DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO ATTENTION OF
Regulatory Division

Department of the Army Permit

Regional General Permit SAJ-86
SAJ-2004-01861

Residential, Commercial, Recreational, and Institutional Fill in the Choctawhatchee Bay, Lake Powell, and West Bay Basins Bay and Walton Counties, Florida

Upon recommendation of the Chief of Engineers, pursuant to Section 404 of the Clean Water Act (33 U.S.C. 1344), general authority is hereby given for the discharge of fill and dredged material into non-tidal waters of the United States, including wetlands, for residential, commercial, recreational, and institutional development in portions of the Choctawhatchee Bay, Lake Powell, and West Bay basins in accordance with the following special conditions:

SPECIAL CONDITIONS:

1. Projects qualifying for SAJ-86 must be authorized under Part IV of Chapter 373, *F.S*. by the Florida Department of Environmental Protection (DEP), Northwest Florida Water Management District (NWFWMD) under Section 373.069, *F.S*., or a local government with delegated authority under Section 373.441, *F.S*., as well as any authorizations as required for the use of sovereign submerged lands under Chapters 253 and 258, *F.S*. Water quality certification for a portion of the Regional General Permit (RGP) area may be granted by the Ecosystem Management Agreement (EMA), executed between the DEP and The St. Joe Company (Exhibit 1) for those projects located within the EMA portion of the RGP area. All of the conditions specified in the EMA water quality certification must be complied with as special conditions to this RGP. All projects outside the EMA area authorized by this RGP will require separate water quality certifications from DEP, NWFWMD, or delegated local government. The conditions specified in such certifications constitute special conditions of this RGP for those specific projects.

2. Surface water management systems for all projects authorized by this RGP shall be designed, constructed, operated, and maintained in compliance with the *Stormwater System Design and Review Criteria Manual, February 2004* (Exhibit 2).

3. This permit applies to discharges of dredged or fill material into non-tidal waters of the United States for the construction of residential, commercial, recreational and

institutional projects, including building foundations, building pads and attendant features that are necessary for the use and maintenance of the structures. Attendant features may include, but are not limited to, roads, parking lots, garages, yards, utility lines, and stormwater management facilities. Residential developments include multiple and single unit developments. Examples of commercial developments include retail stores, light industrial facilities, restaurants, business parks, and shopping centers. Examples of recreational facilities include playgrounds, playing fields, golf courses, hiking trails, bike paths, horse paths, stables, nature centers, and campgrounds. Examples of institutional developments include schools, fire stations, government office buildings, judicial buildings, public works buildings, libraries, hospitals, and places of worship. This permit applies only to the portions of Bay and Walton Counties, Florida, as depicted by Exhibit 3, as being within the "GP Boundary."

4. This RGP authorizes impacts to wetlands that are defined as low and high quality. Low quality wetlands are wetlands that are planted in pine trees. Low quality wetlands include ditches. High quality wetlands are all other jurisdictional wetlands. Low quality wetlands are typically hydric pine plantations. High quality wetlands are typically cypress domes/strands, bay/gallberry swamps, harvested cypress swamp areas, titi monocultures, and *Hypericum* bogs.

5. Impacts to wetlands must meet all of the following criteria:

a. Impacts to low quality wetlands shall not exceed 20% of the total low quality wetlands in any one sub-basin. The area within a particular sub-basin to be used to make the 20% calculation does not include areas within either mitigation banks or conservation units located within the sub-basin. Sub-basins are depicted in Exhibit 4.

b. Projects may impact more than 20% of the low quality wetlands within an individual project site, if cumulative low quality wetland impacts for all approved projects within the sub-basin do not exceed 20% at any time. Examples of how this may occur include:

(1) An individual project impacts only 15% of the low quality wetlands in the project site and the remaining on-site wetlands are preserved through a conservation easement to the DEP. A subsequent project owned by the same applicant within that sub-basin may impact more than 20% of the low quality wetlands in the project site, as long as the total impact to low quality wetlands for all approved projects for the same landowner within the sub-basin does not exceed 20%.

(2) An individual project impacts 30% of the low quality wetlands on the project site. As a part of the project, a sufficient area of low quality wetlands are preserved through a conservation easement to DEP elsewhere within the same sub-basin so as not to exceed the maximum 20% impact to low quality wetlands for all approved projects within the sub-basin.

c. Impacts to high quality wetlands shall be limited to road and bridge crossings necessary to support the associated development, and shall not exceed a width of 100 feet of combined filling or clearing at each crossing. The aggregate total filling or clearing of high quality wetlands for road crossings within the RGP area shall not exceed 125 acres. The first preference for new high quality wetland road crossings will be at existing silviculture road crossings. Road crossings at locations other than existing silviculture crossings are allowed if the crossing is designed and constructed to minimize wetland impacts. In addition, for each crossing proposed at a point where no previous crossing existed, an existing silviculture road crossing within the sub-basin must be removed and the wetland connection restored. All road or bridge crossings in wetlands shall be designed so that the hydrologic conveyance is not reduced or impaired. Bridging is encouraged wherever practicable. The following factors shall be considered when determining if bridging of the wetlands is practicable: (1) the degree of water flow within the wetland, (2) the length of the wetland crossing, (3) the topography of the wetland and associated upland, and (4) the degree to which a roadway would adversely affect the movement of wildlife expected to use the wetland.

d. All wetlands not authorized for impact on each project site shall be preserved. Conservation easements shall be placed over such wetlands (see Special Condition 13.b. below). Individual project sites, including offsite preservation areas to meet the requirement in Special Condition 5.b.(2) above, shall have reasonable boundaries that include intermixed and adjacent low and high quality wetlands. The following activities are allowed within these preserved areas placed under conservation easements:

(1) Wetland and upland habitat enhancement and restoration.

(2) Wetland mitigation.

(3) Fire fighting or fire suppression activities.

(4) Mechanical clearing of fire lanes/fire breaks as part of controlled burn activities, fire fighting, or fire suppression.

(5) Installation of fences for land management or habitat protection purposes.

(6) Removal or extermination of nuisance or exotic animal species.

(7) Hunting of deer, quail, and other indigenous animal species pursuant to properly issued hunting permits only where consistent with the St. Joe Hunt Plan approved by and on file with Grantee at the time of the recording of the conservation easement.

(8) Installation of signs for land management, facilitation of passive recreation or habitat protection purposes.

(9) Maintenance of unpaved nature trails.

(10) Installation of interpretive signs for nature trails.

(11) Maintenance of existing drainage ditches to original as-built dimensions and configurations. All materials removed for the maintenance of existing ditches must be disposed of within an upland disposal site, which is not located within any preserved lands subject to this RGP.

6. No fill material may be placed in wetlands for septic tanks or drainfields.

7. Buffers are required around Lake Powell. A 100-foot buffer between the lake from the ordinary high water line (OHWL) and development is required in Walton County. A 30-foot buffer between the lake from the OHWL and development is required in Bay County. All buffers, whether upland or wetland, will be preserved and maintained in a natural condition, except boardwalks for dock access and on-grade trails. Buffers may be enhanced or restored to a more natural condition. Application of fertilizers, herbicides, or pesticides is prohibited in all buffers, except for the use of herbicides for the eradication of exotic and invasive plants.

8. In general, low quality wetlands shall buffer high quality wetlands throughout the RGP area. Except at road crossings on a per project basis, upland and/or low quality wetland buffers adjacent to high quality wetlands shall be an average of 50 feet wide, with a minimum 30-foot width for each individual project. All buffers, whether upland or wetland, will be preserved and maintained in a natural condition, except for the construction of boardwalks for dock access and on-grade trails. Buffers may be enhanced or restored to a more natural condition. Application of fertilizers, herbicides, or pesticides is prohibited in all buffers, except for the use of herbicides for the eradication of exotic and invasive plants. Such buffers shall be placed under conservation easements (see Special Condition 13.b below). The following activities are allowed within these preserved buffers placed under conservation easements:

a. Wetland and upland habitat enhancement and restoration.

b. Wetland mitigation.

c. Fire fighting or fire suppression activities.

d. Mechanical clearing of fire lanes/fire breaks as part of controlled burn activities, fire fighting, or fire suppression.

e. Installation of fences for land management or habitat protection purposes.

f. Removal or extermination of nuisance or exotic animal species.

g. Hunting of deer, quail, and other indigenous animal species pursuant to properly issued hunting permits only where consistent with the St. Joe Hunt Plan approved by and on file with Grantee at the time of the recording of the conservation easement.

h. Installation of signs for land management, facilitation of passive recreation or habitat protection purposes.

i. Maintenance of unpaved nature trails.

j. Installation of interpretive signs for nature trails.

k. Maintenance of existing drainage ditches to original as-built dimensions and configurations. All materials removed for the maintenance of existing ditches must be disposed of within an upland disposal site, which is not located within any preserved lands subject to this RGP.

9. Only clean fill and rock material compatible with existing soils (e.g., soil, rock, sand, marl, clay, stone, and/or concrete rubble) shall be used for wetland fills.

10. No wetland fill shall sever a jurisdictional connection or isolate a jurisdictional area.

11. Compensatory mitigation:

a. Compensatory mitigation for individual project wetland impacts may be satisfied within: (1) two specified regional offsite mitigation banks, (2) designated conservation units, or (3) within the project area. However, mitigation at a mitigation bank shall not be an available option for a project within the Lake Powell basin. Mitigation for projects within the Lake Powell basin can only be located within the Lake Powell basin. Mitigation for impacts within the Lake Powell basin can be within the project site, or within a designated Conservation Unit in the Lake Powell basin.

b. The first priority for compensatory mitigation of permitted wetland impacts in the RGP area, except for impacts within the Lake Powell basin as described above, is restoration/ enhancement-based activities at one of the two following mitigation banks: (1) the Breakfast Point Mitigation Bank for projects within the Breakfast Point Basin; and (2) the Devils Swamp Mitigation Bank for projects within the Devils Swamp Basin. The location of the two mitigation banks and their respective basins within the RGP area, as well as the Lake Powell basin, are depicted in Exhibits 3, 5 and 6.

c. The U.S. Army Corps of Engineers (Corps) on a case-by-case basis may approve compensatory mitigation projects located within the conservation units or within individual project sites. Conservation easements shall be placed over areas on which compensatory mitigation projects are located (see Special Condition 13.c. below). The activities, as described by Special Condition 12.b below, are allowed within compensatory mitigation project areas within conservation units, unless otherwise

prohibited or modified by the specific compensatory mitigation plan for the site. The following activities are allowed in compensatory mitigation project areas not located within conservation units, unless otherwise prohibited or modified by the specific compensatory mitigation plan for the site:

(1) Wetland and upland habitat enhancement and restoration.

(2) Wetland mitigation.

(3) Fire fighting or fire suppression activities.

(4) Mechanical clearing of fire lanes/fire breaks as part of controlled burn activities, fire fighting, or fire suppression.

(5) Installation of fences for land management or habitat protection purposes.

(6) Removal or extermination of nuisance or exotic animal species.

(7) Hunting of deer, quail, and other indigenous animal species pursuant to properly issued hunting permits only where consistent with the St. Joe Hunt Plan approved by and on file with Grantee at the time of the recording of the conservation easement.

(8) Installation of signs for land management, facilitating passive recreation or habitat protection purposes.

(9) Maintenance of unpaved nature trails.

(10) Installation of interpretive signs for nature trails.

(11) Maintenance of existing drainage ditches to original as-built dimensions and configurations. All materials removed for the maintenance of existing ditches must be disposed of within an upland disposal site, which is not located within any preserved lands subject to this RGP.

d. Compensatory mitigation credits and debits are defined in terms of functional units (FU), as determined using the *Wetland Rapid Assessment Procedure (WRAP), Technical Publication REG-001, September 1997*. Each acre of impact to low quality wetlands shall be valued at 0.65 FU, and each acre of impact to high quality wetlands shall be valued at 0.92 FU.

e. Compensatory mitigation will occur prior to or be implemented concurrent with permitted impacts.

f. Compensatory mitigation projects required for projects authorized by this RGP must be maintained in perpetuity in the enhanced/restored ecological condition, as described in the individual compensatory mitigation project's plan.

12. Conservation units:

a. Ten conservation units (Exhibits 7 through 17) will be excluded from development and preserved, as described Special Condition in 12.b below, by the St. Joe Company, commencing with the first authorization issued under this RGP for any project of the St. Joe Company or any of its constituent companies.

b. Conservation units may only be used for conservation purposes, wetland or habitat mitigation, and limited passive recreational purposes. The uses and activities authorized in the conservation units are limited to the following:

(1) Wetland and upland habitat enhancement and restoration.

(2) Forest management shall be conducted so as to enhance conservation and habitat restoration, using Best Management Practices and uneven age management regimes in accordance with the *Principles for Forest and Wildlife Management of Conservation Units within the Regional General Permit Area and Ecosystem Agreement Area – Revision 2014* (Exhibit 18). Timber management for the sole purpose of timber production is prohibited. No timbering of cypress or wetland hardwoods will occur in conservation units. Clear cutting is prohibited except as allowed in the referenced management plan.

(3) Hunting pursuant to properly issued hunting permits, fishing, and birding.

(4) Prior approval from the Corps is required for construction of nature trails, boardwalks, gathering shelters, restroom facilities and other similar passive recreational activities in the conservation units. These activities shall result in no more than minimal impacts to the conservation units. Additional activities may be approved after review by the Corps, and only if the Corps determines the proposed activity to be consistent with the purpose of this RGP.

(5) Wetland mitigation. The management plan, as provided in Exhibit 18, may be replaced by a wetland mitigation plan, upon the written approval of the Corps.

(6) Effluent disposal, including necessary transmission lines, distribution facilities, and attendant structures, in the Cypress and Wet Pine Flats Conservation Unit, if authorized by separate DEP and Corps permits. Treatment facilities shall not be allowed in the conservation unit.

(7) Reinstitution of fire regime, including necessary firebreaks, which mimics natural conditions.

(8) Incorporation into adjacent developments as open space and limited to the uses outlined above.

(9) Maintenance of roads and ditches where needed to implement activities listed above.

(10) Maintenance of existing drainage ditches to original as-built dimensions and configurations. All materials removed for the maintenance of existing ditches must be disposed of within an upland disposal site, which is not located within any preserved lands subject to this RGP.

(11) Construction of five new or improved road crossings, as shown on Exhibit 19. Crossing Number 4, through the Wildlife Corridor Conservation Unit, shall be bridged. These road crossings shall be subject to the road crossing criteria and wetland impact limitations as required in Special Condition 5.c above.

(12) Activities needed to maintain, in current condition, existing access within and through the conservation units. With the exception of the crossings identified in Special Condition 12.b(11) above, these do not include activities to improve, enlarge or relocate such access.

c. By February 15th of each year, The St. Joe Company shall have placed perpetual conservation easements with the DEP as the grantee (or ensure that conservation easements are placed on sold or transferred parcels) on portions of conservation units equal to the percentage of the total acreage of approved projects in each sub-basin. Conservation easements for projects authorized 45 days prior to February 15th may be recorded by the following year. To determine the acreage of the conservation units that must be placed under an easement:

(1) Using the EMA area only, divide the total acreage within an approved project boundary in a sub-basin (including off-site wetland preservation areas) by the total acreage of land within the sub-basin minus the area of any conservation units with the same sub-basin.

(2) This percentage of the conservation units in each sub-basin shall be placed under conservation easement.

(3) The cumulative acreage of conservation units conveyed to governmental entities or 501c (3) conservation organization buyers shall count toward the acreage placed under a conservation easement.

d. Sale or transfer of a conservation unit is limited to a governmental entity or 501c (3) private conservation owner, and only when the requirements in Special Conditions 12.a & 12.b above are met. If conservation units, or any portion thereof or interest therein, are conveyed to subsequent owners, if not already subject to a

conservation easement pursuant to Special Condition 12.c above, The St. Joe Company shall place conservation easements on such property to assure the perpetual conservation use of the conservation units, as described in Special Condition 12.b above. The perpetual conservation easement shall be in the form of Exhibit 20 and comply with Special Condition 13.d. Within seven days of conveyance of any portion or interest of a conservation unit, The St. Joe Company shall provide to the new owner a complete copy of the RGP, including the U.S. Fish and Wildlife Service's (FWS) revised Biological Opinion (BO) dated March 3, 2005 and the re-issued BO letter dated May 19, 2009 [NOTE: PLACEHOLDER for 2014 LETTER FROM FWS](Exhibit 21). Written assurance that a complete copy of the RGP has been given and received shall be provided to the Corps by The St. Joe Company within fourteen days of any such conveyance. The written assurance shall consist of a letter to the Corps stating that the exchange has taken place and shall be signed by the appropriate representatives of The St. Joe Company and the new owner.

13. Conservation easements. This section addresses the placement of conservation easements, as required by this RGP, under three different scenarios:

a. Perpetual conservation easements with the DEP as the grantee will be placed on conservation units as described in Special Condition 12.d above. The easement shall be in the form of Exhibit 20.

b. Perpetual conservation easements with the DEP as the grantee will be placed on wetlands, not authorized for impact on each project site; and will include any buffers, as required by Special Condition 8 above. The conservation easements will be in place following individual project approval, but prior to commencing any activities authorized by this RGP or according to the timeframe specified in the approval. The easement shall be in the form of Exhibit 20.

c. For areas to be used for compensatory mitigation conducted outside of a mitigation bank, a perpetual conservation easement with the DEP as the grantee, will be placed on the mitigation area prior to commencing any activities authorized by this RGP on the individual project for which the mitigation is approved. The easement shall be in the form of Exhibit 20.

d. In addition to the above, the following shall apply for all conservation easements:

(1) The permittee shall have the conservation easement, including a legal description, survey, and scaled drawings, of the areas in question, prepared and sent for legal review and approval to the U.S. Army Corps of Engineers, Regulatory Division, Enforcement Section, 41 North Jefferson Street, Suite 301, Pensacola, Florida 32502.

(2) Within 30 days of U.S. Army Corps of Engineers' approval of the proposed easement, the permittee shall record the easement or deed restriction in the public records of Bay or Walton County, Florida. A certified copy of the recorded

document, plat, and verification of acceptance from the grantee will be forwarded to the Corps at the address in Special Condition 13.d(1) above.

(3) The Permittee must show that it has clear title to the real property and can legally place it under a conservation easement. Along with the submittal of the draft conservation easement, the Permittee shall submit a title insurance commitment, in favor of the grantee, for the property that is being offered for preservation. Any existing liens or encumbrances on the property must be subordinated to the conservation easement. At the time of recordation of the conservation easement, a copy of a title insurance policy written in favor of the DEP must be provided to the Corps in an amount equal to the current market value of the property.

(4) In the event the permit is transferred, proof of delivery of a copy of the recorded conservation easement to the subsequent permittee or permittees must be submitted to the Corps together with the notification of permit transfer.

(5) Grantee shall not assign its rights or obligations under a conservation easement except to another organization qualified to hold such interests under the applicable state and federal laws, including §704.06 Florida Statutes, and committed to holding this conservation easement exclusively for conservation purposes. The Corps shall be notified in writing of any intention to reassign the conservation easement to a new grantee and must approve selection of the grantee. The new grantee must accept the assignment in writing and deliver a copy of this acceptance to the Corps. The conservation easement must then be re-recorded and indexed in the same manner as any other instrument affecting title to real property, and a certified copy of the recorded conservation easement shall be furnished to the Corps.

14. The St. Joe Company shall establish and maintain a GIS-based ledger and map depicting the amount, type and percentage of wetland impact, project area, and conservation easement area implemented in the EMA area. An updated ledger balance sheet demonstrating compliance with this RGP shall be submitted with each individual request for project approval. The ledger shall include the following by sub-basin:

a. Total high quality and low quality wetlands in the EMA area.

b. Total project size – uplands and wetlands.

c. Project impacts – high quality and low quality wetlands amount and percent of total.

d. Mitigation required and location.

e. Cumulative project impacts (acreage total and percentage).

f. Total wetlands by quality remaining in the EMA area.

g. The St. Joe Company shall submit an annual report by February 15 of each year for the proceeding calendar year identifying:

(1) The location and acreage of any mitigation activity undertaken;

(2) Conservation easements recorded;

(3) Conservation units conveyed to other owners;

(4) Activities undertaken within conservation units; and

(5) Other activities that may impact this RGP.

15. For the purposes of Section 404 of the Clean Water Act under this RGP, the identification and delineation of wetlands must be in accordance with the most recent guidance and wetland delineation manual or manual supplement issued by the Corps. As of the date of reissuance of this RGP, applicants should use the *Interim Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Atlantic and Gulf Coastal Plain Region (2008)*. Wetlands may be delineated using aerial photo-interpretation (API) and ground-truthing, and, if necessary, mapped using the Global Positioning System (GPS) and other Geographical Information System (GIS) mapping techniques. In much of the project area, historical aerial photography will be used to obtain pre-pine plantation wetland community signatures. If a construction line falls within 250 feet of a wetland boundary, estimated using the method described in this paragraph, then a documented field wetland jurisdictional determination based on ground-truthing with flagged wetland delineation lines, which have been surveyed and approved by the Corps, will be required for that segment of the proposed project

16. Listed and protected species:

a. This RGP does not authorize the take of an endangered species, with the exception of the flatwoods salamander, *Ambystoma bishopi*. In order to legally take a listed species, separate authorization under the Endangered Species Act (ESA) is required (e.g., an ESA section 10 permit, or a biological opinion (BO) under ESA section 7, with “incidental take” provisions with which permittees under this RGP must comply). The enclosed FWS’s revised BO dated March 3, 2005 and the re-issued BO letter dated May 19, 2009 (Exhibit 21) NOTE: PLACEHOLDER for 2014 LETTER FROM FWS]contain mandatory terms and conditions to implement the reasonable and prudent measures that are associated with the “incidental take” that is specified in the BO. Authorization under this RGP is conditional upon your compliance with all of the mandatory terms and conditions associated with incidental take of the attached BO, which terms and conditions are incorporated herein by reference. Failure to comply with the terms and conditions associated with incidental take of the BO, where a take of the listed species occurs, will constitute an unauthorized take, and will also constitute non-compliance with this RGP. The FWS is the appropriate authority to determine compliance with the terms and conditions of its BO, and with the ESA.

b. Reticulated flatwoods salamander (*Ambystoma bishopi*): A site evaluation for the reticulated flatwoods salamander shall be performed by completion of the *RGP-86 Flatwoods Salamander Pre-application Evaluation* (Exhibit 22). The completed site evaluation shall be provided at the pre-application meeting, as described in Special Condition 18 below.

c. Bald eagle (*Haliaeetus leucocephalus*) In order to avoid potential impacts to the bald eagle nests located within the RGP area measures will be implemented as dictated by the *National Bald Eagle Management Guidelines (May 2007)* (U.S. Fish and Wildlife Service (USFWS)), attached as Exhibit 23; and the *FWC Bald Eagle (Haliaeetus leucocephalus) Management Plan Handbook (June 2010)* (Florida Fish and Wildlife Commission (FWC)), attached as Exhibit 24.

d. Telephus spurge (*Euphorbia telephioides*): A site evaluation for Telephus spurge shall be performed by the completion of the *RGP-86 Telephus Surge Pre-application Evaluation* (Exhibit 25). The completed site evaluation shall be provided at the pre-application meeting, as described in Special Condition 18 below.

e. Eastern indigo snake (*Drymarchon corais couperi*)**:** The Permittee shall comply with FWS's *Standard Protection Measures for the Eastern Indigo Snake* dated February 12, 2004 (Exhibit 26).

f. State listed/protected species: If any state listed/protected species are encountered, coordination with Florida Fish and Wildlife Conservation Commission (FWC) will be initiated. The FWS web-site includes a reference to federal and state-listed species by county.

17. Cultural resources and/or historic properties:

a. No structure or work shall adversely affect, impact, or disturb properties listed in the *National Register of Historic Places (NRHP)* or those eligible for inclusion in the *NRHP*.(see Special Condition 18.a(7) below).

b. If during the ground disturbing activities and construction work within the permit area, there are archaeological/cultural materials encountered which were not the subject of a previous assessment survey (and which shall include, but not be limited to: pottery, modified shell, flora, fauna, human remains, ceramics, stone tools or metal implements, dugout canoes, evidence of structures or any other physical remains that could be associated with Native American cultures or early colonial or American settlement), the Permittee shall immediately stop all work in the vicinity and notify the Corps. The Corps shall then notify the Florida SHPO and the appropriate Tribal Historic Preservation Officer(s) (THPO(s)) to assess the significance of the discovery and devise appropriate actions.

c. A cultural resources assessment may be required of the permit area, if deemed necessary by the SHPO, THPO(s), or Corps, in accordance with 36 CFR 800 or 33 CFR 325, Appendix C (5). Based on the circumstances of the discovery, equity to all parties, and considerations of the public interest, the Corps may modify, suspend or revoke the permit in accordance with 33 CFR Part 325.7. Such activity shall not resume on non-federal lands without written authorization from the SHPO and the Corps.

d. In the unlikely event that unmarked human remains are identified on non-federal lands, they will be treated in accordance with Section 872.05 Florida Statutes. All work in the vicinity shall immediately cease and the Permittee shall immediately notify the medical examiner, Corps, and State Archeologist. The Corps shall then notify the appropriate SHPO and THPO(s). Based on the circumstances of the discovery, equity to all parties, and considerations of the public interest, the Corps may modify, suspend or revoke the permit in accordance with 33 CFR Part 325.7. Such activity shall not resume without written authorization from the State Archeologist, SHPO, and the Corps.

18. Individual project approval:

a. The evaluation process to determine if an individual project conforms to the requirements and criteria of this RGP shall begin with a pre-application meeting to which the appropriate representatives from the Corps, DEP, FWS, National Marine Fisheries Service, U.S. Environmental Protection Agency, FWC and NWFWMD are invited. The primary purpose of the pre-application process is to identify and produce preliminary data necessary for evaluation during the application phase and to conduct an informal analysis of the project and evaluate how it complies with the RGP criteria. The pre-application meeting shall also provide an opportunity to discuss the proposed project design and the opportunity for habitat corridors between on-site wetlands, the conservation units, and other wetlands in the RGP area. At the pre-application meeting, the following information will be provided by the applicant:

(1) Scope of the project – Type of project and how it comports with activities authorized by the RGP.

(2) Location / project boundaries – Exhibits showing general project location within the project area boundaries and specific location (1"=200' or other appropriate scale).

(3) The identification and delineation of wetlands must be in accordance with the most recent guidance and wetland delineation manual or manual supplement issued by the Corps. As of the date of reissuance of this RGP, applicants should use the *Interim Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Atlantic and Gulf Coastal Plain Region (2008)*. Wetlands may be delineated using API and ground-truthing, and if necessary, mapped using GPS and other GIS mapping techniques. In much of the project area, historical aerial photography will be used to obtain pre-pine plantation wetland community signatures. If the construction

line falls within 250 feet of a wetland boundary estimated using the method described in this paragraph, then a documented field wetland jurisdictional determination with ground-truthing with flagged jurisdiction lines, which have been surveyed and approved by the Corps, will be required for that segment of the proposed project.

(4) Maps of high quality and low quality wetlands onsite. For sites within the EMA area, the existing high quality/low quality wetland map shall be used as a starting point for delineation of onsite wetlands (Exhibit 27). During or after wetland boundaries have been established using the method described in Special Condition 18.a(3) above, the resulting wetland areas will be classified and mapped by quality, as defined in Special Condition 4 above. The procedure will use a combination of GPS technology, visual inspection of photography, and ground-truthing. Additional data that may be used including overlays involving timber stand data.

(5) Proposed wetland impacts. The number, type, location, and acreage of all wetland impacts, as well as drawings and other exhibits that sufficiently depict that the proposed project fully complies with this RGP.

(6) Stormwater management systems for projects authorized under this RGP area will be in accordance with the *Stormwater System Design and Review Criteria Manual, February 2004* (Exhibit 2). A signed statement by a Florida licensed engineer which verifies that the project conforms to the aforementioned manual will be submitted.

(7) Documentation of coordination with the State Historic Preservation Officer (SHPO). When required by the SHPO, the applicant shall conduct a Phase I archeological and historical survey on each individual project site. This information shall be provided to the SHPO and the Corps, so that measures can be identified to avoid, minimize or mitigate adverse impacts to historic properties listed, or eligible for listing in the *NRHP*, or otherwise of archeological or historical value.

(8) Reticulated flatwoods salamander (*Ambystoma bishopi*): Documentation of a site evaluation for the reticulated flatwoods salamander shall be provided by completion of the *RGP-86 Flatwoods Salamander Pre-application Evaluation* (Exhibit 22).

(9) Bald eagle (*Haliaeetus leucocephalus*): Documentation shall be provided that states whether or not a bald eagle's nest is located on or in the vicinity of the project site. If a bald eagle's nest occurs within 660 feet of a project, the applicant will implement measures in order to avoid potential impacts to bald eagle nests, as dictated by the *National Bald Eagle Management Guidelines (May 2007)* (FWS)), attached as Exhibit 23, and the *FWC Bald Eagle (Haliaeetus leucocephalus) Management Plan Handbook (June 2010)*, attached as Exhibit 24. Appropriate protections shall be incorporated in the project and documentation shall be provided showing how the appropriate protections will be implemented.

(10) Telephus spurge (*Euphorbia telephioides*): Documentation of a site evaluation for Telephus spurge shall be provided by the completion of the *RGP-86 Telephus Surge Pre-application Evaluation* (Exhibit 25).

(11) Eastern indigo snake (*Drymarchon corais couperi*)**:** The applicant shall provide documentation that Special Condition 16.b above shall be implemented.

(12) The applicant shall provide documentation whether coordination with the FWC was required and/or initiated regarding any needed fish and wildlife surveys for the project area, and any measures needed to avoid, minimize, or mitigate adverse impacts to state listed/protected fish and wildlife species and their habitats including any plan to obtain a permit if required by Chapter 68A-27, F.A.C.

b. Application to the Corps for individual projects under this RGP will be made using the form *Joint Application for Works in the Waters of Florida Form #62-312.900*. The exhibits and information referenced in Special Condition 18.a above shall be included in their final form with the application. No regulated work may proceed until after written authorization under this RPG has been issued.

19. On a case-by-case basis, the Corps may impose additional Special Conditions that are deemed necessary to minimize adverse environmental impacts.

20. Failure to comply with all conditions of the Federal authorizations under this Permit will constitute a violation of the Federal authorization.

21. Self-Certification: Within 60 days of completion of the work authorized and mitigation (if applicable), the attached "Self-Certification Statement of Compliance" must be completed and submitted to the Corps. Mail the completed form to: U.S. Army Corps of Engineers, Regulatory Division, Enforcement Section, 41 North Jefferson Street, Suite 301, Pensacola, Florida 32502. A copy of the "Self-Certification Statement of Compliance" must also be provided to the DEP at: Florida Department of Environmental Protection, SLERP, 160 Governmental Center, Suite 202, Pensacola, Florida 32501.

22. This Permit will be valid for 5 years from the date of issuance unless suspended or revoked by issuance of a public notice by the District Engineer. The Corps, in conjunction with the Federal resource agencies will conduct periodic reviews, which will include compliance reviews, to determine if continuation of the permit is not contrary to the public interest. The permit can be reissued for 5-year periods indefinitely, if it is found not to be contrary to the public interest.

23. If this RGP expires prior to the completion of work authorized by an Individual Project Approval, authorization of activities that have commenced or are under contract to commence in reliance on the Individual Project Approval will remain in effect provided the activities are completed within 12 months of the date this RGP expires.

BY AUTHORITY OF THE SECRETARY OF THE ARMY

Alan M. Dodd
Colonel, U.S. Army
District Commander

GENERAL CONDITIONS:

1. The time limit for completing the work authorized ends on _____. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and State coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature and mailing address of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

( ) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

(X) Section 404 of the Clean Water Act (33 U.S.C. 1344).

( ) Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, State, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal projects.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision: This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (see 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision. Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions: General Condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

DEPARTMENT OF THE ARMY PERMIT TRANSFER REQUEST
FOR REGIONAL GENERAL PERMIT SAJ-86

PERMIT NUMBER: _____

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. Although the construction period for works authorized by Department of the Army permits is finite, the permit itself, with its limitations, does not expire.

To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below and mail to the U.S. Army Corps of Engineers, Panama City Regulatory Office, 475 Harrison Avenue, Suite 202, Panama City, FL 32401.

_____ _____
(TRANSFEREE-SIGNATURE) (SUBDIVISION)

_____ _____ _____
(DATE) (LOT) (BLOCK)

_____
(NAME-PRINTED)

_____
(MAILING ADDRESS)

_____
(CITY, STATE, AND ZIP CODE)

SELF-CERTIFICATION STATEMENT OF COMPLIANCE
FOR REGIONAL GENERAL PERMIT SAJ-86

Permit Number: _____

Permittee's Name & Address (please print or type):_____

_____

_____

Telephone Number:_____

Location of the Work:_____

_____

Date Work Started:_____ Date Work Completed:_____

Description of the Work (e.g. bank stabilization, residential or commercial filling, docks, dredging, etc.):_____

_____

_____

Acreage or Square Feet of Impacts to Waters of the United States:_____

_____

Describe Mitigation completed (if applicable):_____

_____

_____

Describe any Deviations from Permit (attach drawing(s) depicting the deviations):

_____

_____

_____

I certify that all work, and mitigation (if applicable) was done in accordance with the limitations and conditions as described in the permit. Any deviations as described above are depicted on the attached drawing(s).

_____
Signature of Permittee

_____
Date

List of Exhibits for Regional General Permit SAJ-86

Exhibit 1: Ecosystem Management Agreement

Exhibit 2: *Stormwater System Design and Review Criteria Manual, February 2004*

Exhibit 3: SAJ-86 Boundary Map/Mitigation Strategy

Exhibit 4: Sub-basin Map

Exhibit 5: Breakfast Point Mitigation Bank

Exhibit 6: Devils Swamp Mitigation Bank

Exhibit 7: Conservation Units Map

Exhibit 8: Conservation Unit 1 – Point Washington State Forest

Exhibit 9: Conservation Unit 2 – Wildlife Corridor

Exhibit 10: Conservation Unit 3 - Side Camp Road

Exhibit 11: Conservation Unit 4 - Lake Powell Headwater

Exhibit 12: Conservation Unit 5 - Cypress and Wet Pine Flats

Exhibit 13: Conservation Unit 6 - Ward Creek

Exhibit 14: Conservation Unit 7 - South American Swamp

Exhibit 15: Conservation Unit 8 - Southwest West Bay

Exhibit 16: Conservation Unit 9 - Salamander Triangle

Exhibit 17: Conservation Unit 10 - Breakfast Point Peninsula

Exhibit 18: *Principles for Forest and Wildlife Management of Conservation Units within the West Bay Ecosystem Management Agreement and RGP SAJ-86 - Revision 2014*

Exhibit 19: Conservation Unit Road Crossings

Exhibit 20: Conservation Easement

Exhibit 21: Biological Opinion and Updates

Exhibit 22: *RGP-86 Flatwoods Salamander Pre-Application Evaluation*

Exhibit 23: *National Bald Eagle Management Guidelines (May 2007)* (USFWS)

Exhibit 24: *FWC Bald Eagle (Haliaeetus leucocephalus) Management Plan Handbook (June 2010)* (FWC)

Exhibit 25: *RGP-86 Telephus Spurge Pre-application Evaluation*

Exhibit 26: *Standard Protection Measures for the Eastern Indigo Snake*

Exhibit 27: High/Low Quality Wetlands

St. Joe Ecosystem Management Agreement

For Bay and Walton Counties

This agreement is made and entered into by The St. Joe Company (St. Joe) and the Florida Department of Environmental Protection (DEP).

I. Threshold and Procedural Matters

1. This Ecosystem Management Agreement (the "Agreement") is entered into pursuant to the authority provided by Sections 403.0752, Florida Statutes (F.S.). It is intended to be a binding agreement under Subsections 403.0752(7) and 403.0752(8). Governmental approvals addressed herein will be subject to public notice, hearing and decision-making procedures (including points of entry for third parties) as set forth in the applicable provisions of state law and this Agreement.

2. The ecosystem management process established herein coordinates the regulatory responsibilities of the DEP and the U.S. Army Corps of Engineers (USACE) with the interests of the business community, private landowners and the public, as partners in a streamlined and effective program to protect the environment and to provide net ecosystem benefits (403.0752(1), F.S.).

3. This Agreement is intended to coordinate and facilitate flexible permitting for community and economic development and to achieve Net Ecosystem Benefit (NEB) and related public objectives for the region. The Parties acknowledge that the permitting process described in this EMA will provide reasonable assurance the objectives and requirements of subsections 403.0752(1), (2), (3), (4), F.S. are met.

4. Subsection 403.0752(2), F.S. provides that an ecosystem management agreement may be entered into by DEP and regulated entities when DEP determines that:

   a. Implementation of such an agreement meets all the applicable standards and criteria, so that there is a net ecosystem benefit to the subject ecosystem more favorable than operation under applicable rules;
   b. entry into such an agreement will not interfere with the Department's obligations under any federally delegated or approved program;
   c. implementation of the agreement will result in a reduction in overall risks to human health and the environment compared to activities conducted in the absence of the agreement; and
   d. the regulated entity has certified to the Department that it has in place internal environmental management systems or alternative internal controls sufficient to implement this Agreement.

The Department has determined that these requirements of subsection 403.0752(2) are satisfied by the approach outlined in this Agreement.

II. Agreement Overview

This Agreement addresses regulatory approvals for development within a 31,369 acre tract of land in Bay and Walton Counties owned by St. Joe, identified as the Agreement Area on Exhibit 1. Specifically, this Agreement sets forth the procedures and criteria to be followed by DEP and St. Joe for pre-application meetings, and procedures for application submittal, review and approval for individual projects within the Agreement Area, as well as coordination with federal agencies and notice to the public. Execution of the Agreement by DEP shall constitute final agency action for dredge and fill, storm water, and mitigation banking permits pursuant to Chapters 403 and 373, F.S. and Rules 62-312, 62-25, and 62-342, Florida Administrative Code (F.A.C.). This Agreement is intended to be the sole mechanism used by St. Joe for authorization to conduct the specific activities included in the Agreement within the Agreement Area.

This Agreement constitutes a finding that reasonable assurance has been provided that the activities described herein meet or exceed the substantive criteria of Rules 62-312, 62-25 and 62-342, F.A.C. This agreement also constitutes certification of compliance with state water quality standards under Section 401 of the Clean Water Act, 33 U.S.C. Prior to construction, individual projects must demonstrate compliance with the conditions of this Agreement under an individual project approval process outlined in subsequent sections of this Agreement.

This Agreement does not constitute approval by the Board of Trustees of the Internal Improvement Trust Fund to conduct activities on sovereign submerged lands. Such approval, if needed, must be obtained separately by St. Joe prior to conducting any activities on sovereign submerged lands.

III. Description of Agreement Area & Ecosystem Characteristics

Located within the St. Andrew Bay Watershed and Gulf Coastal Lowland physiographic region of Northwest Florida, the Bay and Walton County Agreement Area encompasses 31,369 acres of St. Joe Company property. General cardinal boundaries are as follows: Northern boundary = the Intracoastal Waterway (ICW), Eastern boundary = St. Andrew Bay-West Bay, Southern boundary = U.S. Highway 98, Western boundary = Peach Creek. These boundaries include portions of Walton & Bay Counties, the City of Panama City Beach, and Westbay Township.

The Agreement Area has been divided into three basins: Breakfast Point, Devil's Swamp and Lake Powell. These three basins have been further subdivided into a total of 17 sub-basins. Basins and sub-basins are shown on Exhibit 1a.

IV. EMA Process

The St. Joe Company has extensive landholdings in northwest Florida, some of which it intends to develop, requiring dredge and fill and stormwater permits. The USACE and

DEP initiated discussions with St. Joe and several federal and state commenting agencies to improve communication and coordination on many pending permit applications. Since September 2000, meetings have been held on a regular, usually quarterly, basis. Early on it was recognized that a more comprehensive approach to the evaluation and regulation of development would benefit all involved. The ensuing discussions were guided by an interagency team of senior staff representatives from the USACE, DEP, Environmental Protection Agency (EPA), U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), Northwest Florida Water Management District (NWFWMD) and The St. Joe Company. The interagency team continues to meet on a regular basis and will provide ongoing guidance and monitoring of the Agreement. The team meetings provide the forum for identification of issues and set work scopes for a smaller "technical team" to research, conduct field studies and report back to the full interagency team. The smaller technical team consists of field biologists and scientists from USACE, DEP, USFWS, NMFS, EPA, St. Joe and its consultant team. Workshops and specific field exercises were conducted on topics including wetland functional assessment, flat woods salamander habitat identification, selection of suitable regional offsite mitigation areas, identification and mapping of conservation units, and field verification of GIS data used in the analysis.

V. Conservation Units

Central to this Agreement is the concept of "Conservation Units", areas of high quality habitat and landscape function, which have been identified and are to be excluded from

development. The 10 Conservation Units within the Agreement Area are identified on Exhibit 2. Future development will be planned and designed to accommodate and complement the Conservation Units, in order to maximize their habitat values and functions. As community and economic development occurs within the Agreement Area, the Conservation Units and open space within individual project sites will be designed with connective qualities, primarily to link Conservation Units. Over time, this will increase the value of the conservation landscape within the Agreement Area.

These Conservation Units link wildlife corridors and protected upland/wetland habitats from St. Andrew Bay to the Point Washington State Forest and Devil's Swamp mitigation bank (discussed in Section VIII), which in turn continues the connection to Northwest Florida Water Management District lands and eventually the Choctawhatchee floodplain and Bay systems. The result is a two-pronged "Bay to Bay" wildlife corridor which will help to preserve the ecological integrity of two of Northwest Florida's most rapidly developing watersheds. The Conservation Units also provide wetland, water resource and wildlife protection within the watershed of Lake Powell, an Outstanding Florida Water.

Five ecological criteria were adopted by the EMA Interagency Team to analyze and select appropriate areas for inclusion in Conservation Units: Regional Significance, Biodiversity, Water Quality, Essential Fish Habitat and Nursery/Living Marine Resources (Appendix C). Many of these Conservation Units are presently in planted pine plantations, but are restorable to more natural conditions. Their specific locations were

chosen based on their present and potential contributions to the ecosystems in and surrounding the Agreement Area. Conservation Units may only be used for conservation purposes and limited passive recreational purposes. The uses and activities authorized in the conservation units are limited to the following:

1. Wetland and upland habitat enhancement and restoration.
2. Timber management shall be conducted in accordance with the Forest and Wildlife Plan in Appendix D. Allowable timber management includes activities conducted to enhance conservation and restore habitat, including BMPs and uneven age management regimes. This does not include timber management for the sole purpose of timber production. No timbering of cypress or wetland hardwoods shall occur in Conservation Units. Clear cutting is prohibited except as allowed in the referenced management plan.
3. Hunting pursuant to properly issued hunting permits, fishing, and birding.
4. Construction of nature trails, boardwalks, gathering shelters, restroom facilities and other similar passive recreational activities that result in minimal impacts to the Conservation Units. Prior to beginning construction, these activities must obtain an authorization under USACE Regional General Permit Number (RGP) SAJ-86 based upon a demonstration that the activity will result in minimal impacts. Additional activities of a similar nature may be conducted, after review and approval by the USACE under USACE RGP Number SAJ-86.
5. Wetland mitigation.

6. Effluent disposal, including the necessary transmission and distribution facilities and attendant structures in the Cypress and Wet Pine Flats Conservation Unit, if authorized by a separate DEP permit. Treatment facilities shall not be allowed in the Conservation Unit.
7. Reinstitution of fire regime, including necessary fire breaks which mimics natural conditions.
8. Incorporation into adjacent developments as open space and limited to the uses outlined above.
9. Maintenance of roads and ditches where needed to implement activities listed above.
10. Construction of five new or improved road crossings shown on Exhibit 3.
11. Crossing Number 4, through the Wildlife Corridor Conservation Unit, shall be bridged. These road crossings shall be subject to individual project approval as required in Section IX, and shall be subject to the wetland impact limitations of Section VII.
11. Activities needed to maintain, in current condition, existing access within and through the Conservation Units. With the exception of the crossings identified in No. 10 above, these do not include activities to improve, enlarge or relocate such access.

VI. Permitted Activities

This Agreement authorizes dredging and filling in waters of the State, establishment of two mitigation banks, and construction and maintenance of stormwater facilities,

associated with residential, commercial, recreational and institutional projects, including supporting infrastructure, by St. Joe within the identified 31,369-acre Agreement Area, excluding the Conservation Units described in Section V. Subject to the conditions of this Agreement, dredging and filling for the referenced activities is authorized in wetlands and ditches. Dredging and filling in, on or over other surface waters is limited to road, bridge, or boardwalk crossings.

Specifically, this permit includes activities such as the construction of building foundations, building pads and attendant features that are necessary for the use and maintenance of the structures. Attendant features may include, but are not limited to, roads, parking lots, garages, yards, utility lines, and storm water management facilities. Residential developments include multiple and single unit developments. Examples of commercial developments include retail stores, light industrial facilities, restaurants, business parks, and shopping centers. Examples of recreational facilities include playgrounds, playing fields, golf courses, hiking trails, bike paths, horse paths, stables, nature centers, and campgrounds. No marinas or docking structures are authorized under this Agreement. Examples of institutional developments include schools, fire stations, government office buildings, judicial buildings, public works buildings, libraries, hospitals, and places of worship.

VII. Wetland Impacts

The Agreement Area, as depicted in Exhibit 1, is divided into three basins: Breakfast Point, Lake Powell and Devil's Swamp. Wetland jurisdiction was assessed using the

USACE wetland delineation methodology. The USACE wetland boundaries will be used as the Department wetland jurisdictional line, providing the state with a "safe" upland line to represent the landward edge of waters of the State. For projects under the Agreement, the state will be allowed to exercise regulatory jurisdiction over a significantly larger area than presently allowable under state law.

Wetlands in each basin have been identified, mapped and classified as either high or low quality, Exhibit 5. Low quality wetlands are jurisdictional areas, which are in silviculture. Low quality wetlands also include ditches. High quality wetlands are all other jurisdictional areas. Low quality wetlands are typically hydric pine plantations. High quality wetlands are typically cypress domes/strands, bay/gallberry swamps, harvested cypress swamp areas, titi monocultures, and hypericum bogs.

In order to be approved, wetland impacts must meet all of the following criteria:

1. Impacts to low quality wetlands shall not exceed 20% of the total low quality wetlands in any one sub-basin. The areas within a particular sub-basin to be used to make the 20 percent calculation do not include areas within either mitigation banks or conservation units located with the sub-basin. Sub-basins are depicted in Exhibit 1a.
2. Projects may impact more than 20% of the low quality wetlands within an individual project site if cumulative low quality wetland impacts for all approved projects within the sub-basin do not exceed 20% at any time. Examples of where this may occur include:

a. An individual project impacts only 15% of the low quality wetlands in the project site and the remaining on-site wetlands are preserved through a conservation easement to DEP in the form of the applicable easement document in Exhibit 6. St. Joe may request that a subsequent project within that sub-basin impact more than 20% of the low quality wetlands in the project site, as long as the total impact to low quality wetlands for all approved projects within the sub-basin does not exceed 20%.

b. An individual project impacts 30% of the low quality wetlands on the project site. Simultaneously with approval of the project, a sufficient amount of low quality wetlands are preserved through a conservation easement to DEP, in the form of the applicable easement document in Exhibit 6, elsewhere within the same sub-basin so as not to exceed the maximum 20% impact to low quality wetlands for all approved projects within the sub-basin.

3. Impacts to high quality wetlands shall be limited to road and bridge crossings necessary to support the associated development, and shall not exceed a width of 100 feet of combined filling and clearing at each crossing. The total filling and clearing of high quality wetlands for road crossings within the Agreement Area shall not exceed 125 acres. The first preference for new high quality wetland road crossings will be at existing silviculture road crossings. Road crossings at locations other than existing silviculture crossings are allowed if the crossing is designed and constructed to minimize wetland impacts. In addition, for each

crossing proposed at a point where no previous crossing existed, an existing silviculture road crossing within the sub-basin must be removed and the wetland connection restored.

4. All road or bridge crossings in wetlands shall be designed so that the hydrologic conveyance is not reduced or impaired. Bridging is encouraged wherever practical. The following factors shall be considered when determining if bridging of the wetlands is practical: 1) the degree of water flow within the wetland, 2) the length of the wetland crossing, 3) the topography of the wetland and associated upland, and 4) the degree to which a roadway would adversely affect the movement of wildlife expected to use the wetland.

VIII. Mitigation

Within the Agreement Area, individual project wetland impact mitigation may be satisfied within: (1) the two specified mitigations banks, (2) designated Conservation Units, or (3) within the project area. Mitigation at a mitigation bank shall not be an available option for a project within the Lake Powell basin. Projects within this basin must provide mitigation within the basin. Mitigation for impacts within the Lake Powell basin can be within the project site, or within a designated Conservation Unit in the basin.

The first priority for mitigation of permitted wetland impacts in the Agreement Area, except for impacts within the Lake Powell basin as described above, is restoration/enhancement-based activities at one of two designated mitigation banks.

1. Breakfast Point mitigation bank, 4,637 acres in size, is only available for projects within the Breakfast Point Basin.
2. Devil's Swamp mitigation bank, 3,049 acres, is only available for projects within the Devil's Swamp Basin.

The two mitigation banks and their respective basins, as well as the Lake Powell basin, are depicted in Exhibit 4. Together with the 10 Conservation Units discussed above, these wildlife corridors and significant habitats traverse the Agreement Area, actively linking public resources from Choctawhatchee Bay to St. Andrew Bay, filling gaps roughly 15 miles long.

The mitigation potential for each mitigation bank has been evaluated using WRAP analysis and field observations, and mitigation credits have been assigned pursuant to Rule 62-342. The number and type of mitigation credits available in each mitigation bank are given in Appendices A and B. Based on representative impacts to low and high quality wetlands within the Agreement area, the number of credits required within either the Breakfast Point or Devil's Swamp mitigation bank for impacts to low and high quality wetlands has been determined, and are shown in Appendices A and B.

Mitigation for impacts to estuarine wetlands and other surface waters may be higher than indicated above based on an individual project evaluation. Factors to be considered in determining if additional mitigation is needed shall include: 1) the extent of direct impacts from fill, including pilings and support structures, 2) the amount of shading or

other secondary impacts expected to result from the activity, and 3) impacts from construction methodologies, such as barge access or the use of heavy equipment. Mitigation for impacts to estuarine wetlands shall be conducted either on siste or within a conservation unit that contains estuarine species.

Each mitigation bank shall be constructed, managed and monitored according to the approved mitigation plans, included as Appendices A and B. The conditions included in Appendices A and B are considered conditions of this Agreement.

IX. Individual Project Approval

Pre-Application Process

The evaluation process to determine if an individual project conforms to the requirements and criteria of this Agreement shall begin with a pre-application meeting to which the appropriate representatives from DEP, USACE, USFWS, NMFS, EPA and NWFWMD are invited. The primary purpose of the pre-application process is to identify and produce preliminary data necessary for evaluation during the application phase and to conduct an informal analysis of the project and evaluate how it complies with the Agreement criteria. The pre-application meeting shall also provide an opportunity to discuss the proposed project design and the opportunity for habitat corridors between on-site wetlands, the Conservation Units, and other wetlands in the Agreement Area.

Additionally, the Department and St. Joe will discuss the need for a separate approval to use sovereign submerged lands to implement the proposed project. If sovereign submerged lands approval is needed, every effort will be made to process such approval concurrently with the individual project review required by this Agreement.

At the pre-application meeting, the following information will be provided:

1. Scope of the Project – Type of project and how it comports with activities authorized by the Agreement.
2. Location / Project Boundaries – Exhibits showing general project location within the Project Area boundaries and specific location (1"=200' or other appropriate scale).
3. The identification and delineation of wetlands and other surface waters within the individual project area. Wetlands may be delineated using aerial photo-interpretation (API) and ground-truthing, and if necessary, mapped using GPS and other GIS mapping techniques. The identification and delineation of wetlands must be in accordance with the USACE's Wetlands Delineation Manual (1987). In much of the project area, historical aerial photography will be used to obtain pre-pine plantation wetland community signatures. If the construction line falls within 250 feet of a wetland boundary estimated using the method described in this paragraph, then a ground-truthed wetland jurisdictional determination will be required for that segment of the proposed project.

4. Maps of high quality and low quality wetlands onsite - The existing high quality/low quality wetland map shall be used as a starting point for classification of onsite wetlands (Exhibit 5). During or after the estimation of jurisdictional wetland boundaries using the API method described in 3. above, the resulting wetland area will be classified and mapped by quality. The procedure will use a combination of GPS technology, visual inspection of photography, and ground-truthing. Additional data that may be used include overlays involving timber stand data.
5. Proposed Wetland Impacts – The number, type, location, and acreage of all wetland impacts, as well as drawings and other exhibits that accurately and sufficiently depict the proposed project.
6. Stormwater attenuation and treatment options under consideration.
7. Documentation of submittal of project to the State Historic Preservation Officer (SHPO) and the Florida Fish and Wildlife Conservation Commission. When required by the SHPO, the applicant shall conduct a Phase I archeological and historical survey on each individual project site. This information shall be provided to the SHPO and the USACE, so that measures can be identified to avoid, minimize or mitigate adverse impacts to historic properties listed, or eligible for listing in the National Register of Historic Places, or otherwise of archeological or historical value.

Formal Individual Project Review

Following the pre-application meeting, St. Joe shall formally submit the individual project for approval using the form Joint Application for Works in the Waters of Florida

Form #62-312.900. A processing fee shall accompany each application in an amount consistent with the fee schedule in Rule 62-4.050, F.A.C. for dredge and fill permits. Form #62-312.900 shall be completed pursuant to the instructions, with the exception of items 7 and 8, which shall be completed as follows:

> Item 7. Desired Permit Duration (see Fee Schedule): *Duration of the individual project approvals shall be 10 years.*
>
> Item 8. General Permit or Exemption Requested: *St. Joe Ecosystem Management Agreement for Bay and Walton Counties should be referenced here.*

In addition to the application form, the submittal shall include:

1. The necessary technical information, drawings and calculations describing the stormwater management system proposed for the individual project, and,
2. Documentation of coordination with the State Historic Preservation Officer regarding any needed archaeological and historical surveys for the project area, and any measures needed to avoid, minimize or mitigate adverse impacts to sites of historical or archaeological value.
3. Documentation of coordination with the Florida Fish and Wildlife Conservation Commission.

Upon receipt of the complete application for individual project approval, DEP will have 60 days to review the information for compliance with the terms of this Agreement. The review shall also consider St. Joe's history of compliance with previously issued permits,

and individual project approvals granted under this Agreement, as a factor in determining if reasonable assurance has been provided that the terms of the Agreement or individual project approval will be met. A history of non-compliance with previously issued permits and approvals may serve as the basis for project denial, modification, or the addition of specific conditions, based on the nature, severity, and extent of the non-compliance.

If the application is found to provide reasonable assurance that the project complies with the terms of this Agreement, DEP shall approve the individual project. DEP shall issue a letter of approval or denial of the individual project that shall include a point of entry for challenging the agency action. The letter will also include a public notice of the agency action that St. Joe shall publish in a newspaper of general circulation in the county where the individual project is located and publication shall be accomplished in the same manner as provided in Rule 62-110.106(3)(a), F.A.C. Any challenge to the agency action on the individual project shall be limited to whether or not the individual project complies with the terms of this Agreement.

Preservation of Third Partv Rights

This Agreement is not intended to alter or modify the rights of third parties to challenge agency actions, except that the requirements imposed by this Agreement for stormwater management systems, dredge and fill of wetlands, and wetlands impact mitigation shall govern rather than the requirements of Florida Statutes and Florida Administrative Code.

If the DEP proposes to issue an Individual Project Approval pursuant to section IX of this Agreement, any Florida corporation not for profit which meets the requirements of § 403.412(6), Fla. Stat., and any person whose substantial interests will be determined or affected by individual project approvals under the Agreement may petition the Department for a formal administrative hearing pursuant to § 120.569 or 120.57, Fla. Stat.

The scope of a challenge to an Individual Project Approval is limited to whether the Individual Project Approval complies with this Agreement. General issues that may be raised include, as applicable, whether the stormwater management system, the dredging and filling of waters of the state and the mitigation to offset wetland impacts, proposed for an individual project approval comply with this Agreement. Examples of specific issues which may be raised in such hearings, to determine compliance with this Agreement, include the following:

1. Stormwater Management Systems:

a. Whether an activity is subject to the stormwater management system requirements contained in Appendix E of this Agreement which shall include the following:

i. whether the activity is below the thresholds of section 2.1.1 of Appendix E;

ii. whether the activity qualifies for an exemption under rule 62-25.030, F.A.C. (except for subsection 62-25.030(1)(c), F.A.C.)

iii. whether the activity qualifies for a noticed general permit under Chapter 62-341, F.A.C.

b. If an activity exceeds the thresholds of section 2.1.1 of Appendix E of this Agreement, whether reasonable assurance has been provided that the proposed stormwater management system meets the requirements of Part IV of Appendix E of this Agreement.

c. If a stormwater management system exceeds the thresholds of section 2.1.3 of Appendix E of this Agreement, whether reasonable assurance has been provided that the proposed stormwater management system (with all criteria as further defined in Part III of Appendix E of this Agreement):

i. will not cause adverse water quantity impacts to receiving waters and adjacent lands;

ii. will not cause flooding to on-site or off-site property;

iii. will not cause adverse impacts to existing surface water storage and conveyance capabilities;

iv. will not adversely impact the value of functions provided to fish and wildlife and listed species by wetlands and other surface waters;

v. will not result in discharges from the system to surface and ground water of the state that cause or contribute to violations of state water quality standards as set forth in chapters 62-4, 62-302 and 62-520, F.A.C., including any antidegradation provisions of paragraphs 62-4.242(1)(a) and (b), subsections 62-4.242(2) and (3), and section 62-302.300, F.A.C., and any special standards for Outstanding Florida Waters

and Outstanding National Resource Waters set forth in subsections 62-4.242(2) and (3), F.A.C.;

vi. will not cause adverse secondary impacts to the water resources;

vii. will not adversely impact the maintenance of surface or ground water levels or surface water flows established pursuant to Section 373.042, Fla. Stat.;

viii. will be capable, based on generally accepted engineering and scientific principles, of being performed and of functioning as proposed;

ix. will be conducted by an entity with the financial, legal, and administrative capability of ensuring that the activity will be undertaken in accordance with the terms and conditions of the permit, if issued; and

x. will comply with any applicable special basin or geographic area criteria rules within the EMA area including, but not limited to, whether the water quality design and performance criteria meet OFW standards for those stormwater systems discharging to the Lake Powell Basin.

2. Dredging and Filling of Waters of the State:

a. Whether reasonable assurance has been provided that wetlands boundaries set forth in any individual project approval sought pursuant to this Agreement have been accurately identified and delineated in accordance with the USACE's Wetlands Delineation Manual (1987) as set forth in Section VII of this Agreement.

b. Whether reasonable assurance has been provided that wetlands proposed to be impacted meet the low quality or high quality wetland definitions set forth in section VII of this Agreement.

c. Whether reasonable assurance has been provided that impacts to high quality wetlands do not exceed area, width, and use limitations and impacts to low quality wetlands do not exceed use limitations specified in section VII of this Agreement.

d. Whether reasonable assurance has been provided that the appropriate width of upland or low quality wetland buffers are proposed to be established around high quality wetlands as set forth in section X. 17. of this Agreement.

e. Whether reasonable assurance has been provided that any proposed road or bridge crossing is designed so that hydraulic conveyances are not reduced or impaired as set forth in section VII and Appendix E of this Agreement.

3. Wetlands Impact Mitigation:

a. Whether mitigation credits are properly assigned to compensate for wetlands impacts as set forth in section VIII and Appendices A and B of this Agreement.

b. Whether mitigation for wetlands impacts occurs within the appropriate mitigation bank, Conservation Unit, or project area depending upon the applicable basin as set forth in section VIII of this Agreement.

4. General:

a. Whether the application for Individual Project Approval was submitted to and coordinated with the State Historic Preservation Officer and the Florida Fish and Wildlife Conservation Commission as set forth in section IX. 7. of this Agreement.

b. Whether the appropriate public notice of the proposed individual project approval was provided as set forth in section IX of this Agreement.

c. Whether the individual project approval incorporates the applicable St. Joe commitments set forth in section X of this Agreement.

Individual Project Approval General and Specific Conditions

The General Conditions contained in Appendix F shall be conditions of any individual project approval.

If mitigation for the project is provided in a mitigation bank, the approval shall specify the number of credits to be used to offset the project impacts, pursuant to Section VIII. If mitigation for the individual project is to be provided either on-site or in a Conservation Unit, rather than a mitigation bank, the individual project approval shall also include Specific Conditions describing the details of the required mitigation, and any associated requirements for monitoring the success of the mitigation.

As part of reasonable assurance that the mitigation provided outside of the mitigation bank will be maintained in perpetuity in its enhanced or restored state, the individual project approval shall also include a requirement for the placement of a conservation easement over the mitigation site. The conservation easement shall be in the form of the applicable easement document in Exhibit 6. Prior to issuing a letter of approval for the individual project, St. Joe shall submit a draft of the conservation easement, along with documentation that the property over which the conservation easement will be granted has no encumbrances or liens that would be contrary to the purpose of the conservation easement. The individual project approval shall include a condition requiring that the

conservation easement be executed, delivered and recorded prior to conducting the activities authorized in the project approval letter.

St. Joe shall use best management practices during individual project construction to minimize impacts to wetlands and other surface waters not authorized to be dredged or filled, and to control erosion and turbidity to ensure that state water quality standards are not violated. The Department may include specific conditions related to project construction techniques in the individual project approval letters to address these issues.

Web Site for Public Information

The Department agrees to maintain a web site, accessible to the public, containing information regarding individual projects reviewed under the Agreement. At a minimum, the web site will include information on the individual projects approved, or pending approval by the Department. This information may be viewed at the following web address: www.dep.state.fl.us./northwest. Posting of such information does not constitute public notice of a point of entry to challenge the Department's action on individual project approvals. Such public notice shall be accomplished as set forth in Section IX.

X. St. Joe Commitments

St. Joe Corporation agrees to the following commitments:

1. This Agreement is intended to be the sole mechanism used by St. Joe for authorization to conduct the specific activities included in the Agreement within the Agreement Area. Any change in authorized activities, or any other deviation

from the terms of the Agreement, will require amendment of the Agreement. Separate individual or general permits may be applied for within the Agreement Area for activities that are not addressed by this Agreement, including but not limited to marinas and docking facilities.

2. The Conservation Units shall be excluded from development plans or activities, other than those authorized under Section V.
3. St. Joe will manage the Conservation Units and mitigation banks consistent with their ultimate conservation use unless or until transferred in accordance with paragraph 4 below.
4. If Conservation Units, or any portion thereof or interest therein, are conveyed to subsequent owners, if not already subject to a conservation easement pursuant to paragraph 11 below, St. Joe shall place conservation easements on such property to assure the perpetual conservation use of the Conservation Units. The conservation easement shall be in the form of the applicable easement document in Exhibit 6.
5. Ownership or interest in a mitigation bank, other than the sale of mitigation credits to a third party, may only be transferred to a governmental agency for conservation purposes, or to a 501c(3) conservation organization. If a mitigation bank, or any part thereof or any interest therein, is conveyed to a subsequent conservation owner, St. Joe will ensure that the new owner is bound by the conditions and requirements of the mitigation plan approved by this Agreement. Prior to the conveyance, the Department must approve the instrument(s) that ensure compliance with the Agreement, and may require execution of a

subsequent agreement with the conservation owner to provide for continued compliance with the approved mitigation plan. The Department's approval of the assurance instruments shall be contingent on the conservation owner providing reasonable assurance that such owner has the technical and financial resources to comply with the approved mitigation bank plan.

6. Mitigation of project impacts will be conducted in a manner consistent with the approved mitigation plan for each of the mitigation banks, or in accordance with the conditions of the individual project approval if mitigation is to be conducted on the project site or within a Conservation Unit.
7. Mitigation will occur prior to or be implemented concurrently with permitted impacts.
8. A perpetual conservation easement will be placed on each mitigation bank, or each approved phase of a mitigation bank, prior to commencing any development that will use the bank or phase of the bank for mitigation. The conservation easement shall be in the form of the applicable easement document in Exhibit 6.
9. For mitigation conducted outside of a mitigation bank, a perpetual conservation easement will be placed on the mitigation area prior to beginning work on the individual project for which the mitigation is approved and shall be in the form of the applicable easement document in Exhibit 6.
10. Perpetual conservation easements will be placed on the wetlands not authorized for impact on each project site following the individual project approval and according to the timeframe specified in the approval. The easement shall be in the form of the applicable easement document in Exhibit 6.

11. By February 15 of each year, St. Joe shall have placed a perpetual conservation easement, in the form of the applicable easement document in Exhibit 6, on portions of Conservation Units equal to the percentage of the total acreage of approved projects in each sub-basin. To determine the acreage of the Conservation Units that must be placed under conservation easement:
    a. Divide the total acreage within approved project boundaries in a sub-basin (including impact and preserved area) by the total acreage of land within the sub-basin minus the area of any conservation units within the sub-basin contained within the Agreement area.
    b. This percentage of the Conservation Units in each sub-basin shall be placed under a conservation easement by the end of each annual reporting period.
12. Stormwater management systems in project areas within the Agreement Area will be designed, constructed and maintained to meet the criteria in Appendix E.
13. There will be no wetland fill for septic tanks or drain fields.
14. St. Joe base maps will depict the location of Conservation Units to assure each business unit within the company is aware of their location and restrictions placed upon them to assure that there is no encroachment or activity incompatible with conservation use.
15. Forest management activities within the Conservation Units will be based on uneven age management, with no clear cutting except as part of mitigation plans for forest restoration as set forth in Appendix D.
16. Buffers are required around Lake Powell, a coastal dune lake. A 100-foot buffer between the lake from the Ordinary High Water Line (OHWL) and development

is required in Walton County. A 30-foot buffer between the lake from the OHWL and development is required in Bay County. All buffers, whether upland or wetland, will be preserved and maintained in a natural condition, except for boardwalks for dock access and on-grade trails. Application of fertilizers, herbicides and pesticides is prohibited within all buffer areas.

17. In general, high quality wetlands shall be buffered from development by uplands/and or low quality wetlands. Except at road crossings, upland and/or low quality wetland buffers adjacent to high quality wetlands shall be an average of 50 feet wide, with a minimum 30-foot width for each individual project area. All buffers, whether upland or wetland, will be preserved and maintained in a natural condition, except for boardwalks for dock access and on-grade trails. Application of fertilizers, herbicides and pesticides is prohibited within all buffer areas.
18. Only clean fill and rock material compatible with existing soils (*e.g.*, soil, rock, sand, marl, clay, stone, and/or concrete rubble) shall be used for wetland fill.
19. No wetland fill will sever jurisdiction.
20. No work is authorized under this Agreement on properties listed or eligible for listing in the *National Register of Historic Places*.
21. When required by the State Historic Preservation Officer, St. Joe will conduct a Phase I archeological and historical survey on each individual project site. This information will be provided to the State Historic Preservation Officer, the Department and the USACE so that measures can be identified to avoid, minimize or mitigate adverse impacts to historic properties listed, or eligible for

listing in the *National Register of Historic Places*, or otherwise of historical or archeological value.

22. No activity is authorized by this Agreement that is likely to adversely affect a federal or state listed threatened or endangered species or a species proposed for such designation, or destroy or adversely modify its designated critical habitat.
23. St. Joe certifies that it has and will maintain internal systems and controls to ensure adherence to these commitments and implementation of this Agreement.

XI. Monitoring and Reporting

1. St. Joe shall submit the monitoring related to the mitigation banks, as specified in Appendices A and B.
2. St. Joe shall establish and maintain a GIS based ledger and map for each basin and sub-basin, depicting the amount, type and percentage of wetland impact and mitigation implemented in the Agreement Area. An updated ledger balance sheet demonstrating compliance with the Agreement shall be submitted with each individual request for project approval. The ledger will include the following:
   a. Total high quality and low quality wetlands in Agreement Area.
   b. Total project size – uplands and wetlands.
   c. Project impacts – high quality and low quality amount and percent of total.
   d. Mitigation required and location.
   e. Cumulative project impacts (acreage total and percentage).
   f. Total wetlands by quality remaining in the Agreement Area.

St. Joe shall submit an annual report by February 15 for the proceeding calendar year identifying: 1) The location and acreage of any mitigation activity undertaken;

2) conservation easements executed;

3) conservation units or mitigation banks conveyed to other owners;

4) activities undertaken within Conservation Units; and

5) other activities that may impact this Agreement.

XII. Net Ecosystem Benefits

The parties acknowledge that the Agreement will result in NEBs and implement progressive policies for ecosystem management and team permitting because:

1. Implementation of this Agreement satisfies applicable standards and criteria, and includes commitments to various operational, mitigation and conservation conditions that exceed current regulatory requirements;
2. Implementation of this Agreement will result in a significant reduction in overall risks to the environment compared to activities conducted in absence of the Agreement through the NEBs listed below;
3. Implementation of this Agreement will result in conservation at a regional landscape-scale, that includes the best possible diversity and extent of habitats, selected prior to development occurring;
4. That the regional conservation plan established by this Agreement increases the ability of adjacent – existing and proposed – public conservation lands and waters

to sustain long term ecological values, enhances regional wildlife dispersal and survival; protects regional water resources; and creates significant opportunities for public nature based recreation.

The specific NEBs provided by this Agreement are as follows:

1. Ten Conservation Units will be established as depicted on Exhibit 2, in addition to mitigation required for wetland impacts. These units link wildlife corridors and protected upland/wetland habitats to create a two-pronged "Bay-to-Bay" wildlife corridor which will help to preserve the ecological integrity of two of Northwest Florida's most rapidly developing watersheds.
2. The wetland impact criteria included in the agreement is expected to result in a larger percentage of preserved wetlands than would otherwise be expected as a result of the usual permitting process.
3. Two landscape-scale mitigation banks will be established and implemented, resulting in immediate ecosystem benefits from expedited restoration.
4. The wetland resource permitting program does not protect upland habitat. Through this Agreement, both uplands and wetlands shall be enhanced or restored in the mitigation banks and Conservation Units and protected in perpetuity. Significant uplands, such as xeric sandhills, scrubby flatwoods and mesic flatwoods were included in Conservation Units to increase habitat diversity, wildlife conservation and corridor values adjacent to high priority wetlands. 3,011 acres of uplands will be protected within the Conservation Units. 2,033 acres of uplands will be protected within the mitigation banks.

5. By protecting and restoring uplands within the Conservation Units and mitigation banks, the St. Joe Company is providing habitat for the Flatwoods Salamander, a Federally listed threatened species.
6. Throughout the Agreement Area, wetland jurisdictional determinations will be conducted utilizing the USACE wetland jurisdictional line, rather than one federal and one State, resulting in more regulatory jurisdiction for the State.
7. Development immediately next to high quality wetlands will have a buffer of uplands and/or low quality wetlands, which is not required under existing rules, with an average width of 50 feet and a minimum width of 30 feet.
8. No fill for septic tanks or drain fields will occur in wetlands.
9. Breakfast Point mitigation bank will enhance the protection of water quality for St. Andrew Bay by restoring the natural system and providing a perpetual buffer between development and the Bay.
10. Devil's Swamp mitigation bank will enhance the protection of water quality for Choctawhatchee Bay by restoring the natural system and providing a perpetual buffer between development and the Bay.
11. Storm water management systems will incorporate water quantity and quality components which exceed the rule criteria in Rule 62-25, F.A.C, which will provide greater protection for water quality and provide protection from off-site flooding.

XIII. Amendments

This Agreement may be modified at any time by written amendment approved by both parties, which shall be submitted, reviewed and processed in the same manner as this

Agreement or as otherwise provided for by law. Amendments must be consistent with the provisions of sections 403.075 and 403.0752, F.S.

XIV. Term of Agreement

This agreement shall be perpetual, unless modified according to Section XIII or terminated according to Section XV.

XV. Termination

1. DEP may terminate this Agreement by giving thirty days prior written notice to St. Joe or request renegotiation of this Agreement if DEP demonstrates that:
   a. There has been a material change in conditions from the original Agreement such that the intended net ecosystem benefits are not being, or may not reasonably be expected to be, achieved through continuation of the Agreement.
   b. St. Joe is in material breach of the terms of the agreement. Nothing in this paragraph shall preclude the Department from taking appropriate enforcement action in lieu of, or in combination with, termination for violations of this Agreement or any individual project approval issued hereunder.
2. St. Joe may terminate this Agreement by giving thirty days prior written notice to the DEP as provided in Section XVI, provided that:

a. The mitigation commitments in the approved mitigation bank plans, or mitigation commitments identified in the individual project approvals, are fulfilled or agreements are entered into to ensure fulfillment.

b. The conservation easements required by the Agreement and individual project approvals up to the time of termination have been properly executed, delivered and recorded.

3. Upon termination of the Agreement, previously issued individual project approval letters shall remain in effect for the duration of such approval. Such individual projects shall continue to be subject to the General and Specific Conditions included in the individual project approval letter, and the terms of this Agreement.

4. Every five years, FDEP shall hold a public information-gathering forum to receive public comment on whether there is cause for FDEP to terminate this Agreement. At least 30 days prior notice of such forum shall be published in a newspaper of general circulation in both Bay and Walton Counties. Actual notice shall also be provided to the NMFS, USCOE, UFWS, NWFWMD, Bay County Commission, and Walton County Commission.

XVI. Notices

Notices under this Agreement shall be sent by certified mail, return receipt requested, express mail or telefax to the parties.

XVII. Effective Date

The effective date of this Agreement shall be the date on which the last party executed the Agreement.

IN WITNESS THEREOF, the parties, by and through the undersigned duly authorized representatives, have executed this Agreement on the dates set forth below.

THE ST. JOE COMPANY

Robert M. Rhodes
Executive Vice President

October 11, 2004
Date

STATE OF FLORIDA DEPARMENT
OF ENVIRONMENTAL PROTECTION

Mary Jean Yon
District Director - Northwest District

October 8, 2004
Date

EXHIBIT 2

ECOSYSTEM MANAGEMENT AGREEMENT

STORMWATER SYSTEM DESIGN AND REVIEW CRITERIA MANUAL February 2004

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PART I -- POLICY AND PROCEDURES

1.0 Introduction

The purpose of the Manual is to provide design criteria and a review process for the stormwater management systems within the Agreement Area. The design criteria are based the FDEP ERP rules developed for the Northwest District.

1.1 Applicability

The design criteria and review process presented in the Manual is applicable to all new stormwater systems within the Agreement area, with the following exceptions:

- Activities below the thresholds given in Section 2.1.1 of the Manual.
- Activities that are qualified exemptions under chapter 62-25.030, FAC, except for 62-25.030(1) (c).
- Activities that qualify for a noticed general permit under chapter 62-341, F.A.C.

1.2 Review Process

As outlined in the EMA, the applicant will prepare an environmental and stormwater design for the project area in accordance with the design criteria contained in the EMA and the Manual. A pre-application meeting will be held to review the intent of the design. During the pre-application meeting, the stormwater design strategy will be presented and reviewed. At a minimum, the following stormwater information will be presented:

- A map of the site showing pre-development conditions including topographic contours, soils, natural watercourses, man-made stormwater features, areas of off-site flow entering the site, and generalized surface water flow patterns across the site.
- A map of the site showing the proposed site plan along with a conceptual design for the stormwater system serving the site including routing of off-site flows. The conceptual design will address water quality and quantity (if required) design techniques.
- If a site plan is not available for the pre-application meeting, a design strategy for the water quality, quantity, and off-site flow requirements will be presented.

The stormwater design will be prepared in conjunction with the environmental design, and will be presented for review during the individual project approval process.

If the activity falls below the thresholds given in Section 2.1.1 or the activity qualifies for an exemption under Chapter 62-25.030, F.A.C., evidence supporting such will be provided at the pre-application meeting. If the activity qualifies for a noticed general permit under Chapter 62-341, FAC, the permit will be provided prior to approval of the Individual Project as outlined in the EMA. All other activities that would require a standard or individual permit will be reviewed for compliance with this Manual during the Individual Project Approval process outlined in the EMA. A finding of compliance of the activity with the Manual and the EMA constitutes approval of the activity. A separate stormwater permit is not required. All designs for activities including those below the thresholds given in Section 2.1.1 of the Manual, qualified exemptions under Chapter 62-341, FAC, and those qualified for a noticed general permit under Chapter 62-341, FAC shall conform with the environmental requirements in the EMA.

1.3 Forms

Application will be made using Form, # **17-1.215(2),** Notice of Intent to Use General Permit for New Stormwater Discharge Facility Construction.

PART II -- GENERAL CRITERIA

2.0 General Design and Performance Criteria for all Surface Water Management Systems

2.1 Systems Requiring Engineered Stormwater Management Systems

2.1.1 All activities within the Agreement Area that would require a permit under chapter 62-25, F.A.C., but do not qualify for a noticed general permit under chapter 62-341, F.A.C., shall include an Engineered Stormwater Management system designed, constructed, operated, and maintained in accordance with this **Manual**, if they exceed any of the following criteria:

(a) Systems involving the construction or alteration of more than 4,000 square feet of impervious or semi-impervious surface area subject to vehicular traffic. This area includes roads, parking lots, driveways, and loading zones;

(b) Systems involving the construction or alteration of more than 5,000 square feet of building area or other impervious area not subject to vehicular traffic; or

(c) Systems involving the construction or alteration of more than 1 acre of recreational area. Recreational areas include but are not limited to golf courses, tennis courts, putting greens, driving ranges, or ball fields.

2.1.2 All activities that require an Engineered Stormwater Management system under **section 2.1.1 of the Manual** shall be designed, constructed, operated, and maintained in conformance with the Stormwater Quality provisions of **Part IV of the Manual**.

2.1.3 In addition to complying with the criteria in **Part IV of the Manual**, systems that exceed any of the following thresholds must additionally be designed, constructed, operated, and maintained to comply with the Stormwater Quantity/Flood Control criteria of **Part III of the Manual**:

(a) Systems that serve projects of 40 or more acres of total land area;

(b) Systems that provide for the placement of 12 or more acres of impervious surface, which constitutes more than 40 percent of the total land area;

(c) Systems that are capable of impounding a volume of water of 40 or more acre-feet.

2.1.4 Activities that require an Engineered Stormwater Management System under this Handbook shall additionally meet all the other applicable design and performance criteria requirements of **Part II of the Manual**.

2.2 Criteria for Evaluation

2.2.1 Reasonable Assurance

In order to obtain an environmental resource permit for a system that requires an engineered stormwater management system under **section 2.1 of the Applicant's Handbook Volume II**, an applicant must give reasonable assurance that the stormwater management system will meet the criteria in this **Manual**. This includes a determination that the activity:

(a) Will not cause adverse water quantity impacts to receiving waters and adjacent lands;

(b) Will not cause adverse flooding to on-site or off-site property;

(c) Will not cause adverse impacts to existing surface water storage and conveyance capabilities;

(d) Will not adversely impact the value of functions provided to fish and wildlife and listed species by wetlands and other surface waters;

(e) Will not result in discharges from the system to surface and ground water of the state that cause or contribute to violations of state water quality standards as set forth in chapters 62-4, 62-302 and 62-520, F.A.C., including any antidegradation provisions of paragraphs 62-4.242(1)(a) and (b), subsections 62-4.242(2) and (3), and section 62-302.300, F.A.C., and any special standards for Outstanding Florida Waters and Outstanding National Resource Waters set forth in subsections 62-4.242(2) and (3), F.A.C.;

(f) Will not cause adverse secondary impacts to the water resources;

(g) Will not adversely impact the maintenance of surface or ground water levels or surface water flows established pursuant to Section 373.042, F.S.;

(h) Will be capable, based on generally accepted engineering and scientific principles, of being performed and of functioning as proposed;

(i) Will be conducted by an entity with the financial, legal, and administrative capability of ensuring that the activity will be undertaken in accordance with the terms and conditions of the permit, if issued; and

(j) Will comply with any applicable special basin or geographic area criteria rules within the EMA area. This includes, but is not limited, to the following:

a. For those stormwater systems discharging to the Lake Powell Basin, the water quality design and performance criteria shall meet OFW standards.

2.3 Professional Certification

All construction plans and supporting calculations submitted for surface water management systems that require the services of a registered professional (i.e., engineer, geologist, or landscape architect) under Chapters 471, 481, or 492, F.S., must be signed, sealed, and dated by the appropriate registered professional.

2.4 Maintenance Access

Regular maintenance is crucial to the long-term effectiveness of stormwater management systems. Such systems must be designed to permit personnel and equipment access and to accommodate regular maintenance activities. For example, high maintenance features such as inlets, outlets, and pumps should be easily accessible to maintenance equipment and personnel.

Legal authorization, such as an easement, deed restrictions, or other instrument must be provided establishing a right-of-way or access for maintenance of the stormwater management system unless the operation and maintenance entity wholly owns or retains ownership of the property. The following are requirements for specific types of maintenance access easements:

(a) Easements must cover at least the primary and high maintenance components of the system (i.e., inlets, outlets, littoral zones, filters, pumps, etc.).

(b) Easements for waterbodies, open conveyance systems, stormwater basins and storage areas must meet the following requirements:

1. Include the area of the water surface measured at the control elevation; and

2. Be a minimum of 20 feet from the edge of water at the control elevation or top of bank and include side slopes no steeper than 4H:1V.

(c) Easements adjacent to water control structures must be a minimum of 20 feet wide.

(d) Easements for piped stormwater conveyance must be a minimum of the width of the pipe plus 4 times the depth of the pipe invert.

(e) Access easements must be 20 feet wide from a public road or public right-of-way to the stormwater management system.

(f) As an alternative, the applicant may propose other authorization for maintenance access provided the applicant affirmatively demonstrates that equipment can enter and perform the necessary maintenance on the system.

2.5 Legal Authorization

Applicants who propose to utilize offsite areas not under their control must obtain sufficient legal authorization prior to permit issuance to use the area. For example, an applicant who proposes to locate the outfall pipe from the stormwater basin to the receiving water on an adjacent property owner's land must obtain a drainage easement or other appropriate legal authorization from the adjacent owner. A copy of the legal authorization should be submitted with the application.

2.6 Public Safety

2.6.1 Normally dry basins designed to impound more than two feet of water or permanently wet basins must contain side slopes that are no steeper than 4:1 (horizontal to vertical) out to a depth of two feet below the control elevation. As an alternative, the basins can be fenced or otherwise restricted from public access if the slopes must be deeper due to space or other constraints.

2.6.2 Detention and retention basins must be designed with side slopes of 4:1 (horizontal to vertical) to a depth at least two feet below the control elevation. Side slopes must be stabilized with vegetation to prevent erosion and provide pollutant removal.

2.6.3 Basin Side Slope Stabilization

All stormwater basin side slopes shall be stabilized by either vegetation or other material to minimize erosion of the basin.

2.6.4 Control Structures

Control structures that are designed to contain more than two feet of water within the structure under the design storm and have openings of greater than one-foot minimum dimension must be restricted from public access.

2.7 Conveyance and Flood Storage

2.7.1 Projects that alter existing conveyance systems (e.g., rerouting an existing ditch) must not adversely affect existing conveyance capabilities. It is presumed a system will meet this criterion if one of the following is met:

(a) The existing hydraulic capacity is maintained in the new system. This can be accomplished by maintaining existing headwater and tailwater conditions.

(b) The applicant demonstrates that changes in flood elevation and velocities will not adversely impact upstream or downstream off-site property. For example, this criterion may be satisfied by demonstrating that there is no increase in damages to existing off-site property (e.g., roads, buildings) resulting from changes in the existing flood elevations. Also, the applicant should demonstrate that proposed velocities are non-erosive or that erosion control measures (e.g., riprap, concrete lined channels, etc.) are sufficient to safely convey the flow.

(c) The criteria in **section 3.4 of the** Manual are met.

(d) As an alternative, the applicant may propose to utilize an applicable criteria established by a local government, state agency, or stormwater utility with jurisdiction over the project. However, Department staff must approve the use of these criteria.

2.7.2 There must be no net decrease in storage volume below the 10-year flood elevation within the project area that may result in increased flood hazards.

2.7.3 All storage volumes in detention or retention systems shall be calculated so as not to include any volumes below the average seasonal high-water table for the project area.

2.8 Tailwater for Water Quality

"Tailwater" refers to the water elevation (or pressure) at the final discharge part of the stormwater management system. Tailwater is an important component of the design and operation of nearly all stormwater management systems and can affect any of the following management objectives of the system:

(a) Peak discharge from the stormwater management system;

(b) Peak stage in the stormwater management system;

(c) Level of flood protection in the project;

(d) Recovery of peak attenuation and stormwater treatment volumes; and

(e) Control elevations, normal water elevation regulation schedules, and ground water management.

2.8.1 Tailwater Design and Performance Criteria

Stormwater management systems (except retention and exfiltration systems) must provide gravity or pumped discharge that effectively operates (i.e., meets applicable rule criteria) under one of the following tailwater conditions:

(a) Maximum stage in the receiving water resulting from the two-year, 24-hour storm. This storm depth is shown on the isopluvial map in **Figure 2.7-1**. Generally, applicants utilizing this option would model the receiving waters utilizing standard hydrologic and hydraulic methods for the two-year, 24-hour storm to determine peak stages at various points of interest. Lower stages may be utilized if the applicant demonstrates that flow from the project will reach the receiving water prior to the time of maximum stage in the receiving water.

(b) Mean annual high tide for tidal areas. This elevation is the average of all the high tides for each year. This elevation may be determined from tide charts or other similar information.

(c) Mean annual seasonal high water elevation. This elevation may be determined by water lines on vegetation or structures, historical data, adventitious roots or other hydrological or biological indicators, design of man-made systems, or estimated by a registered professional using standard hydrological methods based on the site and receiving water characteristics.

(d) The applicant may propose applicable criteria established by a local government, state agency, or stormwater utility with jurisdiction over the project. However, the Department must approve the use of alternative criteria. In this case, the applicant is encouraged to consult with Department staff prior to submitting an application.

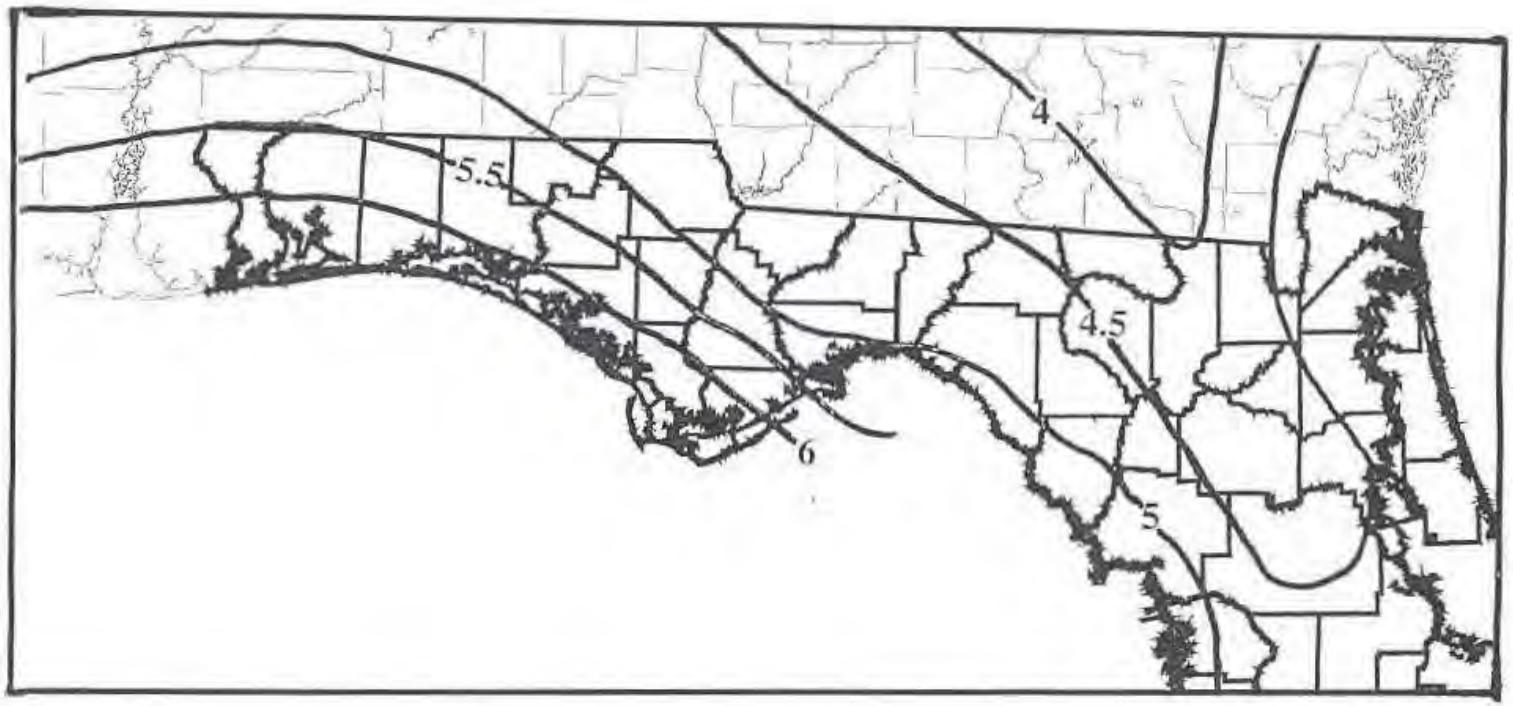


Figure 2.7-1 2 year - 24-Hour Maximum Rainfall, inches (Source: FDEP modified Technical Paper No. 40 Rainfall Frequency Atlas of the United States)

2.9 Applicant Responsibility

2.9.1 The applicant must provide for an operation and maintenance entity as required in **section 2.10 of the Manual.**

2.9.2 The applicant is responsible for transferring the permit from the construction phase to the operation and maintenance phase.

2.9.3 The applicant is responsible for notifying the Department of any transfer of ownership, including applying to the Department for applicable transfer of ownership within 30 days of such transfer.

2.10 Operation and Maintenance

All systems requiring an engineered stormwater management system under the **Manual** must be transferred to an operation and maintenance phase as follows.

2.10.1 Operation Phase

All authorization to construct, alter and maintain a surface water management system also constitutes a permit to operate the system. An applicant must submit the information described in this section to specify the entity that will operate and maintain the system with the construction, alteration or maintenance permit application. A permit authorizing construction, alteration, or maintenance will be converted to the operation phase once the Department determines the system or independent portion of a system has been constructed in compliance with the permit, and an appropriate entity has accepted responsibility for operation and maintenance of the system or independent portion of a system. The Department also will transfer the operation permit to an operation and maintenance entity upon request once all conditions for converting the construction, alteration, or maintenance permit have been met.

2.10.2 The following entities are acceptable for ensuring that a surface water management system will be operated and routine custodial maintenance will be performed in compliance with the **Manual**.

(a) local governmental units including counties and municipalities, and Municipal Service Taxing Units,

(b) active water control districts created pursuant to chapter 298, F.S., drainage districts created by special act, special districts defined in chapter 189, Community Development District created pursuant to chapter 190, F.S., Special Assessment Districts created pursuant to chapter 170, F.S., or water management districts created pursuant to chapter 373, F.S.,

(c) state or federal agencies,

(d) duly constituted communication, water, sewer, stormwater, electrical or other public utilities,

(e) profit or non-profit corporations as indicated below, or

(f) property owners or developers provided:

1. the property owner or developer provides written proof, either by letter or resolution, that a governmental entity or an acceptable entity set forth in **paragraphs 6.2.1(a) through (e) above** will accept the operation and maintenance of the stormwater management system when construction of the system is completed;

2. the property owner or developer provides proof of bonding or other assurance of a similar nature in an amount sufficient to cover the costs of the operation and maintenance of the system for a period of 10 years;

3. The property owner or developer wholly owns the property, and intends to retain this ownership; or

4. The property owner or developer will retain ownership of the property and will lease or rent it to third parties.

If the property owner or developer is to serve as the operation and maintenance entity, the property owner or developer must provide a copy of legal documentation demonstrating that the property owner or developer will have the right to enter upon the property and maintain the system. Bonding or other financial assurances provided to other governmental entities is acceptable under paragraph 2.10.2(f)2 of the Manual, provided such bonding or other financial assurance covers the costs of operating and maintaining the system for a period of ten years in addition to the cost of any other activity the bond or other financial assurance secures.

If the proposed maintenance entity falls within paragraph 2.10.2(a), (b), (c), or (d) above, a letter of intent from such entity must be submitted to the Department as part of the permit application, indicating the entity's intention to accept responsibility for operation and maintenance of the permitted system when construction of the system is complete. The letter of intent shall also specify any portions of the system that the governmental entity will operate and maintain.

The documentary assurances required under paragraph 2.10.2(f) above or section 2.10.3 below must be submitted to the Department as a part of the permit application and approved by the staff before a recommendation for approval of the permit will be made.

2.10.3 Profit or non-profit corporations such as homeowners associations, property owners associations, condominium owners associations or master associations are acceptable operation and maintenance entities only if the corporation has the financial, legal, and administrative capability to provide for the long term operation and routine custodial maintenance of the surface water management system.

(a) If a homeowner, property owner, condominium or master association is proposed, the applicant must submit draft Articles of Incorporation, Declaration, Restrictive Covenants, Deed Restrictions or other organizational or operation documents, or draft amendments thereto, that affirmatively assign responsibility for the operation or routine custodial maintenance of the surface water management system. These documents must be submitted to the Department as part of the permit application.

(b) The association must have sufficient powers reflected in its organizational or operational documents to:

1. operate and perform routine custodial maintenance of the surface water management system as exempted or permitted by the Department,

2. establish rules and regulations,

3. assess members for the cost of operating and maintaining the system, and enforce the collection of such assessments,

4. contract for services to provide for operation and routine custodial maintenance (if the association contemplates employing a maintenance company), and

5. exist in perpetuity; the articles of incorporation must provide that if the association is dissolved, the system shall be transferred to and maintained by an entity described in **paragraphs 6.2.1(a) through (e) of the Maunal** prior to the association's dissolution.

2.10.4 If an operation and maintenance entity is proposed for a project which will be constructed in phases, and subsequent phases will utilize the same surface water management system as the initial phase or phases, the entity must have the ability to accept responsibility for the operation and routine custodial maintenance of the surface water management system for future phases of the project.

If the development scheme contemplates independent operation and maintenance entities for different phases, and the system is integrated throughout the project, the entities, either separately or collectively, must have the responsibility and authority to operate and perform routine custodial maintenance of the system for the entire project area. That authority must include cross easements for surface water management and the ability to enter and maintain the various works, should any sub-entity fail to maintain a portion of the system within the project area.

2.10.5 When the applicant intends to convey the property to multiple third parties, the applicant will be an approved operation and maintenance entity from the time construction begins until the system is dedicated to and accepted by an established legal entity as described in **paragraphs 2.10.2(a) through (e) of the Manual,** provided that the applicant provides adequate proof that such an entity (as described in **subsection 2.10.2 of the Manual**) will exist when construction of the system is complete, and of the future acceptance of the system by such entity.

2.10.6 The operation phase of a noticed general permit shall automatically commence when construction is completed in conformance with all the terms, conditions, and limitations of the applicable noticed general permit; a formal request to transfer a noticed general permit to the operation phase is not required.

2.11 Retrofits of Existing Surface Water Management Systems

2.11.1 Stormwater retrofit projects are those that are intended only to reduce stormwater pollutant loadings from existing systems and are not intended to serve new developments. Such systems can be exempted from complying with some or all of the water quality and water quantity design and performance requirements in **Parts II, III, and IV of the Manual** if the applicant has conducted an alternatives analysis that documents why such design and performance requirements cannot be met. In such cases, the applicant shall seek to achieve the highest level of stormwater treatment in the most cost effective manner, which may include the use of sophisticated treatment technologies such as alum injection or stormwater reuse. Any alum injection system must provide for disposal of alum sludge in a manner that does not dispose of such sludge in waters of the state, complies with applicable industrial waste rules, and does not result in violations of state water quality standards.

PART III -- STORMWATER QUANTITY/FLOOD CONTROL

3.0 General Flood Control Requirements

3.1 Engineered Stormwater Management Systems That Must Meet Water Quantity Criteria

Systems that trip any of the following thresholds must be designed, constructed, operated, and maintained in accordance with this Part:

(a) Systems that serve projects of 40 or more acres of total land area;

(b) Systems that provide for the placement of 12 or more acres of impervious surface, which constitutes more than 40 percent of the total land area; or

(c) Systems that are capable of impounding a volume of water of 40 or more acre-feet.

Surface water management systems that do not exceed the above thresholds are not required to meet the stormwater quantity and flood control criteria of this Part.

3.2 Standards that Apply and Relationship to Part IV

In addition to the criteria in this Part, all activities that require an engineered stormwater management system (in accordance with **section 2.1.1 of the Manual**) must also comply with the Water Quality criteria in **Part IV of the Manual**.

As an example, a system that has 6 acres of impervious surface that comprises 26 percent of the total land area of 100 acres would have to meet the Stormwater Quantity/Flood Control criteria of this Part, because such a system trips the 40-acre total land area threshold. The applicant for such a system therefore must design the surface water management system to meet the flood control peak discharge criteria of **section 3.3 of the Manual** in addition to the **streambank protection discharge criteria as required in section 4.5.2 of the Manual**. This can be accomplished by designing a multi-staged outlet structure to attenuate both the flood control and 2-year, 24-hour storm events. See **Figure 3.2-1** for a conceptual design of a multi-staged outlet structure. Examples of multi-staged outlet structures include two staged weirs, risers with multiple orifice controls, and combinations of weir and orifice controls.

3.3 Peak Discharge Attenuation

Criterion: The post-development peak rate of discharge must not exceed the pre-development peak rate of discharge.

(a) If the project is located totally within a stream or open-lake watershed, detention systems must be installed such that the peak rate of post-development runoff will not exceed the peak-rate of pre-development runoff for storm events up through and including either:

1. A design storm with a 10-year, 24-hour rainfall depth with SCS (NRCS) Type II Florida Modified distribution falling on average antecedent moisture conditions for projects serving exclusively agricultural, forest, conservation, or recreational land uses; or

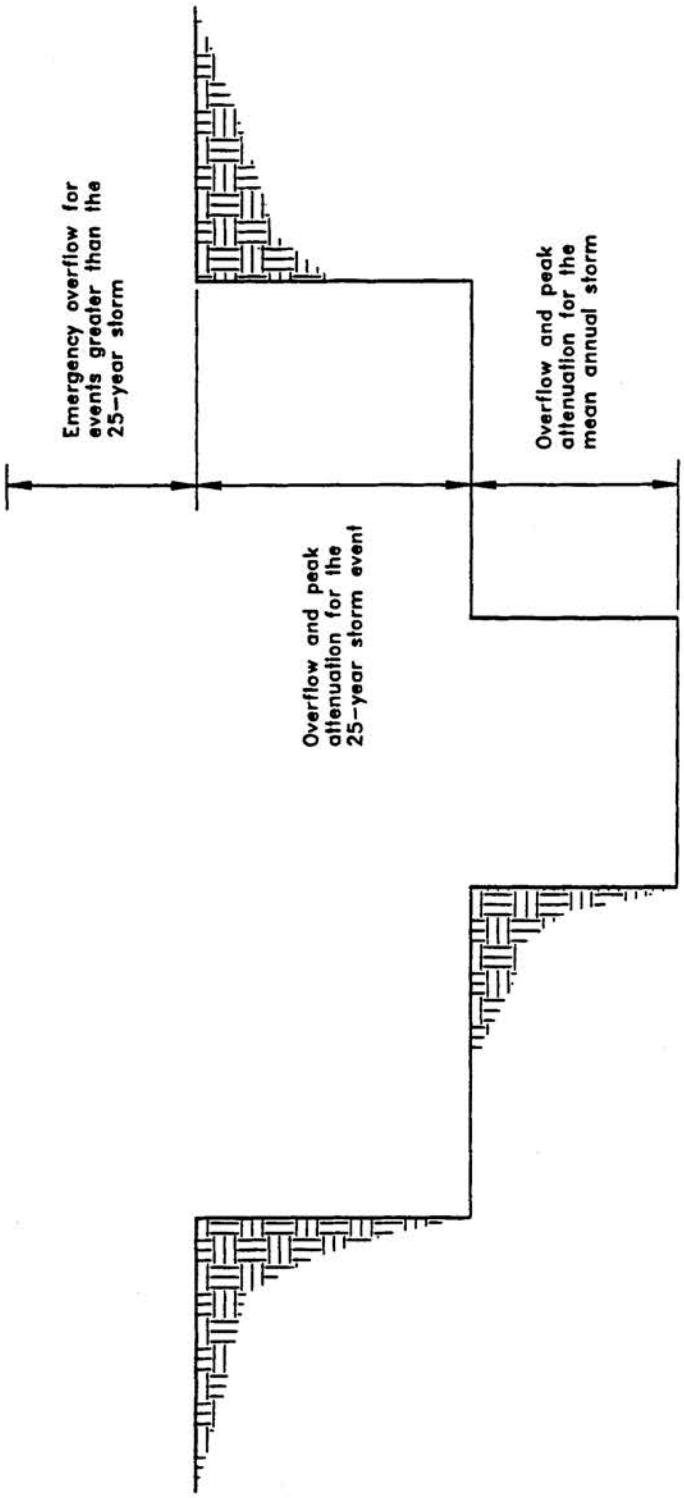


Figure 3.2-1 Conceptual design of a multi-stage outlet structure

2. A design storm with a 25-year, 24-hour rainfall depth for projects serving any land uses other than agricultural, silvicultural, conservation, or recreational uses.

(b) If the project area falls within an internally drained or closed-lake watershed or any part of the project area is in a stream-to-sink watershed, the retention volume shall be the total post-development runoff less the pre-development runoff resulting from a 25-year, 24-hour storm.

Storage volumes designed into retention or detention systems to meet the requirements of (a) and (b), above must be available as follows:

1. One-half of the total volume within seven days following the end of the design storm event, and

2. The total volume within 30 days following the end of the design storm event.

3.3.1 Alternative Peak Discharge Criteria

As an alternative to the peak discharge criteria in **section 3.2 of Manual**, applicants may propose to utilize applicable storm event, duration, or criteria specified by a local government, state agency (including FDOT), or stormwater utility with jurisdiction over the project. However, the Department must approve the use of the alternative criteria. Applicants proposing to use alternative criteria are encouraged to have a pre-application conference with Department staff.

3.3.2 Methodologies

A peak discharge analysis typically consists of generating predevelopment and post development runoff hydrographs, routing the post development hydrograph through a detention basin, and sizing an overflow structure to control post development discharges at or below predevelopment rates.

Peak discharge computations should consider the duration, frequency, and intensity of rainfall, the antecedent moisture conditions, upper soil zone and surface storage, time of concentration, tailwater conditions, changes in land use or land cover, and any other changes in topographic and hydrologic characteristics. Large systems should be divided into subbasins according to artificial or natural drainage divides to allow for more accurate hydrologic simulations. Examples of accepted methodologies for computation of runoff are as follows:

(a) Soil Conservation Service Method (see U.S. Department of Agriculture, Soil Conservation Service “National Engineering Handbook, Section 4, Hydrology,” TR-55 ("Urban Hydrology for Small Watershed") or TR-20 users manuals).

(b) Santa Barbara Urban Hydrograph Method.

(c) U.S. Army Corps of Engineers HEC-1 Computer Programs.

(d) Other hydrograph methods approved by the Department.

3.3.3 Aggregate Discharge

Depending on the location and design of large systems where multiple off-site discharges are designed to occur, the Department may allow the total post-development peak discharge not to exceed the pre-development peak discharge for the combined discharges rather than for each individual discharge. Such a consideration shall be made only if the combined discharges meet all other requirements of the **Manual**, and discharge to the same receiving water body.

3.3.4 Rainfall Intensity and Volume

In determining peak discharge rates, intensity of rainfall values shall be obtained through a statistical analysis of historical long-term rainfall data or from sources or methods generally accepted as good engineering practice.

(a) Examples of acceptable sources include:

1. USDA Soil Conservation Service, "Rainfall Frequency Atlas of Alabama, Florida, Georgia, and South Carolina for Durations from 30 Minutes to 24 Hours and Return Periods from 1 to 100 Years" January 1978; Gainesville, Florida.

2. U.S. Weather Bureau Technical Paper No. 49.

3. U.S. Weather Bureau Technical Paper No. 40.

4. U.S. Department of Interior, Bureau of Reclamation, "Design of Small Dams", 2nd Edition.

5. F.D.O.T. Drainage Handbook, Hydrology, Latest Edition

(b) For a drainage basin greater than 10 square miles, the areal rainfall can be calculated from point rainfall using a method that has been well documented. The converting factor as described in U.S. Weather Bureau Technical Paper No. 49 may be used.

3.3.5 Tailwater for Quantity

Receiving water stage can affect the amount of flow, which will discharge from the project to the receiving water. This stage may be such that tailwater exists in portions of the project system, reducing the effective flow or storage area. Typical examples of this are illustrated in **Figures 3.3.5-1** (gravity) and **3.3.5-2** (pumped).

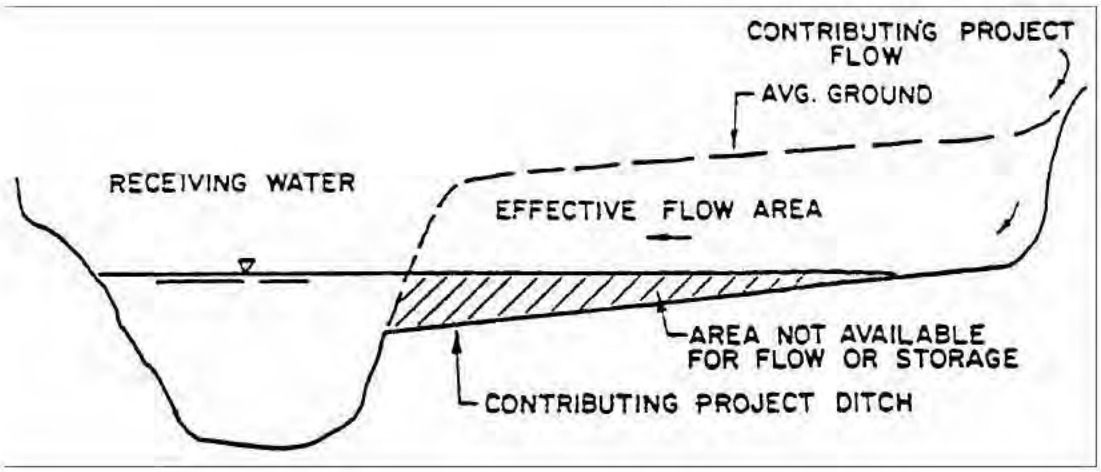


Figure 3.3.5-1

The stage in the receiving water should be considered to be the maximum stage, which would exist in the receiving water from a storm equal to the project design storm. Lower stages may be used if the applicant can show that the flow from his project will reach the receiving water prior to the time of maximum stage in the receiving water.

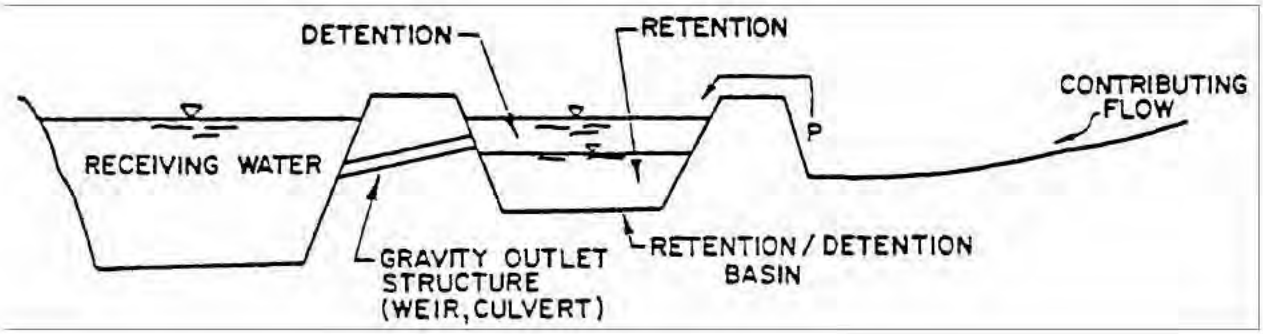


Figure 3.3.5-2

3.3.6 Design Techniques

Various design techniques are available to the engineer to estimate approximate pre-development peak discharge rates for the system through a reduction in excess runoff. Acceptable design techniques include detention basins, the use of grassed waterways, and any other storage capability that the particular system may have.

3.3.7 Upper Soil Zone Storage and Surface Storage

In most instances, the upper soil zone storage and surface storage capacities will have an effect on the pre-development and post-development peak discharges and should be considered in these computations. Any generally accepted and well-documented method may be used to develop the upper soil zone storage and surface storage values.

(a) The soil zone storage at the beginning of a storm should be estimated by using reasonable and appropriate parameters to reflect drainage practices, average wet season water table elevation, the antecedent moisture condition (AMC II) and any underlying soil characteristics which would limit or prevent percolation of storm water into the entire soil column. In no case should the soil storage used in the computation exceed the difference between the maximum soil water capacity and the field capacity (i.e., gravitational water) for the soil columns above any impervious layer or seasonal ground water table.

(b) Surface storage, including that available in wetlands and low-lying areas, shall be considered as depression storage. Depression storage shall be analyzed for its effect on peak discharge and the time of concentration. Depression storage can also be considered in post-development storage routing, which would require development of stage-storage relationships; if depression storage is considered, then both pre-development and post-development storage routing must be considered.

3.4 Storage and Conveyance

3.4.1 Criterion: Floodways and floodplains, and levels of flood flows or velocities of adjacent streams, impoundments or other water courses must not be altered so as to adversely impact the off-site storage and conveyance capabilities of the water resource.

3.4.2 (a) A system may not cause a net reduction in flood storage within a 10-year floodplain except for structures elevated on pilings or traversing works. Traversing works, works or other structures shall cause no more than a one-foot increase in the 100-year flood elevation immediately upstream and no more than one tenth of a foot increase in the 100-year flood elevation 500 feet upstream. A system will not cause a net reduction in flood storage within a 10-year floodplain if compensating storage is provided outside the 10-year floodplain.

(b) A system may not cause a reduction in the flood conveyance capabilities provided by a floodway except for structure elevated on pilings or traversing works. Such works, or other structures shall cause no more than a one-foot increase in the 100-year flood elevation immediately upstream and no more than one tenth of a foot increase in the 100-year flood elevation 500 feet upstream.

(c) An applicant may only be permitted to contravene the requirements of (a) or (b) if the applicant gives reasonable assurance that, if all other persons who could impact the surface water of any impoundment, stream, or other watercourse by floodplain encroachment exceed

(a) and (b) above to the same degree as the applicant proposes, the cumulative impacts would not contravene subsection 2.2.1 of the **Manual**.

3.5 Stabilization of Side Slopes

Stabilization of side slopes is necessary in order to prevent erosion due to flow velocity and runoff from the banks. Good engineering practices shall be employed, taking into consideration soil, flow, and drainage characteristics. Again, the retardation of overland runoff and soil stabilization using naturally occurring vegetation coverage shall be considered before paving, riprap, lining, energy dissipation and other structural measures are employed.

3.6 Low Flow and Base Flow Maintenance

3.6.1 Criterion: Flows of adjacent streams, impoundments or other watercourses must not be decreased so as to cause adverse impacts.

3.6.2 Low Flow:

(a) Only systems with both of the following conditions must meet the low flow performance criteria in (b) and (c), below.

1. Systems that impound water for purposes in addition to temporary detention storage. Water impounded longer than a 14-day bleed down period is considered conservation storage for benefits other than detention storage (i.e., recreation, irrigation, etc.).

2. Systems that impound a stream or other watercourse which, under pre-development conditions, discharged surface water off-site to receiving water during 5-year, 30-day drought frequency conditions.

(b) Any system meeting the conditions of (a) above shall be designed with an outlet structure to maintain a low flow discharge of available conservation storage. When the conservation storage is at the average dry season design stage, the low flow discharge should equal the average pre-development surface water discharge, which occurred from the project site to receiving waters during the 5-year, 30-day drought.

(c) The system shall be operated to provide a low flow discharge whenever water is impounded. However, discharge may be discontinued, if desired, during the wet season (considered as June through October) unless a water shortage condition is declared by a water management district. The actual discharge will vary according to the water stage in the impoundment. When conservation storage is at the average dry season design stage, the discharge will be the average 5-year, 30-day low flow. When storage is below the average dry season design stage, the discharge may be less than the average 5-year, 30- day low flow.

3.6.3 Base Flow

It is presumed that an adverse impact will result if the system causes the ground water table to be lowered:

a) More than an average three feet lower, over the project area, than the average dry season low water table; or

b) At any location, more than five feet lower than the average dry season low water table; or

c) To a level that would decrease the flows or levels of surface water bodies below any minimum level or flow established by a water management district Governing Board pursuant to Section 373.042, F.S.

PART IV -- STORMWATER QUALITY

4.0 Purpose and Background

4.1 Thresholds for Designing in Conformance with Stormwater Quality Criteria

Surface water management systems that meet all the following are not required to meet the Stormwater Quality design criteria in this Part:

(a) The construction or alteration involves less than 4,000 square feet of impervious or semi-impervious surface area subject to vehicular traffic. This area includes roads, parking lots, driveways, and loading zones;

(b) The construction or alteration involves less than 5,000 square feet of building area or other impervious area not subject to vehicular traffic; and

(c) The construction or alteration involves less than 1 acre of recreational area. Recreational areas include but are not limited to golf courses, tennis courts, putting greens, driving ranges, or ball fields.

All other activities requiring a permit under chapter 62-25, F.A.C., require an engineered stormwater management system that is designed, constructed, operated, and maintained in conformance with the criteria in this Part. In addition, those systems that exceed the thresholds in **section 2.1 of the Manual** must also be designed, constructed, operated, and maintained in accordance with **section III of the Manual**.

4.2 Criterion

Florida's stormwater quality regulations are "technology-based" not "water quality effluent-based." The design criteria in this handbook are presumed to meet the minimum levels of stormwater treatment established in chapter 62-40, F.A.C., the State Water Resource Implementation Rule.

4.3 Integration with State Resource Implementation Rule

4.3.1 General

Paragraph 62-40.432(2), F.A.C. (State Water Resource Implementation Rule), provides:

> (2) Minimum Stormwater Treatment Performance Standards.
>
> (a) When a stormwater management system complies with rules establishing the design and performance criteria for such systems, there shall be a rebuttable presumption that the discharge from such systems will comply with state water quality standards. The Department and the Districts, pursuant to Section 373.418, F.S., shall, when adopting rules pertaining to stormwater management systems, specify design and performance criteria for new stormwater management systems which:
>
> 1. Achieve at least 80 percent reduction of the average annual load of pollutants that would cause or contribute to violations of state water quality standards.

2. Achieve at least 95 percent reduction of the average annual load of pollutants that would cause or contribute to violations of state water quality standards in Outstanding Florida Waters.
3. If a District or the Department adopts basin-specific design and performance criteria in order to achieve an adopted TMDL or the pollutant load reduction goals established in a watershed management plan, such design and performance criteria shall replace those specified in subparagraphs 1. and 2. above.

(b) Erosion and sediment control plans detailing appropriate methods to retain sediment on-site shall be required for land disturbing activities.

(c) The pollutant loading from older stormwater management systems shall be reduced as necessary to restore or maintain the designated uses of waters.

4.3.2 Systems meeting the design and performance criteria of the **Manual** are presumed to meet the State Water Resource Implementation Rule performance standards stated above. However, as new research on the design and effectiveness of stormwater treatment systems becomes available, the design and performance criteria of this Handbook may be revised as appropriate through future rulemaking.

4.4 State Water Quality Standards

4.4.1 Surface Water Quality Standards

State surface water quality standards are set forth in chapters 62-4 and 62-302, F.A.C., including the antidegradation provisions of sections 62-4.242(1)(a) and (b), 62-4.242(2) and (3), and 62-302.300, F.A.C., and the special standards for Outstanding Florida Waters and Outstanding National Resource Waters set forth in sections 62-4.242(2) and (3), F.A.C. Furthermore, the Department cannot authorize permits that modify the quantity of water-discharged offsite if such discharge will cause adverse environmental or water quality impacts.

4.4.2 Ground Water Quality Standards

State water quality standards for ground water are set forth in chapter 62-520, F.A.C. In addition to the minimum criteria, Class G-I and G-II ground water must meet primary and secondary drinking water quality standards for public water systems established pursuant to the Florida Safe Drinking Water Act, which are listed in sections 62-550.310 and .320, F.A.C.

Only the minimum criteria apply within a zone of discharge, as determined in section 62-520.400**,** F.A.C. A zone of discharge is defined as a volume underlying or surrounding the site and extending to the base of a specifically designated aquifer or aquifers, within which an opportunity for the treatment, mixture or dispersion of wastes into receiving ground water is afforded. Generally, stormwater systems have a zone of discharge 100 feet from the system boundary or to the project's property boundary, whichever is less.

4.4.3 How Standards are Applied

The quality of stormwater discharged to receiving waters is presumed to meet the surface water standards in chapters 62-4, and 62-302, F.A.C., and the ground water standards in chapter 62-550, F.A.C., if the system is permitted, constructed, operated and maintained in accordance with the **Manual**. However, this determination is rebuttable.

4.5 Criteria for Evaluation

4.5.1 Reasonable Assurance

In addition to complying with the criteria in **section 2.2 of the Manual,** in order to obtain an environmental resource permit for a system that requires an engineered stormwater management system under **section 2.1 of the Manual**, an applicant must give reasonable assurance that the stormwater management system will:

(a) Not adversely affect drainage and flood protection on adjacent or nearby properties not owned or controlled by the applicant in accordance with **Section 2.6**;

(b) Be capable of being effectively operated and maintained;

(c) Meet any applicable Sensitive Karst Area Basin requirements in **Section 11.0** of this Handbook; and

(e) For systems serving a use that produces or stores hazardous or toxic substances, be designed to have no stormwater discharge that contains such substances.

4.5.2 Peak Discharge Criteria to Protect Streambanks

4.5.2.1 Overview

Urbanization increases total runoff volume, peak discharge rates, and the magnitude and frequency of flood events. With an increase in the number of flood events a stream is subjected to, the potential for accelerated erosion of both the stream banks and channel bottom is enhanced. Proper design of detention systems to limit post development peak discharge rates to predevelopment rates can minimize some of the stormwater effects of urbanization.

4.5.2.2 Two-Year, 24-Hour Storm Requirements

Proper selection of the design storm for peak discharge control is crucial to determining the effectiveness of the detention basin. Historically, stormwater programs only regulated the peak discharge from large storm events (i.e., 25-year, 24-hour storm) Unfortunately that approach suffers from the following drawbacks:

(a) If a detention pond is only designed to reduce the peak of the 25-year storm, the discharge rates from lesser events such as the 2, 5, and 10-year flood events may not be controlled. The ineffectiveness of controlling small flood events may appear to be unimportant with respect to flood damages. However, these more frequent events do cause localized flood damage and are of prime importance as a cause of channel and streambank erosion.

(b) Cumulative water quantity impacts may occur from several projects below the chapter 62.343, F.A.C., thresholds located within the same watershed.

To address these concerns, peak discharge rate must be controlled for the 2-year, 24-hour storm event and potentially for a larger storm event. The 2-year, 24-hour was selected as the design event for this rule because the shape and form of natural channels is controlled by approximately the 2-year return frequency storm. The rainfall depth for the 2-year, 24-hour storm for the Florida panhandle is shown

in **Figure 2.7.1-1**. The rainfall depth at a particular location may be established by interpolating between the nearest isopluvial lines.

4.5.2.3 Peak Discharge Attenuation Criteria to Protect Streambanks

The post development peak discharge rate must not exceed predevelopment rates for the 2-year, 24-hour storm for systems serving new construction area greater than 50 percent impervious (excluding water bodies).

This condition must be met before a project is required to comply with the peak discharge criterion. Projects that modify existing systems without adding new impervious surfaces are exempt from this criterion. However, if a project modifies an existing system by adding new impervious surfaces, the peak discharge criteria requirements must be met only for the newly added impervious surfaces. Pervious concrete and turf blocks are not considered impervious surface for this purpose. However, compacted soils and limerock are considered impervious for this purpose.

4.6 Erosion and Sediment Control Criteria for Surface Water Management Systems

Land clearing activities, including the construction of stormwater management systems, shall be designed, constructed, and maintained at all times so that erosion and sedimentation from the system, including the areas served by the system, do not cause violations of applicable state water quality standards in receiving waters. Further, because sedimentation of off site lands can lead to public safety concerns, erosion and sediment controls shall be designed and implemented to retain sediment on-site as required by subsection 62-40.432(2), F.A.C. In particular, the erosion and sediment control requirements described in **Part IV of the Applicant's Handbook Volume I,** shall be followed during construction of the system.

4.7 Oil and Grease Control

Systems that receive stormwater from areas with a greater than 50 percent impervious area (excluding water bodies) or which are a potential source of oil and grease (e.g., parking lots and gasoline stations) must include a baffle, skimmer, grease trap or other mechanism suitable for preventing oil and grease from leaving the stormwater system in concentrations that would cause a violation of water quality standards. A typical illustration of a skimmer on an outlet structure is shown is **Figure 4.7-1**.

4.8 On-Line and Off-line Stormwater Systems

Each stormwater treatment Best Management Practice (BMP) specifies a required volume of stormwater runoff to be captured and treated (i.e., treatment volume) prior to release to surface or ground water. There are two basic types of configurations for capturing the treatment volume: on-line and off-line systems. On-line systems (**Figure 4.8-1**) consist of a storage area which provides storage of the required treatment volume for smaller storm events and, if required, temporary detention storage for peak discharge control during larger storm events. Runoff

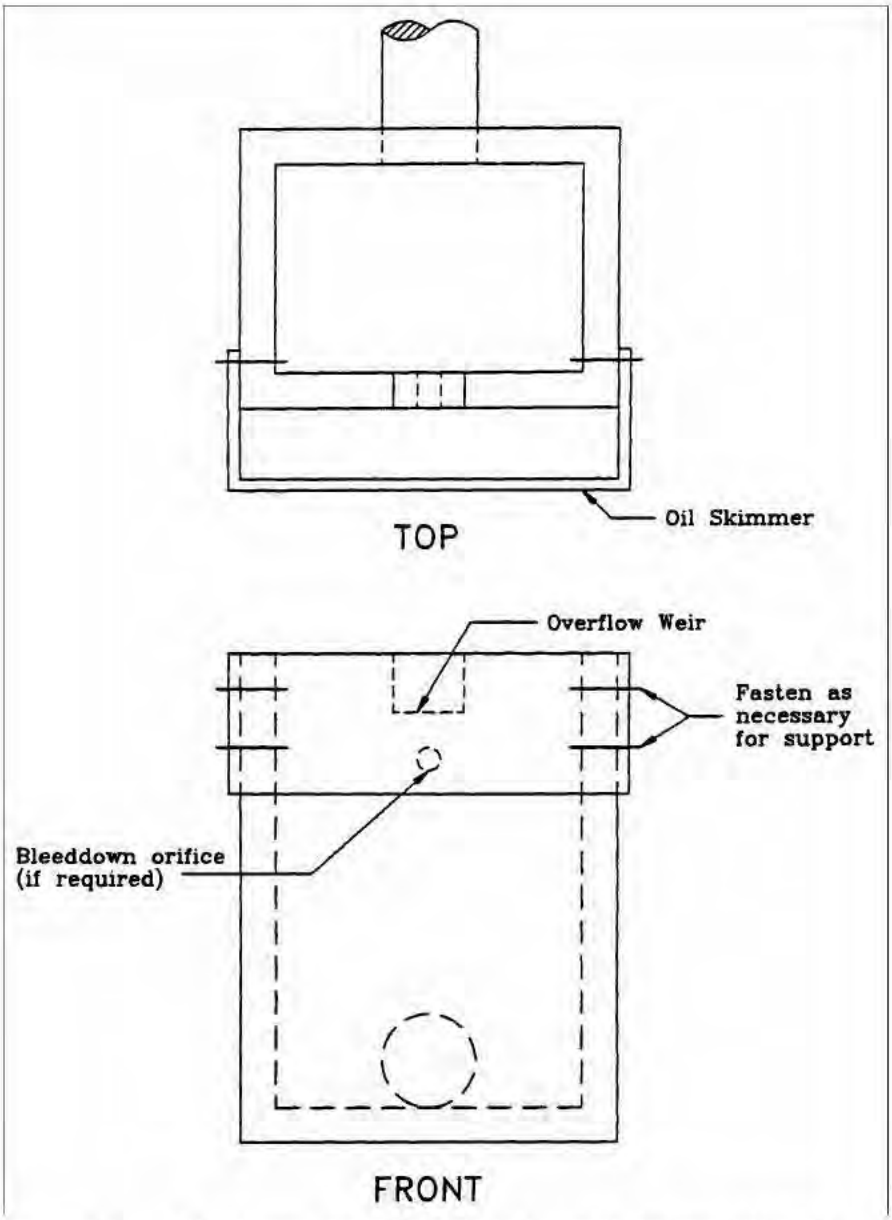


Figure 4.7-1 Oil skimmer detail for a typical outfall structure (N.T.S.)

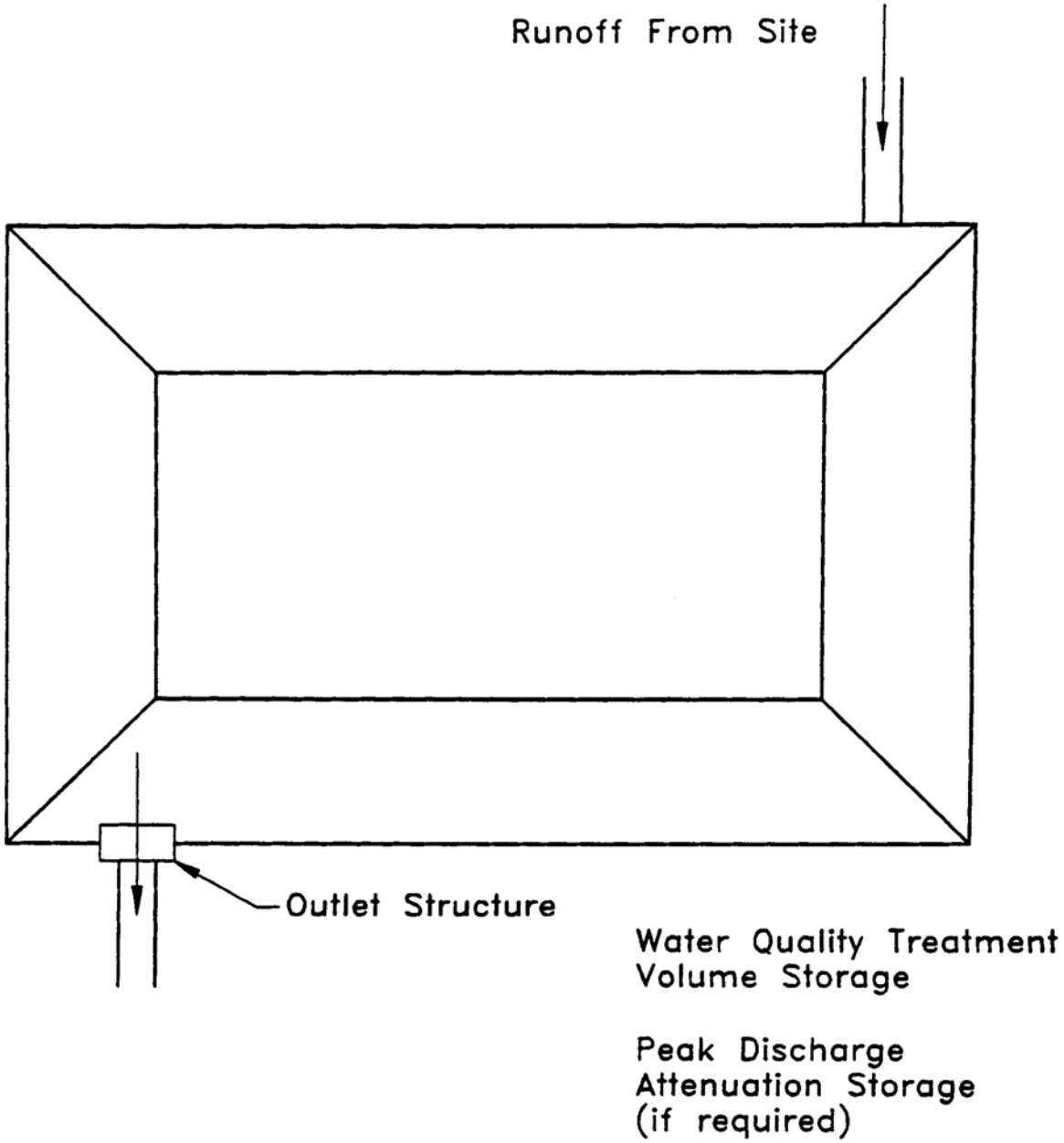


Figure 4.8-1 On-line treatment system

volumes in excess of the treatment volume mix with the treatment volume in the basin and transport a portion of the pollutant mass load over the basin control structure.

Off-line treatment systems (**Figure 4.8-2**) divert the treatment volume into a BMP that is designed for storage and treatment of the applicable treatment volume. Runoff volumes in excess of the treatment volume by-pass the off-line BMP and are discharged to the receiving water or routed to a detention basin if peak discharge attenuation is required. A diversion box (**Figure 4.8-3**) typically is used to divert the treatment volume to the off-line BMP and route subsequent flows away from it. .

Off-line systems are generally more effective at removing pollutants than on-line systems because accumulated pollutants cannot be "flushed out" during storm events that produce runoff volumes exceeding the treatment storage volume. Consequently, on-line systems must treat a greater volume of runoff than off-line systems to reduce the likelihood of flushing accumulated pollutants out of the system and achieve the minimum stormwater treatment levels required by State Water Resource Implementation Rule (chapter 62-40, F.A.C.). Treatment volumes for each of the stormwater treatment practices described in this handbook are discussed in **Sections 5 through 11 of the Manual.**

The treatment storage provided in an off-line system can be considered in the stage/storage calculations for peak discharge attenuation. Off-line systems should be designed to bypass essentially all additional stormwater runoff volumes greater than the treatment volume to a discharge point or other detention storage area. Of course, there will be some incremental additional storage in the off-line system associated with the hydraulic grade line at the weir structure in the typical diversion structure. This will depend on the size of the weir, but the weir should be sized to pass the design flow with minimal headwater.

Proposed off-line systems that will also serve to provide significant detention storage above the off-line treatment volume storage will be considered to function as on-line systems. These systems should either be designed to meet on-line treatment volume requirements or the designer should discuss the merits of the particular system (in terms of potential of flushing accumulated pollutants) with Department staff in a pre-application conference.

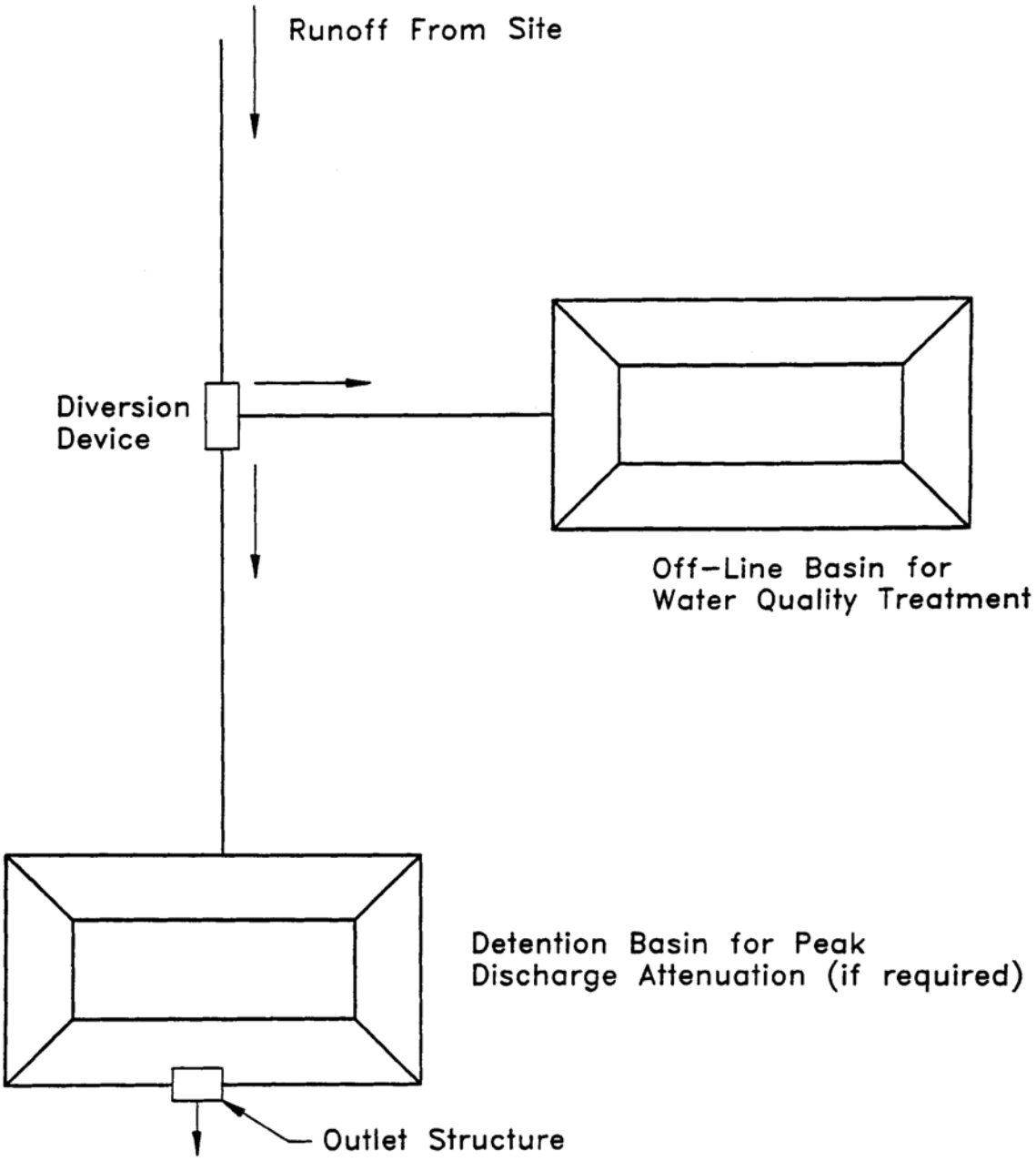


Figure 4.8-2 Off-line treatment system

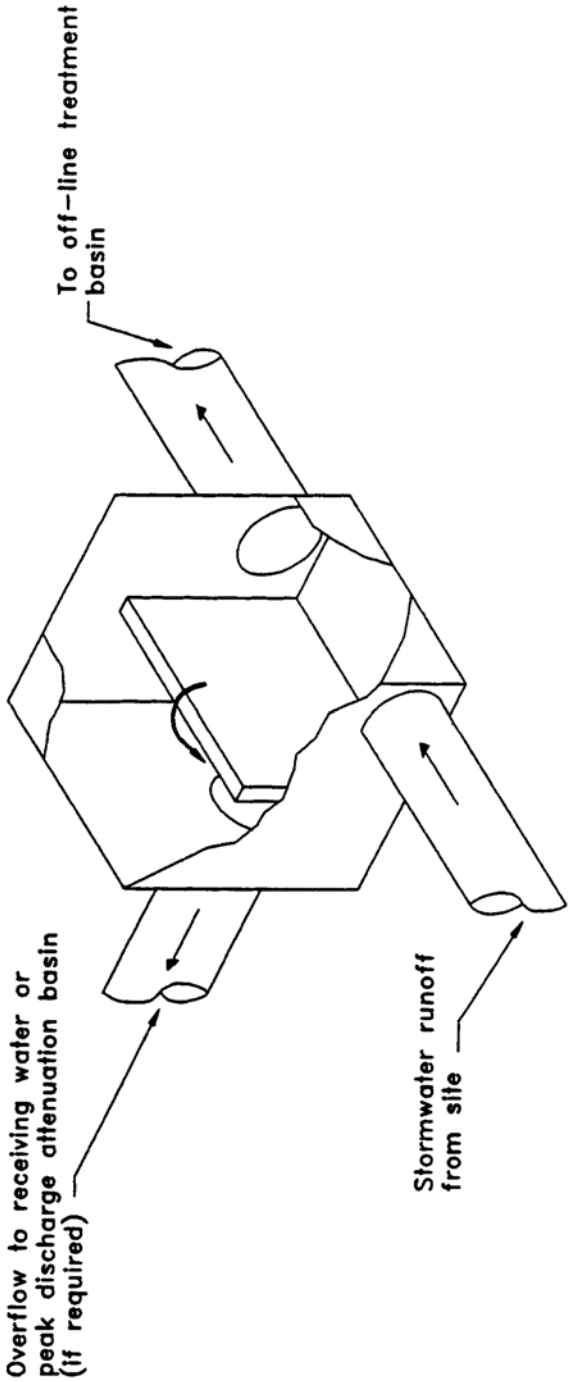


Figure 4.8-3 Diversion box (N.T.S.)

PART V -- BEST MANAGEMENT PRACTICES

5.0 Design Criteria and Guidelines for Retention Systems

5.1 Description

The term "retention system" is defined as a storage area designed to store a defined quantity of runoff, allowing it to percolate through permeable soils into the shallow ground water aquifer. Stormwater retention works best using a variety of retention systems throughout the project site. Examples of retention systems include:

- Man-made or natural depressional areas where the floor is graded as flat as possible and turf is established to promote infiltration and stabilize the basin slopes (see **Figure 5.1-1**);
- Shallow landscaped areas designed to store stormwater;
- Vegetated swales with swale blocks or raised inlets; and
- Pervious concrete with continuous curb.

Soil permeability and water table conditions must be such that the retention system can percolate the desired runoff volume within a specified time following a storm event. After drawdown has been completed, the basin does not hold any water, thus the system is normally "dry." Unlike detention basins, the treatment volume for retention systems is not discharged to surface waters.

Retention systems provide excellent removal of stormwater pollutants. Substantial amounts of suspended solids, oxygen demanding materials, heavy metals, bacteria, some varieties of pesticides and nutrients such as phosphorus are removed as runoff percolates through the vegetation and soil profile.

Retention systems should not be located in close proximity to drinking water supply wells. Chapter 62-22, F.A.C., requires stormwater treatment facilities to be at least 100 feet from any public supply well. **Section 11 of the Manual**, provides additional design features for systems constructed in Sensitive Karst Areas where the drinking water aquifer is close to the land surface.

Besides pollution control, retention systems can be utilized to promote the recharge of ground water to prevent saltwater intrusion in coastal areas or to maintain groundwater levels in aquifer recharge areas. Retention systems can also be used to meet the runoff volume criteria for projects that discharge to land-locked lakes (see **section 3.3(b) of** the **Manual).**

There are several design and performance criteria specific to retention systems that are described below.

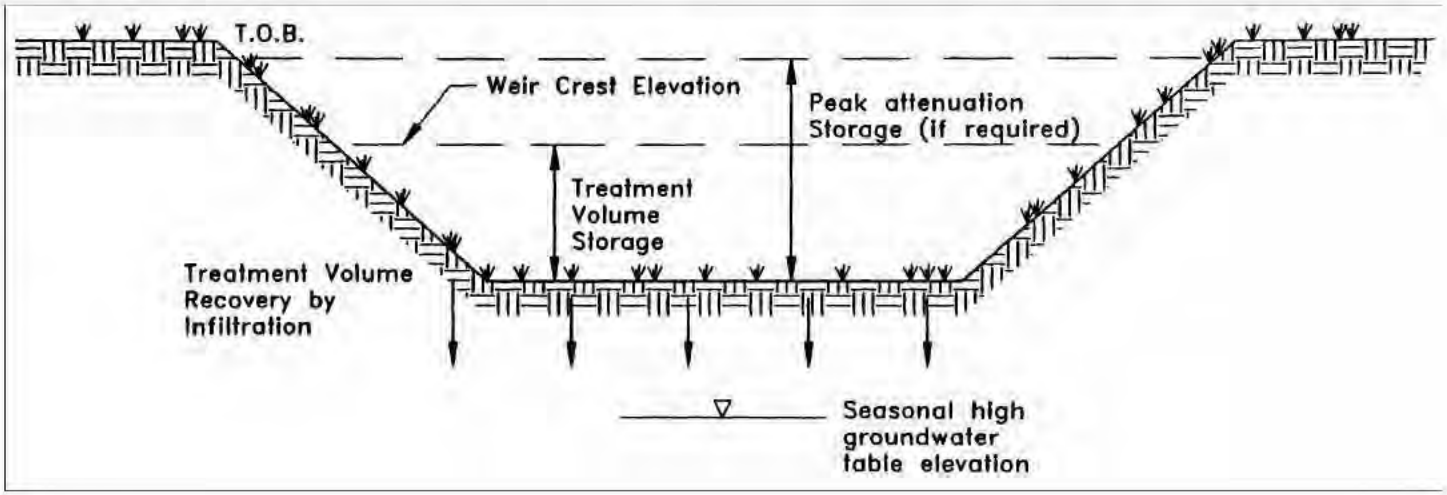


Figure 5.1-1 Retention (N.T.S.)

5.2 Treatment Volume

The first flush of runoff should be routed to the retention basin and percolated into the ground. For systems which discharge to Class III receiving water bodies, the rule specifies one of the following:

(a) Off-line retention of the first one-half inch of runoff or 1.25 inches of runoff from the impervious area, whichever is greater.

(b) On-line retention of an additional one half inch of runoff from the drainage area over that volume specified for off-line treatment.

(c) On-line retention that provides for percolation of the runoff from the three-year, one-hour storm.

(d) On-line retention of the runoff from one inch of rainfall or 1.25 inches of runoff from the impervious area, whichever is greater, for systems which serve an area with less than 40 percent impervious surface and that contain only U.S. Department of Agriculture Natural Resources Conservation Service (NRCS, SCS) hydrologic group "A" soils.

For direct discharges to Class I, Class II, OFWs, or Class III waters that are approved, conditionally approved, restricted, or conditionally restricted for shellfish harvesting, the applicant should provide retention for one of the following:

(a) At least an additional fifty percent of the applicable treatment volume specified for off-line retention in (a), above. Off-line retention must be provided for at least the first one-half inch of runoff or 1.25 inches of runoff from the impervious area, whichever is greater, of the total amount of runoff required to be treated.

(b) On-line retention of an additional fifty percent of the treatment volume specified in (b), above.

(c) On-line retention of the runoff from the three-year, one-hour storm.

(d) On-line retention that provides at least an additional 50 percent of the runoff volume specified in (d), above, for systems which serve an area with less that 40 percent impervious surface and that contain only U.S. Department of Agriculture Natural Resources Conservation Service (NRCS, or SCS) hydrologic group "A" soils.

5.3 Recovery Time

The retention system must provide the capacity for the appropriate treatment volume of stormwater specified in **Section 5.2 of the Manual** within 72 hours following a storm event assuming average antecedent moisture conditions. In retention systems, the stormwater is drawn down by natural soil infiltration and dissipation into the ground water table, evaporation, or evapotranspiration, as opposed to underdrain systems which rely on artificial methods like drainage pipes.

Antecedent moisture condition (AMC) refers to the amount of moisture and storage in the soil profile prior to a storm event. Antecedent soil moisture is an indicator of wetness and availability of soil to infiltrate water. The AMC can vary from dry to saturated depending on the amount of rainfall received prior to a given point in time. Therefore, "average AMC" means the soil is neither dry or saturated, but at an average moisture condition at the beginning of a storm event when calculating recovery time for retention systems.

The antecedent condition has a significant effect on runoff rate, runoff volume, infiltration rate, and infiltration volume. The infiltration volume is also known as the upper soil zone storage. Both the infiltration rate and upper soil zone storage are used to calculate the recovery time of retention systems and should be estimated using any generally accepted and well documented method with appropriate parameters to reflect drainage practices, seasonal high water table elevation, the AMC, and any underlying soil characteristics which would limit or prevent percolation of storm water into the soil column.

5.4 Basin Stabilization

The retention basin should be stabilized with pervious material or permanent vegetative cover. To provide proper treatment of the runoff in very permeable soils, permanent vegetative cover must be utilized when U.S. Department of Agriculture Natural Resources Conservation Service (NRCS, SCS) hydrologic group "A" soils underlie the retention basin, except for pervious pavement systems.

5.5 Retention Basin Construction

5.5.1 Overview

Retention basin construction procedures and the overall sequence of site construction are two key factors that can control the effectiveness of retention basins. Sub-standard construction methods or construction sequence can render the basin inoperable prior to completion of site development.

Since stormwater management systems typically are required to be constructed during the initial phases of site development, retention basins are often exposed to poor quality surface runoff. Stormwater runoff during construction contains considerable amounts of suspended solids, organics, clays, silts, trash and other undesirable materials. For example, the subgrade stabilization material utilized during construction of roadways and pavement areas typically consist of clayey sand or soil cement. If a storm occurs when these materials are exposed (prior to placement of the roadway wearing surface), considerable amounts of these materials end up in the retention basin. Another source of fine material generated during construction is disturbed surface soil that can release large quantities of organics and other fine particles. Fine particles of clay, silt, and organics at the bottom of a retention basin create a poor infiltrating surface (Andreyev and Wiseman 1989).

5.5.2 Construction Requirements

The following construction procedures are recommended to avoid degradation of retention basin infiltration capacity due to construction practices (Andreyev and Wiseman 1989):

(a) Initially construct the retention basin to rough grade by under-excavating the basin bottom and sides by approximately 12 inches.

(b) After the drainage area contributing to the basin has been fully stabilized, the interior side slopes and basin bottom should be excavated to final design specifications. The excess soil and undesirable material should be carefully excavated and removed from the pond so that all accumulated silts, clays, organics, and other fine sediment material has been removed from the pond area. The excavated material should be disposed of beyond the limits of the drainage area of the basin.

(c) Once the basin has been excavated to final grade, the entire basin bottom should be deep raked and loosened for optimal infiltration.

(d) Finally, the basin should be stabilized according the **Section 5.4 of the Manual**.

5.6 References

Andreyev, N.E., and L.P. Wiseman. 1989. *Stormwater Retention Pond Infiltration Analysis in Unconfined Aquifers*. Prepared for Southwest Florida Water Management District, Brooksville, Florida.

6.0 Underdrain Design and Performance Criteria

6.1 Description

Stormwater underdrain systems consist of a dry basin underlain with perforated drainage pipe which collects and conveys stormwater following percolation from the basin through suitable soil. Underdrain system are generally used where high water table conditions dictate that recovery of the stormwater treatment volume cannot be achieved by natural percolation (i.e., retention systems) and suitable outfall conditions exist to convey flows from the underdrain system to receiving waters. Schematics of a typical underdrain system are shown in **Figures 6.1-1 and 6.1-2.**

Underdrain systems are intended to control both the water table elevation over the entire area of the treatment basin and provide for the drawdown of the treatment volume. Underdrains are utilized where the soil permeability is adequate to recover the treatment volume since the on-site soils overlay the perforated drainage pipes.

Underdrain systems provide excellent removal of stormwater pollutants. Substantial amounts of suspended solids, oxygen demanding materials, heavy metals, bacteria, some varieties of pesticides and nutrients such as phosphorus are removed as runoff percolates through the vegetation and soil profile.

There are several design and performance criteria which must be met in order for an underdrain system to meet the rule requirements. The underdrain rule criteria are described below.

6.2 Treatment Volume

The first flush of runoff should be detained in a dry detention basin and percolated through the soil. For discharges to Class III receiving water bodies, the rule specifies either of the following treatment volumes:

(a) Off-line retention of the first one-half inch of runoff or 1.25 inches of runoff from the impervious area, whichever is greater, or

(b) On-line retention of an additional one half inch of runoff from the drainage area over that volume specified for off-line treatment.

For direct discharges to Class I, Class II, OFWs, or Class III waters which are approved, conditionally approved, restricted, or conditionally restricted for shellfish harvesting the applicant should provide retention for either of the following:

(a) At least an additional fifty percent of the applicable treatment volume specified for off-line retention in (a), above. Off-line retention must be provided for at least the first one-half inch of runoff or 1.25 inches of runoff from the impervious area, whichever is greater, of the total amount of runoff required to be treated; or

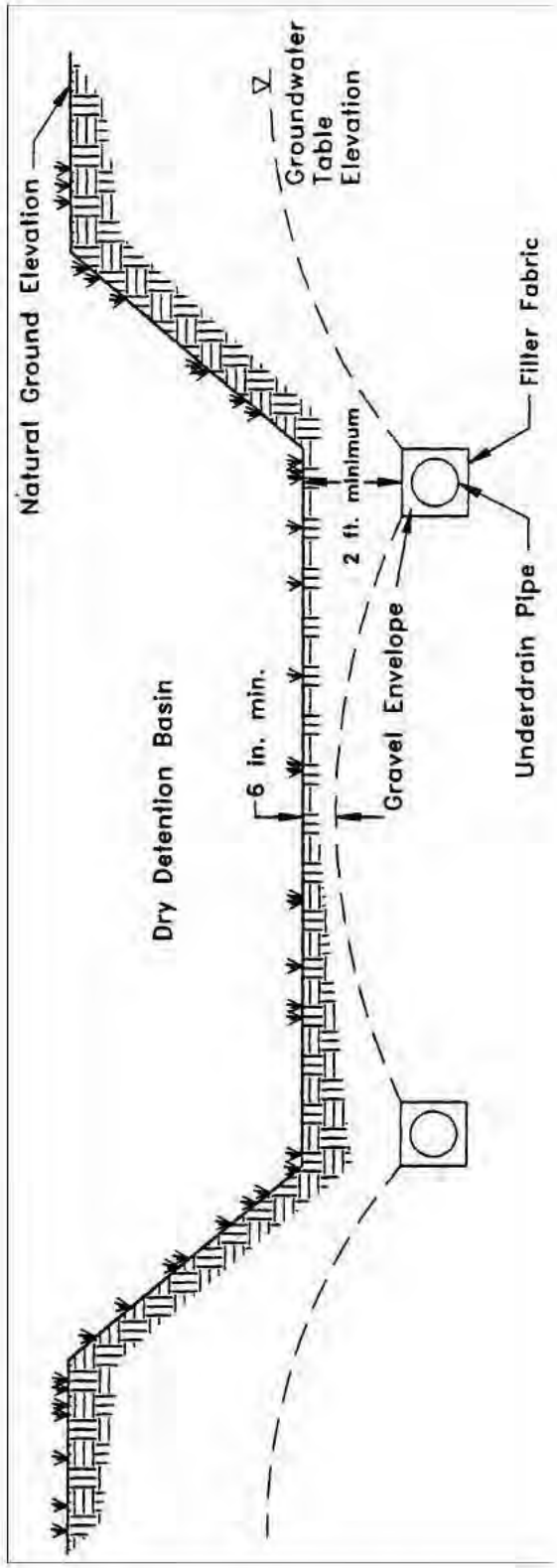


Figure 6.1-1 Cross-section of underdrain system (N.T.S.)

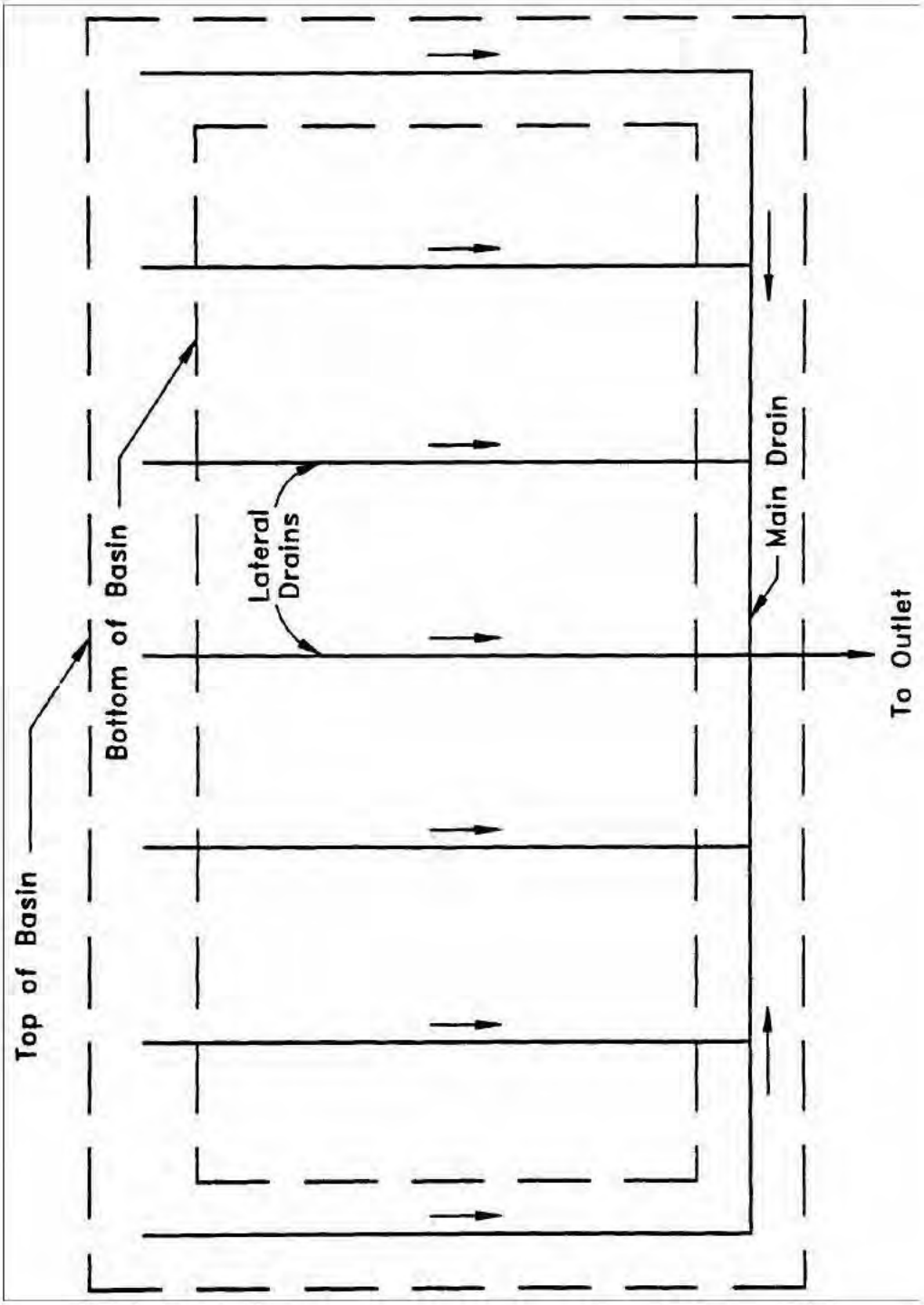


Figure 6.1-2 Top view of underdrain system (N.T.S.)

(b) On-line retention of the runoff from the three-year, one-hour storm or an additional fifty percent of the treatment volume specified in (b), above, whichever is greater.

6.3 Recovery Time

The system should be designed to provide for the drawdown of the appropriate treatment volume specified in **Section 6.2 of the Manual** within 72 hours following a storm event. The treatment volume is recovered by percolation through the soil with subsequent transport through the underdrain pipes. The system should only contain standing water within 72 hours of a storm event.

The pipe system configuration (e.g., pipe size, depth, pipe spacing, and pipe inflow capacity) of the underdrain system must be designed to achieve the recovery time requirement. Underdesign of the system will result in reduced hydraulic capacity. This, in turn, will result in a reduction in storage between subsequent rainfall events and an associated decrease in the annual average volume of stormwater treated resulting in a reduction of pollutant removal (Livingston et al. 1988). Such circumstances also reduce the aesthetic value of the system and may promote mosquito production.

6.4 Safety Factor

The underdrain system must be designed with a safety factor of at least two unless the applicant affirmatively demonstrates based on plans, test results, calculations or other information that a lower safety factor is appropriate for the specific site conditions. Examples of how to apply this factor include but are not limited to the following:

(a) Reducing the design percolation rate by half; and

(b) Designing for the required drawdown within 36 hours instead of 72 hours.

6.5 Underdrain Media

To provide proper treatment of the runoff, at least two feet of indigenous soil must be between the bottom of the basin storing the treatment volume and the outside of the underdrain pipes (or gravel envelope as applicable).

6.6 Filter Fabric

Underdrain systems should utilize filter fabric or other means to prevent the soil from moving into and clogging perforated pipe.

6.7 Inspection and Cleanout Ports

To facilitate maintenance of the underdrain system, capped and sealed inspection and cleanout ports which extend to the surface of the ground should be provided, at a minimum, at the following locations for each drainage pipe:

(a) The terminus; and

(b) At every 400 feet or every bend of 45 or more degrees, whichever is shorter.

6.8 Basin Stabilization

The underdrain basin should be stabilized with permanent vegetative cover and should contain standing water only immediately following a rainfall event.

6.9 References

Livingston, E.H., E. McCarron, J. Cox, P. Sanzone. 1988. *The Florida Land Development Manual: A Guide to Sound Land and Water Management*. Florida Department of Environmental Regulation, Nonpoint Source Management Section, Tallahassee, Florida.

7.0 Exfiltration Trench Design and Performance Criteria

7.1 Description

Exfiltration trench is a subsurface system consisting of a conduit such as perforated pipe surrounded by natural or artificial aggregate which temporarily stores and infiltrates stormwater runoff (**Figure 7.1-1**). Stormwater passes through the perforated pipe and infiltrates through the trench walls and bottom into the shallow groundwater aquifer. The perforated pipe increases the storage available in the trench and helps promote infiltration by making delivery of the runoff more effective and evenly distributed over the length of the system (Livingston et al. 1988). Generally, exfiltration trench systems are utilized where space is limited and/or land costs are high (i.e., downtown urban areas).

Soil permeability and water table conditions must be such that the trench system can percolate the required stormwater runoff treatment volume within a specified time following a storm event. The trench system is returned to a normally "dry" condition when drawdown of the treatment volume is completed. Like retention basins, the treatment volume in exfiltration trench systems is not discharged to surface waters. Thus, exfiltration is considered a type of retention system.

Like other types of retention systems, exfiltration trench systems provide excellent removal of stormwater pollutants. Substantial amounts of suspended solids, oxygen demanding materials, heavy metals, bacteria, some varieties of pesticides and nutrients such as phosphorus are removed as runoff percolates through the soil profile. Exfiltration trench systems should not be located in close proximity to drinking water supply wells. Chapter 62-22, F.A.C., requires stormwater treatment systems to be at least 100 feet from any public supply well. **Section 11 of Volume II of the Manual**, provides additional design features for systems constructed in Sensitive Karst Areas where the drinking water aquifer is close to the land surface.

Besides pollution control, exfiltration trench systems can be utilized to promote the recharge of ground water and to prevent saltwater intrusion in coastal areas, or to maintain groundwater levels in aquifer recharge areas. Exfiltration trench systems can also be used to meet the runoff volume criteria for projects which discharge to land-locked lakes (see **section 3.3(b) of the Manual).**

The operational life of an exfiltration trench is believed to be short (possibly 5 to 10 years) for most exfiltration systems. Sediment accumulation and clogging by fines can reduce the life of an exfiltration trench (Wanielista et al. 1991). Total replacement of the trench may be the only possible means of restoring the treatment capacity and recovery of the system. Periodic replacement of the trench should be considered routine operational maintenance when selecting this management practice.

There are several design and performance criteria which must be met in order for an exfiltration trench system to meet the rule requirements. A description of each criterion is presented below.

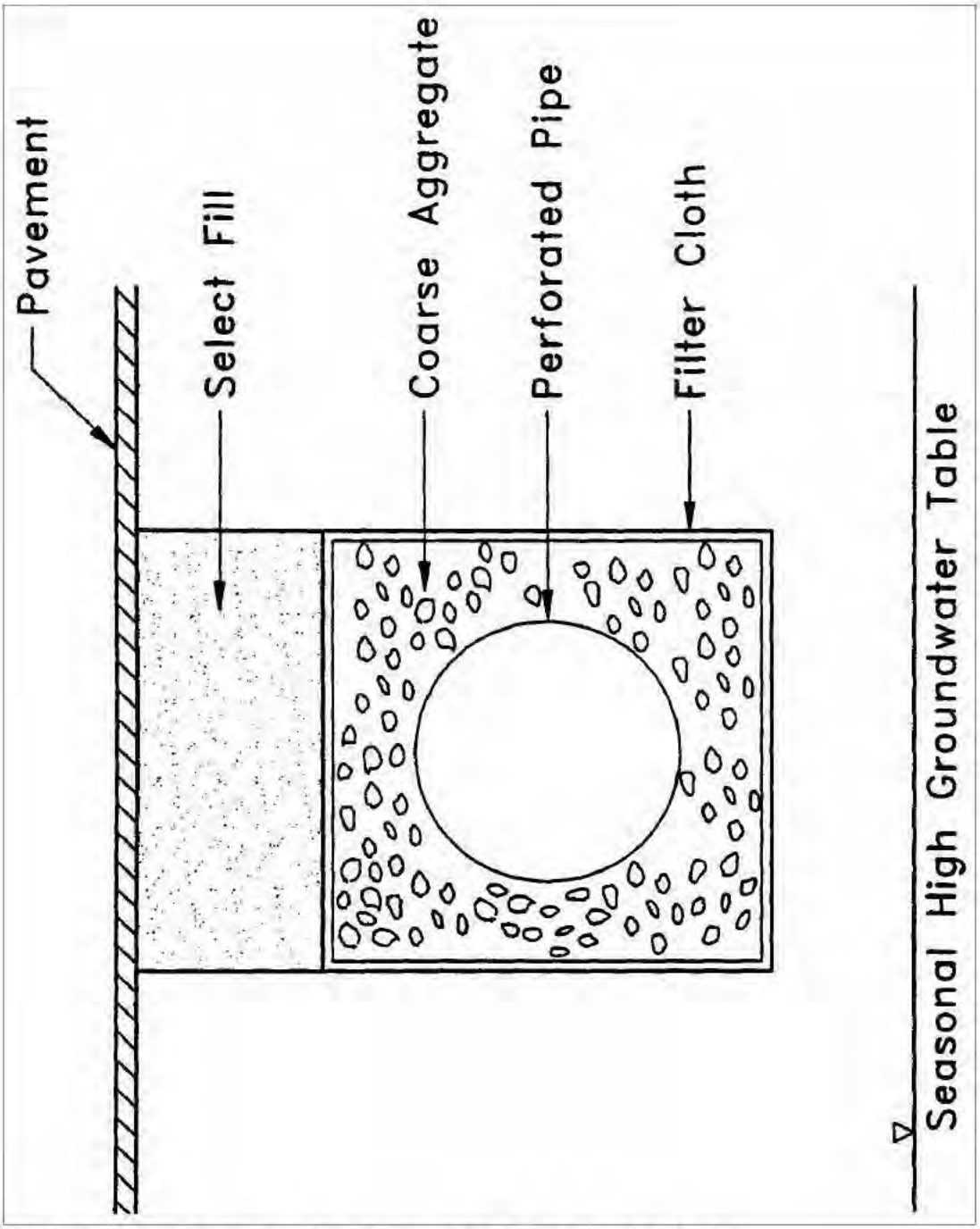


Figure 7.1-1 Cross-section of typical underground exfiltration trench (N.T.S.)

7.2 Treatment Volume

The first flush of runoff should be collected in the exfiltration trench and infiltrated into the surrounding soil. For systems which discharge to Class III receiving water bodies, the rule specifies either of the following:

(a) Off-line storage of the first one-half inch of runoff or 1.25 inches of runoff from the impervious area, whichever is greater; or

(b) On-line storage of an additional one half inch of runoff from the drainage area over that volume specified for off-line treatment.

For direct discharges to Class I, Class II, OFWs, or Class III waters which are approved, conditionally approved, restricted, or conditionally restricted for shellfish harvesting the applicant should provide storage for either of the following:

(a) At least an additional fifty percent of the applicable treatment volume specified for off-line storage in (a), above. Off-line storage must be provided for at least the first one-half inch of runoff or 1.25 inches of runoff from the impervious area, whichever is greater, of the total amount of runoff required to be treated; or

(b) On-line storage of the runoff from the three-year, one-hour storm or an additional fifty percent of the treatment volume specified in (b), above, whichever is greater.

Exfiltration trench systems must be designed to have the capacity to retain the required treatment volume without considering discharges to ground or surface waters.

7.3 Recovery Time

The system should be designed to provide for the appropriate treatment volume of stormwater runoff specified in **Section 7.2 of the Manual** within 72 hours following a storm event assuming average antecedent moisture conditions. The stormwater is drawn down by infiltration into the soil.

Antecedent moisture condition (AMC) refers to the amount of moisture and storage in the soil profile prior to a storm event. Antecedent soil moisture is an indicator of wetness and availability of soil to infiltrate water. The AMC can vary from dry to saturated depending on the amount of rainfall received prior to a given point in time. Therefore, “average AMC” means the soil is neither dry or saturated, but at average moisture condition at the beginning of a storm event when calculating recovery time for exfiltration systems.

The antecedent condition has a significant effect on runoff rate, runoff volume, infiltration rate, and infiltration volume. The infiltration volume is also known as the upper soil zone storage. Both the infiltration rate and upper soil zone storage are used to calculate the recovery time of retention systems and should be estimated using any generally accepted and well documented method with appropriate parameters to reflect drainage practices, seasonal high water table elevation, the AMC,

and any underlying soil characteristics which would limit or prevent percolation of storm water into the soil column.

7.4 Safety Factor

The exfiltration trench system must be designed with a safety factor of at least two unless the applicant affirmatively demonstrates based on plans, test results, calculations or other information that a lower safety factor is appropriate for the specific site conditions. For example, two possible ways to apply this factor are:

(a) Reducing the design percolation rate by half; and

(b) Designing for the required drawdown within 36 hours instead of 72 hours.

7.5 Minimum Dimensions

The perforated pipe should be designed with a 12 inch minimum pipe diameter and a three 3 foot minimum trench width. The perforated pipe should be located within the trench section to minimize the accumulation of sediment in the aggregate void storage and maximize the preservation of this storage for stormwater treatment. To meet this goal, it is recommended that the perforated pipe be located at or within 6 inches of the trench bottom. The maximum trench width will be limited by the rate at which stormwater can effectively fill the void storage within the trench.

7.6 Filter Fabric

Exfiltration trench systems should be designed so that aggregate in the trench is enclosed in filter fabric. This serves to prevent migration of fine materials from the surrounding soil that could result in clogging of the trench. Wanielista et al. (1991) reports that woven fabric (Mirafi 700XG) performed better in mixed sand and silty soil than non-woven fabric (Mirafi 140N). On the other hand, the 140N had higher exfiltration rates in sandy soils than the woven fabric.

Filter fabric may also be utilized directly surrounding the perforated pipe. In this instance, sedimentation of particulates will occur in the perforated pipe. Consequently, the pipe is more prone to clogging and reductions in capacity will occur more often than usual. Livingston et al. (1988) points out that while this may seem unacceptable, the pipe may be cleaned relatively easy using high pressure hoses, vacuum systems, etc. On the other hand, designs without the fabric directly surrounding the perforated pipe requires complete replacement when clogging occurs.

7.7 Inspection and Cleanout Structures

Inspection and cleanout structures that extend to the surface of the ground should be provided, at a minimum, at the inlet and terminus of each exfiltration pipe. Inlet structures should include sediment sumps. These inspection and cleanout structures provide four primary functions:

(a) Observation of how quickly the trench recovers following a storm;

(b) Observation of how quickly the trench fills with sediment;

(c) Maintenance access to the perforated pipe; and

(d) Sediment control (sumps).

Standard precast concrete inlets and manholes are widely used to furnish the inspection and cleanout access.

7.8 Ground Water Table

The exfiltration trench system should be designed so that the invert elevation of the trench is at least two feet above the seasonal high ground water table elevation unless the applicant affirmatively demonstrates based on plans, test results, calculations or other information that an alternative design is appropriate for the specific site conditions.

7.9 Construction

During construction, every effort should be made to limit the parent soil and debris from entering the trench. Wanielista (1991) reports complete failure (no exfiltration) when a 1 inch to 2 inch thickness of parent soil and stormwater solids were added to an exfiltration trench. Applicants and system designers should consult chapters 3 and 6 of *The Florida Land Development Manual* (Livingston et al. 1988) for information on erosion and sediment control. Any method used to reduce the amount of fines entering the exfiltration trench during construction will extend the life of the system (Wanielista et al. 1991). The use of an aggregate with minimal fines is also recommended (Wanielista et al. 1991).

7.10 References

Branscome, J., and R.S. Tomasello. 1987. *Field Testing of Exfiltration Systems*. South Florida Water Management District Technical Publication 87-5. West Palm Beach, Florida.

Livingston, E.H., E. McCarron, J. Cox, and P. Sanzone. 1988. *The Florida Land Development Manual: A Guide to Sound Land and Water Management*. Florida Department of Environmental Regulation, Nonpoint Source Management Section, Tallahassee, Florida.

South Florida Water Management District. 1987. *Management and Storage of Surface Waters Permit Information Manual, Volume IV*. West Palm Beach, Florida.

Wanielista, M.P., M.J. Gauthier, and D.L. Evans. 1991. *Design and Performance of Exfiltration Systems*. Department of Civil and Environmental Engineering, University of Central Florida, Orlando, Florida.

8.0 Wet Detention Design and Performance Criteria

8.1 Description

To meet the objectives of this Handbook, the traditional flood attenuation pond was modified to maximize water quality treatment processes. These modified detention ponds are identified by the name "wet detention systems." These systems are permanently wet ponds which are designed to slowly release collected stormwater runoff through an outlet structure. A schematic of a typical wet detention system is shown in **Figure 8.1-1**.

Wet detention systems are the recommended BMP for sites with moderate to high water table conditions. The Department strongly encourages the use of wet detention treatment systems for the following two reasons. First, wet detention systems provide significant removal of both dissolved and suspended pollutants by taking advantage of physical, chemical, and biological processes within the pond (CDM 1985). Second, the complexity of BMPs such as underdrains are not encountered in a wet detention pond control structure. Wet detention systems offer an effective alternative for the long term control of water levels in the pond, provide a predictable recovery of storage volumes within the pond, and are easily maintained by the maintenance entity.

In addition to providing good removal of pollutants from runoff, wet detention systems also provide other benefits such as flood detention, passive recreation activities related adjacent to ponds, storage of runoff for irrigation, and pleasing aesthetics. As stormwater treatment systems, these ponds should not be designed to promote in-water recreation (i.e., swimming, fishing, and boating).

There are several components in a wet detention system which must be properly designed to achieve the level of stormwater treatment required bythe **Manual**. A description of each design feature and its importance to the treatment process is presented below. The design and performance criteria for wet detention systems are discussed below.

8.2 Treatment Volume

For wet detention systems, the design treatment volume is the greater of the following:

(a) One inch of runoff over the drainage area; or

(b) 2.5 inches times the impervious area (excluding water bodies).

Additional treatment volume may be required for systems that discharge directly to Class I, Class II, Outstanding Florida Waters, or Class III waters which are approved, conditionally approved, restricted, or conditionally restricted for shellfish harvesting (see **Section 8.13 of the Manual**).

8.3 Recovery Time

The outfall structure should be designed to drawdown one-half the required treatment volume between 48 and 60 hours.

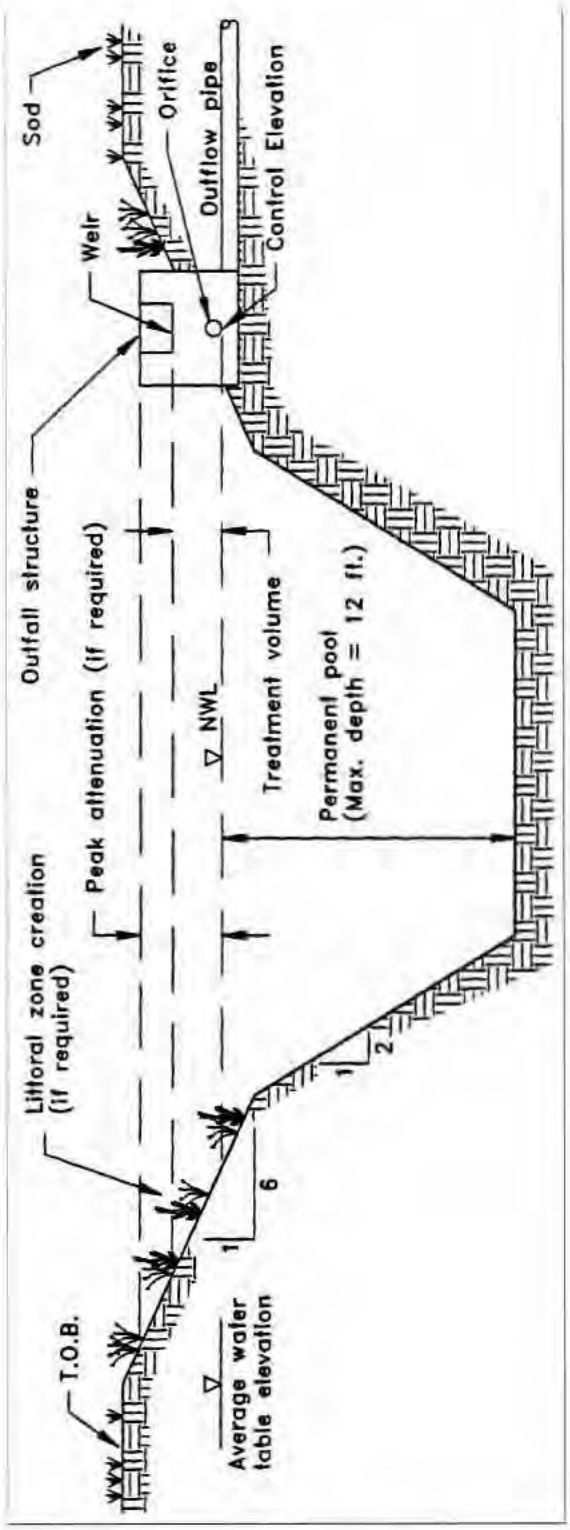


Figure 8.1-1 Wet detention (N.T.S.)

8.4 Outlet Structure

The outlet structure generally includes a drawdown device (such as an orifice, "V" or square notch weir) set to establish a normal water control elevation and slowly release the treatment volume (see **Figures 8.4-1 and 8.4-2** for schematics). The design of the outfall structure must also accommodate the passage of ground water baseflows and flows from upstream stormwater management systems (see **Figure 8.4-3**).

The control elevation should be set at or above the design tailwater elevation so the pond can effectively recover the treatment storage. Also, drawdown devices smaller than 3 inches minimum width or less than 20 degrees for "V" notches shall include a device to eliminate clogging. Examples of such devices include baffles, grates, screens, and pipe elbows.

8.5 Permanent Pool

A significant component and design criterion for the wet detention system is the storage capacity of the permanent pool (i.e., section of the pond which holds water at all times). The permanent pool should be sized to provide at least a 14-day residence time based upon annual rainfall.

Important pollutant removal processes which occur within the permanent pool include: uptake of nutrients by algae, adsorption of nutrients and heavy metals onto bottom sediments, biological oxidation of organic materials, and sedimentation (CDM 1985). Uptake by algae is probably the most important process for the removal of nutrients. Sedimentation and adsorption onto bottom sediments is likely the primary means of removing heavy metals (CDM 1985).

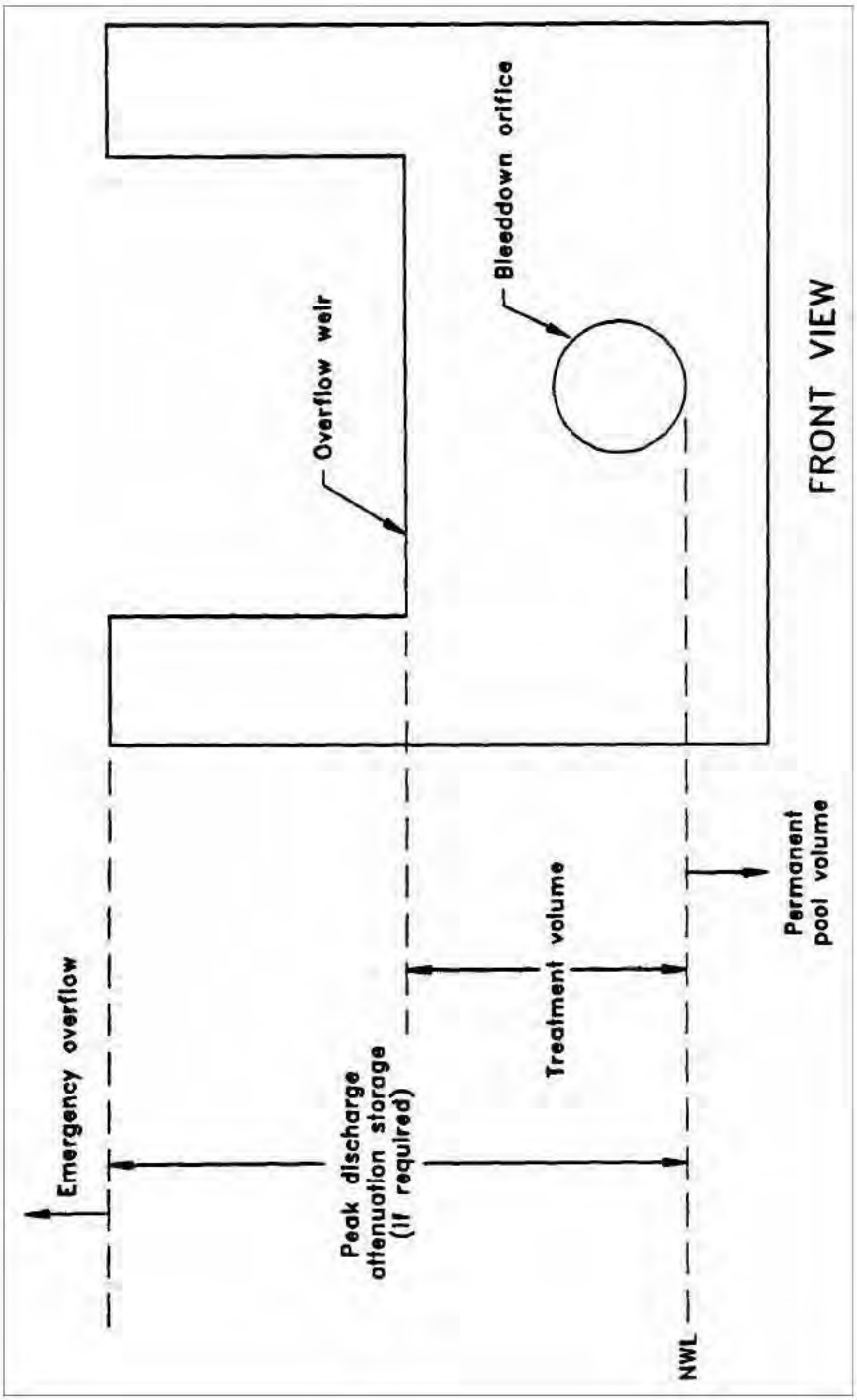
The storage capacity of the permanent pool must be large enough to detain the untreated runoff long enough for the treatment processes described above to take place. Since one of the major biological mechanisms for pollutant removal in a wet detention basin is phytoplankton growth, the average hydraulic residence time of the pond must be long enough to ensure adequate algal growth (CDM 1985). A residence time of 2 weeks is considered to be the minimum duration that ensures adequate opportunity for algal growth (CDM 1985).

Additional permanent pool volume may be required for wet detention systems which directly discharge to Class I, Class II, or Outstanding Florida Waters (see **Section 8.13 of the Manual**)

8.6 Littoral Zone

The littoral zone is that portion of a wet detention pond which is designed to contain rooted aquatic plants. The littoral area is usually provided by extending and gently sloping the sides of the pond down to a depth of 2 to 3 feet below the normal water level or control elevation. Also, the littoral

Figure 8.4-1 Typical wet detention outfall structure (N.T.S.)



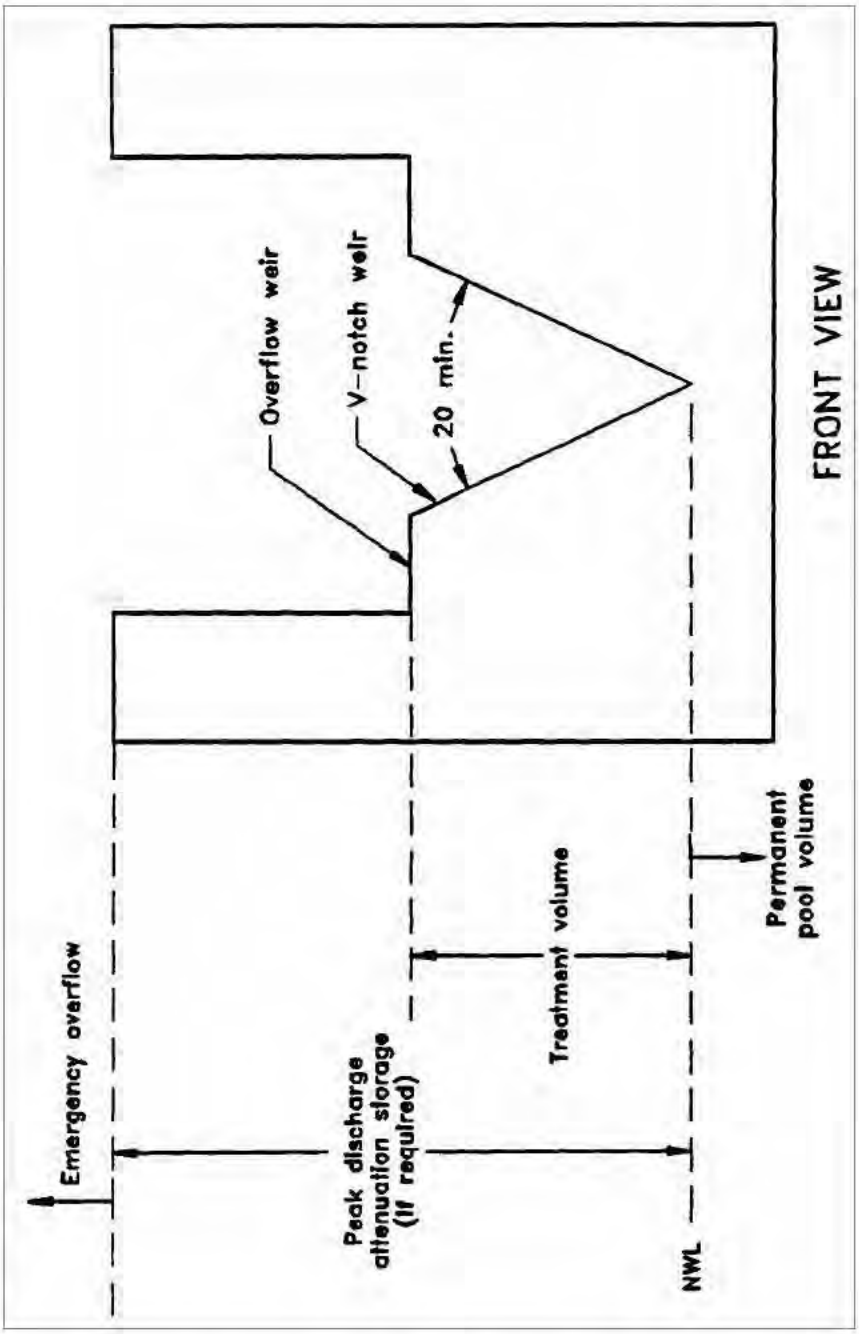


Figure 8.4-2 Typical wet detention outfall structure with "V"-notch weir (N.T.S.)

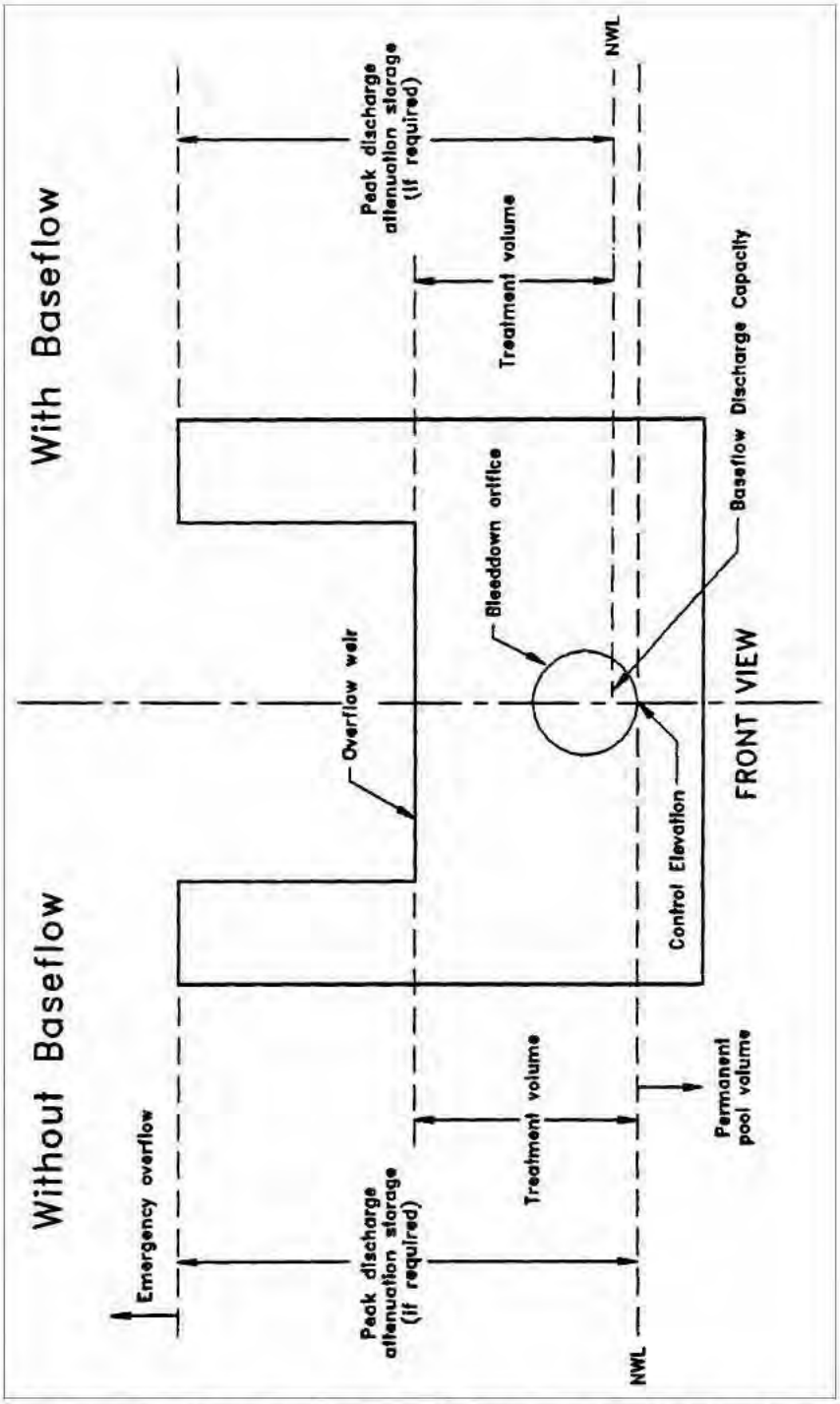


Figure 8.4-3 Typical wet detention outfall structure with and without baseflow conditions (N.T.S.)

zone can be provided in other areas of the pond that have suitable depths (i.e., a shallow shelf in the middle of the lake).

The littoral zone is established with native aquatic plants by planting and/or the placement of wetland soils containing seeds of native aquatic plants. A specific vegetation establishment plan must be prepared for the littoral zone. The plan must consider the hydroperiod of the pond and the type of plants to be established. Livingston et al. (1988) has published a list of recommended native plant species suitable for littoral zone planting. In addition, a layer of muck can be incorporated into the littoral area to promote the establishment of the wetland vegetation. When placing muck, special precautions must be taken to prevent erosion and turbidity problems in the pond and at its discharge point while vegetation is becoming established in the littoral zone.

The following is a list of the design criteria for wet detention littoral zones:

(a) The littoral zone shall be gently sloped (6:1 Horizontal:Vertical or flatter). At least 30 percent of the wet detention pond surface area shall consist of a littoral zone. The percentage of littoral zone is based on the ratio of vegetated littoral zone to surface area of the pond at the control elevation.

(b) The treatment volume should not cause the pond level to rise more than 18 inches above the control elevation unless the applicant affirmatively demonstrates that the littoral zone vegetation can survive at greater depths.

(c) Within 24 months of completion of the system, 80 percent coverage of the littoral zone by suitable aquatic plants is required.

(d) Planting of the littoral zone is recommended to meet the 80% coverage requirement. As an alternative to planting, portions of the littoral zone may be established by placement of wetland top soils (at least a four inch depth) containing a seed source of desirable native plants. When utilizing this alternative, the littoral zone must be stabilized by mulching or other means and at least the portion of the littoral zone within 25 feet of the inlet and outlet structures must be planted.

8.7 Littoral Zone Alternatives

As an option to establishing and maintaining vegetative littoral zones as described in **Section 8.6 of the Manual,** the applicant can provide either:

(a) An additional 50% of the appropriate permanent pool volume as required in **Sections 8.5 or 8.13 of the Manual**, or

(b) Pre-treatment of the stormwater prior to the stormwater entering the wet detention pond. The level of pre-treatment must be at least that required for retention, underdrain, exfiltration, or swale systems. See **Section 8.11 of the Manual** for additional information on pre-treatment.

Providing a larger permanent pool or pre-treatment will compensate for the pollutant removal benefits associated with a well vegetated littoral zone. However, even under the above alternatives, shallow portions of the wet detention pond may be colonized with nuisance species such as cattails that will need to be controlled. This should be considered routine operational maintenance.

8.8 Pond Depth

The rule requires a maximum pond depth of 12 feet and a mean depth (pond volume divided by the pond area at the control elevation) between 2 and 8 feet. Many of the nutrients and metals removed from the water column accumulate in the top few inches of the pond bottom sediments (Yousef et al. 1990). If a pond is deep enough, it will have a tendency to stratify, creating the potential for anaerobic conditions developing at the bottom of the pond (CDM 1985). An aerobic environment should be maintained throughout the water column in wet detention ponds in order to minimize the release of nutrients and metals from the bottom sediments (Yousef et al. 1990). The maximum depth criteria minimizes the potential for significant thermal stratification which will help maintain aerobic conditions in the water column that should maximize sediment uptake and minimize sediment release of pollutants.

On the other hand, the minimum mean depth criteria minimizes aquatic plant growth which may be excessive if the pond is too shallow.

The Department will consider pond depths in excess of 12 feet providing the applicant can provide reasonable assurance that the proposed pond depth will not cause adverse water quality conditions due to anaerobic bottom conditions.

8.9 Pond Configuration

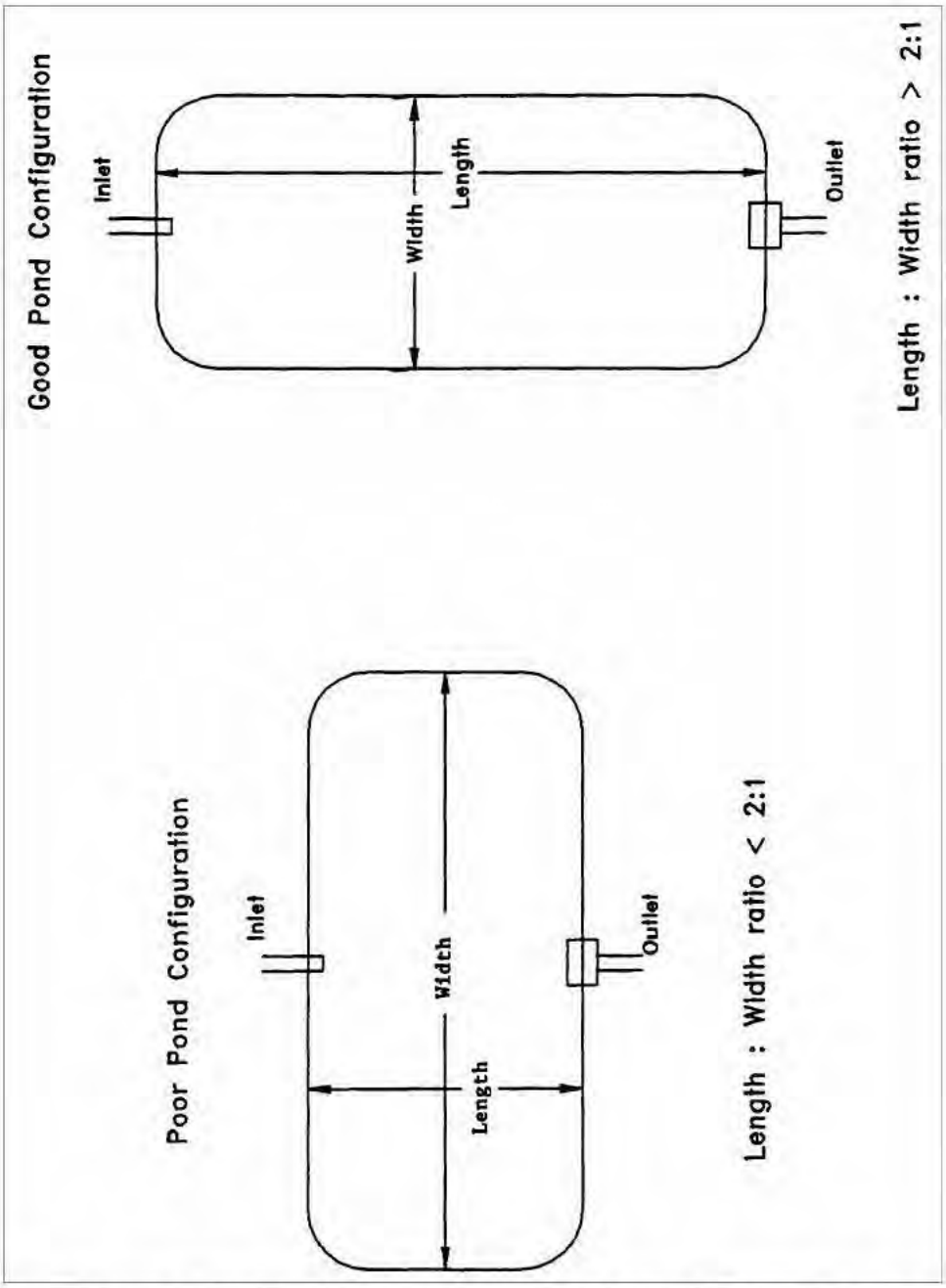
The average length to width ratio of the pond must be at least 2:1. Yousef et al. (1990) reports that it is important to maximize the flow path of water from the inlets to the outlet of the pond to promote good mixing (i.e., no dead spots). Under these design conditions, short circuiting is minimized and pollutant removal efficiency and mixing is maximized.

If short flow paths are unavoidable, the effective flow path can be increased by adding diversion barriers such as islands, peninsulas, or baffles to the pond. Inlet structures should be designed to dissipate the energy of water entering the pond. Examples of good and poor pond configurations are given in **Figure 8.9-1**.

The Department will consider pond configurations with the average length to width ratio less than 2:1 if the applicant can demonstrate reasonable assurance that the alternate design of the pond minimizes short circuiting.

8.10 Ground Water Table

To minimize ground water contributions which may lower treatment efficiencies, the control elevation should be set at or above the normal on-site ground water table elevation (Yousef et al. 1990). This elevation may be determined by calculating the average of the seasonal high and seasonal low ground water table elevations.



Ground water inflow (baseflow) must be considered when the control elevation is set below the normal ground water table elevation or the project utilizes underdrains (i.e., road underdrains) to control ground water conditions on-site. The design of the outfall structure must provide for the discharge of baseflow at the design normal water level in the pond. Baseflow rates must be included in the drawdown calculations for the outfall structure. Baseflow should also be considered

Figure 8.9-1 Examples of good and poor wet detention pond configurations (N.T.S.)

in the permanent pool residence time design. Establishment of the normal water level in the pond will also be influenced by baseflow conditions (see **Figure 8.4-3**).

8.11 Pre-treatment

"Pre-treatment" is defined as the treatment of a portion of the runoff prior to its entering the wet detention pond. Pre-treatment increases the pollutant removal efficiency of the overall stormwater system by reducing the pollutant loading to the wet detention pond. Pre-treatment may be used to enhance the appearance of the wet detention pond or meet the additional treatment criteria for discharges to receiving water which are classified as Class I, Class II, Outstanding Florida Waters (OFWs), or Class III waters which are approved, conditionally approved, restricted, or conditionally restricted for shellfish harvesting.

For developments where the appearance of the lake is important, pre-treatment can reduce the chances of algal blooms and slow the eutrophication process. Some types of pre-treatment practices include utilizing vegetative swales for conveyance instead of curb and gutter, perimeter swales or berms around the lake, oil and grease skimmers on inlet structures, retention storage in swales with raised inlets, or shallow landscaped retention areas (when soils and water table conditions will allow for adequate percolation).

For systems in which pre-treatment is utilized to meet the additional design criteria requirements for systems which direct discharge to Class I, Class II, OFWs, or Class III waters which are approved, conditionally approved, restricted, or conditionally restricted for shellfish harvesting, pre-treatment practices must meet the appropriate design and performance criteria for that BMP. Acceptable types of pre-treatment include the following:

(a) Retention systems which meet the design and performance criteria in **Section 5 of the Manual**;

(b) Underdrain systems which meet the design and performance criteria in **section 6 of the Manual**;

(c) Exfiltration trench (see **section 7 of the Manual**); or

(d) Swales systems which meet the design and performance criteria in **section 8 of the Manual**.

Alternative pre-treatment methods will be evaluated on a case-by-case basis by the Department. Applicants or system designers are encouraged to meet with Department staff in a pre-application conference if alternative methods are proposed.

8.12 Pond Side Slopes

The pond must be designed so that the average pond side slope measured between the control elevation and two feet below the control elevation is no steeper than 3:1 (horizontal:vertical). Because the pond sediments are an important component in the wet detention treatment processes, this criterion will ensure sufficient pond bottom/side slope area for the appropriate processes to occur.

8.13 Direct Discharges to Class I, Class II, OFWs, or Shellfishing Waters

Wet detention systems which discharge to Class I, Class II, OFWs, or Class III waters which are approved, conditionally approved, restricted, or conditionally restricted for shellfish harvesting, must provide either:

(a) An additional fifty percent of both the required treatment and permanent pool volumes

(b) Pre-treatment of the stormwater prior to the stormwater entering the wet detention pond. The level of pre-treatment must be at least that required for retention, underdrain, exfiltration, or swale systems (see **Section 8.11 of the Manual**).

8.14 References

Camp Dresser & McKee Inc (CDM). 1985. *An Assessment of Stormwater Management Programs.* Prepared for Florida Department of Environmental Regulation, Tallahassee, Florida.

Livingston, E.H., E. McCarron, J. Cox, P. Sanzone. 1988. *The Florida Land Development Manual: A Guide to Sound Land and Water Management*. Florida Department of Environmental Regulation, Nonpoint Source Management Section, Tallahassee, Florida.

Yousef, Y.A., M.P. Wanielista, L.Y. Lin, and M. Brabham. 1990. *Efficiency Optimization of Wet Detention Ponds for Urban Stormwater Management (Phase I and II).* University of Central Florida, Orlando, Florida.

9.0 Design Criteria and Guidelines for Swale Systems

9.1 Description

Swales are a man-made or natural system shaped or graded to required dimensions and designed for the conveyance and rapid infiltration of stormwater runoff. Swales are designed to infiltrate a defined quantity of runoff through the permeable soils of the swale floor and side slopes into the shallow ground water aquifer (**Figure 9.1-1**). Turf is established to promote infiltration and stabilize the side slopes. Soil permeability and water table conditions must be such that the swale can percolate the desired runoff volume from the 3-year, 1-hour storm event. The swale holds water only during and immediately after a storm event, thus the system is normally "dry." Unlike retention basins, swales are "open" conveyance systems. This means there are no physical barriers such as berms or check-dams to impound the runoff in the swale prior to discharge to the receiving water.

Swales provide excellent removal of stormwater pollutants. Substantial amounts of suspended solids, oxygen demanding materials, heavy metals, bacteria, some varieties of pesticides and nutrients such as phosphorus are removed as runoff percolates through the vegetation and soil profile. Swale systems should not be located in close proximity to drinking water supply wells. As required by chapter 62-22, F.A.C., stormwater treatment facilities must be at least 100 feet from any public supply well. Additional design criteria are established for swale systems constructed in Karst Sensitive Areas where the drinking water aquifer is close to the land surface (see **section 11 of the Manual**).

Besides pollution control, swale systems can be utilized to promote the recharge of groundwater to prevent saltwater intrusion in coastal areas, and to maintain ground water levels in aquifer recharge areas. Swales can be incorporated into the design of a stormwater management system to meet the runoff volume criteria for projects which discharge to land-locked lakes (see **section 3.3(b) of the Manual**).

Swales can also be utilized to provide pre-treatment of runoff prior to its release to another treatment BMP such as wet detention (see **Section 8.11 of the Manual**) or wetlands stormwater management systems (see **Section 10.4**). Pre-treatment reduces the pollutant loading to the downstream treatment system, increases the pollutant efficiency of the overall stormwater management system, and reduces maintenance. In some cases, pre-treatment may be used to meet the additional treatment criteria for discharges to sensitive receiving waters (Class I, Class II, and OFWs). For developments where the appearance of the downstream system (i.e., wet detention lake) is important, pre-treatment can reduce the probability of algal blooms occurring and slows the eutrophication process.

The design and performance criteria specific to swale systems are described below.

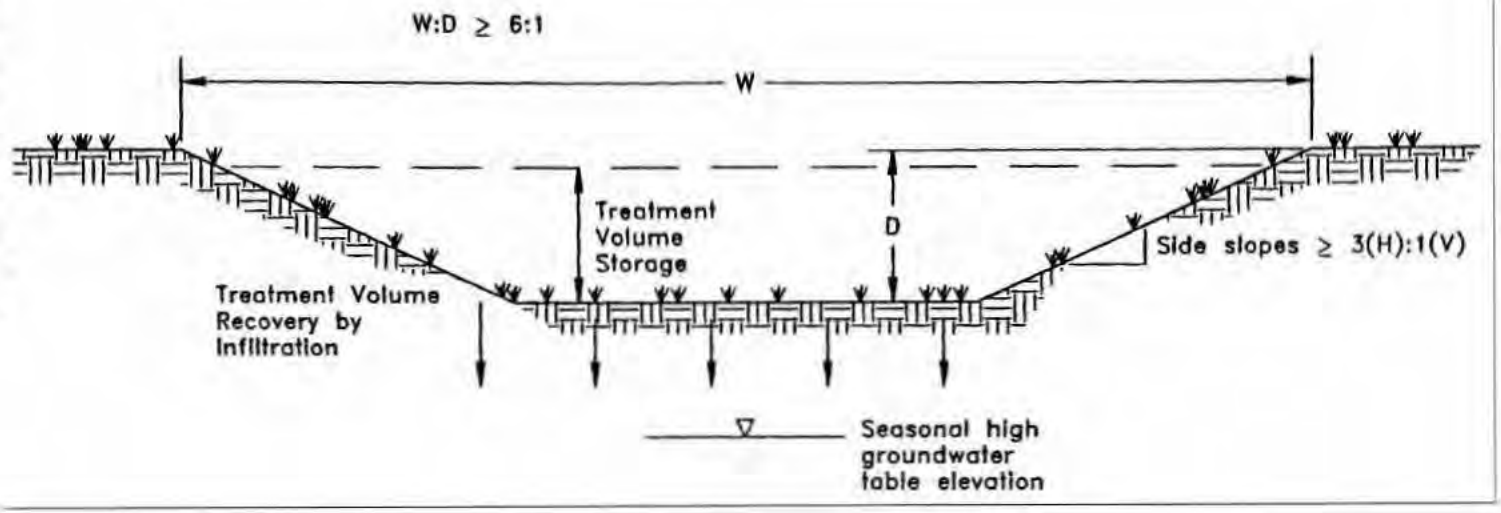


Figure 9.1-1 Cross-section of swale system (N.T.S.)

9.2 Treatment Volume

The runoff from the site should be routed to the swale system for conveyance and percolation into the ground. For systems which discharge to Class III receiving water bodies, the swales should be designed to percolate 80% of the runoff from the 3-year, 1-hour storm. The remaining 20% of the runoff from the 3-year, 1-hour storm event may be discharged offsite by the swale system.

Swale systems which directly discharge to Class I, Class II, OFWs, or Class III waters which are approved, conditionally approved, restricted, or conditionally restricted for shellfish harvesting, should be designed to percolate all of the runoff from the 3-year, 1-hour storm.

9.3 Recovery Time

Swale systems must provide the capacity for the specified treatment volume of stormwater and contain no contiguous areas of standing or flowing water within 72 hours following the storm event referenced in **section 9.2 of the Manual** assuming average antecedent moisture conditions. The treatment volume must be provided by percolation through the soil, evaporation, or evapotranspiration.

Antecedent moisture condition (AMC) refers to the amount of moisture and storage in the soil profile prior to a storm event. Antecedent soil moisture is an indicator of wetness and availability of soil to infiltrate water. The AMC can vary from dry to saturated depending on the amount of rainfall received prior to a given point in time. Therefore, "average AMC" means the soil is neither dry or saturated, but at an average moisture condition at the beginning of a storm event when calculating recovery time for swale systems.

The antecedent condition has a significant effect on runoff rate, runoff volume, infiltration rate, and infiltration volume. The infiltration volume is also known as the upper soil zone storage. Both the infiltration rate and upper soil zone storage are used to calculate the recovery time of retention systems and should be estimated using any generally accepted and well documented method with appropriate parameters to reflect drainage practices, seasonal high water table elevation, the AMC, and any underlying soil characteristics which would limit or prevent percolation of storm water into the soil column.

9.4 Dimensional Requirements

Swales must have a top width to depth ratio of the cross-section equal to or greater than 6:1 or side slopes equal to or greater than 3:1 (horizontal to vertical).

9.5 Stabilization

Swales should be stabilized with vegetative cover suitable for soil stabilization, stormwater treatment, and nutrient uptake. Also, the swale should be designed to take into account the soil erodibility, soil percolation, slope, slope length, and drainage area so as to prevent erosion and reduce pollutant concentrations.

10.0 Design Criteria and Guidelines for Wetlands Stormwater Management Systems

10.1 Description

Wetlands are an essential part of nature's stormwater management system. Important wetland functions include the conveyance and storage of stormwater. These function to dampen flooding impacts; reduce flood flows and velocity of stormwater which in turn reduces erosion, increases sedimentation, and helps the assimilation of pollutants typically carried in stormwater. Accordingly, there is interest in the incorporation of natural wetlands into stormwater management systems, especially wetlands which have been previously drained. This concept provides an opportunity to use wetlands to meet the requirements of the stormwater rule. In addition, by using wetlands for stormwater management, drained wetlands can be revitalized and landowners and developers have greater incentive to preserve or restore wetlands (Livingston 1989).

For wetlands stormwater management systems the District must attempt to ensure that a proposed wetlands stormwater management system is compatible with the existing ecological characteristics of the wetlands proposed to be utilized for stormwater treatment. The District must also ensure that water quality standards will not be violated by discharges from wetlands stormwater management system. To achieve these goals, specific performance criteria are set forth in the stormwater rule and are described below for systems which incorporate wetlands for stormwater treatment.

10.2 Types of Wetlands that may be Utilized for Stormwater Treatment

The only wetlands which may be considered for use to provide stormwater treatment are those which:

(a) Are isolated wetlands; and

(b) Would be isolated wetlands, but for a hydrologic connection to other wetlands or surface waters via another watercourse that was excavated through uplands.

10.3 Treatment Volume

The system should be part of a comprehensive stormwater management system that utilizes wetlands in combination with other best management practices to provide treatment of the runoff from the project. For systems discharging to Class III waters, the rule specifies treatment of the runoff from the greater of the following:

(a) First one inch of runoff, or

(b) 2.5 inches times the impervious area.

Those systems which directly discharge to Class I, Class II, OFWs, or Class III waters which are approved, conditionally approved, restricted, or conditionally restricted for shellfish harvesting, shall provide an additional fifty percent of the applicable treatment volume specified above.

If the wetland alone cannot provide the treatment volume, then other best management practices should be incorporated upstream and outside of the wetland to store the proper level of runoff. Utilization of other BMPs must not adversely affect the ability of the wetlands stormwater management system from meeting the requirements of this section.

10.4 Recovery Time

The system should be designed to bleed down one-half the applicable treatment volume specified above between 60 and 72 hours following a storm event.

10.5 Inlet Structures

Inlet structures should be designed to dissipate the energy of runoff entering the wetland and minimize the channelized flow of stormwater. Methods include, but are not limited to, sprinklers, pipe energy dissipators, overland flow or spreader swales.

10.6 Wetland Function

Pre-treatment can reduce the impact of untreated stormwater upon the wetland. In addition, pre-treatment can be utilized to attenuate stormwater volumes and peak discharge rates so that the wetland's hydroperiod is not adversely altered (Livingston 1989). Swale conveyances and lakes adjacent to the wetland are typical pre-treatment practices.

10.7 Residence Time

The design features of the system should maximize residence time of the stormwater within the wetland to enhance the opportunity for the stormwater to come into contact with the wetland sediment, vegetation, and micro-organisms (Livingston 1989). This can be accomplished by several means. The inlets and outlets should be located to maximize the flow path through the wetland. Energy dissipators and spreader swales can promote overland flow and reduce the possibility of channelized flow occurring. In some instances, berms in wetlands can act as baffles to increase the flow path of surface flow through the wetland.

10.8 Monitoring

In order to establish a reliable, scientifically valid data base upon which to evaluate the performance criteria and the performance of the wetlands stormwater management system, a monitoring program may be required. Monitoring programs shall provide the Department with comparable data for different types of wetlands and drainage designs. Data to be collected may include but not be limited to:

(a) Sedimentation rate;

(b) Sediment trace metal concentrations;

(c) Sediment nitrogen and phosphorus concentrations;

(d) Changes in the frequency, abundance and distribution of vegetation; and

(e) Inflow and outflow water quality for nutrients, metals, turbidity, oils and greases, bacteria and other parameters related to the specific site conditions.

Inflow and outflow water quality parameters will be monitored on such storm event occurrences as established by the District based on a site specific basis. The District shall eliminate the requirement to continue the monitoring program upon its determination that no further data is necessary to evaluate the performance criteria or ensure compliance with the performance criteria and applicable water quality standards.

10.9 Dredge and Fill

Dredge or fill in wetlands or other surface waters to construct or alter a stormwater treatment system is an allowable impact providing the impact meets the criteria in Section VII of the EMA.

11.0 Karst Sensitive Area Criteria

Section 2.2 of the **Manual** provides that a condition for issuance of a permit includes compliance with any applicable special basin or geographic area criteria rules. The only areas within the geographical extent of the Northwest Florida Water Management District (NWFWMD) for which additional geographic area criteria have been developed are two Sensitive Karst Areas (SKAs). These areas cover seven counties the central and eastern regions of the geographical extent of the NWFWMD **(**See **Figure 11.0-1).** These areas were identified using the same methodology, and the design criteria for both of these SKAs are the same.

11.1 Background of the Sensitive Karst Area Design Criteria

The following additional surface water management criteria are used in reviewing applications for permits in the SKAs.

The Floridan aquifer system is the drinking water source for most of the population in the geographical extent of the NWFWMD. In parts of **some** of the counties within the NWFWMD, the limestones that make up or comprise this aquifer system are at or very near the land surface. Potential contamination of the Floridan aquifer from surface pollutant sources in these areas is greater than within the rest of the geographical extent of the NWFWMD due to the hydrogeology and geology of these "sensitive karst areas." "Karst" is a geologic term used to describe areas where sinkhole formation is common and landscapes are formed by the dissolution of limestone/dolomite.

11.2 Hydrogeology of the Sensitive Karst Areas

Throughout the majority of the geographical extent of the NWFWMD the highly porous limestone that comprises the Floridan aquifer system is generally overlain by tens to hundreds of feet of sands, clays, and other material. Where present, this material may act as a buffer, protecting the Floridan aquifer from surface pollutants. Surface water seeps through this material slowly, which allows for filtration, adsorption, and biological neutralization of contaminants.

However, in SKAs, the limestone that comprises the Floridan aquifer system exists at, or near the land surface (**Figure 11.2-1**), and sand overburden, confining clays, or other confining cover material is discontinuous or absent. As a result, there is rapid movement of surface water into the aquifer. The SKAs are areas of high recharge to the Floridan aquifer system. According to the Florida Geological Survey, the Floridan aquifer ground water levels vary from land surface to approximately 60 feet below land surface in the SKAs.

One factor which makes the SKAs particularly prone to stormwater contamination is the formation of solution pipe sinkholes. Solution pipe sinkholes are common in these areas and form due to the collapse of surficial material into vertical cavities that have been dissolved in the upper portion of the limestone (**Figure 11.2-2**). They are also formed by the movement of surface material into the underlying porous limestone of the SKAs. In most cases, the solution pipes are capped by a natural plug of sands and clays (**Figures 11.2-1 and 11.2-2**). If the cap is washed out, the resulting solution pipe sinkhole (**Figure 11-2-3**) can act as a direct avenue for the movement of inadequately treated stormwater into the Floridan aquifer.

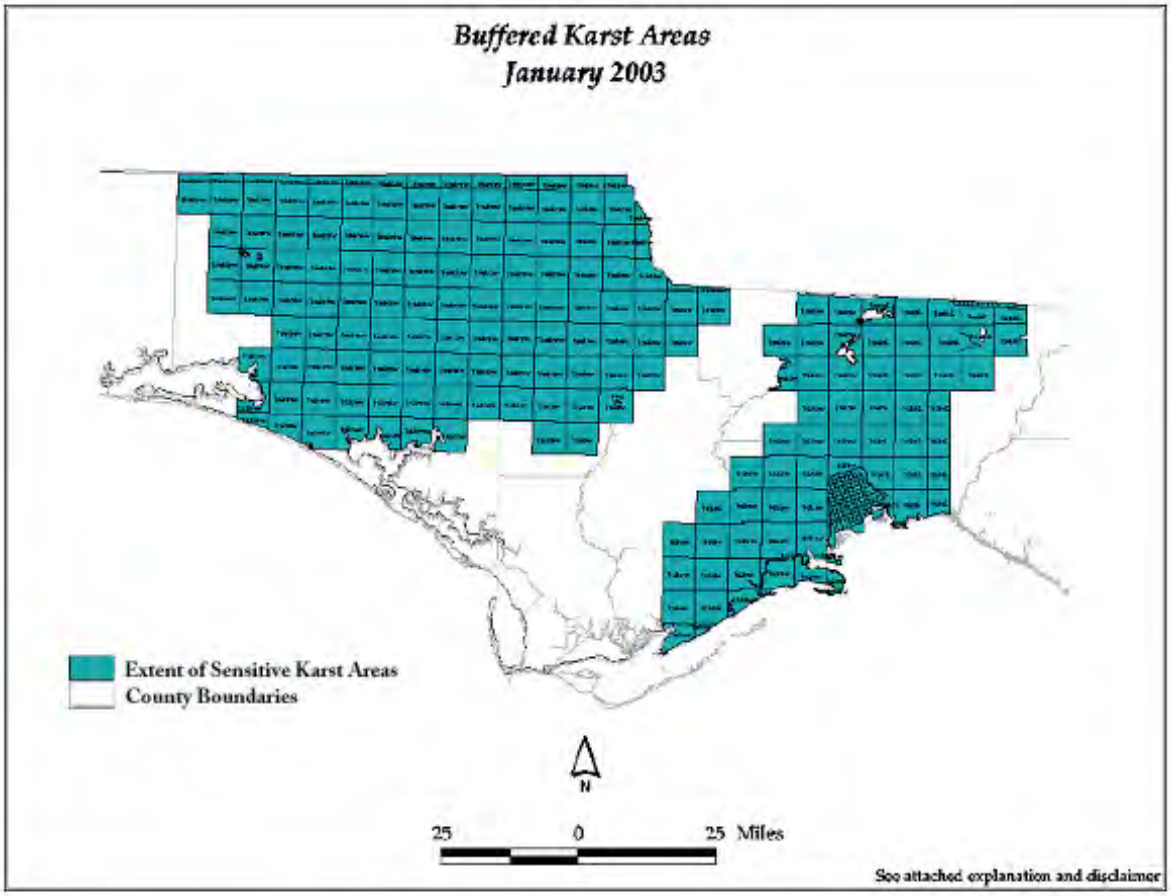


Figure 11.0-1. Karst areas in the Northwest ERP

DISCLAIMER

This geologic data was developed by the Florida Department of Environmental Protection (FDEP) - Florida Geological Survey (FGS) to carry out agency responsibilities related to management, protection, and development of Florida's natural resources. Although efforts have been made to make the information accurate and useful, the FDEP/FGS assumes no responsibility for errors in the information and does not guarantee that the data are free from errors or inaccuracies. Similarly FDEP/FGS assumes no responsibility for the consequences of inappropriate uses or interpretations of the data. As such, these data are distributed on "as is" basis and the user assumes all risk as to their quality, the results obtained from their use, and the performance of the data. FDEP/FGS bears no responsibility to inform users of any changes made to this data. Anyone using this data is advised that precision implied by the data may far exceed actual precision. Comments on this data are invited and FDEP/FGS would appreciate that documented errors be brought to staff attention. The development of these data sets represents a major investment of staff time and effort. As a professional responsibility, we expect that the FDEP/FGS will receive proper credit when you utilize these data sets. Further, since part of this data was developed and collected with U.S. Government or State of Florida funding, no proprietary rights may be attached to it in whole or in part, nor may it be sold to the U.S. Government or the Florida State Government as part of any procurement of products or services.

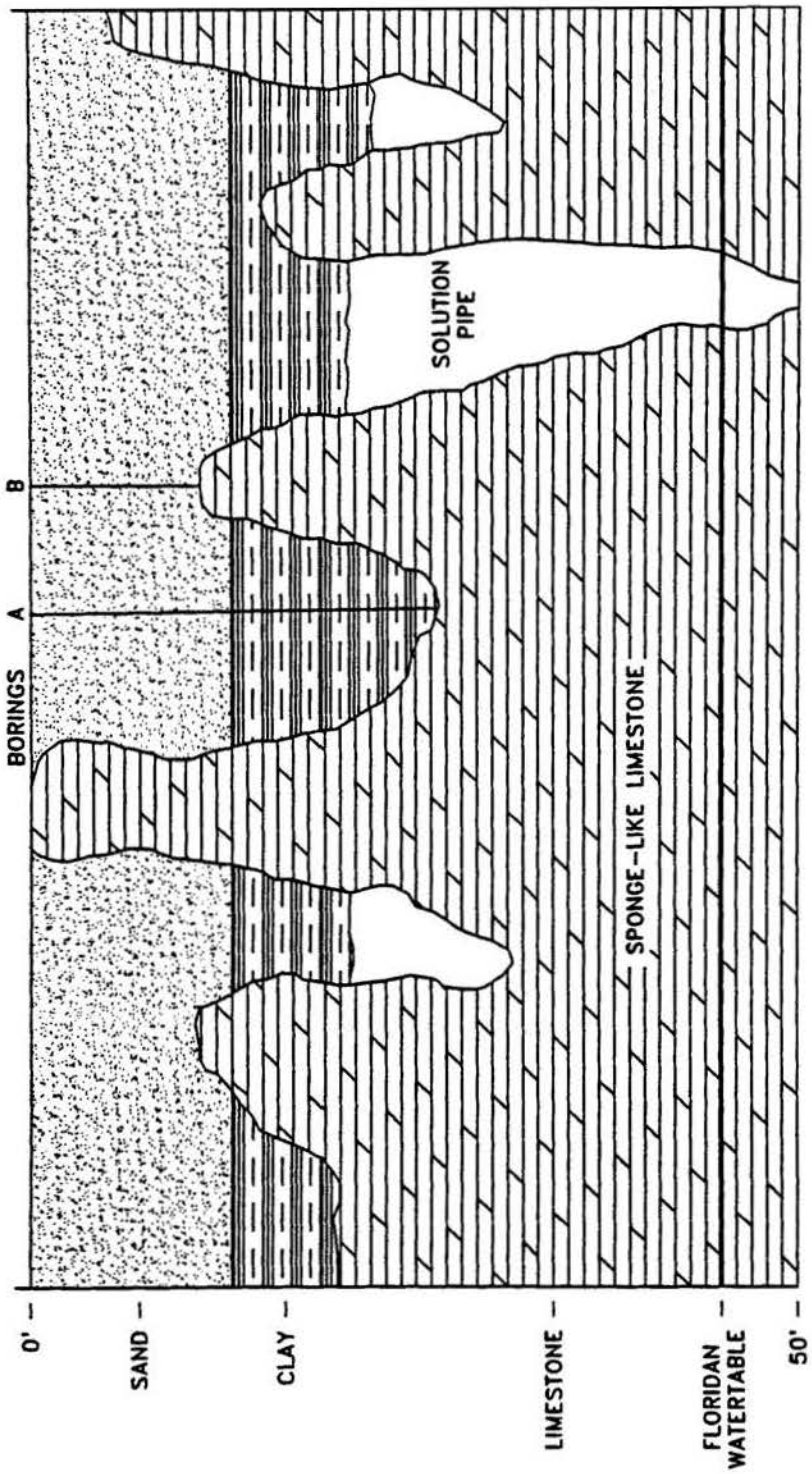


Figure 11.2-1 Generalized geologic section in karst sensitive area

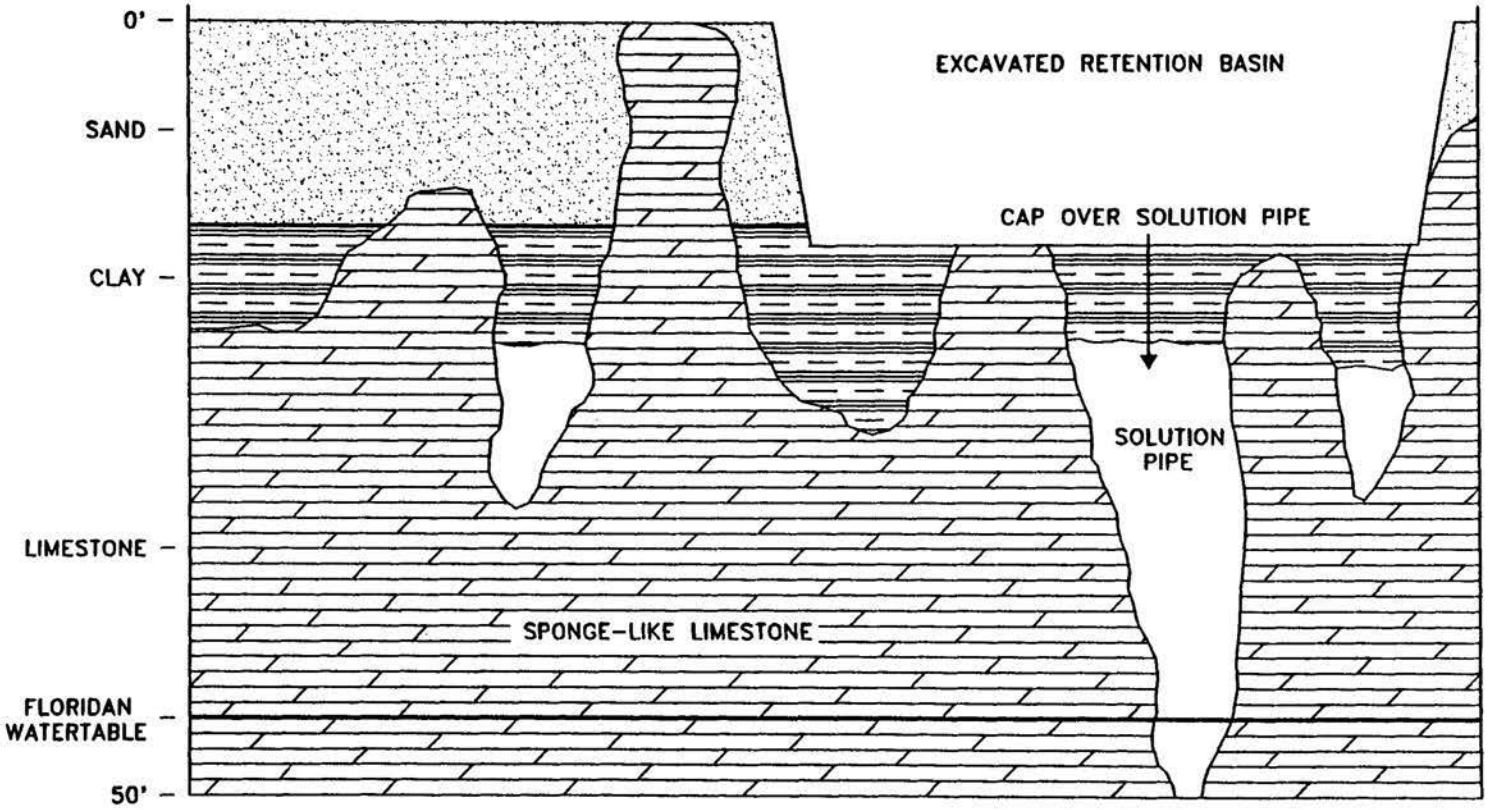


Figure 11.2-2 Generalized geologic section in karst sensitive area with excavated retention basin

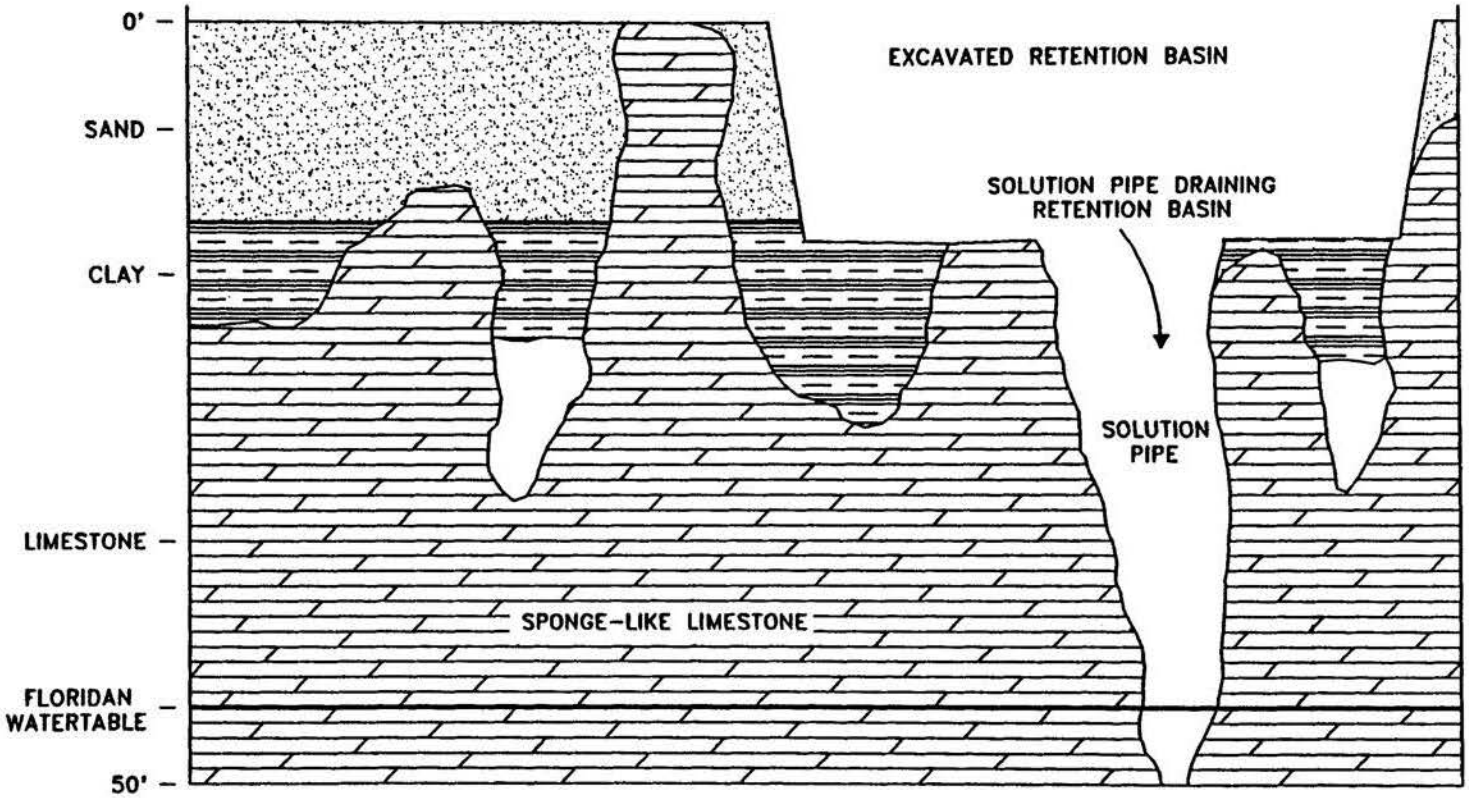


Figure 11.2-3. Generalized geologic section in karst sensitive area with excavated retention basin

Solution pipe sinkholes may open in the bottom of stormwater retention basins. The capping plug or sediment fill may be reduced by excavation of the basin. Stormwater in the basin may increase the hydraulic head on the remaining material in the pipe throat. Both of these factors can wash material down the solution pipe. Solution pipes act as natural drainage wells and can drain stormwater basins.

The irregular weathering of the limestone surface in the SKAs contributes to uncertainty and errors in predicting the depth from land surface to limestone. For example, in **Figure 11.2-2**, boring A would show limestone much deeper than it would actually be encountered during excavation, shown at boring B. This potential for error must be considered for site investigations when evaluating site borings, and load-specific geological analyses must be included to base site designs.

The SKAs have been delineated within the geographical extent of NWFWMD as follows:

(a) First, a map depicting the elevation of the Floridan aquifer system in the Florida panhandle relative to sea level (Pratt and others, 1996) was subtracted from a land surface elevation model (FGS, 2003). The output reflects overburden thickness. A map was then produced to represent all areas that had overburden thickness values of less than or equal to 100 feet. This value represents a conservative estimate of sediment thickness (assuming clean quartz sand) needed to minimize significant adverse impact to the Floridan aquifer system due to natural or human-induced phenomena. Additional research would be required to refine this thickness value to account for sediments of variable permeability (e.g., silt and clay). The resulting map was merged with a map indicating areas affected by karst topography in Northwest Florida (Scott, 1991). Groundwater in Florida is generally considered vulnerable to surface sources of contamination in areas dominated by karst topography.

(b) The "Top of Floridan aquifer system map" (Pratt and others, 1996) is based on lithologic and hydrologic data from a variety of public-agency sources, such as the Florida Geological Survey, the U.S. Geological Survey and the NWFWMD (Jeff Wagner, personal communication, 2003). Based on an estimated average spacing of wells used to generate the top of Floridan aquifer system map (Pratt, 1996) in karst topography areas, a conservative five-mile buffer is included in the Sensitive Karst Area Map to accommodate the estimated level of uncertainty in the source map.

11.3 Design Criteria for Sensitive Karst Areas

11.3.1 Stormwater management systems should be designed to avoid direct discharge of untreated stormwater into sinkholes and into the Floridan aquifer. Such systems shall be designed and constructed in a manner that avoids breaching an aquitard and such that construction excavation will not allow direct commingling of lesser quality water between surface and groundwater systems. The system design also should prevent the triggering of solution pipe sinkholes in the SKAs.

11.3.2 Systems that are designed as follows shall be presumed to comply with **Sections 11.3.1(a) and (b) of the Manual**:

(a) A minimum of three feet of unconsolidated soil material between the surface of the limestone bedrock and the bottom and sides of the stormwater basin. Excavation and backfill of suitable material may be made to meet this criteria. This provides reasonable assurance of adequate treatment of stormwater before it enters the Floridan aquifer.

(b) Stormwater storage areas should be as shallow as possible with a horizontal bottom (no deep spots). In general, the size of a stormwater storage basin can be minimized by providing retention throughout the project site by using shallow landscaped areas and swales.

(c) Maximum basin depth of 10 feet. (Items (b) and (c) reduce the potential for solution pipe sinkhole formation cause by a large hydraulic head.).

(d) Fully vegetated basin side slopes and bottom. Vegetation plays a critical role in the removal of contaminants from stormwater and stabilization of side slopes. In the SKAs, droughty, highly alkaline soils are common and prevent successful establishment of commonly used grasses such as bahia. Typically poor survival of vegetation in stormwater basins in the SKAs has demonstrated the need for mat-forming vegetation which can tolerate these conditions.

Two species of grasses are best suited for use in retention basins in the SKAs. These grasses are:

St. Augustine: This grass can tolerate high alkalinity and brief inundation. However, irrigation is required to foster a healthy cover during dry periods.

Bermuda: This grass can grow in alkaline conditions, is drought resistant, and can stand brief inundation. It is also a low maintenance species which provides excellent cover and soil stabilization. Bermuda grass grows in a thick mat, eventually covering all exposed soil. It recovers quickly after even extended drought. Mowing is rarely required because bermuda creeps laterally rather than growing vertically. Seed is available commercially and is inexpensive.

11.3.3 Applicants who choose not to design their system in conformance with **Section 11.3.2 of the Manual** shall furnish the Department with reasonable assurance that the alternate design and construction of the stormwater management system on the site complies with **Section 11.3.1** of the **Manual**. Such reasonable assurance shall include:

(a) An analysis including existing soil, geologic, and lithographic data of the site or immediately surrounding lands that demonstrates the presence of an aquitard that will not be breached by the proposed design and construction;

(b) The presence of more than three feet of unconsolidated soil material between the surface of the limestone bedrock and the bottom and sides of the stormwater basin that will not be breached by the proposed design and construction; and

(c) Ground penetrating radar (GPR) analyses to detect pre-existing buried cavities on the site.

A Professional Geologist registered in Florida in accordance with Section 492, F.S., shall be required to certify that the submitted information, the site characteristics, and the project design provide reasonable assurance of compliance with **Section 11.3.1** of the **Manual.** The analyses shall not

include new core borings on the site, which if drilled, may create or promote the formation of direct conduits to the Floridan aquifer.

11.3.4 In addition to sites that are not identified on **Figure 11.0-1,** the Department may require compliance with the criteria in **Section 11.3.2 of the Manual** when available data and information indicate that a substantial likelihood exists that a proposed stormwater management system on a site has the potential to be located in a karst feature and has the potential to adversely affect the Floridan aquifer.

11.3.5 The criteria in **Sections 11.3.2 and 11.3.3 of the Manual** represent the minimum design requirements for systems in the SKA. Depending on the potential for contamination to the Floridan aquifer, more stringent criteria may apply. Industrial and some commercial sites will normally require more stringent design features. Some of the more stringent site specific design requirements which may be necessary include:

(a) More than 3 feet of material between the limestone bedrock surface and the bottoms and sides of retention basins;

(b) Basin liners (Clay or geotextile);

(c) Sediment trapping structures at stormwater inlets;

(d) Off-line treatment

(e) Special stormwater system design

(f) Ground water monitoring

(g) Paint/solvent and water separators

If the design of the proposed stormwater management systems does not include the minimum design criteria discussed in this section, an analysis must be submitted to the Department that provides reasonable assurance that the ground water quality standards as set forth in chapters 62-4, 62-302, and 62-520, 62-522, and 62-550, F.A.C., are met.

11.4 References

Florida Geological Survey/Florida Department of Environmental Protection, 2003, Digital Elevation Model (DEM) of Northwest Florida (unpublished data).

Livingston, E.H. 1989. The Use of Wetlands for Urban Stormwater Management. In *Design of Urban Runoff Quality Controls*, ed. L.A. Roesner, B. Urbonas, and M.B. Sonnen, pages 467-490. American Society of Civil Engineers. New York.

Pratt, T.R., Richards, C.J., Milla, K.A., Wagner, J.R., Johnson, J.L., and Curry, R.J., 1996, Hydrogeology of the Northwest Florida Water Management District, Northwest Florida Water Management District Water Resources Special Report 96-4, 98 p.

Scott, T.M., 1991, A geological overview of Florida, in: Florida's ground water quality monitoring program – Hydrogeological framework, Scott, T.M., Lloyd. J.M., and Maddox, G., (eds.), Florida Geological Survey Special Publication No.32, pp. 97.

PART VI – APPENDICES

APPENDIX A
CRITERIA/PERFORMANCE CRITERIA

The following is intended to provide the applicant/consultant an abbreviated compilation of the performance criteria outlined within the rule and Handbook. Refer to the Applicant's Handbook section noted.

I. Engineered stormwater management systems required to meet the criteria in **Manual**(Section 2.1.1)

A. Requirements for professional certification (Section 2.2), legal authorization (Section 2.4), Public Safety (Section 2.5), and Operation and Maintenance (Section 2.9)

B. Conveyance and Storage—systems that alter existing conveyances must not adversely affect existing conveyance capabilities (Section 2.6)

C. All systems must meet tailwater criteria for water quality in receiving waters at discharge point of stormwater management system (Section 2.7)

II. Engineered stormwater management systems that must meet stormwater quantity/flood control (Section 3.1)

A. Peak Discharge Attenuation: Post-development peak rate of discharge must not exceed pre-development peak rate of discharge (Section 3.3).

1. For systems falling totally within a stream or open-lake watershed (Section 3.3(a)).

2. For systems within an internally drained or closed-lake watershed, or within any part of a stream-to-sink watershed (Section 3.3(b)).

B. Storage and Conveyance (Section 3.4)

1. A system may not cause a net reduction in flood storage within a 10 year floodplain (Section 3.4.2(a));

2. A system may not cause a reduction of flood conveyance capabilities within a floodway (Section 3.4.2(b));

3. For exceptions refer to 3.4.2(a), 3.4.2(b) and 3.4.2(c).

C. Low Flow and Base Flow Maintenance (Section 3.6)

1. Systems that impound water for purposes in addition to temporary detention storage or systems that discharged water off-site during a 5-year, 30-day drought frequency shall be designed with outlet structure to maintain a low flow discharge of available conservation storage (Section 3.6.2(b)) and be operated to provide a low flow discharge whenever water is impounded (Section 3.6.2 (c)).

2. System will not cause the ground water table to decline more than an average of three feet over the project area than the average dry season low water table (Section 3.6.3(a)) or more than five feet than the average dry season low water table at any location (Section 3.6.3(b);

3. Systems will not cause ground water table to be lowered to a level that would decrease flows or levels below any minimum level of flow established by a water management district.

III. Engineered stormwater management systems that must meet stormwater quality (Section 4.1)

A. No water quality degradation below standards in Chapters 62-4, 62-302, 62-520, or 62-55-, F.A.C. (Section 4.4).

B. Peak Discharge Criteria to Protect Streambanks

1. Peak discharge rates must be controlled for the 2-year, 24-hour storm event, and potentially for a larger storm event (Section 4.5.2.2)

2. Post development peak discharge rate must not exceed pre-development rates for the 2-year, 24-hour storm for systems werving new construction area greater than 50 percent impervious (Section 4.5.2.3)

APPENDIX B
LEGAL DESCRIPTION OF SENSITIVE KARST AREA

All lands contained in he following Section:
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Township 3 North, Range 20 West
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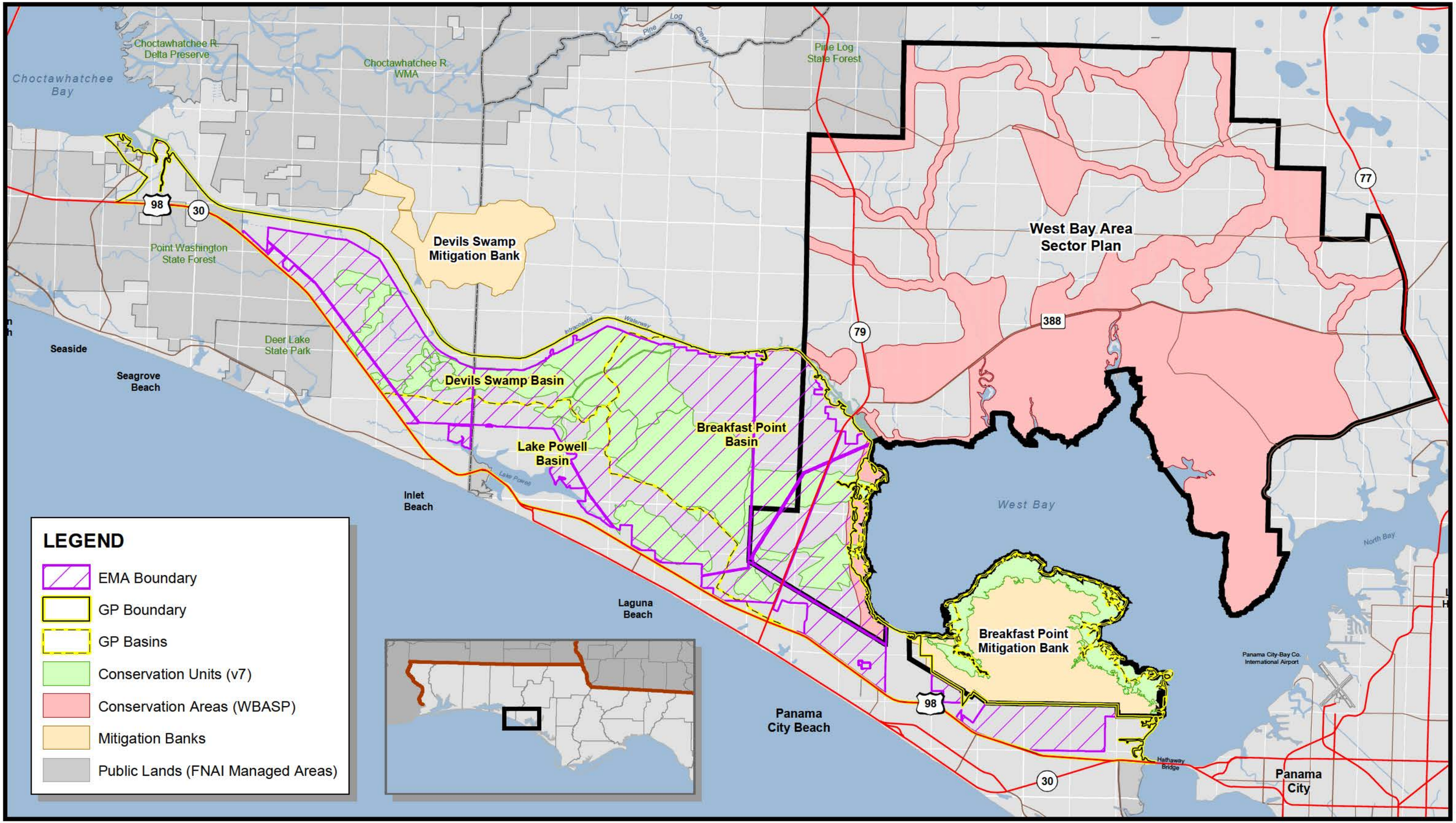

EXHIBIT 03

MITIGATION STRATEGY

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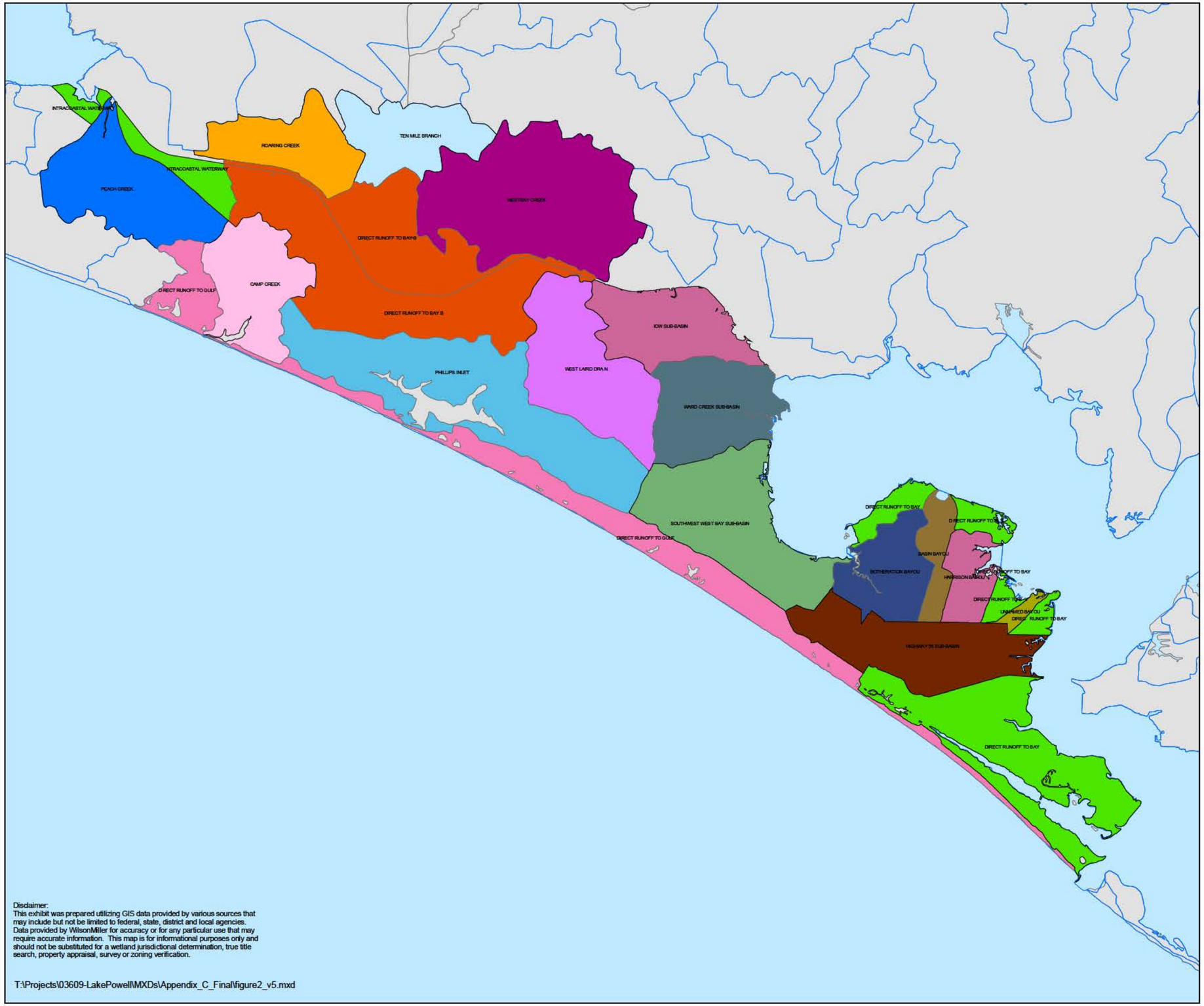
1:120,000

Exhibit 4

Sub-Basin Map



Legend

- MAJOR ROADS

BASINS

- BASIN BAYOU
- BOTHERATION BAYOU
- CAMP CREEK
- DIRECT RUNOFF TO BAY
- DIRECT RUNOFF TO BAY-B
- DIRECT RUNOFF TO GULF
- HARRISON BAYOU
- HIGHWAY 98 SUB-BASIN
- ICW SUB-BASIN
- INTRACOASTAL WATERWAY
- PEACH CREEK
- PHILLIPS INLET
- ROARING CREEK
- SOUTHWEST WEST BAY SUB-BASIN
- TEN MILE BRANCH
- UNNAMED BAYOU
- WARD CREEK SUB-BASIN
- WEST LAIRD DRAIN
- WESTBAY CREEK

N

1 0.5 0 1 2 Miles

ST JOE

WilsonMiller

New Directions In Planning, Design & Engineering

Disclaimer:
This exhibit was prepared utilizing GIS data provided by various sources that may include but not be limited to federal, state, district and local agencies. Data provided by WilsonMiller for accuracy or for any particular use that may require accurate information. This map is for informational purposes only and should not be substituted for a wetland jurisdictional determination, true title search, property appraisal, survey or zoning verification.

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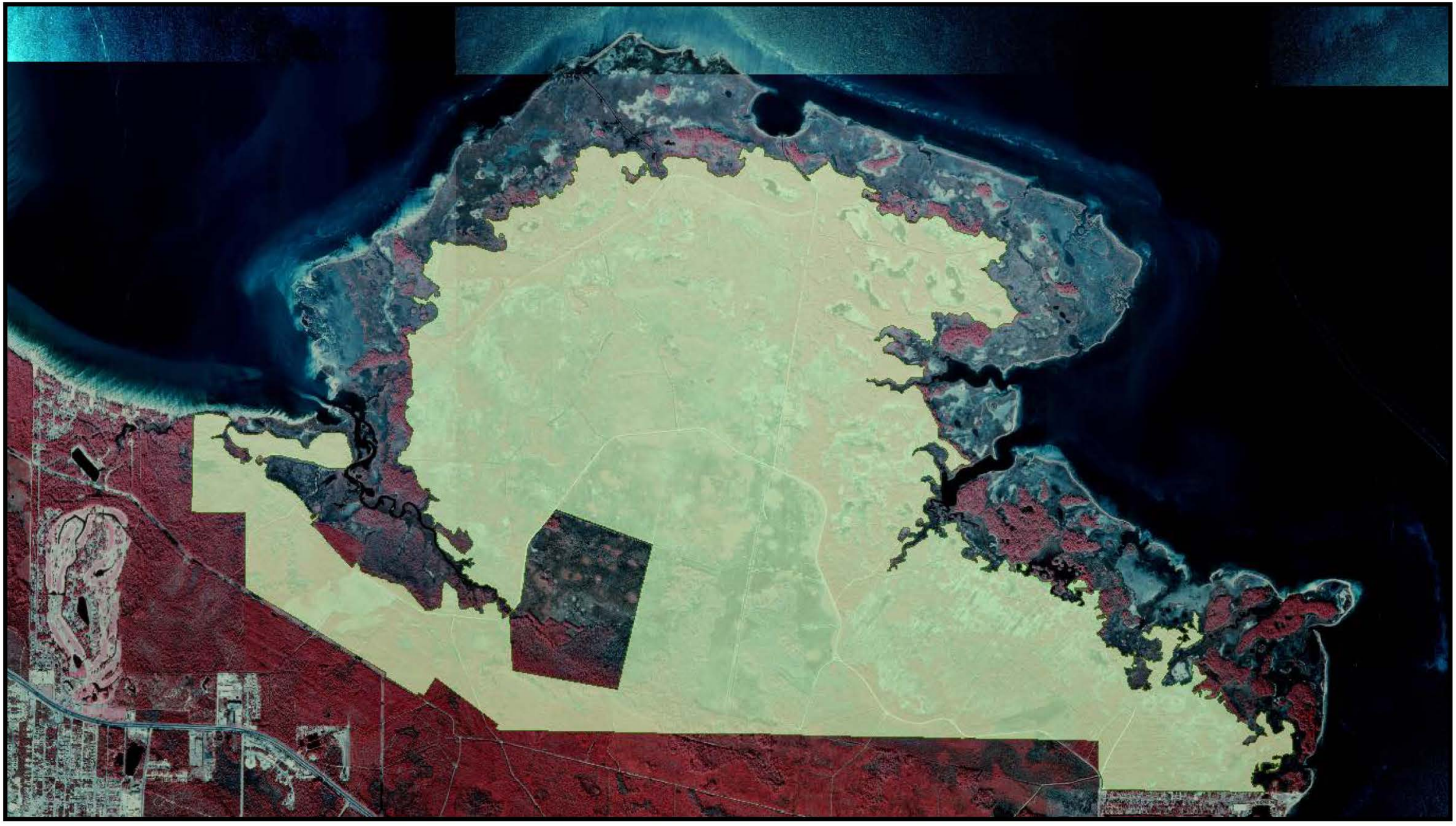

EXHIBIT 05

BREAKFAST POINT MITIGATION BANK

4,636 ACRES

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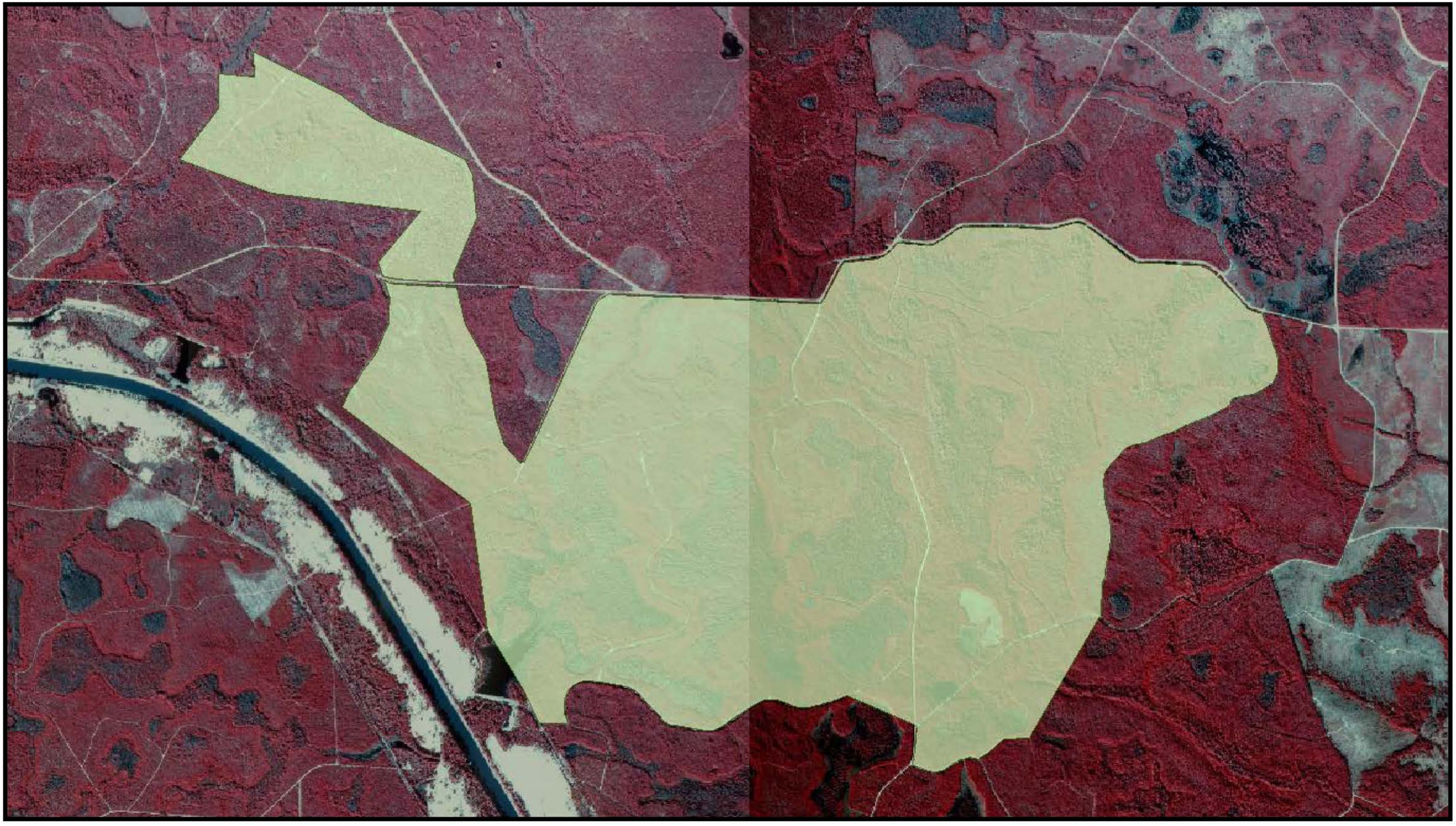

EXHIBIT 06

DEVILS SWAMP MITIGATION BANK

3,049 ACRES

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MILES

1 INCH EQUALS 0.33 MILES
1:21,000

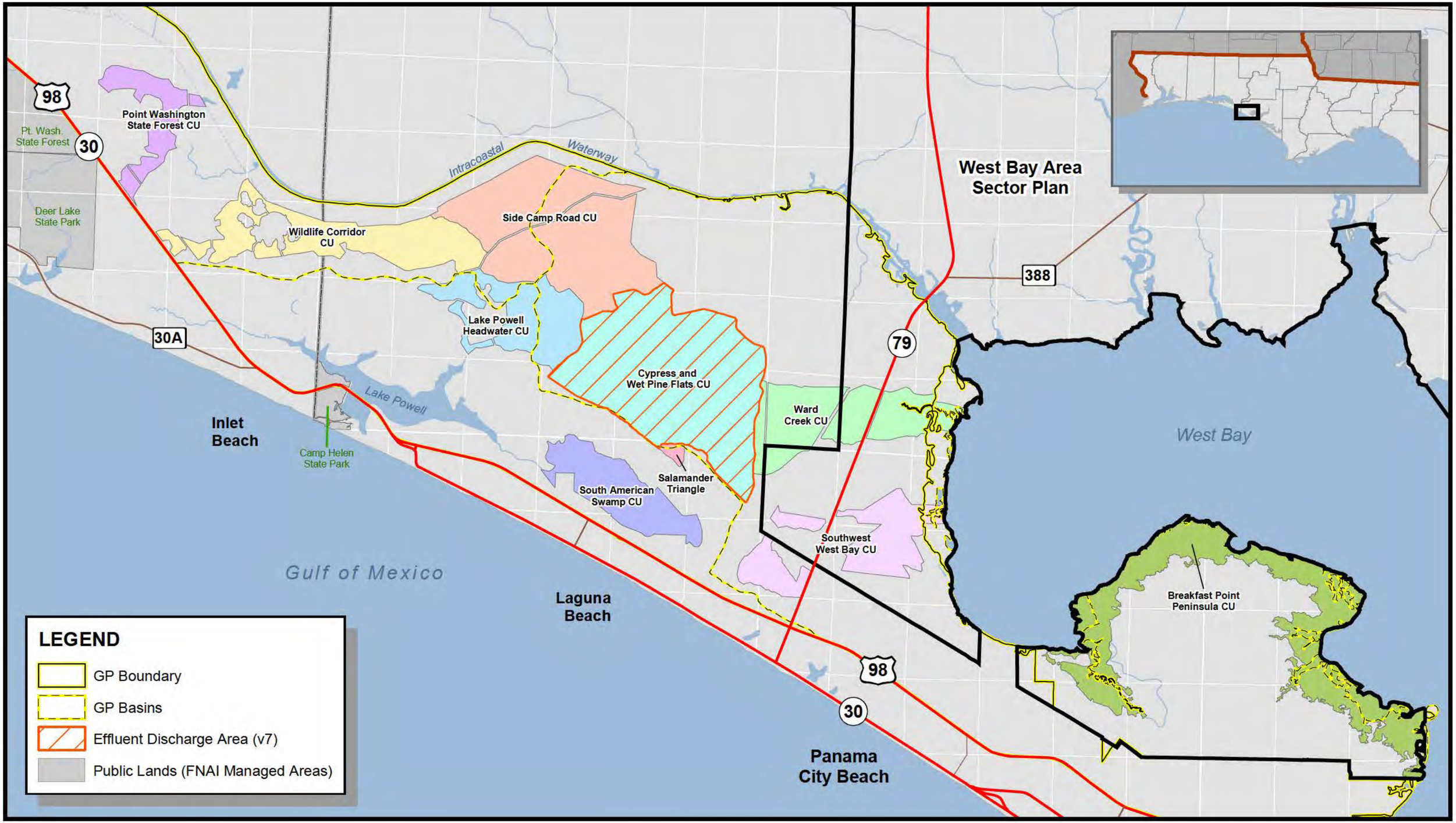

EXHIBIT 07

CONSERVATION UNITS

0 1 2 3
MILES
1 NCH EQUALS 1.18 M LES
1:75,000

EXHIBIT 08

Conservation Unit 1
Point Washington State Forest
466 Acres

0 0.25 0.5
MILES

1 INCH EQUALS 2,000 FEET
1 24,000

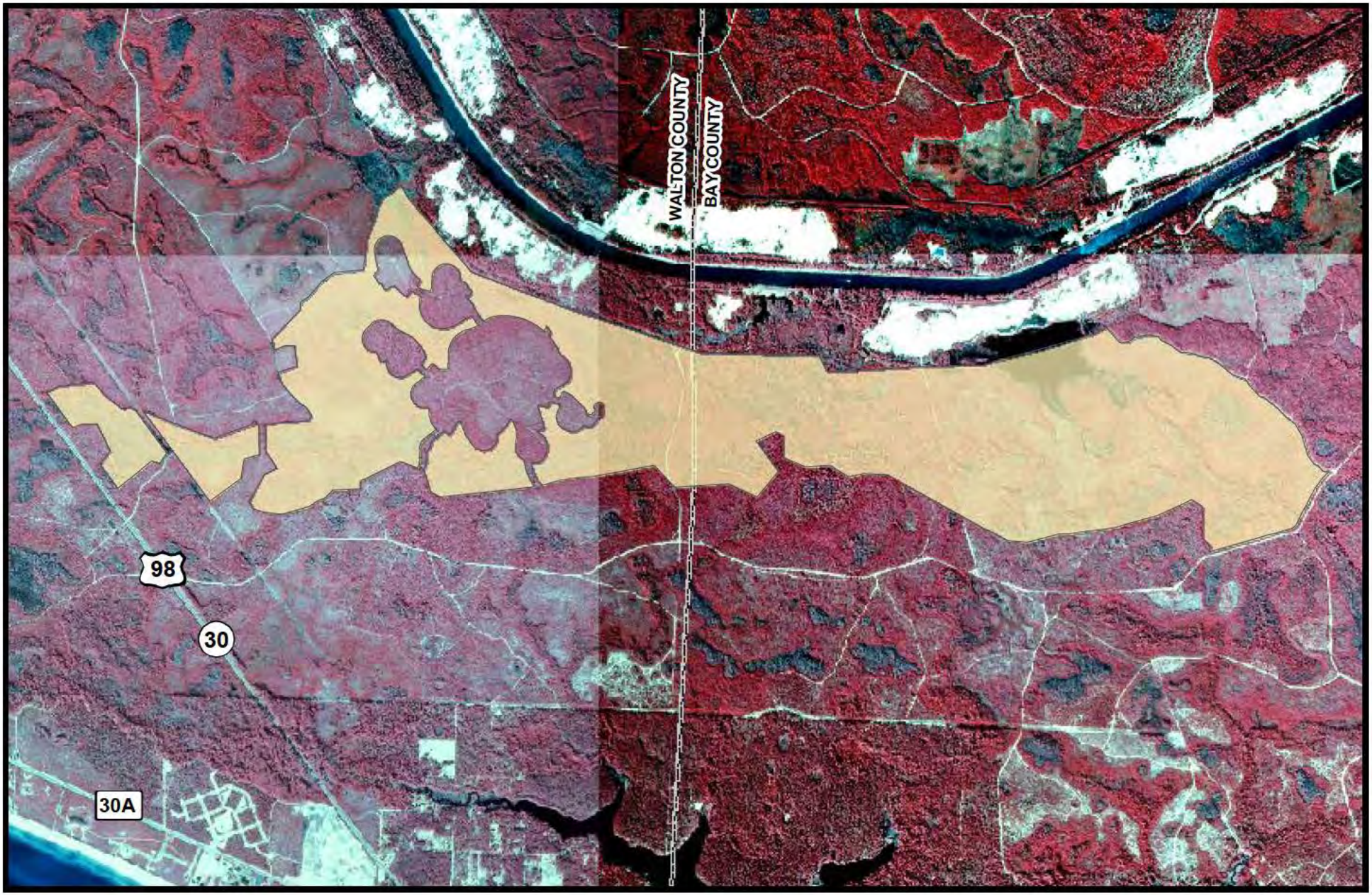

EXHIBIT 09

Conservation Unit 2
Wildlife Corridor
1,247 Acres

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MILES

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1 30,000

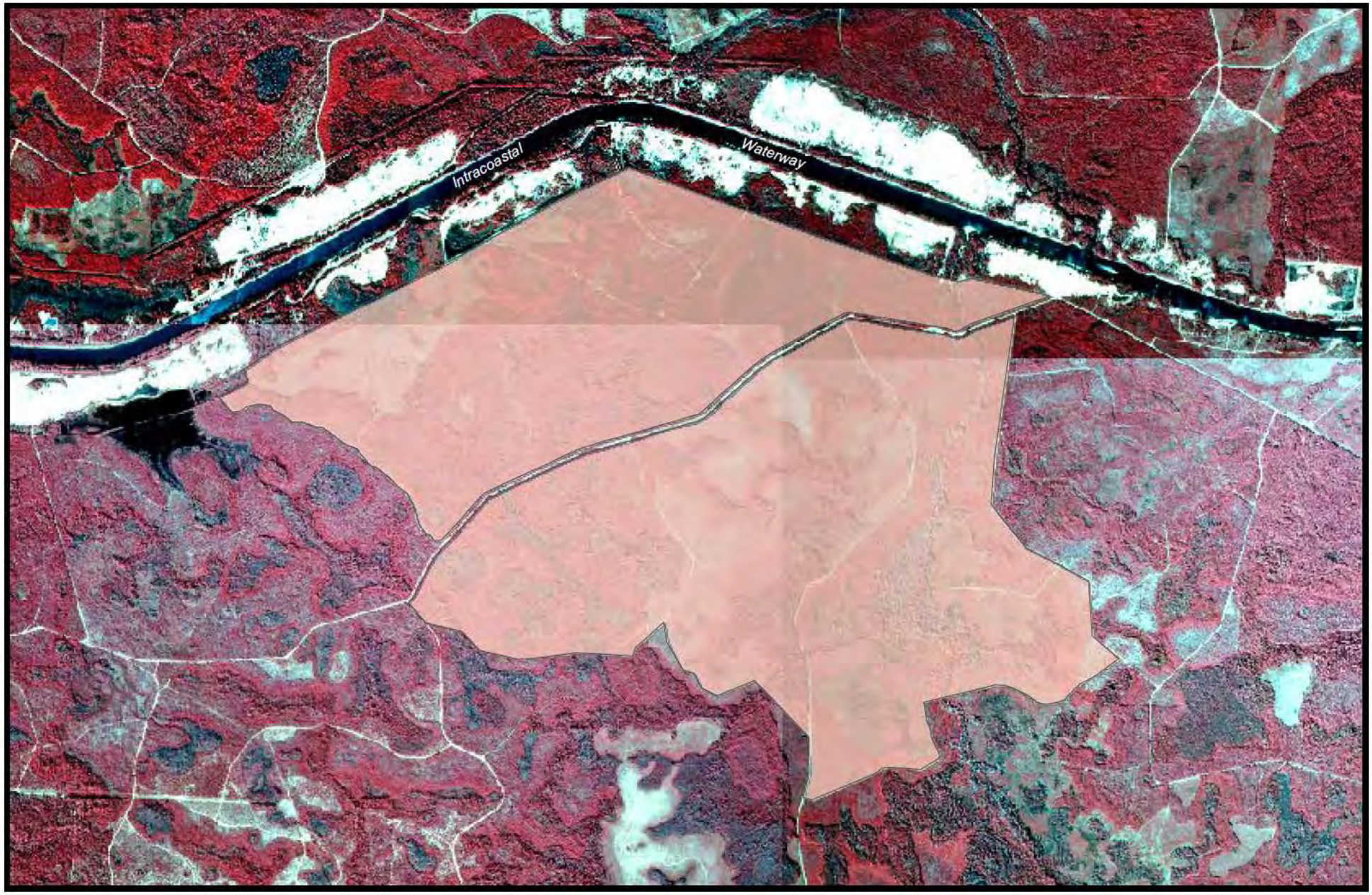


EXHIBIT 10

Conservation Unit 3
Side Camp Road
2,330 Acres

0 0.25 0.5
MILES

1 NCH EQUALS 2,500 FEET
1 30,000

EXHIBIT 11

Conservation Unit 4
Lake Powell Headwater
912 Acres

0 0.25 0.5
MILES

1 NCH EQUALS 2,000 FEET
1:24,000

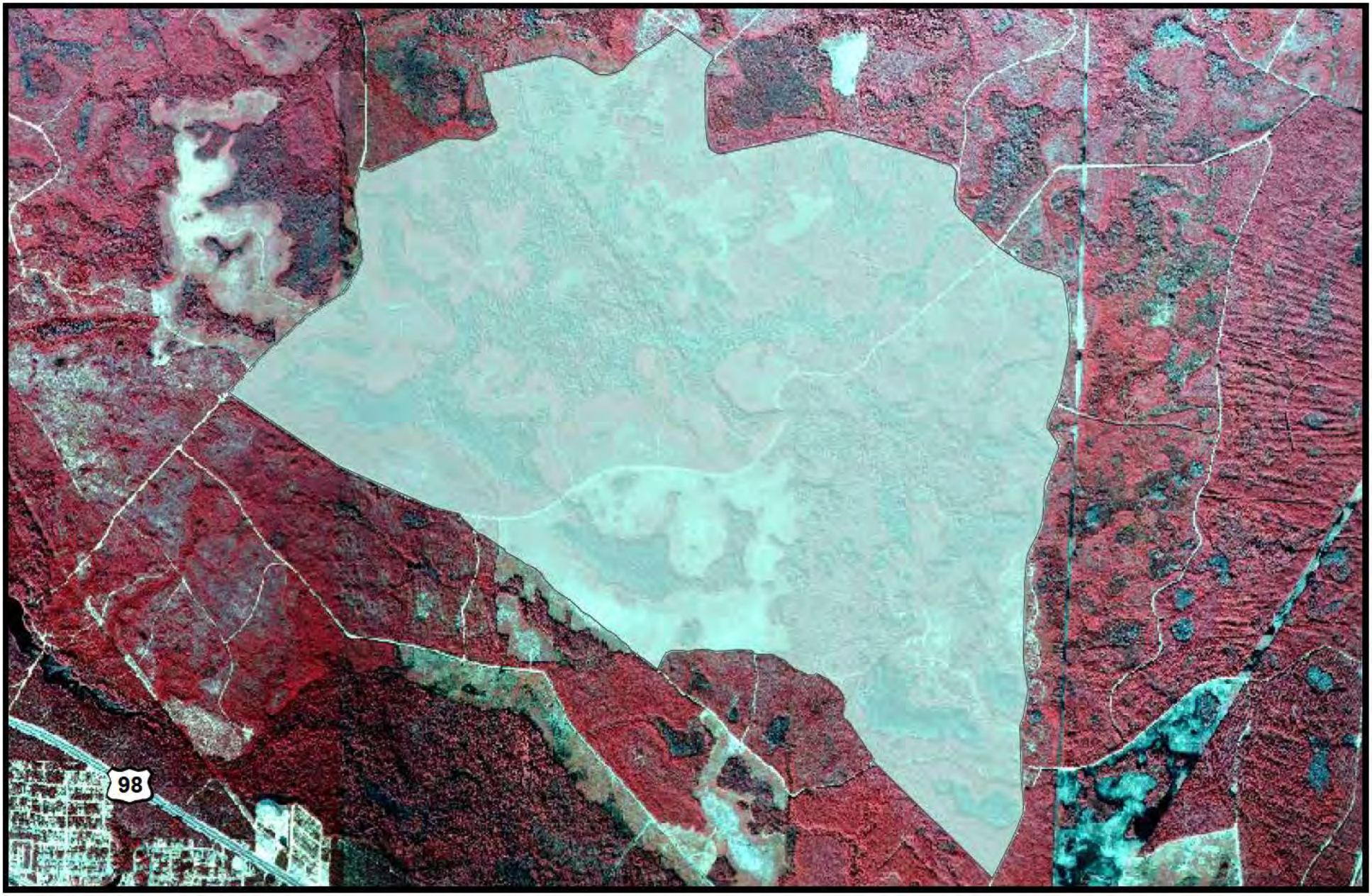


EXHIBIT 12

Conservation Unit 5
Cypress and Wet Pine Flats
2,910 Acres

0 0.25 0.5
MILES

1 NCH EQUALS 2,500 FEET
1 30,000

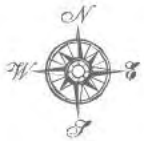
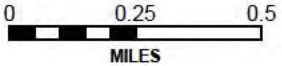


EXHIBIT 13

Conservation Unit 6
Ward Creek
1,239 Acres



1 INCH EQUALS 2,000 FEET
1:24,000

EXHIBIT 14

Conservation Unit 7
South American Swamp
803 Acres

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MILES

1 INCH EQUALS 2,000 FEET
1:24,000

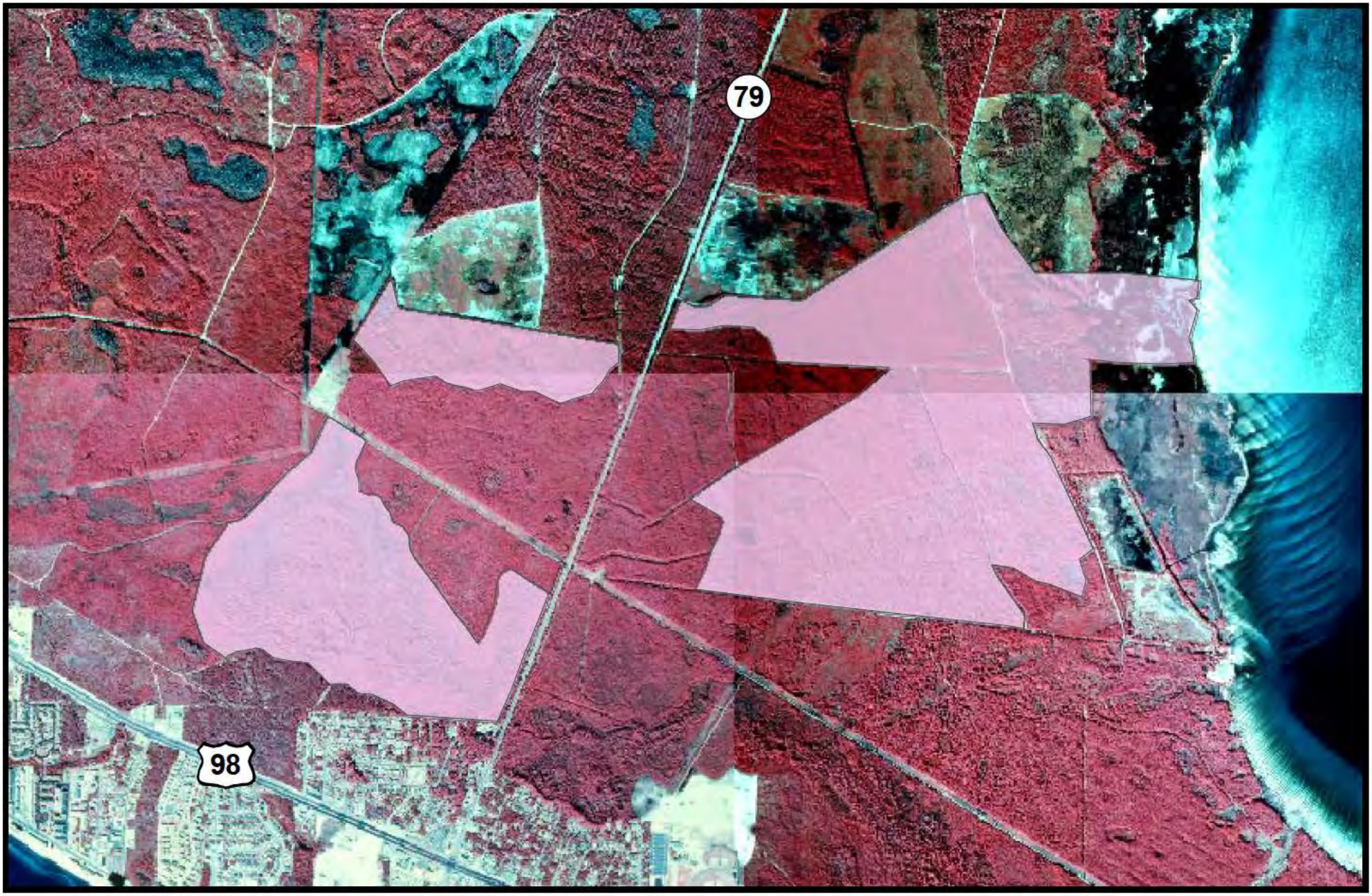

EXHIBIT 15

Conservation Unit 8
Southwest West Bay
962 Acres

0 0.25 0.5
MILES

1 INCH EQUALS 2,000 FEET
1:24,000

EXHIBIT 16

Conservation Unit 9
Salamander Triangle
42 Acres

0 0.25 0.5
MILES

1 INCH EQUALS 2,000 FEET
1:24,000

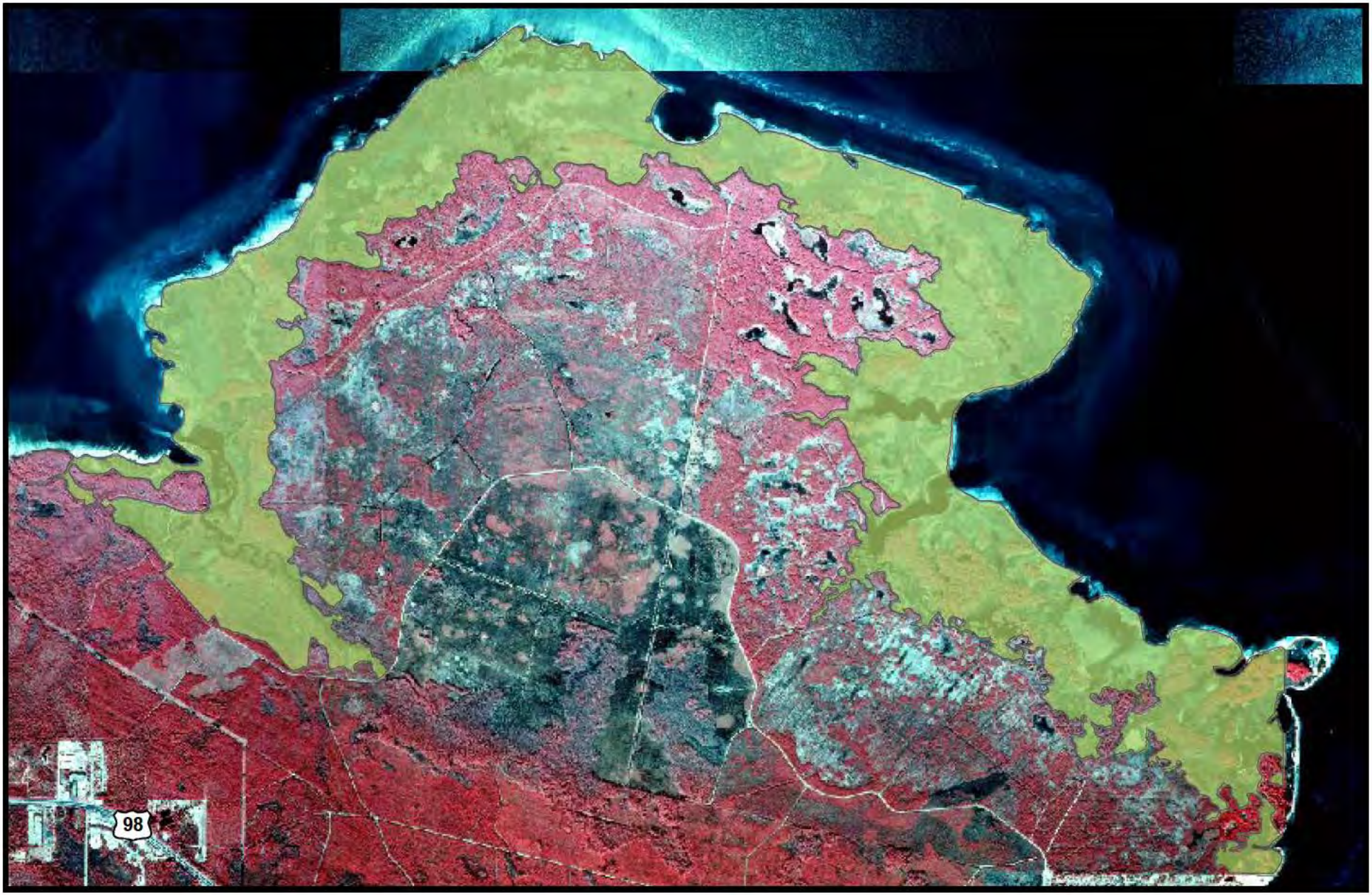

EXHIBIT 17

Conservation Unit 10
Breakfast Point Peninsula
2,289 Acres

0 0.25 0.5 0.75
MILES

1 INCH EQUALS 3,000 FEET
1:36,000