NORTH CREEK BASIN MASTER PLAN

F I N A L

Prepared for:

Sarasota County
Stormwater Environmental Utility

November, 1996
Revised October, 1997
Finaled April, 1999

Contract No. 95-373
Purchase Order No. P509450

Prepared by

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Job No. 95-250.00, Task 226

5/18/99

Bob Cross
Professional Land Surveying, P.A.

May 18, 1999

To: Whom it may concern

RE: North Creek Drainage Basin Study

I hereby certify that the field information dated May 7, 1996 for the above reference project was true and correct as of that date to the best of my information, knowledge and belief.

BOB CROSS PROFESSIONAL LAND SURVEYING, P.A.

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Florida Registration Number 4451

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SECTION 1

INTRODUCTION

1.1 Purpose

The North Creek Basin is situated in the middle part of western Sarasota County, in the area north of Oscar Scherer State Park, generally west of South Creek and south of Catfish Creek. The basin drains approximately 3.7 sq. miles of primarily residential area with small areas of agricultural and institutional land uses.

The North Creek Basin recently experienced severe flooding conditions within the basin, including wide extent of street flooding scattered around the basin and some structural flooding concentrated in Osprey Acres.

The objectives of the North Creek Basin Master Plan were to evaluate the existing and future flooding and water quality conditions within the basin, to identify the areas where the existing conditions indicated deficiencies in Levels of Service (LOS), to develop and evaluate conceptual solutions to the problem areas, and to conduct a detailed evaluation of the selected alternatives. The Master Plan was submitted to the SWFWMD for review and conceptual approval.

The purpose of this Draft Comprehensive Report is to document the findings of the analyses, present the results of the evaluations of the existing and future conditions of the basin, and provide conclusions.

1.2 Authorization

The Sarasota County Board of County Commissioners authorized engineering services to develop the North Creek Basin Master Plan on September 8, 1995, by issuing Purchase Order No. P509450, under Contract No. 95-373. The study area includes portions of the Oaks Development and the area approximately bounded by Old Venice Road to the west, Bay Street to the north, Seminole Gulf Line RR to the east, and Oscar Scherer Park to the south. After contract approval, through a series of public meetings, it was determined that Osprey Acres was in dire need of stormwater improvements. The Osprey Acres area outfalls to North Creek and improvements should be studied in conjunction with the North Creek Basin Master Plan.

The Board of County Commissioners approved Amendment No. 1 for Additional Engineering Services to include Osprey Acres on December 20, 1995. Osprey Acres is bounded by the Tamiami Trail (U.S. Hwy. 41) to the west, Bay Street to the south, the Oaks Development to the north, and Bay Street Park and the Oaks Development to the east.

1.3 Coordination with Federal, State, and Local Agencies

The North Creek Basin Master Plan was coordinated with the following agencies:

- Sarasota County
- Southwest Florida Water Management District (SWFWMD)
- Florida Department of Environmental Protection (DEP)
- Florida Department of Transportation (DOT)
- Federal Emergency Management Agency (FEMA)
- U. S. Department of Agriculture, Natural Resources Conservation Service (NRCS)
- U. S. Environmental Protection Agency (EPA)
- U. S. Army Corps of Engineers (COE)
- Sarasota Bay National Estuary Program (SBNEP)
- United States Geological Survey (USGS)

In addition, the North Creek Basin Master Plan was coordinated with the following private entities:

- Parsons Engineering Science
- Kimley-Horn & Associates, Inc.
- Mosby Engineering
- AM Engineering, Inc.
- Rivolta Development. Inc.
- Camp, Dresser & McKee

SECTION 2

BACKGROUND

2.1 Description of Study Area

The North Creek Basin is situated in the middle part of western Sarasota County, in the area of and just north of Oscar Scherer State Park, west of South Creek and south of Catfish Creek. The basin encompasses approximately 3.7 sq. miles of area under normal conditions. A Location Map is included as Figure 2.1.

Topography of the area generally slopes very gradually east to west and the ground elevations range, generally, from EL 16 ft.+ NGVD to EL 10 ft. NGVD. The basin is composed, primarily, of the following residential developments:

- Stoneybrook in the northern portion;
- The Oaks Development in the middle portion;
- Pine Ranch East and Bay Oaks Estates in the central eastern portion;
- Pine Ranch, Trinity Acres, and SaraBay Acres in the southern portion; and,
- Osprey Acres, Oak Creek, and Cordes in the central western portion of the Basin.

The basin merges with Catfish Creek and discharges into the Little Sarasota Bay. Most of the large residential developments have moved into the basin area recently. The soil types throughout the North Creek watershed are typically poorly drained EauGallie, Myakka, Holopaw, and Pineda fine sands.

The watershed is divided in the middle by North Creek which has some small tributaries draining generally flat areas. The watershed basin boundaries are difficult to define due to the flat areas between North Creek Basin and the South Creek or Catfish Creek Basins. The drainage divide may change, depending upon the flood stages in adjacent watersheds. For example, the flood stage at U.S. Geological Survey (USGS) Stream Flow Gauging Site on South Creek, located just east of Seminole Gulf Line RR near Bay Street, was recorded at 16.5 ft. NGVD, which exceeded the general land elevation in the North Creek Basin during the flood event of June 1992. This means that the flood flow from the South Creek Basin may spill over to the North Creek Basin under certain flood conditions.

FIGURE 2.1 - LOCATION MAP

The adopted FEMA Flood Insurance Maps for this area indicate a 100-year elevation of 11.0 ft. NGVD, which is based on the tidal surge elevation (see Plate 1). There was no 100-year elevation available, based on a riverine flooding event, at the time this study was initiated.

The study area includes North Creek and its lateral tributaries south of Preymore Street, including the Osprey Acres area and the roadside ditch along the south side of Bay Street.

2.2 Past Flooding Events

Flood conditions in the North Creek Basin generally result from tropical storm events and hurricanes causing intense rainfall, excessive runoff, and tidal surge influences. Storms passing in the vicinity of Sarasota County have produced several flooding conditions in the basin. Recently, there were two significant storm events which occurred and caused severe flooding conditions in the basin, as described below:

- June 1992 Storm Event

Rainfall in June 1992 varied dramatically across Sarasota County. Heavy rainfall for the period of June 24-30, associated with a tropical disturbance in the Gulf of Mexico, left an average of 16 to 24 inches of rainfall in Sarasota County during the 7-day period. According to temporary rainfall gauging station data obtained near the southeastern limits of the basin boundary, the total accumulation of rainfall was 17.86 inches over a 140-hour period during June 24 through 30, 1992. The data was measured by the USGS at the South Creek gauging station located upstream of the railroad trestle, directly east of Bay Street. The station consisted of a continuous water level gauge and a rainfall gauge. Operation of the station has been discontinued and the equipment was removed from the site.

After the storm event, Sarasota County surveyed high water marks in flooded areas throughout Sarasota County. Four high water marks were surveyed within the North Creek Basin. Locations and elevations of the high water marks are listed below:

Location	Elevation (NGVD)
1. Downstream face of U.S. Hwy. 41 Bridge over North Creek	3.49 ft.
2. Upstream face of MacEwen Drive Bridge over North Creek	10.69 ft.
3. Downstream face of MacEwen Drive Culverts on South Lateral Ditch	9.69 ft.
4. Upstream face of MacEwen Drive Culverts on South Lateral Ditch	10.74 ft.

Many streets and yards were flooded throughout the basin. It was noted that a considerable amount of overflow from the South Creek Basin was observed across Pine Ranch East Road.

Mr. Shawn Leins, a Professional Engineer for AM Engineering, visually observed that during this storm event, the water flowing (South Creek to North Creek) over Bay Street was about 2" deep. About 200-300 ft. of Bay Street was covered for about one day.

- July 1995 Storm Event

Rainfall in July 1995 also varied widely across Sarasota County. Heavy rainfall for the period of July 14-20, associated with a tropical disturbance in the Gulf of Mexico, left an average of 3.0 to 11.0 inches of rainfall during a 15 hour period (see Figure 2.2). This analysis was prepared by Sarasota County staff. For North Creek Basin, the Figure indicates average rainfall amount of approximately 10 inches. However, there is no reliable rainfall gauge data available within the basin.

Mr. Leins sent a letter report to Sarasota County, with rain gauge readings that he obtained personally. Total rainfall measured on July 18th and 19th was 7.8 and 1.25 inches, respectively. He also stated that his rain gauge overflowed on the afternoon of July 18th.

During the afternoon of July 18 and the morning of July 19, 1995, Mr. Leins established 13 high water marks in and around the North Creek Basin. Descriptions are listed below, with their locations annotated on a USGS map (see Figure 2.3).

High Water Mark Locations and Elevations:

1. Street sign at NE corner of Pine Ranch East Road and Bay Street. Water elevation 16.00 ft. NGVD.
2. Nail in south edge of pavement of Bay St. in front of proposed Bay Oaks II subdivision. Water elevation 15.95 ft. NGVD.
3. Nail in fence post between Lots 2 and 3, Pine Ranch Subdivision. Water elevation 15.7 ft. NGVD.
4. Nail in road on Bay St. 200'± west of Pine Ranch Subdivision. Water elevation 15.5 ft. NGVD.
5. Nail in Bay St. 500'± east of Old Venice Road. Water elevation 15.24 ft. NGVD.

FIGURE 2.2

ISOHYETAL MAP FOR JULY 18, 1995
15-HOUR STORM EVENT

Isohyetal Map For July 18, 1995 - 15 hr Storm Event

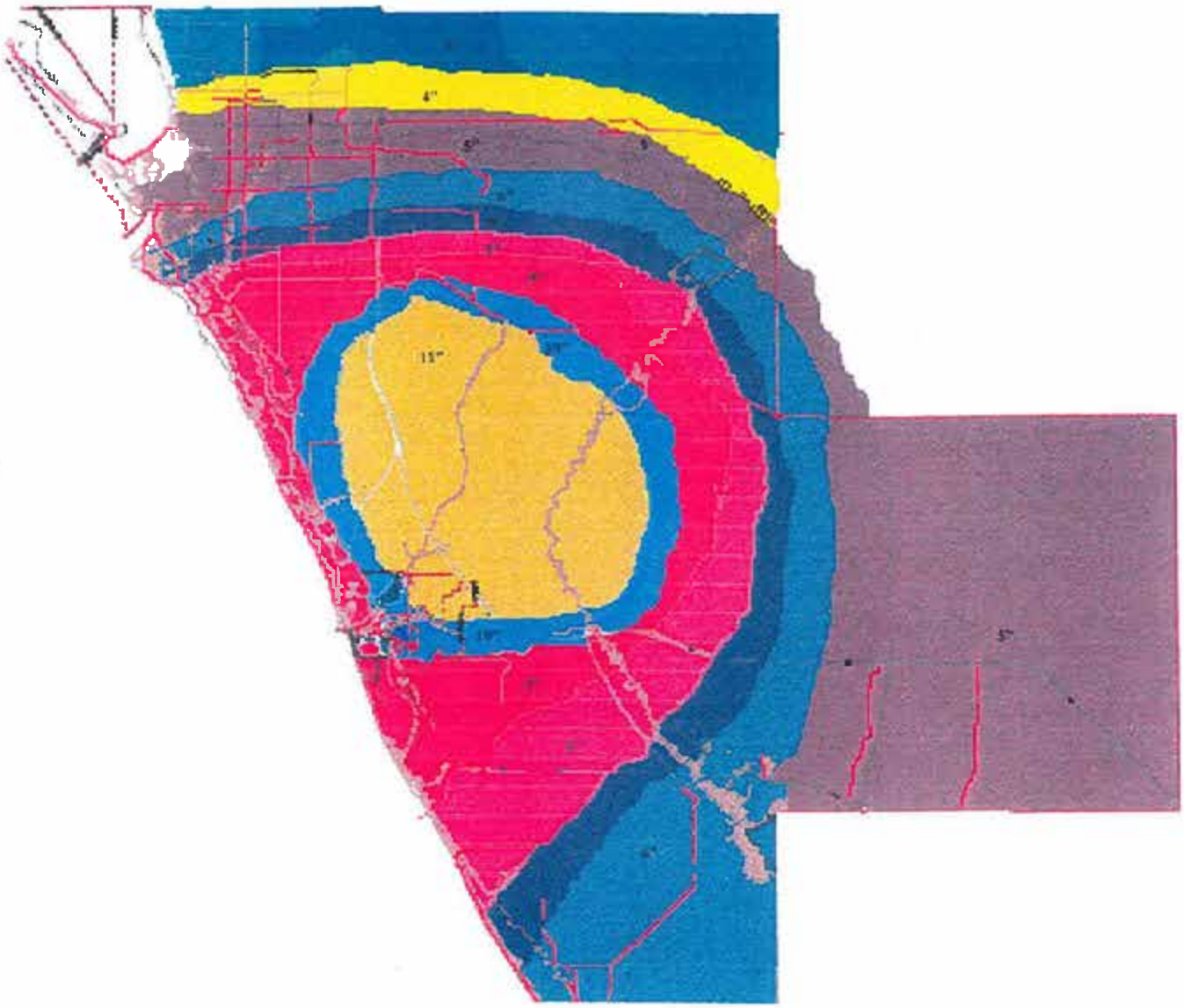

Figure 2.2

FIGURE 2.3

JULY 1995 HIGH WATER MARK LOCATIONS

FROM MR. LEINS' REPORT

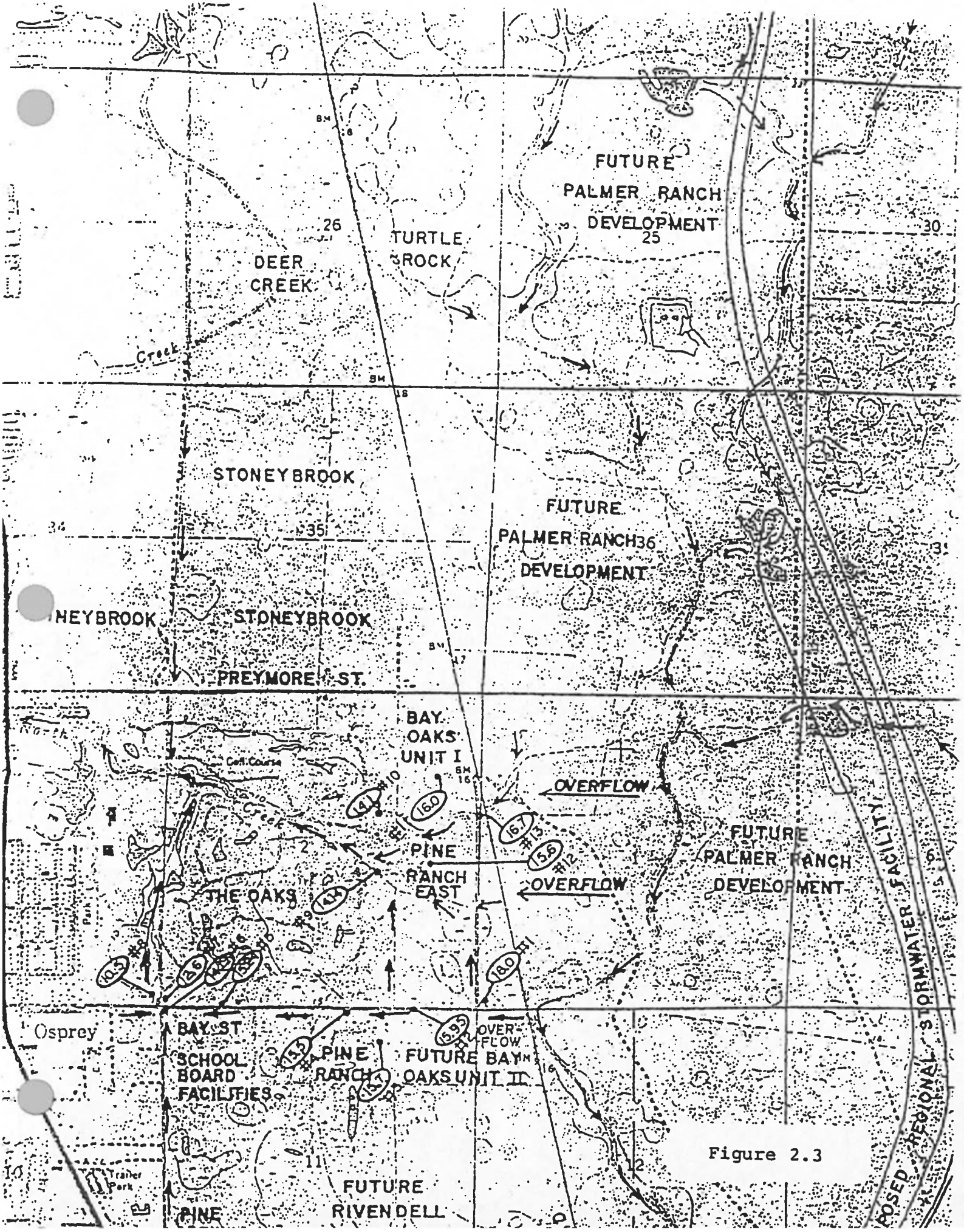
FUTURE
PALMER RANCH
DEVELOPMENT
TURTLE
ROCK
DEER
CREEK
Creek
26
25
30
STONEYBROOK
FUTURE
PALMER RANCH
DEVELOPMENT
36
35
HEYBROOK
STONEYBROOK
PREYMORE ST.
BAY
OAKS
UNIT I
Golf Course
OVERFLOW
#10
#13
#12
PINE
RANCH
EAST
THE OAKS
OVERFLOW
FUTURE
PALMER RANCH
DEVELOPMENT
Osprey
BAY ST
SCHOOL
BOARD
FACILITIES
PINE
RANCH
FUTURE BAY
OAKS UNIT II
OVER-
FLOW
Trailer
Park
PINE
FUTURE
RIVENDELL
PROPOSED REGIONAL STORMWATER FACILITY

Figure 2.3

6. Wood hub set on Bay St. at "No Outlet" sign just east of Old Venice Road. Water elevation 14.19 ft. NGVD.
7. Storm inlet on north side of Bay St. just east of Old Venice Road. Water elevation 12.6 ft. NGVD.
8. Pipe discharge to north to ditch which discharges to the Oaks Subdivision, north side of Bay St. west of Old Venice Road. Water elevation 10.5 ft. NGVD.
9. Nail in pine tree on the Oaks golf course along east property line, south of where North Creek lateral enters the Oaks Subdivision from the east. Water elevation 14.14 ft. NGVD.
10. Nail in oak tree on the Oaks golf course along east property line north of where North Creek lateral enters the Oaks Subdivision from the east. Water elevation 14.10 ft. NGVD.
11. Water level at Bay Oaks Estates, Unit I control structure. Water elevation 16.0 ft. NGVD.
12. Pine Ranch East Subdivision. Water elevation 15.6 ft. NGVD.
13. Bottom of railroad trestle east of Bay Oaks Estates, Unit I. Water elevation 16.7 ft. NGVD.

These elevations were based on USC&GS C 255 bench mark which has a published elevation of 16.44 ft. NGVD.

Excerpts from some of Mr. Leins' flooding descriptions in the area are listed below:

Bay Street ... Bay Street experienced flooding of between 6 and 12" over the road during the heaviest period of the storm on Tuesday. The road was impassable for most cars. By Wednesday morning, Bay St. west of Old Venice Rd. was dry. However, east of Old Venice Rd., Bay St. was still under 6"± of water, all the way to Pine Ranch East Rd., but was passable for most cars. From what I could observe, the water was being held back for many reasons, the most important being:

1. *The berm along the Oaks golf course prevented water from sheetflowing toward North Creek. The debris line on the berm was approximately 12" higher than the adjacent grade. Opening holes in the berm would help alleviate flooding on Bay Street.; however, it would not be the same as sheetflowing toward North Creek. If*

the berm had not been constructed, the depth of flooding on Bay St. and adjacent properties would not have been as severe; however, flooding in the Oaks Subdivision may have been exacerbated.

2. *The inlet at the SE corner of Old Venice Rd. and Bay St. was not allowing water to pass efficiently. It seems the grate was clogged and once it was unclogged, the water seemed to drain quickly. I still believe this piping system, constructed in conjunction with Bay St. for the School Board, needs to be reconstructed to allow historical drainage from Bay St. to North Creek through the Oaks Subdivision. This is evidenced by the 3.7 ft. water elevation difference from the north side of Bay St. to the south side of Bay St. at the intersection of Old Venice Rd.*

Preymore Street ... For the most part, Preymore St. had minor roadway flooding (1"-2" or less) from U.S. 41 to the entrance to Bay Oaks Estates, Unit I. The main problem was at the North Creek lateral ditch crossing located approximately ½ mile east of U.S. 41. This pipe crossing (S-1, Plate 4) was designed and constructed by Palmer Ranch to serve mainly the Stoneybrook Subdivision. The design was based on a 25-year, 24-hour storm (8") in 24 hours. During the storm on July 18th, the water depth at this location was approximately 18"-24" deep and the road was impassable by most cars. The street flooding on Preymore St. had subsided by Wednesday morning.

Bay Oaks Estates, Unit I ... The stormwater management system for Bay Oaks Estates, Unit I, was designed based on a 25-year, 24-hour storm event (8"). During the July 18th storm event, street flooding was approximately 6"-9" at the low points in the road. The subdivision roads were passable by most cars, and the street flooding met LDR criteria for the storm event.

Historically, the Bay Oaks, Unit I property drained to the south into the North Creek lateral. After development, the drainage outfall remains to the North Creek lateral. North Creek meanders through the southern portion of Bay Oaks, Unit I. Prior to development, Pine Ranch East Rd. was a dirt road with a 60" CMP located at the North Creek crossing. Bay Oaks, Unit I was designed and constructed with twin 42" RCP at

this same crossing to allow for drainage to flow from east to west. Construction of Bay Oaks, Unit I did not impede drainage coming from the east at the pipe crossing.

A concern has been raised by some Pine Ranch East residents that drainage from Bay Oaks Unit I was flowing into their subdivision along Pine Ranch East Road. What the residents saw was water flowing into their subdivision from the North Creek lateral. This same thing happened in the June 1992 storm prior to Bay Oaks Unit I development when the 60" CMP was in place. The twin 42" RCP crossing Pine Ranch East Road continued to flow full for several days after the storm event which contributed to the time it took the system to drain. The water actually rose 2"± overnight which can be attributed to the drainage coming from the east.

<u>Other Subdivision Flooding</u> ... Some of the other subdivisions which had at least road flooding in the North Creek Basin included:

1. *The Oaks had street flooding, some garage and house flooding.*
2. *Pine Ranch East Road had street and yard flooding.*
3. *Pine Ranch had street and yard flooding.*
4. *Most low-lying areas in the Osprey area east of U.S. 41 had street and yard flooding.*
5. *U.S. 41 was under 12"± of swiftly flowing water at the Osprey Post Office.*

This storm event caused several structural flooding events in the Osprey Acres area. The houses reporting to Sarasota County Initial Response Team structural flooding are as follows:

50 Glenwood Avenue
322 Glenwood Avenue
268 Glenwood Avenue
112 Ogburn Street
233 Pennsylvania Avenue
143 Washington Avenue
462 Washington Avenue

In addition to the above listed houses with structural flooding, many streets and yards were flooded throughout the basin. Trinity Acres experienced extensive street (Faith Avenue and Shotgun Lane) and yard flooding. Structural flooding has not been reported. It was noted that a considerable amount of overflow from the South Creek Basin was observed across Pine Ranch East Road.

The following homes in Osprey Acres and on Bay Street have flooded during past flood events:

NORTH CREEK STRUCTURAL FLOODING

ADDRESS	FINISHED FLOOR – NGVD
143 Washington Avenue	15.69
230 Washington Avenue	15.13
236 Washington Avenue	14.90
457 Washington Avenue	16.26
462 Washington Avenue	15.31
221 Pennsylvania Avenue	14.26
233 Pennsylvania Avenue	14.58
42 Patterson Avenue	14.44
330 Patterson Avenue	14.10
125 Ogburn Street	14.04
10 Glenwood Avenue	N/A
12 Glenwood Avenue	N/A
50 Glenwood Avenue	12.66 GARAGE, 2-STORY
268 Glenwood Avenue	N/A
322 Glenwood Avenue	12.80
352 Glenwood Avenue	15.11
334 Bay Street	N/A

2.3 Land Uses

2.3.1 Existing Land Uses

The existing land uses were referenced from the Land Use/Land Cover Maps obtained from Sarasota County in Geographical Information System (GIS) format. The maps were originally prepared by SWFWMD and updated based on the 1992 aerial photographs.

The existing Land Use Map (see Plate 2) indicates that the majority of the basin is classified as Low and Moderate Density Residential, with smaller areas of high density residential, industrial, commercial and office, public buildings, vacant, wetlands, agriculture, and rivers and lakes.

2.3.2 Future Land Uses

The future land uses were obtained from future land use maps provided by Sarasota County (see Plate 2A) which indicated that the majority of the basin is classified as low and moderate density residential, with smaller areas of high density residential, industrial, commercial and office, public buildings, rivers and lakes, similar to the existing land use maps.

2.4 Soils

The dominant soil types in the North Creek Basin are the EauGallie-Myakka-Holopaw-Pineda series, according to NRCS General Soil Map of Sarasota County.

These soil series have a sandy surface layer and a sandy-loamy subsoil and are about 30% EauGallie, 23% Myakka, 15% depressional Holopaw, 14% Pineda, and 18% soils of minor extent. These soils series are typically level and are poorly to very poorly drained. They are well suited for improved pasture.

For this study, a detailed soils map was utilized and a detailed breakdown of soil types for each sub-basin was analyzed. Plate 3 shows the soils for the entire basin.

2.5 Conveyance System and Structures

2.5.1 Existing Conveyance System and Structures

North Creek is a natural channel which flows northwesterly from the central eastern part of the basin to its confluence with Catfish Creek and traverses the northern half of The Oaks Development. The stream corridor slightly meanders through primarily residential development areas of The Oaks Subdivision. The Creek ranges in width from approximately 25 ft. to 50 ft., starting at the eastern study limits, to approximately 100 ft. approaching the confluence with the north lateral canal which drains the Stoneybrook area. North Creek becomes wider, to approximately 200 ft., toward the confluence with Catfish Creek, west of U.S. 41. The headwaters of North Creek and its tributary receive runoff mainly from undeveloped vacant land east of the Seminole Gulf Line RR and Pine Ranch East Road.

As mentioned above, there is one north lateral canal which discharges into North Creek through several culverts and manmade canals, including a concrete-lined channel. There is no water control structure to regulate the canal stage near the confluence with North Creek. In addition, there are three north lateral inflow connections to North Creek which discharge runoff from the northern part of The Oaks Subdivision through a series of interconnected lakes and water control structures.

There are also three southern lateral inflow connections to North Creek:

- The western connection has a drop inlet-type water control structure located at the north end of a large detention lake and discharges runoff from The Oaks Subdivision and the northern portion of Osprey Acres.

- The middle connection has a concrete spillway with bleeder slot and discharges runoff from large portions of The Oaks Subdivision through a series of interconnected lakes. This lateral also receives runoff from Bay Street and the area south of Bay Street (through a series of culverts), and the southern portion of Osprey Acres and the County's detention facility through an existing ditch within Bay Street Park.

- The eastern connection has a drop inlet-type water control structure and discharges runoff from the eastern portion of The Oaks Subdivision.

Plate 4 shows the existing drainage structures which were used in the study. Table 2.5.1 provides an inventory of the existing drainage structures.

2.5.2 Proposed Conveyance System and Structures

The proposed conveyance system of the North Creek Basin will be similar to the existing one except that improvements to the existing system are recommended to improve its conveyance capacity and ability to provide additional water quality treatment volumes. For specific details pertaining to the proposed improvements, refer to Section 6.

TABLE 2.5.1 - FIVE PAGES

TABLE 2.5.1
INVENTORY OF EXISTING DRAINAGE STRUCTURES

STRUCTURE NUMBER	STRUCTURE LOCATION	STRUCTURE TYPE	CONTROL ELEVATION (FT NGVD)	WEIR INFORMATION	PIPE LENGTH (LF)	PIPE SIZE (INCHES)	PIPE MATERIAL
WCS-1	NC-3	Riser with Outfall	8.3	35.1 ft. Weir at Elevation 9.80 ft.	1,140	42	Reinforced Concrete
WCS-2	NC-4	Riser with Outfall	8.3	20.0 ft. Weir at Elevation 9.80 ft.	600	54	Reinforced Concrete
WCS-3	NC-1	Riser with Outfall	9.95	30.7 ft. Weir at Elevation 10.48 ft.	610	36	Reinforced Concrete
WCS-4	NC-2	Riser with Outfall	9.0	27.8 ft. Weir at Elevation 11.66 ft.	8	24	Reinforced Concrete
WCS-5	NC-8	Riser with Outfall	8.6	10.0 ft. Weir at Elevation 10.1 ft.	550	30	Reinforced Concrete
WCS-6	NC-11	Riser with Outfall	6.5	16.0 ft. Weir at Elevation 8.0 ft.	60	(2) 24x38	Reinforced Concrete
WCS-7	NC-12	Riser with Outfall	9.25	27.1 ft. Weir at Elevation 10.75 ft.	210	24	Reinforced Concrete
WCS-8	NC-30	Drop Inlet	12.5	5.0 ft. Weir at Elevation 13.83 ft.	8	24	Reinforced Concrete
WCS-9	NC-14	Riser with Outfall	11.19	20.0 ft. Weir at Elevation 11.19 ft.	8	24	Reinforced Concrete
WCS-10	NC-16	Riser with Outfall	9.25	9.26 ft. Weir at Elevation 10.75 ft.	100	24	Reinforced Concrete
WCS-11	NC-17	Riser with Outfall	8.42	10.0 ft. Weir at Elevation 8.42 ft.	335	30	Reinforced Concrete
WCS-12	NC-19A	Riser with Outfall	10.5	11.8 ft. Weir at Elevation 11.98 ft.	60	24	Reinforced Concrete
WCS-13	NC-21	Riser with Outfall	8.0	20.0 ft. Weir at Elevation 9.07 ft.	550	24	Reinforced Concrete
WCS-14	NC-26	Spillway	8.0	40.0 ft. Weir at Elevation 8.74 ft.	-	-	-
WCS-15	NC-22	Spillway	6.91	16.0 ft. Weir at Elevation 7.66 ft.	-	-	-
WCS-16	NC-23	Spillway	9.0	10.0 ft. Weir at Elevation 9.74 ft.	-	-	-
WCS-17	NC-25	Riser with Outfall	8.0	15.0 ft. Weir at Elevation 8.75 ft.	8	18	Reinforced Concrete
WCS-18	NC-28A	Drop Inlet	10.0	5.0 ft. Weir at Elevation 10.91 ft.	160	18	Reinforced Concrete
WCS-19	NC-28	Overland Weir	10.0	30.0 ft. Weir at Elevation 10.0 ft.	-	-	-
WCS-20	NC-55A	Drop Inlet	9.99	4.23 ft. Weir at Elevation 10.82 ft.	36	24x38	Reinforced Concrete
WCS-21	NC-102	Drop Inlet	14.84	0.75 ft. Weir at Elevation 14.84 ft.	35	14x23	Reinforced Concrete
WCS-22	NC-106	Drop Inlet	15.04	1.35 ft. Weir at Elevation 15.04 ft.	30	19x30	Reinforced Concrete
WCS-23	NC-46A	Junction Box	11.10	-	74	(2) 24x38	Reinforced Concrete
WCS-24	NC-34	Water Control	-	-	-	-	-
WCS-25	NC-38A	Riser with Outfall	14.0	12.58 ft. Weir at Elevation 14.0 ft.	700	36	Reinforced Concrete
WCS-26	NC-100	Drop Inlet	15.1	0.5 ft. Weir at Elevation 15.1 ft.	40	14x23	Reinforced Concrete
WCS-27	NC-101	Drop Inlet	14.92	0.94 ft. Weir at Elevation 14.92 ft.	35	19x30	Reinforced Concrete
WCS-28	NC-104	Drop Inlet	14.1	1.01 ft. Weir at Elevation 14.1 ft.	150	14x23	Reinforced Concrete
WCS-29	NC-103	Drop Inlet	14.92	0.97 ft. Weir at Elevation 14.92 ft.	50	19x30	Reinforced Concrete
WCS-30	NC-105	Drop Inlet	13.8	4.0 ft. Weir at Elevation 13.80 ft.	110	14x23	Reinforced Concrete

STRUCTURE NUMBER	STRUCTURE LOCATION	STRUCTURE TYPE	CONTROL ELEVATION (FT MSL)	WEIR INFORMATION	PIPE LENGTH (FEET)	PIPE SIZE (INCHES)	PIPE MATERIAL
WCS-31	NC-27	Drop Inlet	7.77	4.67 ft. Weir at Elevation 9.01 ft.	130	18	Reinforced Concrete
S-1	NC-58	Culvert	-	-	78	38x72	Reinforced Concrete
S-2	NC-29	Culvert	-	-	215	48	Reinforced Concrete
S-3	NC-29	Culvert	-	-	215	48	Reinforced Concrete
S-4	NC-29	Culvert	-	-	103	48	Reinforced Concrete
S-5	NC-29	Culvert	-	-	103	48	Reinforced Concrete
S-6	NC-29	Culvert	-	-	250	48	Reinforced Concrete
S-7	NC-29	Culvert	-	-	250	48	Reinforced Concrete
S-8	NC-29	Culvert	-	-	115	30x44	Reinforced Concrete
S-9	NC-29	Culvert	-	-	115	30x44	Reinforced Concrete
S-10	NC-29	Culvert	-	-	115	30x44	Reinforced Concrete
S-11	NC-29	Culvert	-	-	115	30x44	Reinforced Concrete
S-12	NC-27	Culvert	-	-	130	15	Reinforced Concrete - Part of WCS-31
S-13	NC-37	Culvert	-	-	96	42	Reinforced Concrete
S-14	NC-37	Culvert	-	-	96	42	Reinforced Concrete
S-15	NC-39	Culvert	-	-	106	26x42	Reinforced Concrete
S-16	NC-39	Culvert	-	-	73	26x42	Reinforced Concrete
S-17	NC-42	Culvert	-	-	68	26x42	Reinforced Concrete
S-18	NC-56C	Culvert	-	-	27	18	Reinforced Concrete
S-19	NC-45	Culvert	-	-	24	31x48	Corrugated Metal
S-20	NC-45	Culvert	-	-	34	31x48	Corrugated Metal
S-21	NC-45A	Culvert	-	-	50	36	Reinforced Concrete
S-22	NC-46A	Culvert	-	-	96	29x45	Reinforced Concrete
S-23	NC-46A	Culvert	-	-	120	29x45	Reinforced Concrete
S-24	NC-46A	Culvert	-	-	74	24x38	Reinforced Concrete - Part of WCS-23
S-25	NC-46A	Culvert	-	-	74	24x38	Reinforced Concrete - Part of WCS-23
S-26	NC-56	Culvert	-	-	400	38x60	Reinforced Concrete
S-27	NC-56	Culvert	-	-	32	38x60	Reinforced Concrete
S-28	NC-48	Culvert	-	-	74	19x30	Reinforced Concrete
S-29	NC-24	Culvert	-	-	70	29x45	Reinforced Concrete
S-30	NC-24	Culvert	-	-	70	29x45	Reinforced Concrete
S-31	NC-55A	Culvert	-	-	56	14x23	Reinforced Concrete

STRUCTURE NUMBER	STRUCTURE LOCATION	STRUCTURE TYPE	CONTROL ELEVATION (FT NGVD)	WEIR INFORMATION	PIPE LENGTH (FT)	PIPE SIZE (INCHES)	PIPE MATERIAL
S-32	NC-55A	Culvert	-	-	56	14x23	Reinforced Concrete
S-33	NC-54	Culvert	-	-	20	14x23	Reinforced Concrete
S-34	NC-54	Culvert	-	-	33	14x23	Reinforced Concrete
S-35	NC-54	Culvert	-	-	48	14x23	Reinforced Concrete
S-36	NC-54	Culvert	-	-	33	12x18	Reinforced Concrete
S-37	NC-54	Culvert	-	-	267	14x23	Reinforced Concrete
S-38	NC-54	Culvert	-	-	31	24	Reinforced Concrete
S-39	NC-54	Culvert	-	-	32	24	Reinforced Concrete
S-40	NC-54	Culvert	-	-	-	-	-
S-41	NC-53A	Culvert	-	-	-	-	-
S-42	NC-53A	Culvert	-	-	39	18	Reinforced Concrete
S-43	NC-53A	Culvert	-	-	21	12x18	Reinforced Concrete
S-44	NC-53A	Culvert	-	-	52/270	12x18/36	Reinforced Concrete/Corrugated Metal
S-45	NC-53A	Culvert	-	-	220	36	Reinforced Concrete
S-46	NC-53	Culvert	-	-	40	24	Corrugated Metal
S-47	NC-53	Culvert	-	-	20	12x18	Reinforced Concrete
S-48	NC-53	Culvert	-	-	80	12x18	Reinforced Concrete
S-49	NC-53	Culvert	-	-	20	12x18	Reinforced Concrete
S-50	NC-53	Culvert	-	-	20	12x18	Reinforced Concrete
S-51	NC-53	Culvert	-	-	20	12x18	Reinforced Concrete
S-52	NC-53	Culvert	-	-	20	12x18	Reinforced Concrete
S-53	NC-53A	Culvert	-	-	40	18	Reinforced Concrete
S-54	NC-53A	Culvert	-	-	20	14x23	Reinforced Concrete
S-55	NC-53A	Culvert	-	-	20	14x23	Reinforced Concrete
S-56	NC-54	Culvert	-	-	30	24	Reinforced Concrete
S-57	NC-54	Culvert	-	-	42	12x18	Reinforced Concrete
S-58	NC-54	Culvert	-	-	31	13x17	Corrugated Metal
S-59	NC-54	Culvert	-	-	168	24	Corrugated Metal
S-60	NC-53	Culvert	-	-	25	14x23	Reinforced Concrete
S-61	NC-53	Culvert	-	-	18	12x18	Reinforced Concrete
S-62	NC-53	Culvert	-	-	30	12x18	Corrugated Metal
S-63	NC-53	Culvert	-	-	49	18x24	Reinforced Concrete

STRUCTURE NUMBER	STRUCTURE LOCATION	STRUCTURE TYPE	CENTRO ELEVATION (FT MSL)	WEIR INFORMATION	PIPE LENGTH (LF)	PIPE SIZE (INCHES)	PIPE MATERIAL
S-64	NC-53	Culvert	-	-	49	12x18	Reinforced Concrete
S-65	NC-53	Culvert	-	-	47	12x18	Reinforced Concrete
S-66	NC-53	Culvert	-	-	51	12	Corrugated Metal
S-67	NC-53	Culvert	-	-	20	15	Corrugated Metal
S-68	NC-53	Culvert	-	-	32	14x23	Reinforced Concrete
S-69	NC-53	Culvert	-	-	29	13x17	Corrugated Metal
S-70	NC-53	Culvert	-	-	-	(2) 12	Corrugated Metal
S-71	NC-53	Culvert	-	-	64	12	Reinforced Concrete
S-72	NC-53	Culvert	-	-	48	18	Reinforced Concrete
S-73	NC-53	Culvert	-	-	20	-	-
S-74	NC-53	Culvert	-	-	73	15	Reinforced Concrete
S-75	NC-53	Culvert	-	-	21	15	Reinforced Concrete
S-76	NC-53	Culvert	-	-	18	12	Reinforced Concrete
S-77	NC-53	Culvert	-	-	-	18	Reinforced Concrete
S-78	NC-53	Culvert	-	-	18	15	Reinforced Concrete
S-79	NC-53	Culvert	-	-	18	15	Reinforced Concrete
S-80	NC-53	Culvert	-	-	19	15	Reinforced Concrete
S-81	NC-53	Culvert	-	-	18	18	Corrugated Metal
S-82	NC-54	Culvert	-	-	16	12	Reinforced Concrete
S-83	NC-54	Culvert	-	-	20	12	Polyvinyl Chloride
S-84	NC-54	Culvert	-	-	38	12 & 15	Polyvinyl Chloride & Rein. Concrete
S-85	NC-54	Culvert	-	-	77	24	Corrugated Metal
S-86	NC-54	Culvert	-	-	-	-	-
S-87	NC-54	Culvert	-	-	-	15 & 18	Corrugated Metal & Rein. Concrete
S-88	NC-54	Culvert	-	-	30	18	Reinforced Concrete
S-89	NC-54	Culvert	-	-	24	15	Corrugated Metal
S-90	NC-54	Culvert	-	-	25	-	-
S-91	NC-54	Culvert	-	-	19	15	Corrugated Metal
S-92	NC-54	Culvert	-	-	36	15	Corrugated Metal
S-93	NC-54	Culvert	-	-	16	18	Corrugated Metal
S-94	NC-54	Culvert	-	-	20	12	Corrugated Metal
S-95	NC-54	Culvert	-	-	20	12	Corrugated Metal

STRUCTURE NUMBER	STRUCTURE LOCATION	STRUCTURE TYPE	CONTROL ELEVATION (FT MSL)	DESCRIPTION	PIPE LENGTH (FT)	PIPE SIZE (INCHES)	PIPE MATERIAL
S-96	NC-54	Culvert	-	-	108	15	Reinforced Concrete
S-97	NC-54	Culvert	-	-	24	24	Reinforced Concrete
S-98	NC-54	Culvert	-	-	25	14x23	Reinforced Concrete
S-99	NC-54	Culvert	-	-	12	15	Corrugated Metal
S-100	NC-54	Culvert	-	-	20	12x18	Reinforced Concrete
S-101	NC-54	Culvert	-	-	37	12	Reinforced Concrete
S-102	NC-54	Culvert	-	-	39	15x21	Corrugated Metal
S-103	NC-54	Culvert	-	-	12	15	Reinforced Concrete
S-104	NC-54	Culvert	-	-	12/4	12/12	Reinforced Concrete/Corrugated Metal
S-105	NC-54	Culvert	-	-	18	15	Reinforced Concrete
S-106	NC-56C	Culvert	-	-	44	13x22	Corrugated Metal
S-107	NC-44A	Culvert	-	-	20	32x49	Corrugated Metal
S-108	NC-5	Culvert	-	-	400	24	Reinforced Concrete
S-109	NC-9	Culvert	-	-	350	24	Reinforced Concrete
S-110	NC-13	Culvert	-	-	50	18	Reinforced Concrete
S-111	NC-10	Culvert	-	-	200	(2) 30	Reinforced Concrete
S-112	NC-20	Culvert	-	-	200	24	Reinforced Concrete
B-1	NC-52	Bridge	-	-	-	-	-
B-2	NC-19	Bridge	-	-	-	-	-
B-3	NC-22	Bridge	-	-	-	-	-
B-4	NC-19	Bridge	-	-	-	-	-
B-5	NC-20A	Bridge	-	-	-	-	-
B-6	NC-30	Bridge	-	-	-	-	-
B-7	NC-37	Bridge	-	-	-	-	-
B-8	NC-22	Bridge	-	-	-	-	-
B-9	NC-22	Bridge	-	-	-	-	-
B-10	NC-22	Bridge	-	-	-	-	-

2.6 Environmental Assessment of Wetlands Along North Creek Corridor

The vegetated natural areas adjacent to the North Creek Channel consists of primarily pine flatwood communities.

Vegetation varies along the creek, but consists generally of slash pine, saw palmetto, oaks (laurel and live), wax myrtle, cabbage palm, Brazilian pepper, primrose willow, willow, and herbaceous species (pennywort, red ludwigia, grasses). Several portions of the creek were completely covered by vegetation.

Other typical vegetative species observed were: shield fern, giant leather fern, cattails, and needlerush (observed approaching U.S. 41, approximately less than 2,000 ft. away). Near the juncture of U.S. 41, some white mangroves were observed on the east side, and needlerush along with the pines, oaks, Brazilian pepper, etc. Mangroves were also observed on the west side, along with the typical vegetation mentioned previously. Near the end of the study limits, more mangroves were present.

A meeting was held with representatives of SWFWMD on October 17, 1995 to look at the maintenance potential of North Creek at three locations. Exhibit A provides the SWFWMD minutes of this meeting. SWFWMD addressed maintenance by manual methods. Dredging would require a permit.

There is potential for enhancement, preservation and conservation of the corridor, if not already protected by the existing subdivisions.

<u>Potential Recreation/Enhancement/Preservation/Conservation</u>

Recreation potential for the majority of the creek system is not significant due to the narrow width of the creek in many areas. The portion which could provide recreation (other than aesthetic) is in the vicinity of U.S. 41 (approximately 2,000 ft. east), where the creek channel widens and becomes more navigable, and to the west of U.S. 41 where the channel is even wider.

Endangered and Threatened Species

Wildlife

During the field review with SWFWMD in October, 1995, a Sandhill Crane was observed on the Oaks golf course.

Since the pine flatwoods community is directly adjacent to the creek in several locations, there could be potential habitat for listed species.

According to the Sarasota County Apoxsee, Chapter 2, the following listed (endangered or threatened or Species of Special Concern) species are referenced as potential for the flatwoods community:

- Burrowing Owl
- Audubon Caracara
- Red Cockaded Woodpecker
- Gopher Tortoise
- Gopher Frog
- Sherman's Fox Squirrel
- Bald Eagle

Scrubby flatwoods are adjacent to the creek in a few locations and could provide potential habitat for these listed (endangered or threatened or Species of Special Concern) species (according to Sarasota County Apoxsee):

- Gopher Tortoise
- Gopher Frog
- Scrub Jay

North Creek, itself, could provide potential habitat as follows:

- West of U.S. 41 (Mangrove Areas): According to the Apoxsee, the mangroves could provide habitat for the following listed (endangered and threatened, or Species of Special Concern) species:

  E. Brown Pelican
  Wood Stork
  Bald Eagle
  Peregrine Falcon
  Manatee
  Roseate Spoonbill
  Louisiana Heron
  Snowy Egret
  Little Blue Heron

Plant Species

Giant leather ferns observed along the creek are listed on the Florida Department of Agriculture (FDA) plant list. There could be potential for other listed plant species based on the vegetative cover.

For any proposed modifications to the existing North Creek corridor, it would be recommended that an Endangered & Threatened Species Survey be accomplished to determine if any potential impacts exist.

2.7 Drainage Basins and Sub-basins

The drainage basin boundaries were delineated using the SWFWMD aerial topography with contours (date of photography: September 1981; date of mapping: May 1982) and Sarasota County's aerial photographs (date of photography: November 1992, February 1993, March 1995, and April 1995). The basin boundaries were compared to the basin boundaries previously developed as part of previous studies which included Bay Street Drainage Study Report by Kimley-Horn; the County-wide basin delineation maps developed by Camp, Dresser and McKee (CDM); and Bay Oaks Unit II site maps prepared by AM Engineering. There were some differences in each map, which was reviewed during field inspection and consulted with Parsons Engineering Science, Inc., who is the study contractor for South Creek Basin Master Plan. The delineation of basin boundaries was also reviewed by the County and various interested parties who attended the Study Coordination Meetings.

The North Creek Basin was further subdivided into 78 sub-basins, as plotted and shown in Plates 4 and 6. The sub-basin boundaries were delineated, based on previous design reports, as-built subdivision design plans, SWFWMD topographic maps, aerial photographs, field survey data, and field inspections.

The delineated basin and sub-basins were digitized in GIS format in order to be consistent with the County's base maps.