

**FINAL SUPPLEMENTAL ENVIRONMENTAL
ASSESSMENT**

Plantation Key Colony / North Plantation Key
Proposed Wastewater Treatment System
Village of Islamorada
Monroe County, Florida



FEMA

Prepared For
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In response to Hurricane Georges damages and losses, Congress enacted Public Law 106-31, Emergency Supplemental Appropriations Act for Fiscal Year 1999, to fund long-term disaster recovery projects in Florida counties whose needs were unmet through primary disaster relief funds. Monroe County was included among the counties eligible for “Unmet Needs” funding and requested that wastewater management improvement projects be considered for this funding since many existing wastewater facilities in the county are not storm-resistant.

Since then, the Federal Emergency Management Agency (FEMA) has received a grant application from the Village of Islamorada (Islamorada), requesting Federal assistance to construct a new wastewater treatment facility to service Plantation Key Colony/North Plantation Key. FEMA prepared this draft Supplemental Environmental Assessment (SEA) to address the likely effects of implementing three alternatives proposed in North Plantation Key. The alternatives evaluated in this document include:

Alternative 1 – No Action Alternative

FEMA would not fund the proposed wastewater treatment project within North Plantation Key. Alternate funding sources would need to be located to finance the large capital costs of constructing a wastewater treatment system to meet the Florida Statutory Treatment Standards by 2010. Until alternate funding is secured, environmental degradation would continue. Depending on the amount of alternative funding secured, increased wastewater management costs and the potential for significant economic impacts would be likely, particularly to service recipients that currently have cesspits or septic systems. The likely increase in wastewater management costs could cause a disproportionately high and adverse economic effect on low-income service recipients.

Alternative 2 – Centralized Wastewater Treatment Plant on Bayside Alternative (Proposed)

The Village would use FEMA funding to construct a new community WWTP on the bayside of U.S. Route 1 (US-1) at Mile Marker (MM) 89.8 and associated collection system for Plantation Key Colony. Although the WWTP is designed for capacity to serve the present North Plantation Key service area population, grant funding would not include installation of a collection system for this sub-service area. Wastewater effluent would be collected through either vacuum pumping or a low-pressure grinder pump system. Following Advanced Wastewater Treatment (AWT), wastewater effluent would be disposed of through shallow injection wells or made available for reuse. The Village would be responsible for facility construction, operation, and maintenance.

Alternative 3 – Centralized Wastewater Treatment Plant on Oceanside Alternative

The Village would use FEMA funding to construct a new community WWTP serving the same area as described under Alternative 2, but on the ocean side of US-1 at MM 89.7. Wastewater collection, treatment and disposal, as well as plant operation responsibilities would be the same as under Alternative 2.

Alternatives 2 and 3

For both Alternative 2 and Alternative 3, potential project effects on topography, soils, geology, floodplains and wetlands, air quality, hazardous materials, infrastructure, land use and planning, and noise and visual resources within the project area are expected to be minimal. Appropriate mitigation measures would reduce any potential adverse effects of the project alternatives on these resources. Effects on public health, water resources, and water quality are anticipated to be beneficial. Effects on cultural resources would be negligible. Potential effects on biological resources resulting from site development would be mitigated through the purchase and protection of replacement habitat at a 2 to 1 ratio. Socioeconomic effects would be mitigated with the use of FEMA grant funding, and the system capital costs associated with Alternative 2 & 3 would be affordable to service recipients. Implementation of the proposed wastewater projects would equally benefit, through improved water quality, the various demographic groups in the Keys. FEMA has imposed assistance guidelines that will further lower the system capital costs, and the lateral hook-up and onsite system abandonment costs in order to mitigate any disproportionately high and adverse economic effects on low-income service recipients. The levels of assistance are based on U.S. Department of Housing and Urban Development's (HUD) very-low and low family income levels. In addition, the Village is providing assistance, beyond the FEMA mandated levels, to help low-income service recipients with onsite system abandonment and lateral hook-up costs.

1.1 PROJECT AUTHORITY

In 1998, after Hurricane Georges, Congress enacted Public Law 106-31, Emergency Supplemental Appropriations Act for Fiscal Year 1999, to provide additional monies for long-term disaster recovery projects in the State of Florida. The funds were allocated to assist counties whose needs were not met through allocation of primary disaster relief funds. This Unmet Needs money was earmarked for the counties most impacted by Hurricane Georges, including Monroe County. The Federal Emergency Management Agency (FEMA), State of Florida, and the impacted counties determined funding priorities.

Monroe County requested that wastewater management improvement projects be considered for disaster funding since many existing wastewater facilities in Monroe County are not storm-resistant, do not provide adequate wastewater treatment, and contribute to degraded water quality in the Keys. Since then, the Village of Islamorada (Village), through the State of Florida Department of Community Affairs (DCA), has applied for Federal funding assistance from FEMA for construction of a wastewater treatment plant (WWTP) that would service Plantation Key Colony (PKC) and North Plantation Key, improve wastewater treatment and ultimately water quality in the Florida Keys, as well as assist residents in meeting state mandated water quality targets as set forth in the Florida Statutory Treatment Standards of 2010. The *Village 2001 Comprehensive Plan* requires these Standards be met by 2010. Specifically, wastewater treatment systems must treat discharge to advanced wastewater treatment (AWT) levels or best available technology (BAT). For facilities that treat over 100,000 gallons per day (gpd), the AWT standards are 5 mg/L Biological Oxygen Demand (BOD), 5 mg/L Total Suspended Solids (TSS), 3 mg/L Total Nitrogen (TN), 1 mg/L Total Phosphorus (TP); and for facilities treating less than 100,000 gpd the BAT standards are 10, 10, 10, 1 respectively.

1.2 RELATED ENVIRONMENTAL DOCUMENTS

A Programmatic Environmental Assessment (PEA) was prepared in accordance with the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508), and FEMA regulations (44 CFR Part 10, Environmental Considerations). These laws and regulations require FEMA to take into account environmental considerations when funding any Federal actions. The PEA, finalized on December 23, 2002, provides a framework to address impacts associated with a range of wastewater treatment projects in the Florida Keys. PEA Section 1.7 (Water Quality Protection Measures at the Local, State, and Federal Levels) provides a complete discussion of water quality protection measures at federal, state, and local levels.

This Supplemental Environmental Assessment (SEA) tiers from the PEA for Wastewater Management Improvements in the Florida Keys (URS 2002) as proposed by FEMA and hereby incorporates the PEA by reference, in accordance with 40 CFR Part 1508.28.

1.3 PROJECT LOCATION

The Village is located in the northern portion of the Florida Keys chain, known as the Upper Keys, and encompasses four islands, which are, from north to south, Plantation Key, Windley Key, Upper Matecumbe and Lower Matecumbe Key. The Village limits extend from US-1 Mile

Marker (MM) 72.7 to MM 90.9; Plantation Key is located between MM 85.5 and MM 90.9. It is about 1,071 acres in area and is bordered by Tavernier Creek to the north and Snake Creek to the south.

Proposed wastewater treatment improvements would service the Plantation Key Colony and other subdivisions (Table 1-1), as well as possible schools, businesses, and other residences in North Plantation Key, for a total wastewater service area of about 517 acres, located within Sections 4 and 5, Townships 62 and 63 South, Range 38 East (Figure 1-1). The service area is mostly developed (79.5 percent), with 106.0 acres of vacant land.

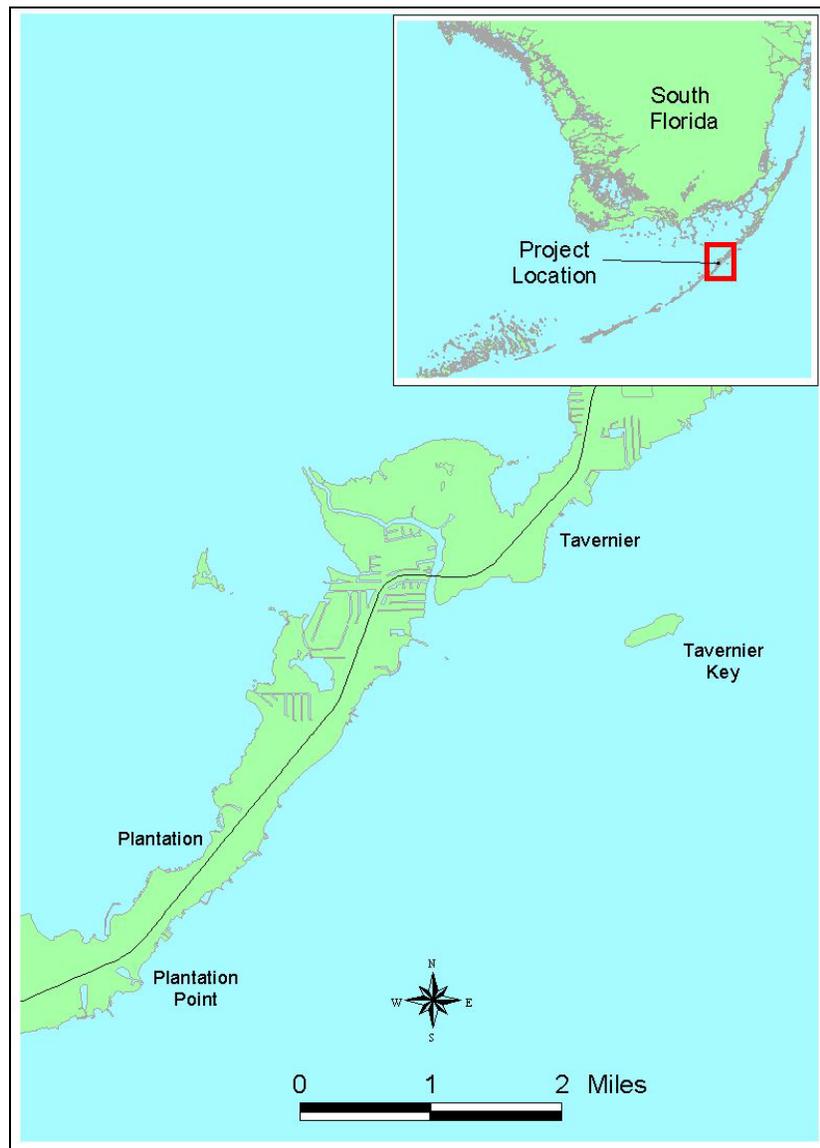


Figure 1-1. Project Vicinity Map

The area to be served by the proposed Plantation Key Colony/North Plantation Key wastewater treatment plant are comprised of two sub-service areas as follows:

- Plantation Key Colony Subdivision (PKC) Sub-service Area (Phase I):** This sub-service area occupies 130 acres and is located west of U.S. Route 1 (US-1) in the center of Plantation Key. It is bounded by Plantation Canal to the north, Lake Road to the south, Florida Bay to the west and Gardenia Street to the east.
- North Plantation Key Sub-service Area (Phase II):** This sub-service area is comprised of the remainder of North Plantation Key and is located north and east of the PKC Sub-service area. It is bounded by Tavernier Creek to the north and northeast, the Atlantic Ocean to the east, High Street to the south, and Florida Bay and US-1 to the west, and is 387 acres in area.

**Table 1-1. Subdivisions within the Service Area
(First American Real Estate Solutions, 1999)**

Oceanside	Bayside
Boatman’s Colony ²	Kahiki Harbor ²
Tropical Atlantic Shores ²	Edenaire ²
Fontaine Lake Estates ²	Tavernaero ²
Plantation Shores ²	Plantation Tropical Park ²
	Sunshine Estates ²
	Plantation Key Colony ¹
	Lake Harbor ¹

¹ PKC Subdivision Sub-service Area

² North Plantation Key Sub-service Area

1.4 PURPOSE AND NEED

The purpose and need for action is described in PEA Section 1.9 (Purpose of and Need for Action). In particular, the purpose of the proposed Village project is to reduce wastewater nutrient loading at selected Monroe County-identified “hot spots,” thereby improving water quality. These “hot spots” are believed to contribute to water quality degradation.

As described in PEA Section 2.1 (Alternative Development Background), “hot spots” represent priority areas where the high concentration of people and poor existing wastewater treatment practices justify the installation of a more advanced wastewater treatment system within that area. The Monroe County Sanitary Wastewater Master Plan (MCSWMP; Monroe County, 2001) ranked Plantation Key Colony as the 6th most critical “hot spot” in the Upper Keys, the 14th most critical “hot spot” Keys-wide (Appendix C [Hot Spot Locations] of the PEA), and is the number one priority within the Village (MCSWMP; Monroe County, 2003). The “hot spot” ranking is linked to the use of onsite septic systems as a main wastewater treatment system for the majority of residences and businesses in North Plantation Key. The remainder of residences and businesses are connected to one of six existing WWTPs (Table 1-2).

Table 1-2. Existing Wastewater Treatment Plants in the Service Area

Name	Address/Location
Plantation Key Elementary School	100 Lake Street
Coral Shores High School	MM 90, Bayside
Sea Gulls Condominium	100 Wrenn Street
Turek Building	MM 90.5, Bayside
Tavernier Harbor	90311 Overseas Highway
Tropic Vista Motel	90701 Overseas Highway

NEPA, CEQ regulations implementing NEPA (40 CFR Parts 1500 to 1508), and FEMA regulations for NEPA compliance (44 CFR Part 10) direct FEMA to investigate and evaluate project alternatives. The Village has prepared the Plantation Key Colony/North Plantation Key Wastewater Treatment System Conceptual Design (PBSJ, 2002), and subsequent request for proposals (RFP; Islamorada, 2002) that outline preferred alternatives for wastewater improvements within its selected service area. Based on the information contained in the conceptual design report and in consultation with representatives from the Village, the following alternatives were developed for consideration in this SEA: No Action (Alternative 1), Centralized Wastewater Treatment Plant on Bayside Site (Alternative 2), and Centralized Wastewater Treatment Plant on Oceanside Site (Alternative 3). While FEMA funding would only be applied to the Plantation Key Colony subservice (Phase I) area, this document considers the effects of the entire service area the plant is designed for (Phase I and II, the North Plantation Key subservice area) because these are viewed as “connected actions” under NEPA despite separate and possibly delayed funding.

2.1 ALTERNATIVE 1 – NO ACTION ALTERNATIVE

As discussed in Section 2.3.1 (No Action Alternative) of the PEA, FEMA would not provide funding assistance to the Village for the proposed wastewater treatment project. To meet the Florida Statutory Treatment Standards of 2010, the Village and service area residents and businesses would need to identify another funding source for upgrading currently inadequate wastewater treatment systems.

2.2 ALTERNATIVE 2 – CENTRALIZED WASTEWATER TREATMENT PLANT ON BAYSIDE SITE)

Alternative 2 is described in Section 2.3.2 (Centralized Wastewater Treatment Plant Alternative) of the PEA. The Village would apply FEMA funding to the construction of a new community WWTP on the bayside of Plantation Key, including the associated wastewater collection system for Plantation Key Colony. Alternative 2 would establish new service to residents formerly utilizing onsite systems within the Plantation Key Colony and eventually to the North Plantation Key service areas. Estimated annual average daily wastewater flow (AADF) for the Plantation Key Colony subservice area would be about 70,410 gpd. The Estimated AADF for the entire service area would be about 226,940 gpd. The system design assumes a complete build-out of PKC and North Plantation Key that would total 1,232 single-family homes, 49 mobile homes, 39 businesses, and two schools (PBSJ, 2002). At the owner’s expense, existing onsite septic systems and cesspools would be removed from residences and businesses in the service area. Similarly, service recipients would be responsible for installing piping from their residence or business to the wastewater collection system service lateral at the street.

Wastewater improvements would be implemented in a three-phased approach as shown in Figure 2-1. Phases I and II would consist of the PKC Sub-service area and North Plantation Key Sub-service Area, respectively. Phase IA would consist of two schools: Plantation Key Elementary School and Coral Shores High School; although it should be noted these schools may build/expand their own wastewater system and not require service from the proposed plant. Removal of existing systems would be phased in accordance with construction of the collection system, and pursuant to Florida Department of Health (DOH) requirements.

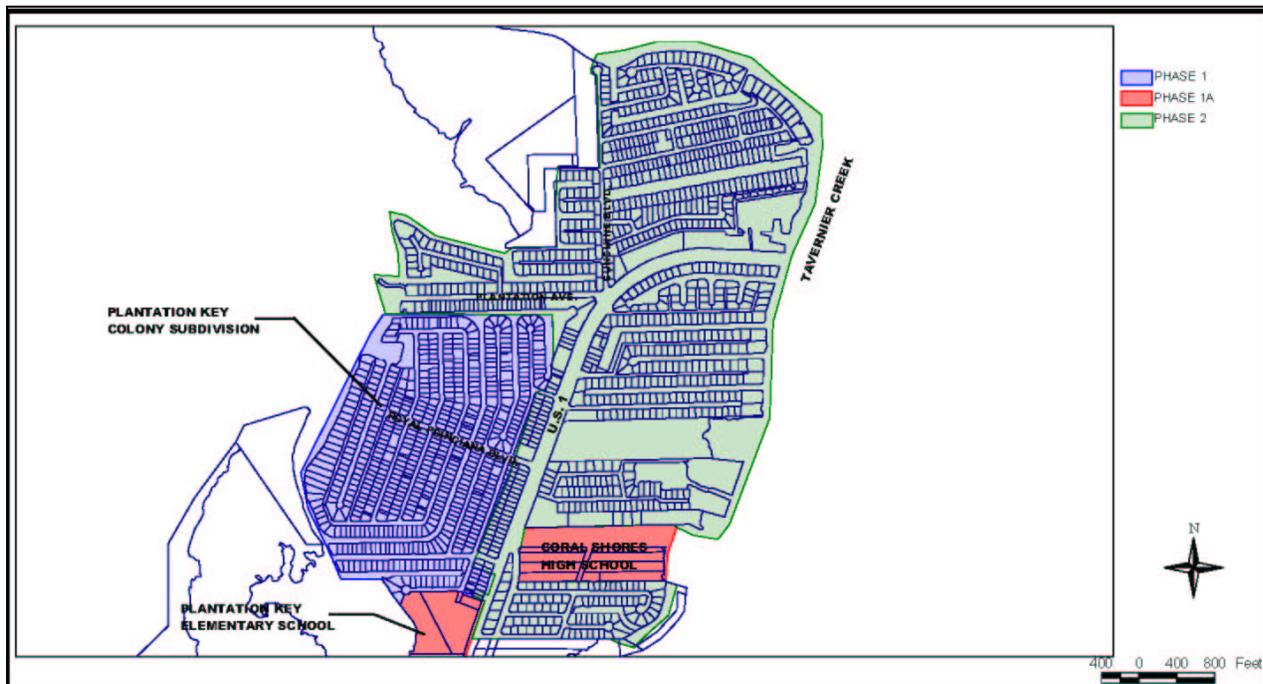


Figure 2-1. Service Area for the Plantation Key Colony/North Plantation Key Wastewater Treatment System (PBSJ, 2002)

2.2.1 Wastewater Collection and Transmission System

As described in Section 2.3.2.1.1 (Collection Option 1 – Vacuum Pumping) of the PEA, a vacuum sewer system would be used to collect and transfer wastewater flow from houses and businesses to the WWTP. Vacuum sewers are typically considered for areas, such as the Upper Keys, that are difficult to sewer by gravity due to the relatively flat terrain, high ground water tables, and soil conditions. Therefore, the plant design would be based on a vacuum sewer system.

2.2.1.1 Collection System

Wastewater flow would be conveyed from houses and businesses via gravity lines to a vacuum pit or collection sump located in the rights-of-way (ROWs) within the service area (Figures 2-2a, b, and c). Wastewater collection mains would be installed within existing portions of ROWs or easements, along the service area roads in front of the residences and businesses to be served. The streets and ROWs in the service area consist of paved roads with ROW widths of about 40 feet. When wastewater accumulates in the sump, the vacuum interface valve located above the sump would automatically open and differential air pressure would propel the sewage through the valve and into the polyvinyl chloride (PVC) or high-density polyethylene (HDPE) vacuum. On average, 2.5 connections would be serviced by each vacuum pit. In high-density residential areas, fewer vacuum pits would be required. In commercial areas, separate vacuum pits could be required for each connection. The gravity lines would consist of PVC pipes and would terminate at the ROW line.

Service laterals, for connection to the collection system by the resident, would be provided up to the ROW. Connection to the collection system would be the responsibility of the property owner. Special plumbing fixtures or electrical connections would not be required at houses or mobile homes, since the current fittings are adequate. Soil material would be excavated for the installation of vacuum sewer mains, vacuum pits, buffer tanks, and gravity service laterals.

2.2.1.2 Transmission System Components

Wastewater would be conveyed from the vacuum pits to the wastewater collection tank at the WWTP through HDPE vacuum lines ranging in size from 3-inches to 10-inches in diameter. The incoming vacuum lines would connect individually to the collection tank, effectively dividing the system into zones. The main vacuum lines installed in Phase I would be sized to accommodate the additional flows from Phase IA and Phase II.



Figure 2-2(a). Plantation Key Colony/North Plantation Key Wastewater Collection System Preliminary Layout (PBSJ, 2002)



Figure 2-2(b). Plantation Key Colony/North Plantation Key Wastewater Collection System Preliminary Layout (PBSJ, 2002)



Figure 2-2(c). Plantation Key Colony/North Plantation Key Wastewater Collection System Preliminary Layout (PBSJ, 2002)

2.2.2 Wastewater Treatment Plant**2.2.2.1 Site Description**

The proposed WWTP site (preferred alternative site) is located on six contiguous, vacant lots on the bayside of Plantation Key at MM 89.8 (Figure 2-3), immediately northeast of Plantation Key Elementary School, on the southeast corner of the Plantation Key Colony Sub-service area, between US-1 to the east and Gardenia Street to the west (Photo 2-1). The site is roughly L-shaped, about 0.8 acre in area, with the long axis of the L-shaped site running along US-1 (Photo 2-2).



Photo 2-1. North View of the Western Property Boundary along Gardenia Street



Photo 2-2. North View of the Eastern Property Boundary along US-1

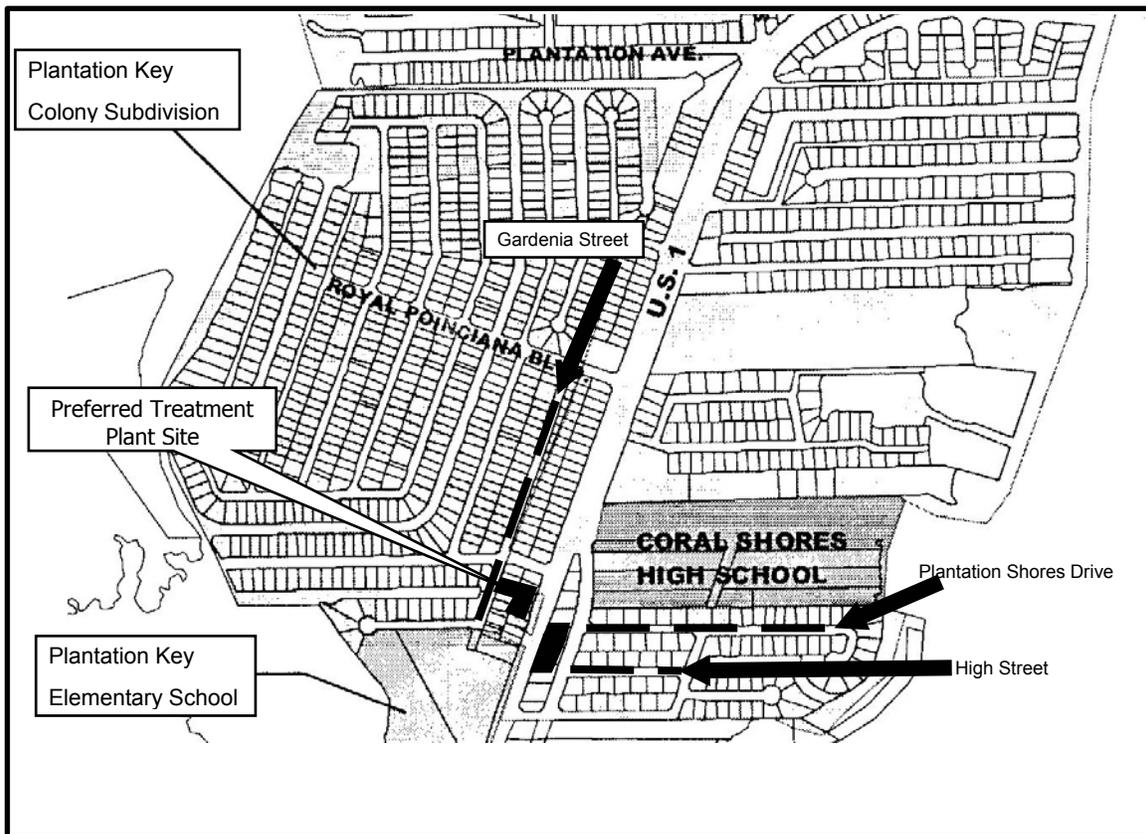


Figure 2-3. Preferred Wastewater Treatment Plant Site Location

2.2.2.2 System Components

Design elements at the site include the new WWTP, vacuum station, storage facilities for maintenance equipment, treatment chemicals, and other operations materials; as well as parking, paved access roads, and landscaping (Figure 2-4). The WWTP itself would contain three aeration tanks, odor control equipment, a chlorine tank, Class V injection wells, and an equipment container for all pumps and blowers. The vacuum station would be located next to the WWTP and would contain vacuum pumps, sewage pumps, a collection tank, and controls. The vacuum collection tank in the vacuum station would be made of either steel or fiberglass.

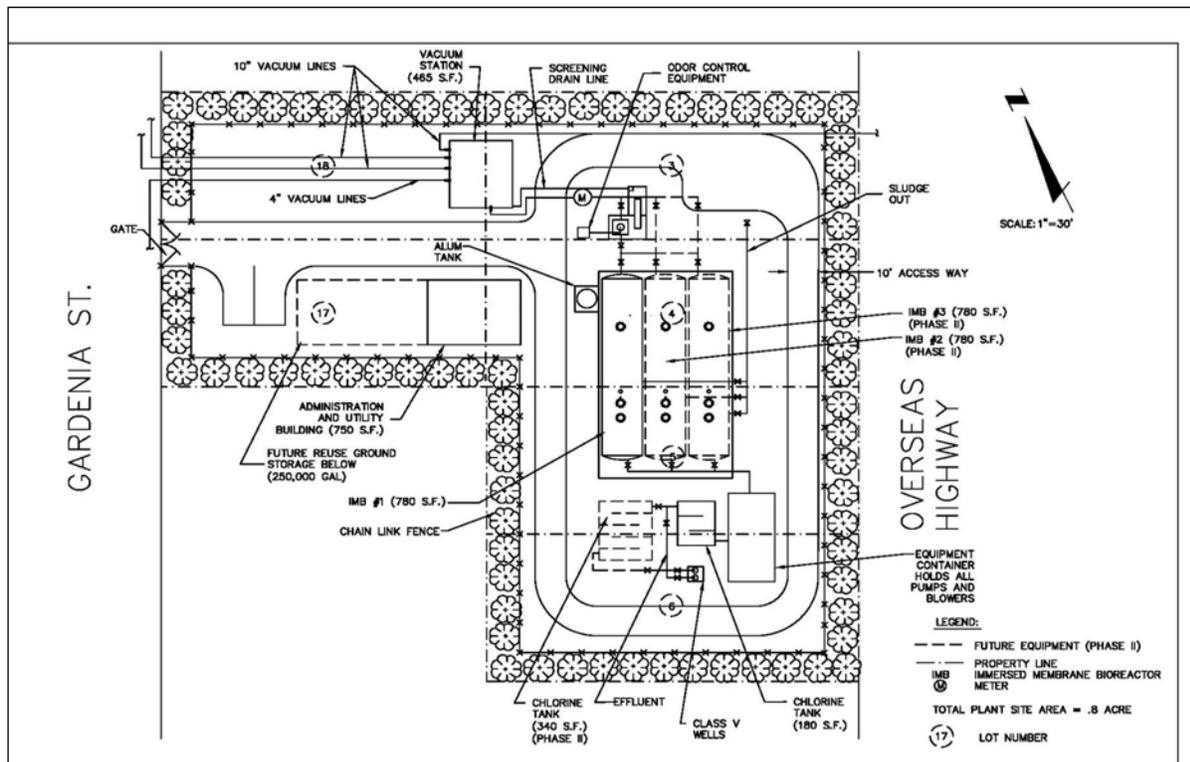


Figure 2-4. Wastewater Treatment Plant Preliminary Site Plan

2.2.2.3 System Operation

The vacuum pumps, located within the vacuum station, would create a negative pressure condition in the sewer lines (16 to 20 inches of mercury [Hg]). The pressure differential would open the vacuum interface valves at the vacuum pits that would transport the sewage. These interface valves would normally be closed and the vacuum pumps would not need to run continuously. Sewage would flow through the vacuum lines and collect in a collection tank at the vacuum station. As sewage enters the system, the vacuum would slowly decrease. The station would be automated based on vacuum and collection tank levels. A stand-by generator would keep the vacuum sewer system in operation during any extended power outages.

Sewage pumps would transfer sewage from the collection tank through a force main to the WWTP headworks. Wastewater influent to the WWTP would be typical domestic wastewater (Table 2-1; Islamorada, 2002). Incoming sewage would be screened by a screenings press, which would dewater and compact the materials collected by the screens. The screenings would be removed as required and disposed in an appropriate landfill. Odor control would be provided at the WWTP headworks, where the screens and screenings press would be located.

Table 2-1. Preliminary Wastewater Influent Characteristics

Parameter	Concentration (mg/l)
Biochemical Oxygen Demand (BOD)	250
Total Suspended Solids (TSS)	250
Total Nitrogen (TN)	45
Total Phosphorous (TP)	8
Total Alkalinity (as CaCO ₃)	150

Effluent at the WWTP would be treated to high-level disinfection (62-600 Florida Administrative Code [F.A.C.], Regulations of Domestic Wastewater Facilities, water with fecal coliform values below detectable limits per 100 milliliters [ml] of sample) through the addition of liquid chlorine and passage of the effluent through a chlorine contact tank. The system would be capable of delivering different dosages of chlorine based on the requirements for the different disposal methods. The chlorination systems would be operated to deliver sufficient chlorine to maintain a chlorine residual of 0.5 milligrams per liter (mg/l) when discharging to the shallow wells and 1.0 mg/l when discharging to reuse storage. The higher residual for reuse is required to meet F.A.C. 62- 600.440 criteria.

2.2.2.4 Effluent Disposal

Shallow Injection Wells

Effluent disposal to shallow injection wells, described in detail in Section 2.3.2.2.1 (Disposal Option 1 – Shallow Injection Wells) of the PEA, would be the primary method of effluent disposal. Because the proposed WWTP would be expected to treat about 226,940 gdp, it would be designed to meet Florida Statutory Treatment Standards of 2010 for AWT plant (5 BOD/ 5 TSS/ 3 TN/ 1 TP in ppm) effluent requirements for disposal to shallow Class V Injection Wells. The injection wells would be designed and constructed to 90-foot depth and cased to 60-feet, in accordance with the Federal Underground Injection Control program, and F.A.C. 62-528.

Sludge that is generated at the WWTP may be transported to a suitable facility for final disposal. Suitable disposal facilities are located in the City of Homestead and the Miami-Dade County South or Central District Wastewater Treatment Plants, both in Miami-Dade County (PBS&J 2002). Sludge may also be disposed of as described in Section 3.8.2.2 (Centralized Wastewater Treatment Plan Alternative) of the PEA by being hauled to a remote agricultural land application site outside of Monroe County in the Lake Okeechobee area of South Florida.

Wastewater Reuse

Reuse of treated wastewater is discussed in detail in Section 2.3.2.2.2 (Disposal Option 2 - Wastewater Reuse) of the PEA. Treated wastewater may be reused for various purposes in compliance with Florida Department of Environmental Protection (FDEP) regulations governing wastewater reuse.

Design of this wastewater treatment system may include the option of implementing water reuse at Founders' Park. Using a Phase I plus IA flow of 79,100 gpd, it was estimated about 10.2 acres would be required to fully reuse the treatment plant effluent. Effluent may be reused at Founders' Park over a 24-acre area. This system would require a storage tank, pump station, and additional piping. The Village would be responsible for identifying a willing recipient of the treated effluent if this option were selected or used in conjunction with other options.

FDEP regulates the reuse of treated wastewater through its Domestic Wastewater and Water Reuse Programs in accordance with Florida State objectives in Section 373.250 and Section 403.064 Florida Statutes of encouraging and promoting reuse and requires permits under these regulations. See PEA Appendix E (Applicable Permit Information, Section 3) for additional information on permits.

2.2.3 Construction Activities

Construction activities will include building the WWTP and associated structures, and will require installation of treatment tanks, underground and aboveground pipes, pumping stations, and sand or fabric filtration facilities. Other related activities at the site would include the construction of storage facilities for maintenance equipment, treatment chemicals, and other operations materials; as well as, construction of an administrative building, parking lot, and paved access road. Removal of septic systems and pipeline trenching activities would occur throughout the service area.

Excavation for the collection system and WWTP site development, pipelines, and removal of septic tanks and cesspools would require a bulldozer, front-end loader, and several dump trucks to haul material, equipment, and construction debris. Temporary construction traffic would be expected to increase in the vicinity of the proposed facility for about 16 months (PBSJ, 2002). The proposed site would also contain an area that would be used as a temporary staging area for construction equipment and building materials.

All construction activities would be conducted pursuant to applicable facility planning regulations at the State and county level. Coordination between the Village of Islamorada Building Department, Public Works, and Village Engineers, among other parties, would be required to ensure that the plant's structural and mechanical integrity meet current code, and to ensure that permits relating to siting, planning, design, and operation are obtained and any conditions to those permits are met. The Village would also contact the diggers/excavation utility hotline at the Sunshine State One-Call Center at least two business days prior to construction.

Because the WWTP and service areas are located in the 100-year floodplain, the design provisions of the Village's Floodplain Ordinance will apply. Furthermore, because of federal funding, per Executive Order 11988 (Floodplain Management), as implemented in FEMA's regulations at 44 CFR Part 9, wastewater treatment facilities are considered critical facilities and therefore subject to more stringent construction requirements. Specifically, the WWTP and its critical operating components must be floodproofed to the 500-year flood elevation (44 CFR Part 9.11).

Appendix E (Applicable Permit Information) of the PEA provides a summary of permits required for construction of wastewater improvements. The design/build contractor would be responsible for obtaining all applicable permits.

2.2.4 Operation and Maintenance

The new WWTP would be operated and maintained by the Village.

2.3 ALTERNATIVE 3 – CENTRALIZED WASTEWATER TREATMENT PLANT ON OCEANSIDE

Alternative 3 is described in Section 2.3.2 (Centralized Wastewater Treatment Plant Alternative) of the PEA. The Village would apply FEMA funding to the construction of a new community wastewater treatment system on the ocean side of North Plantation Key, including associated wastewater collection system for Plantation Key Colony. This alternative would establish new service to residents formerly utilizing onsite systems. Under this alternative, the engineering and system design are identical to that of Alternative 2; however, the construction of the WWTP would occur on an alternate site.

2.3.1 Site Description

The alternate site for the North Plantation Key/Plantation Key Colony WWTP is located on the ocean side (east side) of US-1 at about MM 89.7 (Figure 2-5). The project area is rectangular in shape and is slightly more than 1 acre in area. It is bounded by US-1 to the west, Old State Road 4A to the east, Plantation Shores Drive to the north and High Street to the south. The project area is part of a narrow, contiguous vegetated corridor that extends along the ocean side of US-1 (Photos 2-3 and 2-4).

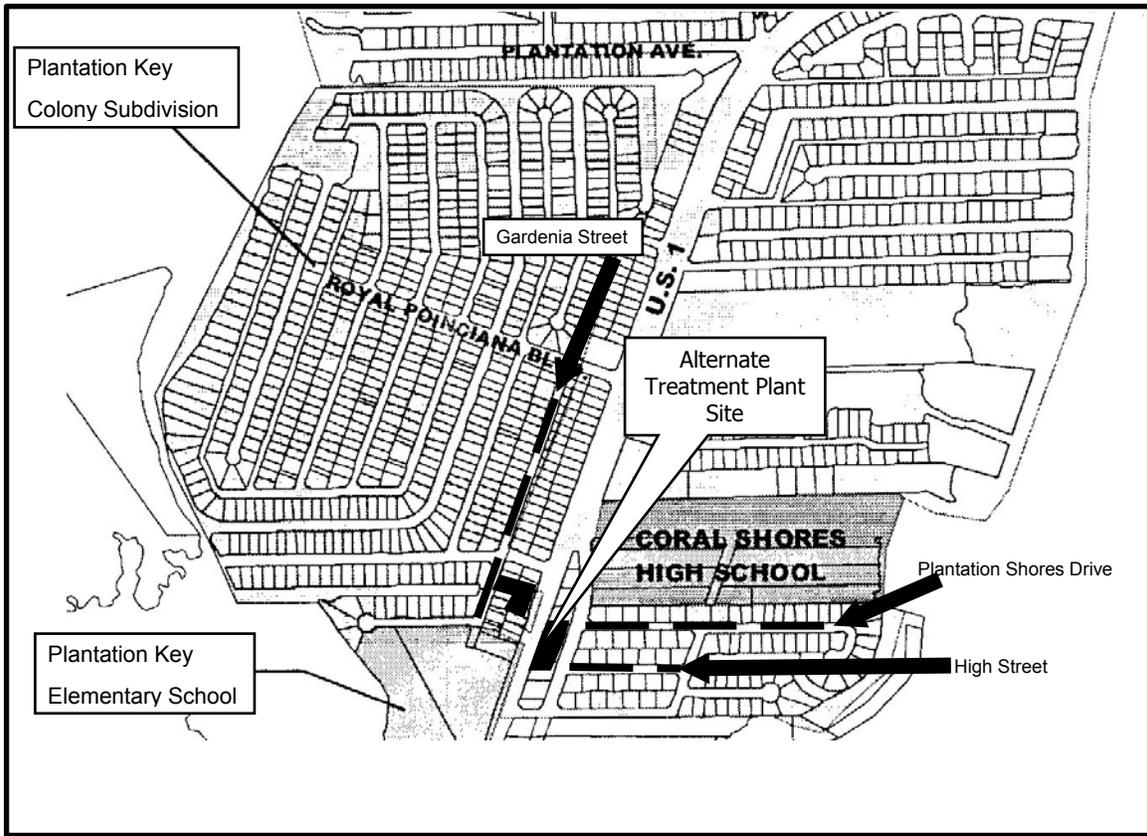


Figure 2-5. New Oceanside Wastewater Treatment Plant Site Location Map

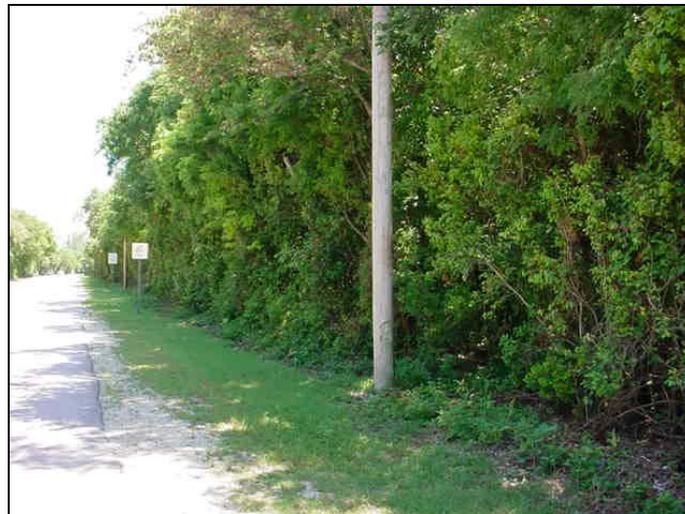


Photo 2-3. South View of Western Property Boundary along US-1 Access Road



Photo 2-4. South View of Eastern Property Boundary along US-1

2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER CONSIDERATION

A number of alternatives were considered but eliminated from further consideration in Section 2.4 (Alternatives Considered but Dismissed) of the PEA. The Bayside Site analyzed in the Preferred Alternative of this SEA was selected by the Village due to its proximity to the service area as well as the reduced environmental impacts associated with the property.

This section describes environmental consequences of the No Action Alternative and the two Action Alternatives, and details the potential effects on physical, natural, and socioeconomic resources within the project area. Discussion in this document includes direct, indirect, and cumulative effects.

3.1 TOPOGRAPHY, SOILS, AND GEOLOGY

3.1.1 Topography

Affected Environment

The existing environment is similar to that described in PEA Section 3.1.1.1 (Topography, Affected Environment) . North Plantation Key is relatively flat and elevations are often less than 5.0 feet to about 10.0 feet above mean sea level (amsl) National Geodetic Vertical Datum (NGVD). The elevation of US-1 in the service area is about 5.0 feet amsl NVGD. Elevations of 10.0 feet amsl NVGD or greater are found in central PKC, Kahiki Harbor and Plantation Shores. The slope throughout the preferred WWTP site is between 5.0 feet and 10.0 feet amsl NVGD; while the slope at the alternate site is between 5.0 and 10.0 feet amsl NVGD but increases to 10.0 feet or greater amsl NGVD in the vicinity of the southwestern corner of the property.

Environmental Consequences

Under the No Action Alternative, the Village would not receive FEMA funds for wastewater management. North Plantation Key/Plantation Key Colony residents would still need to comply with Florida Statutory Treatments Standards of 2010. It is anticipated that once funding is secured, effects on topography would be similar to those under Alternatives 2 and 3.

Topographic impacts of Alternatives 2 and 3 would be limited to temporary surface disturbances during construction of the collection system, treatment plant, and removal of existing onsite treatment septic systems. The WWTP site would require site clearing and grubbing and fill to possibly elevate the administration and utility buildings for appropriate flood protection . Grading requirements would permanently change the surficial topographic elevation of the proposed project sites, but this impact is minor because it would not significantly alter the flat surface topography of the service area.

3.1.2 Soils

Affected Environment

The existing soil conditions are similar to those described in the PEA, Section 3.1.2.1 (Soils, Affected Environment). The project sites' soil types are Pennekamp Gravelly muck and Udorthents-Urban Land Complex (Figure 3-1). Pennekamp Gravelly muck is a well-drained soil found on tropical hammocks in the Upper Keys. About 10 percent of the surface of this soil is covered with stones that are predominantly 10 to 20 inches in diameter. Per the Farmland Protection Policy Act, there are no prime farmlands in Monroe County. Elevations are generally 5.0 feet to 15.0 feet amsl NVGD so that the higher areas are subject to rare flooding from hurricanes and other tropical storms. The Pennekamp soil has a seasonal high water table at a

depth of 3.5 to 5.0 feet during the wet periods of most years, and permeability is moderately rapid (USDA, 1995).

The Udorthents-Urban Land Complex is a moderately well-drained soil consisting of crushed oolitic limestone or coral bedrock. The seasonal high water table is at a depth of two to four feet during the wet periods of most years and permeability is variable. This soil type is generally found in constructed upland areas next to water bodies throughout the Keys; houses and other urban structures cover most areas with this soil type. Other soil types present in the vicinity of the service area include Islamorada muck, tidal; Key Largo muck, tidal; Matecumbe muck, occasionally flooded; and Rock outcrop – Tavernier complex, tidal (USDA, 1995).

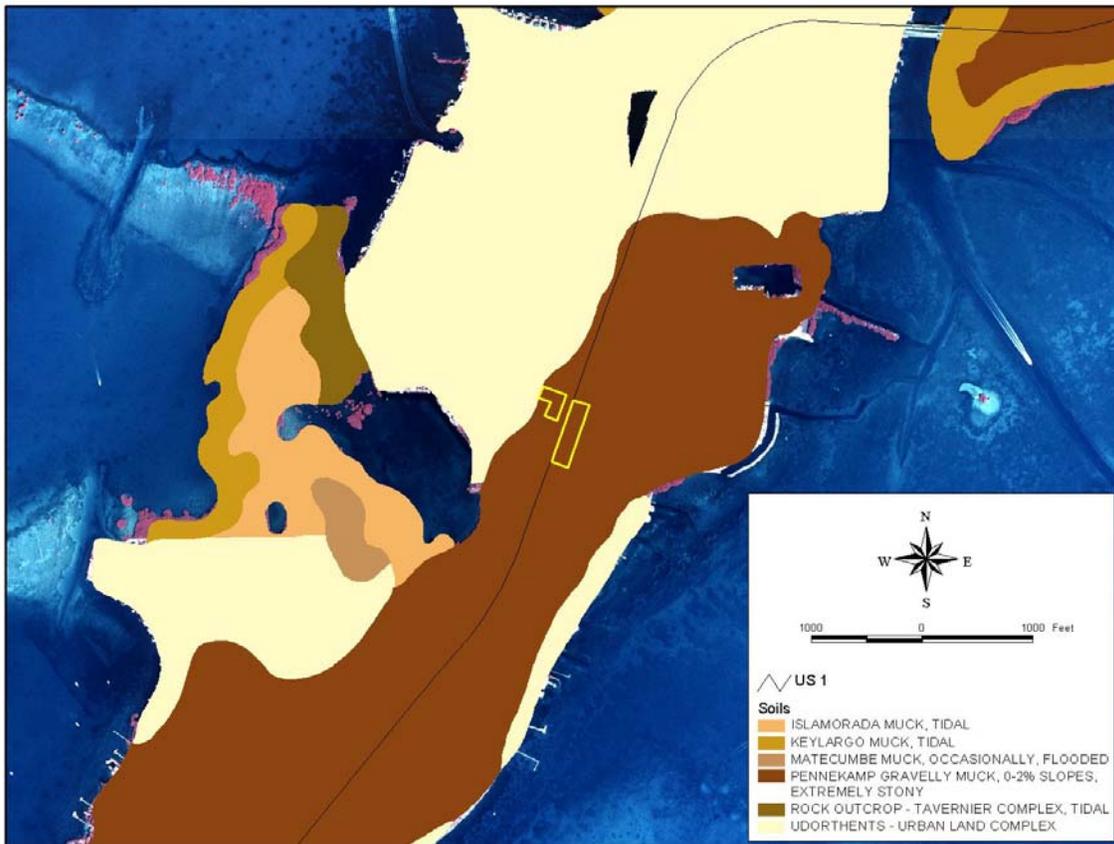


Figure 3-1. Project Area Soils (USDA, 1995)

Environmental Consequences

Under the No Action Alternative, The Village would not receive FEMA funds for wastewater management. North Plantation Key/Plantation Key Colony residents would still need to comply with Florida Statutory Treatments Standards of 2010. It is anticipated that once funding is secured, effects on soils would be similar to those under Alternatives 2 or 3.

Under both Alternatives 2 and 3, soils would be disturbed during the construction processes. Clean, suitable fill may be required to achieve the final grade at the proposed WWTP site. In

addition, soil would be excavated for the installation of sewer mains, vacuum pits, and buffer tanks.

Implementation of appropriate best management practices (BMPs), development of an approved Erosion and Sediment Control Plan, and use of conventional site preparation techniques are recommended prior to and during construction to protect area water bodies and canals. Planned measures to control sediment from discharge to nearshore surface waters may include, but are not limited to, silt dams, barriers, and straw bales placed at the foot of sloped surfaces. Planned measures to control soil erosion may include, but are not limited to, grassing, mulching, watering, and seeding of onsite surfaces. Site preparation may include grubbing of vegetative root systems, topsoil materials, followed by surface compaction and placement of fill to attain the required construction elevation.

Applying BMPs and appropriate erosion mitigation measures would limit adverse soil impacts during construction of the wastewater treatment system. Both the preferred and the alternate sites are located in the Pennekamp Gravelly muck, which is well suited for urban development due to the increased elevations. Overall, no long-term adverse effects on soils are anticipated if site soil excavation, disposal, and erosion potential are managed in accordance to state standards and applicable BMP and erosion control guidelines.

3.1.3 Geology

Affected Environment

The existing geologic environment is similar to what is described in the PEA, Section 3.1.3.1 (Geology, Affected Environment). Results of geotechnical test borings at the Alternative 2 plant site revealed a surface layer of gray to brown fine sand and limestone to depths ranging from 1 to 3 feet below the ground surface. Below the surface layer, hard to very hard limestone with coralline limestone lenses was encountered within 8 feet, the maximum depth explored (Nutting Engineers, 2003).

Environmental Consequences

Under the No Action Alternative, the Village would not receive FEMA funds for wastewater management. North Plantation Key/Plantation Key Colony residents would still need to comply with Florida Statutory Treatments Standards of 2010. It is anticipated that once funding is secured, effects on geology would be similar to those under Alternatives 2 and 3.

Alternatives 2 and 3 new WWTP construction would have minor impacts on geology. Excavation would be done to install sewer mains at 1-foot to 2–feet amsl NVGD along service area roads and for the removal of cesspits and septic systems.

WWTP construction would require underground installation of two shallow wells to dispose of treated wastewater effluent and one groundwater monitoring well. Very hard limestone will be encountered during the installation of the sewer line. Therefore, the equipment used to excavate the trenches would need to be capable of penetrating the coralline limestone. The shallow injection wells would be cased and grouted to 60 feet below land surface (bls), with a gravel-packed open hole section from 60 feet to 90 feet bls (see Section 2.3.2.2 [Wastewater Treatment

Plant Effluent Disposal Options] of the PEA). The shallow wells' effects on project area geology are expected to be minor and are discussed in Section 3.1.3.2.2 (Centralized Wastewater Treatment Plant Alternative) of the PEA. The applicant is responsible for obtaining all applicable FDEP permits for Class V shallow injection wells (Table 3-1).

Table 3-1. FDEP Forms Required for Injection Wells

Form Title	Form Number
Application to Construct/Operate/Abandon Class I, III, or V Injection well Systems	62-528.900(1)
Certification of Plugging Completion Class I, III, or V Well	62-528.900(2)
Construction/Clearance Permit Application for Class V Well	62-528.900(3)
Certification of Class V Well Construction Completion	62-528.900(4)
Authorization for Class V Well Use	62-528.900(5)
Application for Class V Well Plugging and Abandonment Permit	62-528.900(6)
General Permit Form for Closed-Loop Air Conditioning Return Flow Class V Injection well	62-528.900(7)
Notification to the Florida Department of Environmental Protection of Class V Well Ownership	62-528.900(8)
Certification of Monitor Well Completion	62-528.900(10)

As discussed in PEA Section 3.1.3.2.2 (Centralized Wastewater Treatment Plant Alternative), aside from the potential impacts of injection well use, WWTP construction is not expected to adversely affect the project area geology. The environmental consequences to the geologic environment with shallow injection well use are expected to be limited to the effects of injection of relatively fresh effluent into brackish to saline water aquifers, which could affect the rate of limestone solution (dissolving). In mainland Florida, sinkhole development, especially in areas of declining water tables, has been a severe engineering problem. However, on Plantation Key, the water table is about 4 feet below the existing ground surface, and water tables have not been declining. Therefore, new and/or expanded sinkholes are not likely to result from this alternative.

3.2 WATER RESOURCES AND WATER QUALITY

3.2.1 Groundwater

Affected Environment

The affected environment for groundwater is described in PEA Section 3.2.2.1 (Groundwater, Affected Environment). Throughout the project area, the water of the Biscayne Aquifer ranges from brackish to saline and is of little potential utility except as input for desalination systems. Freshwater lenses have not been documented for Plantation Key.

Results of geotechnical test borings at the Alternative 2 plant site generally revealed the groundwater was encountered about four feet below the existing ground surface (Nutting Engineers, 2003). This water table elevation is subject to change due to tidal fluctuations, rainfall, construction activity, and other site-specific factors.

Seven shallow Class V injection wells are located in the service area; three are located on the bayside of US-1, and four are on the ocean side (FDEP 2003) These wells discharge relatively fresh but nutrient-rich waters and effluents into the Biscayne Aquifer within the service area.

Environmental Consequences

Under the No Action Alternative, FEMA funding would not be available for the wastewater management projects. Although residents of the service area would still need to comply with Florida Statutory Treatment Standards of 2010, reduction of nutrient and pathogen inputs to the shallow groundwater of Plantation Key would not occur until a funding source is secured. Therefore, local groundwater quality improvements would be delayed under the No Action Alternative.

Under Alternatives 2 and 3, a new WWTP would be designed and constructed to meet Florida Statutory Treatment Standards of 2010 effluent requirements for disposal to shallow injection wells from an AWT system. Treated effluent would still contain some nutrients under conditions that meet the 2010 standards. However, by removing the septic and cesspool systems, the overall nutrient and pathogen inputs to the shallow groundwater of the island would be substantially reduced, and overall local groundwater quality would improve. These improvements would be on the order of 92 and 86 percent reductions in TN and TP loadings, respectively (refer to Appendix D [Water Quality Improvement Analysis] of the PEA).

3.2.2 Inland, Nearshore, and Offshore Waters

Affected Environment

Surface water resources of the project area include: (1) canals for boat access to marinas and residential developments; (2) stormwater runoff to ditches and drainage systems in developed areas; and (3) nearshore and offshore marine waters.

3.2.2.1 Inland Waters

Project area inland waters include San Pedro Lake, human-made canals, and boat basins as described in PEA Section 3.2.3.1.1 (Inland Waters). Five boat harbors and numerous canals are scattered throughout PKC and North Plantation Key. San Pedro Lake is a 33-acre water body located immediately south of Plantation Key Elementary School and is connected to Florida Bay via a human-made canal.

Canals and other confined water bodies showing signs of eutrophication during a review of Outstanding Florida Waters (OFW) in the Florida Keys were listed as “hot spots” (see PEA Appendix C [Hot Spot Locations]). Monroe County (2000) ranked North Plantation Key as the sixth and fourteenth most critical “hot spots” believed to contribute to water quality degradation in the Upper Keys and Florida Keys, respectively.

3.2.2.2 Nearshore and Offshore Marine Waters

Kruczynski (1999) and Szmant and Forrester (1996) determined that, in general, nutrient pollution emanating from the Keys has greater nearshore effects than offshore effects due to

dilution by tides and currents. Offshore areas in the Middle Keys that had higher nutrient levels than offshore areas in the Upper Keys were attributed to the relatively high nutrient-content of Florida Bay (Kruczynski 1999; Szmant and Forrester, 1996).

Project area nearshore and offshore marine waters are described in PEA Section 3.2.3.1.2 (Nearshore and Offshore Marine Waters). The Florida DOH collects beach water quality data from the Founders' Park water quality monitoring station in the Village (MM 87.0), located about 2.8 miles southwest of the proposed project areas. It is the closest monitoring station to the proposed project sites. Since August 2002, four health advisories/warnings have been issued (State of Florida, DOH, 2003). Health advisories are issued by DOH when sampling results indicate that contact with the water at that site may pose increased risk of infectious disease, particularly for susceptible individuals. A poor rating is measured as 104 or greater of *Enterococcus* sp. organisms per 100 ml of marine water or 400 or greater fecal coliform organisms per 100 ml of marine water. A poor rating requires resampling before issuing a health advisory. A moderate rating is measured as 35 to 103 *Enterococcus* sp. organisms per 100 ml of marine water. On four occasions between August 2002 and February 2003, water at this site received a moderate water quality rating. However, no trends were observed correlating poor or moderate water quality ratings with a particular time of year for either fecal coliforms or *Enterococcus* sp. categories.

The Water Quality Monitoring Project for the Florida Keys National Marine Sanctuary's Water Quality Protection Program maintains a monitoring station (Station 226, Tavernier Harbor) in the vicinity of Tavernier, northeast of the proposed project sites. Established by the U.S. Environmental Protection Agency (EPA) in 1995, the goal of the Project is to characterize status and trends in water quality of the Florida Keys. Station 226 is sited about three miles west of the project area in Hawk Channel (SERC, 2003). Surface levels of total nitrogen recorded at Station 226 average at 0.2318 ppm; these levels are higher (33.5 percent more) than the average total nitrogen (TN) reading taken from all monitoring stations, Keys-wide (0.1756 ppm). Total phosphorus (TP) loadings recorded at Station 226 average at 0.0067 ppm; these levels are comparable to the Keys-wide average (0.0069 ppm). Over time, TN and TP are only slightly increasing. It is difficult to correlate these trends directly with nutrient loads from Plantation Key due to the distance from Station 226 to Plantation Key due to potential influences from other nutrient sources on Windley and Upper Matecumbe Keys as well as Florida Bay.

3.2.2.3 Stormwater

Although few data exist, Monroe County has represented US-1 as the topographic divide for each island, whereby lands to the bayside of US-1 drain mainly toward Florida Bay, and lands to the ocean side of US-1 drain toward the Florida Straits (Monroe County, 2000). In August 2001, Monroe County released a Stormwater Management Master Plan (SMMP), an integrated approach for addressing stormwater management throughout the Keys that includes proposed management alternatives (Monroe County, 2001). The Village is planning two projects to improve stormwater management in the area (refer to Figure 3-6 [Stormwater Retrofit and Rehabilitation Projects] in the PEA). Stormwater improvement projects have not been conducted within the project area. In the Keys, stormwater runoff from roadways, bridges, driveways and yards, rooftops, and shopping center parking lots contribute stormwater loading to nearshore waters.

Environmental Consequences

Under the No Action Alternative, impacts on surface water quality in the vicinity of North Plantation Key and Plantation Key Colony would likely continue due to nutrient and pathogen inputs from onsite systems on the island. Under this alternative FEMA would not provide funds for wastewater management projects. North Plantation Key/Plantation Key Colony residents would still need to comply with Florida Statutory Treatments Standards of 2010. It is anticipated that once funding is secured, effects on surface waters would be similar to those under Alternatives 2 and 3; although delayed because of later implementation.

The effects on inland, nearshore, and offshore water quality are similar for Alternatives 2 and 3. These effects are expected to be beneficial and are discussed in PEA Section 3.2.3.2 (Inland, Nearshore and Offshore Waters, Environmental Consequences). Treated effluent would still contain some nutrients under conditions that meet the 2010 Advanced Wastewater Treatment Standards. However, by removing the septic and cesspool systems, the overall nutrient and pathogen inputs to inland and nearshore waters via shallow groundwater of the island would be substantially reduced, and the service area's inland and nearshore water quality would improve. These improvements would be on the order of 92 and 86 percent reductions in TN and TP loadings, respectively (refer to Appendix D [Water Quality Improvement Analysis] of the PEA).

Implementation of either alternative would not adversely affect stormwater flows or quality, and are expected to result in generally positive effects on the water quality of stormwater flows. Use of appropriate BMPs, and development and full implementation of a Stormwater Pollution Prevention Plan under FDEP National Pollutant Discharge Elimination System (NPDES) requirements would be needed before and during construction to protect area water bodies and surrounding areas. Planned measures to control sediment from discharge into nearshore surface waters include, but are not limited to, silt dams, barriers, and straw bales placed at the foot of sloped surfaces.

If wastewater reuse is implemented with Alternatives 2 and 3, it is estimated that a land area of about 10.2 acres, using a Phase I plus IA flow of 79,100 gpd, would be required to fully reuse the plant effluent. The application method and effluent treatment standards would be based on State regulations. Effluent may be reused over the 24-acre Islamorada Founder's Park on Plantation Key (MM 87). Other uses of this reclaimed water that may be considered by the Village, in general, include:

- Preservation of various freshwater hammocks and rejuvenation of desirable species of native plant life, in addition to re-planting areas where native plant life has disappeared;
- Public access reuse at various schools, government buildings, parks, golf courses, and marinas;
- Private residence irrigation water; and
- Reuse at the treatment plant including: flushing water, chlorination system make-up water, and hose connections for washdown water.

3.2.3 Floodplains and Wetlands

Affected Environment

3.2.3.1 Floodplains

Executive Order (EO) 11988, Floodplain Management, requires Federal agencies to take action to minimize occupancy and modification of floodplains. Application of the Eight-Step Decision-Making Process, per 44 CFR Part 9, is required to ensure that Federally funded projects are consistent with EO 11988 objectives. By its very nature, the NEPA compliance process involves the same basic decision-making methods to meet its objectives as the Eight-Step Decision-Making Process. Therefore, the Eight-Step Decision-Making Process has been applied through the implementation of the NEPA process.

The majority (86 percent) of North Plantation Key is located within the designated 100-year floodplain (Figure 3-2; FIRM panel 12087C1131G). According to the National Flood Insurance Program (NFIP) Flood Insurance Rate Map (FIRM), about 444.5 acres of North Plantation Key are located within the 100-year floodplain in Zones AE and VE. (See Section 3.2.4.1.1 [Floodplains] of the PEA for description of the Zones). Zone VE is located along the Plantation Key shoreline, on the ocean side and bayside, seaward of Zone AE. Central Plantation Key Colony, and portions of Kahiki Harbor and Plantation Shores, about 72.6 acres of the service area, are located in Zone X and Zone X500, both of which are outside the 100-year floodplain.

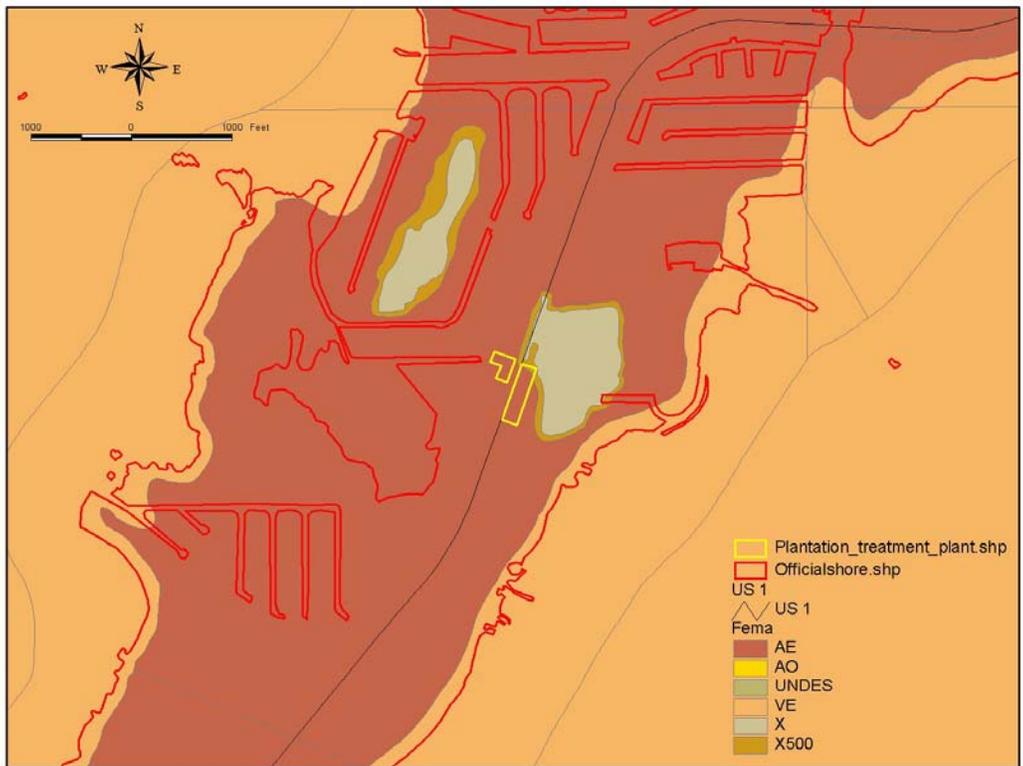


Figure 3-2. Project Area Floodplains (FEMA, 1999)

3.2.3.2 Wetlands

Wetland communities are discussed in PEA Section 3.2.4.1.2 (Wetlands, Affected Environment). Under EO 11990 (Protection of Wetlands), Federal agencies are required to minimize the destruction, loss, or degradation of wetlands and preserve and enhance their natural and beneficial values. FEMA applies the same Eight-Step Decision-Making Process, required by 44 CFR Part 9, to meet the requirements of EO 11990, as described above. Field investigations were conducted by two URS biologists on July 31, 2002, to identify wetlands within the project area. Wetlands communities in the project area consist of mangroves, salt marshes, and salt pans. Marine seagrass meadows also fall under the definition of wetland communities. All sites were qualitatively assessed during the field investigations. No freshwater wetlands or jurisdictional wetlands were identified within the project sites (Figure 3-3).

Environmental Consequences

Under the No Action Alternative, impacts on floodplains or wetlands would likely be similar to Alternatives 2 or 3. Without FEMA funding, water quality degradation in the above described wetlands may continue, until existing systems are upgraded with another funding source. In the absence of federal funding, EO 11988 and 11990 would not apply; meaning wastewater system designs would only have to comply with the Village's Floodplain Ordinance (01-04) and be protected to the 100-year flood level. Specific floodplain ordinance provisions are further described in PEA Section 3.2.4.2.1 (No Action Alternative).

No notable effects on floodplains associated with Alternatives 2 and 3 are anticipated; these are further described in PEA Section 3.2.4.2.2 (Centralized Wastewater Treatment Plant Alternative). Since the treatment plant would be constructed in the floodplain and considered a critical facility, the plant and its critical operating components would be protected to the 500-year flood, through elevation or floodproofing, to protect the federal investment from flood damages, per EO 11988 (44 CFR Part 9.11). Because much of the Keys are in the 100-year floodplain, there are no practicable alternatives to siting this facility outside the floodplain. For Alternatives 2 and 3, no direct impacts on wetlands are anticipated on North Plantation Key since no wetlands occur at the proposed and alternate WWTP sites or along service area roads. Jurisdictional wetlands would not be impacted by construction activities. Specific effects to mangrove, salt marsh, salt pan, and seagrass meadows wetlands are described in Section 3.3 below; and are expected to be minimal.

There is public concern that the proposed WWTP would lead to further development in the floodplain within the service area by introducing key infrastructure, which is often linked to additional development. However, development within the Village of Islamorada is not controlled by addition of key infrastructure, but instead by a Building Permit Allocation System (BPAS). The BPAS regulates both residential and non-residential growth through the year 2020. During the period from 2001 to 2020 the BPAS allows a total of 302 residential units, an average of 15 per year. The construction of new wastewater treatment systems in the Keys is for the purpose of effectively treating existing wastewater flows, and is not proposed as a way to introduce or support increased development. Therefore, if growth and development in the floodplain occurs following implementation of any of the above alternative, it is a function of established Village planning and is not directly related to wastewater management

improvements. Given the above points, neither of the action alternatives are expected to cause secondary adverse effects from increased growth on floodplains.

As stated in PEA Section 3.2.3.2 (Inland, Nearshore and Offshore Waters, Environmental Consequences) the use of appropriate BMPs and development and full implementation of an FDEP/SFWDM-approved Erosion and Sediment Control Plan is recommended prior to and during construction to protect area water bodies and wetlands. Planned measures to control sediment from discharge to nearshore surface waters include, but are not limited to, silt dams, barriers, and hay bales placed at the foot of sloped surfaces.

3.3 BIOLOGICAL RESOURCES

As in much of the Keys, humans have significantly altered the land within the project area through urban development activities, including clearing, grading, and filling. Of the six major native terrestrial communities (pine rocklands, tropical hardwood hammocks, mangroves, salt marsh, freshwater systems and dunes/coastal ridges) that are Keys-wide and further described in PEA Section 3.3.1.1 (Terrestrial Ecosystems, Affected Environment), three types (tropical hardwood hammocks, mangroves, and salt marsh) occur within the project area. Two of the four marine communities that occur in the Keys (seagrasses and sandy bottom) are found near the project area. Limited areas of hardbottom/seagrass are also present. Coral reefs and hardbottom areas are not present near the project area. Terrestrial and aquatic ecosystems are discussed separately in the following two sections. The existing ecosystems on a region-wide basis are described in PEA Section 3.3 (Biological Resources).

Field investigations were conducted by two URS biologists on July 31, 2002. The purpose of the investigation was to verify preliminary terrestrial community type boundaries established in office literature reviews and during photo interpretation. A composite list of plant species observed and identified at the sites for Alternatives 2 and 3 is included in Tables 3-2 and 3-3, respectively. Section 3.3.3 describes the potential for special status species to occur in the project area. Photo-documentation obtained from the field investigation is provided in Appendix C (Site Photographs).

**Table 3-2. Observed Plant Species at the Preferred Site (Alternative 2)
(URS site visit; July 31, 2002)**

Common Name	Scientific Name
Yellow joyweed	<i>Alternanthera flavescens</i>
Beggarticks	<i>Bidens alba</i> var. <i>radiata</i>
Gumbo limbo	<i>Bursera simaruba</i>
Australian pine	<i>Casuarina equisetifolia</i>
Madagascar periwinkle	<i>Catharanthus roseus</i>
Hyssopleaf sandmat	<i>Chamaesyce hyssopifolia</i>
Snowberry	<i>Chiococca alba</i>
Pigeon plum	<i>Coccoloba diversifolia</i>

Table 3-2. Observed Plant Species at the Preferred Site (Alternative 2)
(URS site visit; July 31, 2002)

Common Name	Scientific Name
Golden pothos	<i>Epipremnum pinnatum</i>
White stopper	<i>Eugenia axillaries</i>
Spanish stopper	<i>Eugenia foetida</i>
Strangler fig	<i>Ficus aurea</i>
Chewstick	<i>Gouania lupuloides</i>
Scorpionstail	<i>Heliotropium angiospermum</i>
Bladdermallow	<i>Herissantia crispa</i>
Oceanblue morningglory	<i>Ipomoea indica</i>
White leadtree	<i>Leucaena leucocephala</i>
False tamarind	<i>Lysiloma latisiliqua</i>
Wild bushbean	<i>Macroptilium lathyroides</i>
Snow squarestem	<i>Melanthera nivea</i>
Poisonwood	<i>Metopium toxiferum</i>
Redgal	<i>Morinda royoc</i>
Lancewood	<i>Ocotea (=Nectandra) coriacea</i>
Virginia creeper	<i>Parthenocissus quinquefolia</i>
Jamaican dogwood	<i>Piscidia piscipula</i>
Paintedleaf	<i>Poinsettia cyathophora</i>
Wild coffee	<i>Psychotria nervosa</i>
Brazilian pepper	<i>Schinus terebinthifolius</i>
Everglades greenbrier	<i>Smilax havanensis</i>
Potatotree	<i>Solanum erianthum</i>
Wedelia	<i>Sphagneticola trilobata</i>
Shrubby false buttonweed	<i>Spermacoce verticillata</i>
Blue porterweed	<i>Stachytarpheta jamaicensis</i>
St. Augustine grass	<i>Stenotaphrum secundatum</i>
Cheesytoes	<i>Stylosanthes hamata</i>
West Indian mahogany	<i>Swietenia mahagoni</i>
Florida thatch palm	<i>Thrinax radiata</i>
Muscadine	<i>Vitis rotundifolia</i>
Wild lime	<i>Zanthoxylum fagara</i>

Table 3-3. Observed Plant Species at the Alternate Site (Alternative 3)
(URS site visit; July 31, 2002)

Common Name	Scientific Name
Barbed-wire cactus	<i>Acanthocereus tetragonus</i>
Yellow joyweed	<i>Alternanthera flavescens</i>
Beggarticks	<i>Bidens alba</i> var. <i>radiata</i>
Gumbo limbo	<i>Bursera simaruba</i>
Snowberry	<i>Chiococca alba</i>
Pigeon plum	<i>Coccoloba diversifolia</i>
White stopper	<i>Eugenia axillaries</i>
Spanish stopper	<i>Eugenia foetida</i>
Strangler fig	<i>Ficus aurea</i>
Chewstick	<i>Gouania lupuloides</i>
Firebush	<i>Hamelia patens</i>
Scorpionstail	<i>Heliotropium angiospermum</i>
Bladdermallow	<i>Herissantia crispa</i>
Black ironwood	<i>Krugiodendron ferreum</i>
Smallcane	<i>Lasiacis divaricata</i>
White leadtree	<i>Leucaena leucocephala</i>
False tamarind	<i>Lysiloma latisiliqua</i>
Poisonwood	<i>Metopium toxiferum</i>
Redgal	<i>Morinda royoc</i>
Lancewood	<i>Ocotea (=Nectandra) coriacea</i>
Monk orchid	<i>Oeceoclades maculata</i>
Jamaican dogwood	<i>Piscidia piscipula</i>
Wild coffee	<i>Psychotria nervosa</i>
Brazilian pepper	<i>Schinus terebinthifolius</i>
Willow bustic	<i>Sideroxylon salicifolium</i>
Shrubby false buttonweed	<i>Spermacoce verticillata</i>
Blue porterweed	<i>Stachytarpheta jamaicensis</i>
West Indian mahogany	<i>Swietenia mahagoni</i>
West Indian almond	<i>Terminalia catappa</i>
Wild lime	<i>Zanthoxylum fagara</i>

Affected Environment

3.3.1 Terrestrial Ecosystems

Little native vegetation remains on North Plantation Key; natural vegetation has largely been replaced by planted ornamental species and exotic species. Existing vegetation within the project area, as characterized by the Florida Keys Advance Identification of Wetlands (ADID) mapping project, is dominated by developed and/or filled land, canals, and other surface waters, hammocks, mangroves (McNeese, 1998; Figure 3-3; Table 3-4).

Table 3-4. Existing Vegetation in the Service Area (McNeese 1998)

Habitat Type	Acres
Developed	378.7
Canals and other surface waters	94.0
Tropical hardwood hammock	19.6
Mangroves and Salt Marsh	10.3
Exotics	0.5
Total	503.1*
* - Difference (13.9 acres) due to data manipulation	

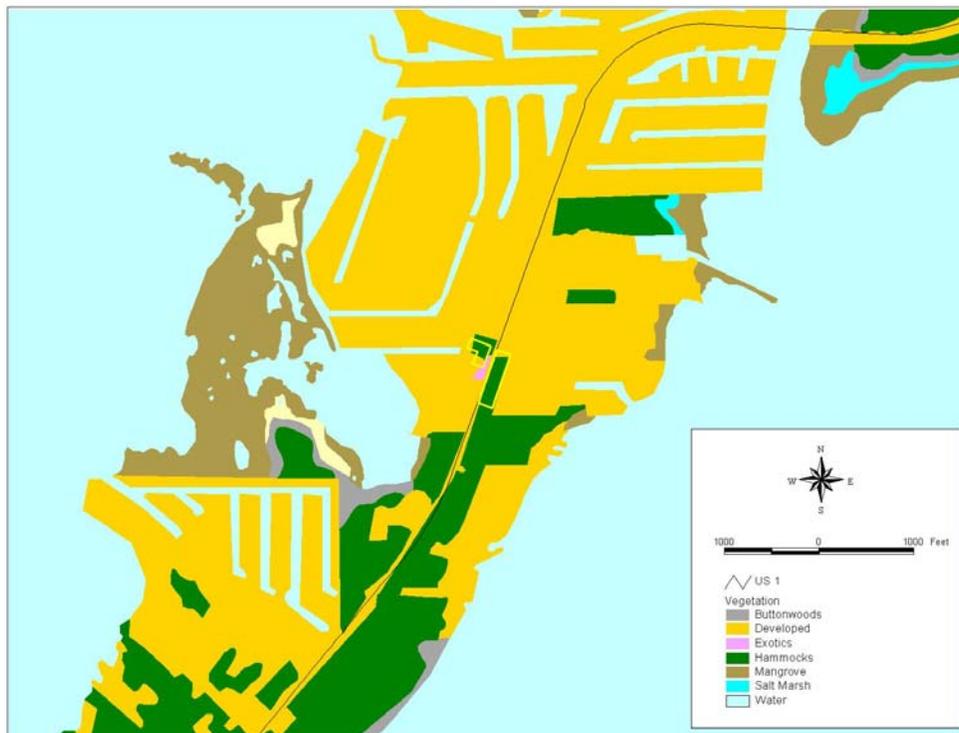


Figure 3-3. Project Area Vegetation (McNeese, 1998)

Alternative 2, the preferred site is located on the bayside of US-1 at about MM 89.8 on Plantation Key (Figure 2-3). This roughly L-shaped, 0.8-acre site is located between US-1 to the east and Gardenia Street to the west. Existing vegetation at this site can largely be characterized as a degraded hardwood hammock impacted by habitat fragmentation and infestation by invasive, non-indigenous plant species. Between the proposed WWTP site and Woods Avenue to the north are undeveloped forested parcels comprised of similar vegetation although with a lesser occurrence of Brazilian pepper. Residences and undeveloped parcels to the south, between the proposed WWTP site and the driveway to Plantation Key Elementary School, are dominated by Brazilian pepper (*Schinus terebinthifolius*) and Australian pine (*Casuarina equisetifolia*).

During the field investigations, Eurasian collared doves (*Streptopelia decaocto*) and Mourning doves (*Zenaida macroura*) were observed near the preferred site. No other birds were observed during the site visit. However, unidentified bird species were heard calling or singing near the Alternative 2 site.

Brown anoles (*Anolis sagrei*) were observed near the Alternative 2 site. Several land crab (*Cardisoma guanhumii*) burrows were observed and four giant swallowtail butterflies (*Papilio cresphontes*) were observed near the wild lime plants (*Zanthoxylum fagara*). No other reptiles, amphibians, or mammals were observed during the field investigation. No nests, burrows, or other roosting means were observed on or near the Alternative 2 site.

The Alternative 3, site is located on the ocean side of US-1 at approximate MM 89.7 on Plantation Key (Figure 2-5). The Alternative 3 site is rectangular, about one acre in size, and is bounded by US-1 to the west, Old State Road 4A to the east, Plantation Shores Drive to the north, and High street to the south. Existing vegetation at this site appears to be a higher quality hardwood hammock community in which the occurrence of exotic plant species has been largely excluded from the interior and that has been impacted to a lesser extent by habitat fragmentation. The presence of vegetated lands north and south of this site has resulted in a narrow, contiguous corridor of hammock habitat that extends along the ocean side of US-1 in North Plantation Key.

During the site investigations, Eurasian collared doves and Mourning doves were observed near the alternate site. No other birds were observed during the site visit. However, unidentified bird species were heard calling or singing near the Alternative 3 site.

Brown anoles were observed near the Alternative 3 site. No other reptiles, amphibians, or mammals were observed during the field investigations. No nests, burrows, or other roosting means were observed on or near the Alternative 3 site.

A discussion of individual habitat types is provided below.

3.3.1.1 Pine Rocklands and Tropical Hardwood Hammocks

Pine rocklands and tropical hardwood hammocks are limited in distribution throughout the Upper and Middle Keys. Remnants of hammocks are present at the preferred site and the alternate site, and throughout the service area (Figure 3-3). Pine rocklands habitat is not present at the Alternative 2 and 3 sites.

The Alternative 2 site contains isolated and degraded hardwood hammock habitat heavily infested by invasive, non-indigenous plants. Native species common in the canopy at this site include false tamarind (*Lysiloma latisiliqua*), poisonwood (*Metopium toxiferum*), Jamaican

dogwood (*Piscidia piscipula*), gumbo limbo (*Bursera simaruba*), and pigeon plum (*Coccoloba diversifolia*). Smaller individuals of the canopy species, and Spanish stopper (*Eugenia foetida*), are common in the understory at the site. Snowberry (*Chiococca alba*) is very common on the periphery of the wooded area. Ground cover at the site is comprised almost exclusively of redgal (*Morinda royoc*). Exotic species such as Brazilian pepper and Australian pine have invaded this hardwood hammock community. Brazilian pepper is the dominant canopy species in the western and southern portions of the site; Australian pine is the dominant canopy species along the eastern property boundary.

Three Florida thatch palm (*Thrinax radiata*) seedlings, listed by the State of Florida as Threatened, were noted in the southwestern portion of the site near Gardenia Street. A few individuals of West Indian mahogany (*Swietenia mahagoni*), state-listed Endangered, were observed in the central and northern portions of the site. No federally listed plant or animal species were observed.

The Alternative 3 site consists of tropical hardwood hammock relatively free of invasive, non-indigenous species infestation. Exotic plant intrusions at the site, by species such as Brazilian pepper and white lead tree (*Leucaena leucocephala*), are generally limited to roadside margins and the property immediately north of the site. Canopy vegetation at this site consists of hammock species such as West Indian mahogany, false tamarind, gumbo limbo, pigeon plum, poisonwood, and Jamaican dogwood. In addition to smaller individuals comprising the canopy, important components of the subcanopy include black ironwood (*Krugiodendron ferreum*), Spanish stopper, white stopper (*Eugenia axillaris*), and lancewood (*Ocotea coriacea*). The floor of this community is relatively free of ground cover with a moderate leaf litter development. Snowberry is very common on the periphery of the forested area.

A small population of barbed-wire cactus (*Acanthocereus tetragonus*), listed by the State of Florida as Threatened, were noted in the west central portion of the site near US-1. Several large individuals of mahogany, a state-listed Endangered species, were observed at the site as well as a number of large individuals of gumbo limbo, strangler fig (*Ficus aurea*), and wild tamarind. No federally listed plant or animal species were observed.

3.3.1.2 Mangrove Forests and Salt Marshes

Throughout the Keys, mangroves form the predominant coastal vegetation community. Mangroves are found along the edges of shorelines, bays and lagoons and on over wash areas throughout the Keys. Mangroves and salt marshes are discussed in PEA Section 3.3.1.1.2 (Mangrove Forests and Salt Marshes).

Fringing mangroves dominate shorelines near the project area. Three mangrove tree species, red mangrove (*Rhizophora mangle*), black mangrove (*Avicennia germinans*) and white mangrove (*Laguncularia racemosa*), are the dominant components. About 10.3 acres of mangrove habitat are present in the service area, including a large mangrove forest in the northwest portion of the service area (Figure 3-3). West of PKC and San Pedro Lake, outside the service area is a second large mangrove forest.

Salt marshes, which are not well developed in most of the Keys, usually consist of largely monospecific (single species) stands of black needlerush (*Juncus roemerianus*) and salt marsh cordgrass (*Spartina alterniflora*). Other common salt marsh species in the Keys include marsh

elder (*Iva frutescens*), saltbush (*Baccharis halimifolia*), seaside goldenrod (*Solidago sempervirens*), salt grass (*Distichlis spicata*), sea purslane (*Sesuvium portulacastrum*), and mangroves. Sand or limerock areas at the upper end of the tidal range may have sea ox-eye (*Borrchia arborescens*), saltwort (*Batis maritima*), seablight (*Suaeda linearis*), and sea lavender (*Argusia gnaphalodes*). About 1.2 acres of salt marsh habitat is present in the North Plantation Key Sub-service area, east of US-1 and north of Coral Shores High School.

3.3.1.3 Freshwater Systems

Freshwater wetlands are restricted to areas landward of the seasonal high tide level and are primarily restricted to portions of the Lower Keys underlain by freshwater lenses (McNeese, 1998). There are no freshwater wetlands in the project sites (Figure 3-3).

3.3.1.4 Dunes and Coastal Ridges

Dune systems form along sandy beaches where wind and wave-borne sand is trapped and accumulated by extremely salt-tolerant low-lying beach vegetation. Dunes and coastal ridges are not present within the project sites (Figure 3-3).

3.3.2 Aquatic Ecosystems

Marine habitats are present within the human-made canals and marine waters surrounding North Plantation Key. Seagrasses and hardbottom communities dominate marine habitats near the project area. Areas of bare substrate and hardbottom/seagrass are also present (Figure 3-4). A discussion of individual marine community types is provided below.

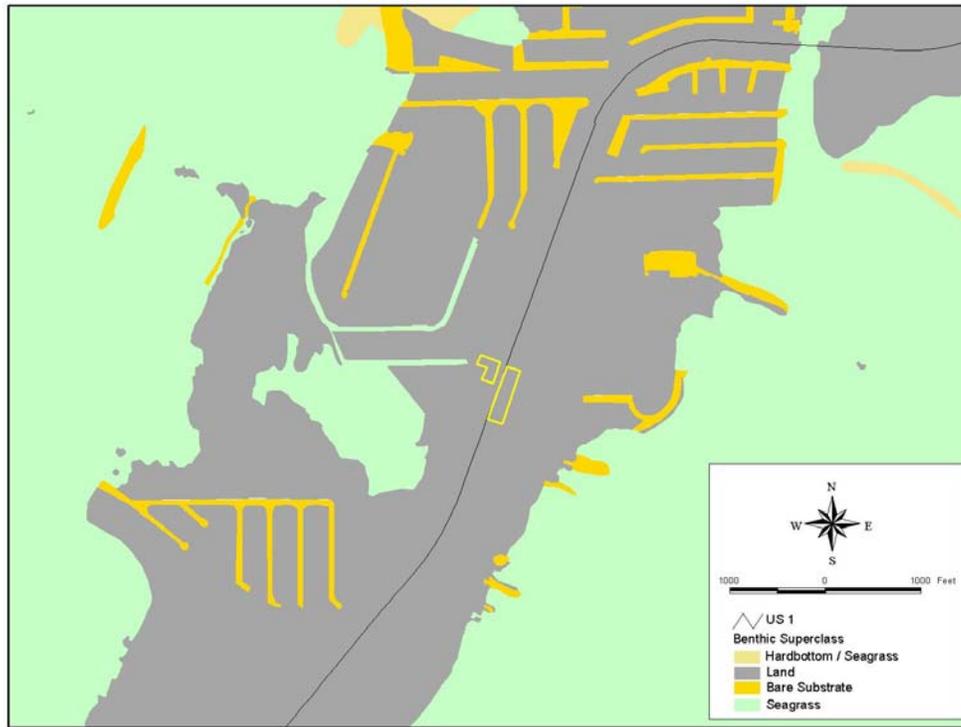


Figure 3-4. Project Area Benthic Habitats (FMRI, 1992)

As described in PEA Section 3.3.3 (Special Status Species), essential fish habitat (EFH) present near the project area consists of estuarine seagrass, marine live/hard bottom, mangrove communities, and the marine water column. In the Keys, federally-regulated fisheries are managed through the Gulf of Mexico (GMFMC) and South Atlantic (SAFMC) Fishery Management Councils. A compiled list of the fishery species under GMFMC and SAFMC management is included in Appendix F.

Two of the four marine communities that occur in the Keys (e.g., seagrasses and sandy bottom) are found near the project area. Limited areas of hardbottom/seagrass are also present. Coral reefs and hardbottom areas are not present near the project area.

3.3.2.1 Seagrass Beds and Sand Flats

Seagrass communities are the most abundant sea bottom community type in the Keys. Distribution of seagrass communities is influenced by the interaction of factors such as water quality, water depth, sediment depth, and current velocity (FMRI, 2000). Seagrass communities are dominated by turtle-grass (*Thalassia testudinum*) and manatee-grass (*Syringodium filiforme*), with shoal-grass (*Halodule wrightii*) becoming dominant in more eutrophic areas (Fonseca et al., 1998).

Near the project sites, seagrass communities dominate the ocean side and bayside nearshore areas surrounding North Plantation Key (Figure 3-4). This community type also exists on the north and northeast sides of the island in combination with hardbottom communities. The

affected environment for seagrass beds and sand flats is described in PEA Section 3.3.1.2.1 (Seagrass Beds and Sand Flats).

3.3.2.2 Coral Reefs

The presence of fewer channels for water to flow through and impede coral growth have resulted in better developed outer reefs in the Upper Keys. The outer coral reefs in the Upper Keys are somewhat removed from bay and nearshore influence. Nearshore coral reefs are not present near the project sites.

3.3.2.3 Hardbottom

Hardbottom habitats are solid, flat, low-relief, rock substrate composed of rock or rubble that is exposed or covered with a thin layer of sediment (FMRI, 2000). Nearshore hardbottom is the dominant ecological community throughout the Keys. Low-relief hardbottom communities are characterized by their proximity to shore, shallow depth, and visual dominance of octocorals (Chiappone and Sullivan, 1994). These communities occur within 1.25 miles of shore on either side of the Keys at depths of about three to 16 feet (Chiappone and Sullivan, 1996).

Near the project sites, seagrass/hardbottom communities are present on the north and northeast sides of North Plantation Key (Figure 3-4). The affected environment for hardbottom communities is described in PEA Section 3.3.1.2.3 (Hardbottom).

3.3.2.4 Sandy Bottom

Bare bottom communities, over either calcareous muds or calcareous sand, are devoid of algae and seagrasses. The flora and fauna is sparse and is typically dominated by sponges, small corals, and calcareous algae (Chiappone, 1996).

Near the project sites, sandy bottom communities exist in limited patches on the bayside of North Plantation Key and throughout the artificial waterways in the project area (Figure 3-4). The affected environment for sandy bottom communities is described in PEA Section 3.3.1.2.4 (Sandy Bottom).

Environmental Consequences

3.3.2.5 Alternative 1 - No Action Alternative

Under the No Action Alternative, improved wastewater management activities would be implemented to meet the new Florida Statutory Treatment Standards of 2010. Implementation of wastewater management improvements consistent with the Florida Statutory Treatment Standards of 2010 would reduce nutrient loading in nearshore marine waters and result in a corresponding improvement to their long-term ecological health. However, without FEMA funding, the Village or homeowners may need to identify alternate financing options, delaying wastewater treatment improvements. As discussed in PEA section 3.3.2.1 (No Action Alternative), while mangrove swamps could benefit slightly from higher TP concentrations, coral reefs prefer nutrient-poor environments with clear waters and low turbidity. Adverse effects on nearshore marine habitats would continue as a result of septic tank and cesspools

effluents, which can lead to increased eutrophication of nearshore marine waters. Therefore, area reefs may continue to be adversely affected by high nutrient levels by encouraging algal blooms that reduces water clarity and decreases coral growth or by favoring the growth of macroalgae that can out compete and shade corals causing shading and eventual death.

3.3.2.6 *Alternative 2 - Centralized Wastewater Treatment Plant on Bayside Site*

Under this alternative, no direct effects on marine biological resources are anticipated as a result of construction of the collection system and treatment plant. Construction activities are proposed along the roads in front of the residences and businesses in the service area and therefore would not notably impact biological resources. Individual homeowners may encounter minor, temporary, indirect impacts on landscaped plants and vegetation during connection of individual residences.

The WWTP site is heavily vegetated and project construction would directly affect about 0.8 acre of hardwood hammock habitat . The hardwood hammock habitat at this site is isolated, degraded, and heavily infested with Brazilian pepper and Australian pine. The site would be cleared and grubbed in preparation for construction. No additional areas would be cleared. The purchase and protection of hardwood hammock habitat at a 2:1 ratio would provide adequate mitigation for these impacts (Appendix G). Construction activities would require authorization in the form of two Environmental Resource Permits (ERPs): one from the Florida Department of Environmental Protection (FDEP) for stormwater-related facilities, and one from the Monroe County Growth Management Division.

Although there are no direct effects on marine resources, wastewater treatment improvements would indirectly affect the nearshore marine waters near North Plantation Key. Improvements to nearshore marine water quality on the order of 92 and 86 percent reductions in wastewater TN and TP loadings, respectively, would occur due to increased treatment and as a result of meeting Florida Statutory treatment Standards (see Appendix D [Water Quality Improvement Analysis] of the PEA). Although treated to Florida Statutory Treatment Standards of 2010, effluent would have a higher level of nutrients than ambient concentrations (SERC 2003). There is little available research that specifically assesses the impact of effluent treated to AWT standards on biological resources; however, reducing nutrient loading in nearshore marine waters is expected to cause a corresponding improvement to long-term ecological health.

In general, as discussed in PEA Section 3.3.2.1 (No Action Alternative), while mangrove swamps could benefit slightly from high TP levels, coral reefs prefer oligotrophic environments with clear waters and low turbidity and therefore can be adversely affected by high nutrient levels by encouraging algal blooms that reduces water clarity and decreases coral growth or by favoring the growth of macroalgae that can out compete and shade corals causing shading and eventual death. Implementation of the wastewater treatment plant that meets Florida Statutory Treatment Standards of 2010 would reduce nutrient loading in nearshore marine waters and result in a corresponding improvement to long-term ecological health.

3.3.2.7 *Alternative 3 - Centralized Wastewater Treatment Plant on Oceanside*

Under Alternative 3, effects on terrestrial and marine biological resources would be similar to those in Alternative 2. Individual homeowner impacts are described in Alternative 2, as the

service area is the same. Direct impacts to the alternate WWTP site would occur to about 0.8 acre of hardwood hammock as a result of site preparation and construction. Hardwood hammock habitat at this site is relatively free of invasive, non-indigenous species infestation, with exotic plant intrusions limited to the roadside margins. No additional areas would be cleared. The purchase and protection of hardwood hammock habitat at a 2:1 ratio would mitigate these effects. As in Alternative 2, construction activities would require authorization in the form of two Environmental Resource Permits (ERPs): one from the Florida Department of Environmental Protection (FDEP) for stormwater-related facilities and one from the Monroe County Growth Management Division.

3.3.3 Special Status Species

Affected Environment

The Endangered Species Act (ESA) of 1973 requires Federal agencies to consider impacts of their actions on threatened and endangered species and their habitats, and take steps to conserve and protect these species. Additionally, Federal agencies must also comply with the 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. 1801 et seq.) that requires the identification of EFH for federally managed fishery species and the implementation of measures to conserve and enhance this habitat, per the Sustainable Fisheries Act (SFA) Public Law 104-297. Special status species are described in PEA Section 3.3.3.1 (Special Status Species, Affected Environment).

Two URS biologists conducted a site visit on July 31, 2002, concurrently with vegetation and wildlife investigations, to investigate the potential presence of Federally protected species and suitable habitat for these species in the project area and sites. Very little habitat was observed that could support Federally listed terrestrial threatened and endangered species that potentially occur in this portion of the Florida Keys. Although potential habitat for the Shaus' swallowtail exists onsite, the butterfly is rarely observed outside of Key Largo, and the only documented sighting of the butterfly in the project vicinity occurred on Upper Matecumbe Key in 1986.

State-listed terrestrial threatened and endangered plant species were observed at both sites. Three Florida thatch palm (*Thrinax radiata*) seedlings, listed by the State of Florida as Threatened, were noted in the southwestern portion of the preferred site, near Gardenia Street. Individuals of West Indian mahogany (*Swietenia mahagoni*), state-listed Endangered, were observed in the central and northern portions of the site. A small population of barbed-wire cactus (*Acanthocereus tetragonus*), listed by the State of Florida as Threatened, were noted in the west central portion of the alternate site near US-1. Several large mahogany trees were also observed at the alternate site.

Environmental Consequences

Under the No Action Alternative, FEMA funds would not be used for wastewater management improvements. As such, FEMA would not be required to undertake activities related to compliance with Section 7 of ESA and EFH. North Plantation Key and Plantation Key Colony residents would still need to comply with Florida Statutory Treatment Standards of 2010. It is

anticipated that effects on special status species, once funding is secured, would be similar to those under Alternatives 2 and 3.

FEMA consulted the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) regarding the potential impacts of Alternatives 2 and 3. URS biologists conducted site-specific surveys and, based on information collected, determined that the proposed alternatives would have the potential to effect but would not likely adversely effect special status species. In a letter dated, February 18, 2003, FEMA notified both USFWS and NMFS of their finding determination, requested concurrence, and initiated informal consultation. USFWS coordinated with URS regarding possible mitigation measure for the proposed project that included restoration of scarified lands, acquisition of hammock habitat, and transplantation of state-listed species to suitable publicly owned recipient sites. Prior to construction, the Village would prepare a Tree Relocation Plan and submit a copy to the USFWS for review and approval. Based on the information provided, the USFWS stated in their response on April 22, 2003 that they concurred with the “not likely to adversely effect” finding for Federally listed species or their critical habitat. Therefore, no further action is required under Section 7(a)(2) of the ESA. The NMFS stated in their response on March 17, 2003 that neither alternative would be likely to affect EFH; therefore, no further action is required under the MSA and the SFA. Agency coordination letters for this SEA are included in Appendix B.

The three state-listed threatened and endangered species, Florida thatch palm, West Indian mahogany, and barbed-wire cactus would be directly impacted by construction of Alternatives 2 and 3. Without mitigation measures, land clearing activities would result in the loss of these species from the site. As a result of coordination with the USFWS, these species would be covered in the Tree Relocation Plan that would be developed by the Village in coordination with the USFWS prior to construction. A letter dated January 31, 2003, was sent to the Florida Fish and Wildlife Conservation Commission (FFWCC) concerning state listed species and they have not responded. Another letter was sent to FFWCC on July 24, 2003 affording the agency an opportunity to review the Draft SEA; no comments have been received. Agency coordination letters for this SEA are included in Appendix B.

3.4 AIR QUALITY

Affected Environment

Air pollution within the project area has not been extensively documented; however, motor vehicles are the main source of emissions. The FDEP has designated Monroe County as an air quality attainment area, which means that air quality standards set by both FDEP and the EPA are maintained county-wide (Monroe County, 1995). Air quality in the Florida Keys is generally excellent, and data from FDEP’s two ambient air monitoring stations in Key West and Marathon indicate that particulate matter concentrations remain well below the State’s standards. The affected environment for air quality is similar to that described in PEA Section 3.4.1 (Air Quality, Affected Environment).

Environmental Consequences

Under the No Action Alternative, the Village would not receive FEMA funds for wastewater management improvements. North Plantation Key and Plantation Key Colony residents would still need to comply with Florida Statutory Treatment Standards of 2010. It is anticipated that effects on air quality, once funding is secured, would be similar to those under Alternatives 2 and 3.

Under Alternatives 2 and 3, minor temporary adverse effects on air quality would occur during construction as a result of increased exhaust pollutants and fugitive dust. These temporary impacts would be mitigated through standard construction practices including a decrease in idle time, and watering down of construction areas. Operational effects of the WWTP on air quality would be similar to those discussed in PEA Section 3.4.2.2 (Centralized Wastewater Treatment Plant).

During operation, atmospheric air used for transport within the collection system would enter through the 4-inch screened air intake on the gravity line. It is unlikely that odor would emanate from this air inlet due to the small volume of sewage (10 gallons) and short detention times in the sump. Odor control would be provided at the headworks of the treatment plant, where the screens and screenings press would be located, to eliminate odors. Therefore, no notable long-term adverse effects on air quality are anticipated.

3.5 CULTURAL RESOURCES***Affected Environment***

PEA Section 3.5.1 (Cultural Resources, Affected Environment) provides an overview of Monroe County's cultural history. In addition to review under NEPA, consideration of impacts on cultural resources is mandated under Section 106 of the National Historic Preservation Act (NHPA), as amended, and implemented by 36 CFR Part 800. Requirements include identification of significant historic properties that may be affected by the proposed project. For the purposes of Section 106, historic properties are defined as archaeological sites, buildings, structures, districts, or sites that are listed in or are eligible for listing in the National Register of Historic Places (NRHP) (36 CFR 60.4).

As defined in 36 CFR Part 800.16(d), the Area of Potential Effect (APE) "is the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist."

The APE for Alternatives 2 and 3 differ, and are described in Sections 2.2 and 2.3 respectively. In addition to identifying historic properties that may exist in the proposed project's APE, the federal agency must also determine, in consultation with the appropriate State Historic Preservation Officer (SHPO), what effect, if any, the action would have on historic properties. Moreover, if the project would have an adverse effect to these properties, the federal agency must consult with the SHPO on ways to avoid, minimize, or mitigate the adverse effect.

A Cultural Resources Assessment was conducted in the service area by a URS archaeologist on July 31, 2002. The purpose of the assessment was to assist FEMA's project planning, ensure compliance with NEPA and the NHPA, and provide the Florida SHPO with information on

possible impacts on cultural resources pursuant to Section 106. Activities conducted for the assessment included records search at the Florida Master Site File SHPO and 100 percent of the pedestrian reconnaissance survey of the APEs.

Background archaeological site records research was conducted on July 29 and 30, 2002, at the Florida Master Site File System, Florida SHPO, to gather information on previously identified archaeological sites and historic properties listed, or eligible for listing, in the NRHP. A review of cultural resource management reports for previous projects in Monroe County and the project area vicinity was also conducted.

Archaeological site investigations were conducted on July 31, 2002. Pedestrian surveys of the project sites consisted of a visual inspection of exposed surfaces along transects spaced 10 feet apart. Inspection of tree falls and animal burrows was also conducted. No subsurface testing was conducted during these investigations.

Site files located at the Florida SHPO listed no historic standing structures or archaeological sites within or adjacent to the project sites, or within one mile of each project sites' boundary. Pedestrian surveys confirmed the project areas were previously cleared and contain secondary growth forest. The field reconnaissance did not identify any artifacts or cultural features in the project sites. There are no standing structures in the preferred and alternate project sites, but there are nearby structures on adjacent parcels. However, no structure appeared to be 50 years old or older. No above-ground cultural resources were observed that might potentially be eligible for the NRHP. The results of the assessment indicate a low potential for significant archaeological remains to be present within the project sites and no additional archaeological investigations were recommended (see Appendix H, Cultural Resources Assessment Survey)

Environmental Consequences

Under the No Action Alternative, FEMA would not provide funds for wastewater management improvements. North Plantation Key and Plantation Key Colony residents would still need to comply with Florida Statutory Treatment Standards of 2010. It is anticipated that effects on cultural resources, once funding is secured, would be similar to those under Alternatives 2 and 3.

Under Alternatives 2 and 3, no effects on historic, archaeological, or cultural resources are anticipated because none were identified within the APE. A Cultural Resources Assessment summarizing these findings was prepared and submitted to the SHPO on February 26, 2003 (Appendices B and H). The final report was considered sufficient based on the criteria specified in Chapter 1A-46.001(2), Florida Administrative Code, and in a letter dated May 8, 2003 the SHPO concurred with FEMA's findings of "no effect."

Should any unanticipated historic or archeological materials be discovered during project work, all activities on the site shall be halted immediately and the Village shall consult with FEMA, SHPO and other appropriate agencies for further guidance. In addition, if a human burial is discovered, Florida's unmarked human burial law will be implemented (Florida Statute Title XLVI, 872.05 Unmarked human burials). Specifically:

“When an unmarked human burial is discovered ... all activity that may disturb the unmarked human burial shall cease immediately, and the district medical examiner shall be notified. Such activity shall not resume unless specifically authorized by the district medical examiner or the State Archaeologist. If the

district medical examiner finds that the unmarked human burial may be involved in a legal investigation or represents the burial of an individual who has been dead less than 75 years, the district medical examiner shall assume jurisdiction over and responsibility for such unmarked human burial, and no other provisions of this section shall apply. The district medical examiner shall have 30 days after notification of the unmarked human burial to determine if he or she shall maintain jurisdiction or refer the matter to the State Archaeologist. If the district medical examiner finds that the unmarked human burial is not involved in a legal investigation and represents the burial of an individual who has been dead 75 years or more, he or she shall notify the State Archaeologist, and the division may assume jurisdiction over and responsibility for the unmarked human burial pursuant to subsection (6) [of Florida Statute 872.05]. When the division assumes jurisdiction over an unmarked human burial, the State Archaeologist shall consult a human skeletal analyst who shall report within 15 days as to the cultural and biological characteristics of the human skeletal remains and where such burial or remains should be held prior to a final disposition [Florida Statute Title XLVI, Chapter 872.05].”

3.6 SOCIOECONOMIC RESOURCES

3.6.1 Tourism

Affected Environment

Tourist facilities on Plantation Key are concentrated along the US-1 corridor and include three restaurants, three dive centers, two motels, a fish factory, gas station, bank, supermarket, coin laundry, the Florida Keys Aqueduct Authority (FKAA), and 25 other small businesses (Table 3-5). According to the U.S. Census results (2000), 36 percent of the housing units in the Village (including Plantation Key, Windley Key, Upper Matecumbe, and Lower Matecumbe) are seasonal residences, rentals or other occasional use. Tourist populations are distributed throughout the project area, further south in the Village, and north in Key Largo.

Table 3-5. Commercial Businesses in the Service Area (PBSJ, 2002)

Business Name	Location
Amoco Gas Station / Kuts Korner Store	90270 Overseas Hwy. Tavernier
Bensons Camera of the Florida Keys	90240 Overseas Hwy. Tavernier
Cingular Wireless	90250 Overseas Hwy. Tavernier
Coral Shores Coin Laundry	90071 Overseas Hwy. Tavernier
Craig's Restaurant	90154 Overseas Hwy. Tavernier
Dolphin Storage	90575 Old Hwy. Tavernier
Fish Factory	90775 Overseas Hwy. Tavernier
Florida Keys Aqueduct Authority	Address not provided
Florida House of Representatives	90311 Overseas Hwy., Suite A, Tavernier

Table 3-5. Commercial Businesses in the Service Area (PBSJ, 2002)

Business Name	Location
Florida Keys Dive Center	90500 US-1, Tavernier
Hershoff, Lupino & Mulick, LLP	90130 Old Hwy. Tavernier
Island Auto Electric	90010 US-1, Tavernier
Islands in the Sun Nursery	MM 90, Tavernier
John A. Jabro (Attorney and Counselor at Law)	90311 Overseas Hwy., Suite B, Tavernier
John G. Abbott, Jr. Certified Public Accountant	Address not provided
Old Tavernier Restaurant-Lounge	90311 Overseas Hwy. Tavernier
Payfair Supermarket	90164 Overseas Hwy. Plantation Key
Pegan Insurance Agency, Inc.	90144 Overseas Hwy. Plantation Key
Perdue- Dean Cellular, Inc.	90152 Overseas Hwy. Plantation Key
Port O'Palms Apartments	90341 Overseas Hwy.
Raveson Upholstering	90511 Overseas Hwy.
Republic Bank Plantation Key Office	90184 Overseas Hwy. Tavernier
Sea Gulls Condo	100 Wrenn St.
Storage Solutions	90080 Overseas Hwy. Tavernier
Sun Key Imports	103 Sunshine Blvd. Tavernier
Tavernier Boat Tops	90507 US-1, Tavernier
Tavernier Dive Center	90791 Overseas Hwy. Tavernier
Tavernier Harbor	90311 Overseas Hwy. Tavernier
The Keys Motel	90611 Old Hwy. Tavernier
Treasure Gallery	Address not provided
Tropic Vista Motel	90701 Old Hwy. Tavernier
Tropical Café	90691 Old Hwy. Tavernier
Turek Building	90290 Overseas Hwy. Tavernier
Undeveloped lot next to Tavernier Creek Marina	MM 90 1/2, Tavernier
Unknown	90515 Overseas Hwy.
Unknown business next to FKAA	Address not provided
Unknown business next to Upper Keys Dive and Sport Center and Fish Factory	Address not provided
Upper Keys Dive and Sport Center	90701 Old Hwy. Tavernier
Vic's Auto Tech, Inc.	90575 Old Hwy. Tavernier

Environmental Consequences

Under the No Action Alternative, FEMA funding would not be applied to wastewater management alternatives. Under this scenario, wastewater treatment projects would likely be funded by local sources, which could increase local taxes. This could be passed on to tourists through higher hotel costs, food costs, and other purchases in North Plantation Key. In addition, economic losses associated with decreased water quality, beach closures, and other infrastructure impacts during and after storms would continue until wastewater improvements were

implemented. It is anticipated that once funding is secured, effects on tourism would be similar to those under Alternatives 2 or 3

Under Alternatives 2 and 3, adverse impacts on tourist enjoyment of North Plantation Key from temporary construction activities would be short-term and minimal. Installation of the collection system would temporarily hinder, but not obstruct, traffic movement throughout the residential neighborhood of PKC and North Plantation Key. Collection service laterals would be placed at the rear of the property for most of the commercial businesses along US-1. One collection main would traverse US-1 at the location of the treatment plant site. Installation of this collection main would not interfere with traffic along US-1. Appropriate signage and traffic management (as described in Section 3.9.1, Traffic and Circulation) would reduce the degree of this impact. Installation and operation of the treatment plant is not expected to impact tourism beyond those effects described in PEA Section 3.6.1.2.1 (No Action Alternative).

Additionally, improved water quality would incrementally benefit the tourism industry by increasing tourist enjoyment of activities listed in the PEA Section 3.6.1.1 (Tourism, Affected Environment).

3.6.2 Fishing Industry

Affected Environment

The Village of Islamorada has been referred to as the Sportfishing Capital of the World. It hosts numerous fishing tournaments and has many charter boats with captains and guides for recreational fishing in the Straits of Florida, Florida Bay, and Everglades National Park. Recreational gamefish commonly caught offshore Islamorada include sailfish, tuna, dolphin, wahoo, and kingfish. Reef fish species caught offshore near the Village include, yellowtail snapper, mutton snapper, and numerous species of grouper and sharks. Fish species such as permit, tarpon, and bonefish are caught in the flats on the bayside of Islamorada. Charter boats may also fish further north into the Everglades National Park for snook, tarpon, redfish, sea trout, cobia, and Spanish mackerel. Regulated commercial species which may be harvested in the Islamorada area are included in Appendix F. Plantation Key has 28 commercial fishing businesses (Islamorada Chamber of Commerce, 2003)The affected environment for the fishing industry is described further in PEA Section 3.6.2.1 (Fishing Industry, Affected Environment).

Environmental Consequences

Under the No Action Alternative, the Village would not receive FEMA funds for wastewater management improvements. North Plantation Key and Plantation Key Colony residents would still need to comply with Florida Statutory Treatment Standards of 2010. It is anticipated that effects on the fishing industry, once funding is secured, would be similar to those under Alternatives 2 and 3.

Under Alternatives 2 and 3, FEMA would provide funding for construction of a treatment plant and wastewater transmission system. The project is expected to improve nearshore water quality, which would, in turn, benefit recreational and commercial species currently being adversely affected by poor water quality in the Plantation Key area. Beneficial effects on commercial fishing are described in PEA Section 3.6.2.2 (No Action Alternative). FEMA consulted the

NMFS regarding the potential impacts of Alternatives 2 and 3. The NMFS stated in their response on March 17, 2003 that neither alternative would be likely to affect EFH; therefore, no further action is required under the MSA and the SFA. Agency coordination letters for this SEA are included in Appendix B.

3.6.3 Local Fees and Taxes

Affected Environment

Monroe County residents must pay county, State, and Federal taxes. The average property tax rate for all Monroe County districts is 13.4% of the appraised property value, excluding property tax deductions such as the homestead exemption (Monroe County, 2001b). Several governmental agencies within Monroe County affect the total property tax rate. Additional details on local taxes are in PEA Section 3.6.3.1 (Local Fees and Taxes, Affected Environment).

At the time of publication, the Village of Islamorada has identified two potential service areas within Plantation Key in which to provide wastewater service using FEMA grant funding. The two service areas under consideration both include the Phase 1 area (discussed in Section 2.2 above) but each also includes additional residences from Phase 2, which have yet to be designated. At this time, only residences will be served by the proposed WWTPs discussed as Alternatives 2 & 3.

Existing Wastewater Management Costs in the Plantation Key Service Area

For the purpose of this SEA, wastewater management cost discussions include reference to:

- 1) **System capital costs**, which include expenses associated with planning, designing, engineering, purchasing, building, and installing a wastewater treatment system, and the required wastewater conveyance piping in public ROWs and selected effluent disposal method;
- 2) **Abandonment and lateral costs**, which include the expenses associated with removal and disposal of the existing wastewater treatment system and piping on service recipients' property for connection to a new system; and
- 3) **Operation and maintenance (O&M) costs** for the new system. In addition, the term Equivalent Dwelling Unit (EDU) is used to indicate a wastewater service recipient that generates approximately 167 gallons per day of wastewater. For the purpose of this SEA, a single family home is assumed to be one EDU, while businesses can be more than one EDU.

Five basic types of wastewater systems are presently used in Monroe County: cesspits, septic tanks, onsite aerobic treatment units (ATUs), onsite wastewater nutrient reduction systems (OWNRS), and centralized WWTPs. Septic systems collect sewage in a tank and allow the liquid waste to filter through the drainfield into shallow soils and subsurface limestone. For septic systems in working condition, pumping to remove solid waste is needed only about every 6 to 10 years (D and D Enterprises, Inc., Pers. Comm., 2001). The cost to pump a standard 1,000-gallon septic tank, presently about \$300, would average about \$38 a year or a little over \$3 a month if pumped once every 8 years.

Almost all Keys' cesspits are at residences built before 1970. From discussions with wastewater service companies in the Keys, it was found that "properly" functioning cesspits (i.e., those that drain and leach out effluent into the surrounding soil and subsurface limestone) do not need to be pumped out, and consequently, have little or no associated operation and maintenance costs. As most of them were installed more than 30 years ago, there are also currently no associated system capital costs. Cesspits are currently illegal to install in Monroe County, and are being removed as part of the Monroe Cesspit Identification and Elimination Grant Program (discussed in detail in PEA Section 3.6.3.2.1 [Local Fees and Taxes, Environmental Consequences]).

For comparison, the average monthly wastewater rates for customers that currently use non-compliant WWTP systems in other parts of Monroe County are \$56, \$64, and \$55 per month for customers of Key Haven Utilities, Ocean Reef Club, and K W Resort Utilities, respectively.

Environmental Consequences

Under the No Action Alternative, FEMA would not fund the Plantation Key Colony/North Plantation Key wastewater management projects. To achieve compliance with Florida Statutory Treatment Standards, residents would have to use other funding for improvements.

Economic effects of the No Action Alternative on local wastewater fees or taxes are difficult to quantify, as they will depend on the final costs of the 2010-compliant systems chosen, the amount of State and Federal grants and contributions, and the details of the chosen financing options, including applicable repayment terms. Although the Village already has other State grant funding available to it for this service area, based upon information in PEA Section 3.6.3.2.1 (No Action Alternative), the No Action Alternative may result in higher wastewater management costs for Plantation Key Colony/North Plantation Key residences than would be expected from either FEMA-funded Alternatives 2 or 3.

Under Alternatives 2 and 3, FEMA funds and funds from a number of other sources identified by the Village would be used to offset the cost of the WWTP to the service recipients. The Village is currently considering two service recipient cost options under both Alternatives 2 & 3; Option 1 being a service recipient share of 17.5% of the total project costs and Option 2 being a service recipient share of 35% of the total project costs. The Village has decided that instead of charging service recipients a one-time fee to cover system capital costs, they will charge a monthly capital cost fee (which will include a small amount towards debt service) and spread the cost over 30 years, at an interest rate near 6% (Lawson, Pers. Comm., 2003).

Under Option 1, the new wastewater system would serve about 523 EDUs and service recipients would pay a monthly O&M fee of \$39 and a monthly capital cost fee of \$15, for a total of \$54 per month. Under Option 2, the new wastewater system would serve about 670 EDUs and service recipients would pay a monthly O&M fee of \$34 and a monthly capital cost of \$30, for a total of \$64 per month (Village of Islamorada, 2003).

These cost options were designed in consideration of potential future wastewater grant funds from U.S. Army Corps of Engineers (USACE). Those grants would require a 35% project cost match. This would be satisfied by the capital cost fee charged to service recipients would make up the match and the State could also provide match.

With either Alternative, and either user cost option, property owners would pay for their abandonment and lateral costs. Abandonment and lateral costs are estimated to range between

\$1,500 and \$5,000 per EDU, depending on the type of existing onsite system and the amount of work needed to remove or abandon the system.

Under both Alternatives 2 and 3 and with user cost options 1 or 2, wastewater costs, after grant funding has been applied, would fall at or below the affordability threshold of near 2% of Median Household Income and within the O&M (\$30 to \$60 per month) and system capital cost (\$3,000 to \$4,500, as spread over a 30 year term) ranges set forth in PEA Section 3.6.3 (Local Fees and Taxes). With the use of FEMA grant funding towards the costs of wastewater treatment for Plantation Key Colony/North Plantation Key, no significant economic impacts to service recipients are expected.

3.6.4 Public Health

Affected Environment

As mentioned in Section 3.2.2.2 (Nearshore and Offshore Marine Waters), beach water quality data have been collected since August 2002 by the Florida DOH from the Islamorada Founders' Park monitoring station on Plantation Key (MM 87.0). On four separate occasions, these data indicated elevated levels of fecal coliform and *Enterococcus* sp. near the monitoring station that could potentially pose a health risk. However, the levels recorded by the DOH did not result in the issuance of a health advisory. The Islamorada Founders' Park monitoring station, located about 2.8 miles southwest, is the closest monitoring station to the service area. Public health consequences from contaminated water are described further in PEA Section 3.6.4.1 (Public Health, Affected Environment).

Environmental Consequences

Under the No Action Alternative, it is likely that nearshore and offshore water quality conditions affecting public health would improve similar to Alternatives 2 or 3, but the rate of improvement would be dependent on finding alternate funding sources to implement wastewater improvements. The available data do not conclusively demonstrate instances of infection or health problems specifically related to groundwater or offshore contamination caused by current sewage treatment practices. However, as described in PEA Section 3.6.4.1 (Public Health, Affected Environment), the presence of enteric microbes in canals and nearshore marine waters can pose a health risk if ingested while swimming or eating contaminated seafood (Paul et al., 1995; Caffry, Pers. Comm., 2001). Therefore, it may be assumed that public health risks exist and would continue under this alternative.

Under Alternatives 2 or 3, improved wastewater treatment facilities would benefit service area residents by reducing the public health risk from existing wastewater management practices. The environmental consequences of Alternative 2 are discussed further in PEA Section 3.6.4.2.2 (Centralized Wastewater Treatment Plant Alternative).

3.7 DEMOGRAPHICS AND ENVIRONMENTAL JUSTICE

Executive Order (EO) 12898 (Environmental Justice), entitled "Federal Action to Address Environmental Justice in Minority Populations," directs Federal agencies "to make achieving

environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States...” EO 12898 also requires Federal agencies to ensure that public notifications regarding environmental issues are concise, understandable, and easily accessible. Accordingly, the socioeconomic and demographic conditions in the service area were examined, including alternative impacts.

Affected Environment

3.7.1 Population and Race

Plantation Key, encompassing the service area of Plantation Key Colony/North Plantation Key, is a moderately sized area with over 500 residences and over 50 businesses. U.S. 2000 Census results were obtained for the Plantation Key Colony/North Plantation Key area, which is in Census Tract 9708 but encompasses two census Block Groups. A Block Group is a geographically delineated statistical entity, defined for each decennial census according to Census Bureau guidelines. The two Block Groups that cover Plantation Key Colony/North Plantation Key do not match with the delineations of Phase I and Phase II of the wastewater service plan (as described in section 2 of this document). While Phase I service recipients are all within Block Group 1, Phase Ia and Phase II service recipients are in both Block Group 1 and Block Group 2 (U.S. Census, 2000).

3.7.2 Income and Poverty

U.S. Census (2000) data for Block Groups 1 and 2 indicate that in combination, about 26% of families had incomes less than \$35,000 per year and about 23% had incomes between \$35,000 and \$59,999 per year. The remaining 51% had incomes greater than \$60,000 per year.

As discussed in PEA Section 3.6 (Socioeconomic Resources), a common indicator of income level used by government agencies is the county-specific estimated Median Family Income (MFI). In 2003, the annual MFI for Monroe County was estimated at \$56,500 (U.S. Dept. of Housing and Urban Development [HUD], see citation below Table 3-3.). The indicator known as the “poverty threshold” is set for the entire nation and, with the exception of Alaska and Hawaii, is not adjusted for local cost-of-living differences. For the year 2003, the poverty threshold was set at an annual income of \$15,260 for a household of three people (U.S. Census, 2003). In areas like the Keys, where the cost of living is higher than the national average, \$15,260 consequently buys less, effectively making a household near the poverty threshold in the Keys poorer than similar households in areas where the cost of living is lower. The Monroe County Housing Authority currently uses the first two tiers of the U.S. Department of Housing and Urban Development’s (HUD’s) MFI-based income levels to administer its *low-income* assistance programs. To administer their programs fairly, HUD makes annual projections of MFI by county and adjusts for family size. The first two tiers of *low-* and *very low-income* levels are set as percentages of the county MFI. In 2003, the income limits for a family of three in Monroe County were \$40,700 for the *low-income* level and \$25,450 for the *very low-income* level. Table 3-6 below shows HUD’s FY 2003 *low* and *very low-income* levels for various family sizes in Monroe County.

Table 3-6. Fiscal Year 2003 – HUD’s *Low-Income* and *Very Low-Income* Limits, Monroe County, Florida – Median Family Income = \$56,500

Number of People in Household								
	1	2	3	4	5	6	7	8
Low-Income	\$31,650	\$36,150	\$40,700	\$45,200	\$48,800	\$52,450	\$56,050	\$59,650
Very Low-Income	\$19,800	\$22,600	\$25,450	\$28,250	\$30,000	\$32,750	\$35,050	\$37,300

<http://204.29.171.80/framer/navigation.asp?charset=utf-8&cc=US&frameid=1565&lc=en-us&providerid=112&realname=HUD&uid=2318084&url=http%3A%2F%2Fwww.hud.gov%2F>

Published by U.S. Department of Housing and Urban Development annually.

MFI figures are projected from the most recent county level census.

3.7.3 Wastewater Fees and Affordability for Keys Low-income Residents

The installation of systems that meet Florida Statutory Treatment Standards, under any of the alternatives, would improve water quality in shallow aquifers, canals, and nearshore marine waters, and to a lesser extent, off-shore marine waters as well. The resulting reduced fecal contamination and nutrient pollution would likely reduce adverse effects on public health. *Low-income* and minority populations are expected to benefit from these wastewater management improvements to the same degree as other Keys demographic populations.

Environmental Consequences

Under the No Action Alternative, FEMA would not fund the Plantation Key Colony/North Plantation Key wastewater management projects. To comply with Florida Statutory Treatment Standards of 2010, residents and businesses would have to use other funding for improvements. Although the Village already has other State grant funding available for this service area, as described in PEA Section 3.6.3.2.1 (No Action Alternative), the No Action Alternative may result in higher wastewater management costs for Plantation Key Colony/North Plantation Key residents and businesses than would be expected with the benefit of FEMA funding. No disproportionately high or adverse effects on minority populations are expected, unless they are also *low-income*.

Under the No Action Alternative, households at or below the *low-income* level would incur financial hardship if their wastewater management costs increase to levels that approximate the affordability threshold cited in PEA Section 3.6.3.1.2 (Wastewater Management Costs and Affordability for Florida Keys Residents), of near 2% of Median Household Income (approximately \$75/month). Unmitigated, increased wastewater management costs would disproportionately and adversely affect *low-income* populations, as the increased financial burden would represent a higher percentage of their discretionary income.

Implementation of either Alternative 2 or 3 would equally benefit, through improved water quality, the various demographic groups in the Plantation Key service area. Siting the WWTP at either the Alternative 2 or 3 site will not highly disproportionately and adversely affect minority

or low income populations because no concentration of these demographic groups exists immediately adjacent to the sites.

Under Alternatives 2 and 3, FEMA funds and funds from a number of other sources identified by the Village would be used to offset the cost of the WWTP to the service recipients. The Village is currently considering two user cost options under both Alternatives 2 & 3, as outlined in Section 3.6.

To reduce costs to *low-income* and *very low-income* service recipients in compliance with EO 12898, financial assistance guidelines have been developed that go beyond the basic level FEMA grant funding that would be applied to each EDU. As described in PEA Section 3.7, the estimated amount of assistance available to cover the system capital costs for homestead-exempt *low-* and *very low-income* property owners under Alternatives 2 and 3 is shown in Table 3-7. Once the per EDU cost, after applying grant funding, has been established; *low-income* property owners would receive additional assistance with at least 70% of these system capital cost; and 70% of their existing system abandonment and lateral costs, up to \$3,000. Similarly, *very low-income* property owners would receive assistance with at least 90% of their system capital cost, and 90% of their existing system abandonment and lateral costs, up to \$3,000.

Under Alternatives 2 & 3, for *low-income* property owners, the estimated resulting monthly cost after assistance would be about \$45 under Option 1 (\$39 for O&M and 30% of \$15 for capital costs) and about \$44 under Option 2 (\$34 for O&M and 30% of \$30 for capital costs). For *very low-income* property owners, the estimated resulting monthly cost after assistance would be about \$40.50 under Option 1 (\$39 for O&M and 10% of \$15 for capital costs) and about \$37 under Option 2 (\$39 for O&M and 10% of \$30 for capital costs).

Table 3-7. Alternatives 2 & 3 Low-Income and Very Low-Income Funding Assistance for the System Capital Cost

	Amount of Assistance – % of Connection Fee Covered	Estimated Monthly Cost After Assistance: Option 1	Estimated Monthly Cost After Assistance: Option 2
Low-Income Qualified Family	70%	\$45.00	\$44.00
Very Low-Income Qualified Family	90%	\$40.50	\$37.00

Because the property owner’s total cost for abandonment and lateral costs will vary from one property to the next, it is not possible to estimate the final cost with the FEMA mandated assistance program. Nevertheless, the assistance program would cover at least 70% of this cost for *low-income* property owners (up to \$3,000 total) and at least 90% of this cost for *very low-income* property owners (up to \$3,000 total). At this time, no programs would be available to help *low-* and *very low-income* populations with the payment of monthly operation and maintenance fees.

The assistance guidelines presented above represent a minimum goal and would be required during project implementation in order for the Village to receive FEMA grant funding. Costs to

low-income service recipients may be further offset at the applicant’s discretion. At the time of publication, the Village is considering its own assistance program with abandonment and lateral costs for homeowners and property owners who provide rentals to qualified beneficiaries. This program (see Appendix E, Community Development Block Grant Program Overview), if implemented, would go beyond the FEMA mandated assistance program outlined above. The program under consideration would cover 100% assistance to the neediest 60 or so residents in the service area (an approximate figure). Those with the greatest need would be prioritized by using the scoring system in Table 3-5 below (Williams, Pers. Comm., 2003).

Table 3-8. The Village of Islamorada – Abandonment and Lateral Costs Assistance Program Priority Scoring System

Priority	Points
Elderly (one owner greater than 62 yrs.)	10
Disabled household member	10
Documented Housing Code violation	10
Very Low Income	5
Children in household (greater than 2)	5
Length of Ownership (greater than 15 yrs.)	5
Single Parent household	5

The FEMA assistance program set forth under Alternatives 2 and 3 is designed to address the needs of *low-income* and *very low-income* property owners. Although FEMA does not have specific requirements under EO 12898 to assist *low-income* renters, renters may seek assistance through local assistance programs, such as the Village proposed assistance program.

With the implementation of the FEMA assistance program and the use of FEMA grant funding, no disproportionately high or adverse affects would be felt by *low-income* or *very-low income* property owners.

3.8 WASTES AND HAZARDOUS MATERIALS

Affected Environment

Nutting Environmental, Inc. performed a Phase I Environmental Property Assessment of the preferred WWTP site (Alternative 2) in November 2002, in accordance with American Society of Testing and Materials Practice (ASTM) E-1527. The assessment was performed on 10 vacant lots near Woods Avenue and US-1, in the Village. The project area consisted of an about 1.32-acre (57,500 square foot), irregularly shaped vacant and undeveloped parcel comprised of ten separate lots designated as Lots 1-6, and 17-20 in Block 1 of Lake Harbor Estates and included the preferred site. The area is bounded by Woods Avenue and single family residences to the north; vacant land and single family residences to the south; Gardenia Street and single family residences to the west; and US-1 to the east.

Results of the Phase I assessment indicate that the project area is visibly overgrown with dense vegetation. No areas of distressed or discolored vegetation, which would be attributed to obvious discharge of environmental contaminants, were noted. Based on a review of the information collected during the investigation, it was determined that the subject property was historically vacant and vegetated land prior to 1964 until the present date. The results of the Phase I assessment indicated no evidence of recognized environmental conditions (RECs) in connection with the property.

Environmental Consequences

Under the No Action Alternative, impacts related to wastes and hazardous materials are expected to be similar to Alternatives 2 or 3 described below. Wastewater sludge from the Keys would continue to be hauled to a transfer facility and taken to a wastewater treatment facility in Miami-Dade County for treatment.

Under Alternatives 2 and 3, wastewater would be treated as described in Section 2.2.3.4 of this document (Effluent Disposal). Additional environmental consequences of this alternative are discussed in PEA Section 3.8.2.2 (Centralized Wastewater Treatment Plant Alternative). For Alternative 2, based on the results of the above described Phase I ESA, no notable environmental effects or hazardous materials abatement are anticipated for construction at this site. Alternative 3 is adjacent to Alternative 2, on the opposite side of US Route 1, and is within the records review search radius that was conducted as part of the above described Phase I ESA for Alternative 2. This records search returned no known records associated with this site. However, in the event Alternative 3 was selected, a Phase I Environmental Property Assessment would be conducted in accordance with ASTM E-1527.

The most common hazardous materials that enter the wastewater systems are grease and typical household cleaning products (Rios, Pers. Comm., 2001). The effects of an inadvertent disposal of hazardous wastes into wastewater effluent is more likely to affect smaller plants like the Plantation Key WWTP than larger plants, because the materials are usually more diluted in the larger plants. However, the frequency of these incidents at a smaller facility should be correspondingly lower, so there would likely be no net increase in potential concern. Hazardous materials that would enter the WWTP could kill the biological component that treats the wastewater. Such material would have to be pumped out and sent to a larger treatment plant for reprocessing.

Under Alternatives 2 and 3, treatment chemicals would be added at various points in the treatment process. The pH of influent wastewater may be adjusted with the addition sodium hydroxide, a buffering agent. The sodium hydroxide would immediately dissolve and be consumed in a reaction which raises the wastewater pH and would no longer be an active compound. In order to remove phosphorus from the wastewater, metal salts may be added to coagulate the excess phosphorus. The resultant sludge would be collected and disposed as previously described. The metal salts would be disposed with this material and not released to the aquatic environment. Disinfectants, such as sodium hypochlorite or calcium hypochlorite may be added as the wastewater effluent is release to the environment to kill remaining biologic pathogens. These materials would be dissolved and be consumed in disinfecting reactions with organic materials.

3.9 INFRASTRUCTURE

3.9.1 Traffic and Circulation

Affected Environment

Traffic capacity limitations are found along four segments of US-1. As discussed in PEA Section 3.9.1.1 (Traffic and Circulation, Affected Environment), the conditions of the roadway are based on levels of service (LOS). This is defined by the 1985 Highway Capacity Manual as a qualitative measure describing operational conditions within a traffic stream, and their perception of motorists. Roadway LOS is ranked from A (the best) to F (the worst), with C being the average. Plantation, Upper Matecumbe Key, Lower Matecumbe Key, and Big Pine Key do not meet LOS C and are considered to be critical growth constraints.

Environmental Consequences

Under the No Action Alternative, FEMA funds would not be used for wastewater management projects in North Plantation Key. North Plantation Key and Plantation Key Colony residents would still need to comply with Florida Statutory Treatment Standards of 2010. It is anticipated that effects on traffic and circulation, once funding is secured, would be similar to those under Alternatives 2 and 3.

Under Alternatives 2 and 3, construction traffic would temporarily increase during the implementation of wastewater management projects. Temporary construction traffic would increase near the proposed facility and would be expected to last up to 16 months, i.e., the duration of construction. Construction would not interrupt vehicular traffic or scheduled transportation services on US-1. Installation of a collection system would temporarily hinder, but not obstruct, traffic throughout the service area. Installation and operation of the treatment plant would temporarily increase traffic to each facility depending on capacity and operations.

Public service disruptions from construction are expected to be infrequent and brief. A traffic control plan would be developed and implemented as required by funding and/or permitting agencies. This plan would include specific information about temporary traffic control, alternate routes, staging area locations, and optimal working times to minimize traffic disruption. Construction activities in the ROW would not be subject to Monroe County Land Development Regulations since development, as defined by the Monroe County Comprehensive Plan (Monroe County, 1995), excludes roads.

3.9.2 Utilities and Services

Affected Environment

Electricity, gas, and potable water services for the project area are detailed in PEA Section 3.9.2.1 (Utilities and Services, Affected Environment). The main types of wastewater treatment within the project area include septic tanks and cesspools. Six package wastewater treatment plants service the remainder of the area (Table 3-9).

Table 3-9. Existing Wastewater Treatment Plants in the Village of Islamorada (PBSJ, 2002)

Name	Address/Location
Plantation Key Elementary	100 Lake Street
Coral Shores High School	MM 90, Bayside
Sea Gulls Condominium	100 Wrenn Street
Turek Building	MM 90.5, Bayside
Tavernier Harbor	90311 Overseas Highway
Tropic Vista Motel	90701 Overseas Highway

The Village Public Works Division (Division) maintains 51 miles of ROWs and four parks (Islamorada, 2003). The Division has overall management of all construction projects involving roadways, storm water drainage, sidewalks, bike paths, vegetation clearing, and roadway marking, and manages executed contracts for all new construction of Village facilities and infrastructure.

Environmental Consequences

Under the No Action Alternative, the Village would not receive FEMA funds for wastewater management projects. North Plantation Key and Plantation Key Colony residents would still need to comply with Florida Statutory Treatment Standards of 2010. It is anticipated that effects utilities and service, once funding is secured, would be similar to those under Alternatives 2 and 3.

Under Alternatives 2 and 3, there would likely be temporary adverse effects on utilities and services during the construction phase. Plantation Key is fully developed and currently receives all services, which are supportive of the proposed wastewater improvement alternatives. The Village would contact the diggers/excavation utility hotline at the Sunshine State One-Call Center at least two business days prior to construction. Short-term adverse impacts would occur as residents and businesses hook up to the new wastewater system. Long-term adverse effects on utilities and services are not expected provided that proper utility notification and construction practices are observed. Long-term positive effects would occur as current wastewater methods are switched out and operated accordingly. The existing six package plants may be decommissioned, and connect to the new WWTP.

For both Alternatives 2 and 3, sewer collection mains would be installed with a 10-foot horizontal separation from the existing FCAA water system as required by the FDEP. Proposed rule changes may require the separation of water and vacuum sewer collection mains to change to a 3-foot horizontal separation and a 12-inch vertical separation. However, the current, applicable rule requirements would be applied at the time of construction. No interruptions to water service are expected.

3.10 LAND USE AND PLANNING

Affected Environment

Plantation Key is part of the Village of Islamorada, located in Monroe County. The preferred site is zoned suburban commercial (SC) and the alternate site is zoned suburban residential (SR) (Figure 3-5; First American Real Estate, 1999). Plantation Key Colony is a high density residential area, whereas the remainder of the service area is medium to low density residential. The affected environment for land use and planning is further discussed in PEA Section 3.10.1 (Land Use and Planning, Affected Environment).

State-identified Conservation and Recreation Lands (CARL) present on the ocean side and bayside of the service area is the Lake San Pedro Hammock. No other conservation lands are present on North Plantation Key. The Florida Keys National Marine Sanctuary surrounds the island seaward from the mean high water line; the Key Largo National Marine Sanctuary is located on the ocean side of Plantation Key, seaward from the mean high water line. Plantation Key is not located within a Coastal Barrier Resource System (CBRS) unit.

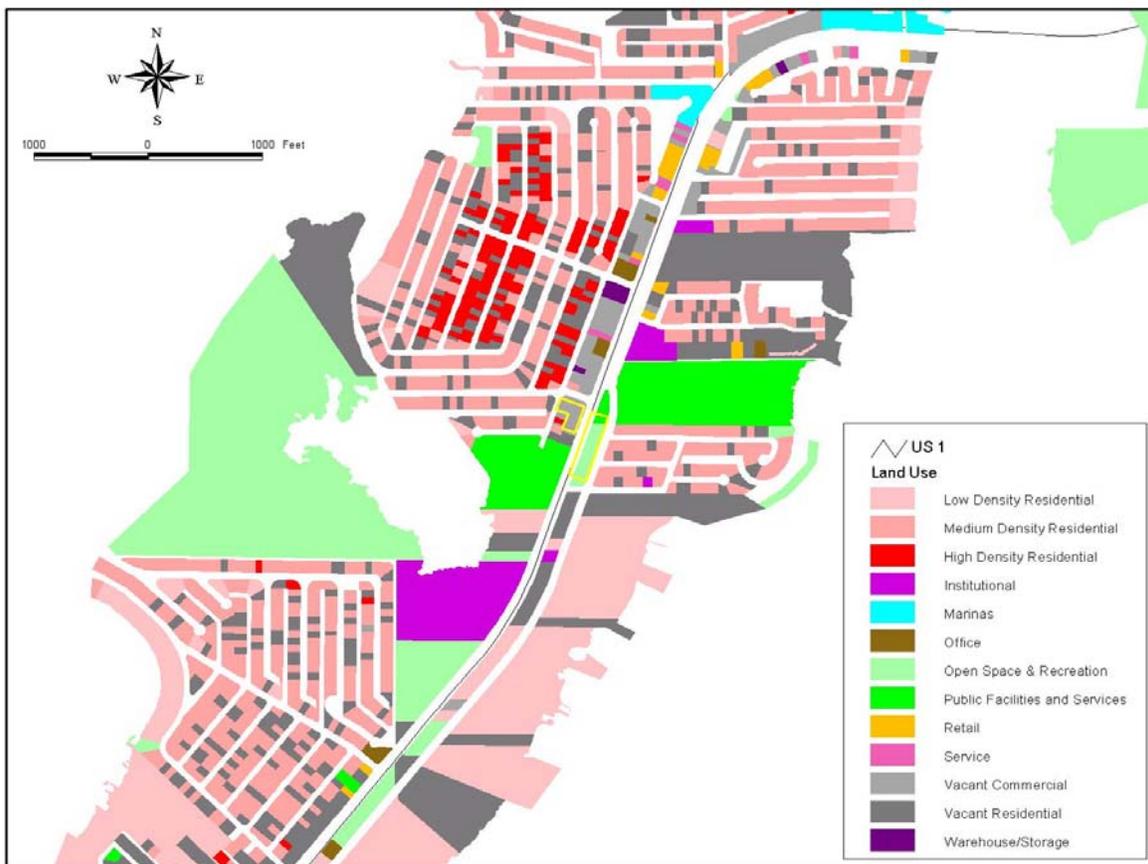


Figure 3-5. Current Land Uses of the Service Area
(Monroe County Property Appraiser’s Database, 2001)

Under Alternative 3, the treatment plant for would be located on land currently owned by the Monroe County Land Authority, as part of the CARL program.

Environmental Consequences

Under the No Action Alternative, FEMA funds would not be used for wastewater management projects in North Plantation Key. North Plantation Key and Plantation Key Colony residents would still need to comply with Florida Statutory Treatment Standards of 2010. It is anticipated that effects on land use and planning, once funding is secured, would be similar to those under Alternatives 2 or 3.

Impacts on land use and planning are similar for Alternatives 2 and 3 and are discussed in PEA Section 3.10.2.2 (Centralized Wastewater Treatment Plant Alternative). Under Alternative 2, the proposed WWTP would be located on property currently owned by the Village. In accordance with the Monroe County Comprehensive Plan (Sections 9.5-257.4 and 9.5-257.5), the construction of a new treatment plant or pump station would not require amendments to the land uses permitted in either Suburban Commercial, or Suburban Residential (Jerry Buckley, Pers. Comm., 2003). This was made applicable to the Village through Ordinance No. 98-13, wherein the Village adopted the Monroe County Code until superseded by action of the Village Council.

Under Alternative 3, the WWTP would be located on land currently owned by the Monroe County Land Authority, as part of the CARL program. If the Village should select Alternative 3, the Village would then enter into a Memorandum of Agreement (MOA) with the Monroe County Land Authority to mitigate with land of similar habitat quality.

As described in PEA Section 3.10.1.1 (Future Land Use and Planning), development within the Keys is not controlled by addition of key infrastructure, but instead by a Building Permit Allocation System (BPAS). The BPAS regulated both residential and non-residential growth through the year 2020. During the period from 2001 to 2020 the BPAS allows a total of 302 residential units, an average of 15 per year (PEA 2002).. The construction of new wastewater treatment infrastructure in the Keys is essential to effectively treat existing wastewater flows, and is not proposed as a way to introduce or support increased development. Therefore, if growth and development occurs following implementation of these alternatives, it is a function of established Village planning and is not directly related to proposed projects for wastewater management improvements.

Construction of the collection system would not impact the Lake San Pedro Hammock. Direct impacts on other conservation lands or CBRS units would not occur since these are not located in the project area.

FEMA consulted the Florida Department of Community Affairs (DCA) regarding the potential impacts of this project. The Florida DCA stated in their response on April 4, 2003, that based on the information provided, Alternatives 2 and 3 are consistent with the State's comprehensive coastal management program (Appendix B).

3.11 NOISE AND VISUAL RESOURCES

3.11.1 Noise

Affected Environment

Noise within the project area has not been extensively documented, but is associated primarily with traffic. Sensitive noise receptors are considered areas that sustain greater impacts from noise sources than other areas (such as industrial areas). Sensitive receptors to noise typically include churches, schools, residential areas and dwellings, hospitals, and public facilities. All potential noise receptors in the project area were documented by URS on August 1, 2002.

The proposed site, to be used under Alternative 2, consists of dense remnant tropical hardwood hammock. The lots located north of Alternative 2 are vegetated and provide a level of buffering for noise to the north. Two commercial businesses and about 100 feet of forested natural land occur between the site and the Plantation Key Elementary School to the south and west, providing a good level of buffering for noise. No other natural or artificial noise buffers were observed between the project sites and the sensitive noise receptors identified.

This forested natural site may be considered a mixed urban commercial/residential area along a major roadway. As discussed in PEA Section 3.11.1 (Noise, Affected Environment), the overall noise level for this type of classification is moderately loud. The current generation of noise is associated primarily with the following:

- General vehicle operation along US-1;
- Activities associated with nearby commercial businesses along US-1 and Gardenia Street, e.g., Sundance Construction Company;
- Activities associated with the operation of Plantation Elementary School about 300 feet south of the site; and
- Activities associated with the renovation and operation of the Coral Shores High School located about 500 feet northeast of the site.

Observed noise receptors near the project sites include:

- Occupied single-family residential homes; the closest home is located about 100 feet west of the plant site;
- Plantation Elementary School located about 300 feet south of the site; and
- Coral Shores High School located about 500 feet northeast of the site.

The Alternative 3 site consists of dense remnant tropical hardwood hammock. The southern edge of the site borders with a continuous hardwood hammock providing a level of buffering for noise to the south. A small fringe of landscaped vegetation exists along the edge of the nearby homes to the east providing minimal buffering for noise. No other natural or artificial noise buffers were observed between the project sites and the sensitive noise receptors identified. It may be considered a commercial area along a major roadway. As discussed in PEA Section 3.11.1 (Noise, Affected Environment), the overall noise level for this type of classification is moderately loud. The current generation of noise is associated primarily with the following:

- General vehicle operation along US-1;
- Activities associated with nearby commercial businesses along US-1;
- Activities associated with the operation of Plantation Elementary School about 250 feet southwest; and
- Activities associated with the renovation and operation of the Coral Shores High School located about 200 feet northeast of the site.

Observed noise receptors near the project sites include:

- Occupied single-family residential homes, the closest home is located about 50 feet east of the plant site;
- Plantation Elementary School located about 250 feet southwest; and
- Coral Shores High School located about 200 feet northeast of the site.

No other noise receptors were identified in the project area.

Environmental Consequences

Under the No Action Alternative, the Village would not receive FEMA funds for wastewater management projects. North Plantation Key and Plantation Key Colony residents would still need to comply with Florida Statutory Treatment Standards of 2010. It is anticipated that effects on noise levels, once funding is secured, would be similar to those under Alternatives 2 or 3.

Given that the activities for Alternatives 2 and 3 would involve a range of construction activities, the impacts related to construction and noise within the project area would be similar and are discussed in PEA Section 3.11.1.2 (Noise, Environmental Consequences). An increase in localized noise levels would occur at various locations throughout the duration of construction for about 16 months (PBSJ, 2002). Plantation Key Colony/North Plantation Key residents may endure annoying and disruptive noises during allowable construction work hours, as cited in the applicable noise ordinance. However, the potential for the population to experience hearing damage or loss due to construction noises is considered low.

To mitigate noise impacts on residents, vegetative barriers may be constructed around construction areas. Construction personnel would observe the Village's Noise Ordinance (03-06) to reduce annoying and disruptive noises to adjacent areas.

To mitigate noise impacts on laborers, workers would comply with applicable occupational safety regulations and implement appropriate noise control measures, such as wearing hearing protection (e.g., ear plugs, ear muffs, a helmet, or canal caps) and limiting exposure times. If these measures are implemented during construction and operations, no adverse effects on workers should occur.

3.11.2 Visual Resources

Affected Environment

As discussed in PEA Section 3.11.2.1 (Visual Resources, Affected Environment), visual resources refer to the landscape character (i.e., what is seen), visual sensitivity (i.e., human preferences and values regarding what is seen), scenic integrity (i.e., degree of intactness and wholeness of landscape character), and landscape visibility (i.e., relative distances of seen areas) of a geographically defined viewshed. A visual resources assessment was conducted for the project area by URS on August 1, 2002.

The Alternative 2 site is a forested natural site that can be considered a mixed urban commercial/residential area along a major roadway. The site consists of a dense remnant tropical hardwood hammock. The existing vegetation acts as an aesthetic buffer for the residential homes and businesses along Gardenia Street, west of US-1. Lots north of the site are vegetated, providing a level of buffering for aesthetics. No other natural aesthetic buffers exist between the site and adjacent lands. Dominant features of the project viewshed include:

- US-1;
- Residential homes and yard landscaping;
- Vacant land consisting of tropical hardwood hammock;
- Commercial structures;
- Plantation Elementary School; and
- Coral Shores High School

The Alternative 3 site is a forested natural site that can be considered a commercial area along a major roadway. The site consists of a dense remnant tropical hardwood hammock that is an aesthetic buffer from US-1 for the residential homes located east of the site. No natural aesthetic buffers exist between the project sites and adjacent lands. Visual resources are similar to those identified for Alternative 2.

Environmental Consequences

Under the No Action Alternative, the Village would not receive FEMA funds for wastewater improvements projects. North Plantation Key and Plantation Key Colony residents would still need to comply with Florida Statutory Treatment Standards of 2010. It is anticipated that effects on visual resources, once funding is secured, would be similar to those under Alternatives 2 and 3.

Under Alternatives 2 and 3, construction of a WWTP would not adversely affect the scenic quality of the service area because the immediate vicinity has no unique natural communities, high quality and unique views, or natural areas. The facility may cause an aesthetic impact onto the nearby residences. To mitigate these effects, the areas surrounding the WWTP may be landscaped with vegetative screens to obscure views from nearby residences and US-1.

Under the No Action Alternative, FEMA would not provide funding to the Village for wastewater management improvements. Thus, the county (Monroe County, cities, private wastewater utility operators, business owners, and homeowners) would have to locate alternate funding sources to finance the large capital costs to improve their wastewater treatment systems to meet the Florida Statutory Treatment Standards of 2010. Communities that currently use onsite systems, such as cesspools and septic systems, to manage wastes would have to construct either community or regional WWTPs, install onsite wastewater nutrient reduction systems (OWNRS), and/or upgrade or rebuild existing WWTPs. As a result, the cumulative effects on physical, biological, and socioeconomic resources would be similar across all alternatives, eventually, and are discussed below. Cumulative effects under the no action alternative may be delayed. Currently there are no proposed projects planned or underway in the Plantation Key area that would contribute to environmental impacts within the WWTP project area (Sheahan, Pers. Comm., 2003).

4.1 TOPOGRAPHY, SOILS, AND GEOLOGY

Implementation of new wastewater treatment services on North Plantation Key would cumulatively increase the Village's impervious surface area due to the construction of wastewater treatment systems; however, the actual land area required for these activities is small relative to the extent of the surface area of North Plantation Key. Soils would be temporarily disturbed during construction; however, the implementation of BMPs would decrease the potential for long-term surface soil erosion. No cumulative effects are anticipated for topography and geology.

4.2 WATER RESOURCES AND WATER QUALITY

Cumulative effects on water resources, including surface waters and jurisdictional wetlands, and water quality for the Florida Keys are discussed in PEA Section 4.2.2 (Water Resources and Water Quality). The Monroe County School Board has undertaken a redevelopment of Coral Shores High School, located near Alternatives 2 and 3. This project involves replacement of a majority of the school, as well as drainage improvements and upgrades to the on site package plant. This project is being undertaken in accordance with appropriate water quality controls and would result in long term improvements to water quality. In addition, an upgrade to the Plantation Key Elementary School is planned for the future. Considering Keys-wide wastewater and stormwater management activities and the Comprehensive Everglades Restoration Program (CERP), cumulative water quality improvements are expected in the service area, in the canals and nearshore marine waters, and to a lesser extent, also in offshore marine waters.

4.3 BIOLOGICAL RESOURCES

Cumulative effects on biological resources and special species status are expected to be beneficial due to improved groundwater, surface waters, and marine water quality. Cumulative effects on biological resources are discussed in PEA Section 4.2.3 (Biological Resources).

4.4 AIR QUALITY

Potential cumulative effects on air quality are expected to be minimal and are discussed in PEA Section 4.2.4 (Air Quality).

4.5 CULTURAL RESOURCES

Since wastewater projects under the No Action Alternative would not be subject to Section 106 review for potential effects on cultural resources, potential cumulative effects on historic and cultural resources may occur. Coordination and project review with the State Historic Preservation Office would minimize the effects on cultural resources from ground-disturbing activities associated with wastewater projects. Cumulative effects on cultural resources are discussed in PEA Section 4.2.5 (Cultural Resources).

4.6 SOCIOECONOMICS

The implementation of wastewater services would cumulatively improve ground and nearshore water quality and presumably reduce or eliminate the number of health advisories in beaches and canals in the Keys. This would likely increase the number of visitors to beaches that formerly posted advisories, and/or reduce visitor pressure on alternate beaches and recreational activities. Water quality improvements would also benefit commercial and recreational fisheries to the extent they are currently being adversely impacted by nutrient pollution. Generally, it may be predicted that harvested species that occur in nearshore waters such as spiny lobster, white mullet, gray snapper, various flounder, shrimp, and stone crab would benefit from improved water quality. Benefits may range from relatively insignificant to potentially substantial improvements in harvest rates thus benefiting the fishing industry. With the use of FEMA grant funding towards the costs of wastewater treatment for Plantation Key Colony/North Plantation Key, no significant cumulative economic impacts to service recipients are expected.

4.7 DEMOGRAPHICS AND ENVIRONMENTAL JUSTICE

The siting of wastewater facilities is not expected to have any cumulative adverse effects on minority and/or low-income populations. Although the implementation of any of the alternatives would generally result in an increase in the cost of wastewater disposal for service recipients; these costs would be substantially reduced for qualifying low-income homeowners through implementation of the PEA and Village assistance provisions. The FEMA mandated provisions would not be required for the No Action alternative, consequently economic impacts to low-income homeowners would depend on the chosen wastewater system and Village's rate structure. Cumulative adverse economic effects are not expected from Alternatives 2 or 3, and are further discussed in PEA Section 4.2.7 (Demographics and Environmental Justice).

4.8 WASTES AND HAZARDOUS MATERIALS

Potential cumulative effects from wastes and hazardous materials are not expected and are discussed in PEA Section 4.2.8 (Hazardous Materials).

4.9 INFRASTRUCTURE

The construction of wastewater facilities proposed in Alternatives 2 or 3, in combination with other wastewater activities throughout the Keys, would lead to an overall centralization of wastewater treatment systems compared to individual septic tanks and cesspits. This should improve the maintenance and servicing of wastewater systems and improve overall water quality throughout the Keys. Implementation of Alternative 2 or Alternative 3 is expected to result in minimal adverse cumulative impacts on Monroe County's overall utility infrastructure.

4.10 LAND USE AND PLANNING

The installation of new wastewater facilities is not expected to cause changes to the Village's existing growth pattern. Since Alternative 2 is located outside of conservation, CARL lands and CBRS units, adverse cumulative effects on these special status lands are not anticipated. The site for Alternative 3 is owned by the Monroe County Land Authority as part of the CARL Program. Use of the Alternative 3 project area would require the Village to enter into an MOA with the Monroe County Land Authority and mitigate the loss with lands of similar habitat quality, minimizing the cumulative effect on CARL lands. In addition, the CARL program plans on adding more lands. PEA Section 4.2.10 (Land Use and Planning) further discusses the cumulative effects of the alternatives on land use and planning.

4.11 NOISE AND VISUAL RESOURCES

Potential cumulative effects on noise and visual resources are expected to be minimal and are further discussed in PEA Section 4.2.11 (Noise and Visual Resources).

FEMA's public involvement activities related to the proposed Plantation Key wastewater projects began with the publication of a Notice of Intent (NOI) (Appendix D) to prepare this SEA. The NOI was published in The Reporter on January 24, 2003, the Key West Keynoter on January 25, 2003, and in the Key West Citizen on January 26, 2003. The Draft SEA was released on July 7, 2003 for a 15-day public comment period. It was made available at the Monroe County Branch Library in Islamorada and on FEMA's web page www.fema.gov/ehp/. The Draft SEA was sent on July 25, 2003 for a 30-day intergovernmental review period. Specifically, it was sent to the agencies listed in Appendix B. FEMA held a public meeting on the proposed project on July 16, 2003 at the Village Council Chamber at Founder's Park, 87000 Overseas Hwy, Islamorada, Florida. The public meeting was advertised on July 9, 2003 in the Key West Keynoter and The Miami Herald, Keys Edition (Appendix D). Although the public meeting was well advertised by both FEMA and the Village of Islamorada, there was a lack of attendance. In addition, FEMA received no comments as a part of the public review period and received two letters from government agencies as a result of the intergovernmental review period. Those letters are included in Appendix B. Prior to FEMA's public involvement process, the Village of Islamorada had undertaken several efforts to provide information on this project to the community and to seek comment and input through the Village Council and the Village's Water Quality Committee.

6.1 MITIGATION

To mitigate impacts from the preferred alternative, the project applicant would be required to:

- Implement appropriate best management practices (BMPs) during construction;
- Develop an Erosion and Sediment Control Plan;
- Use conventional site preparation techniques prior to and during construction;
- Construct vegetative barriers around the WWTP site to reduce construction noise and obscure views from US-1 and adjacent residences;
- Ensure that construction personnel would observe the established noise ordinance, comply with applicable occupational safety regulations and implement appropriate noise control measures;
- Purchase and protect hammock habitat, of similar quality to the selected site, at a two to one ratio, near the service area (Appendix G);
- Design the WWTP to minimize construction affects to the hammock, including transplanting key tree species and replanting 75% natives species in site landscaping (Appendix B – USFWS 4/22/03 letter);
- Ensure that residential service recipients will not be charged system capital costs beyond those presented in PEA Section 3.6.3.2.2 ([Centralized Wastewater Treatment Plant Alternative] \$4,500 per EDU after grant funding has been applied); and
- Provide wastewater service (inclusive of any amortized system capital costs) at a cost that falls below or near the affordability threshold described in PEA Section 3.6.3.2.2 ([Centralized Wastewater Treatment Plant] \$75/month); and
- Implement financial assistance for qualifying *low-income* and *very low-income* service recipients for system capital costs and decommissioning and lateral hook-up costs, consistent with guidelines and definitions as described in PEA Section 3.7.1.5 (Centralized Wastewater Treatment Plant Alternative).

6.2 PERMITS AND LICENSES

Permits required for the construction and operation of the Plantation Key Wastewater Treatment System are listed in Appendix E of the PEA (Applicable Permit Information). These permits may include an Application for a Domestic Wastewater Facility; Application to Construct/Operate/Abandon Class V Injection well Systems; a Construction/Clearance Permit for Class V Well; a Certification of Class V Well Construction Completion; an Authorization for Class V Well Use; an Application for Class V Well Plugging and Abandonment Permit; a Notification to the Florida Department of Environmental Protection of Class V Well Ownership; and a Certification of Monitor Well Completion. Construction activities would also require authorization in the form of two Environmental Resource Permits (ERPs), one from the Florida Department of Environmental Protection (FDEP) and one from the Monroe County Growth Management Division. Siting the wastewater treatment system in the 100-year floodplain will require compliance with the Village's Floodplain Ordinance. Moreover, because it is considered

a critical action under EO 11988, the plant and its critical operating components must be protected to the 500-year flood elevation (44 CFR Part 9.11).

Construction and operation of either the Alternative 2 or 3 wastewater project, as outlined, would have some limited adverse impacts and long-term positive impacts on the human environment. The majority of adverse impacts would be short-term and construction-related. Effects on topography, soils, and geology; floodplains and wetlands; biological resources; air quality; hazardous materials and wastes; infrastructure; land use and planning; and noise and visual resources are expected to be minimal; with implementation of appropriate mitigation measures. Effects on tourism, the fishing industry, and cultural resources are expected to be negligible. Positive effects on water resources; including inland, nearshore, and offshore waters; are expected from better water quality because of incremental improvements in wastewater treatment. Similarly, improved water quality will benefit public health from reduced nutrient and pathogen release in the wastewater discharge. Increased wastewater management costs would have limited adverse economic effects on wastewater service recipients, particularly for those who have cesspits or septic systems. Implementation of either outlined Village rate option and compliance with the PEA established service and system capital cost affordability criteria will mitigate this adverse economic effect, and wastewater costs would be considered affordable. Moreover, this potential disproportionately high and adverse effect on low-income service recipients will be further reduced through compliance with the PEA outlined and Village low-income assistance provisions. Implementation of prescribed adverse affect minimization/mitigation measures outlined in this SEA, along with applicable permit compliance; impacts to the human environment are expected to be less than significant for Alternatives 2 or 3.

For the No Action alternative, environmental effects from wastewater system construction and operation would generally be similar those described above. Environmental benefits may be delayed pending Village receipt of alternative funding. Adverse economic effects on service recipients could be significant, particularly on low-income residents. The severity of this effect would depend on the chosen wastewater system and level of Village financial assistance. Consequently, the significance of human environment impacts for the No Action alternative would depend on the Village's implementation choices.

These conclusions are based on the analyses, conditions, and assumptions contained in the PEA and SEA.

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Amy Lecours, M.S., Project Environmental Scientist. Technical researcher and document author.

Laura Cherney, Environmental Scientist. Technical researcher and document author.

Keith Stannard, Senior Environmental Scientist. Field biologist and document author.

Michael Breiner, Project Technician. Field biologist and document author.

Justin Patton, Archaeologist. Lead archaeologist and document author.

Joyce Friedenber, M.S., Economist. Technical researcher and document author.

Brian Richards, GIS Analyst. Lead GIS analyst and document author.

Technical Peer Review

Roger Gunther, M.S., Ecological Services Program Director. Document peer reviewer.

Stephen Carruth, M.S., Project Environmental Scientist. Document peer reviewer.

Angela Chaisson, NEPA Group Leader. Document peer reviewer.

Science Kilner, M.S., FEMA Region IV Lead Environmental-Historic Preservation Specialist. Document peer reviewer.

William Straw, Ph.D., FEMA Region IV Environmental Officer. Document peer reviewer.

Appendix A
Acronyms and Abbreviations

Appendix A Acronyms and Abbreviations

AADF	Annual average daily wastewater flow
ADID	Florida Keys Advance Identification of Wetlands
APE	Area of Potential Effect
ASTM	American Society of Testing and Materials
BAT	Best available technology
BFE	Base flood elevation
BMPs	Best management practices
bls	below land surface
BOD	Biochemical Oxygen Demand
CARL	Conservation and Recreation Lands
CBRS	Coastal Barrier Resource System
CEQ	Council on Environmental Quality
CERP	Comprehensive Everglades Restoration Program
CFR	Code of Federal regulations
DCA	Department of Community Affairs
DOH	Department of Health
EDU	Equivalent Dwelling Unit
EFH	Essential Fish Habitat
EO	Executive Order
EPA	Environmental Protection Agency
ERP	Environmental Resource Permit
ESA	Endangered Species Act
F.A.C.	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FKAA	Florida Keys Aqueduct Authority
FMRI	Florida Marine Research Institute
gpd	gallons per day
GMFMC	Gulf of Mexico Fishery Management Council
HDPE	high-density polyethylene
Hg	mercury
IFC	Islamorada Fishing Club
LOS	level of service
MCSWMP	Monroe County Stormwater Master Plan
mg/l	milligrams per liter

Appendix A Acronyms and Abbreviations

ml	milliliters
MM	Mile marker
MOA	Memorandum of Agreement
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NGVD	National Geodetic Vertical Datum
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NRHP	National Register of Historic Places
OFW	Outstanding Florida Waters
OWNRS	Onsite wastewater nutrient reduction systems
PBSJ	Post Buckley Shuh and Jernigan
PEA	Programmatic Environmental Assessment
PKC	Plantation Key Colony
Plan	Monroe County Year 2010 Comprehensive Plan
ppm	parts per million
PVC	polyvinyl chloride
REC	recognized environmental condition
RFP	Request for Proposals
ROGO	Rate-of-Growth Ordinance
ROW	Right-of-way
SAFMC	South Atlantic Fishery Management Council
SEA	Supplemental Environmental Assessment
SERC	Southeast Environmental Research Center
SFA	Sustainable Fisheries Act
SHPO	State Historic Preservation Officer
T&E	Threatened and Endangered Species
TN	Total Nitrogen
TP	Total Phosphorus
TSS	Total Suspended Solids
URS	URS Group, Inc.
US-1	U.S. Route 1
USDA	U. S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
Village	Village of Islamorada
WWTP	Wastewater treatment plant

Appendix B
Agency Coordination Letters

List of Agencies Contacted

Jay Slack, Field Supervisor
USFWS
South Florida Ecological Services Office
1339 20th Street
Vero Beach, FL 32960
cc: Phil Frank, Biologist
U.S. Fish and Wildlife Service
Winn-Dixie Plaza
Big Pine Key, FL 33043

Georgia Cranmore, Acting Assistant
Regional Administrator
NMFS, Southeast Region
Protective Resources Division
9721 Executive Center Drive North
St. Petersburg, FL 33702

Jocelyn Karazsia, Fishery Biologist
National Marine Fisheries Service
11420 N. Kendall Drive, Suite 103
Miami, FL 33176
cc: Rickey N. Ruebsamen, Acting Assistant

Regional Administrator
NMFS, Southeast Region
Habitat Conservation Division
9721 Executive Center Drive North, Suite
201
St. Petersburg, FL 33702

Dr. Janet Matthews, Director
State Historic Preservation Officer
Division of Historical Resources
R.A. Gray Building, Room 305
500 South Bronough Street
Tallahassee, FL 32399-0250
cc: Laura Kammerer, Section Administrator
Compliance and Review Section

Florida State Clearinghouse
Department of Community Affairs
2555 Shumard Oak Boulevard
Tallahassee, Florida 32399-2100

Mark Robson, Regional Director
Florida Fish and Wildlife Conservation
Commission
South Region
8535 North Lake Blvd.
West Palm Beach, FL 33412

Gus Rios, Branch Manager
FDEP, South District - Marathon Branch
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Marathon, FL 33050
cc: Richard Cantrell, South District Director
FDEP – South District Office
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Fort Myers, Florida 33902-2549

Cecilia Weaver, Acting Director
South Florida Water Management District
Florida Keys Service Center
80431 Old Hwy.
Islamorada, FL 33036

John Studt, South Permits Branch Chief
U.S. Army Corps of Engineers
Regulatory Permits Division
4400 PGA Blvd., Suite 500
Palm Beach Gardens, FL 33410
cc: Vic Anderson

U.S. Army Corps of Engineers
Marathon Regulatory Office
2796 Overseas Highway, Suite 221
Marathon, FL 33050-4276

Heinz J. Mueller, Chief
US EPA, Region 4
Office of Environmental Assessment
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
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Appendix B Agency Coordination Letters

Gerald Briggs, Chief
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4052 Bald Cypress Way, Bin #A08
Tallahassee, FL 32399-1713

Bart Bibler, Chief
Florida Department of Health
Bureau of Water Programs, HSEW
4042 Bald Cypress Way
Tallahassee, FL 32311

Teresa Tinker, Policy Coordinator
Growth Management and Strategic Planning
Office of the Governor
1501 Capitol
Tallahassee, FL 32399-0001

Miles Anderson
Division of Emergency Management
Florida Department of Community Affairs
2555 Shumand Oak Blvd.
Tallahassee, FL 32399-2100

Rebecca Jetton
Planning Manager
Marathon Regional Service Center
2796 Overseas Highway, Suite 212
Marathon, FL 33050

Bill Causey, Superintendent
Florida Keys National Marine Sanctuary
P.O. Box 500368
Marathon, FL 33050

Tim McGarry
Monroe County Growth Management
Director
2798 Overseas Highway
Marathon, FL 33052

Appendix C
Site Photographs

Appendix D
Public Notice

**FEMA 1) NOTICE OF FINAL PROGRAMMATIC ENVIRONMENTAL ASSESSMENT,
2) NOTICE OF PROGRAMMATIC FINDING OF NO SIGNIFICANT IMPACT,
AND 3) NOTICE OF INTENT TO PREPARE A
SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED
ISLAMORADA, VILLAGE OF ISLANDS WASTEWATER PROJECT**

The Federal Emergency Management Agency (FEMA) has received a grant application from the Florida Keys Aqueduct Authority (FKAA) to fund construction of a wastewater treatment system to serve Plantation Key Colony/North Plantation Key, Florida. The proposed project would be funded through FEMA 1249-DR Post Disaster - Unmet Needs funds, as noticed on August 6, 1999, in Vol. 64 No. 151 of the *Federal Register*. Matching funds will be provided through the Florida Division of Emergency Management and the FKAA. The purpose of the project is to improve the Plantation Key Colony/North Plantation Key service area's wastewater treatment to meet State requirements (Chapter 99-395 Laws of Florida) by 2010, per the *Monroe County Year 2010 Comprehensive Plan*.

FEMA has completed a Programmatic Environmental Assessment (PEA) for Wastewater Management Improvements in the Keys, for various wastewater projects including Plantation Key Colony/North Plantation Key; and hereby publishes notice of availability of the Final PEA. A Programmatic Finding of No Significant Impact has been issued for the PEA. These documents can be obtained by writing to the point of contact below or may be viewed and downloaded at the following website: <http://www.fema.gov/ep/assess.shtm>.

Furthermore, FEMA hereby publishes its notice of intent to prepare a Supplemental Environmental Assessment (SEA) of the proposed action serving Plantation Key, pursuant to the National Environmental Policy Act (PL 91-190) and associated environmental statutes, as implemented by FEMA's regulations 44 CFR Part 10; and in accordance with Presidential Executive Order 11988 (Floodplain Management); as implemented in 44 CFR Part 9. This SEA will address the purpose and need of the proposed project, project alternatives considered, the affected environment, project and site-specific environmental consequences, and impact mitigation measures. Once completed, the Draft SEA will be available for public review and comment; and a public meeting will be scheduled.

Project Alternatives:

Alternatives to be considered in the SEA include:

- 1) No Action Alternative: The Plantation Key Colony/North Plantation Key service area continues to use its existing wastewater treatment systems and obtains funding from other sources to meet the State 2010 requirements and the *Comprehensive Plan* deadline;
- 2) Action Alternative 1 (Preferred): FEMA/FDEM grant funding would be applied towards the construction of a community wastewater collection system and treatment plant serving Plantation Key Colony/North Plantation Key ; with the plant sited on the bayside between US 1 and Gardenia Street at Mile Marker 89.8 just north of Plantation Key Elementary School;
- 3) Action Alternative 2: FEMA/FDEM grant funding would be applied as described under alternative 2, but the treatment plant would be sited on the Oceanside between US 1 and Old State Road 4A near Mile Marker 89.7 just southwest of Coral Shores High School.

Comment Period:

Comments will be accepted from the affected public; local, state and federal agencies; and other interested parties in order to consider and appropriately scope and evaluate the likely effects of the proposed Plantation Key project alternatives on the physical, biological, and social/built environment. Comments should be in writing, sent to the FEMA point of contact listed below, and postmarked no later than 15 days of this notice.

Point of Contact:

Ms. Science Kilner, Lead Environmental Specialist
FEMA Region IV
3003 Chamblee Tucker Road
Atlanta, Georgia 30341
Fax: (770) 220-5440
science.kilner@fema.gov

**FEMA PUBLIC NOTICE
DRAFT SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT
FOR THE PROPOSED ISLAMORADA, VILLAGE OF ISLANDS WASTEWATER PROJECT**

The Federal Emergency Management Agency (FEMA) has received a grant application from Islamorada, Village of Islands to fund construction of a wastewater treatment system to serve Plantation Key Colony/North Plantation Key, Florida. The proposed project would be funded through FEMA 1249-DR Post Disaster - Unmet Needs funds, as noticed on August 6, 1999, in Vol. 64 No. 151 of the *Federal Register*. Matching funds will be provided through the Florida Division of Emergency Management (FDEM) and the Village of Islamorada. The purpose of the project is to improve the Plantation Key Colony/North Plantation Key service area's wastewater treatment; consistent with the Village adopted, Monroe County Sanitary Wastewater Master Plan and to meet State requirements (Chapter 99-395 Laws of Florida) by 2010.

FEMA has completed a Programmatic Environmental Assessment (PEA) for Wastewater Management Improvements in the Keys, for various wastewater projects including Plantation Key. A Draft Supplemental Environmental Assessment (SEA) of the proposed action on Plantation Key is now complete, which focuses on site/project specific issues. These documents were prepared pursuant to the National Environmental Policy Act (PL 91-190) and associated environmental statutes, as implemented by FEMA's regulations 44 CFR Part 10; and in accordance with the Presidential Executive Order 11988 (Floodplain Management); as implemented in 44 CFR Part 9.

Project Alternatives:

Alternatives to be considered in the SEA include:

- No Action Alternative: No FEMA/FDEM grant funding would be applied to the Plantation Key Colony/North Plantation Key service area, which would continue to use its existing wastewater treatment systems, and funding would have to be obtained from other sources to meet the State 2010 requirements and deadline;
- Action Alternative 1 (preferred): FEMA/FDEM grant funding is applied towards construction of a wastewater collection system serving Plantation Key Colony, and construction of a community wastewater treatment plant serving Plantation Key Colony and North Plantation Key; with the plant sited on the bayside between US 1 and Gardenia Street at Mile Marker 89.8 just north of Plantation Key Elementary School;
- Action Alternative 2: FEMA/FDEM grant funding is applied as under Alternative 2, but the treatment plant would be sited on the oceanside between US 1 and Old State Road 4A near Mile Marker 89.7 just southwest of Coral Shores High School.

Notice of Draft Supplemental Environmental Assessment Available for Comment:

The DSEA addresses the purpose and need of the proposed project, project alternatives considered, the affected environment, project and site-specific environmental consequences, and impact mitigation measures. Comments to the DSEA will be accepted from the affected public; local, state and federal agencies; and other interested parties in order to consider and appropriately scope and evaluate the likely effects of the proposed Plantation Key project alternatives on the physical, biological, and social/built environment. Comments should be made in writing and sent to the FEMA official listed below or given at the public meeting. Comments will be accepted no later than July 25, 2003. The DSEA may be accessed as indicated below; the PEA and FONSI may also be accessed at these locations, however the public comment period for the latter two documents has passed.

- The DSEA may be viewed and downloaded at the following website: <http://www.fema.gov/ehp/docs.shtm>
- A copy of the DSEA will be available for viewing at the following public repository
Helen Wadley Branch Library, Mile Marker 81.5 Overseas Highway, Islamorada

Public Meeting Notice:

A public meeting has been scheduled for the DSEA. The purpose of the meeting is to present the DSEA, discuss the issues and gather information, and receive public comments.

- JULY 16TH 6:30 to 9:30pm – Village Council Chambers, Founder's Park, 87000 Overseas Highway, Islamorada

Point of Contact:

Ms. Science Kilner, Lead Environmental Specialist
FEMA Region IV
3003 Chamblee Tucker Road
Atlanta, Georgia 30341
Fax: (770) 220-5440

Appendix E
Community Development Block Grant Housing Rehabilitation Program Overview

Appendix F
Regulated Fisheries Species in the Keys

Appendix F

Regulated Fisheries Species in the Keys

<u>Species Common Name</u>	<u>Scientific Name</u>	<u>Managed By</u>
Almaco Jack	<i>Seriola rivoliana</i>	SAFMC, GMFMC
Albacore	<i>Thunnus alalunga</i>	GMFMC
Anchor Tilefish	<i>Caulolatilus intermedius</i>	GMFMC
Atlantic Angel shark	<i>Squatina dumeril</i>	GMFMC
Atlantic Bonito	<i>Sarda sarda</i>	GMFMC
Atlantic Sharpnose	<i>Rhizoprionodon terraenovae</i>	GMFMC
Banded Rudderfish	<i>Seriola zonata</i>	SAFMC, GMFMC
Bank Sea Bass	<i>Centropristis ocyurus</i>	SAFMC
Basking Shark	<i>Cetorhinus maximus</i>	GMFMC
Bigeye Sixgill Shark	<i>Hexanchus nakamurai</i>	GMFMC
Bigeye Sand Tiger Shark	<i>Odontaspis noronhai</i>	GMFMC
Bigeye Tresher	<i>Alopias superciliosus</i>	GMFMC
Bigeye Tuna	<i>Thunnus obesus</i>	GMFMC
Bignose Shark	<i>Carcharhinus altimus</i>	GMFMC
Black Grouper	<i>Mycteroperca bonaci</i>	SAFMC, GMFMC
Black Margate	<i>Anisotremus surinamensis</i>	SAFMC
Black Snapper	<i>Apsilus dentatus</i>	SAFMC
Black Sea Bass	<i>Centropristis striatus</i>	SAFMC
Blackfin Snapper	<i>Lutjanus buccanella</i>	SAFMC, GMFMC
Blackfin Tuna	<i>Thunnus atlanticus</i>	GMFMC
Blackline Tilefish	<i>Caulolatilus cyanops</i>	GMFMC
Blue Marlin	<i>Makaira nigicans</i>	GMFMC
Bluefin Tilefish	<i>Caulolatilus microps</i>	SAFMC
Bluefin Tuna	<i>Thunnus orientalis</i>	GMFMC
Blueline Tilefish	<i>Caulolatilus microps</i>	GMFMC
Blue Stripe Grunt	<i>Haemulon sciurus</i>	SAFMC
Caribbean Reef Shark	<i>Carcharhinus perezii</i>	GMFMC
Caribbean Sharpnose Shark	<i>Rhizoprionodon porosus</i>	GMFMC
Cero	<i>Scomberomorus regalis</i>	SAFMC
Cobia	<i>Rachycentron canadum</i>	SAFMC, GMFMC
Coney	<i>Epinephelus fulvus</i>	SAFMC
Cubera Snapper	<i>Lutjanus cyanopterus</i>	SAFMC, GMFMC
Dog Snapper	<i>Lutjanus jocu</i>	SAFMC, GMFMC
Dolphin Fish	<i>Coryphaena hippurus</i>	SAFMC
Dusky Shark	<i>Carcharhinus obscurus</i>	GMFMC
French grunt	<i>Haemulon flavolineatum</i>	SAFMC
Gag	<i>Mycteroperca microlepis</i>	SAFMC, GMFMC
Galapagos shark	<i>Carcharhinus galapagensis</i>	GMFMC
Golden Crab	<i>Chaceon fenneri</i>	SAFMC
Golden Tilefish	<i>Lopholatilus chamaeleonticeps</i>	SAFMC
Goliath Grouper	<i>Epinephelus itajara</i>	SAFMC
Goldface Tilefish	<i>Caulolatilus chrysops</i>	SAFMC
Graysby	<i>Epinephelus cruentatus</i>	SAFMC
Gray Snapper	<i>Lutjanus griseus</i>	SAFMC, GMFMC
Gray Triggerfish	<i>Balistes capriscus</i>	SAFMC, GMFMC
Greater Amberjack	<i>Seriola dummerili</i>	SAFMC, GMFMC
Hogfish	<i>Lachnolaimus maximus</i>	SAFMC, GMFMC
Jewfish Grouper	<i>Epinephelus itajara</i>	GMFMC
Jolthead Porgy	<i>Calamus bajonado</i>	SAFMC
King Mackerel	<i>Scomberomorus cavalla</i>	SAFMC, GMFMC
Knobbed Porgy	<i>Calamus nodosus</i>	SAFMC
Lane Snapper	<i>Lutjanus synagris</i>	SAFMC, GMFMC
Lesser Amberjack	<i>Seriola fasciata</i>	SAFMC, GMFMC
Longbill Spearfish	<i>Tetrapturus pfluegeri</i>	GMFMC

Appendix F Regulated Fisheries Species in the Keys

<u>Species Common Name</u>	<u>Scientific Name</u>	<u>Managed By</u>
Little Tunny	<i>Euthynnus alletteratus</i>	SAFMC
Mahogany Snapper	<i>Lutjanus mahogoni</i>	SAFMC, GMFMC
Margate	<i>Haemulon album</i>	SAFMC
Misty Grouper	<i>Epinephelus mystacinus</i>	SAFMC, GMFMC
Mutton Snapper	<i>Lutjanus analis</i>	SAFMC, GMFMC
Narrowtooth Shark	<i>Carcharhinus brachyurus</i>	GMFMC
Nassau Grouper	<i>Epinephelus striatus</i>	SAFMC
Night Shark	<i>Carcharhinus signatus</i>	GMFMC
Ocean Triggerfish	<i>Canthidermis sufflamen</i>	SAFMC
Penaeid Shrimp	<i>Penaeus sp.</i>	SAFMC
Queen Snapper	<i>Etelis oculatus</i>	SAFMC, GMFMC
Queen Triggerfish	<i>Balistes vetula</i>	SAFMC
Red Drum	<i>Sciaenops ocellatus</i>	SAFMC, GMFMC
Red Grouper	<i>Epinephelus morio</i>	SAFMC, GMFMC
Red Hind	<i>Epinephelus guttatus</i>	SAFMC, GMFMC
Red Porgy	<i>Pagrus pagrus</i>	SAFMC
Red Snapper	<i>Lutjanus campechanus</i>	SAFMC
Rock Hind	<i>Epinephelus adscensionis</i>	SAFMC, GMFMC
Rock Sea Bass	<i>Centropristis philadelphicus</i>	SAFMC
Rock Shrimp	<i>Sicyonia brevirostris</i>	SAFMC
Sailfish	<i>Istiophorus playpteras</i>	GMFMC
Sand Tiger Shark	<i>Carcharhinus taurus</i>	GMFMC
Sevengill Shark	<i>Notorynchus cepedianus</i>	GMFMC
Sixgill Shark	<i>Hexanchus griseus</i>	GMFMC
Smalltail Shark	<i>Carcharhinus porosus</i>	GMFMC
Saucereye Porgy	<i>Calamus calamus</i>	SAFMC
Scamp	<i>Mycteroperca phenax</i>	SAFMC, GMFMC
Schoolmaster	<i>Lutjanus apodus</i>	SAFMC, GMFMC
Scup	<i>Stenotomus chrysops</i>	SAFMC
Sheepshead	<i>Archosargus probatocephalus</i>	SAFMC
Silk Snapper	<i>Lutjanus vivanus</i>	SAFMC, GMFMC
Skipjack Tuna	<i>Katsuwonus pelamis</i>	GMFMC
Snowy Grouper	<i>Epinephelus niveatus</i>	SAFMC, GMFMC
Spadefish	<i>Chaetodipterus faber</i>	SAFMC
Spanish Mackerel	<i>Scomberomorus maculatus</i>	SAFMC, GMFMC
Speckled Hind	<i>Epinephelus drummondhayi</i>	SAFMC, GMFMC
Spiny Lobster	<i>Panulirus argus</i>	SAFMC, GMFMC
Swordfish	<i>Xiphias gladius</i>	GMFMC
Tiger Grouper	<i>Mycteroperca tigris</i>	SAFMC
Tilefish	<i>Lopholatilus chamaeleonticeps</i>	GMFMC
Tomtate	<i>Haemulon aurolineatum</i>	SAFMC
Vermilion Snapper	<i>Rhomboplites aurorubens</i>	SAFMC, GMFMC
Wahoo	<i>Acanthocybium solanderi</i>	SAFMC
Warsaw Grouper	<i>Epinephelus nigritus</i>	SAFMC, GMFMC
Wenchman Snapper	<i>Pristipomoides aquilonaris</i>	GMFMC
Whale Shark	<i>Rhincodon typus</i>	GMFMC
Whitebone Porgy	<i>Calamus leucosteus</i>	SAFMC
White Grunt	<i>Haemulon plumieri</i>	SAFMC
White Marlin	<i>Tetrpturus albidus</i>	GMFMC
White Shark	<i>Aloa sapidissima</i>	GMFMC
Wreckfish	<i>Polyprion americanus</i>	SAFMC
Yellowedge Grouper	<i>Epinephelus flavolimbatus</i>	GMFMC
Yellowfin Grouper	<i>Mycteroperca venenosa</i>	SAFMC, GMFMC
Yellowfin Tuna	<i>Thunnus albacares</i>	GMFMC

Appendix F
Regulated Fisheries Species in the Keys

<u>Species Common Name</u>	<u>Scientific Name</u>	<u>Managed By</u>
Yellowmouth Grouper	<i>Mycteroperca interstitialis</i>	SAFMC, GMFMC
Yellowtail Snapper	<i>Ocyrus chrysurus</i>	SAFMC, GMFMC

Appendix G
Land Protection Agreement between DCA and the Village

Appendix H
Plantation Key Cultural Resources Assessment Survey Report