

Water Resource Protection

STATEMENT OF ISSUE

An evaluation of the objectives and policies of the GMP for their effect on managing water resource protection throughout the County by promoting mechanisms to protect the County's estuarine and wetland systems.

ISSUE BACKGROUND

Subsection 163.3177 (5)(d), Florida Statutes requires all local governments within the State of Florida to have, as part of their respective Local Government Comprehensive Plans, an Element, dealing with "the conservation, use, and protection of natural resources in the area, including air, water, water recharge areas, wetlands, water wells, estuarine marshes, soils, beaches, shores, flood plains, rivers, bays, lakes, harbors, forests, fisheries and wildlife, marine habitat, minerals, and other natural and environmental resources."

The statute further relates the functions of the Conservation and Coastal Elements so that, in effect, local governments in designated coastal areas, such as Collier County, are required to prepare a Conservation and Coastal Management Element, which fulfills the requirements for both Elements. Accordingly, Collier County's Conservation and Coastal Management Element is divided into thirteen (13) separate goal areas. These may be summarized as follows:

1. Protection of natural resources;
2. Protection of surface and estuarine water resources;
3. Protection of groundwater resources;
4. Protection of freshwater resources;
5. Protection of mineral and soil resources;
6. Protection of native vegetation and wildlife habitat;
7. Protection of fisheries and wildlife;
8. Maintenance of existing air quality;
9. Management of hazardous materials and hazardous wastes;
10. Protection of coastal resources;
11. Protection of historic resources;
12. Hurricane evacuation and sheltering; and
13. Avoiding duplication of regulations.

Collier County is a large land area of approximately 2000 square miles in southwest Florida. The topography is extremely flat ranging from a high elevation of approximately forty (40) feet above sea level in the unincorporated community of Immokalee in the northeastern portion of the County to the back of a low coastal dune system at approximately four (4) feet at the coastline along the western and southern portions of the County. The typical ground slope is approximately one (1) foot per mile in the western half of the County and less than that in the eastern half of the County. Additionally the area receives an average rainfall of about 53 inches with 37 inches during the wet season (June through October). Due to the lack of relief, abundant rainfall, highly permeable soils, and proximity to sea level the ground water table is very close to

the ground surface. The flat topography results in large areas of sheetflow across natural ground, but canals, road construction, agricultural operations, and urban development have greatly altered this sheetflow in the western portion of the County.

Collier County, due to the Immokalee Ridge in the northeast, is basically its own drainage watershed. The shallow topography, with the Immokalee Ridge located in the northeastern portion of the County near the Lee County and Hendry County boundaries, creates a series of drainage basins with very little exchange of stormwater crossing County lines. Additionally, in some locations agricultural and development activities have constructed earthen berms along their property lines that correspond to the County lines that further define the drainage basin boundaries. The eastern half of the County is predominantly federally owned wetlands that receives sheet flow as a part of the Everglades system, but this remains in the eastern half of the County and continues the flow in a southwesterly direction.

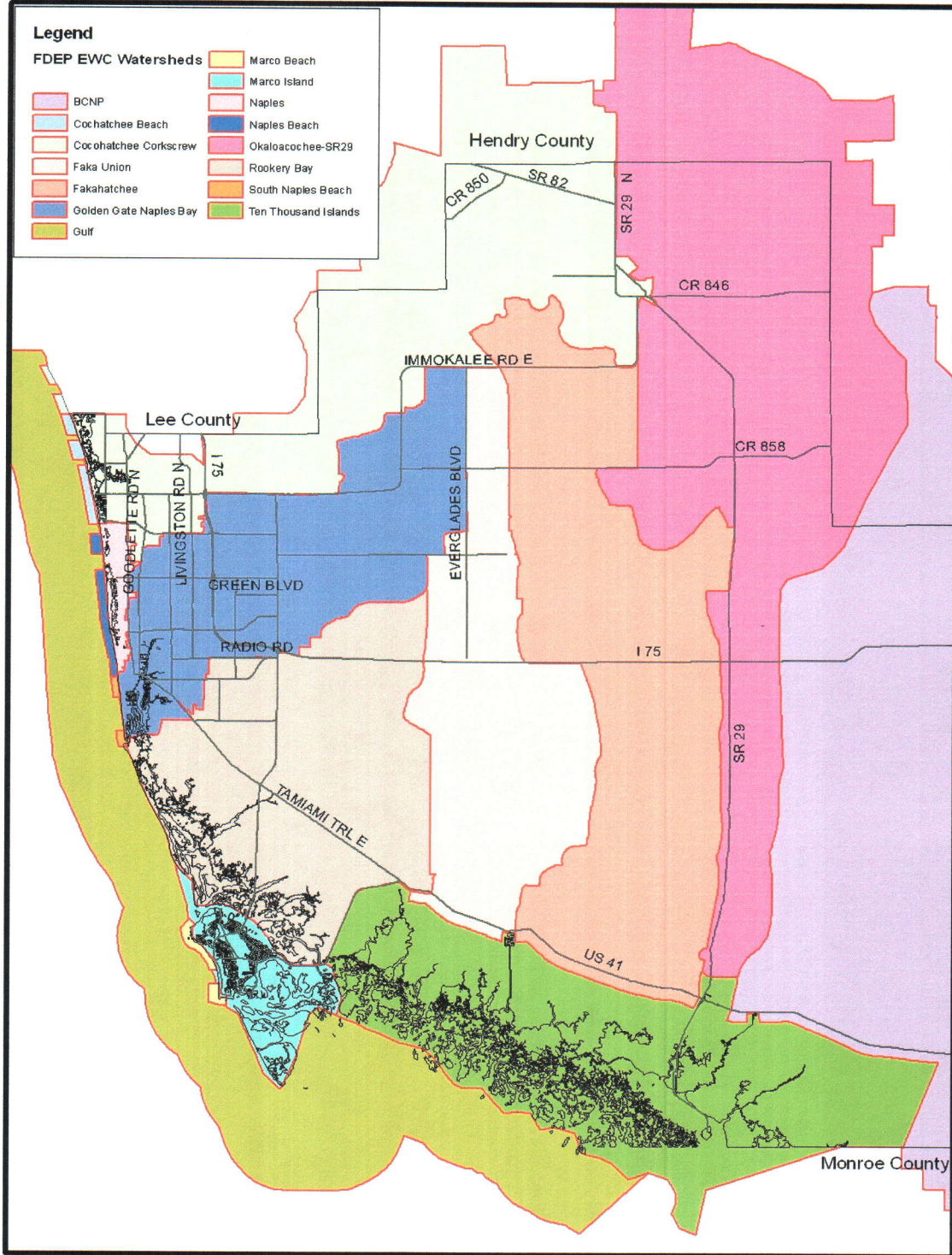
Due to the low gradient terrain and wetland hydrologic features, construction of canals along section lines and roads, drainage is not uniform and implementation of a uniform level of service for flood conveyance in all areas of Collier County is not feasible. The County generally considers a 25-year 3-day rainfall event as the design storm for area west of Collier Blvd. (CR-951) and a 10-year 1-day rainfall event as the design storm for the Golden Gate Estates areas east of Collier Boulevard (CR 951).

Because the soils are so porous the canals drain preserves and shallow aquifers as well as residential developments. The shallow aquifers are utilized by suburban and rural residents for potable water. Additionally the large fresh water discharges, contributed from the development of the county, during the wet season have been found detrimental to the estuaries. For these reasons there have been many adjustable water level controls installed in the canal systems to improve functionality.

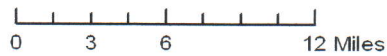
The development of Watershed Management Plans and interim regulations is specified in the Conservation and Coastal Management Element (CCME) Objective 2.1 of the Collier County Growth Management Plan, as adopted by the Board of County Commissioners on 1-25-07 (Ordinance 2007-16). The Florida Department of Community Affairs reviewed all amendments to the CCME, including the addition of these “interim standards” and on 5-2-07 issued their Notice of Intent to find the CCME amendments “in compliance” with Florida Statutes. After the 21-day challenge period ended without a challenge being filed, the amendments to the CCME became effective on 5-24-07.

The interim standards require a new development and re-development projects shall meet 150% of the water quality volumetric requirements of Section 5.2.1(a) of the Basis of Review for Environmental Resource Permit Applications (February 2006) and the retention and detention requirements, and the allowable offsite discharge rates required by Drainage Sub-element Policy 6.2 and 6.3, respectively. The 150% water quality volumetric requirement also applies to the County’s minimum requirement of one (1) inch under Ordinance 90-10, as amended; thus increasing the County’s minimum requirement to one and one-half (1.5) inches.

WMP Watersheds - FDEP Everglades West Coast Watersheds



Data Source: Basins / Watershed - FDEP
 Created By GIS / CDES / Environmental Services
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 Date: 11/6/2007



Loss of storage or conveyance volume resulting from direct impacts to wetlands shall be

compensated for by providing an equal amount of storage or conveyance capacity on site and within or adjacent to the impacted wetland.

Floodplain storage compensation shall be evaluated for developments within the designated flood zones "A", "AE", and "VE" as depicted on the Flood Insurance Rate Maps published by the Federal Emergency Management Agency with an effective date of November 17, 2005. Floodplain storage compensation shall also be evaluated for areas known to be periodically inundated by intense rainfall or sheetflow conditions.

Comprehensive Plan Implementation

The Collier County Growth Management Plan addresses the need to complete the prioritization and begin the process of preparing Watershed Management Plans, which is to contain appropriate mechanisms to protect the County's estuarine and wetland systems. The process consist of (1) an evaluation of areas for which Watershed Management Plans are not necessary based on current or past watershed management planning efforts, (2) an assessment of available data and information that can be used in the development of Watershed Management Plans, and (3) budget authorization to begin preparation of the first Watershed Management Plan. A funding schedule is established to ensure that all Watershed Management Plans will be completed by 2010. In selecting the order of Plan completion, the County shall give priority to watersheds where the development growth potential is greatest and will impact the greatest amount of wetland and listed species habitats. The schedule and priorities shall also be coordinated with the Federal and State agency plans that address Total Maximum Daily Loads (TMDLs). Until the Watershed Management Plans are completed, The County shall apply the interim standards for development.

As described in the Collier County Comprehensive Plan, Watershed Management Plans (WMPs) are to serve as a watershed management tool to guide future development – they are to "protect the County's estuarine and wetland systems." They are to help identify areas where state standards are not currently met and to develop strategies to help meet them in the future. They are also to identify water management strategies appropriate to each drainage basin that can be used to guide development, land use changes, and mitigation within that basin.

The County's Watershed Management Plan that is being developed will help protect estuaries and wetland systems to:

- Restore historical water quantity and estuarine discharges.
- Improve water quality within watersheds and estuaries.
- Address flood control and water supply issues

Below are the public comments received related to Water Resource Protection:

WATER RESOURCE PROTECTION

- *County should re-evaluate monitoring and maintenance procedures for nutrient loads/pollution/water quality. Objective 1 of the Drainage Sub-Element.*

- *Improve public participation outreach and involvement for watershed management planning. **Observational.***
- *The County needs better outreach and education with user-friendly terminology and use illustrations. **Observational.***
- *The County Watershed Management Planning needs to be holistic – more than just water. **Observational.***
- *With a future unpredictable climate we cannot depend on previous historical levels of water. **Observational.***
- *Develop new tools to predict future water availability. **Policy 1.3 of Potable Water Sub-Element.***
- *GMP elements need to consider the effects they have on each other and; Available water supply; Waste Management (Landfills); and Drainage. **Observational.***
- *If and when sea levels rise, what has the BCB done to keep water in the Eastern Collier area fresh and apart from encroaching seas? **Observational – Major Issue - Climate Change.***
- *The County has let the residents down by acquiescing in the FIRM. **Observational.***
- *The County has failed to provide guidance to the people who will need a LOMA. **Programmatic.***
- *The County has failed to limit growth based on available resources. **Objective 2 (Financial Feasibility) Capital Improvement Element.***
- *The County has failed to consider the cumulative effect of deep aquifer withdrawal. **Observational.***
- *The County has failed to develop a County-wide Storm Water Plan. **Objective 2.1 Conservation and Coastal Management Element.***
- *Canals not cleaned (algae and weeds cover canal along Frangipani Ave.) Algae sheet sunk (causing future problems for fish and drainage). **Programmatic.***
- *C 7 connector has better flow due to culverts being installed. **Observational.***
- *FEMA elevations too large a burden during severe recession. **Observational.***
- *Need more efficient water management of rural areas east of CR951 to prevent flooding and being rezoned to flood area. **Observational.***
- *The new Flood Insurance is unacceptable. **Observational.***
- *The County should protest FIRM. **Observational.***
- *If flooding is a problem, don't allow additional buildings and asphalt (which can impact their neighbors). **Observational.***
- *Ditches and swales are not being cleaned and cleared; and driveways do not have proper culverts. **Programmatic.***
- *Standing water only 3 times ('95, '06 and '08) the same time the county took readings. **Observational.***
- *County Government has failed to implement the Watershed Management Plan into which all other Construction and Coastal Elements, Goals and Objectives were to be involved. **Observational - Objective 2.1 Conservation and Coastal Management Element.***

- *Disappointed with County's failure to put the '89 GMOP LDC into place in a timely manner. **Observational.***
- *County has failed to address sustainability and quality of life for all resources. **Observational.***
- *The '89 GMP required that all aspects will be evaluated, watershed by watershed, where is that guidance? **Observational - Objective 2.1 Conservation and Coastal Management Element.***
- *All development in the urban zones and outside should be considered and evaluated after each watershed and its characteristics were developed. **Objective 2.1 Conservation and Coastal Management Element.***
- *Failed to put into place a Watershed Management Plan. **Objective 2.1 Conservation and Coastal Management Element.***
- *Dropping water table in GG Estates, GG Estates water resources are being used by City and other areas without benefit to GG Estates. **Observational.***
- *Re-use water – can it be turned into a drinking water source? Potential waste of re-use water is a concern (If there is no demand, why pay for treatment?) **Policy 1.1 Potable Water Sub-Element.***
- *County has no Flood Plain Management Plan. **Policy 6.3 Drainage Sub-Element.***
- *No coordination with Big Cypress Basin; SFWMD; FEMA and DEP (ex: - Picayune Strand Restoration project was completed without consideration of the effect of the RLSA on the flood plain). **Observational.***
- *Where are the Comprehensive Watershed Management Plan and the Comprehensive Water Resource Management Plan? **Policy 1.5 Drainage Sub-Element.***
- *When are the efforts going to be: Funded; Delivered; and Scheduled. **Observational.***
- *Where is monitoring and maintenance of water resource? **Potable Water and Drainage Sub-Elements.***
- *Watershed/Water Resource Management needs to be holistic. **Observational.***
- *Environment/Development/Conservation/Recharge/Recycle/Reuse/Alternative Water Resources **Observational.***
- *The County needs to establish a Stormwater Utility fee to address needed improvements and to address EPA's implementation of the NNC (Numeric Nutrient Criteria). **Observational & Policy 1.5 Drainage Sub-Element.***

The following pages documents is a summary of related GOPs that addresses watershed planning and which serve as the premise of the current County's effort in addressing water resource protection.

Water Resource Protection

The following is a partial excerpt of Goals Objectives and Policies from the Collier County Growth Management Plan that address watershed planning issues.

Introduction

Subsection 163.3177 (5)(d), Florida Statutes requires all local governments within the State of Florida to have, as part of their respective Local Government Comprehensive Plans, an Element, dealing with “the conservation, use, and protection of natural resources in the area, including air, water, water recharge areas, wetlands, water wells, estuarine marshes, soils, beaches, shores, flood plains, rivers, bays, lakes, harbors, forests, fisheries and wildlife, marine habitat, minerals, and other natural and environmental resources.”

The statute further relates the functions of the Conservation and Coastal Elements so that, in effect, local governments in designated coastal areas, such as Collier County, are required to prepare a Conservation and Coastal Management Element, which fulfills the requirements for both Elements. Accordingly, Collier County’s Conservation and Coastal Management Element is divided into thirteen (13) separate goal areas. These may be summarized as follows:

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CONSERVATION AND COASTAL MANAGEMENT ELEMENT

January 25, 2007

Policy 1.3.5:

Where possible, the implementation of the NRPA program shall be coordinated with the preparation and implementation of watershed and sub-basin management plans.

GOAL 2: THE COUNTY SHALL PROTECT ITS SURFACE AND ESTUARINE WATER RESOURCES.

Objective 2.1:

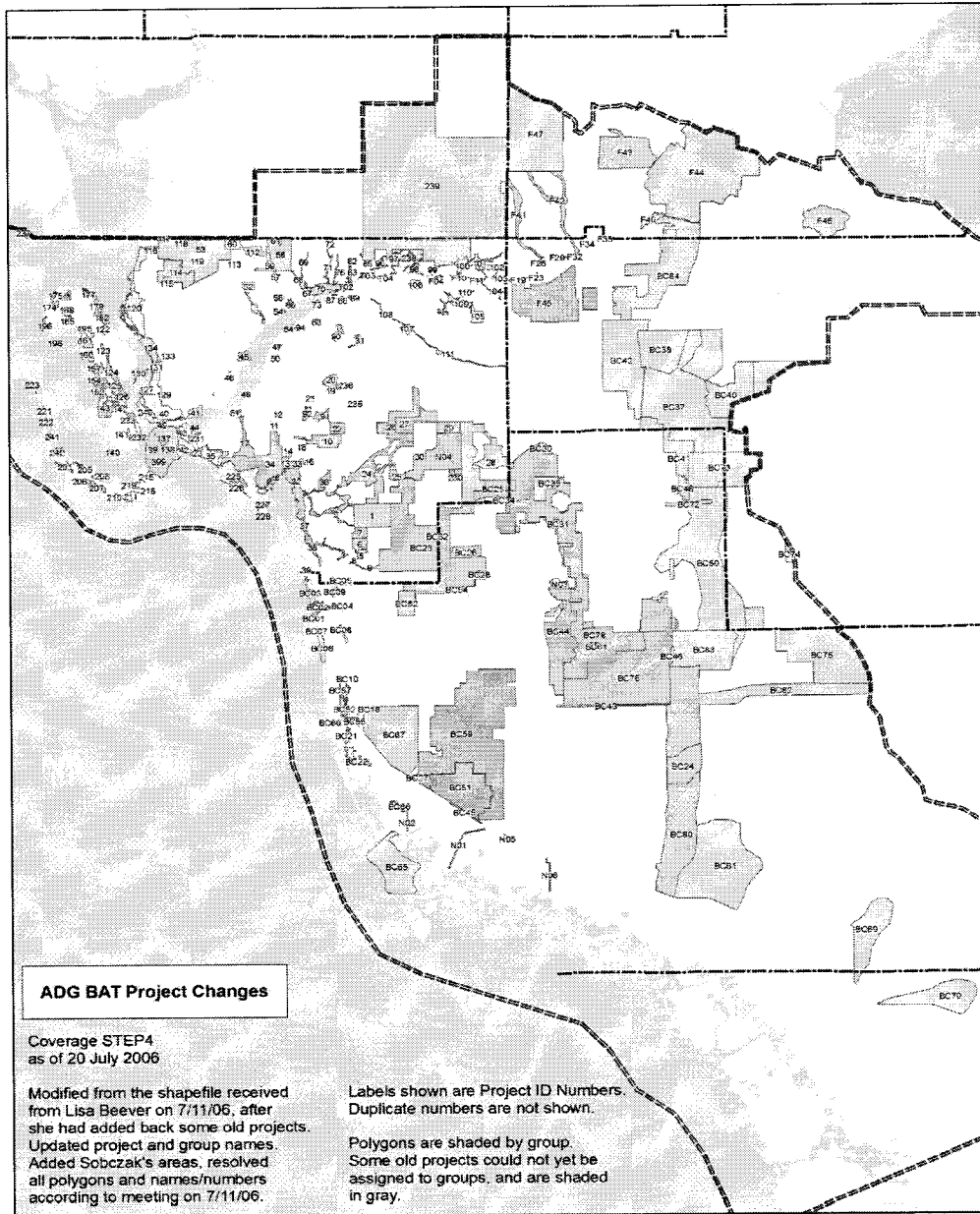
By January 2008, the County shall complete the prioritization and begin the process of preparing Watershed Management Plans, which contain appropriate mechanisms to protect the County’s estuarine and wetland systems. The process shall consist of (1) an evaluation of areas for which Watershed Management Plans are not necessary based on current or past watershed management

planning efforts, (2) an assessment of available data and information that can be used in the development of Watershed Management Plans, and (3) budget authorization to begin preparation of the first Watershed Management Plan by January 2008. A funding schedule shall be established to ensure that all Watershed Management Plans will be completed by 2010. In selecting the order of Plan completion, the County shall give priority to watersheds where the development growth potential is greatest and will impact the greatest amount of wetland and listed species habitats. The schedule and priorities shall also be coordinated with the Federal and State agency plans that address Total Maximum Daily Loads (TMDLs). Until the Watershed Management Plans are completed, the County shall apply the following as interim standards for development:

- a. All new development and re-development projects shall meet 150% of the water quality volumetric requirements of Section 5.2.1(a) of the Basis of Review for Environmental Resource Permit Applications Within the South Florida Water Management District (February 2006) and the retention and detention requirements, and the allowable offsite discharge rates required by Drainage Sub-element Policy 6.2 and 6.3, respectively;
- b. Loss of storage or conveyance volume resulting from direct impacts to wetlands shall be compensated for by providing an equal amount of storage or conveyance capacity on site and within or adjacent to the impacted wetland.
- c. Floodplain storage compensation shall be evaluated for developments within the designated flood zones "A", "AE", and "VE" as depicted on the Flood Insurance Rate Maps published by the Federal Emergency Management Agency with an effective date of November 17, 2005. Floodplain storage compensation shall also be evaluated for areas known to be periodically inundated by intense rainfall or sheetflow conditions.
- d. All development located within areas identified on Figure 1 shall be evaluated to determine impacts to natural wetlands, flowways, or sloughs. For this particular evaluation, natural wetlands, flowways, or sloughs shall be tentatively identified as contiguous lands having a continual preponderance of wetland or wet facultative plant species and a ground elevation through the major portion of the natural wetland, flowway, or slough at least one (1) foot lower than the ground at the edge of the natural wetland, flowway, or slough. The edge of the natural wetlands, flowways, or sloughs shall be identified by field determination and based upon vegetation and elevation differences from the adjacent uplands or transitional wetlands. The County shall require the applicant to avoid direct impacts to these natural wetlands, flowways, or sloughs or, when not possible, to ensure any direct impact is minimized and compensated for by providing the same conveyance capacity lost by the direct impact. The County shall adhere to the limiting discharge rates of each basin as outlined in Ordinance 2001-27, adopted May 22, 2001 which amended the County Water Management Policy and provided basin delineations where special peak discharge rates have been established. The limiting discharge rates will be reviewed as a part of the Watershed Management Plans, and modified according to the analyses and findings of the Watershed Management Plans.
- e. All new development and re-development projects shall ensure surrounding properties will not be adversely impacted from the project's influence on stormwater sheet flow.
- f. Prior to the issuance of a final development order, the County shall require all development projects to obtain the necessary state and federal environmental permits.

- g. Within one year of the effective date of these amendments, the County shall adopt land development regulations to require Best Management Practices of future development or re-development projects. Best Management Practices means structural and nonstructural facilities or practices intended to reduce pollution either through source control or treatment of stormwater.

Figure 1. Restoration Project Areas Where Interim Development Standard 2.1.d is Applicable [See Figure 1 following CCME text]



Policy 2.1.1:

These Plans will evaluate activities in the watersheds that drain into the estuaries in order to evaluate cumulative impacts on the estuarine system as well as impacts within the watersheds themselves.

Policy 2.1.2:

The Plans will provide for various tasks such as monitoring land-disturbing activities in the watersheds, collecting canal flow and water quality data, stormwater quality data, and assessing habitat changes.

Policy 2.1.3:

The Plans will also evaluate structural and non-structural controls for restoring historical hydroperiods in impacted watersheds where possible and for reducing the impacts of canal and stormwater discharges to estuaries.

Policy 2.1.4:

All Watershed Management Plans shall address the following concepts:

- a. Appropriate wetlands and uplands serving as a buffer to wetlands are conserved;
- b. Drainage systems do not degrade wetland and estuary ecosystems;
- c. Surface water that potentially could recharge ground water is not unduly drained away;
- d. When feasible the extent and effects of salt-water intrusion are lessened;
- e. The timing and flow of fresh water into the estuaries from the watershed shall, as a minimum, not degrade estuarine resource value;
- f. The needs of the watershed's natural resources and human populations are balanced;
- g. The effects on natural flood plains, stream channels, native vegetative communities and natural protective barriers which are involved in the accommodation of flood waters;
- h. Non-structural rather than structural methods of surface water management should be considered first in any proposed new works;
- i. Wetland and estuarine habitat functions are conserved and/or enhanced; and
- j. Wetland and estuarine ecosystems will be conserved and/or enhanced using a variety of innovative tools, including landowner incentives, public acquisition, conservation easements, and/or transferable development rights.

Policy 2.1.5:

Upon establishment of the various Watershed Management Plans for Collier County, all environmental data collection, environmental management and environmental planning

- a. activities conducted by Collier County shall be conducted using a basin-by-basin approach.

Policy 2.1.6:

Until the completion and adoption of individual watershed management plans, promote water management permitting on a basin by basin approach.

Policy 2.1.7:

Collier County shall take the lead and promote intergovernmental coordination between the County and other governmental agencies involved with watershed planning, including, but not

necessarily limited to, the municipalities of Marco Island, Naples and Everglades City, the Florida Department of Environmental Protection, the South Florida Water Management District, the Florida Fish and Wildlife Conservation Commission, the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers and other governmental agencies. The County will take the lead and oversee the preparation of the necessary watershed management plans, and will rely upon the work performed or data collected by other agencies, to the extent that these agencies have data and/or experience, which may be useful within the watershed basin planning and management process.

OBJECTIVE 2.2:

All canals, rivers, and flow ways discharging into estuaries shall meet all applicable Federal, State, or local water quality standards.

Policy 2.2.1:

Wastewater treatment plants shall not be allowed to discharge directly to rivers, canals or jurisdictional wetlands unless they meet Florida Department of Environmental Protection (FDEP) regulations and are not in violation of other Goals, Objectives and Policies of this Element.

Policy 2.2.2:

In order to limit the specific and cumulative impacts of stormwater run-off, stormwater systems should be designed in such a way that discharged water does not degrade receiving waters and an attempt is made to enhance the timing, quantity and quality of fresh water to the estuarine system. Non-structural methods such as discharge and storage in wetlands are encouraged.

Policy 2.2.3:

Chemical spraying for aquatic weed control should be conducted with extreme caution. The use of appropriate biological and mechanical (use of harvesting equipment to remove vegetation) controls in both the canal system and stormwater detention ponds is encouraged. Manufacturers and EPA guidelines for chemical use in aquatic habitat will be followed.

Policy 2.2.4:

Continue and expand when needed the existing water quality monitoring program for sampling canals and rivers and assess the data annually.

Policy 2.2.5:

By December 31, 2008, and no less than every three years, stormwater management systems shall be inspected and certified by a licensed Florida professional engineer for compliance with their approved design, and any deficiencies shall be corrected.

OBJECTIVE 2.3:

All estuaries shall meet all applicable federal, state and local water quality standards.

Policy 2.3.1:

No new untreated point source discharge shall be permitted directly to the estuarine system or rivers or canals that flow into the estuarine system.

Policy 2.3.2:

Stormwater systems discharging directly to estuaries shall be designed to meet the same requirements as stated in Policy 2.2.2.

Policy 2.3.3:

All watershed basin modification activities shall include appropriate detention and retention criteria, consistent with the rules and regulations of the South Florida Water Management District, Big Cypress Basin Board and Collier County, as may be applicable.

Policy 2.3.4:

Continue to implement and refine a water quality and sediment monitoring program for the estuarine system.

Policy 2.3.5:

Continue to have staff coordinate with the City of Naples staff regarding coordinated and cooperative planning, management, and funding programs for limiting specific and cumulative impacts on Naples Bay and its watershed. At a minimum, this agreement includes the following:

- a. Insure adequate sites for water dependent uses,
- b. Prevent estuarine pollution,
- c. Control run-off,
- d. Protect living marine resources,
- e. Reduce exposure to natural hazards,
- f. Ensure public access,
- g. Provide a continuing monitoring program.

Policy 2.3.6:

The County will only allow development activities which will not adversely impact coastal water resources. This is implemented through the following mechanisms:

- a. Require all applicable Federal and State permits addressing water quality to be submitted to Collier County before Collier County issues a Final Development Order.
- b. Excluding single family homes, any project impacting 5 acres or more of wetlands must provide a pre and post development water quality analysis to demonstrate no increase in nutrient, biochemical oxygen demand, total suspended solids, lead, zinc and copper loading in the post development scenario.
- c. By January 2008, the County shall undertake an assessment of the current model used to evaluate pre and post development pollutant loadings referenced in (b) of this Policy. At a minimum, the purpose of this assessment will be to verify the accuracy of the model and to provide data evaluating stormwater management structure design. In reviewing the accuracy of the model, the County will include an evaluation of the reduction of lake depths with time and the corresponding loss of retention volume, the impact of lake stratification, and the need for aeration. The assessment will also include the sampling of runoff from undisturbed sites and from permitted stormwater outfalls for the parameters listed in Paragraph (b) of this Policy and pesticides. The results of the assessment and recommendations regarding the pollutant loading analysis, revisions to current model

methodology, potential regulatory restrictions, and further monitoring shall be presented to the Board of County Commissioners for further direction.

Objective 2.4:

Collier County shall continue taking a coordinated and cooperative approach with the Florida Department of Environmental Protection (FDEP) regarding environmental planning, management and monitoring programs for Rookery Bay and Cape Romano – Ten Thousand Islands Aquatic Preserves and their watersheds. As part of this process, the County shall continue to notify FDEP of development projects within the watersheds of these preserve areas.

Policy 2.4.1:

At a minimum the County shall notify Department of Environmental Protection of proposed land development projects that could affect these preserves.

Policy 2.4.2:

The County shall request the Department of Environmental Protection staff to participate in the development of future coastal and watershed management plans.

Policy 2.4.3:

The County will request the cooperation of the Department of Environmental Protection to gather data and information needed for monitoring water quality, habitat changes and land use activities within the watersheds of these preserves.

OBJECTIVE 2.5:

The County will continue with the implementation of its estuarine management program by requiring development to meet its current standards addressing stormwater management, and the protection of seagrass beds, dune and strand, and wetland habitats.

Policy 2.5.1:

Identify land use activities that have the potential to degrade the estuarine environmental quality.

Policy 2.5.2:

This management program shall incorporate information obtained from the various watershed management plans described elsewhere in this Element.

Policy 2.5.3:

This program shall in part be based on the estuarine data analyses and management recommendations contained in the County's coastal management program's technical reports.

Other Pertinent CCME GOPs

OBJECTIVE 3.4:

Collect and evaluate data and information designed to monitor the quality of ground water in order to identify the need for additional protection measures. (Refer to Objective 1.3 in the Natural Ground Water Aquifer Recharge Sub-Element.)

Policy 3.4.2:

Coordinate data gathering activities with State and Federal agencies to minimize duplication of efforts and enhance the quality of information gathered.

GOAL 4: THE COUNTY SHALL CONSERVE, PROTECT AND APPROPRIATELY MANAGE THE COUNTY'S FRESH WATER RESOURCES.

OBJECTIVE 4.1:

Collect and evaluate data and information designed to more accurately determine water use in Collier County such as the County's database tracking all permitted wells and wells having consumptive use permits.

Policy 4.1.1:

Use as much as possible the existing reporting requirements and computer database of the South Florida Water Management District.

Policy 4.1.2:

Work with the agricultural community to devise a method for determining agricultural pumpage.

Policy 4.1.3:

Compile from appropriate local, State, Federal and private organizations the water use requirements of the native plant and animal community associations within the County.

Objective 4.2:

The Collier County Water-Sewer District and the Collier County Water and Wastewater Authority will continue to promote conservation of Collier County's potable water supply and will continue to develop, implement and refine a comprehensive conservation strategy, which will identify specific goals for reducing per capita potable water consumption.

Policy 4.2.1:

Continue to rely on the South Florida Water Management District to take appropriate measures to conserve water in emergency situations.

Policy 4.2.2:

The County shall negotiate agreements with area golf courses to accept and use treated wastewater effluent for irrigation when and where such treated effluent is available from existing and future wastewater treatment plants.

Policy 4.2.3:

Identify existing and future publicly owned lands suitable for irrigation with treated wastewater effluent, such as government building grounds, parks and highway medians, and incorporate these into future planning for effluent disposal.

Policy 4.2.4:

Identify existing and future privately owned lands suitable for irrigation with treated wastewater effluent, such as cemeteries, agricultural operations, nurseries and commercial/industrial parks, and incorporate these into future planning for effluent disposal.

Policy 4.2.5:

Evaluate and make recommendations, where appropriate, for plumbing fixtures and landscapes that are designed for water conservation purposes.

GOAL 6: THE COUNTY SHALL IDENTIFY, PROTECT, CONSERVE AND APPROPRIATELY USE ITS NATIVE VEGETATIVE COMMUNITIES AND WILDLIFE HABITAT.

Objective 6.1:

The County shall protect native vegetative communities through the application of minimum preservation requirements. The following policies provide criteria to make this objective measurable. These policies shall apply to all of Collier County except for that portion of the County which is identified on the Countywide Future Land Use Map (FLUM) as the Rural Lands Stewardship Area Overlay.

Policy 6.1.1:

For the County’s *Urban Designated Area, Estates Designated Area, Conservation Designated Area, and Agricultural/Rural Mixed Use District, Rural-Industrial District and Rural-Settlement Area District* as designated on the FLUM, native vegetation shall be preserved through the application of the following preservation and vegetation retention standards and criteria, unless the development occurs within the Area of Critical State Concern (ACSC) where the ACSC standards referenced in the Future Land Use Element shall apply. Notwithstanding the ACSC requirements, this policy shall apply to all non-agricultural development except for single-family dwelling units situated on individual parcels that are not located within a watershed management conservation area identified in a Watershed Management Plan developed pursuant to policies supporting Objective 2.1 of this Element.

	Coastal High Hazard Area		Non-Coastal High Hazard Area	
Residential and Mixed Use Development	Less than 2.5 acres	10%	Less than 5 acres.	10%
	Equal to or greater than 2.5 acres	25%	Equal to or greater than 5 acres and less than 20 acres.	15%
			Equal to or	

		greater than 20 ac.	25%
Golf Course			35%
Commercial and Industrial Development	Less than 5 acres.		10%
	Equal to or greater than 5 acres.		15%
Industrial Development (Rural-Industrial District only)		50%, not to exceed 25% of the project site.	50%, not to exceed 25% of the project site.

The following standards and criteria shall apply to the vegetation retention requirements referenced above.

(1) For the purpose of this policy, “native vegetation” is defined as a vegetative community having 25% or more canopy coverage or highest existing vegetative strata of native plant species. The vegetation retention requirements specified in this policy are calculated based on the amount of “native vegetation” that conforms to this definition.

(2) The preservation of native vegetation shall include canopy, under-story and ground cover emphasizing the largest contiguous area possible, which may include connection to offsite preserves. The purpose for identifying the largest contiguous area is to provide for a core area that has the greatest potential for wildlife habitat by reducing the interface between the preserve area and development which decreases the conflicts from other land uses. Criteria for determining the dimensional standards of the preserve are to be set out in the Land Development Code.

(3) Areas that fulfill the native vegetation retention standards and criteria of this policy shall be set aside as preserve areas. On-site and off-site preserve areas shall be protected by a permanent conservation mechanism to prohibit further development, consistent with the requirements of this policy. The type of permanent conservation mechanism, including conservation easements, required for a specific development may vary based on preserve area size, type of development approval, and other factors, as set forth in the County’s land development regulations.

(4) Selection of native vegetation to be retained as preserve areas shall reflect the following criteria in descending order of priority:

- a. Wetland or upland areas known to be utilized by listed species or that serve as corridors for the movement of wildlife shall be preserved and protected in order to facilitate the continued use of the site by listed species or the movement through the site, consistent with the requirements of Policy 7.1.1 and 7.1.2 of this element.

b. Xeric Scrub, Dune and Strand, Hardwood Hammocks.

Objective 6.2:

The County shall protect and conserve wetlands and the natural functions of wetlands pursuant to the appropriate policies under Goal 6. The following policies provide criteria to make this objective measurable. The County's wetland protection policies and strategies shall be coordinated with the Watershed Management Plans as required by Objective 2.1 of this Element.

Policy 6.2.1

As required by Florida Administrative Code 9J5-5.006(1)(b), wetlands identified by the 1994-95 SFWMD land use and land cover inventory are mapped on the Future Land Use Map series. These areas shall be verified by a jurisdictional field delineation, subject to Policy 6.2.2 of this element, at the time of project permitting to determine the exact location of jurisdictional wetland boundaries.

Policy 6.2.2

Wetlands shall be defined pursuant to Section 373.019 Florida Statutes. The location of jurisdictional wetland boundaries are further described by the delineation methodology in Section 373.421 Florida Statutes.

Policy 6.2.3:

Collier County shall implement a comprehensive process to ensure wetlands and the natural functions of wetlands are protected and conserved. This wetland preservation and conservation process shall be coordinated with the Watershed Management Plan process, as referenced in Objective 2.1 of this Element. However, the process outlined within this policy is primarily based on directing concentrated population growth and intensive development away from large interconnected wetland systems. These wetland systems have been identified based on their type, values, functions, sizes, conditions and locations within Collier County. These systems predominantly occur east of the County's Urban boundary, as delineated on the Countywide Future Land Use Map (FLUM), within the Future Land Use Element (FLUE). Many of these wetlands fall within public lands or land targeted for acquisition. High quality wetlands systems located on private property are primarily protected through native vegetation preservation requirements, or through existing PUD commitments, conservation easements, or Stewardship Sending Area Designations, or via the NRPA or Sending designations within the Rural Fringe Mixed Use District or land/easement acquisition, or innovative landowner incentives. Protection measures for wetlands and wetland systems located within the northeastern portion of Collier County, excluding the community of Immokalee, are contained in the Rural Lands Stewardship Area Overlay (RLSA Overlay) of the FLUE (and as depicted on the FLUM). Protection measures for wetlands and wetland systems located within the Urban and Estates designated areas of the County shall be based upon the jurisdictional determinations made by the applicable state or federal agency. Where permits issued by such state or federal agencies allow for impacts to wetlands within Urban and Estates designated areas and require mitigation for such impacts, the permitting agency's mitigation requirements shall be deemed to preserve and protect wetlands and their functions, except for wetlands that are part of a Watershed Management Plan preserve area. The County shall direct impacts away from such wetlands.

The large connected wetland systems that exist at the landscape scale in Collier County shall be protected through various Land Use Designations and Overlays that restrict higher intensity land uses and require specific land development standards for the remaining allowable land uses. Collier County shall direct incompatible land uses away from these large landscape scale wetland systems through implementation of the following protection and conservation mechanisms:

(1) *Conservation Designation*

Best available data indicates that 76% of all wetlands found in Collier County are contained within the boundaries of the Conservation Designation as depicted on the Countywide Future Land Use Map. The overall purpose of the Conservation Designation is to conserve and maintain the natural resources of Collier County and their associated environmental, recreational, and economic benefits. The allowed land uses specified in the FLUE's Conservation Designation (*Reference FLUE Land Use Designation Section IV.*) will accommodate limited residential development and future non-residential development. These limitations support Collier County's comprehensive process to direct concentrated population growth and intensive land development away from large connected wetland systems.

(2) *Big Cypress Area of Critical State Concern Overlay (ACSC)*

Best available data indicates that 74% of the County's wetlands are within the Big Cypress Area of Critical State Concern Overlay. The land development regulations contained in the ACSC Overlay District, as depicted on the Countywide Future Land Use Map, provide standards that facilitate the goal of directing higher intensity land uses away from wetland systems. The development standards for the ACSC Overlay (*Reference FLUE Land Use Designation Section V.*) specify that site alterations shall be limited to 10% of the total site. The majority of the land contained within the ACSC is also within the Conservation Designation and thus is subject to the land use limitations of that Land Use Designation.

(3) *Natural Resource Protection Areas (NRPAs)*

Major wetland systems and regional flow-ways were used as criteria to establish the NRPA Overlay District as shown on the Future Land Use Map, and as discussed in FLUE Land Use Designation, Section V.C. These areas include high functioning wetland systems and, although portions of the NRPA Overlay include lands within the Conservation Designation, represent approximately 12% of the County's wetlands, which are not located in Conservation Lands. Based on the relatively high concentration of wetlands within NRPA designated lands, incompatible land uses shall be directed away from these areas. Allowable land uses within NRPAs are also subject to native vegetation retention and preservation standards of 90%.

(4) *Rural Fringe Mixed Use District Sending Lands*

Best available data indicates that 16,000+ acres of wetlands are contained within designated Sending Lands and that such wetlands constitute approximately 70% of land cover in these areas. Incompatible land uses are directed away from the Rural Fringe Mixed Use District Sending Lands through an incentive-based Transfer of Development Rights (TDR) Program that allows land owners within these Sending Lands to transfer their residential density out of the Sending Lands to Rural Fringe Mixed Use District (and limited Urban) Receiving Lands. A complete description of the TDR Program is contained in the FLUE, Future Land Use Designation Description Section, Agricultural/Rural Designation, Rural Fringe Mixed Use

District. Incompatible land uses are also directed away from Sending Lands through restrictions on allowable uses. Finally, allowable uses within these lands are also subject to native vegetation retention and preservation standards of 80% to 90%, as required by Policy 6.7.1 of this Element.

(5) *Flowway Stewardship Areas [re-numbered to reflect merger of Ordinance No. 2002-32 and 2002-54]*

Flowway Stewardship Areas have been designated within the Rural Lands Stewardship Area Overlay (RLSA), as depicted on the Future Land Use Map, and are shown on the Rural Lands Study Area Natural Resource Index Map Series. Flowway Stewardship Areas (FSAs) are for the most part privately owned wetlands that are located within the Camp Keais Strand and Okaloacoochee Slough. These lands form the principal wetland flowway systems in the RLSA. The Overlay provides an incentive to permanently protect FSAs through the creation and transfer of Stewardship Credits. It also contains provisions that eliminate incompatible uses from the FSAs and, which establish protection measures.

(6) *Watershed Management Plans*

Collier County will establish watershed management plans throughout the County, but with particular emphasis on the Urban and Estates designated areas. These watershed management plans shall be established in accordance with Objective 2.1 of this Element and will include the preservation or, where feasible, creation of landscape-scale wetland conservation areas to act as habitat, natural water quality treatment and water quantity retention/detention areas. The County shall direct incompatible land uses away from such large-scale wetlands.

Collier County shall allow for more intensive development to occur in Rural Fringe Receiving Lands, North Golden Gate Estates, the Rural-Settlement Area District, and the Urban Designated Areas subject to the land uses identified in the Future Land Use Element, the Immokalee Area Master Plan, and the Golden Gate Area Master Plan. These areas account for only 6% of Collier County's wetlands. Except for tidal wetlands within the coastal portion of the Urban Designated Area and wetlands that are part of an established watershed management plan, the County finds that the wetland systems in these areas are more fragmented and altered than those systems located within the Conservation Lands, ACSC and NRPA Overlays, and Rural Fringe Sending Lands.

On a project-specific basis, wetlands and wetland functions shall be protected through the following mechanisms:

- (1) Federal and State jurisdictional agency review and wetland permitting;
- (2) Vegetation preservation policies supporting CCME Objective 6.1;
- (3) Wetland protection policies supporting CCME Objective 6.2;
- (4) Clustering provisions specified in the Rural Fringe Mixed Use District of the FLUE
- (5) The protection of wetlands that are part of an established watershed management plan, as per Objective 2.1 of this Element.
- (6) Land or easement acquisition.
- (7) Land owner incentives, such as transferable development rights, tax relief, or USDA grants for restoration.

Policy 6.2.4:

Within the *Urban Designated* area, the County shall rely on the wetland jurisdictional determinations and permit requirements issued by the applicable jurisdictional agency, except for wetlands that are part of a Watershed Management Plan preserve area. The County shall direct impacts away from such wetlands.

This policy shall be implemented as follows:

- (1) Where permits issued by such jurisdictional agencies allow for impacts to wetlands within this designated area and require mitigation for such impacts, this shall be deemed to meet the objective of protection and conservation of wetlands and the natural functions of wetlands within this area, except for wetlands that are part of a Watershed Management Plan preserve area. The County shall direct impacts away from such wetlands.
- (2) The County shall require the appropriate jurisdictional permit prior to the issuance of a final local development order permitting site improvements, except in the case of single-family residences, which are not part of an approved development or are not platted, unless the residences are within a watershed management conservation area identified in a Watershed Management Plan developed pursuant to policies supporting Objective 2.1 of this Element, in which case the appropriate jurisdictional permit is required prior to the issuance of a final local development order permitting site improvements.
- (3) Collier County will work with the jurisdictional agencies and applicants to encourage mitigation to occur within targeted areas of the County including, but not limited to: Natural Resource Protection Areas (NRPAs); lands targeted for a acquisition by a public or private conservation entity; wetlands that are part of an approved watershed management plan, as per Objective 2.1 of this Element; and other areas appropriate for mitigation, such as flow ways and areas containing habitat for animal listed species.
- (4) Within the Immokalee Urban Designated Area, there may exist high quality wetland systems connected to the Lake Trafford/Camp Keais Strand system. These wetlands require greater protection measures than wetlands located in other portions of the Urban Designated Area, and therefore the wetland protection standards set forth in Policy 6.2.5 shall apply in this area. This area is generally identified as the area designated as Wetlands Connected To Lake Trafford/Camp Keais Strand System on the Immokalee Future Land Use Map and is located in the southwest Immokalee Urban designated area, connected to the Lake Trafford/Camp Keais System. Within one (1) year of the effective date of these amendments, the County shall adopt land development regulations to determine the process and specific circumstances when the provisions of Policy 6.2.5 will apply.

Policy 6.2.5:

Within the *Rural Fringe Mixed Use District, and that portion of the Lake Trafford/Camp Keais Strand System which is contained within the Immokalee Urban Designated Area*, Collier County shall direct land uses away from higher functioning wetlands by limiting direct impacts within wetlands based upon the vegetation requirements of Policy 6.1.2 of this element, the wetland functionality assessment described in paragraph (2) below, and the final permitting requirements of the South Florida Water Management District. A direct impact is hereby defined

as the dredging or filling of a wetland or adversely changing the hydroperiod of a wetland. This policy shall be implemented as follows:

- (1) The County shall apply the vegetation retention requirements of Policy 6.1.2 of this element to preserve an appropriate amount of native vegetation on site. Wetlands shall be preserved as part of this vegetation requirement according to the following criteria:
 - a. The acreage requirements of Policy 6.1.2 of this element shall be met by preserving wetlands with the highest wetland functionality scores. Wetland functionality assessment scores shall be those described in paragraph (2) of this policy. Wetlands having a WRAP score of at least 0.65 or a Uniform Wetland Mitigation Assessment Method score of 0.7 shall be preserved on site. This policy is not intended in all cases to require preservation of wetlands exceeding the acreage required by Policy 6.1.2 of this element. Within one year, the County shall develop specific criteria to be used to determine when wetlands having a WRAP score greater than 0.65 or a Uniform Wetland Mitigation Assessment Method score of greater than 0.7 shall be required to be retained exceeding the acreage required by Policy 6.1.2 of this element.
- (2) In order to assess the values and functions of wetlands at the time of project review, applicants shall rate functionality of wetlands using the South Florida Water Management District's Wetland Rapid Assessment Procedure (WRAP), as described in Technical Publication Reg-001, dated September 1997, and updated August 1999, or the Uniform Wetland Mitigation Assessment Method, F.A.C. Chapter 62-345. The applicant shall submit to County staff, agency accepted WRAP scores or Uniform Wetland Mitigation Assessment Method scores. County staff shall review this functionality assessment as part of the County's EIS provisions and shall use the results to direct incompatible land uses away from the highest functioning wetlands according to the requirements found in paragraph (1) above.
- (3) All direct impacts shall be mitigated for pursuant to the requirements of paragraph (6) of this policy.
- (4) Single family residences shall follow the requirements contained within Policy 6.2.7 of this element.
- (5) The County shall separate preserved wetlands from other land uses with appropriate buffering requirements. The County shall require a minimum 50-foot vegetated upland buffer adjacent to a natural water body, and for other wetlands a minimum 25-foot vegetated upland buffer adjacent to the wetland. A structural buffer may be used in conjunction with a vegetative buffer that would reduce the vegetative buffer width by 50%. A structural buffer shall be required adjacent to wetlands where direct impacts are allowed. Wetland buffers shall conform to the following standards:
 - a. The buffer shall be measured landward from the approved jurisdictional line.
 - b. The buffer zone shall consist of preserved native vegetation. Where native vegetation does not exist, native vegetation compatible with the existing soils and expected hydrologic conditions shall be planted.
 - c. The buffer shall be maintained free of Category I invasive exotic plants, as defined by the Florida Exotic Pest Plant Council.

- d. The following land uses are considered to be compatible with wetland functions and are allowed within the buffer:
 - 1. Passive recreational areas, boardwalks and recreational shelters;
 - 1. Pervious nature trails;
 - 3. Water management structures;
 - 4. Mitigation areas;
 - 5. Any other conservation and related open space activity or use which is comparable in nature with the foregoing uses.
- e. A structural buffer may consist of a stem-wall, berm, or vegetative hedge with suitable fencing.
- (6) Mitigation shall be required for direct impacts to wetlands in order to result in no net loss of wetland functions.
 - a. Mitigation Requirements:
 - 1. "No net loss of wetland functions" shall mean that the wetland functional score of the proposed mitigation equals or exceeds the wetland functional score of the impacted wetlands. However, in no case shall the acreage proposed for mitigation be less than the acreage being impacted.
 - 2. Loss of storage or conveyance volume resulting from direct impacts to wetlands shall be compensated for by providing an equal amount of storage or conveyance capacity on site and within or adjacent to the impacted wetland.
 - 3. Protection shall be provided for preserved or created wetland or upland vegetative communities offered as mitigation by placing a conservation easement over the land in perpetuity, providing for initial exotic plant removal (Class I invasive exotic plants defined by the Florida Exotic Pest Plant Council) and continuing exotic plant maintenance.
 - 4. Prior to issuance of any final development order that authorizes site alteration, the applicant shall demonstrate compliance with paragraphs (6)a.1, (6)a.2, and (6)a.3 of this policy. If agency permits have not provided mitigation consistent with this policy, Collier County will require mitigation exceeding that of the jurisdictional agencies.
 - 5. Mitigation requirements for single-family lots shall be determined by the State and Federal agencies during their permitting process, pursuant to the requirements of Policy 6.2.7 of this element.
 - b. Mitigation Incentives:
 - 1. Collier County shall encourage certain types of mitigation by providing a variety of incentives in the form of density bonuses and credits to open space and vegetation retention requirements. Density bonuses shall be limited to no more than 10% of the allowed density.
 - 2. Preferred mitigation activities that would qualify for these incentives include, but are not limited, to the following:

- (a) Adding wetland habitat to or restoring wetland functions within Rural Fringe Mixed Use District Sending Lands,
 - (b) Creating, enhancing or restoring wading bird habitat to be located near wood stork, and/or other wading bird colonies.
3. Within one (1) year of the effective date of these amendments, Collier County shall adopt specific criteria in the LDC to implement this incentive program, and to identify other mitigation priorities.

Policy 6.2.6: [re-numbered to reflect merger of Ordinance No. 2002-32 and 2002-54]

Within the *Urban Designation and the Rural Fringe Mixed Use District*, required wetland preservation areas, buffer areas, and mitigation areas shall be dedicated as conservation and common areas in the form of conservation easements and shall be identified or platted as separate tracts; and, in the case of a Planned Unit Development (PUD), these areas shall also be depicted on the PUD Master Plan. These areas shall be maintained free from trash and debris and from Category I invasive exotic plants, as defined by the Florida Exotic Pest Plant Council. Land uses allowed in these areas shall be limited to those listed in Policy 6.2.5(5)d of this element and shall not include any other activities that are detrimental to drainage, flood control, water conservation, erosion control or fish and wildlife habitat conservation and preservation.

Policy 6.2.7:

Within the *Estates Designated Area and the Rural Settlement Area*, the County shall rely on the wetland jurisdictional determinations and permit requirements issued by the applicable jurisdictional agency, except for wetlands that are part of a Watershed Management Plan preserve area. The County shall direct impacts away from such wetlands. This policy shall be implemented as follows:

- (1) For single-family residences within Southern Golden Gate Estates or within the Big Cypress Area of Critical State Concern, the County shall require the appropriate federal and state wetland-related permits before Collier County issues a building permit.
- (2) Outside of Southern Golden Gate Estates and the Big Cypress Area of Critical State Concern, Collier County shall inform applicants for individual single-family building permits that federal and state wetland permits may be required prior to construction unless the proposed residence is within a watershed management conservation area identified in a Watershed Management Plan developed pursuant to policies supporting Objective 2.1 of this Element, in which case the appropriate jurisdictional permit is required prior to the issuance of a building permit. The County shall also notify the applicable federal and state agencies of single-family building permits applications in these areas.
- (3) Within North Golden Gate Estates and the Rural Settlement Area, Collier County shall incorporate certain preserved and/or created wetlands and associated uplands into the County's approved watershed management plans, as per Objective 2.1 of this Element. The size and location of wetlands incorporated into the watershed management plans will be based upon the approved requirements for such plans. The County may issue single-family building permits within or adjacent to such wetlands, subject to appropriate

mitigation requirements, which preserve the functionality of the wetland within the applicable watershed management plan. For a proposed residence which is to be located within a watershed management conservation area identified in a Watershed Management Plan developed pursuant to policies supporting Objective 2.1 of this Element, the appropriate jurisdictional permit is required prior to the issuance of a building permit.

- (4) Collier County shall continue to work with federal and state agencies to identify properties that have a high probability of wetlands and animal listed species occurrence. The identification process will be based on hydric soils data and other applicable criteria. Once this identification process is complete, the County will determine if the process is sufficiently accurate to require federal and state wetland approvals prior to the issuance of a building permit within these areas. The County shall use information on wetland and/or listed species occurrence to inform property owners of the potential existence of wetlands and/or listed species on their property.
- (5) Within one year after Watershed Management Plans are accepted by the Board of County Commissioners, Collier County shall develop and implement additional means to protect wetland systems identified in each Plan for preservation or restoration. Means to consider include innovative landowner incentives, transferable development rights, tax relief, land or easement acquisition, state and federal grants, and enhanced regulations.

Policy 6.2.8

For the *County's Rural Lands Stewardship Area (RLSA) Overlay, as designated on the FLUM*, wetlands shall be preserved pursuant to the RLSA Overlay policies found in the Future Land Use Element.

Policy 6.2.9 *[re-numbered to reflect merger of Ordinance No. 2002-32 and 2002-54]*

The County shall provide for adequate staff to implement the policies supporting Objective 6.2.

GOAL 13: THE COUNTY SHALL AVOID UNNECESSARY DUPLICATION OF EXISTING REGULATORY PROGRAMS.

OBJECTIVE 13.1:

To establish, prior to the adoption of any land development regulation to implement this Element, including but not limited to NRPA management guidelines and watershed management plans, a program to review such regulations and identify existing regulatory programs exercised by regional, State, or Federal agencies with jurisdiction over the activities sought to be regulated.

Policy 13.1.1:

There will be no unnecessary duplication of existing Regional, State, or Federal permitting programs.

Policy 13.1.2:

The County may adopt regulations to strengthen existing permitting programs.

Policy 13.1.3:

Prior to adopting any new regulations to implement this Element, the following guidelines shall be met:

- a. The regulation fulfills an important need that is not adequately addressed by existing Regional, State, or Federal regulations.
- b. The regulation can be effectively and efficiently administered by existing County staff or by an authorized expansion of County staff.
- c. The cost to the County of implementing the regulation has been identified and considered.

Other Pertinent Section GOPs

Some of the following GOPs do not directly address Watershed Management Plan goals specifically however, they address relevant issues that must be considered and supported by the plans.

PUBLIC FACILITIES ELEMENT DRAINAGE SUB-ELEMENT

I. INTRODUCTION

This portion of the Collier County Growth Management Plan inventories both the natural conditions and stormwater management activities within unincorporated Collier County. In Collier County, there are two (2) primary service providers with regard to the provision of stormwater management services. The County's Transportation Services Division maintains drainage systems associated with County and State Roadways as well as the Secondary Drainage System. The Big Cypress Basin Board, an arm of the South Florida Water Management District (SFWMD), maintains the larger, regional surface water management systems within Collier County. The regional drainage system is also referred to as the Primary Drainage System.

However, management of stormwater is concerned not only with flood prevention (a quantity issue), but also with the removal of various pollutants picked up by the stormwater as it flows across the County's developed land areas (a quality issue). Such pollutants can include oils, greases, heavy metals, pesticides, fertilizers and other substances, which can have a deleterious impact on the County's natural systems and, above all, its groundwater quality. Note that, in this respect, there is overlap in the intended purpose between the Drainage and Natural Groundwater Aquifer Recharge Sub-elements: both seek to protect aquifer recharge areas. However, the emphasis of the Drainage Sub-element is on surface water protection, whereas the emphasis of the Natural Groundwater Aquifer Recharge Sub-element is on groundwater protection.

The term "stormwater management" refers to a set of comprehensive strategies for dealing with both stormwater quantity and stormwater quality issues. The primary component of these strategies is the need to ensure that the volume, rate, timing and pollutant load of stormwater runoff after development is similar to that which occurred prior to development. To accomplish this task, stormwater management entities employ a

combination of structural and non-structural techniques. Non-structural techniques emphasize preservation or restoration of natural drainage features to promote infiltration, filtering and slowing of runoff. Structural techniques include the variety of manmade channels and control structures maintained within the primary and secondary drainage systems. The objective of stormwater management is to develop a combination of techniques which provide for adequate pollutant removal and flood protection in the most economical manner.

One of the key principles of current stormwater management techniques is recognition of the need for basin-wide (or watershed basin) planning. The stormwater management system has to be designed so as to ensure that the final outlet point has adequate capacity to handle all discharges from the upstream portion of the watershed under conditions present at the time of design. Subsequent development upstream must then utilize stormwater management techniques and systems, which will maintain predevelopment run-off conditions so that the capacity of the downstream portion of the watershed is not exceeded. In this respect, there is an overlap between the intended purpose of the Drainage Sub-element and Goal 2 of the Conservation and Coastal Management Element, including the Watershed Management Plans discussed under Objective 2.1 of the CCME.

GOAL:

COLLIER COUNTY SHALL PROVIDE DRAINAGE AND FLOOD PROTECTION FOR EXISTING AND FUTURE DEVELOPMENT, MINIMIZE THE DEGRADATION OF QUALITY OF RECEIVING WATERS AND SURROUNDING NATURAL AREAS AND PROTECT THE FUNCTIONS OF NATURAL GROUNDWATER AQUIFER RECHARGE AREAS.

OBJECTIVE 1 (CAPITAL FACILITY PLANNING FOR DRAINAGE SYSTEMS):

The County shall utilize the Annual Update and Inventory Report on Public Facilities (AUIR) process to update the Drainage Atlas Maps and Channel/Structure Inventory components of the adopted Water Management Master Plan and to verify the existing watershed basin boundaries within Collier County. The County will also verify the design storm capacity of the drainage facilities within each basin, and determine the costs necessary to maintain the facility capacities to selected design storm standards. This information shall be used to program operational funds in the Annual County Budget and to identify necessary capital projects and basin studies in the Annual Capital Improvement Element Update and Amendment.

Policy 1.1:

The County shall update and revise stormwater management maintenance procedures and capital projects based on continual facilities performance monitoring activities. Consideration will be given to natural systems as identified in Policy 2.1.4 of the Conservation and Coastal Management Element, existing developments and proposed developments.

Policy 1.2:

County drainage system capital facility planning shall be designed to implement procedures and projects in a manner to ensure that adequate stormwater management facility capacity is available at the time a development permit is issued, or that such capacity will be available when needed to serve the development.

Policy 1.3:

The County shall continue to develop public drainage facilities, which maintain the groundwater table as a source of recharge for the County's potable water aquifers, provide a source of irrigation water for agricultural, horticultural and golf course operations and provide water to native vegetation.

Policy 1.4:

The County shall continue to evaluate structural and non-structural measures for restoring historical hydroperiods in impacted watersheds where possible and for reducing the impacts of canal and stormwater discharges to estuaries. Selected measures will be implemented through the watershed management planning process identified within Goal 2 of the Conservation and Coastal Management Element of the Growth Management Plan.

Policy 1.5:

Watershed Management Plans will be undertaken as set forth in Objective 2.1 of the Conservation and Coastal Management Element (CCME). After each plan is completed, the results will be made available to the property owners located within the basin's boundaries for their use in petitioning the Board of County Commissioners to create a taxing/assessment unit to fund the proposed implementation of the plan's recommendations. Until the Watershed Management Plans are completed, the County shall apply the interim standards for development as contained in CCME Objective 2.1.

OBJECTIVE 2:

The County shall maintain adopted drainage level of service standards for basins and sub-basins identified in the Water Management Master Plan. Maintenance of the drainage level of service (LOS) identified for each basin will be implemented through the watershed management planning process identified within Goal 2 of the Conservation and Coastal Management Element of this Growth Management Plan.

Policy 2.1:

The following levels of service for drainage are hereby adopted for the purpose of issuing development permits. Upon completion of each associated Watershed Management Plan, the level of service will be modified, if warranted.

- A. Future "private" developments - water quantity and quality standards as specified in Collier County Ordinance Numbers 74-50, 90-10 and 2001-27, and Land Development Code Ordinance Number 2004-41, as amended.

B. Existing "private" developments and existing or future public drainage facilities - those existing Levels of Service identified (by design storm return frequency event) by the completed Water Management Master Plan as follows:

LEVELS OF SERVICE ATTAINED BY BASINS

BASIN	LEVEL OF SERVICE
MAIN GOLDEN GATE SYSTEM	
Main Golden Gate Canal Basin	D
Cypress Canal Basin	D
Harvey Canal Basin	D
Green Canal Basin	C
Airport Road Canal South Basin	D
Corkscrew Canal Basin	D
Orange Tree Canal Basin	D
951 Canal Central Basin	C
DISTRICT NO. 6 SYSTEM	
Rock Creek Basin	D
C-4 Canal Basin	C
Lely Main Canal Basin	D
Lely Canal Branch Basin	D
Lely Manor Canal Basin	D
Haldeman Creek Basin	D
Winter Park Outlet Basin	D
COCOHATCHEE RIVER SYSTEM	
Cocohatchee River Basin	D
Pine Ridge Canal Basin	C
Palm River Canal Basin	D
West Branch Cocohatchee River Basin	C
East Branch Cocohatchee River Basin	D
Airport Road Canal North Basin	D
951 Canal North Basin	D
GORDON RIVER EXTENSION	
Gordon River Extension Basin	D
Goodlette-Frank Road Ditch Basin	D

HENDERSON CREEK BASIN

Henderson Creek Basin

D

OBJECTIVE 5:

The County shall continue to regulate land use and development in a manner that protects the functions of natural drainage features and natural groundwater aquifer recharge areas. Implementation of this Objective will be consistent with the Watershed Management Planning process identified within Goal 2 of the Conservation and Coastal Management Element of the Growth Management Plan, and with relevant provisions contained within the adopted Land Development Code (Ordinance Number 2004-41, as amended).

Policy 5.1:

Collier County shall periodically review all appropriate Water Management Ordinances and regulations to determine their effectiveness in protecting the functions of natural drainage features and natural groundwater aquifer recharge areas.

Policy 5.2:

Based upon the periodic review described in Policy 5.1, the County shall develop any appropriate new ordinances and regulations that are necessary to ensure protection of the functions of natural drainage features and natural groundwater aquifer recharge areas.

OBJECTIVE 6:

The County shall protect the functions of natural drainage features through the application of standards that address the quality and quantity of discharge from stormwater management systems. Implementation of this Objective will be consistent with the watershed management planning process identified within Goal 2 and Objective 2.1 of the Conservation and Coastal Management Element of the Growth Management Plan. This objective is made measurable through the following policies:

Policy 6.1:

Projects shall be designed and operated so that off-site discharges will meet State water quality standards, as set forth in Chapter 62-302.300, F.A.C., as it existed at the date of project approval.

Policy 6.2:

Collier County's retention and detention requirements shall be the same as those provided in the South Florida Water Management District's Basis of Review, as it existed at the time of project approval.

Policy 6.3:

Allowable off-site discharge rates shall be computed using a storm event of 3 day duration and 25 year return frequency. The allowable off-site discharge rates are as follows:

- a. Airport Road North Sub-Basin 0.04 cfs/acre
(North of Vanderbilt Beach Road)

b. Airport Road South Sub-basin (South of Vanderbilt Beach Road)	0.06 cfs/acre
c. Cocohatchee Canal Basin	0.04 cfs/acre
d. Lely Canal Basin	0.06 cfs/acre
e. Harvey Basin	0.055 cfs/acre
f. Wiggins Pass Basin	0.13 cfs/acre
g. All other areas	0.15 cfs/acre

The County may exempt projects from these allowable off-site discharge rates if any of the following applies:

1. The project is exempt from allowable off-site discharge limitations pursuant to Section 40E-400.315, FAC.
2. The project is part of an existing SFWMD permit, which allows discharge rates different than those listed above.
3. It can be documented that the project currently discharges off-site at a rate higher than those listed above. The documentation required for this purpose shall be prepared by a registered professional engineer, and will consist of an engineering study which utilizes the applicable criteria in the "SFWMD Basis of Review for Environmental Resource Permit Applications". The study shall be subject to review and approval by the County and SFWMD staff. The study shall include the following site-specific information:
 - a. Topography
 - b. Soil types and soil storage volume
 - c. Vegetation types
 - d. Antecedent conditions
 - e. Design rainfall hydrograph
 - f. Depression storage capacity
 - g. Receiving water hydrograph, and
 - h. Other relevant hydrologic and hydraulic data.

Using the above information, a hydrologic and hydraulic model shall be developed which demonstrates the higher off-site discharge rate.

PUBLIC FACILITIES ELEMENT

Potable Water Sub-Element

I. INTRODUCTION

The purpose of the Potable Water Sub-Element is to provide for the health and safety of the residents of Collier County by ensuring adequate potable water supply and distribution facilities that are cost-effective and environmentally sound. Such facilities may be provided through the Collier County Water-Sewer District, private utilities, other public utilities that operate within portions of the unincorporated County, or (in certain areas) private supply wells. In addition to the supply and distribution of potable water for residential and commercial purposes, the Potable Water Sub-Element also contains provisions related to establishment of new potable water sources, water conservation, and irrigation.

Goal, Objectives and Policies Potable Water Sub-Element

GOAL:

TO PROTECT THE HEALTH AND SAFETY OF THE PUBLIC BY ENSURING ACCESS TO ENVIRONMENTALLY SOUND, COST EFFECTIVE AND IMPLEMENTABLE POTABLE WATER FACILITIES AND SERVICES.

OBJECTIVE 1:

The County shall locate and develop potable water supply sources to meet the future needs of the County owned and operated systems, said supply sources meeting the minimum Level of Service Standards established by this Plan. The development and utilization of new potable water supply sources and the acquisition of land necessary for such development shall be based upon the information, guidelines and procedures identified within the County's Ten-Year Water Supply Facilities Work Plan (as updated annually), the Collier County Water-Sewer Master Plan, and the Lower West Coast Water Supply Plan prepared by the South Florida Water Management District.

Policy 1.1:

The County shall continue to expand the ASR (Aquifer Storage and Recovery) system as a potential emergency and seasonal potable water source.

Policy 1.2:

The County shall continue to implement a program for the protection of existing and potential potable water supply sources.

Policy 1.3:

The County shall continue to identify sufficient quantities of water sources to meet the County's estimated growth-related needs. Potential water sources to meet the County's 2025 water demands include raw water from Hawthorn Zone I Aquifer (Intermediate Aquifer System) and Lower Hawthorn Aquifer (Florida Aquifer System), identified within the County's 2005 Water Master Plan. The County shall use these water sources as well as alternative sources, as permitted by the State, to meet the County's needs.

Policy 1.4:

The County shall coordinate with the South Florida Water Management District and other regulatory agencies in implementing effective linkages between growth management and water planning.

Policy 1.5:

The County shall coordinate with the South Florida Water Management District in the development of the Water Master Plan Update, which is the primary planning document for the Collier County Water-Sewer District.

Policy 1.6: The County shall coordinate with the South Florida Water Management District to produce future plans for water supply as described within the Water Master Plan Updates that ensure the County's ability to maintain its stated Level of Service standard.

PUBLIC FACILITIES ELEMENT Natural Groundwater Aquifer Recharge Sub-Element

I. INTRODUCTION

The Natural Groundwater Aquifer Recharge Sub-Element establishes the manner in which Collier County will identify and protect the natural groundwater aquifers that serve as the primary sources of drinking water for County residents and visitors. This Sub-Element relates only to those aquifer recharge areas located in unincorporated Collier County that serve as potable water wellfields.

The Implementation Section of this Sub-Element contains a single Goal, divided into five (5) Objectives. Beneath each Objective are the specific County implementing policies.

The water supply protection Objectives in this Sub-Element include:

- Mapping and delineation of natural aquifer recharge areas;
- Protection of groundwater quality;
- Groundwater quality monitoring;
- Public education with regard to groundwater protection issues; and,
- Protection of critical recharge areas and groundwater resources.

GOAL, OBJECTIVES AND POLICIES

NATURAL GROUNDWATER AQUIFER RECHARGE SUB-ELEMENT

GOAL:

THE COUNTY SHALL IDENTIFY AND PROTECT NATURAL GROUNDWATER AQUIFER RECHARGE AREAS FROM ACTIVITIES THAT COULD DEGRADE AND/OR CONTAMINATE THE QUALITY OF GROUNDWATER.

OBJECTIVE 1: (MAPPING AND DELINEATION OF RECHARGE AREAS)

The County shall continue to review every two years, and revise as necessary, existing map delineations of County potable water wellfields that are most sensitive to contamination from nearby land development and other surface activities. The biennial review and any subsequent map revisions will be based on geologic, hydrogeologic, hydrologic, and updated anthropogenic contaminant data aggregated since the previous revision.

Policy 1.1: The County shall revise and update its 3-dimensional computer models of ground water flow around public water supply wellfields, as additional data (e.g., withdrawal rates, numbers and locations of wells within wellfields, and hydrogeologic information) become available.

Policy 1.2: The County shall identify those County potable water wellfields, or portions of wellfields, which are susceptible to contamination, caused by adjacent or nearby land uses, drainage patterns, geomorphic conditions, soil properties, and/or hydrogeologic factors, including the presence or absence of confining units. This information shall be revised and updated as necessary.

Policy 1.3: The County shall maintain and update data on existing land uses and land use activities that possess the greatest potential for ground water contamination.

Policy 1.4: The County shall maintain and update its maps of sensitive recharge areas as additional anthropogenic and hydrogeologic information becomes available.

Policy 1.5: This Sub-Element shall incorporate by reference annual recharge amounts for the Surficial and Lower Tamiami aquifers and deeper aquifers such as the Sandstone and Hawthorne Aquifers, as described in the South Florida Water Management District's official publications dated April, 2000 (and scheduled to be published in 2006).

OBJECTIVE 2: (PROTECTION OF GROUNDWATER QUALITY)

Ground water quality shall meet all applicable Federal and State water quality standards.

Policy 2.1: The County shall prohibit discharges to sinkholes or other karst related features that have direct hydrologic connections to the Surficial or Intermediate Aquifer Systems.

Policy 2.2: Non-agricultural developments requiring an Environmental Resources Permit from the South Florida Water Management District (SFWMD) shall preserve groundwater recharge characteristics as required by the SFWMD and as set forth in the SFWMD's Basis for Review, dated January 2004 and as regularly updated. Ground water recharge shall also be protected through the application of the retention/detention requirements and allowable off-site discharge rates for non-agricultural developments specified in Policies 6.2 and 6.3 in the Drainage Sub-Element.

Policy 2.3: The County standards for protecting the quality of ground water recharge within the wellhead protection areas identified in the Future Land Use Element (FLUE) shall be those provided in Policy 3.1.1 of the Conservation and Coastal Management Element.

Policy 2.4: Collier County shall evaluate the necessity for adopting more stringent ground water recharge standards for High or Prime Recharge areas within 2 years of the SFWMD Governing Board's adoption of such areas.

OBJECTIVE 3: (GROUNDWATER QUALITY MONITORING) The County shall continue to collect and evaluate ground water quality data, identifying ambient water quality values and trends, comparing analyzed concentrations to Florida Ground Water Guidance Concentrations,

and providing information to water resources planning and management entities, and to the general public.

Policy 3.1: The County shall continue its existing water quality monitoring program to provide baseline data, evaluate long-term trends, identify water quality problems, and evaluate the effectiveness of the County's ground water protection program.

Policy 3.2: The County shall coordinate data gathering activities with State and Federal agencies to minimize duplication of efforts and enhance the quality of information gathered.

Policy 3.3: The County will annually assess its groundwater quality monitoring data to determine whether monitoring activities and County Ordinances require expansion, modification or reduction.

Policy 3.4: The County shall continually gather and evaluate appropriate data for the purpose of refining and improving the groundwater quality monitoring database used in the County's 3-dimensional ground water model.

Policy 3.5: Collier County shall continue to conduct water resource planning with appropriate County, City of Naples, and SFWMD staff to provide for ground water resource development, utilization, and conservation.

OBJECTIVE: 4: (PUBLIC EDUCATION WITH REGARD TO GROUNDWATER PROTECTION ISSUES) The County shall continue current activities of providing the public with educational materials concerning ground water protection issues in Collier County. These may include, but shall not be limited to, the preparation of annual technical publications of ground water quality data, an informational website for groundwater quality issues, general information publications, establishment of a speakers' bureau, K-12 classroom presentations, and in-service teacher workshops and seminars.

Policy 4.1: The County shall continue to advise the public on the appropriate disposal methods for hazardous wastes, for the purpose of reducing or avoiding the potential for groundwater contamination. In performing this task, the County may utilize the public educational measures listed within Objective 4 of this Sub-Element, or any other measures which may be appropriate.

Policy 4.2: The County shall continue to provide information in a manner that can be understood by the general public regarding Collier County's groundwater system, its vulnerability to contamination and measures needed to protect it from contamination. In performing this task, the County may utilize the public educational measures listed within Objective 4 of this Sub-Element, or any other measures which may be appropriate.

OBJECTIVE 5: (PROTECTION OF CRITICAL RECHARGE AREAS AND GROUNDWATER RESOURCES) The County shall implement plans to preserve critical ground water recharge areas and ground water resources, and will review, evaluate, and revise (if

warranted) those plans and actions, based on the best available geologic, hydrologic, hydrogeologic, and anthropogenic contaminant data.

Policy 5.1: The County shall develop, and continually update, technical criteria for determining those recharge areas, which are critical to the County's long-term ground water needs.

Policy 5.2: The County shall continue to identify critical recharge areas and appropriate protective mechanisms.

Policy 5.3: The County shall continue to identify costs, funding mechanisms and private property rights issues associated with the protection of critical recharge areas.

Policy 5.4: The County shall continue to operate the petroleum storage tank inspection program, especially in identified wellfield protection zones, operating within available State Funding