Integrated Pest Management Plan

For City's Stormwater Conveyance System

SEPTEMBER 2021

CITY OF SEBASTIAN
HOME OF PELICAN ISLAND

SWIPM.PLAN.V1

ACKNOWLEDGEMENTS

This Integrated Pest Management Plan is the collaborative product of hard work, in-depth discussion, thoughtful review, and peer-reviewed scientific research conducted over five (5) months, by the following charter members of the **Stormwater IPM Sub-Committee**:

Natural Resources Board Members
Thomas Carrano
Jessica Lovell
Charles Stadelman

Scientific Advisors
Ruth Callaghan, CEAC (Certified Environmental Analytical Chemist)
Dr. Graham Cox, Pelican Island Audubon Society
Nickie Monroe, University of Florida- IFAS Indian River County Extension Office

City Staff
Brian Benton, Leisure Services Director
Kimberly Haigler, Environmental Planner/IPM Coordinator

The IPM Sub-Committee hereby approves this IPM Plan, in its entirety, on the 19th day of July, 2021.

The Natural Resources Board hereby approves this IPM Plan, in its entirety, on the 3rd day of August, 2021.

The aforementioned collectively present this IPM Plan and accompanying Resolution (R-21-14) for City Council approval on the 8th day of September, 2021.

The City of Sebastian's IPM Program is a Sustainable Sebastian Initiative.
For more information about Sustainable Sebastian please visit:
https://www.sebastiannrb.com/

TABLE OF CONTENTS

XI. APPENDIX

INCLUDED FIGURES

I. INTRODUCTION

Scope

The City of Sebastian's **stormwater conveyance system** encompasses 9 miles of **canals**, 80 miles of **ditches**, and over 15 ponds and **retention areas**. Other **stormwater** assets include: 310 **culvert pipes** and **catch basins**, 7 **baffle boxes**, as well as countless **swales**, road crossing pipes, **dams**, **weirs**, **rights-of-way**, and a **seawall** canal perimeter. The Stormwater and Public Works Departments are charged with maintaining all of these features so that the treatment, transportation, and storage capacity of the entire conveyance system is preserved, while also ensuring the safety of City staff, residents, structures, wildlife, and the surrounding natural waters.

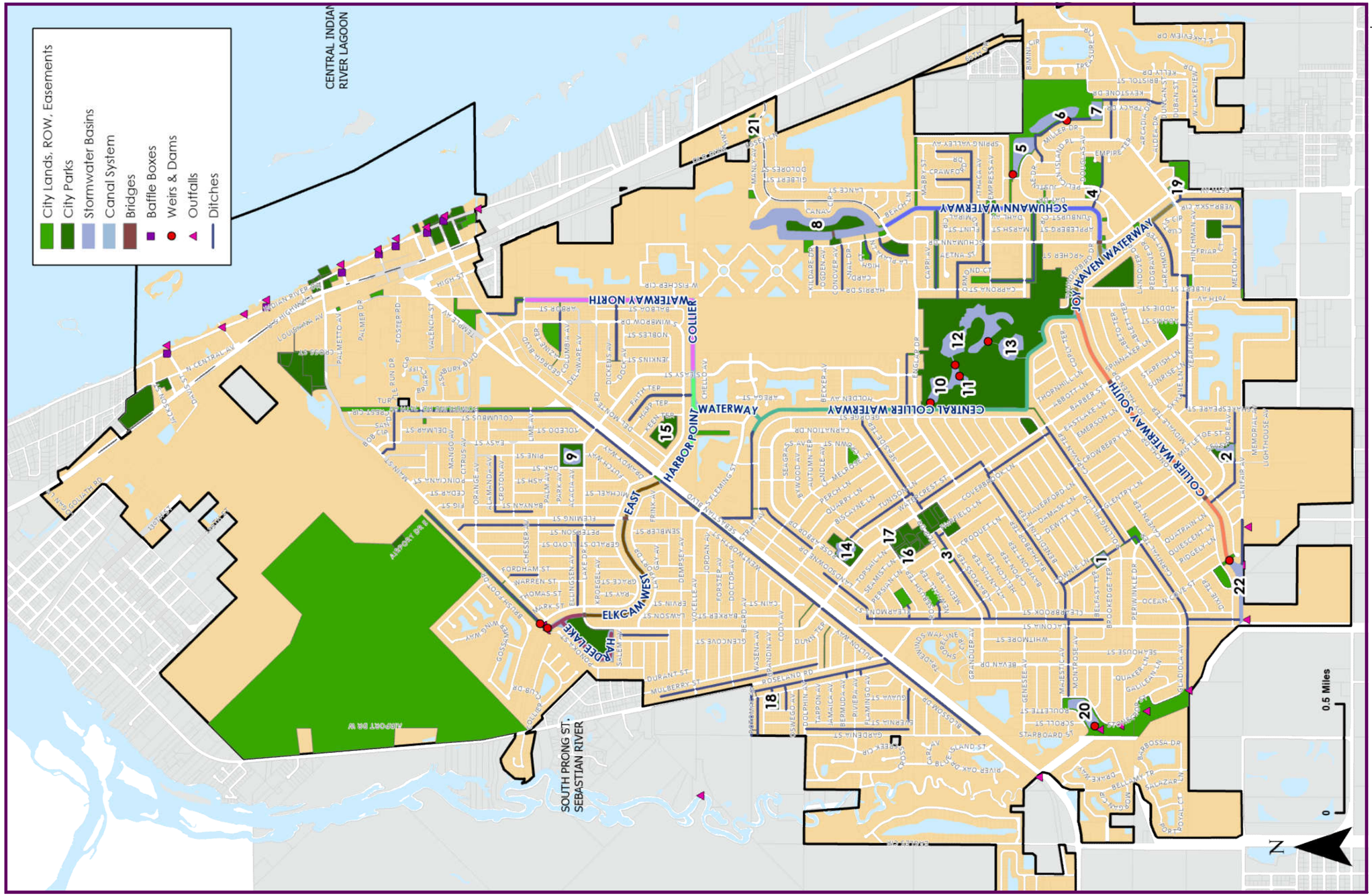
The City of Sebastian is bordered on the east by the Indian River Lagoon (IRL) and on the west by the St. Sebastian River (SSR). Both of these waterways are environmentally sensitive, support a large number of native species, and are integral to the natural health of our region. Therefore, the City must also serve as a steward to the IRL and SSR by ensuring that the stormwater entering these waterways is as healthy as possible.

Noxious aquatic vegetation will be the only "pest" addressed in this plan. While there are species of fish, shellfish and insects present within the stormwater system, which are classified as **"invasive"**, none besides the mosquito have achieved populations which require management. Mosquito Control is handled by the Indian River County Mosquito Control District and is exempt from the City's IPM Plan.

In order to best manage pests within the stormwater system, while also protecting environmental health, City staff and contractors will continue utilizing the principles of **Integrated Pest Management (IPM)** through the implementation of this IPM Plan. Please note that this plan will not apply to any stormwater features located within any planned unit development (PUD), as these subdivisions have direct contracts with the water management district to design and maintain their own stormwater system. Also, not covered by this plan is the City's cemetery, parks, or other properties, as these assets are managed collectively by the City's Leisure Services Department and are addressed in a separate "Parks and Properties IPM Plan," which was adopted by City Council on October 14th, 2020.

Otters are year-round residents in our stormwater conveyance system.

Figure 1: *Map of City's Stormwater Assets*



#	STORMWATER BASIN NAME
1	Cheltenham Pond
2	Periwinkle Pond
3	Tulip Pond
4	Pelican Island Pl. Detention Area
5	Day Drive Retention Area
6-7	Miller Drive Detention Area
8	Schumann Lake
9	Easy Street Lake
10-13	Stormwater Treatment Area
14	Garden Club Park Pond
15	Bark Park Pond
16-17	Barber Street Park Ponds
18	Blossom Drive Pond
19	Barber Street Retention Area
20	Stonecrop Retention Area
21	Historic Park Pond
22	Concha Basin

ASSET SUMMARY

- **Canals: 9 miles**
- **Ditches: 80 miles**
- **Basins: 22**
- **Baffle Boxes: 7**
- **Weirs/ Dams: 12**
- **Bridges: 4**
- **IRL Outfalls: 10**
- **SSR Outfalls: 8**

IPM Sub-Committee

In October of 2020, the Stormwater IPM Sub-Committee was formed to assist City staff in the development of an Integrated Pest Management Plan for the City of Sebastian's stormwater conveyance system. The sub-committee is to be comprised of the Stormwater Director, Leisure Services Director, IPM Coordinator, three **Natural Resource Board** Members, and two local scientific consultants.

The role of the IPM Sub-Committee is to assist in the development of a cohesive IPM Plan, advise on pest management issues, and evaluate the City's progress towards the goals of the IPM Plan. The Sub-Committee will review and approve the annual IPM report before it is presented to City Council. As part of the annual review, Sub-Committee Members will evaluate the current techniques and products to ensure they are based on the best available technologies and scientific information available. Recommendations will be made regarding changes to the annual reporting process and the IPM Plan document.

In the development of the initial Stormwater IPM Plan, the IPM Sub-Committee will meet bi-monthly. Following adoption of the final IPM Plan by City Council, the committee will meet annually, unless more frequent meetings are needed, as determined by staff. All IPM Sub-Committee meetings will be held in compliance with Florida's Sunshine Laws, with public notice, posted agenda, and minutes taken by a recording secretary.

IPM Coordinator

In order to provide for the planning and oversight of the IPM program, the position of IPM Coordinator is established. The appointed IPM Coordinator shall be a member of City staff who is in a position related to environmental or planning, who shall coordinate with the Stormwater Director. Together, they will lead the creation and implementation of the IPM Plan, which will apply to the City's pest management activities on all of its stormwater ponds, canals, and ditches. Their responsibilities will also include the following:

- Serve as liaison to IPM Sub-Committee
- Monitor that City staff and contractors are adhering to the IPM Plan Standard Operating Procedures (SOPs)
- Maintenance of accurate records on IPM implementation and use
- Keep records of staff training in Erosion and Sediment Control, Green Business Best Management Practices, and staff pesticide applicator certification
- Assure the inclusion of City IPM policies and practices in any applicable third party contracts or purchase orders for pest management
- Implement outreach efforts and maintain City's IPM Website.

The IPM Coordinator will prepare an annual report of the City's IPM activities, which will be reviewed each March, by the IPM Sub-Committee, Leisure Services Director, and the Stormwater Director in an effort to assess the effectiveness of pest control methods, feasibility of new methods and technologies, and decide whether revision of the IPM Plan is required.

IPM Plan

A **pest**, by definition is any plant, animal, or pathogen which causes disease, inflicts damage, or out-competes a more desirable species for an area. In addition, a pest may be aesthetically undesired, or threaten to impact human/animal health. However, for the purposes of this plan, noxious aquatic weeds are the only pest of concern.

According to the "Florida Aquatic Plant Management Act," Section 369.22, Florida Statute, the uncontrolled growth of this vegetation poses a variety of environmental, health, safety, and economic problems *(Appendix K)*. This legislation charges the Florida Fish and Wildlife Conservation Commission (FWC) with the supervision and control of aquatic plant management. Therefore, the FWC establishes that a "**noxious aquatic plant**", is any part or whole of an aquatic plant which has the potential to hinder the growth of beneficial plants, to interfere with irrigation or navigation, or to adversely affect the public welfare or the natural resources of the state.

The "Florida Aquatic Plant Management Act" recommends that the management of these aquatic plants be carried out primarily through "maintenance programs," as they achieve more effective management at a lower overall cost.

The City adopts this IPM Plan as its aquatic vegetation **maintenance control program** and adopts the following definition of Integrated Pest Management as established by the City's IPM Sub-Committee:

> "To promote the most **sustainable** pest management methods, based on planning and prevention; which aim to minimize risks to human and environmental health through the limited use of pesticides, while also remaining economically feasible."

Goals

- Protect environmental resources by reducing the amount of pollutants entering surface and ground water and minimizing effects on native plants, animals and habitats
- Ensure effective, economic pest management within the City's stormwater conveyance system, while minimizing health risks to the public, City staff, and the environment
- Promote the transparency of the City's pest management activities
- Increase public awareness of IPM methods and benefits

IPM Program

IPM Policy. The Stormwater IPM plan, as well as future modifications or amendments will be reviewed and voted on initially and annually by the IPM Sub-Committee, Natural Resources Board, and then presented to City Council for final approval. The plan will then be incorporated as City policy through the adoption of Resolution R-21-14 by City Council *(Appendix A)*.

IPM Program Coordination. The Stormwater Director, Leisure Services Director, and the IPM Coordinator are responsible for coordinating, tracking, and reporting the implementation of the City's IPM Program.

Tracking Pesticide Use. City Staff and Contractors conducting pest management activities within the City's **stormwater conveyance system** are required to record thorough field data. Accurate records will be maintained on herbicide use and all non-chemical methods utilized, these records will be accessible for reference. All records will be retained for 1 year and stored on the City's Laser fiche system per record retention schedule.

Staff Training. All City employees who, within the scope of their duties, direct maintenance activities on the stormwater system will be trained on the City's IPM Policies. A certification course on Green Business Best Management Practices will be provided through partnership with the University of Florida Indian River County Extension Office as needed. Stormwater and Public Works staff also receives certification training on Sediment and Erosion Control. The training sessions are coordinated by the Human Resources Director, who will track employees' attendance and ensure that City field staff holds an active certification.

Licensed Applicators. At this time, City staff will not be applying any herbicides on the surface of, or within ten feet of aquatic areas. All aquatic herbicide applications will be performed by a State licensed contractor.

Information Resources for Staff. The IPM coordinator will act as a resource for City staff to help identify new pests and pest related concerns, and to assist in determining the best course of action consistent with the established IPM Program's Standard Operating Practices (SOPs). The IPM Coordinator will also seek out and provide access to expert resources when needed.

Public Outreach. Education and outreach efforts will include distribution of information, either created internally, or obtained through partnership with local and state government agencies. The IPM Coordinator will coordinate and keep records of the following:

- A City webpage where the public may obtain information on IPM practices for their property, view the City's IPM Plan, annual IPM reports, IPM Sub-Committee minutes, and pest management treatment records.
- The City's efforts to promote the reduction of urban pesticide use through social media, the City's website, print and television media.
- The City's outreach to pest control operators (PCO's) and landscapers.
- Distribution of IPM information and resources at public outreach and community events.
- IPM information distributed to residents through the "New Homeowner Folders" during the final planning and zoning inspection.
- Updates and status reports following the annual report and as requested by City officials.

Contract Provisions. The Procurement Coordinator will review **contract** provisions and/or amendment(s) to agreements that provide pest management services within city maintained ponds, canals and ditches covered under this IPM Plan. All such **contractors** shall be required to review and sign the "contractor agreement" *(Appendix B)*. Contract work will be monitored to ensure that City IPM policies and practices are adhered to by all contractors performing pest management work.

Regulatory Reporting. The IPM Coordinator will handle reporting to regulatory agencies, which credit the adoption of an IPM Plan as a Best Management Practice (BMP).

- Incorporate the IPM Plan into the Florida Department of Environmental Protections (FDEP)'s **National Pollutant Discharge and Elimination System (NPDES) Phase II, MS4 Permit** Cycle 4, Year 2 Annual Report (September, 2022) and the Cycle 5 NOI (September, 2024) as a new BMP for Element 6: Pollution Prevention/ Good Housekeeping.
- Add as new project and update through the statewide Basin Management Action Plan (BMAP) annual report on water quality projects.
- Add as new activity and provide update to the Indian River Lagoon Council for the Indian River Lagoon Comprehensive Conservation and Management Plan (CCMP) annual report on lagoon-related accomplishments.

The Blossom Pond benefits from fountain aeration.

Community IPM Cycle

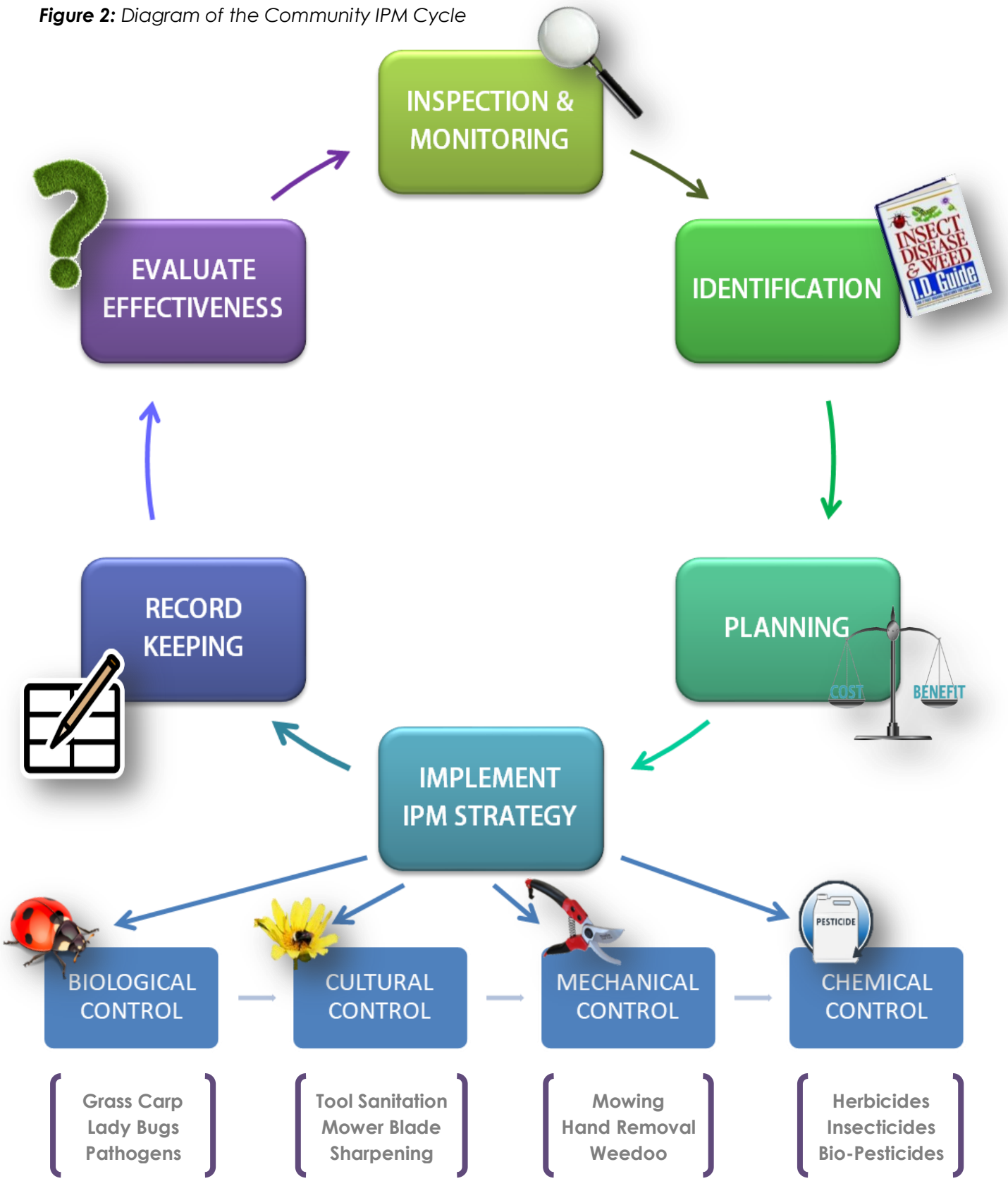
This established cycle *(Figure 2)* will serve as the guideline for IPM Plan development and is based on planning and prevention, with the use of chemicals as the last resort for pest control.

1. **Inspection and Monitoring:** Staff and contractors routinely scout the waters and surrounding landscapes to locate pests. **Noxious aquatic vegetation** populations are monitored by visual checks.
2. **Identification:** Plants must be accurately identified. Life history attributes are to be known for each species identified. This step is key to effective treatment.
3. **Planning:** The focus is on prevention- what it takes to keep noxious vegetation out. Determine what action is needed and whether a threshold has been crossed. Proper techniques and timing are for required management.
4. **Implement Strategy:** All pest management strategies are classified as biological, cultural, mechanical, or chemical. All methods are combined to maintain pests at acceptable thresholds.
    - Biological Control: enhances natural enemy populations by creating habitat or adding populations
    - Cultural Control: Disrupts the pest's environment by removing pest attractants or utilizing pest resistant variety of desired species
    - Mechanical: Creates physical barrier to pest entry
    - Chemical Control: the last tool in the IPM toolbox, the goal is evaluate costs and benefits to choose the least-toxic and most feasible option available that will do the job
5. **Record Keeping:** Accurate record keeping is essential to a successful IPM program. Data must be kept on control methods implemented, purchase orders, and chemical usage by contractors. Determine if control methods were effective by knowing what has changed through trap counts and observation.
6. **Evaluate Effectiveness:** Document if the program is meeting expectations. Establish if all actions have been in compliance with the City's IPM Standard Operating Procedures (SOPs). Assess what was learned and determine whether the plan needs revised.

City staff uses a vacuum truck to remove sediments and vegetation from a catch basin

A juvenile alligator hangs out in Periwinkle Pond.

Figure 2: *Diagram of the Community IPM Cycle*



Standard Operating Procedures

When selecting and implementing a pest management strategy, from this plan, the following will be considered by City Staff:

Site Factors. Use and function of the waters and surrounding landscape.

- Considering the use and function of the assets and the surrounding landscape, stormwater features are divided into four functional categories *(Figure 3)* in which the action threshold and methods are determined:
  - Structures: including **dams**, **weirs**, **spillways**, **catch basins**, **baffle boxes**, **culvert pipes**, **inlets**, **outlets**, and **outfalls**. These assets have a virtually zero tolerance for plant growth, as they must stay clear of vegetation and debris at all times in order to function.
  - Canals: shoreline and seawall vegetation is acceptable and often encouraged. However, vegetation must be controlled to the seawall perimeters so that the storage and flow of the waterways is maintained.
  - Ponds: shoreline **emergent vegetation** is beneficial and encouraged. However, when the vegetation is not maintained, it can quickly take over open water areas, reduce stormwater storage capacity and degrade habitat quality.
  - Ditches: along with **dry detention areas**, and **rights-of-way (ROW)** areas have the highest tolerance threshold for vegetative growth, maintenance required is minimal.
- Erosion and runoff potential of site
- Proximity to other surface, surficial, and groundwater resources

Figure 3: *Stormwater Asset Classification Table*

STRUCTURES	CANALS	PONDS	DITCHES
Dams	Elkcam Waterway	Retention Ponds	ROWs
Weirs	Collier Waterway	Detention Ponds	Dry DAs
Spillways	Schumann Lake	Retention Areas	Swales
Catch Basins	Hardee Lake	Treatment Areas	
Baffle Boxes	Harbor Waterway	Stormwater Basins	
Culvert Pipes	Schumann Waterway		
Inlets	Harbor Pt. Waterway		
Outlets	Joy Haven Waterway		
Outfalls	Seawall Perimeter		

Costs. Both short and long term costs, as they relate to:

- Costs of the material or method
- Application and labor costs
- Effectiveness and duration of effects on pest populations
- Overall feasibility

Other Factors. Additional factors relevant to the selection

- Special equipment or storage required for method
- Method of delivery
- Terrestrial Fertilizer application must adhere to the standards of the City's Fertilizer Ordinance, Ch.50 Sec.50-5 *(Appendix C)*
- How all criteria may be affected by weather conditions
- Previous pesticide applications on site and interval between treatments
- Chemical application set-backs from slopes along waterways
- Possibility of pest resistance
- Equipment cleaning consideration before and after use
- Potential synergistic effects of pesticide combinations

The following considerations are addressed through the use of the **Environmental Impact Quotient (EIQ)**, which is explained on page 24:

Health and Safety Concerns. Potential effects on City staff and residents.

- Toxicological properties and potential health effects of materials or methods
- Equipment operation safety issues
- Staff safety and injury concerns

Environmental Considerations. Protection of native plants, animals and **pollinators**.

- Consider toxicity or potential harm caused by the method to non-target organisms and habitat.
- Potential for **bioaccumulation** of materials within soils and groundwater
- Know if there is potential for negative effects from any pest control method or lack thereof on any federally or state **protected species** that may be in the area
- Be aware of any nesting birds in the area and potential affects the method may cause
- Understand the effects the method may have on pollinators
- The effects of reduced control of invasive plants or pests to native biodiversity

Product Characteristics. Specific product features

- Possible residual effect and decomposition products
- Volatility and flammability
- Product formulation, recommended dilution and package size
- **Leachability** and **solubility**

Roseate Spoonbills graze at the temporary pond at the Friendship Park dry detention area.

II. Key Aquatic Pests

Overview

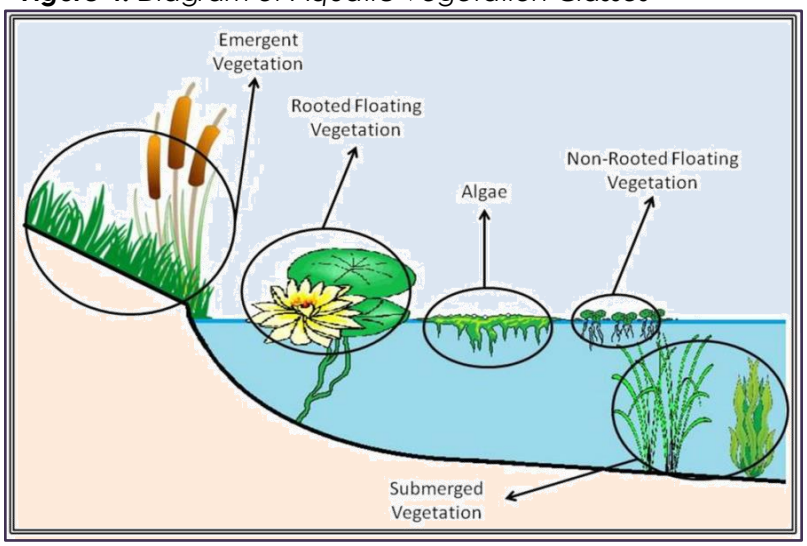
This plan will only address the management of **noxious aquatic vegetation** pests within the **stormwater conveyance system**. While vegetation is certainly a natural and integral element of any water body, species characteristics and environmental conditions can cause the aquatic vegetation to become a pest within a specific location, requiring diligent monitoring and control.

Aquatic Vegetation Classes

Any plants that are able to establish, grow, and reproduce in water, whether year-round or seasonal, is considered aquatic vegetation. There are three primary classes *(Figure 4)* of aquatic vegetation, each presenting unique management challenges:

- **Emergent:** erect, rooted, herbaceous plants growing in water or on a substrate that is at least periodically inundated with water
- **Floating:** leaves that float on the water surface. Their roots may be attached in the substrate or floating in the water column, includes algae.
- **Submersed:** Rooted plants with flaccid or limp stems with most of their vegetative mass located below the water surface, although small portions may extend above the water.

Figure 4: *Diagram of Aquatic Vegetation Classes*



Pros and Cons

Native aquatic vegetation plays a vital and irreplaceable role in an aquatic ecosystem. These plants provide shelter, habitat and food for many important species of fish, birds, insects, and other wildlife. Shoreline vegetation is critical to preventing erosion and filtering sediments and nutrients from entering the waterbody. Many species of aquatic vegetation also help improve water quality by uptaking excess nutrients from the water and settling sediments out of the water column as they slow the movement of water.

At times aquatic vegetation can become a huge management concern in both natural and stormwater systems. In a natural ecosystem, non-native vegetation can out compete native vegetation, adversely affecting habitat quality and biodiversity. In fact, an overgrowth of aquatic vegetation can actually alter entire ecosystems. In man-made aquatic systems, vegetation can block flood control, clog pipes and damage structures. The stormwater conveyance system must preserve the storage and flow of water in order to remain effective.

Invasive aquatic vegetation, in particular, has several common traits which makes it very difficult to control and nearly impossible to eradicate:

- Very rapid growth (exponential), which can quickly cover very large areas.
- Can survive in a wide variety of temperature, light, water, and soil conditions.
- Reproduce multiple ways, including seeds, buds, fragments, and shoots from roots.

Native aquatic vegetation is more adapted to the local system and tends to stay within its niche, contributing to biodiversity. However, under specific environmental conditions they too can form dense monocultures that require management as well. Therefore the term "**noxious aquatic vegetation**" includes any native or non-native vegetation requiring control within the stormwater system.

Figure 5: *Table of the City's Key Aquatic Pests*

COMMON NAME	SCIENTIFIC NAME	CLASS	STATUS
Hydrilla	*Hydrilla vericillata*	Submersed	Invasive, Non-Native
Water Hyacinth	*Eichornia crassipies*	Floating	Invasive, Non-Native
Primrose Willow	*Ludwigia sp.*	All	Native
Spatterdock	*Nuphar advena*	Floating	Native
Duckweed	*Lemna minor*	Floating	Native
Cattail	*Typha sp.*	Emergent	Native
Torpedo Grass	*Panicum repens*	All	Invasive, Non-Native
Green Algae	*Chlorophyta sp.*	Submersed	All
Salvinia	*Salvinia molesta*	Floating	Invasive, Non-Native
Alligator Weed	*Alternanthera philoxeroides*	All	Invasive, Non-Native

Without early detection and rapid response, noxious aquatic vegetation can not only cause ecological and structural harm but can also result extensive economic costs. In the United States alone, invasive weed damage and management costs exceed $30 billion each year. Each day, invasive aquatic weeds cover an additional 4,500 acres of public lands and waters across the country. The key to avoiding these costs is to be proactive and create a plan for **maintenance control**.

III. STRUCTURES

Overview

Stormwater assets classified as "structures" includes all **dams**, **weirs**, **spillways**, **catch basins**, **baffle boxes**, **culvert pipes**, **inlets**, **outlets**, and **outfalls**. There are over 100 such structures across the stormwater system. These assets have a virtually zero tolerance for plant growth; they must stay clear of vegetation and debris at all times in order to function.

Do Nothing Option

There are numerous ways that aquatic plants can interfere with the operating of water management structures, as each structure is unique in its design and/or purpose. Overgrowth of aquatic vegetation around and within these structures can greatly impede the flow of water, block gates opened or closed, often when the operation of these structures is the most critical. These structures are often critical to flood control during major rain events. The damage caused to the structures and by the resulting flooding problems can become very costly to repair. Therefore, the tolerance threshold for **noxious aquatic vegetation** growth, before action is taken is considered the very low for these assets.

Non-Chemical Methods

In order to eradicate vegetation, the following cultural and mechanical methods will be conducted routinely as part of standard proactive maintenance procedures within the City's stormwater system:

- **Excavation.** Sediments can build up at outfalls and create a substrate for vegetation to establish. At times of low outfall, City staff may clear the outfall areas with equipment to mechanically remove any vegetation and accumulated sediments.
- **Vacuum Removal.** A vacuum truck is utilized to remove all accumulated sediments and vegetative debris from catch basins and baffle boxes as needed. Note that these assets are never sprayed with herbicides.
- **Manual Removal.** When safe and practicable, vegetation will be removed by hand from structures as part of routine inspections.
- **Replacement of Structures.** Structure design has been modified over time to be more resistant to pest establishment and damage. The defective or aging structures should be replaced with these upgraded versions, when applicable.

IV. CANALS

Overview

Stormwater assets classified as "**canals**" include the entire interconnected system of wide, mostly sea walled waterways. Altogether, the City maintains over 9 miles of canals and **seawalls**. It is acknowledged that aquatic vegetation provides an important ecological function in the canals. However, the City must be careful that the storage and flow capacity of these important waterways is protected.

Do Nothing Option

The overgrowth of aquatic vegetation within the canal system can greatly impede the flow of water, crucial for flood control throughout the City. The canals are also frequently utilized for kayaking and fishing. These recreational opportunities are hindered when dense vegetation blocks access and affects the habitat quality by altering the water's chemistry and decreasing light penetration.

Finally, and most importantly, the canal system has multiple direct outfalls to the St. Sebastian River (SSR). Any vegetation that is not properly maintained in the canal system is easily introduced into this State protected freshwater system. For this reason, the "Florida Aquatic Plant Management Act," Section 369.22, Florida Statute (*Appendix K*) requires that all public and private water owners enact a "**maintenance program**" for aquatic vegetation. Therefore, the tolerance threshold for **noxious aquatic vegetation** growth, before action is taken is considered moderate for these assets.

Non-Chemical Methods

In order to control vegetation, the following cultural and mechanical methods will be conducted routinely as part of standard proactive maintenance procedures within the City's stormwater system:

- **Excavation.** When areas of the canal system are at their lowest storage, the City can access the canal bottoms with equipment to mechanically remove the vegetation and accumulated sediments.
- **Mechanical Removal by Contractor.** During periods where invasive vegetation has spread too extensively at a location to be brought back under control by routine methods, a contractor may be hired with the equipment to cut and remove the vegetation by boat.
- **Sediment and Erosion Control at Development Sites.** In compliance with City Ordinance No. 54-3-11.2. (*Appendix J*) and the City's MS4 **NPDES** Permit (*Appendix L*), proper erosion and sediment control at all sites of development is required to be established and maintained throughout the duration of the project and is inspected regularly for compliance. Sediments directly washing off a site, and into the canals created a mound of substrate for vegetation to establish and carry nutrients which many invasive species thrive on.

- **Planting Native Emergent Vegetation.** In areas of the canal where seawalls are not installed, maintaining a healthy, natural shoreline of native vegetation will help prevent the pest vegetation from re-establishing and enhance the habitat and aesthetic quality of the waterways.

Local resident fishes off the Concha Dam into the Concha Basin.

Bobcats and other wildlife use the canal and ditch rights-of-way to travel between conservation areas.

City staff works hard to remove sediments and vegetation from the City's vast system of ditches.

V. PONDS

Overview

There are 17 stormwater ponds throughout the City. These include all of the ponds located within City parks, as well as the interconnected ponds of the **Stormwater Treatment Area**, and the multiple ponds of the Day Drive **Retention Area**. Pond vegetation provides an ecological as well as an aesthetic benefit. If left to grow uncontrolled, however, the flood control and safety of these properties can be impaired.

Do Nothing Option

Overgrowth of aquatic vegetation in the ponds can very quickly reduce their stormwater storage capacity, especially in the smaller ponds. This accelerated **succession** can cause localized flooding problems in a very short time.

All of the stormwater ponds are connected to the entire stormwater conveyance system. Aquatic vegetation can block the water flow in and out of the pond. Many species of tall grasses growing around the pond edges can create dense thickets which readily hide dangerous wildlife and can prohibit police and park visitors from seeing beyond; this creates a serious safety concern. Four of the City's ponds also contain a fountain for **aeration** and algae control. Dense vegetation can damage the fountains by clogging the pump system or blocking the spray. The tolerance threshold for noxious vegetation growth, before action is taken is considered high for these assets.

Non-Chemical Methods

In order to control vegetation, the following cultural and mechanical methods will be conducted routinely as part of standard proactive maintenance procedures within the City's stormwater system:

- **Excavation.** When all or parts of the ponds are at their lowest storage, the City can access the pond bottoms and edges with equipment to mechanically remove the vegetation and accumulated sediments.
- **Mechanical Removal by Contractor.** During periods where invasive vegetation has spread too extensively at a location to be brought back under control by routine methods, a contractor may be hired with the equipment to cut and remove the vegetation by boat.
- **Fountain Aeration.** A fountain installed in the center of the pond provides water circulation and increases the dissolved oxygen of the water. This inhibits vegetation growth and increases the habitat quality for aquatic animals as well. Currently, there are only 4 ponds with fountains.
- **Planting Native Emergent Vegetation.** Maintaining a healthy, natural shoreline of native vegetation will help prevent the **noxious aquatic vegetation** from re-establishing and enhance the habitat and aesthetic quality of the pond.

VI. DITCHES, RIGHTS-OF-WAY, DRY RETENTION AREAS

Overview

The stormwater conveyance system is an expansive spider web connected by a massive 80 mile network of **ditches**. Within the ditches, vegetation assists with the infiltration of the water through the soil and stabilizes the steep banks. However, the growth of **noxious aquatic vegetation** must also be controlled enough to preserve the flow of the entire stormwater system.

Along-side many of the City's water retaining assets are the **rights-of-way** areas such as designated access roads, **drainage easements, buffer zones,** and **swales**. In these areas, groundcover is important to stabilize the soil from erosion; however, it is critical that the vegetation not become so overgrown that it blocks maintenance access to the ponds, canals and ditches.

Dry retention areas are located throughout the City and they are areas of lower elevation, which only hold water during periods of heavy rainfall. They are designed to overflow excess water into nearby water features through catch basins and pipes. Keeping dry retention areas vegetated is important to preventing compaction and increasing water infiltration. Too much vegetation can decrease the storage capacity and block the flow of stormwater towards other features.

Do Nothing Option

The overgrowth of aquatic vegetation around in the ditches and dry retention areas can eventually decrease their storage capacity, creating localized flooding problems. The ditch vegetation can cause very costly blockages in the road crossing culvert pipes. Many of the ditches bisect blocks of residential lots and an overgrowth of woody vegetation from the ditches threatens utility and residential structures. Overgrowth in rights-of-way areas prevents staff and contractors from performing proper maintenance of structures, canals, ponds, and ditches. The tolerance threshold for **noxious aquatic vegetation** growth, before action is taken is considered very high for these assets.

Non-Chemical Methods

In order to control vegetation, the following cultural and mechanical methods will be conducted routinely as part of standard proactive maintenance procedures within the City's stormwater system. These assets are virtually never treated with herbicides. The City maintains a separate mowing contract (*Appendix I*) to address the control of vegetation in these areas:

- **Excavation.** When the ditches are at their lowest storage, the City can access the **ditch** bottoms with equipment and mechanically remove the vegetation and accumulated sediments.
- **Sediment and Erosion Control at Development Sites.** In compliance with City Ordinance No. 54-3-11.2. (*Appendix J*) and the City's **NPDES Permit** (*Appendix L*), proper erosion

and sediment control at all sites of development is required to be established and maintained throughout the duration of the project and is inspected regularly for compliance. Sediments directly washing off a site, and into the ditches build a mound of **substrate** for vegetation to establish and carry nutrients which many invasive species thrive on. These sediments can travel with stormwater and enter the canals as well.

- **Mowing.** The City maintains a contract for mowing of all right-of-way areas and ditch banks. Mowing the ditch banks reduces the self-seeding of the pest vegetation while still allowing the vegetation to remain established as it plays an important role in stabilizing the banks and filtering nutrients and sediments.
- **Mow at correct height.** Mowing to low can thin out and starve the vegetation and mowing too high or not often enough can facilitate the further spread of the plants.
- **Always mow with sharp blades and Sanitize Tools.** Dull mower blades cause uneven cutting and weaken the grasses. Vegetation can easily spread among sites by hitchhiking seeds and plant fragments on un-sanitized mowing and maintenance equipment. Cleaning these tools between areas minimizes the transport of **noxious aquatic vegetation**.

Water flows between ponds, through the reconstructed rocky spillway at the Stormwater Treatment Area.

A massive mat of Torpedo Grass dominates this canal.

VII. FURTHER NON-CHEMICAL RECOMMENDATIONS

Future Considerations

In addition to the cultural and mechanical **noxious aquatic vegetation** control methods currently being implemented within the City's stormwater conveyance system, observations of the areas and sub-committee member research prompted the following recommendations for future consideration *(Figure 6):*

- **Seawall Reconstruction.** **Seawalls** border most of the City's canal system. The seawalls stabilize the canal banks and help hold back nutrient laden run-off from residential and commercial landscapes, forcing it to filter downward through the soil profile before entering surficial or ground waters. In many areas the seawalls are damaged and/or failing and in need of replacement.
- **Skimmer Device.** Large device that requires electricity and is easily movable between **ponds**. Water and material are pumped into an onshore filtration unit which is effective in removing duckweed, water meal, azolla, but not larger aquatic plants. Should these species become a frequent problem in the ponds, the purchase of this device is recommended.
- **Expanded Excavation of Open Water Areas.** **Excavation** of canal, pond, and ditch bottoms to de-muck the nutrient rich deposits that comprise the top layer of the **substrate** and remove seawall sediments, which readily accommodate noxious aquatic vegetation growth
- **Environmental Enhancements.** Creation of a self-maintaining **littoral shelf** with native aquatic vegetation, which will provide healthy habitat and nutrient filtration.
- **Pathogens.** The control of some noxious aquatic vegetation can be aided by aerobic **pathogens**, such as specific bacteria or fungus, which are amended to the **herbicides** or the water itself. While these bio herbicides are currently under research and review, many studies have shown that when partnered with added **aeration**, they may help provide more effective long-term control. It is also recommended that the **pathogens** be added fresh daily which will also require specialized equipment and dedicated staff. The best candidates for this method are small to medium sized ponds, during periods of very little in/outflow, which have existing aeration.
- **Stormwater Fee Credits.** Utilize the existing Stormwater Fee Credit Program to incentivize commercial property owners to install a **buffer zone** of **emergent vegetation** along their stormwater features. Also, enhanced outreach efforts could increase participation in the existing program.
- **Nutrient Management.** Excess nutrients in an aquatic system are known to be one of the largest contributors to noxious aquatic vegetation overgrowth. It is recommended that the City continue championing programs like the septic to sewer conversion grants and oyster reef restoration projects and outreach regarding the City's Fertilizer Ordinance (*Appendix C*). City staff should continue to seek participation in similar programs that help to further reduce nutrient outputs into waterbodies.

BIOLOGICAL, CULTURAL, AND MECHANICAL CONTROLS

	Control Method	Vegetation Type	Asset Classification	Description	How to Implement	Currently in Use?
BIOLOGICAL	**Pathogens**	Limited	All	Some plant pathogens, such as bacteria, enzymes, or fungi, can stress aquatic plants – commercially available pathogens(bioherbicides) are under research evaluation	Usually combined with herbicides to provide more effective long-term control. Requires areas of still water and is often paired with direct aeration	No
CULTURAL	**Always Mow with Sharp Blades**	Emergent	Ditches	Dull mower blades cause uneven cutting and weaken the grass blades. Vegetation along sloping shorelines is crucial to shoreline stabilization and the prevention of sediment and nutrient laden runoff entering the waters.	Ensure that staff sharpens all mower blades on a consistent schedule and when necessary. The City and the contractor has the tools and trained staff to accomplish this.	Yes
CULTURAL	**Minimizing Nutrient Inputs**	All	All	Reducing the amount of Nitrogen and Phosphorus entering the conveyance system to the maximum extent practicable.	Ferilizer Ordinance, NPDES Compliance, erosion control ordinance and inspections, BMAP participation, stormwater park ponds, resident outreach.	Yes
CULTURAL	**Native Shoreline Plantings**	Emergent	Ponds, Canals	Native shoreline plantings will attract natural predators, prevent the establishment of invasive aquatics, filter water entering the waterbody, and support a healthy aquatic ecosystem.	As the budget allows or in working with local non-profit groups begin to introduce more plantings of florida freshwater shoreline natives to our accessible shorelines.	Yes
CULTURAL	**Maintain Updated Chemical and Fertilizer Application Equipment**	All	All	Maintaining updated chemical and fertilizer application equipment is necessary to adhere to the label requirements for applications to ensure equipment is calibrated. Updated motorized equipment cleans more efficiently, calibrates and hold calibration more accurately and deteriorated parts can be easily replaced.	Staff will stay up-to-date on the equipment and ensure that equipment is replaced as necessary to ensure the correct calibrations are applied per the label. Staff will also maintain servicing all parts necessary as recommended from the manufacturer.	Yes
CULTURAL	**Direct Aeration**	Algae	All	Bottom-up hypnolimnetic aeration provides oxygen for microorganisms to more efficiently break down muck and nutrients, effectively reducing algal growth. Also can prevent fish kills in small ponds. Aeration is especially helpful in water bodies with limited circulation	Would specifically be reccommended at structural choke points where muck accumulates and used in correlation with the addition of pathogens.	No
CULTURAL	**Fountains**	Algae	Ponds	Fountains help move the water from the pond's surface to the bottom. Aeration by the fountain oxygenates the water, keeping hydrogen sulfide gas from collecting at the bottom and ultimately, significantly reducing the amount of this gas in the pond. Effectively reduces algae, duckweed and watermeal.	Many ponds already have fountains installed. Future addition of fountains in other ponds is advisable where site conditions are favorable.	Yes
CULTURAL	**Mow at Correct Height**	All	Ditches	Mowing shoreline vegetation at the correct height will ensure that we promote healthy grass and maintain shoreline stabilization	Ensure that staff and contractors are not mowing the shoreline grasses so short that it poses a risk to the plant and root health	Yes
CULTURAL	**Tool Sanitation**	All	All	Pests can easily spread among sites on unsanitized equipment. Many aquatic pests multiply easily from small pieces of vegetation. Cleaning mowers, tractors, and equipment between areas minimizes pest transport.	Stormwater Staff and contractors must wash down and clean all equipment as frequently as possible, especially when leaving areas with pest problems.	Yes
MECHANICAL	**Dredging/ Excavation**	All	Canals, Ponds, Ditches	Plants and sediments are removed-increases water depth,restores storage capacity, and removes nutrient rich sediments. Ideal for highly impacted areas.	Heavy equipment requires broad access path to areas. This is not for natural areas as the turbidity is greatly incresed and nutrients are released into water column	Yes
MECHANICAL	**Manual Weed Pulling**	Emergent	Structures	Where safe and applicable, manual weed eradication will involve staff manually pulling weeds.	Areas where it is safe and applicable can have manual weed eradication.	Yes
MECHANICAL	**Vacuum Removal**	All	Structures	A vacuum truck is utilized by City staff to remove all accumulated sediments and vegetative debris from all catch basins	Staff cleans out these structures regularly and keeps record of how much debris is removed.	Yes
MECHANICAL	**Mechanical Removal**	All, except duckweed, watermeal	Ponds, Canals, Some structures	Removal of vegetation by specially designed aquatic harvesters. Cut vegetation is removed and piled on shoreline for disposal. This process must be repeated throughout the growing season to maintain control. This process disturbs the sediments in the substrate and is non-selective, often removing fish and other fauna in the process. This method can be very costly.	Only about 50% of the City's canal system is accessible by this type of equipment and most of the shoreline is privately-owned with very limited access for piling and removing the cut vegetation. This method is reccommended when the location and cost are feasible,	Yes
MECHANICAL	**Skimmer Device**	Duckweed, Watermeal, Azolla	Ponds	Large device that requires electricity and is easily movable between ponds. which is effective in removing small floating vegetation.	Water and material are pumped into an onshore filtration unit. Vegetation is piled onto shoreline by conveyor, then must be manually removed off site.	No

Figure 6: *Table of Recommended Non-Chemical Control Methods*

VIII. AQUATIC HERBICIDE USE METHODOLOGY

Minimal chemical controls are to be utilized in collaboration with biological, mechanical, and cultural control methods, as listed on *Figure* 6. The non-chemical control methods are being implemented by City staff and contractors as part of routine maintenance of the stormwater conveyance system, but alone cannot always reduce **noxious aquatic vegetation** populations below tolerance thresholds; therefore, the City will support these efforts with an aquatic weed spraying program. The use of aquatic herbicides requires extensive species and product knowledge, highly specialized licensing, and years of work experience to master. For this reason, aquatic **herbicide** application will not be conducted by City staff, but rather by a reputable and certified aquatic plant management contractor. The pesticides used as part of this IPM program will only be those that have met federal and state approval standards for aquatic use, as research has found them to be the most effective and pose the least risk to environmental and human health. This integrated pest management strategy is aimed at reducing the total amount of herbicides needed over the long term.

Planning Pesticide Application

Inspection and Monitoring. Frequent surveillance and proper identification of noxious aquatic vegetation is integral to the early detection and rapid response that minimizes herbicide use. Before chemical control methods are utilized, the certified applicator will properly identify the plant, weather, and location. All inspection and application data will be recorded in the field by the certified applicator on the "Field Treatment Sheets" Form *(Appendix D)*.

Application Methods. Aquatic herbicides may be applied directly to the plants, directly to the water, or to the plant and the water simultaneously. The method of application utilized is greatly dependent on the individual species' characteristics and growth habit. Also considered is the location, the time of year, weather, water-oxygen levels, in addition to numerous other variables which may be indicated on the product's label. If the species is not in its growth season, it may not uptake and be affected by a systemic herbicide. Environmental conditions, such as high winds, low temperatures, or heavy rainfall may dictate that the use of certain herbicides is not permissible. These limitations are indicated on the label and of course, the LABEL IS THE LAW.

Discouraged Procedures. Large-scale broadcast applications increase the risks to non-target plant/ animal species and increase the chance of **herbicide resistance**. While invasive plants are the primary target for control, native plants should only be treated when their localized populations are approaching nuisance levels, impeding the functions of the stormwater system. Additionally, the full labeled application rate of an aquatic herbicide is often significantly higher than what may be the lowest effective rate for a target species. Careful attention must be paid to what is recommended for the target plant. These procedures should be avoided whenever possible, unless such applications may be reasonably expected to

result in an overall reduction in **herbicide** use when compared with all other practicable alternatives.

Buffer Zones. The "IPM Plan for City Parks and Properties" provides that as park landscapes are treated with pesticides or fertilizers near stormwater features, a **buffer zone** must be observed in order to protect the shoreline integrity and water quality. Therefore, no terrestrial application of pesticides or fertilizers may occur within a minimum of 10 feet from these features by City staff or by landscape contractors. These areas contain emergent wetland vegetation and are to only be treated for **noxious aquatic vegetation** by the licensed aquatic herbicide contractor. Native emergent vegetation should be protected to the maximum extent possible.

Concentrations & Application Rates. Proper herbicide application entails applying the minimum amount of product to provide effective control. For this reason, the herbicide manufacturers spend millions of dollars to determine the rate, and therefore the amount, that the herbicide should be applied at. These products rarely arrive from the manufacturer ready to use for commercial applications. It is up to the applicator to dilute or mix the product with water, and appropriate adjuvants, or other herbicides, according to the specific directions for aquatic use on the product label. If fact, what is visibly seen being applied in the field is approximately only 1-5% actual herbicide, the rest is water. The exact concentration of the active ingredient in the herbicide mixture is critical to its effectiveness. Too little product in the mixture may result in reduced efficacy, while too much may result in injury to the treated surface, illegal residues, impacts to the surrounding environment, or unnecessary expense. While the instructions for mixing the product involve simple calculations, it is important that all measurements be made accurately, carefully, and with the most precise measuring equipment available.

Directions for mixing and applying aquatic herbicides come in two general scenarios: rate per volume of water (herbicide concentration) or rate per area of land (lb. or qt. per acre). Mixing directions will vary. Herbicides that are mixed by concentration generally have specific directions for application. Some insecticide application directions may state to apply until spray runs off the target plant. Some herbicide application directions may state to apply only enough spray material to wet the leaves uniformly. Proper calibration of equipment and knowing how fast it is moving is crucial to controlling how much herbicide is being applied. The applicator must read the label to know how much product to apply and what method of application to use. THE LABEL IS THE LAW.

Safety Data Sheets. A binder of product labels and **safety data sheets (SDS)** for all approved herbicides will be provided to City staff and third party contractors whom apply, or may come in direct contact with the herbicides. In addition, this data will be available on the City's IPM website.

Aquatic Herbicide Selection

There are seventeen **herbicide** active ingredients (chemical compounds) approved by the state for use in Florida waters. These active ingredients may be formulated and sold under various trade names. There are more than 100 different registered trade names currently in use in Florida. A comprehensive list of approved herbicides for use within the City's **stormwater conveyance system** has been compiled by the IPM Sub-Committee. All trade names which have been previously, or are currently used by our spraying contractors are listed on this table, categorized by their active ingredient. The "Approved Herbicide and Adjuvant Table" includes pertinent chemical attributes such as: active ingredients and their percentages, EPA Registration #, targeted plant class, labeled signal word, and a cost rating per 1000 ft². *(Figure 7)*. Selection of herbicides for aquatic use should be based upon a combination of a low Environmental Impact Quotient (EIQ), low cost, and maximum efficacy.

Mode of Action. Each active ingredient varies in how they affect the plant's tissues, or disrupt biological processes, in order to damage the plant. The sequences of events initiated by the herbicide, which begin with absorption and end eventually with the plant's death, are considered the herbicide's **mode of action (MOA)**. Herbicides with the same MOA will have the same translocation pattern within the plant and cause similar injury symptoms. All individual EPA approved aquatic herbicides have a single active ingredient and therefore a single MOA. The repeated use of same MOA herbicides is frequently associated with the eventual creation of a plant hybrid which is less susceptible to herbicide management. This potential for hybridization is a great operational concern in managing aquatics.

Herbicide Resistance. Single MOA compounds have also proven to be more prone to resistance development, which is unique to Florida's aquatic systems. For this reason, aquatic herbicides have to be carefully used in order to prevent **herbicide resistance**. Resistance management strategies are an important component of a successful long-term integrated pest management program for aquatic plants. The Weed Science Society of America (WSSA) has classified the active ingredients for aquatic herbicides into groupings. The "WSSA group" number describes the possibility of a plant population developing resistance after repeated use. To prevent/mitigate herbicide resistance, it is advised to rotate or combine herbicide MOAs , which will help reduce the selective pressure applied by any one product. For example: Imazypyr and glyphosate-based herbicides are combined to effectively treat torpedo grass without harming the surrounding bulrush and native grasses.

Chemical Adjuvants. An important component to herbicide application is the use of a class of chemicals called **adjuvants**. Adjuvants do not directly affect the plant but they can greatly affect the physical characteristics of the applied product(s). Adjuvants can be added to the application solution in order to increase leaf coverage, assist with herbicide uptake, prevent chemical drift to non-target species, and control and sink submersed treatments. Knowledge of basic adjuvant chemistry and proper use of adjuvants helps increase the efficacy of the treatment, reduce effects on non-target species, and ultimately reduce the amount of

herbicide applied. Overall adjuvants are important to protecting water quality and ensuring the environmental and economic sustainability of the IPM program. All adjuvants used by the contractors will be included in the "Approved Herbicide and Adjuvant" Table as well.

Environmental Impact Quotient (EIQ). To best create a comparison among chemical methods, the **Environmental Impact Quotient (EIQ)** Method will be applied. Developed by Cornell University, the EIQ is a numerical model for general pesticide selection. The formula takes into account factors such as: toxicity to humans, leachability to groundwater, runoff potential, soil persistence, and the effects on non-target terrestrial and aquatic species. *(Appendix F)* The risk of each chemical is the product of its overall toxicity and the potential for exposure. Cornell has a published table of commonly used chemicals and their calculated scores. The EIQ was developed for terrestrial use and the numbers may not be as accurate for all products when used in an aquatic system, however, it remains the most feasible comparison tool available. (Kovatch, et.al, 1992)

Field Use EIQ. However, since the risk of a chemical's use increases with the amount that is applied, it is necessary to take into account the rate of application. In order to accomplish this, the EIQ is multiplied by the % of the active ingredient and the rate of application to create the Field Use EIQ Rating. The **field use EIQs** for all chemicals applied over a period of time can then be summed to create a field number that can then be compared to assess the reduction in environmental impacts among years or seasons. The Field Use EIQ can also be utilized to compare when multiple applications of a low EIQ pesticide, such as a bio pesticide, are required versus when single applications are required of a higher EIQ pesticide *(Appendix F)*. (Kovatch, et.al, 1992)

Bio-Herbicides. In the IPM Sub-Committee's quest to provide pest management options that are not only effective, but also have the least possible risk to human and environmental health, **bio-herbicide** options were reviewed extensively. Bio-herbicides, also called "natural" or "organic" herbicides, are non-synthetic and contain only naturally occurring substances. These products break down rapidly in sunlight or especially in water. This means that they do not persist long in the environment and therefore pose the least risk to non-target organisms.

There are potential risks associated with the application of natural products that the IPM Sub-Committee must consider when reviewing herbicide options for the "Approved Herbicide and Adjuvant Table." It is important to note that all herbicides, whether natural or synthetic, carry inherent risks and require safety precautions. The ability to break down fast can also mean that multiple applications are required to match the efficacy of the synthetic chemical option. Multiple applications can drastically increase the cost and the risks of the product. Because bio herbicides are made of natural substances, they often are exempt from the Environmental Protection Agency (EPA) review process. Therefore, there is little to no data on the long-term risks or efficacy in aquatic systems. Bio-herbicides have only proven minimally effective on the dense cell structure of aquatic plants.

Of those that are registered by the EPA, many are not registered for sale in Florida, due to the lack of data. A licensed applicator may not legally use an aquatic herbicide that is not state registered in this manner, per Florida Statutes: 482 and 487. Bio-herbicides that are registered may not be mass produced for commercial use and therefore may be priced too high for use over large areas, or simply not readily available. The lack of EPA review and state registration also means that they are produced by a variety of different sources, which often results in inconsistent potency and efficacy among producers and even within different batches from the same producer. For these reasons, there no bio-herbicides named on the "Approved Herbicide and Adjuvant Table."

Herbicide Restrictions. In the development of a thorough and reasonable IPM Plan for aquatic plants, it is not advisable to prohibit the use of any IPM Method or herbicide active ingredient which has been EPA and State approved. Unforeseeable conditions may arise in which the contractor is limited in what will be effective at reducing **noxious aquatic vegetation** populations. In addition, the IPM Sub-Committee recognizes that the applicator must constantly alter the herbicide solutions/combinations and rotate herbicides applied in order to reduce overall herbicide use, increase the efficacy of treatments, reduce effects on non-target species, and protect water quality. Therefore, no herbicide active ingredient on the "Approved Herbicide and Adjuvant Table" *(Figure 7)* will be exempted, limited, or restricted from use.

Prior to the use of any new herbicide which is not included on this table, a "Pesticide Exemption Form" (*Appendix G*) must be completed by the applicator and submitted to the Leisure Services Director, Stormwater Director, IPM Coordinator, and City Manager for signed approval. This form is to be submitted four days prior to proposed application date. The form requires justification for the use of the pesticide. However, should a new herbicide trade name, containing the same concentration, or less, of active ingredient(s) as already appears on the table be preferred by the spraying contractor, the exemption form must be completed and submitted to the IPM Coordinator, but approval will not be required.

Treatment Notification

The City shall provide the public with notification of planned aquatic herbicide applications, 24 hours prior, through the City's IPM website. Visitors to the City's IPM website may view specific information about upcoming treatments and opt to join an email list to receive regular notifications directly.

In addition, the Aquatic Herbicide Notification Sign *(Appendix E)* will be completed and posted at time of application, at all major public points of entry (including kayak launches), or areas with direct access to the treated area pursuant to state and/or federal law, the City's IPM Plan, and according to product label instructions. Signage will remain in place for 48 hours following the application, unless the manufacturer's product label specifies a longer posting period. Signs shall be of standardized design, printed in color, laminated, and contain the name of the herbicide product, target plant, date and time applied, required re-entry interval

and the phone number for the Citizen Request Line, where they may request more information.

Conditional Exemptions. The Stormwater Director, Leisure Services Director, and IPM Coordinator may grant authorization to apply an herbicide within the stormwater system without providing a 24 hour online notification. Authorization requires that there is a compelling need to use the herbicide, such as immediate threat to public health, safety, City property, or substantial economic detriment. Online notification will be posted as soon as possible. All documentation of this exemption must be retained and included in the annual report. On-site signage shall not be required in right-of-way locations that the general public is not authorized to use for recreation, or pedestrian purposes, such as those that are completely fenced in or separated by seawall, or otherwise inaccessible.

The sun sets on the Elkcam Waterway.

Water lilies, Torpedo Grass, and Water Hyacinth all flourish in a ditch bordering fertilized lawns.

Water flows freely at the Hardee Dam following a massive mechanical removal project.

Figure 7: *Approved Herbicide and Adjuvant Table* (SWIPM.APT.V1)

ACTIVE INGREDIENT	ACTION	TRADE NAME	EPA REG. #	WSSA RESISTANCE MGT. GROUP	ACTIVE INGREDIENT	LABELED SIGNAL WORD*	EIQ	Maximum Use Rate	FIELD USE EIQ	EIQ ECOLOGICAL COMPONENT**	TRAITS	TARGET CLASS	TARGET SPECIES	PRODUCT COST	COST RATING/ ACRE ***
Alkanolamide	adjuvant	Cohere	NA	NA	90.00%	warning	NA	NA	NA	NA	spreader, sticker	NA	NA	$138 per 2.5 gals	$
methelated seed oil	adjuvant	Alligare MSO 1 SunEnergy	NA	NA	100.00%	warning	30.9	NA	NA	NA	surfactant	NA	NA	$61.25 per 2.5 gals	$
polyacrylamide	adjuvant	Accuracy Polycontrol 2	NA	NA	30%	warning	NA	NA	NA	NA	deposition & drift retardant	NA	NA	$129.77 per 1 gal	$
D-limonene	adjuvant	Kammo Plus	NA	NA	100%	warning	NA	NA	NA	NA	surfactant	NA	NA	$92.51 per 1 gal	$
polyoxlkane ethers	adjuvant	Induce	NA	NA	90%	warning	NA	NA	NA	NA	wetter, spreader	NA	NA	$136.39 per 2.5 gals	$
Bispyribac	herbicide	Tradewind (powder)	59639-165	2	80%	caution	11.47	2oz/acre	1.1	2.3	systemic, selective	submersed, floating	Hydrilla	$1,175.95 per 2 lbs	$$$$
Carfentrazone	herbicide	Stingray Speedzone	279-3279-67690 2217-833	14	21.3% 28.6%	caution	20.2	13.5 oz/acre 5 pints/acre	3.6 28.9	8.5 68.0	contact, selective	emergent, floating	Primrose, Water Lettuce, Hyacinth	$205.95 per 1 qt	$$
Copper	herbicide, algaecide	copper sulfate (crystals)	56576-1	NA	99%	danger	61.9	1.75 lbs/acre	107.2	256.8	contact, non-selective	submersed	algae	$45.95 per 1 gal	$
Diquat	herbicide	Tribune Reward	100-1390 100-1091	22	37.30%	caution	39.2	.5 gal/acre	58.5	111.3	contact, non-selective	submersed, emergent floating	hyacinth, water lettuce, salvinia, mosquito fern	$221.95 per 1 gal	$
Endothall	hebicide	Aquathol	70506-176	Unknown	40.30%	danger	24	9.4 fl oz/ acre	38.7	82.1	contact/systemic, non-selective	submersed	hydrilla, filementous algae	$135.95 per 1 gal	$$
Florpyrauxifen	herbicide	ProcellaCOR SC Clipper	67690-79	4	26.50%	caution	NA	6.75 oz/acre-ft	NA	NA	systemic, non-selective	submersed, emergent, floating	hydrilla, hyacinth, primrose, watermilfoil	$595.95 per 5 lbs	$$$
Flumioxazin	herbicide	Clipper Schooner Semera (granule)	59639-120-91234	14	51%	caution	23.97	3 oz/acre	2.3	4.8	contact, non-selective	submersed, emergent, floating	algal mats, hydrilla, cabomba, water lettuce, duckweed, salvinia, spatterdock, water lilly	$300 per 5 gals	$$
Fluridone	herbicide	Avast	67690-30	12	41.70%	caution	8	2.1 lb/acre	7	12.3	systemic, non-selective	submersed	hydrilla, duckweed	$2,215.95 per 1 gal	$$$$
Glyphosate	herbicide	Roundup Custom AquaNeat	228-365	9	53.80%	caution	15.3	6 pints/acre	49.5	113	systemic, non-selective	emergent, floating	grasses, cattail, primrose, tussocks	$89.95 per 2.5 gals	$
Imazamox	herbicide	Clearcast	241-437-67690	2	12.10%	caution	19.5	1 gal/acre	18.9	41.2	systemic, selective	submersed, emergent, floating	cattail, wild taro, hyacinth	$355.95 per 1 gal	$$$
Imazapyr	herbicide	Polaris AQ Ecomazapyr 2	241-426-228	2	28.70%	caution	22.3	4 pints/acre	25.6	61.9	systemic, non-selective	emergent	tussocks, cattail, torpedo-grass, rush, melaleuca	$235.95 per 2.5 gals	$$
Penoxsulam	herbicide	Galleon SC	67690-47	2	21.70%	caution	18.72	5.6 fl oz/acre	1.4	2.6	systemic	emergent, floating, submersed	hydrilla, hyacinth	$695.95 per 1 qt.	$$
Peroxides	algaecide	GreenCleenPRO	70299-15	Unclassified	2760%	danger	16	.5 lb/ 1000 ft2	96.2	72.1	contact, non-selective	submersed, algae	planktonic algae, esp. blue-green	$139.95 per 50 lbs	$
Sethoxydim	herbicide	Segment	7969-88	1	13%	caution	20.89	40 oz/ acre	6.8	16.6	systemic, selective	emergent	grasses	$707.06 per 2.5 gals	$$$
Topramezone	herbicide	Oasis	7969-339-67690	27	29.70%	caution	27.17	16 fl oz/ acre	8.1	19	systemic	submersed	hydrilla, hyacinth	$811.95 per 1 qt	$$$
Triclopyr	herbicide	Garlon 3A Trycera	62719-37 5905-580	4	44.4% 29.4%	danger	11	8 qt/acre	78.1 51.7	142.1 94.1	systemic	submersed, emergent	brazilian pepper, broadleaf, hyacinch, water milfoil	$69.95 per 1 qt	$
2, 4-D	herbicide	Weedar 64 (liquid) Rugged (liquid)	71368-1 1381-247	4	46% 38.4%	danger	20.67 16.67	1gal/acre 4.12 gal/acre	56.4 53.0	128.8 121	systemic, selective	submersed, emergent, floating	milfoil, hyacinth	$23.95 per 1 gal	$

*** LABELED SIGNAL WORD**

CAUTION: The pesticide product is slightly toxic if eaten, absorbed through the skin, inhaled, or it causes skin irritation.
WARNING: Indicates the pesticide product is moderately toxic if eaten, absorbed through the skin, inhaled, or it causes moderate eye or skin irritation.
DANGER: The pesticide is highly toxic by at least one route of exposure. It may be corrosive, causing irreversible damage to the skin or eyes. Alternatively, it may be highly toxic if eaten, absorbed through the skin, or inhaled. If this is the case, then the word "POISON" must also be included in red letters on the front panel of the product label

**** EIQ ECOLOGICAL COMPONENT**

= Combined score for effects on (Fish)+(Bird) +(Bee)+ (Beneficial)

***** COST/ ACRE RATNG**

$ = LESS THAN $10.00
$$ = $11.00-30.00
$$$ =$31.00-59.00
$$$$ = OVER $60.00

IX. DATA MANAGEMENT

Accurate records are essential for the success of an IPM program. They provide staff with historical, site-specific knowledge of **noxious aquatic vegetation** growth and herbicide application. With this information, it can be predicted when certain plant problems are likely to occur. Effective record-keeping can also call attention to patterns of noxious vegetation outbreaks and associations among plant populations, as well as provide valuable data for assessment of the IPM Program.

Data Recording & Collection

Field Data. All Non-Chemical pest control activities conducted within the stormwater system will be recorded on the "Monthly IPM Log" *(Appendix H)*. Before chemical control methods are utilized, the licensed applicator will need to properly identify the plant. All information regarding the species of plant, along with the date, time, location, herbicide applied, application rate, and applicator will be recorded on the "Field Treatment Sheet" *(Appendix D)* each time that herbicides are applied. These sheets will be completed manually in the field by the certified applicator and submitted to the IPM Coordinator monthly so that the data may be digitally compiled and stored.

Quality Control. Staff will conduct random post-spraying visual assessments. In particular, specific problem areas will be followed-up on with contractor, as appropriate. Notes will be added to "field treatment sheets" *(Appendix D)*.

Purchase Orders. All purchase orders for chemicals or IPM related equipment and materials will be submitted annually to the IPM Coordinator.

Contractors. All contractors who manage **noxious aquatic vegetation** on City owned, leased, or managed property shall be required to adhere to the guidelines established in the City's Stormwater IPM Plan. Contractors must sign the "Contractor Agreement" *(Appendix B)* and maintain complete records of all chemical and non-chemical pest control activities. When applicable, a "Pesticide Exemption Form" must be submitted. "Aquatic Herbicide Notification Signage" must also be posted per the IPM plan requirements. A summary of these activities must be submitted to the IPM Coordinator monthly, or upon completion of the job. These records must include "field treatment sheets" for all herbicide applications.

Program Transparency

All records and information regarding the IPM Program will be made available to employees and the public through the City's IPM Program Website and upon request, in accordance with the Freedom of Information Act, Florida Statute: 119.

Annual Report & Evaluation

The IPM Coordinator will maintain all records relevant to the IPM Program, in order to prepare an annual report of the City's IPM activities. The annual report will be reviewed, each March, by the IPM Sub-Committee and City staff in an effort to assess the effectiveness of all pest control methods, feasibility of new methods and technologies, and to decide whether revision of the IPM Plan is required. The annual report will include the following elements:

- A summary of all field treatment sheet data
- All non-chemical plant control methods implemented
- Summarized data presented in tables and graphs to depict trends in usage and Field use EIQ
- A discussion of all restricted chemical wavier forms submitted
- Purchase orders for all herbicides
- Plant management challenges reported by staff and contractors
- Determine if the results have met expectations, or if the IPM plan requires modification
- Summary of all public outreach activities conducted
- Any proposed modifications to the "Approved Herbicide and Adjuvant Table"
- Suggestions for amendments to the IPM Plan and policy
- Summary of all staff training activities

The "watering hole," is a scenic spot along the St. Sebastian River, at the Stonecrop outfall area.

An overgrowth of Water Hyacinth blocks up the weir at the Stonecrop outfall.

X. FUTURE RECOMMENDATIONS

The IPM Sub-Committee acknowledges that this plan does not encompass every aspect of integrated pest management, nor could it address every possible scenario that may arise as this plan is incorporated into City policy. For this reason, the sub-committee members are in consensus that they shall reconvene six (6) months following adoption of this plan in order to closely review the data collected and address any inconsistencies, or amendments needed.

For future consideration the Sub-Committee Members make the following recommendations:

- Cornell University's **EIQ** is designed for crop and turf grass applications; there are no other similar numerical pesticide evaluation methods designed specifically for aquatic herbicide use. The committee agrees that the EIQ is still useful and will provide a good numerical comparison of chemicals used over time. During future annual reviews of this plan, committee members will research for updates to the EIQ, or the creation of other numerical comparison methods which are better suited.
- The collection of data for purposes of monitoring impact to native plants, animals, and pollinators from the conduct of all plant management activities is not being required. The field EIQ formula assumes that native plants, animals, and pollinators are all present and measures potential risks to them by using the score assigned to the active ingredient and incorporating the area covered and frequency of application. Should future review of data that are being collected indicate excessive or regular use of chemicals, a more quantitative approach may be needed.
- At the time that this IPM plan was drafted, there are no **bio-herbicides** that are state-approved for use on aquatic vegetation. It is therefore recommended that the IPM Coordinator check the state website regularly, so that as soon as one is available, it may be approved for inclusion into the "Approved Herbicides and Adjuvants Table."
- This plan addresses **noxious aquatic vegetation** as the only "pest" of the stormwater conveyance system, however, the committee realizes this may not always be the case and upon future annual reviews, the need for control of insects or pathogens may need to be addressed.

City staff works hard year-round to mechanically remove vegetation and sediments to keep the stormwater moving.

Appendix A: R-21-14

RESOLUTION NO.R-21-14

A RESOLUTION OF THE CITY OF SEBASTIAN, INDIAN RIVER COUNTY, FLORIDA, SUPPORTING THE "INTEGRATED PEST MANAGEMENT (IPM) PLAN FOR THE CITY'S STORMWATER CONVEYANCE SYSTEM" TO BE IMPLEMENTED INTO CITY POLICY; PROVIDING FOR SCRIVENER'S ERRORS; PROVIDING FOR EFFECTIVE DATE.

WHEREAS, City Council believes that a commitment to the environment is integral to a thriving and livable community; are in support of the "Sustainable Sebastian" Initiative (R-19-30), and are committed to keeping sustainability in mind while supporting the ecological, economic, and social needs of our community, and

WHEREAS, the Stormwater Integrated Pest Management (IPM) Sub-Committee was created in November, 2020 by request of the City Council, to assist City staff in the development of an IPM Plan for the City's stormwater conveyance system, and

WHEREAS, The "Florida Aquatic Plant Management Act," Section 369.22, Florida Statute recognizes that the uncontrolled growth of noxious aquatic vegetation in the waters of Florida poses a variety of environmental, health, safety, and economic problems and charges the owners of the waters with the implementation of a "maintenance control program" to decrease the growth and spread of noxious aquatic plants, and

WHEREAS, the control of noxious aquatic vegetation is required in order to maintain an effective stormwater conveyance system which provides for the movement, storage, and treatment of the City's stormwater.

WHEREAS, to adopt an *integrated pest management* policy is to promote the most sustainable noxious aquatic plant management methods, based on planning and prevention; which aim to minimize risks to human and environmental health by promoting biological, physical, mechanical, and cultural plant control methods, and through the limited use of chemicals, while also remaining economically feasible.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF SEBASTIAN, INDIAN RIVER COUNTY, FLORIDA, as follows:

SECTION 1. SUPPORT FOR THE *"IPM PLAN FOR THE CITY'S STORMWATER CONVEYANCE SYSTEM"*. The City Council hereby is in support of the "IPM Plan for the City's Stormwater Conveyance System", which shall be implemented into City policy and regularly reviewed, by the Leisure Services Director, Stormwater Director, IPM Coordinator, IPM Sub-Committee, and City Council to ensure that the four following goals are being achieved to the maximum extent practicable:

- Protect environmental resources by reducing the amount of pollutants entering surface and ground water, minimizing effects on native plants, animals and habitats
- Ensure effective, economic plant management within city-maintained waters and waterways, while minimizing health risks to the public, City staff, and the environment
- Promote the transparency of the City's aquatic plant management activities
- Increase public awareness of IPM methods and benefits

SECTION 2. CONFLICT. All resolutions or parts of resolutions in conflict herewith are hereby repealed.

SECTION 3. SCRIVENER'S ERRORS. Sections of this resolution may be renumbered or re-lettered and corrections of typographical errors which do not affect the intent may be authorized by the City Manager, or the City Manager's designee, without need of further action of the City Council by filing a corrected copy of same with the City Clerk.

SECTION 4. EFFECTIVE DATE. This resolution shall take effect immediately upon its adoption.

The foregoing Resolution was moved for adoption by Councilmember Hill. The motion was seconded by Councilmember Jones and, upon being put into a vote, the vote was as follows:

Mayor Ed Dodd	aye
Vice Mayor Jim Hill	aye
Councilmember Bob McPartlan	aye
Councilmember Christopher Nunn	aye
Councilmember Fred Jones	aye

The Mayor thereupon declared this Resolution duly passed and adopted this 8th day of September, 2021.

CITY OF SEBASTIAN, FLORIDA

By: _____
Ed Dodd, Mayor

ATTEST:

Jeanette Williams, MMC
City Clerk

Approved as to Form and Content for
Reliance by the City of Sebastian Only:

Manny Anon, Jr., City Attorney

Appendix B: Contractor Agreement

Administrative Services Department
Procurement Division
1225 Main Street
Sebastian, FL 32958
(772) 388-8232

STORMWATER IPM PLAN CONTRACTOR AGREEMENT

The Contractor, _____, hereby agrees to all of the
(Company Name)
following:

- Review and follow the City's IPM Plan for the stormwater conveyance system completely
- Inform and train employees of the IPM Plan's policies and procedures.
- Use only herbicides/ adjuvants listed in the "Approved Herbicide and Adjuvant Table", and apply in accordance with rates/methods on the associating label.
- Complete the "Field Treatment Sheets" completely with every pesticide application.
- Should there be a need to apply an approved pesticide with a higher percent active ingredient than listed on the table or a pesticide which is not named on the table, a "Pesticide Exemption Form" must be completed and submitted to the Stormwater Director at least four (4) days before proposed application date.
- Notify the Stormwater Director at least three (3) business days before pesticide application. Provide the location, date and anticipated chemicals being used.
- Post the completed "Aquatic Herbicide Notification Signage" at time of application, in accordance with the IPM Plan requirements.
- Report monthly to the IPM Coordinator with all treatment sheets and detailed invoices

I am a legal agent of the above named company and am fully authorized to sign and bind the above listed Company to this IPM Plan Contractor.

Print Name: _____ Title: _____

Signature: _____ Date: _____

Appendix C: City Fertilizer Ordinance

City of Sebastian

Code of Ordinances

CH.50 Sec. 50-5. - Florida-friendly fertilizer use on urban landscapes.

(a) *Findings.* As a result of impairment to the City of Sebastian's surface waters caused by excessive nutrients, or, as a result of increasing levels of nitrogen in the surface and/or ground water within the aquifers or springs within the boundaries of the City of Sebastian, the city council has determined that the use of fertilizers on lands within the City of Sebastian creates a contributing risk that adversely effects surface and/or ground water.

(b) *Purpose and intent.* This section regulates the proper use of fertilizers by any applicator; requires proper training of commercial and institutional fertilizer applicators; establishes training and licensing requirements; establishes a prohibition application period; specifies allowable fertilizer application rates and methods, fertilizer-free zones, low maintenance zones, and exemptions. The ordinance requires the use of Best Management Practices which provide specific management guidelines to minimize negative secondary and cumulative environmental effects associated with the misuse of fertilizers. These secondary and cumulative effects have been observed in and on the City of Sebastian's natural and constructed stormwater conveyances, rivers, creeks, canals, springs, lakes, estuaries and other water bodies. Collectively, these water bodies are an asset critical to the environmental, recreational, cultural and economic well-being of the City of Sebastian's residents and the health of the public. Overgrowth of algae and vegetation hinder the effectiveness of flood attenuation provided by natural and constructed stormwater conveyances. Regulation of nutrients, including both phosphorus and nitrogen contained in fertilizer, will help improve and maintain water and habitat quality.

(c) *Definitions.* For this chapter, the following terms shall have the meanings set forth in this section unless the context clearly indicates otherwise.

"*Administrator*" means the city manager, or any other city official designated by the city manager.

"*Application*" or "*apply*" means the actual physical deposit of fertilizer to turf or landscape plants.

"*Applicator*" means any person who applies fertilizer on turf and/or landscape plants in the City of Sebastian.

"*Board*" or "*governing board*" means City Council of the City of Sebastian.

"*Best Management Practices*" means turf and landscape practices or combinations of practices based on research, field-testing, and expert review, determined to be the most effective and practicable on-location means, including economic and technological considerations, for improving water quality, conserving water supplies and protecting natural resources.

"*Commercial fertilizer applicator*" , except as provided in F.S. § 482.1562(9), means any person who applies fertilizer for payment or other consideration to property not owned by the person or firm applying the fertilizer or the employer of the applicator.

"*Fertilize*", "*fertilizing*", or "*fertilization*" means the act of applying fertilizer to turf, specialized turf, or landscape plants.

"*Guaranteed analysis*" means the percentage of plant nutrients or measures of neutralizing capability claimed to be present in a fertilizer.

"*Institutional applicator*" means any person, other than a private, non-commercial or a commercial applicator (unless such definitions also apply under the circumstances), that applies fertilizer for the purpose of maintaining turf and/or landscape plants. Institutional applicators shall include, but shall not

be limited to, owners, managers or employees of public lands, schools, parks, religious institutions, utilities, industrial or business sites and any residential properties maintained in condominium and/or common ownership.

"*Landscape plant*" means any native or exotic tree, shrub or groundcover (excluding turf).

"*Low maintenance zone*" means an area a minimum of ten feet wide adjacent to water courses which is planted and managed in order to minimize the need for fertilization, watering, mowing, etc.

"*Person*" means any natural person, business, corporation, limited liability company, partnership, limited partnership, association, club, organization, an/or any group of people acting as an organized entity.

"*Prohibited application period*" means June 1 through September 30 or the time period during which a flood watch or warning, or a tropical storm water or warning, or a hurricane watch or warning is in effect for any portion of the City of Sebastian, issued by the National Weather Service, or if heavy rainfall is likely.

"*Sebastian Approved Management Practices Training Program*" means a training program approved per F.S. § 403.9338, or any more stringent requirements set forth in this Chapter that includes the most current version of the Florida Department of Environmental Protection's "Florida-Friendly Best Management Practices for Protection of water Resources by the Green Industries, 2008" as revised and approved by the administrator.

"*Saturated soil*" means a soil in which the voids are filled with water. Saturation does not require flow. For the purpose of this section, soils shall be considered saturated if standing water is present or the pressure of a person standing on the soil causes the release of free water.

"*Slow release*" , "*controlled release*" , "*timed release*" , "*slowly available*" or "*water insoluble nitrogen*" means nitrogen in a form which delays its availability for plant uptake and use after application, or which extends its availability to the plant longer than a reference rapid or quick release product.

"*Turf*" , "*sod*" , or "*lawn*" means a piece of grass-covered soil held together by the roots of the grass.

"*Urban landscape*" means pervious areas on residential, commercial, industrial, institutional, highway right-of-way, or other nonagricultural lands that are planted with turf or horticultural plants. For the purposes of this section, agriculture has the same meaning as in F.S. § 570.02.

(d) *Applicability*. This section shall be applicable to and shall regulate all applicators of fertilizer and areas of application of fertilizer within the City of Sebastian unless such applicator is specifically exempted by the terms of this section from the regulatory provision of this section. This section shall be prospective only, and shall not impair any existing contracts.

(e) *Timing of fertilizer application*. No applicator shall apply fertilizers containing nitrogen and/or phosphorus to turf and/or landscape plants during the prohibited application period, or to saturated soils.

(f) *Fertilizer free zones.* Fertilizer shall not be applied within ten feet of any pond, stream, watercourse, lake, canal, or wetland as defined by the Florida Department of Environmental Protection (Chapter 62-340, Florida Administrative Code) or from the top of a seawall. If more stringent City of Sebastian Code regulations apply, this provision does not relieve the requirement to adhere to the more stringent regulations. Newly planted turf and/or landscape plants may be fertilized in this zone only for a 60-day period beginning 30 days after planting if need to allow the plants to become well established. Caution shall be used to prevent direct deposition of nutrients into the water.

(g) *Low maintenance zones.* A voluntary ten-foot low maintenance zone is strongly recommended, but not mandated, from any pond, stream, water course, lake, wetland or from the top of a seawall. A swale/berm system is recommended for installation at the landward edge of this low maintenance zone to capture and filter runoff. If more stringent City of Sebastian Code regulations

apply, this provision does not relieve the requirement to adhere to the more stringent regulations. No mowed or cut vegetative material may be deposited or left remaining in this zone or deposited in the water. Care should be taken to prevent the over-spray of aquatic weed products in this zone.

(h) *Fertilizer content and application rates.*

(1) No fertilizer containing phosphorous shall be applied to turf or landscape plants in the City of Sebastian unless a soil or plant tissue deficiency is verified by a University of Florida, Institute of Food and Agriculture Sciences, approved testing methodology. In the case that a deficiency has been verified, the application of a fertilizer containing phosphorous shall be in accordance with the rates and directions for the Central Region of Florida as provided by Rule 5E-1.003(2), Florida Administrative Code. Deficiency verification shall be no more than two years old. However, recent application of compost, manure, or top soil shall warrant more recent testing to verify current deficiencies.

(2) The nitrogen content of fertilizer applied to turf or landscape plants within the City of Sebastian shall contain at least 50 percent slow release nitrogen per guaranteed analysis label.

(3) Fertilizers applied to an urban lawn or turf within the City of Sebastian shall be applied in accordance with requirements and directions set forth on the label or tag for packaged fertilizer products, or in the printed information accompanying the delivery of bulk fertilizer products, as provided by Rule 5E-1.003(2), Florida Administrative Code, Labeling Requirements For Urban Turf Fertilizers. All packaged and bulk fertilizer products sold in the City of Sebastian shall be sold in packages with labels or tags, or, if sold in bulk, be accompanied by printed information, which complies with the requirements of Rule 5E-1.003(2), Florida Administrative Code.

(4) Fertilizer containing nitrogen or phosphorus shall not be applied before seeding or sodding a site, and shall not be applied for the first 30 days after seeding or sodding, except when hydro-seeding for temporary or permanent erosion control in an emergency situation (wildfire, etc.), or in accordance with the Stormwater Pollution Prevention Plan for that site.

(i) *Application practices.*

(1) Spreader deflector shields are required when fertilizing via rotary (broadcast) spreaders. Deflectors must be positioned such that fertilizer granules are deflected away from all impervious surfaces, fertilizer-free zones and water bodies, include wetlands.

(2) Fertilizer shall not be applied, spilled or otherwise deposited on any impervious surfaces.

(3) Any fertilizer applied, spilled, or deposited, either intentionally or accidentally, on any impervious surface shall be immediately and completely removed to the greatest extent practicable.

(4) Fertilizer released on an impervious surface must be immediately contained and either legally applied to turf or any other legal site, or returned to the original or other appropriate container.

(5) In no case shall fertilizer be washed, swept, or blown off impervious surfaces into stormwater drains, ditches, conveyances, or water bodies.

(j) *Management of grass clipping and vegetative matter.* In no case shall grass clippings, vegetative material, and/or vegetative debris be washed, swept, or blown off into stormwater drains, ditches, conveyances, water bodies, wetlands, or sidewalks or roadways. Any material that is accidentally so deposited shall be immediately removed to the maximum extent practicable.

(k) *Exemptions.* The provisions set forth in the chapter shall not apply to:

(1) Bona fide farm operations as defined in the Florida Right to Farm Act, F.S. § 823.14;

(2) Other properties not subject to or covered under the Florida Right to Farm Act that have pastures used for grazing livestock;

(3) Any lands used for bona fide scientific research, including, but not limited to, research on the effects of fertilizer use on urban stormwater, water quality, agronomics, or horticulture.

(4) Golf courses when landscaping is performed within the provisions of the Florida Department of Environmental Protection document, "Best Management Practices for the Enhancement of Environmental Quality on Florida Golf Courses", these provisions shall be followed when applying fertilizer to golf course practice and play areas;

(5) Athletic fields at public parks and school facilities that apply the concepts and principles embodied in the Florida Green BMPs, while maintaining the health and function of their specialized turf areas;

(6) Vegetable gardens owned by individual property owners or a community, and trees grown for their edible fruit.

(l) *Training.*

(1) All commercial and institutional applicators or fertilizer within the City of Sebastian, shall abide by and successfully complete the six-hour training program in the "Florida-Friendly Best Management Practices for Protection of Water Resources by the Green Industries" offered by the Florida Department of Environmental Protection through the University of Florida Extension "Florida-Friendly Landscapes" program, or an approved equivalent.

(2) Private, non-commercial applicators are encouraged to follow the recommendations of the University of Florida IFAS Florida Yards and Neighborhoods program when applying fertilizers.

(m) *Licensing of commercial applicators.*

(1) Prior to January 1, 2014, all commercial applicators of fertilizer with the City of Sebastian, shall abide by and successfully complete training and continuing education requirements in the "Florida-Friendly Best Management Practices for Protection of Water Resources by the Green Industries", offered by the Florida Department of Environmental Protection through the University of Florida IFAS "Florida-Friendly Landscapes" program, or an approved equivalent program, prior to obtaining a City of Sebastian Local Business Tax Receipt for any category of occupation which may apply any fertilizer to turf and/or landscape plants.

(2) After December 31, 2013, all commercial applicators of fertilizer within the City of Sebastian, shall have and carry in their possession at all times when applying fertilizer, evidence of certification by the Florida Department of Agriculture and Consumer Services as a Commercial Fertilizer Applicator per 5E-14.117(18) F.A.C.

(3) All businesses applying fertilizer to turf and/or landscape plants (including but not limited to residential lawns, golf courses, commercial properties, and multi-family and condominium properties) must ensure that at least one employee has a "Florida-Friendly Best Management Practices for Protection of Water Resources by the Green Industries" training certificate prior to the business owner obtaining a local business tax receipt. Owners for any category of occupation which may apply and fertilizer to turf and/or landscape plants shall provide proof of completion of the program to the City of Sebastian.

(n) *Enforcement.* The provisions of this section may be enforced pursuant to any method provided for by the Code or Ordinances or general law.

(Ord. No. O-12-06, § 1, 5-9-12; Ord. No. O-14-02, § 1, 3-26-14)

Appendix D: Field Treatment Sheets

AQUATIC VEGETATION CONTROL, INC.

DAILY PROGRESS REPORT FOR ENVIRONMENTAL MANAGEMENT

Field Treatment Sheets

DATE:

CUSTOMER	PROJECT NAME/JOB
City of Sebastian	Sebastian Canals

T&M Billable: Y

JD Gillenwalters

POSITION	START TIME	END TIME	EFFECTIVE HRS	LUNCH HRS	TRAVEL HRS	SURVEY HRS	PLAN/PREP HRS	TOTAL HRS
Applicator								
Crew Supervisor								
Crew Member								
Site Manager								
Project Manager								

RESOURCES		
SOURCE	NAME	HOURS
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		

EQUIPMENT		
EQUIP NO.	DESCRIPTION	HOURS

WEATHER INFORMATION		
WIND MEASURMENTS		
TIME	VEL	DIR

I acknowledge that data presented is accurate.

Signature:

I acknowledge that data presented has been verified.

Manager:

Comments

Status

- ☐ On-going
- ☐ Completed
- ☐ Data Entered

Billing Type

T&M

AVC.CANAL.V1

AQUATIC VEGETATION CONTROL, INC.

DAILY PROGRESS REPORT FOR ENVIRONMENTAL MANAGEMENT

Field Treatment Sheets

DATE:

CUSTOMER	PROJECT NAME/JOB	T&M Billable
City of Sebastian	Sebastian Ponds	Y

JD Gillenwalters

POSITION	START TIME	END TIME	EFFECTIVE HRS	LUNCH HRS	TRAVEL HRS	SURVEY HRS	PLAN/PREP HRS	TOTAL HRS
Applicator								
Crew Supervisor								
Crew Member								
Site Manager								
Project Manager								

RESOURCES		
SOURCE	NAME	HOURS
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		

EQUIPMENT		
EQUIP NO.	DESCRIPTION	HOURS

WEATHER INFORMATION		
WIND MEASURMENTS		
TIME	VEL	DIR

I acknowledge that data presented is accurate.

Signature:

I acknowledge that data presented has been verified.

Manager:

Comments

Status

☐ On-going

☐ Completed

☐ Data Entered

Billing Type

T&M

AVC.POND.V1

Appendix E: Aquatic Herbicide Notification Sign

RESTORATION IN PROGRESS

CAUTION

As a part of Sebastian's work to restore and maintain a healthy and functional stormwater conveyance system, noxious aquatic vegetation is being treated with approved herbicides by state-licensed applicators, in compliance with the City's Integrated Pest Management Policy.

Thank you for your cooperation.

TARGET PLANT(S): _____

AREA TREATED: _____

HERBICIDE(S): _____

RE-ENTRY PERIOD: _____

APPLICATION DATE: _____

APPLICATION TIME: _____

For more information, contact the City's Citizen Request Line:

(772) 581-0111

SUSTAINABLE SEBASTIAN

To learn more about Sebastian's IPM Program and other Sustainable Sebastian initiatives please visit the Natural Resources Board Website:

SWIPM.PNS.V1

Appendix F: Environmental Impact Quotient Formula

Environmental Impact Quotient (EIQ) Formula:

EIQ={C[(DT*5)+(DT*P)]+

[(C*((S+P)/2)*SY)+(L)]+

[(F*R)+(D*((S+P)/2)*3)+(Z*P*3)+(B*P*5)]}/3

- **DT = dermal toxicity** ability of a substance to cause local reaction and/or systemic poisoning in people or animals by contact with the skin
- **C = chronic toxicity** Harmful effects caused in repeated exposure situations
- **SY = systemicity** ability of the product to be translocated to other tissues which have not received the product directly
- **F = fish toxicity** risk to fish, the most sensitive aquatic vertebrate to toxicity
- **L = leaching potential** risk of moving through the soil profile, leaching, and getting into groundwater
- **R = surface loss potential** susceptible to loss through runoff and erosion during high-intensity rainfall events
- **D = bird toxicity** risk to birds, which are the vertebrates most sensitive to toxicity
- **S = soil half-life persistence**, or the "lasting-power" of a pesticide within the soil
- **Z = bee toxicity** risk to the essential pollinators
- **B = beneficial arthropod toxicity** risk to non-target organisms which are an important group of microorganisms that work to maintain ecosystem health
- **P = plant surface half-life.** Persistence, or the "lasting- power" of a pesticide on the surface of the leaves, stems, and fruit

Once an EIQ value has been established for the active ingredient of each pesticide, field use calculations can begin. To accurately compare pesticides and pest management strategies, the dose, the formulation or percent active ingredient of the product and the frequency of application of each pesticide needs to be determined. To account for different formulations of the same active ingredient and different use patterns, a simple equation called the EIQ Field Use Rating was developed. This rating is calculated by multiplying the EIQ value for the specific chemical obtained in the tables by the percent active ingredient in the formulation by the rate per acre used (usually in pints or pounds of formulated product).

EIQ FIELD USE RATING = EIQ x % ACTIVE INGREDIENT x RATE

Source: Kovach, J., Petzoldt, C., Degni, J., and Tette, J. 1992. A method to measure the environmental impact of pesticides. New York's Food and Life Sciences Bulletin 139:1–8

Appendix G: Aquatic Pesticide Exemption Form

AQUATIC PESTICIDE EXEMPTION FORM

This form is to be submitted for approval in order to request exemption for use of a product that is:
1) Not classified on the "Approved Pesticide Table" OR
2) Contains a higher concentration active ingredient than listed on the table
Form to be submitted to the Stormwater Director for approval at least 4 days before application

Name: _____ Date: _____
Department/Contractor: _____

PESTICIDE

Date(s) of Proposed Use: _____
Product Name: _____
Active Ingredient(s): _____
Concentration: _____
Application Rate: _____
EPA Registration #: _____
Target Pest(s): _____

LOCATION

Site Name: _____
General Area Description: _____

JUSTIFICATION

Reason for Use: _____

Explanation of any Previous Control Methods: _____

Strategy to Prevent Future Exemptions: _____

APPROVAL

Stormwater Dir. Approval: _____ Date: _____
IPM Coordinator Approval: _____ Date: _____
City Manager Approval: _____ Date: _____

Appendix H: Monthly IPM Log

MONTHLY IPM LOG

FOR STORMWATER SYSTEM

MONTH:_____

DATE	LOCATION	CLEAR CULVERT PIPE	VACUUM CATCH BASIN	VACUUM BAFFLE BOX	POND MECHANICAL	CANAL MECHANICAL	MANUAL REMOVAL	.	.	.	.				COMMENTS

SWIPM.MIL.V1

CITY OF SEBASTIAN

STORMWATER DEPARTMENT

Appendix I: City Mowing Contract Details

EXHIBIT A
TECHNICAL SPECIFICATIONS

A. Scope of Work

Furnish all supervision, labor, materials, supplies, equipment and tools necessary to perform mowing maintenance services at various locations throughout the City of Sebastian, on an as needed basis and as designated by the City of Sebastian. Services include but are not limited to power blade edging, trash pickup, fertilization of turf, fertilization of trees and plants, shrubbery trimming, tree trimming and dead limb removal; quarter round cleaning.

Contractor shall furnish all vehicles, trucks and equipment with company name and phone number on the sides of the vehicles or units or visible to the public.

Contractor shall make sure all area of work clean-up and debris is cleared after completing the mowing or cleaning.

B. Work Areas

Mowing shall be done in the City Right of Way areas for the unimproved lots on all collector and City unit roads as well as in Collier Creek respectively. The sites have been divided in two categories according to the frequency of service and site type. There are nine (9) **Collector Road Right of Way** areas, which shall be mowed approximately **twenty-four (24) times per year**. The Collector Roads are as follows:

1. Barber Street
2. Schumann Drive
3. Wimbrow Drive
4. Fleming Street
5. Main Street
6. Laconia Street
7. Easy Street
8. Englar Drive
9. Powerline Road

All **other Right of Way areas** along City Unit Roads excluding the Collector Roads shall be done approximately 9 times per year. Lots in alleyways are included in this group.
Also, mowing shall be done **four (4) times per year** of all the ditches listed on *Exhibit B - Ditches Mowing Map*.

The Contractor is responsible for the cutting of rear ditches within easement boundaries in such a manner that a clear line of sight is seen within the easement, both side to side and top to bottom.

The Contractor shall mow the grass/turf to a height, which shall not exceed four (4) inches. The Contractor shall perform in conjunction with the mowing activity all the necessary edging and trimming of grass around all fixed obstacles and structures located along and within designated areas including but not limited to catch basins, posts, poles, trees, etc. Contractor shall leave area in a neat and uniform condition after mowing.

Other mowing services will be done as determined in the comments section listed on *Form C - Bid Price Form* and upon request by the City on an as needed basis.

The City of Sebastian reserves the right to add work sites over and above the ones shown on *Exhibit B – Ditches Mowing Map* supplied as a part of this Bid and/or deletes any of the designated work locations shown on the previously cited map.

C. Work Requirements

The Contractor is responsible for mowing the full extent of the designated length and width of each Right of Way area. Any Right of Way areas, which cannot be mowed the entire width due to the existing field conditions, shall be mowed from the roadway to two (2) feet behind the swale water flow line as a minimum or as otherwise directed by the City of Sebastian.

Prior to starting any mowing activity, the Contractor shall remove and dispose of any litter and debris such as palm fronds, tree-shrub limbs and cuttings, glass, paper, cans, tires, hub caps, boxes, wood, cable and any other materials encountered in the designated mowing areas using all means necessary.

The Contractor shall mow the grass/turf to a height, which shall not exceed four (4) inches. The Contractor shall perform in conjunction with the mowing activity all the necessary edging and trimming of grass around all fixed obstacles and structures located along and within designated areas including but not limited to sidewalks, curbs, gutters, posts, poles, trees, shrubs, fire hydrants, end walls, flower beds, buildings, etc. Contractor shall leave area in a neat and uniform condition after mowing. **Note: grassy areas between the road and the sidewalk are to be mowed by the Contractor whether the area is improved or unimproved as some homeowners tend not to mow this area.**

Curb and sidewalk edging shall be accomplished by mechanical methods only. No herbicide applications shall be done for edging purposes. The Contractor shall edge the back of curbs and gutters. Gutters shall be left in a neat condition and free of grass, weeds and related clippings, such that drainage is not impaired.

Work shall be performed in drainage swales. The Contractor shall maintain the existing slopes during the performance of the work. In areas with standing water and/or too wet to support mechanical mowing equipment, work shall be performed utilizing hand-trimming methods. These areas shall be left in a neat and uniform condition, and all cut debris shall be removed from the drainage swales immediately to prevent possible drainage obstructions.

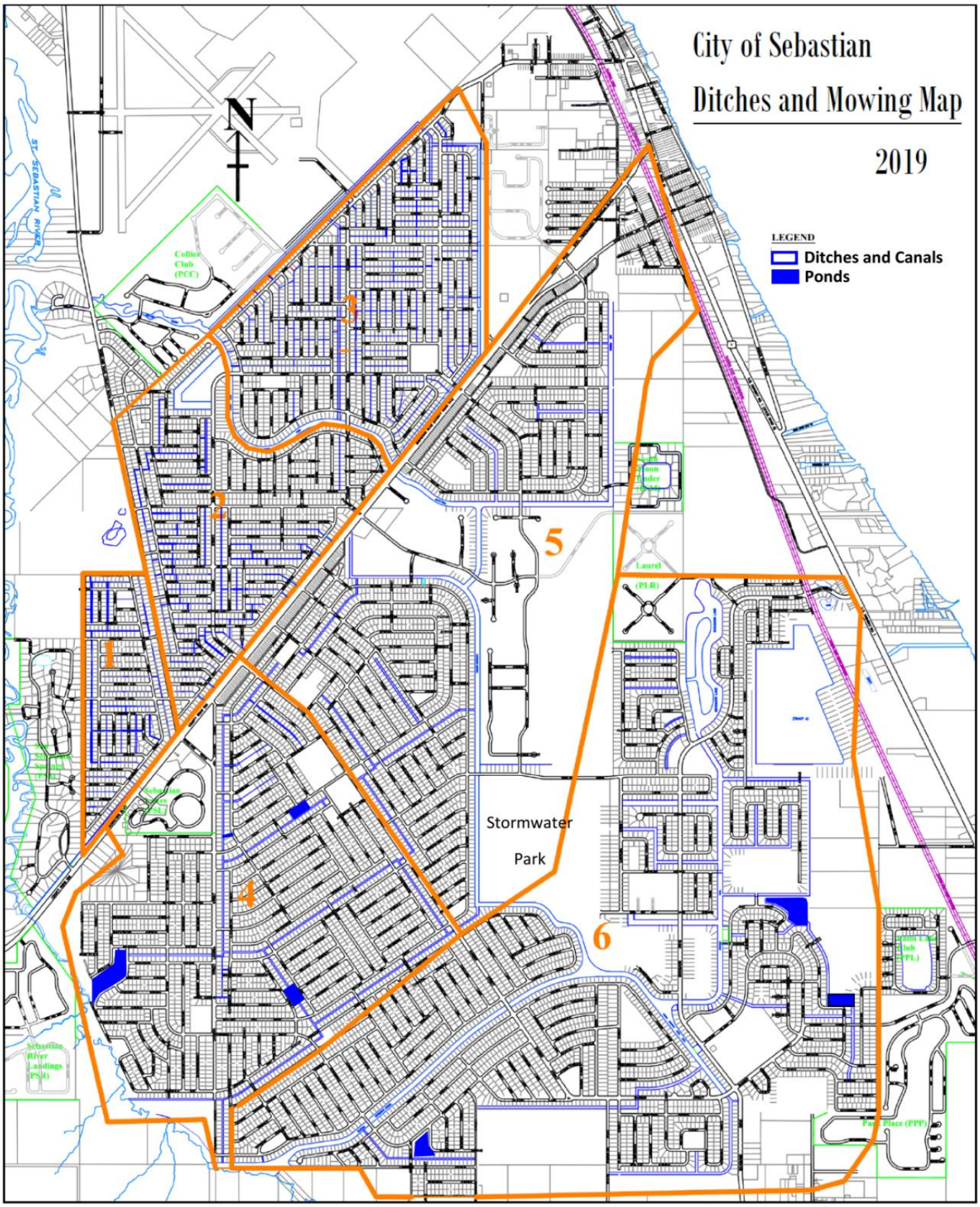
The Contractor shall be responsible for the immediate clean-up of litter and cut debris thrown or dragged by his equipment onto adjacent property and roadways.

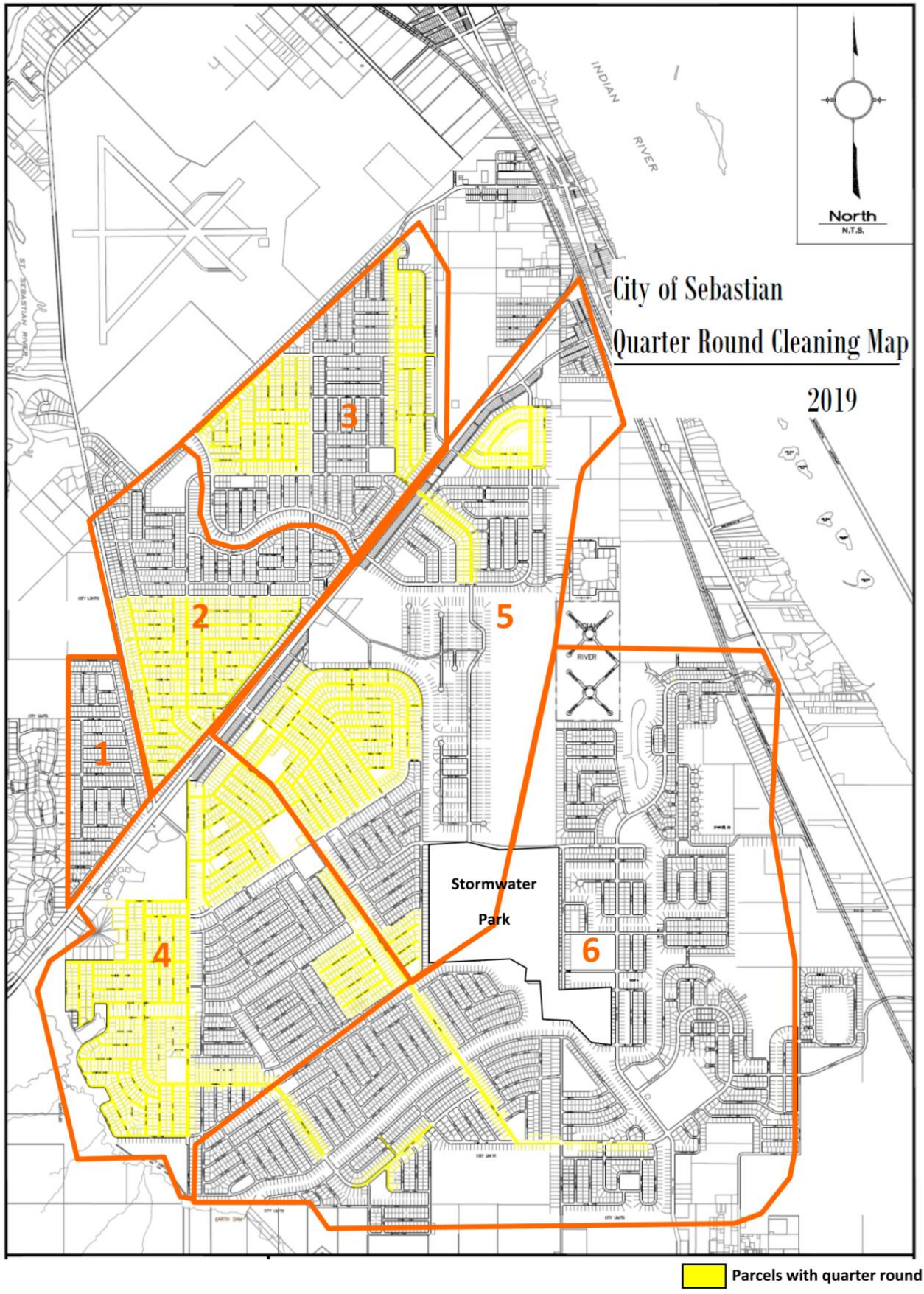
The Contractor shall be responsible for the proper disposal of all litter and debris removed by them from the designated mowing areas.

Stockpiling of debris on or along the designated work areas shall not be permitted. If the City deems that stockpiling is necessary it shall be done at specific locations approved by the City. Mowing operations shall be performed in such manner that it will not create excessive airborne dust and other particulates as determine by the City of Sebastian.

The Contractor shall exercise the necessary care during all work activities and avoid damages to any private and/or public structures and vegetation including but not limited to utilities, signs, poles, fences, concrete structures, culvert pipes, sprinkler heads, storm water swale line/slopes, trees, shrubs, planting beds, mulching rings, etc. Damages caused by the Contractor shall be reported immediately to the City. The Contractor shall be responsible for the repairs of damages caused by them to any private or public property.

The City and the Contractor will agree on the best way to accomplish repairs. The work to repair the damages may be performed by the Contractor or by others. Work shall be performed as soon as reasonably possible. Damages caused by the Contractor, subcontractor or supplier shall be reported by the Contractor immediately to the City of Sebastian. Vandalism or storm damage shall be reported to the City as soon as possible.


City of Sebastian
Ditches and Mowing Map
2019
LEGEND
Ditches and Canals
Ponds
N
ST. SEBASTIAN RIVER
Collier Club (PCC)
Laurel (PLR)
Stormwater Park
1
2
3
4
5
6


INDIAN RIVER
North
N.T.S.
City of Sebastian
Quarter Round Cleaning Map
2019
1
2
3
4
5
6
Stormwater
Park
Parcels with quarter round


City of Sebastian
Stormwater Park Mowing Map
2019
HOLDEN AV HOLDEN CT
ENGLAR DR
ENGLAR DR
GEORGE ST
CAPRI AV
CAPRONA ST
ORMAND CT
EMPRESS A
S EASY ST
GEORGE ST
CARAVAN TER
SURFSIDE LN
TEABERRY LN
THORNHILL LN
ABBOTT LN
BARBER ST
CHALOUPE TER
COPLY TER
CONCHA DR
CHERRY CT
Do not mow

Appendix J: City Sediment Control Ordinance

City of Sebastian

Code of Ordinances

Article XI, Sec. 54-3-11.2. - Soil Erosion and Sedimentation Control.

(a) Required soil erosion and sedimentation control plan. In order to prevent both soil erosion and sedimentation, a soil erosion and sedimentation control plan shall be required as a part of an application for a subdivision construction permit, site plan review, plot plan review of a single-family residential lot and whenever a development will involve any clearing, removal of native or protected vegetation, grading, transporting, or other form of disturbing land by the movement of earth.

(b) Erosion control measures. All measures necessary to minimize soil erosion and to control sedimentation in the disturbed land area shall be implemented. The following protection shall be provided for all disturbed areas: minimize velocities of water runoff and wind erosion, maximize protection of disturbed areas from stormwater runoff, and prevent or retain sedimentation within the development site as early as possible following disturbances. A list of major problem areas for erosion and sedimentation control follows. For each one, the purpose(s) of requiring control is described. Soil erosion and sedimentation control measures for all such areas shall be provided with a view toward achieving the specific purpose listed below for which a control plan is required:

(1) Erodable slopes: Prevent detachment and transportation of soil particles from slope.

(2) Streams, streambeds, streambanks, bodies of water, lake shorelines: Prevent detachment and transportation of soil particles.

(3) Drainageways: Prevent detachment and transportation of soil particles (which would otherwise deposit in streams, bodies of water, or wetlands); promote deposit or sediment loads (traversing these areas) before these reach bodies of water.

(4) Land adjacent to streams, ponds, lakes, and wetlands: Prevent detachment and transportation of soil particles. The applicant shall not adversely impact aquatic vegetation within the sensitive transition zone located between the upland and the mean high water line (ordinary high water line for non-tidal waters). No such vegetation shall be disturbed without approval of the city. Any such approval shall be based on a demonstrated necessity that promotes the overall public health, safety and welfare. Furthermore, any such disturbance of aquatic vegetation shall be compensated by re-vegetation based on a plan approved by the city as stipulated herein. The applicant shall coordinate plans for riverfront development with the Florida Department of Environmental Protection as well as the U.S. Army Corps of Engineers where tidal waters might be impacted. Where deemed appropriate, the site plan shall include the planting of native indigenous aquatic plant vegetation to promote stability of the shoreline.

(5) Enclosed drainage structure: Prevent sedimentation in structure, erosion at outfall of system and deposit of sediment loads within system or beyond it.

(6) Large flat surface areas (unpaved): Prevent detachment of soil particles and their off-site transportation.

(7) Impervious surfaces: Prevent the detachment and transportation of soil (in response to an increase in the rate and/or volume of runoff of the site or its concentration caused by impervious surfaces).

(8) Borrow and stockpile areas: Divert runoff from face of slopes exposed in the excavation process; convey runoff in stabilized channels to stable disposal points; leave borrow areas and stockpiles in stable condition.

(c) Applicability. Appropriate measures shall be taken during land clearing and building operations to assure that exposed, destabilized or otherwise altered soil is expeditiously covered with an acceptable erosion control material. The provision shall be applicable to the act of subdividing and installation of related improvements as well as during the development review process including the period during which improvements may occur as well as the length of time soil may be exposed to the environment. The tree and native vegetation protection ordinance shall be applicable to all clearing and grading activities and shall include specifications for management principles guiding the removal or placement of vegetation and landscaping design. Regulations shall also require developers to take precautionary measures, where necessary, to avert destruction or damage to native vegetation.

Appendix K: Florida Aquatic Plant Management Act

State of Florida

State Statutes

Title XXVII Chapter 369.22. – Aquatic Plant Management.

(1)This section shall be known as the "Florida Aquatic Plant Management Act."(2)For the purpose of this section, the following words and phrases shall have the following meanings:

(a) "Commission" means the Fish and Wildlife Conservation Commission.

(b) "Aquatic plant" is any plant growing in, or closely associated with, the aquatic environment and includes "floating," "emersed,""submersed," and "ditch bank" species.(c)A "maintenance program" is a method for the management of aquatic plants in which control techniques are utilized in a coordinated manner as determined by the commission.

(d) An "eradication program" is a method for the management of aquatic plants in which control techniques are utilized in a coordinated manner in an attempt to kill all the aquatic plants on a permanent basis in a given geographical area.

(e) A "complaint spray program" is a method for the management of aquatic plants in which weeds are allowed to grow unhindered to a given level of undesirability, at which point eradication techniques are applied in an effort to restore the area in question to are relatively low level of infestation.

(f) "Waters" means rivers, streams, lakes, navigable waters and associated tributaries, canals, meandered lakes, enclosed water systems, and any other bodies of water.(g)"Districts" means the six water management districts created by law and named, respectively, the Northwest Florida Water Management District, the Suwannee River Water Management District, the St. Johns River Water Management District, the Southwest Florida Water Management District, the Central and Southern Florida Flood Control District, and the Ridge and Lower Gulf Coast Water Management District; and on July 1, 1975, shall mean the five water management districts created by chapter 73-190, Laws of Florida, and named, respectively, the Northwest Florida Water Management District, the Suwannee River Water Management District, the St. Johns River Water Management District, the Southwest Florida Water Management District, and the South Florida Water Management District.

(3) The Legislature recognizes that the uncontrolled growth of aquatic plants in the waters of Florida poses a variety of environmental, health, safety, and economic problems. The Legislature acknowledges the responsibility of the state to cope with the uncontrolled and seemingly never-ending growth of aquatic plants in the waters throughout Florida. It is, therefore, the intent of the Legislature that the state policy for the management of aquatic plants in waters of state responsibility be carried out under the general supervision and control of the commission. It is the intent of the Legislature that the management of aquatic plants be carried out primarily by means of maintenance programs, rather than eradication or complaint spray programs, for the purpose of achieving more effective management at a lower long-range cost. It is also the intent of the Legislature that the commission guide, review, approve, and coordinate all aquatic plant management programs within each of the water management districts as defined in paragraph (2)(g). It is the intent of the Legislature to account for the costs of aquatic plant management programs by watershed for comparison purposes.

(4)The commission shall supervise and direct all management programs for aquatic plants, as provided in this section, so as to protect human health, safety, and recreation and, to the greatest degree practicable, prevent injury to plant, fish, and animal life and to property.(5)When state funds are involved, or when waters of state responsibility are involved, it is the duty of the commission to guide, review, approve, and coordinate the activities of all public bodies, authorities, state agencies, units of local or county government, commissions, districts, and special districts engaged in operations to manage or eradicate aquatic plants. The commission may delegate all or part of such functions to any appropriate state agency, special district, unit of local or county government, commission, authority, or other public body. However, special attention shall be given to the keeping of accounting and cost data in order to prepare the annual fiscal report required in subsection (7).

(6)The commission may disburse funds to any district, special district, or other local authority for the purpose of operating a program for managing aquatic plants in the waters of state responsibility upon:

(a)Approval by the commission of the management techniques to be used by the district or authority; and

(b)Review and approval of the program of the district or authority by the commission.(7)The commission shall prepare an annual report on the status of the aquatic plant management program which shall be posted on the commission's Internet website.

(8)The commission shall have the authority to cooperate with the United States and to enter into such cooperative agreements or commitments as the commission may determine necessary to carry out the control or eradication of water hyacinths, alligator weed, and other noxious aquatic plant growths from the waters of the state and to enter into contracts with the United States obligating the state to indemnify and save harmless the United States from any and all claims and liability arising out of the initiation and prosecution of any project undertaken under this section. However, any claim or claims required to be paid under this section shall be paid from money appropriated to the aquatic plant management program.

(9)The commission may delegate various aquatic plant management functions to any appropriate state agency, special district, unit of local or county government, commission, authority, or other public body. The recipient of such delegation shall, in accepting commitments to engage in aquatic plant management activities, be subject to the rules of the commission. In addition, the recipient shall render technical and other assistance to the commission in order to carry out most effectively the purposes of s. 369.20.

(10)The commission is directed to use biological agents for the management of aquatic plants when determined to be appropriate by the commission.

(11)The commission shall adopt rules pursuant to ss. 120.536(1) and 120.54 to implement the provisions of this section conferring powers or duties upon it and perform any other acts necessary for the proper administration, enforcement, or interpretation of this section, including adopting rules and forms governing reports.

(12)No person or public agency shall control, eradicate, remove, or otherwise alter any aquatic plants in waters of the state unless a permit for such activity has been issued by the commission, or unless the activity or waters are expressly exempted by commission rule. The commission shall develop standards

by rule which shall address, at a minimum, chemical, biological, and mechanical control activities; an evaluation of the benefits of such activities to the public; specific criteria recognizing the differences between natural and artificially created waters; and the different amount and quality of littoral vegetation on various waters. Applications for a permit to engage in aquatic plant management activities, including applications to engage in management activities on sovereign submerged lands, shall be made to the commission. In reviewing such applications, the commission shall consider the criteria set forth in subsection (4) and, in accordance with applicable rules, shall take final agency action on permit applications for the use of aquatic plant activities on sovereign submerged lands.

(13)The commission has the power to enforce this section in the same manner and to the same extent as provided in ss. 379.501-379.504.

(14)Activities that are exempt from permitting pursuant to s. 403.813(1)(r) are granted a mixing zone for turbidity for a distance not to exceed 150 meters downstream in flowing streams or 150 meters in radius in other water bodies as measured from the cutter head, return flow discharge, or other points of generation of turbidity.

History.—ss. 1, 2, ch. 74-65; s. 4, ch. 80-129; s. 33, ch. 83-218; s. 16, ch. 84-254; s. 2, ch. 89-151; s. 188,ch. 94-356; s. 76, ch. 98-200; s. 92, ch. 99-245; s. 7, ch. 2008-150; s. 31, ch. 2009-86.

Note.—Former s. 372.932.

Appendix L: City MS4 NPDES Permit

APPENDIX A
PHASE II MS4 STORMWATER MANAGEMENT PROGRAM (SWMP) ELEMENTS FORM

SECTION A.I. MINIMUM CONTROL MEASURE (check only one)

- [X] 1. Public Education and Outreach
- [ ] 2. Public Involvement/Participation
- [ ] 3. Illicit Discharge Detection/Elimination
- [ ] 4. Construction Site Stormwater Runoff Control
- [ ] 5. Post-construction Stormwater Management (optional)
- [ ] 6. Pollution Prevention/Good Housekeeping

SECTION A.II. BEST MANAGEMENT PRACTICES (BMPs) For The Minimum Control Measure Identified In Section A.I. Of This Form

Element ID	BMP Number	A Description of BMP	B Measurable Goal(s)	C Schedule for Implementation/Completion	D Responsible Entity/Department
1a.	01	**City Stormwater Website** Information and links on: Clean Water Program/NPDES, Public Education, History & Restrictions, Comments & Complaints. Educational materials are available for download. Site is updated regularly. A "Contact Us" button prompts residents to email the City regarding their stormwater questions or concerns.	1. Document and report the number of visitors to pages with stormwater specific information. 2. Document and report the number of material downloads. 3. Document and report communications received through the website. 4.	1. Year 1- Year 5 2. Year 1- Year 5 3. Year 1- Year 5 4	MIS Department City Clerk
1a.	02	**City Natural Resources Board Website** Information on: Florida Friendly Landscaping, Stormwater, Composting, Landscaping and Fertilizer Ordinance. Site is updated regularly and promoted through the City's Facebook page and on all outreach materials. A "Contact Us" button prompts residents to email the City regarding their environmental questions or concerns.	1. Document and Report the number of website visitors. 2. Document and report communications received through the website. 3. 4.	1. Year 1- Year 5 2. Year 1- Year 5 3. 4.	MIS Department City Clerk
1a.	03	**Outreach Brochures and Flyers** Developed to educate residents on locally relevant stormwater topics, which are determined through the documentation of citizen request line calls and emails. Materials are distributed throughout the City (Library, City Hall, Building Department, and Community Events.	1. Document and report the number of brochures distributed. 2. Document and report the number of distribution points. 3. 4.	1. Year 1- Year 5 2. Year 1- Year 5 3. 4.	Environmental Technician
1a.	04	**Community Presentations** Guest speakers present at Board and Council Meetings on environmental and stormwater topics. Public Meetings are held monthly at City Hall and televised throughout the month on local government channel, and available for streaming through the City's Website. All meeting agendas are available on City's website one week prior.	1. Document and report number of presentations informing the public of the impacts of stormwater discharges on waterbodies and the steps that the public can take to reduce pollutants in stormwater. 2. Document and report number attendees at meetings featuring stormwater specific information.	1. Year 1- Year 5 2. Year 1- Year 5	Environmental Technician
1a.	05	**Community Events** Educate the public through an onsite booth, with presentations and distribution of outreach materials on stormwater topics. There will be photo documentation of booth and presentations.	1. Document and report the number of events where stormwater information was presented and distributed. 2. Document and report the number of materials distributed. 3. Document and report the number of stormwater presentations conducted at community events. 4.	1. Year 1- Year 5 2. Year 1- Year 5 3. Year 1- Year 5 4.	Environmental Technician & Stormwater Department

Page # 1 of 10 total pages of SWMP Elements Forms attached to the NOI

DEP Form 62-621.300(7)(b), May 1, 2003

APPENDIX A
PHASE II MS4 STORMWATER MANAGEMENT PROGRAM (SWMP) ELEMENTS FORM

SECTION A.I. MINIMUM CONTROL MEASURE (check only one)

- [X] 1. Public Education and Outreach
- [ ] 2. Public Involvement/Participation
- [ ] 3. Illicit Discharge Detection/Elimination
- [ ] 4. Construction Site Stormwater Runoff Control
- [ ] 5. Post-construction Stormwater Management (optional)
- [ ] 6. Pollution Prevention/Good Housekeeping

SECTION A.II. BEST MANAGEMENT PRACTICES (BMPs) For The Minimum Control Measure Identified In Section A.I. Of This Form

Element ID	BMP Number	A Description of BMP	B Measurable Goal(s)	C Schedule for Implementation/Completion	D Responsible Entity/Department
1a.	06	**Local Government Channel** 24 hour television channel, which is also streamed live on City's website. Live Streams and replays Council and Board Meetings. Displays public notices and stormwater outreach videos and PowerPoint slides. Promotes websites and Citizen Request Line.	1. Document and report SWMP relevant materials posted and duration posted. 2. 3. 4.	1. Year 1- Year 5 2. 3. 4	MIS Department
1a.	07	**City Facebook Page** Updates public on current stormwater projects, outreach information, and addresses frequently asked questions and concerns. Streams all public meetings live. Promotes City websites, educational programs, and Citizen Request Line.	1. Document and report "likes" and reposts on stormwater topics. 2. Document and report number of page followers. 3. 4.	1. Year 1- Year 5 2. Year 1- Year 5 3. 4.	MIS Department
1a.	08	**Community Oyster Garden Project** Cost-share Grant Project designed to educate visitors and volunteers of all ages. Community groups can register for interactive site tours, which engage volunteers and participants of all ages in hands on water quality data collection, species identification and the role of the City's MS4 in maintaining a healthy lagoon.	1. Document and report all volunteer and participant sign-in sheets. 2. Document and report the number of classes presented at site. 3. 4.	1. Year 1- Year 5 2. Year 1- Year 5 3. 4.	Environmental Technician
1a.	09	**New Homeowner Folder** Folder delivered at final inspection for all new residential development. Includes materials on stormwater, Florida Friendly Landscaping, water conservation, swale maintenance, IPM, and City Landscaping Ordinances.	1. Document and report the number of new homeowner folders distributed. 2. 3. 4.	1. Year 1- Year 5 2. 3. 4.	Environmental Technician
1a.	10	**Community Events** Stormwater Booth manned by Stormwater Staff available to answer resident questions and to educate on current projects.	1. Document and report number of booth visitors. 2. 3. 4.	1. Year 1- Year 5 2. 3. 4.	Environmental Technician & Stormwater Department

Page # 2 of 10 total pages of SWMP Elements Forms attached to the NOI

DEP Form 62-621.300(7)(b), May 1, 2003

APPENDIX A
PHASE II MS4 STORMWATER MANAGEMENT PROGRAM (SWMP) ELEMENTS FORM

SECTION A.I. MINIMUM CONTROL MEASURE (check only one)

☐ 1. Public Education and Outreach	☐ 3. Illicit Discharge Detection/Elimination	☐ 5. Post-construction Stormwater Management (optional)
☒ 2. Public Involvement/Participation	☐ 4. Construction Site Stormwater Runoff Control	☐ 6. Pollution Prevention/Good Housekeeping

SECTION A.II. BEST MANAGEMENT PRACTICES (BMPs) For The Minimum Control Measure Identified In Section A.I. Of This Form

Element ID	BMP Number	A Description of BMP	B Measurable Goal(s)	C Schedule for Implementation/Completion	D Responsible Entity/Department
2a.	01	**Public Input** Resolution NO. R-15-09 requires that all appointed Boards and Committees include a section for solicitation of "Public Input" on meeting agendas. It will be documented when an agenda features items related to the City's SWMP. All agendas are posted one week prior to the meetings on the City's Website and Facebook Page.	1. Document and report number of public meetings held where the City's SWMP is discussed. 2. Document and report number of attendees at public Board Meetings where the City's SWMP is discussed. 3. 4.	1. Year 1- Year 5 2. Year 1- Year 5 3. 4	City Clerk
2a.	02	**MS4 Cleanup Events** City partners with local organizations to host two volunteer waterway clean-up events per year. Selection of clean-up sites will be focused on those areas with a direct impact on stormwater quality. Volunteer sign-in sheets will be used to track participants. The events are marketed through the City's Facebook page, website, television channel, community flyers, and the Chamber of Commerce's website, Facebook page, and newsletter.	1. Document and report number of events. 2. Document and report number of volunteers. 3. Document and report weight of litter collected. 4. Document and report the names of clean-up events.	1. Year 1- Year 5 2. Year 1- Year 5 3. Year 1- Year 5 4. Year 1- Year 5	Environmental Technician

Page # 3 of 10 total pages of SWMP Elements Forms attached to the NOI

DEP Form 62-621.300(7)(b), May 1, 2003

APPENDIX A
PHASE II MS4 STORMWATER MANAGEMENT PROGRAM (SWMP) ELEMENTS FORM

SECTION A.I. MINIMUM CONTROL MEASURE (check only one)

☐ 1. Public Education and Outreach	☒ 3. Illicit Discharge Detection/Elimination	☐ 5. Post-construction Stormwater Management (optional)
☐ 2. Public Involvement/Participation	☐ 4. Construction Site Stormwater Runoff Control	☐ 6. Pollution Prevention/Good Housekeeping

SECTION A.II. BEST MANAGEMENT PRACTICES (BMPs) For The Minimum Control Measure Identified In Section A.I. Of This Form

Element ID	BMP Number	A Description of BMP	B Measurable Goal(s)	C Schedule for Implementation/Completion	D Responsible Entity/Department
3a.	01	**Storm Water System Map** GIS Map of City's stormwater system indicates all outfalls, receiving surface water bodies, stormwater structures and retention areas. Any changes in conveyance channels, outfalls, or structural assets will be amended in the map.	1. Document and report any new outfalls. 2. 3. 4.	1. Year 1- Year 5 2. 3. 4	Stormwater Department & Environmental Technician
3b.	01	**Illicit Discharge Ordinance** City Ordinance, Article VI: Urban Stormwater Quality Management and Discharge Control, prohibits non-stormwater discharges into the MS4 system and implements inspection, reporting, and enforcement procedures.	1. City will maintain the Ordinance and report any changes, or amendments, if applicable. 2. 3. 4.	1. Year 1- Year 5 2. 3. 4.	Stormwater Department
3c.	01	**Illicit Discharge Detection and Inspection** Staff performs daily inspections and review of potential illicit discharges, hazardous disposals, or illegal dumping. Potential illicit discharges are reported to the Police Department Code Enforcement Office for enforcement.	1. Document and report any "Notice of Violations" issued by Code Enforcement. 2. Document and report the penalty and procedure required of each violator. 3. 4.	1. Year 1- Year 5 2. Year 1- Year 5 3. 4.	Police Department Code Enforcement Office
3d.	01	**Illicit Discharge Education: Public** City provides illicit discharge educational materials to residents. Materials are posted on City's Website and distributed through various community events, City Hall, and in new homeowners' packets.	1. Document all educational materials utilized and their distribution points. 2. Document and report the number of materials distributed. 3. 4.	1. Year 1- Year 5 2. Year 1- Year 5 3. 4.	Environmental Technician
3d.	02	**Illicit Discharge Education: Business** City provides industry specific illicit discharge educational materials to businesses. Materials are posted on City's Website and distributed through community events, and at City Hall as they apply for new or renewal licensing.	1. Document and report all educational materials created, and distribution points. 2. Document and report the number of materials distributed. 3. 4.	1. Year 1- Year 5 2. Year 1- Year 5 3. 4.	Building Department

Page # 4 of 10 total pages of SWMP Elements Forms attached to the NOI

DEP Form 62-621.300(7)(b), May 1, 2003

APPENDIX A
PHASE II MS4 STORMWATER MANAGEMENT PROGRAM (SWMP) ELEMENTS FORM

SECTION A.I. MINIMUM CONTROL MEASURE (check only one)

☐ 1. Public Education and Outreach	☒ 3. Illicit Discharge Detection/Elimination	☐ 5. Post-construction Stormwater Management (optional)
☐ 2. Public Involvement/Participation	☐ 4. Construction Site Stormwater Runoff Control	☐ 6. Pollution Prevention/Good Housekeeping

SECTION A.II. BEST MANAGEMENT PRACTICES (BMPs) For The Minimum Control Measure Identified In Section A.I. Of This Form

Element ID	BMP Number	A Description of BMP	B Measurable Goal(s)	C Schedule for Implementation/Completion	D Responsible Entity/Department
3d.	03	**Illicit Discharge Education: Employees** City requires all new employees view a training video on the proper storage and disposal of waste and hazardous materials. All current staff members are required to attend annual refresher class, which also includes this video.	1. Document and report the number of new employees receiving this training.	1. Year 1- Year 5	Human Resources
			2. Document and report the number of existing employees receiving additional training.	2. Year 1- Year 5	
			3.	3.	
			4.	4	

Page # 5 of 10 total pages of SWMP Elements Forms attached to the NOI

DEP Form 62-621.300(7)(b), May 1, 2003

APPENDIX A
PHASE II MS4 STORMWATER MANAGEMENT PROGRAM (SWMP) ELEMENTS FORM

SECTION A.I. MINIMUM CONTROL MEASURE (check only one)

- ☐ 1. Public Education and Outreach
- ☐ 2. Public Involvement/Participation
- ☐ 3. Illicit Discharge Detection/Elimination
- ☒ 4. Construction Site Stormwater Runoff Control
- ☐ 5. Post-construction Stormwater Management (optional)
- ☐ 6. Pollution Prevention/Good Housekeeping

SECTION A.II. BEST MANAGEMENT PRACTICES (BMPs) For The Minimum Control Measure Identified In Section A.I. Of This Form

Element ID	BMP Number	A Description of BMP	B Measurable Goal(s)	C Schedule for Implementation/Completion	D Responsible Entity/Department
4a.	01	**Surface Water Management Ordinance** Article XII requires that any land development, which disturbs the soil, implement an erosion and sediment control plan. Such sites are subject to frequent inspections. Chapter 1, Article I and II provides for the general administration of violation and enforcement procedures for non-compliance to the Land Development Code.	1. Document and report any changes or amendments to the ordinance, if applicable. 2. 3. 4.	1. Year 1- Year 5 2. 3. 4	Planning and Zoning Department
4b.	01	**Erosion and Sediment Control on Construction Sites** Article XVIII Sec.54-4-18.4 requires that sites greater than an acre, submit a SWPPP as part of their site plans that meets all City Land Development Ordinances, as well as apply for an NOI with the FDEP. The SWPPP, or Erosion and Sediment Control Plan will be reviewed for BMPs as they relate to the proposed construction	1. Document and report any changes or amendments to the ordinance, if applicable. 2. Document and report the number of NOIs received. 3. Document and report the number of active sites. 4.	1. Year 1- Year 5 2. Year 1- Year 5 3. Year 1- Year 5 4.	Planning and Zoning Department
4c.	01	**Construction Site Waste Management** The Surface Water Management Ordinance requires that all construction site operators control discarded materials and provide a sanitary waste facility. Waste management on each site is inspected as part of the scheduled "Erosion Control" inspections.	1. Document and report any changes or amendments to the ordinance, if applicable. 2. Document and report number of sites operating under waste control requirement. 3. Document and report number of compliance issues pertaining to waste controls. 4.	1. Year 1- Year 5 2. Year 1- Year 5 3. Year 1- Year 5 4.	Stormwater Department
4d.	01	**Site Plan Review** Article XVII outlines the site plan review procedures. Site plans are thoroughly reviewed by a committee of staff to ensure no adverse effects on water quality or environmentally sensitive areas.	1. Document and report any changes or amendments to the ordinance, if applicable. 2. Document and report number of site plans reviewed for construction. 3. Document and report the number of site plans that require special environmental permitting. 4. Document and report the number of site plans approved for construction.	1. Year 1- Year 5 2. Year 1- Year 5 3. Year 1- Year 5 4. Year 1- Year 5	Planning and Zoning Department
4e.	01	**Public Input** The public may provide input on active/proposed construction activities at any time by website submissions, or calls to the Citizen Request Line, which is advertised on the stormwater website, all stormwater educational material, new homeowner packets, and the public television channel. All stormwater related communications are monitored and recorded on spreadsheet by stormwater administrative support staff.	1. Document and report all complaints on potential site violations received through stormwater website or citizen request line. 2. Document and report the number of emails received. 3. Document and report the number of phone calls received to the citizen request line. 4. Document and report the number of follow-up actions.	1. Year 1- Year 5 2. Year 1- Year 5 3. Year 1- Year 5 4. Year 1- Year 5	Stormwater Department

Page # 6 of 10 total pages of SWMP Elements Forms attached to the NOI

DEP Form 62-621.300(7)(b), May 1, 2003

APPENDIX A
PHASE II MS4 STORMWATER MANAGEMENT PROGRAM (SWMP) ELEMENTS FORM

SECTION A.I. MINIMUM CONTROL MEASURE (check only one)

☐ 1. Public Education and Outreach	☐ 3. Illicit Discharge Detection/Elimination	☐ 5. Post-construction Stormwater Management (optional)
☐ 2. Public Involvement/Participation	☒ 4. Construction Site Stormwater Runoff Control	☐ 6. Pollution Prevention/Good Housekeeping

SECTION A.II. BEST MANAGEMENT PRACTICES (BMPs) For The Minimum Control Measure Identified In Section A.I. Of This Form

Element ID	BMP Number	A Description of BMP	B Measurable Goal(s)	C Schedule for Implementation/Completion	D Responsible Entity/Department
4f.	01	**Construction Site Inspections** City staff will be scheduled through the Building Department to inspect all development sites following initial land clearing activities. Supplemental inspections will be conducted weekly and within 24 hours of a rain event of .5 inch, or greater. Failure of inspection will result in a re-inspection fee, which increases with each additional re-inspection.	1. Document and report number of erosion control inspections performed. 2. Document and report all erosion control re-inspections. 3. Document and report all re-inspection fees charged. 4.	1. Year 1- Year 5 2. Year 1- Year 5 3. Year 1- Year 5 4	Building Department

Page # 7 of 10 total pages of SWMP Elements Forms attached to the NOI

DEP Form 62-621.300(7)(b), May 1, 2003

APPENDIX A
PHASE II MS4 STORMWATER MANAGEMENT PROGRAM (SWMP) ELEMENTS FORM

SECTION A.I. MINIMUM CONTROL MEASURE (check only one)

☐ 1. Public Education and Outreach	☐ 3. Illicit Discharge Detection/Elimination	☒ 5. Post-construction Stormwater Management (optional)
☐ 2. Public Involvement/Participation	☐ 4. Construction Site Stormwater Runoff Control	☐ 6. Pollution Prevention/Good Housekeeping

SECTION A.II. BEST MANAGEMENT PRACTICES (BMPs) For The Minimum Control Measure Identified In Section A.I. Of This Form

Element ID	BMP Number	A Description of BMP	B Measurable Goal(s)	C Schedule for Implementation/Completion	D Responsible Entity/Department
5a.	01	**Alternative Program** City of Sebastian relies on the St. John's River Water Management District and Florida Department of Environmental Protection regulatory criteria by providing stormwater treatment for Environmental Resource Program.	1. Continue to maintain compliance with Florida Department of Environmental Protection and St. John's River Water Management District criteria.	1. Effective upon issuance of MS4 Permit	Florida Department of Environmental Protection & St. John's River Water Management District
			3.	3.	
			4.	4	

Page # 8 of 10 total pages of SWMP Elements Forms attached to the NOI

APPENDIX A
PHASE II MS4 STORMWATER MANAGEMENT PROGRAM (SWMP) ELEMENTS FORM

SECTION A.I. MINIMUM CONTROL MEASURE (check only one)

☐ 1. Public Education and Outreach	☐ 3. Illicit Discharge Detection/Elimination	☐ 5. Post-construction Stormwater Management (optional)
☐ 2. Public Involvement/Participation	☐ 4. Construction Site Stormwater Runoff Control	☒ 6. Pollution Prevention/Good Housekeeping

SECTION A.II. BEST MANAGEMENT PRACTICES (BMPs) For The Minimum Control Measure Identified In Section A.I. Of This Form

Element ID	BMP Number	A Description of BMP	B Measurable Goal(s)	C Schedule for Implementation/Completion	D Responsible Entity/Department
6a.	01	**Fleet Maintenance** All waste oil, hydraulic fluids, antifreeze, and oil filters from the City's equipment/ fleet maintenance division are properly stored for recycling.	1. Document and report the number of gallons per year of waste oil and hydraulic fluid recycled each year. 2. Document and report the number of gallons per year of antifreeze recycled each year. 3. Document and report the number of oil filters disposed of each year. 4.	1. Year 1- Year 5 2. Year 1- Year 5 3. Year 1- Year 5 4	Public Works Department
6a.	02	**Catch Basin and Baffle Box Maintenance** The City regularly cleans debris from it catch basins and baffle boxes with a vacuum truck.	1. Document and report the number of baffle boxes cleaned each year and how often. 2. Document and report the total amount of debris collected from baffle boxes each year. 3. Document and report the number of catch basins cleaned each year and how often. 4. Document and report the total amount of debris collected from catch basins each year.	1. Year 1- Year 5 2. Year 1- Year 5 3. Year 1- Year 5 4. Year 1- Year 5	Stormwater Department
6a.	03	**Culvert Pipe Maintenance** Road crossing and driveway culvert pipes are regularly cleared of debris by various methods.	1. Document and report the total number of road crossing culvert pipes cleared each year. 2. Document and report the total amount of debris collected from road crossing culverts each year. 3. Document and report the total number of driveway culvert pipes cleared each year. 4. Document and report the total amount of debris collected from driveway culverts each year.	1. Year 1- Year 5 2. Year 1- Year 5 3. Year 1- Year 5 4. Year 1- Year 5	Stormwater Department
6a.	04	**Pet Waste Collection** The City provides pet waste collection stations at many of its parks and open spaces	1. Document and report the number disposable pet waste bags purchased each year. 2.	1. Year 1- Year 5 2.	Parks and Recreation Department
6a.	05	**Basin Management Plan (BMAP) for Adopted TMDL** In accordance with Section 403.067, F.S., the City of Sebastian must comply with the adopted provisions of the Central Indian River Lagoon BMAP that specify activities to be undertaken by the City of Sebastian. If a BMAP is in development and scheduled to be adopted within two years by DEP and watershed stakeholders, the City of Sebastian shall continue to participate in the BMAP process and comply with the adopted provisions of the BMAP that specify activities to be undertaken by the City during the permit cycle.	1. Continue to participate and implement the scheduled activities defined in the adopted BMAP. 2. 3. 4.	1. Year 1- Year 5 2. 3. 4.	Florida Department of Environmental Protection & Central Indian River Lagoon Stakeholders

Page # 9 of 10 total pages of SWMP Elements Forms attached to the NOI

DEP Form 62-621.300(7)(b), May 1, 2003

APPENDIX A
PHASE II MS4 STORMWATER MANAGEMENT PROGRAM (SWMP) ELEMENTS FORM

SECTION A.I. MINIMUM CONTROL MEASURE (check only one)

☐ 1. Public Education and Outreach	☐ 3. Illicit Discharge Detection/Elimination	☐ 5. Post-construction Stormwater Management (optional)
☐ 2. Public Involvement/Participation	☐ 4. Construction Site Stormwater Runoff Control	☒ 6. Pollution Prevention/Good Housekeeping

SECTION A.II. BEST MANAGEMENT PRACTICES (BMPs) For The Minimum Control Measure Identified In Section A.I. Of This Form

Element ID	BMP Number	A Description of BMP	B Measurable Goal(s)	C Schedule for Implementation/Completion	D Responsible Entity/Department
6a.	06	**Swales and Ditches Maintenance** The City will inspect and maintain all city-maintained swales, ditches, and canals in order to remove debris and particle matter once per month and additionally as necessary.	1. Document and report the number of miles of swales, ditches, and canals maintained. 2. Document and report the amount of debris collected. 3. 4.	1. Year 1- Year 5 2. Year 1- Year 5 3. 4	Stormwater Department
6b.	01	**Stormwater Pollution Prevention Training** All City field staff members are required to attend the Green Industries BMP Course. Taught annually by the County's IFAS Extension Office, the class is designed as a water quality and water conservation program. It instructs how MS4 operator activities should be conducted to prevent runoff and leaching of chemicals and fertilizers into water bodies.	1. Document and report the number of new employees receiving training. 2. Document and report the number of current employees receiving refresher courses. 3. 4.	1. Year 1- Year 5 2. Year 1- Year 5 3. 4.	Human Resources Department
6b.	02	**Stormwater Inspectors Training** Stormwater Department Staff are encouraged to attend stormwater inspector training class as it pertains to their duties. The Stormwater Department will pay any fees associated with classes and/or certifications.	1. Document and report the number of employees who attend classes. 2. Document and report the number of employees who are currently certified. 3. 4.	1. Year 1- Year 5 2. Year 1- Year 5 3. 4.	Human Resources Department

Page # 10 of 10 total pages of SWMP Elements Forms attached to the NOI

DEP Form 62-621.300(7)(b), May 1, 2003

Appendix M: Glossary of Terms

IPM Glossary of Terms

Aeration	The use of pumps and/or fountains to diffuse oxygen into the water column of a waterbody to increase the levels of dissolved oxygen within the water which enhances the natural breakdown of pollutants and excess nutrients.
Baffle Boxes	An underground structure, installed at outlet and outfall points. Baffle boxes have a series of settling chambers, whose primary function is to remove sediment, debris, trash, and their associated pollutants from stormwater before it enters a larger waterbody. The boxes are vacuum cleaned and the material is properly disposed of, preventing the sediment, debris and trash from ever entering the water body.
Beneficial Species	An organism which naturally feeds upon, out-competes, or otherwise hinders the growth of pest populations, i.e. Ladybug, Air potato Beetle.
Best Management Practice (BMP)	Actions that are taken based upon current science and technology that have been proven to be effective, with the least detriment to public health and safety, wildlife and the local ecosystems.
Bioaccumulation	The gradual accumulation of substances, such as pesticides or other chemicals in an organism that occurs when a substance is absorbed at a rate faster than that which the substance is lost by catabolism and/or excretion.
Biodiversity	The naturally occurring variety of species that coexist in an area.
Bio-Herbicide	Any herbicide which is either derived from naturally occurring compounds and minerals or produced by the metabolism or excretions of living organisms, such as animals, plants, and bacteria.
Broadcast Application	The general distribution of a substance over the entire surface of an area. In comparison to "spot application" in which the substance is applied directly to a specific location.
Buffer Zone	A predetermined distance surrounding a body of water where fertilizer and pesticide applications are prohibited.
Canal	A man-made waterway/channel with a width ten (10) feet or greater, created for recharge, collection, storage, and the movement of stormwater.

Catch Basin	A reservoir or well into which surface water runoff drains into, in order to catch and retain sediments and other floatable and suspended materials entering the stormwater system or natural waterway.
Chemical	Any substance consisting of matter. This includes any liquid, solid, or gas. A chemical may be a pure substance (an element) or any mixture (a solution, compound, or gas). A chemical may occur naturally or can be created artificially.
Complaint Control Program	Emergency control of noxious aquatic vegetation that relies heavily on chemical controls to bring a species population back down to an acceptable threshold where it can then be controlled by a **maintenance control program.** The need for complaint control occurs when a management entity has failed to establish an effective maintenance program or following a period of mandated non-spraying (moratorium).
Contract	A legally binding written agreement, including but not limited to a contract, lease, permit, license or easement, between a person, firm, corporation, or other entity, including but not limited to: Federal government, State of Florida, County government, City government or any subdivision thereof which grants a right to use, lease, or occupy property of the City for a specified purpose or purposes.
Contractor	A person, firm, or corporation or other entity, including any governmental authority of a political unit or organization, or any subdivision thereof that enters into a contract with the City for services.
Conveyance System	The interconnected ponds, ditches, and canals that are designed to collect, store, and transport stormwater throughout the City.
Culvert	An underground pipe that transports stormwater between catch basins, swales, ditches, ponds, and canals.
Dam	A barrier constructed to hold back water and raise its level, forming a reservoir.
Detention Area	An area where stormwater is temporarily stored, or detained, and is eventually allowed to drain slowly when water levels recede in the receiving channel. Detention areas are often referred to as dry ponds or dry detention areas.
Ditch	An open constructed channel with its top width less than 10 feet at design flow, may serve as detention or retention area.

Drop Inlets	Collects stormwater from a parking lot, or other similar impervious surface. Drop inlets collect runoff from roads and parking lots and convey it to an underground storm drain system.
Dry Detention Area	See "**Detention Area**"
EIQ	A formula developed for agriculture and turfgrass applications to provide pesticide applicators with numerical guide regarding the relative environmental and health impacts associated with their pesticide options to ensure that they utilize the best management practices regarding their pesticide selection.
Emergent Vegetation	Wetland vegetation that is characterized by erect, rooted, herbaceous plants growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content, excluding mosses and lichens. This vegetation is typically along the shoreline and present for most of the growing season in most years and is usually dominated by perennial plants.
Endangered Species	A protected species, as listed by the Federal Government or the State of Florida that has the potential to become extinct in the near future, either worldwide or in a particular political jurisdiction without the additional protections provided by law. "Endangered" is the highest level of conservation status in the U.S.
Eradication	The complete removal of noxious aquatic vegetation to the point where it is unlikely to return. Eradication of noxious aquatic plants is virtually impossible and is NOT the goal of a **control management program**.
Field Use EIQ Rating	A rating calculated by multiplying the EIQ value for the specific pesticide active ingredient listed in the tables by the percentage of active ingredient in the formulation by the rate per acre used. The rating allows comparisons of potential environmental impacts associated with the use of a particular pesticide and the potential impact of its application. This serves as a practical tool for the use of best management practices in pesticide application.
Fertilizer	A chemical or natural substance added to soil or land to increase its ability to grow vegetation. The substance usually contains a percentage of organic or inorganic nitrogen, phosphorus and Potassium to enhance plant and root growth and/or flowering.
Floating Vegetation	Aquatic vegetation with leaves that float on the water surface. Their roots may be attached in the substrate or floating in the water column.

Fungicide	A substance (pesticide) that is intended to be used for the prevention, control and/ or eradication of fungal pests.
Herbicide	A substance (pesticide) that is intended to be used for the prevention, control and/ or eradication of noxious vegetation.
Herbicide Resistance	The inherited ability of an individual plant to survive a herbicide application that would kill a normal population of the same species. Most commonly found in aquatic plants, such as hydrilla.
Inlet	A device located above the mean high water line that admits surface waters to the stormwater drainage system.
Insecticide	A substance (pesticide) that is intended to be used for the prevention, control and/ or eradication of insect pests.
Invasive	Non-native species that causes ecological, physical, or economic harm in a new environment, beyond its natural range.
Irrigation	The application of water from a well, reservoir or other water supply across a land to assist in the health and durability of a cultivated plant species.
Key Pests	Pests which are encountered at an unacceptable population level at least once a year. Key pests are often cyclic in their impact and may only require control in specific location(s), based on their habitat requirements and the use or purpose of the location.
Leachability	The ability of a pesticide to travel downward through the soil profile where it can contribute to groundwater contamination. The potential for contamination is a product of the pesticide's ingredients and soil characteristics.
Littoral Zone	The area of land that extends from the highest point of the shoreline or abutment which is rarely or seasonally inundated with surface water to the highest point that is permanently submerged.
Littoral Shelf	The area of land between the shoreline of a body of water and the banks surrounding it. When planted, it can create a natural barrier around the waterbody to absorb excess nutrients and pollutants from the land and add to both the function and natural aesthetics of the area.
Maintenance Control Program	A method for the management of aquatic plants in which techniques are used in a coordinated manner, on a continuous or periodic basis, in order to maintain the target plant population at the lowest feasible level funding and technology will permit. This is the goal of the IPM Program.

Mode of Action (MOA)	The way in which the **herbicide** controls susceptible plants. It usually describes the biological process or enzyme in the plant that the herbicide interrupts, affecting normal plant growth and development.
Native Species	An indigenous species. Any species that is normally present in a particular ecosystem as a result of natural processes, with no human intervention. Natives may be adversely affected by the introduction of exotic species, contributing a reduction in biodiversity.
Natural Resources Board	A volunteer board comprised of City residents, created with the mission to improve the quality of life in Sebastian by nurturing the beneficial relationship between our citizens and our environment by protecting, preserving, and promoting our natural resources.
Nematode	Any of the phylum, Nematoda, consisting of round worms most of which are free-living in soil or water. Many nematodes are parasitic in plants and animals and may be very host-specific. Nemotodes may be classified as a **pest** or are often utilized as a **biological control** for another pest.
Non-Native	Often referred to as alien, exotic, nonindigenous, or introduced species, are those that occur in areas outside of their natural geographic range.
Noxious Aquatic Vegetation	Any aquatic vegetation (**native** or **non-native**) which has growth that has spread beyond the tolerance threshold in that it threatens structures or decreases the **stormwater conveyance system**'s ability to store and move water.
Outfall	A terminal point where collected surface and storm water runoff is discharged from a pipe system or culvert into a body of water. The outfall is the final **outlet** of a drainage system.
Outlet	The point at which water discharges from a stormwater pipe or drain into a pond, ditch, or canal.
Pathogen	Any disease-producing organism or virus. Pathogens may be classified as a pest or are often utilized as a biological control for another pest.
Pest	Any plant (weed), vertebrate (bird, rodent, or other mammal), invertebrate (insect, tick, mite, or snail), nematode, or pathogen (bacteria, virus, or fungus), which may cause disease, inflict damage, or out-compete the native or more desirable species for an area. In addition, a pest may be aesthetically undesired, or threaten to impact human and/or animal health/safety.

Pesticide	Any substance or combination of substances which is intended to be used for preventing, destroying, repelling, or mitigating any pest; this includes herbicides, insecticides, bio pesticides, fungicides, and the like.
Phase II MS4 Permit	FDEP permit issued to the City every 5 years, which contains all of the approved BMPs which the stormwater department must implement in order to protect local surface and subsurface water quality.
Pond	A natural or man-made waterbody with a defined perimeter and limited in size. A retention basin, also referred to as a wet pond, wet detention basin or stormwater management pond (SWMP). A pond includes a permanent pool of water in its design.
Pollinators	A living organism that helps carries pollen from the male part of the flower (stamen) to the female part of the same or another flower (stigma) Pollinators are viewed as "beneficial species" and an integral member of the ecosystem.
Retention Area	An area where **stormwater** is held or retained stormwater on a permanent basis. These areas are used to store large amounts of stormwater until it eventually infiltrates downward into groundwater or the water reaches an elevation that it spills over into an outlet, sending it through the conveyance system.
Protected Species	Any species that is protected from harm due to anthropogenic activities such as land development and hunting through state or federal government legislation.
Right-of-Way	An Easement, a privilege to pass over the land of another, whereby the holder of the easement acquires only a reasonable and temporary access of the property and the owner of the land retains the benefits and privileges of ownership consistent with the easement. Examples of the City's rights-of-way include roadside swales and access paths to maintain stormwater assets.
Safety Data Sheets	The data sheets that are federally required for all hazardous chemicals. Sheets must contain all of the physical, health, and environmental health hazards; protective measures; and safety precautions for handling, storing, and transporting the chemical. Any entity creating, storing, distributing, or applying these chemicals must have these SDS's on-site and accessible to all staff.

Seawall	A retaining wall located along the perimeter of a water body, designed to maintain a fixed shoreline at a specific elevation above the seasonal high water mark of the adjacent waterbody. Seawalls can help prevent erosion and surface water runoff.
Sediment	Fine soil particles that have been detached from the land by erosion and are deposited into a body of water through surface water runoff, often mixing with decaying organic matter to create a muddy **substrate**. Sediments can suspend in the water, decreasing clarity and often contributing nutrients and other pollutants into the water.
Solubility	The measure of the ability of a substance to dissolve in a solvent, such as water. Pesticides that are highly soluble in water dissolve/dilute easily and are more likely to surface and groundwater.
Spillway	A device within a dam that regulates the height of the water on the inflow side, creating a reservoir or storage area for water, and maintains the **dam**'s structural integrity by allowing surplus water to be released on the outlet side.
Stormwater	Rainwater that runs off impermeable surfaces such as rooftops, paved streets, highways, and parking lots. Stormwater can also come from semipermeable surfaces hard such as lawns, playing fields, and from gravel roads and parking lots before it flows into the stormwater conveyance system. Stormwater can also travel through shallow aquifers or groundwater, seeping into **ponds**, **canals**, and **ditches** that intersect the groundwater table.
Submersed Aquatic Vegetation	Rooted plants that exist within the sublittoral zone, which have flaccid or limp stems with most of their vegetative mass located below the water surface, although small portions may extend above the water.
Sustainable (ecological)	The quality of not being detrimental to the environment, thereby maintaining long-term ecological balance without depleting the existing natural resources, or altering the native biodiversity.
Substrate	The collection of inundated soil and **sediments** that comprise the "ground" at the bottom of a waterbody.
Swale	A man-made, grassed, shallow, depression designed to be part of stormwater **runoff** collection and drainage conveyance system. Swales are characterized by its relatively gentle side slopes, and shallow depth when wet, designed to hold **stormwater** for 72 hours following a storm event.

Threatened Species	Any species that is vulnerable to becoming **endangered** in the near future, either worldwide or in a particular political jurisdiction. Moderate level of conservation status
Total Maximum Daily Load (TMDL)	Total Maximum Daily Load is a calculation of the maximum amount of a **pollutant** that a waterbody can receive and still meet water quality standards set by Federal, State, or local governments.
Weedoo	A specific brand of specialized airboat designed to cut and collect aquatic vegetation from shallow waterways.
Weir	A low head **dam** constructed to form a barrier across the width of a **canal** or river, to either raise the water level on the upstream side or regulate the rate of flow on the downstream side. Many times **spillways** are installed within a weir to allow seasonal manipulation of the water depth and flow.

This IPM Plan is Coordinated and Written by:
Kimberly Haigler
Environmental Planner
khaigler@cityofsebastian.org
(772) 388-8206