SCOPE OF SERVICES

Introduction

This scope of services outlines the process that will be followed to prepare the South Miami-Dade Watershed Study and Plan. This scope of services meets the requirements associated with the Request for Proposals (#SM-DWS0201) issued by the South Florida Regional Planning Council on April 8, 2002.

Project Purpose

The Miami-Dade County Comprehensive Development Master Plan ("CDMP") Land Use Policy 3E, adopted by the Board of County Commissioners (BCC) on October 10, 1996, requires development and implementation of a Watershed Plan for southeastern Miami-Dade County. The Watershed Plan is to be based on a comprehensive study that projects, examines, and analyzes surface and groundwater uses and corresponding land uses, including water uses for sustaining and restoring the environment, sustaining economically viable agriculture, providing flood protection, and supplying and protecting drinking water and other water uses pertinent to probable land uses. All work products will be delivered electronically in an ESRI shape file format for geographic information or in a Microsoft Office format for text files, spreadsheets, databases, and powerpoint presentation materials. The Watershed Plan is required by the CDMP to fulfill the following specific objectives:

a. Identify and protect lands, including their uses and functions, that are essential for preserving the environmental, economic, and community values of Biscayne National Park,

b. Identify and establish mechanisms for protecting constitutional private property rights of owners of land identified in 3(a) above,

c. Support a viable, balanced economy including agriculture, recreation, tourism, and urban development in the Plan area, and

d. Assure compatible land uses and zoning decisions in the Study Area consistent with long term objectives for a sustainable South Miami-Dade.

The study must project, examine, and analyze surface- and groundwater uses and corresponding land uses, including water uses for sustaining and restoring the environment, sustaining economically viable agriculture, providing flood protection, supplying and protecting drinking water, and other water uses pertinent to probable land uses. The study must provide data and analysis necessary to thoroughly support the South Dade Land Use and Water Management Plan. The Study must include an examination and analysis of:

a. Examples and models of mechanisms of conservation;
b. All relevant studies pertaining to the Study Area;

c. Property rights of landowners as they relate to objectives of the plan;
d. Existing and needed numeric standards for quality, quantity, timing and distribution of waters into and of Biscayne National Park;
e. Existing and needed studies of freshwater and groundwater supply;
f. Methods and policies for best management practices of all sources of water runoff and levels of service for flood control in the Study Area;
g. Socioeconomic factors for optimization of the objectives to the Plan; and
h. Ways to integrate the Plan into the Central and Southern Florida Restudy.

The Study Area is defined as the area shown in the map herein shown as Attachment A.

Task 1: Existing Conditions and Issue Identification

Sub-task 1.1: Analysis and Documentation of Relevant Studies

The CONSULTANT will review, analyze and document the following studies and plans:

Federal
The Comprehensive Everglades Restoration Plan (CERP)
Biscayne National Park Resources Management Plan
Biscayne National Park General Management Plan
CERP - Biscayne Bay Coastal Wetlands
CERP - South Miami-Dade County Reuse
CERP - C-111N Spreader Canal
CERP - Central Lake Belt Storage Area
C-102 / C-103 Wetland Restoration
The Sustainable Everglades Initiative Strategic Issues Assessment
Everglades National Park General Management Plan
Florida Keys National Marine Sanctuary Final Management Plan
Florida Keys Carrying Capacity Study
Final Habitat Plan for the South Atlantic Region
State and Regional
State of Florida Comprehensive Plan
Governor's Commission for a Sustainable South Florida Reports
The South Dade Watershed Project
Strategic Regional Policy Plan for South Florida
Eastward Ho! Revitalizing South Florida's Urban Core
Eastward Ho! Development Futures: Paths to More Efficient Growth in Southeast Florida
Coordinating Success: Strategy for Restoration of the South Florida Ecosystem
Biscayne Bay Access Strategic Plan
Biscayne Bay Aquatic Preserve Rule and Act
Biscayne Bay Management Plan

Biscayne Bay Surface Water Improvement and Management Plan
Biscayne Bay Strategic Science Plan
Biscayne Bay Water Quality Monitoring
Biscayne Bay Partnership Initiative Final Report
Best Management Practices for South Florida Urban Stormwater Management Systems
Lower East Coast Regional Water Supply Plan
Bill Baggs Cape Florida State Recreation Area Plan
South Florida Multi-Species Recovery Plan
South Biscayne Bay Paleoecological Historical Salinity Benchmark Study
Biological Performance Measures and Targets in Western Nearshore South Biscayne Bay
L-31 E Culvert/Creek Performance Monitoring and Topographic Survey
Long-range Dredged Material Management Plan
Local
Miami-Dade County Comprehensive Development Master Plan
City of Coral Gables Comprehensive Plan
City of Homestead Comprehensive Plan
City of Florida City Comprehensive Plan
City of West Miami Comprehensive Plan
City of South Miami Comprehensive Plan
City of Pinecrest Comprehensive Plan
City of Palmetto Bay Comprehensive Plan
Monroe County Comprehensive Plan
Miami-Dade County and Municipal Land Development Regulations
Miami-Dade County Stormwater Management Master Plan
Miami-Dade Agricultural and Rural Areas Study
Naranja Master Plan
City of Homestead Visioning Report
Various South Dade Planning Charrettes
Master Planned Projects such as the Villages of Homestead Development of Regional Impact and the Homestead Air Force Base Reuse Plan

The above list is not all-inclusive and will be further refined with input from the Watershed Advisory Committee and Technical Review Committee.

The Consultant will develop a summary sheet for each study reviewed. The criteria for evaluating existing data and ongoing studies will be based on several factors including: the timing of the study; data source; agency or group responsible for the study; current status of the plan; geography; and the availability of comparable data. Where inconsistencies or incompatibilities in assumptions, methodologies, or conclusions exist between studies or plans addressing the same topic, the CONSULTANT will use appropriate resource specialists from the CONSULTANT team, to work with members

of the Technical Review Committee and the Watershed Advisory Committee to resolve the conflicts.

Lead Team Member Responsible

Michael Davis and Eric Silva

Interim Work Product:

Listing of existing data and studies relevant to the South Miami-Dade Watershed Study and Plan.

Final Work Product:

A summary of each study which will include at a minimum the following information:

Entity responsible for the plan;
Completion date;
Status;
Geographic area;
Scope; and
Key goals or objectives that relate to the South Miami-Dade Watershed Study and Plan.

See attached project schedule for estimated completion date.

Sub-task 1.2: Population Growth

The CONSULTANT will gather and analyze population data from Miami-Dade County, the United States Census Bureau, the University of Florida's Bureau of Economic and Business Research and the South Florida Regional Planning Council and other relevant population data sources to determine the most likely population projections for the years 2015 and 2050. The accuracy of previous projections will be analyzed to determine which source is most appropriate for the study. A determination of the 2050 population projections will include analysis of projections in other studies. In consultation with the Technical Review Committee, establish the Study's population levels for the year 2050.

Lead Team Member Responsible:

Richard Weiskoff and Eric Silva

Interim Work Product:

Determine and catalog source for population projections based on the accuracy of previous projections.

Final Work Product:

Population projections for South Miami-Dade Watershed Study Area for the years 2015 and 2050. A report describing methodologies and assumptions. See attached project schedule for estimated completion date.

Sub-task 1.3: Development Features

The CONSULTANT will obtain development feature information related to existing land use activity and infrastructure systems to describe the physical make-up of the built environment. The existing spatial assignment of land use activity and infrastructure systems will be used in formulating future land use scenarios. Impervious and pervious surfaces of the watershed will be calculated based on land use patterns to help the Team understand how an increase in impervious surface may affect future water quality and flood protection. The current model projections of the 2025 FSUTMS Miami Urban Area Transportation Model will be utilized to assess traffic conditions under the adopted future land use plan. The primary sources of information on development features are Miami-Dade County Department of Environmental Resource Management Stormwater Planning Studies, and Department of Planning and Zoning (DP&Z), local comprehensive plans, the South Florida Regional Planning Council, and the South Florida Water Management District (SFWMD). In consultation with the Technical Review Committee, the consultant will establish the baseline dates that will form the basis of this subtask (e.g. CERP water supply baseline).

Lead Team Member Responsible:

Eric Silva

Interim Work Product:

Compile development approval information.

Final Work Product:

A series of appropriate maps, graphics, or other visual aids necessary to describe baseline conditions, and overlays to include large developments and areas committed for future development since the baseline, land use and pervious surface maps. A report describing methodologies and assumptions. See attached project schedule for estimated completion date.

Sub-task 1.4: Natural Resources/Wildlife Resources

The CONSULTANT will conduct an inventory of the natural communities within the coastal, urban and agricultural areas of the Watershed and Biscayne Bay. Information will be collected from existing plans, studies and resource management programs to develop a Geographic Information System (GIS) database of both terrestrial and aquatic communities, their location, acreage, existing condition, ownership, conservation management requirements, and uniqueness within the South Florida ecosystem.

Additionally, the CONSULTANT will review regional programs such as, the Comprehensive Everglades Restoration Plan (CERP), Biscayne Bay Partnership Initiative (BBPI) Report, Environmentally Endangered Lands (EEL), and others to evaluate complementary and/or conflicting objectives for natural resources management within the Study area.

The results of the inventory will be used to establish consensus on the importance of preserving and restoring natural communities within the Watershed and Biscayne Bay. A process of priority ranking alternatives of preservation, restoration and/or designation as suitable or unsuitable for development by natural community type will be developed with input from the Watershed Advisory Committee. Based on information gathered during the inventory and program review, the CONSULTANT Team, in coordination with the Technical Review Committee and Watershed Advisory Committee, will identify and catalog beneficial and/or conflicting natural resources management objectives for the Watershed area.

Lead Team Member Responsible:

Marie Ecton

Interim Work Product:

Complete data collection.

Complete review of regional programs.

Catalog natural resource management objectives for the watershed area.

Final Work Product:

Report, including appropriate maps, graphics, and other visual aids and descriptions necessary to describe existing natural resources issues, methodologies and assumptions. See attached project schedule for estimated completion date.

Sub-task 1.5: Water Resources

The CONSULTANT's water resources assessment will make use of and expand on previous work by Miami-Dade County DERM which has developed XPSWMM models of basins throughout the County. The CONSULTANT will obtain the XPSWMM Models of all basins (specifically C-1, C-2, C-100, C-102, C-103, North Canal and Florida City Canal) within the primary South Miami-Dade Watershed Study Area, and the C-3 Basin to the extent that model data is available from DERM. These models will be executed in their existing form to assure stability and compatibility with software and platforms. Results will be compiled for water quality and quantity parameters. The CONSULTANT will work with DERM to determine pollutant contribution from Drainage Areas 3 and 4.

Parameters generated under this sub task will be evaluated in comparison to thresholds established by regulation, previous studies and recommendations by the Technical Review Committee.

The DERM models will be updated to reflect the baseline condition. This baseline condition scenario will be based on the existing system as modeled by DERM. The baseline condition scenario may be further modified, in consultation with the Technical Review Committee, to establish the one selected baseline condition. Only one baseline condition scenario will be modeled as part of this project.

Lead Team Member Responsible:

Jeff Anton

Interim Work Product:

Set-up GIS database with data for analysis by basin.

Review existing studies and usable information.

Final Work Product:

Full and complete written description of the baseline condition scenario.

Report, including appropriate maps, graphics, and other visual aids necessary to present an accurate representation of the chemical, physical and biological conditions of the Study Area, including methodologies and assumptions. See attached project schedule for estimated completion date.

Sub-task 1.6: Description of Regulatory and Planning Agency Jurisdictions

The CONSULTANT will inventory and examine existing federal, state and local regulatory policies and agreements, and planning documents. The CONSULTANT will develop a matrix of regulations affecting the Watershed and Biscayne Bay.

Lead Team Member Responsible:

Michael Davis

Interim Work Product:

Identify and map jurisdictional boundaries, regulations and agencies with jurisdiction in the Watershed and Biscayne Bay.

Final Work Product:

Matrix and map series, graphics and other visuals aids necessary to describe regulations affecting the watershed area. Report of methodologies and assumptions. See attached project schedule for estimated completion date.

Sub-task 1.7: Land Inventory and Ownership Characteristics

The CONSULTANT will inventory significant parcels of land, research current approvals, ownership characteristics and development restrictions on these parcels.

The ownership characteristics of significant parcels or potential redevelopment sites will be researched through the Miami-Dade County Property Appraiser's Office. Federal, State, local and special interest land acquisition programs will be consulted and documented as part of the CONSULTANT's background research.

Lead Team Member Responsible:

Michael Davis

Interim Work Product:

Define the characteristics of a significant parcel.

Define criteria to determine parcels for conversion and/or redevelopment.

Identify significant parcels.

Describe development regulations and ownership of significant parcels.

Final Work Product:

Report, including appropriate maps, graphics and other visual aids necessary to describe land ownership characteristics of significant parcels, methodologies and assumptions. See attached project schedule for estimated completion date.

Sub-task 1.8: Watershed Characteristics - - Parameters and Thresholds

Based on information generated during Sub-tasks 1.1 through 1.7, the CONSULTANT will establish appropriate tolerance levels for baseline parameters and thresholds for the purpose of future planning analysis. ***Parameters*** are variables (e.g., preserved land, water quality, flood protection, and water supply) of the greatest concern to the Watershed Advisory Committee. ***Thresholds*** define maximum limits, conditions, or concentrations acceptable for each parameter.

Once determined, parameter thresholds will define the standard for impact tolerance and provide a measure by which alternative scenarios and actions can be evaluated and compared. For Water Resources, the CONSULTANT will complete a comparative analysis against the established parameters. The Consultant will work with the Technical Review Committee to evaluate the most significant water resources parameters that will constitute thresholds to be used in Sub-task 3.4.

The CONSULTANT will use parameter thresholds during the impact assessment phase of the project. Output data from impact assessments conducted, as part of Task 3 will be compared to the parameter thresholds established. Thresholds will determine whether the result of an action or scenario meets the basic criteria for "go" or "no-go". If a threshold is exceeded, the action causing or determined to be contributing to the problem would be considered a "no-go". At that point, the CONSULTANT may consider applying alternative actions, or appropriate mitigation, (see examples of actions in Task 4) to create a "go". At a minimum, thresholds will be established for the following parameters:

- Air quality;
- Water quality;
- Water quantity;
- Wetlands;
- Threatened and endangered species;
- Land conservation;
- Infrastructure;
- Employment;
- Tourism;
- Demographics;
- Economic diversity;
- Open space;
- Aesthetics;
- Affordable housing;
- Crime/public safety.

Lead Team Member Responsible:

Michael Davis and Eric Silva

Interim Work Product:

Define parameters.

Define thresholds.

Final Work Product:

Description and analysis of thresholds for each parameter, including methodologies and assumptions. See attached project schedule for estimated completion date.

Watershed Advisory Committee Involvement in Task 1

As described in the Public Involvement section of the scope, the Watershed Advisory Committee will be consulted with and will receive monthly updates on the project. Work product review dates are shown in the attached project schedule.

Technical Review Committee Involvement in Task 1

As described in the attached project schedule and in Attachment 1, the Technical Review Committee will be consulted with during the development of all work products associated with Task 1.

Task 2: Formulate Land Use Scenarios

Subtask 2.1: Opportunities and Constraints Analysis

The CONSULTANT will conduct an opportunities and constraints analysis using information and data (e.g., projects, plans, stakeholders, conditions, etc.) collected and evaluated during Task 1. This information will be utilized to assist in a determination of realistic options for development, restoration and/or resource protection within the Watershed and Biscayne Bay. As an example, existing studies and plans such as *Eastward Ho!, The South Dade Watershed Project, CERP, Miami-Dade County Agricultural and Rural Area Study, etc.*, as well as information such as topography (Miami Ridge), stormwater flow/flood impact, aquifer recharge areas, socioeconomic and land use patterns, and environmentally sensitive features will be used to formulate an opportunities and constraints map. The map and associated data, will provide the "framework" for guiding the assignment of land use classifications within the study area by identifying

opportunities for growth, as well as areas where growth should be prohibited or discouraged.

Lead Team Member Responsible:

Michael Davis

Interim Work Product:

Compile and summarize relevant studies.

Final Work Product:

Maps, graphics, and other visual aids necessary to describe opportunities and constraints and the issues associated with specific opportunities and constraints, methodologies and assumptions. See attached project schedule for estimated completion date.

Subtask 2.2: Development of Land Use Policy Scenarios

The CONSULTANT will develop three land use scenarios for south Miami-Dade County. The scenarios will be developed based on the population projections identified in Sub-task 1.2. The Regional Economic Models, Inc. (REMI) economic model for Miami-Dade County may be used to assist in distributing the projected population among various sectors of the economy. This model will be provided to the CONSULTANT by the SFRPC. These projections will be applied to all scenarios for the years 2015 and 2050. The scenarios may be further refined after consultation with the Technical Review Committee and Watershed Advisory Committee at their regularly scheduled meetings.

Scenario I will be based on the continuation of existing land use and zoning practices, including practices that reflect current development trends. This scenario assumes expansion of the Urban Development Boundary to accommodate population growth. The CONSULTANT will review and analyze existing policies and practices to determine the most likely distribution of population and future development.

Scenario II will be based on full implementation of existing policies. This scenario assumes expansion of the Urban Development Boundary may be necessary to accommodate population growth in the most efficient patterns. Land use classifications, along with LDRs will be assigned to capture and integrate the future land use demands of economic activity and population growth within the study area. At a minimum this scenario will address policies which:

1. Direct land use patterns to areas best suited for that form of development;
2. Protect environmentally sensitive areas and critical facilities;

3. Expand and create opportunities for mass transit to reduce automobile dependency;
4. Encourage mixed-use development;
5. Maximize the efficient use of existing infrastructure;
6. Consider hurricane evacuation issues;
7. Consider increases the intensity and density of existing land uses, as appropriate;
8. Consider incremental land uses changes to existing land use classifications, if necessary; and
9. Promote redevelopment and infill development.

It is anticipated that this approach will result in: an increase of nodal and corridor development along suitable areas of the Miami Ridge; opportunities for mass transit or regional transit corridor development; reduced sprawl; improved stormwater treatment/regulations for the developed areas; improved watershed characteristics; the protection and/or acquisition of environmentally sensitive lands and open space; the sustainability of economically viable agricultural areas; central and efficient infrastructure to serve population nodes and corridors.

Scenario III assumes that no change to the location of the current Urban Development Boundary. Land use classifications, along with LDRs will be assigned to capture and integrate the future land use demands of economic activity and population growth within the study area. The CONSULTANT will prepare strategies and policy changes that allow for anticipated population growth at densities necessary to accommodate all new development within existing areas allocated for urban development.

The CONSULTANT will apply LDRs and planning principles to the land use classifications assigned to each scenario. Information to be determined will include, but is not limited to impervious surface coverage by land use activity, applications of BMPs, type of residential units and density, non-residential acreage by type of activity including agricultural, protected acreage and remaining habitat and natural communities, population and employment centers.

In addition to providing data for modeling, the application of LDRs will provide valuable information for understanding opportunities for and effects on resources that cannot necessarily be modeled such as mass transit opportunities, property rights impacts, land acquisition needs, and quality of life issues.

Lead Team Member Responsible:

Eric Silva

Interim Work Product:

Develop a list of planning principles for each scenario with input from the Watershed Advisory Committee.

Final Work Product:

Future land use maps, graphics and other visual aids necessary to describe each scenario, including an analysis of appropriate data to support the rationale behind the assumptions used, and a complete discussion of LDR and policy changes as appropriate. See attached project schedule for estimated completion date.

Watershed Advisory Committee Involvement in Task 2

As described in the Public Involvement section of the scope, the Watershed Advisory Committee will receive monthly updates on the project. Work product review dates are shown in the attached project schedule.

Technical Review Committee Involvement in Task 2

It is anticipated that the Technical Review Committee will have significant involvement in Task 2.

Task 3: Modeling and Impact Assessment

Sub-task 3.1: Quantifying the Effects of Population Growth

The CONSULTANT will analyze the effects of population growth using the REMI. REMI provides a dynamic modeling capability that allows the user to simulate scenarios involving a large number of economic and demographic variables. The historical coefficients are based on time series information and the blocks of variables include economic output, population, labor, market shares and prices.

The CONSULTANT will quantify and project employment and other economic characteristics for fifty-three (53) sectors of the economy projected into the future for the time horizons 2015 and 2050. If necessary, in the opinion of the Technical Review Committee, the CONSULTANT will utilize the Impact Analysis for Planning (IMPLAN) model and the Regional Input-Output Modeling System (RIMS-II) to make more detailed delineations between sectors of the economy. Economic modeling will be performed using development activities over the last twenty years along with information on approved but un-built projects within the Watershed. The CONSULTANT will build a REMI model for the Watershed area. This will provide a description of countywide economic factors that may influence future development patterns within the Watershed.

The outputs of this REMI modeling will identify changes in public expenditures, taxes generated, population data and other socioeconomic information. The CONSULTANT will create links from this output data to identify specific infrastructure demands, water resource impacts and changes to the natural environment. In addition, Economic Input-Output Life-Cycle Analysis (EIO-LCA), in the opinion of the Technical Review Committee, may also be applied during this task to identify key polluting sectors. Economic Input Output-Life Cycle Analysis traces out the various economic transactions, resource requirements and environmental emissions required for a particular product or service. The analysis will aid in understanding how industrial development demands in the Study Area create stressors that impact the watershed and Biscayne Bay environments.

Development levels under each land use scenarios will be extracted by census tract allowing for iterative impact modeling using the REMI economic modeling tool. As development levels (absorption etc.) for each tract are increased or decreased based on the scenario being studied, the impact on infrastructure, water resources and the natural environment will vary.

Team Members Responsible:

Dr. Richard Weiskoff, Eric Silva and Ian Miller

Interim Work Product:

Analyze socio-economic data and other outputs.

Final Work Product:

Economic models, including methodologies and assumptions, for the Watershed area and Miami-Dade County.
Report, including appropriate maps, graphics and other visual aids necessary to describe costs associated with each scenario, their impacts on infrastructure expenditures and socio-economic data. See attached project schedule for estimated completion date.

Subtask 3.2: Infrastructure Assessment

The CONSULTANT will link the projected population for 2015 and 2050 to Miami-Dade consumption and discharge rates in accordance with existing conditions and adopted plans for water, sewage and solid waste. REMI will be used to determine the water, sewage, solid waste and transportation costs required to meet the demands created by each scenario. Future impacts to schools and recreation/open space will also be calculated based on the currently adopted Miami-Dade County/or State of Florida

demand calculations. The CONSULTANT will compare municipal capital improvement programs against the REMI outputs for infrastructure costs. This comparison is necessary to draw conclusions on potential public facility/investment-shortfalls and to identify potential feasible changes to existing capital improvement plans. Where maximum thresholds for water, sewage, solid waste, flood protection and transportation facilities have been reached, adjustments will be made to the REMI input controls. The CONSULTANT will seek input on potential revisions to the REMI model from the Technical Review Committee to establish a better understanding of critical factors and potential tradeoffs.

The CONSULTANT will compare their analysis and projections with existing financial/economic models on surface and underground water abstraction (water/supply and demand models) used by the SFWMD in establishing affordable water rates and customer charges necessary to sustain infrastructure within the project area of the district. These models would be used to assess the financial and economic impacts to any implied or proposed changes in water use permitting and environmental resource permitting flowing from the growth scenarios. This service goal can be accomplished by obtaining input from key stakeholders and possible sharing of mission critical data that will enhance the practicality and relevance of the analysis (growth scenario modeling impacting water infrastructure).

The transportation modeling component of the project will examine the transportation impacts of the three alternative scenarios. Each scenario will be modeled for two time horizons (years 2015 and 2050). The transportation analysis will identify the most congested areas for each scenario and will develop a general mitigation plan and a preliminary cost estimate for transportation improvements. The evaluation matrix will include measures of effectiveness (MOE) such as the average trip length per trip purpose, overall traveled mileage (VMT), and the roadway volume/capacity (v/c) ratio. With the consideration of the Technical Review Committee, the 2025 FSUTMS Miami Urban Area Transportation Model, or other validated model, will be used as a baseline for all traffic projections. The Urban Land Use Allocation Model (ULAM) and other techniques may be used to project future land uses by geographic area for each of the scenarios.

Lead Team Member Responsible:

Eric Silva, Dr. Richard Weiskoff and Ian Miller

Interim Work Product:

Link population data to infrastructure data.

Link water supply plans and CERP implementation to infrastructure assessment.

Determine where infrastructure improvements are required to meet the needs of each scenario.

Provide financial review and analysis including an affordability analysis relating to proposed infrastructure requirements.

Final Work Product:

Report, including appropriate maps, graphics and other visual aids necessary to compare the required improvements for each scenario and local Capital Improvement Plans and other agency plans, including methodologies and assumptions. See attached project schedule for estimated completion date.

Sub-task 3.3: Natural Resources Assessment

The CONSULTANT will conduct a qualitative evaluation of the direct, indirect and cumulative effects of the three land use scenarios on natural communities. The comparative overlay map of land use opportunities and constraints developed in Task 2.1 will be used to identify potential impacts to natural communities within the Watershed and Biscayne Bay.

The CONSULTANT will evaluate the impacts of future land development in terms of limiting factors known to affect the quality of natural communities. At a minimum, the CONSULTANT will conduct the following impact assessments of the future land use scenarios on natural communities within the Watershed and Biscayne Bay:

- Wetlands will be assessed by evaluating the effects of direct loss through dredge and fill activities, stormwater runoff, pollutants, siltation, hydroperiod alteration, and exotic species on the hydrologic functions and wildlife habitat values of the ecosystem;

- Upland habitats will be assessed by evaluating the uniqueness of an area within the Watershed, habitat loss and/or degradation, biological diversity of flora and fauna, invasive and exotic species, sufficient buffer from adjacent land use, fire dependence in urban environs (e.g., pine rocklands), and natural resource-based recreation opportunities; and

- The potential impacts of future land use scenarios on coastal and marine habitats, important to the preservation and protection of Biscayne National Park, Biscayne Bay and Florida Bay will be evaluated. For example, land alterations of mangrove communities affects the protection of coastal areas from storm surge damage and the ability of the area to support nurseries of

species important in commercial fisheries. The impacts of development on seagrass beds include the direct effects of siltation, pollutants, changes in salinity regimes and physical damage by prop scarring. Nearshore hardbottoms and coral reef communities are affected by siltation, water quality degradation and physical damage of anchoring vessels (i.e., the cumulative effects of coastal development activities).

Lead Team Member Responsible:

Marie Ecton

Interim Work Product:

Overlay each land use scenario with natural areas map.

Identify limiting factors known to affect the quality of natural communities.

Final Work Product:

Report, including appropriate maps, graphics, and other visual aids necessary to describe the impacts of each scenario on natural resources, methodologies and assumptions. See attached project schedule for estimated completion date.

Sub-task 3.4: Water Resources Analysis and Modeling

Macro Level Assessment – Watershed Management

The CONSULTANT will develop a Watershed area or macro level analysis to describe what is occurring on the larger scale including the overall effects on Biscayne Bay, the freshwater environment and critical water supply issues. The analysis will recommend specific actions, policies and regulations that may be used to protect water resources and guide consistent watershed management policies and environmentally sustainable growth. The first step in this effort is to develop an integrated picture of the Watershed and Biscayne Bay based upon review of existing modeling efforts. At a minimum the CONSULTANT will review the following studies and analyses:

1. Lower East Coast Water Supply Plan – SFWMD – SFWMM Model

2. XPSWMM Runoff Pollutant Loading and Flooding Analysis – Miami-Dade DERM

3. Saline Groundwater Interface and other Groundwater Models – USGS

4. MODBRANCH Groundwater Model with Surface Conveyance – ACOE

5. Biscayne Bay Circulation Model – ACOE

6. Institute for Food and Agricultural Services models of agricultural impacts on water quality

The studies listed above will be thoroughly reviewed for input data, sensitivity to assumptions and interpretation of results as they relate to other study conclusions. The team will also make recommendations of the most critical topics where additional investigation and analyses are most warranted.

Groundwater

The Consultant will review existing groundwater literature and studies. Significant land use practices leading to point and non-point pollution sources will be identified and analyzed. In consultation with the Technical Review Committee, Best Management Practices to reduce groundwater degradation will be suggested.

Model Execution

Surface Water/Pollutants

The land use input parameters in the DERM models will be updated to reflect the three land use scenarios developed in Sub-task 2.2. The CONSULTANT will complete a comparative analysis against the parameters established in Sub-task 1.8. The CONSULTANT will report to the Technical Review Committee parameter changes reflected against the results of the selected baseline condition. The CONSULTANT will also suggest potential strategies that may be implemented to mitigate adverse impacts or enhance positive changes to quality, distribution and timing.

It is expected these results and suggestions will be utilized to develop the Preferred Land Use Plan. The basin models will be updated to reflect only the land use changes proposed under the preferred plan. Model results will be evaluated to determine positive and negative impacts, which will be reported to the project team. The modeling team will also recommend potential infrastructure or policy changes that may mitigate adverse impacts or enhance positive changes.

Lead Team Member Responsible:

Jeff Anton

Interim Work Product:

Determine input data for each scenario.

Determine runoff resulting from site development.

Execute modeling for each scenario.

Execute the review of DERM's basin specific modeling.

Final Work Product:

Report, including appropriate maps, graphics, and visual aids necessary to describe the impacts of each scenario on water resources, methodologies and assumptions. See attached project schedule for estimated completion date.

Sub-task 3.5: Property Rights Evaluation

The CONSULTANT will complete a comparison of competing interests under each scenario and the property data acquired as part of Sub-task 1.7 to determine potential property rights of landowners as they relate to the objectives of the plan, and identify mechanisms for protecting constitutional private property rights of affected landowners. Property acquisition sites, new land use designations and competing public interests are some of the property rights issues that may play a role in deciding the future development scenario for south Miami-Dade County. Because some of these actions will be required to implement each of the three future scenarios, this evaluation will prove beneficial in deciding which actions to implement.

Lead Team Member Responsible:

Michael Davis and Beth Carlson

Interim Work Product:

Identify potential issues.

Produce white paper on the existing legal framework, including property rights trends in other watershed areas.

Final Work Product:

Report, including appropriate maps, graphics and other visual aids necessary to describe property rights considerations and issues, and identification of mechanisms for protecting constitutional private property rights of affected landowners, and applicable policies and programs to resolve such issues. See attached project schedule for estimated completion date.

Sub-task 3.6: Output Evaluation and Key Issues for Alternative Actions

The CONSULTANT will evaluate the outputs of the infrastructure analysis, natural resources assessment, economic modeling, and water resources modeling from each land use scenario against the thresholds established as part of Sub-task 1.8. The output data for which no thresholds were established will be used, in part, for comparison of land use scenario impacts. A matrix will be prepared showing all output data including threshold exceedances.

Based on our analysis and feedback received, the CONSULTANT will prepare a list of key features for an alternative action evaluation. The component(s) of a land use scenario causing an exceedance of a threshold may be addressed through alternative action cost-benefits analysis or may have to be eliminated as part of the land use scenario.

Lead Team Member Responsible:

Michael Davis

Interim Work Product:

Identify relevant output data for which no thresholds were established.

Final Work Product:

Matrix comparing assessment outputs and thresholds. List of key features for alternative action evaluation, including methodologies and assumptions. See attached project schedule for estimated completion date.

Watershed Advisory Committee Involvement in Task 3

As described in the Public Involvement section of the scope, the Watershed Advisory Committee will receive monthly updates on the project. Work product review dates are shown in the attached project schedule.

Technical Review Committee Involvement in Task 3

As described in the attached project schedule and in Attachment 1, the Technical Review Committee will be consulted with during the development of all work products associated with Task 3.

Task 4: Formulate Alternative Actions

Sub-task 4.1 - Cost-Benefit Analysis

The CONSULTANT, at the direction of the Project Manager, will conduct a cost-benefit analysis of alternative watershed management projects, programs and policies that are linked to sustainable watershed management. The cost-benefit analysis will be used to evaluate the interaction and relationship between the following plan elements: water supply stewardship: storage, distribution, use and quality, flood protection, wetlands/ecosystem integrity, recreation and future land use development and impacts.

A cost benefit analysis is an analytical framework or set of procedures employing economic analyses that assist policymakers in organizing information about costs, externalities and the benefits of a particular action or alternative from society's standpoint**.**

- Since all stakeholders are considered, cost benefit analysis is a useful tool for watershed management and land use planning.
- The cost benefit analysis does not substitute for a decision, but will enable the SFPRC Miami-Dade County and the public to consider numerous issues impacting stakeholders in an organized fashion using common terms**.**
- Especially when evaluating tradeoffs, cost benefit analysis provides more informed analysis than simply describing in qualitative terms the benefits and costs of an action.

Based on the assessment results from (Task 3) and the cost benefit analysis conducted in Task Sub-task 4.1, the CONSULTANT will develop a list or menu of alternatives for possible inclusion in the final plan.

- The alternatives will be actions that relate to effective watershed management and long-term sustainable development planning practices.

- Each possible alternative will contain a supporting economic analysis report and associated project/policy resource statement displaying the benefits and costs in monetary terms over time. The report will enable the policymaker to see whether the favorable effects of the alternative (benefits) outweigh the unfavorable effects (costs) of the action.

Alternatives Analysis

The alternatives list will include watershed management strategies, projects, policies, and tradeoff issues for evaluation using economic analysis. At a minimum the CONSULTANT will evaluate the following project impacts and planning strategies using cost-benefit or cost effectiveness analysis:

- Modifications to Comprehensive Plan; e.g. land use classifications and overlays.
  Altering existing land use classifications to accommodate a preferred land use alternative can involve tradeoffs. These tradeoffs can be evaluated using cost-benefit analysis. For example, limiting development and types of agricultural activities may involve sacrifices that can be costed and compared to the benefits of improved groundwater quantities and quality and the protection of critical life-sustaining ecosystems.

- Modifications to regional, state, and/or federal regulations, policies, or plans.

- Economic Incentives.
  Economic incentives geared towards sustaining the water supply and promoting sustainable land uses within the watershed will be evaluated.

- Pollution Abatement Strategies.

- Modifications/additions to LDRs may include but are not limited to,
  (a) Better site design requirements including street/roadways design, site specific stormwater facilities, setbacks, parking lot design and materials.
  (b) Zoning; (e.g., consider overlay zoning, watershed zoning);
  (c) Subdivisions requirements (e.g. lot size);
  (d) Environmental regulations, floodplain buffers, tree protection, landscaping; and
  (e) Wastewater regulations.

- BMPs

  Cost-effectiveness analysis will, as appropriate, be applied to evaluate alternative best management practices or BMPs.

- Land Conservation and Management Strategies

Within a sub-basin watershed area alternative growth scenarios will have an impact on the integrity of aquatic and terrestrial ecosystems and other uses compatible with sustainable development. For example, land may need to be purchased or leased to protect critical habitats, aquatic corridors or hydrologic reserves. Cost-benefit analysis can shed light on the relative costs and benefits from society's perspective of implementing land conservation and management strategies to achieve these watershed management objectives.

- Terrestrial and aquatic buffers

  Regulations that encourage the formation of terrestrial and aquatic buffers, tree protection and landscaping can result in direct and indirect benefits that can be compared to the costs of implementing these watershed management strategies. Cost-benefit analysis can aid in comparing how the economic costs of establishing buffers relates to the benefits derived from flood control protection, pollutant filtration and removal from receiving water bodies (improved water quality), habitat protection and limited low impact recreational uses.

- Capital improvement projects (e.g. water, sewer and roadways)

  The capital appropriations for environmental and transportation related infrastructure together with the necessary operation and maintenance costs can be compared to the future economic benefits that will be realized from these investments over time.

- Water Management Options/Plans
  Hydrologic restoration, flood protection and possible changes to the canal system, evaluation of inputs to Biscayne Bay

- Type of stormwater and wastewater treatment and disposal evaluating facilities and practices

- Management of non-stormwater discharge.

Economic valuation is part of the cost-benefit analysis used to assign money values to benefit and cost streams over time. Valuation means the placing of monetary values on environmental goods and services or the impacts of environmental quality changes. Valuation allows further economic analysis of alternative development projects and policies by enabling the assessment of the whole range of direct and indirect benefits and costs of proposed actions (alternatives) from a broader societal perspective.

The CONSULTANT will apply the following economic analyses framework and procedures in implementing the Cost-Benefit Analysis:

1) Conduct an Environmental Screening Analysis to Identify Possible Environmental Externalities and Economic Damages.

As part of Task 3, the CONSULTANT will have identified stressors on infrastructure, the natural environment and water resources associated with each land use scenario. Some examples of environmental impacts and their related economic damages or negative externalities (bads) relevant to South Florida are listed in Table 1. A watershed management strategy or land use policy change may result in averting some of the damages shown in Table 1. Within the cost benefit framework this avoided damage would be counted as a benefit stream over time.

Table 1

Characteristics of Selected Externalities in South Florida*

Source	Environmental Impact	Externality
Urbanization/Urban Sprawl	Loss of habitat; fragmentation of habitat	Reduced tourism; Reduced recreation
Urbanization/Urban Sprawl	Reduced Groundwater Recharge	Increased Costs for Water Supply
Increased Energy Use (Vehicles and Stationary Sources)	Reduced Air Quality	Decreased Public Health
Burning of Fields	Reduced Air Quality	Decreased Public Health
Coastal Development	Loss of Marshes and Mangroves	Reduced Storm and Flood Protection

* Source: Correia, M.E and Craig Diamond, Application of Valuation Methodologies to South Florida Externalities, (1995).

The CONSULTANT will use **full cost accounting, in consultation with the Technical Review Committee,** to identify, evaluate and price the externality impacts within the watershed. Externalities are the impacts of actions taken to produce or consume a good that are not reflected in costs or prices and affect those who are not directly involved in or compensated for the goods production or consumption. For example, some agricultural runoff or stormwater discharges migrating downstream may impact water quality and fishery breeding grounds or habitats in Biscayne Bay. The effluents impose an externality on fishermen and recreators using impacted resources.

2) Review and analyze both benefit and cost sides of all situations. A benefit foregone is a cost; an avoided cost is a benefit.

3) Specify the basis of comparison or specify the "with" and "without" project scenarios or alternatives. What will the likely conditions be in the absence of the alternative's project, policy or program?

4) Economic Analysis will be applied to value these impacts such that they can be included in the formal analysis of the project. Formal analysis means that resource

flows are valued in dollars and compared over time. In consultation with the Technical Review Committee, the CONSULTANT, will select the most appropriate methods to implement the cost-benefit analyses. This means that the budget, situation, data and information obtained during the course of the project will guide what methods will be applied. The following lists some of the most widely used methods in this area.

- **The opportunity cost** of using scarce resources. What activities are precluded by a policy action and what is that cost?
- **Preventive Expenditures -** Sometimes expenditures made to avert or mitigate environmental damages can be viewed as minimum costs for these environmental problems.
- **Replacement Costs -** This approach is useful when an environmental impact causes or necessitates the replacement of some physical asset, such as a dam, road, canal or bridge.
- **Shadow Projects -** This approach involves examining the costs of a hypothetical supplementary project that would provide substitute environmental services to a resource that was damaged or wiped out by some development alternative or activity.
- **Travel Cost Method -** This method derives the value of the environmental quality at a location from revealed information on the costs people incur to travel to that park, resource or habitat area as recreators.
- **Hedonic Methods** - These indirect methods are used to infer the value of an environmental good when the good is an attribute that affects the value of a market good.
- **Contingent Valuation Methods -** The contingent valuation method or CVM uses carefully constructed surveys to elicit valuations of resources for which no market exists.

In consultation with the Technical Review Committee, the CONSULTANT will select the appropriate valuation approaches to provide quantitative measures of benefit and cost streams associated with each alternative. Where benefits cannot be monetized using established economic approaches, cost effectiveness analysis will be used. **Cost-Effectiveness Analysis** seeks the least cost solution to achieve a given physical target (i.e. what are the minimum costs that will achieve an X% reduction in phosphorous loadings?).

Quantitative measures of merit will be used to evaluate the feasibility of projects, programs and policies. The main measures of merit, which may be used as part of Sub-task 4.1Task 4, are:

- **Economic Internal Rate of Return (EIRR) -** The EIRR is usually compared to a hurdle rate called the economic opportunity cost of capital (EOCC) in assessing economic feasibility of projects, programs and policies. If the EIRR exceeds the EOCC, then the project/policy action is considered economically feasible from a societal viewpoint in terms of the correct allocation of resources.

- **B/C (Benefit Cost Ratio) -** The B/C ratio compares the discounted benefits to the discounted costs. If the ratio exceeds one the project is considered viable.

- **NPV (Net Present Value) -** The net present value represents the present sum of the discounted net benefits over time. Net benefits are discounted to year 0 or the present period to determine the present worth of the project.

5) Sensitivity Analysis - Sensitivity analyses examine how the project outcomes (net benefits) may change as a result of altering one or more variables (resource flows or other parameters and assumptions) in isolation or in tandem.

Lead Team Member Responsible:

Ian Miller

Interim Work Product:

Develop a list of alternatives that relate to effective watershed management and sustainable land use planning.

Final Work Product:

Reports, including appropriate maps, graphics and other visual aids necessary to describe economic analysis watershed management to support the selection of alternative projects, programs or policies that substantiates the management strategies. The reports will include project resource statements containing the measures of merit to be used in Sub-task 4.2 and a description of methodologies and assumptions. See attached project schedule for estimated completion date.

Sub-task 4.2: Select Practicable Alternative Actions (Implementation Steps) for Scenario I, Scenario II and Scenario III and Selection of a Preferred Scenario

Based on the results of the impact assessment and cost-benefit analysis, the CONSULTANT will establish a set of alternative actions for each of the land use scenarios. These options will be identified based on an evaluation of potential amendments to existing land development regulations (LDRs) and comprehensive plan elements. This may include, but is not limited to, special overlay zones, changes in zoning and comprehensive plan classifications, building and site design changes, and best management practices. Additional options will be identified through the evaluation of regional and state policies. Alternative actions may include but are not limited to those listed in Sub-task 4. Alternative actions will meet the objectives of Land Use Policy 3E and mitigate for impacts of each of the three land use scenarios.

The CONSULTANT will recommend the most appropriate set of alternative actions for each scenario but the final decision on alternative actions will be made after consultation with the Watershed Advisory Committee.

The CONSULTANT will present the results from the outputs/threshold evaluation and cost-benefit analysis to the Watershed Advisory Committee, stakeholders, elected officials and general public. The CONSULTANT will report back to these groups on the land use scenario outputs, threshold evaluation (subtask 3.6), which exceed the critical thresholds identified in Task 1.8 and the benefits and costs associated with specific alternative actions. This is required to develop a set of practicable "alternative actions" which can actually be approved and implemented by the County. The purpose of this public involvement is to obtain consensus on acceptable alternative actions and frame a preferred future land use scenario for the Watershed.

After consideration of the feedback from the Watershed Advisory Committee, stakeholders, elected officials and the general public, the CONSULTANT will develop a draft preferred alternative and practicable alternative actions for final review by the Watershed Advisory Committee.

Lead Team Member Responsible:

Michael Davis, Eric Silva and Carey Sirianni

Interim Work Product:

Develop a matrix and associated factors for evaluating each alternative action.

Develop an inventory of potential alternative actions.

Report to the Watershed Advisory Committee, stakeholders, elected officials and general public on the results of the outputs/threshold evaluation and cost-benefit analysis.

Final Work Product:

Report, including appropriate maps, graphics and other visual aids necessary to describe practicable alternative actions for each scenario, methodologies and assumptions.

Report, including appropriate maps, graphics and other visual aids necessary to describe the preferred alternative land use scenario and associated alternative actions, methodologies and assumptions. Report of proceedings on the public comments received during the community outreach meetings.
See attached project schedule for estimated completion date.

Sub-task 4.3: Evaluate Preferred Land Use Scenario

As a process check, the CONSULTANT will conduct the infrastructure assessment, natural resources analysis, water resources analysis and economic modeling, including cost/benefit and effectiveness analyses as determined necessary by the Technical Review Committee, completed as part of Task 3 on the preferred scenario. Final assessments and model simulations will be executed for both 2015 and 2050 to evaluate the overall effectiveness of the preferred scenario in protecting water and natural resources and its ability to supply water for build out conditions. Alternative actions for the preferred scenario will be tied to and support the goal of Land Use Policy 3E of the CDMP, which is to optimize the economic, social and environmental values currently recognized in the CDMP within the Watershed area. The CONSULTANT will evaluate whether existing plans and programs, or other feasible measures, can be applied to mitigate the negative consequences resulting from the implementation of the preferred land use scenario.

The CONSULTANT will select a suite of infrastructure and policy changes which will then be applied to further refine the Preferred Land Use Plan. Water resources model results will be evaluated both for the efficacy and cost effectiveness of the preferred land use scenario, system and policy changes. The affect of LDR changes on water quality/quantity will be evaluated.
The refined basin models will be optimized by removing ineffective or inefficient changes while keeping recommended changes. This model will be executed one final time to provide the predictive tool of the recommendations of the South Miami-Dade Watershed Study.

Lead Team Member Responsible:

Michael Davis

Interim Work Product:

Conduct economic, infrastructure, water resources and natural resources assessments.

Determine if existing plans and policies can mitigate potential impacts.

Final Work Product:

Report, including appropriate maps, graphics, and other visual aids necessary to describe alternative actions to be selected for the preferred land use scenario, methodologies and assumptions. See attached project schedule for estimated completion date.

Watershed Advisory Committee Involvement in Task 4

As described in the Public Involvement section of the scope, the Watershed Advisory Committee will receive monthly updates on the project. Work product review dates are shown in the attached project schedule.

Technical Review Committee Involvement in Task 4

As described in the attached project schedule and in Attachment 1, the Technical Review Committee will be consulted with during the development of the cost benefit analysis associated with Sub-task 4.1.

Task 5: Implementation Strategies for the Preferred Land Use Scenario

Sub-task 5.1 Draft Implementation Strategies

The CONSULTANT will develop a series of specific actions to facilitate implementation of the preferred scenario and associated support materials. Implementation strategies will be formulated for the short term and the long term planning horizons. These strategies will be consistent with major programs such as CERP and the long range planning goals of Miami-Dade County.

As part of our evaluation of potential implementation strategies, the CONSULTANT will identify funding sources that are permissible within the applicable statutory guidelines. Our approach in formulating financing plans will integrate previous local, regional and state recommendations on funding mechanisms for south Miami-Dade County. Equitable public funding structures that take into account such considerations as the proportional allocation of tax burdens may be considered. Financing plans for alternatives may involve, but not be limited to some mix of Federal and State grants/appropriations, Special District and Fee/Revenue based bonding structures, public/private financing vehicles and preservation/conservation funds.

Fundamental to the implementation of the SDWSP is its adoption by the Miami-Dade County Board of County Commissioners (BCC) and other municipalities within the Watershed area. Implementation of the Plan will require changes to the Miami-Dade County Comprehensive Development Master Plan and municipal comprehensive plans and modification to other regulatory and operational and capital policies of federal, state, regional and local agencies. Specific strategies for implementation will be incorporated into these plans to make certain that the priorities of the Watershed Plan for 2015 and 2050 are met.

Lead Team Member Responsible:

Michael Davis

Interim Work Product:

Identify potential funding sources to assist in the implementation of the preferred alternative.

Final Work Product:

Report, including appropriate maps, graphics, and other visual aids necessary to describe draft implementation strategies and identify funding sources for 2015.

Report, including appropriate maps, graphics, and other visual aids necessary to describe draft implementation strategies and identify funding sources for 2050.

Sub-task 5.2: Public Outreach on Implementation Strategies

The CONSULTANT will disseminate information and request feedback on the proposed implementation strategies from the Watershed Advisory Committee and other interested parties. The public outreach events and actions at this stage in the process will be targeted to those groups and individuals who have played an active role in the process. The purpose of these outreach actions are to assure the participants that their input over the last two years has been considered and to build consensus for approval of the plan. A discussion on the strategies for implementing the Watershed Plan, which will have been built in a major part by these participants, is crucial to the adoption process and subsequent actions by Miami-Dade County staff.

Lead Team Member Responsible:

Michael Davis and Carey Sirianni

Interim Work Product:

Draft public outreach event presentation materials will be developed.

Final Work Product:

Final public outreach event presentation materials.
Report of proceedings on the public comments received during the community outreach meetings. See attached project schedule for estimated completion date.

Sub-task 5.3 – Finalize Implementation Strategies and Final Deliverables

Each deliverable will include the necessary actions, time frames, monitoring and evaluation requirements for adoption into the local comprehensives plans and LDRs, as well as regional, state, and/or federal plans. At a minimum, the final work product for the preferred alternative will consist of the following deliverables:

1. Project Management Manual

A comprehensive project management tool for use by the client and consultant team that includes: work programs, project schedules with milestones and QA/QC, reference materials, contracts and standard documents. This manual will be updated on a regular basis to assist the client and consultant team with organization and information.

2. Public Involvement Report

A report documenting all public outreach and involvement activities during the project including presentation materials.

3. Existing Conditions Data, Maps and Analysis Master File

A master reference document that reports and categorizes all data, techniques, analysis, maps and findings relevant to the project. Selected reports and documents from this master file will be utilized and included with subsequent studies and deliverables.

4. Land Use Plan

A plan and map of the recommended distribution, density/intensity and configuration of land uses.

- Existing land use map;
- Future land use plan map;
- Map series of all relevant data and graphics;
- Constraints and opportunities map/analysis;
- Identification of public acquisition areas, redevelopment and in full areas and appropriate land development patterns; and
- Associated land use categories and text amendments.

5. Water Management Plan

A report and plan defining the applicable land use, environmental and management parameters for the preferred plan including:

- Ground water studies, evaluation and model selection;
- Surface water studies, evaluation and model selection;
- Evaluation of existing development regulations and practices;

- Summary of water resource evaluation of various land use scenarios including the preferred plan; and
- Management practices to achieve water quantity and quality standards.

6. Land Development Regulatory Strategies

A report on recommended land development regulatory strategies designed to implement the Water Management Plan and Land Use Plan. These strategies will recognize the potential effects on property rights and property values and include any measures to balance these effects. At a minimum these strategies will include:

- Identify potential changes to the Miami-Dade County Land Development Code;
- Site development standards;
- Best management practices for water quality and quantity and environmental protection;
- Land development processes and evaluation criteria; and
- Property preservation techniques such as TDR's, acquisition, regulatory incentives, land trusts and buffers.

7. Implementation Projects and Programs

Identifies changes in intergovernmental coordination for institutional, regulatory and organizational arrangements between governmental entities having jurisdiction in the plan area. Include new or revised public service policies, plans and programs as appropriate. Provides implementing instruments such as draft implementing ordinances, resolutions, guidelines and procedures manuals.

8. Fiscal Impact Analysis Report

Identifies land development costs that would be incurred by the private sector arising from implementation of plan recommendations, and identifies methods for offsetting any additional development costs through incentives, bonuses, property rights transfer and / or subsidies.

9. Financial Plan

Identifies costs to county, regional, state and federal entities responsible for implementing the land use and water management plans. Identifies and recommends appropriate funding sources that may be utilized to finance implementation, according to a capital improvement program for needed public improvements or facilities.

10. Technical Models

Electronic version with supporting documentation of all models used and revised in the study, which may include the following:

- Economic and demographic models;
- Data management and GIS information;
- Water resource model;
- Transportation model; and
- Service and utility impact models.

11. Consolidated Plan and Report

An abridged, executive summary document of the most pertinent and useful information, maps, illustrations and recommendations from the results of the project. This document is intended as a general reference document with collateral material for the public, officials and agencies.

12. Staff Manual

The Keith and Schnars Team final product will include a "staff manual" describing land use scenario development and evaluation procedures. It is our belief that the final Watershed Plan should be a "living" document. It should be a tool that the Miami-Dade County Department of Planning and Zoning (DP&Z) can use as part of the Evaluation and Appraisal Report (EAR) process or other analysis to update the Miami-Dade County Comprehensive Master Development Plan. As described in the approved project schedule, the Watershed Plan is anticipated to be completed in month 26, approximately one year after the current timeframe for the EAR. The Watershed Plan should be an iterative tool for DP&Z staff and should become a part of the future EAR processes.

Lead Team Member Responsible:

Michael Davis

Interim Work Product:

Not applicable this task is related to compiling final reports for the South Miami-Dade Watershed Study and Plan.

Final Work Product:

See each work product described above for submittal deadlines.

Watershed Advisory Committee Involvement in Task 5

As described in the Public Involvement section of the scope, the Watershed Advisory Committee will receive monthly updates on the project. Work product review dates are shown in the attached project schedule.

Technical Review Committee Involvement in Task 5

As described in the attached project schedule and in Attachment 1, the Technical Review Committee will be consulted with during the development of implementation strategies associated with Sub-task 5.1.

Community Outreach Process - General

Public Involvement Strategy

The CONSULTANT will prepare, as part of Task 1, a detailed Public Involvement Plan to be included in the Project Management Manual. This Strategy will be developed in consultation with the Watershed Advisory Committee. The public involvement strategy for the South Miami-Dade Watershed Study and Plan contains four approaches to interacting with the Watershed Advisory Committee, stakeholders, the general public and elected officials.

Watershed Advisory Committee

Communication with the Watershed Advisory Committee will take place through the SFRPC Project Manager as shown in Attachment 1. The CONSULTANT will participate in monthly meetings with the Watershed Advisory Committee. Updates will be provided to the WAC on previous activities and planned tasks for the upcoming month. The CONSULTANT will participate in a maximum of twenty-four Watershed Advisory Committee Meetings and seven Technical Review Committee Meetings.

Data and work products will be submitted to the SFRPC Project Manager 28 days prior to a scheduled Watershed Advisory Committee Meeting. The CONSULTANT will explain and lead a discussion with the WAC on the information. The Watershed Advisory Committee will take this information back to their respective constituent groups for comment. At the following Watershed Advisory Committee Meeting, the Committee Members will provide feedback to CONSULTANT on the item(s) discussed at the previous meeting. The CONSULTANT will incorporate this feedback into the project. The CONSULTANT will also make a presentation on any new items. This will be a continuous loop taking approximately 60 days from the time an item is submitted to the SFRPC Project Manager to the time final comments are received from the Watershed Advisory Committee.

Stakeholder Groups

Those groups with an interest in the Watershed Study but are not represented on the Watershed Advisory Committee will be informed about the project by the CONSULTANT. The CONSULTANT will participate in a maximum of twenty Stakeholder meetings. The Watershed Advisory Committee and the SFRPC Project Manager will assist the CONSULTANT in defining the list of stakeholder groups and an appropriate outreach strategy for each one. The CONSULTANT will implement the following strategies to ensure participation by stakeholder groups:

- Maintain a database of key stakeholder groups to meet with, keep informed, and obtain input from. The database will be updated on a regular basis;
- Inform and invite their members to meetings using targeted mailings;
- Conduct briefings at stakeholder group functions as requested by the SFRPC Project Manager;
- Coordinate with stakeholders to create links between the Watershed website and their groups website; and
- Prepare profiles and editorials for stakeholder newsletters and publications.

General Public

General public meetings will be held at four milestones in the work schedule. Public meetings will be held at two different locations. The CONSULTANT will provide facilitators for each meeting.

A kick-off meeting will be held during the first three months of the project to introduce the general public to the project and give them an opportunity to become involved for the duration of the study. The purpose of this initial meeting is to introduce the public to the Watershed team, outline the project work plan and disseminate information on the history of the study. The CONSULTANT will describe the features of the project website and other watershed related information resources. Public input at this meeting will be focused on identifying issues of concern.

The CONSULTANT will develop and maintain a database of those individuals who participate in the kick-off meeting and subsequent meetings. Mailings will be limited to those individuals listed in the participant database. The participant database will be updated based on input from the SFRPC Project Manager and the Watershed Advisory Committee.

The second public meeting will be conducted after the completion of Task 2. At this point in the process the CONSULTANT will have developed the three land use

scenarios. The CONSULTANT will present the justification for the distribution of land uses associated with each scenario. The purpose of this meeting is to extract and consider input from the public on each of the scenarios. Opportunities and constraints for development, redevelopment and preservation will be discussed with the public.

Following the development of a preferred alternative land use scenario the CONSULTANT will host a public meeting to explain the reasoning behind the recommended alternative. The CONSULTANT will present and lead a discussion on the water resources assessment, infrastructure studies, natural systems analysis and economic modeling/cost benefit analysis completed on the three land use scenarios. The public will be asked to provide input on the pros and cons of the recommended preferred alternative.

The fourth public meeting will be held prior to finalization of implementation strategies for the preferred land use scenario. The public outreach events at this stage in the process will be targeted to those groups and individuals who have played an active role in the process. The purpose of these outreach actions are to assure the participants that their input over the last two years will be put into action through an established set of strategies. The results of the impact assessment for the preferred scenario will also be discussed. Decision makers and staff persons will be consulted with to determine the feasibility of the proposed implementation strategies.

The CONSULTANT will utilize the following strategies to ensure community outreach and participation by the general public:

- Develop an interactive project website;
- Prepare press releases;
- Presentations at Community Council meetings, the Board of County Commissioners and City Commission meetings;
- Prepare press packages for community newsletters and publications;
- Public Service Announcements; and
- Stakeholder briefings
- Multi-media announcements and presentations.

Miami-Dade County Board of County Commissioners, City Commissioners and Community Councils

The CONSULTANT will make presentations or provide written updates to the Miami-Dade County Board of County Commissioners and the Community Councils with jurisdiction over the area. Presentations and/or written updates will also be provided to City Commissions with jurisdiction over the area. The timing and frequency of these meetings will be determined based on input from the SFRPC Project Manager and city

staff. The CONSULTANT will participate in a maximum of thirty municipal meetings. The following CONSULTANT staff will be responsible for updates to elected officials: Michael Davis, John Hart, Richard Pettigrew, Guillermo Olmedillo and Alan Milledge.

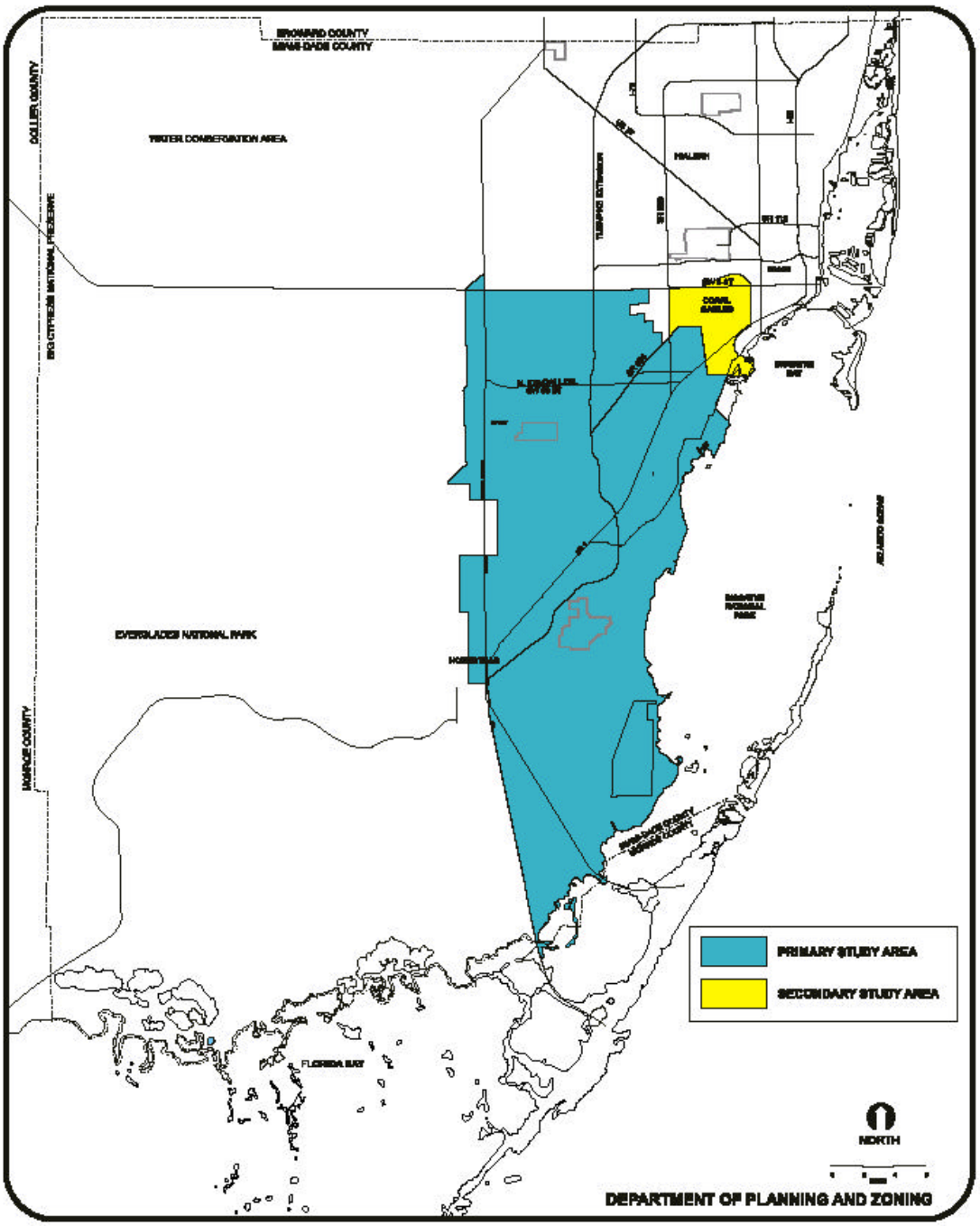
Public Comment Response Process

Public comments regarding the South Miami-Dade Watershed Study and Plan will be formally received in three different ways: 1) through public comment at General Public meetings and Watershed Advisory Committee meetings; 2) through e-mail messages to the CONSULTANT and South Florida Regional Planning Council Watershed web pages; and 3) through U.S. Mail or other courier service received by the CONSULTANT or the South Florida Regional Planning Council (SFRPC).

Public comments received at meetings open to the public will be recorded on flip charts, and transcribed to the official record of the proceedings of such meetings. Public comments received by the CONSULTANT through e-mail or post will be transmitted to the Project Manager at the SFRPC. The CONSULTANT will be responsible for transmission within seven (7) days of its receipt. Public comments received by the SFRPC will be copied to the Project Manager at the SFRPC. Upon request of the Project Manager, the CONSULTANT will participate in drafting a response to the public comment.

The Project Manager will transmit process-oriented public comment regarding Watershed Advisory Committee meetings to the Facilitator at the Institute for Community Collaboration for further response. Likewise, the Project Manager will transmit process-oriented public comment regarding General Public meetings to the CONSULTANT for further response. All other public comment will receive a response posted on the SFRPC Watershed web page no later than thirty (30) days after its receipt. The Project Manager will transmit responses to the CONSULTANT for posting on its Watershed web page as well. Comments received from elected officials will, if not answered satisfactorily in a meeting with the official, be answered in formal correspondence on SFRPC letterhead, drafted by the Project Manager.

ATTACHMENT A
MAP OF STUDY AREA



ATTACHMENT B
WATERSHED STUDY AND PLAN SCHEDULE

THE SOUTH MIAMI-DADE WATERSHED STUDY & PLAN SCHEDULE

Year 1

	1				2				3				4				5				6				7				8				9				10				11				12			
	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4
Updates to Miami-Dade BCC, Community Council and City Commissions																																														
GENERAL PUBLIC MEETINGS							A			A			A						A				A				A				A				A				A				A			
TASK 1: EXISTING CONDITIONS AND ISSUE IDENTIFICATION																																														
1.1: Analysis and Documentation of Relevant Studies					J	t		T	k		A				af		J	t		T	k		A				af	KSF																	
1.2: Population Growth					J	t		T	k		A				af		J	t		T	k		A				af	KSF																	
1.3: Development Features					J	t		T	k		A				af		J	t		T	k		A				af	KSF																	
1.4: Natural Resources/Wildlife Resources					J	t		T	k		A				af		J	t		T	k		A				af	KSF																	
1.5: Water Resources					J	t		T	k		A				af		J	t		T	k		A				af	KSF																	
1.6: Description of Regulatory and Planning Agency Jurisdictions					J	t		T	k		A				af		J	t		T	k		A				af	KSF																	
1.7: Land Inventory and Ownership Characteristics					J	t		T	k		A				af		J	t		T	k		A				af	KSF																	
1.8: Watershed Characteristics - Parameters and Thresholds																												J	t		T	k		A				af	KSF						
TASK 2: FORMULATE LAND USE SCENARIOS																																														
2.1: Opportunities and Constraints Analysis																															T	k				J				A			af	KSF	
2.2: Comparison of Land Use Policy Scenarios																																								A						

THE SOUTH MIAMI-DADE WATERSHED STUDY & PLAN SCHEDULE

Year 2

	13				14				15				16				17				18				19				20				21				22				23				24				25				26			
	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4
Updates to Miami-Dade BCC, Community Council and City Commissions																																																		
GENERAL PUBLIC MEETINGS			A				A				A				A				A				A				A				A				A				A				A				A			
TASK 3: MODELING AND IMPACT ASSESSMENT		af	2.2		KSF																																												
3.1: Quantifying the Effects Population Growth					J	t		T	k		A				af		KSF																																	
3.2: Infrastructure Assessment					J	t		T	k		A				af		KSF																																	
3.3: Natural Resources Assessment					J	t		T	k		A				af		KSF																																	
3.4: Water Resources Analysis and Modeling					J	t		T	k		A				af		KSF																																	
3.5: Property Rights Evaluation					J	t		T	k		A				af		KSF																																	
3.6: Output Evaluation and Key Issues for Alternative Actions															J	t		T	Ak				af		KSF																										
TASK 4: FORMULATION OF ALTERNATIVE ACTIONS																																																		
4.1 - Cost Benefit Analysis																		T	k					J	t		Ak				af		KSF																		
4.2: Select Practicable Alternative Actions for each Scenario and Selection of a Preferred Scenario																															J				A				af		KSF									
4.3: Evaluate Preferred Land Use Scenario																																			A							J	t		T		Ak			af		KSF		
TASK 5: IMPLEMENTATION STRATEGIES FOR THE PREFERRED LAND USE SCENARIO																																																		
5.1 Draft Implementation Strategies for Alternative Actions																																																		
5.2 Public Outreach Events on Implementation Strategies																																																		
5.3 Finalize Implementation Strategies and Final Deliverables																																																		
MIAMI-DADE COUNTY BOARD OF COUNTY COMMISSIONS SCHEDULE PUBLIC HEARING FOR PLAN ADOPTION																																																		

LEGEND

J - Keith and Schnars submits work product to SFRPC Project Manager
t - SFRPC Project Manager submits work product to Technical Review Committee
T - Technical Review Committee Meeting
k - Technical Review Committee comments submitted to Keith and Schnars
A - Watershed Advisory Committee Meeting
af - Watershed Advisory Committee comments submitted to Keith and Schnars
KSF - Keith and Schnars Finalizes Work Product

complete each task described in the scope of services. The SFRPC Project Manager will exchange information between Keith and Schnars, the Technical Review Committee and the Watershed Advisory Committee. He will ensure that information is submitted by Keith and Schnars, the Technical Review Committee and the Watershed Advisory Committee within the specified timeframes.