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October 21, 2009
L-2009-227
10 CFR 50.36

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555-0001

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
Wastewater Permit Number FL0001562
Request for Permit Renewal Notification

By letter L-2009-160 dated June 30, 2009, Florida Power & Light Company (FPL) notified the NRC of the submittal of an Application for Modification and Renewal of the Turkey Point Plant Industrial Wastewater Facility Permit No. FL0001562. The renewal application encompassed the current operating units – fossil Units 1, 2 and 5, nuclear Units 3 and 4, and the proposed nuclear Units 6 and 7.

During a follow-up conversation with the Florida Department of Environmental Protection (FDEP), it was requested that FPL prepare and submit a separate permit renewal application. The Application submittal on June 30, 2009, will serve only as a request to modify the existing permit to allow for the addition of Turkey Point Units 6 and 7. Following FDEP guidance, the application for renewal includes relevant Units 6 and 7 Project information including the Stormwater Management Plan and Calculations (SMPC) previously submitted as part of the Site Certification Application. Please note that stormwater management for the existing facility has not changed; the SMPC is specific to Units 6 and 7.

In accordance with Section 3.2.3 of the Turkey Point Units 3 and 4 Environmental Protection Plan (Appendix B of Facility Operating Licenses DPR-31 and DPR-41), enclosed is a copy of the request to renew Industrial Wastewater Facility Permit Number FL0001562.

Should there be any questions, please contact us.

Very truly yours,

for:
Michael Kiley
Vice President
Turkey Point Nuclear Plant

Enclosure
cc: Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, Turkey Point Plant

CUDI
NRR

ENCLOSURE TO

L-2009-227

WASTEWATER FACILITY OR ACTIVITY PERMIT
APPLICATION FORM 1
GENERAL INFORMATION

I - IDENTIFICATION NUMBER:

Facility ID FL0001562

II - CHARACTERISTICS:

INSTRUCTIONS: Complete the questions below to determine whether you need to submit any permit application forms to the Department of Environmental Protection. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the blank in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements. See Section B of the instructions. See also, Section C of the instructions for definitions of the terms used here.

SPECIFIC QUESTIONS	YES	NO	FORM ATTACHED
A. Is this facility a domestic wastewater facility which results in a discharge to surface or ground waters?		X	
B. Does or will this facility (either existing or proposed) include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters?		X	
C. Does or will this facility (other than those describe in A. or B.) discharge process wastewater, or non-process wastewater regulated by effluent guidelines or new source performance standards, to surface waters?		X	2CS
D. Does or will this facility (other than those described in A. or B.) discharge process wastewater to ground waters?	X		2CG
E. Does or will this facility discharge non-process wastewater, not regulated by effluent guidelines or new source performance standards, to surface waters?		X	
F. Does or will this facility discharge non-process wastewater to ground waters?	X		0127512-002-UO
G. Does or will this facility discharge stormwater associated with industrial activity to surface waters?		X	
H. Is this facility a non-discharging/closed loop recycle system?		X	
I. Is this facility a public water system whose primary purpose is the production of potable water for public consumption and which discharges demineralization concentrate to surface water or groundwater?		X	

III - NAME OF FACILITY: (80 characters and spaces)

FPL Turkey Point Power Plant (Units 1-7)

DEP Form 62-620.910(1)
(Effective July 7, 2006)

Facility ID FL0001562

IV - FACILITY CONTACT: (A. 30 characters and spaces)

A. Name and Title (Last, first, & title)	B. Phone (area code & no.)
Kiley, Michael W., Plant Vice President	305-246-6113

V - FACILITY MAILING ADDRESS: (A. 30 characters and spaces; B. 25 characters and spaces)

A. Street or P.O. Box: 9760 S.W. 344 Street		
B. City or Town: Florida City	State: FL	Zip Code: 33035

VI - FACILITY LOCATION: (A. 30 characters and spaces; B. 24 characters and spaces; C. 3 spaces (if known); D. 25 characters and spaces; E. 2 spaces; F. 9 spaces)

A. Street, Route or Other Specific Identifier: 10 miles East of Florida City on S.W. 344 Street		
B. County Name: Miami-Dade	C. County Code (if known):	
D. City or Town: Florida City	E. State: FL	F. Zip Code: 33035

VII - SIC CODES: (4-digit, in order of priority)

1. Code #: 4911	(Specify) Electric Serv	2. Code #:	(Specify)
3. Code #:	(Specify)	4. Code #:	(Specify)

VIII - OPERATOR INFORMATION: (A. 40 characters and spaces; B. 1 character; C. 1 character (if other, specify); D. 12 characters; E. 30 characters and spaces; F. 25 characters and spaces; G. 2 characters; H. 9 characters)

A. Name: Florida Power & Light Company		B. Is the name in VIII A. the owner? X Yes ☐ No	
C. Status of Operator: F = Federal; S = State; P = Private; O = Other; M = Public (other than F or S)	(code) P	(specify) Private	D. Phone No.: 305-246-6113
E. Street or P. O. Box: 9760 S.W. 344 Street			
F. City or Town: Florida City		G. State: FL	H. Zip Code: 33035

IX - INDIAN LAND:

A. Is the facility located on Indian lands?	☐ Yes	X No

Facility ID FL0001562

X - EXISTING ENVIRONMENTAL PERMITS:

A. NPDES Permit No.	B. UIC Permit No.	C. Other (specify)	D. Other (specify)
FL0001562-0071WB/MR	0127512-002-UO	See Form 1-X-C Atch.	NA

XI - MAP: Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

XII - NATURE OF BUSINESS (provide a brief description)

Electric Power Generating Station

XIII - CERTIFICATION (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Michael W. Kiley
A. Name (type or print)

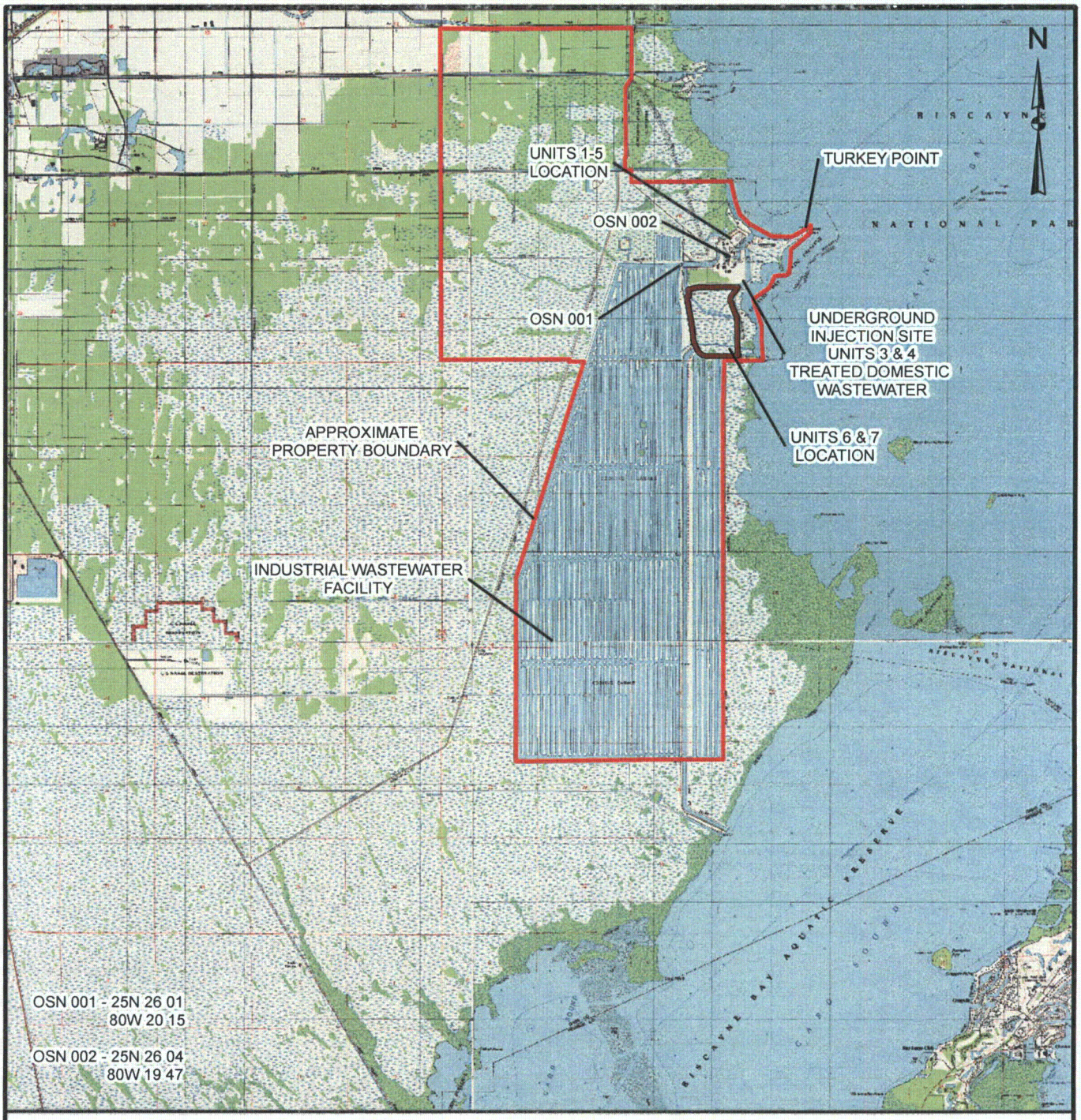
B. Signature

Plant Vice President
Official Title (type or print)

10/9/09
C. Date Signed

Form 1-X-C Attachment
Other Existing Permits (not listed on Form 1)
Florida Power & Light Company - Turkey Point

Permitting Agency	Permit Name	Permit Number
State of Florida Department of Environmental Protection	Domestic Wastewater	FLA013612-002-DW3P
Miami-Dade County Department of PublicWorks	Domestic Wastewater	DWO-000010-2008/2009
Miami-Dade County Department of Environmental Resources Management	Industrial Waste	IW-000003-2008/2009



LEGEND

- Turkey Point Units 6 & 7 Plant Area
- Turkey Point Plant Property

REFERENCES

1. USGS TOPOGRAPHIC MAP, 7.5 MIN. QUADRANGLE MAP SERIES: HOMESTEAD, ARSENICKER KEYS, GLADES, AND CARD SOUND QUADRANGLES, FLORIDA.

PROJECT

TURKEY POINT UNITS 6 & 7 PROJECT

TITLE

FORM I - XI ATTACHMENT
SITE LOCATION MAP

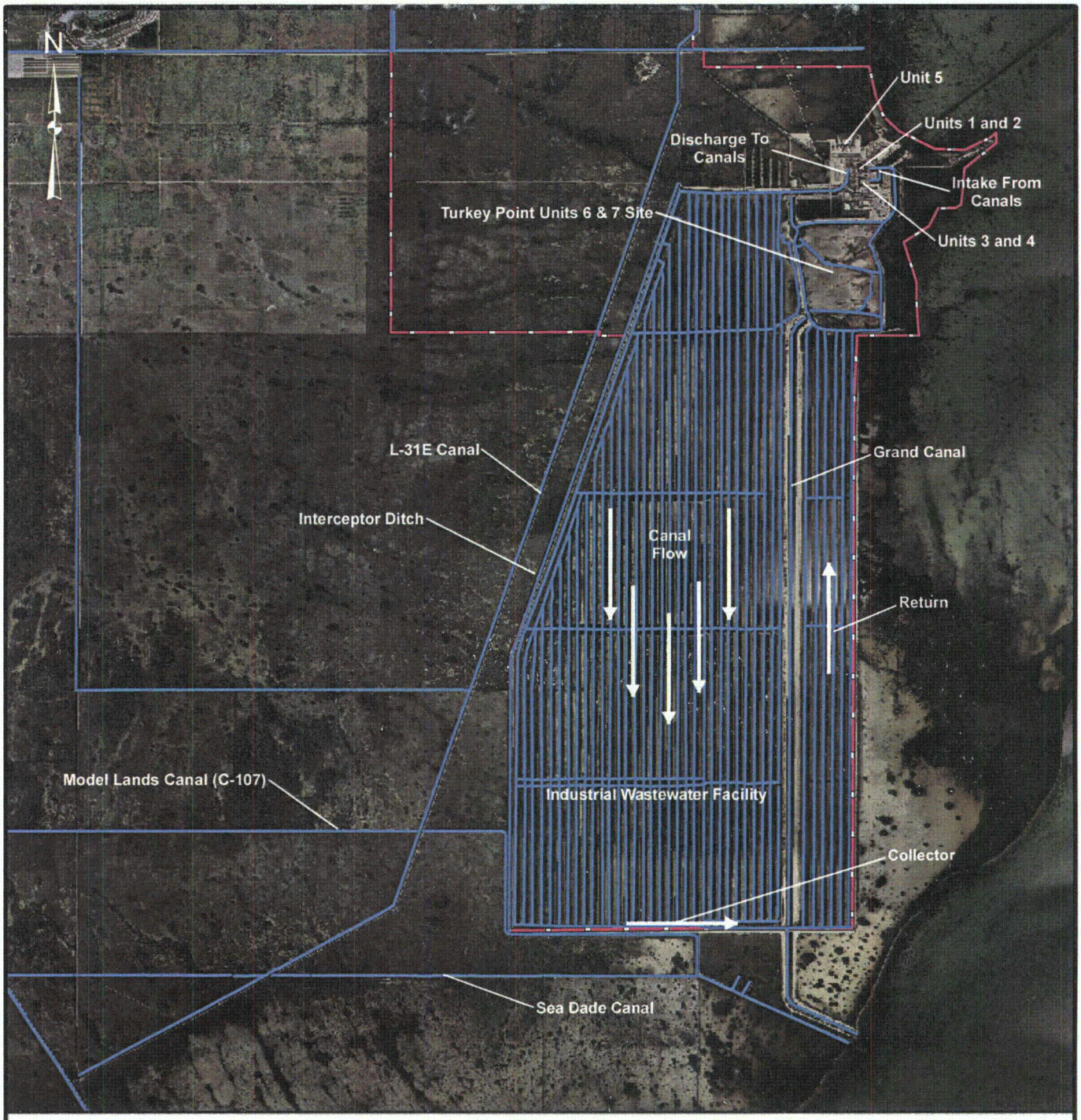
FPL

FILE No. 08387584Q001

REV. 0

PLOT DATE 6/14/2009

FIGURE 1



5,400 0 5,400 Feet

LEGEND

- Canals
- Turkey Point Plant Property

REFERENCES

1. Imagery, Miami-Dade County, 2007.

PROJECT: TURKEY POINT UNITS 6 & 7 PROJECT

TITLE: FORM I - XI ATTACHMENT
TURKEY POINT COOLING CANAL SYSTEM

FPL

FILE No. 08387584Q002
REV. 0
PLOT DATE 6/14/2009

FIGURE 2

FORM
2CS

WASTEWATER APPLICATION FOR PERMIT TO DISCHARGE PROCESS WASTEWATER FROM NEW OR EXISTING INDUSTRIAL WASTEWATER FACILITIES TO SURFACE WATERS

Facility I.D. Number: FL0001562

Please print or type information in the appropriate areas.

I OUTFALL LOCATION For each outfall, list the X,Y coordinates and the name of the receiving water.
(latitude/longitude to the nearest 15 seconds)

A. Outfall No. (List)	B. Latitude			C. Longitude			D. Name of Receiving Water
	Deg.	Min.	Sec.	Deg.	Min.	Sec.	
NA	NA	NA	NA	NA	NA	NA	These are internal outfalls that discharge
002	NA	NA	NA	NA	NA	NA	to the Closed-loop Cooling Canal System
							No Discharge to Waters of the U.S.

II OUTFALL DESIGN

A. Outfall No. (List)	B. Design Configuration and Construction Materials	C. Distance from shore	D. Diameter	E. Elevation of Discharge Invert (MSL)	F. Receiving Water Depth at POD (MSL)
NA	NA	NA	NA	NA	NA

Facility I.D. Number: FL0001562

III RECEIVING WATER INFORMATION

For each surface water that will receive effluent, supply the following information:

A. Name of Receiving Water	B. Check One		C. Classification (See Ch. 62-302, F.A.C.)	D. Type of Receiving Water (canal, river, lake, etc.)
	Fresh	Salt or Brackish		
NA	☐	☐	NA	NA
	☐	☐		Closed Loop Cooling
	☐	☐		Canals
	☐	☐		No Discharge to Waters
	☐	☐		Of the U.S.
	☐	☐		

E. Minimum 7-day 10-year low flow of the receiving water at each outfall (if appropriate).

F. Identify and describe the flow of effluent from each outfall to a major body of water. A suitably marked map or aerial photograph may be used.

G. Do you request a mixing zone under Rule 62-4.244, F.A.C.? If yes, for what parameters or pollutants?

IV FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES

A. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in Item B. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfalls. If a water balance cannot be determined (e.g., for certain mining activities), provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.

B. For each outfall, provide a description of:

1. All operations contributing wastewater to the effluent; including process wastewater, sanitary wastewater, cooling water, and stormwater runoff;

2. The average flow contributed by each operation; and

3. The treatment received by the wastewater.

Use the space on the next page. Continue on additional sheets, if necessary.

(1) Outfall No. (List)	(2) Operation(s) Contributing Flow		(3) Treatment		
	(a) Operation (list)	(b) Avg. Flow & Units	(a) Description	(b) List Code from Table 2CS-1	
002	Solids Settling Basin	17,235 gal/day	Sedimentation (Settling)	1-U	
			Chemical Treatment	2-C	
001	Closed-loop Cooling Canals	1.92 MGM	Evaporation/Sedimentation	1-F	1-U
	Unit 5 CT Blowdown	2,444 gpm	Chemical Treatment	2-F, 2-H	2-K
	Unit 5 Wastewater Sump	3,040 gpm	Physical/Chemical treatment	1-O, 1-U	2-K
	Units 6 & 7 Stormwater	No Change	Sedimentation (Settling)	1-U	
NA	Units 6 & 7 Wastewater	25 MGD (est.)	Underground Injection	4-D	

C. Except for storm runoff, leaks, or spills, are any of the discharges described in Items II-A or B intermittent or seasonal?
☒ Yes (complete the following table) ☐ No (go to D. below)

(1) Outfall No. (List)	(2)Operation(s) Contributing Flow(List)	(3) Frequency		(4) Flow				
		(a) Days per Week (specify avg.)	(b) Months per Yr. (specify avg.)	(a) Flow Rate (in mgd)		(b) Total Volume (specify with units)		(c) Duration (in days)
				Long Term Avg.	Max. Daily	Long Term Avg.	Max. Daily	
002	Solids Settling Basin	0-7	0-12	.01724	NA	NA	NA	NA

D. Describe practices to be followed to ensure adequate wastewater treatment during emergencies such as power loss and equipment failures causing shutdown of pollution abatement equipment of the proposed/permitted facilities.

E. List the method(s) and location(s) of flow measurement.

V PRODUCTION

A. Does an effluent guideline limitation promulgated by EPA under Section 304 of the Clean Water Act apply to your facility?

☒ Yes (complete Item V-B) ☐ No (go to Section VI)

B. Are the limitations in the applicable guideline expressed in terms of production (or other measure of operation)?

☐ Yes (complete Item V-C) ☒ No (go to Section VI)

C. If you answered "yes" to Item V-B, list the quantity which represents an actual measurement of your level of production, expressed in the terms and units used in the applicable effluent guideline, and indicate the affected outfalls.

1. AVERAGE DAILY PRODUCTION			2. Affected Outfalls
a. Quantity per Day	b. Units of Measure	c. Operation, Product, Materials, Etc. (specify)	(list outfall nos.)
NA	NA	NA	NA

VI IMPROVEMENTS

A. Are you now required by any Federal, State or local authority to meet any implementation schedule for the construction, upgrading or operation of wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement order, enforcement compliance schedule letter, stipulations, court orders, and grant or loan conditions.

☐ Yes (complete the following table) ☒ No (go to Item VI-B)

1. Identification of Condition, Agreement, Etc.	2. Affected Outfalls		3. Brief Description of Project	4. Final Compliance Date	
	a. No.	b. Source of Discharge		a. Required	B. Projected
NA	NA	NA	NA	NA	NA

B. OPTIONAL: You may attach additional sheets describing any additional water pollution control programs (or other environmental projects which may affect your discharges) you now have underway or which you plan. Indicate whether each program is now underway or planned, and indicate your actual or planned schedules for construction.

☐ Mark "X" if description of additional control programs is attached.

VII INTAKE AND EFFLUENT CHARACTERISTICS

A, B, & C: See instructions before proceeding--Complete one set of tables for each outfall -- Annotate the outfall number in the space provided. NOTE: Tables VII-A, VII-B, and VII-C are included on separate sheets number VII-1 through VII-9.

D. Use the space below to list any of the pollutants listed in Table 2CS-3 of the instructions, which you know or have reason to believe is discharged or may be discharged from any outfall. For every pollutant you list, briefly describe the reasons you believe it to be present and report any analytical data in your possession.

1. Pollutant	2. Source	1. Pollutant	2. Source
Dimethyl amine	Boiler/StmGen Blowdown	NA	NA

Facility I.D. Number: FL0001562

VIII POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS

Is any pollutant listed in Item VII-C a substance or a component of a substance which you currently use or manufacture as an intermediate or final product or by-product?

☐ YES (list all such pollutants below) ☒ NO (go to IX)

NA

IX BIOLOGICAL TOXICITY TESTING DATA

Do you have any knowledge or reason to believe that any biological test for acute or chronic toxicity has been made on any of your discharges or on a receiving water in relation to your discharge within the last 3 years?

☐ YES (identify the test(s) and describe their purposes below) ☒ NO (go to Section X)

NA

X CONTRACT ANALYSIS INFORMATION

Were any of the analyses reported in Item VII performed by a contract laboratory or consulting firm?

☐ YES (list the name, address, telephone number, and certification number of, and pollutants analyzed by each such laboratory or firm below) ☒ NO (go to Section XI)

A. Name	B. Address	C. Telephone (area code & no.)	D. Pollutants Analyzed (list)
NA	NA	NA	NA

Facility I.D. Number: FL0001562

XI CONNECTION TO REGIONAL POTW

A. Indicate the relationship between this project and area regional planning for wastewater treatment. List steps to be taken for this industrial wastewater facility to become part of an area-wide wastewater treatment system.

FPL has been working with Miami-Dade Water and Sewer Department (MDWASD) to make the Turkey Point Plant part of the area-wide wastewater treatment system. Turkey Point Units 6 & 7 will use reclaimed water from MDWASD as makeup water to the circulating water system. When reclaimed water is fully available, the Turkey Point facility may utilize up to 90 MGD. Domestic wastewater generated by the facility will be managed onsite and will not be released to the area-wide wastewater treatment system.

XII-A CERTIFICATIONS FOR NEW OR MODIFIED FACILITIES

This is to certify the engineering features of this pollution control project have been designed by me and found to be in conformity with sound engineering principles, applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules of the Department. It is also agreed that the undersigned, if authorized by the owner, will furnish the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

_____	NA
Signature	Company Name
NA	Address NA
Name (please type)	NA
	NA
(Affix Seal)	Florida Registration No.: NA
	Telephone No:: NA
	Date _____

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

NA	_____
Name & Official Title (Please type or print)	Signature
NA	_____
Telephone No. (area code & No.)	Date Signed

XII-B CERTIFICATIONS FOR PERMIT RENEWALS

This is to certify the engineering features of this pollution control project have been examined by me and found to be in conformity with sound engineering principles, applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules of the Department.

Signature

Gregory M. Powell

Name (please type)

(Affix Seal)

Golder Associates Inc. (Certificate of Authorization No. 1670

Company Name

Address 9428 Baymeadows Road

Suite 400

Jacksonville, FL 32256

Florida Registration No.: 31165

Telephone No:: 904-363-3430

Date 10/7/2009

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Michael W. Kiley, Plant Vice President

Name & Official Title (Please type or print)

Signature

305-246-6113

Telephone No. (area code & No.)

10/9/09

Date Signed

Form 2CS Attachment Summary

Florida Power & Light Company – Turkey Point Plant

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I.A, B, C & D: These internal outfalls discharge to closed-loop cooling canals, which are also an industrial wastewater facility. There is no discharge to waters of the U.S. and no discharge to surface waters of the State. The cooling canals are not lined; therefore, there may be a release to Class G-III groundwater.

IB & C: Latitude and Longitude are not shown for purposes of Homeland Security pursuant to federal regulations found at 18 CFR 388.113(c)(i) and (ii) and by Presidential Directive dated December 17, 2003.

II.A through F: Not Applicable. There is no discharge to waters of the U.S. and no discharge to surface waters of the State.

Page 17

III. A through G: Not Applicable. There is no discharge to waters of the U.S. and no discharge to surface waters of the State.

Page 17

IV.A. See Attachment III.A: FPL Turkey Point Power Plant General Plant Description

IV.A. See Attachment III.A-1: Flow Diagram Turkey Point Fossil Plant Units 1 &2.

IV.A. See Attachment III.A-2: Flow Diagram Turkey Point Nuclear Plant Units 3 & 4.

IV.A. See Attachment III.A-3: Flow Diagram Turkey Point Combined Cycle Plant Unit 5.

IV.A. See Attachment III.A-4: Flow Diagram Turkey Point Nuclear Plant Units 6 & 7.

IV.B. See Attachment III.B-1: Operations Contributing Wastewater to the Internal Outfalls.

IV.B. See Attachment III.B-2: Plant Maintenance Activities, For All Units.

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IV.D See Attachment III.D-1: Practices to Ensure Wastewater Treatment during Power Loss.

IV.E Flows are metered at the water supplies.

Page 20

VII.A, B, & C, Including Tables VII-A, VII-B and VII-C: Zero discharge facility. No point source discharges to waters of the U.S. or surface waters of the State. No discharge point to

groundwater of State. All internal outfalls discharge to closed-loop cooling canals/industrial wastewater facility.

Page 21

VIII. Potential Discharges: The following chemicals are used at the facility for the following purposes:

Continuum AEC3145 and Corrshield MD4100	**Cooling Tower**
Inhibitors AZ8101 and OP8413	**Cooling Tower**
Sulfuric acid	Cooling Tower
Sodium hypochlorite	**Cooling Tower**
Foamtrol AF2290	**Cooling Tower**
Biocides such as Spectrus CT1300 or equivalent	Cooling Tower
Soda ash, polymer, hydrated lime,	**Water Treatment Chemicals**
Betz Dearborn DCL30, Hypersperse MDC120	**Water Treatment Chemicals**
Kleen MCT103 and MCT511	Water Treatment Chemicals
ROClean L212, ROClean L403, ROClean P111, ROClean L811	**RO Membrane Cleaning**
Hydrazine, carbohydrazide, monoethanolamine (EIA)	**Boiler/Steam Gen Blowdown**
Molybdate, Tolytriazole and Nitrite	Aux Equipment Cooling System

A minor revision has been submitted to FDEP to change chemical vendors to supply equivalent products. The revision was approved by FDEP on April 15, 2009 as a minor revision C to Industrial Wastewater Permit Number FL0001562.

FORM

2CG

WASTEWATER APPLICATION FOR PERMIT TO DISCHARGE PROCESS WASTEWATER FROM NEW OR EXISTING INDUSTRIAL WASTEWATER FACILITIES TO GROUND WATER

Facility I.D. Number: FL0001562

Please print or type information in the appropriate areas.

I DISCHARGE LOCATION For each location, list the X,Y coordinates and, where applicable, the name of the land application site.

(latitude/longitude to the nearest 15 seconds)

A. Discharge Location No. (list)	B. Latitude			C. Longitude			D. Name of Land Application
	Deg.	Min.	Sec.	Deg.	Min.	Sec.	
001	NA	NA	NA	NA	NA	NA	These are internal outfalls that discharge
002	NA	NA	NA	NA	NA	NA	to the Closed-loop Cooling Canal System
							No Discharge to Waters of the U.S.

II LAND APPLICATION DESIGN

A. Discharge No.	B. Design Configuration and Construction Materials	C. Cover Crop	D. Application Rate	E. Land Application Area	F. Ground Water
NA	NA	NA	NA	NA	NA

Form 62-620.910(4)
(Effective November 29, 1994)

Facility I.D. Number: FL0001562

III FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES

A. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in Item B. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and discharge points. If a water balance cannot be determined (e.g., for certain mining activities), provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.

B. For each discharge location, provide a description of:

1. All operations contributing wastewater to the effluent; including process wastewater, sanitary wastewater, cooling water, and storm water runoff;

2. The average flow contributed by each operation; and

3. The treatment received by the wastewater.

Use the space below. Continue on additional sheets, if necessary.

(1) Discharge Location No.	(2) Operation(s) Contributing Flow		(3) Treatment		
	(a) Operation (list)	(b) Avg. Flow & Units	(a) Description	(b) List Code from Table 2CG-1	
002	Solids Settling Basin	17,235 gal/day	Sedimentation (Settling)	1-U	
			Chemical Treatment	2-C	
001	Closed-loop Cooling Canals	1.92 MGM	Evaporation/Sedimentation	1-F	1-U
	Unit 5 CT Blowdown	2,444 gpm	Chemical Treatment	2-F, 2-H	2-K
	Unit 5 Wastewater Sump	3,040 gpm	Physical/Chemical Treatment	1-O,1-U	2-K
	Units 6 & 7 Stormwater	No Change	Sedimentation (Settling)	1-U	
NA	Units 6 & 7 Wastewater	25 MGD (est.)	Underground Injection	4-D	

Form 62-620.910(4)
(Effective November 29, 1994)

III Contd.

C. Except for storm runoff, leaks, or spills, are any of the discharges described in Items II-A or B intermittant or seasonal?

☒ Yes (complete the following table) ☐ No (go to D. below)

(1) Outfall # (List)	(2) Operations(s) Contributing Flow (List)	(3) Frequency		(4) Flow				
		(a) Days per Week (specify avg.)	(b) Months per Yr. (specify avg.)	(a) Flow Rate (in mgd)		(b) Total Volume (specify with units)		(c) Duration (in days)
				Long Term Avg	Max. Daily	Long Term Avg.	Max. Daily	
002	Solids Settling Basin	0-7	0-12	0.01724	NA	NA	NA	NA

*For land application systems, also include the Rest Period.

D. Describe practices to be followed to ensure adequate wastewater treatment during emergencies such as power loss and equipment failures causing shutdown of pollution abatement equipment of the proposed/permitted facilities.

E. List the method(s) and location(s) of flow measurement.

IV IMPROVEMENTS

A. Are you now required by any Federal, State or local authority to meet any implementation schedule for the construction, upgrading or operation of wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders, and grant or loan conditions.

☐ Yes (complete the following table) ☒ No (go to Item VI-B)

1. Identification of Condition, Agreement, Etc.	2. Affected Discharge Locations		3. Brief Description of Project	4. Final Compliance Date	
	a. No.	b. Source of Discharge		a. Required	b. Projected
NA	NA	NA	NA	NA	NA

B. OPTIONAL: You may attach additional sheets describing any additional water pollution control programs (or other environmental projects which may affect your discharges) you now have underway or which you plan. Indicate whether each program is now underway or planned, and indicate your actual or planned schedules for construction.

☐ Mark "X" if description of additional control programs is attached.

Form 62-620.910(4)
(Effective November 29, 1994)

Facility I.D. Number: FL0001562

V INTAKE AND EFFLUENT CHARACTERISTICS

A, B, & C: See instructions before proceeding--Complete one set of tables for each discharge location -- Annotate the location number in the space provided. NOTE: Tables V-A, V-B, and V-C are included on separate sheets number V-1 through V-10.

D. Use the space below to list any of the pollutants listed in Table 2CG-3 of the instructions, which you know or have reason to believe is discharged or may be discharged from any outfall. For every pollutant you list, briefly describe the reasons you believe it to be present and report any analytical data in your possession.

1. Pollutant	2. Source	1. Pollutant	2. Source
Dimethyl amine	Boiler/ StmGen Blowdown	NA	NA

VI POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS

Is any pollutant listed in Item V-C a substance or a component of a substance which you currently use or manufacture as an intermediate or final product or by-product?

☐ YES (list all such pollutants below) ☒ NO (go to VII)

NA

VII CONTRACT ANALYSIS INFORMATION

Were any of the analyses reported in Item V performed by a contract laboratory or consulting firm?

☐ YES (list the name, address, telephone number, and certification number of, and pollutants analyzed by each such laboratory or firm below)

☒ NO (go to Section VIII)

A. Name	B. Address	C. Telephone (area code & no.)	D. Pollutants Analyzed (list)
NA	NA	NA	NA

Form 62-620.910(4)
(Effective November 29, 1994)

Facility I.D. Number: FL0001562

VIII CONNECTION TO REGIONAL POTW

A. Indicate the relationship between this project and area regional planning for wastewater treatment. List steps to be taken for this industrial wastewater facility to become part of an area-wide wastewater treatment system.

FPL has been working with Miami-Dade Water and Sewer Department (MDWASD) to make the Turkey Point Plant part of the area-wide wastewater treatment system. Turkey Point Units 6 & 7 will use reclaimed water from MDWASD as makeup water to the circulating water system. When reclaimed water is fully available, the Turkey Point facility may utilize up to 90 MGD. Domestic wastewater generated by the facility will be managed onsite and will not be released to the area-wide wastewater treatment system.

IX-A CERTIFICATIONS FOR NEW OR MODIFIED FACILITIES

This is to certify the engineering features of this pollution control project have been designed by me and found to be in conformity with sound engineering principles, applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules of the Department. It is also agreed that the undersigned, if authorized by the owner, will furnish the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

_____
Signature

NA
Name (please type)

(Affix Seal)

NA
Company Name

Address NA

NA

NA

Florida Registration No.: NA

Telephone No:: _____ Date _____

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

NA
Name (type or print)

NA
Title

NA
Telephone No. (area code & No.)

_____
Signature

_____
Date Signed

Form 62-620.910(4)
(Effective November 29, 1994)

Facility I.D. Number: FL0001562

IX-B CERTIFICATIONS FOR PERMIT RENEWALS

This is to certify the engineering features of this pollution control project have been examined by me and found to be in conformity with sound engineering principles, applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules of the Department.

Signature

Gregory M. Powell
Name (please type)

(Affix Seal)

Golder Associates Inc. (Certificate of Authorization No. 1670)
Company Name

Address 9428 Baymeadows Road

Suite 400

Jacksonville, FL 32256

Florida Registration No.: 31165

Telephone No:: 904-363-3430 Date 10/7/2009

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Michael W. Kiley
Name (type or print)

Signature

Plant Vice President
Title

10/9/09
Date Signed

305-246-6113
Telephone No. (area code & No.)

Form 62-620.910(4)
(Effective November 29, 1994)

Form 2CG Attachment Summary

Florida Power & Light Company – Turkey Point Plant

Page 14

I.A, B, C & D: These internal outfalls are routed to closed-loop cooling canals, which are also an industrial wastewater facility. There are no point source discharges to waters of the U.S. and no discharge to surface waters of the State. The cooling canals are not lined; therefore, there may be a release to Class G-III groundwater.

1B & C: Latitude and Longitude are not shown for purposes of Homeland Security pursuant to federal regulations found at 18 CFR 388.113(c)(i) and (ii) and by Presidential Directive dated December 17, 2003.

II.A, B, C, D, E & F: There is no Land Application at this facility and no discharge point to groundwater. The groundwater is Class G-III.

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III.A. See Attachment III.A: FPL Turkey Point Power Plant General Plant Description

III.A. See Attachment III.A-1: Flow Diagram Turkey Point Fossil Plant Units 1 &2.

III.A. See Attachment III.A-2: Flow Diagram Turkey Point Nuclear Plant Units 3 & 4.

III.A. See Attachment III.A-3: Flow Diagram Turkey Point Combined Cycle Plant Unit 5.

III.A. See Attachment III.A-4: Flow Diagram Turkey Point Nuclear Plant Units 6 & 7.

III.B. See Attachment III.B-1: Operations Contributing Wastewater to the Internal Outfalls.

III.B. See Attachment III.B-2: Plant Maintenance Activities, For All Units.

Page 16

III.D See Attachment III.D-1: Practices to Ensure Wastewater Treatment during Power Loss.

III.E Flows are metered at the water supplies.

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V.A, B, & C, Including Tables V-A, V-B and V-C: Zero discharge facility. No point source discharges to waters of the U.S. or surface waters of the State. No discharge point to groundwater of State. All internal outfalls are routed to closed-loop cooling canals/industrial wastewater facility.

VI. Potential Discharges: The following chemicals are used at the facility for the following purposes:

Continuum AEC3145 and Corrshield MD4100	Cooling Tower
Inhibitors AZ8101 and OP8413	Cooling Tower
Sulfuric acid	**Cooling Tower**
Sodium hypochlorite	**Cooling Tower**
Foamtrol AF2290	Cooling Tower
Biocides such as Spectrus CT1300 or equivalent	**Cooling Tower**
Soda ash, polymer, hydrated lime,	Water Treatment Chemicals
Betz Dearborn DCL30, Hypersperse MDC120	Water Treatment Chemicals
Kleen MCT103 and MCT511	**Water Treatment Chemicals**
ROClean L212, ROClean L403, ROClean P111, ROClean L811	**RO Membrane Cleaning**
Hydrazine, carbohydrazide, monoethanolamine (EIA)	Boiler/Steam Gen Blowdown
Molybdate, Tolytriazole and Nitrite	**Aux Equipment Cooling System**

A minor revision has been submitted to FDEP to change chemical vendors to supply equivalent products. The revision was approved by FDEP on April 15, 2009 as a minor revision C to Industrial Wastewater Permit Number FL0001562.

Form 2CG ATTACHMENT III.A.

FLORIDA POWER & LIGHT COMPANY

TURKEY POINT POWER PLANT

GENERAL PLANT DESCRIPTION

Florida Power & Light Company (FPL) Turkey Point Plant is located adjacent to Biscayne Bay at 9760 S.W. 344th Street, Florida City, Florida 33035. The Turkey Point plant property covers approximately 11,000 acres (Form 1-XI Attachment).

The existing facility consists of five electrical generating units: Two oil/natural gas-fired units (Units 1 and 2), two nuclear units (Units 3 and 4) and one natural gas-fired combined cycle unit (Unit 5). The two 400-MW (nominal) oil/natural gas-fired electric generation units have been in service since 1967 (Unit 1) and 1968 (Unit 2). These units currently burn residual fuel oil and/or natural gas with a maximum equivalent sulfur content of one (1) percent. The two 700-MW (nominal) nuclear units have been in service since 1972 (Unit 3) and 1973 (Unit 4). Construction, design, and operational aspects are essentially the same for both nuclear units.

Units 1 through 4 obtain their once-through condenser cooling water from, and release to, a closed-loop cooling canals/industrial wastewater facility. Process water for Units 1 and 2 is obtained from the Upper Floridan Aquifer and/or from MDWASD. Units 3 and 4 obtain process water from MDWASD.

Unit 5 is a natural gas-fired combined cycle power plant with a generating capacity of 1150-MW (nominal). Turkey Point Unit 5 began operation in 2007. Unit 5 uses cooling towers and obtains cooling water from Upper Floridan Aquifer wells. Process water is obtained from Upper Floridan wells and/or from MDWASD. Unit 5 wastewater is discharged to the closed-loop cooling canals/industrial wastewater facility.

The Turkey Point plant property includes 5,900-acres closed-loop cooling canal system that serves Units 1 through 4 for cooling and Units 1 through 5 as an industrial wastewater facility. There are no point source discharges to waters of the United States, or to surface waters of the State from the plant site.

Wastewater generated by the existing Turkey Point Plant (Units 1 through 5) consists of non-contact once through condenser cooling water (OTCW), auxiliary equipment cooling water (AECW), cooling tower blowdown, low-volume waste (LVW) and stormwater. LVW consists of chemical treatment system wastewater, boiler blowdown, heat recovery steam generator blowdown, reverse osmosis concentrate, condensate polishing system backwash water and other process wastestreams. Stormwater includes stormwater associated with industrial activity and stormwater not associated with industrial activity. LVW, equipment area stormwater and non-equipment area stormwater/drainage is released either directly to the onsite closed-loop

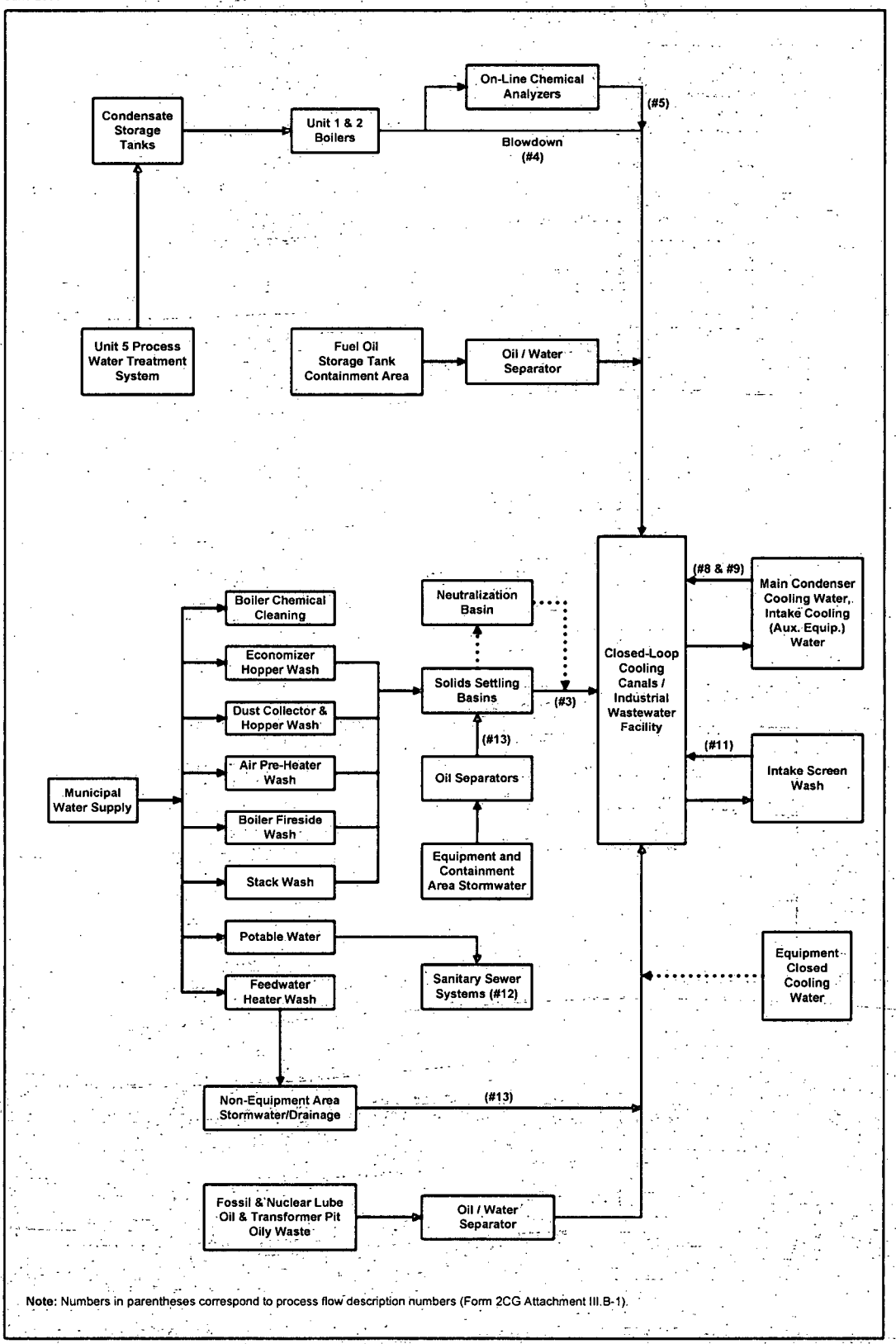
cooling canal system or indirectly to the same system after treatment via oil/water separator, solids settling basin and/or neutralization basin. The closed-loop cooling canal system does not discharge to surface waters of the state.

Two new nuclear units (Units 6 & 7), with in-service dates of 2018 and 2020, are proposed for the FPL Turkey Point Plant. Units 6 & 7 will contribute approximately 2,200 MW (net) of new generation to FPL's system. The Units 6 & 7 Site will be south of the existing Unit 4, within the closed-loop cooling canal system/industrial wastewater facility, on approximately 300 acres. Water for these units will be obtained from a reclaimed water supply, a saline water supply, and a potable water supply. The circulating water system will use mechanical draft cooling towers. Reclaimed water from MDWASD will be used as makeup water to the circulating water system. When reclaimed water is not available in sufficient quantity, saltwater from radial collector wells will be used as makeup for the circulating water system.

Potable water will be used as makeup water for the service water system. The potable water supply will also provide water to the potable water system, fire protection system, demineralized water treatment system and other miscellaneous uses. Cooling tower blowdown and other site wastewater streams will be collected in a common blowdown sump and injected through deep injection wells. The deep injection wells will meet the requirements established by the Florida Department of Environmental Protection (FDEP) (Rule 62.528, F.A.C.), and the underground injection control program permit. The only operational discharge from the Units 6 & 7 Site to the closed-loop cooling canal system will be stormwater.

Stormwater from the Units 6 & 7 Site and the associated nuclear administration building, training building and parking area, which is adjacent to the industrial wastewater facility, will continue to be released to the industrial wastewater facility.

A separate stormwater management system will be designed and constructed for the FPL reclaimed water treatment facility and the radial collector well area. All other wastewater generated by the operation of Units 6 & 7 will be released through the deep injection wells.



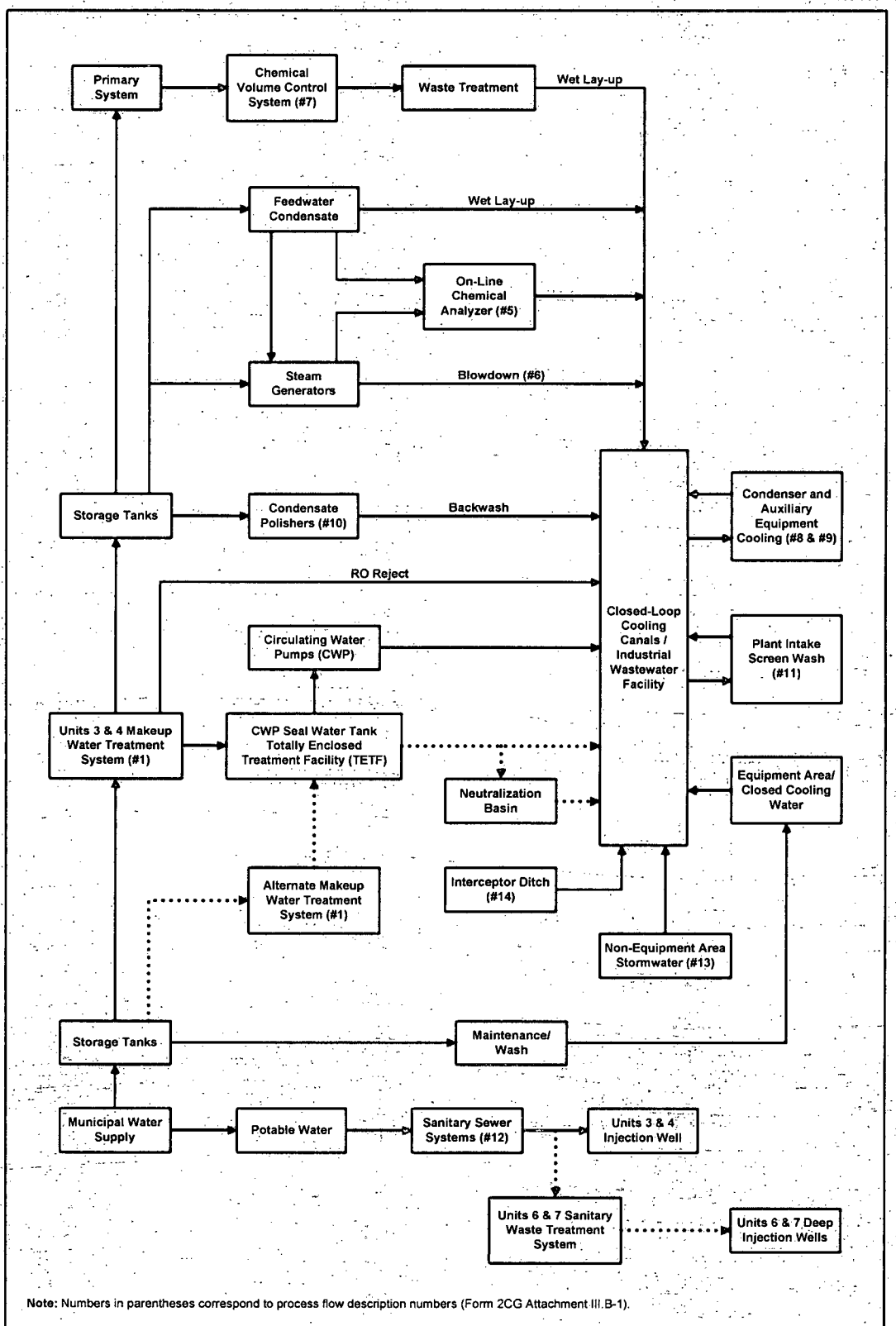
Note: Numbers in parentheses correspond to process flow description numbers (Form 2CG Attachment III.B-1).

Flow Diagram Units 1 and 2
Attachment III.A-1

Flow diagrams.vsd/Units 1 & 2

Legend
Regular Path
Alternate Path

FPL



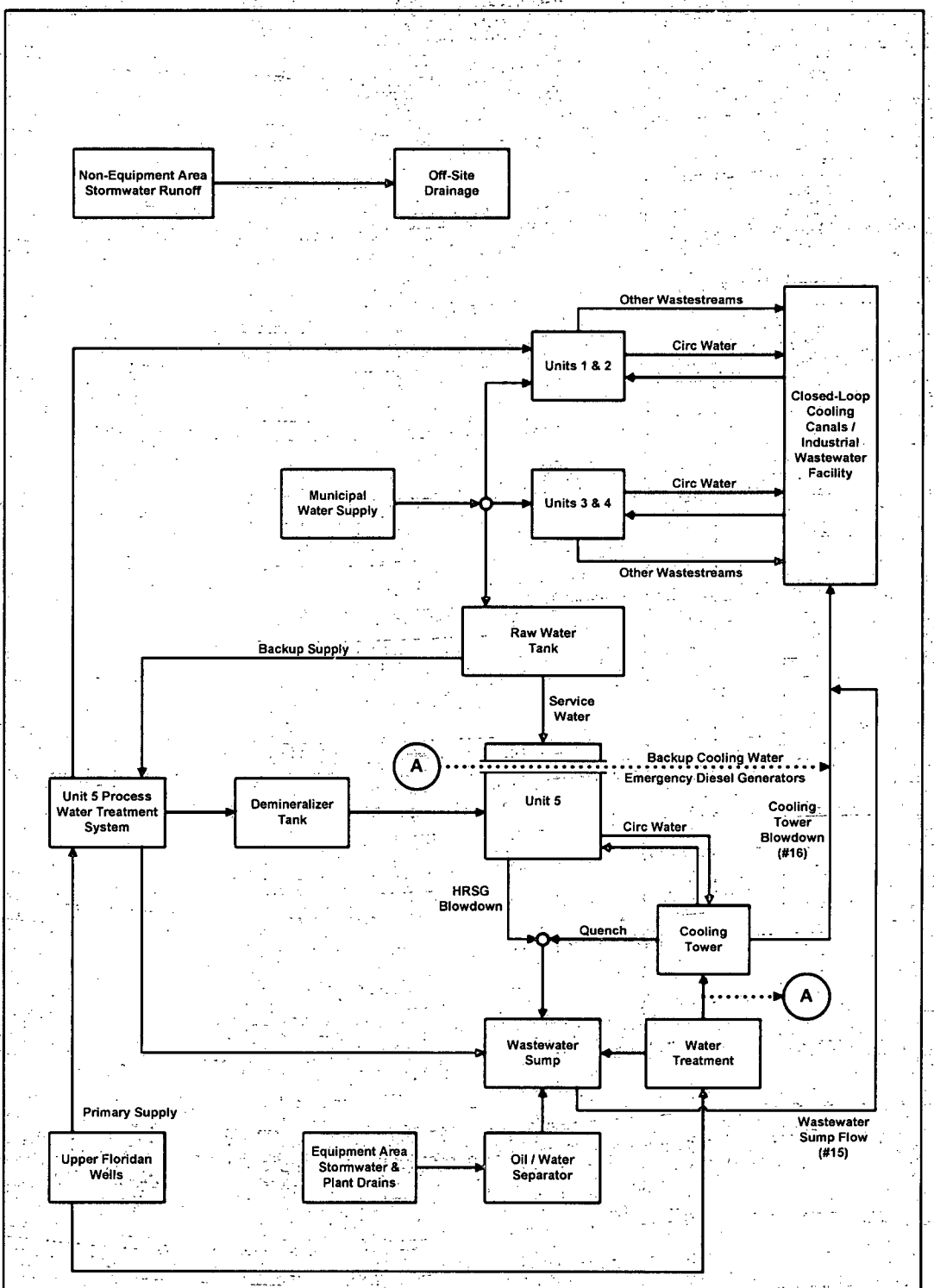
Note: Numbers in parentheses correspond to process flow description numbers (Form 2CG Attachment III.B-1).

Flow Diagram Nuclear Units 3 and 4
Attachment III.A-2

Flow diagrams.vsd/Units 3 & 4

Legend
Regular Path
Alternate Path

FPL



A = Backup cooling water system for emergency diesel generators

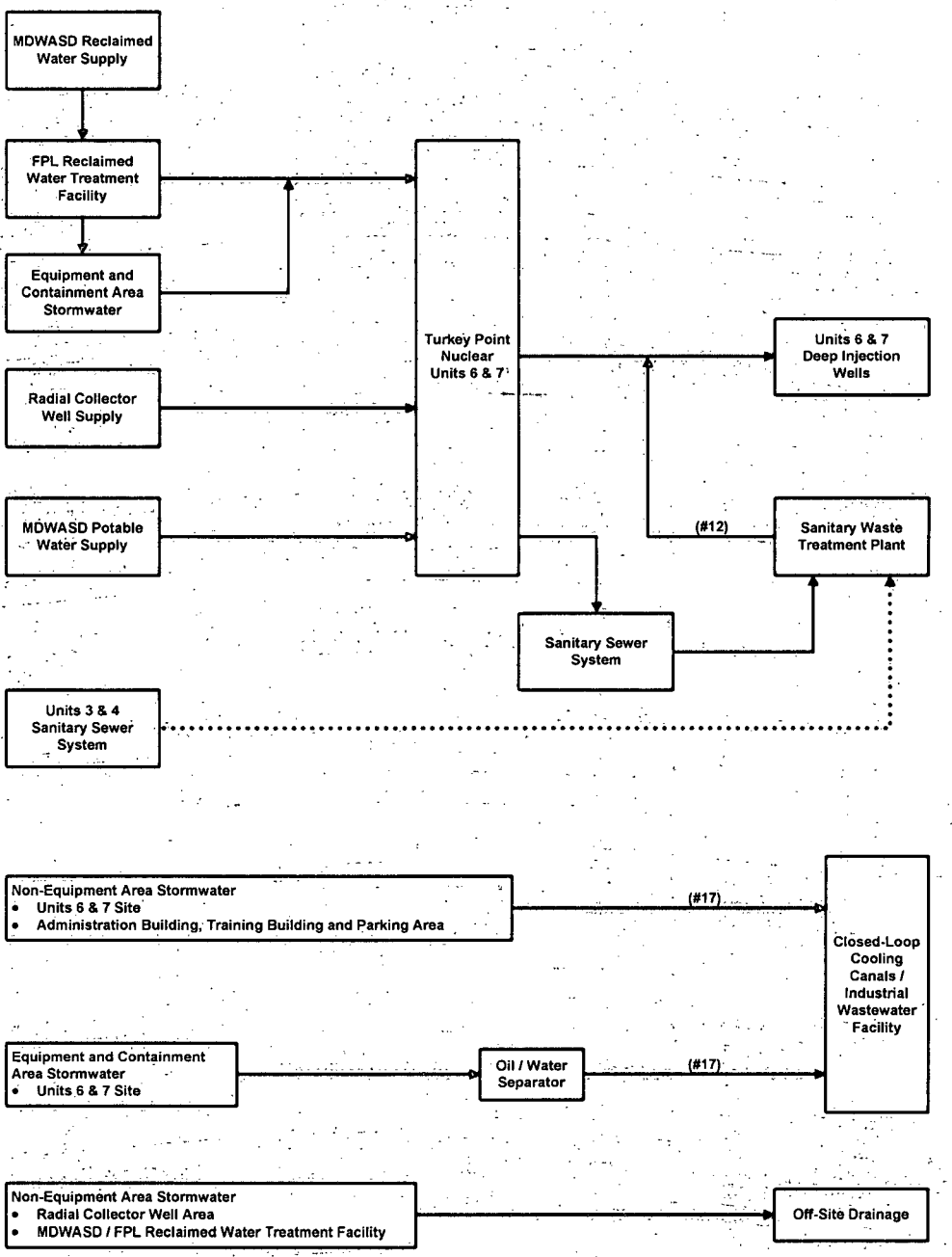
Note: Numbers in parentheses correspond to process flow description numbers (Form 2CG Attachment III.B-1).

Flow Diagram Combined-Cycle Unit 5
Attachment III.A-3

Flow diagrams.vsd/Unit 5

Legend
Regular Path
Alternate Path

FPL



MDWASD = Miami-Dade Water and Sewer Department

Note: Numbers in parentheses correspond to process flow description numbers (Form 2CG Attachment III.B-1).

Flow Diagram Nuclear Units 6 & 7
Attachment III.A-4

Flow diagrams.vsd/Units 6 & 7

Legend
Regular Path
Alternate Path

FPL

Form 2CG Attachment III.B-1
OPERATIONS CONTRIBUTING WASTEWATER TO THE INTERNAL OUTFALLS FROM ALL UNITS

Production Related Activities

Major processes and associated Units at the Turkey Point power plant, which generate wastewater as a function of steam production to generate electricity, are as follows:

Major Process	Associated Units
1. Unit 3 & 4 Make-up Water Treatment System	Nuclear
2. Boiler Make-up Water Treatment System	Fossil & Unit 5 CC
3. Combustion By-Products	Fossil
4. Boiler and HRSG Blowdown	Fossil & Unit 5 CC
5. On-line Chemical Analyzer Waste	All Units
6. Steam Generator Blowdown	Nuclear
7. Chemical Volume Control System	Nuclear
8. Main Condenser Cooling Water System	Fossil & Nuclear
9. Auxiliary Equipment Cooling Water System	Fossil & Nuclear
10. Condensate Polishers	Nuclear
11. Plant Intake Screen Wash	Fossil & Nuclear
12. Sanitary Sewer Systems	Fossil & Nuclear
13. Stormwater	Fossil, Nuclear & Unit 5 CC
14. Interceptor Ditch	All Units
15. Wastewater Treatment System	Unit 5 CC
16. Cooling Tower Blowdown	Unit 5 CC
17. Stormwater	Units 6 & 7 Nuclear
18. Wastewater	Units 6 & 7 Nuclear

1. Unit 3 & 4 Make-up Water Treatment System (Nuclear)

Municipal water is passed through a vendor-supplied water treatment system consisting of activated carbon filters for the removal of organic and inorganic suspended solids. The filtered water then passes through a reverse osmosis unit to remove total dissolved solids and silica. This is followed by a forced draft aerator for the removal of carbon dioxide. Subsequently, hydrazine is added to the influent for the deoxygenating purposes. This is then passed through an activated carbon media to catalyze the reaction, and then further treated by ion exchange bed to remove any carbon impurities or hydrazine overfeed. The effluent is further purified via a mobile flow demineralizer that removes cations and anions. The final purification involves the passing of the mixture through a cation/anion polishing mixed bed. The treated water is typically directed into storage tanks for use in the nuclear units.

All regenenerations of the resin beds are performed off-site at the vendors' service center.

The carbon filters are backwashed with municipal water to remove trapped suspended solids previously filtered from the process water. The backwash water is discharged to the closed-loop cooling canals.

It is necessary to inject sulfuric acid to the influent of the reverse osmosis unit to reduce the pH to between 6.0 standard units (s.u.) and 8.5 s.u. This maintains the solubility of the calcium carbonate that is used in the reverse osmosis unit. The reject water from this process will have a pH of between 6.0 s.u. and 8.5 s.u. and is discharged to the closed-loop cooling canals.

Alternate Make-up Water Treatment System

Municipal water is passed through a coagulator and a fine sand filter to remove suspended solids and then passed through activated carbon filters for additional removal of organic and inorganic suspended solids. The softened, filtered water is further purified by passing through a cation resin bed where cations such as sodium (Na), magnesium (Mg), and calcium (Ca) are removed, and then through an anion resin bed where anions such as sulfate (SO_4) and Chlorides (Cl) are removed. Finally, it passes through a polishing mixed bed containing both cation and anion resins.

After a period of use, the anion and cation resins become exhausted and must be returned to their original adsorptive capacity (regenerated). Cation resins are regenerated with 5% H_2SO_4 (sulfuric acid) where the H^+ replaces the cations exchanged by the resins during the demineralization process. The anion resin bed is regenerated with 5% NaOH (sodium hydroxide), where OH^- replaces anions exchanged by the resin during regeneration.

The sand and carbon filters are backwashed with municipal water to remove trapped suspended solids previously filtered from the process water.

Corrosive anion and cation regenerant waste (**pH $\leq$ 2.0 s.u. or $\geq$12.5 s.u.) is sent to a** totally enclosed treatment facility where the pH is adjusted to a range of between >2.0 s.u. to <12.5 s.u. This wastewater is routed to the neutralization basin where, if **necessary, the pH is adjusted to** $\geq$ 6.0 s.u. to $\leq$ 8.5 s.u. and then discharged to the closed-loop cooling canal system. Alternatively, the wastewater can be discharged to the closed-loop cooling canal system after the pH has been adjusted to > 6.0 s.u. to < 8.5 s.u.

2. **Boiler Make-up Water Treatment System (Fossil & Unit 5 CC)**

Boiler make-up for Units 1 & 2 is supplied by the Unit 5 Process Water Treatment System. The primary supply source is from Floridan aquifer wells, with backup from the municipal water supply.

3. **Combustion By-Products (Fossil)**

All combustion by-products waste streams from Units 1 and 2 are sent to B2 and B3 Solids Settling Basins for treatment. B2 Basin dimensions are 170 ft x 50 ft x 7.8 ft and it is a lined basin. B3 Basin dimensions are 170ft x 50 ft x 7.8 ft and the basin is lined. Soda ash and citric acid are the chemicals used in the treatment of the solids settling basins. The supernatant is discharged to the closed-loop cooling canal system or alternatively routed to the neutralization basin prior to discharge through Internal Outfall 002.

A carbon re-injection system provides a means for collecting carbon and unburned by-products of combustion in the flue gases. This carbon residue is recycled back into the boiler fire to maximize the use of combustion material. The resulting fly ash and slag contain various non-combustible compounds that are sluiced to one of the two solids settling basins. Combustion residue is also accumulated during various maintenance functions. Supernatant from the solids settling basins is treated with citric acid or soda ash, if needed, to adjust pH to proper limits prior to discharging to the closed-loop cooling canals. Ash is sent to a filter press and disposed of in accordance with state and federal regulations.

Economizer Hopper Wash (Fossil)

The economizer section of the boiler collects combustion by-products during plant operations, resulting in slag formation. Periodically, the interior surface of the economizer hopper is washed. This washing typically is performed daily or as needed. The wash water is discharged to one of two on-site settling basins. The supernatant from these basins is discharged to the closed-loop cooling canals. Prior to discharge, the waste stream undergoes pH adjustments.

Air Preheater Wash (Fossil)

Air preheaters operate in an atmosphere near the dewpoint of boiler exit gas. Since there is some deposition of sulfuric compounds on the preheater surface, wash water is typically acidic. Air preheaters are washed with water on an as needed basis and usually followed by rinsing with water. The air preheater waste effluent is routed to, and treated in, one of two solids settling basins.

Stack Wash (Fossil)

Each stack is washed approximately every five years to remove combustion products, which adhere to the interior stack surfaces. The stack wash is discharged to one of two solids settling basins. Supernatant from these basins is discharged to the closed-loop cooling canals.

Dust Collector and Dust Collection Hopper Wash (Fossil)

Particulate materials collected by the dust collectors falls into dust collector hoppers and are injected into the boiler for re-burning, or is sluiced to one of the solids settling basins. At present, the collectors and hoppers are routinely washed. However, if clogging occurs, the appropriate section may be taken apart and the loose ash removed. The ash is caught within a curbed area and is sluiced to one of two solids settling basins. Supernatant from these basins is discharged to closed-loop cooling canals.

Boiler Fireside Wash (Fossil)

Boiler fireside washing is typically performed once per year per unit or as needed. The high-pressure wash water is utilized to clean combustion products deposited on boiler tubes during operation. This system is designed to pump the boiler fireside waste water to one of two solids settling basins. Supernatant from these basins is discharged to the closed-loop cooling canals.

4. **Boiler & HRSG Blowdown (Fossil & Unit 5 CC)**

High purity water generated by the plants' water treatment system for Units 1,2 and 5 is used for makeup to the boiler/HRSG water/steam cycle. During the continual vaporization of water occurring in the boiler, dissolved solids build up in the boiler water and must be controlled by the boiler blowdown.

Two forms of sodium phosphate are added to the boiler water for control of calcium and magnesium scaling. Ammonium hydroxide is added for feedwater pH control. Hydrazine is added for dissolved oxygen removal. Undesirable boiler water contaminants such as Cl^- and silica can be introduced from condenser tube leaks resulting in contamination of the boiler water. When dissolved solids reach unacceptable levels they must be reduced by boiler blowdown. Boiler blowdown is taken from the bottom of the steam drum, which contains such contaminants as silica, sodium phosphate dissolved solids, calcium or magnesium phosphate sludge, and metals such as copper and iron. Some of the boiler blowdown flashes into steam and discharges into the atmosphere. The remaining liquid portion of the boiler blowdown is routed to the closed-loop cooling canals.

5. **On-Line Chemical Analyzer Waste (All Units)**

A very low volume of sample water is diverted from various locations within the steam cycle to online chemical analyzers to test water chemistry. A very small quantity of chemical effluent from these analyzers is discharged to the closed-loop cooling canals along with the blowdown.

6. **Steam Generator Blowdown (Nuclear)**

High purity water generated by the plants' make-up water treatment system is routed via storage tanks to the condensers for makeup to the water/steam cycle. Advanced

amines such as ammonium hydroxide, ethanolamine (ETA) and dimethylamine (DMA) or equivalent are added for pH and corrosion control and hydrazine or equivalent for dissolved oxygen removal. Strict operating specifications require that suspended and dissolved solids be removed from steam generator water by continuous steam generator blowdown. This blowdown is routed to the closed-loop cooling canals.

During overhauls and/or refueling outages the steam generators, feedwater systems, and/or condensers may be placed in a static mode where the internal metal surfaces of these components must be protected from corrosion. The typical method used is to fill the system with a hydrazine/carbohydrazine/amerzine ammonia/demineralized water solution. This solution has a pH range of 9.0 s.u. to 10.5 s.u. and usually contains less that 300 ppm hydrazine. Approximately 1,000,000 gallons of this solution may be discharged to the closed-loop cooling canals following each overhaul or refueling outage. Testing in the discharge canal for hydrazine concentrations, following the discharges, has shown hydrazine values to be less than 10 ppb.

7. **Chemical Volume Control System (Nuclear)**

This waste stream originates from various maintenance and operational activities, which take place within the Reactor Auxiliary Building. Discharges from the Chemical Volume Control System are intermittent, and are strictly regulated by the Atomic Energy Act and the Nuclear Regulatory Commission.

8. **Main Condenser Cooling Water System (Fossil and Nuclear)**

Condenser cooling water for Units 1 through 4 is withdrawn from the closed-loop cooling canal system through two intake canals on the east side of the units. The waste heat from the steam condensation is transferred to the cooling water in the condensers which discharge back to the closed-loop cooling canal system on the west side of the units. With all 12 circulating water pumps operating the cooling water flow is rated at 1,800,000 gpm.

9. **Auxiliary Equipment Cooling Water System (Fossil and Nuclear)**

An additional 120,000 gpm of water from the closed-loop cooling canal system is used to cool, via heat exchangers, the closed component cooling water system for Units 1 through 4. Actual equipment cooling is accomplished by aqueous molybdate-nitrite-tolytriazole (TTA) solution that is re-circulated through the various pieces of equipment to be cooled and then through the aforementioned heat exchangers. Sodium hydroxide and nitric acid may be added for pH control.

10. Condensate Polishers (Nuclear)

The condensate polishers are utilized during the operation of Units 3 and 4. Backwash water from this system is discharged to a holding tank, then to a filtration/resin collection system prior to being discharged to the closed-loop cooling canals. Flow from this system is intermittent. This effluent may contain small amounts of powdered resin.

11. Intake Screen Wash (Fossil and Nuclear)

Periodically, it is necessary to clean the traveling screens associated with the intake cooling water pumps to prevent debris from reaching the condensers. Cooling canal water is pumped through spray nozzles to clean the screens and then the wash stream is returned to the canal system via a debris screen at the intake area or to the discharge canal.

12. Sanitary Sewer (Fossil and Nuclear)

Sanitary waste from showers, water closets, toilets, etc. is routed to county approved on-site septic systems for the fossil and land management facilities.

The nuclear units' domestic wastewater is routed to an on-site county and state approved, contact stabilization sewage treatment plant. Effluent from this treatment plant is discharged to an on-site, approved, underground injection well. Wastewater residuals generated by this plant are transported to an approved offsite facility.

When Units 6 & 7 sanitary waste treatment system and deep injection wells are operational, sanitary waste from Units 3 & 4 will be routed to the new system and the Units 3 & 4 sanitary system will no longer be used.

13. Stormwater (Fossil, Nuclear and Unit 5 CC)

Non-Equipment Area Stormwater runoff for Units 1 through 4 collects in drainage channels and floor drains, then typically through a series of stormwater catch basins before being released to the closed-loop cooling canals. Non-Equipment Area Stormwater for Unit 5 is routed to a stormwater detention basin and released to local drainage.

Equipment and Containment Area Stormwater floor drains typically receive small amounts of particulate material, lubricating and fuel oils. The Equipment and Containment Area Stormwater drains, which can receive oil, are routed to oil/water separators then to the Solids Settling Basins prior to being discharged to the closed-loop cooling canal system.

14. Interceptor Ditch (All Units)

The Interceptor Ditch restricts inland movement of closed cooling canal water by maintaining a seaward groundwater gradient during times when a natural seaward gradient does not exist. Normally, during the wet season (June - November) and the early part of the dry season, a natural seaward gradient does exist. During the rest of the year, however, it may be necessary to artificially generate a seaward gradient by pumping water out of the Interceptor Ditch to the cooling canal.

15. Wastewater Treatment System (Unit 5 Combined Cycle)

The Unit 5 wastewater treatment system effluent includes cooling water and process water treatment system effluent, HRSG blowdown, quench water from the cooling towers, equipment area stormwater and plant drains. Equipment area stormwater is routed to an oil/water separator and then to the wastewater solids settling /neutralization basin (sump). The other waste streams are collected in the sump before discharge to the closed-loop cooling canals/industrial wastewater facility.

16. Cooling Tower Blowdown (Unit 5 Combined Cycle)

Blowdown from the Unit 5 cooling towers is released to the closed-loop cooling canals/industrial wastewater facility. Unit 5 obtains cooling water from the Upper Floridan. Under rare conditions, if power is lost to the cooling towers, cooling water will be diverted from the cooling towers and used to cool emergency diesel generators using a once-through non-contact cooling system. The cooling water will then be discharged to the closed-loop cooling canals/industrial wastewater facility.

17. Stormwater (Units 6 & 7)

Stormwater is the only operational release from Turkey Point Units 6 & 7 to the closed-loop cooling canal system. All other wastewater from these units is discharged through the deep injection wells.

Non-equipment area stormwater runoff from the plant will collect in drainage channels and floor drains, and then will typically flow through stormwater catch basins before being released directly to the closed-loop cooling canals/industrial wastewater facility.

Equipment and containment area stormwater floor drains typically receive small amounts of particulate material, lubricating and fuel oils. The Equipment and Containment Area Stormwater drains, which can receive soil/oil, are routed to oil/water separators then to solids settling basins prior to being released to the closed-loop cooling canals/industrial wastewater facility.

Non-equipment area storm water runoff from the Reclaimed Water Treatment Facility and the Radial Collector Well area will be released to off-site drainage. Equipment and containment area stormwater from the Reclaimed Water Treatment Facility will be routed back into the process flow.

18. Wastewater (Units 6 & 7)

All wastewater from Units 6 & 7, except for stormwater, will be routed to the deep injection wells that will be permitted through, and will meet the requirements of, the Underground Injection Control Program.

Form 2CG Attachment III.B-2
IDENTIFICATION OF PLANT MAINTENANCE ACTIVITIES FOR ALL UNITS

Maintenance Process	Associated Units
1. Boiler Waterside Chemical Cleaning	Fossil
2. Boiler Cold/Wet Lay-up	All Units
3. Equipment Area Routine Cleaning	All Units
4. Feedwater Heater Wash	Fossil
5. Equipment Closed Cooling Water Systems Maintenance	Fossil and Nuclear

1. Boiler Waterside Chemical Cleaning (BCCM) - Fossil

Boiler water tube internal surfaces are typically cleaned every 5-10 years. These cleanings are performed to remove inorganic scale and metal oxides that are deposited on the ID of the tube surfaces. The cleaning solvents of choice (in order of preference) are Tetraammonium Ethylenediaminetetraacetate (or Tetraammonium EDTA), Diammonium EDTA, Diammonium Citrate (byproduct is citric acid), or a similar type material. After completion of the boiler cleaning, the spent solution (known as boiler chemical cleaning material or BCCM) and subsequent rinses are collected into a series of temporary 20,000-gallon storage tanks (Frac Tanks). These tanks are connected to each other through a common manifold. A hazardous waste determination is then performed on a representative number of tanks as determined by the Waste Analysis Plan. BCCM that is determined to be non-hazardous is evaporated on site in an operational boiler in accordance with the applicable air permit stipulations. In some cases, non-hazardous waste may be disposed off-site in approved wastewater disposal facility. BCCM that is determined to be hazardous (very infrequent) will typically be disposed of off-site at a permitted waste facility.

2. Boiler Cold/Wet Lay-up

During plant overhauls the boilers, feedwater systems and/or condensers may be placed in a static mode where the internal metal surfaces of these components need to be protected against surface corrosion. The typical method to protect this equipment is through the use of ammoniated demineralized water solution. Ammonium Hydroxide is added to ultra pure water to raise the pH to above 9.0 s.u. In some cases where dissolved oxygen may risk damaging the metal components, a small amount of hydrazine may also be used. This water remains in place until system start-up and operation. In some cases, the ammoniated water will be drained and sent to the closed-loop cooling canal system.

3. **Equipment Area Routine Cleaning (All Units)**

Equipment area floor drains typically receive small amounts of particulate material, lubricating and fuel oils, as well as wash water and stormwater. Equipment area drains, which can receive oil, are routed to oil/water separators prior to being discharged to the closed-loop cooling canals.

4. **Feedwater Heater Wash (Fossil)**

After a unit overhaul, typically each of the five (5) low pressure feedwater heaters will be flushed with condensate water. The wastewater will go through the storm drains and be discharged to the closed-loop cooling canals. The condensate wastsewater will have low levels of silica, chloride, phosphate, calcium, and magnesium.

5. **Equipment Closed Cooling Water Systems Maintenance (Fossil and Nuclear)**

Molybdates, nitrites, and tolyltriazoles for corrosion control are used in Plant equipment closed cooling water systems, such as the Component Cooling Water System, the Turbine Plant Cooling Water System, air conditioning coolant systems, the cooling jackets of diesel driven pumps and compressors coolant systems. During routine maintenance of this equipment water is discharged to the close-loop cooling canals.

The nuclear plant's closed cooling water systems are infrequently treated with the biocide, gluteraldehyde or isothiazolin to prevent biological corrosion. However, the biocides are not discharged to the closed-loop cooling canal system.

STORMWATER MANAGEMENT PLAN AND CALCULATIONS

Submitted by:

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10.8 Stormwater Management and Calculations

Appendix 10.8 demonstrates that the surface water management systems for the Turkey Point Site and associated non-linear facilities will be designed to meet all applicable requirements. This analysis utilizes a 25-year, 72-hour design storm (12.6 inches) as required by applicable regulations.

The Site stormwater management system is designed to release stormwater runoff into the existing industrial wastewater facility. The stormwater runoff from the nuclear administration building, training building, and parking area will also be released to the industrial wastewater facility. The industrial wastewater facility currently has sufficient capacity and will not be impacted by Turkey Point Units 6 & 7 during the post-development condition.

All stormwater associated with industrial activity from the FPL reclaimed water treatment facility (equipment area runoff) will be captured, treated as necessary and reused within the reclaimed water treatment process. Runoff from other areas (non-equipment areas) will be routed to stormwater management facilities and released to local drainage. The surface water management system will be designed to meet all applicable requirements.

10.8.1 Stormwater Runoff Calculation

This section examines the changes in stormwater runoff in the post-development condition of the Turkey Point Units 6 & 7 plant area and laydown area (Turkey Point Site); nuclear administration building, training building, and parking area; and FPL reclaimed water treatment facility. The runoff volumes into the industrial wastewater facility at existing conditions are calculated and compared to the runoff volumes at post-development conditions. The runoff volume from the FPL reclaimed water treatment facility at existing conditions to the surrounding area is calculated and compared to the runoff volume at post-development conditions. In addition, applicable stormwater detention and discharge criteria and management practices for the FPL reclaimed water treatment facility are discussed.

10.8.1.1 Runoff Volume at Turkey Point Site

The Site is located south of the existing Turkey Point Units 3 and 4 and within the northeast portion of the existing industrial wastewater facility as shown in Figure 1. The Site includes the

plant area and the laydown area to the west of the plant area across the west return canal of the industrial wastewater facility. The plant area is approximately 218 acres, and the laydown area is approximately 51.9 acres. The total area of the Site used for stormwater analysis is 269.9 acres.

Runoff Volume at Existing Condition

Stormwater runoff from the Site currently drains to the existing industrial wastewater facility and will continue to do so during operation of Units 6 & 7. The sub-basin area of the Site is shown in Table 1 (Reference 1).

Table 1: Sub-basin Area of Units 6 & 7 Site at Existing Condition

Sub-basin	Sub-basin Area		
	sq. ft	acres	sq. mi.
Site	11,756,844	269.90	0.422

Hydrologic soil groups are used to determine the runoff curve numbers (CN). The soil survey for the plant area of Miami-Dade County as presented by United States Department of Agriculture (USDA) is shown in Figure 2 (Reference 2).

Map units 31 and 32 in Figure 2 indicate Pennsuco marl (tidal) and Terra Ceia muck (tidal), respectively (Reference 2), as listed in Table 2. These are the soil types that make up the plant area. Pennsuco marl is deep, nearly level, very poorly drained soil, and is subject to tidal flooding. Under natural conditions, Pennsuco marl remains saturated and the water table fluctuates with the tides. The soil is moderately saline or saline. Permeability is moderately low. Terra Ceia muck (tidal) is deep, level, very poorly drained soil in saltwater swamps and marshes, and is subject to tidal flooding. Under natural conditions, the Terra Ceia remains saturated (Reference 2).

Table 2: Index to Soil Survey Map Units

Soil Legend	
2	Biscayne gravelly marl, drained
3	Lauderhill muck, depressional
4	Pennsuco marl, drained
5	Pennsuco marl
6	Perrine marl, drained
7	Krome very gravelly loam
9	Udorthents-water complex
10	Udorthents, limestone substratum-Urban land complex
11	Udorthents, marl substratum-Urban land complex
12	Perrine marl
13	Biscayne marl
14	Dania muck, depressional
15	Urban land
16	Biscayne marl, drained
18	Tamiami muck, depressional
20	Cardsound-Rock outcrop complex
22	Opalocka-Rock outcrop complex
23	Chekika very gravelly loam
24	Matecumbe muck
25	Biscayne-Rock outcrop complex
26	Perrine marl, tidal
28	Demory-Rock outcrop complex
30	Pahokee muck, depressional
31	Pennsuco marl, tidal
32	Terra Ceia muck, tidal
33	Plantation muck
34	Hallandale fine sand
35	Margate fine sand
37	Basinger fine sand
38	Rock outcrop-Vizcaya-Biscayne complex
39	Beaches
40	Pomello sand
41	Dade fine sand
42	Udorthents, limestone substratum, 0 to 5 percent slopes
45	Canaveral sand
47	St. Augustine sand
48	Kesson muck, tidal

Terra Ceia muck is classified as hydrologic soil group or type B/D according to USDA's Technical Release (TR)-55 indicating that drained Terra Ceia muck is in Type B and the undrained Terra Ceia muck is in type D (Reference 3). Type B soils have moderate infiltration rates when thoroughly wetted and consist mainly of moderately deep to deep, moderately well to well drained soils with moderately fine to moderately coarse textures. Type D soils have high runoff potential. They have low infiltration rates when thoroughly wetted and consist of clay soils with a permanent high water table. High water table may cause a drainage problem, and some soils in areas of high water table may be classified as type D (Reference 3).

The existing elevation of the plant area ranges from -2.8 ft to -1 ft NAVD 88 in the eastern perimeter to a range of -1.6 ft to -0.5 ft NAVD 88 in the western perimeter, and ranges from 2.1 ft to 2.21 ft NAVD 88 in the northern perimeter to a range of -1.7 ft to -1.0 ft NAVD 88 in the southern perimeter (Reference 1). The soils in the plant area are saturated and would have low permeability; thus, the soils in the plant area would be classified as D (Reference 3). Some of the areas are submerged by water while other areas are composed of vegetation; thus, the ground cover percentage is estimated as shown in Table 3. The Runoff Curve Number (CN) values for different soil covers are obtained from Reference 3.

Table 3: Runoff Curve Number for the Site at Existing Condition

Subbasin	Ground Cover Percentage				Composite CN
	Impervious CN	Gravel CN (Type D)	Pond CN	Grass CN (Type D, fair)	
	98	91	100	84	
Site	0%	0%	70%	30%	95.20

The Soil Conservation Service (SCS) runoff Curve Number (CN) method is used to estimate the stormwater runoff from the design storm rainfall. The SCS runoff equation is (Reference 3):

$$Q = \frac{(P - I_a)^2}{(P - I_a) + S}$$

Where

Q = runoff (in);
P = rainfall (in);
S = potential maximum retention after runoff begins (in); and
I_a = initial abstraction (in)

S is the function of the soil and cover condition of the watershed through CN (Reference 3):

$$S = \frac{1000}{CN} - 10$$
$$I_a = 0.2S$$

Accordingly, the runoff volumes for the drainage areas are calculated using the SCS runoff equation. Table 4 shows the stormwater runoff volume from the plant area at the existing condition, for the 25-year, 72-hour rainfall of 12.6 inches.

Table 4: Runoff Volume of the Site at Existing Condition

Sub-basin	Composite CN	S	Ia	Q	Runoff Volume, ac-ft
		in	in	in	
Site	95.20	0.50	0.10	12.01	270.23

Note: The values in the table are rounded up to two decimal places

Runoff Volume at Post-Development Condition

Site includes the Units 6 & 7 plant area and the laydown area (Figure 3). The finished Units 6 & 7 plant area will consist of the Units 6 & 7 power block, parking area, Clear Sky substation, the area outside of the power block that contains the road and swales, and makeup water reservoir as shown in Figure 3 (References 1 and 4). The laydown area consists of a heavy haul road that connects the plant area to the area north of the Site, the bridge over the west return canal of the industrial wastewater facility, and the bridge over the canal north of nuclear administration building, training building and parking area.

In the post-development condition, stormwater runoff from the power block, Clear Sky substation and parking area would release to the industrial wastewater facility. The sub-basin areas of the Units 6 & 7 power block, Clear Sky Substation, and parking area are shown in Table 5 (References 4 and 5). The area for the makeup water reservoir is not included in the sub-basin area because it does not contribute to post-development runoff as discussed below.

Table 5: Sub-Basin Areas of the Plant Area at Post-Development Condition

Sub-basin	Sub-basin Area		
	sq. ft	acres	sq. mi.
Units 6 & 7 Power Block & Exterior area	5,622,649	129.08	0.202
Clear Sky Substation	1,165,154	26.75	0.042
Parking Area	1,096,519	25.17	0.039
Total	**7,884,322**	**181.00**	**0.283**

The total drainage areas for the Units 6 & 7 power block catch basins will include buildings, paved roads and grassed surfaces. The Clear Sky substation area will include a gravel yard, gravel road and some seeded areas that are not credited in this calculation. The parking area consists of a paved area. The area outside of the power block consists of paved road and grassed swale. The composite runoff curve numbers calculated for all catch basins in the Units 6 & 7 power block, substation, parking area, and the area outside of the power block are presented in Table 6. Type D soil has been considered for all areas during the operational phase condition. Type D soil yields higher runoff values; therefore it is more conservative.

Table 6: Plant Area Runoff Curve Number for Post-Development Phase

Sub-basin	Ground Cover Percentage				Composite CN
	Impervious CN	Gravel CN (Type D)	Pond CN	Grass CN (Type D, fair)	
	98	91	100	84	
Units 6 & 7 Power Block & Exterior area	90%	0%	0%	10%	96.60
Clear Sky Substation	0%	100%	0%	0%	91.00
Parking Area	100%	0%	0%	0%	98.00

Accordingly, the runoff volumes for the drainage areas are calculated using the SCS runoff equation for the design storm event and are shown in Table 7:

Table 7: Runoff Volume for Plant Area for Post-Development Phase

Sub-basin	Composite CN	S	Ia	Q	Runoff Volume
		in	in	in	Ac-ft
Units 6 & 7 Power Block & Exterior area	96.60	0.35	0.07	12.19	131.09
Clear Sky Substation	91.00	0.99	0.20	11.49	25.60
Parking Area	98.00	0.20	0.04	12.36	25.92
				Total	**182.62**

Note: The values in the table are rounded up to two decimal places.

In addition to the plant area, the Site includes the laydown area across the west return canal of the industrial wastewater facility. Stormwater runoff from the laydown area currently drains to the industrial wastewater facility and will continue to do so during the operation of Units 6 & 7. The heavy haul road and the new bridge in the laydown area as shown in the Construction Site Utilization Plan (Reference 6) would increase the imperviousness, and is considered in the post-development runoff volume calculation. The existing road north of the Site will be improved to serve as a heavy haul road. The drainage area and imperviousness of the road will remain the same with the improvement of the road; therefore the changes in stormwater runoff would be minimal. Drainage area of the laydown area is shown in Table 8.

Table 8: Sub-Basin Area of the Laydown Area West of Units 6 & 7 Plant Area

Subbasin	Subbasin Area		
	sq. ft	acres	sq. mi.
Laydown Area	2,260,764	51.90	0.081

Table 9: Laydown Area Runoff Curve Number for Post-Development Phase

Subbasin	Ground Cover Percentage				Composite CN
	Impervious CN	Gravel CN (Type D)	Pond CN	Grass CN (Type D, fair)	
	98	91	100	84	
Laydown Area	50%	50%	0%	0%	94.50

Accordingly, the runoff volumes for the drainage areas are calculated using the SCS runoff equation and are shown in Table 10:

Table 10: Runoff Volume for Laydown Area for Post-Development Phase

Subbasin	Composite CN	S	Ia	Q	Runoff Volume
		in	in	in	Ac-ft
Laydown Area	94.50	0.58	0.12	11.93	51.59

Note: The values in the table are rounded up to two decimal places

Table 11 compares the runoff at the Site at the existing and post-development condition and shows that the runoff into the industrial wastewater facility decreases at the post-development condition. The area for the makeup water reservoir is not included in the sub-basin area because it does not contribute to post-development runoff as discussed below.

Table 11: Comparison of Existing and Post-Development Runoff Volume at the Site

Runoff	Existing Condition	Post-Development Condition		Net Change
		Units 6 & 7 Plant Area	Construction Laydown Area	
Ac-ft	270.23	182.62	51.59	-36.02

Runoff from the potentially oil-contaminated areas (containment area for transformers, and other oil-containing or handling equipment) will be first directed through oil/water separators and then released to the industrial wastewater facility.

The makeup water reservoir is designed to retain reclaimed water as a storage pond. This area collects rainfall but does not contribute to the stormwater runoff to the industrial wastewater facility. Table 12 shows the storage area of the makeup water reservoir.

Table 12: Area of the Makeup Water Reservoir for Post-Development Phase

Subbasin	Subbasin Area		
	sq. ft	acres	sq. mi.
Makeup water reservoir	1,611,720	37.00	0.058

The design rainfall will add 12.6 inches of water into the makeup water reservoir. The maximum storage level of the makeup water reservoir is 22.5 ft NAVD 88 and the top of the retaining wall is at elevation 24 ft NAVD 88. Therefore, during the design storm, the water will be completely contained within the makeup water reservoir.

10.8.1.2 Runoff Volume at Nuclear Administration Building, Training Building, and Parking Area

The nuclear administration building, training building, and parking area are located north of the Units 6 & 7 plant area as shown in Figure 3. The post-development runoff from the nuclear administration building, training building, and parking area will release to the industrial wastewater facility. The following discussion compares the release from the sub-basin areas at post-development conditions.

Runoff Volume at Existing Condition

Table 13 presents the sub-basin areas of the nuclear administration building, training building, and parking area; and Figure 3 shows the existing condition of these areas.

Table 13: Sub-Basin Areas of the Nuclear Administration Building, Training Building, and Parking Area at Existing Condition

Subbasin	Subbasin Area		
	sq. ft	acres	sq. mi.
Nuclear Administration Building, Training Building and Parking Area (West)	871,200	20.00	0.031
Nuclear Administration Building, Training Building and Parking Area (East)	348,480	8.00	0.013

Currently, the areas for the nuclear administration building, training building, and parking area are surrounded by berms. Stormwater runoff in these sub-basins currently does not release by surface discharge to the industrial wastewater facility. Stormwater in these areas remains in the sub-basins and infiltrates into the ground within the industrial wastewater facility.

Runoff Volume at Post-Development Condition

The post-development runoff from the nuclear administration building, training building and parking area will be released to industrial wastewater facility. For the purposes of this calculation, the drainage area for the nuclear administration building, training building, and parking area consist of impervious ground covers. The composite runoff curve numbers calculated for the catch basins are presented in Table 14. Type D soil has been considered for all areas during the post-development condition. The CN values for different soil covers are obtained from Reference 3.

Table 14: Runoff Curve Number for the Nuclear Administration Building, Training Building, and Parking Area for Post-Development Phase Condition

Subbasin	Ground Cover Percentage				Composite CN
	Impervious CN	Gravel CN (Type D)	Pond CN	Grass CN (Type D, fair)	
	98	91	100	84	
Nuclear Administration Building, Training Building and Parking Area (West)	100%	0%	0%	0%	98.00
Nuclear Administration Building, Training Building and Parking Area (East)	100%	0%	0%	0%	98.00

Since it is assumed that there is no direct runoff into the industrial wastewater facility from the nuclear administration building, training building, and parking area at the existing condition, the surface runoff in the post-development condition would increase. With the estimated CN, runoff volume for the nuclear administration building, training building, and parking area is evaluated as shown in Table 15.

Table 15: Runoff Volume for the Nuclear Administration Building, Training Building, and Parking Area for Post-Development Phase Condition

Subbasin	Composite CN	S	Ia	Q	Runoff Volume
		in	in	in	Ac-ft
Nuclear Administration Building, Training Building and Parking Area (West)	98.00	0.20	0.04	12.36	20.60
Nuclear Administration Building, Training Building and Parking Area (East)	98.00	0.20	0.04	12.36	8.24
Total				**Total**	**28.84**

Note: The values in the table are rounded up to two decimal places

Runoff from the potentially oil-contaminated areas such as the parking area will first be directed through oil/water separators and then released to the industrial wastewater facility.

In Section 10.8.1.1 and this section, stormwater runoff into the industrial wastewater facility at the existing condition and post-development condition are discussed. The net change in the runoff volume can be estimated by comparing the runoff into the industrial wastewater facility from the

Site and the nuclear administration building, training building and parking area at the existing condition and post-development condition. Table 16 shows that the runoff into the industrial wastewater facility decreases at the post-development condition.

Table 16: Runoff Volume into the Industrial Wastewater Facility at the Existing and Post-Development Condition

Runoff	Runoff into the Industrial Waste Water Facility at Existing Condition	Post-Development		Net Change
		Units 6 & 7 Site	Nuclear Administration Building, Training Building and Parking Area	
Ac-ft	270.23	234.21	28.84	-7.18

10.8.1.3 Runoff Volume at FPL Reclaimed Water Treatment Facility and Stormwater Management Basins

The FPL reclaimed water treatment facility will be located northwest of the Site as shown in Figure 4. The minimum elevation of the FPL reclaimed water treatment facility will be 14 ft NAVD 88. The Site is presently tidally influenced and affected by the water level of the Biscayne Bay. The 100-year flood level at the site of the FPL reclaimed water treatment facility is 10.5 ft. NAVD 88. The area is flat and consists of poorly drained and saturated soil under natural conditions; therefore, the runoff would remain as sheet flow in all directions. The stormwater runoff in post-development condition will discharge to the surrounding wetland area.

All stormwater associated with industrial activity (equipment area runoff) will be captured, treated as necessary and reused within the reclaimed water treatment process. Runoff from other areas (non-equipment areas) will be routed to stormwater management facilities and released to local drainage.

The runoff volumes at the existing condition and post-development condition are compared in this section. In addition, the facility will be designed to comply with the applicable state and local stormwater regulations. This section examines the criteria set forth by the state and local stormwater regulations and describes FPL's proposed stormwater management practices to comply with applicable regulations.

Runoff Volume at Existing Condition

Figure 5 shows the soil survey of the area (Reference 2) and Table 2 shows the index to the soil survey map. The soil survey map shows that the location of the proposed FPL reclaimed water treatment facility is composed of Pennsuco marl, tidal (map unit 31) and Terra Ceia muck, tidal (map unit 32). The soils in this area are poorly drained and saturated under natural conditions. Therefore the permeability is moderately low. The soils in this area would be classified as Type D.

The area of the FPL reclaimed water treatment facility is shown in Table 17.

Table 17: Sub-Basin Area of the FPL Reclaimed Water Treatment Facility

Subbasin	Subbasin Area		
	sq. ft	acres	sq. mi.
Pre-Development FPL Reclaimed Water Treatment Facility	1,916,640	44.0	0.0687

As shown in Figure 4, the area consists of wetland where the permeability is low. Thus, the runoff curve number for the area is estimated as shown in Table 18 and runoff volume is estimated as shown in Table 19.

Table 18: Runoff Curve Number for the FPL Reclaimed Water Treatment Facility at Existing Condition

Subbasin	Ground Cover Percentage				Composite CN
	Impervious CN	Gravel CN (Type D)	Pond CN	Grass CN (Type D, fair)	
	98	91	100	84	
Pre-Development FPL Reclaimed Water Treatment Facility	0%	0%	75%	25%	96

Table 19: Runoff Volume of the FPL Reclaimed Water Treatment Facility at Existing Condition

Subbasin	Composite CN	S	Ia	Q	Runoff Volume
		in	in	in	Ac-ft
Pre-Development FPL Reclaimed Water Treatment Facility	96.00	0.42	0.08	12.11	44.42

Note: The values in the table are rounded up to two decimal places

Runoff Volume at Post-Development Condition

The FPL reclaimed water treatment facility will consist of open ponds, clarifiers, containment areas with tanks and pumps, filters, open tanks, covered facilities, roads, and parking areas as shown in Figure 6.

All stormwater associated with industrial activity (equipment area runoff) will be captured, treated as necessary and reused within the reclaimed water treatment process. Runoff from other areas (non-equipment areas) will be routed to stormwater management facilities and released to local drainage.

Approximately 8.2 acres of the FPL reclaimed water treatment facility consists of equipment areas and open basin structures. These areas do not contribute to the total runoff. The post-development drainage area of 35.8 acres (44 acres minus 8.2 acres) is shown in Table 20. Accordingly, the total post-development drainage areas including the drainage areas in the reclaimed water treatment facility minus the open basin structures and the seeded fill slope as shown in the Figure 6 is presented in Table 20.

Table 20: Sub-Basin Area for the FPL Reclaimed Water Treatment Facility

Sub-Basin	Area* (ft^2)	Area* (ac)	Area* (mi^2)
Post-Development FPL Reclaimed Water Treatment Facility	1,559,448	35.8	0.056

*Total drainage area subtracted by the open structures areas that do not contribute to runoff

The land cover percentages for the post-developed condition have been estimated in Table 21. Since the drainage area excludes the open basin structures, they are not included in the CN number computation. The reclaimed water treatment facility consists of covered water treatment units and components, and storage tanks that are impervious and the gravel-filled grounds. The seeded fill slope of the reclaimed water treatment facility is grass-covered. The calculations of composite runoff curve numbers for the areas are shown in Table 21:

Table 21: Runoff Curve Number for the FPL Reclaimed Water Treatment Facility

Subbasin	Ground Cover Percentage				Composite CN
	Impervious CN	Gravel CN(Type D)	Pond CN	Grass CN(Type D, fair)	
	98	91	100	84	
Post-Development FPL Reclaimed Water Treatment Facility	12%	50%	6%	32%	90

Accordingly, the runoff volumes for the drainage area are calculated using the SCS runoff equation and are shown in Table 22:

Table 22: Runoff Volume of the FPL Reclaimed Water Treatment Facility

Subbasin	Composite CN	S	Ia	Q	Runoff Volume
		in	in	in	Ac-ft
Post-Development FPL Reclaimed Water Treatment Facility	90	1.09	0.22	11.38	33.94

Note: The values in the table are rounded up to two decimal places

Table 23 compares the existing and post-development runoff volume at the FPL reclaimed water treatment facility.

Table 23: Comparison of Existing and Post-Development Runoff Volume at FPL Reclaimed Water Treatment Facility

Runoff	Existing Condition	Post-Development Condition	Net Change
Ac-ft	44.42	33.94	-10.48

Stormwater Management Basins

The runoff from the FPL reclaimed water treatment facility will be collected in stormwater management basins (SWB A and SWB B) as shown in Figure 6. The basins will be designed to handle the design storm event, a 25-year, 72-hour storm.

The design criteria for stormwater management of the FPL reclaimed water treatment facility include the following:

- Provide dry detention volume equal to 75 percent of the amounts computed for wet detention; wet detention volume is calculated as either the first inch of runoff from the developed project, or the total runoff of 2.5 inches times the percentage of imperviousness, whichever is greater (for this Project, the first inch of runoff is the controlling condition);
- Provide detention basin capacity for the first 0.5 inch of runoff for projects with drainage areas less than 100 acres, and an additional level of treatment equal to 50 percent of the treatment criteria specified; and
- Size the gravity control devices based upon a maximum design discharge of 0.5 inches of the detention volume in 24 hours, with a dimension no smaller than six square inches of cross-sectional area.

The stormwater basins (SWBs) are designed to provide the required detention volumes satisfying the design criteria. The stage-area-volume information of the basins is provided in Tables 24 and 25.

Table 24: Stage-Area-Storage for the Stormwater Basin (SWB A)

Elevation	Surface Area	Surface Area	Incremental Volume	Storage Volume	Storage Volume
(ft)	(ft^2)	(ac)	(ft^3)	(ft^3)	(acre-ft)
7	19481.4	0.447			
8	23687.9	0.544	21584.6	21584.6	0.496
9	28276.0	0.649	25982.0	47566.6	1.092
10	33171.0	0.762	30723.5	78290.1	1.797
10.5	35776.4	0.821	17236.8	95527.0	2.193
11	38381.7	0.881	18539.5	114066.5	2.619
12	43908.2	1.008	41144.9	155211.4	3.563
13	49781.0	1.143	46844.6	202056.0	4.639
14	55981.2	1.285	52881.1	254937.1	5.853

Table 25: Stage-Area-Storage for the Stormwater Basin (SWB B)

Elevation	Surface Area	Surface Area	Incremental Volume	Storage Volume	Storage Volume
(ft)	(ft^2)	(ac)	(ft^3)	(ft^3)	(acre-ft)
7	12266.2	0.282			
8	15653.8	0.359	13960.0	13960.0	0.320
9	19453.9	0.447	17553.8	31513.9	0.723
10	23679.0	0.544	21566.4	53080.3	1.219
10.5	25952.4	0.596	12407.8	65488.1	1.503
11	28225.8	0.648	13544.5	79032.7	1.814
12	33116.9	0.760	30671.3	109704.0	2.518
13	37325.1	0.857	35221.0	144925.0	3.327
14	43862.9	1.007	40594.0	185519.0	4.259
15	49732.2	1.142	46797.6	232316.6	5.333

The stormwater basins will have dry detention storage volume below the riser crest. Table 26 shows the available and required detention volumes. The calculation of the volumes is shown in Attachment A.

Table 26: Available and Required Detention Volumes for the SWBs

Stormwater Basin	Available Detention: Volume between riser crest (10.5 ft) and orifice invert (8 ft)	Available Detention: Volume between riser crest (10.5 ft) and orifice invert (8 ft)	Required Detention*	Required Detention*
	ft^3	ac-ft	ft^3	ac-ft
SWB A	73,942	1.70	42,360	0.97
SWB B	51,528	1.18	28,846	0.66
Total*	**125,470**	**2.88**	**71,206**	**1.63**

* **Note:** One inch over the 26.16 developed acres (44 total acres minus 9.64 acres of grass slope, minus 8.2 acres of non-contributing area).

Discharge hydrographs were developed using Natural Resources Conservation Service (NRCS) methodology (Reference 3) for the 2-, 5-, 10-, and 25-year, 72-hour design storm events. The HEC-HMS computer program (Reference 8) is used as the tool to generate the hydrographs and route them through the stormwater basins.

Although the traditional requirement is to limit the post-development peak outflow to no more than the pre-existing, there are three reasons not to do so for this facility:

- The stormwater management basins (SWBs) will be constructed in existing wetlands. In order to minimize the acreage of those wetlands being impacted by construction of the SWBs, its acreage has been minimized by establishing its volume to meet detention requirements, but allowing its outlets to essentially pass the inflow as it comes in, without reducing its peak. This allows the minimum footprint possible.
- The outflow from the detention pond will be used to rehydrate the tidally isolated wetland areas adjacent to the pond. The released stormwater will be spread over that area, thus the wetland area surrounding the FPL reclaimed water treatment facility will provide further peak attenuation prior to ultimate release to the environment.
- A large portion of the area is presently tidally influenced, and is inundated under high tide. Pre-existing flows are not meaningful for such tidal areas.

The stormwater design will comply with the applicable regulatory standards.

Runoff from the potentially oil-contaminated areas (oil-containing components) will be routed through oil/water separators that are designed to meet the applicable standards.

Tables 27 and 28 summarize the peak stormwater discharges and water levels in the SWB A and SWB B. Attachment A shows the calculation.

Table 27: Peak Stormwater Discharge and Water Level in the SWB A

Storm	SWB A Peak Inflow (cfs)	SWB A Peak Outflow (cfs)	SWB A Peak Water Level (ft)
2-yr	78.9	62.7	11.4
5-yr	105.1	87.5	11.7
10-yr	126.3	97.7	11.9
25-yr	152.3	107.7	12.3

Table 28: Peak Stormwater Discharge and Water Level in the SWB B

Storm	SWB B Peak Inflow (cfs)	SWB B Peak Outflow (cfs)	SWB B Peak Water Level (ft)
2-yr	56.7	48.3	11.3
5-yr	75.5	65.3	11.5
10-yr	90.7	71.7	11.7
25-yr	109.4	75.1	12.0

The capacity of the emergency spillways provided in stormwater basins has been checked by passing the 100-year, 72-hour storm through the spillway. The spillways have a width of 50 ft with its crest elevations at 12.5 ft. Table 29 shows that the spillways are sized to pass 100-year discharge without overtopping the banks.

Table 29: Peak Stormwater Discharge and Water Level for 100-year Storm

SWB	Peak Inflow (cfs)	Peak Outflow (cfs)	Peak Water Level (ft)	Top of the Basin (ft)
SWB A	231.3	178.5	13.1	14.0
SWB B	166.1	123.6	12.9	15.0

10.8.2 Erosion and Sediment Control

This section describes the effort to minimize erosion and retain sediment in order to control the nonpoint source pollutants associated with the construction activities.

Erosion control measures such as silt fences, hay bales, etc. will be installed during the construction phase to intercept and detain small amounts of sediment from disturbed areas during construction, and to decrease the velocity of sheet flows and low-to-moderate level channel flows (Reference 7).

Temporary basins/traps with a controlled stormwater release structure will be installed as necessary to detain sediment-laden runoff from disturbed areas. The best locations for the temporary sediment basins are generally low areas and natural drainage way below disturbed areas (Reference 7).

Plant Area

As the fill activity begins on the plant area, temporary sediment basins will be placed to trap the sediment-laden runoff before it enters the industrial wastewater facility that surrounds the plant area. In order to effectively divert the sediment-laden stormwater runoff from a disturbed area to the temporary sediment basins, temporary diversion dikes may be constructed (Reference 7).

The center of the plant area will become the high point of the Site after the fill activity is completed (References 4 and 5). As the plant area is being filled, temporary fill diversions may be placed to divert the stormwater runoff away from the exposed slopes surrounding the plant area to a stabilized outlet or the temporary sediment basins. The temporary fill diversion will provide some slope protection on a daily basis until the final elevations are reached and a more permanent measure can be constructed (Reference 7).

FPL Reclaimed Water Treatment Facility

During construction of the FPL reclaimed water treatment facility, temporary sediment basins will be placed to trap the sediment-laden runoff in addition to installation of silt fences. Temporary diversion dikes and fill diversions will be placed to divert the stormwater runoff away from the exposed slopes during the fill activities (Reference 7). The surface water runoff from the FPL reclaimed water treatment facility at the existing condition flows to the surrounding wetlands. In addition to the temporary erosion and sedimentation control measures such as silt fences, and/or other impermeable barriers (e.g. Fabriform, soil, cement bags, and sheet piling), temporary sediment basins/traps will be installed to capture the sediment-laden runoff during construction. Temporary erosion and sedimentation control measures will be designed to prevent the sediment from being displaced and carried off-site by the construction runoff. As necessary, the sediment collected during the construction will be removed. All temporary sediment and erosion control measures will be removed at the end of construction or at an appropriate time. Construction stormwater discharges released into waters of the state from associated non-linear facilities will be addressed through compliance with Rule 62-621.300(4) [General Permit for Stormwater from Large and Small Construction Activities].

Radial Collector Wells

The construction activities for the radial collector wells and delivery pipeline would be performed in accordance with the required local, state, and federal guidelines and accepted industry practices. Installation of the wells and delivery pipeline to the Units 6 & 7 plant area would cause short-term changes in the surface water drainage in the vicinity of the wells and pipeline route during the construction activities. Sedimentation barriers and sedimentation traps would be installed to minimize the potential impacts to the surface water bodies in accordance with FDEP regulations. The drainage characteristics would be restored to preconstruction conditions once the construction activities are completed. Construction stormwater discharges released into waters of the state from associated non-linear facilities will be addressed through compliance with Rule 62-621.300(4) [General Permit for Stormwater from Large and Small Construction Activities].

10.8.3 Conclusions

The stormwater runoff from the Turkey Point Site (plant area and laydown area) and the nuclear administration building, training building, and parking area will be released to the industrial wastewater facility.

Stormwater runoff from the 25-year, 72-hour design storm into the industrial wastewater facility from the Site and nuclear administration building, training building, and parking area will decrease by 7.18 acre-ft at the post-development condition. Thus, the industrial wastewater facility currently has sufficient capacity and will not be impacted by Turkey Point Units 6 & 7 during the post-development condition.

Stormwater runoff from the FPL reclaimed water treatment facility discharges to the surrounding wetland area. The runoff from the 25-year, 72-hour design storm will decrease by approximately 10.48 acre-ft during the operational phase compared to the existing condition runoff. The stormwater management basins are designed (a) to maintain the water quality volume of 0.75 inch of runoff for dry detention as required by the applicable detention/retention criteria; and (b) to provide the capacity for the first 0.5 inch of runoff, plus an additional 50 percent for treatment. The outlet structures are sized to release the maximum design discharge in 24 hours.

10.8.4 References

1. 25409-0-C2-0010-00001 Rev. 4: Site Plan
2. U.S. Department of Agriculture, Natural Resources Conservation Services, *Soil Survey of Dade County Area, Florida,* http://soils.usda.gov/ , Accessed 12/16/2008
3. U.S. Department of Agriculture, Natural Resources Conservation Service, Conservation Engineering Division, *Technical Release 55: Urban Hydrology for Small Watersheds*, June 1986.
4. 25409-0-CG-0010-00002 Rev.3: Site Finish Grading Plan
5. 25409-0-CG-0010-00001 Rev.3: Nuclear Island Power Block Finish Grading Plan
6. 25409-0-C2-0010-00002 Rev.F: Construction Site Utilization Plan
7. Environmental Resource Permit Information Manual Volume IV, Environmental Resource Regulation Department South Florida Water Management District, 2009.
8. HEC-HMS Hydrologic Modeling System, Version 3.1.0 User's Manual, U.S. Army Corps of Engineers, November 2006

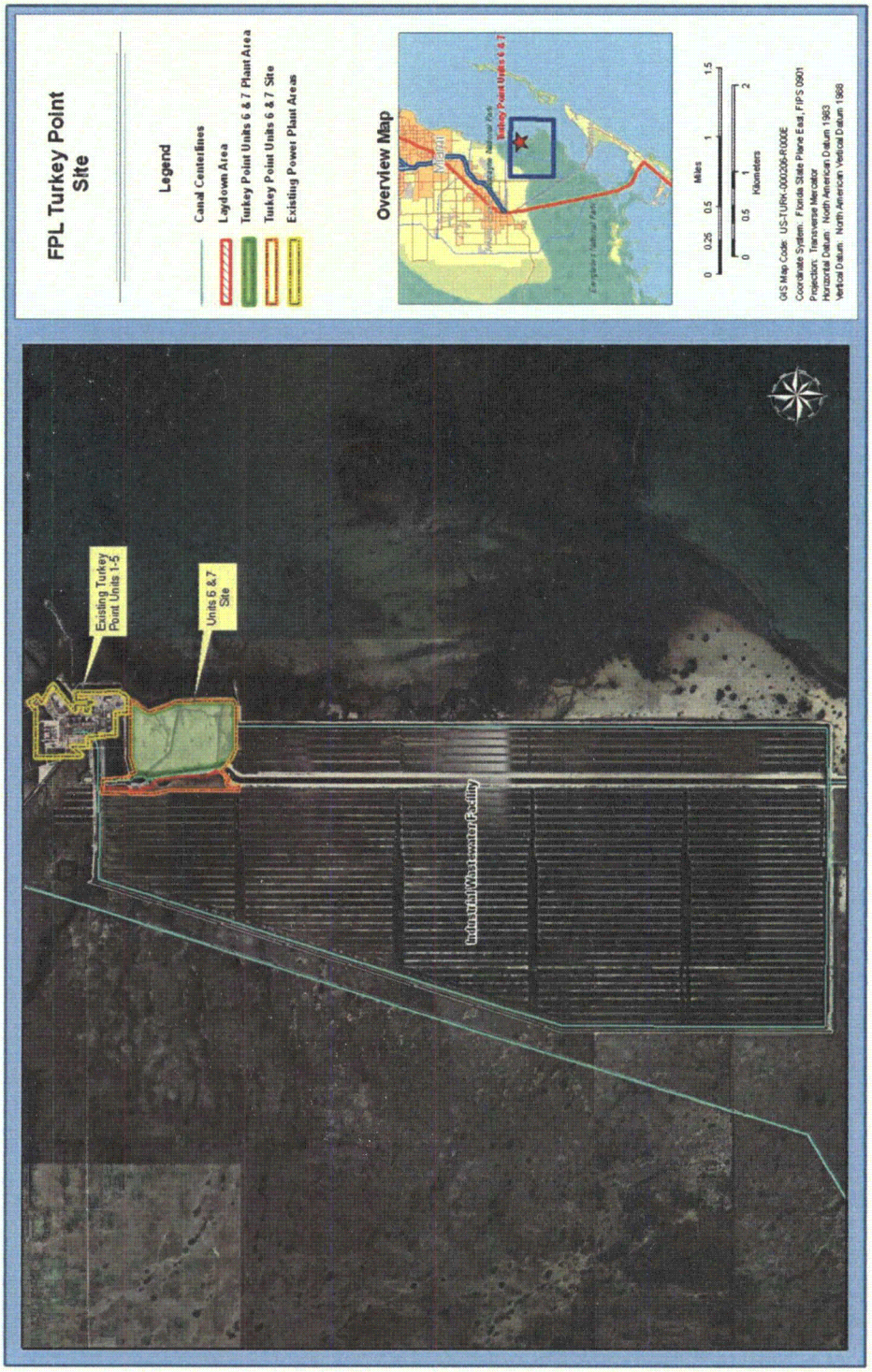


Figure 1: Turkey Point Site and Surrounding Area

FPL

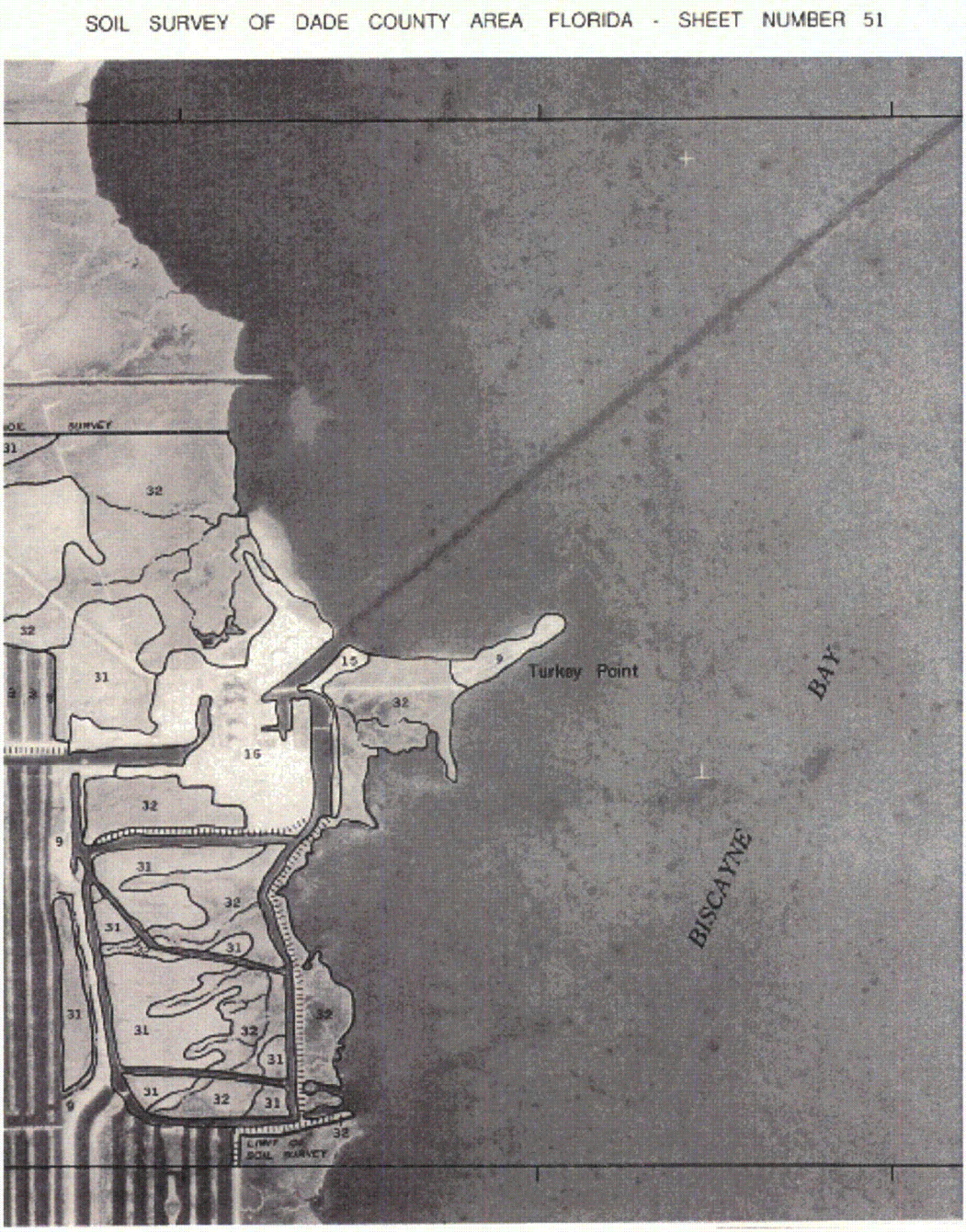


Figure 2: Site Soil Survey of Miami-Dade County, Florida

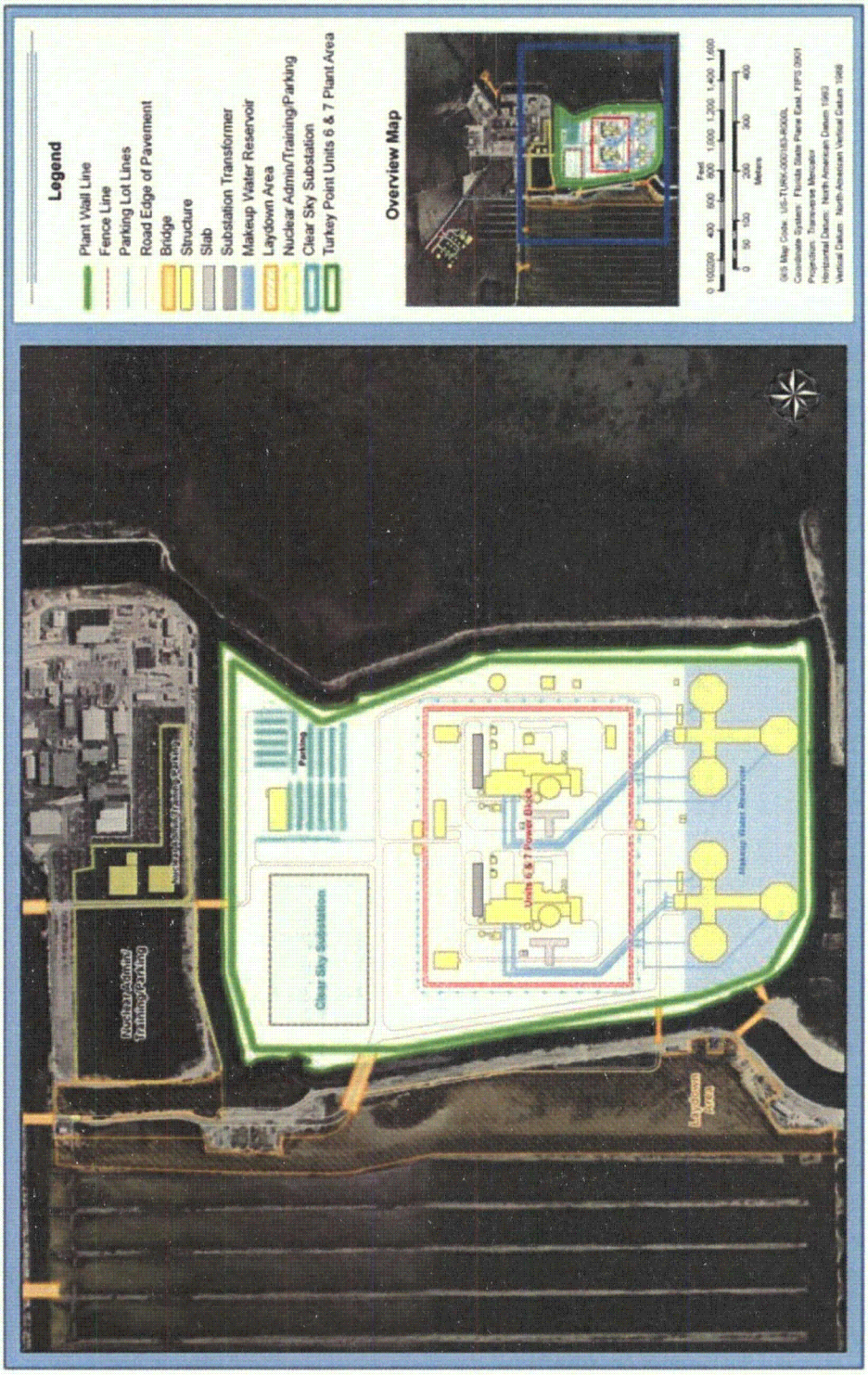


Figure 3: Turkey Point Units 6 & 7 Site and Nuclear Administration Building, Training Building, and Parking Area

FPL

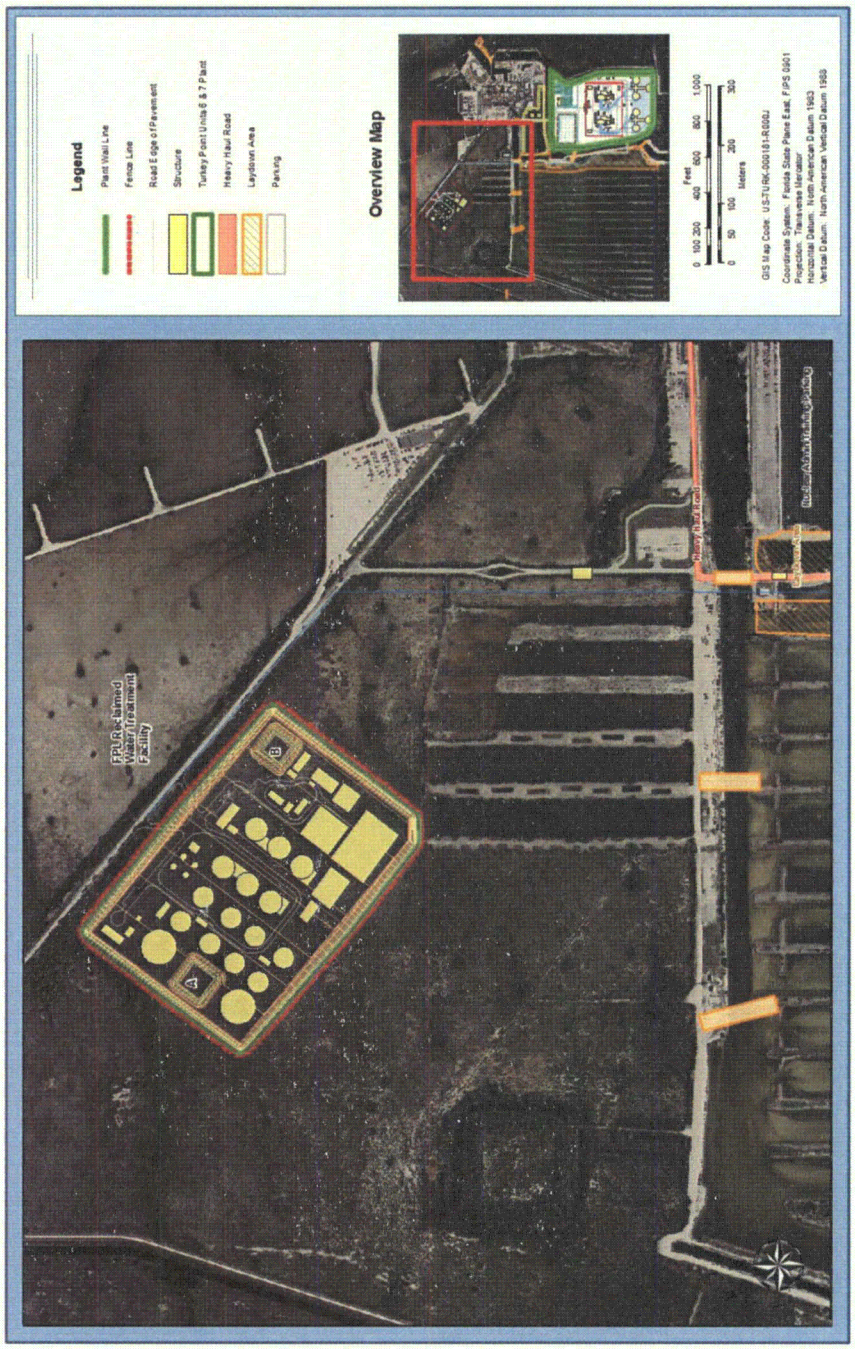


Figure 4: FPL Reclaimed Water Treatment Facility

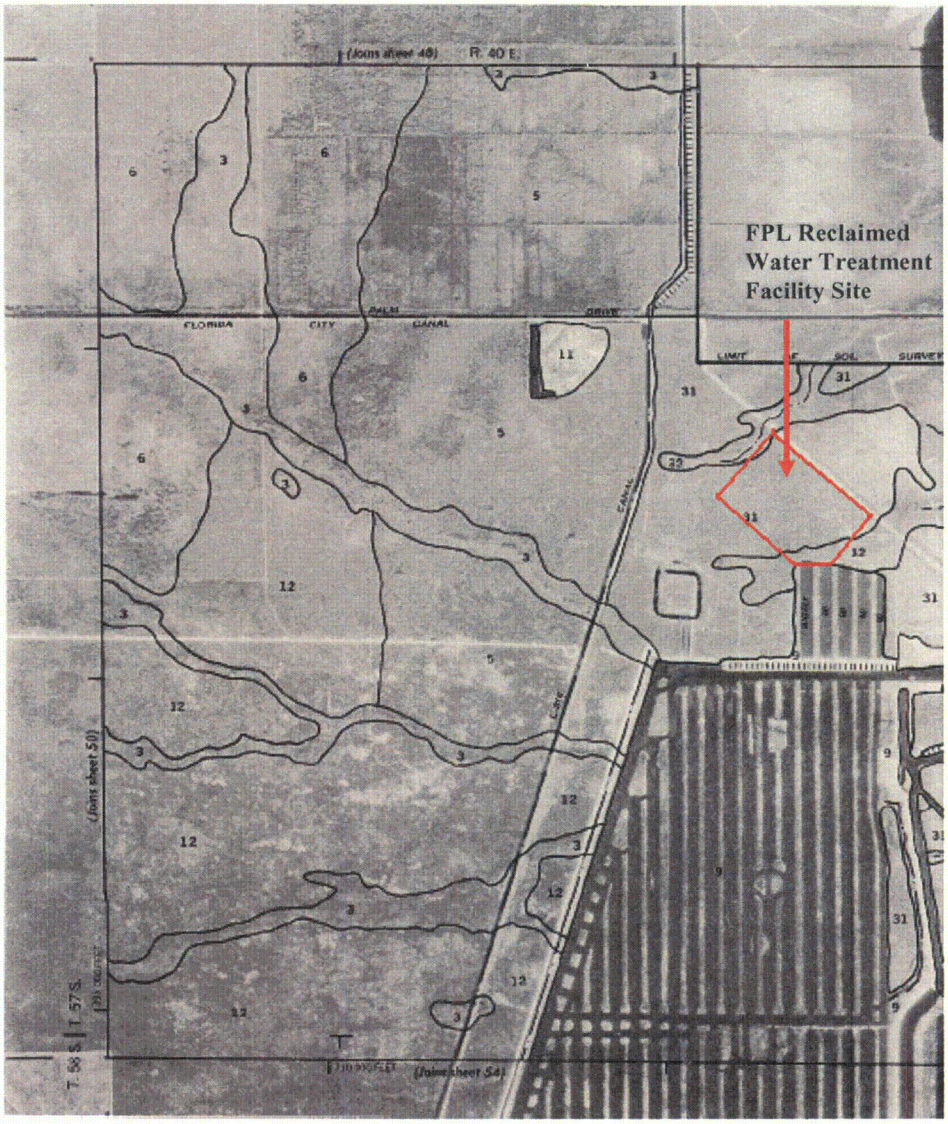


Figure 5: FPL Reclaimed Water Treatment Facility Soil Survey of Miami-Dade County Area, Florida

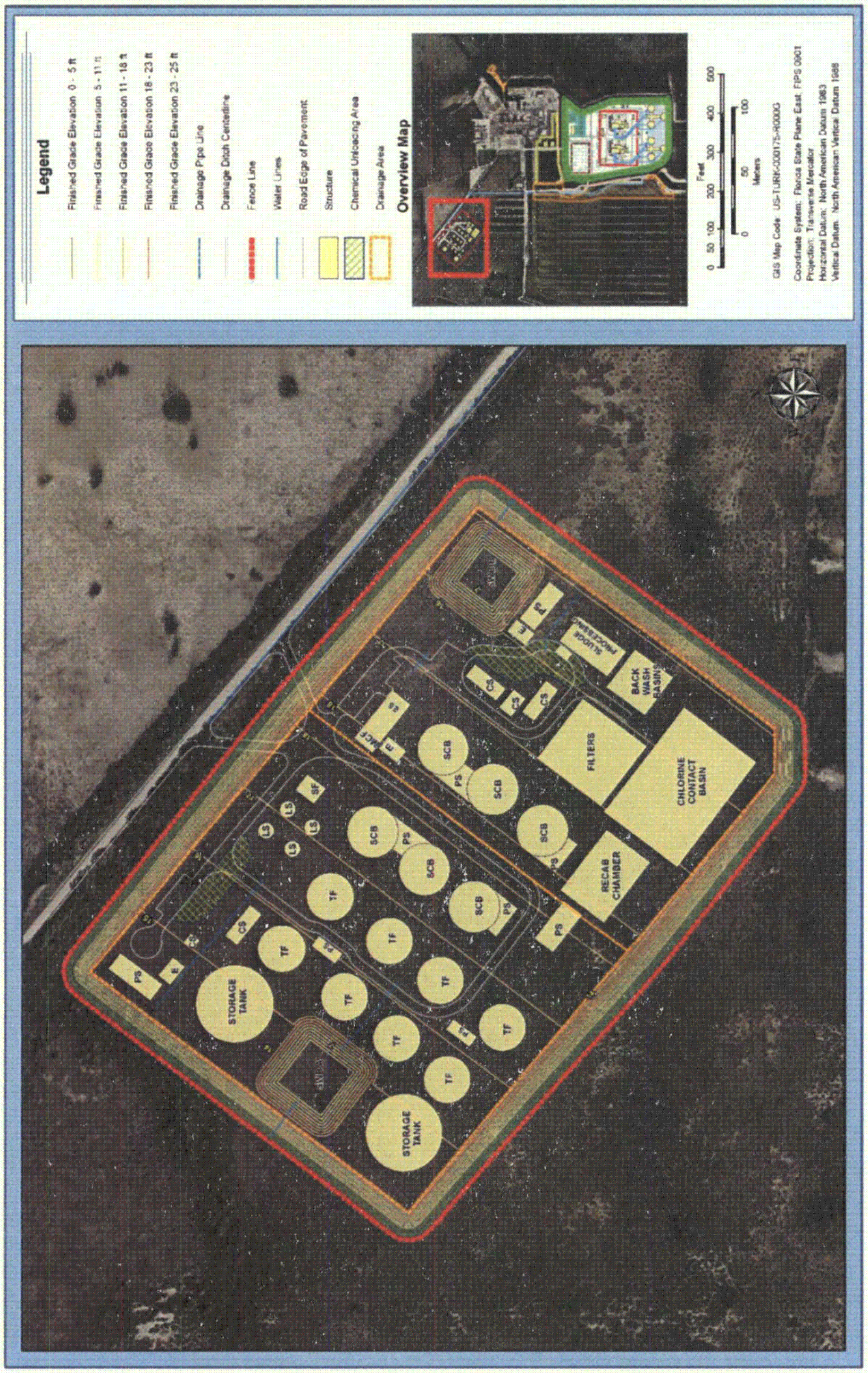


Figure 6: Layout of the FPL Reclaimed Water Treatment Facility

This Attachment presents the inputs, calculation details and the outputs of the stormwater basin design for the FPL Reclaimed Water Treatment Facility (RWTF).

The storm water basins (SWBs) are designed to provide the required detention of the storm water runoff to comply with applicable regulations. The computation also includes the calculation of post development peak discharge summary for the design storm events.

The inputs, outputs and the details of the calculations are presented in the following sections.

72-Hour Rainfall Depths

A Type-III rainfall distribution is used in the HEC-HMS program to develop the rainfall hyetographs for the design rainfall events using the rainfall depths. The 72-hour rainfall depths for different frequencies are given in Table A-1.

Table A-1: 72-Hour Rainfall Depths for the FPL Reclaimed Water Treatment Facility Site

Frequency	2-year	5-year	10-year	25-year	100-year
Depth (in)	6.7	8.8	10.5	12.6	19.0

Drainage Areas

The FPL reclaimed water treatment facility consists of storage tanks, pump stations, and other reclaimed water treatment components and units as shown in Table A-2.The post-development drainage areas are shown in Attachment B. Runoffs from the drainage areas A and B drain into the SWB A and SWB B, respectively and their areas are 19.4 acres and 15 acres, respectively. Open basin structures capture the rainfall and do not contribute to the total runoff. The areas consisting of the open basin structures in the drainage area A and B are approximately 3.84 acres and 4.4 acres, respectively. Thus, the post-development drainage areas are calculated by subtracting the open basin structures accordingly as shown in Table A-3.

Table A-2: FPL Reclaimed Water Treatment Facility Components

Component / Unit Process	No. of Units	Open / Covered	Dimensions, each	Height, each (above grade)
Storage Tanks (Reclaimed Water from MDWASD)	2	Covered	195-ft diameter	47.2-ft water depth 1
Trickling Filters Pump Station Return Flow/Chemical addition	2	Covered	75-ft by 35-ft	16-ft
Trickling Filters	8	Open	120-ft diameter	35-ft
Chemical Unloading Areas, stormwater from these areas is pumped to the back wash basin and is then added to the process flow stream	2	Open	37,000 sq. ft. toal area	curbed area
Solids Contact Basin	6	Open	130-ft diameter	4-ft
Sludge Pump Stations	4	Covered	14,000 sq. ft total area	14-ft
Ferric Chloride Storage Tanks	3	Covered	14-ft diameter	27-ft-4-in
Containment Area w/Pumps	1	Slab	40-ft by 100-ft	4-ft (walls)
Filter and Pump Station	1	Covered	50-ft by 120-ft	16-ft
Filters	22	Open	15-ft by 75-ft	18-ft
Filter Gallery (between 2 rows of Filters)	1	Covered	40-ft by 190-ft	18-ft
Methanol Storage Tanks	4	Covered	14-ft diameter	23-ft
Containment Area w/Pumps	1	Slab	40-ft by 100-ft	4-ft (walls)
Waste Backwash Basin	1	Open	120-ft by 120-ft	3-ft (berms)
Chlorine Contact Basin	1	Open	230-ft by 330-ft	10-ft
Sodium Hypochlorite Storage Tanks	3	Covered	12-ft diameter	25-ft
Containment Area w/Pumps	1	Slab	40-ft by 100-ft	4-ft (walls)
Treated Water Pump Station	1	Covered	135-ft by 50-ft	16-ft
Sludge Processing Facility	1	Covered	80-ft by 150-ft	25-ft
Sludge Truck Loading Canopy	1	Covered	900 sq.ft total area	25-ft
Electrical	3	Covered	40-ft by 60-ft	14-ft
Roads and Parking Areas	0	0	126,000 sq.ft total area	0
Maintenance/Control Facility and Covered Equipment Storage	1	Covered	60-ft by 155-ft	20-ft
Lime Silos	4	Covered	41-ft diameter	64-ft
Housekeeping Area	0	Slab	100-ft by 100-ft	2-ft (walls)
Slaker Facility	1	Covered	60-ft by 50-ft	16-ft
Sodium Bisulfite Tank	1	Covered	12-ft diameter	19-ft-1-in
Containment Area w/Pumps	0	Slab	30-ft by 30-ft	4-ft (walls)
Polymer	2	Covered	totes included in Sludge Processing	n/a
Acid	1	Covered	12-ft diameter	19-ft
Containment Area w/Pumps	0	0	40-ft by 40-ft	4-ft (walls)

Table A-3: Post-development Drainage Areas for Storm Water Basins

Sub-Basin	Subbasin Area		
	sq. ft	acres	sq. mi.
Drainage Area A	677,766	15.56	0.024
Drainage Area B	461,530	10.60	0.017

Runoff Curve Numbers

During the post-development condition, the soil type for all the developed areas are assumed as Type D soil for the runoff analysis as the site will consist of compacted fill. The land cover percentages for the post-developed condition have been estimated based on the FPL Reclaimed Water Treatment Facility site components and units as shown in Table A-2. The calculations of composite runoff curve numbers for the areas are shown in Table A-4.

Table A-4: Post-development CN Number Calculation for Storm Water Basins

Sub-basin	Ground Cover Percentage				
	Impervious CN	Gravel CN (Type D)	Pond CN	Grass CN (Type D, fair)	Composite CN
	98	91	100	84	
Drainage Area A	17%	76%	7%	0%	93
Drainage Area B	17%	72%	10%	0%	93

Lag Time

The HEC-HMS program uses the lag time rather than Tc directly in calculating the peak discharge. The lag time is calculated as 60% of the time of concentration (Tc) for each sub-basin.

Time of Concentration

Each flow path is divided into sheet flow, and shallow concentrated flow segments. The sheet flow and shallow concentrated flow segments for each flow path are determined using Natural Resources Conservation Service

(NRCS) procedures. The ditch or pipe flow segment travel time is determined by estimating the flow velocity and computing the travel time

The equations used for sheet flow and shallow concentrated flow are shown below.

Sheet Flow:

$$T_i = \frac{0.007(nL)^{0.8}}{P_2^{0.5} S^{0.4}}$$ Where:

n = surface roughness coefficient for sheet flows (n = 0.011 for concrete, asphalt, gravel or bare soil)

L = flow path length, ft (maximum = 100 ft)

P = 2-yr, 24-hr rainfall = 6 inches

S = Flow path slope

Shallow Concentrated Flow:

Velocity V = 20.3282 $S^{0.5}$ (for paved/gravel surfaces)

$$T_i = \frac{L}{3600 \cdot V}$$

Lag times for the post-development condition are calculated following similar procedure as described above. The time of concentration values and lag times for each basin are summarized in Table A-5.

Table A-5 Post-development Tc and Lag Time Calculation

	Sheet Flow (Segment A-B)				Shallow Concentrated Flow (Segment B-C)				Pipe/Ditch Flow (Segment C-D)				
Sub-Basin	Length, L (ft)	Manning's Coefficient, n	Slope, S	T1 (hr)	Length, L (ft)	Slope, S	Calculated Velocity, V (fps)	T2 (hr)	Length, L (ft)	Est. Velocity, V (fps)	T3 (hr)	Time of Concentration (min)	Lag Time (min)
Drainage Area A	100	0.011	0.005	0.026	300	0.005	1.44	0.058	430	5.00	0.024	6.5	3.9
Reach A									350	5.00	0.019	1.2	1.2
Drainage Area B	100	0.011	0.005	0.026	120	0.005	1.44	0.023	550	5.00	0.031	4.8	3.6*
Reach B									475	5.00	0.026	1.6	1.6

*Minimum Tc of 6 minutes is used

Basin Stage-Storage

The stage-area-storage relationships for storm water basins are shown in the following Tables A-6 and A-7. The elevations and areas for each basin are measured from finished grade drawing.

Table A-6: Stage-Storage for Stormwater Basin (SWB A)

Elevation	Surface Area	Surface Area	Incremental Volume	Storage Volume	Storage Volume
(ft)	(ft^2)	(ac)	(ft^3)	(ft^3)	(acre-ft)
7	19481.4	0.447			
8	23687.9	0.544	21584.6	21584.6	0.496
9	28276.0	0.649	25982.0	47566.6	1.092
10	33171.0	0.762	30723.5	78290.1	1.797
10.5	35776.4	0.821	17236.8	95527.0	2.193
11	38381.7	0.881	18539.5	114066.5	2.619
12	43908.2	1.008	41144.9	155211.4	3.563
13	49781.0	1.143	46844.6	202056.0	4.639
14	55981.2	1.285	52881.1	254937.1	5.853

Table A-7: Stage-Storage for Stormwater Basin (SWB B)

Elevation	Surface Area	Surface Area	Incremental Volume	Storage Volume	Storage Volume
(ft)	(ft^2)	(ac)	(ft^3)	(ft^3)	(acre-ft)
7	12266.2	0.282			
8	15653.8	0.359	13960.0	13960.0	0.320
9	19453.9	0.447	17553.8	31513.9	0.723
10	23679.0	0.544	21566.4	53080.3	1.219
10.5	25952.4	0.596	12407.8	65488.1	1.503
11	28225.8	0.648	13544.5	79032.7	1.814
12	33116.9	0.760	30671.3	109704.0	2.518
13	37325.1	0.857	35221.0	144925.0	3.327
14	43862.9	1.007	40594.0	185519.0	4.259
15	49732.2	1.142	46797.6	232316.6	5.333

Detention Volume Calculation

The bottom elevations for the SWBs are at 7 ft. NAVD 88. Since the ground water level in the area is approximately the same as the water level in Biscayne Bay, and the mean water level in Biscayne Bay is at Elevation 0, the SWBs are dry detention ponds. The required detentions for the respective areas are calculated by multiplying the first inch of the runoff by the area of the RWTF, or multiplying the first 2.5 inches to the impervious area. The higher value is considered as the required volume. The required detention for the dry detention pond is 75% of the wet detention requirement. The calculation of the required detention is shown in Table A-8.

Table A-8 Detention Volume Computation

2.5" over the impervious area			
SWB A		SWB B	
Total impervious area =	115,220 ft^2	Total impervious area =	83,075 ft^2
	2.65 ac		1.91 ac
Wet detention =	24004 ft^3	Wet detention =	17307 ft^3
	0.55 ac-ft		0.40 ac-ft
Dry detention =	18003.17 ft^3	Dry detention =	12980.54 ft^3
	0.41 ac-ft		0.30 ac-ft

First inch of runoff from the developed project			
SWB A		SWB B	
Total area=	677,766 ft^2	Total area=	461,530 ft^2
	15.56 ac		10.60 ac
Wet detention =	56481 ft^3	Wet detention =	38461 ft^3
	1.30 ac-ft		0.88 ac-ft
Dry detention =	42360.40 ft^3	Dry detention =	28845.64 ft^3
	0.97 ac-ft		0.66 ac-ft

Computation of the required detentions for the SWBs in Table A-8 shows that the runoff detention requirements from the first inch of runoff from the contributing area are greater. Table A-9 compares the provided storages of the SWBs with the detention requirement from the first inch of runoff from the Reclaimed Water Treatment Facility area.

Table A-9: Available and Required Detentions Volumes for the SWBs

Stormwater Basin	Available Detention: Volume between riser crest (10.5 ft) and orifice invert (8 ft)	Available Detention: Volume between riser crest (10.5 ft) and orifice invert (8 ft)	Required Detention*	Required Detention*
	ft^3	ac-ft	ft^3	ac-ft
SWB A	73,942	1.70	42,360	0.97
SWB B	51,528	1.18	28,846	0.66
Total*	**125,470**	**2.88**	**71,206**	**1.63**

*** Note:** One inch over the 26.16 developed acres (44 total acres minus 9.64 acres of grass slope, minus 8.2 acres of non-contributing area).

Therefore, the SWB A and SWB B satisfy the detention requirements.

150% Treatment

The following computation shows that the SWB A and B provide enough storage for detention of the first 0.5 inch of runoff for the FPL reclaimed water treatment facility area, plus an additional 50% treatment.

SWB A

Drainage Area=		15.56	ac		
		677766	ft^2		
Required detention=	1/2 inches * 1.5 =	3/4	inches		
Required WQ Volume=		0.97	ac-ft		
		42360	ft^3		
Volume between riser crest (10.5 ft) and orifice invert (8 ft)=		1.70	ac-ft	**OK**	(As shown on Table A-6)
		73942	ft^3	**OK**	(As shown on Table A-6)

SWB B

Drainage Area=		10.60	ac		
		461530	ft^2		
Required detention =	1/2 inches * 1.5 =	3/4	inches		
Required WQ Volume=		0.66	ac-ft		
		28846	ft^3		
Volume between riser crest (10.5 ft) and orifice invert (8 ft)=		1.18	ac-ft	**OK**	(As shown on Table A-7)
		51528	ft^3	**OK**	(As shown on Table A-7

Orifice size calculation

The gravity control devices shall be sized based upon a maximum design discharge of 0.5 inch of the detention volume in 24 hours. The outlet orifices are sized to maintain the required water quality.

SWB A Orifice size calculation

Design runoff =	1/2	inches
Required water quality volume (ft^3) =	28240	ft^3
Volume between riser crest (10.5 ft) and pond bottom=	73942	ft^3
Maximum Allowable Discharge (for 24 hour) =	0.327	cfs
Select 3" dia orifice with invert El at 8'		
Water Surface Elevation for required volume =	9.074	ft (by interpolation of Table A-6)
Surface area for required volume =	28635.8	ft^2 (by interpolation of Table A-6)
Max head above 3" dia orifice centerline =	0.949	ft
Dewatering time =	66	hrs

SWB B Orifice size calculation

Design runoff =	1/2	inches
Required water quality volume (ft^3) =	19230	ft^3
Volume between riser crest (10.5 ft) and pond bottom=	51528	ft^3
Maximum Allowable Discharge (for 24 hour) =	0.223	cfs
Select 3" dia orifice with invert El at 8'		
Surface area for required volume =	19782.3	ft^2 (by interpolation of Table A-7)
Water Surface Elevation for required volume =	9.078	ft (by interpolation of Table A-7)
Max head above 3" dia orifice centerline =	0.953	ft
Dewatering time =	45	hrs

Above computation shows that the use of 3-inch diameter orifice is adequate to comply with applicable stormwater criteria.

Basin Stage-Discharge Curve

A summary table of the outlet elevations and sizes, as well as the stage-discharge relationship is shown for each storm water basin on the Tables A-10 and A-11. The tail water levels for Pond A and Pond B have been assumed as 4.0 ft and 3.5 ft respectively considering full pipe flow.

Table A-10: Stage-discharge calculation for the SWB A basin Outlet structure

SWB A

Riser Dim (ft x ft)	6	Riser Crest EL.(ft)	10.5	Riser Crest Length (ft)	24.00	Orifice Diameter (ft)	0.25
Pipe Diameter (ft)	3	Outlet Inv. EL.(ft)	1.00	Pipe Length (ft)	120	Orifice Area (sq ft)	0.049
Em Spillway Crest EL (ft)	12.5	Pipe Area (sq ft)	7.069	Top of the basin(ft)	14	Orifice Invert EL.(ft)	8.0
		Em Spillway Width (ft)	50.0	Bottom of the basin(ft)	7	Orifice center EL.(ft)	8.125
						No. of orifice	1

	Orifice Flow		Riser Weir Flow		Total	Pipe Flow		Spillway Flow		Total Basin
Elevation	h	Q	H	Q	Riser Flow	h	Q	H	Q	Flow*
(ft)	(ft)	(cfs)	(ft)	(cfs)	(cfs)	(ft)	(cfs)	(ft)	(cfs)	(cfs)
7.00	0.00	0.00			0.00	0.00	0.00			0.00
8.00	0.00	0.00			**0.00**	4.00	78.05			0.00
8.50	0.38	0.14			**0.14**	4.50	82.78			0.14
9.00	0.88	0.22			**0.22**	5.00	87.26			0.22
10.00	1.88	0.32			**0.32**	6.00	95.59			0.32
10.50	2.38	0.36	0.00	0.00	**0.36**	6.50	99.49			0.36
11.00	2.88	0.40	0.50	23.76	**24.16**	7.00	103.25			24.16
11.50	3.38	0.43	1.00	67.20	**67.63**	7.50	106.87			67.63
11.75	3.63	0.45	1.25	93.91	**94.36**	7.75	108.64			94.36
12.50	4.38	0.49	2.00	190.07	190.56	8.50	**113.78**	0.0	0.00	113.78
12.75	4.63	0.51	2.25	226.80	227.31	8.75	**115.44**	0.3	17.50	132.94
13.00			2.50	265.63	265.63	9.00	**117.07**	0.5	49.50	166.57
13.50			3.00	349.18	349.18	9.50	**120.28**	1.0	140.00	260.28
14.00			3.50	440.02	440.02	10.00	**123.41**	1.5	257.20	380.60

* Note: Total Basin Flow is determined by adding either the Total Riser Flow or the Pipe Flow, which ever is controlling (bold type face indicates controlling flow), to the spillway flow
Total Riser Flow = Orifice + Central opening + Weir Flow

Table A-11: Stage-discharge calculation for the SWB B basin Outlet structure

SWB B

Riser Dim (ft x ft)	6	Riser Crest EL.(ft)	10.5	Riser Crest Length (ft)	24.00	Orifice Diameter (ft)	0.25
Pipe Diameter (ft)	2.5	Outlet Inv. EL.(ft)	1.00	Pipe Length (ft)	130	Orifice Area (sq ft)	0.049
Em Spillway Crest EL (ft)	12.5	Pipe Area (sq ft)	4.909	Top of the basin(ft)	15	Orifice Invert EL.(ft)	8.0
		Em Spillway Width (ft)	50.0	Bottom of the basin(ft)	7	Orifice center EL.(ft)	8.125
						No. of orifice	1

	Orifice Flow		Riser Weir Flow		Total	Pipe Flow		Spillway Flow		Total Basin
Elevation	h	Q	H	Q	Riser Flow	h	Q	H	Q	Flow*
(ft)	(ft)	(cfs)	(ft)	(cfs)	(cfs)	(ft)	(cfs)	(ft)	(cfs)	(cfs)
7.00	0.00	0.00			0.00	0.00	0.00			0.00
8.00	0.00	0.00			**0.00**	4.50	54.55			0.00
8.50	0.38	0.14			**0.14**	5.00	57.50			0.14
9.00	0.88	0.22			**0.22**	5.50	60.31			0.22
10.00	1.88	0.32			**0.32**	6.50	65.56			0.32
10.50	2.38	0.36	0.00	0.00	**0.36**	7.00	68.04			0.36
11.00	2.88	0.40	0.50	23.76	**24.16**	7.50	70.43			24.16
11.50	3.38	0.43	1.00	67.20	**67.63**	8.00	72.74			67.63
11.75	3.63	0.45	1.25	93.91	94.36	8.25	**73.86**			73.86
12.50	4.38	0.49	2.00	190.07	190.56	9.00	**77.15**	0.0	0.00	77.15
13.00	4.88	0.52	2.50	265.63	266.15	9.50	**79.26**	0.5	49.50	128.76
13.50			3.00	349.18	349.18	10.00	**81.32**	1.0	140.00	221.32
14.00			3.50	440.02	440.02	10.50	**83.33**	1.5	257.20	340.53
15.00			4.50	641.49	641.49	11.50	**87.21**	2.5	553.40	640.61

* Note: Total Basin Flow is determined by adding either the Total Riser Flow or the Pipe Flow, which ever is controlling (bold type face indicates controlling flow), to the spillway flow
Total Riser Flow = Orifice + Central opening + Weir Flow

Storm Water Management Basin Discharge Summary

The post-development peak discharges from the basins as well as the peak water levels are determined for the 2-, 5-, 10-, and 25-year, 72-hour storm using the computer program HEC-HMS. The schematic of the model, model inputs and model outputs are contained in Attachment C, and are summarized in Tables A-12 and A-13.

Table A-12 Post Development SWB A Discharge Summary

Storm	SWB A Peak Inflow (cfs)	SWB A Peak Outflow (cfs)	SWB A Peak Water Level (ft)
2-yr	78.9	62.7	11.4
5-yr	105.1	87.5	11.7
10-yr	126.3	97.7	11.9
25-yr	152.3	107.7	12.3

Table A-13 Post Development SWB B Discharge Summary

Storm	SWB B Peak Inflow (cfs)	SWB B Peak Outflow (cfs)	SWB B Peak Water Level (ft)
2-yr	56.7	48.3	11.3
5-yr	75.5	65.3	11.5
10-yr	90.7	71.7	11.7
25-yr	109.4	75.1	12.0

The peak inflow and outflow values shown in Tables A-12 and A-13 are based on a SCS Type III storm of 24-hour duration. Consequently, the peak discharges are conservatively higher than they would be if a 72-hour storm had been used.

Emergency Spillway Capacity

The capacity of the emergency spillways provided in storm water basins have been checked by passing the 100-year, 72-hour storm through the spillway. The simulation results presented in Attachment C and are also summarized in Table A-14.

Table A-14 Post Development Basin Discharge Summary for 100-year, 72-hour Storm

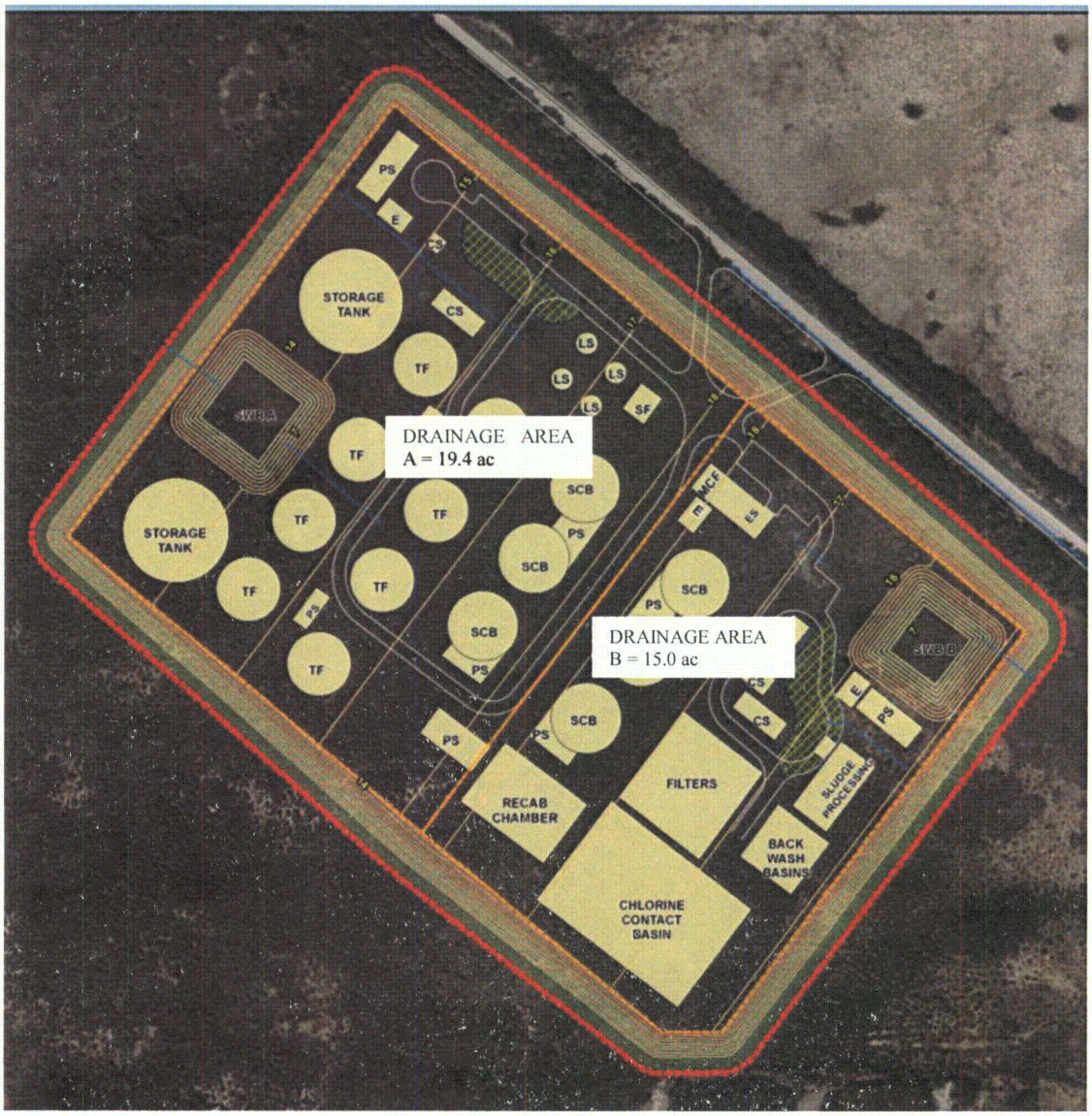
SWB	Peak Inflow (cfs)	Peak Outflow (cfs)	Peak Water Level (ft)	Top of the Basin (ft)
SWB A	231.3	178.5	13.1	14.0
SWB B	166.1	123.6	12.9	15.0

ATTACHMENT B **FPL SCA Appendix 10.8**

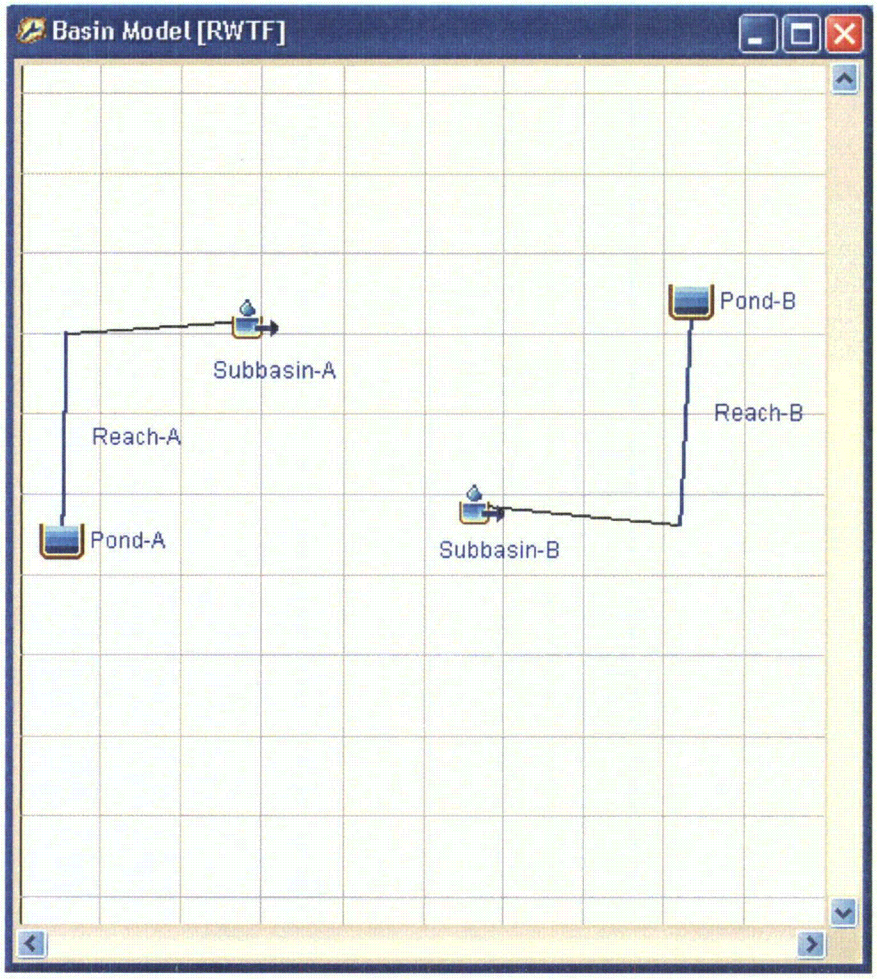
SUBJECT Layout for FPL Reclaimed Water Treatment Facility Storm Water Basins

SHEET NO 1 OF 1

REV. NO. 000



SCREEN CAPTURES OF HEC-HMS SCREEN FOR HYDROLOGIC ANALYSIS:



HEC-HMS INPUT FILES

Text contents of Basin input file

```
Basin: RWTF
     Last Modified Date: 17 June 2009
     Last Modified Time: 21:48:02
     Version: 3.1.0
     Unit System: English
     Missing Flow To Zero: No
     Enable Flow Ratio: No
     Allow Blending: No
     Compute Local Flow At Junctions: No
End:

Reservoir: Pond-A
     Canvas X: -4246.724890829694
     Canvas Y: -502.1834061135369
     Label X: -1.0
     Label Y: 0.0

     Route: Modified Puls
     Routing Curve: Elevation-Area-Outflow
     Initial Elevation: 8
     Elevation-Area Table: Pond A
     Elevation-Outflow Table: Pond A
End:

Reservoir: Pond-B
     Canvas X: 3417.0305676855887
     Canvas Y: 2969.43231441048

     Route: Modified Puls
     Routing Curve: Elevation-Area-Outflow
     Initial Elevation: 8
     Elevation-Area Table: Pond B
     Elevation-Outflow Table: Pond B
End:

Subbasin: Subbasin-A
     Canvas X: -2041.4847161572052
     Canvas Y: 2248.9082969432316
     Label X: -37.0
     Label Y: -27.0
     Area: 0.024
     Downstream: Reach-A

     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
     Curve Number: 93

     Transform: SCS
     Lag: 3.9

     Baseflow: None

     Erosion: None
End:

Subbasin: Subbasin-B
     Canvas X: 835.2941176470595
     Canvas Y: -247.0588235294117
     Label X: -39.0
```

```
     Label Y: -24.0
     Area: 0.017
     Downstream: Reach-B

     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
     Curve Number: 93

     Transform: SCS
     Lag: 3.6

     Baseflow: None

     Erosion: None
End:

Reach: Reach-A
     Canvas X: -4246.724890829694
     Canvas Y: -502.1834061135369
     From Canvas X: -4203.056768558952
     From Canvas Y: 2008.7336244541484
     Label X: 0.0
     Label Y: 2.0
     Downstream: Pond-A

     Route: Lag
     Lag: 1.2
     Channel Loss: None
End:

Reach: Reach-B
     Canvas X: 3417.0305676855887
     Canvas Y: 2969.43231441048
     From Canvas X: 3211.7437722419927
     From Canvas Y: -373.66548042704653
     Downstream: Pond-B

     Route: Lag
     Lag: 1.6
     Channel Loss: None
End:

Basin Schematic Properties:
     Last View N: 5000.0
     Last View S: -5000.0
     Last View W: -5000.0
     Last View E: 5000.0
     Maximum View N: 5000.0
     Maximum View S: -5000.0
     Maximum View W: -5000.0
     Maximum View E: 5000.0
     Extent Method: Elements
     Buffer: 0
     Draw Icons: Yes
     Draw Icon Labels: Yes
     Draw Gridlines: Yes
     Draw Flow Direction: No
End:
```

Text contents of meteorological input file

```
Meteorology: T02
     Last Modified Date: 2 June 2009
     Last Modified Time: 16:44:17
     Version: 3.1.0
     Unit System: English
     Precipitation Method: SCS Storm
     Snowmelt Method: None
     Basin Model List: RWTF
End:

Precip Method Parameters: SCS Storm
     Storm Depth: 6.7
     Storm Type: Type III
End:

Subbasin: Subbasin-A
End:

Subbasin: Subbasin-B
End:

Meteorology: T05
     Last Modified Date: 2 June 2009
     Last Modified Time: 16:44:21
     Version: 3.1.0
     Unit System: English
     Precipitation Method: SCS Storm
     Snowmelt Method: None
     Basin Model List: RWTF
End:

Precip Method Parameters: SCS Storm
     Storm Depth: 8.8
     Storm Type: Type III
End:

Subbasin: Subbasin-A
End:

Subbasin: Subbasin-B
End:

Meteorology: T10
     Last Modified Date: 2 June 2009
     Last Modified Time: 16:44:27
     Version: 3.1.0
     Unit System: English
     Precipitation Method: SCS Storm
     Snowmelt Method: None
     Basin Model List: RWTF
End:

Precip Method Parameters: SCS Storm
     Storm Depth: 10.5
     Storm Type: Type III
End:

Subbasin: Subbasin-A
End:

Subbasin: Subbasin-B
End:

Meteorology: T25
     Last Modified Date: 2 June 2009
```

```
     Last Modified Time: 16:44:34
     Version: 3.1.0
     Unit System: English
     Precipitation Method: SCS Storm
     Snowmelt Method: None
     Basin Model List: RWTF
End:

Precip Method Parameters: SCS Storm
     Storm Depth: 12.6
     Storm Type: Type III
End:

Subbasin: Subbasin-A
End:

Subbasin: Subbasin-B
End:

Meteorology: T100
     Last Modified Date: 2 June 2009
     Last Modified Time: 16:47:15
     Version: 3.1.0
     Unit System: English
     Precipitation Method: SCS Storm
     Snowmelt Method: None
     Basin Model List: RWTF
End:

Precip Method Parameters: SCS Storm
     Storm Depth: 19
     Storm Type: Type III
End:

Subbasin: Subbasin-A
End:

Subbasin: Subbasin-B
End:
```

Text contents of Run data file

```
Run: 100-yr POST
     Default Description: Yes
     Log File: 100_yr_POST.log
     Basin: RWTF
     Precip: T100
     Control: SWM
     Precip Last Execution Date: 17 June 2009
     Precip Last Execution Time: 21:48:43
     Basin Last Execution Date: 17 June 2009
     Basin Last Execution Time: 21:48:43
End:

Run: 10-yr POST
     Default Description: Yes
     Log File: 10_yr_POST.log
     Basin: RWTF
     Precip: T10
     Control: SWM
     Precip Last Execution Date: 17 June 2009
     Precip Last Execution Time: 22:30:07
     Basin Last Execution Date: 17 June 2009
     Basin Last Execution Time: 22:30:07
End:
```

```
Run: 25-yr POST
     Default Description: Yes
     Log File: 25_yr_POST.log
     Basin: RWTF
     Precip: T25
     Control: SWM
     Precip Last Execution Date: 17 June 2009
     Precip Last Execution Time: 22:30:13
     Basin Last Execution Date: 17 June 2009
     Basin Last Execution Time: 22:30:13
End:

Run: 2-yr POST
     Default Description: Yes
     Log File: 2_yr_POST.log
     Basin: RWTF
     Precip: T02
     Control: SWM
     Precip Last Execution Date: 17 June 2009
     Precip Last Execution Time: 22:29:55
     Basin Last Execution Date: 17 June 2009
     Basin Last Execution Time: 22:29:55
End:

Run: 5-yr POST
     Default Description: Yes
     Log File: 5_yr_POST.log
     Basin: RWTF
     Precip: T05
     Control: SWM
     Precip Last Execution Date: 17 June 2009
     Precip Last Execution Time: 22:30:01
     Basin Last Execution Date: 17 June 2009
     Basin Last Execution Time: 22:30:01
End:
```

Text contents of pdata

```
Table: Pond A
     Table Type: Stage-Flow
     Last Modified Date: 17 June 2009
     Last Modified Time: 21:47:46
     X-Units: FT
     Y-Units: CFS
     Use External DSS File: NO
     DSS File: Project_2.dss
     Pathname: //Pond A/STAGE-FLOW///TABLE/
End:

Table: Pond B
     Table Type: Stage-Flow
     Last Modified Date: 3 June 2009
     Last Modified Time: 13:48:56
     X-Units: FT
     Y-Units: CFS
     Use External DSS File: NO
     DSS File: Project_2.dss
     Pathname: //POND B/STAGE-FLOW///TABLE/
End:

Table: Pond A
     Table Type: Elevation-Area
     Last Modified Date: 17 June 2009
     Last Modified Time: 21:39:33
     X-Units: FT
```

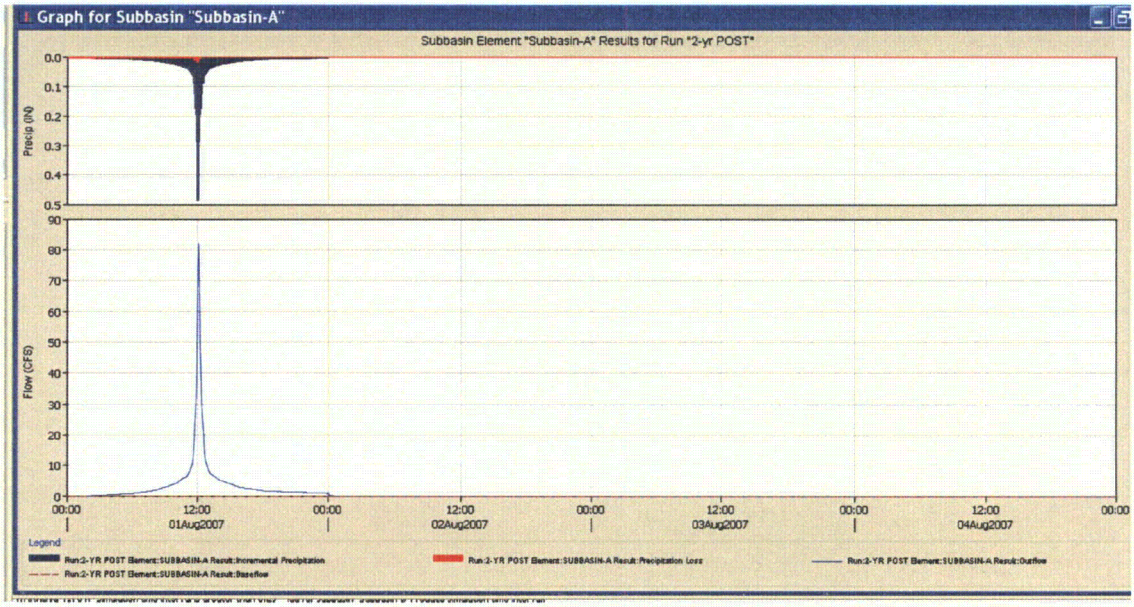
```
     Y-Units: ACRE
     Use External DSS File: NO
     DSS File: Project_2.dss
     Pathname: //Pond A/ELEVATION-AREA///TABLE/
End:

Table: Pond B
     Table Type: Elevation-Area
     Last Modified Date: 17 June 2009
     Last Modified Time: 21:41:20
     X-Units: FT
     Y-Units: ACRE
     Use External DSS File: NO
     DSS File: Project_2.dss
     Pathname: //Pond B/ELEVATION-AREA///TABLE/
End:
```

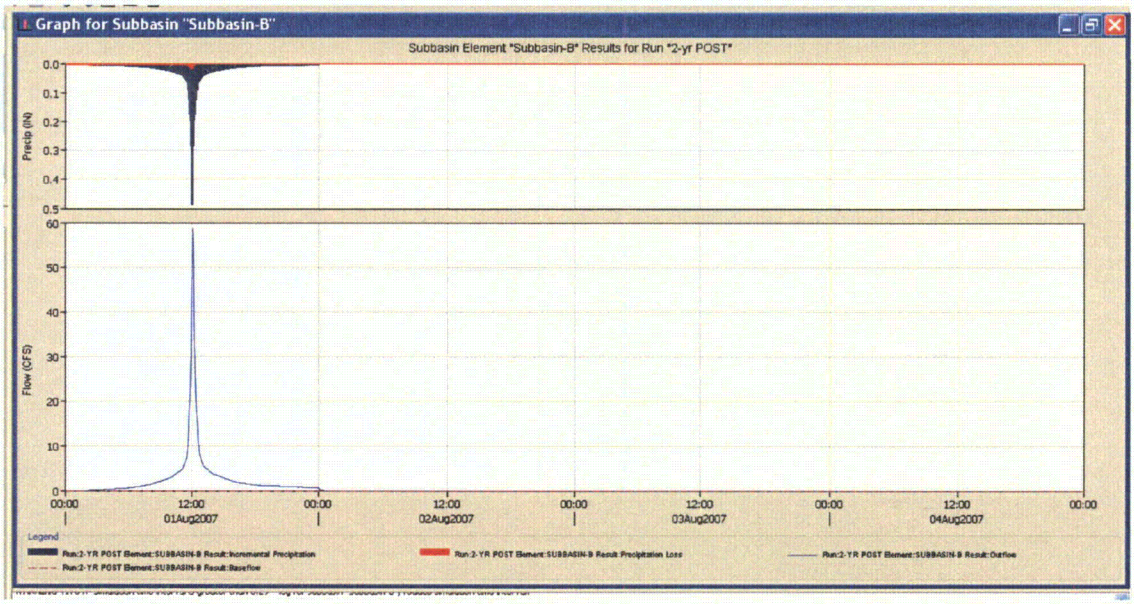
Text contents of SWM.control

```
Control: SWM
     Description: Design Storm
     Last Modified Date: 17 June 2009
     Last Modified Time: 21:42:22
     Start Date: 1 August 2007
     Start Time: 00:00
     End Date: 5 August 2007
     End Time: 00:00
     Time Interval: 5
End:
```

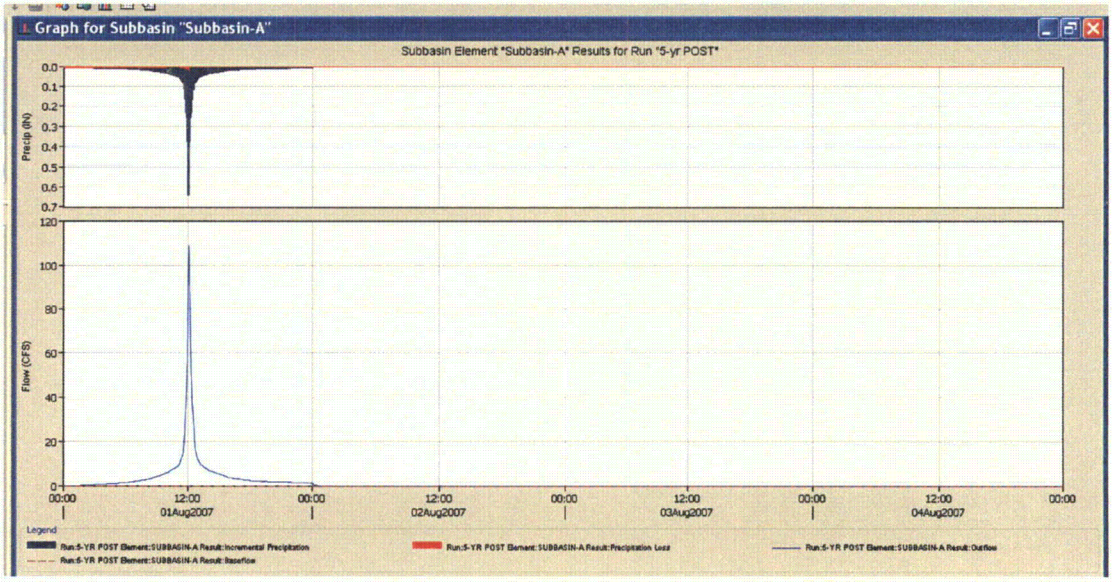
RUNOFF HYDROGRAPHS FOR DRAINAGE BASINS:

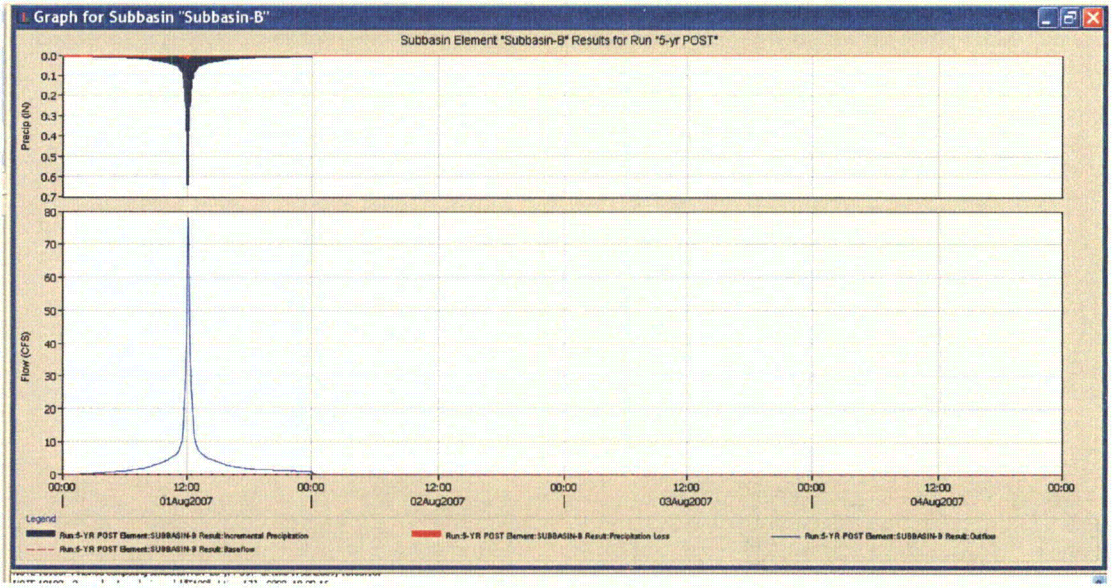
2-YEAR



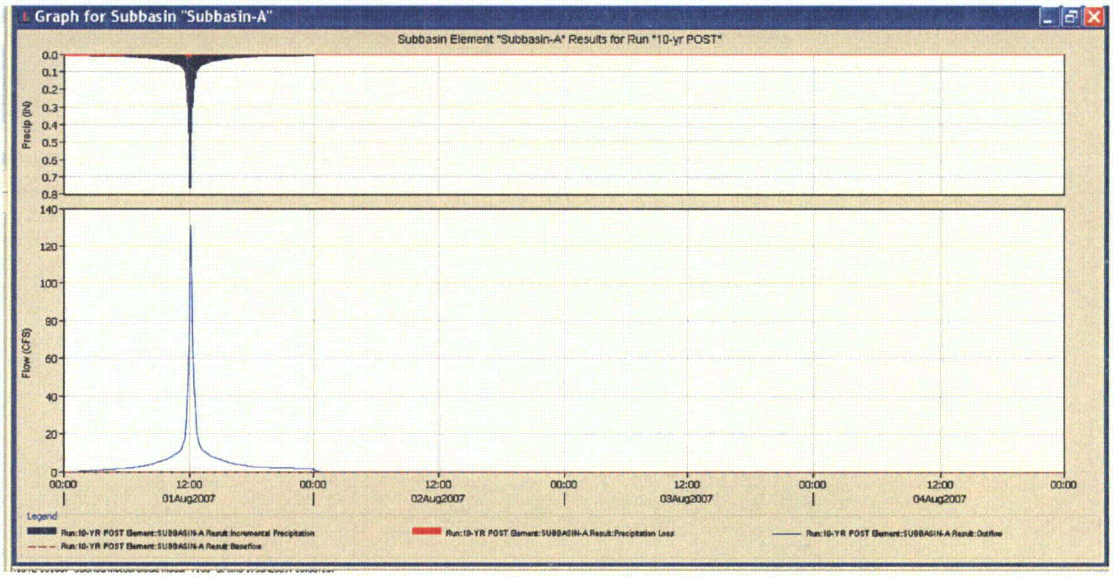


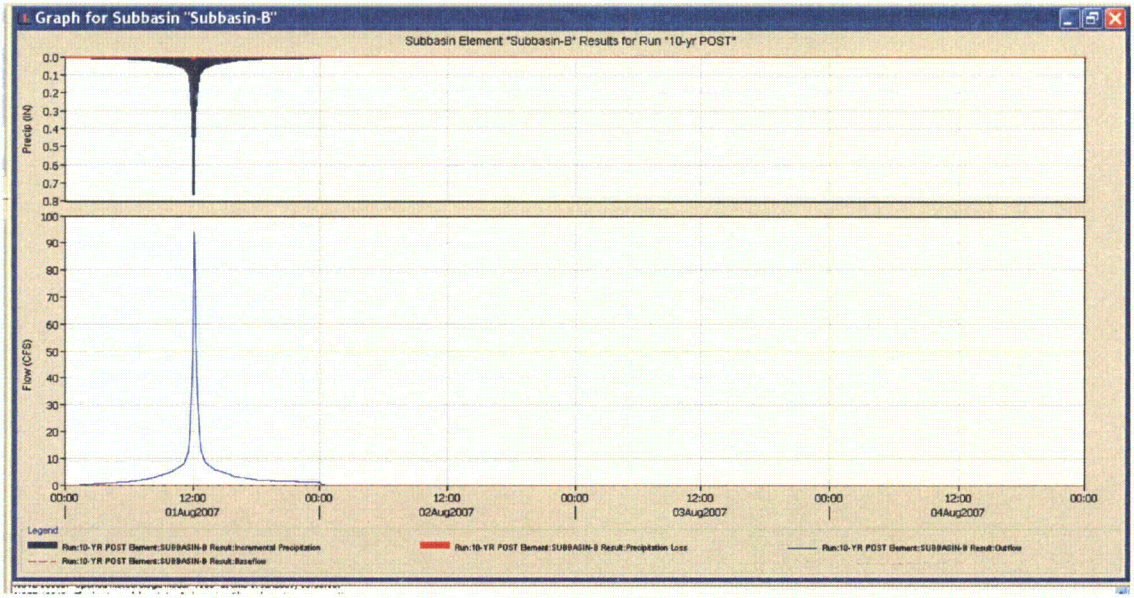
5-YEAR


Graph for Subbasin "Subbasin-A"
Subbasin Element "Subbasin-A" Results for Run "5-yr POST"
Precip (IN)
Flow (CFS)
01Aug2007
02Aug2007
03Aug2007
04Aug2007
Legend

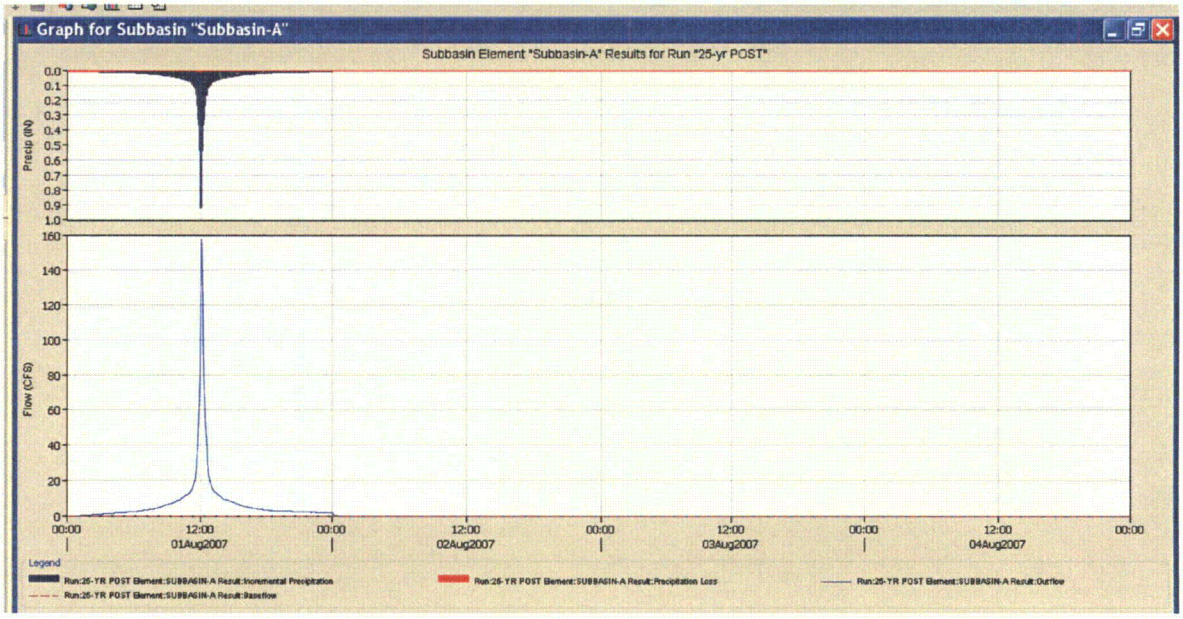

Graph for Subbasin "Subbasin-B"
Subbasin Element "Subbasin-B" Results for Run "5-yr POST"
Precip (IN)
Flow (CFS)
01Aug2007
02Aug2007
03Aug2007
04Aug2007
Legend

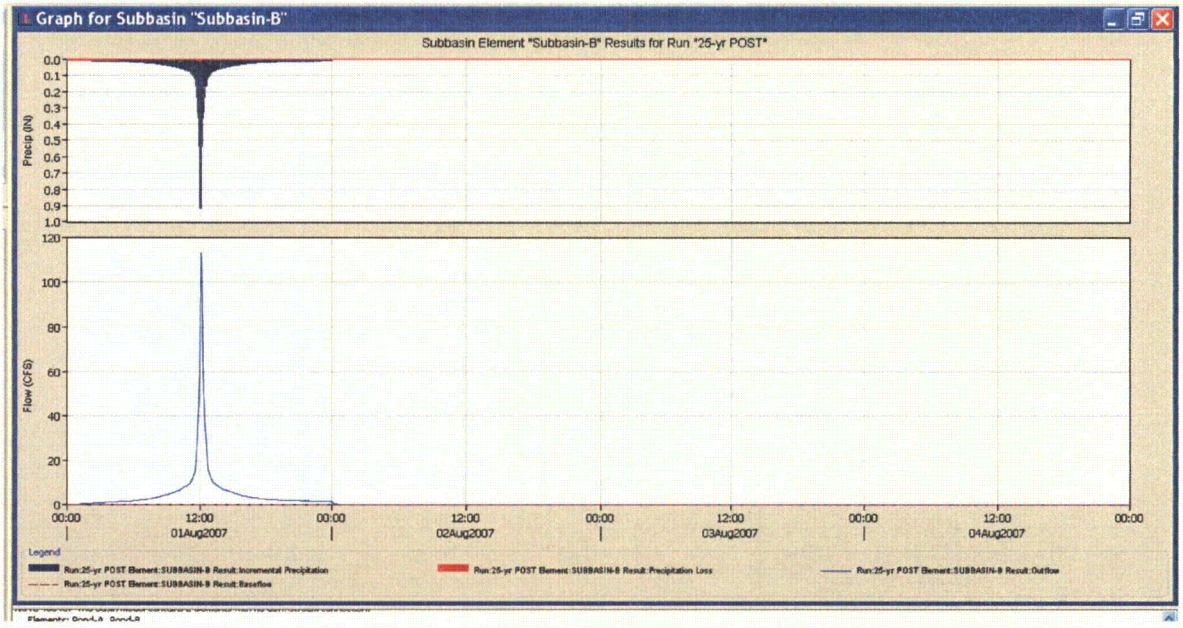
10-YEAR


Graph for Subbasin "Subbasin-A"
Subbasin Element "Subbasin-A" Results for Run "10-yr POST"
Precip (IN)
Flow (CFS)
01Aug2007
02Aug2007
03Aug2007
04Aug2007
Legend

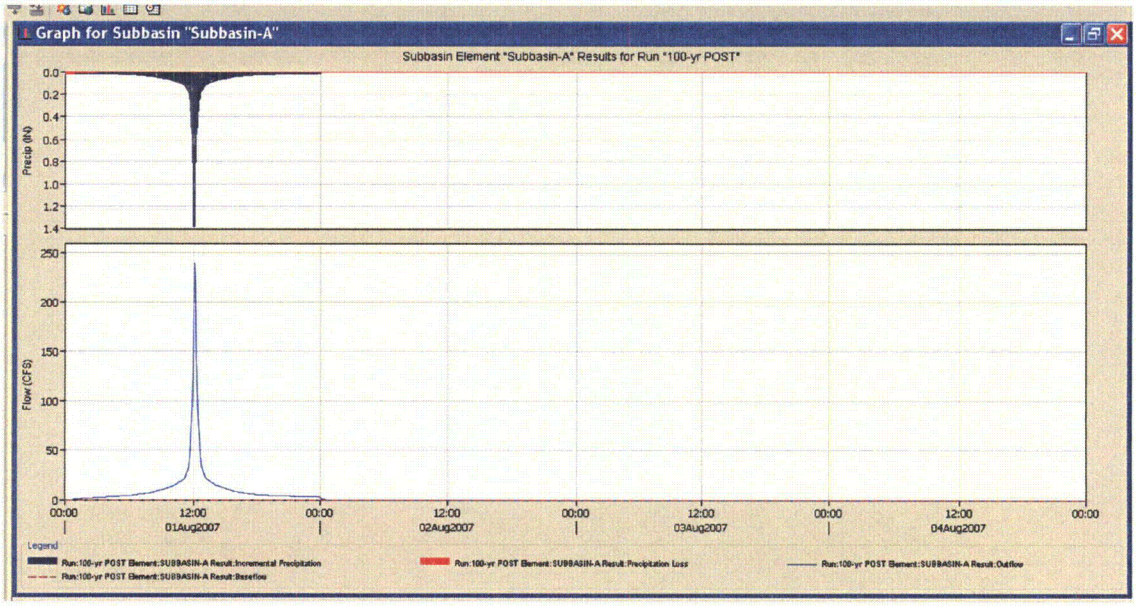

Graph for Subbasin "Subbasin-B"
Subbasin Element "Subbasin-B" Results for Run "10-yr POST"
Precip (IN)
Flow (CFS)
01Aug2007
02Aug2007
03Aug2007
04Aug2007
Legend

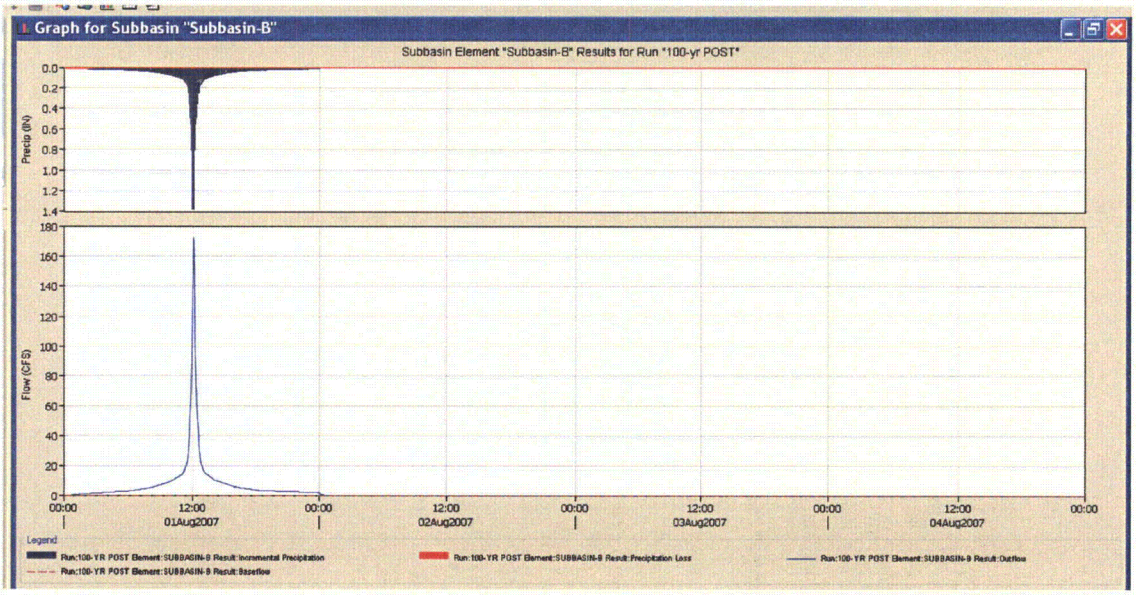
25-YEAR


Graph for Subbasin "Subbasin-A"
Subbasin Element "Subbasin-A" Results for Run "25-yr POST"
Precip (IN)
Flow (CFS)
01Aug2007
02Aug2007
03Aug2007
04Aug2007
Legend
Run:25-YR POST Element:SUBBASIN-A Result:Incremental Precipitation
Run:25-YR POST Element:SUBBASIN-A Result:Precipitation Loss
Run:25-YR POST Element:SUBBASIN-A Result:Outflow
Run:25-YR POST Element:SUBBASIN-A Result:Baseflow


Graph for Subbasin "Subbasin-B"
Subbasin Element "Subbasin-B" Results for Run "25-yr POST"
Precip (IN)
Flow (CFS)
01Aug2007
02Aug2007
03Aug2007
04Aug2007
Legend
Run:25-yr POST Element:SUBBASIN-B Result:Incremental Precipitation
Run:25-yr POST Element:SUBBASIN-B Result:Precipitation Loss
Run:25-yr POST Element:SUBBASIN-B Result:Outflow
Run:25-yr POST Element:SUBBASIN-B Result:Baseflow

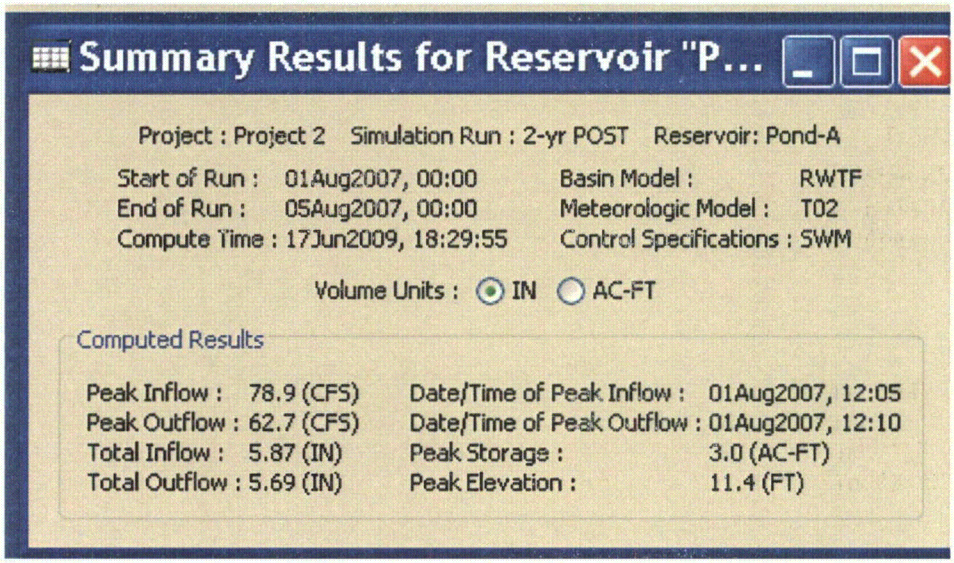
100-YEAR

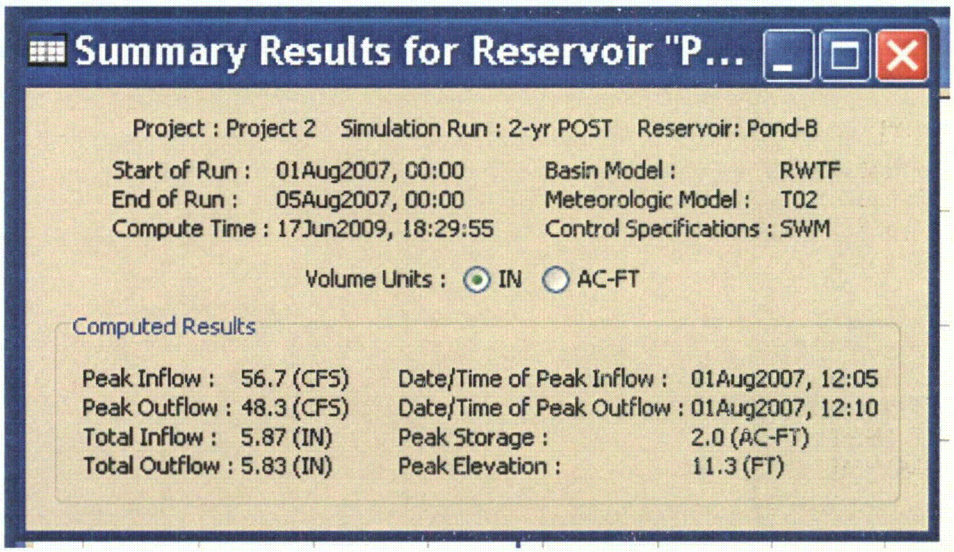




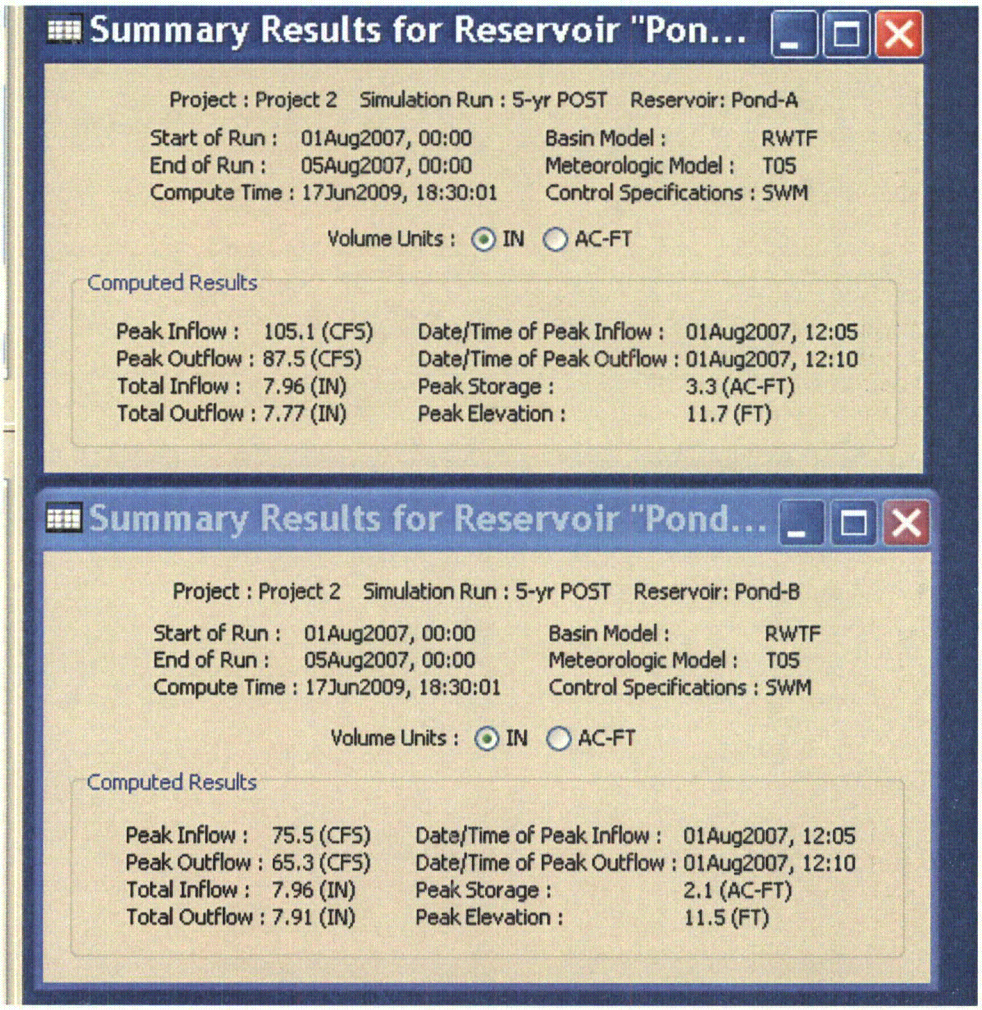
STORM WATER BASIN SUMMARY TABLES

2-YEAR

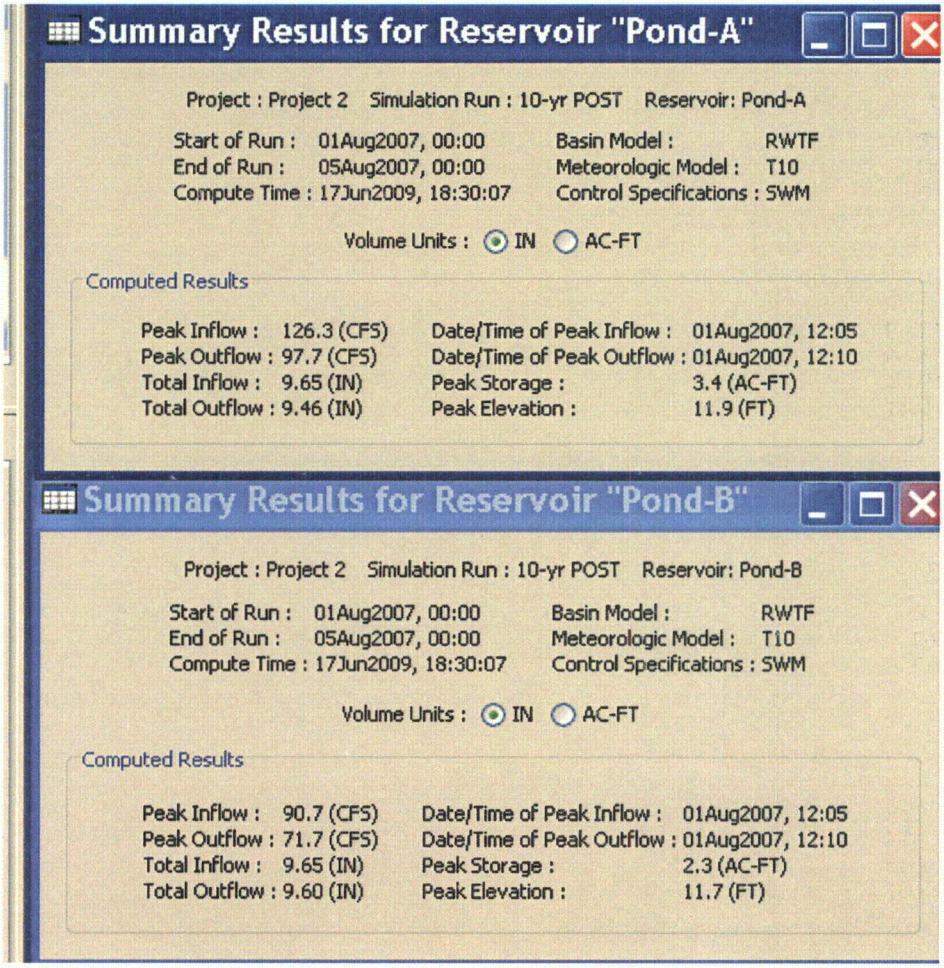

Summary Results for Reservoir "P...
Project : Project 2 Simulation Run : 2-yr POST Reservoir: Pond-A
Start of Run : 01Aug2007, 00:00
End of Run : 05Aug2007, 00:00
Compute Time : 17Jun2009, 18:29:55
Basin Model : RWTF
Meteorologic Model : T02
Control Specifications : SWM
Volume Units : IN AC-FT
Computed Results
Peak Inflow : 78.9 (CFS)
Peak Outflow : 62.7 (CFS)
Total Inflow : 5.87 (IN)
Total Outflow : 5.69 (IN)
Date/Time of Peak Inflow : 01Aug2007, 12:05
Date/Time of Peak Outflow : 01Aug2007, 12:10
Peak Storage : 3.0 (AC-FT)
Peak Elevation : 11.4 (FT)


Summary Results for Reservoir "P...
Project : Project 2 Simulation Run : 2-yr POST Reservoir: Pond-B
Start of Run : 01Aug2007, 00:00
End of Run : 05Aug2007, 00:00
Compute Time : 17Jun2009, 18:29:55
Basin Model : RWTF
Meteorologic Model : T02
Control Specifications : SWM
Volume Units : IN AC-FT
Computed Results
Peak Inflow : 56.7 (CFS)
Peak Outflow : 48.3 (CFS)
Total Inflow : 5.87 (IN)
Total Outflow : 5.83 (IN)
Date/Time of Peak Inflow : 01Aug2007, 12:05
Date/Time of Peak Outflow : 01Aug2007, 12:10
Peak Storage : 2.0 (AC-FT)
Peak Elevation : 11.3 (FT)

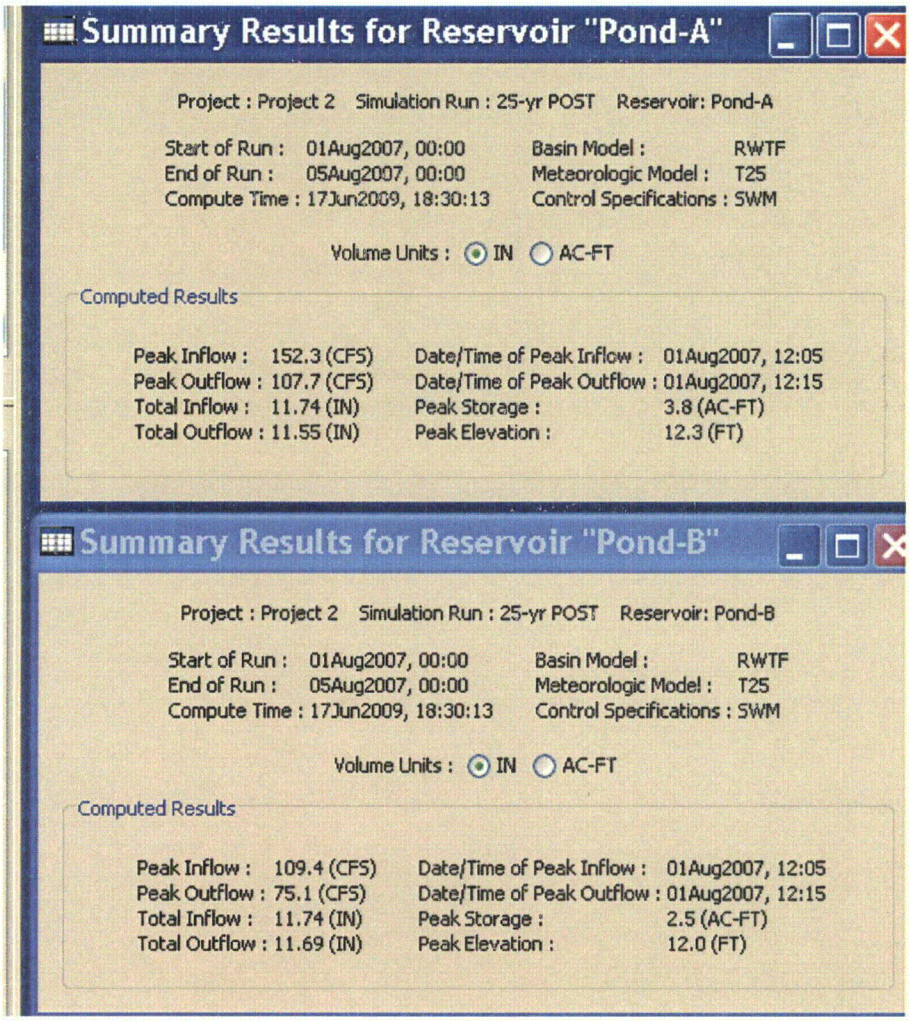
5-YEAR

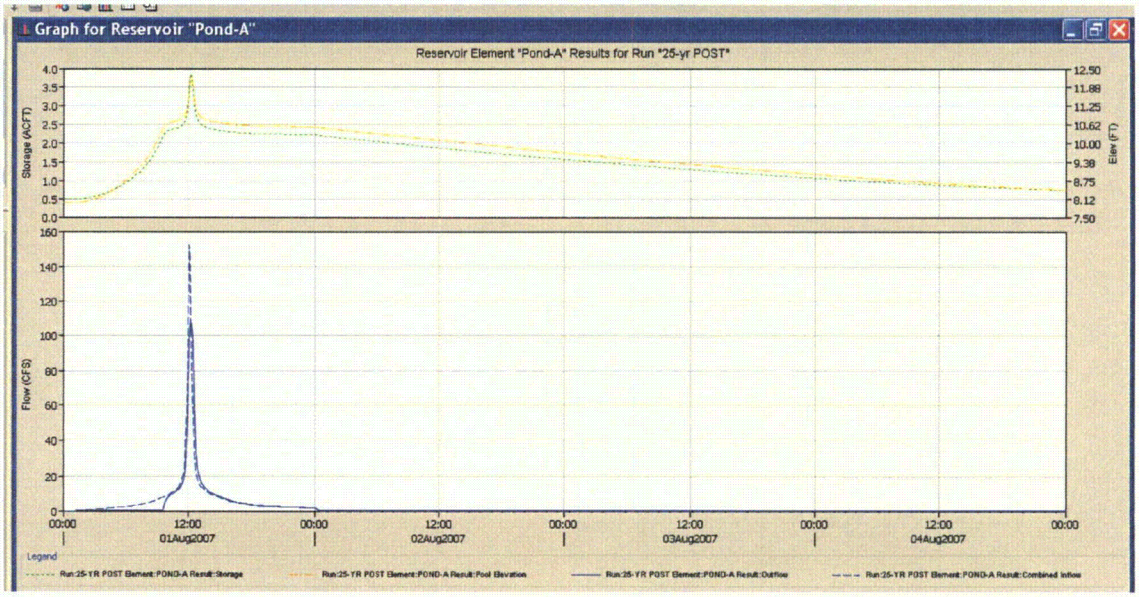

Summary Results for Reservoir "Pon...
Project : Project 2 Simulation Run : 5-yr POST Reservoir: Pond-A
Start of Run : 01Aug2007, 00:00
End of Run : 05Aug2007, 00:00
Compute Time : 17Jun2009, 18:30:01
Basin Model : RWTF
Meteorologic Model : T05
Control Specifications : SWM
Volume Units : IN AC-FT
Computed Results
Peak Inflow : 105.1 (CFS)
Peak Outflow : 87.5 (CFS)
Total Inflow : 7.96 (IN)
Total Outflow : 7.77 (IN)
Date/Time of Peak Inflow : 01Aug2007, 12:05
Date/Time of Peak Outflow : 01Aug2007, 12:10
Peak Storage : 3.3 (AC-FT)
Peak Elevation : 11.7 (FT)
Summary Results for Reservoir "Pond...
Project : Project 2 Simulation Run : 5-yr POST Reservoir: Pond-B
Start of Run : 01Aug2007, 00:00
End of Run : 05Aug2007, 00:00
Compute Time : 17Jun2009, 18:30:01
Basin Model : RWTF
Meteorologic Model : T05
Control Specifications : SWM
Volume Units : IN AC-FT
Computed Results
Peak Inflow : 75.5 (CFS)
Peak Outflow : 65.3 (CFS)
Total Inflow : 7.96 (IN)
Total Outflow : 7.91 (IN)
Date/Time of Peak Inflow : 01Aug2007, 12:05
Date/Time of Peak Outflow : 01Aug2007, 12:10
Peak Storage : 2.1 (AC-FT)
Peak Elevation : 11.5 (FT)

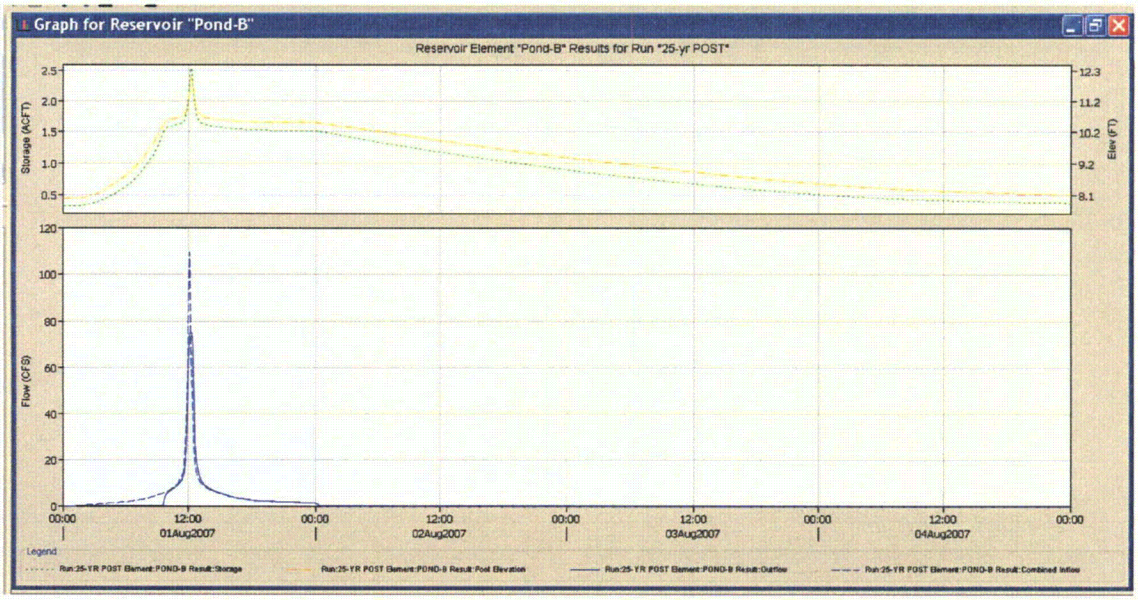
10-*YEAR*


Summary Results for Reservoir "Pond-A"
Project : Project 2 Simulation Run : 10-yr POST Reservoir: Pond-A
Start of Run : 01Aug2007, 00:00
End of Run : 05Aug2007, 00:00
Compute Time : 17Jun2009, 18:30:07
Basin Model : RWTF
Meteorologic Model : T10
Control Specifications : SWM
Volume Units : IN AC-FT
Computed Results
Peak Inflow : 126.3 (CFS)
Peak Outflow : 97.7 (CFS)
Total Inflow : 9.65 (IN)
Total Outflow : 9.46 (IN)
Date/Time of Peak Inflow : 01Aug2007, 12:05
Date/Time of Peak Outflow : 01Aug2007, 12:10
Peak Storage : 3.4 (AC-FT)
Peak Elevation : 11.9 (FT)
Summary Results for Reservoir "Pond-B"
Project : Project 2 Simulation Run : 10-yr POST Reservoir: Pond-B
Start of Run : 01Aug2007, 00:00
End of Run : 05Aug2007, 00:00
Compute Time : 17Jun2009, 18:30:07
Basin Model : RWTF
Meteorologic Model : T10
Control Specifications : SWM
Volume Units : IN AC-FT
Computed Results
Peak Inflow : 90.7 (CFS)
Peak Outflow : 71.7 (CFS)
Total Inflow : 9.65 (IN)
Total Outflow : 9.60 (IN)
Date/Time of Peak Inflow : 01Aug2007, 12:05
Date/Time of Peak Outflow : 01Aug2007, 12:10
Peak Storage : 2.3 (AC-FT)
Peak Elevation : 11.7 (FT)

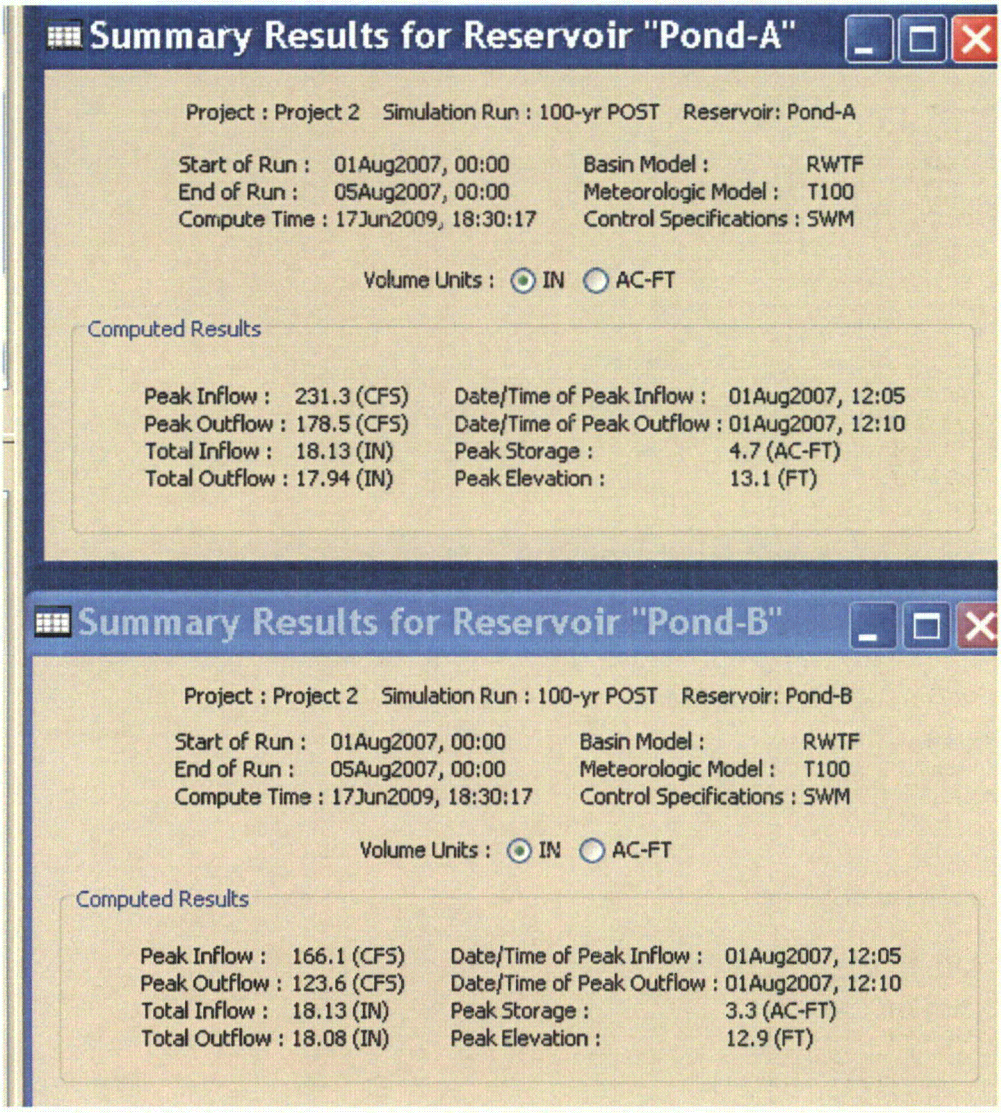
25-YEAR


Summary Results for Reservoir "Pond-A"
Project : Project 2 Simulation Run : 25-yr POST Reservoir: Pond-A
Start of Run : 01Aug2007, 00:00
End of Run : 05Aug2007, 00:00
Compute Time : 17Jun2009, 18:30:13
Basin Model : RWTF
Meteorologic Model : T25
Control Specifications : SWM
Volume Units : IN AC-FT
Computed Results
Peak Inflow : 152.3 (CFS)
Peak Outflow : 107.7 (CFS)
Total Inflow : 11.74 (IN)
Total Outflow : 11.55 (IN)
Date/Time of Peak Inflow : 01Aug2007, 12:05
Date/Time of Peak Outflow : 01Aug2007, 12:15
Peak Storage : 3.8 (AC-FT)
Peak Elevation : 12.3 (FT)
Summary Results for Reservoir "Pond-B"
Project : Project 2 Simulation Run : 25-yr POST Reservoir: Pond-B
Start of Run : 01Aug2007, 00:00
End of Run : 05Aug2007, 00:00
Compute Time : 17Jun2009, 18:30:13
Basin Model : RWTF
Meteorologic Model : T25
Control Specifications : SWM
Volume Units : IN AC-FT
Computed Results
Peak Inflow : 109.4 (CFS)
Peak Outflow : 75.1 (CFS)
Total Inflow : 11.74 (IN)
Total Outflow : 11.69 (IN)
Date/Time of Peak Inflow : 01Aug2007, 12:05
Date/Time of Peak Outflow : 01Aug2007, 12:15
Peak Storage : 2.5 (AC-FT)
Peak Elevation : 12.0 (FT)


Graph for Reservoir "Pond-A"
Reservoir Element "Pond-A" Results for Run "25-yr POST"
Storage (ACFT)
Elev (FT)
Flow (CFS)
01Aug2007
02Aug2007
03Aug2007
04Aug2007
Legend


Graph for Reservoir "Pond-B"
Reservoir Element "Pond-B" Results for Run "25-yr POST"
Storage (ACFT)
Elev (FT)
Flow (CFS)
01Aug2007
02Aug2007
03Aug2007
04Aug2007
Legend

100-*YEAR*



Summary Results for Reservoir "Pond-A"

Project : Project 2 Simulation Run : 100-yr POST Reservoir: Pond-A

Start of Run :	01Aug2007, 00:00	Basin Model :	RWTF
End of Run :	05Aug2007, 00:00	Meteorologic Model :	T100
Compute Time :	17Jun2009, 18:30:17	Control Specifications :	SWM

Volume Units : (•) IN ( ) AC-FT

Computed Results

Peak Inflow :	231.3 (CFS)	Date/Time of Peak Inflow :	01Aug2007, 12:05
Peak Outflow :	178.5 (CFS)	Date/Time of Peak Outflow :	01Aug2007, 12:10
Total Inflow :	18.13 (IN)	Peak Storage :	4.7 (AC-FT)
Total Outflow :	17.94 (IN)	Peak Elevation :	13.1 (FT)

Summary Results for Reservoir "Pond-B"

Project : Project 2 Simulation Run : 100-yr POST Reservoir: Pond-B

Start of Run :	01Aug2007, 00:00	Basin Model :	RWTF
End of Run :	05Aug2007, 00:00	Meteorologic Model :	T100
Compute Time :	17Jun2009, 18:30:17	Control Specifications :	SWM

Volume Units : (•) IN ( ) AC-FT

Computed Results

Peak Inflow :	166.1 (CFS)	Date/Time of Peak Inflow :	01Aug2007, 12:05
Peak Outflow :	123.6 (CFS)	Date/Time of Peak Outflow :	01Aug2007, 12:10
Total Inflow :	18.13 (IN)	Peak Storage :	3.3 (AC-FT)
Total Outflow :	18.08 (IN)	Peak Elevation :	12.9 (FT)