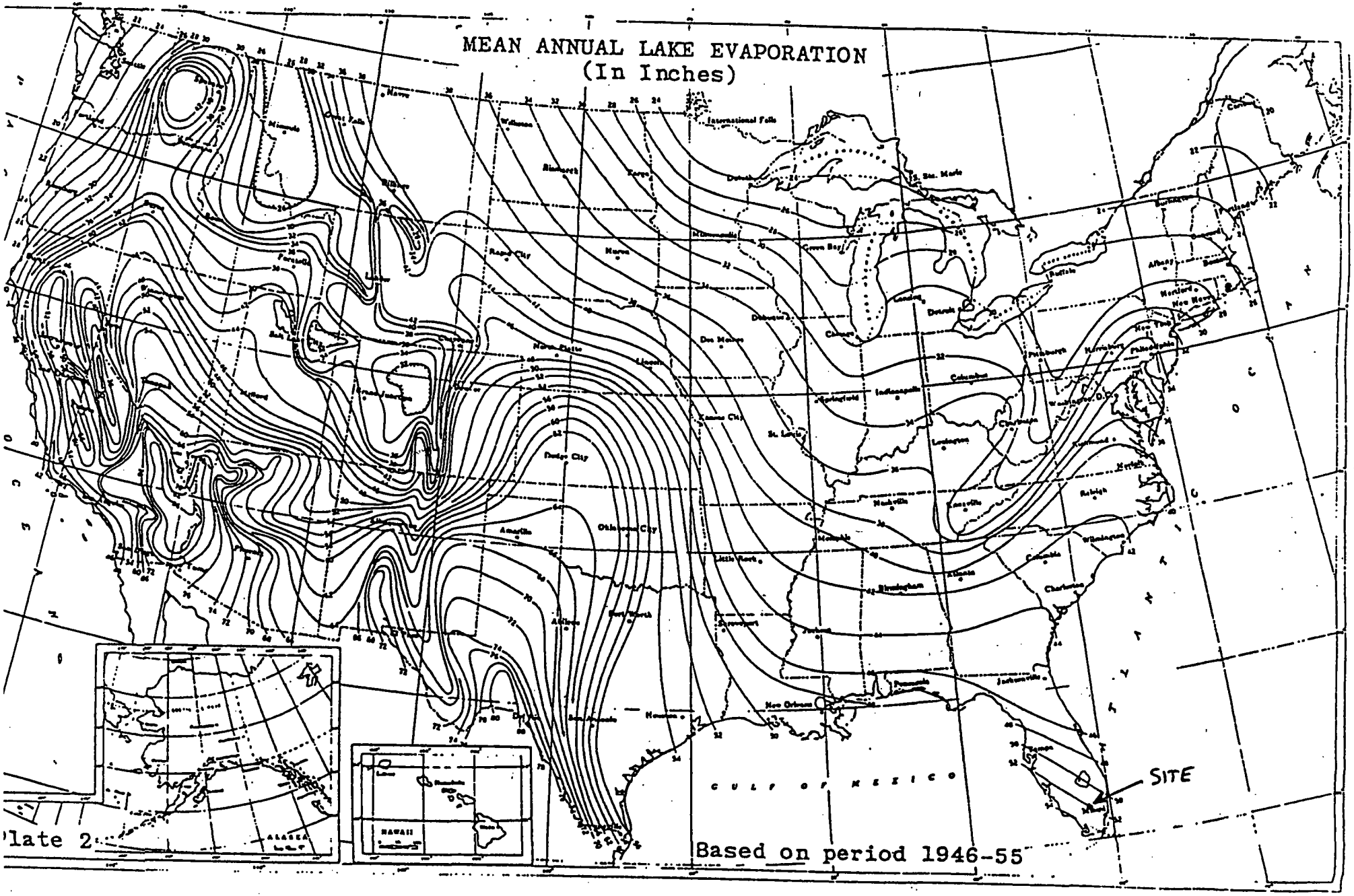
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Plate 2

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for Durations from 30 Minutes to 24 Hours and Return Periods from 1 to 100 Years

Prepared by
DAVID M. HERSHFIELD
Cooperative Studies Section, Hydrologic Services Division
for
Engineering Division, Soil Conservation Service
U.S. Department of Agriculture

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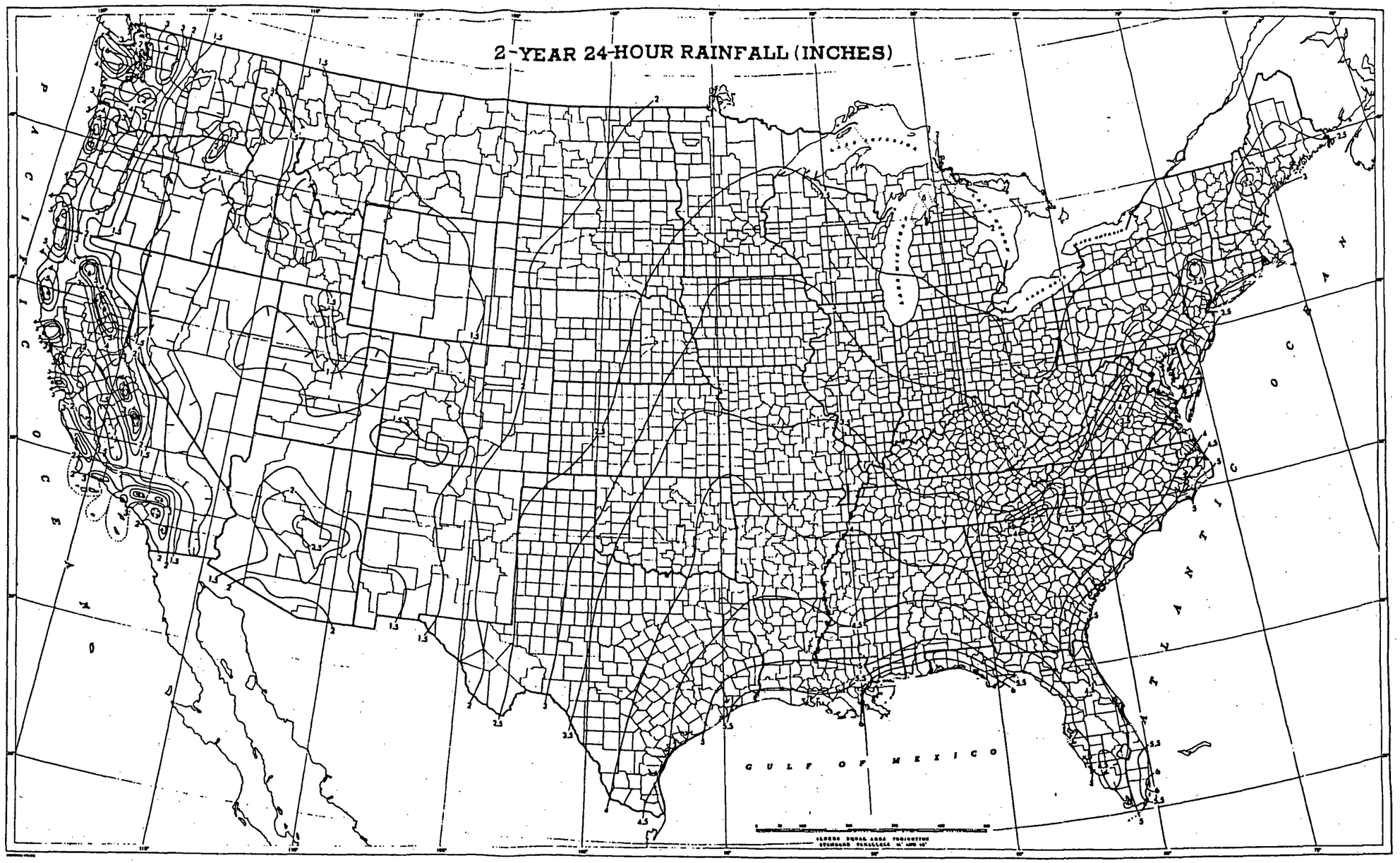
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Reference 15

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Jiny's Learning Ctr (305) 819-3004
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Kiddie Wonderland Inc (305) 887-9330
2863 W 2nd Ave, Hialeah, FL 33010
Smartpage Map Driving Directions SearchNear SaveThis

Kids Day Care & Kindergarten (305) 825-8666
1301 W 68th St, Hialeah, FL 33014
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Kid's Love (305) 824-1612
375 E 49th St, Hialeah, FL 33013
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Kid's Play House (305) 362-4009
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La Scala Pre-School Learning (305) 558-6600
499 E 21st St, Hialeah, FL 33013
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21 E 59th St, Hialeah, FL 33013

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Marisol Torres (305) 557-2231
6878 NW 169th St, Hialeah, FL 33015

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14 W 45th Pl, Hialeah, FL 33012

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My Child's Dream Day Care (305) 822-2885
1570 W 43rd Pl Ste 15, Hialeah, FL 33012

Smartpage Map Driving Directions SearchNear SaveThis

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New Aladdin Learning Ctr (305) 362-0016
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Smartpage Map Driving Directions SearchNear SaveThis

Nubia Serna Child Care (305) 829-7975
7324 Fox Chapel Dr, Hialeah, FL 33015
Smartpage Map Driving Directions SearchNear SaveThis

Nuestra Sra De Lourdes Nrsry (305) 822-2645
1164 W 71st St, Hialeah, FL 33014
Smartpage Map Driving Directions SearchNear SaveThis

Nuevo Amanecer Day Care (305) 826-2024
10550 NW 77th Ct Ste 211, Hialeah, FL 33016
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Nuevo Amanecer Daycare (305) 362-1112
5042 W 12th Ave, Hialeah, FL 33012
Smartpage Map Driving Directions SearchNear SaveThis

Saint Cecilia Day Care Ctr (305) 885-6034
1040 W 29th St, Hialeah, FL 33012
Smartpage Map Driving Directions SearchNear SaveThis

Silvia's School (305) 822-9757
7091 W 14th Ct, Hialeah, FL 33014
Smartpage Map Driving Directions SearchNear SaveThis

Snow White & the Seven Dwarfs (305) 825-1477
2400 W 56th St, Hialeah, FL 33016
Smartpage Map Driving Directions SearchNear SaveThis

Thumbelina Learning Ctr (305) 362-0622
3670 E 4th Ave, Hialeah, FL 33013

Smartpage Map Driving Directions SearchNear SaveThis

Thumbelina Learning Ctr (305) 836-0535
490 E 32nd St, Hialeah, FL 33013

Smartpage Map Driving Directions SearchNear SaveThis

We Love Kids Day Care Ctr (305) 885-2490
891 W 29th St, Hialeah, FL 33012

Smartpage Map Driving Directions SearchNear SaveThis

William Lehman Child Day Care (305) 556-8223
7605 W 10th Ave, Hialeah, FL 33014

Smartpage Map Driving Directions SearchNear SaveThis

Wise Kids Daycare (305) 821-7336
2360 W 68th St Ste 111, Hialeah, FL 33016

Smartpage Map Driving Directions SearchNear SaveThis

Wiz Kids Learning Ctr (305) 823-0668
6883 W 4th Ave, Hialeah, FL 33014

Smartpage Map Driving Directions SearchNear SaveThis

Wonderland Daycare Ctr (305) 887-1955
55 W 29th St, Hialeah, FL 33012

Smartpage Map Driving Directions SearchNear SaveThis

Young America Child Care Ctr (305) 836-7578
600 E 24th St, Hialeah, FL 33013

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Reference 16

Ecosystems of Florida

Edited by Ronald L. Myers and John J. Ewel

Foreword by Marjorie H. Carr

ning about 25 to 20 MYBP, to bring clastic sediments that eventually nearly covered the carbonate plateau. This transgression of clastic sediments marked the start of the Miocene epoch in Florida (Vernon and Puri, 1964; Cooke, 1945). Some of the Miocene and younger sediments contained large amounts of phosphorite, attapulgite (Fuller's earth), kaolin, and heavy minerals (Vernon and Puri, 1964; Riggs, 1984; Pirkle et al., 1977).

Post-Oligocene orogeny also produced two areas of pronounced uplift: the Ocala Uplift and the Marianna Structural High (also known as the Chattahoochee Arch). These two areas—associated respectively with the Ocala Uplift and Dougherty Karst physiographic districts (fig. 3.2)—have little or no Miocene sediment and today are areas of outcrop of Eocene and Oligocene carbonates (Vernon and Puri, 1964; Brooks, 1982).

Due to the dominance of carbonate-rich rocks in Florida's geology, karst topography is widespread. Karst is defined as "a landscape, generally lacking

Fig 3.1 (*continued*)

Pleistocene:

- Qa: Anastasia Formation (limestone, sand, clay)
- Qc: Caloosahatchee Formation (sand, shell marl)
- Qf: Fort Thompson Formation (shell, marl, clay, sand)
- Qk: Key Largo Limestone (coral reef limestone)
- Qm: Miami Oolite (oolitic limestone)

Plio-Pleistocene:

- Pc: Citronelle Formation (sand, gravel, clay)

Miocene:

- Ma: Alachua Formation (clay, sand, sandy clay)
- Mb: Bone Valley Formation (phosphatic boulders, pebbles, sandy clay)
- Mc: Chipola Formation (marl, sandy limestone, sand, clay)
- Mf: Fort Preston Formation (sand)
- Mh: Hawthorn Formation (phosphatic sand, clay, marl, sandy limestone)
- Mj: Jackson Bluff Formation (sand, marl)
- Mm: Miccosukee Formation (silty, clayey sand)
- Mr: Red Bay Formation (sandy and clayey marl)
- Ms: Shoal River Formation (sand)
- Mt: Tamiami Formation (limestone, marl, sand, clay)
- Mu: Miocene Undifferentiated (includes small areas of Mc, Mf, Mh, Mj, and Ms)

Oligocene:

- Os: Suwannee Limestone (limestone, dolomitized limestone)
- Ou: Oligocene Undifferentiated (limestone, fossiliferous sediment)

Eocene:

- Ea: Avon Park Limestone (limestone, dolomite)
- Ec: Crystal River Formation (limestone)
- Ei: Inglis Formation (limestone, dolomite)
- Ew: Williston Formation (limestone, dolomite)

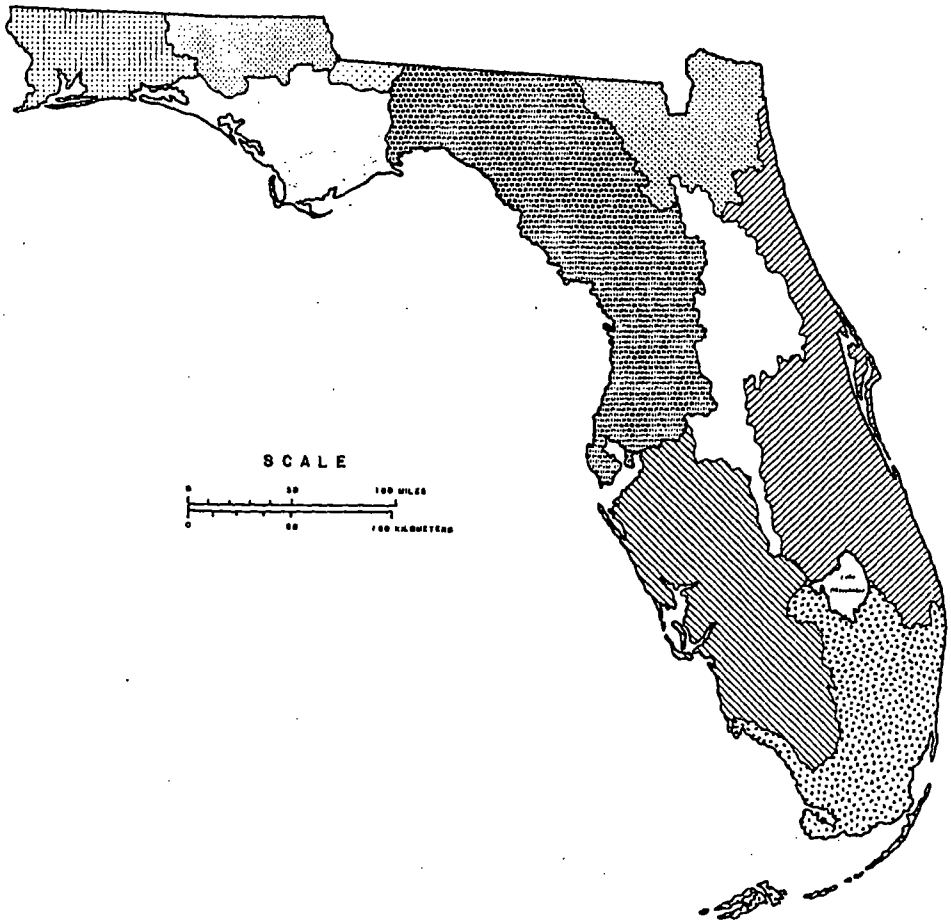

Fig. 3.2. Generalized physiographic map of Florida. Adapted from Brooks, 1982.

- Sea Island District. Mostly pine flatwoods, dunes, and salt marshes.
- Eastern Flatwoods District. Mostly pine flatwoods, prairies, cypress domes, dunes, and mangroves.
- Gold Coast—Florida Bay District. Mostly sawgrass and other marshes, dwarf cypress, prairies, calcareous rockland, and mangroves.
- Southwestern Flatwoods District. Mostly pine flatwoods, prairies, cypress domes, dwarf cypress, mangroves, and dunes.
- Central Lake District. Mostly sandhills and sand pine scrub.
- Ocala Uplift District. Mostly mixed hardwood forest, pine flatwoods, and sandhills.
- Tifton Upland District. Mostly pine and mixed hardwood forests.
- Dougherty Karst District. Mostly pine and mixed hardwood forests.
- Apalachicola Delta District. Mostly pine flatwoods, mixed hardwood swamps, salt marshes, and dunes.
- Southern Pine Hills District. Mostly pine and mixed hardwood forests, sandhills, and dunes.

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in rivers, marked by sinkholes and caves; formed because the underlying rock dissolves more easily than most rocks" (Beck and Sinclair, 1986). Sinkhole formation is part of the natural process of landscape evolution in Florida, which has led to the many lakes and closed depressions so characteristic of the state. Sinkholes are formed by solution of near-surface limestone or limy materials and consequent subsidence or collapse of overlying material into the solution cavities.

Solution sinkholes are the dominant type in terrain having bare or thinly covered limestone, as in much of the Dougherty Karst District, Ocala Uplift District, the south and west parts of the Gold Coast–Florida Bay District, and the extreme southern Southwestern Flatwoods District (fig. 3.2). Solution is most active at the surface of the limestone and is concentrated where cracks in the rock permit water to drain easily to the subsurface. Rather than forming large voids, the cover material gradually subsides as the limestone surface dissolves, leaving a bowl-shaped depression. If surface runoff carries clayey sediment into the depression, a lake or marsh may form. Thus are formed the gently rolling hills and shallow depressions typical of these thinly covered limestone areas (Beck and Sinclair, 1986; Sinclair and Stewart, 1985).

Where the sedimentary cover over limestone is 10 to 60 m thick and consists of relatively incohesive, permeable materials, cover subsidence sinkholes tend to predominate. This kind of sinkhole is found in the central and southern Eastern Flatwoods District, the northeastern Gold Coast–Florida Bay District, and the south-central part of the Southwestern Flatwoods District (fig. 3.2), though sinkholes of any type are comparatively rare in these regions. Solution cavities that develop initially along cracks in the limestone are propagated upward as overlying sands move downward to fill the voids. Sinkholes formed in this way often are only a few meters in diameter and depth, because the limestone cavities quickly fill with sand (Beck and Sinclair, 1986; Sinclair and Stewart, 1985).

Where the sedimentary cover is 10 to 60 m thick but a dense layer of impermeable clay—such as the Hawthorn formation (fig. 3.1)—occurs between the overlying sandy material and the underlying limestone, cover collapse sinkholes dominate. This situation occurs in much of the Central Lake District, on the fringes of the Ocala Uplift District, in the northern part of the Eastern Flatwoods District, and in the northern part of the Southwestern Flatwoods District (fig. 3.2). Here sinkholes are numerous and of varying size and develop abruptly. The clay forms a bridge over a developing cavity in the limestone. Eventual failure of the bridge results in a cover collapse sinkhole that may be small or very large (Beck and Sinclair, 1986; Sinclair and Stewart, 1985).

Sinkholes are rare where the cover is more than about 60 m thick, as in the north-central Southwestern Flatwoods District, the Sea Islands District, the Tifton Upland District, the Apalachicola Delta District, and the South-

ern Pine Hills District. A dearth of sinkholes is reflected in the better defined stream patterns that can be seen on topographic maps, air photos, and satellite images of these areas, in contrast to most other parts of the state where closed depressions are common. A few large, deep, cover collapse sinkholes do occur in these areas of thick cover, however, as does small-scale subsidence where shell beds or limestone lenses are buried at shallow depths (Beck and Sinclair, 1986; Sinclair and Stewart, 1985; Brooks, 1982).

Physiography

The topography of Elorida is the result of erosional, depositional, and solution-related processes that have sculptured the land over time. Step-like surfaces or terraces, variously dissected by erosional processes, are thought to range in age from Recent (less than about 10,000 YBP) in the case of the lowest coastal terraces to possibly as old as Miocene (about 5 to 25 MYBP) in the case of the highest surfaces of Panhandle, north-central, and central Florida (Healey, 1975). Ten major physiographic subdivisions of Florida are outlined here (Brooks, 1982; Caldwell and Johnson, 1982).

Sea Island District

The Sea Island District of northeastern Florida is the only Florida portion of what Brooks (1982) calls the Atlantic Coastal Plain Section of the Coastal Plain Physiographic Province. In most parts of this district, the underlying limestone is too thickly covered by overburden to influence the landscape or drainage. The landscape ranges from upland terraces, with variable or no dissection, to plains and ridges. Surficial materials are dominantly sandy, but significant expanses of relatively clayey deposits exist.

Eastern Flatwoods District

This generally low, flat district originated as a sequence of barrier islands and lagoons in Plio-Pleistocene and Recent times. The resulting landscape consists of broad expanses of flatwoods with prairies, ridges, and a variety of coastal features. Surficial materials are primarily sandy with significant areas of peaty deposits.

Gold Coast–Florida Bay District

This uniformly low-lying district includes the area of sluggish south and southeastward drainage from Lake Okeechobee (i.e., the Everglades), together with coastal ridges, mangrove swamps, and the Florida Keys. Rocks are Pleistocene and largely limestones (fig. 3.3). The covering materials are dominantly sand, marl, organic material, and limestone.

Fig. 3.3.
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STATE OF FLORIDA

STATE BOARD OF CONSERVATION

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FLORIDA GEOLOGICAL SURVEY

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REPORT OF INVESTIGATIONS NO. 17

BISCAYNE AQUIFER OF DADE AND BROWARD COUNTIES, FLORIDA

By

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U. S. Geological Survey

Prepared by the

UNITED STATES GEOLOGICAL SURVEY

in cooperation with the

FLORIDA GEOLOGICAL SURVEY

CENTRAL AND SOUTHERN FLORIDA FLOOD CONTROL DISTRICT

DADE COUNTY

CITIES OF MIAMI, MIAMI BEACH and FORT LAUDERDALE

TALLAHASSEE, FLORIDA

1958

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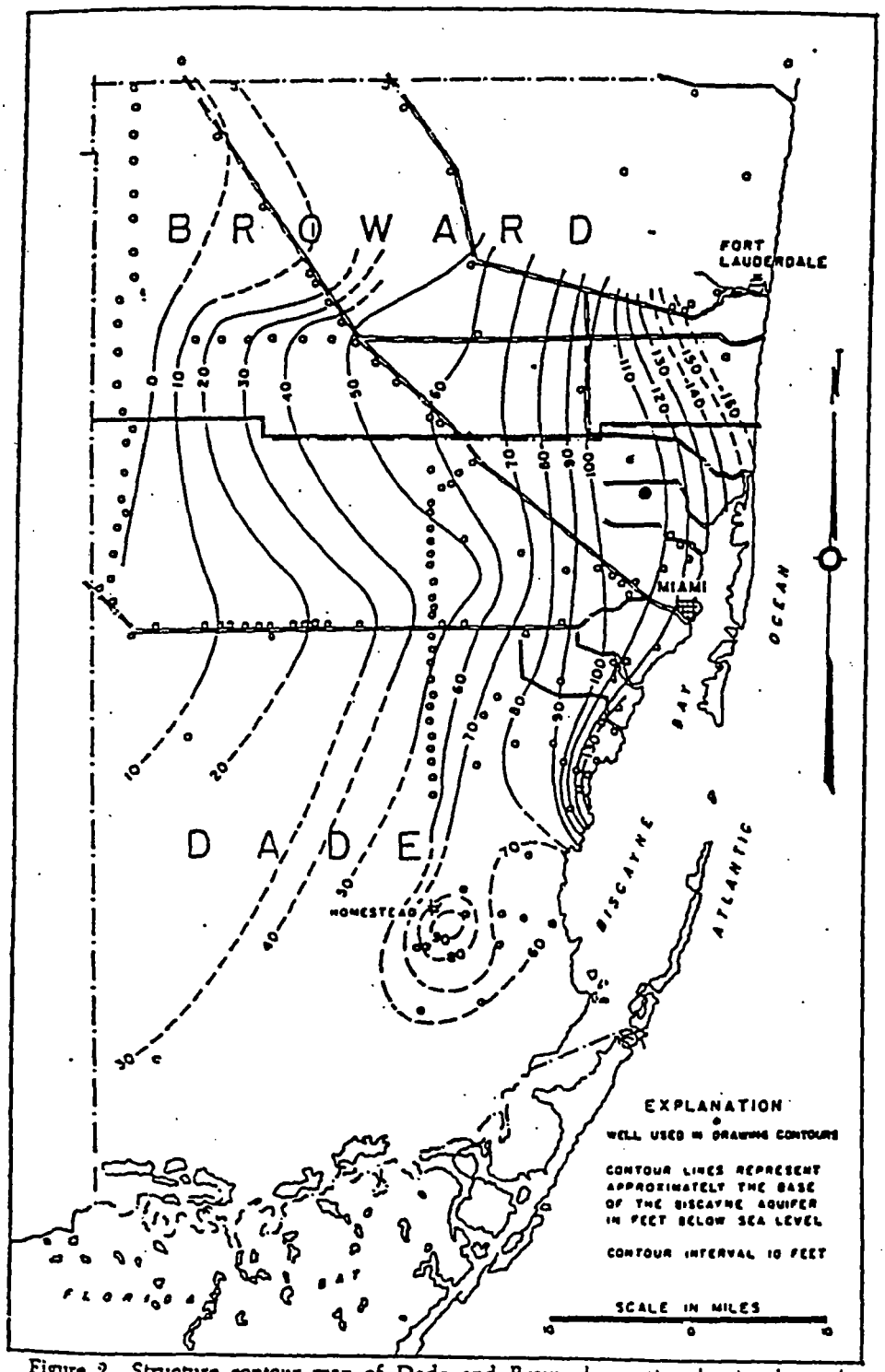

Figure 2. Structure contour map of Dade and Broward counties showing base of Biscayne aquifer.

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LATE CENOZOIC FORMATIONS OF DADE AND BROWARD COUNTIES

Age	*Formation*	*Characteristics*	*Thickness (feet)*
Recent and Pleistocene	Soils	Peat and muck; laterite.	0-12
	Lake Flirt marl	White to gray calcareous mud, rich with shells of *Helisoma* sp., a fresh-water gastropod. In some places casehardened to a dense limestone. Relatively impermeable.	0-6
Pleistocene (Formations are contemporaneous in part)	Pamlico sand	Quartz sand, white to black or red, depending upon nature of staining materials, very fine to coarse, average medium. Mantles large areas underlain by Miami oolite and Anastasia formation.	0-40
	Miami oolite	Limestone, oolitic, soft, white to yellowish, containing streaks or thin layers of calcite, massive to crossbedded and stratified; generally perforated with vertical solution holes. Fair to good aquifer.	0-40
	Anastasia formation	Coquina, sand, calcareous sandstone, sandy limestone, and shell marl. Probably composed of deposits equivalent in age to marine members of Fort Thompson formation. Fair to good aquifer.	0-120
	Key Largo limestone	Coralline reef rock, ranging from hard and dense to soft and cavernous. Probably interfingers with the marine members of the Fort Thompson formation. Crops out along southeastern coast line of Florida from Soldier Key in Biscayne Bay to Bahia Honda. Excellent aquifer.	0-60
	Fort Thompson formation	Alternating marine, brackish-water and fresh-water marls, limestones, and sandstone. A major component of the highly permeable Biscayne aquifer of coastal Dade and Broward counties, which yields copious supplies of ground water.	0-150
Pliocene	Caloosahatchee marl	Sandy marl, clay, silt, sand, and shell beds. Yields ground water less abundantly than most other parts of the Biscayne aquifer.	0-25
Miocene	*Tamiami* formation	Cream, white, and greenish-gray clayey marl, silty and shelly sands, and shell marl, locally hardened to limestone. Upper part, where permeability is high, forms the lower part of the Biscayne aquifer. Lower and major part of formation is of low permeability and forms the upper beds of the aquiclude that confines water in the Floridan aquifer (Ocala and associated limestones) below.	0-100

MIOCENE SERIES

TAMIAMI FORMATION

The Tamiami formation as redefined by Parker (1951, p. 823) i cludes all the upper Miocene materials in southern Florida, includi the Tamiami limestone of Mansfield (1939, p. 8). Excluded from t formation is the "Tamiami" formation of Parker and Cooke (1944, 62-65) in Dade County. Parker and Cooke correlated the limestone th Mansfield found cropping out along the Tamiami Trail in Collier a Monroe counties with the highly permeable limestones and sandston which unconformably underlie the Miami oolite of Pleistocene age in t eastern Everglades and Miami area. Their correlation was based on c tings from percussion-type or cable-tool drilled wells, which penetrat the aquifer, but the comminuted condition of the cuttings preven identification of any fresh-water limestones intercalated with marine lim stones. Subsequent exploratory core drillings in the Everglades and M ami area by the Corps of Engineers, U. S. Army, and the U. S. Geologi Survey revealed the occurrence of fresh-water gastropods in limeston beds underlying the Miami oolite to a depth of 55 feet below sea leve Because the oldest known fresh-water limestones in this region are Pleistocene age, most of the material underlying the eastern Everglad and the Miami area has been tentatively referred to the Pleistocene, b Parker (1951, p. 822, 823), and Hoy and Schroeder (1952, p. 283-28

The Tamiami formation is divisible lithologically and hydrologicall into two units: a relatively impermeable clastic unit, and a permeabl limestone and sandstone unit. The two units have no stratigraphic signi cance, although in many places the clastics form the base and sandstone or limestones the uppermost part of the formation. However, the uni are primarily geographic. Limestone is commonly exposed at the surfac in the outcrop of the Tamiami formation in the Big Cypress Swamp an the Sunniland area; permeable sandstone composes the upper part the formation in the subsurface of the coastal area of Broward Coun and northeastern Dade County. The subsurface Tamiami formation ne Carnestown, Sunniland, and Immokalee in Collier County is a cream white, clayey, shelly marl, which in part has been indurated to a pe meable limestone as a result of water-table fluctuation and ground-wate percolation. Toward the east the formation increases in sand and ma content, and in Dade and Broward counties most of the formation con sists of relatively impermeable clastics composing the upper part of th aquiclude that confines water in the Floridan aquifer, the principal a tesian aquifer of the Florida Peninsula and adjacent area.

PLIOCENE SERIES

CALOOSAHATCHEE MARL

The Caloosahatchee marl is the only Pliocene material found in southern Florida. It was named by Matson and Clapp (1909, p. 123) for the soft, semiconsolidated sediments that form low bluffs along the Caloosahatchee River between La Belle and Denaud in Hendry County.

The Caloosahatchee marl is commonly a light greenish-gray silty, shelly marl, with varying amounts of sand. Sand and shells, occurring both in beds and in lenses, locally form a shell marl. Ground-water movement and exposure to air have locally casehardened and cemented the more sandy and shelly material to a calcareous rock which subsequently has been made permeable by solution of limestone and washing out of clastic material. Generally the formation is relatively impermeable, except locally where very shelly layers or lenses predominate.

The Caloosahatchee marl is known to extend 25 miles southward from Lake Okeechobee where it underlies Pleistocene rocks in the form of thin permeable limestone and sandstone reefs or "shoestring" sands. Present data are not yet sufficient to determine the extent of Pliocene deposits beneath the lower Everglades, but faunal evidence from a well near Kendall suggests the possibility of the occurrence in Dade County of isolated remnants of the Caloosahatchee marl.

It was previously thought by Parker and Cooke (1944, p. 59) that, south of Lake Okeechobee between the Dade-Broward county line and the approximate latitude of Twenty-Six Mile Bend of the North New River Canal, the Caloosahatchee and Tamiami formations were possibly contemporaneous and interfingered in the subsurface. However, more recent exploratory drilling has indicated that this material to about 60 feet below sea level is probably of Pleistocene age. This would mean that the Caloosahatchee marl, which is 30 to 50 feet thick near Lake Okeechobee, thins to 6 feet at a place a mile south of the Broward-Palm Beach county line and the North New River Canal. The marl has not been definitely recognized in well cuttings south of that place in Broward or Dade counties.

PLEISTOCENE SERIES

FORT THOMPSON FORMATION

The Fort Thompson formation is the name applied to the alternating fresh-water and marine limestones and marl beds which unconformably overlie the Caloosahatchee marl at old Fort Thompson 1¾ miles east of La Belle. Originally referred to as the Fort Thompson beds by Sellards

(1919, p. 71, 72), the unit was later named the Fort Thompson formation by Cooke and Mossom (1929, p. 211-215), and was defined to include the overlying marine Coffee Mill Hammock marl. In the lower Everglades the Fort Thompson formation overlies the Tamiami formation, or, where present, erosional remnants of the Caloosahatchee marl, and underlies the Miami oolite unconformably. In the northern part of the area the Fort Thompson is overlain by the younger portion of the Anastasia formation, the Lake Flirt marl, or the Pamlico sand.

The Fort Thompson formation at the type locality is a succession of shelly marine and nonmarine limestones and marls, including three distinct marine beds. The uppermost, the Coffee Mill Hammock member, is a shell marl, consisting chiefly of shells of *Chione cancellata*. The marine marl members are separated by gray, shelly, marl beds, in part indurated to limestone, containing the fresh-water gastropods *Helisoma* and *Ameria*. The fresh-water beds are pierced by vertical and lateral solution cavities formed by ground-water percolations. Subsequent filling of the cavities by marine marls has produced a network of interconnected and isolated marine and fresh-water marls and limestones. In places, holes penetrate the entire thickness of the formation so that the Coffee Mill Hammock member lies directly upon the Caloosahatchee marl of Pliocene age as a solution-hole filling. The alternation of marine and fresh-water beds indicates, according to Parker and Cooke (1944, p. 94-96, fig. 4), onlapping and offlapping seas from the end of Pliocene time through the Sangamon interglacial stage of the Pleistocene.

Core borings of the thick section of permeable limestone and sandstone in the lower Everglades, between the Miami oolite and the Tamiami formation, similarly show interbeds and cavity fillings of fresh-water limestone with marine limestone (figs. 4-9). This interbedded material forms the major part of the Biscayne aquifer and, as previously mentioned, has been tentatively correlated by Hoy and Schroeder (1952, p. 283-286) with the Fort Thompson formation.

The Fort Thompson formation in the Dade-Broward county area is predominantly light gray to cream, fossiliferous, marine, sandy limestone and calcareous sandstone, with a few thin beds of gray and tan fresh-water limestone. The entire section has been subjected to solution by ground water, and the result is a cavity-riddled mass of permeable rock. Solution cavities are as much as several feet in diameter; some are filled or partially filled with fine and medium quartz sand. Some sand filling possibly occurred during flooding by Pleistocene seas. Loose sand such as this decreases the permeability of the aquifer, but if wells are heavily pumped much of the sand will be removed and a high permeability adjacent to a well will result.

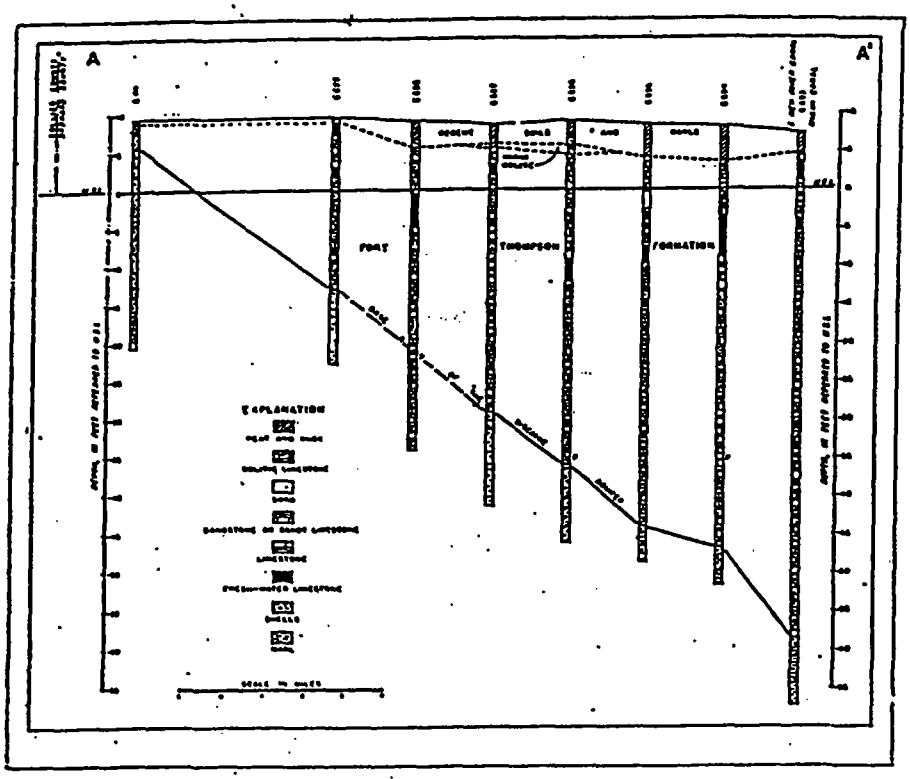

Figure 4. West-east geologic cross section in western Broward County.

Cementation and redeposition of materials by ground-water movement are very much in evidence throughout the Fort Thompson formation. Cementation of sand bodies by calcium carbonate has produced layers of hard, dense sandstone. Locally the cement is siliceous, producing a very hard quartzitic sandstone. An examination of limestone cores frequently shows secondary deposits of calcite crystals inside cavities or within concavities of marine shells. Fossils are preserved chiefly as molds and casts, rarely in their original form. Some cores of the Fort Thompson formation show indications of bedding planes which provide zones of weakness along which ground-water solution takes place. Part of the Fort Thompson formation is composed of very dense, hard nonfossiliferous limestone exhibiting little or no effect of ground-water action. In general, highly fossiliferous beds are markedly pitted with solution holes.

Because no unconformable relationship has been noted between the Fort Thompson and older formations, the contact is normally placed

beneath the lowest sandy marine limestone which underlies fresh-water beds. It is recognized that a part of this basal material in some places may include formations of either Pliocene or late Miocene age.

The contact between the Fort Thompson formation and the Miami oolite, as observed in spoil banks along canals in the Everglades, is unconformable and is usually placed at the maximum depth at which oolites appear. The upper surface of the Fort Thompson is uneven and is characterized by solution pits and depressions and vertical solution holes. Oolitic material admixed with loose, sandy detritus from the Fort Thompson was deposited on this eroded surface and filled depressions to depths a few feet below the actual contact. These cavity fillings are easily discerned in core samples because the filling material is heterogeneous and shows a color contrast. A layer of very hard, dense, cream to gray, sandy limestone, which is peculiarly mottled or banded with brown and tan limestone, occurs in the Fort Thompson below the contact. In places the material appears to be a conglomerate containing weathered pebbles of the Fort Thompson formation, but in at least some of these places the "conglomerate" is the result of irregular deposition of iron oxide in interstices of the Fort Thompson, along with differential cementation of those areas. The banding may denote an old eroded surface or may be the result of water-table fluctuations.

The occurrence of fresh-water limestones in a great number of core borings that penetrate the aquifer west of the coastal ridge has been plotted in cross sections (figs. 4-6), the locations being shown on figure 7. In addition, a series of shallower borings, 25 to 30 feet below mean sea level, along U. S. Highway 27 (Miami Canal northward to North New River Canal) across Broward County between the Dade and Palm Beach county lines, were examined. Fresh-water limestones are present at shallow depth along U. S. Highway 27 where it adjoins the South New River Canal north to the Palm Beach county line. In another series of holes bored to a depth of about 20 to 25 feet below mean sea level and extending from the North New River Canal to the Hillsboro Canal, along a line approximately 8 miles west of Florida Highway 7, no fresh-water material was noted in the cores. Obviously, it is difficult to determine exactly where the Fort Thompson and Anastasia formations merge, but they seem to merge near the eastern edge of the Everglades.

A similar situation exists in Dade County where fresh-water limestones are not known to occur in coastal areas. Along the western edge of the coastal ridge, a few beds of fresh-water limestone are present, as well as some indications of reef corals. The fresh-water limestones, ranging in thickness from 1 to 3 feet, were noted in the following wells (fig. 7) which are not included in the cross sections:

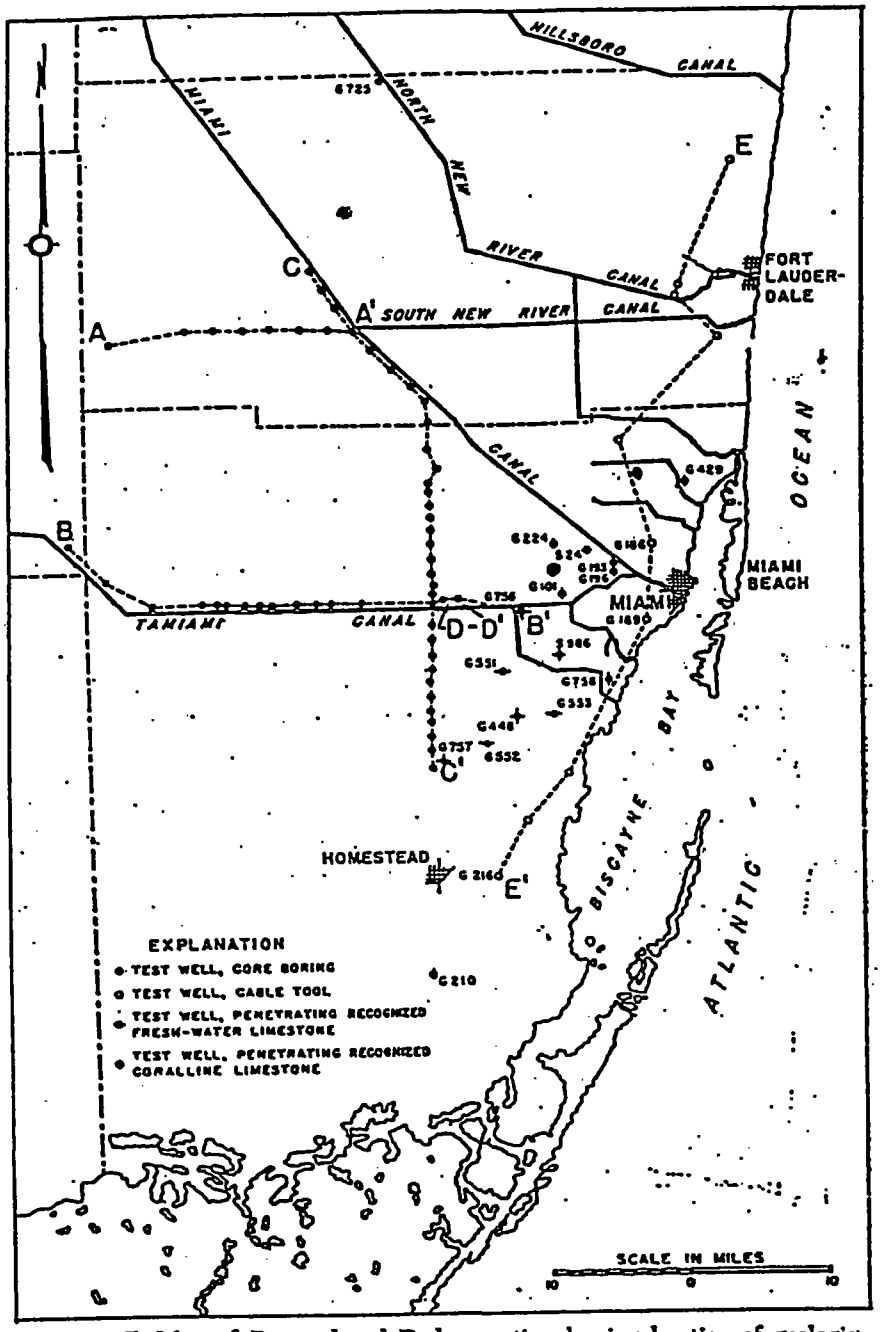

Figure 7. Map of Broward and Dade counties showing location of geologic cross sections and certain test wells.

Well No.	Depth to top of fresh-water limestone, in feet below msl
G 448	41
G 551	37 and 50
G 553	42
G 552	10
S 24	40 to 45 (depth uncertain)
S 986	39

Reference to the section on the Anastasia formation, and to figure 7 showing wells that have penetrated coralline rocks, makes it evident that the Fort Thompson, Key Largo, and Anastasia formations interfinger. Pleistocene marine limestones in certain areas of coastal Dade County cannot be definitely assigned to one of the three formations, because of their transitional character. In some instances the limestone has been arbitrarily placed in the Fort Thompson formation, although it does not contain fresh-water beds, but in others the limestone is placed in the Key Largo, although it is not coralline.

Figures 4 and 5 show west-east geologic sections across the lower Everglades, and figure 6 shows a north-south section at the longitude of Krome Avenue. Figure 8 shows a short west-east section along the Tamiami Trail east of Krome Avenue, where wells were closely spaced, and a possible correlation of fresh-water limestones. Several zones of fresh-water limestone are apparent between wells G 670 and G 624, shown in figure 6, where the uppermost zone occurs between the base of the Miami oolite and a position 8 feet below mean sea level. The most persistent zone and one that definitely appears to be a single layer occurs between 8 and 15 feet below mean sea level and extends southward from well G 670 to well G 653, and possibly farther. The thickness of the fresh-water limestone of this zone ranges from 1 to nearly 5 feet, although the greater thickness may be due to filling of solution holes. This fresh-water limestone is not found at comparable depths in wells G 657 and G 656. Possibly the core pierced a marine cavity fill within the fresh-water limestone, or the bed has been eroded and subsequently covered by younger marine limestone. However, limestone beds plotted a few feet below the minus 15-foot mean-sea-level horizon in these 2 wells may indicate that this bed was deposited in a locally depressed area or a wide solution hole.

A second fresh-water limestone occurs approximately 20 to 30 feet below sea level. This zone extends between wells G 631 and G 653, and wells G 669, G 667, and G 664 farther north containing fresh-water

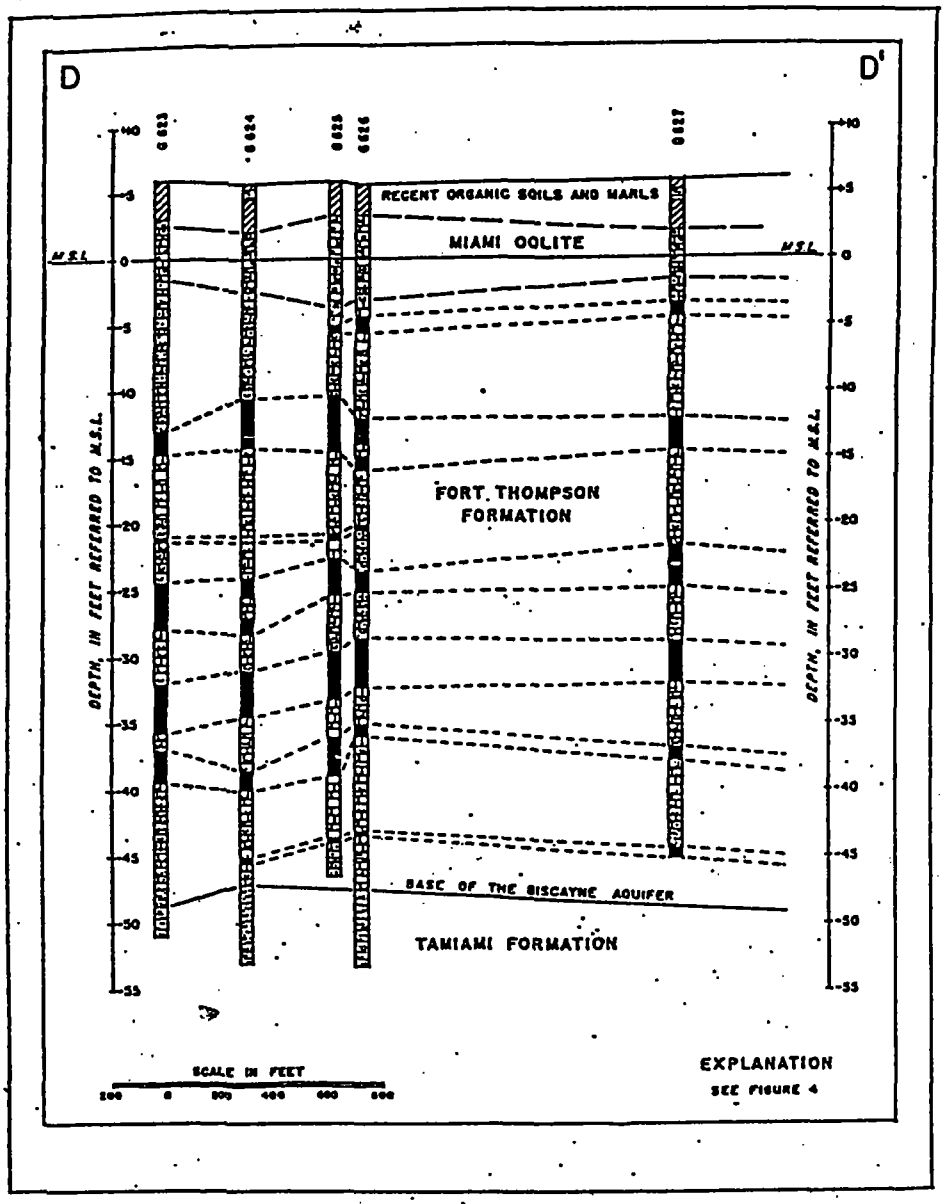

Figure 8. West-east geologic cross section near Krome Avenue at Tamiami Trail.

limestones, at slightly lower elevations, which are probably a continuation of this zone. A similar situation may be true of the wells south of G 653, although these limestones are generally at slightly higher elevations.

Cores from wells G 667, G 664, G 624, and G 757 indicate that 2 or possibly 3 zones of fresh-water limestone may be present between the second zone and the base of the Fort Thompson formation, but definite correlation between wells cannot be made with the information available.

In well G 667 the highest fresh-water limestone is associated with oolitic material and may be part of the Miami oolite. North of the Dade-Broward county line the distribution of fresh-water material was such that it could not be correlated with the more uniformly bedded strata to the south.

Figure 8 shows a locality east of Krome Avenue along the Tamiami Trail, where some of the closely spaced core borings penetrate the entire thickness of the highly permeable aquifer. This section again shows a possible correlation of 6 fresh-water limestone zones similar to that shown in figures 5 and 6. Well G 607 (fig. 5) penetrated 6 beds of fresh-water limestone and a well 42 feet east pentrated the same 6 beds.

At least four limestone beds of fresh-water origin occur within the Pleistocene section at the Palm Beach-Broward county line and the North New River Canal (fig. 7), as shown by the following log of well G 725:

Description	*Depth, in feet, with reference to msl*
Peat and muck, dark brown	+ 10.9 to + 6.1
Clay, mucky, black	+ 6.1 to + 4.8
Limestone, fresh-water, brown, dense, shelly	+ 4.8 to + 4.7
Marl, sandy, marine, in places indurated to sandstone	+ 4.7 to + 1.7
Limestone, fresh-water, dense, brown	+ 1.7 to + 1.1
Sandstone, calcareous, fossiliferous, marine	+ 1.1 to 0.0
Limestone, fresh-water, cream	0.0 to — 1.0
Sandstone, shelly, marine, calcareous	— 1.0 to — 6.0
Limestone, cream, shelly, probably fresh-water (?)	— 6.0 to — 6.5
Marl, very sandy, shelly, tan, marine, with a few fresh-water shells	— 6.5 to — 8.6
Marl, fresh-water, sandy, shelly	— 8.6 to — 10.7
Marl, fresh-water, partially shelly, indurated to limestone	— 10.7 to — 11.5
Sand, marly, tan, very shelly, fresh-water gastropods from — 11.5 to — 12.0, apparently as cavings, containing some marine shells (*Chione cancellata*)	— 11.5 to — 13.5
Sandstone, cream to tan, very shelly, mixed marine and fresh-water at bottom	— 13.5 to — 16.5

A glance at the geologic sections indicates that each fresh-water bed was probably deposited on an undulating and solution-pitted marine limestone. The beds range in thickness from 0.2 foot to nearly 5 feet. Their upper surfaces were probably eroded to some extent by shallow encroaching seas which removed less resistant materials. It is recognized

that a few of the fresh-water limestones as plotted are cavity fillings which were deposited in what is definitely marine material. Fresh-water materials could easily have been washed in and deposited in subsurface cavities as well as at the surface.

It is possible that, during major portions of the Pleistocene glacial stages, the lower Everglades was a low-lying marginal area bounded on the west by slightly higher land and on the east by the coastal ridge composed of reef materials. Because of the marginal character of the area, slight rises in sea level would bring about marine floods during which thin marine limestones were deposited. However, with a fall in sea level, the land emerged so that the resulting weathering and eroding of the marine limestones accompanied the deposition of some thin fresh-water limestone. A major advance of the continental ice sheet would cause an extended lowering of sea level, thus allowing a greater thickness of fresh-water limestone to be deposited over a larger area. On the other hand, a major or complete retreat of the ice sheet probably resulted in inundation of the area for a long period, and in deposition of a greater thickness of marine limestone in which were thin, isolated bodies of reworked older material.

The lower Everglades appears to have been a depressed area which, during Pleistocene time, was intermittently shut off from the sea by a barrier along the coastal ridge of southeastern Florida. This barrier was formed by the deposition of the Anastasia formation, the Key Largo limestone, and the Miami oolite. During times of lowered sea level the Everglades lay exposed and contained swamps and fresh-water lakes, and fresh-water limestones were deposited as fills in the lower materials and as beds. The sea level probably was not stable during the glacial stages but rose and fell with relatively short retreats and advances of the ice. Such activity produced thin layers of marine limestone during short sea floodings, interbedded with thin fresh-water or brackish-water deposits during recessions. However, after a complete retreat of the continental ice sheet, the resulting rise of sea level would permit thick marine sections to be deposited. Optimum conditions for the most widespread deposition of fresh-water limestone in the lower Everglades probably occurred at times between the beginning of a glacial stage and of maximum advance of the continental ice sheet. Times of maximum advance of the ice and lowering of sea level were most favorable for channel cutting, resulting in draining of the land.

Correlation of the six postulated beds of fresh-water limestone with specific glacial stages of the Pleistocene is a more difficult problem than the correlation by Parker and Cooke (1944, p. 89) of the beds at the

site of old Fort Thompson. The data suggests that the tentative correlation by Parker and Cooke of individual beds with specific glacial and interglacial stages may need revision.

KEY LARGO LIMESTONE

The Key Largo limestone, named and described by Sanford (1909, p. 214-218), is a dead coral reef that makes up the Florida Keys from Soldier Key southwest to Bahia Honda. The Key Largo limestone is a part of the Biscayne aquifer along the coastal area of Dade County. It constitutes the whole of the aquifer in the part of the Florida Keys described. The rest of the Keys southwest from Bahia Honda are composed of the Miami oolite and there the Key Largo limestone may constitute only a small part of the aquifer. The aquifer in the Keys yields saline water to wells.

The Key Largo limestone consists chiefly of recemented reef detritus and precipitated limestone surrounding coral heads of the old reef. The corals were subjected to wave action, which eroded the softer parts and deposited the waste in the openings along with other bioherm material. The formation in general is very permeable, containing solution cavities which were produced in the same manner as in the Fort Thompson formation.

Corals, most of them of the reef-building type, have been found in material from the following wells (fig. 7), at the noted depths:

Well No.	*Depth, in feet below msl*
G 101	20 to 56
G 186	39 to 43
G 189	13 to 32, and 41 to 48
G 193	35 to 43
G 196	41 to 54
G 210	13 to 19
G 216	15 to 20, 24 to 33, and 44 to 60
G 224	18 to 44
G 429	18 to 23
G 448	31 to 40
G 756	56
G 757	44 and 49
G 758	52 and 56
S 986 (and nearby wells)	38, 40, 60, and 70

All except the last four wells, which were cored, were drilled by the cable-tool method. The coralline material in well G 448 directly

overlies fresh-water limestone, whereas in well S 986 a fresh-water limestone bed at 39 feet is overlain and underlain by reef-limestone material. Coral was noted in wells G 756 and G 757 below the lowest fresh-water limestone. In many wells that were not cored the coralline limestone appears to be discontinuous, because only a trace of coralline limestone was noted in the samples from wells G 101 and G 224. The comminution of the material by the bit action prevents any possible indentification of fresh-water limestone in such samples. However, along the eastern part of the coastal ridge, fresh-water limestones are not apparent in the underlying limestones and only an occasional bed is penetrated in the western part of the coastal ridge. The occurrence of coral in the vicinity of the western part of the ridge demarks the area of interfingering between the Key Largo limestone and the Fort Thompson formation. The nature of this interfingering is not known nor is the western limit of coralline limestone. An abundance of reef coral was excavated from the borrow ditch for the levee which crosses the Tamiami Trail a mile west of Krome Avenue. The corals apparently are from the top part of the Fort Thompson formation, although it is possible that they are in the Miami oolite also.

A great number of wells along the coastal ridge penetrate Pleistocene limestones that apparently include neither fresh-water limestones nor coralline limestone. These limestones have been placed in the Anastasia formation.

The upper part of the Key Largo limestone, according to Parker and Cooke (1944, p. 68), interfingers with the lower part of the Miami oolite.

ANASTASIA FORMATION

The Anastasia formation was named by Sellards (1912) from its typical development of coquina on Anastasia Island, near St. Augustine, Florida, and as defined in this report includes all pre-Pamlico marine sand, limestone, and shell beds of Pleistocene age along the coastal area.

The Anastasia formation represents the chief component of the Biscayne aquifer in the vicinity of Fort Lauderdale and along the coastal ridge as far north as Delray Beach in Palm Beach County. In the area to the west, the Anastasia is equivalent to the marine portions of the Fort Thompson formation, and to the south the upper part of the Anastasia merges with the Miami oolite and the lower part merges and interfingers with the Key Largo limestone (fig. 9). The formation is composed of marine sandy limestone, calcareous sandstone, in part coquinoid, and shelly sand. It was initially laid down in a shallow beach environment as an offshore bar which was exposed from time to time by eustatic sea-level fluctuations during the Pleistocene. An outcrop of

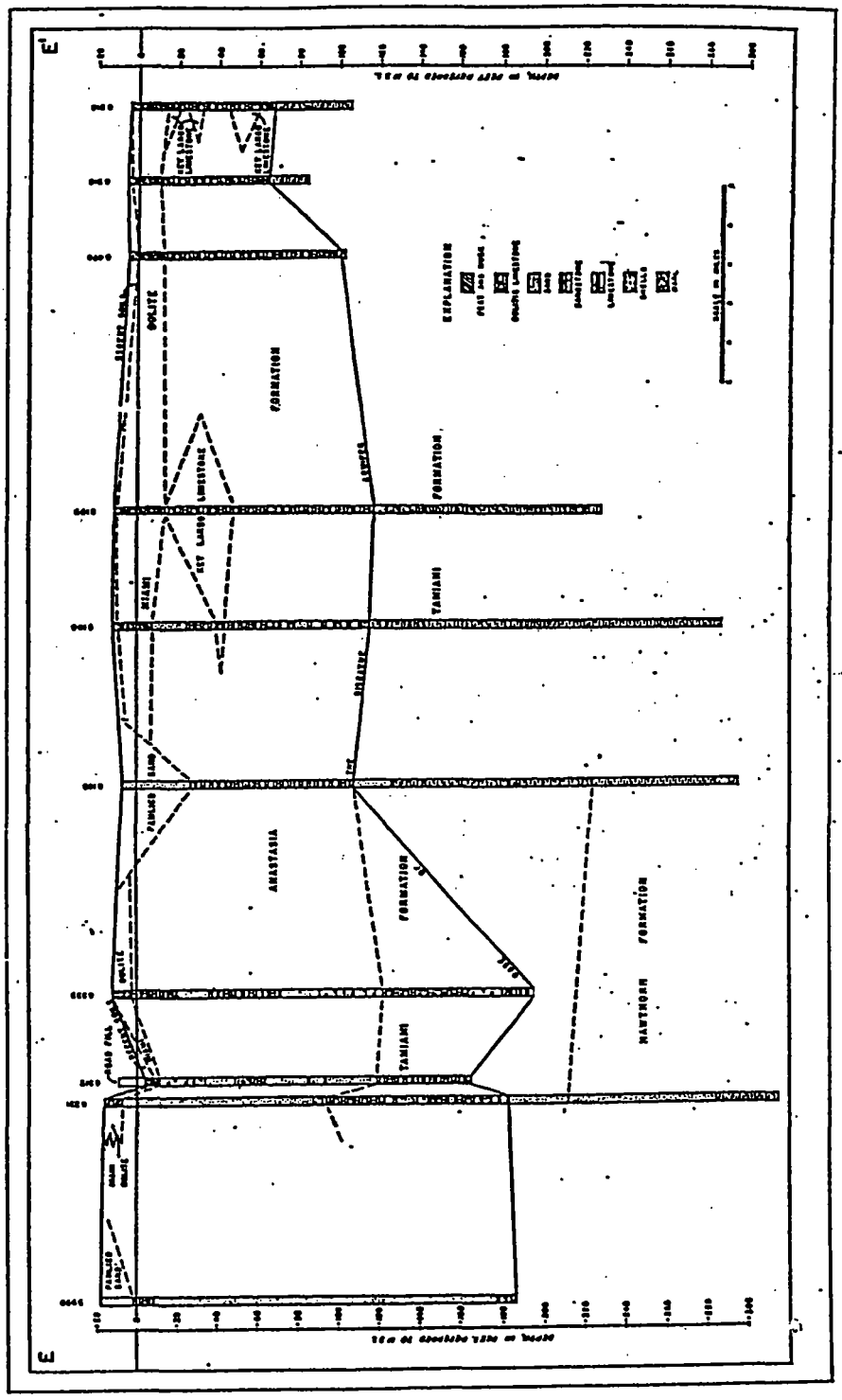

Figure 9. North-south geologic cross section on the coastal ridge.

the Anastasia formation at Palm Beach shows younger eolian crossbedded sandstone lying unconformably on marine calcareous sandstone. The unconformity is characterized by brown sandy soil which fills solution holes in the older material. The Anastasia formation represents sediments deposited throughout all or a major part of the Pleistocene, according to Parker and Cooke (1944, p. 66).

The permeability of the Anastasia formation ranges widely from place to place. Away from the coastal areas, where it is well indurated, groundwater action has produced large solution cavities and the permeability high. Adjacent to the coast the material contains more sand and silt so that the permeability is markedly reduced.

MIAMI OOLITE

The Miami oolite was named by Sanford (1909, p. 211-214). Cooke and Mossom (1929, p. 204-207) redefined the formation to include all the oolitic limestone of southern Florida, including that on the Keys.

The Miami oolite is the surface rock that blankets nearly all of Dade County, parts of eastern and southern Broward County, the southern mainland area of Monroe County, the Florida Keys from Big Pine Key to Key West, and a triangular area extending from Dade County westward along the Collier-Monroe county line. The formation thins out at its western extremity and gradually thickens to the east, attaining a maximum thickness of about 40 feet.

In the lower Everglades the Miami oolite unconformably overlies and fills cavities in the upper surface of the Fort Thompson formation. Along the coast the formation interfingers with the upper portions of the Fort Thompson, Anastasia, and Key Largo formations. Where not exposed at the surface in the lower Everglades, it is covered by Recent organic materials. In northwest Dade County and southwest Broward County, it is overlain unconformably by the Pamlico sand, a terrace deposit of Pleistocene age, or by the Lake Flirt marl of Pleistocene and Recent age.

The Miami oolite is typically a white to yellowish massive crossbedded oolitic limestone containing varying amounts of sand, usually in solution holes. Where exposed to weathering, as in the Silver Bluff area, the surface of the oolite turns a dull gray color. Crossbedding and cone-in-cone structures are outstanding features. The angle of dip of the crossbedded material changes from place to place, and the material is apparently a dune or beach-ridge deposit. The high angle crossbeds in places are beveled by flat-lying oolitic material containing marine shells. In the Silver Bluff area large pieces of crossbedded oolitic limestone are

incorporated in portions of oolite which show no evidence of bedding. This is definite evidence of reworking of younger oolite deposits and, according to Parker and Cooke (1944, p. 71), might indicate either that the Miami oolite represents deposits of two or more interglacial stages or that the deposition, reworking, and redeposition occurred during a single stage. In either case, oscillation of the sea level was involved. At many places in Broward County the formation is composed almost entirely of calcareous oolitic sand or of mixtures of calcareous and quartz sand.

PAMLICO SAND

The Pamlico sand is a late Pleistocene terrace deposit of marine origin (Parker and Cooke, 1944, p. 75). Parker and Cooke (p. 74, 75) extended the term Pamlico sand from North Carolina to southern Florida, and defined it to include all the marine Pleistocene deposits younger than the Anastasia formation.

The Pamlico sand blankets much of the Everglades north of the latitude of Fort Lauderdale and covers the coastal area as far south as Coral Gables. It unconformably overlies and fills cavities in the Miami oolite, the Fort Thompson formation, and the Anastasia formation. In the northern part of the region the sand is covered by Recent marls and organic soils.

The Pamlico sand is chiefly a quartz sand ranging in color from light gray or white to red and gray-black, depending on the amount of incorporated iron oxide or carbonaceous material. In localities where shells are admixed, the Pamlico sand may be semiconsolidated as a result of solution and redeposition of calcium carbonate. The quartz sand ranges in size from very fine to coarse, the medium-sized grains predominating. Where the material is medium to coarse, and well sorted, it will furnish adequate fresh-water supplies for domestic purposes.

The Pamlico sand lies below the 25-foot contour; areas within its outcrop that lie at higher elevations represent dunes or shore ridges formed during the Recent. The formation increases in thickness from a featheredge to perhaps 40 feet, the greatest thickness being along the coastal ridge.

GROUND-WATER OCCURRENCE

GENERAL FEATURES

All the water that recharges the Biscayne aquifer is derived from local rainfall. When rain falls to the surface, a part is evaporated, a part

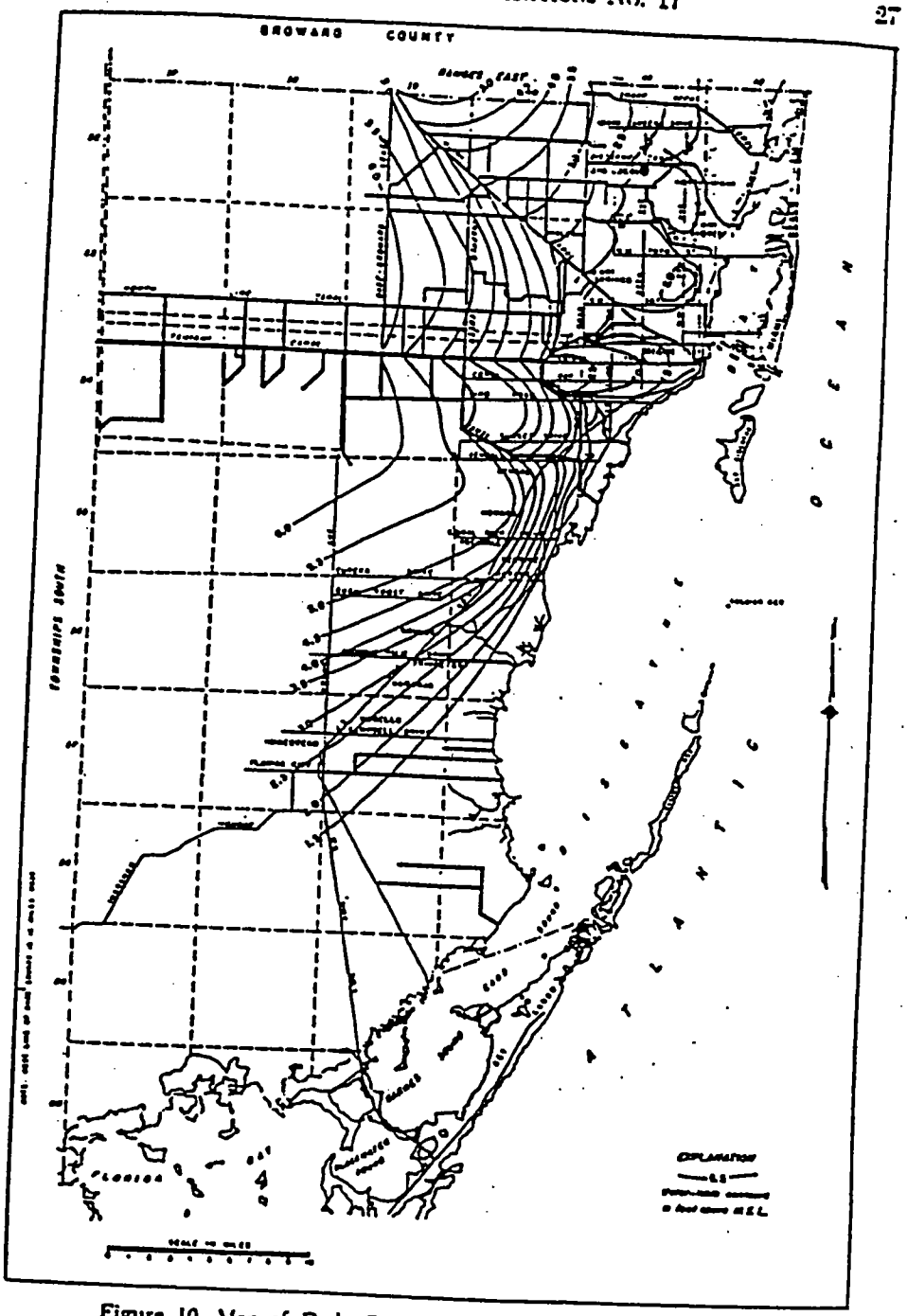

Figure 10. Map of Dade County showing average water levels in eastern part, 1940-1950.

IVEY

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the water table may slope

red for the eastern part
changes in the shape of
drainage canals and the
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TABLE

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2 to 8 feet, depending
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ground water. Ground water moves laterally and vertically under gravitational influence to points of discharge in streams, canals, lakes, and the ocean, and carries, in both solution and suspension, materials removed from the rock.

The permeability of a rock is a measure of its ability to transmit water. Porosity is the property of containing openings or interstices. Materials such as clay or marl are highly porous but relatively impermeable because the components are so finely divided that the molecular attraction between the clay-sized particles tends to hold the contained water in place, thereby restricting movement. High permeability is usually associated with clean, well-sorted gravel or open shell beds. The material that forms the Biscayne aquifer has a permeability equivalent to that of coarse, well-sorted gravel, because the interconnected solution cavities greatly facilitate ground-water movement.

Several pumping tests have been made on wells penetrating the Biscayne aquifer in the Greater Miami area. The purpose of these tests was to determine values for the coefficients of transmissibility and storage of the aquifer at different localities. The coefficient of transmissibility may be defined as the number of gallons of water per day that will move through a complete section of the aquifer one mile wide, under a hydraulic gradient of one foot per mile. A value for the field coefficient of permeability may be determined by dividing the coefficient of transmissibility by the saturated thickness of the aquifer, in feet; thus, the coefficient of permeability refers to the hydrologic characteristic of a unit of the water-bearing rock, whereas transmissibility refers to that characteristic of the aquifer as a whole. The coefficient of storage of an aquifer is defined as the volume of water it releases from or takes into storage per unit surface area of the aquifer per unit change in the component of head normal to that surface. The Biscayne aquifer on a long-term basis behaves as an unconfined or water-table aquifer (although in short tests it may behave as an artesian aquifer having a leaky roof), and the coefficient of storage is essentially equal to the specific yield — 0.10 to 0.35.

The average transmissibility (T) of the Biscayne aquifer, as stated by Parker (1951), is about 5 million gallons per day per foot, the lowest value observed being about 3 million. The storage coefficient (S) ranges from 0.10 to 0.35 and averages about 0.20.

Pumping rates for these tests were about 3,500 gpm, except for the test on well G 218 which was at a rate of about 1,500 gpm. The results of these tests computed by the Theis nonequilibrium formula (1935,

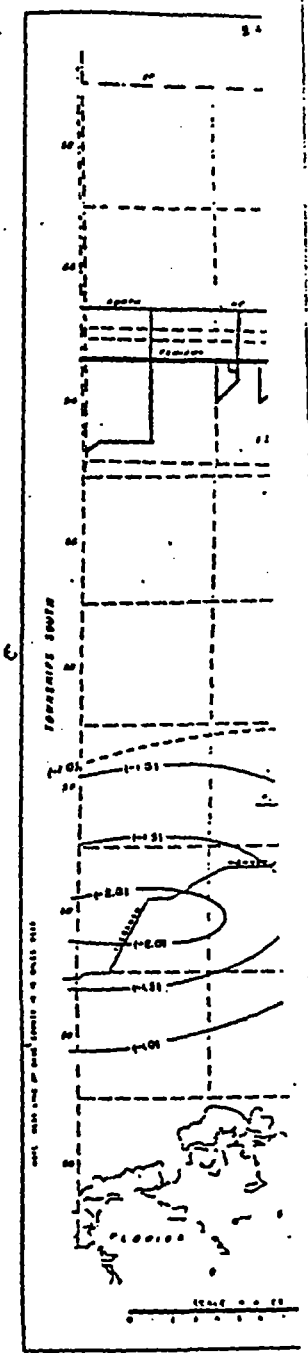

Figure 14. Low stage

esulted in water levels reaching what are
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3.

stations in southern Florida ranged as

.....65.9 to 96.1 inches
.....50.0 to 74.2 inches
.....53.8 to 62.6 inches

from 5 to 15 inches and averaged about
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west of the coastal ridge that was not
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Other canals were similarly out of their
several hours at the most, although many
eral weeks.

ctober 11, 12 showing the peak (fig. 16)
bservation wells equipped with recorders,
during the flood period, leveled measure-
rpolation of the measurements made in a
out October 7. In a few places the water
the map is believed to be a good approxi-
n the area between Snapper Creek and
niami Canal, the presence of several small
network of canals make it difficult to
water table, but the general slope was as

E AND DISCHARGE

pal source of recharge to the Biscayne
l varies within relatively short distances,
annually in Dade County. In Broward
iods ranging from 5 to 25 years indicate
ging from 51 to 65 inches. The lower
e Everglades, and the higher ones to the

vater moves into the aquifer in Broward
y and from the North New River Canal.
rolled by dams and in areas where the
by pumping, as in the well field in Miami
arge to the Biscayne aquifer.

p. 519-524) and as reported by Parker (Parker, Ferguson, Love, and others, 1955, p. 239-274) are summarized in the following table (see fig. 14 for location of test sites).

Test site	*Range in computed coefficient of transmissibility (gpd/ft)* Lowest	-	Highest
S 1	3,250,000		4,300,000
G 551	9,000,000	–	14,000,000
G 552	2,800,000		5,700,000
G 553	2,500,000		3,900,000
G 218	3,900,000		4,400,000

At all the test sites the Miami oolite forms the upper part of the Biscayne aquifer, and at most of them it is underlain by a bed of sand. The permeability of the oolite and sand is lower than that of the underlying cavernous limestone of the Fort Thompson formation and thus acts as a leaky roof during the pumping of a well, and the formation initially acts as an artesian aquifer. The Bessel function then can be used in the computations using formulas developed by Jacob (1945, p. 198-208). John G. Ferris (1950, personal communcation) determined the following values from the test data:

Well No.	*Coefficient of transmissibility (gpd/ft)*
S 1	3,200,000
G 551	9,700,000
G 552	3,200,000
G 553	3,200,000

The T value of the test for well G 551 by both calculations is inconsistent with the values for the other tests. The results of the other three tests using the Bessel function are extraordinarily consistent considering the character of the aquifer. The permeability of the Biscayne aquifer probably averages between 50,000 and 70,000 gallons per day per square foot, according to Parker (1951). No satisfactory computation of the storage coefficient has yet been obtained.

Several assumptions concerning the aquifer must be applied in using formulas to determine these coefficients: (1) the aquifer is homogeneous and isotropic and transmits water with equal readiness in all directions; (2) the discharging well penetrates the entire thickness of the aquifer; (3) there is no turbulent flow within the aquifer, and during the pumping there is no vertical convergence of flow lines toward the pumped well; and (4) water is discharged from storage instantaneously with reduction in head.

Reference 18

GEOLOGY OF THE SURFICIAL AQUIFER SYSTEM

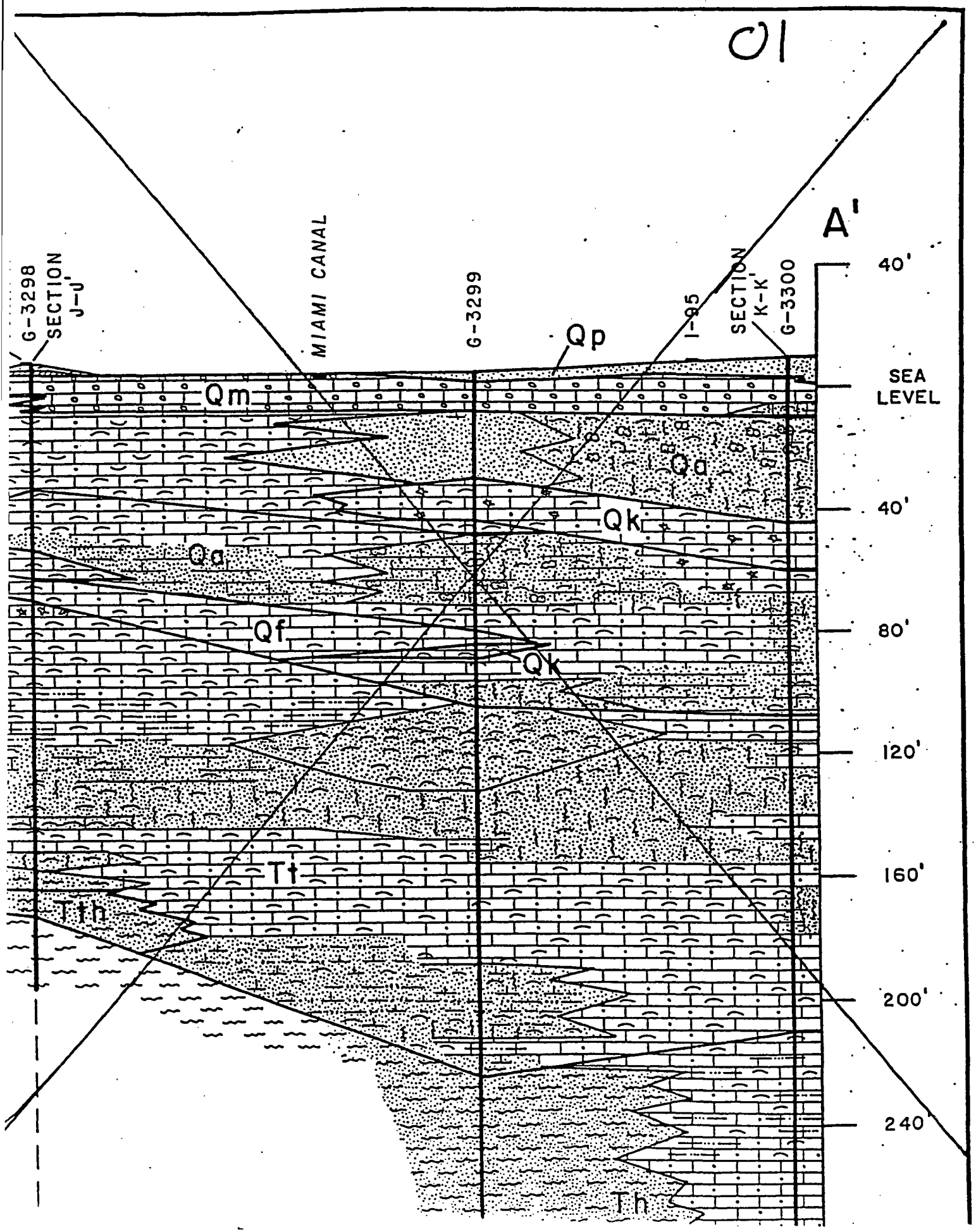
DADE COUNTY, FLORIDA

LITHOLOGIC LOGS

By Carmen R. Causarás

U.S. GEOLOGICAL SURVEY

WATER-RESOURCES INVESTIGATIONS REPORT 86-4126


01
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INTRODUCTION

The principal source of freshwater in southeast Florida is the surficial aquifer system. The surficial aquifer system is composed of upper Cenozoic sediments that are hydraulically connected and are mostly under water-table conditions. The most permeable unit of this system is the Biscayne aquifer, the major and only formally named unit of this system, which extends northward into Broward County and parts of eastern Palm Beach County. The Biscayne aquifer is a highly permeable limestone and sandstone sequence that occurs at or near land surface in most of Dade County (Parker and others, 1955). In western Dade County, the highly permeable Pleistocene limestones and sandstones are separated from the underlying Pliocene limestone and sandstone of moderate permeability by a thick sequence of Pliocene clastic sediments that have low permeability and, in places, are practically impermeable. These Pliocene clastics make up the base of the Biscayne aquifer in this area, but are absent in eastern Dade County where the limestones and sandstones of Pleistocene and Pliocene age are in direct contact. Accordingly, in eastern Dade County the Pliocene limestone and sandstone are included in the Biscayne aquifer, whereas in western Dade County they make up a separate, unnamed lower aquifer within the surficial aquifer system. The base of the surficial aquifer system throughout Dade County is delineated at the top of a thick sequence of relatively impermeable clay and silt in the lower part of the Tamiami Formation and the upper part of the Hawthorn Formation. Locally, the base of the aquifer system consists of semi-indurated claystone and siltstone interbedded with sand of low to moderate permeability.

This report describes the geologic framework of the surficial aquifer system in Dade County, Fla. (fig. 1). It is part of a long-term intensive study begun by the U.S. Geological Survey in 1979, in cooperation with the South Florida Water Management District, to describe the geology, hydrologic characteristics, and ground-water quality of the surficial aquifer system in Dade and Broward Counties. A similar report has been published on the geology of the surficial aquifer system in Broward County (Causaras, 1985).

A total of 33 test wells were drilled completely through the surficial aquifer system and into the underlying, relatively impermeable units of the Tamiami and Hawthorn Formations to obtain the data needed to describe the geology of the surficial aquifer system. The test wells were rotary drilled with an open-end bit using the reverse-air dual-wall method. This method provided geologic samples superior to those obtainable by most other methods, in that the samples are uncontaminated by drilling fluid and were large enough for describing sedimentary characteristics. Detailed lithologic logs were made from microscopic examination of rock cuttings and cores obtained from these wells and are presented in this report. These logs were used to prepare geologic sections that show the lithologic variations, thickness of the lithologic units, and different geologic formations that comprise the aquifer system.

METHODS

The lithologic logs presented in this report were made from microscopic examination of the well cuttings and cores collected during the drilling phase. Other methods such as stain, dilute hydrochloric acid tests, and geophysical logs were used when additional aid was needed in identifying and describing the samples and in correlating stratigraphic units. Folk's 1962 classification of carbonate rocks was used in classifying rocks with a calcium carbonate content of 50 percent or more (Folk, 1968). The standard Wentworth terrigenous grain-size classification (Pettijohn, 1957, p. 27) was used in classifying sediments and rocks consisting of less than 50 percent calcium carbonate. A modifying term was added to the description of the terrigenous samples if a foreign size content of more than 10 percent but less than 50 percent was present. A silty sand contains more than 10 percent silt, a clayey silt contains more than 10 percent clay, and a sandy clay contains more than 10 percent but less than 50 percent sand. The same guideline was used for carbonate rocks so that a sandy limestone contains more than 10 percent sand. The percentage of a given constituent was determined by using the "Comparison Chart for Visual Percentage of Estimation" *from* Terry and Chilingar (*in* Scholle, 1978, p. x). The constituent rock fragments found in some samples are noted in the lithologic descriptions in the abbreviated form RF. The colors indicated by the chart numbers in parentheses are based on the "Rock-Color Chart" by Goddard and others (1948) and were assigned while the samples were damp.

Relative porosity abundance and type were determined only for cores and rock cuttings of adequate size. Porosity abundance was visually estimated and described in the lithologic logs by using the following qualitative terms: virtually nonporous, slightly porous, moderately porous, porous, and very porous. Choquette and Pray's (1972, p. 169-182) classification of basic porosity types was used in classifying pores and pore systems in carbonate rocks.

GEOLOGY

The surficial aquifer system in Dade County is composed of limestone, sandstone, sand, shell, lime mud, silt, clay, claystone, siltstone, and an admixture of these materials. These sediments were deposited during the Pliocene through Holocene Epochs and were assigned (Parker and others, 1955, p. 160) to the following general ascending order of stratigraphic sequence that varies depending on the area: Tamiami Formation, Caloosahatchee Marl, Fort Thompson Formation, Key Largo Limestone, Anastasia Formation, Miami Oolite, Pamlico Sand, and Lake Flirt Marl. The Caloosahatchee Marl was not encountered in any of the wells drilled for the Dade County and Broward County study (Causaras, 1985).

Geologic sections A-A' through K-K' (sheets 1, 2, and 3) show some of the variations in the sediments that compose the surficial aquifer system. The base of the surficial aquifer system is an indulating erosional surface (unconformity), causing the aquifer to range in thickness from about 140 feet in southeastern Dade County to more than 280 feet in northeastern Dade County. The surficial aquifer system is composed of distinct lithologic units with numerous facies changes that were brought about primarily by changes in sea level. A contrast in lithologies exists between western and eastern Dade County, defined as the areas west and east of State Road 27 (SR-27, fig. 1). In the western area, the surficial aquifer system is primarily an admixture of sand, silt, lime mud, and shell hash that separates the limestone of the Pleistocene Fort Thompson Formation from the limestone unit of the Pliocene Tamiami Formation; but in the eastern part it is primarily composed of limestone, sandstone, and shelly sand (see sections B-B' through E-E', sheets 1 and 2). North of the Tamiami Trail, the lithology of the aquifer system is similar to that in Broward County (Causaras, 1985), in that the western area is primarily limestone with some lime mud and sand interbedded with sandstone, and the eastern area is primarily sandy limestone, sandstone, and sand (see sections A-A' and F-F', sheets 1 and 2).

The Pamlico Sand (late Pleistocene) includes all the marine terrace deposits younger than the Pleistocene Anastasia Formation (Parker and Cooke, 1944, p. 75) and consists of nonfossiliferous, very fine to coarse quartz sand (averaging medium) that is generally well sorted. The absence of fossils is probably caused by the dissolution of calcite or aragonite shell material by percolating water. The Pamlico Sand is usually cream to brown in color, depending on the amount of iron mineral coating the quartz grains. The Pamlico Sand was penetrated in eastern Dade County generally north of the Tamiami Trail in the vicinity of test wells G-3299, G-3300, G-3306, and G-3307 (sections A-A' and B-B', sheet 1). In these test wells, the sand overlies and fills cavities in the Miami Oolite.

The Anastasia Formation consisting of porous to very porous, sandy, shelly limestone and nodular and shelly sandstone interbedded with sand and shelly sand. These materials are thickest to the northeast toward Broward County where they are more than 180 feet thick below land surface (Causaras, 1985). The Anastasia Formation thins to the south in the vicinity of test wells G-3312 and G-3313 (section C-C', sheet 2) where it is overlain by and interfingers with the Fort Thompson Formation and the Key Largo Limestone. The Fort Thompson Formation underlies the Miami Oolite in most of Dade County and outcrops in the northwestern part of The Everglades where it interfingers with the Miami Oolite. The contact between the Miami Oolite and the Fort Thompson Formation is usually denoted by the presence of a subaerial crust containing intraclasts and stained by iron oxide.

The Fort Thompson Formation consists of a series of alternating shallow marine, brackish-water, and freshwater limestones. The marine limestone is porous to very porous and pale orange to yellowish gray containing corals, bryozoans, abundant mollusks including *Chione cancellata*, and the benthic foraminifer Archais angulatus. The species *Archais* sp. is commonly found on thalassia grass beds behind reefs and are abundant in patch reefs and outer reef tracts (Stainker, 1977). The marine limestone, in places, may grade to a moderately porous, brackish-water estuarine limestone containing both freshwater snails (*Helisoma* sp.) and marine clams. The freshwater limestone is gray, very well cemented, generally slightly to moderately porous, and contains abundant snail remains including *Helisoma* sp. and *Ameria* sp. This freshwater limestone unit may either be in sharp contact with the marine limestone or occurs transitionally with the brackish-water limestone. Where the contact is sharp, freshwater limestone clasts are embedded in a matrix of the marine limestone, giving the rock a brecciated texture and showing that the freshwater limestone has locally been broken up and reworked into the marine limestone. The Fort Thompson Formation is wedge shaped and is thickest between SR-27 and the coastal area, thinning westward to a featheredge in Collier County (Schroeder and Stain, 1954).

Klein, 1954).

In eastern Dade County, localized lense the Key Largo Limestone interfinger with Miami Oolite, Anastasia Formation, and l Thompson Formation (see sections C-C', I-J-J', and K-K', sheets 2 and 3). The Key L Limestone is highly crystalline, very porc and reefal containing corals (*Montastrea* sp large bryozoans, and mollusks. The Key La Limestone crops out near the Monroe-Dade Cou boundary (see test well G-3395, section I-sheet 3).

Below the Pleistocene deposits in west Dade County (see sections A-A' through E-sheets 1 and 2) are numerous lenses and lay of low permeability sand, shells, lime m silt, and an admixture of these material These interbedded materials form the base of Biscayne aquifer in western Dade County and w assigned to the Pliocene Tamiami Formation Parker (*in* Schroeder and others, 1958, p. 1 figs. 7-10). Mansfield (1939, p. 16) thoug that the fauna of the sand penetrated in a dit along the Tamiami Trail, 42 miles west of Mia (near test well G-3301, section B-B', sheet 1 was probably closely related to the limesto unit that he called the Buckingham Formatio Parker and others (1955, p. 87) concluded th the Buckingham Formation is merely a facies the Tamiami Formation. Recent paleontologic studies by E.J. Petuch (Florida Internation University, oral commun., 1984) indicate the these clastic materials are of Buckingham ag (late Pliocene), but are not part of the Tamiam Formation. In this report, these sediments ar assigned to the Tamiami Formation (Parker an others, 1955, p. 85, pl. 9, cross-section F-F' to maintain continuity in terminology unti these paleontological studies are completed.

The Tamiami ("Buckingham" facies) sediments have numerous facies due to the variable depositional environments in which they formed, ranging from reef, to beach, to lagoonal, and terrestrial. Because of the numerous and frequent facies changes that may occur within a short distance, the different facies were grouped as a unit body of sediments (sections B-B' through K-K', sheets 1, 2, and 3). In western Dade County, these sediments are underlain by the limestone which was described by Mansfield (1939, p. 8) as the prototype of the Tamiami Formation. The sediments thin toward the east where they interfinger with the limestone unit of the Tamiami Formation (sections B-B' through E-E', sheets 1, 2, and 3).

The limestone of the Tamiami Formation is gray, loosely to well cemented, and contains a shallow marine, nearshore faunal assemblage with abundant pelecypods (*Pecten* sp. and *Ostrea* sp.), gastropods (*Turritella* sp.), pink barnacles (*Balanus* sp.), and echinoids (including *Encope* sp.). The limestone is porous to very porous and makes up a significant part of the surficial aquifer system in western Dade County from the Tamiami Trail northward into Broward County. In eastern and coastal Dade County, the gray limestone decreases in thickness and, in places, grades into loosely to well cemented sandstone, and interfingers with layers and lenses of shelly sand and sand interbedded with claystone and siltstone.

Formation which consists of gray to green, very coarse to fine grained, shelly sand and sandstone that contains phosphorite, heavy minerals, and mica as accessory minerals and was deposited in an inner shelf environment. This sand and sandstone unit grades vertically and interfingers with a shelly, silty, calcareous sand, siltstone, and claystone. The lower clastic unit of the Tamiami is moderately porous to virtually nonporous and is unconformably underlain by the shelf deposits of the Hawthorn Formation.

The Hawthorn Formation is Miocene in age and consists of gray to green, sandy, calcareous silt and sandy, silty, calcareous clay that contains scarce macrofossils and that is cemented, in places, into a claystone and siltstone. The claystone and siltstone contain both benthic and planktonic foraminifers with the latter less abundant and usually underdeveloped in size. This underdevelopment indicates a marginal growth habitat, possibly one that was located between a shallow and deeper continental shelf. The claystone or siltstone is generally interbedded with well sorted, medium-grained sand that contains garnet and other heavy minerals. This sand yields from low to moderate quantities of water.

the Hawthorn clastic deposits or are mixed with reworked Hawthorn clastic sediments. In these wells, the symbol "Tth" was used for Tamiami Formation and Hawthorn Formation undifferentiated. In the coastal areas of northern Dade County near well G-3300 (section A-A', sheet 1), instead of the Hawthorn clastic, a pale-green, loosely cemented, outer shelf limestone unit with abundant bethonic and planktonic foraminifers was penetrated from about 210 to 320 feet below land surface. This low permeability limestone is probably of Hawthorn age, and together with the slightly porous to virtually nonporous clastic deposits of both the Tamiami and Hawthorn Formations, delineates the base of the surficial aquifer system in Dade County.

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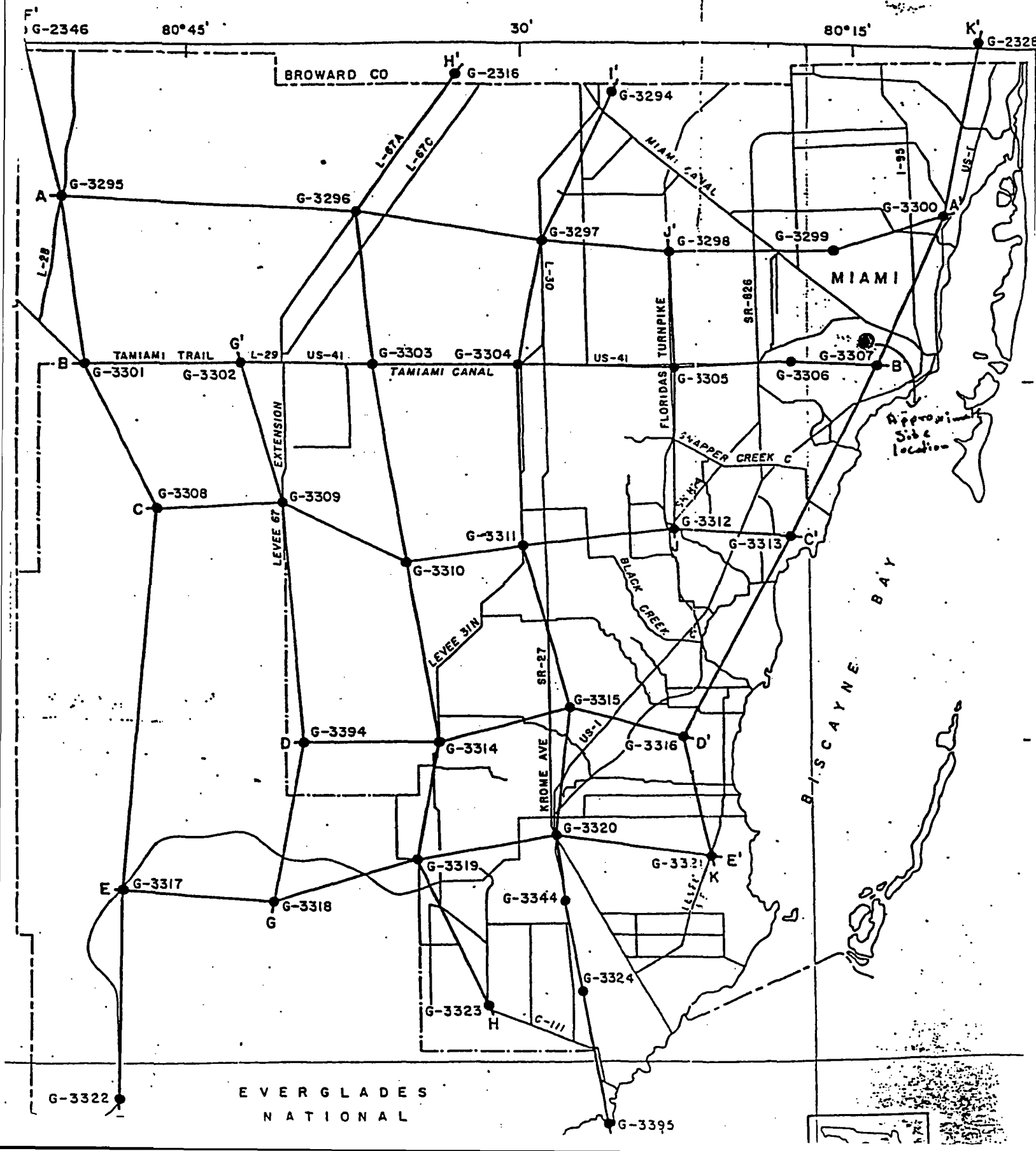

F'
G-2346
80°45'
30'
80°15'
K'
G-2328
BROWARD CO
H'
G-2316
I'
G-3294
MIAMI CANAL
L-67A
L-67C
I-95
US-1
A
G-3295
G-3296
G-3297
J'
G-3298
G-3299
G-3300
A'
L-28
L-30
SR-826
MIAMI
TAMIAMI TRAIL
G'
L-29
US-41
G-3303
G-3304
US-41
FLORIDAS TURNPIKE
G-3307
B
B'
G-3301
G-3302
TAMIAMI CANAL
G-3305
G-3306
EXTENSION
SWAPPER CREEK C
Approximate Site location
C
G-3308
G-3309
LEVEE 67
G-3311
G-3312
G-3313
C'
G-3310
BLACK CREEK
LEVEE 31N
SR-27
G-3315
US-1
G-3316
D'
D
G-3394
G-3314
KROME AVE
BISCAYNE BAY
G-3320
G-3319
G-3321
E'
K
E
G-3317
G-3318
G
G-3344
LEVEE
G-3324
G-3323
H
C-111
G-3322
EVERGLADES NATIONAL
G-3395

EXPLANATION

- Fill
- Peat or muck
- Sand
- Sandstone
- Detrital carbonate sand
- Rock fragments
- Concretions
- Marine shells
- Freshwater shells
- Silt
- Clay
- Claystone or siltstone
- Micrite, lime mud
- Limestone
- Oolitic limestone
- Coralline limestone, biolithite

GEOLOGIC FORMATIONS

- Ql Lake Flirt Marl
- Qp Pamlico Sand
- Qm Miami Oolite
- Qa Anastasia Formation
- Qk Key Largo Limestone
- Qf Fort Thompson Formation
- Tt Tamiami Formation
- Th Hawthorn Formation
- Tth Tamiami Formation and Hawthorn Formation undifferentiated

Formation boundary

G 3295 Test well and number

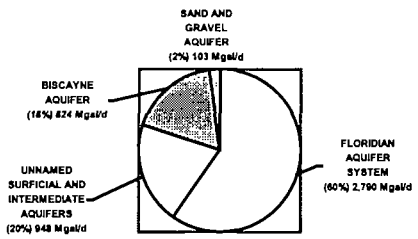
0 5 10 MILES

0 5 10 KILOMETERS

Vertical Scale Greatly Exaggerated

FLORIDA GROUND WATER CONDITIONS

Ground water Importance: Sources of high quality, potable ground water underlie virtually all of Florida, and supported average withdrawals of more than 4600 million gallons per day (MGD) in 1990. This remarkable resource supplies more than 90% of Florida's 14+ million residents with drinking water. Additionally, over 50% of all water needs including agricultural, industrial, mining, and electric power generation are supplied by ground water resources. A significant number of watersheds depend upon ground water inflow as the base flow of surface streams. Florida also contains 27 of the 78 first-magnitude springs in the United States, an indication of the significant ground and surface water interchange Florida experiences. Thus, integrating ground and surface water protection efforts is necessary to safeguard both resources.



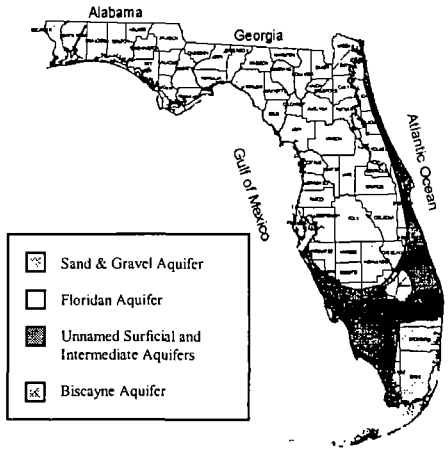
What is it? Florida is in the Coastal Plain physiographic province, blanketed by surficial sands and underlain by a thick sequence of bedded limestone and dolomite. Together the surficial sands, and the limestone and dolomites form an enormous ground water reservoir that provides proportionally larger quantities of ground water than in any other State. (McGuiness, 1963).

Florida primarily relies on three aquifer systems as drinking water sources. The Biscayne Aquifer supplies the densely populated counties of Dade, Broward, Palm Beach and Monroe Counties in southeast Florida. Virtually all the water needs for over 3 million residents are supplied by this unconfined aquifer. The Biscayne aquifer is a sole source drinking water aquifer as designated by the U.S. Environmental Protection Agency.

The Sand-and-Gravel Aquifer is the major source of water supply in the western part of the Florida Panhandle. The aquifer consists of surficial sediments and the water resources exist under unconfined and confined conditions depending upon the presence of discontinuous clay lenses.

The Floridan Aquifer system is one of the most productive sources of ground water in the United States. It extends across the entire state of Florida, southern Georgia, and adjoining parts of Alabama and South Carolina. This aquifer system is the lowermost part of the ground water reservoir in Florida. Many public water systems tap the Floridan including Jacksonville, Orlando, Clearwater, St. Petersburg, and Tallahassee. This system is a major supply for industrial, irrigation and rural use water.

Unnamed Surficial and Intermediate aquifers are present over much of the state and these are used when the deeper aquifers contain non-potable water quality. These aquifers serve to supply the water needs for perhaps 10 percent of the population, especially in the rural locations. The intermediate aquifer system produces under semi-confined conditions in southwestern Florida where the deeper Floridan Aquifer contains non-potable water.



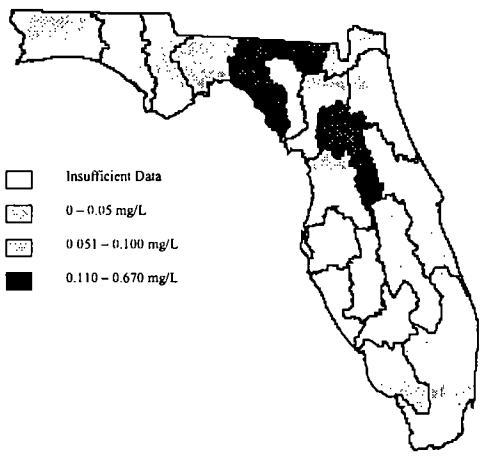
How Good Is The Water? Threatened by a growing population and attendant development, an expanding business community, and a productive agricultural industry, Florida manages to maintain drinking water quality ground water across the entire state. Florida has approximately 7,000 ground water dependent public water

systems and more than 3 million people are supplied by private wells. Many of these public water systems and private water wells are used without any extensive treatment. This is a tribute to dedicated efforts to protect these water resources, to direct state resources to this end.

The vast majority of contamination sites exist from insufficient protection practices of over 20 years ago. These sites are typically small in size but can exhibit significant exceedances of ground water standards, especially near a spill or leaking underground storage tank (UST). Within the past five years, Florida has required that USTs be double walled and leak detection systems installed to minimize environmental release of the products. Programs to address brownfields and dry cleaner contamination sites have recently been implemented.

Historical application of agricultural chemicals at some sites have degraded the shallow ground water locally. Ambient water quality data indicate that the average nitrate concentrations in surficial aquifers vary across the state, and while some regions have elevated concentrations, the vast majority of the ground water is within the ground water standard. At the present time, three state agencies are cooperating to develop best management practices to reduce this effect.

Median Dissolved Nitrate + Nitrite, 1994 –1997 Background Network Sweep, Surficial Aquifer



Costs of Contamination: Millions of dollars of federal and state funds have been directed into cleanup programs to remediate site-specific ground waters. Programs have been implemented to address federally designated sites through the RCRA and CERCLA programs and state priorities such as brownfields, dry cleaner and petroleum contamination, historic landfills, and other contaminated sites.

Efforts to Protect Ground water: Florida has a high water table, a porous sandy land cover, and a karst topography that allows the rapid transport of surface inputs into ground water. These features make ground water very vulnerable to contaminants from surface activities. It is essential that Florida protect its water resources for the valuable uses they support. Florida implements a sophisticated ground water protection program using a strategy of ground water quality standards, classifications, and monitoring regulations. Potential pollutant sources are permitted and regulated for compliance to water quality standards through permit reviews, compliance inspections and compliance reports. These regulated facilities include landfills, industrial and domestic wastewater facilities, and power plants. Non-point sources are being addressed through development of best management practices.

Regional water management districts implement a water withdrawal regulatory permitting and evaluation program that balances the water needs with the available resources. Together with a state funded Ambient Water Quality Monitoring Program, these programs monitor and protect the ground water resources.

What Else is Needed? The level of funding for ground water cleanup activities in the 1980s was eleven times that provided for protection programs. An equal level of support is needed for pollution prevention and protection programs to maintain the ground water in an unpolluted state. It is imperative that high quality ground waters be available to replenish surface waters, support ecological needs, and continue as a drinking water source for Florida's growing population. The emerging issues associated with the conversion of land uses from agricultural or industrial uses to an urban or residential use also requires the development of new protective strategies. Ground and surface water quality standards must be designed to address the interactions between the two resources. A public discussion and significant educational effort will be needed to confront these issues.

USGS

GROUND WATER ATLAS of the UNITED STATES
Alabama, Florida, Georgia, South Carolina
HA 730-G

Preview and download Biscayne aquifer figures--(26 thru 41)

Download the text (This is the text for all of HA 730-G in ascii format, no links, no page formatting) G-text.ascii--(164k)

BISCAYNE AQUIFER

INTRODUCTION

The Biscayne aquifer underlies an area of about 4,000 square miles and is the principal source of water for all of Dade and Broward Counties and the southeastern part of Palm Beach County in southern Florida (fig. 26). During 1985, an average of about 786 million gallons per day was withdrawn from the Biscayne aquifer for all uses; pumpage at present (1990) is somewhat greater. About 70 percent of the water was withdrawn for public supply. Major population centers that depend on the Biscayne aquifer for water supply include Boca Raton, Pompano Beach, Fort Lauderdale, Hollywood, Hialeah, Miami, Miami Beach, and Homestead. The Florida Keys also are supplied primarily by water from the Biscayne aquifer that is transported from the mainland by pipeline.

Because the Biscayne aquifer is highly permeable and lies at shallow depths everywhere, it is readily susceptible to contamination. The aquifer is the only source of drinking water for about 3 million people.

Water in the Biscayne aquifer is under unconfined, or water-table, conditions and the water table fluctuates in direct and rapid response to variations in precipitation. The aquifer extends beneath Biscayne Bay, from whence it was named, and the Atlantic Ocean. The aquifer is highly permeable where it forms part of the floor of the bay and the ocean, and contains saltwater there. Some of this saltwater has migrated inland in response to the lowering of inland ground-water levels adjacent to canals constructed for drainage of low-lying areas and near large well fields.

HYDROGEOLOGIC UNITS

The Biscayne aquifer consists of highly permeable limestone and less-permeable sandstone and sand. Most of the geologic formations comprising the aquifer are of Pleistocene age but, locally, Pliocene rocks also are included in the aquifer (fig. 27).

Most of the formations are thin and lens-like, and the entire sequence shown in figure 27 is not present at any one place. Some of the units interfinger and some are lateral equivalents of each other. For example, the Anastasia Formation and Key Largo Limestone interfinger with the Fort Thompson Formation; in places, the Miami Oolite is equivalent to the Key Largo Limestone and in other places to the upper part of the Fort Thompson Formation; and so on. The thickest and most extensive

geologic unit in the Biscayne aquifer is the Fort Thompson Formation, which is the surficial unit in northwestern Broward County and part of Palm Beach County (fig. 28); this unit is the major water-producing unit of the aquifer. The Anastasia Formation comprises much of the Biscayne at Fort Lauderdale and northward into Palm Beach County. However, the Pamlico Sand is the surficial unit in this area (fig. 28). The Miami Oolite, although thin, is a very porous, oolitic limestone that is present at the land surface throughout much of Dade County and parts of Broward and Monroe Counties (fig. 28). In general, the entire aquifer is more sandy in its northern and eastern parts, and contains more limestone and calcareous sandstone to the south and west.

The Fort Thompson, Anastasia, and Key Largo Formations yield the most water of any of the geologic formations of the Biscayne aquifer. The Fort Thompson is the most used of these three units. At Fort Lauderdale, the Tamiami Formation is a productive aquifer where it consists of calcareous sandstone. Most of the water is obtained from solution cavities in the sandstone. Yields of as much as 7,000 gallons per minute are reported for some wells completed in the Tamiami Formation, and drawdowns in the wells are less than 10 feet. The Biscayne aquifer is most permeable in a band near the coast in Dade and Broward Counties, but a cavity-riddled zone in the northern part of the aquifer in Palm Beach County yields as much as 1,000 gallons per minute to wells.

The Biscayne aquifer grades northward and westward into sandy deposits that are part of the surficial aquifer system. Well yields from these sandy deposits are small compared to well yields from the Biscayne. A sequence of low-permeability, largely clayey deposits about 1,000 feet thick separates the Biscayne aquifer from the underlying Floridan aquifer system. The Floridan contains saltwater in southeastern Florida, and is not hydraulically connected to the Biscayne aquifer.

BASE AND THICKNESS

The base of the Biscayne aquifer in Dade County and southern Broward County is a low-permeability sandy silt that is part of the Tamiami Formation. Farther north, the base is not as distinct; rather, it consists of a transition zone that changes from a mixture of moderately permeable calcareous sand, shell, and silt, which probably are part of the Anastasia Formation, to low-permeability silty clay which is part of either the Anastasia or Tamiami Formations.

The altitude and configuration of the base of the Biscayne aquifer are shown in figure 29. The base is somewhat irregular but generally slopes seaward from the western limit of the aquifer, where it is at the land surface, to a depth of about 240 feet below sea level near Boca Raton. Throughout much of the mapped area, the top of the aquifer is at or near the land surface. Accordingly, thickness of the aquifer can be estimated by subtracting the altitude of the base of the aquifer from the altitude of the land surface at a given point. The aquifer is wedge-shaped and ranges in thickness from a few feet near its western limit to about 240 feet near the coast.

Saltwater locally has entered the Biscayne aquifer, mostly near its base. The approximate extent of saltwater encroachment in 1982 is shown in color in figure 29.

HYDROLOGIC SYSTEM

Ground water and surface water form an integrated hydrologic system in southern Florida. Before development of these water resources, a large proportion of the abundant precipitation that fell on the flat, low-lying area drained southward to the Gulf of Mexico and Florida Bay. Most of this drainage was in the form of wide, shallow sheets of water that moved sluggishly southward during the wet

season, when as much as 90 percent of areas, such as the Everglades, was inundated. This drainage was the major source of recharge to the underlying aquifers. During the dry season, water moved only through the deeper sloughs and covered probably less than 10 percent of the Everglades. Lake Okeechobee, the second largest freshwater lake wholly within the conterminous United States, was a major water-storage component in the system, functioning as a retarding basin for streams, such as the Kissimmee River, that drained southward into the lake.

Today, the shallow, southward-moving sheet of surface water still is a major source of recharge to the Biscayne aquifer in addition to the precipitation that falls directly on the aquifer. Where the Biscayne is either exposed at the land surface or is covered only by a veneer of soil, the slowly moving surface water passing over the recharge area of the aquifer is able to readily percolate downward into the aquifer.

Freshwater Controls

Canals have been used extensively in southern Florida for drainage and flood control. Levees also were constructed, first to prevent flooding from Lake Okeechobee, and subsequently to impound excess water in three large water-conservation areas for later release. These alterations to the natural hydrologic system have culminated in a regional water system; major features of this system are shown in figure 30. The South Florida Water Management District utilizes a system of canals, levees, control structures, pumping stations, and water-conservation (storage) areas (Conservation Areas 1 through 3 in fig. 30) to manage the freshwater resources of southern Florida. The system conserves freshwater, provides flood control, and minimizes saltwater encroachment.

Impoundments, such as the water-conservation areas, provide water to the extensive canal system during dry periods. Seepage from the canals into the Biscayne aquifer during such periods helps maintain the water level in the aquifer. A network of major pumping stations provides flood protection by pumping excess stormwater from canals into the conservation areas. During prolonged droughts, this water is released to maintain canal flow. Natural land-surface elevations and levee heights are such that the overall movement of impounded water is from Lake Okeechobee to Conservation Area 1, and, thence, sequentially to Conservation Areas 2 and 3. Some of the water released from Conservation Area 3 sustains the flow of freshwater into the Everglades National Park.

Canals concentrate and channel what had been natural sheetflow. The drainage of wetlands is perhaps the most important aspect of the canal network, and was the primary reason for canal construction. However, a network of control structures also allows water to be diverted through the canal system to points where it may be needed to help maintain ground-water levels, such as near municipal well fields. Rapid interchange of water from the canals to the Biscayne aquifer is possible in most places because of the high permeability of the aquifer. Control structures near the coast on the major canals are particularly important in helping to prevent encroachment of saltwater into the canals, and subsequently into the aquifer, during periods of less than normal precipitation.

Ground-Water Flow

The major features of the flow system in the Biscayne aquifer are shown by a generalized water-table map (fig. 31). The configuration of the water table is a subdued replica of the land surface; that is, the water table is at a higher altitude under hills and at a lower altitude under valleys. The water table fluctuates rapidly in response to variations in recharge (precipitation), natural discharge, and pumpage from wells. Natural discharge is by seepage into streams, canals, or the ocean; by evaporation; and by

transpiration by plants.

The contours in figure 31, and the arrows superimposed on them, show that the general movement of water in the Biscayne aquifer is seaward. Water levels are generally highest near the water-conservation areas and lowest near the coast. Contours are not drawn in the conservation areas because they represent impoundments, and, accordingly, there is no slope in the water table there. The effects of natural surface drainage and uncontrolled canals on the water table are shown by the irregular patterns of the contours, particularly where they point upstream in a sharp "V" shape, showing that the aquifer is discharging to the canals. Near the coast, the contours point downstream, showing that the aquifer is being recharged from the canals. The water level of an unconfined aquifer typically is markedly affected by surface drainage.

Some of the local variations in the water table are due to other causes. The local high area in eastern Palm Beach County (fig. 31), where the water table is higher than 16 feet, is due to a local topographic high. The closed depressions in eastern Broward and Dade Counties reflect large-scale pumpage from major well fields supplying Miami and Fort Lauderdale (compare figs. 31 and 32). Withdrawal of large volumes of ground water has locally reversed the natural flow direction (note westward-pointing arrows adjacent to depressions), thereby increasing the possibility of saltwater encroachment. The wide spacing of contours in Dade County and southeastern Broward County indicates a slight gradient (slope) in the water table, as compared to a steep gradient to the north where the contours are closely spaced. The wide spacing of contours reflects areas where the Biscayne aquifer consists mostly of highly permeable limestone; permeability is less in the steep-gradient areas where the aquifer is sandier.

Water-Table Fluctuations

Major fluctuations in the water table of the Biscayne aquifer result from variations in recharge and natural or artificial discharge, or both. Fluctuations may range from 2 to 8 feet per year, depending primarily on variations in precipitation and pumpage. Pumpage is generally greater during periods of less than normal precipitation, as farmers and homeowners apply irrigation water to maintain crop production and lawn growth. Extremely low water-table conditions, such as those shown in figure 33, result from prolonged periods of less than normal precipitation. Total precipitation for the 2 years preceding the date of the water levels shown in figure 33 barely exceeded the long-term average precipitation for a single year. As a result, water levels declined slightly below sea level throughout a large area in southern Dade County, primarily due to transpiration by plants coupled with domestic pumpage. Water levels also were below sea level in a smaller area at Miami Springs, due to pumpage from the municipal well field. Under these conditions, saltwater migrated inland for considerable distances. Most of the drainage canals also were uncontrolled at the time (1940's) represented by figure 33, thus the lowering of the water table; saltwater encroachment was accelerated by continuous drainage to canals.

Extensive flooding also occurs during periods of greater than average precipitation, such as that preceding the high-stage water levels of October 1947, shown in figure 34. Water overflowed the banks of many of the canals, and a large part of the inland area was inundated. West of Biscayne Bay, water levels were almost 11 feet higher than those shown in figure 33. In Hialeah, water levels that had declined to about 0.5 foot above sea level in 1945 rose to almost 9 feet above sea level in 1947. The numerous types of control structures in southern Florida were constructed largely to avoid the problems associated with such extreme water-level fluctuations as those indicated by these two figures.

Response to Recharge

The highly permeable rocks of the Biscayne aquifer are covered in most places only by a veneer of porous soil. Accordingly, water levels in the aquifer rise rapidly in response to rainfall. The rise in the water level in well G-86, located in Miami, following two periods of intense rainfall in April 1942, is shown in figure 35. Eleven inches of rainfall during a 4-hour period in the early morning of April 16 produced a 4.5-foot rise in the water level in the well within a few hours. Six inches of rainfall during the late morning and early afternoon of April 17 was responsible for an additional rise of 1.5 feet in the water level in the well, also within only a few hours.

Canal-Aquifer Connection

The hydraulic connection between the Biscayne aquifer and the canals that cross it is direct. Water passes freely from the canals into the aquifer and vice versa. A decline in the water level of a canal lowers the adjacent water table of the aquifer almost immediately. Similarly, a rise in the water level in a canal is rapidly followed by a rise in the water table of the aquifer adjacent to the canal. These canal-aquifer water-level relations are shown schematically in figure 36. The arrows show the direction that water moves when the water level of the canal is lower (fig. 36A) and higher (fig. 36B) than the water table in the aquifer. The degree of connection decreases as fine sediment settles out of the canal water and lines the canal bottom. Accordingly, the degree of connection may change from time to time because of either accumulation of these sediments or their removal during runoff from intense storms.

The hydraulic connection between the canals and the aquifer results in both benefits and problems. Perhaps the most obvious benefit is the ability of the canals to rapidly remove excess surface and ground water, thereby preventing flooding in low-lying interior areas. A more subtle benefit is the ability to move water from inland parts of the aquifer to coastal areas through the canals, allowing ground-water levels near the coast to remain high enough to retard saltwater encroachment during periods of less than normal precipitation. Problems also can result from the direct hydraulic connection. For example, aquifer contamination by any pollutants in the canal water can be both rapid and widespread. In addition, the canals provide channels by which saltwater can encroach into the aquifer for considerable distances inland during periods of low water. The latter problem has been greatly alleviated by the construction of large-scale canal control structures near the coastal ends of the major canals (fig. 37). These structures prevent the movement of saltwater up the canals when water levels in the canals are low.

SALTWATER ENCROACHMENT

The delicate natural balance between freshwater and saltwater in the Biscayne aquifer is tipped when canals and well fields are superimposed on it. Where a highly permeable aquifer, such as the Biscayne, is hydraulically connected to the ocean, inland movement of saltwater is offset by a slightly higher column of freshwater. Because freshwater is lighter than saltwater, a 41-foot column of freshwater is necessary to balance a 40-foot column of saltwater. This means that, for each foot of freshwater above sea level, there is approximately a 40-foot column of freshwater below sea level. Accordingly, lowering of freshwater levels by drainage canals or by intensive pumping creates an imbalance that causes the inland movement of saltwater.

How saltwater can encroach coastal areas as a result of development is shown diagrammatically in

figure 38. In the natural, balanced condition shown in figure 38A, saltwater is present only near the shoreline and is balanced by a thick inland column of freshwater. Construction of a drainage canal, however (fig. 38B), lowers freshwater levels and allows landward movement of saltwater in the canal and aquifer. In addition, the canal becomes a tidal channel that conveys saltwater inland and, thence, laterally into the Biscayne aquifer. Where municipal well fields withdraw large quantities of ground water, the water level in the aquifer is lowered still farther, and saltwater can enter the well field (fig. 38C). Some coastal well fields have been abandoned for this reason. Control structures (fig. 38D) placed near the coast dam the water in the canal, thus, artificially raising water levels in both the canal and the adjacent aquifer. Thus, further saltwater encroachment is prevented and, in some instances, has even been reversed.

The saltwater body in the aquifer is approximately wedge-shaped, as shown in figure 39, being thickest near the coast and tapering inland. Therefore, the maximum inland extent of saltwater is located near the base of the aquifer. The cross section shown in figure 39 represents conditions near Biscayne Bay, where the aquifer is highly permeable and free interchange of freshwater and saltwater is possible. Farther northward, especially in Palm Beach County, the Biscayne aquifer is sandy and less permeable, and saltwater encroachment does not extend as far inland. The exact position of the saltwater front, defined by a chloride concentration of 1,000 milligrams per liter, varies in response to the height of freshwater in the aquifer, which in turn varies directly with precipitation. Movement of the saltwater front is inland and upward in response to low ground-water levels and seaward and downward in response to high ground-water levels. The arrows in figure 39 show that freshwater at the bottom of the aquifer flows upward and then discharges seaward along the saltwater front.

The sequence of maps in figure 40 shows the inland movement of saltwater in the Biscayne aquifer in response to development. The colored area on all the maps shows the inland extent of saltwater at the base of the aquifer. Under natural conditions, as shown by the 1904 map, saltwater was limited to a narrow band along the coastline and to short tidal reaches of natural water courses. Urban and agricultural development and the resulting drainage of the land had not yet begun. Before 1946, canal flow was virtually uncontrolled and groundwater levels were greatly lowered because of extensive pumpage. The threat of contamination of inland municipal well fields spurred remedial action. Salinity-control structures were constructed in coastward reaches of the major canals and halted or reversed saltwater encroachment, particularly adjacent to the canals (compare the 1953 and 1969 maps of fig. 40). By 1977, additional control structures and effective water-management practices had reduced the area of saltwater contamination considerably from its maximum extent in 1953.

SUSCEPTIBILITY TO CONTAMINATION

Because the Biscayne aquifer is highly permeable and is at or near the land surface practically everywhere, it is readily susceptible to ground-water contamination. Because of the high permeability of the aquifer, most contaminants are rapidly flushed. Major sources of contamination are saltwater encroachment and infiltration of contaminants carried in canal water. Additional sources include direct infiltration of contaminants, such as chemicals or pesticides applied to or spilled on the land, or fertilizer carried in surface runoff; landfills; septic tanks; sewage-plant treatment ponds; and wells used to dispose of storm runoff or industrial waste. Most disposal wells are completed in aquifers containing saltwater that underlie the Biscayne aquifer, but they are a potential source of contamination where they are improperly constructed. Numerous hazardous-waste sites have been identified in the area underlain by the Biscayne aquifer, and three unlined landfills are known to have contaminated the aquifer. Remedial action to prevent further contamination is underway at many of these sites.

Uncontaminated water in the Biscayne aquifer is suitable for drinking and most other uses. The water is hard, is a calcium bicarbonate type, and contains small concentrations of chloride and dissolved solids. Locally, the water contains large concentrations of iron. In places in southern Broward County and northern and central Dade County, the water is darkly colored, reflecting large concentrations of organic material.

FRESH GROUND-WATER WITHDRAWALS

Withdrawals of freshwater from the Biscayne aquifer during 1985 totaled 786 million gallons per day. Public-supply withdrawals were almost three-quarters, or about 569 million gallons per day, (fig. 41). Domestic and commercial withdrawals were about 19 million gallons per day. Agricultural withdrawals were about 180 million gallons per day. Withdrawals for industrial, mining, and thermoelectric-power uses were about 18 million gallons per day.

Move to next section Intermediate aquifer system
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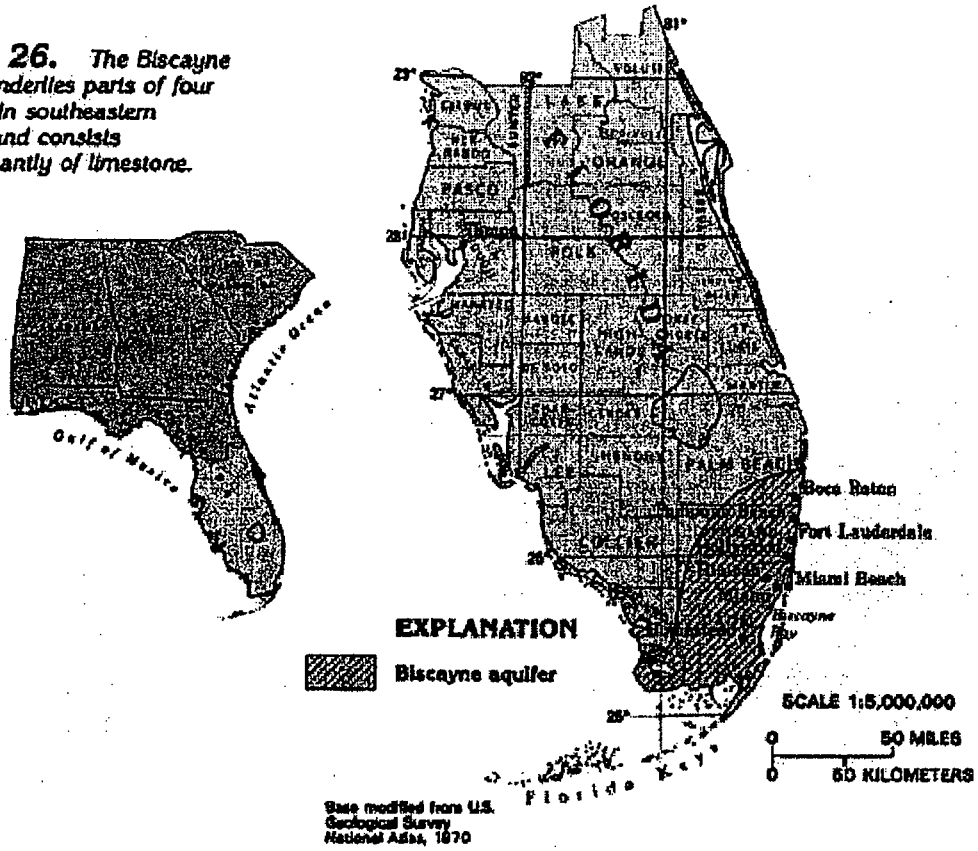
Figure 26. *The Biscayne aquifer underlies parts of four counties in southeastern Florida, and consists predominantly of limestone.*



Series	Stratigraphic and hydrologic units		Lithology and water-yielding characteristics	Thickness (feet)
Holocene	Organic soils Lake Flirt Marl	Confining unit	Peat and muck; water has high color content. Almost impermeable. Lake Flirt is shelly, calcareous mud	0-18
Pleistocene[1]	Pamlico Sand	Biscayne aquifer	Quartz sand; water high in iron. Small yields to domestic wells	0-40
	Miami Oolite		Sandy, oolitic limestone. Large yields	0-40
	Fort Thompson Formation		Alternating marine shell beds and freshwater limestone. Generally high permeability. Large yields	0-150
	Anastasia Formation		Coquina, sand, sandy limestone, marl. Moderate to large yields	0-120
	Key Largo Limestone		Coralline reef rock. Large yields	0-60
	Caloosahatchee Marl		Sand, shell, silt, and marl. Moderate yields	0-25
Pliocene	Tamiami Formation	Confining unit	Limestone, clay, and marl. Occasional moderate yields in upper few feet. Remainder forms upper part of basal confining unit.	25-220

[1] Stratigraphic units are equivalent in part. Order does not necessarily reflect relative age.

Modified from Klein and Causaras, 1982

Figure 27. *Several geologic units comprise the Biscayne aquifer. Most of these units are of Pleistocene age.*

Figure 28. *The rocks that comprise the top of the Biscayne aquifer vary in character. They are mostly limestone, but sand marks the top of the aquifer to the northeast.*

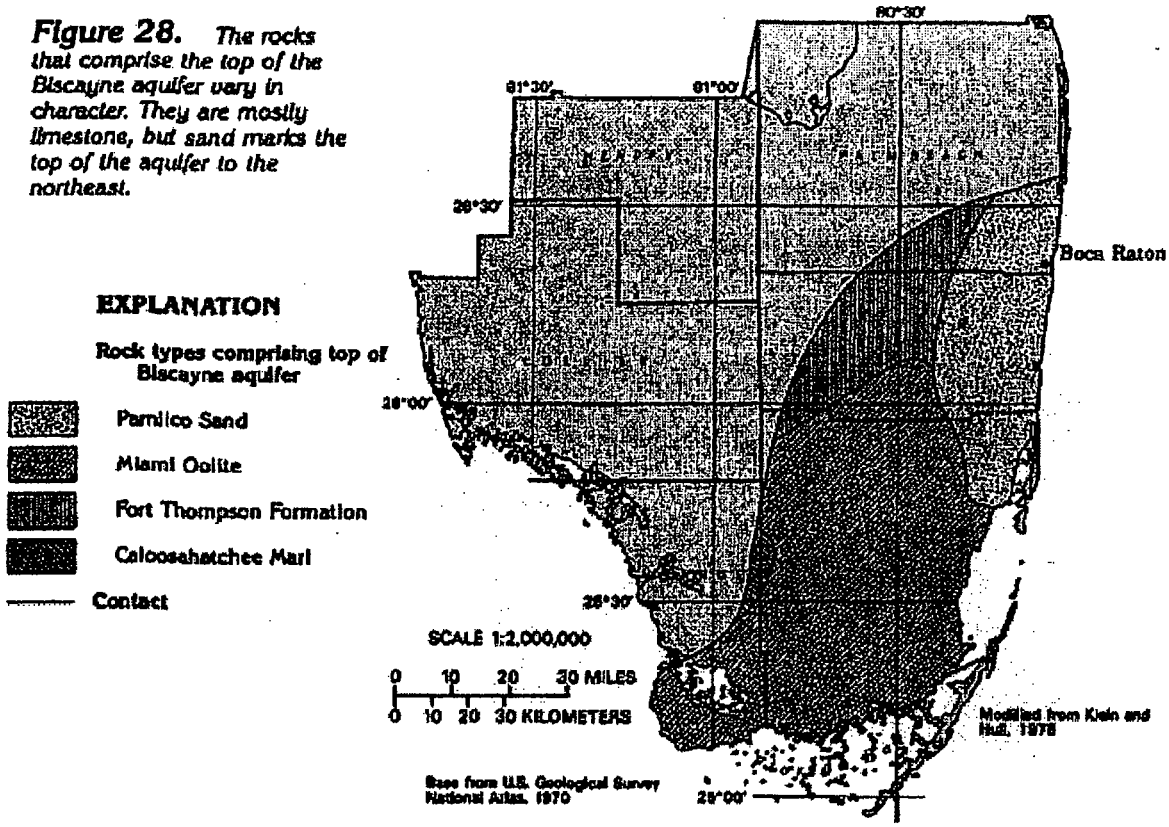


Figure 29. *The base of the Biscayne aquifer slopes seaward to a maximum depth of about 240 feet below sea level. Saltwater is present at the base of the aquifer in a narrow band along the coast.*

EXPLANATION

Extent of saltwater at base of Biscayne aquifer

—200— Base-of-aquifer contour—Shows altitude of base of aquifer. Dashed where approximately located. Contour interval 10 and 20 feet. Datum is sea level

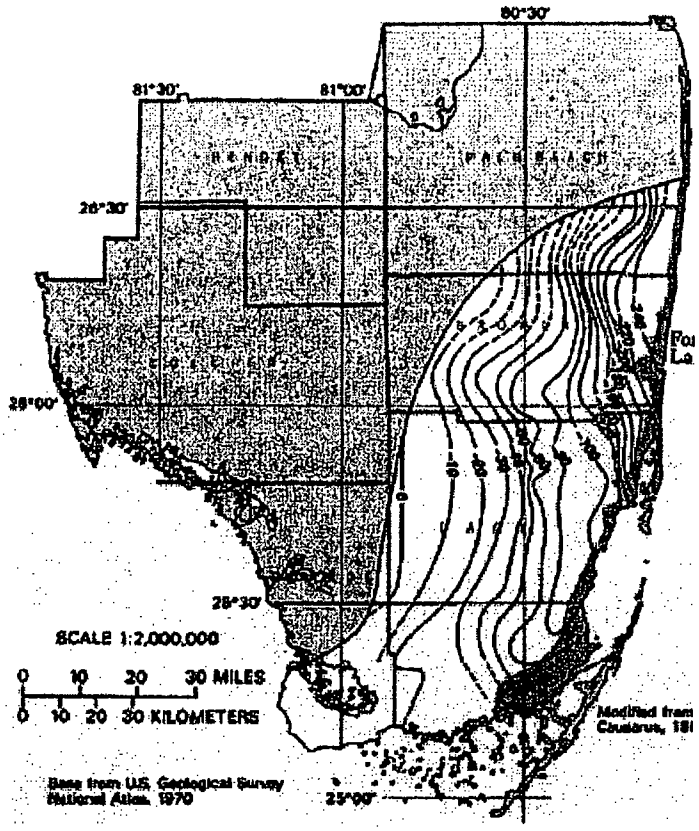
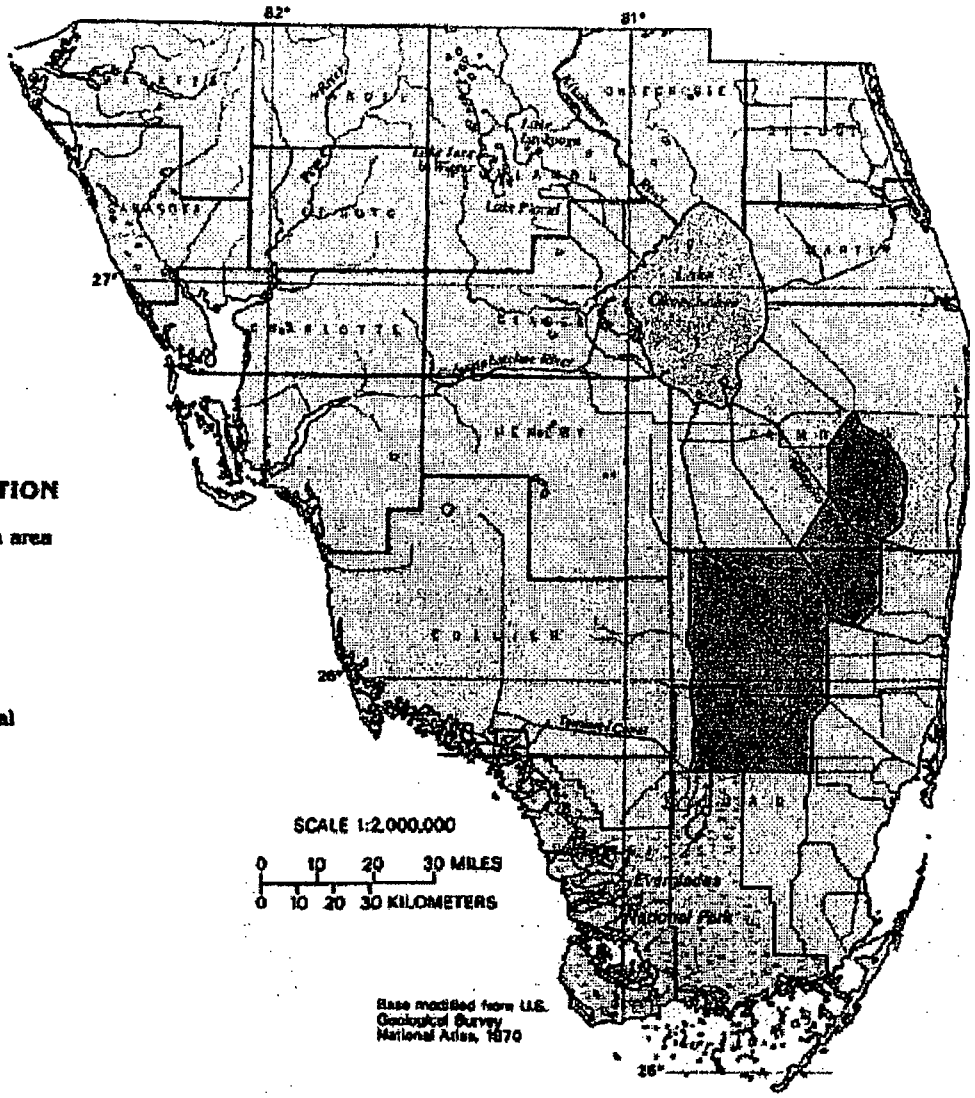


Figure 30. *Lake Okeechobee, an extensive canal system, and three water-conservation areas are all linked as parts of a sophisticated water-management system. Dikes, pumps, and control structures on the canals are used to store stormwater and release it when and where it is later needed.*



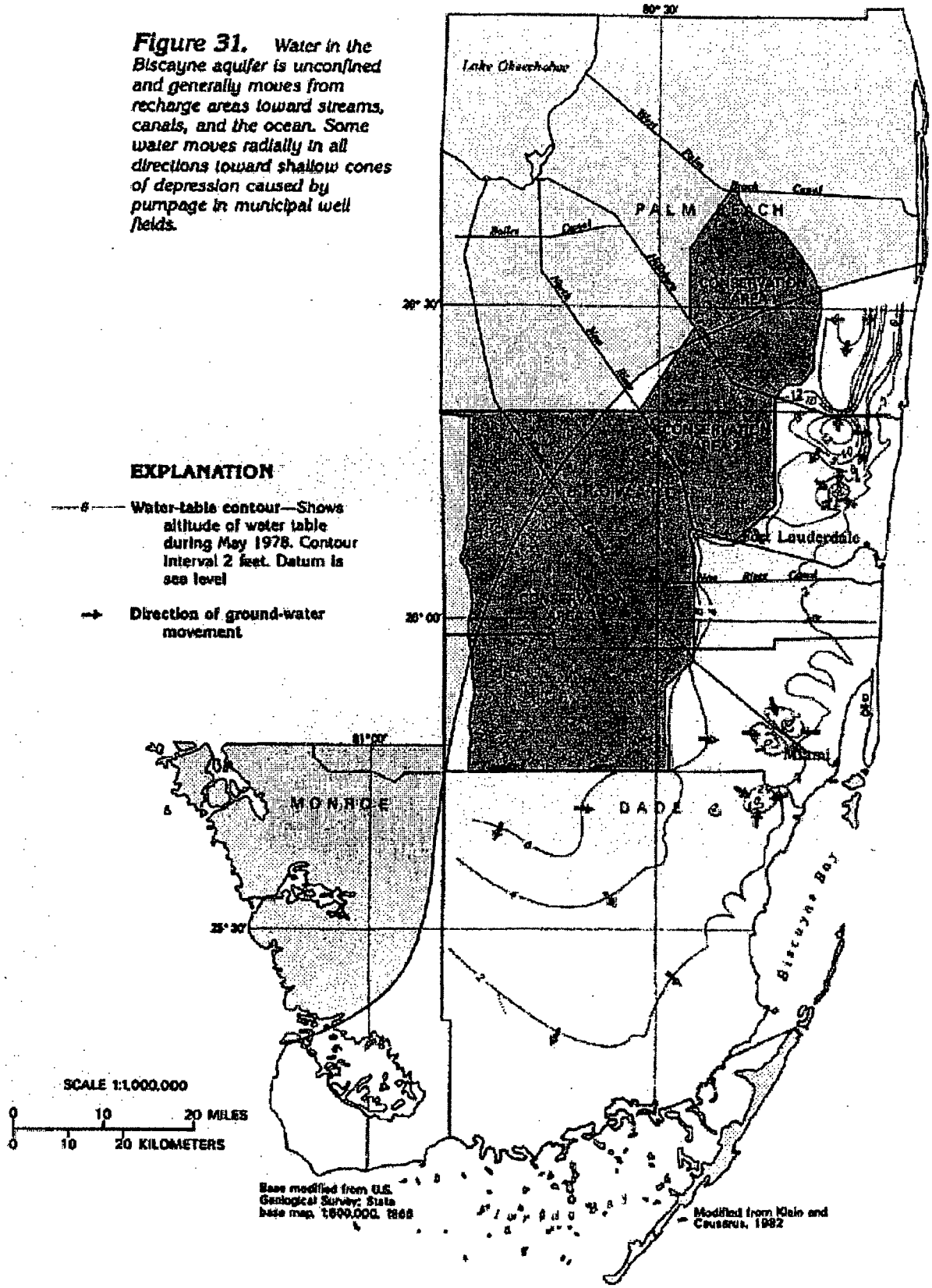
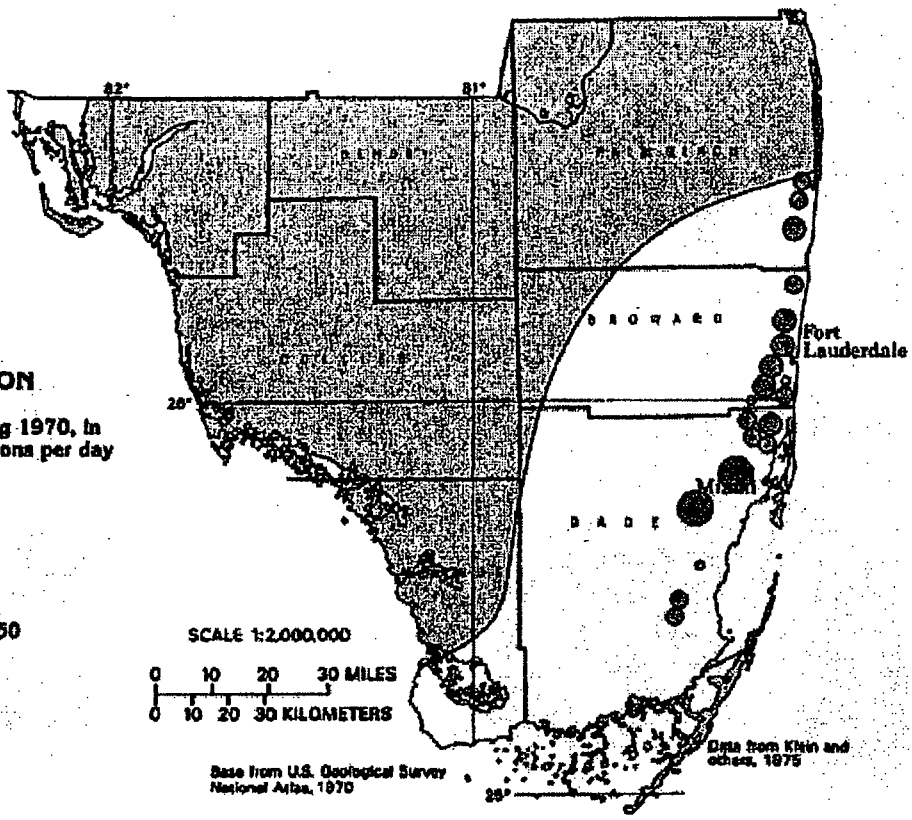
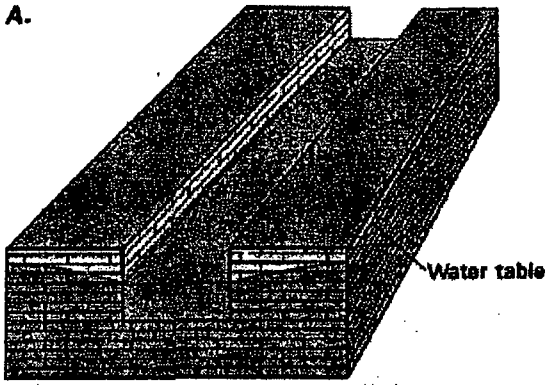


Figure 31. Water in the Biscayne aquifer is unconfined and generally moves from recharge areas toward streams, canals, and the ocean. Some water moves radially in all directions toward shallow cones of depression caused by pumpage in municipal well fields.

Figure 32. *The magnitude of municipal pumpage from the Biscayne aquifer is greatest in the Miami and Fort Lauderdale areas. However, a considerable volume of water also is pumped from the aquifer in Palm Beach County.*

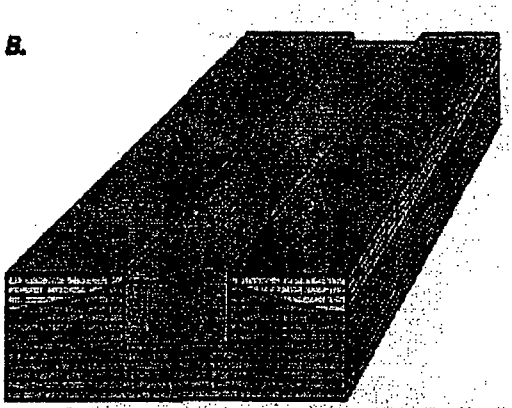


A.



When the water level in an aquifer is higher than that in a canal that penetrates it, water moves toward the canal.

B.



When the water level in a canal is higher than that in the aquifer it penetrates, water moves into the aquifer.

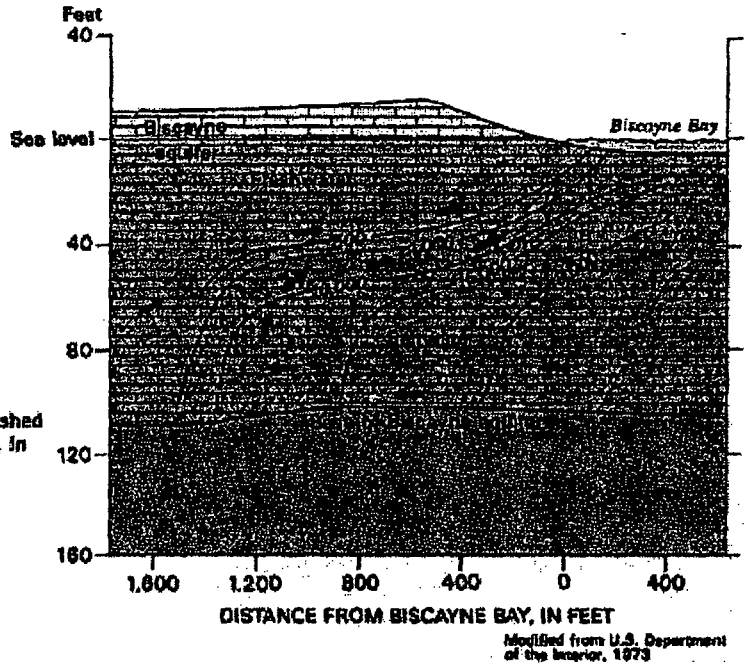
Modified from Klein and others, 1979

Figure 36. During periods of less than normal precipitation, water passes freely from the aquifer into canals that are dug into it (top diagram). When storm runoff raises canal water levels, the movement of water is reversed (B).

Figure 37. Dam-like control structures, such as this one, have been constructed in near-coastal reaches of the major drainage canals. The structures are closed to prevent inland movement of saltwater up the canals during less than normal precipitation periods.

Sherwood and others, 1972

Figure 39. *Saltwater extends farther inland near the base of the Biscayne aquifer rather than near the top of it.*



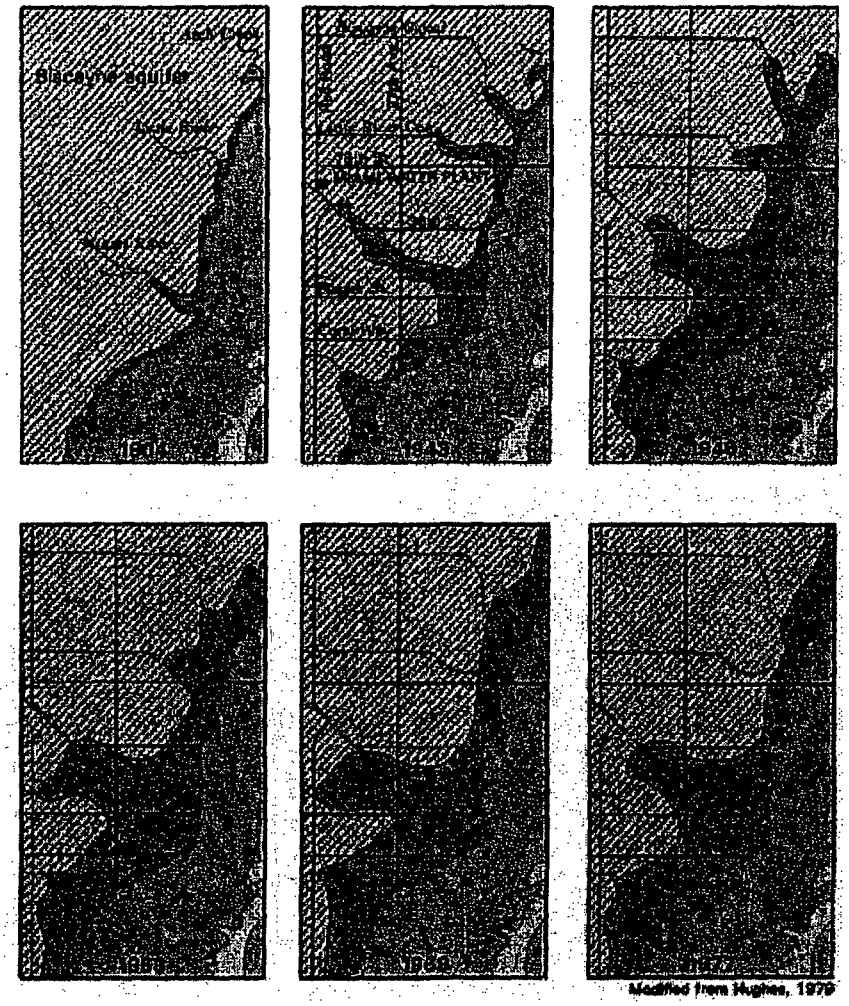
EXPLANATION

----600—— Line of equal chloride concentration—Dashed where approximately located. Interval, in milligrams per liter, is variable

Direction of ground-water movement

➡ Freshwater

➡ Saltwater



Modified from Hughes, 1979

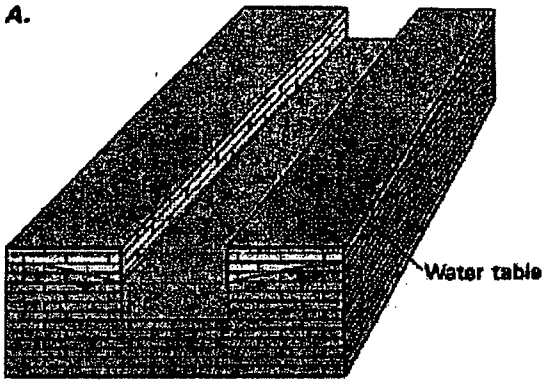
Figure 40. *Saltwater encroachment in the Biscayne aquifer, mainly adjacent to canals, occurred in increasingly larger areas from 1904 until 1953. After the emplacement of control structures on major canals, encroachment was markedly slowed and even reversed in places.*

EXPLANATION

Extent of saltwater encroachment at base of Biscayne aquifer in the Miami area

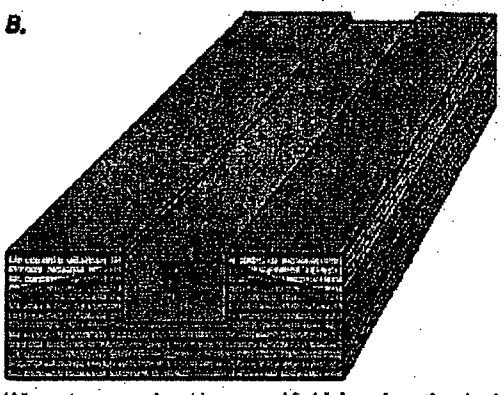
0 2 4 6 MILES
0 2 4 6 KILOMETERS

A.



When the water level in an aquifer is higher than that in a canal that penetrates it, water moves toward the canal.

B.



When the water level in a canal is higher than that in the aquifer it penetrates, water moves into the aquifer.

Modified from Klein and others, 1975

Figure 36. During periods of less than normal precipitation, water passes freely from the aquifer into canals that are dug into it (top diagram). When storm runoff raises canal water levels, the movement of water is reversed (B).

Reference 22

E.C. JORDAN CO.

CONSULTING ENGINEERS

4535-01

September 14, 1984

Mr. Eric Nuzie
Florida Department of Environmental Regulation
2600 Blairstone Road, Twin Towers Building
Tallahassee, FL 32301

Dear Mr. Nuzie:

SUBJECT: PRELIMINARY ASSESSMENT REPORT
London Platers, Inc. - FLD004125514
Hialeah, Florida

Submitted herewith is a Preliminary Assessment Report for the subject site indicating no further action. This priority assessment has been assigned as a result of FDER hazardous waste compliance report which designates London Platers as a nonhandler of hazardous waste (09/09/83). FDER correspondence stated that no hazardous waste violations were observed and no follow up inspection was recommended. Copies of the approrpiate correspondence have been attached to the Preliminary Assessment for your review.

Sincerely,

E.C. JORDAN CO.

David E. Troutman

DET:amp

Enclosure

1311 EXECUTIVE CENTER DRIVE • SUITE 255 • TALLAHASSEE, FLORIDA 32301 • (904) 656-1293
PORTLAND, ME • BOSTON, MA • WASHINGTON, D.C. • DETROIT, MI

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
FL	D004125514

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
London Platers, Inc.	1080 E. 24th Street

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
Hialeah	FL	33010	Dade	025	18

09 COORDINATES LATITUDE	LONGITUDE	
25 50 40.0	080 15 43.0	UTM: (5) 741 (28) 585

10 DIRECTIONS TO SITE (Starting from nearest public road)

6-½ blocks east of Hialeah Park; 1 block south of E. 25th Street artery.

III. RESPONSIBLE PARTIES

01 OWNER (If known)	02 STREET (Business, mailing, residential)
London Plating - David London (owner)	1080 E. 24th Street

03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
Hialeah	FL	33010	(305) 691-3472

07 OPERATOR (If known and different from owner)	08 STREET (Business, mailing, residential)
London Plating - David London (owner)	1080 E. 24th Street

09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
Hialeah	FL	33010	(305) 691-3472

13 TYPE OF OWNERSHIP (Check one)

☒ A. PRIVATE ☐ B. FEDERAL: _____ (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL

☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)

☐ A. RCRA 3001 DATE RECEIVED: __/__/__ (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: __/__/__ (MONTH DAY YEAR) ☒ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION

☒ YES DATE 09/08/83 (MONTH DAY YEAR)
☐ NO

Result of a complaint.

BY (Check all that apply)

☐ A. EPA ☐ B. EPA CONTRACTOR ☒ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: _____ (Specify)

CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)

☒ A. ACTIVE ☐ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION

_____ BEGINNING YEAR _____ ENDING YEAR ☒ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED

London Plating is a custom plating facility that does antiques and other valuable pieces. No hazardous wastes are generated. Potential contaminants are solvents, acids and heavy metals.

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

A 09/09/83 FDER inspection turned up no violations. There is no potential environmental hazard at this site. No follow-up inspection was recommended.

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)

☐ A. HIGH (Inspection required promptly) ☐ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☒ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NUMBER
Eric Nuzie	Florida DER	(904) 488-0190

04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
David E. Troutman	N/A	E.C. Jordan Co.	(904) 656-1293	09 05 84 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
FL	D004125514

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☐ A. SOLID
- ☐ B. POWDER, FINES
- ☒ C. SLUDGE
- ☐ D. OTHER _____ (Specify)
- ☐ E. SLURRY
- ☐ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____

CUBIC YARDS _____

NO. OF DRUMS 1/2

03 WASTE CHARACTERISTICS (Check all that apply)

- ☐ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☒ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☐ G. FLAMMABLE
- ☐ H. IGNITABLE
- ☐ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS Nickel	25	Gal	This is not a hazardous waste, it is a byproduct to be sold.

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
	None				

V. FEEDSTOCKS (See Appendix for CAS Numbers) N/A

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See attached reference list.

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE: FL | 02 SITE NUMBER: D004125514

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☐ A. GROUNDWATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

No potential hazard.

01 ☐ B. SURFACE WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

No potential hazard.

01 ☐ C. CONTAMINATION OF AIR
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

No potential hazard.

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

No potential hazard.

01 ☐ E. DIRECT CONTACT
3 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

No potential hazard.

01 ☐ F. CONTAMINATION OF SOIL
03 AREA POTENTIALLY AFFECTED: _____ (Acres)
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

No potential hazard.

01 ☐ G. DRINKING WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

No potential hazard.

01 ☐ H. WORKER EXPOSURE/INJURY
03 WORKERS POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

No potential hazard.

01 ☐ I. POPULATION EXPOSURE/INJURY
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

No potential hazard.

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
FL	D004125514

II. HAZARDOUS CONDITIONS AND INCIDENTS *(Continued)*

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

None reported.

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION *(Include name(s) of species)*

None reported.

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

None reported.

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES *(Spills/runoff/standing liquids/leaking drums)* — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

None reported.

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

None reported.

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

None reported - discharge to sewer is monitored monthly.

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

None reported.

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

None.

III. TOTAL POPULATION POTENTIALLY AFFECTED: None

IV. COMMENTS

A rinse tank at the site empties into a sewer drain. This flow is monitored each month by Dade County Environmental Resource Management. It has a pH of 7.7 and is not hazardous.

V. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

See attached reference list.

SITE SCREENING SUMMARY

11-25-86

Site Name: London Platers

EPA ID #: FLD 004 125 514

Reviewer Name: Craig Feen Date: 7/17/87

I. INITIAL REVIEW: (Check where appropriate)

NPL ____ RCRA ____ Fed. Fac. ____ "Low Priority" Landfill ____

NFA X reason: Nickel sulfate is stored for eventual sale and all other wastes are discharged to the city sewer TLT. Therefore, containment score is 0.

II. LEAD: Fund ____ Enforcement ____ Unknown ____

III. REMOVAL: Needed ____ reason: ____

Completed ____ (score using preremoval conditions)

IV. HRS SCORE: 0 Confidence: high ____ medium X low ____

V. LOCATION: Latitude: 35° 50' 3[illegible]" Longitude: 80° 17' 0[illegible]"

V. INFORMATION NEEDED: (Check information needed to determine disposition)

A. Preliminary Assessment (Notes/sources for future reference)

____ 1. RCRA Status Information ____
____ 2. Observed Release ____
____ 3. Target Information ____
____ 4. Distance to Surface Water ____
____ 5. Depth to aquifer of concern ____
____ 6. Waste identity ____
____ 7. Hazardous waste quantity ____
____ 8. Others (list) ____

B. Site Investigation

____ 1. Waste identity ____
____ 2. Distance to surface water ____
____ 3. Slope/intervening terrain ____
____ 4. Containment ____
____ 5. Observed release (surface) ____
____ 6. Observed release (ground) ____
____ 7. Hazardous waste quantity ____
____ 8. Others (list) ____

CRITICAL HRS FACTOR DOCUMENTATION FORM DATE: _____

SITE NAME: _____

EPA ID #: _____ REVIEWER: _____

1.) Is an observed release documented (background and site samples are available and the site is shown to be the source of the contamination) or is one likely?

GROUNDWATER: Yes___ No___ Likely ___ SURFACE WATER: Yes___ No___ Likely___
Groundwater info source: _____
Surface water info source: _____

2) What is the depth at the site to the shallowest aquifer used locally for drinking water?

Depth: _____ Known ___ Estimated ___ Unknown ___
Source: _____

3) What is the distance to surface water from the hazardous waste?

Distance: _____ Known ___ Estimated ___ Unknown ___
Source: _____

4) What are the most toxic/persistent chemicals at the site: Unknown ___

a)_____ b)_____ c)_____
Source: _____

5) What is the hazardous waste quantity?

Quantity: _____ Known ___ Estimated ___ Unknown ___
Source: _____

6) What is the distance to the nearest public water supply well using the aquifer of concern and what is the population served?

Distance: _____ Known ___ Estimated ___ Unknown ___
Population: _____ Known ___ Estimated ___ Unknown ___
Source: _____

7) What is the distance to the nearest private water supply well using the aquifer of concern and what is the population served within 3 miles?

Distance: _____ Known ___ Estimated ___ Unknown ___
Population: _____ Known ___ Estimated ___ Unknown ___
Source: _____

8) What is the distance to the nearest downstream surface water intake and the population served?

Distance: _____ Known ___ Estimated ___ Unknown ___
Population: _____ Known ___ Estimated ___ Unknown ___
Source: _____

HRS SCORE SHEET

DATE: 7/7/86

SITE NAME: Loatsa Platers

EPA ID #: FLD 004 125 514 REVIEWER: Craig Ferry

HRS FACTOR SCORES	Score	Default	Known	Estimate
1) Toxicity/persistence (TP)		none		
2) Waste quantity (WQ)		(1)		
3) Containment (Groundwater) (C_{gw})	0 [1]	(3)		
4) Depth to aquifer of concern (D_{ac})		(6)		
5) Distance to nearest well/population (DP_g)		none		
6) Containment (Surface Water) (C_{sw})	0 [1]	(3)		
7) Distance to surface water (D_{sw})		(6)		
8) Distance to surface intake/population (DP_s)		none		

HRS GROUNDWATER ROUTE SCORING:

a) If observed release: $S_{gw} = \frac{(TP + WQ)\ (DP_g + 9)}{12.74}$ = _____

b) If no observed release: $S_{gw} = \frac{(D_{ac} + 7)\ (TP + WQ)\ (DP_g + 9)(C_{gw})}{573.3}$ = 0

HRS SURFACE WATER ROUTE SCORING

a) If observed release: $S_{sw} = \frac{(TP + WQ)\ (DP_s + 9)}{14.3}$ = _____

b) If no observed release: $S_{sw} = \frac{(D_{sw} + 5)\ (TP + WQ)\ (DP_s + 9)(C_{sw})}{643.5}$ = 0

MULTIMEDIA HRS SCORING

Do not score the air route unless an observed release is known to have occurred.

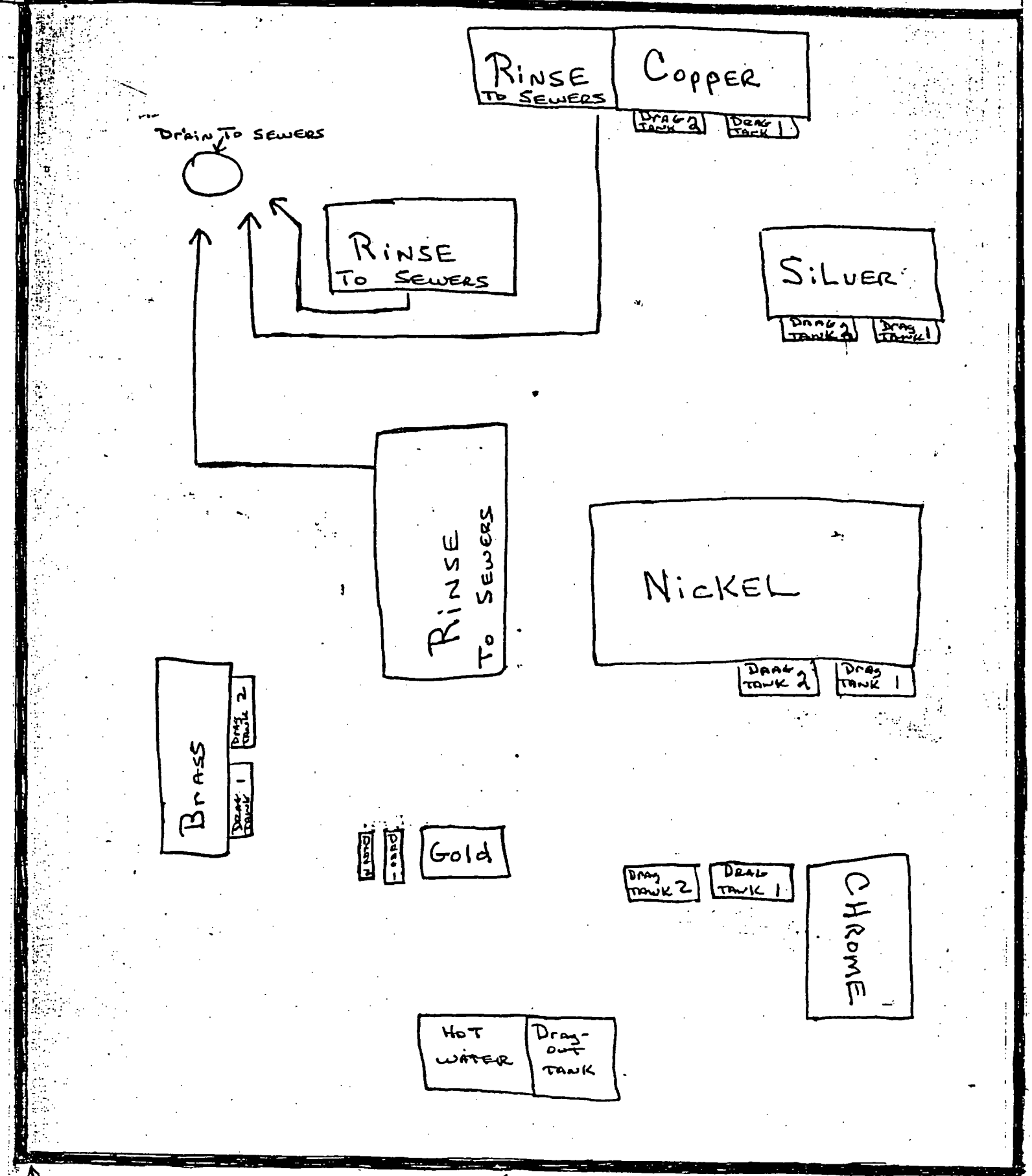
$$S_m = \sqrt{\frac{S_{gw}^2 + S_{sw}^2}{1.73}} = 0$$

The scoring in above steps is based on the following default scores:

1) the sum of the scores for net precipitation, permeability, and physical state is 7,
2) the groundwater use is for drinking and the score used is 9.
3) the sum of the scores for slope/terrain, rainfall and physical state is 5,
4) the sum of the scores for surface water use and distance to sensitive environments is 9.

If these assumptions are known to be substantially incorrect, complete an HRS scoring sheet.

London Platers, Inc.



4" High Concrete

London Platers,Inc.

Treatment:

Counter Flow Drag-out System:

The Treatment System we use to insure clean rinse water has worked extremly well over the years and has been verified by monthly water samples and Derm inspections.Very simply put,the system works as follows:After each plating tank is a series of two drag-out tanks.The first drag-out tank eliminates approximately 95% of the plating chemicals.The second drag-out tank takes out the balance, thus,the final rinse tank to sewers is chemical free.
Because the plating tanks are heated there is a great loss of water due to evaporation.We than take the water in the first Drag-out tank to replenish the water that was evaporated in the plating tank.The second Drag-out tank is than emptied into the first Drag-out tank and than refilled with clean water.
The benefits of this system are numerous but the big advantages are:

1.Protecting of the enivironment
2.Simple to operate
3.Nothing to break down(i,e Motors, pumps ect).
4.Saving of expensive chemicals

(8)

safety-kleen corp. DUNS NO. 05106-0408 FOR SERVICE CALL

777 BIG TIMBER ROAD • ELGIN, ILLINOIS 60123

TRANSPORTER JORGE CARVAJAL 305-591-9409

SCHEDULED SERVICE WEEK	SCHEDULED SERVICE TERRITORY	REFERENCE NUMBER
90- 6	03	198987

FED. ID NO. 39-6090019

MANIFEST NUMBER XXXXX

CUSTOMER

3-097-02-7183-8

LONDON PLATERS

1080 E 24TH ST

HIALEAH FL 33013

PRICES EFFECTIVE 7/10/89

BILL TO

SERVICE DATE	SALESMAN'S NO.	SALES SPECIALIST	SALES TAX EXEMPTION NUMBER	HANDLING CODE	CREDIT CODE		PREVIOUS BALANCE	PORTION OVER 60 DAYS
2940 834		XXXX			C			

BUSINESS TYPE	CHAIN	CUSTOMER P.O. NUMBER	GENERATOR/CUSTOMER PHONE #		V.O.C.	SVC P/S	PROD. P/S	SERVICE TAX	C.O.M.S. TAX	PRODUCT TAX
09	NO		305-691-3472	NO	NO	501	001	.06	.06	.06

MACHINE SERVICE SECTION

MACHINE NUMBER	SERVICE CHARGE	SALES TAX	TOTAL CHARGE	SERVICE TERM	CHANGE SERVICE TO WEEK	CHANGE SERVICE TO DAY	REMARKS 0123
170-64023	49.00	2.94	51.94	06			
TOTAL SERVICE SECTION	49.00	2.94	51.94				

MACHINE INSPECTION SECTION (PLEASE CHECK APPROPRIATE BOXES): MACHINE CONDITION & CLEANLINESS; LAMP ASSEMBLY CONDITION; DECALS IN PLACE AND LEGIBLE; PUSSIBLE LAMP INSTALLED; EMERGENCY CLOSING OF LID UNOBSTRUCTED; MACHINE PROPERLY GROUNDED; LOCAL PHONE NO. STICKER APPLIED TO MACHINE; SPRINT BOX VENT MEETS ACCEPTANCE CRITERIA

GENERATOR USA EPA ID NO.: GENERATOR STATE ID NO.: 10-065-3269

HAZARDOUS WASTE INFORMATION:

CONTAINERS					
PAILS	DRUMS	16 GAL. OR LESS	30 GAL. OR MORE	TOTAL LBS. OR GAL.	US DOT DESCRIPTION INCLUDING PROPER SHIPPING NAME, HAZARD CLASS, AND ID
	1			45	Waste Petroleum Naphtha, Combustible Liquid, UN 1256 (EPA, D001)

LAND DISPOSAL RESTRICTION NOTICE (40 CFR 268.7): Waste are restricted wastes under restrictions and treatment standards under 268. Waste Acetone (1000 mg/l), Waste Methyl Ethyl Ketone (200 mg/l), Cresylic acid (0.75 mg/l), 1,2-dichlorobenzene (0.125 mg/l) restricted wastes in 40 CFR 268.

I certify that the hazardous waste ignitable total more than 220 pounds (100 kg) per two calendar months and that I am not required to comply with the land disposal restrictions.

GENERATOR INITIALS

Total Quantity = Number of Drums x Ave. Wt/Drum of: Pails 35.0 27 16 Gal. 45 30 Gal. 86

DESIGNATED FACILITY NAME AND ADDRESS: SAFETY-KLEEN CORP. 7875 NORTHWEST 54TH ST MIAMI FL 33166

USA EPA ID NO. FLD980840086

STATE ID NO.

PRODUCT SALES SECTION

SOLD ON PREVIOUS SERVICES 2 PRIOR	PRIOR	LAST	PRODUCT NUMBER	DESCRIPTION	PRICE	U/M	QUANTITY DELIVERED	SALES AMOUNT	TAX	LINE TOTAL

PAYMENT RECEIVED SECTION

CASH ☐ CHECK NUMBER

TOTAL RECEIVED

APPLY PAYMENT TO: ☐ TODAYS SERVICE/SALE ☐ PREVIOUS BALANCES AS FOLLOWS

INV. AMOUNT $

INV. AMOUNT $

INV. AMOUNT $

TOTAL PRODUCT AMOUNTS

CHARGE MY ACCOUNT FOR THIS TRANSACTION UNLESS OTHERWISE INDICATED IN THE PAYMENT RECEIVED SECTION. ALSO I HAVE NOTED THE MACHINE INSPECTION SECTION ABOVE AND THE PRESENCE OF MACHINE, SOLVENT AND RECLAMATION AGREEMENT INFORMATION ON THE REVERSE SIDE. THE ABOVE AMOUNT IS SUBJECT TO AN INTEREST CHARGE OF THE LESSOR OF 1.5% PER MONTH (18% PER ANNUM) OR THE MAXIMUM RATE ALLOWED BY LAW ON ANY UNPAID INVOICES THAT ARE NOT PAID WITHIN 30 DAYS

TOTAL SERVICE AMOUNT (FROM ABOVE) 51.94

TOTAL DUE

IN THE EVENT OF DEFAULT, DEBTOR ALLEGED SHALL BE ENTITLED TO RECOVER COSTS OF COLLECTION, INCLUDING REASONABLE ATTORNEY'S FEES.

X

GENERATOR/CUSTOMER SIGNATURE

SERVICE/SALES ACKNOWLEDGEMENT CUSTOMER

FORM NO. 200-18 (7-89)

LONDON PLATERS INC.
1080 E. 24th STREET
HIALEAH, FLORIDA 33013
Phone: 691-3472

Feb.21,1990

Bureau of Waste Cleanup

FEB 23 1990

Technical Review Section

Dear Mr.Logan,

In responce to our conversation of ~~Feb.~~20th,inclosed please find the following;

1.All of 1989 & Jan.1990 photocopies of our monthly compliance analysis of our effluent by Enviropact,Inc.

2.A photocopy of the latest invoice of Safety-Kleen Corp.

3.A discription of the plating process & how we insure clean rinse water to sewers.

4.A sketch of the plating area & flow diagram also,we have a 4" high concrete berm enclosing the entire plating area in case of accidental spills.which,I'm happy to report that we have never had.

Along with the monthly water sample that Enviropact,Inc. takes.We are ramdomly inspected by Metropolitan Dade County Environmental Resources Managment (Derm) approximately every 3 months.

Hopefully this will give you the imformation that you need in resolving this matter.

Respectfully,

David F. London, President

David F.London,Pres.

ENVIROPACT

11098
LONDON PLATERS
1080 E. 24 STREET
HIALEAH, FL 33013

January 5, 1989
Report 28745
LAB ID. 86119

ATT : MR. DAVE LONDON
Sample Collected: 12/09/88
Sample Received: 12/09/88 Collected By: YOUR REP.
Sample Description:MONTHLY COMPLIANCE ANALYSIS

REPORT OF ANALYSIS : EFFLUENT		UNITS	DATE
CHROMIUM, HEXAVALENT	< 0.01	mg/l	12/12/88
CHROMIUM, TOTAL	< 0.10	mg/l	12/13/88
COPPER	< 0.1	mg/l	12/12/88
NICKEL	< 0.10	mg/l	12/14/88
CYANIDE, TOTAL	< 0.01	mg/l	12/13/88
pH	8.5		12/09/88
AVERAGE DAILY FLOW	310	GPD	1/04/89
SLUDGE VOLUME DISPOSED OF	0		1/03/89

Analyses performed in accordance with E.P.A., A.S.T.M., Standard Methods or other approved methods.

C.C. DERM
CONTACT CITY OF HIALEAH

Respectfully Submitted,

Jeffrey S. Glass
Laboratory Supervisor
Enviropact Services, Inc.

ENVIROPACT SERVICES, INC.
MIAMI DIVISION
4790 N.W. 157th STREET
MIAMI, FL 33014-6421
305-620-1700

ENVIROPACT

11098
LONDON PLATERS
1080 E. 24 STREET
HIALEAH, FL 33013

January 30, 1989
Report 29194
LAB ID. 86119

ATT : MR. DAVE LONDON
Sample Collected: 1/19/89
Sample Received: 1/19/89 Collected By: YOUR REP.
Sample Description: MONTHLY COMPLIANCE ANALYSIS

REPORT OF ANALYSIS : EFFLUENT		UNITS	DATE
CHROMIUM, HEXAVALENT	< 0.01	mg/l	1/20/89
CHROMIUM, TOTAL	< 0.1	mg/l	1/26/89
COPPER	< 0.1	mg/l	1/26/89
NICKEL	< 0.1	mg/l	1/27/89
CYANIDE, TOTAL	< 0.01	mg/l	1/20/89
pH	8.8		1/19/89
AVERAGE DAILY FLOW	290	GPD	1/19/89
SLUDGE VOLUME DISPOSED OF	0		1/19/89

Analyses performed in accordance with E.P.A., A.S.T.M., Standard Methods or other approved methods.

C.C. DERM
CONTACT CITY OF HIALEAH

Respectfully Submitted,

Jeffrey S. Glass
Laboratory Manager
Enviropact Services, Inc.

ENVIROPACT SERVICES, INC.
MIAMI DIVISION
4790 N.W. 157th STREET
MIAMI, FL 33014-6421
305-620-1700

ENVIROPACT

11098
LONDON PLATERS
1080 E. 24 STREET
HIALEAH, FL 33013

February 14, 1989
Report 29388
LAB I.D. 86119

ATT : MR. DAVE LONDON
Sample Collected: 2/07/89
Sample Received: 2/07/89
Collected By: CLAUDIUS GEORGE
Sample Description: MONTHLY COMPLIANCE ANALYSIS

REPORT OF ANALYSIS : EFFLUENT		UNITS	DATE
CHROMIUM, HEXAVALENT	< 0.01	mg/l	2/08/89
CHROMIUM, TOTAL	< 0.1	mg/l	2/08/89
COPPER	< 0.10	mg/l	2/07/89
NICKEL	< 0.10	mg/l	2/09/89
CYANIDE, TOTAL	0.01	mg/l	2/09/89
pH	8.1		2/07/89
AVERAGE DAILY FLOW	310	GPD	2/07/89
SLUDGE VOLUME DISPOSED OF	0		2/07/89

Analyses performed in accordance with E.P.A., A.S.T.M., Standard Methods or other approved methods.

C.C. DERM
CONTACT CITY OF HIALEAH

Respectfully Submitted,

Jeffrey S. Glass
Laboratory Manager
Enviropact Services, Inc.

ENVIROPACT SERVICES INC
MIAMI DIVISION
4790 N.W. 157th STREET
MIAMI FL 33014-6421
305 620-1700

ENVIROPACT

11098
LONDON PLATERS
1080 E. 24 STREET
HIALEAH, FL 33013

March 22, 1989
Report 29759
LAB ID. 86119

ATT : MR. DAVE LONDON
Sample Collected: 3/09/89
Sample Received: 3/09/89 Collected By: YOUR REP.
Sample Description:MONTHLY COMPLIANCE ANALYSIS

REPORT OF ANALYSIS : EFFLUENT		UNITS	DATE
CHROMIUM, HEXAVALENT	< 0.01	mg/l	3/09/89
CHROMIUM, TOTAL	< 0.1	mg/l	3/10/89
COPPER	< 0.1	mg/l	3/13/89
NICKEL	< 0.1	mg/l	3/13/89
CYANIDE, TOTAL	< 0.002	mg/l	3/13/89
pH	9.2		3/09/89
AVERAGE DAILY FLOW	270	GPD	3/09/89
SLUDGE VOLUME DISPOSED OF	0		3/09/89

Analyses performed in accordance with E.P.A., A.S.T.M., Standard Methods or other approved methods.

C.C. DERM
CONTACT CITY OF HIALEAH

Respectfully Submitted,

Jeffrey S. Glass
Laboratory Manager
Enviropact Services, Inc.

ENVIROPACT SERVICES, INC.
MIAMI DIVISION
4790 N.W. 157th STREET
MIAMI, FL 33014-6421
305-620-1700

ENVIROPACT

11098
LONDON PLATERS
1080 E. 24 STREET
HIALEAH, FL 33013

April 11, 1989
Report 30028
LAB I.D. 86119

ATT : MR. DAVE LONDON
Sample Collected: 4/04/89
Sample Received: 4/04/89 Collected By: YOUR REP.
Sample Description:MONTHLY COMPLIANCE ANALYSIS

REPORT OF ANALYSIS : EFFLUENT		UNITS	DATE
CHROMIUM, HEXAVALENT	< 0.01	mg/l	4/05/89
CHROMIUM, TOTAL	< 0.1	mg/l	4/05/89
COPPER	< 0.1	mg/l	4/05/89
NICKEL	< 0.1	mg/l	4/05/89
CYANIDE, TOTAL	< 0.002	mg/l	4/06/89
pH	9.2		4/05/89
AVERAGE DAILY FLOW	315	GPD	4/04/89
SLUDGE VOLUME DISPOSED OF	0		4/04/89

Analyses performed in accordance with E.P.A., A.S.T.M., Standard Methods or other approved methods.

C.C. DERM
CONTACT CITY OF HIALEAH

Respectfully Submitted,

Jeffrey S. Glass
Laboratory Manager
Enviropact Services, Inc.

ENVIROPACT SERVICES, INC.
MIAMI DIVISION
4790 N.W. 157th STREET
MIAMI, FL 33014-6421
305-620-1700

ENVIROPACT

11098
LONDON PLATERS
1080 E. 24 STREET
HIALEAH, FL 33013

Page 1 of 1
May 23, 1989
Report 30378
LAB ID. 86119

ATT : MR. DAVE LONDON
Sample Collected: 5/05/89
Sample Received: 5/05/89
Collected By: CLAUDIUS GEORGE
Sample Description: MONTHLY COMPLIANCE ANALYSIS

REPORT OF ANALYSIS : EFFLUENT		UNITS	DATE
CHROMIUM, HEXAVALENT	< 0.01	mg/l	5/05/89
CHROMIUM, TOTAL	< 0.1	mg/l	5/08/89
COPPER	< 0.1	mg/l	5/08/89
NICKEL	< 0.1	mg/l	5/08/89
CYANIDE, TOTAL	< 0.002	mg/l	5/16/89
pH	8.5		5/05/89
AVERAGE DAILY FLOW	290		5/22/89
SLUDGE VOLUME DISPOSED OF	0		5/22/89

Analyses performed in accordance with E.P.A., A.S.T.M., Standard Methods or other approved methods.

C.C. DERM
CONTACT CITY OF HIALEAH

Respectfully Submitted,

Jeffrey S. Glass
Laboratory Manager
Enviropact Services, Inc.

ENVIROPACT, INC.
MIAMI DIVISION
4790 N.W. 157th STREET
MIAMI, FL 33014-6421
305-620-1700

ENVIROPACT

11098
LONDON PLATERS
1080 E. 24 STREET
HIALEAH, FL 33013

June 22, 1989
Report 30696
LAB ID. 86119

ATT : MR. DAVE LONDON
Sample Collected: 6/07/89
Sample Received: 6/07/89 Collected By: YOUR REP.
Sample Description: MONTHLY COMPLIANCE ANALYSIS

REPORT OF ANALYSIS : EFFLUENT		UNITS	DATE
CHROMIUM, HEXAVALENT	< 0.01	mg/l	6/07/89
CHROMIUM, TOTAL	< 0.1	mg/l	6/14/89
COPPER	0.04	mg/l	6/09/89
NICKEL	< 0.1	mg/l	6/09/89
CYANIDE, TOTAL	< 0.002	mg/l	6/09/89
pH	9.1		6/07/89
AVERAGE DAILY FLOW	300	GPD	6/07/89
SLUDGE VOLUME DISPOSED OF	0		6/07/89

Analyses performed in accordance with E.P.A., A.S.T.M., Standard Methods or other approved methods.

C.C. DERM
CONTACT CITY OF HIALEAH

Respectfully Submitted,

Jeffrey S. Glass
Laboratory Manager
Enviropact Services, Inc.

ENVIROPACT, INC.
MIAMI DIVISION
4790 N.W. 157th STREET
MIAMI, FL 33014-6421
305-620-1700

ENVIROPACT

11098
LONDON PLATERS
1080 E. 24 STREET
HIALEAH, FL 33013

July 31, 1989
Report 31016
LAB I.D. 86119

ATT : MR. DAVE LONDON
Sample Collected: 7/12/89
Sample Received: 7/12/89 Collected By: YOUR REP.
Sample Description:MONTHLY COMPLIANCE ANALYSIS

REPORT OF ANALYSIS : EFFLUENT		UNITS	DATE
CHROMIUM, HEXAVALENT	< 0.01	mg/l	7/14/89
CHROMIUM, TOTAL	< 0.1	mg/l	7/14/89
COPPER	< 0.1	mg/l	7/17/89
NICKEL	< 0.01	mg/l	7/14/89
CYANIDE, TOTAL	< 0.002	mg/l	7/19/89
pH	8.9		7/12/89
AVERAGE DAILY FLOW	205	GPD	7/12/89
SLUDGE VOLUME DISPOSED OF	0		7/12/89

Analyses performed in accordance with E.P.A., A.S.T.M., Standard Methods or other approved methods.

C.C. DERM
CONTACT CITY OF HIALEAH

Respectfully Submitted,

Jeffrey S. Glass
Laboratory Manager
Enviropact Services, Inc.

ENVIROPACT, INC.
MIAMI DIVISION
4790 N.W. 157th STREET
MIAMI, FL 33014-6421
305-620-1700

ENVIROPACT

11098
LONDON PLATERS
1080 E. 24 STREET
HIALEAH, FL 33013

August 17, 1989
Report 31256
LAB ID. 86119

ATT : MR. DAVE LONDON
Sample Collected: 8/04/89
Sample Received: 8/04/89
Collected By: CLAUDIUS GEORGE
Sample Description:MONTHLY COMPLIANCE ANALYSIS

REPORT OF ANALYSIS : EFFLUENT		UNITS	DATE
CHROMIUM, HEXAVALENT	< 0.01	mg/l	8/07/89
CHROMIUM, TOTAL	< 0.1	mg/l	8/08/89
COPPER	< 0.1	mg/l	8/09/89
NICKEL	< 0.1	mg/l	8/09/89
CYANIDE, TOTAL	< 0.002	mg/l	8/11/89
pH	8.9		8/04/89
AVERAGE DAILY FLOW	320	GPD	8/04/89
SLUDGE VOLUME DISPOSED OF	0		8/04/89

Analyses performed in accordance with E.P.A., A.S.T.M., Standard Methods or other approved methods.

C.C. DERM
CONTACT CITY OF HIALEAH

Respectfully Submitted,

Jeffrey S. Glass
Laboratory Manager
Enviropact Services, Inc.

ENVIROPACT, INC.
MIAMI DIVISION
4790 N.W. 157th STREET
MIAMI, FL 33014-6421
305-620-1700

ENVIROPACT

11098
LONDON PLATERS
1080 E. 24 STREET
HIALEAH, FL 33013

September 28, 1989
Report 31625
LAB I.D. 86119

ATT : MR. DAVE LONDON
Sample Collected: 9/12/89
Sample Received: 9/12/89 Collected By: YOUR REP.
Sample Description:MONTHLY COMPLIANCE ANALYSIS

REPORT OF ANALYSIS : EFFLUENT		UNITS	DATE
CHROMIUM, HEXAVALENT	< 0.01	mg/l	9/14/89
CHROMIUM, TOTAL	< 0.1	mg/l	9/13/89
COPPER	< 0.1	mg/l	9/18/89
NICKEL	< 0.1	mg/l	9/14/89
CYANIDE, TOTAL	0.008	mg/l	9/15/89
pH	8.8		9/26/89
AVERAGE DAILY FLOW	290	GPD	9/12/89
SLUDGE VOLUME DISPOSED OF	0		9/12/89

Analyses performed in accordance with E.P.A., A.S.T.M., Standard Methods or other approved methods.

C.C. DERM
CONTACT CITY OF HIALEAH

Respectfully Submitted,

Jeffrey S. Glass
Laboratory Manager
Enviropact Services, Inc.

ENVIROPACT, INC.
MIAMI DIVISION
4790 N.W. 157th STREET
MIAMI, FL 33014-6421
305-620-1700

ENVIROPACT

11098
LONDON PLATERS
1080 E. 24 STREET
HIALEAH, FL 33013

October 26, 1989
Report 31945
LAB ID. 86119

ATT: MR. DAVE LONDON

Sample Description: MONTHLY COMPLIANCE ANALYSIS

SAMPLE ID.: EFFLUENT
COLLECTED: 10/13/89
RECEIVED: 10/13/89
COLLECTED BY: YOUR REP.

PARAMETER	RESULT	UNIT	METHOD	METHOD DET. LIMIT	DATE EXTRACTED	DATE ANALYZED	ANALYST
CHROMIUM, HEXAVALENT	BDL	mg/l	7196	0.01	N/A	10/12/89	MS
NICKEL	BDL	mg/l	249.1	0.10	10/16/89	10/17/89	JK
COPPER	BDL	mg/l	220.1	0.10	10/16/89	10/16/89	MS
CHROMIUM, TOTAL	BDL	mg/l	218.1	0.10	10/16/89	10/16/89	MS
CYANIDE, TOTAL	BDL	mg/l	335.3	0.005	N/A	10/25/89	JB
pH	8.2						
SLUDGE VOLUME DISPOSED OF	0						
AVERAGE DAILY FLOW	275	GAL			N/A	10/18/89	RP

* BDL = Below Detection Limit

Analyses performed in accordance with E.P.A., A.S.T.M., Standard Methods or other approved methods.
All rush analyses are reported as Estimated pending QA/QC review.

C.C. DERM
CONTACT CITY OF HIALEAH

Respectfully Submitted,

Jeffrey S. Glass

Jeffrey S. Glass
Laboratory Supervisor
Enviropact Services, Inc.

ENVIROPACT SERVICES, INC.
MIAMI DIVISION
4790 N.W. 157th STREET
MIAMI, FL 33014-6421
305-620-1700

ENVIROPACT

11098
LONDON PLATERS
1080 E. 24 STREET
HIALEAH, FL 33013

November 14, 1989
Report 32111-01
LAB ID. 86119

ATT: MR. DAVE LONDON

Sample Description: MONTHLY COMPLIANCE ANALYSIS

SAMPLE ID.: EFFLUENT
COLLECTED: 11/02/89
RECEIVED: 11/02/89
COLLECTED BY:CLAUDIUS GEORGE

PARAMETER	RESULT	UNIT	METHOD	METHOD DET. LIMIT	DATE EXTRACTED	DATE ANALYZED	ANALYST
CHROMIUM, HEXAVALENT	BDL	mg/l	7196	0.01	N/A	11/06/89	TG
NICKEL	BDL	mg/l	249.1	0.1	11/03/89	11/06/89	MS
CHROMIUM, TOTAL	BDL	mg/l	218.1	0.1	11/03/89	11/07/89	JK
COPPER	BDL	mg/l	220.1	0.1	11/03/89	11/06/89	MS
CYANIDE, TOTAL	BDL	mg/l	335.3	0.002	N/A	11/03/89	JB
pH	8.2						
AVERAGE DAILY FLOW	275						
SLUDGE VOLUME DISPOSED OF	0						

* BDL = Below Detection Limit

Analyses performed in accordance with E.P.A., A.S.T.M., Standard Methods or other approved methods.
All rush analyses are reported as Estimated pending QA/QC review.

C.C. DERM
CONTACT CITY OF HIALEAH

Respectfully Submitted,

Jeffrey S. Glass
Laboratory Supervisor
Enviropact Services, Inc.

ENVIROPACT, INC.
MIAMI DIVISION
4790 N.W. 157th STREET
MIAMI, FL 33014-6421
305-620-1700

ENVIROPACT

11098
LONDON PLATERS
1080 E. 24 STREET
HIALEAH, FL 33013

ATT: MR. DAVE LONDON

Page 1 of 1
January 2, 1990
Report: 32462-01
LAB ID. 86119

Sample Description: MONTHLY COMPLIANCE ANALYSIS

SAMPLE ID.: EFFLUENT
COLLECTED: 12/12/89
RECEIVED: 12/12/89
COLLECTED BY: YOUR REP.

PARAMETER	RESULT	UNIT	METHOD	METHOD DET. LIMIT	DATE EXTRACTED	DATE ANALYZED	ANALYST
CHROMIUM, HEXAVALENT	BDL	mg/l	7196	0.02	N/A	12/12/89	JB
CHROMIUM, TOTAL	BDL	mg/l	218.1	0.1	12/13/89	12/14/89	MS
COPPER	BDL	mg/l	220.1	0.1	12/13/89	12/13/89	MS
NICKEL	BDL	mg/l	249.1	0.1	12/13/89	12/13/89	JK
CYANIDE, TOTAL	0.003	mg/l	335.3	0.002	N/A	12/21/89	JB
AVERAGE DAILY FLOW	290	GPD	CACULATIONS		N/A	12/12/89	RP
SLUDGE VOLUME DISPOSED OF	0		CACULATIONS		N/A	12/12/89	RP
pH	6.6		150.1	0.1	N/A	12/12/89	MP

* BDL = Below Detection Limit

Analyses performed in accordance with E.P.A., A.S.T.M., Standard Methods or other approved methods.
All rush analyses are reported as Estimated pending QA/QC review.

C.C. DERM
CONTACT CITY OF HIALEAH

Respectfully Submitted,

Jeffrey S. Glass
Laboratory Supervisor
Enviropact Services, Inc.

ENVIROPACT, INC.
MIAMI DIVISION
4790 N.W. 157th STREET
MIAMI, FL 33014-6421
305-620-1700

Conversation Record

To:	Eric Nuzie, BWC	File Name:	London Platers, Inc.
From:	Charles Logan, BWC	Contact Person:	David London
Date:	2/21-22/90	Phone No.:	(305) 691-3472
Time:		Subject:	Hazardous Waste Compliance

Asked if he generated any hazardous waste on-site. He said he uses a unit supplied by Safety-Kleen in Tampa to clean parts and that the cleaning fluids are picked-up and replaced with clean fluids every six weeks. He stated that all sludge generated in the plating operations are reused. With reference to soil contamination in the 2'X2' drain, he said, it was dust and build-up over the years of their operation on the surface. He also said that his father commented that the drain was a closed metal sump. Water discharged to the sewers is analyzed each month by Enviropact Inc. and a copy of the report is sent to DERM. DERM performs periodic on-site inspections.

CSL/mlr

Conversation Record

To:	Eric Nuzie, BWC	File Name:	London Platers, Inc.
From:	Charles Logan, BWC	Contact Person:	David London
Date:	2/21-22/90	Phone No.:	(305) 691-3472
Time:		Subject:	Hazardous Waste Compliance

Asked if he generated any hazardous waste on-site. He said he uses a unit supplied by Safety-Kleen in Tampa to clean parts and that the cleaning fluids are picked-up and replaced with clean fluids every six weeks. He stated that all sludge generated in the plating operations are reused. With reference to soil contamination in the 2'X2' drain, he said, it was dust and build-up over the years of their operation on the surface. He also said that his father commented that the drain was a closed metal sump. Water discharged to the sewers is analyzed each month by Enviropact Inc. and a copy of the report is sent to DERM. DERM performs periodic on-site inspections.

CSL/mlr

CONVERSATION RECORD

Date: 2/21/90

Time:

By: Charles S. Logan
FDER/BWC

File Name: London Platers, Inc

Contact Person: Zachery Chasan (DER)

Phone No.: ( ) SunCom 445-3300

Subject: Hazardous Waste Compliance Inspections

Asked Mr. Chasan about sample analysis of discharges to the municipal sewer system. He stated that since January of 1985 there have been ~~one~~ two Sewer Discharge Violations. A Warning Notice was issued ~~for the violation~~ on 12/18/87. ~~the violation~~ an concerned a sample analysis which showed 3.13 mg/l of (blank spec). No other violations concerning sewer discharges have occurred.

In October of 1985 an analysis showed cyanide concentrations of 0.07 mg/l but a Warning Notice was not issued.

PP

On 3/30/89 a surface soil sample was taken from a 2'x2' drain inside the building where plating is done and the analysis (Total Metals only) of the sample was as follows:

Nickel	–	8.3	g/kg
Chromium	–	3.0	g/kg
Lead	–	1.8	g/kg
Copper	–	19.8	g/kg
Zinc	–	12.0	g/kg

CONVERSATION RECORD

Date:

Time:

File Name: Lowdon Platers, Inc.

Contact Person:

Phone No.: ( )

Subject: H

Continued
Pg 2 of 2

beneath the initial sample or drain top. An analysis of a soil sample at this depth revealed, with the exception of zinc (1.2 mg/l) no EP Toxic concentrations of Lead, Chromium, Cadmium, Copper, or Nickle above a detection limit of 0.1 mg/l. A subsequent sampling/analysis, with ground water detection limits, will be done within the next month (3/90).

Mr. Chasan stated that all of the sludge generated on site is reused.

In-depth sampling and sample analysis is scheduled for the later part of 2/90. Results will be forwarded to us.

(12)

Conversation Record

To:	Eric Nuzie, BWC	File Name:	London Platers, Inc.
From:	Charles Logan, BWC	Contact Person:	Pedro Espinal (Safety-Kleen Corp.
Date:	2/21/90	Phone No.:	(305) 591-9409
Time:		Subject:	Parts Cleaner

Mr. Espinal stated that they have provided a parts cleaner for London Platers, Inc. since 3/1/80. The cleaner utilizes 9 gallons of mineral spirits. The mineral spirits are picked-up and replaced once every 6 weeks.

CSL/mlr

15

Conversation Record

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Date:	2/21/90	Phone No.:	(305) 591-9409
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CSL/mlr

Record of Telephone Conversation

Reference 23

Date: 6-26-01 Time: 12:30	London Platers, Inc. EPA ID Number: FLD004125514
Organization: T N & Assoc., Inc. Reg. 4 EPA STAT Contract Name: Nancy Ellen Keene Signature: Nancy Ellen Keene	Contacted: Mr. Andras Clerk Safety-Kleen Corporation 8755 NW 95th St. Medley, FL 305-884-0123

Subject: Contract for recycling cleaning solution

Spoke to Mr. Andras concerning whether or not London Platers still rented machine cleaning solution from Safety-Kleen. Mr. Andras said that Safety-Kleen has an ongoing contract to pickup and replace cleaning solution at London Platers. He also said that they do this every two months.

RESPONSE REQUIRED

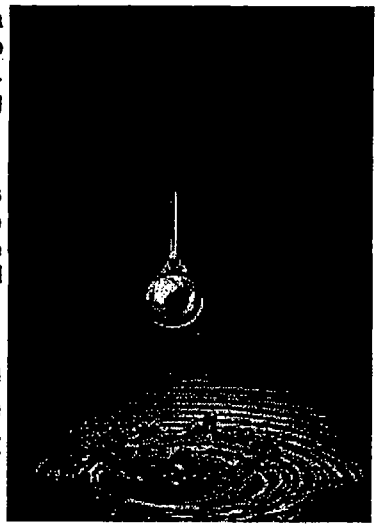
(x) None ( ) Phone call ( ) Memo ( ) Letter ( ) Report

cc: (x) File (x) Project Manager ( ) Principal Investigator ( ) Other (specify) _____

Reference 24

Miami-Dade Water and Sewer Department
1999 Water Quality Report - Cont.

GROUNDWATER UNDER THE DIRECT INFLUENCE (GWUDI) OF SURFACE WATER



In 1998, the Miami-Dade Water and Sewer Department and the Florida Department of Environmental Protection regulation entered into a five year agreement as part of a statewide GWUDI evaluation program. The goal of the program is to identify wells which are at risk of being under the direct influence (UDI) of surface water.

WASD is proud to report that at the end of 1999, 83 of the 88 wells which supply water to the treatment facilities have been screened. The five wells which have not been screened are being replaced because they did not meet newer well construction criteria and will be screened once completed.

Of the 83 wells screened, only five wells have been identified as suspect wells. Four of these wells have been rehabilitated and retested. All post rehabilitation testing has produced results which indicate that the wells are no longer suspect UDI wells. The fifth well will be rehabilitated and retested in 2000.

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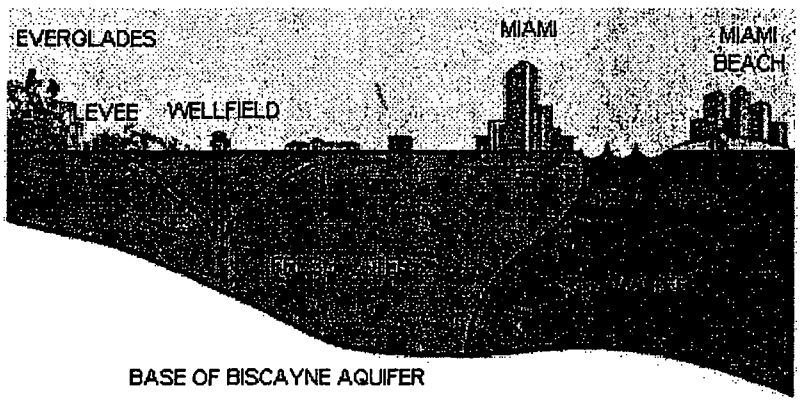
ADDITIONAL INFORMATION

The sources of drinking water (both tap water and bottled water) include lakes, rivers, springs and wells. WASD's drinking water is drawn from the underground aquifer through wells extending an average of 80 feet below the ground surface. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and can pick up substances resulting form the presence of animals or from human activity.



In order to ensure that tap water is safe to drink, EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. FDA regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants

does not necessarily indicate that the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline at 1-800-426-4791 or visit their web site at www.epa.gov/ogwdw.

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FOR CUSTOMERS WITH SPECIAL HEALTH CONCERNS

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants, can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium are available from the Safe Drinking Water Hotline at 1-800-426-4791.

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WHAT IF I HAVE ANY QUESTIONS?

Feel free to call us at any of the numbers listed below:

Public Affairs Section (305) 669-3704
Alexander Orr Lab (305) 275-3170
John E. Preston Lab (305) 887-2007

or visit our web site at www.co.miami-dade.fl.us/wasd

For additional sources regarding water quality or health effects information in the local area, residents are encouraged to call the Department of Environmental Resources Management at (305) 372-6524 or the Florida Department of Health, Miami-Dade County Environmental Health Office at (305) 623-3500. Also, the Miami-Dade County Board of County Commissioners, charged with making decisions relating to the department, meets regularly on Tuesdays and Thursdays at the Stephen P. Clark Center located in Downtown Miami.

Landlords and businesses are encouraged to share this report with non-billed water users. Additional copies of this report for posting in common areas or bulletin boards are available by calling the department's Public Affairs Section at (305) 669-3704.

There is no lead on the water supplied by WASD. However, infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than at other homes because of your home's plumbing. If you are concerned about elevated lead levels in your home's water, you may flush your tap for 30 seconds to two minutes before using tap water.

MIAMI-DADE COUNTY'S WATER CONSISTENTLY MEETS STATE AND FEDERAL STANDARDS FOR BOTH APPEARANCE AND SAFETY.

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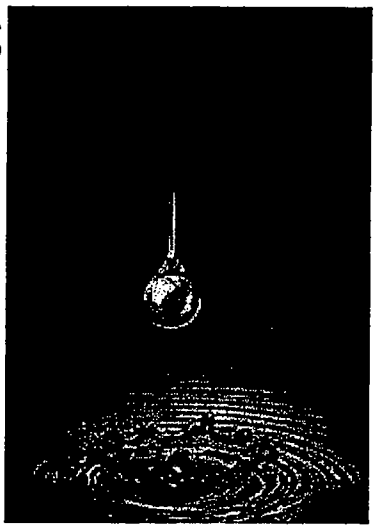
Miami-Dade Water and Sewer Department
1999 Water Quality Report - Cont.

GROUNDWATER UNDER THE DIRECT INFLUENCE (GWUDI) OF SURFACE WATER



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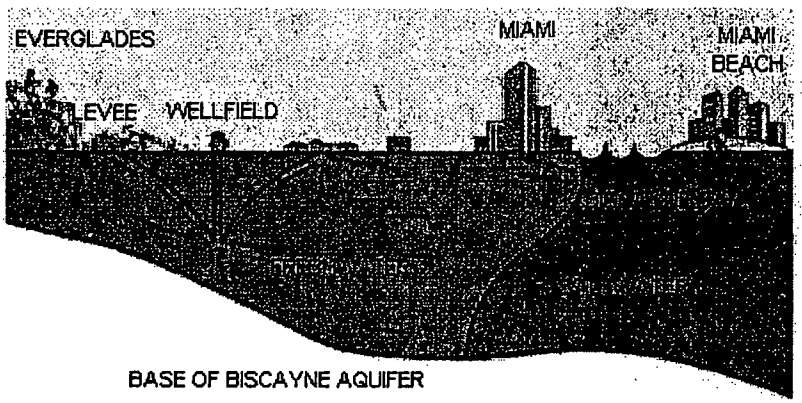

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MIAMI-DADE COUNTY'S WATER CONSISTENTLY MEETS STATE AND FEDERAL STANDARDS FOR BOTH APPEARANCE AND SAFETY.

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Reference 25

Miami-Dade Water and Sewer Department
1999 Water Quality Report

WATER, our most precious resource, save it!

The Miami-Dade Water and Sewer Department (WASD) is pleased to present its Annual Water Quality Report. This report is designed to inform you about the water we deliver to you every day. Our primary goal is to provide you with a safe and dependable supply of drinking water. We want you to understand the efforts the department has made to continually improve the water treatment process and protect our water resources.

This water report reflects the hard work and dedication of department employees who ensure that the water delivered from WASD's facilities meets all standards for safety, reliability and quality. The department is proud to report that WASD has met all federal, state and local standards for drinking water during 1999.

Included on these web pages is a summary of the quality of the drinking water we provided you during 1999. We are committed to providing you this information about your water supply because customers that are well informed are our best supporters in any improvements necessary to maintain the highest drinking water standards. If you have any questions or concerns about the information provided, please feel free to call any of the numbers listed on this web site.

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WHERE DOES MIAMI-DADE GET ITS DRINKING WATER

The Biscayne Aquifer (refer to diagram), an underground geologic formation, is the source of water for WASD. Approximately 330 million gallons per day (mgd) are withdrawn from the aquifer to meet the needs of the community. Water is pumped to WASD's water treatment facilities: Hialeah, John E. Preston, Alexander Orr and the South Dade Water Supply System.

The Hialeah and Preston Plants serve residents living north of Flagler Street to the Miami-Dade/Broward Line. The Alexander Orr Plant serves residents south of Flagler Street to S.W. 248 Street. These three regional water plants supply treated water to a common distribution system. The South Dade Water Supply System is comprised of five smaller water treatment plants which serve the residents south of S.W. 248th Street in the unincorporated areas. These five plants pump treated water into a common distribution system which is separate from the main system. Highly trained microbiologists, chemists and water treatment specialists conduct or supervise more than 100,000 analyses of water samples each year. Water quality samples are collected throughout the county and tested regularly. Samples include untreated and treated water taken at our facilities, sample sites throughout the service areas and at customers' homes. These tests are overseen by various regulatory agencies on a federal, state and local level.

local level.

Customers judge the quality of their drinking water based on taste and appearance. The water delivered to residents in the northern part of the county originates from a region of the Biscayne Aquifer that contains natural organic material. These natural substances increase the color of the water. Although the water has a yellow tint, there is no harm associated with the color.

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WHAT SHOULD I KNOW ABOUT CERTAIN CONTAMINANTS?

DISINFECTION BYPRODUCTS

In May 1996, the Environmental Protection Agency (EPA) promulgated an Information Collection Rule (ICR) which required large water systems to test for disinfection byproducts (DBPs). DBPs are compounds that form when disinfectants used for microbial control react with naturally occurring organic compounds already present in the source water.

The table titled "Disinfection Byproducts Detected", lists the DBPs detected in the drinking water produced by WASD. It also lists the disinfectants used to control microbial contaminants in drinking water. The Leisure City Water Treatment Plant was selected to represent the drinking water for the South Dade Water Supply System.

In December 1998, the EPA promulgated the Stage 1, Disinfectants and Disinfection Byproducts Rule (D/DBPR) which established an MCL of 60 parts per billion (ppb) for five Haloacetic Acids (HAA%) monitored under the ICR. The effective date for required compliance by groundwater systems such as ours is December 2003.

Because of the higher levels of natural organic compounds in the source water supplied to the Preston plant, additional treatment processes will be implemented to reduce these levels and meet the new standard by the effective date. As an added benefit, the new treatment process will reduce the yellow tint of the water in northern Miami-Dade County.

The most effective treatment process, enhanced softening followed by ozonation, underwent full scale pilot testing. While this process is the most cost-effective alternative, it is estimated that the treatment modifications will cost the department and its customers $90 million.

The (D/DBPR) also established a Maximum Disinfectant Residual Level (MDRL) of 4 parts per million (ppm) for the disinfectants chlorine and chloramines, currently used by the department. The use of these disinfectants are required to ensure microbial protection of the drinking water in the distribution system.

RADON

Radon 222, or radon for short, is a colorless, odorless gas that naturally occurs in soil, air and water. Radon is formed from the radioactive decay products of natural uranium that is found in many soils. Most radon in indoor air comes from the soils below the foundation of the home, and in some locations can accumulate to dangerous levels in the absence of proper ventilation. In most homes, the health risk from radon in drinking water is very small compared to the health risk from radon in indoor air.

In October 1999, the EPA proposed an MCL of 300 pCi/L or an alternative maximum contaminant level (AMCL) of 4000 pCi/L for radon. The AMCL requires development of a multimedia mitigation (MMM) program which also addresses radon exposure from indoor air. It is expected that the final rule will be published in August 2000.

CRYPTOSPORIDIUM

In April of 1993, the cryptosporidosis outbreak in Milwaukee, Wisconsin alerted water utilities to the potential threat that this protozoan organism presents to public water supplies. There were an estimated 400,000 cases of diarrhea and several deaths associated with the disease in severely immuno-compromised persons. This organism is primarily associated with surface water sources.

Although WASD uses the Biscayne Aquifer as a source of supply, the State has raised the issue that some groundwater sources may be under the direct influence of surface water (UDI) and therefore, be susceptible to the Cryptosporidium organism. As a result of the UDI issue and the sensitivity of the immuno-compromised, WASD first tested for Cryptosporidium in 1993 and has continued testing monthly since 1994. To date, neither Cryptosporidium not Giardia, another protozoan have been found in the source water supplying WASD's water treatment plants.

NITRATE

Although the level of nitrate (refer to the table on water quality data) is well below the health effect level, EPA requires the following information: "Nitrate in drinking water at levels above 10 ppm is a health risk for infants of less than six months of age. High nitrate levels in drinking water can cause baby blue syndrome. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. If you are caring for an infant, you should ask advice from your health care provider."

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| WATER QUALITY REPORT | WASD HOME |

Record of Telephone Conversation

Reference 26

Date: May 18, 2001 Time: 0930	General Electric Apparatus Service Shop 1062 South 28th Street Hialeah, Dade County, Florida EPA ID Number: FLD065657959
Organization: T N & Assoc., Inc., Reg. 4 EPA STAT Contract Name: Brenda J. Shaw Signature: Brenda J. Shaw	Contacted: Mr. Dan Mathews Miami-Dade Water and Sewer Department Water Distribution Division 3537 South Lejune Road Miami, Florida 305/547-7004

Subject: Municipal water supply Dade County

Spoke with Dan Mathews regarding drinking water information for Dade County. The following subjects were discussed:

- Miami-Dade Water and Sewer Department (MDWSD) supplies approximately 80 percent of the county's drinking water needs. Some residents are served directly by MDWSD, others are supplied by smaller utilities that purchase their water wholesale from MDWSD.

- Technically, the system is a blended distribution system (looped system), though in practice, the Hialeah and John E. Preston Water Treatment Plants (located across the street from one another) primarily serve the northern portion of the county, and the Alexander Orr, Jr. Water Treatment Plant primarily serves the southern portion of the county south to 248th Street.

- Differences in distribution vary according to season, time of day, number and location of wells in service, pressure, etc.

RESPONSE REQUIRED

(x) None ( ) Phone call ( ) Memo ( ) Letter ( ) Report

cc: (x) File (x) Project Manager ( ) Principal Investigator ( ) Other (specify) _____

Record of Telephone Conversation

Reference 27

Date: May 18, 2001 Time: 0950	General Electric Apparatus Service Shop 1062 South 28th Street Hialeah, Dade County, Florida EPA ID Number: FLD065657959
Organization: T N & Assoc., Inc., Reg. 4 EPA STAT Contract Name: Brenda J. Shaw Signature: Brenda J. Shaw	Contacted: Mr. Jack Epave Miami-Dade Water and Sewer Department Water Production Division 6800 SW 87th Avenue Miami, Fl 33173 305/665-7471

Subject: Municipal water supply Dade County

Spoke with Jack Epave regarding drinking water information for Dade County. The following subjects were discussed:

- The Miami-Dade Water and Sewer Department (MDWSD) is comprised of two distribution systems: one main system that serves the majority of the population in the heavily populated areas of Dade County [330 million gallons per day (gpd)] and a smaller system that serves the southern unincorporated portion of the county.

- The main distribution system is comprised of three regional water plants: Hialeah, John E. Preston, and Alexander Orr, Jr. Though the system is a blended system (looped system), in practice, the Hialeah and Preston plants primarily serve residents north of State Highway 836 (East-West Expressway, Dolphin Expressway), and the Orr plant serves residents south of State Highway 836 (south to approximately 248th Street).

- The South Dade Water Supply System is comprised of five smaller water treatment plants that serve residents south of 248th Street (6 million gpd). The boundaries of the area served are approximately 248th Street (northern boundary), SW 320th Street (southern boundary), SW 137th Avenue (eastern boundary), and SW 192nd Street (southern boundary).

- Homestead and Florida City have their own municipal supply systems (approximately 60 percent of the population south of 248th Street).

- Approximately 25 percent of the residents south of 248th Street are served by private groundwater wells.

- Municipal water is not used for irrigation of commercial crops or watering of commercial livestock (usually private wells for these purposes).

- There may be some use of municipal water for commercial food processing.

RESPONSE REQUIRED

(x) None ( ) Phone call ( ) Memo ( ) Letter ( ) Report

cc: (x) File (x) Project Manager ( ) Principal Investigator ( ) Other (specify) _____

Record of Telephone Conversation

Reference 28

Date: May 18, 2001 Time: 0950	General Electric Apparatus Service Shop 1062 South 28th Street Hialeah, Dade County, Florida EPA ID Number: FLD065657959
Organization: T N & Assoc., Inc., Reg. 4 EPA STAT Contract Name: Brenda J. Shaw Signature: Brenda J. Shaw	Contacted: Mr. Frank Calderon Miami-Dade Water and Sewer Department Public Information Division 4200 Salzedo Street Coral Gables, FL 33146 305/668-3620

Subject: Municipal water supply Dade County

Spoke with Frank Calderon regarding drinking water information for Dade County. The following subjects were discussed:

- The Miami-Dade Water and Sewer Department (MDWSD) is comprised of two distribution systems: one main system that serves the majority of the population in the heavily populated areas of Dade County [337.1 million gallons per day (mgd)] and a smaller system that serves the southern unincorporated portion of the county (6.7 million mgd).

- The number of people served by the main system is 337.1 mgd divided by individual usage per day (182 gallons) = 1,852,198 individuals served by the main MDWSD system.

- The number of people served by the South Dade Water Supply System is 6.7 mgd/182 gpd = 36,813.

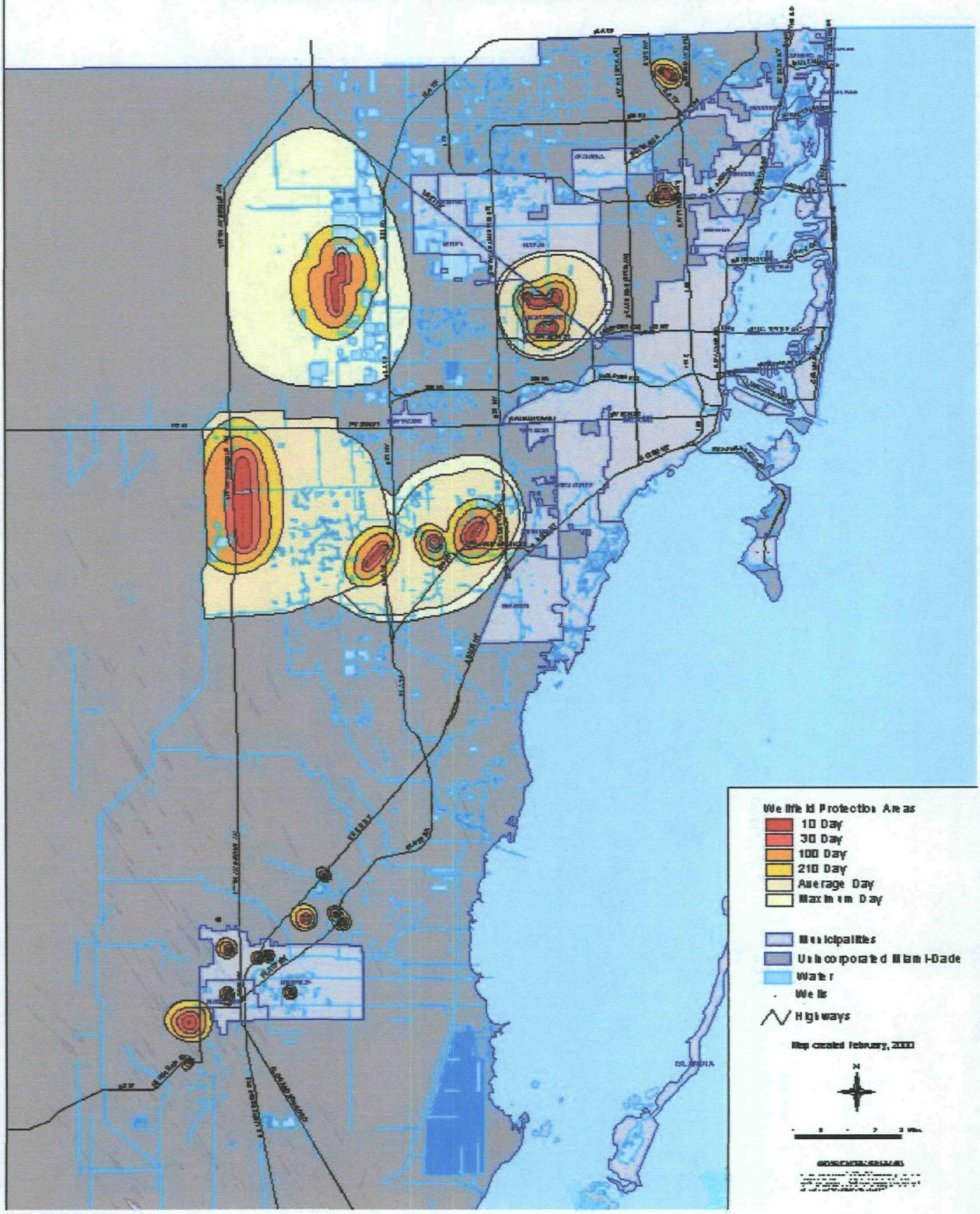
RESPONSE REQUIRED

(x) None ( ) Phone call ( ) Memo ( ) Letter ( ) Report

cc: (x) File (x) Project Manager ( ) Principal Investigator ( ) Other (specify) _____

Miami-Dade County

Wellfield Protection Areas



05/16/01 09:27 FAX 678 355 5545 TN & ASSOC. 003

Enlarged Version

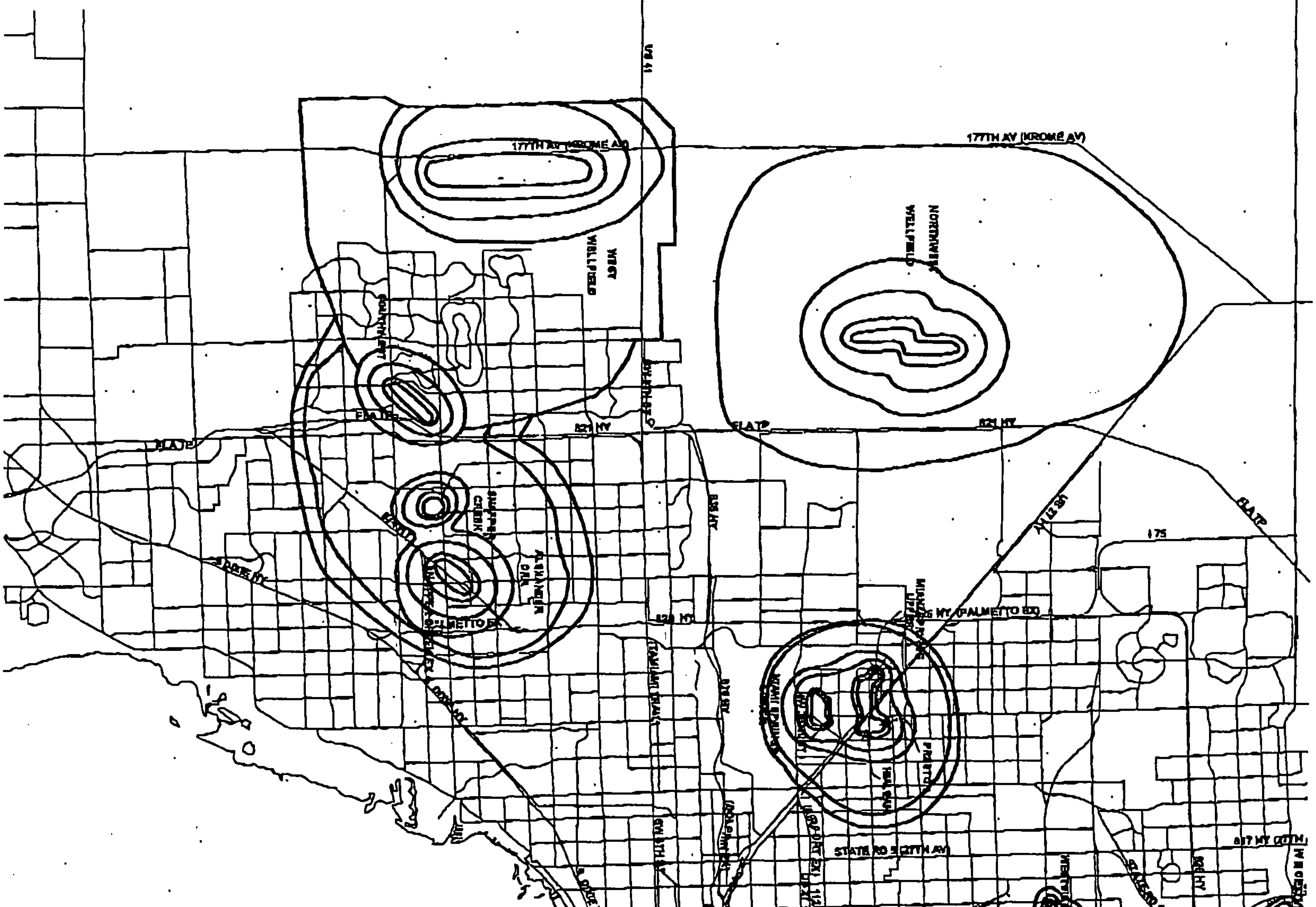


TABLE 2. LOCATION OF THE WATER SUPPLY WELLS.

LATITUDE AND LONGITUDE

MIAMI SPRING LOWER AND UPPER WELLFIELD

SECTION: (See Note below)

	WELL #	LATITUDE	LONGITUDE
Lower Wellfield	1	25° 48' 54"	80° 17' 15'
	2	25° 48' 46"	80° 17' 19"
	3	25° 48' 56"	80° 17' 24"
	4	25° 49' 00"	80° 17' 17"
	5	25° 48' 57"	80° 17' 34"
	6	25° 48' 53"	80° 17' 43"
	7	25° 48' 48"	80° 17' 49"
	8	25° 48' 48"	80° 17' 38"
Upper Wells	9	25° 49' 52"	80° 18' 18"
	10	25° 49' 43"	80° 17' 33"
See Hialeah Plant site			
Upper Wellfield	14	25° 49' 43"	80° 17' 26"
	15	25° 49' 46"	80° 17' 38"
	16	25° 49' 46"	80° 17' 48"
	17	25° 49' 37"	80° 17' 38"
	18	25° 49' 46"	80° 17' 56"
	19	25° 49' 46"	80° 18' 04"
	20	25° 49' 36"	80° 17' 47"
	21	25° 49' 36"	80° 17' 56"
	22	25° 49' 36"	80 18' 04'
	23	25° 49' 52"	80 18' 10"

Note: Sec. 13-53-40 (wells 9, 10, and 14 thru 23)

Sec. 19-53-41 (wells 1, 2, 4.)

Sec 24-53-40 (wells 3, 5, 6, 7, 8.)

15° = 13.7

142 = % x 100

27% x 4

PLS No 3178

Mike Hernandez

LATITUDE AND LONGITUDE

HIALEAH PLANT WELLFIELD

SECTION: 18-53-41

WELL #	LATITUDE	LONGITUDE
11	25° 49' 38"	80° 17' 09"
12	25° 49' 42"	80° 17' 12"
13	25° 49' 39"	80° 17' 14

Mike Hernandez
R.L.S. No 3178

LATITUDE AND LONGITUDE

PRESTON PLANT WELLFIELD

SECTION: 18-53-41

WELL #	LATITUDE	LONGITUDE
1	25° 49' 46"	80° 17' 15.5
2	25° 49' 51"	80° 17' 15.5
3	25° 49' 58"	80° 17' 15.9
4	25° 49' 48"	80° 17' 09.(
5	25° 49' 53"	80° 17' 09.:
6	25° 49' 58"	80° 17' 10.(
7	25° 49 43"	80° 17' 19.

Mike Hernande
R.L.S No 3178

LATITUDE AND LONGITUDE

NORTHWEST WELLFIELD

Hialeah SW
Quad West of Hialeah

SECTION: (See Note below)

WELL #	LATITUDE	LONGITUDE
1	25° 49' 35.5"	80° 25' 02.5"
2	25° 49' 42.8"	80° 25' 02.9"
3	25° 49' 50.4"	80° 25' 03.2"
4	25° 49' 57.9"	80° 25' 03.5"
5	25° 50' 05.4"	80° 25' 03.7"
6	25° 50' 12.8"	80° 25' 03.9"
7	25° 50' 20.3"	80° 25' 04.1"
8	25° 50' 27.6"	80° 25' 04.5"
9	25° 50' 27.4"	80° 24' 50.1"
10	25° 50' 35.2"	80° 24' 50.3"
11	25° 50' 42.6"	80° 24' 50.6"
12	25° 50' 50.0"	80° 24' 50.9"
13	25° 50' 57.5"	80° 24' 51.3"
14	25° 51' 04.9"	80° 24' 51.5"
15	25° 51' 12.4"	80° 24' 51.8"

NOTE:

Sec 14-53-39 (wells #1 thru #7)

Sec 11-53-39 (wells #8 thru #15)

Mike Hernone
P.L.S. 3178

(14)

LATITUDE AND LONGITUDE

ORR PLANT WELLFIELD

SECTION: 28-54-40

WELL #	LATITUDE	LONGITUDE
1	25° 42' 25.6"	80° 20' 07.0"
2	25° 42' 23.2"	80° 20' 07.0"
3	25° 42' 21.0"	80° 20' 08.1"
4	25° 42' 19.4"	80° 20' 10.0"
5	25° 42' 17.8"	80° 20' 11.2"
6	25° 42' 16.1"	80° 20' 13.8"
7	25° 42' 14.4"	80° 20' 15.4"
8	25° 42' 12.9"	80° 20' 17.5"
9	25° 42' 11.0"	80° 20' 19.2
10	25° 42' 09.3"	80° 20' 21.0

3-25-84

Mike Hernandez

RLS No. 3178

LATITUDE AND LONGITUDE

SOUTHWEST WELLFIELD

Quad west of S. Miami

SECTION: (see NOTE below)

WELL #	LATITUDE	LONGITUDE
11	25° 41' 43"	80° 23' 29"
12	25° 41' 41"	80° 23' 31"
13	25° 41' 39"	80° 23' 33"
(10) 14	25° 41' 37"	80° 23 36'
15	25° 41' 34"	80° 23' 38"
16	25° 41' 32"	80° 23' 41"
17	25° 41' 30"	80° 23' 43"
18	25° 41' 28"	80° 23' 45"
19	25° 41' 26"	80° 23' 48"
20	25° 41' 24"	80° 23' 50"
✓ See Snapper Creek wellfield.		
25	25° 41' 21"	80° 23' 52"
26	25° 41' 19"	80° 23' 55"
(4) 27	25° 41' 16"	80° 23' 58"
28	25° 41' 14"	80° 24' 00"

NOTE: Wells 28, 27, 26 are on Sec. 35-54-39
All other are on sec. 36-54-39

Mike Hernandez
R.L.S. No 3178

LATITUDE AND LONGITUDE

SNAPPER CREEK WELLFIELD

SECTION: 32-54-40

	WELL #	LATITUDE	LONGITUDE
sterly well	1	25° 41' 53.0"	80° 21' 31.7"
therly well	2	25° 41' 56.4"	80° 21' 38.5"
therly well	3	25° 41' 52.7"	80° 21' 40.4"
sterly well	4	25. 41' 54.6"	80° 21' 44.3"

Note:- These are wells # 21, 22, 23, 24.
Correspondence between numbers shown were not possible.

Mike Hernandez
R.L.S. No 3178

Record of Telephone Conversation

Reference 30

Date: May 30, 2001 Time: 0900	London Plating, Inc. (London Platers) Hialeah, Dade County, Florida EPA ID Number: FLD004125514
Organization: T N & Assoc., Inc., Reg. 4 EPA STAT Contract Name: Mark A. Escobar Signature:	Contacted: Mr. Jack Strain, Public Works Engineer North Miami Public Works Operations Center 1815 NE 150 St. North Miami, Florida 33181 305-787-1007

Subject: North Miami Water Treatment Plant and Wellfield

Spoke with Mr. Jack Strain, Public Works Engineer with the North Miami Water District on obtaining information on the water treatment plant and its well field specifications in Dade County, Florida.

- The well field contains eight municipal wells, each at depths of 65 feet bls.
- The population served is at 80,000 and services only the North Miami community.
- The system is blended and consists of 60 percent of the water coming from the well field serving the North Miami area. The remaining 40 percent of the water in the system is obtained by bulk-purchase from the Miami-Dade Water and Sewer well field districts (Miami Springs, Preston-Hialeah, Orr, SW, etc.).
- The systems average pumping rate is currently at 9.8 million gallons per day and no single well supplies more than 40% of water to the system.
- Over 7-8 years ago, there was one incident where a minor contamination of the water was detected in the supply system, but was not significant enough to shut any one well or the entire water treatment system down.
- Water continues to be pumped from Lake Okeechobee to the canal systems in the area to allow for recharge during this drought season. Lake Okeechobee is at an all time low water level.
- There are no surface water intakes utilized with the system.
- The system does not supply a major or designated water recreational area, excluding drinking water use.
- The system does support several businesses as utilizing groundwater as an ingredient in food prep (i.e., frozen seafood, fruit, etc.).

RESPONSE REQUIRED

(x) None ( ) Phone call ( ) Memo ( ) Letter ( ) Report

cc: (x) File ( ) Project Manager ( ) Principal Investigator ( ) Other (specify)

POPULATION WORKSHEET	
London Plating, Inc.	
FLD004125514	
Population Radius	**Population**
0.25 Mile	891
0.50 Mile	4111
1 Mile	20044
2 Mile	93704
3 Mile	191127
4 Mile	327194
Population Ring*	**Population**
0 to 0.25 Mile	891
0.25 to 0.5 Mile	3220
0.5 to 1 Mile	15933
1 to 2 Mile	73660
2 to 3 Mile	97423
3 to 4 Mile	136067

*Population rings were determined by subtracting out the previous area's value from the current population value.

Reference: LandView IV

Name: _____

Signature: _____

TN&Associates, Inc.
840 Kennesaw Avenue, Suite 7
Marietta, GA 30060
(678) 355-5550

LandView 1990 Census Population Estimator London Plating

Step 1: Enter Latitude and Longitude. The defaults are the current MARPLOT map values.
Or, you may enter your own values in Degrees/Minutes/Seconds, or Decimal Degrees.
Step 2: If you entered the Latitude & Longitude, choose the approporiate Hemisphere.
The continental U.S. is North and West.
Step 3: Enter the Radius.
Step 4: Press the Calculate Population button.

	deg.	min.	sec.	hemisphere	decimal degrees
Latitude	25	50	39	◉ North ○ South	25.844167
Longitude	80	15	42	◉ West ○ East	80.261944

Main Menu

Enter Radius .25 miles

Calculate Population

Clear all fields | Refresh Lat/Long from MARPLOT | Print this screen | Show this radius on map

Note: Population Statistics are not available for Virgin Islands., Guam, American Samoa, and N. Mariana Islands.
Race statistics are not available for Puerto Rico.

Results

Total population:	891	White:	834
Housing units:	268	Black:	3
Census Block count:	14	Indian:	0
Area within radius (sq. mi.):	0.196	Asian:	0
		Hispanic	818

LandView 1990 Census Population Estimator

Step 1: Enter Latitude and Longitude. The defaults are the current MARPLOT map values.
Or, you may enter your own values in Degrees/Minutes/Seconds, or Decimal Degrees.
Step 2: If you entered the Latitude & Longitude, choose the approporiate Hemisphere.
The continental U.S. is North and West.
Step 3: Enter the Radius.
Step 4: Press the Calculate Population button.

	deg.	min	sec.	hemisphere	decimal degrees
Latitude	25	50	39	◉ North ○ South	25.844167
Longitude	80	15	42	◉ West ○ East	80.261944

Main Menu

Enter Radius 5 miles

Calculate Population

Clear all fields | Refresh Lat/Long from MARPLOT | Print this screen | Show this radius on map

Note: Population Statistics are not available for Virgin Islands, Guam, American Samoa, and N. Mariana Islands.
Race statistics are not available for Puerto Rico.

Results

Total population:	4111	White:	3704
Housing units:	1324	Black:	106
Census Block count:	61	Indian:	9
Area within radius (sq. mi.):	0.785	Asian:	25
		Hispanic	3580

LandView 1990 Census Population Estimator

Step 1: Enter Latitude and Longitude. The defaults are the current MARPLOT map values.
Or, you may enter your own values in Degrees/Minutes/Seconds, or Decimal Degrees.
Step 2: If you entered the Latitude & Longitude, choose the approporiate Hemisphere.
The continental U.S. is North and West.
Step 3: Enter the Radius.
Step 4: Press the Calculate Population button.

	deg.	min.	sec.	hemisphere	decimal degrees
Latitude	25	50	39	◉ North ○ South	25.844167
Longitude	80	15	42	◉ West ○ East	80.261944

Main Menu

Enter Radius: 1 miles

Calculate Population

Clear all fields | Refresh Lat/Long from MARPLOT | Print this screen | Show this radius on map

Note: Population Statistics are not available for Virgin Islands, Guam, American Samoa, and N. Mariana Islands.
Race statistics are not available for Puerto Rico.

Results

Total population:	20044	White:	16028
Housing units:	6308	Black:	2532
Census Block count:	233	Indian:	51
Area within radius (sq. mi.):	3.142	Asian:	100
		Hispanic:	15746

LandView 1990 Census Population Estimator

Step 1: Enter Latitude and Longitude. The defaults are the current MARPLOT map values.
Or, you may enter your own values in Degrees/Minutes/Seconds, or Decimal Degrees.
Step 2: If you entered the Latitude & Longitude, choose the approporiate Hemisphere.
The continental U.S. is North and West.
Step 3: Enter the Radius.
Step 4: Press the Calculate Population button.

	deg.	min	sec.	hemisphere	decimal degrees
Latitude	25	50	39	◉ North ○ South	25.844167
Longitude	80	15	42	◉ West ○ East	80.261944

Main Menu

Enter Radius 2 miles

Calculate Population

Clear all fields | Refresh Lat/Long from MARPLOT | Print this screen | Show this radius on map

Note: Population Statistics are not available for Virgin Islands., Guam, American Samoa, and N. Mariana Islands.
Race statistics are not available for Puerto Rico.

Results

Total population:	93704	White:	64032
Housing units:	30401	Black:	23667
Census Block count:	1264	Indian:	133
Area within radius (sq. mi.):	12.566	Asian:	321
		Hispanic	63064

LandView 1990 Census Population Estimator

Step 1: Enter Latitude and Longitude. The defaults are the current MARPLOT map values.
Or, you may enter your own values in Degrees/Minutes/Seconds, or Decimal Degrees.
Step 2: If you entered the Latitude & Longitude, choose the approporiate Hemisphere.
The continental U.S. is North and West.
Step 3: Enter the Radius.
Step 4: Press the Calculate Population button.

	deg.	min.	sec.	hemisphere	decimal degrees
Latitude	25	50	39	◉ North ○ South	25.844167
Longitude	80	15	42	◉ West ○ East	80.261944

Main Menu

Enter Radius 3 miles

Calculate Population

Clear all fields | Refresh Lat/Long from MARPLOT | Print this screen | Show this radius on map

Note: Population Statistics are not available for Virgin Islands,, Guam, American Samoa, and N. Mariana Islands.
Race statistics are not available for Puerto Rico

Results

Total population:	191127	White:	115654
Housing units:	63994	Black:	64860
Census Block count:	2573	Indian:	251
Area within radius (sq. mi.):	28.274	Asian:	839
		Hispanic:	107905

LandView 1990 Census Population Estimator

Step 1: Enter Latitude and Longitude. The defaults are the current MARPLOT map values.
Or, you may enter your own values in Degrees/Minutes/Seconds, or Decimal Degrees.
Step 2: If you entered the Latitude & Longitude, choose the approporiate Hemisphere.
The continental U.S. is North and West.
Step 3: Enter the Radius.
Step 4: Press the Calculate Population button.

	deg.	min.	sec.	hemisphere	decimal degrees
Latitude	25	50	39	◉ North ○ South	25.844167
Longitude	80	15	42	◉ West ○ East	80.261944

Main Menu

Enter Radius 4 miles

Calculate Population

Clear all fields | Refresh Lat/Long from MARPLOT | Print this screen | Show this radius on map

Note: Population Statistics are not available for Virgin Islands, Guam, American Samoa, and N. Mariana Islands.
Race statistics are not available for Puerto Rico.

Results

Total population:	327194	White:	185874
Housing units:	110843	Black:	121417
Census Block count:	3975	Indian:	468
Area within radius (sq. mi.):	50.265	Asian:	1534
		Hispanic	178503

Reference 32

Nancy Keene
From: Lillian R Feltman [lfeltman@usgs.gov]
Sent: Tuesday, July 17, 2001 10:47 AM
To: Nancy Keene
Cc: Lillian R Feltman
Subject: (1/2 code) USGS DATA REQUEST

Good morning, Nancy!
I am sending you the available data in our database
We publish our data yearly in the Annual Report, in two books: Surface water and Ground water.
Are you interested in receiving a copy? Is free of charge.
If you do, please send me you mailing address, phone and fax number, company name, and how many copies do you need.
Have a nice day!
Lillian
(See attached file: NKEENE.1.xls)

Nancy I will forward your request to Lillian who takes care of our SW requests.
We only have stage for 02286350 Little River Canal at Palm Ave, Hialeah Fl

Just for your information - Generally there is a charge to requestors that are not part of our cooperative program.
This covers our time to fill the requests. But this is a small request and there will not be a charge for this one.

We stop monitoring sites when the cooperator decides that it is no longer necessary.
Sometimes they take over the job of collecting the data.

For S-27 data after we stopped you should contact South Florida Water management District.

Lillian we take care of this for you next week.

Thanks
Carolyn

Carolyn Price
Supervisor
e-mail eprice@usgs.gov

U.S. Geological Survey Telephone: 305-717-5843
Miami Subdistrict Fax: 305-717-5801
9100 NW 36 Street

NKEENE.1.xls

Miami, Fl 33178

1979	12	19	1.87	1.79	104
1979	12	20	1.87	1.78	94
1979	12	21	1.87	1.74	127
1979	12	22	1.87	1.72	120
1979	12	23	1.86	1.75	121
1979	12	24	1.87	1.74	145
1979	12	25	1.84	1.7	125
1979	12	26	1.87	1.74	
1979	12	27	1.87	1.8	31
1979	12	28	1.87	1.8	43
1979	12	29	1.87	1.81	85
1979	12	30	1.87	1.79	97
1979	12	31	1.84	1.76	55
1980	1	1	1.87	1.79	30
1980	1	2	1.87	1.79	28
1980	1	3	1.87	1.82	29
1980	1	4	1.86	1.81	58
1980	1	5	1.86	1.8	83
1980	1	6	1.85	1.78	61
1980	1	7	1.88	1.81	51
1980	1	8	1.89	1.86	26
1980	1	9	1.86	1.8	55
1980	1	10	1.88	1.81	37
1980	1	11	1.88	1.81	52
1980	1	12	1.87	1.8	47
1980	1	13	1.88	1.8	61
1980	1	14	1.85	1.79	61
1980	1	15	1.88	1.87	19
1980	1	16	1.89	1.85	38
1980	1	17	1.87	1.85	25
1980	1	18	1.9	1.89	1.9
1980	1	19	1.88	1.84	41
1980	1	20	1.89	1.86	27
1980	1	21	1.89	1.89	27
1980	1	22	1.89	1.85	25
1980	1	23	1.87	1.85	71
1980	1	24	1.85	1.82	
1980	1	25	1.89	1.9	58
1980	1	26	1.89	1.9	93
1980	1	27	1.94	1.82	278
1980	1	28	1.88	1.73	272
1980	1	29	1.85	1.77	196
1980	1	30	1.86	1.7	221
1980	1	31	1.86	1.76	210
1980	2	1	1.85	1.76	168
1980	2	2	1.84	1.75	157
1980	2	3	1.86	1.77	172
1980	2	4	1.84	1.77	146
1980	2	5	1.84	1.76	91
1980	2	6	1.85	1.76	86
1980	2	7	1.85	1.76	88
1980	2	8	1.88	1.77	67

1980	2	9	1.87	1.78	74
1980	2	10	1.83	1.75	85
1980	2	11	1.85	1.8	79
1980	2	12	1.86	1.78	57
1980	2	13	1.88	1.82	44
1980	2	14	1.87	1.84	45
1980	2	15	1.84	1.78	125
1980	2	16	1.86	1.82	111
1980	2	17	1.88	1.83	93
1980	2	18	1.88	1.81	122
1980	2	19	1.91	1.78	106
1980	2	20	1.89	1.77	63
1980	2	21	1.89	1.79	86
1980	2	22	1.86	1.75	112
1980	2	23	1.88	1.76	123
1980	2	24	1.89	1.77	90
1980	2	25	1.86	1.78	125
1980	2	26	1.84	1.79	68
1980	2	27	1.84	1.82	50
1980	2	28	1.85	1.81	83
1980	2	29	1.88	1.88	49
1980	3	1	2	1.95	186
1980	3	2	2	1.87	302
1980	3	3	1.87	1.72	270
1980	3	4	1.9	1.71	225
1980	3	5	1.92	1.75	187
1980	3	6	1.86	1.67	201
1980	3	7	1.92	1.79	119
1980	3	8	1.85	1.71	202
1980	3	9	1.85	1.74	188
1980	3	10	1.85	1.73	165
1980	3	11	1.75	1.62	191
1980	3	12	1.84	1.77	72
1980	3	13	1.83	1.73	79
1980	3	14	1.85	1.75	149
1980	3	15	1.88	1.8	52
1980	3	16	1.89	1.81	51
1980	3	17	1.9	1.84	91
1980	3	18	1.87	1.78	69
1980	3	19	1.9	1.85	21
1980	3	20	1.89	1.83	59
1980	3	21	1.88	1.81	48
1980	3	22	1.9	1.85	14
1980	3	23	1.92	1.9	5.9
1980	3	24	1.91	1.85	24
1980	3	25	1.76	1.71	127
1980	3	26	1.82	1.75	34
1980	3	27	1.88	1.84	0
1980	3	28	1.88	1.85	0
1980	3	29	1.88	1.85	0
1980	3	30	1.89	1.85	0
1980	3	31	1.89	1.88	0

1980	4	1	1.92	1.82	124
1980	4	2	1.89	1.79	129
1980	4	3	1.88	1.79	154
1980	4	4	1.87	1.82	129
1980	4	5	1.9	1.8	186
1980	4	6	1.92	1.8	193
1980	4	7	2.41	1.87	397
1980	4	8	2.45	1.86	550
1980	4	9	2.37	1.79	478
1980	4	10	2.32	1.74	465
1980	4	11	2.24	1.8	363
1980	4	12	2.2	1.88	362
1980	4	13	2.12	1.85	328
1980	4	14	2.1	1.84	296
1980	4	15	2.01	1.78	270
1980	4	16	1.97	1.77	270
1980	4	17	1.95	1.77	269
1980	4	18	1.95	1.79	254
1980	4	19	2.04	1.81	302
1980	4	20	2	1.76	318
1980	4	21	1.91	1.69	319
1980	4	22	1.9	1.73	289
1980	4	23	1.84	1.72	267
1980	4	24	1.83	1.72	248
1980	4	25	1.84	1.74	218
1980	4	26	1.83	1.76	167
1980	4	27	1.85	1.74	197
1980	4	28	1.83	1.72	204
1980	4	29	1.82	1.74	162
1980	4	30	1.86	1.81	126
1980	5	1	1.85	1.82	93
1980	5	2	1.84	1.8	113
1980	5	3	1.63	1.75	106
1980	5	4	1.65	1.74	104
1980	5	5	1.65	1.8	88
1980	5	6	1.65	1.8	116
1980	5	7	1.69	1.82	100
1980	5	8	1.69	1.81	114
1980	5	9	1.67	1.82	102
1980	5	10	1.7	1.81	147
1980	5	11	1.7	1.78	116
1980	5	12	1.68	1.76	132
1980	5	13	1.71	1.82	60
1980	5	14	1.69	1.79	63
1980	5	15	1.66	1.78	80
1980	5	16	1.72	1.83	17
1980	5	17	1.71	1.85	17
1980	5	18	1.71	1.84	28
1980	5	19	1.69	1.84	32
1980	5	20	1.7	1.82	50
1980	5	21	1.72	1.77	139
1980	5	22	1.71	1.74	194

1980	5	23	1.71	1.75	177
1980	5	24	1.74	1.77	217
1980	5	25	1.75	1.76	217
1980	5	26	1.75	1.78	186
1980	5	27	1.76	1.78	201
1980	5	28	1.77	1.83	150
1980	5	29	1.77	1.81	180
1980	5	30	1.73	1.78	131
1980	5	31	1.74	1.81	150
1980	6	1	1.73	1.8	142
1980	6	2	1.68	1.75	142
1980	6	3	1.66	1.72	125
1980	6	4	1.68	1.75	99
1980	6	5	1.7	1.83	43
1980	6	6	1.71	1.88	29
1980	6	7	1.74	1.94	0
1980	6	8	1.72	1.91	23
1980	6	9	1.69	1.91	18
1980	6	10	1.72	1.92	27
1980	6	11	1.71	1.89	59
1980	6	12	1.71	1.84	82
1980	6	13	1.7	1.84	78
1980	6	14	1.72	1.89	65
1980	6	15	1.71	1.88	38
1980	6	16	1.71	1.87	28
1980	6	17	1.69	1.87	0
1980	6	18	1.71	1.9	0
1980	6	19	1.7	1.83	146
1980	6	20	1.69	1.8	165
1980	6	21	1.68	1.78	150
1980	6	22	1.66	1.71	214
1980	6	23	1.74	1.81	182
1980	6	24	1.71	1.8	185
1980	6	25	1.76	1.81	194
1980	6	26	1.74	1.78	224
1980	6	27	1.72	1.72	271
1980	6	28	1.71	1.72	227
1980	6	29	1.68	1.73	201
1980	6	30	1.71	1.76	212
1980	7	1	1.73	1.8	194
1980	7	2	1.76	1.79	181
1980	7	3	1.77	1.79	202
1980	7	4	1.74	1.78	210
1980	7	5	1.73	1.8	175
1980	7	6	1.7	1.82	208
1980	7	7	1.86	1.81	183
1980	7	8	1.94	1.84	206
1980	7	9	1.93	1.82	165
1980	7	10	1.93	1.81	147
1980	7	11	1.87	1.75	132
1980	7	12	1.84	1.75	191
1980	7	13	1.86	1.79	157

1980	7	14	1.88	1.8	107
1980	7	15	1.94	1.84	141
1980	7	16	1.94	1.73	222
1980	7	17	1.89	1.67	286
1980	7	18	2	1.68	319
1980	7	19	2.02	1.65	328
1980	7	20	2.11	1.69	363
1980	7	21	2.03	1.71	310
1980	7	22	2.02	1.66	366
1980	7	23	2.06	1.64	360
1980	7	24	2.02	1.66	336
1980	7	25	1.96	1.71	274
1980	7	26	1.91	1.76	230
1980	7	27	1.94	1.77	221
1980	7	28	1.92	1.72	213
1980	7	29	1.93	1.75	232
1980	7	30	1.96	1.76	282
1980	7	31	1.96	1.76	262
1980	8	1	1.92	1.75	250
1980	8	2	1.95	1.77	257
1980	8	3	2.01	1.79	287
1980	8	4	1.92	1.74	237
1980	8	5	2.15	2.17	0
1980	8	6	2.24	2.25	0
1980	8	7	2.25	2.27	0
1980	8	8	2.11	2	182
1980	8	9	1.88	1.81	201
1980	8	10	1.9	1.81	180
1980	8	11	1.94	1.75	219
1980	8	12	1.93	1.74	267
1980	8	13	1.91	1.78	206
1980	8	14	1.92	1.77	201
1980	8	15	1.91	1.77	166
1980	8	16	1.89	1.79	146
1980	8	17	1.88	1.78	158
1980	8	18	1.94	1.83	171
1980	8	19	1.91	1.74	220
1980	8	20	1.93	1.8	194
1980	8	21	1.93	1.78	206
1980	8	22	1.98	1.85	196
1980	8	23	1.94	1.79	219
1980	8	24	1.95	1.77	196
1980	8	25	1.95	1.79	172
1980	8	26	1.96	1.85	181
1980	8	27	1.96	1.83	164
1980	8	28	1.94	1.84	142
1980	8	29	1.94	1.82	204
1980	8	30	1.98	1.82	197
1980	8	31	1.95	1.79	222
1980	9	1	1.97	1.83	235
1980	9	2	2.1	1.79	282
1980	9	3	2.08	1.73	296

1980	9	4	2.03	1.7	293
1980	9	5	2.03	1.74	248
1980	9	6	1.97	1.71	249
1980	9	7	1.96	1.74	219
1980	9	8	2.01	1.78	196
1980	9	9	1.97	1.74	204
1980	9	10	1.97	1.72	186
1980	9	11	1.95	1.71	170
1980	9	12	1.94	1.74	159
1980	9	13	1.93	1.68	204
1980	9	14	1.95	1.71	233
1980	9	15	1.97	1.7	243
1980	9	16	1.96	1.72	231
1980	9	17	1.96	1.79	202
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1980	9	19	1.92	1.77	173
1980	9	20	1.95	1.86	120
1980	9	21	1.96	1.82	132
1980	9	22	1.97	1.82	129
1980	9	23	1.95	1.8	121
1980	9	24	1.96	1.79	132
1980	9	25	1.96	1.82	122
1980	9	26	1.95	1.8	114
1980	9	27	1.94	1.81	113
1980	9	28	1.92	1.76	137
1980	9	29	1.88	1.8	131
1980	9	30	1.89	1.8	105

Reference 33

ArcData Online GIS Data on the Web

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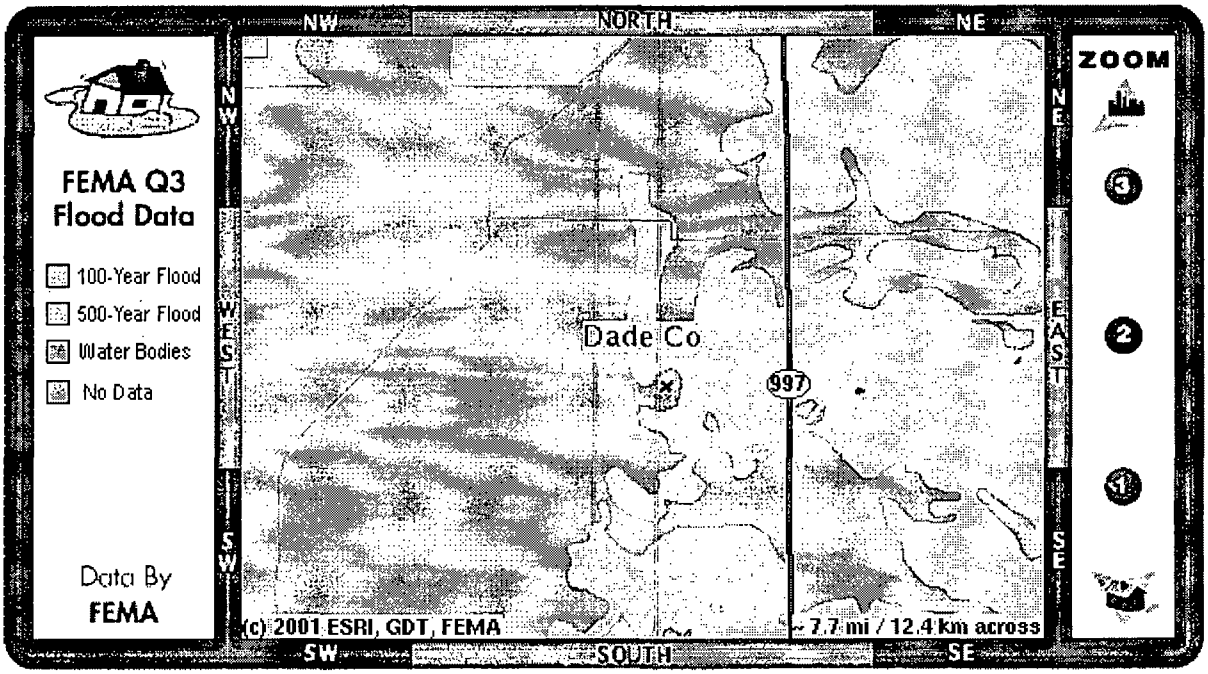

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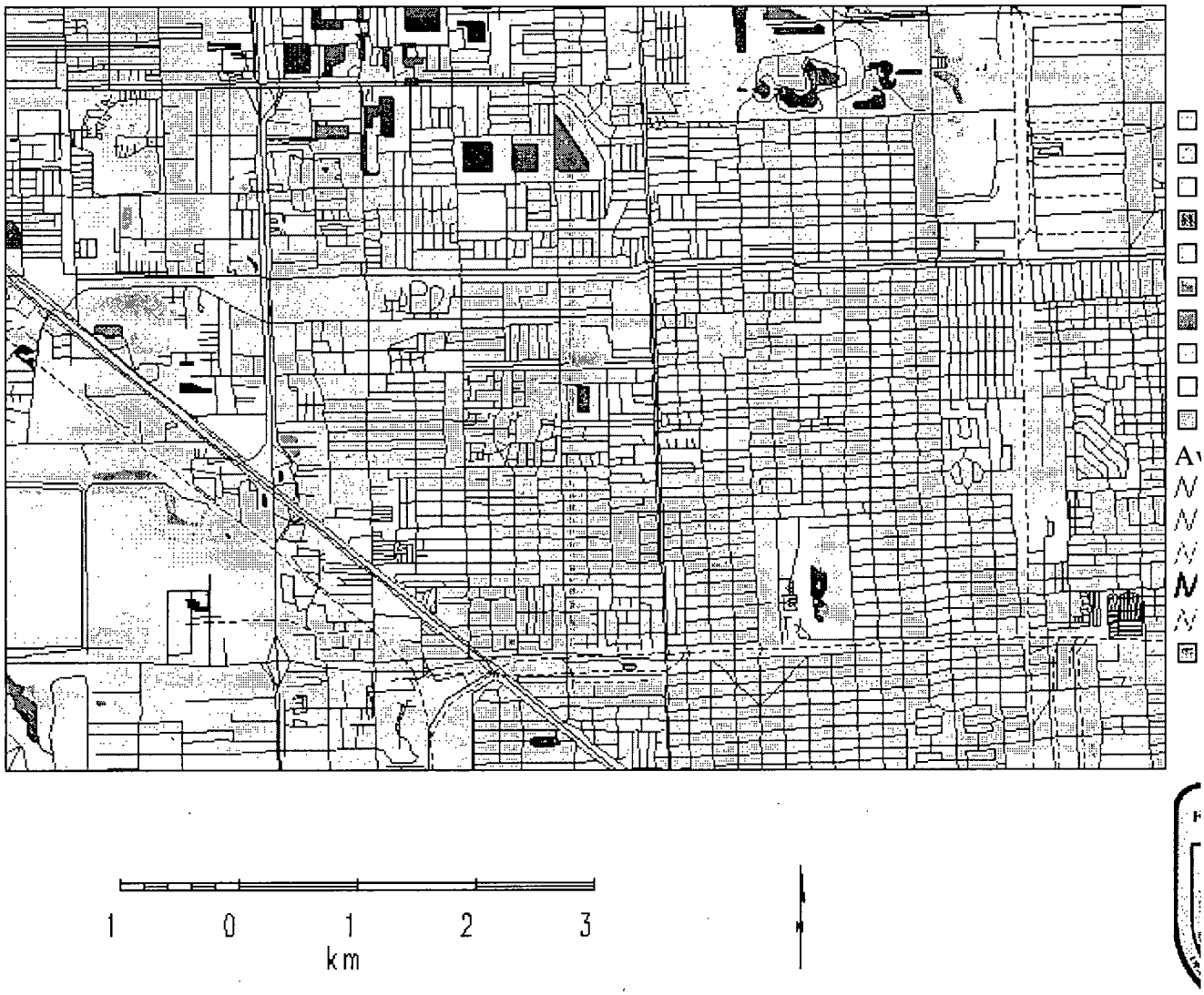
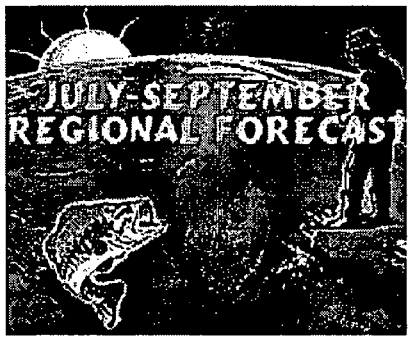
Reference 34

Wetland Data Provided by the U.S. Fish and Wildlife Service's National Wetland Inventory



Reference 35

SOUTH REGION QUARTERLY FISHING FORECAST



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The following is a general description and quarterly forecast (teal-colored updates) for fishing conditions in major public water bodies in this region. For even more up-to-date information, we suggest you call or visit a local bait-and-tackle shop, fishing marina or guide service. We have provided information for some local contacts, who indicated they were willing to be listed herein. If you would like additional descriptions of these and other fishing sites listed by county, you can visit the Great Outdoors Recreation Page listing for Florida's South Region. Please note, however, that their site is not routinely updated to reflect current fishing conditions.

We have created maps to help you find many of these locations. All you need to do is click on the appropriate MAP icon below the forecast entry. Follow the instructions at the Maps On Us site and you can recenter the map on a particular area, zoom in or zoom out, as well as routing your trip, finding local bait and tackle shops, restaurants, motels etc. One special note, the red cross marking is a hot link back to this page--click near it to zoom in, but clicking on it will bring you back here. A few sites have additional links to local web pages or to topographic maps and brochures. We will continue to expand these links as they become available to us.

Everglades Conservation Areas	Miami-Dade, Broward & West Palm Canals	Lake Okeechobee
Lake Osborne	Lake Trafford	Statewide Forecasts

EVERGLADES CONSERVATION AREAS (Palm Beach, Broward and Dade counties): Water Conservation Areas (WCA) 2 and 3 are two sections of northern everglades habitat that are managed for multiple uses. Health advisories related to consumption of fish, especially bass, gar and bowfin are in effect for the area. The WCAs were designated primarily to receive flood waters from adjacent areas and store them for beneficial municipal, urban, and agricultural uses. The Florida Fish and Wildlife Conservation Commission (FWC) currently manages the fish and wildlife in these areas. Both areas have continually provided superior fishing throughout the years. Largemouth bass is the most sought after species, and when waters levels are right, provide anglers with some of the highest catch rates in the state. Other popular species readily caught include bluegill, redear sunfish, pickerel, oscar, and Mayan cichlid. The majority of fishing pressure takes place during the winter and spring

months when water levels are typically dropping, which concentrates fish into the perimeter canals. When water levels are up, anglers have access to vast marsh systems for a different type of angling experience.

Water Conservation Area 2 encompasses 210 square miles and is located in western Palm Beach and Broward counties. The majority of fishing takes place within the L-35B and L-38E canals which are each approximately 12 miles long. Main access for this area is the Sawgrass Recreation Area, located two miles north of Alligator Alley (SR84) on U.S. 27. Current fishing information, as well as a guide service, camping, food, boat rental, fishing licenses, and bait and tackle can be found there (telephone number 954-389-0202).

The 915 square mile WCA-3 is located in western Broward and Dade counties, just south of WCA-2 and north of Everglades National Park. Many miles of canals run around and through the area, including the L-67A, L-67C, Miami, and Tamiami canals. All are accessible by boat and the Tamiami Canal has abundant bank access. In a joint project, the FWC and the South Florida Water Management District constructed eight boat trails off the L-67A Canal to provide anglers access to the marsh areas (when water levels are high enough) for "flats" fishing. Many of the canals can be accessed at Holiday Park Recreation Area (telephone number 954-434-8111). Amenities there include fishing guides, boat rentals, camping, food, bait and tackle, and the sale of fishing licenses. Other access points to WCA-3 are boat ramps along Alligator Alley, Tamiami Trail (SR41), and at Mack's Fish Camp (305-822-5033) which is located on Krome Ave., one-half mile south of U.S. 27. The L-67A Canal runs from Holiday Park Recreation Area to the S-333 spillway at Tamiami Trail. Those anglers wanting to try their luck in WCA-2 will find access at Sawgrass Recreation Area, two miles north of SR84 along U.S. 27. Twenty-five miles of canals and their associated marsh can be found there.

This is the period in which fishing in the Water Conservation Areas should peak. Last year, catch rates for both largemouth bass and oscar peaked in April when dropping water levels concentrated fish in the canals. So this year=s peak is yet to come. Surveys indicate that March catch rates had already exceeded two bass per angler hour (statewide average = 0.33 bass/hour). Due to low water, marsh access is limited. Use caution when entering the marsh to avoid damaging equipment. Early indications are that catch rates of oscar are already increasing. However, the Mayan cichlid, a common fish last year, has shown up only recently in this year=s creel surveys. For bass, the best bet is to work heavy cover along the canal banks and areas between spoil piles. At present, the hot lures are Rapala-type shallow diving minnow imitations. Plastic worms and live bait continue to be consistent producers. For oscar, the usual plan of working along the bank and moving when the action slows is still the best bet. Jigs, crickets, minnows, or any combination are the best baits. Bream fishing will also continue to improve. Live bait, especially worms, is the best bet. As with oscar, work the banks and move when things slow. An added bonus to the angler is chain pickerel. Recently, the catch rate for this feisty predator has increased significantly, with many fish over two pounds.

MAP

An alternate map in PDF format is available courtesy of the South Florida Water Management District here.

LAKE OKEECHOBEE (Palm Beach, Martin, Glades, Okeechobee, and Hendry counties):

Lake Okeechobee is Florida's largest lake and the second largest body of freshwater in the contiguous United States. The word Okeechobee comes from the Seminole Indian language AOki@ (water) and AChubi@ (big) and means Abig water@. These early Floridians chose the name well. Vast surface area (730 sq. mi.), shallowness (averages only 9 feet) and enormous habitat diversity make the ecosystem unique on the North American continent. The lake is a multiple use resource, which supports valuable commercial and sport fisheries, provides flood control, and acts as a reservoir for potable water and irrigation water for much of south Florida.

Lake Okeechobee is located on the south-central portion of the Florida peninsula at latitudes 27o 12'N to 26o 40'N and longitudes 81o 07'W to 80o 37'W. Major natural tributaries to the lake are Fisheating Creek, Taylor Creek and the Kissimmee River. Sheet outflow occurred originally across the entire southern rim into the Everglades. Prior to the 1900's, water quality was characterized as clear and alkaline, and bottom sediments were described as "clean sand." Levee and canal construction during the first half of the century confined the lake to a smaller area, eliminated overflow along the south shore, and facilitated backpumping of excess water from the Everglades agricultural area into the lake. During the past 30 years, rising nutrient levels and periodic increases in the lake stage regulatory schedule have decreased habitat quality and pushed the system nearer a hypereutrophic, and ecologically undesirable state.

Primary sources of lake water include rainfall (30%) and major tributaries, canals and runoff (70%). Evaporation accounts for 70% of water loss, with the remainder exiting through engineered outflows. High water levels are maintained from October through March (dry season), while low water levels are maintained from June through August. Shallow depth, long fetch and moderate winds combine to preclude thermal stratification. Regular mixing by wind and wave action ensures dissolved oxygen levels adequate for biological processes throughout the water column. Water temperatures average between 59EF(14E C) in January to 86EF (30E C) in August.

Lake Okeechobee is nationally recognized as supporting high quality largemouth bass and black crappie fisheries. The lake also supports a commercial fishery dominated by catfish species. However, the commercial fishery is also nationally unique in that a limited entry fishery (10 nets) exists for haul seine gear which is permitted to legally harvest and sell bluegill and redear sunfish. Recreational and commercial fisheries generate $28 million US (1985) annually for local economies. Economists have placed an asset value of $100 million US (1985) on the recreational fishery of Lake Okeechobee. Biologically, Lake Okeechobee can successively support recreational and commercial fishery interest. Fishery management concerns on Lake Okeechobee not only require allocating available fishery resources between recreational and commercial interests, but must also be concerned with resolution of socio-political issues that result from user conflicts.

Aquatic plant communities benefit fish by providing spawning habitat, serving as refuge areas from the environment and predators, and support an intricate food web by providing nutrients for invertebrates and herbivorous fishes, which serve as forage. Despite ecological advantages provided by aquatic plants to fishes and wildlife on Lake Okeechobee, controversy over management of vegetation continues among federal and state agencies with regulatory authority for aquatic plant management, water quality and supply, flood control, and fish and wildlife management.

Changes in water level and differences in plant community structural complexity and water quality within vegetation communities exert the greatest effect on fish distribution in the littoral zone of Lake Okeechobee. Historically, bulrush has yielded the highest mean standing stock values for total fish

and game fish in block net sampling conducted on Lake Okeechobee. Importance of bulrush as habitat for adult game fishes has long been recognized by fisheries biologists and is frequently planted during lake restoration and habitat enhancements projects.

Submersed vegetation types provide important habitat for forage fish, such as minnows, shiners, and small bream. A positive relationship between hydrilla and production of juvenile game fish and forage fish has been documented by fisheries biologists. Dominant fish species abundance estimates for hydrilla, eel-grass, and Illinois pondweed (peppergrass) were similar which indicated equivalent habitat value for these vegetation types.

Since the adoption of higher regulation water level stages on Lake Okeechobee during the early 1990s, extreme high water events greater than 18 ft. above msl.(mean sea level) have occurred. High water levels, together with high winds, has had a devastating effect on many plant communities. From the constant beating of high wind and waves, thousands of acres of plants such as bulrush, peppergrass, eel-grass, and hydrilla were uprooted or broken off. Plants near the bottom or in protected areas were subjected to die off from little or no sunlight reaching them as a result of highly turbid water.

The water level on Lake Okeechobee was lowered during May 2000 from 15 ft. msl. to 13 ft. msl. The current drought, that has struck much of the state of Florida, has lowered the lake level to 10.7 ft. msl (February 2001). The lake will probably be another foot lower before the next rainy season. Periods of drought have occurred on Lake Okeechobee about every ten years. Normally an expansive vegetated littoral zone (150 sq. mi.) is located in the northwest, west, and southern regions of Lake Okeechobee. Due to the drought, nearly all emergent vegetation on Lake Okeechobee is exposed (see forecast area of this report).

A new WSE (water supply and environment) water level regulatory schedule has been adopted, that hopefully will prevent periods of extreme high water levels that have plagued the lake in recent years. In one to two years, Lake Okeechobee should be back in prime condition, with many new acres of vegetation and clean bottom in the littoral zone.

Water levels on Lake Okeechobee this spring were the lowest in recorded history. The current level as of this writing (late May) is 9.0 ft. msl. Spring seasons are usually dry in South Florida, so we should have low water levels until this summer's rainy season. Be careful where you go. Lower units are expensive. Many boat ramps may be unuseable. A guide is highly recommended, if you are unfamiliar with Lake Okeechobee during low water periods.

Water levels should be on the increase by late summer and fall. We are seeing new vegetation around the lake, both submerged and emergent. Bulrush has responded very well. Bulrush is growing from seed on much of the exposed bottom around the lake. Little Grassy Island on the north end of Lake Okeechobee has increased with many new acres of young bulrush from only about 200 bulrush stems in July 2000. Peppergrass, southern naiad, chara (shrimp grass), and eel grass has increased in various areas of the lake. Terrestrial and moist soil vegetation is also covering many bars and shorelines that were exposed.

Largemouth bass fishing will be best in the open areas in eighteen inches or more of water. Look for areas offshore that have shrimp grass, small eelgrass plants, peppergrass, or southern naiad growing on the bottom. As water levels come up, you will be able to fish on the newly vegetated areas. Drop offs at the edge of channels and canals are holding a good number of bass. Recommended lures for

largemouth bass are slow-fished plastics, spinnerbaits, crankbaits, topwater plugs, and of course, golden shiners.

Although slower than in winter months, black crappie are being caught in the Kissimmee River. Harney Pond canal will probably continue to be one of the best spots to catch these specks during the summer. The rim canal on the west and south of the lake, from Sportsmans Village to near the Pahokee Airport is another good area for crappie and bream. Use the usual fishing techniques for crappie throughout this time. Minnows should be suspended at various depths to locate schools. Jig fishing is very productive, as you can cover a great deal more area. The secret to successful crappie fishing is to move often, until you locate a school.

Bluegill and redear fishing should be good during the summer. Look for beds around the edge of the lake in two feet of water or more. One of the best areas for bluegill and redear will be the open areas of Lake Okeechobee from Observation Island to Ritta Island. Just be careful if you venture into these areas because much of it is rocky. Other excellent areas will be the rim canals around Lake Okeechobee, the numerous canals leading to the lake, and the Kissimmee River. Most redear are taken on live worms. Beetle-spins and crickets are the preferred baits for bluegill.

MAP

An alternate map in PDF format is available courtesy of the South Florida Water Management District here.

OSBORNE CHAIN-OF-LAKES (Palm Beach County): Lake Osborne is a 356-acre water body located in Palm Beach County. Aquatic vegetation consists of cattail, spatterdock, and hydrilla. Nine fish attractors have been constructed on the lake and are marked with buoys. Fish present in Lake Osborne include largemouth bass, sunshine bass, black crappie, bluegill, redear sunfish, catfish, and Mayan cichlids.

Because much of the lake is surrounded by John Prince Park, bank access is plentiful. The park has a public boat ramp and fishing dock equipped with its own automatic fish feeder. Picnic pavilions, a campground, and public restrooms are also present in John Prince. There are no marinas, fish camps, or bait and tackle stores on the lake. Numbers to call for information or guide service on Lake Osborne are Lone Star Bassin' Pro Shops (561) 967-2248 and fish guide Butch Mosier (561) 732-5996.

A good bit of aquatic vegetation has returned to the Osborne chain and should provide excellent cover for bluegill and redear sunfish (shellcracker). Fishing was good this May and should continue through September as bluegill and redear continue to spawn through the early months of summer. Look for bedding areas and areas that provide some cover to be the most productive. The bait of choice is live crickets with red wigglers providing good results as well. Best bet for largemouth bass during the summer months is topwater lures in the early morning and plastic worms as the heat of the day drives bass to shadier depths. Red-shad and black-green/grape are good worm colors to try. Black crappie (speck) fishing was slow this past winter and anglers should not expect to see them again until well into next fall and winter. The summer heat will drive sunshine bass to the deep refuges in the lake, but they may hit live shad free lined in the deep holes on Lake Osborne and Ida. Catfish can be caught on chicken liver or live worms throughout the summer by fishing the bottom.

MAP

METROPOLITAN MIAMI CANALS (Broward, Miami-Dade, West Palm counties): The man-made canals of coastal southeast Florida are part of an extensive, interconnecting network of canals that were primarily constructed in the early 1900's for drainage, flood protection, and water storage purposes. The freshwater canals in the southern section (Cypress Creek Canal and south) are mostly box-cut into a coral rock substrate, more than 10 feet deep with little littoral zone, and have much subsurface water flowing into them. The amount of groundwater flowing into some canals is sufficient enough to dramatically increase water clarity. Canals in the northern section (Hillsboro Canal and north) tend to be shallower, more bowl-shaped, have sugar-sand substrate, and little water ground water intrusion.

These urban canals provide excellent angling for a variety of sportfishes. Largemouth bass and snook roam throughout the tri-county canals and in the southern section, butterfly peacock and tarpon provide anglers an opportunity to complete a canal "trifecta" or "grand slam". The butterfly peacock is a world renowned sportfish that was successfully introduced by the Florida Game and Fresh Water Fish Commission in 1984 to eat undesirable exotic fishes and to provide more sportfishing opportunities for anglers.

The L-67A, Miami, and Alligator Alley Canals have all enjoyed excellent fishing recently; however, a recent decline in catch rates has been noticed. Continuing low water levels will cause fish to remain concentrated in the canals. This is normally good for fishing; however, the heat of summer will slow down the bass fishing a bit. At this time it is best to concentrate largemouth bass fishing effort in the cooler morning and evening hours. Night fishing is also an option. When fishing during the day, avoid areas of high surface temperature. Seek out shaded and deeper areas where fish can escape the daytime heat. Anglers who are still reporting good catches have been using shallow-running crankbaits in the early morning. The heat does not seem to affect angling for sunfish as much. Sunfish (bluegill and redear) may still be found in many of the same areas as before, and the usual baits, worms and crickets, will still be effective. The combination of low water and high heat has made for fast action angling for Mayan cichlid. These South American invaders are well adapted to extremes of heat. As always, work the shoreline areas with small jigs and crickets. Due to a winterkill, oscar and peacock bass have been uncommon this year and will probably remain so for the next few years. As the season progresses and rain storms become more frequent, rising water levels will cause fish to disperse into the marsh areas. This may be the last opportunity for the Ahigh-numbers@ fishing that has been enjoyed recently.

Palm Beach County Canals: Butch Moser, who guides primarily in the urban canals and lakes south of Lake Osborne in eastern Palm Beach County, stated that fishing should be excellent during these hot summer months. For largemouth bass, Moser recommends using live shiners or small Rapalas and Pop R=s in the morning then switching to plastic worms in the heat of the day. Moser also reported good catches of Mayan cichlid an exotic fish that is increasing in abundance and can provide a great deal of action for anglers, in the urban canals of Miami-Dade, Broward, and Palm Beach counties. This aggressive, hard-fighting panfish will take a variety of natural and artificial baits and Moser recommends small minnows, worms, bread, small tube jigs (chartreuse with glitter is one of his favorites) and small beetle spins. Some of Moser=s customers flyfish for Mayan cichlid using black spider-poppers with white legs, and bumblebee poppers. There are no bag limits on Mayan cichlid so anglers can keep and eat as many as they like. The Congress (E-4), Boynton (C-16), and Hillsboro (G-08) canals are all excellent places for catching Mayan cichlid.

Broward County Canals - Bill Smith of North Lauderdale Bait and Tackle said that plenty of fish

were biting in area canals. For largemouth bass in these urban canals, Smith recommends live shiners and plastic worms in black grape and white, and top-water, frog-colored, chugging lures. The best bet for butterfly peacock is small shiners. For panfish, Smith said worms and a dough-based product called Sticky Bait also works well for both native bluegill and redear sunfish as well as the exotic Mayan cichlid.

Miami-Dade County Canals - Neil Cobo of The Fishing Line said butterfly peacock fishing should really take off with rising water temperatures. He said live shiners on a #4 or #6 Mustad live bait hook are the best way to hook one of these urban battlers, but small (5RT or 7RT) Rapalas in black/silver, blue/white, and perch color, Bill Lewis rattletraps in butterfly peacock colors, chartreuse Flu - Flu jigs, Mini-King spinner baits in chartreuse and white are all effective lures for butterfly peacock. Neil recommends using 8 to 10# test line and tie on an 18" of 15# mono leader to reduce break-offs.

Cobo suggests that largemouth bass anglers use 6 to 7 2" plastic worms. Charlie's, Culprit, and Zoom worms in red grape, June bug, and pumpkinseed are effective colors. Many of Miami-Dade=s canals also have snook and tarpon. Cobo recommends using topwater lures such as Heddon's Zara Spook and Zara Puppy for snook. Tarpon will hit live shiners and chugging baits such as Storm Lures Chug Bug and Rebel Pop R's. To land a snook or tarpon requires heavier tackle and Cobo recommends using at least 12# test line. Tie on a 10 to 18" piece of 30# mono leader for snook and at least 40# mono leader for tarpon for fewer break-offs. If live bait fishing, tie on a bronze Mustad 2/0 or 1/0 live bait hook for best results. Snake Creek (C-9), Tamiami (C-4), and Black Creek (C-1) canals are some of the best canals for targeting snook or tarpon. Good locations for snook and tarpon are on the downstream side of water control structures with flowing water in both fresh and brackish water sections of canals.

Panfish are plentiful in urban canals and Cobo said that red wigglers or night crawlers on a #10 or smaller bronze Mustad (3191) hook tied to 8 to 10# test line and fished 6 to 8" below a small split shot is a sure way to get a few bites. Adding a bobber 10 to 14" above the sinker is a great way to show kids when the fish are biting. Small Flu-Flu jigs in orange, chartreuse, and white are also effective baits.

Grass carp have been stocked in most southeast Florida urban waters to eat fast growing aquatic vegetation. They can grow in excess of 30 pounds and put up a great fight when caught on hook and line. Cobo suggests using a bronze, long-shank, Mustad hook (43191) threaded with whole kernel corn. Put a small split shot 6 to 8" above the hook and hold on! Small dough balls and berries from ficus or sea grape trees are also effective baits. Please remember that all grass carp must be immediately released and it is against the law to keep one.

A free set of angler guides to 12 southeast Florida urban canals and a pamphlet listing boat ramp accessing the butterfly peacock sportfishery can be obtained by writing: FWC Non-Native Fish Research Laboratory, Attn: Canal Maps, 801 NW 40th Street, Boca Raton, FL 33431.

These maps are also available at FWC's web site at www.state.fl.us/fwc/fishing/pdf.

LOCAL FISHING GUIDES include:

- Burke, John—954/971-1915
- Fettes, Clark—954/426-2094

- Harris, Doub—954/435-0486
- Norling, Gregg—954/979-4933
- Zaremba, Allen—954/961-7512

LOCAL BAIT AND TACKLE SHOPS include:

- Everglades Pro-Bass Center—954/434-4495
- Sea Shacks—305/279-8285
- Southern Bass & Offshore Tackle Shop—954/979-4933
- The Fishing Line—305/598-2444

TAXIDERMISTS include:

- Marine Taxidermy of the Palm Beaches—561/585-0830
- Steve's Marine Designs—954/752-4360
- Don Winge—941/353-9359

MAP

An alternate map in PDF format is available courtesy of the South Florida Water Management District here.

LAKE TRAFFORD (Collier County): Lake Trafford, located in Collier County, encompasses approximately 1,500 acres. Aquatic vegetation consists of cattail, spatterdock, and hydrilla. Fish species present in the lake include largemouth bass, black crappie, bluegill, redear sunfish, and large brown bullheads. Access to Lake Trafford is mainly by boat. However, there is a small county park located on the lake that provides some bank access along with a nice public fishing pier. Lake Trafford Marina and the park both have public boat ramps. Services available from the marina include boat rentals, guide service, airboat tours, and bait and tackle. The phone number for Lake Trafford Marina is (941) 657-2401.

Things have not changed much from last year with the exception of water levels being a bit lower. Anglers should be cautious and are advised to stay in deeper areas in the middle of the lake. Bluegill fishing has been very good though and should continue throughout the summer months. The bait of choice for most anglers is crickets. Crappie action has been good through May but will be minimal until late September when the first hints of cooler weather return. Largemouth bass fishing will be challenging and anglers should concentrate their efforts in the early mornings and late afternoons. Brown bullhead are plentiful and can be taken from the shoreline or pier area using live worms and chicken livers fished on the bottom.

MAP

[FRESHWATER RULES | FISHING LICENSES | FISH IDENTIFICATION | FISHING TIPS | FISHING SITES |
BOAT RAMPS	FISHING PIERS	FISH MANAGEMENT AREAS	FISHING LINKS
FISHERIES PUBLICATIONS	PROGRAM UPDATES	FISHERIES NEWS	FISHERIES OFFICES
FISHERIES PERMITS	BIG CATCH PROGRAM	SPORT FISH RESTORATION	BASS TAG FOR CARS
DIVING/PHOTOGRAPHY	KIDS and JOE BUDD AQUAT. ED. CENTER
THREATENED FISHES and HABITAT	FISHING EVENTS CALENDAR	HEALTH ADVISORIES
QUESTIONS and ANSWERS	MULTIMEDIA SHOWS	SITE MAP	SEARCH

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Reference 36

Listed Species in Miami-Dade County

(updated June 2000)

Species	Federal status	Habitat
Florida panther *Puma (=Felis) concolor coryi*	E	High pine, Tropical hardwood hammock, Scrub, Maritime hammock, Mesic temperate hammock, Pine rockland, Scrubby flatwoods, Mesic pine flatwoods, Hydric pine flatwoods, Dry prairie, Wet prairie, Freshwater marsh, Seepage swamp, Pond swamp, Mangrove
Puma (=Mountain lion) *Puma (=Felis) concolor*	T (S/A)	High pine, Tropical hardwood hammock, Scrub, Maritime hammock, Mesic temperate hammock, Pine rockland, Scrubby flatwoods, Mesic pine flatwoods, Hydric pine flatwoods, Dry prairie, Wet prairie, Freshwater marsh, Seepage swamp, Flowing water swamp, Pond swamp, Mangrove
West Indian manatee *Trichechus manatus*	E (CH)	Mangrove, Seagrass, Nearshore reef
Bald eagle *Haliaeetus leucocephalus*	T	High pine, Scrubby high pine, Maritime hammock, Mesic temperate hammock, Pine rockland, Scrubby flatwoods, Mesic pine flatwoods, Hydric pine flatwoods, Dry prairie, Wet prairie, Freshwater marsh, Seepage swamp, Flowing water swamp, Pond swamp, Mangrove, Saltmarsh, Seagrass
Cape Sable seaside sparrow *Ammodramus (=Ammospiza) maritimus mirabilis*	E (CH)	Wet prairie, Freshwater marsh
Everglade snail kite *Rostrhamus sociabilis plumbeus*	E (CH)	Hydric pine flatwoods, Freshwater marsh, Pond swamp
Roseate tern *Sterna dougallii dougallii*	T	Beach dune/Coastal strand, Saltmarsh, Seagrass, Nearshore reef
Wood stork *Mycteria americana*	E	Hydric pine flatwoods, Wet prairie, Freshwater marsh, Seepage swamp, Flowing water swamp, Pond swamp, Mangrove, Saltmarsh, Seagrass
American alligator *Alligator mississippiensis*	T (S/A)	Hydric pine flatwoods, Wet Prairie, Freshwater marsh, Seepage swamp, Pond Swamp, Mangrove, Hydric pine flatwoods, Wet prairie, Seepage swamp, Flowing water swamp, Pond swamp
American crocodile *Crocodylus acutus*	E (CH)	Mangrove, Seagrass
Eastern indigo snake *Drymarchon corais couperi*	T	High pine, Tropical hardwood hammock, Scrubby high pine, Beach dune/Coastal strand, Maritime hammock, Mesic temperate hammock, Pine rockland, Scrubby flatwoods, Mesic pine flatwoods, Hydric pine flatwoods, Dry prairie, Cutthroat grass, Freshwater marsh, Seepage swamp, Flowing water swamp, Pond swamp, Mangrove
Green sea turtle *Chelonia mydas (incl. Agassizi)*	E	Beach dune/Coastal strand, Seagrass, Nearshore reef
Hawksbill (=carey) sea turtle	E	Beach dune/Coastal strand, Seagrass, Nearshore reef

Eretmochelys imbricata		[illegible]
Leatherback sea turtle *Dermochelys coriacea*	E	Beach dune/Coastal strand, Seagrass, Nearshore reef
Loggerhead sea turtle *Caretta caretta*	T	Beach dune/Coastal strand, Seagrass, Nearshore reef
Schaus swallowtail butterfly *Heraclides (= Papilio) aristodemus ponceanus*	E	Tropical hardwood hammock
Beach jacquemontia *Jacquemontia reclinata*	E	Beach dune/Coastal strand
Blodgett's silverbush *Arygythamnia blodgettii*	C	Tropical hardwood hammock, Pine rockland
Crenulate lead-plant *Amorpha crenulata*	E	Pine rockland
Deltoid spurge *Chamaesyce(=Euphorbia) deltoidea ssp. Deltoidea*	E	Beach dune/Coastal strand, Pine rockland
Florida brickell-bush *Brickellia mosieri*	C	Pine rockland
Florida pineland crabgrass *Digitaria pauciflora*	C	Pine rockland, Freshwater marsh, Seepage swamp
Garber's spurge *Chamaesyce(=Euphorbia) garberi*	T	Pine rockland
Johnson's seagrass *Halophila johnsonii*	T	Seagrass
Pineland sandmat *Chamaesyce ssp. Pinetorum*	C	Pine rockland
Scrub lupine *Lupinus aridorum*	E	Scrub
Small's milkpea *Galactia smallii*	E	Pine rockland
Tiny polygala *Polygala smallii*	E	High pine, Scrub, Pine rockland, Scrubby flatwoods

Explanations and Definitions

FNAI Global Rank FNAI State Rank Federal Status State Status

Special Animal Listings

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Using a ranking system developed by The Nature Conservancy and the Natural Heritage Program Network, the Florida Natural Areas Inventory assigns two ranks to each element. The **global rank** is based on an element's worldwide status; the **state rank** is based on the status of the element in Florida. Element ranks are based on many factors, the most important ones being estimated number of Element occurrences, estimated abundance (number of individuals for species; area for natural communities), range, estimated adequately protected EOs, relative threat of destruction, and ecological fragility.

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G1 = Critically imperiled globally because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.

G2 = Imperiled globally because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.

G3 = Either very rare and local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.

G4 = Apparently secure globally (may be rare in parts of range)

G5 = Demonstrably secure globally

GH = Of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker)

GX = Believed to be extinct throughout range

GXC = Extirpated from the wild but still known from captivity or cultivation

G#? = Tentative rank (e.g., G2?)

G#G# = Range of rank; insufficient data to assign specific global rank (e.g., G2G3)

G#T# = Rank of a taxonomic subgroup such as a subspecies or variety; the G portion of the rank refers to the entire species and the T portion refers to the specific subgroup; numbers have same definition as above (e.g., G3T1)

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Listed Species in Miami-Dade County

(updated June 2000)

Species	Federal status	Habitat
Florida panther *Puma (=Felis) concolor coryi*	E	High pine, Tropical hardwood hammock, Scrub, Maritime hammock, Mesic temperate hammock, Pine rockland, Scrubby flatwoods, Mesic pine flatwoods, Hydric pine flatwoods, Dry prairie, Wet prairie, Freshwater marsh, Seepage swamp, Pond swamp, Mangrove
Puma (=Mountain lion) *Puma (=Felis) concolor*	T (S/A)	High pine, Tropical hardwood hammock, Scrub, Maritime hammock, Mesic temperate hammock, Pine rockland, Scrubby flatwoods, Mesic pine flatwoods, Hydric pine flatwoods, Dry prairie, Wet prairie, Freshwater marsh, Seepage swamp, Flowing water swamp, Pond swamp, Mangrove
West Indian manatee *Trichechus manatus*	E (CH)	Mangrove, Seagrass, Nearshore reef
Bald eagle *Haliaeetus leucocephalus*	T	High pine, Scrubby high pine, Maritime hammock, Mesic temperate hammock, Pine rockland, Scrubby flatwoods, Mesic pine flatwoods, Hydric pine flatwoods, Dry prairie, Wet prairie, Freshwater marsh, Seepage swamp, Flowing water swamp, Pond swamp, Mangrove, Saltmarsh, Seagrass
Cape Sable seaside sparrow *Ammodramus (=Ammospiza) maritimus mirabilis*	E (CH)	Wet prairie, Freshwater marsh
Everglade snail kite *Rostrhamus sociabilis plumbeus*	E (CH)	Hydric pine flatwoods, Freshwater marsh, Pond swamp
Roseate tern *Sterna dougallii dougallii*	T	Beach dune/Coastal strand, Saltmarsh, Seagrass, Nearshore reef
Wood stork *Mycteria americana*	E	Hydric pine flatwoods, Wet prairie, Freshwater marsh, Seepage swamp, Flowing water swamp, Pond swamp, Mangrove, Saltmarsh, Seagrass
American alligator *Alligator mississippiensis*	T (S/A)	Hydric pine flatwoods, Wet Prairie, Freshwater marsh, Seepage swamp, Pond Swamp, Mangrove, Hydric pine flatwoods, Wet prairie, Seepage swamp, Flowing water swamp, Pond swamp
American crocodile *Crocodylus acutus*	E (CH)	Mangrove, Seagrass
Eastern indigo snake *Drymarchon corais couperi*	T	High pine, Tropical hardwood hammock, Scrubby high pine, Beach dune/Coastal strand, Maritime hammock, Mesic temperate hammock, Pine rockland, Scrubby flatwoods, Mesic pine flatwoods, Hydric pine flatwoods, Dry prairie, Cutthroat grass, Freshwater marsh, Seepage swamp, Flowing water swamp, Pond swamp, Mangrove
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Eretmochelys imbricata		
Leatherback sea turtle *Dermochelys coriacea*	E	Beach dune/Coastal strand, Seagrass, Nearshore reef
Loggerhead sea turtle *Caretta caretta*	T	Beach dune/Coastal strand, Seagrass, Nearshore reef
Schaus swallowtail butterfly *Heraclides (= Papilio) aristodemus ponceanus*	E	Tropical hardwood hammock
Beach jacquemontia *Jacquemontia reclinata*	E	Beach dune/Coastal strand
Blodgett's silverbush *Arygythamnia blodgettii*	C	Tropical hardwood hammock, Pine rockland
Crenulate lead-plant *Amorpha crenulata*	E	Pine rockland
Deltoid spurge *Chamaesyce(=Euphorbia) deltoidea ssp. Deltoidea*	E	Beach dune/Coastal strand, Pine rockland
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Florida pineland crabgrass *Digitaria pauciflora*	C	Pine rockland, Freshwater marsh, Seepage swamp
Garber's spurge *Chamaesyce(=Euphorbia) garberi*	T	Pine rockland
Johnson's seagrass *Halophila johnsonii*	T	Seagrass
Pineland sandmat *Chamaesyce ssp. Pinetorum*	C	Pine rockland
Scrub lupine *Lupinus aridorum*	E	Scrub
Small's milkpea *Galactia smallii*	E	Pine rockland
Tiny polygala *Polygala smallii*	E	High pine, Scrub, Pine rockland, Scrubby flatwoods

Explanations and Definitions

FNAI Global Rank FNAI State Rank Federal Status State Status

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Reference 37

Florida Natural Areas Inventory

Species and Natural Community Summary for Dade County

Fish Amphibians Reptiles Birds Mammals Invertebrates Plants Natural Communities Other

Explanations and Definitions: Global/State Rank, Federal/State Status Occurrence Status

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	Occurrence Status
FISH						
Agonostomus monticola	mountain mullet	G5	S3	N	N	C
Gambusia rhizophorae	mangrove gambusia	G3	S3	N	N	C
Gobiomorus dormitor	bigmouth sleeper	G5	S2	N	N	C
Gobionellus stigmaturus	spottail goby	G2	S2	N	N	C
Rivulus marmoratus	mangrove rivulus	G5	S3	N	LS	C
AMPHIBIANS						
Rana capito	gopher frog	G4	S3	N	LS	P
REPTILES						
Alligator mississippiensis	American alligator	G5	S4	T(S/A)	LS	C
Caretta caretta	loggerhead	G3	S3	LT	LT	C
Chelonia mydas	green turtle	G3	S2	LE	LE	N
Crocodylus acutus	American crocodile	G2	S1	LE	LE	C
Crotalus adamanteus	eastern diamondback rattlesnake	G5	S3	N	N	C
Dermochelys coriacea	leatherback	G3	S2	LE	LE	N
Drymarchon corais couperi	eastern indigo snake	G4T3	S3	LT	LT	C
Eretmochelys imbricata	hawksbill	G3	S1	LE	LE	C
Gopherus polyphemus	gopher tortoise	G3	S3	N	LS	C
Pituophis melanoleucus mugitus	Florida pine snake	G5T3?	S3	N	LS	C
Sceloporus woodi	Florida scrub lizard	G3	S3	N	N	P
Tantilla oolitica	rim rock crowned snake	G1G2Q	S1S2	N	LT	C
BIRDS						

Accipiter cooperii	Cooper's hawk	G4	S3?	N	N	C
Ajaia ajaja	roseate spoonbill	G5	S2S3	N	LS	C
Ammodramus maritimus mirabilis	Cape Sable seaside sparrow	G4T1	S1	LE	LE	C
Aramus guarauna	limpkin	G5	S3	N	LS	P
Ardea alba	great egret	G5	S4	N	N	C
Ardea herodias occidentalis	great white heron	G5T2	S2	N	N	C
Buteo brachyurus	short-tailed hawk	G4?	S3	N	N	P
Charadrius melodus	piping plover	G3	S2	LT	LT	C
Chordeiles gundlachii	Antillean nighthawk	G4	S3	N	N	P
Coccyzus minor	mangrove cuckoo	G5	S3	N	N	C
Columba leucocephala	white-crowned pigeon	G3	S3	N	LT	C
Dendroica discolor paludicola	Florida prairie warbler	G5T3	S3	N	N	C
Dendroica petechia gundlachi	Cuban yellow warbler	G5T4	S3	N	N	P
Egretta caerulea	little blue heron	G5	S4	N	LS	C
Egretta rufescens	reddish egret	G4	S2	N	LS	C
Egretta thula	snowy egret	G5	S4	N	LS	C
Egretta tricolor	tricolored heron	G5	S4	N	LS	C
Elanoides forficatus	swallow-tailed kite	G4	S2S3	N	N	P
Eudocimus albus	white ibis	G5	S4	N	LS	C
Falco columbarius	merlin	G5	SU	N	N	C
Falco peregrinus	peregrine falcon	G4	S2	LE	LE	C
Falco sparverius paulus	southeastern American kestrel	G5T3T4	S3?	N	LT	P
Fregata magnificens	magnificent frigatebird	G5	S1	N	N	P
Grus canadensis pratensis	Florida sandhill crane	G5T2T3	S2S3	N	LT	P
Haematopus palliatus	American oystercatcher	G5	S3	N	LS	P
Haliaeetus leucocephalus	bald eagle	G4	S3	LT	LT	C
Ixobrychus exilis	least bittern	G5	S4	N	N	P
Laterallus jamaicensis	black rail	G4	S3?	N	N	P
Mycteria americana	wood stork	G4	S2	LE	LE	C
Nyctanassa violacea	yellow-crowned night-heron	G5	S3?	N	N	C
Nycticorax nycticorax	black-crowned night-heron	G5	S3?	N	N	C
Pandion haliaetus	osprey	G5	S3S4	N	LS**	C
Pelecanus occidentalis	brown pelican	G4	S3	N	LS	C

Picoides villosus	hairy woodpecker	G5	S3?	N	N	P
Plegadis falcinellus	glossy ibis	G5	S2	N	N	P
Rallus longirostris insularum	mangrove clapper rail	G5T3	S3	N	N	P
Rallus longirostris scottii	Florida clapper rail	G5T3?	S3?	N	N	P
Rostrhamus sociabilis plumbeus	snail kite	G4G5T1	S1	LE	LE	C
Rynchops niger	black skimmer	G5	S3	N	LS	C
Speotyto cunicularia floridana	Florida burrowing owl	G4T3	S3	N	LS	C
Sterna antillarum	least tern	G4	S3	N	LT	C
Sterna caspia	Caspian tern	G5	S2?	N	N	C
Sterna maxima	royal tern	G5	S3	N	N	C
Sterna sandvicensis	sandwich tern	G5	S2	N	N	C
Vireo altiloquus	black-whiskered vireo	G5	S3	N	N	C
MAMMALS						
Eumops glaucinus floridanus	Florida mastiff bat	G5T1	S1	N	LE	C
Felis concolor coryi	Florida panther	G5T1	S1	LE	LE	C
Mustela vison mink pop 1	southern mink, (s. Florida pop.)	G5T2	S2	N	LT**	C
Neofiber alleni	round-tailed muskrat	G3	S3	N	N	P
Podomys floridanus	Florida mouse	G3	S3	N	LS	P
Trichechus manatus	manatee	G2?	S2?	LE	LE	C
Ursus americanus floridanus	Florida black bear	G5T2	S2	C	LT**	P
INVERTEBRATES						
Cicindela abdominalis floridana	Miami tiger beetle	G5THQ	S?	N	N	C
Crangonyx grandimanus	Florida cave amphipod	G2	S2	N	N	C
Crangonyx hobbsi	Hobbs' cave amphipod	G2G3	S2S3	N	N	C
Eumaeus atala florida	Florida atala	G4T3Q	S3	N	N	C
Procambarus milleri	Miami cave crayfish	G1	S1	N	N	C
VASCULAR PLANTS						
Acacia choriophylla	tamarindillo	G4	S1	N	LE	R
Acrostichum aureum	golden leather fern	G5	S3	N	LE	C
Actinostachys pennula	ray fern	G4G5	S1	N	LE	C
Adiantum melanoleucum	fragrant maidenhair fern	G3G4	S1	N	LE	C

Adiantum tenerum	brittle maidenhair fern	G5	S3	N	LE	C
Alvaradoa amorphoides	Everglades leaf lace	G5	S1	N	LE	C
Amorpha herbacea var *crenulata*	crenulate lead-plant	G4G5T1	S1	LE	LE	C
Amyris balsamifera	balsam torchwood	G4	SX	N	N	C
Anemia wrightii	Wright's anemia	G2	S1	N	LE	C
Argusia gnaphalodes	sea lavender	G4	S3	N	LE	C
Argythamnia blodgettii	Blodgett's wild-mercury	G2	S2	N	LE	C
Aristolochia pentandra	Dutchman's pipe	G2G4	S1	N	N	C
Asplenium auritum	auricled spleenwort	G5	S2	N	LE	R
Asplenium serratum	bird's nest spleenwort	G4G5	S1	N	LE	C
Asplenium trichomanes-dentatum	slender spleenwort	G5	S1S2	N	LE	C
Asplenium x biscaynianum	Eaton's spleenwort	G1	S1	N	N	C
Basiphyllaea corallicola	rockland orchid	G1G3	S1	N	LE	C
Bourreria cassinifolia	little strongbark	G3?	S1	N	LE	C
Brassia caudata	spider orchid	G3G4	SX	N	LE	C
Brickellia eupatorioides var *floridana*	Florida thoroughwort brickell-bush	G5T1	S4T1	N	LE	C
Byrsonima lucida	locustberry	G3	S3	N	LE	C
Calyptranthes zuzygium	myrtle-of-the-river	G4	S2	N	LE	C
Campyloneurum angustifolium	narrow-leaved strap fern	G4G5	S1	N	LE	C
Catopsis berteroniana	powdery catopsis	G4	S1S2	N	LE	C
Catopsis floribunda	many-flowered catopsis	G3G4	S2	N	LE	C
Chamaecrista lineata var *keyensis*	big pine partridge pea	G5T2	S2	N	LE	R
Chamaesyce deltoidea ssp *adhaerens*	hairy deltoid spurge	G2T1	S1	LE	LE	C
Chamaesyce deltoidea ssp *deltoidea*	deltoid spurge	G2T1	S1	LE	LE	C
Chamaesyce garberi	Garber's spurge	G1	S1	LT	LE	C
Chamaesyce pinetorum	pinelands spurge	G1Q	S1	N	N	C
Chamaesyce porteriana var *porteriana*	Porter's broad-leaved spurge	G2T2	S2	N	LE	C
Cheilanthes microphylla	southern lip fern	G5	S3	N	LE	C
Cheiroglossa palmata	hand fern	G4	S2	N	LE	C
Coccothrinax argentata	silver palm	G3	S2?	N	LE	C
Colubrina cubensis var *floridana*	Cuban snake-bark	G2G3T1	S1	N	LE	C

Conradina grandiflora	large-flowered rosemary	G3	S3	N	LE	C
Crossopetalum ilicifolium	Christmas berry	G2	S2	N	LE	C
Crossopetalum rhacoma	rhacoma	G5	S3	N	LE	C
Ctenitis sloanei	Florida tree fern	G5	S2	N	LE	C
Cyrtopodium punctatum	cow-horned orchid	G5?	S1	N	LE	C
Digitaria pauciflora	few-flowered crabgrass	G1	S1	N	LE	C
Drypetes diversifolia	milkbark	G3G4	S2	N	N	C
Eleocharis rostellata	beaked spikerush	G5	S1	N	N	C
Eltroplectris calcarata	spurred neottia	G3?	S1	N	LE	C
Elytraria caroliniensis var *angustifolia*	narrow-leaved Carolina scalystem	G4T2	S2	N	N	C
Encyclia boothiana var *erythronioides*	dollar orchid	G4?T4?Q	S1	N	LE	C
Encyclia cochleata var *triandra*	clamshell orchid	G4T2	S2	N	LE	C
Epidendrum nocturnum	night-scented orchid	G4G5	S2	N	LE	C
Eugenia confusa	tropical ironwood	G4G5	S2S3	N	LE	C
Eugenia rhombea	red stopper	G3G5	S1	N	LE	C
Eupatorium villosum	villose fennel	G4G5	S2	N	N	C
Euphorbia pinetorum	rockland painted-leaf	G2	S2	N	LE	C
Forestiera segregata var *pinetorum*	Florida pinewood privet	G4?T2	S2	N	N	C
Galactia pinetorum	pineland milk pea	G2Q	S2	N	N	C
Galactia smallii	Small's milk pea	G1Q	S1	LE	LE	C
Galeandra beyrichii	galeandra	G4G5	S1	N	LE	C
Glandularia maritima	coastal vervain	G3	S3	N	LE	C
Gossypium hirsutum	wild cotton	G4G5	S3?	N	LE	C
Govenia utriculata	sheathing govenia	G5	S1	N	LE	C
Guaiacum sanctum	lignum-vitae	G4G5	S2	N	LE	C
Guzmania monostachia	Fuch's bromeliad	G4G5	S1S2	N	LE	C
Halophila johnsonii	Johnson's seagrass	G2	S2	PT	N	C
Harrisia simpsonii	Simpson's prickly apple	G2Q	S2	N	LE	C
Helianthus debilis ssp *vestitus*	hairy beach sunflower	G5T2	S2	N	N	C
Hippomane mancinella	manchineel	G5	S2	N	LE	C
Hypelate trifoliata	white ironwood	G3G5	S1	N	LE	C
Ilex krugiana	Krug's holly	G2G4	S2	N	LE	C

Indigofera mucronata var *keyensis*	decumbent indigo	G5?T1	S1	N	N	C
Ionopsis utricularioides	delicate ionopsis	G4G5	S1	N	LE	R
Ipomoea microdactyla	wild potato morning glory	G3G4	S1S2	N	LE	C
Ipomoea tenuissima	rocklands morning glory	G2?	S1S2	N	LE	C
Jacquemontia curtissii	pineland jacquemontia	G2	S2	N	LE	C
Jacquemontia reclinata	beach jacquemontia	G1	S1	LE	LE	C
Jacquinia keyensis	joewood	G4	S3	N	LT	C
Lantana canescens	small-headed lantana	G3G4	S2	N	N	C
Lantana depressa var *depressa*	Florida lantana	G2T1	S1	N	LE	C
Lantana depressa var *floridana*	Atlantic Coast Florida lantana	G2T2	S2	N	LE	C
Lechea divaricata	pine pinweed	G2	S2	N	LE	C
Leiphaimos parasitica	ghost plant	G4	S2	N	N	C
Licaria triandra	Gulf licaria	G4	S1	N	LE	C
Linum arenicola	sand flax	G1G2	S1S2	N	LE	C
Linum carteri var carteri	Carter's small-flowered flax	G2T1	S1	N	LE	C
Linum carteri var smallii	Carter's large-flowered flax	G2T2	S2	N	LE	C
Lomariopsis kunzeana	holly vine fern	G3G4	S2S3	N	LE	C
Matelea floridana	Florida spiny-pod	G2	S2	N	LE	C
Microgramma heterophylla	climbing vine fern	G4G5	S2S3	N	LE	C
Myrcianthes fragrans var *simpsonii*	twinberry	G4T3	S3	N	LT	C
Okenia hypogaea	burrowing four-o'clock	G3	S2	N	LE	C
Oncidium floridanum	Florida oncidium	G2Q	S1	N	LE	C
Passiflora multiflora	whitish passionflower	G4	S1	N	N	C
Peperomia humilis	terrestrial peperomia	G5	S2	N	LE	C
Peperomia obtusifolia	blunt-leaved peperomia	G5	S2	N	LE	C
Phoradendron rubrum	mahogony mistletoe	G3G5	S1	N	LE	C
Phyllanthus pentaphyllus ssp *floridanus*	Florida five-petaled leaf-flower	G4G5T2	S2	N	N	C
Picramnia pentandra	bitter bush	G4G5	S1	N	N	C
Polygala boykinii var *sparsifolia*	Boykin's few-leaved milkwort	G3G4T2Q	S2	N	N	C
Polygala smallii	tiny polygala	G1	S1	LE	LE	C
Polyrrhiza lindenii	ghost orchid	G2G4	S2	N	LE	C
Ponthieva brittoniae	Bahama shadow-witch	G2	S1	N	LE	C

Prescotia oligantha	small-flowered prescotia	G4G5	S1	N	LE	C
Prunus myrtifolia	West Indian cherry	G4	S2	N	N	C
Pseudophoenix sargentii	Florida cherry-palm	G3G4	S1	N	LE	C
Pteris bahamensis	Bahama brake	G4	S3	N	LE	C
Pteroglossaspis ecristata	wild coco	G2G3	S2	N	LT	C
Rhipsalis baccifera	mistletoe cactus	G4G5	S1	N	LE	C
Rhynchospora floridensis	Florida white-top sedge	G3	S2	N	N	C
Roystonea elata	Florida royal palm	G2Q	S2	N	LE	C
Sachsia polycephala	Bahama sachsia	G2	S1	N	LE	C
Schaefferia frutescens	yellowwood	G5	S2	N	N	C
Selaginella eatonii	Eaton's spikemoss	G2?	S2	N	LE	C
Sphenomeris clavata	wedgelet fern	G3	S2S3	N	LE	C
Spiranthes costaricensis	Reichenbach's orchid	G3G4	S1	N	LE	C
Spiranthes elata	tall neottia	G4G5	S1	N	LE	C
Spiranthes lanceolata var *paludicola*	Fahkahatchee ladies' -tresses	G4T1	S1	N	N	C
Spiranthes polyantha	green ladies'-tresses	G3G5	S1S2	N	LE	C
Spiranthes torta	southern ladies'-tresses	G3G4	S1	N	LE	C
Stillingia sylvatica ssp *tenuis*	queen's delight	G4G5T2	S2	N	N	C
Stylosanthes calcicola	pineland pencil flowers	G3G4	S2	N	N	C
Swietenia mahagoni	West Indies mahogany	G3G4	S2	N	LE	C
Tectaria coriandrifolia	Hattie Bauer halberd fern	G2?	SX	N	LE	C
Tectaria fimbriata		G2G4	S2	N	LE	C
Tectaria x amesiana	Ames halberd fern	HYB	SX	N	N	C
Tephrosia angustissima var *angustissima*	devil's shoestring	G1TH	SH	N	LE	C
Tephrosia angustissima var *corallicola*	rockland hoary-pea	G1T1	S1	N	LE	C
Thelypteris reptans	creeping fern	G5	S2	N	LE	C
Thelypteris sclerophylla	hard-leaved shield fern	G3	S1	N	LE	C
Thrinax morrisii	brittle thatch palm	G4G5	S3	N	LE	C
Thrinax radiata	Florida thatch palm	G4G5	S2	N	LE	C
Tillandsia flexuosa	banded wild-pine	G4	S3	N	LE	C
Tragia saxicola	pineland noseburn	G2	S2	N	LE	C
Trichomanes krausii	Kraus' bristle fern	G5	S1S2	N	LE	C

Trichomanes punctatum	Florida bristle fern	G4G5	S2	N	LE	C
Tripsacum floridanum	Florida gama grass	G2	S2	N	LE	C
Vallesia antillana	pearl berry	G4	S1	N	N	C
Vanilla barbellata	worm-vine orchid	G4G5	S2	N	LE	C
Vanilla mexicana	scentless vanilla	G2G4	S1	N	LE	C
Vanilla phaeantha	brown-flowered vanilla	G3	S2	N	LE	C
Vernonia blodgettii	Blodgett's ironweed	G3	S3	N	N	C
Warea carteri	Carter's warea	G1G2	S1S2	LE	LE	C
Zanthoxylum coriaceum	Biscayne prickly ash	G3G4	S1	N	LE	C
Zephyranthes simpsonii	rain lily	G2G3	S2S3	N	LT	C
NATURAL COMMUNITIES						
Beach Dune		G4?	S2	N	N	C
Coastal Strand		G3?	S2	N	N	C
Marine Tidal Swamp		G3	S3	N	N	C
Maritime Hammock		G4	S2	N	N	C
Marl Prairie		G?	S4?	N	N	C
Mesic Flatwoods		G?	S4	N	N	C
Pine Rockland		G1	S1	N	N	C
Rockland Hammock		G?	S2	N	N	C
Shell Mound		G3	S2	N	N	C
Sinkhole		G?	S2	N	N	C
OTHER						
Bird rookery				N	N	C
Geological feature				N	N	C
Manatee aggregation site				N	N	C
Migratory bird concentration site				N	N	C

** See Rank and Status Explanations and Definitions, Special Animal Listings - Federal and State Status

County Occurrence Status

Vertebrates and Invertebrates:

C = (Confirmed) Occurrence status derived from a documented record in the FNAI data base.

P = (Potential) Occurrence status derived from a reported occurrence for the county or the occurrence lies within the published range of the taxon.

N = (Nesting) For sea turtles only; occurrence status derived from documented nesting occurrences.

Plants, Natural Communities, and Other:

C = (Confirmed) Occurrence status derived from a documented record in the FNAI data base or from a herbarium specimen.

R = (Reported) Occurrence status derived from published reports.

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Florida Natural Areas Inventory
1018 Thomasville Rd., Suite 200-C
Tallahassee, FL 32303-6374
Phone: 850-224-8207
Fax: 850-681-9364

mail to: *webmaster@fnai.org*

Data Current to December 1997

G#T#Q = Same as above, but validity as subspecies or variety is questioned.

GU = Due to lack of information, no rank or range can be assigned (e.g., GUT2).

G? = Not yet ranked (temporary)

FNAI STATE RANK DEFINITIONS

S1 = Critically imperiled in Florida because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.

S2 = Imperiled in Florida because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.

S3 = Either very rare and local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.

S4 = Apparently secure in Florida (may be rare in parts of range)

S5 = Demonstrably secure in Florida

SH = Of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker)

SX = Believed to be extinct throughout range

SA = Accidental in Florida, i.e., not part of the established biota

SE = An exotic species established in Florida may be native elsewhere in North America

SN = Regularly occurring, but widely and unreliably distributed; sites for conservation hard to determine

FEDERAL LEGAL STATUS

Provided by FNAI for information only.
For official definitions and lists of protected species, consult the relevant federal agency.

Definitions derived from U.S. Endangered Species Act of 1973, Sec. 3. Note that the federal status given by FNAI refers only to Florida populations and that federal status may differ elsewhere.

LE Endangered: species in danger of extinction throughout all or a significant portion of its range.
LT Threatened: species likely to become Endangered within the foreseeable future throughout all or a significant portion of its range.
E(S/A) Endangered due to similarity of appearance to a species which is federally listed such that enforcement personnel have difficulty in attempting to differentiate between the listed and unlisted species.
T(S/A) Threatened due to similarity of appearance (see above).
PE Proposed for listing as Endangered species.
PT Proposed for listing as Threatened species.

C Candidate species for which federal listing agencies have sufficient information on biological vulnerability and threats to support proposing to list the species as Endangered or Threatened.
XN Non-essential experimental population.
MC Not currently listed, but of management concern to USFWS.
N Not currently listed, nor currently being considered for listing as Endangered or Threatened.

STATE LEGAL STATUS

Provided by FNAI for information only.
For official definitions and lists of protected species, consult the relevant federal agency.

Animals: Definitions derived from "Florida's Endangered Species and Species of Special Concern, Official Lists" published by Florida Fish and Wildlife Conservation Commission, 1 August 1997, and subsequent updates.

LE Endangered: species, subspecies, or isolated population so few or depleted in number or so restricted in range that it is in imminent danger of extinction.
LT Threatened: species, subspecies, or isolated population facing a very high risk of extinction in the future.
LS Species of Special Concern is a species, subspecies, or isolated population which is facing a moderate risk of extinction in the future.
PE Proposed for listing as Endangered.
PT Proposed for listing as Threatened.
PS Proposed for listing as Species of Special Concern.
N Not currently listed, nor currently being considered for listing.

Plants: Definitions derived from Sections 581.011 and 581.185(2), Florida Statutes, and the Preservation of Native Flora of Florida Act, 5B-40.001. FNAI does not track all state-regulated plant species; for a complete list of state-regulated plant species, call Florida Division of Plant Industry, 352-372-3505 or see http://doacs.state.fl.us/~pi/5b-40.htm#.0055.

LE Endangered: species of plants native to Florida that are in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue; includes all species determined to be endangered or threatened pursuant to the U.S. Endangered Species Act.
LT Threatened: species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in number as to cause them to be Endangered.
PE Proposed for listing as Endangered.
PT Proposed for listing as Threatened.
N Not currently listed, nor currently being considered for listing.

SPECIAL ANIMAL LISTINGS - STATE AND FEDERAL STATUS

Grus americana (whooping crane) - Federally listed as XN (nonessential experimental population) which refers to the Florida experimental population only; Federal listing elsewhere is LE.

Pandion haliaetus (osprey) - State listed as LS (Species of Special Concern) in Monroe county only; not listed in rest of state.

***Mustela vison mink* pop1** (southern mink, S. Florida population) - State listed as LT (Threatened) which refers to the Everglades population only; species formerly listed as *Mustela vison evergladensis.*

Ursus americanus floridanus (Florida black bear) - State listed as LT but not applicable in Baker and Columbia counties or the Apalachicola National Forest.

FNAI Data
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Florida Natural Areas Inventory

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Tallahassee, FL 32303-6374
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mail to: *webmaster@fnai.org*

Updated 25 January 2001

Explanations and Definitions

FNAI Global Rank FNAI State Rank Federal Status State Status

Special Animal Listings

The Nature Conservancy and the Natural Heritage Program Network (of which FNAI is a part) define an element as any exemplary or rare component of the natural environment, such as a species, natural community, bird rookery, spring, sinkhole, cave, or other ecological feature. An element occurrence (EO) is a single extant habitat that sustains or otherwise contributes to the survival of a population or a distinct, self-sustaining example of a particular element.

Using a ranking system developed by The Nature Conservancy and the Natural Heritage Program Network, the Florida Natural Areas Inventory assigns two ranks to each element. The **global rank** is based on an element's worldwide status; the **state rank** is based on the status of the element in Florida. Element ranks are based on many factors, the most important ones being estimated number of Element occurrences, estimated abundance (number of individuals for species; area for natural communities), range, estimated adequately protected EOs, relative threat of destruction, and ecological fragility.

FNAI GLOBAL RANK DEFINITIONS

G1 = Critically imperiled globally because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.

G2 = Imperiled globally because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.

G3 = Either very rare and local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.

G4 = Apparently secure globally (may be rare in parts of range)

G5 = Demonstrably secure globally

GH = Of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker)

GX = Believed to be extinct throughout range

GXC = Extirpated from the wild but still known from captivity or cultivation

G#? = Tentative rank (e.g., G2?)

G#G# = Range of rank; insufficient data to assign specific global rank (e.g., G2G3)

G#T# = Rank of a taxonomic subgroup such as a subspecies or variety; the G portion of the rank refers to the entire species and the T portion refers to the specific subgroup; numbers have same definition as above (e.g., G3T1)

G#Q = Rank of questionable species - ranked as species but questionable whether it is species or subspecies; numbers have same definition as above (e.g., G2Q)

Record of Telephone Conversation

Reference 38

Date: May 9, 2001 Time: 1530 hours	TNT Chemical Dade County, Florida EPA ID Number: FLD004119897
Organization: T N & Assoc., Inc. Reg. 4 EPA STAT Contract Name: Timothy W. House Signature: Timothy House	Contacted: Chuck Sultzman U.S. Fish and Wildlife Service, Vero Beach Office (561) 562-3909 ext. 241

Subject: Critical Habitat

Mr. Sultzman stated that all waterways, including Biscayne Bay, in Dade county are listed as critical habitat for the Manatee. Specifically, Miami Canal and Miami River are listed as critical habitat for the Manatee.

RESPONSE REQUIRED

(x) None ( ) Phone call ( ) Memo ( ) Letter ( ) Report

cc: (x) File (x) Project Manager ( ) Principal Investigator ( ) Other (specify) _____

Record of Telephone Conversation

Reference 39

Date: 27 July 2001 Time: 3:00	London Platers, Inc. EPA ID Number: FLD004125514
Organization: T N & Assoc., Inc. Reg. 4 EPA STAT Contract Name: Nancy Ellen Keene Signature: Nancy Ellen Keene	Contacted: Isabella Puentes Inspector Waste Water Section DERM 33 Southwest 2nd Ave. Miami, Fl 33130 305-372-6504

Subject: Information on London Platers site.

I spoke with Ms. Puentes concerning the London Platers site for which she is the current wastewater compliance inspector. I asked Ms Puentes who now does the monthly effluent analysis for the site. She replied that it was done by Severn Trent Services of Miami but she did not know when they Enviropact stopped doing the analysis.

I also asked Ms. Puentes if the easement in the rear was dirt. Her reply was that there was no easement in the rear because the site backed onto another building. She did say that the front area was gravel. When asked about the current owner she said that it was Mr. Augusto Casamayor who bought it from the London brothers. Ms Puentes also said that the plating company was run by Mr. Casamayor's cousin, Mani Casamayor and that Mani ran the office and had 4 or 5 employees doing the plating. She also said that she thought the company was going to be sold again. That they were not doing very well because the people who took it over did not have enough experience and they lost customers.

Ms. Puentes said that she had been the inspector since 1994 and that she had never had any trouble with their not being in compliance. She said that they kept their waste to a minimum and followed all the regulations.

RESPONSE REQUIRED

(x) None ( ) Phone call ( ) Memo ( ) Letter ( ) Report

cc: (x) File (x) Project Manager ( ) Principal Investigator ( ) Other (specify)

GAO Sites Questionnaire

Site Name London Platers

Agency FDEP

County Dade

Office Southeast District

Case Manager None

Completed by Jay Koch 8/1/00

1. What is the remedial status of the site (i.e. CAP, CAR, RAP)?

SE District has no information about this site. – Paul Wierzbicki ph. (561) 681-6600

2. The most recent PA/SI report was completed on 3/21/90. Has any significant remedial work been conducted since that date?

Unknown. Site is not being tracked.

3. Has a Consent Order been signed?

Site is not being tracked.

If yes, is the Consent Order adequate for its purpose?

N/A

If yes, is the PRP complying with the Consent Order?

N/A

If no, is the PRP performing a "voluntary cleanup"?

N/A

If so, is there a formal or informal agreement with the PRP for the work being conducted? Is the work satisfactory?

N/A

4. If a Consent Order has not been negotiated, is one necessary?

N/A

5. Do you feel that additional CERCLA Site Assessment activities or NPL determination is warranted? If yes, what Priority (High or Low)?

N/A

6. Comments

[Ref 2]

E.C. JORDAN CO.

CONSULTING ENGINEERS

4535-01

September 14, 1984

Mr. Eric Nuzie
Florida Department of Environmental Regulation
2600 Blairstone Road, Twin Towers Building
Tallahassee, FL 32301

Dear Mr. Nuzie:

SUBJECT: PRELIMINARY ASSESSMENT REPORT
London Platers, Inc. - FLD004125514
Hialeah, Florida

Submitted herewith is a Preliminary Assessment Report for the subject site indicating no further action. This priority assessment has been assigned as a result of FDER hazardous waste compliance report which designates London Platers as a nonhandler of hazardous waste (09/09/83). FDER correspondence stated that no hazardous waste violations were observed and no follow up inspection was recommended. Copies of the approrpiate correspondence have been attached to the Preliminary Assessment for your review.

Sincerely,

E.C. JORDAN CO.

David E. Troutman

DET:amp

Enclosure

1311 EXECUTIVE CENTER DRIVE • SUITE 255 • TALLAHASSEE, FLORIDA 32301 • (904) 656-1293
PORTLAND, ME • BOSTON, MA • WASHINGTON, D.C. • DETROIT, MI

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
FL	D004125514

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER				
London Platers, Inc.	1080 E. 24th Street				
03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
Hialeah	FL	33010	Dade	025	18
09 COORDINATES LATITUDE	LONGITUDE		UTM: (5) 741 (28) 585		
25 50 40.0	080 15 43.0				

10 DIRECTIONS TO SITE (Starting from nearest public road)
6-½ blocks east of Hialeah Park; 1 block south of E. 25th Street artery.

/3

III. RESPONSIBLE PARTIES

01 OWNER (If known)	02 STREET (Business, mailing, residential)		
London Plating - David London (owner)	1080 E. 24th Street		
03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
Hialeah	FL	33010	(305) 691-3472
07 OPERATOR (If known and different from owner)	08 STREET (Business, mailing, residential)		
London Plating - David London (owner)	1080 E. 24th Street		
09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
Hialeah	FL	33010	(305) 691-3472

13 TYPE OF OWNERSHIP (Check one)
☒ A. PRIVATE ☐ B. FEDERAL: _____ (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)
☐ A. RCRA 3001 DATE RECEIVED: ___/___/___ (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: ___/___/___ (MONTH DAY YEAR) ☒ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
☒ YES DATE 09/08/83 (MONTH DAY YEAR)
☐ NO
Result of a complaint.

BY (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ☒ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: _____ (Specify)
CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)
☒ A. ACTIVE ☐ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION
_____ BEGINNING YEAR _____ ENDING YEAR ☒ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED
London Plating is a custom plating facility that does antiques and other valuable pieces. No hazardous wastes are generated. Potential contaminants are solvents, acids and heavy metals.

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION
A 09/09/83 FDER inspection turned up no violations. There is no potential environmental hazard at this site. No follow-up inspection was recommended.

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)
☐ A. HIGH (Inspection required promptly) ☐ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☒ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NUMBER
Eric Nuzie Eric L. Nuzie	Florida DER	(904) 488-0190

04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
David E. Troutman	N/A	E.C. Jordan Co.	(904) 656-1293	09 05 84 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
FL	D004125514

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☐ A. SOLID
- ☐ B. POWDER, FINES
- ☒ C. SLUDGE
- ☐ D. OTHER _____ (Specify)
- ☐ E. SLURRY
- ☐ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____
CUBIC YARDS _____
NO. OF DRUMS 1/2

03 WASTE CHARACTERISTICS (Check all that apply)

- ☐ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☒ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☐ G. FLAMMABLE
- ☐ H. IGNITABLE
- ☐ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS Nickel	25	Gal	This is not a hazardous waste, it is a byproduct to be sold.

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
	None				

V. FEEDSTOCKS (See Appendix for CAS Numbers) N/A

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See attached reference list.

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
FL	D004125514

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☐ A. GROUNDWATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

No potential hazard.

01 ☐ B. SURFACE WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

No potential hazard.

01 ☐ C. CONTAMINATION OF AIR
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

No potential hazard.

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

No potential hazard.

01 ☐ E. DIRECT CONTACT
3 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

No potential hazard.

01 ☐ F. CONTAMINATION OF SOIL
03 AREA POTENTIALLY AFFECTED: _____ (Acres)
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

No potential hazard.

01 ☐ G. DRINKING WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

No potential hazard.

01 ☐ H. WORKER EXPOSURE/INJURY
03 WORKERS POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

No potential hazard.

01 ☐ I. POPULATION EXPOSURE/INJURY
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

No potential hazard.

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
FL	D004125514

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

None reported.

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

None reported.

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

None reported.

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills/runoff/standing liquids/leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

None reported.

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

None reported.

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

None reported - discharge to sewer is monitored monthly.

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

None reported.

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

None.

III. TOTAL POPULATION POTENTIALLY AFFECTED: None

IV. COMMENTS

A rinse tank at the site empties into a sewer drain. This flow is monitored each month by Dade County Environmental Resource Management. It has a pH of 7.7 and is not hazardous.

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See attached reference list.

REMEDIAL SITE ASSESSMENT DECISION - EPA REGION IV

Site Name: London Platers, Inc. **EPA ID#:** FLD004125514

Alias Site Names: ___

City: Hialeah **County or Parish:** Dade **State:** Florida

Refer to Report Dated: September 27, 1995 **Report type:** SIP

Report developed by: Florida Department of Environmental Protection

DECISION:

| | **1. Further Remedial Site Assessment under CERCLA (Superfund) is not required because:**

| | 1a. Site does not qualify for further remedial site assessment under CERCLA (Site Evaluation Accomplished - SEA)

| | 1b. Site may qualify for further action, but is deferred to: | | RCRA | | NRC

|X | **2. Further Assessment Needed Under CERCLA:** 2a. (optional) Priority: | | Higher |X | Lower

2b. Activity Type: | | PA |X | ESI | | SI | | HRS evaluation

| | Other: _____

DISCUSSION/RATIONALE:

London Platers is an active custom metal plating facility for antiques, heirlooms, and other valuable pieces. The facility is located at 1080 E. 24th Street, Hialeah, Dade County. The site consist of a 8,000 sq. ft. building. Copper, silver, gold, nickel, brass and chrome are the primary electroplating metals used at the site. Current structure at the site are the main building and the plating area. The plating area consist of six plating tanks and two drag-out tanks for each plating tank. The plating area is contained by a 4" high cement berm, serving as a containment for any accidental spill.

The facility began operations on 1952. The first record of discharge to the Dade County Municipal Sewer System was on July, 1983. Prior to the connection with the County Sewer, wastes from the plating operation were discharged into the alleys behind the plant. Operation as designed now no metal is wasted and wastewater discharge is continually reused within the system. The DERM periodically conducts inspections at the site and continues to monitor wastewater effluent discharges. On March, 1990 approximately 6 inches of soil were removed from the top of an on-site 2' x 2' sewer drain that was found to have metal contamination. Per conversation with Pamela Reynolds, from FDEP, the alley is believed to be capped.

Since the facility is connected to the County Sewer and the process is designed for the reuse of metals, and the discharges are being monitored by DERM, a low priority for CERCLA action will be recommended.

Report Reviewed and Approved by: Carmen J. Santiago-Ocasio Signature: Carmen J. Santiago-Ocasio Date: 11/29/95

Site Decision Made by: Carmen J. Santiago-Ocasio Signature: Carmen J. Santiago-Ocasio Date: 11/29/95

EPA Form # 9100-31

[Ref. 1]

Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Bob Martinez, Governor Dale Twachtmann, Secretary John Shearer, Assistant Secretary

February 28, 1990

Ms. Dorothy Rayfield
United States Environmental
Protection Agency
Region IV
Superfund Branch
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Re: Site Screening Investigation - Phase I
(Preliminary Assessment Reassessment)
London Platers, Inc.
Hialeah, Dade County, Florida
FLD004125514

Dear Dorothy:

London Platers, Inc. is located at 1080 E. 24th Street in Hialeah, Dade County, Florida. The Section/Township/Range and Latitude/Longitude for the site are 8/41E/53S and 25,50,38/080,15,38, respectively [1,2].

London Plating is a custom plating facility that plates antiques, heirlooms, and other valuable pieces. Copper, Silver, Nickel, Brass, Chrome, and gold plating are done at the site. Due to the custom work done and the design of the plating operations, management claims that the only waste generated on-site is by a parts cleaner [4,7]. A parts cleaner is leased from and serviced by Safety Kleen Corporation. Mineral spirits (9 gallons) are used as the cleaning fluid and are replaced every 6 weeks [8,12]. The plating area is contained by a 4" high concrete berm and the plating system works as follows: After each plating tank are two drag-out tanks in series. The first drag-out tank eliminates approximately 95% of the plating chemicals. The second drag-out tank removes the balance of plating chemicals. The item being plated then proceeds to the final rinse tank. Because the plating tanks are heated (by electric currents), there is a great loss of water due to evaporation. Therefore, water from the first drag-out tank is used to replenish the water in the plating tank. Water from the second drag-out tank is used to replenish the water in the first drag-out tank and is filled with fresh water. The system utilizes back-flushing principles in that contaminants (metals, etc.) and fresh water are continually going upstream. Water from the final

rinse tanks is discharged to the Dade County Municipal Sewer System. Sulfuric acid is utilized as a rinse in the plating line [4,5,7,14]. The average amount of effluent being discharged to the sewers for the year 1989 is between 200 and 300 gallons per day [9].

The first record of London Platers, Inc. is an analysis report of waste water being discharged to the Dade County sewer system on 7/21/83 [3]. Monthly waste water analyses have been performed by Enviropact, Inc. to insure that contaminant free effluent is being discharged to the sewers. These analysis reports are submitted to Dade County Environmental Resource Management (DERM) for monitoring [4,9]. Dade County Environmental Resource Management also performs an on-site Hazardous Waste Compliance inspection approximately every 3 months [4,10,11]. Our records show that the first Hazardous Waste Compliance Report is dated 9/9/83 [4]. The report, which followed a site inspection resulting from an unfounded complaint, reported London Platers, Inc. as a non-handler of hazardous waste, no hazardous waste violations, and recommended no follow-up inspection [4]. A Preliminary Assess- ment (PA) Report on 9/5/84 for the site indicated no further action [5]. This assessment was assigned to the site based on the Hazardous Waste Compliance Report dated 9/9/84 [4,5]. A Site Screening Summary on 7/17/87 indicated that the site did not present a potential hazardous risk to the environment by on-site contaminants [6]. As previously stated, monthly analysis of effluent, random site inspections, and periodic servicing of an on-site parts cleaner have existed while London Platers, Inc. has been in operation [3,4,8,9,10,11,12]. In October of 1985, an analysis of effluent showed Cyanide concentrations of 0.07 mg/l, and no formal enforcement action or warning notice followed [11]. On 12/18/87, a Warning Notice was issued to London Platers, Inc. for an analysis report showing high concentrations (3.13 mg/l) of Nickel [11]. Other than these two instances, no others have been reported concerning sewer discharges. On 3/30/89, during an on-site inspection by DERM, a surface soil sample was taken at a 2'X2' open drain approximately 10' inside the building. An analysis of this sample (not E.P. Toxic) reported Nickel, Chromium, Lead, Copper and Zinc at concentration levels of 8,300, 3,000, 1,800, 19,800, and 12,000 ppm [11,13]. Approximately 1/2' of soil from the 2'X2' drain (15 gallons) was excavated. [An E.P. Toxic analysis of the excavated soil detected concentrations of Lead (0.40 mg/l) and Cadmium (2.0 mg/l) [11,14]] An E.P. Toxic analysis of a soil sample at the excavation point (1/2' BLS) detected only Zinc, at 1.2 mg/l, It should be noted that the minimum detection limit for this test was 0.1 mg/l. It has been reported, not documented, that the drain is

Total metals

contained by a closed system consisting of a metal box [10]. This would account for the sharp difference in metals detected over a 1/2' interval, which is not indicative of leaching effects or principles concerning metals [10,11]. An on-site inspection is scheduled for the latter part of 2/90 at which time an in-depth sampling and sample analysis will be conducted by DERM [11].

The Biscayne aquifer is unconfined and is the primary source of potable drinking water in the vicinity of the site. The aquifer is characterized by rapid, extensive, interaction between the local water table and surface waters making it very susceptible to contamination. Although the geology, hydrology, and demography of the region are highly variable, their geographical distributions exhibit very definite trends, some of which are obvious. These trends are aquifer thickness, water table depth, sand content, permeability, direction of ground water flow, rainfall, pumping of wellfields, area canals, saltwater intrusion, industrial impoundments, and population. The Biscayne aquifer is the only hydrologic unit capable of supplying large quantities of potable ground water in the area. The Biscayne aquifer at the site, inferred from the correlation of offset well data and information, probably consists of the Miami Limestone and Tamiami Formations, in descending order. The Miami Limestone is overlain by sand, and the water table lies at approximately 4' (BLS). The Biscayne aquifer is considered the most productive shallow non-artesian aquifer in Florida and one of the most permeable aquifers in the world. Porosity in the Biscayne aquifer varies from 10% to 35% and average about 20%. The rate of ground water movement is approximately 10 feet per day. The principle source of recharge to the Biscayne aquifer is from rainfall entering vertically over the entire area. In addition, the canals in this area intersect the water table, so they become rain water storage and recharge sources [16,17,18].

The net precipitation for the area of the site is approximately 10 inches [21,23]. The John E. Preston, Hialeah and Miami Springs wellfields lie within 3 miles of the site [17,18,19]. Large volumes of potable water being pumped from these wells create a depression or coning effect which causes water to flow radially towards the wells. The site lies between the maximum and average day protection areas or cone of influence contours [17]. These cone of influence contours are due to water production from the John E. Preston, Hialeah, Upper Miami Springs, and Lower Miami Springs Wellfields [17]. Approximately 258,000 to 1,200,000 people are provided potable drinking water from the Biscayne aquifer within a three (3) mile radius of the site during normal or average production periods [20]. At this time,

production rates are minimal while "Air Strippers" are being installed at the John E. Preston Water Treatment Facility [18,19]. The closest community potable water well is the John E. Preston Well No. 6 which is 9057.6844 feet (1.7155 miles) from the site [1,17,19,21]. Lake Flamingo (Hialeah Race Tracks) and the Miami Canal lie approximately 4,837 feet (0.92 miles) and 10,107 feet (1.91 miles) from the site, respectively [1,2].

A quanitative potential hazard to ground water and a large population have been documented at the site [10,11,14,16,17,20,21,23]. Reviewing the available file information indicates that the site has been operated in a responsible manner and that the on-site hazardous wastes are contained [1 thru 23]. Compliance and sample analyses at the site have been maintained in a responsible manner [3,4,5,6,8,9,-10,11]. The on-site soils containing hazardous substances, as excavated from the 2'X2' drain, appears to be a very small quantity (15 gal.) and is verbally reported to be contained. This would eliminate a hazardous potential of contamination to ground waters and surface waters [10,11].

Therefore, the site is recommended for No Further Action, pending subsequent sampling and sample analyses by the Dade County Department of Environmental Resource Management (DERM). An addendum letter to this PAR will follow with the results of DERM's sample analyses, which should be completed by the end of March 1990.

Respectively,

Charles S. Logan
Engineer I
Site Screening Superfund Subsection
Bureau of Waste Cleanup

CSL/mlr

Enclosure

REFERENCES

LONDON PLATERS, INC.

1. Quadrangle Maps; Hialeah, Opa Locka, North Miami, & Miami, Dade County, Florida, 1988.

2. City Street Map, Hialeah.

3. Report of Analysis, Waste Water to Sanitary Sewer Performed by: Environpact, Inc., (Miami Springs, FL), for: London Platers, Inc., 7/21/83.

4. Hazardous Waste Compliance Report, by: D. Rinaldi & Jeff Tobergte (FDER, S.E. District), 9/9/83.

5. Preliminary Assessment (PA) Report, London Platers, Inc., NFA Recommended, D. Troutman (E.C. Jordan Co.) to E. Nuzie (FDER), 9/14/84.

6. Site Screening Summary, London Platers, Inc., by: C. Feeny, N.F.A. Indicated, 7/17/87.

7. Sketch of Plating Area & Descriptioin of Operations, London Platers, Inc., Submitted by: D. Landon, 2/21/90R), 9/22/81.

8. Invoice for Services Rendered, Company: Safety-Kleen, Corp., Customer: London Platers, Inc., 2/9/90.

9. Monthly Compliance Analysis, Performed by: Enviropact, Inc., for: London Platers, Inc., 12/88 to 1/90.

10. Conversation Record, Subject: Site Operations, To: D. London (London Platers, Inc.), from: C. Logan (FDER/BWC), 2/21/90.

11. Conversation Record, Subject: Hazardous Waste Compliance by London Platers, Inc., To: Z. Chasan (FDER, S.E. District) from: C. Logan (FDER), 2/21/90.

12. Conversation Record, Subject: Parts Cleaner & Service, To: P. Espinal (Safety-Kleen Corp.) from: C. Logan (FDER), 2/21/90.

13. Trace Elements in Soils and Plants, A. Kabata-P.H. Pendias, CRC Press, 1984.

14. Ground Water Monitoring Parametes and Pollution Sources, Third Edition, G.G. Watts (FDER/BWC), 5/89.

15. Hazardous Chemicals Desk Reference, N.I. Sax/ R.J. Lewis, Sr., Van nostrand Reinhold, 1987.

16. Contaminant Behavior in the Biscayne Aquifer, Prepared by: Technos, Inc. for FDER, 2/83.

17. Wellfield Cones of Influence, Metropolitan. Dade County, Department of Environmental Resource Management, J.E. Preston & Hialeah Water Treatment Facilities, 12/80.

18. Recommendation to Clean-up and Protect the Biscayne Aquifer in Southeast Florida, Prepared for U.S.E.P.S. by Meridian Communications, Rifkin & Assoc., & CH_2M Hill, 11/85.

19. Conversation Record, Dade County Wellfields & Closest Community Potable Water Well, C. Logan (FDER) to P. Hernandez (DERM), 2/22/90.

20. Population, Potable Water System, Drinking Water Program, Lat./Long. Range Look-up (3 mile), Prepared by: C.S. Logan, 2/22/90.

21. Inverse Ellipsoid Program, Distance to Closest Community Well, Prepared by: C.S. Logan, 2/22/90.

22. 1 Year/24-Hour Rainfall Map, D.M. Hershfield (U.S. Dept. of Agriculture), Technical Paper No. 40.

23. Hazardous Ranking System, Data Colleciton and Documentation Techniques for HRS Scoring of Hazardous Waste Sites, NUS Corp., 3/87.

SITE INSPECTION PRIORITIZATION REPORT

FOR

LONDON PLATERS, INC.
1080 E. 24TH STREET
HIALEAH, FLORIDA 33010

FLD# 004125514

DADE COUNTY, FLORIDA

Prepared by:

Florida Department of Environmental Protection
Division of Waste Management
Bureau of Waste Clean-up
Technical Review Section
Site Screening Superfund Subsection

September 27, 1995

LONDON PLATERS, INC.

I. INTRODUCTION AND PURPOSE

This Site Inspection Prioritization (SIP) Report was prepared by the Florida Department of Environmental Protection (FDEP) using information provided in the February 28, 1990 Site Screening Investigation (SSI)- Phase I report (Preliminary Assessment Reassessment) [1], the July 17, 1987 Site Screening Summary [6], the September 5, 1984 Preliminary Assessment (PA) [2], and the site file. The purpose of this SIP is to obtain information necessary for a site specific draft Hazard Ranking System (HRS) evaluation and to determine if further work is warranted pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Superfund Amendments and Reauthorization Act of 1986 (SARA), and/or Chapter 403, Florida Statutes. The recommendations and conclusions advanced by the present SIP are subject to modification pending receipt of subsequent information and/or quality assurance review by EPA.

II. SITE BACKGROUND/HISTORY

A. Site Description

London Plating is an operable custom metal plating facility for antiques,heirlooms, and other valuable pieces. Copper, Silver, Gold, Nickel, Brass, and Chrome are the primary electroplating metals used at this site. The facility is located at 1080 E. 24th Street, Hialeah, Dade County, Florida, on the south side of 24th St East of 10th Avenue. Site coordinates are North 25 50' 39" Latitude and West 80 15' 43" Longitude, Section 8, Township 53 South, Range 41 East. The EPA CERCLA ID Number is FLD 004125514. [1,2,31]

London Platers, Inc. consists of one 8,000 sq. ft. building and occupies one city lot. There is no fencing surrounding the site, and an alley way is located at the rear (south side) of the building. During business hours, M-F 8:00 A.M. to 4:00 P.M. the doors are unlocked. At all other times the building is kept locked. The majority of the site property is covered by gravel. On the east side of the building is a grassy area (yard). The remaining portion of the site includes industrial buildings. Located across from the site on the north side of 24th Street is Tempo Lighting Division, and aChevron gas station lies one block to the northwest. Metrorail is located one block to the North trending east-west. There are no residential areas in the immediate vicinity [36, 37].

Current structures at the site consist primarily of the main building and plating area. Within this plating area are six (6) plating tanks along with two (2) drag out tanks for each of the six plating tanks. The largest tank is for Nickel, is eight (8) feet long, and holds up to eleven-thousand (11,000) gallons. The smallest tank is for gold, is two (2) feet long,

and holds up to fifty (50) gallons. The remaining portion of the site include a hot water tank with drag out tank, and three (3) rinse out tanks which empty into an on-site drain thatconnects to the Dade County Municipal Sewer System. The entire plating area and associated above-groundtanks are contained by a four inch high concrete berm for further containment [1,3,4,37].

Site topography is low and flat, with a few low ridges along the east coast, with elevations ranging from sea level to 25 feet above sea level, averaging 5-10 feet above sea level . Regionally, land surface slopes gently off the Atlantic Coastal Ridge, both southeastward toward the Biscayne Bay and southwestward toward the Everglades. Soils in the area are chiefly fine sands, of the sandy pinelands, and sandy praries. The Pamlico Sands often overlie the land surface. Surface drainage varies from slow to rapid, with internal drainage at a rapid infiltration rate. Due to the many canals dug the water table has been lowered and most of the soils are now well drained to excessively drained. Beneath these well-drained soils lie the highly permeable limestone rocks of the Miami Oolite, and upper Tamiami Formation. No evidence of karst topography is known within two (2) miles of the site [Fig. 2,9,13,14,24,45].

The principal source of freshwater in Dade County is the Biscayne Aquifer, of the surficial aquifer system. This system exists under water table conditions with rainfall providing the primary source of recharge. The surficial aquifer is generallly found within 4-10 feet of the land surface. Regional groundwater flow is to the east or southeastward from the site, toward the Atlantic Ocean. Locally, alterations in local groundwater flow patterns are common in response to the complex relationships between pumping wellfields, recharge and discharge areas, (surface water) canal control structures, and tidal fluctuations [5,9,13-15,24,25].

2. Surrounding Areas

London Plating is surrounded by both industrial businesses, residential developments, and lakes/canals. The site lies on the west edge of an industrial strip of buildings approximately three miles long North-South and four blocks wide (~ 4000 feet). The Amtrak Station lies about four blocks to the northeast, and the hospital about three blocks to the west. The nearest school is the Broadmoor School at Kelly Park, located approximately 3,200 feet northeast of the site. Several other schools and parks are located within a mile of the site; Flamingo School and Bright Park to the NW, Madison High School and Broadmoor Park to the NE, and the Miami Technical College to the SW. The Miami International Airport, the Sewage Disposal Plant, and several lakes and golf courses lie within 4-5 miles to the south-southwest [2,5].

Lake Flamingo (Hialeah Race Tracks) is the only water body within one mile of the site, situated approximately 4,837 feet (0.92 miles) west from the site. The Miami Canal and the Little River Canal are situated southwest about 10,107 feet (1.91 miles), and north to

northeast 9,240 feet - 13,200 feet (1.75 - 2.5 miles) from the site respectively. There are no documented endangered or protected species, nor any sensitive environments living within a four (4) mile radius of the site area [1,5,46].

The City of Hialeah is served potable water from the Biscayne Aquifer by the Miami Dade County Water and Sewer Authority (MDWSA) utilizing the following wellfields: Hialeah (6 wells), John E. Preston (4 wells), the Upper and Lower Miami Springs (20 wells) located approximately within 1.7 to 2.5 miles southwest (SW) of the London Platers site. The closest community potable well is the John E. Preston Well No. 6, located 9057.6844 feet (1.7155 miles) southwest from the site. No active private wells (potable) or non-community wells have been identified within a four (4) mile radius of the London Platers site [1,5,7,10,19,35].

An additional, and primary source of supply from the Biscayne Aquifer is the Northwest Municipal Wellfield (15 wells) located approximately nine (9) miles west of the site. This wellfield was developed to serve the Hialeah/Preston water treatment complex due to the 1970's discovery of contamination by volatile organic compounds within the Miami-Springs, and Hialeah/Preston wellfields. All forty-five (45) wells are currently in service. They are operating, equipped with continuously operating air strippers, and sharing a common distribution system [1,5,7,8,10,38].

It is of concern to note that the Upper Miami Springs wellfield site is located on an abandoned sludge pit. For a time the #7 Preston well was inactivated due to petroleum contamination released to a local service station, and the #2 Hialeah well was presently out of service due to engulfment by a sink hole. The Opa Locka wells, situated about four miles North are no longer in service. Also near the site, ~ 4 miles northeast, lies the North Miami (Winson) Wellfield (8 wells) which serves the City of North Miami (68,300 persons) [5,7,29,35,42].

A poulation density of 1,003 persons/square mile exists for Dade County, with a total estimated population for 1991 of 1,961,694. The average number of persons per household is 2.75 in Dade County. The estimated 1991 population figures are 192,002 for the City of Hialeah; 13,183 for Miami Springs; 2,202 for Virginia Gardens ; and 15,187 for the City of Opa_Locka . To the South and East lie greater Miami estimated at 359,076 persons. A service population of 96, 000 exists for the City of Miami Beach, and 68,300 for the City of North Miami [34,35,44].

Within the site area, the MDWSA Main System supplies potable water from the Biscayne Aquifer to a total population of 1,801,156 persons, including the above cities (except for N. Miami). The 45 active wells comprising the Northwest Wellfield, the Hialeah, Preston, Upper & Lower Miami Springs Wellfields portion, constitute 59 % of the total system production from the MDWSA Main System Accordingly, these 45 wells serve a collective population of 1,062,682 persons (1,801,156 x 59 %). Therefore, each well supports an estimated service population of 23,615 persons (1,062,682 persons /45 wells). The following Table lists the wells and population within a four (4) mile radius of the London Platers site [7,35].

TABLE 1.

LONDON PLATERS, INC.

Distance Interval	Name of System	# of Wells	Population
0 - 1/4 mile	N/A	0	N/A
1/4 - 1/2 mile	N/A	0	N/A
1/2 - 1 mile	N/A	0	N/A
1 - 2 miles	* MDWSA Main System Hialeah/ Preston wellfields	10	236,151
2 - 3 miles	* MDWSA Main System (Upper) North & (Lower) South Miami Springs Wellfield	19	448,688**
3 - 4 miles	* MDWSA Main System (Lower) South Miami Springs Wellfield	1	23,615
	City of North Miami Wellfield	8	68,300

** Note: This portion (59 % of system production from a collective service population of **1,801,156** persons [1,705,156 + 96,000 (City of Miami Beach)] of the MDWSA Main System consists of a series of interconnected water distibution lines with a total of **45 wells from the Northwest, Hialeah, Preston, and Miami Upper and Lower Wellfields.** Therefore, the service population from the above Main System is 1,801,156 x 59% = 1,062,682 persons, with each well supporting an estimated service population of 23,615 , ie. (1,801,156/45 [35].*

** .59 x 19wells/45 wells x 1,801,156 total pop. = 448,688 persons served.

3. Climatology

The climate of Dade County is humid sub-tropical. At the Homestead Experiment Station the average annual temperature and rainfall is 73.7 F and 64.69 inches, respectively . Temperatures are kept moderate as sea breezes enter the area from the Atlantic Ocean and the Gulf of Mexico. The coldest months are January and February, averaging 66 F . Winters are short, mild, and sunny with little or no frost for successive years . The average annual rainfall in Dade County is 60- 64.69 inches, with higher averages for the coastal Ridge and lower ones for the Everglades . About 75 % of the total yearly rainfall falls between the months of May through October, commonly as heavy thunderstorms. Also adding to the rainfall is the occasional hurricane which may occur from August through November. The Net Precipitation is 4-5 inches/year . The 2-year , 24 hour rainfall for the Hialeah area is 5.5 inches. The London Plater's site is situated in an area of minimal flooding (outside 500-year floodplain), and bordered on the southwest by areas of a 500-year flood [9,11,12,13,24,30].

B. Ownership History

London Platers, Inc. began operation of London Plating in 1952. The first record of discharge to the Dade County Municipal Sewer System was not until 7/21/83 [1,15,37]. The site facility is still occupied by London Plating under private ownership by David London, and his brother Mike London. The mailing address is 1080 E. 24th Street, Hialeah, Fl., 33010; telephone (305) 691-3472 [2,37].

C. Operational History

1. Previous Operations-General

There is no specific information relating to previous operations at the site prior to operation as London Plating. According to the present owner David London, his father started London Plating in 1952, and the operation has remained unchanged since then. Nickel sulfate, a nickel sludge by-product was found to be stored on-site in a fifty-five gallon drum, approximately half full. Management was in the process of locating a buyer for this nickel,and meanwhile this waste was properly disposed of through hazardous waste carriers. Past reports from DERM have indicated that prior to connection with the Dade County Sewer on July 21, 1983, wastes from the plating facility were discharged into the alleys behind the plant [1,3,31,37,38].

Custom plating involves the use of various types of metals, cleaning solvents, and associated by-products/wastes. Metals used at this facility were copper, gold, silver, brass,nickel, and chrome. Mineral spirits were used as as a cleaning fluid since 3/1/80 [17]. Sulfuric acid is utilized as a rinse in the plating line. In addition to the plating metals, contaminants detected in the wastewater include zinc, cyanide, lead, and cadmium [1].

2. Present Operations

At the London Plating facility antiques, heirlooms, and other valuable pieces are custom plated on-site [1,2,3]. The metals utilized as plating material are copper, gold, silver, brass, nickel, and chrome [1,3,4]. Potential contaminants include solvents, acids, and heavy metals [2]. Management claims that the only waste generated on-site is by a parts cleaner, and that all sludge generated in the plating operations is reused [1,16,18]. As reported in a September 9, 1983 compliance report, the nickel sludge is accumulated on-site in the form of nickel sulfate, a non-hazardous by-product [2,3]. London Platers was unable to find a buyer for this nickel sulfate sludge, as they had hoped to reuse the nickel collected after the refining process. The quantity generated is still less than a drum full, and it is properly disposed of by a hazardous waste carrier. The parts cleaner is still leased from and serviced by Safety Kleen Corporation, and has been in operation since March 1, 1980 . The cleaning fluid used is (9) nine gallons of mineral spirits which is picked up, and replaced every six weeks with new cleaning fluid.[1,16,17,43].

The plating operations and system design are such that no metal is wasted (minimal sludge produced), and that the wastewater discharge is "chemical free" in that contaminants (metals, etc.) are remixed with fresh water, and continually reused within the system. The operation begins with each metal plating tank being followed by a series of two drag-out tanks. Each plating tank is heated (by electric currents) resulting in a great loss of water by evaporation. Sequentially the water in the first drag-out tank replenishes the water lost in the plating tank resulting in maximum conservation of the metal and eliminating approximately 95% of the plating chemicals for discharge. Water from the second drag-out tank is then used to replenish the water transferred out of the first drag-out tank, and then this second drag-out tank is refilled with clean water. Now, virtually all the plating chemicals have been removed from the second drag-out tank. The item being plated is then placed into a final rinse tank. Also, on the plating line is a sulfuric acid rinse tank which is replenished with acid as necessary [1,3,4,16].

From the site drawing there are three (3) final rinse tanks which empty into a 2'x2' drain (closed metal sump) situated within the 4" high cement berm containment surrounding the entire system of tanks This berm may serve as containment for any accidental spills. All wastewater is ultimately discharged into the Dade County Municipal Sewer System through this on-site drain [1,2,3,4,16]. The effluent has been determined to have a pH of 7.7 and is non-hazardous [2,3]. Effluent discharge rates from January 1989 to January 1990 range between 200 to 300 gallons per day , with a pH range of 6.6 - 9.2 [1,22].

D. Regulatory/Permitting History

1. Applicable Construction, Operation or Monitoring Permits

As London Plating Co. is not considered to be a generator of hazardous wastes, no RCRA permits are required [2,3,16]. However, effluent is monitored monthly by DERM since the facilitys' first discharge on July 21, 1983 [1,2]. DERM has not taken any soil or groundwater samples since 1990 [38].

2. Regulatory Inspections (non-sampling)

The first documented FDEP compliance inspection at the facility, initiated by a complaint,was conducted on September 9, 1983 [2,3]. No hazardous waste violations were observed, and it was recommended that no follow-up inspection be performed [2,3]. DERM also periodically performs on-site Hazardous Waste Compliance Inspections [1,16].

3. Enforcement

The only enforcement action initiated was for effluent discharges to the Dade County Municipal Sewer System . The action taken was a December 18, 1987 Warning Notice for excessive Nickel concentration levels of 3.13 mg/l (3130 ug/l), (MCL @ 100 ug/l) [1,18]. There have been no other violations reported in the site file since 1987 [22,38].

E. Investigative History

1. Previous site investigations

DERM performs on-site Hazardous Waste Compliance Inspections on a quarterly basis (about every 3 months), and most recently periodically [1,16]. In the 9/9/83 compliance inspection as described above, no hazardous waste violations were observed, and it was recommended that no follow-up inspection be performed [2,3]. The 9/5/84 Preliminary Assessment Report submitted by E.C. Jordon Co., consulting engineers also indicates no further action for this site [2].

As previously mentioned, wastewater is discharged to the Dade County Municipal Sewer System [1,3,4,16]. Enviropact, Inc. performs monthly wastewater analyses on this effluent, and a copy of the results are submitted to Dade County Environmental Resource Management (DERM) for their monthly monitoring [1,3,16,22].

An initial on-site inspection and soil sampling event was performed in the area of the sewer drain on March 30, 1989 by DERM , with a follow-up sediment sampling conducted on March 2, 1990 [1,18, 20]. No violations or enforcement actions were noted.

III. FIELD INVESTIGATIONS, REPORTS, AND FINDINGS

A. Results of Non-Sampling Investigations

1. Hydrologic Assessment

There is no documentation in the site files pertaining to watyer table elevations, however the average depth to groundwater in the area has been found at five (5) to ten (10) feet below the ground surface General topography and geomorphology indicate regional groundwater flow direction to the East - Southeast toward the Biscayne Bay. Deviations in groundwater flow direction may occur sporadically in response to well pumping, rainfall, and location of drainage canals [14,24].

2. Soil Borings/Field Observations

A windshield survey was performed at this site on July 25, 1995. In 1989 and 1990 sediment soil samples were collected by DERM from a sewer drain inside the plating area at the facility [1,18,20]. There is no information within the site file to indicate any other soil/ sediment sampling was performed.

B. Results of Sampling Investigations

1. Groundwater

The site file does not contain any information pertaining to sampling of the groundwater at the site or in surrounding areas. However, wastewater discharges from the facility are monitored on a monthly basis by DERM [1,22].

2. Soils

On March 30, 1989, during a DERM compliance inspection, approximately six inches (6") of soil was excavated beneath the top of an on-site 2'x2' sewer drain situated within the containment area of the plating and rinse tanks. The **EP-Toxic** analysis of this soil sample indicated concentration levels at 1.2 mg/l for Zinc, while Lead, Chromium, Cadmium, Copper, and Nickel tested below the 0.1 mg/l minimum detection level for this test. All of these concentration levels are below both the Probable Effect Levels for DEP Sediment Quality Assessment Guidelines, and the Phototoxically Excessive Levels in Surface Soils. A surface soil was also taken from this drain and analyzed for **total metals**. These results in mg/kg (ppm) are Nickel 8,300 ; Chromium 3,000 ; Lead 1,800 ; Copper 19,800 and Zinc 12.,000 [1,18,21,Table 2].

On March 2, 1990 a follow-up soil sample was collected from beneath the metal plate of the on-site sewer drain to an excavation depth of approximately twelve to twenty-four inches (1'-2'). Lab analysis results of this sample for **total metals** (mg/kg) and **EP-Toxic** (mg/l) indicated the following concentrations, respectively: Nickel 10.0 / < 0.1; Chromium 14.0/ < 0.1; Lead 51.0 / < .01; Copper 40.0/ < 0.1; Cadmium <10.0/ < 0.1; and Zinc 101.0/ 1.5. Only Cadmium (<10.0 ppm) indicated total trace metal concentrations near excessive limits (3-8 ppm) of phytotoxically levels in surface soils. Please note however, that the detection limit was at 0.1 mg/l. All tested trace metal concentrations from the EP-Toxic analysis are within acceptable guidance concentration levels [1,18,20,33, Table 2].

The following Table summarizes the lab analysis results for the above referenced soil sampling investigations [18,20,21]:

TABLE 2.
London Platers, Inc.
Soil/Sediment Laboratory Anlyses for Trace Metals

	3/30/89 (6" depth)		3/2/90 (12"-24" depth)		*MCL's			
	Total Metals (mg/kg)	EP Toxic (mg/l)	Total Metals (mg/kg)	EP Toxic (mg/l)	PT (ppm)	CS (mg/kg)	DW (mg/l)	NOEL (mg/kg)
Nickel	8,300	< 0.1	10	< 0.1	100	N/A	.100	N/A
Lead	1,800	< 0.1	51	< 0.1	400	108	.015	21.0
Chromium	3,000	< 0.1	14	< 0.1	100	50	.100	33.0
Copper	19,800	< 0.1	40	< 0.1	125	N/A	1.0	28.0
Zinc	12,000	< 0.1	101	1.5	400	N/A	5.0	68.0
Cadmium	N/A	< 0.1	< 10.0	< 0.1	8	37	.005	1.0

PT = Phototoxicity levels
CS = Clean soil criteria (Florida DEP)
DW= Federal Drinking water standards
NOEL = No observed effect level

[21,33 - S.M Roberts UOF Center for Environmental & Human Toxicology 7/23/92, FDEP FAC Ch. 17-775- 11/30/92, Proposed Superfund Trigger Levels 4/93]

In reference to the soil contamination at the on-site sewer drain, the owner stated that his father believed it was dust and build-up during their years of operation on the surface, and that the drain was a closed metal sump [16]. The detection of higher trace metal concentrations in the surface soil sample in comparison to the at depth samples may be attributable to this apparent closed or contained system. Based on all of the soil sampling analyses any leaching effects appear to be minimal [1].

3. Effluent Discharges

Since January 1985 London Plating has had two violations for their sewer discharges to the Dade County Municipal Sewer System. The first one was noted in October 1985 for Cyanide concentration levels of 0.07 mg/l (effluent range of 0.01 - 150 mg/l), however a Warning Notice was not issued (MCL @ .200 mg/l) [1,18]. On December 18, 1987 a Warning Notice was issued for Nickel concentration levels of 3.13 mg/l (MCL @ .100 mg/l) (efluent range of 0.01 - 3000 mg/l). There are t no other violations in the file [1,18,22,32,33].

4. Surface Water

No documentation was found within the site files to indicate that surface water samples were ever collected at this site, nor that any previous contamination was observed or detected.

5. Sediment Samples

No documentation was found within the site files to indicate that sediment samples from any of the nearby ponds/lakes were ever collected at this site, nor that any previous contamination was observed or detected.

IV. HYDROGEOLOGY

1. Regional

This site is situated on the Atlantic Coastal Ridge geomorphologic feature, near the eastern edge of the Everglades, within the Southern or Distal Geomorphologic Province of Florida. Three major hydrogeologic units are present in Dade County. These units include the surficial aquifer system, intermediate aquifer system/confining unit and the Floridan aquifer system [23,24].

The principal source of freshwater in Dade County is the surficial aquifer system. The Biscayne aquifer is the most productive unit of this system. The surficial aquifer system is composed of upper Cenozoic sediments, that are hydraulically connected. The surficial aquifer system includes, in ascending order, the Tamiami Formation (Fm), Caloosahatchee Fm, Fort Thompson Fm, Key Largo Limestone, Anastasia Fm, Miami Limestone and the Pamlico Sand (undifferentiated Pleistocene-Holocene sediments). The surficial aquifer system exists under water-table conditions and is found generally within 5 feet of land surface. It is overlain by a thin veneer of peat, muck (a mixture of silt and very fine-grained decomposed organic matter) or sand. The surficial aquifer system is composed of limestone, sandstone, sand, shell, lime mud, silt, clay, claystone siltstone and an admixture of these materials. The non-artesian, Biscayne Aquifer underlies an area of approximately 3,000 square miles in Dade, Broward and southern Palm Beach counties. The thickness of this aquifer ranges in thickness from 100 to 400 feet thick in coastal Dade and Broward counties thinning to a few feet near the western boundary of the counties [14,15,23,24,25].

The Tamiami Fm consists of sediments of upper Pliocene age ranging in composition from pure quartz sand to nearly pure limestone. The limestone is generally white to gray in color. The Tamiami Fm consists of the Pinecrest Sand, Ochopee Limestone and the Buckingham Limestone Members. These facies of the Tamiami Fm occur over a wide area of southern Florida. The lower part of the formation in Dade County is composed of gray to green, very coarse to fine grained, shelly sand and sandstone to cream, white and greenish-gray clayey marl, silty and shelly sands and shell marl, locally hardened to limestone. The lower part of this formation forms the upper portion of the intermediate aquifer system/confining unit [14b,23,24,25].

The Pleistocene age Caloosahatchee Fm consists of fossiliferous quartz sand with variable amounts of carbonate matrix interbedded with variably sandy, shelly limestones. The sediments show a wide range of induration (nonindurated to well indurated). This unit also contains fresh water limestones. However, this unit is not often encountered while drilling in Dade County [14b,23,24,25].

The Fort Thompson Fm consists of interbedded shell beds and limestones. The shell beds are generally variably sandy and slightly indurated to nonindurated. The sandy limestones within the Fort Thompson Fm were deposited under both fresh water and marine conditions. The Fort Thompson Fm. is a major component of the highly permeable Biscayne aquifer in Dade County [14b,23,24,25].

The Anastasia Fm consists of interbedded quartz sands and coquinoid limestones of Pleistocene age. The sand beds are composed of fine to medium grained, variably fossiliferous, calcareous, quartz sand. The limestone beds (coquina) are composed of mostly broken/abraided mollusk shell fragments, scattered whole shells and quartz sand enclosed in a calcareous matrix. This matrix usually consists of sparry calcite cement. [14b,23,24,25].

The Miami Limestone (Pleistocene age) consists of an oolitic facies and bryozoan facies. The oolitic facies underlies the Atlantic Coastal Ridge southward from southern most Palm Beach County to southern Dade County. The oolitic facies consists of variably sandy limestone composed primarily of oolites with scattered concentrations of fossils. The bryozoan facies underlies and extends west of the western boundary of the oolitic facies. The bryozoan facies consists of calcareous bryozoan colonies imbedded in a matrix of ooids, pellets and skeletal sand. It is commonly found as a variably sandy, recrystallized, fossiliferous limestone [14b,23,24,25].

The Key Largo Limestone of Pleistocene age consists of a coralline limestone composed of coral heads in a calcarenite matrix. This formation outcrops from Soldier Key in Biscayne Bay to Bahia Honda.[14b,23,24].

The undifferentiated sediments (Pamlico Sand) are a late Pleistocene age terrace deposit of marine origin. These sediments are composed of white to black or red, very fine to coarse, mostly medium grained quartz sand with varying amounts of iron oxide. This deposit mantles large areas underlain by the Miami Limestone and Anastasia Fm. [14b,23,24].

The Intermediate aquifer system/confining unit consists of the relatively impermeable marl; greenish-gray, sandy clay and silt units located in the lower part of the Tamiami Fm (Pliocene age) and Hawthorn Group (Miocene age). Well sorted medium grained sands interbedded with claystones or siltstones yield low to moderate quantities of water. This intermediate confining unit underlies the surficial aquifer system to a depth 975 feet in eastern Dade County and forms the upper confining unit for the Floridan aquifer system [14b,23,24,25,26].

The Miocene age Hawthorn Group consists of the (upper) Peace River Formation and (lower) Arcadia Formation in southern Florida. The Peace River Fm (with Bone Valley member) is composed of gray to green interbedded quartz sands, clays and carbonates. The carbonates consist of variably sandy, clayey phosphatic limestones and micro to very fine crystalline, variably sandy phosphatic dolostones. However, the siliciclastic portion of the formation predominates. The Arcadia Fm. (undifferentiated) consists of predominantly limestone and dolostone with varying amounts of quartz sand, clay and phosphate grains. Dolomite is the most abundant carbonate component of the Arcadia Fm., although as we move eastward this section increases in percentage of siliciclastic beds present in the lower portion. The Hawthorn Group is found approximately 150 feet below land surface (bls) and is approximately 750 feet thick in the site area [14b,23,26].

The artesian Floridan aquifer system is composed of carbonate and evaporite units ranging from Eocene to Oligocene age. The Floridan aquifer system consists of, in descending order, the Suwannee Limestone, Ocala Limestone, Avon Park Fm, and the Oldsmar. The

top of the Floridan aquifer system is found approximately 1,000 feet bls and the aquifer is about 2,600 feet thick in northeastern Dade County. Water from the Floridan aquifer system is highly mineralized and unsuitable for potable water supplies in Dade County [23,25,31].

The Suwannee Limestone of Oligocene age consists primarily of variably vuggy and muddy (carbonate) limestone (grainstone to packstone) in southern Florida [23].

The upper Eocene age Ocala Limestone consists of muddy (carbonate) to finely pelletal limestone in southern Florida. However, the Ocala Limestone may be absent in portions of southeast Florida [23]. The Avon Park Fm is composed primarily of middle Eocene age fossiliferous limestone interbedded with vuggy dolostone [23]. The Eocene age Oldsmar Fm consists of primarily limestone interbedded with vuggy dolostone. The lower part of the section is usually more dolomitized than the upper part. Gypsum may occur as thin beds and within pores in some places of the formation [23].

2. Site Specific

The Biscayne aquifer consists of a wedge shaped set of water-bearing rocks, aged Miocene to Pleistocene, ranging in thickness from 140 feet (southeast Dade County) to more than 280 feet (northeast Dade County) in eastern Dade County. The average water saturated thickness is approximately 72 feet [24]. The boundaries of this water-table aquifer are determined by the hydrologic properties of the sediments, rather than formational contact boundaries. In the northeastern part of Dade County, the upper part of the Tamiami formation (limestone, or shelly calcareous sandstone) forms the lower portion of the Biscayne aquifer, underlain by a relatively impermeable greenish marl of the Tamiami Formation. The uppermost portion (4' BSL) of the Biscayne aquifer consists most predominately of the Miami Oolite, typically a white to yellowish massive crossbedded oolitic limestone [24]. The Pamlico Sand, a late Pleistocene terrace deposit of marine origin unconformably overlies and fills in solution cavities of the Miami Oolite [15,24].

The Biscayne aquifer is the primary source of potable drinking water in the site area. This unconfined aquifer is highly productive everywhere along the coastal ridge, and is protected from upward intrusion of saline water from the Floridan aquifer by relatively impermeable beds of marl and clay. Overdrainage of canals however has resulted lateral encroachment of sea water in some areas. The groundwater from the uncontaminated zones of the Biscayne aquifer are fairly uniform in quality, although often colored with organic material or iron, especially in the upper parts of the aquifer. Hardness generally ranges from 200 to 300 mg/l with chloride at 15 to 30 mg/l. [14,15,23,24,25].

Wells of up to 36" in diameter have been developed, and productivity varies considerably from one area to another. Large capacity (500-7,000 gpm) public/municipal supply wells are generally completed in the cavernous part of the aquifer, generally 40' to 150' below ground level (BGL) [13,14,15]. Shallow, sand-point wells completed in the Pamlico sand are used for domestic supply in areas not serviced by municipal systems . Water for agricultural irrigation is preferably pumped from the canals, and ponds, and then from rotary drilled wells 25-35 feet BGL, pumping at rates of 500 to 1000 gpm [14,24]. However, thousands of smaller diameter (2") wells, completed at depths of 20-50 feet BGL, are pumped at rates of 25 to 40 gpm for irrigation of residential lawn and shrubs [14]. The depth to groundwater, ie the water table fluctuates from average depths of 2 - 8 feet above mean sea level (msl), and/or approximately 2-4 feet BGL [1, 24].

Porosity varies from 10% to 35%, averaging about 20%. Permeability averages between 50,000 and 70,000 gpd/sq.ft. The average transmissivity of the Biscayne aquifer unit ranges from 3 to 5 million gpd/ft, to as high as 15 million gpd/ft in East Dade County. The storage coefficient ranges from 0.10 to 0.35. Average yields from a typical 6 inch well range from 1,000 to 1,500 gallons/minute, with less than four feet of drawdown. However, pumping tests have been performed at 3,500 gpm . Specific capacities derived from pump tests in Dade County are about 1,000 gal/min/ft of drawdown . The rate of groundwater movement is approximately 10 feet/day [1,13,14,15,24]..

The principal source of recharge for the surficial aquifer system is local rainfall [14,15,24,25]. Drainage canals and ditches were excavated through marl into the permeable Miami Oolite (Upper Biscayne Aquifer), from about one (1) to six (6) feet in thickness [9]. Where the canals are controlled by dams, during periods of low rainfall, and in areas where groundwater levels are lowered by the pumping of wells, these canals provide recharge to the Biscayne aquifer. Discharge from the aquifer occurs by evapotranspiration, pumping from wells, and ground water flow into the Biscayne Bay, Atlantic Ocean, and canals during the wet season (May - October). Of benefit from potential contamination is that this canal discharge and seasonal heavy rainfall can accelerate groundwater circulation, thereby increasing dilution and flushing the upper zones of the aquifer. Although the regional ground water flow in Dade County is generally east or southeast toward the Atlantic Ocean (Biscayne Bay), the presence of active well fields, surface water control canals and tidal fluctuations commonly cause local deviations in the regional flow pattern [13,14,15,24,25].

V. EXPOSURE ROUTES / MIGRATION PATHWAYS

A. Groundwater Migration Pathway

The groundwater migration pathway, although previously of major concern, appears now to be a less significant pathway of concern at the London Plater's site. The source for

potable water is the unconfined Biscayne Aquifer, lying approximately within four (4) to ten (10) feet below ground surface [24]. The City of Hialeah water supply system is served by the Miami Dade County Water and Sewer Authority (MDWSA). Although the site encompasses a large surrounding population, the threat of contamination of the MDWSA wellfields have been reduced by the installation of air strippers [8]. Furthermore, the London Plater's site is immediately situated within an industrial area, and other more significant sites have been documented in the area [5].

A total of (30 wells) situated approximately within 1.7 - 2.5 miles southwest (SW) of the London Platers site comprise the John E. Preston, the Hialeah, and the Upper and Lower Miami Springs Wellfields [7,10]. The nearest community potable water well is the John E. Preston Well No. 6, located approximately 1.7 miles SW from the site [1,5].

During normal or average production from the Biscayne Aquifer, the MDWSA system supplies approximately 1,801,156 people in Dade County with potable drinking water within a (3) three mile radius of the site [1, 35]. This population figure includes the City of Miami Beach (96,000) located within 3-4 miles of the site, who purchases potable water from MDWSA. The City of North Miami (North Miami Wellfield) supplies potable water from 8 wells to a population of 68,300 persons No private or non-community wells are known to exist in the area [35]. A breakdown of water wells within four (4) miles of the site utilizing the Biscayne Aquifer System is provided in Table 1.

Monthly wastewater analyses have been performed by Enviropact, Inc, and monitored by DERM since September 9, 1983. During that time one (1) Warning Notice was issued, on December 12, 1987 when Nickel concentrations in excess of MCL's for drinking water were detected at 3.13 mg/l (.100 MCL). Yet, this concentration level is within the typical range of organic chemical quality expected for electroplating wastewater. There was no record of any on-site groundwater sampling. Therefore, it is unknown whether additional contaminants exist in the groundwater at the site because no other parameters have been tested [1,18,22,32,33].

On-site soils containing excessive concentrations of toxic metals, as excavated from beneath the 2x2 foot drain (3/30/89) appear to be of a very small quantity. Nickel sludge (nickel sulfate) is stored on-site in a 55-gallon drum waiting for a buyer. Nine (9) gallons of mineral spirits, used as a parts cleaner, is picked up and replaced every six weeks. These on-site hazardous wastes are minimal, and properly contained to prevent spillages. The site is currently operating in a responsible manner utilizing safe operational practices, and is inspected regularly by DERM [1,3,4,16,17,18].

In summary, although a large population exists the potential for contamination of hazardous substances from the London Plater's site appears minimal. There has been no documented evidence of continued or recent contamination on site since 1990. Also, safe operating practices continue to be utilized at the site. Wastewater and potable water

sources are monitored and treated by Dade County. However, due to the absence of groundwater analysis at the site, further CERCLA evaluation of the groundwater pathway may be warranted [1,2,3,18,22].

B. Surface Water Migration Pathway

The surface water migration pathway does not appear to be of concern at the London Platers, Inc. site. The 4" high concrete berm surrounding the plating area provides adequate physical containment from surface water overflow by on- site contaminants. No overland flow pathway exists off site and drainage is internal. With the area's generally flat topography, and sandy, well-drained soils site related contaminants are not expected to impact Lake Flamingo, the Little River Canal, or Miami Canal, the nearest surface water bodies [14, 23,24,25]

C. Soil Exposure Pathway

The soil exposure pathway does not appear to be of concern at the London Platers, Inc. site. The on-site soils containing hazardous substances of toxic metals appear to be of a small quantity, confined to a specific on-site area. Soil samples were collected on 3/30/89, at a depth of 6 inches beneath a 2x2 foot metal drain plate. EP-Toxic analyses for lead, chromium, zinc, copper, cadmium, nickel, and zinc were all within maximum contaminat levels. It has been noted in the February 28, 1990 SSI that lead and cadmium were in exceess of MCL's, however no documentation or lab anlalyses results were found to substantiate this. A subsequent sediment sample collected 3/2/90, at a depth of one (1) to two (2) feet below the surface, and at the same location also indicated safe levels (EPT) for all the above metals [1,18,20]. The plating area is properly contained by a 4" cement berm, and a concrete floor. The nickel sludge is stored in a 55-gallon drum.[4] Providing safe operational practices are continued and no excavation takes place, the potential for exposure through the soil migration pathway appears minimal.

D. Air Migration Pathway

The air migration pathway does not appear to be of concern at the London Platers, Inc. site. There are no uncovered drums, or uncovered soil piles. However, the possibility of migration of particulates through the air pathway may increase during periods of soil disturbances at times of future excavations.

VI. CONCLUSIONS AND RECOMMENDATIONS

The available file information and previous monitoring results indicate that the London Platers site does not pose a significant threat to public health or the environment.

Although there is a large population served by the MDWSA wellfields, the potable water supplies are monitored and equipped with groundwater treatment systems. The DERM periodically conducts inspections at the site and continues to monitor wastewater effluent discharges. Also, DERM has reported in previous inspection reports, and the owners have stated such themselves, that the facility has operated and managed waste generated at the site in a responsible manner. Although, file information indicates that potentially contaminated rinsewater may have been discharged directly into the ground prior to connection with the Dade County Sewer System, no groundwater samples were ever collected on-site. Due to the lack of this data, and the large population served by municipal wells in the area, further CERCLA assessment of the London Platers site is warranted. However, because the facility is connected to a central sewer system and levels of contaminants detected during previous monitoring episodes were below risk levels, it is recommended that future CERCLA Site Assessment activities be initiated on a low priority basis.

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Fig. 1. Site Location Map. 1995. City Street Map, Hialeah.

Fig. 2. U.S. Geological Survey, 7.5 minute series Topographic Quadrangle Maps of Florida: Hialeah,1988. (site specicific for contour elevations). Scale 1:24,000 .

Table 1. Wells and Population Data within a 4-mile radius of the London Platers site.

Table 2. Summary of 1989 and 1990 Soil Sampling Lab Analysis Results.