NPDES PHASE II INDIVIDUAL PERMIT-FINAL

MUNICIPALITY OF HUMACAO

EPA REGION 21- PUERTO RICO

PREPARED BY CSA GROUP, INC

REVIEW BY MUNICIPALITY OF HUMACAO

FEBRUARY 5, 2007

TABLE OF CONTENTS

CERTIFICATION

I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that the Humacao Planning Department properly gather and evaluate the information submitted by CSA Group, Inc. Based on my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Hon. Marcello Trujillo Panisse
Mayor

PO Box 178 Humacao, PR 00792 • Tel. 787.656-0400

EXECUTIVE SUMMARY

The content of this report was created based on the research performed with local environmental agencies in Puerto Rico and information gathered thru meetings with community representatives from the Municipality of Humacao.

The storm water plan presented in the body of this report is founded on the Best Management Practices (BMP's) and measurable goals applied to each of the six minimum control measures established by the EPA. The implementation term was developed for a five-year period.

The first control measure, identified as the Work Plan For Public Education and Outreach Program, is developed with eleven BMP's as follows; Development of Educational and Outreach Materials, Storm water Management Program Kick-Off Press Conference, Storm Water Educational Brochure Distribution Campaign, Public Announcement Radio Campaign, Newspaper Campaign, School Age Educational Campaign, Humacao River Cleanup Activity, Public Education and Program Progress Exhibit, Speakers Bureau, Municipal Employee Good Housekeeping and Illicit Discharge and Dumping Training and the Storm Water Awareness Survey. The second control measure identified as the Work Plan for Public Involvement and Participation Program, is developed with seven BMP's as follows; Community Interviews, Storm Water Interagency Committee, Storm Water Task Force, Public Hearings, Storm Water Stenciling Campaign, Storm Water Volunteer Group, and the Municipal Storm Water Hotline. The third control measure identified as Illicit Discharge Detection and Elimination is composed of a plan to detect and eliminate illegal discharges in conjunction with an educational outreach program to the community and industries. The fourth and fifth control measure, identified as Construction Site Storm Water Runoff Control and Post-Construction Runoff Control are focused on existing regulations and the interaction and involvement of the Municipality in the implementation of these regulations. Structural BMPs such as Bioretention and detention facilities are also recommended. The final control measure known as Pollution Prevention/Good housekeeping focuses on source controls such as automobile maintenance, parking lot and street cleaning, storm drain cleaning, septic system controls and material management by the employees of the Municipality.

The plan is designed in such a way as to provide sufficient lag space between events for the municipality to adjust to the changing environments during the 5-year implementation term.

INTRODUCTION

In 1987 the Environmental Protection Agency (EPA) amended the Clean Water Act (CWA), requiring the implementation of a two-phase program for addressing storm water discharges. On December 9, 1999 EPA published the second phase of the storm water regulations (64 FR 68721). As outlined in these regulations, municipal separate storm sewer systems ("MS4s") serving populations of more than 50,000 and/or possessing a density of 1000 people per square mile are required to obtain a General Phase II National Pollutant Discharge Elimination System (NPDES) Permit. The EPA is yet to issue a general NPDES Phase II permit for regulated MS4s. Given this unforeseen condition, the EPA is requesting municipal storm sewer operators to apply for an individual NPDES permit as required by 40 CFR 122.33.

The EPA has identified the Humacao municipality as an operator of a small MS4 requiring NPDES permit coverage. It is our privilege to present to the EPA, Humacao's Notice of Intent (NOI) to obtain the individual NPDES permit for the municipalities storm sewer system discharge. In the content of this NOI we will render the proposed storm water management plan to be implemented by the municipality in a five-year term. The plan will focus on the Best Management Practices (BMPs) and measurable goals applied to each of the six minimum control measures. These control measures have been identified as:

1. Public Education and Outreach
2. Public Participation and involvement
3. Illicit discharge detection and elimination
4. Construction site runoff control
5. Post-construction runoff control
6. Pollution prevention runoff control

As part of the NOI we will also include general information on the permittee, the nature of their business, a description of the characteristics and hydrology of the Humacao municipality, person(s) responsible for implementing the plan and the MS4 main users.

PERMITTEE GENERAL INFORMATION

The Humacao MS4 is currently owned and operated by the municipality under the direction of its mayor, Honorable Marcello Trujillo Panisse. The municipality is in the process of creating a Department of Environmental Affairs whose responsibility will be to implement and uphold the proposed storm water plan. Until this office is created and responsibilities distributed to its members, Mr. Trujillo Panisse, mayor of the municipality of Humacao will be the person responsible for assuring the plan maintains its proposed schedule. The

municipal offices of Mr. Trujillo Panisse are located at the following physical and mailing addresses:

Physical:	Mailing:
Mayor's Office Corner of Miguel Casillas Street El Pueblo District	Municipality of Humacao PO Box 178 Humacao, PR 00792 Tel: 1-787-852-3600/656-0400

HUMACAO GENERAL CHARACTERISTICS

The town of Humacao is located in the southeast region of the island of Puerto Rico at NAD 83 latitude 18° 09' 06" and longitude 6 5° 49' 06". The municipality covers an area of approximately 44.8 square miles of which 4.93 square miles are classified as urban area (for purposes of our MS4 management plan, only the delineated urban area is considered the service area of the municipality storm sewer system). The municipality borders in the north with the town of Naguabo, east with Las Piedras, south with Yabucoa and west with the Caribbean Sea. The main access roads to the town are road PR-30 entering the town from the west and road PR-3 accessing from the north. Humacao possesses a population of 59,035 habitants of which 20,682 reside in the urban area of the town (source: Yr. 2000 U.S. Census Bureau).

A map of the major roads and a topographic map delineating the urban area of Humacao are provided in Appendix A of this report.

SOIL CLASSIFICATION & TYPE

In accordance with Humacao's Territorial Plan of Yr.2000, know by its Spanish translation ("Plan de Ordenamiento Territorial"-"POT"), the municipality has distributed the extent of its region into three major soil categories and four soil types. The soil categories are: Urban Land ("Suelo Urbano"), Developable Land ("Suelo Urbanizable") and Rustic Land ("Suelo Rústico"). The following soil category percentages where calculated based on Humacao's 44.8 square mile area under the POT Plan:

Urban Land (21.8%)	Urban designation is the portion of land within Humacao that has already been developed.
Developable Land (2.8%)	Developable land is the portion of land that has been designated as an area that will be developed in the future, but at the moment no construction has taken place. This category is subdivided into programmed (1.1%) and non-programmed (1.7%) developments.

Rustic Land (75.4%)	The portion of land that is not to be disturbed by construction or urbanization. This category is subdivided in Common Rustic Land (62.9%) and Protected Rustic Land (12.5%). Common land is defined as the portion of territory that is not intended for urban development, but may be developed if the necessity arises in the future. Protected Rustic Land is the portion of land that is strictly protected from urban development because of its natural resource, agricultural benefits or historical significance.

The four major soil types in the Humacao region, as identified in the POT are: Pandura-Tierra Rocosa-Patillas, Coloso-Toa-Bajura, Caguabo-Mácara-Naranjito and Coloso-Toa Bajura.

For a visual guide of the different soil classifications and types in the municipality of Humacao refer to the maps provided in Appendix A.

MS4 MAIN USERS

The main users and primary pollutant sources of the Humacao MS4 are schools, hospitals, commercial complexes and airports located in the urban region of the town. Approximately 24 schools, 7 undergraduate universities/technical schools, 5 hospitals and 1 airport have been identified within the delineated urban area of Humacao. The potential industrial pollution sources are located around the outskirts of the town. As part of our storm water management plan an outreach program will be presented to promote the participation of the main users in the clean up activities of our plan.

For a visual guide of the potential industrial discharge locations within the municipality of Humacao refer to the maps provided in Appendix A.

HYDROLOGY

Two main waterways cross the municipality of Humacao: the Humacao River and the Mabú River, known within the community as “Los Muertos Creek”. These rivers are illustrated in the hydrology map provided in Appendix A. As portrayed in this map, the Humacao River runs through the middle of the municipality with a northeast to southeast trajectory, discharging into the Humacao beach. The Mabú River starts in the northern mountains of Humacao and runs on a south-southwest trajectory, discharging into the Humacao River. Mabú River was been identified by the municipality as the primary cause of flooding within the Humacao urban area. The shallow depth in some sections has raised the need of dredging and canalization in certain areas of the river. The municipality has

been requesting government financial assistance for this project but has been unsuccessful for several years.

Additional information regarding zoning, geologic and endangered species has been provided within Appendix A for your review.

NATURE OF THE BUSINESS

The Humacao Municipality is a government entity whose institutional mission statement is to provide a service of excellence in order to improve the quality of life within the community. The vision of the municipality is to transform Humacao into the model city of Puerto Rico possessing a healthy social, physical and economic environment. This vision will be made possible by utilizing their human resources and managerial capacity to guarantee a service of excellence to the community.

HUMACAO MUNICIPALITY STANDARD INDUSTRIAL CLASSIFICATION (SIC) CODE

The OSHA SIC code established by the Federal Office of Management and Budget under public administration for general federal, state or local government activities is 9199.

Proyect Name	**Program or Department**	**Permit Number**	**Status**
Proyecto La Casona (Community and Tourist Information Center)	Centro Expreso de Trámite (CET)	06CX2-CET00-02383	The permission was approved.
Construcción de Parque Pasivo y Pista para Trotar Urb. Patagonia	Centro Expreso de Trámite (CET)	06CX2-CET00-12050	The permission was approved.
Mejoras y Ampliación Centro Comunal- Bo. Mambiche Blanco	-------	-------	The permission in process to be submited.
Construcción de Alcantarillado Sanitario, Bo. Candelero Arriba y Bo. Buena Vista-	-------	-------	The permission in process to be submited.
Centro de Bellas Artes	Centro Expreso de Trámite (CET)	05CX2-CET01-04069	The permission was approved.

WORK PLAN FOR PUBLIC EDUCATION AND OUTREACH PROGRAM

PERMIT REQUIREMENT

"Implement a public education program to distribute educational materials to the community or conduct equivalent outreach activities about the impacts of storm water discharges on water bodies and the steps that the public can take to reduce pollutants in storm water runoff."

The minimum control objective established by the EPA for the Public Education and Outreach Program is to educate the general public on the human activities that contaminates storm water and the impacts of these contaminants in the quality of water.

PERMIT COMPLIANCE

The objective of the Municipality of Humacao (Municipality) is to plan and implement public education and outreach activities to educate its citizens on the NPDES Phase II Storm Water Management Program and encourage their participation in support of this effort. As one of six minimum control measures required, this work plan includes various activities that the Municipality will implement as part of its Public Education and Outreach Program. The implementation of this plan will be the responsibility of the Department of Environmental Affairs, to be created by the municipality**.** In conjunction with this department, the Municipality will rely on the Public Relations Office; the Youth Services Coordination Office; Recycle Programs, to plan and carry out the public education and public participation activities. The Municipality will explore federal funding for the environmental education programs presented as part of the Public Outreach Plans.

An illustration of the proposed timeline for the Public Education & Outreach Program as well as for the Public Participation & Involvement Program can be referenced in Appendix B of this report.

In order to meet the permit requirements and objectives established by the EPA, the following best management practices are to be implemented by the Municipality of Humacao:

Development of Educational and Outreach Materials

Measurable Goal

Designated staff will conduct a review of educational materials available from various sources such as the USEPA, USGS, PREQB, PR DNER, and others. At present educational material has been collected from these agencies during the development of the Storm Water Management Program for the Municipality. A preliminary review of various Internet sites recommended by the EPA Storm Water Management Program has provided additional educational material in

English and Spanish. These materials will be reviewed and evaluate for the appropriateness to target audiences.

Materials in Spanish will be developed for the activities to be implemented in the Public Education and Outreach Program. Among the materials suggested are: a general public education brochure that addresses all sectors of contamination; a program press kit to be used for media activities; an educational presentation appropriate for the general public; an educational presentation appropriate for Grades 5 & 6; and a presentation for Municipal employees on good housekeeping practices and identification of illicit discharges.

Each of the public education and outreach activities selected in the Final work plan will have the appropriate educational materials for distribution among the target audience. The development of these materials is estimated at 4 months and will occur during Year 2 of the permit term.

Justification

Appropriate materials that can be distributed to the general public and target audiences are an integral part of any public education and outreach activity.

Costs

Potential costs will vary depending on the printing specifications of each of the educational materials. The Municipality will try to share the reproduction costs with sponsors for this effort.

<u>"HUMACAO PROTEGE SUS AGUAS" – Storm Water Management Program Kick-Off Press Conference</u>

Measurable Goal

A press conference will be held by the Mayor of the Municipality of Humacao to launch the "Humacao Protege sus Aguas" Campaign (Humacao Protects its Waters) and briefly explain the Clean Water Act, NPDES Phase II Permit and describe the Municipality's Storm Water Management Program. The mayor will announce the activities to be implemented during the coming months. This activity will take place during Year 2 of the permit term.

The mayor can include the announcement of the creation of the new Environmental Department of the Municipal Government at this press conference, as well as the plans to create a Storm Water Management Interagency Committee and a Storm Water Task Force.

This activity includes the development of a press kit and educational materials for distribution at the conference. A press release will be issued to the major circulation newspapers, television stations, radio stations and regional media

prior to the press conference. Municipal employees should take pictures of the event for use in other educational and outreach activities.

All media coverage will be documented and tallied to measure effectiveness and be included in the EPA yearly reporting requirements. We anticipate coverage by the regional newspaper, El Oriental, as well as the local radio stations Radio Victoria, WALO and one major circulation newspaper.

Justification

The announcement of the Storm Water Management Program to comply with NPDES Phase II Permit requirements by the mayor, and the commitment of the Municipality in protecting and conserving its waters will provide credibility to the program efforts in the coming months.

Costs

Coverage by media is free, although the copies of press kits and other educational materials will have an associated cost. Sponsorship of this activity by a local pharmaceutical company, supermarket chain, or commercial enterprises will be solicited.

Storm Water Educational Brochure Distribution Campaign – Supermarkets

Measurable Goal

The Municipality will solicit the cooperation of local supermarkets, such as Pueblo, Wal-Mart, Sam's, Raph's Food Warehouse and Econo, to sponsor the distribution of the "Humacao Protege sus Aguas" Campaign's storm water general education brochure at checkout counters. Baggers or cashiers will be asked to include a brochure in groceries bags. Timing of this effort is scheduled for the following (6) months subsequent to the Kick Off Press Conference.

A total of 10,000 brochures will be printed and distributed, one (1) brochure per customer.

Justification

The Municipality would like to increase the overall knowledge of its citizens on storm water pollution and provide a contact number for questions from the public. The brochure will also encourage citizens to serve as volunteers for the program.

Costs

Distribution by the local supermarkets would be free of cost. However, there is an associated cost for the copies of the brochure to be distributed, which could range from $500 for black and white copies to $3,000 for color copies. We

anticipate that the supermarket(s) would cover or share this cost. The Municipality will provide the master brochure for reproduction.

Public Announcement Radio Campaign

Measurable Goal

The Municipality will produce a 30-second public service announcement for radio on how contaminants reach bodies of water through storm water and what the community can do to prevent this pollution.

The ad will air at a minimum three (3) times a month on the local radio station Radio Victoria or Walo thru the second year of the program. The mayor, a locally known actor or radio personality will be recruited to be the spokesperson for this radio announcement.

Justification

To disseminate information on the prevention of contamination of storm water and achieve an appropriate level of exposure of citizens to this message.

Costs

Public Service announcements are usually air free of costs. The spokesperson should donate his/her time to the recording of the ad.

Newspaper Campaign

Measurable Goal

The Municipality will request the cooperation of the regional newspaper "El Oriental" to publish an article/fact sheet in their newspaper at least once (1) a year. The Municipality will coordinate this effort with the other eight (8) municipalities that the newspaper's circulation includes. This activity will occur during the five-year permit term.

The local newspaper has a circulation of 60,000 and covers the municipalities of Humacao, Ceiba, Juncos, Gurabo, San Lorenzo, Las Piedras, Naguabo, Yabucoa and Caguas Pueblo. The estimated circulation in Humacao is 16,500 to 17,000.

Justification

This effort will increase the exposure of citizens to information on the impacts of contaminants on storm water and how the can take steps to prevent such impacts.

Costs

There is no cost associated to publishing the article/fact sheet.

"¿Y LA LLUVIA A DÓNDE VA?" – School Age Educational Campaign

Measurable Goal

A one (1) hour educational presentation entitled "¿Y la lluvia a dónde va?" for 5th and 6th graders will be created using existing materials developed for this purpose. The presentation would cover the hydrologic cycle, the effect of urbanization, and the relationship between raw water, potable water, wastewater, storm water and water quality. An emphasis will be placed on water conservation and contamination prevention. All children will receive educational material plus a general education brochure to take home to their parents.

The Municipality will contact the public and private schools in the Humacao urban area and coordinate presentations during Year 2 and Year 4 of the permit term. Each child will receive an educational kit and a certificate of appreciation as part of the "Humacao Protege sus Aguas" Campaign.

A tally of how many children attend the presentation and receive educational material will be maintained.

Justification

Educating young children on water and how they can help in the conservation of this resource will help promote public awareness. This effort may serve as an informal training for science teachers and the recruitment of volunteers for future activities.

Cost

The municipality should request the assistance of local government agencies such as the Environmental Quality Board (PREQB) and Department of Natural Environmental Resources (PRDNER) to offer these presentations and provide the educational material. Given the support of the local agencies, these presentations should be free of cost or of minimal cost to the municipality.

Humacao and Mabú River Cleanup Activity

Measurable Goal

The Municipality will solicit the sponsorship and cooperation of various public and private entities to conduct a cleanup of the Humacao and Mabú Rivers (Los Muertos Creek) as part of the public education and outreach program. The cleanup will elicit volunteers from community and environmental groups as well as ecologists and science teachers to guide the cleanup and identify the types of

trash collected. The Municipality will coordinate the trash pickup. This activity will take place during the Year 2 and Year 4 of the permit term. The media will be invited to attend the activity. Each of the participants will receive an activity T-Shirt.

The Municipality's intent is to coordinate this activity with the University of Puerto Rico, Humacao Campus, presently submitting their own NPDES Phase II Permit, the Association of Engineers and Surveyors of Puerto Rico ("Colegio de Ingenieros y Agrimensores de Puerto Rico), Humacao Chapter, and prominent community groups such as Casa Roig, Lions Clubs, Boy Scouts of America, etc.

The activity will be documented and photographed for the required EPA report and for other media uses. The Municipality will tally and if possible weight the number of trash bags collected each year that the cleanup is conducted. A comparison between Year 2 and Year 4 should be possible and determine the effectiveness of the storm water management program.

Justification

This activity will improve the health of the river basin as well as heighten awareness of the impacts of trash and pollution on the ecology and quality of bodies of water. The Municipality will notify all media of the event and anticipates, at minimum, local media coverage.

Costs

There is a cost involved in purchasing T-Shirts, trash bags and latex gloves. The sponsors of the events should cover these costs.

Public Education and Program Progress Exhibit

Measurable Goal

A Storm Water Management Program Educational poster board display will be developed to educate the public as well as show photographs of activities to the pubic visiting City Hall. The display will be exhibited in the lobby of City Hall and can be taken to different activities. The display will be designed during Year 2 of the permit term.

The Municipality can utilize this display at activities organized for the Storm Water Management Program as well as its yearly environmental fair, "Feria Ambiental del Este" or other community activities such as local festivals. The display design will be self-explanatory and include a brochure for people to take with them. It can be left alone in a secure public place or be manned by one or two persons.

Justification

This type of portable poster board display will serve as a presentation aid and can be easily transported to the different educational activities.

Costs

The cost of the poster board display is estimated at $500 to $800. The Municipality will seek sponsors to cover these expenses.

Speakers Bureau

Measurable Goal

Speakers, both municipal staff and volunteers, will be trained to attend community meetings and activities and speak on the impacts of contaminated storm water on bodies of waters, and how the general public can avoid contributing to these impacts.

Community organizations, churches, schools and interested groups can request a presentation from the Speakers Bureau. A tally of all such requests and presentations will be maintained for reporting purposes.

Justification

Presentations to community groups will allow increase the exposure of attendees to the Storm Water Management Program and its goals, as well as serve to recruit volunteer for program activities.

Costs

Costs for this activity would include copies of educational materials. The Municipality will try to share costs with a private sponsor.

Municipal Employees Good Housekeeping and Illicit Discharges and Dumping Training

Measurable Goal

The Municipality will distribute educational materials on storm water impacts to all employees during Year 2 of the permit term. In addition, it will prioritize groups of employees involved in public works and provide training on illicit discharges and dumping to storm water inlets during Year 2 of the permit term.

Justification

The training program will reduce the amount of contaminants entering the storm water system through improper storage, use and handling practices. Refer to the

Good Housekeeping section of this report for more details regarding this program.

Costs

Training will be conducted during work hours at a cost to the Municipality as well as the reproduction of good housekeeping training materials.

Storm Water Awareness Survey

Measurable Goal

A questionnaire to test the knowledge and practices of citizens regarding storm water impacts will be developed and a survey conducted at various malls throughout Humacao. The survey results will be tabulated to show the awareness level of the respondents. The survey will be conducted twice during the permit term's second and fourth year. The target number of completed questionnaires is 500. All questionnaires will be confidential and interviews properly identified. The surveys will be conducted during Year 3 and Year 5 of the permit term.

Justification

Although an informal survey, the results can shed light on the effectiveness of the Storm Water Management Program. It also provides an opportunity to provide respondents with educational material.

Costs

The Municipality and a sponsor should share the reproduction of the questionnaires, pencils, clipboards, etc. The costs are estimated at $500.

Additional Best Management Practices

Additional public education and outreach activities to be conducted during the permit term will be evaluate and prioritized according to the input received from community interviews, the NPDES Interagency Committee and the Storm Water Task Force. Among those BMPs considered for implementation in the future are:

- Storm Water Public Education Campaign – Gasoline Stations and Car Repair Shops Oil Recycling Campaign
- Storm water Public Education Campaign – Restaurants
- Storm water Public Education Campaign – Septic Tanks
- Storm water Public Education Campaign – Hospitals

WORK PLAN FOR PUBLIC INVOLVEMENT AND PARTICIPATION PROGRAM

PERMIT REQUIREMENT

"At minimum, comply with State, Tribal and local public notice requirements when implementing a public involvement /participation program.

PERMIT COMPLIANCE

This work plan describes the approach to be taken by the Municipality in order to encourage public participation in the Storm Water Management Program development and implementation.

The minimum control objective established by the EPA for the Public Involvement and Participation Program is the involvement of the community in developing, implementing, and reviewing the storm water management program. It also focuses on the effort made by the organization to reach out and engage all economic and ethnic groups in the program.

In order to meet the permit requirements and objectives established by the EPA, the following best management practices are to be implemented by the Municipality of Humacao:

Community Interviews

Measurable Goal

Community interviews will be held with members of the Humacao Community Board (Junta de Comunidad), municipal employees, elected officials, and the interested community groups to present the Storm Water Management Plan, determine public concerns, gather information on present problems in the Municipality and determine priorities in the implementation schedule.

At minimum, three (3) community interviews will be conducted before the "Humacao Protege sus Aguas" Campaign Kick Off Campaign and public hearing scheduled for May 2008.

Justification

Community interviews are a valuable tool to gather public input for the development of the plan as well as to elicit support for the Storm Water Management Program.

Costs

Refreshments may be appropriate and would involve a minimum cost.

Storm Water Interagency Committee

Measurable Goal

The legal authority over potential illicit discharges may not rest with the Municipality and therefore, an interagency committee composed of municipal and state representative of agencies such as: Department of Public Works, Puerto Rico Aqueduct and Sewer Authority, Department of Natural and Environmental Resources, the Environmental Quality Board, US Fish and Wildlife, US Army Corp of Engineers, US Environmental Protection Agency, is an invaluable tool to coordinate efforts to educate the community and identify illicit discharges that affect the storm water system of Humacao. The committee would meet quarterly.

Justification

The involvement of these agencies in the planning and implementation process will improve support for the Storm Water Management Program, particularly in the elimination of illicit discharges and development of municipal ordinances and regulations.

Costs

Refreshments may be appropriate and need to be covered by the Municipality.

Storm Water Task Force

Measurable Goal

A task force composed of community representatives, elected officials; municipal staff, local business, hospital, pharmaceutical companies and volunteers will be established to help implement the Storm Water Management Program. In particular the development of ordinances and municipal regulations related to illicit discharges, construction activities and post construction activities. The task force will meet quarterly.

Justification

Members of this task force can provide valuable suggestions and voice their concerns in the planning and implementation of the Storm Water Management Plan.

Costs

Refreshments may be appropriate and need to be covered by the Municipality.

Public Hearings

Measurable Goal

The Municipality will hold two (2) public hearings. The first will present the Storm Water Management Program and solicit public input. This event will occur during the second year of the permit term, approximately June 2009. A second hearing will be held during the fourth year of the permit term to solicit public opinion or concerns with the Storm Water Management Program.

Thirty (30) days prior to the public hearing, a public notice will be a published in one (1) major circulation newspaper and the regional newspaper, El Oriental, to notify the public on the date, time and place of the hearing. In addition a public radio announcement will be aired on the regional radio station, Radio Victoria or Walo, with the same information. The plan will be made available for public review at City Hall.

A tally of the number of people attending and speaking at the hearing will be taken to document public participation.

Justification

A Public hearing is an excellent forum to present the Storm Water Management Program and inform the public of storm water impacts. The hearing is also an excellent way to discuss the overall benefits to public health, water quality, and gain support from the attendees.

Costs

Copies of educational materials to be distributed to general public will involve a cost. The Municipality should cover this expense as well as the audio recording of hearing.

Storm Water Stenciling Campaign

Measurable Goal

This campaign involves stenciling storm drain inlets with a message warning citizens not to dump pollutants into the system. A possible example is “Aqui no lo tires…contaminas el Río Humacao” (Don’t dump it here…your polluting the Humacao River”. Municipal storm drain inlets will be prioritized by high pollution potential and a selection of the most visible inlets in the community will be documented and included as illustrations in the educational efforts. Municipal employees will direct groups of volunteers recruited for the implementation efforts. A press release will be issued to invite the media and create awareness to the event.

Justification

This stenciling campaign offers a unique opportunity to educate the public about storm drain systems and their link to drinking water. Volunteers will be asked to observe, pick up trash near inlets and take notes on maintenance needs. This activity can promote volunteers participating in monitoring and enforcement activities under the Storm Water Management Program.

Costs

Stenciling templates vary depending the material they are made of, Mylar stencils cost about 45 cents per linear inch and can be used for at least 25 times. The Municipality will try to secure a sponsor for this event.

Storm Water Volunteer Group

Measurable Goal

The Municipality will be actively recruiting volunteers through the permit term to participate in different activities of the Storm Water Management Program. In particular, these volunteers will receive additional education and training in illicit discharges, dumping, and encouraged to participate in the Municipality's monitoring and compliance activities.

Justification

This group of volunteers will be an integral part of the implementation and success of the Storm

Possible costs included group T-shirts, baseball caps, notepads, etc. The Municipality may choose to cover these expenses or elicit a sponsor.

Municipal Storm Water Hotline

Measurable Goal Water Management Program. The volunteers will allow the Municipality to increase educational and monitoring activities. In addition, volunteers will help in identifying problem areas for the Municipality in order to prioritize its cleanup efforts.

Costs

The Municipality will publicize a hotline telephone number for the public to request additional information, report illicit discharges, maintenance needs, etc. The number will be included in all educational and information materials developed for the program.

The hotline number will be publicized at least once a year in conjunction with the Newspaper Campaign of the Public Education and Outreach Program. The

municipal staff member answering the phone will complete a simple form regarding the call. All calls will be kept confidential. The form will be forwarded to the municipality's Department of Environmental Affairs for proper action.

In addition to newspaper publicity effort, stickers with the number will be included with all educational materials.

Justification

A contact number is an excellent tool for the Municipality to maximize its effort to curb illicit discharges and dumping activities. The general public will be encouraged to report suspicious activities at all activities of the Storm Water Management Program.

Costs

This effort involves the cost of a direct line and the design and reproduction of the Hotline stickers. The Municipality will cover these expenses.

ILLICIT DISCHARGE DETECTION AND ELIMINATION

PERMIT REQUIREMENTS

- Develop, implement and enforce a program to detect and eliminate illicit discharges (as defined in 40 CFR § 122.26(b)) in your small MS4.

- Develop a storm sewer system map, showing the locations of all outfalls and the names and locations of all waters of the United Sates that receive discharges from those outfalls.

- Prohibit, through ordinance, or other regulatory mechanism, non-storm water discharges into your storm sewer system and implement appropriate enforcement procedures and actions.

- Develop and implement a plan to detect and address non-storm water discharges, including illegal dumping to your system.

- Inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste.

- Address any sources of non-storm water discharges or flows if identified as significant contributors of pollutants.

PERMIT COMPLIANCE

This section of the plan has been developed to detect and eliminate illicit discharges, as defined in 40 CFR § 122.26(b) (2), into the MS4 of the urban area in the Municipality of Humacao. The plan includes procedures for locating priority areas likely to have illicit discharges, procedures for tracing the source of an illicit discharge, procedures for removing the source of the discharge, and procedures for program evaluation and assessment.

Storm Sewer Map

A map for the MS4 in Humacao, showing the locations of all outfalls and the names and locations of all waters of the United States that receive discharges from those outfalls, has been developed from the information received by the Municipality. Appendix C contains a summary report of the outfalls identified. A map showing all outfall locations is presented in Appendix D.

A total of forty-eight (48) outfalls were found for Humacao's MS4. The following bodies of water receive discharges from the MS4:

- Humacao River contains 11 different discharge locations

- Caño Fronteras contains 6 different discharge locations
- Mariana Creek contains 7 different discharge locations
- Coto Mabu River contains 18 different discharge locations

It was not possible to identify the exact discharge location or receiving body of water of six (6) outfall structures. The unidentified discharge points are: PD-20, PD-21, PD-22, PD-32, PD-33 and PD-34. Three of these structures discharge into an open channel, whose receiving body of water was not identified.

As part of this program, further investigation will be conducted to identify the exact location and receiving body of water of the six (6) outfall structures that were not identified.

At the time of the investigation, six (6) outfalls were discharging what seemed to be wastewater and fourteen (14) outfalls were discharging clear water. As identified in the report, the outfalls apparently discharging wastewater are: PD-1, PD-24, PD-25, PD-37, PD-40, and PD-43. The outfalls discharging clear water are: PD-9, PD-10, PD-13, PD-16, PD-17, PD-19, PD-21, PD-23, PD-26, PD-27, PD-28, PD-33, PD-35, and PD-36. Field visits to outfalls PD-32 through PD-48 were done three days after a rain event. Due to this event, some of these outfalls may have been discharging surface runoff from the rain events at the time of the visit. However, outfalls discharging water will still be a priority for screening purposes.

The six outfalls that were apparently discharging wastewater will be given first priority during the plan to locate and eliminate illicit discharges. The fourteen outfalls discharging clear water will be given second priority during the plan. After the first and second priority outfalls have been screened and sampled, screening of the remaining outfalls will follow.

In addition, seven (7) outfall locations were found to contain catch basins. These catch basins should be cleaned out and given maintenance regularly. This will be included in the Pollution Prevention/Good Housekeeping section.

Legal Prohibition and Enforcement

A municipal ordinance will be developed to prohibit illicit discharges into the MS4. The ordinance will prohibit non-storm water discharges into Humacao's storm sewer system either by illicit connections to the system or dumping into the MS4. An illicit discharge is defined as any discharge to an MS4 that is not composed entirely of storm water, with exceptions such as discharges from NPDES-permitted industrial sources and discharges from fire fighting activities. Other non-stormwater discharges not addressed in this ordinance, unless they are identified as significant contributors of pollutants to the MS4 are:

- water line flushing,

- landscape irrigation,
- diverted stream flows,
- rising ground waters,
- uncontaminated ground water infiltration,
- uncontaminated pumped ground water,
- discharges from potable water sources,
- foundation drains,
- air conditioning condensation,
- irrigation water,
- springs,
- water from crawl space pumps,
- footing drains,
- lawn watering,
- individual residential car washing,
- flows from riparian habitats and wetlands,
- dechlorinated swimming pool discharges, and
- street wash water

The Municipality of Humacao will carry out enforcement of the ordinance. Enforcement methods to be employed include fines and cost recovery penalties for cleanup. High fines and penalties will be necessary because many individuals dump illegally in order to avoid waste disposal costs. The fine must be more than the cost for proper disposal, or illegal dumping will seem like an easier and more economical choice. The proceeds from fines and penalties can be used to help fund the programs included in this plan.

Plan to Detect and Eliminate Illegal Discharges

The plan to detect and address illegal discharges to the system will include four main steps: locate problem areas, find the source, remove or correct illicit connections and document the ensuing course of action.

Locate Possible Problem Areas

Possible problem areas, some of which have already been identified and any newly identified areas, will be inspected and screened using any of the appropriate methods described under the heading *Find the Source.* The primary focus of these assessments is to determine if these areas contain illicit connections and to identify the point source of the illicit connection. Some problem areas have already been identified by the Municipality in a MS4 Outfall assessment, as well as by the community.

The investigation performed to locate the outfalls for the Municipality's MS4 yielded six (6) first-priority problem areas in which wastewater is suspect of being discharged directly into a receiving body of water. These outfalls will be screened and sampled to determine if in fact wastewater is being discharged. If necessary, testing will be done to determine the type of wastewater being discharged. Sampling and screening of the six outfalls will be conducted by the end of Year 1.

Additional screening will be done at the fourteen (14) second-priority outfalls. Sampling will be done at any of these locations only if deemed necessary to determine presence and composition of waste in the water. Screening of at least half of these locations to determine if wastewater is being discharged will be completed by Year 2. Screening of the remaining second-priority outfalls will be completed by Year 3.

According to information provided by the community, some sections of the sanitary trunk sewer system within the Humacao urban area suffer from overflowing conditions. Sanitary sewer overflows occur when the flow into the system exceeds the design capacity of the conveyance system. Overflows may also occur during flood events, but chronic overflows are an indicator of a failing sewer system. Untreated sewage that overflows onto the roads enters the MS4, causing an illicit discharge. The identification of the problem areas will be carried out by field visits during rain events and/or by public complaints reported in the community HOTLINE.

With respect to illicit discharges from failing septic tanks, possible problem areas, as identified by the "POT", include areas with low population density, areas with a spontaneous origin, or areas that are far away from the main sanitary sewer trunk. Although most of Humacao's urban area is covered by the sanitary sewer system, the aforementioned areas are more likely to discharge their domestic waste into septic tanks.

Thirteen industrial facilities have been identified in the Humacao urban area or within a 1-mile radius from the Humacao urban area. Of the thirteen facilities identified in the list below, the top five are of critical importance due to their location within the identified MS4 study region. These five facilities will be screened to identify any possible discharges into the municipality's MS4. The

locations of these industries are presented in Appendix A under the title "Industrial Potential Discharge Locations".

Industrial Facility Listing Within the Humacao Municipality

- PRASA WTP Humacao/Las Piedras
- PCR Puerto Rico Inc.
- GTE Sylvania Connector Product Inc.
- Syntex (FP) Inc.
- Bourns Puerto Rico Inc.
- Syntex (FP) Palmarejo Creek
- Squibb Manufacturing Inc
- Life Savers Inc.
- Alcon Puerto Rico Inc.
- Caribe GE Distribution Components Inc.
- Ex-Lax Inc.
- Tonka Footwear Company Inc.
- PRASA Humacao WWTP

The screening process for the five critical industrial facilities will include visual inspections and water sampling. Water sampling from surrounding manholes will be taken only on those facilities identified as possible dischargers into the MS4. The visual inspections of the facilities will be completed by Year 2 and water sampling on those facilities identified as possible dischargers into Humacao's MS4 will be performed on a yearly basis. It will be at the municipality's discretion to extend the screening process to the remaining eight industries located within the one mile radius of the urban area.

In addition to the possible problem areas already identified, various techniques will be used to locate additional possible problem areas. The techniques to be employed include visual screening and water sampling during dry weather from critical manholes and the outfalls that have not been identified as priority outfalls at the beginning of this section. Critical manholes are defined as those structures identified in a location near facilities considered having a high risk of discharging pollutants into the MS4 and manholes that experience reoccurring overflow. High-risk facilities include, but are not limited to, hospitals, industries,

automobile repair shops, car washes or any commercial facility whose business requires the handling of hazardous materials. The dry season inspections are to be performed on critical manholes every 4 months during the occurrence of a two-week dry weather period. The visual inspection of the urban area outfalls will be performed twice a year during the months of March and September.

Find the Source

The first step in correcting an illicit discharge is locating the illicit point source of the problem area. In addition to the visual inspections and water monitoring procedure mentioned above, the reporting of illicit connections and dumping will be encouraged through the educational outreach and participation programs mentioned in the prior sections of this report.

Depending on the nature of the identified problem area, the following procedures will be implemented:

Sanitary Sewers

Once the specific location of sanitary sewer overflow or illegal connection has been identified, the responsible agency, Puerto Rico Aqueduct and Sewer Authority (PRASA). PRASA is responsible for any repair and maintenance work to be performed in the sanitary sewer system. The Municipality will be responsible of following up on the notification and assuring, to the extent possible, that remedial action is taken.

Septic Tanks

Performing field visits to the areas which have been identified as more likely to use septic tanks, can identify failing septic systems. Trained personnel should conduct these field visits. During the visits, personnel will pay attention to common indicator of failing systems, such as odors and visual observances including surface pooling and patches of very green grass, particularly in isolated pockets.

Industrial Facilities

Industrial facilities that have been identified as problem areas will be notified. The facility will then be responsible of performing an investigation which includes the following methods to identify the source of improper industrial discharge into the MS4:

- Analysis of dry weather discharges: Water samples from storm drain manholes within the facility or near the facility must be collected. The facility will choose appropriate analytical methods to be conducted for these water samples according to processes and chemicals used in the facility.

- Piping schematic review: Construction plans and plumbing details must be examined for potential sites where improper connections have occurred.

- Smoke testing or dye testing: Either one of these methods must be used to locate problem-causing connections.

A report summarizing the findings from the investigation must be turned in to the Municipality of Humacao Department of Environmental Affairs. The report must include the conclusion reached from the investigation as to whether illicit connections are found within the facility and if illicit discharges have occurred from these connections. If the conclusions report the findings of illegal connections, the municipality must assure the facility takes immediate action to remove this connection.

Dry Weather Discharges

If water sampling from manholes and outfalls during dry weather indicate the presence of illicit discharges, the same procedure used with industrial illicit connections will be applied. As mentioned above, these methods would include piping schematic reviews, and smoke or dye testing.

Remove/Correct the Illicit Connections

Once the source of an illegal discharge has been identified, the offending discharger will be notified and directed to correct the problem. The offender will be subject to fines and cost recovery penalties for cleanup.

After field visits have been performed to identify problem areas due to failing septic systems, the Municipality may assess if the discharge volume is a significant source of pollution. If septic systems are found to be a significant source of pollution, an adequate action plan will be created to eliminate the polluted discharges.

Document the Actions Taken

As a final step, all actions taken under the plan will be documented. This will illustrate the progress being made to eliminate illicit connections and discharges. Documented actions will be inserted in annual reports and include the following information: the number of outfalls and manholes screened, number of septic systems investigated, any complaints received and corrected, and the number of discharges and volume of flow eliminated.

Educational Outreach

As part of the Educational Outreach and Public Involvement measures, public employees, businesses, and the general community will be instructed on ways to detect and eliminate illicit discharges as well as the effects on public health and

the environment caused by illegal discharges. For more details regarding this training refer to the Municipal Employees Good Housekeeping and Illicit Discharges and Dumping Training section of this report.

MEASURABLE GOALS

Measurable goals are intended to gauge permit compliance and program effectiveness. The following measurable goals are targeted for the Illicit Discharge Detection and Elimination Minimum Control Measure.

Permit Term	Activity
Yearly	**Screening and sampling of critical manholes and outfalls.**
1 year	**Completion of storm sewer map identifying the location of all outfalls and the names and location of all receiving bodies of water.**
2 year	Complete sampling of the six (6) first priority outfalls.
2 year	Identification of receiving bodies of water of the six (6) unidentified discharge points.
2 year	Municipal ordinance in place.
2 year	Visual inspection of critical industrial facilities. Identify problem areas related to inspected industrial facilities.
2 year	Correct all problem areas related to overflowing sanitary sewer systems.
2 year	Determine whether septic systems are significant source of pollution.
2 year	Screen and sample, if necessary, at least seven (7) of the fourteen (14) second priority outfalls.
3 year	Correct illicit connections related to industrial problem areas.
3 year	Identify all critical manholes in the urban area.
3 year	Present plan to correct critical septic systems producing polluted discharges.
3 year	Complete screening and sampling, if necessary, of the remaining second priority outfalls.
4 year	Eliminated 60% of all detected illicit discharges.

Permit Term	Activity
5 year	Eliminated 100% of all detected illicit discharges.

CONSTRUCTION SITE STORM WATER RUNOFF CONTROL

PERMIT REQUIREMENTS

Develop, implement and enforce a program to reduce pollutants in any storm water runoff to Humacao's MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. Reduction of storm water discharges from construction activity disturbing less than one acre must be included in your program if that construction activity is part of a larger common plan of development or sale that would disturb one acre or more. If the NPDES permitting authority waives requirements for storm water discharges associated with small construction activity in accordance with § 122.26(b)(15)(i), you are not required to develop, implement, and or enforce a program to reduce pollutant discharges from such sites. The program must include the development and implementation of, at a minimum:

- An ordinance or other regulatory mechanism to require erosion and sediment controls as well as sanctions to ensure compliance, to the extent allowable under State, Tribal, or local law;
- Requirements for construction site operators to implement appropriate erosion and sediment control best management practices;
- Requirements for construction site operators to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts to water quality;
- Procedures for site plan review, which incorporate consideration of potential water quality impacts;
- Procedures for receipt and consideration of information submitted by the public; and,
- Procedures for site inspection and enforcement of control measures.

PERMIT COMPLIANCE

This section of the plan describes the regulations that have already been developed, implemented, and enforced by the Puerto Rico Environmental Quality

Board (EQB) concerning the control of erosion and prevention of sedimentation. The regulations presented in "*Reglamento para el Control de la Erosión y Prevención de la Sedimentación*" (EQB) (from here on referred to as Reglamento), which comply with most of the permit requirements described above, became effective on March 23, 1998.

Regulatory Mechanism

In compliance with *"Ley sobre Política Pública Ambiental",* Law Number 9 of June 18, 1970, as amended, the Reglamento prohibits moving of soil or conducting construction or demolition activities without having implemented a Plan for the Control of Erosion and Prevention of Sedimentation (Plan CES) approved and authorized by the EQB.

Municipal Ordinances will be put in place to assure contractors abide by the EQB regulations. The Municipality's Department of Environmental Affairs will be closely involved in the supervision of the compliance of this permit in construction sites. Appendix A lists the registered constructions within the Humacao MS4.

Implementation of Erosion Control and Sedimentation Prevention Measures

For any construction project with an area greater than 900 meters, (approximately 0.22 acres) a Plan CES must be submitted in order to obtain a Permit CES from the EQB. The Plan CES must include, among other things:

- Location and graphical interpretation of the final drainage pattern proposed for the project and the measures that will be implemented to control the erosion of the soil to prevent sedimentation in nearby waters;

- Detailed description of the provisional and permanent measures for erosion control to prevent sedimentation to be implemented within the project site;

- Detailed description of forestation and planting activities, including among other things, location and extension and pre-existing areas of vegetation that will not be altered by the project; and

- Grading plan indicating the location of the erosion control measures employed.

The erosion control practices to be implemented in the project must be methods approved by the EQB. The EQB suggests implementation of 'management measures' presented in EPA's "*Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters*". The 'management measures' are defined as economically achievable measures to control the addition of pollutant to our coastal waters, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint

pollution control practices, technologies, processes, sitting criteria, operating methods, or other alternatives.

Any non-hazardous solid waste generated during a construction project must comply with local waste handling regulations established by the EQB in "*Reglamento para el Manejo de los Desperdicios Sólidos No Peligrosos",* in effect since December 17, 1997. In general, these regulations prohibit the generation, storage, recollection, transportation, or management of non-hazardous solid waste without previously establishing measures to avoid fires, explosives, spills or discharge of materials with objectionable odors. No person may cause the dispersion, spill, discharge, deposit, or accumulation of non-hazardous solid waste in any site not approved by the EQB.

Inspections and Penalties

The *Reglamento* for sediment control provide the EQB the right to inspect project sites to assure that the terms and conditions agreed upon by the Permit CES are met. Members, employees, and agents, as well as authorized officers from other agencies and organizations may perform these inspections. The appropriate personnel of the Humacao Department of Environmental Affairs will arrange inspection visits with the EQB.

Penalties will be those established in the *Reglamento.* The EQB has the right to impose penalties of up to $25,000 per infraction per day the infraction is committed. Sanctions may be presented for infractions to the *Reglamento* or infractions to the certification process.

Information Submitted by the Public

The hotline developed under the Public Participation/Involvement Minimum Control Measure will provide for the receipt and consideration of public inquiries, concerns, and information submitted regarding local construction activities. The Humacao Department of Environment Affairs is required only to consider the information submitted, and may not need to follow up and respond to every complaint or concern. A record keeping process will be developed in order to document submitted public information, both written and verbal.

MEASURABLE GOALS

Permit Term	Activity
1 year	Procedure for management of information submitted by the public in place.
2 year	Public ordinances in place.
3 years	Procedure for site inspections implemented.

4 years	Improved compliance by construction contractors with established regulations.
4 years	Improved clarity and reduced sedimentation of local water bodies.

POST-CONSTRUCTION RUNOFF CONTROL

PERMIT REQUIREMENTS

Develop, Implement, and enforce a program to address storm water runoff from new developments and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharges into your small MS4. The program must ensure the following conditions:

- The controls in place will prevent or minimize water quality impacts;
- Develop and implement strategies which include a combination of structural and/or non-structural BMPs appropriate for your community; and
- Use an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under State, Tribal, or local law; and
- Ensure adequate long-term operation and maintenance of BMPs.

PERMIT COMPLIANCE

This section of the plan describes management practices that will be developed, as well as others that have already been developed, in order to improve the management of post-construction runoff.

A municipal ordinance that addresses post-construction runoff from new development and redevelopment projects that impact one or more acres will be created. This ordinance will require new developments to comply with non-structural BMPs and to include structural BMPs in their development to the extent practicable and economically feasible.

Non-Structural BMPs

The municipality of Humacao, in compliance with "*Ley de Municipios Autónomos"*, Law Number 81 from August 30, 1991, has developed territorial plans. These plans attend to the different aspects of municipal space and its order. They also develop a strategy for the management of urban land, the transformation to urban land in an aesthetic and compact fashion, and the

utilization of rustic land in a non-urban manner (refer to Soil Classification Map in Appendix A).

The municipality of Humacao will develop a plan that will guide the development of lands away from sensitive areas, such as critical habitats, and will restrict the growth near areas which may compromise the water quality.

Structural BMPs

New development or redevelopment projects that impact one or more acres will be required to identify areas within the project suitable for structural BMPs. These areas will be identified based on (1) the level of pollution in the water, (2) available land, and (3) the amount of flooding occurring at the site.

In addition, the Humacao Department of Environment Affairs will identify any potential sites around the urban zone to locate bioretention areas. Once any areas have been identified as possible sites for structural BMPs, the Department of Environmental Affairs will develop a plan for the installation of this measure.

Several structural BMPs are recommended below. It is up to the Humacao Department of Environment Affairs to evaluate and accept or deny alternate structural BMPs recommended for specific projects.

Detention and Infiltration

Detention and infiltration BMPs control storm water by gathering runoff and slowly releasing it to receiving waters or drainage systems. These practices serve two purposes; they control storm water volume and settle out particulates for pollutant removal.

Once areas have been identified, either an infiltration basin or a dry detention pond may be used as a storm water management practice. An infiltration basin is a shallow impoundment designed to infiltrate storm water into the ground. This practice is believed to have high pollutant removal efficiency. A dry detention pond is a basin designed to intercept a volume of stormwater runoff and temporarily impound the water for gradual release to the receiving stream or storm water sewer system. As a general rule, dry ponds should be implemented for drainage areas greater than 10 acres. In an environment where land is a limiting factor, the pond may be used if a relatively large area is available downstream of the pond.

Depending on the proximity to the MS4, the quality of the runoff, and the amount of land available, either of these BMPs may be selected as a control measure.

Special consideration for the location of these systems will be given to land classified as “rustic lands” (suelo rústico) located around most of the urban land (suelo urbano), refer to Appendix A for Classification Maps. Rustic lands are a viable option for these BMPs given their vast coverage, their proximity to the

urban area and their limited utility. By definition, rustic lands are lands that should be protected from urban development because of their natural, ecological, or recreational value, their risk to public safety or health, or not being necessary for expected urban growth within eight years.

Dry detention ponds construction costs range depending on the size of the pond. Estimated costs for a 1acre-foot pond are approximately $41,600 and $239,000 for a 10 acre-foot pond. The annual cost of routine maintenance is typically estimated at 3 to 5 percent of the construction costs. Maintenance activities include removing litter and debris, management of pesticide and nutrients, mowing of side slopes, semiannual inspections to note any erosion or damage to the embankment. Ponds are long-lived facilities (typically longer than 20 years) and thus, the initial investment into the pond system can be spread over a relatively long time period.

Infiltration basins are relatively cost effective practices because little infrastructure is needed when constructing them. The construction costs of these basins have been estimated at $2 per ft^3. Maintenance costs are usually 5 to 10 percent of construction costs. These costs includes activities such as mowing, removal of litter and debris, repair eroded areas and semiannual inspections of eroded areas. An important consideration in the sitting of infiltration basins is the permeability of the soil. Infiltration basins have a better long-term performance in an area with highly permeable soils. In Humacao, the Pandura and Caguabo soil series consist of well-drained and good permeability. The Coloso soil series, which consist of poorly drained and slowly permeable soils, would not be appropriate for infiltration basins.

Bioretention

Bioretention is a useful BMP for highly urbanized areas and should not be used in areas larger than 5 acres. Bioretention areas are landscaping features adapted to provide on-site treatment of storm water runoff. They are commonly located in parking lot islands or within small pockets of residential land uses. Their use may be extended to road islands as well. These systems are designed with an underdrain system to collect filtered runoff at the bottom of the filter bed and direct it to the storm drain system.

Bioretention areas are relatively expensive and their estimated cost depends on the volume of water treated by the facility. The design, construction, and permitting costs may be estimated using the following formula:

$$C = 7.30\ V^{0.99}$$

Where V is the volume of water treated by the facility in ft^3. Assuming volume of water of 2,025 ft^3 during a 15 minute rain event in a 1 acre facility served by the bioretention area, the design, construction, and permitting costs for this area are approximately $13,700.

An important consideration when evaluating the costs of bioretention is that this practice replaces an area that most likely would have been landscaped. Similarly, maintenance activities conducted on this bioretention area are not very different form maintenance of landscaped areas. Maintenance activities include remulching void areas, treating diseased trees and shrubs, watering plants, removing litter and debris, etc.

MEASURABLE GOALS

Permit Term	Activity
2 years	Public ordinance in place
3 years	Identify potential locations for detention, infiltration, and/or bioretention areas
4 years	Installation of any detention, infiltration, and/or bioretention areas if potential sites were identified.
5 years	Improved clarity and reduced sedimentation of local water bodies.

POLLUTION PREVENTION/GOOD HOUSEKEEPING

REQUIREMENTS

- Develop and implement an operation and maintenance program with the ultimate goal of preventing or reducing pollutant runoff from municipal operations into the storm sewer system;

- Include employee training on how to incorporate pollution prevention/good housekeeping techniques into municipal operations such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and storm water system maintenance. To minimize duplication of effort and conserve resources, the MS4 operator can use training materials that are available from EPA, their State or Tribe, or relevant organizations;

- Determine the appropriate best management practices (BMPs) and measurable goals for this minimum control measure.

Source Controls

Automobile Maintenance

The Municipality of Humacao will pursue the establishment of a program of targeted outreach and training for businesses and municipal fleets (public works, school buses, fire, police, and parks) involved in automobile maintenance about practices that control pollutants and reduce storm water impacts.

Automotive maintenance facilities are considered to be storm water "hot spots" where significant loads of hydrocarbons, trace metals, and other pollutants can be produced that can affect the quality of storm water runoff. Some of the waste types generated at automobile maintenance facilities and at homes of residents performing their own car maintenance include the following:

- Solvents (paints and paint thinners)
- Antifreeze
- Brake fluid and brake lining
- Batteries
- Motor oils
- Fuels (gasoline, diesel, kerosene)
- Lubricating grease.

Fluid spills and improper disposal of materials result in pollutants, heavy metals, and toxic materials entering ground and surface water supplies, creating public health and environmental risks. Alteration of practices involving the cleanup and storage of automotive fluids and cleaning of vehicle parts can help reduce the influence of automotive maintenance practices on storm water runoff and local water supplies.

The most effective way to minimize the impacts of automotive maintenance generated waste is by preventing its production. A pollution prevention program, starting with the municipality's Public Works Department, seeking to reduce liquid discharges to sewer and storm drains from automotive maintenance will stress techniques that allow facilities to run a dry shop. Among the suggestions for creating a dry operation are the following:

- Spills should be cleaned up immediately, and water should not be used for clean up whenever possible.

- Floor drains that are connected to the sanitary sewer should be sealed off.

- A solvent service might be hired to supply parts and cleaning materials, and to collect the spent solvent.

Those facilities that are not able to eliminate discharges to the sanitary sewer system would be required to treat their wastewater prior to release from the site, in accordance to USEPA NPDES or PR Water and Sewer Authority (PRASA) guidelines.

Other methods will be implemented as part of this plan to help prevent or reduce the discharge of pollutants from vehicle maintenance. Table 1 lists some of the measures that would be implemented to reduce vehicle maintenance and repair impacts. Many of these practices apply also to business owners and to residents who maintain their own vehicles. These practices will be applied mainly to maintaining Humacao's municipal fleets, including school buses, public works, fire, police, parks, and other types of municipal fleets.

Table 1. Recommendations for reducing the storm water impacts of automotive maintenance.

Waste Reduction	• The number of solvents used should be kept to a minimum to make recycling easier and to reduce hazardous waste management cost. • Do all liquid cleaning at a centralized station to ensure that solvents and residues stay in one area. • Locate drip pans and draining boards to direct solvents back into solvent sink or holding tank for reuse.
Using Safer Alternatives	• Use non-hazardous cleaners when possible. • Replace chlorinated organic solvents with nonchlorinated ones like kerosene or mineral spirits. • Recycled products such as engines, oil, transmission fluid, antifreeze, and hydraulic fluid can be purchased to support the market of recycled products.

Spill Clean Up	• Use as little water as possible to clean spills leaks, and drips. • Rags should be used to clean small spills, dry absorbent material for larger spills, and a mop for general cleanup. Mop water can be disposed of via the sink or toilet to the sanitary sewer.
Good Housekeeping	• Employee training and public outreach are necessary to reinforce proper disposal practices. o Conduct maintenance work such as fluid changes indoors. o Update facility schematics to accurately reflect all plumbing connections. o Parked vehicles should be monitored closely for leaks and pans placed under any leaks to collect the fluids for proper disposal or recycling. o Promptly transfer used fluids to recycling drums or hazardous waste containers. o Do not pour liquid waste down floor drains, sinks, or outdoor storm drain inlets. o Obtain and use drain mats to cover drains in the event of a spill. o Store cracked batteries in leak-proof secondary containers.
Parts Cleaning	• Use detergent-based or water-based cleaning systems instead of organic solvent degreasers. • Steam cleaning and pressure washing may be used instead of solvent parts cleaning. The wastewater generated from steam cleaning can be discharged to the on-site oil/water separator.

Through the use of structural and nonstructural BMPs, the municipality would be able to reduce concentrations of lead, oil, and grease to levels approaching USEPA benchmarks.

Parking Lot and Street Cleaning

This management measure involves employing pavement-cleaning practices such as street sweeping on a regular basis to minimize pollutant export to receiving waters. These cleaning practices are designed to remove from road and parking lot surfaces sediment debris and other pollutants that are a potential source of pollution impacting urban waterways.

The Municipality of Humacao currently engages in daily (twice a day) street-sweeping activities in the urban center using brooms, shovels and other non-mechanical devices. Street sweeping is practiced in most urban areas, often as an aesthetic practice to remove sediment buildup and large debris from curb gutters. The frequency and intensity of rainfall for a region are also key variables in determining how streets need to be swept to obtain desired removal efficiency. Other factors that affect a street sweeper's ability to reduce non-point pollution include the condition of the street, its geographical location, the operator's skill, and the presence of parked cars.

One factor considered most essential to the success of street sweeping as a pollutant removal practice is use of the most sophisticated sweepers available. The Municipality will pursue the acquisition and effective use of mechanical devices to perform street and public parking spaces cleanup. An economic feasibility assessment will be performed to evaluate the implementation of these measures against the environmental pollutant reduction potential.

The Municipality will implement an aggressive program for the sweeping of parking lots. This is also employed as a nonstructural management practice for industrial sites. This sweeping involves using brooms to remove small quantities of dry chemicals and solids from areas that are exposed to rainfall or storm water runoff. While the effectiveness of this practice at pollutant removal is unknown, the sweeping and proper disposal of materials is a reasonably inexpensive method of pollution prevention that requires no special training or equipment.

A benefit of high-efficiency street sweeping is that by capturing pollutants before they are made soluble by rainwater, the need for structural storm water control measures might be reduced. Structural controls often require costly added measures, such as adding filters to remove some of these pollutants and requiring regular manpower to change-out filters. Street sweepers that can show a significant level of sediment removal efficiency may prove to be more cost-effective than certain structural controls, especially in more urbanized areas with greater areas of pavement.

Storm Drain System Cleaning

Storm drain systems and catch basins need to be cleaned regularly. The Municipality of Humacao will implement a periodic Storm Drain System and catch basins cleanup schedule. Routine cleaning would reduce the amount of pollutants, trash, and debris both in the storm drain system and in receiving waters. Clogged drains and storm drain inlets can cause the drains to overflow, leading to increased erosion. The program will take place once a year before the heavy rain season to ensure an efficient handling of rainwater during peak precipitation periods. The program may include periodic inspections to detect the need for isolated cleaning activities that may be needed in discreet sections of the storm drain network.

Potential benefits of this program would include increased dissolved oxygen, reduced levels of bacteria, and support of in-stream habitat. Areas with relatively flat grades or low flows should be given special attention because they rarely achieve high enough flows to flush themselves.

Through the outfall investigation conducted, there were seven (7) catch basins identified either near or as part of the outfall structure. In addition to the regular maintenance and cleanup activities for the catch basins, further field investigations will be carried out to identify additional catch basins within the MS4.

Septic System Controls

Septic system source control refers to the use of outreach programs to educate homeowners about the proper operation and maintenance of their septic systems to reduce the likelihood of failure.

Septic systems are designed to treat wastewater by separating solids from liquids and then draining the liquid into the ground. Sewage flows into the tank where settling and bacterial decomposition of larger particles takes place, while treated liquid filters into the soil. When system failures occur, untreated wastewater and sewage can be introduced into ground water or nearby streams and water bodies.

Pollution prevention practices are designed to restrict pollutant and nutrient loads from improperly functioning septic systems from entering local water sources. These loadings occur for a number of reasons, including improper site selection, inadequate installation, or system operation failures: As many as 75 percent of all system failures have been attributed to hydraulic overloading. Failures may also occur due to lapses in the regular inspection and maintenance that are required to ensure proper operation during the design life of the septic system. Homeowners may be unaware of the age of their system and whether preemptive planning is necessary before the system fails.

The Municipality will implement an outreach program regarding septic systems controls for large lot development in rural areas that are not served by sewer. When septic systems are used for wastewater treatment, there is a need for educational outreach and training to avoid system failures for owners of both new and existing systems. Septic system maintenance education is extremely important in coastal areas for shoreline development near shellfish beds and spawning areas, where septic effluent discharges can influence water quality and lead to bed closures and algal blooms.

At the state level, the PR Environmental Quality Board (EQB) regulates the construction, operation and closure of septic systems. The Municipality will implement a comprehensive management program aimed at helping enforce EQB rulings with regards to this issue. An onsite wastewater management program can reduce water quality degradation and save the municipal government and homeowners time and money, as well as better tracking of the performance of routine maintenance practices. This comprehensive plan would be administered by the municipality's Environmental Affairs Department.

Public outreach and training are vital elements in the control of septic system failure. Many of the problems associated with improper septic system functioning may be attributed to a lack of homeowner knowledge of operation and maintenance of the system. Educational materials for homeowners and training courses for installers and inspectors will be provided by the municipal government that would reduce the incidence of failure. Education is most effective when used in concert with other source reduction practices, such as phosphate bans and use of low-volume plumbing fixtures.

In addition to the general suggestions above, there are other management measures, which can be implemented to help maintain a properly operating system. These measures include the following:

- Chemical Additive Restrictions
- Phosphorus Detergent Restrictions
- Elimination of Garbage Disposals for Households Served by Septic System
- Proper Septic System Maintenance

Failing septic systems have been linked to water quality problems in streams, lakes, shellfish beds, and coastal areas. Improvements in system operation and maintenance should be a strong element in watershed plans for those areas where septic systems are used for wastewater treatment. Public education and outreach regarding septic system operation and maintenance can be assumed to produce some positive effect on water quality. To better determine whether pollution prevention outreach is being effective, residential surveys should be

part of any program seeking to educate residents on septic systems and their influence on water quality.

Materials Management

Recycling

The municipality of Humacao currently engages in blue bag recycling pick up and recycling drop off points (refer to Appendix A for drop-off point location map).

Blue bags are used by residents to collect any recyclable materials. The municipality has created a schedule to collect these bags on specific days of the week in various urbanizations in Humacao.

Besides collection of blue bags, Humacao has one recycling drop off location. These mainly serve residents who live in areas not covered by blue bags pick up, although anyone can take advantage of this control measure.

Hazardous Material Management

Failure to properly store hazardous materials dramatically increases the probability that they will end up in local waterways. Many people have hazardous chemicals stored throughout their homes, especially in garages and storage sheds. Practices such as covering hazardous materials or even storing them properly, can have dramatic impacts.

The Municipality will enforce both EPA and EQB guidelines with regards to the handling of this type of materials at all its facilities. A number of management considerations for hazardous materials would be proposed as follows:

- Ensuring sufficient aisle space to provide access for inspections and to improve the ease of material transport.

- Storing materials well away from high-traffic areas to reduce the likelihood of accidents that might cause spills or damage to drums, bags, or containers.

- Stacking containers in accordance with the manufacturers' directions to avoid damaging the container or the product itself.

- Storing containers on pallets or equivalent structures. This facilitates inspection for leaks and prevents the containers from coming into contact with wet floors, which can cause corrosion. This consideration also reduces the incidence of damage by pests (insects, rodents, etc.).

- Delegating the responsibility for management of hazardous materials to personnel trained and experienced in hazardous substance management.

Covering hazardous materials and areas where such materials are handled reduces potential contact with storm water and wind. Storage areas, outdoor material deposits, loading and unloading areas, and raw materials should all be covered or enclosed. Priority should be given to locations of the most hazardous substances.

Maintenance of hazardous material storage areas consists mostly of inspection and employee training. The municipality's Office of Environmental Affairs with the support of EQB would carry out employee training. Storage spaces and containers should be routinely inspected for leaks, signs of cracks or deterioration, or any other signs of release.

Improved storage of hazardous materials is effective at reducing contamination of storm water runoff and receiving waters if proper storage and maintenance techniques are used.

Spill Prevention and Control

Spill response and prevention plans should clearly state measures to stop the source of a spill, contain the spill, clean up the spill, dispose of contaminated materials, and train personnel to prevent and control future spills.

On July 17th, 2002, EPA issued a final rule amending the Oil Pollution Prevention regulation promulgated under the authority of the Federal Water Pollution Control Act (Clean Water Act). This rule addresses requirements for Spill Prevention Control and Countermeasure Plans (SPCC Plans), among other issues. The new SPCC rule addresses these revisions and became effective August 16, 2002. The Spill Prevention, Control, and Countermeasure (SPCC) rule can be found in Title 40 of the Code of Federal Regulations (CFR), Part 112 (Oil Pollution Prevention).

Spill prevention and control plans are applicable to construction sites where hazardous wastes are stored or used and are regulated by USEPA. Hazardous wastes include pesticides, paints, cleaners, petroleum products, fertilizers, and solvents.

The Municipality will identify potential spill or source areas, such as loading and unloading, storage, and processing areas, places where dust or particulate matter is generated, and areas designated for waste disposal. Also, spill potential should be evaluated for stationary facilities, including manufacturing areas, warehouses, service stations, parking lots, and access roads. The Municipality will adhere to the stipulations set forth in the Oil Pollution Prevention

regulation on all facilities deemed necessary by the Department of Environmental Affairs.

A spill prevention and control plan can be highly effective at reducing the risk of surface and ground water contamination. However, the plan's effectiveness is enhanced by worker training, availability of materials and equipment for cleanup, and extra time spent by management to ensure that procedures are followed.

Used Oil Recycling

Used motor oil is a hazardous waste because it contains heavy metals picked up from the engine during use. Fortunately, it is recyclable because it becomes dirty from use, rather than actually wearing out. However, as motor oil is toxic to humans, wildlife, and plants, it should be disposed of at a local recycling or disposal facility. Before disposal, used motor oil should be stored in a plastic or metal container with a secure lid, rather than dumped in a landfill or down the drain. Containers that previously stored household chemicals, such as bleach, gasoline, paint, or solvents should not be used. Used motor oil should also never be mixed with other substances such as antifreeze, pesticides, or paint stripper.

Used motor oil is recycled in a number of different ways. Used motor oil can be re-refined into lubricating oils that meet the same standards as virgin/new oil. All of these methods of recycling help to conserve valuable energy resources.

At the local level, the EQB has set forth a number of regulations for the recycling of used oil under Rule Number 5717, Rule for the Handling of Non-Hazardous Waste. The Municipality will take on the responsibility of enforcing this ruling at all its facilities.

When enforcing oil-recycling programs, the Municipality would provide the public with the proper informational resources. Programs would encourage the public to contact local service stations, municipal governments, the county government office, or the local environmental or health departments, if they are unsure where to safely dispose of their oil.

Recycling used motor oil is beneficial to the environment, the public health, and the economy. If oil is improperly disposed of in landfills, ditches, or waterways or dumped on the ground or down storm sewers, it can migrate into surface and ground water. It takes only one gallon of oil to contaminate one million gallons of drinking water (USEPA, 2000). This same oil can also seriously harm aquatic plants and animals. Submerged vegetation is especially affected by oil because the oil blocks sunlight from entering the water and hinders photosynthesis. Recycling used motor oil is also beneficial in protecting public health. As oil circulates through a car's engine, it collects rust, dirt, metal particles, and a variety of contaminants. Engine heat can also break down oil additives, producing acids and a number of other substances. Exhaust gases and antifreeze can also leak into oil when the engine is in use. When any of these

substances mix with oil, the toxicity of oil is greatly increased. Then, if oil is disposed of improperly and enters the water or air, public health can be seriously threatened. Recycling used motor oil is also beneficial to the economy. Oil is a valuable resource that can be re-refined and reused in combustion engines. As oil is a non-renewable resource, it will become increasingly more difficult to find new reserves in the future. Therefore, recycling will provide time to develop alternative fuels and lessen dependence on foreign oil suppliers.

MEASURABLE GOALS

PERMIT TERM	ACTIVITY
2 year	Training of key employees completed
2 year	Plan & procedures in place for storm drain and catch basin maintenance. Plan will include strategy for identifying additional catch basins for cleanup and maintenance.
2 year	Plan & procedures in place for parking lots & street sweeping
3 year	Automobile & septic system public outreach programs completed
4 year	Automobile & septic system public outreach programs implemented
3 year	Municipal procedures in place for hazardous material management
3 year	Municipal procedures in place for spill prevention control
3 year	Municipal procedures in place for used oil recycling

CONCLUSION

The BMPs and measurable goals for the six minimum control measures required by the EPA have been presented within the body of this report. The recommended course of action was created as an outline of the activities the municipality should plan for and budget for in the next five years to reduce the pollution effect on the urban area storm water runoff. These activities may be modified and adapted, as the EPA may deem necessary.

The implementation of the Storm Water Program will be the primary focus of the new Department of Environmental Affairs to be created by the Municipality no later than December 2003. The responsibilities of the tasks described in this report will be distributed between the personnel of this department at the municipality's discretion.

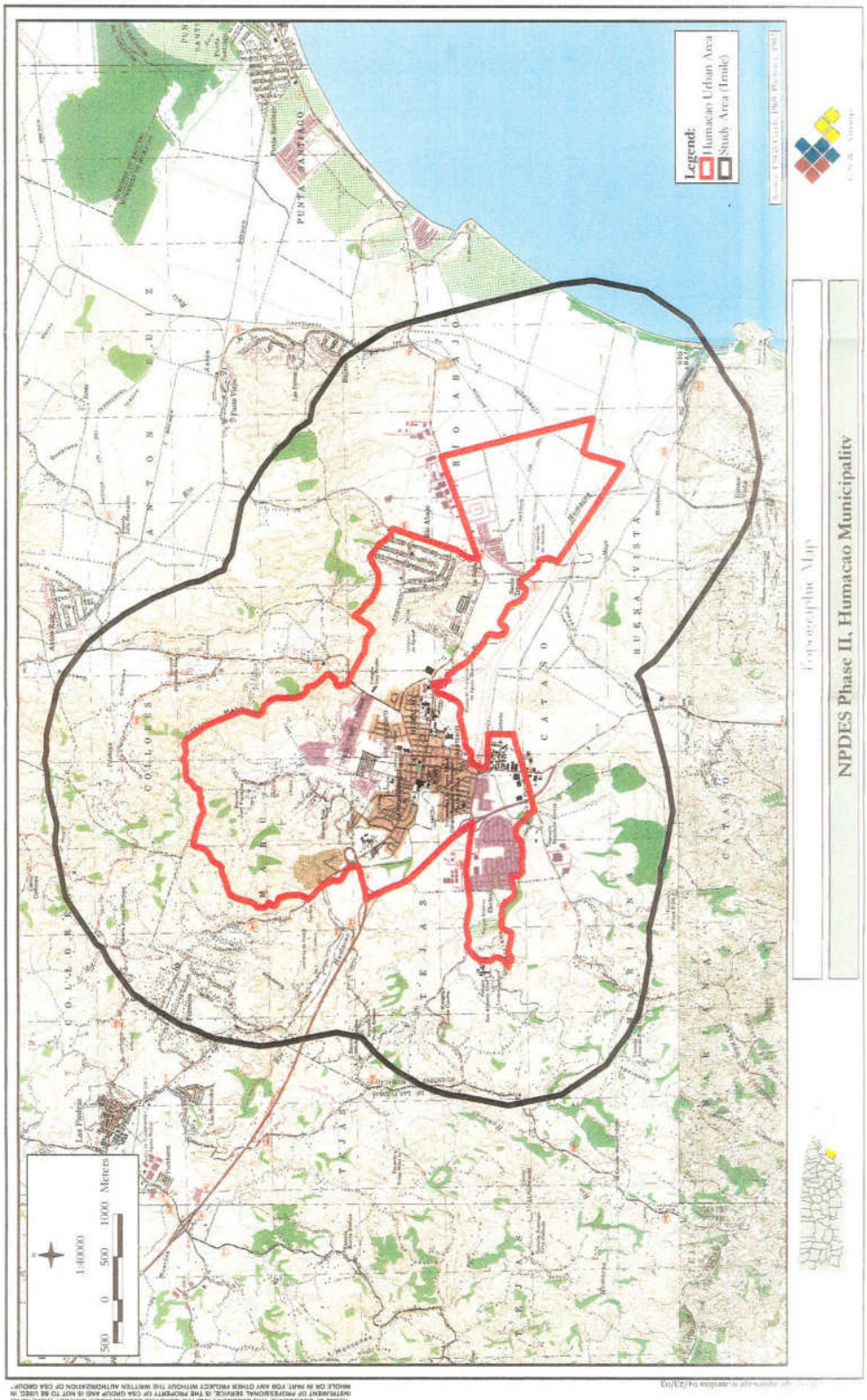
It is through the submittal of this working plan and the municipality's commitment to implement the actions mentioned herein that the Municipality of Humacao requests the awarding of the NPDES Phase II Individual Permit for their Humacao MS4.

APPENDIX A

MAJOR ROADS

Legend:
Urban Zone
Study Area
Roads
Primary
Secondary
Tertiary
NPDES Phase II, Humacao Municipality
Main Roads
1:40000
0
500
1000 Meters

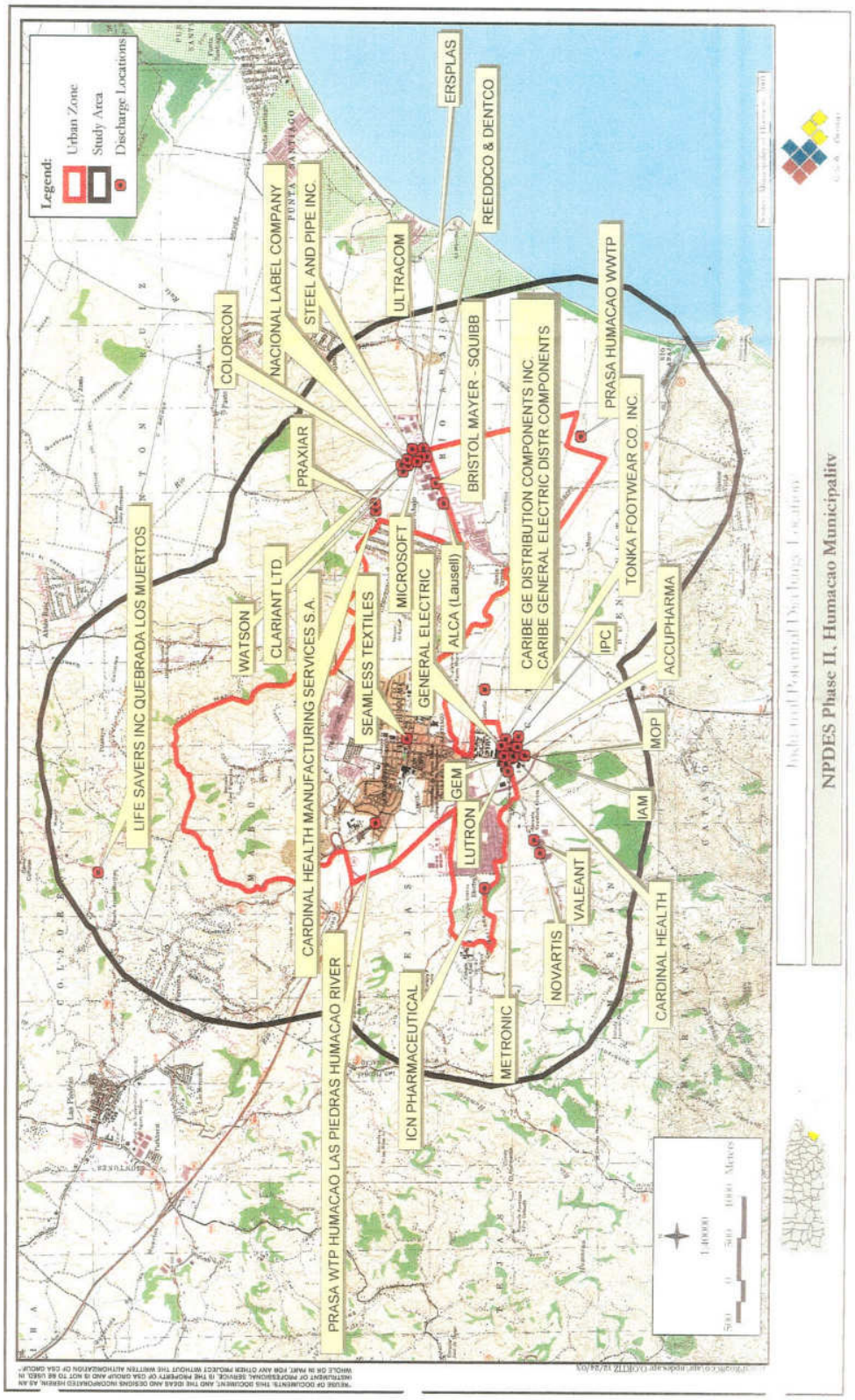
TOPOGRAPHIC MAP


Legend:
Humacao Urban Area
Study Area (Trade)
NPDES Phase II, Humacao Municipality
Topographic Map
1:40000
0
500
1000 Meters

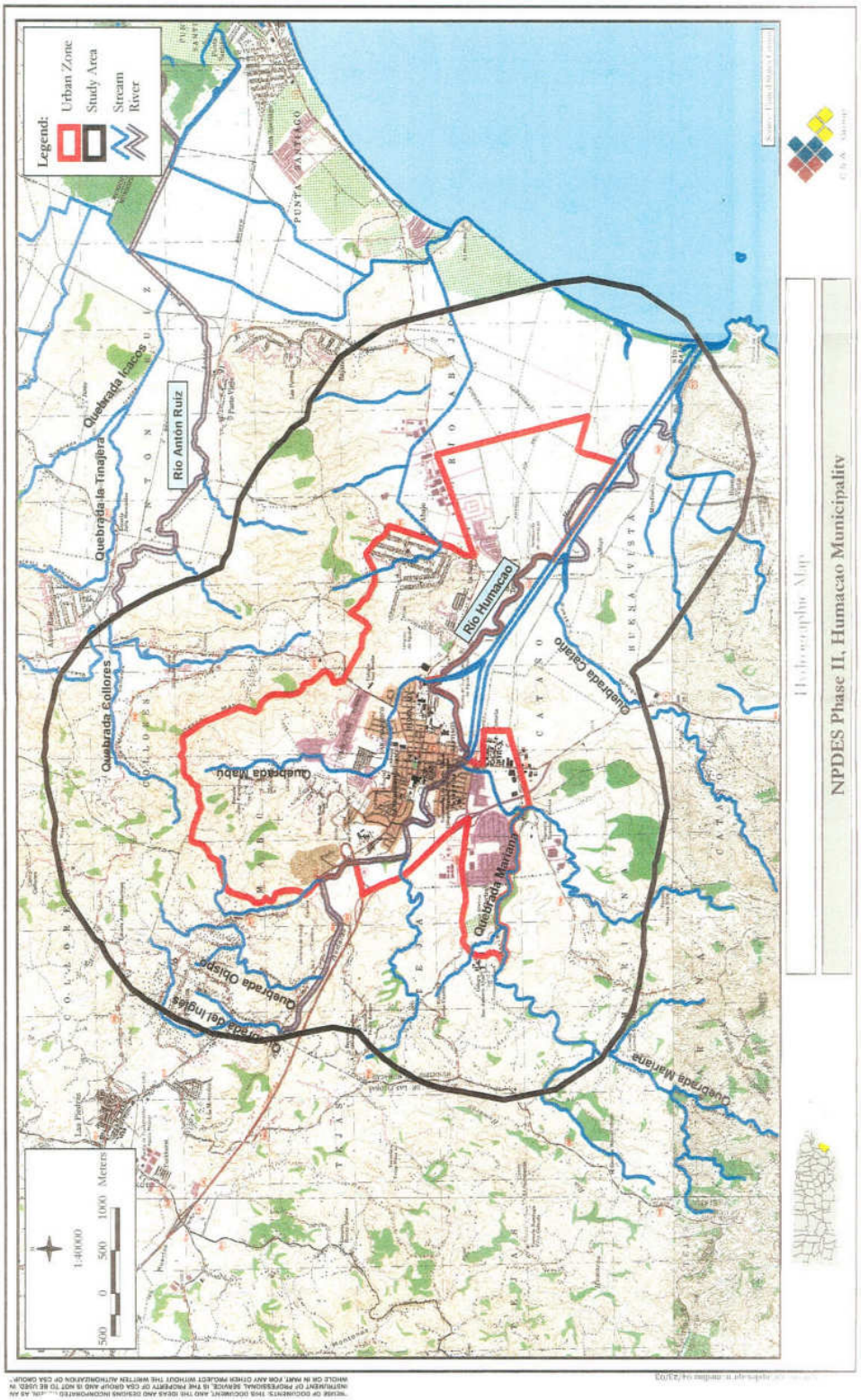
SOIL TYPES

Legend:
Urban Zone
Study Area
Roads
Hydrography
Soils
Aceitunas silty clay loam
Aguadilla loamy sand
Caguabo clay loam
Candelero loam
Catano loamy sand
Cayagua sandy loam
Coastal beaches
Cobby alluvial sand
Coloso silty clay
Coloso silty clay loam
Daguao clay
Daguao silty clay loam
Fortuna clay
Gravel Pit
Humacao loam
Ingenio silty clay loam
Juncalitos gravelly clay loam
Limos clay loam
Lirios silty clay loam
Mabi clay
Maunabo clay
Mayo loam
Naranjito silty clay loam
Pandura loam
Pandura-Very stony land complex
Pinones silty clay
Reilly soils
Rio Arriba clay
Rock land
Sabana silty clay loam
Salt water marsh
Soil not surveyed
Talante soil
Tcpa gravelly sandy loam
Tidal swamp
Toa silty clay loam
Vivi loam
Water
Wet alluvial land
Index Map
NPDES Phase II, Humacao Municipality
1:40000
0
500
1000 Meters

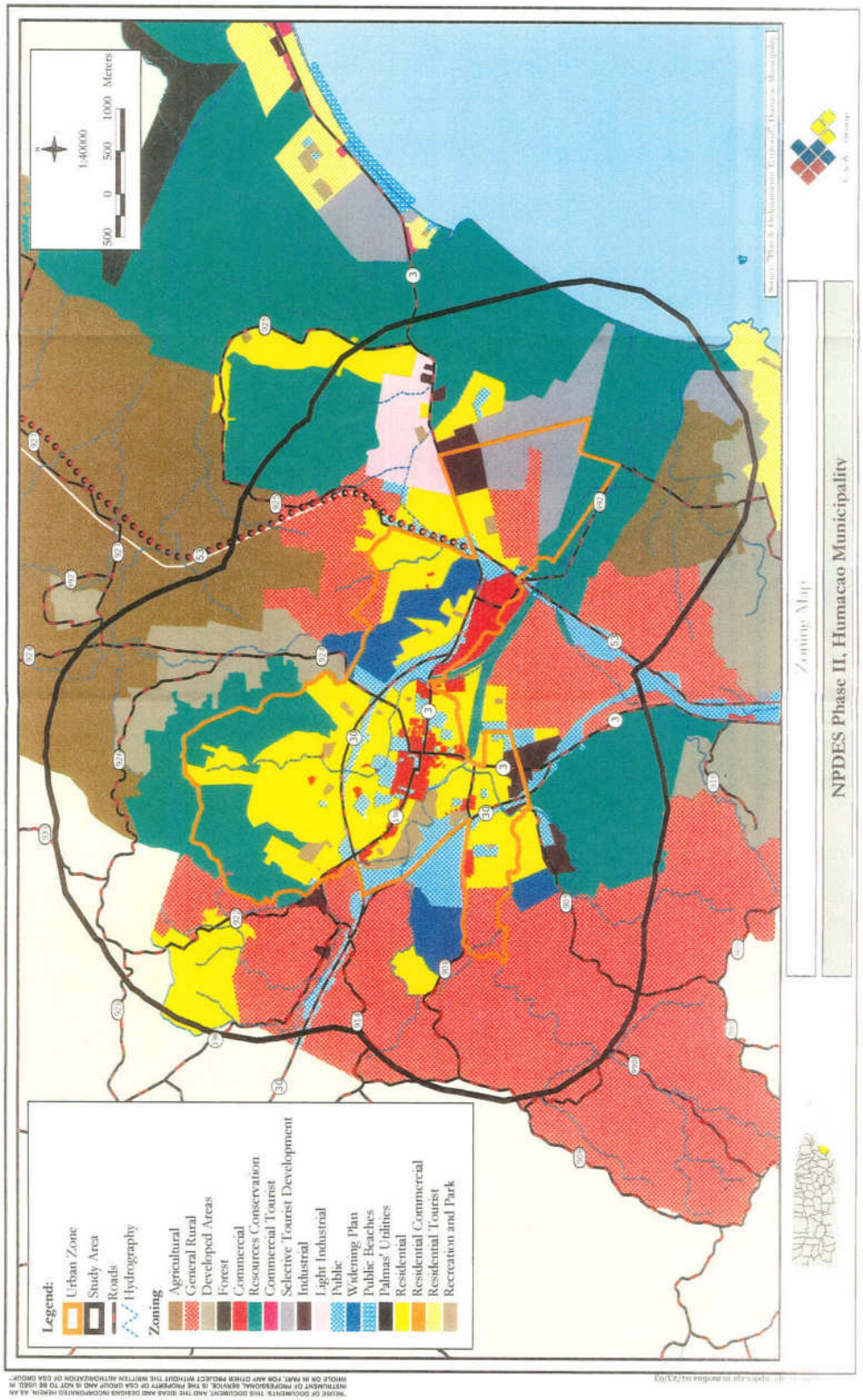
INDUSTRIAL DISCHARGE MAPS


Legend:
Urban Zone
Study Area
Discharge Locations
LIFE SAVERS INC QUEBRADA LOS MUERTOS
PRASA WTP HUMACAO LAS PIEDRAS HUMACAO RIVER
CARDINAL HEALTH MANUFACTURING SERVICES S A
ICN PHARMACEUTICAL
WATSON
CLARIANT LTD
SEAMLESS TEXTILES
METRONIC
MICROSOFT
GENERAL ELECTRIC
GEM
LUTRON
ALCA (Lausell)
NOVARTIS
VALEANT
COLORCON
NACIONAL LABEL COMPANY
STEEL AND PIPE INC
PRAXIAR
ULTRACOM
ERSPLAS
REEDDCO & DENTCO
BRISTOL MAYER - SQUIBB
CARIBE GE DISTRIBUTION COMPONENTS INC
CARIBE GENERAL ELECTRIC DISTR COMPONENTS
PRASA HUMACAO WWTP
TONKA FOOTWEAR CO INC
IPC
IAM
MOP
ACCUPHARMA
CARDINAL HEALTH
NPDES Phase II, Humacao Municipality

HYDROLOGY


Legend:
Urban Zone
Study Area
Stream
River
Rio Antón Ruiz
Quebrada Icacos
Quebrada la Tinajera
Quebrada Collores
Quebrada Mabu
Rio Humacao
Quebrada Catano
Quebrada Mariana
Quebrada Obispo
Quebrada del Ingles
Quebrada Mariana
1:40000
500
0
1000 Meters
NPDES Phase II, Humacao Municipality

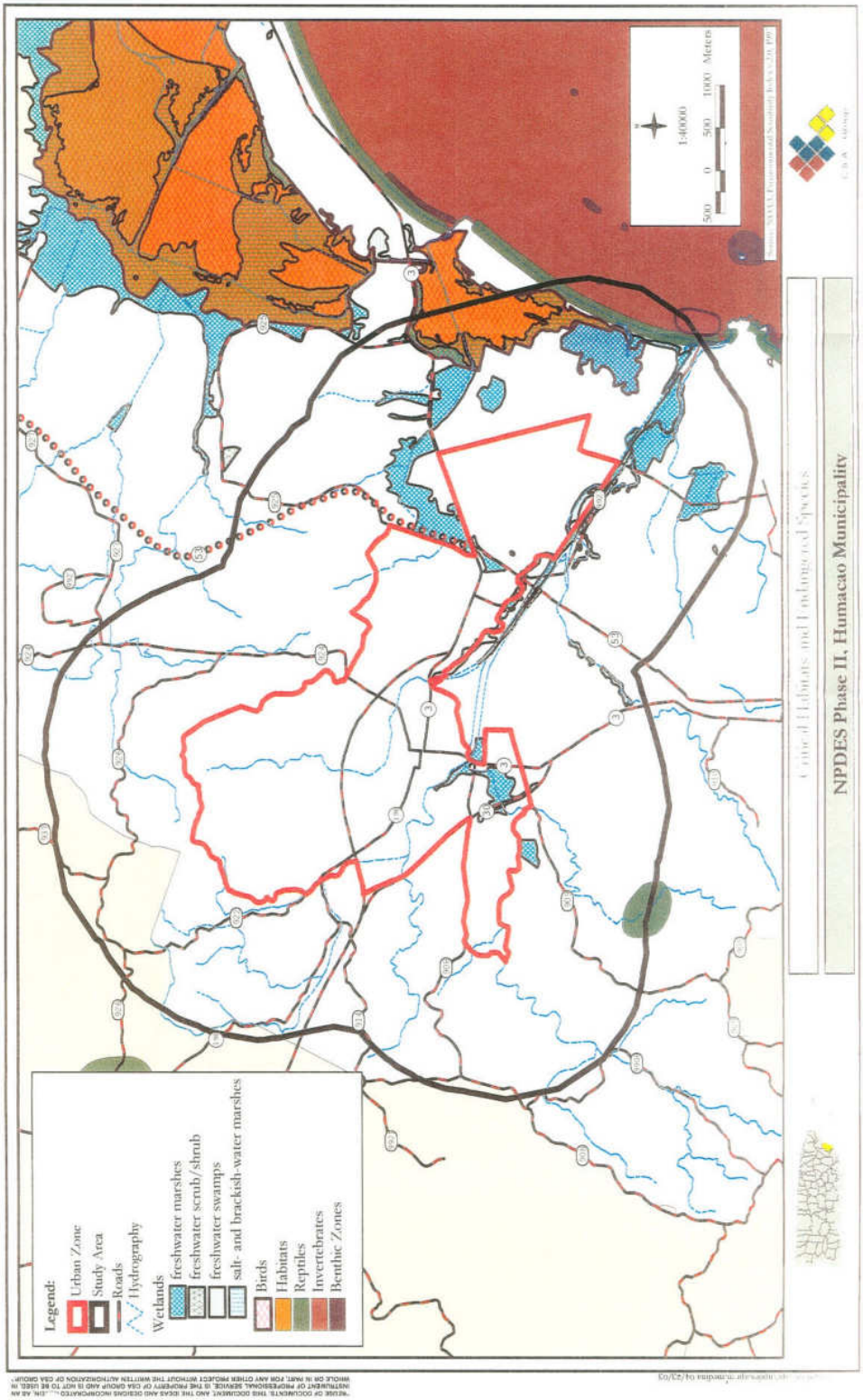
ZONING


NPDES Phase II, Humacao Municipality
Zoning Map
Legend:
Urban Zone
Study Area
Roads
Hydrography
Zoning
Agricultural
General Rural
Developed Areas
Forest
Commercial
Resources Conservation
Commercial Tourist
Selective Tourist Development
Industrial
Light Industrial
Public
Widening Plan
Public Beaches
Palmas Utilities
Residential
Residential Commercial
Residential Tourist
Recreation and Park
1:40000
500 0 500 1000 Meters

GEOLOGIC

Legend:
Urban Zone
Study Area
Roads
Hydrography
Geology
alluvium
beach deposits
granodiorite of San Lorenzo
mambiche sequence
water
alluvial plan deposits
alluvium and fanglomerate
andesite dikes
aplite dikes
artificial fill and manmade land
block of marble
clay sandy clay and silty clay
diorite - hornblendite complex
fairly pure magnetite
granodiorite
hornblende diorite and hornblende granodiorite dikes
hydrothermally altered volcano- clastic rocks and lavas
landslide deposits
lava - breccia - tuff and tuff breccia
lava unit
metavolcanic rocks
mixed rock
mixed rock (granodiorite of Plutonic Complex of Punta Guayanes)
pegmatite dikes
swamp deposits containing considerable peat and peaty muck
terraced deposits
tuff and volcanic sandstone
volcaniclastic unit
500 0 500 1000 Meters
1:40000
Geologic Map
NPDES Phase II, Humacao Municipality

ENDANGERED SPECIES


Legend:
Urban Zone
Study Area
Roads
Hydrography
Wetlands
freshwater marshes
freshwater scrub/shrub
freshwater swamps
salt- and brackish-water marshes
Birds
Habitats
Reptiles
Invertebrates
Benthic Zones
1:40000
500 0 500 1000 Meters
NPDES Phase II, Humacao Municipality

ESTADO LIBRE ASOCIADO DE PUERTO RICO
ADMINISTRACION DE REGLAMENTOS Y PERMISOS
CENTRO EXPRESO DE TRAMITE

Núm. de Radicación:
06CX2-CET00-12050

PERMISO DE CONSTRUCCION

Número de Catastro:
51-304-028-216-01-000

URBANIZACION PATAGONIA
PARQUE DE RECREACION PASIVO Y PISTA ATLETICA PARA TROTAR Y CAMINAR

Estimado(s) :
Orig. : $ 417,910.00 / Sellos CIAPR/CAPR : $ 418

De conformidad con las disposiciones legales y reglamentarias, se expide el presente Permiso de Construcción - **Certificado / Otros / Gobierno** para la propiedad ubicada en :

CALLE SAN JOSE
URB. PATAGONIA
HUMACAO, PR, 00791

Casos de Referencia :

Datos Geográficos / Zonificación:
Zona Inundable 1 : AE
Zonificación 1 : R-4 (Plan Ordenación Territorial)
Cabida Escritura : 1. 7165 cuerdas
Cabida Mensura : 1 7165 cuerdas

Dueño(s)
1. Marcelo Trujillo Panisse (Primario)
MUNICIPIO DE HUMACAO

Proponente / Contacto(s)
1 Proyectista - Ernesto . Camacho Burgos -

Certificado por
1. Ing Ernesto Camacho Burgos . Lic No 8225

Atributos / Características

Plantas
Número de Plantas . 2 plantas

Area
Area Bruta de Piso : 2,132 m.c.

Dimensiones
Alto : 16.50 metros

Condiciones Especiales :

El proyecto a construir incluye
* pista para trotar y caminar
* pista para personas con limitaciones físicas
* estructura abierta para aeróbicos
* área de juegos para niños
* baños
* oficina administrativa

1 Deberá cumplir con todas las disposiciones de la Junta de Calidad Ambiental y la Ley Sobre Política Pública Ambiental para este tipo de obra, así como obtener los permisos correspondientes para la construcción.
2. Deberá consultarse con las agencias con jurisdicción para el comienzo de la construcción.
3. Es responsabilidad del contratista para las obras autorizadas en este permiso obtener la correspondiente póliza del Fondo del Seguro del Estado previo a comenzar las obras.
4. La solicitud para permiso de uso, si aplica, incluirá:
   a. Recibo pago arbitrios municipales por contratista y de pago de póliza de FSE.
   b. Formulario ARPE 15-9-A (Maestro plomero, si aplica
   c. Informes de Inspección periódicos del progreso de la obra hasta su terminación
   d. Certificado de Inspección del Servicio de Bomberos
   e Certificado del Departamento de Salud

Este permiso debe cumplir con las siguientes condiciones generales:

El inspector designado para inspeccionar las obras de construcción de proyecto deberá someter a esta Oficina copia de informes periódicos del progreso de las obras según lo establece la Sección 4 00 del Reglamento de Planificacion Núm 12 para la Certificación de Proyectos de Construcción No se expedirá permiso de uso sin esta información.

Cumplir con los requerimientos de la Administración de Reglamentos y Permisos no exime a una parte de cumplir con las leyes federales, "Fair Housing Act" y "Americans with Disabilities Act".

A tenor con la Ley 288 del 4 de diciembre de 1998, será responsabilidad del desarrollador la instalación de rótulo o cartel en un lugar visible que exprese la obra que se realiza en el lugar, el número del caso aprobado, nombre del dueño del proyecto y nombre del contratista que realiza la obra

La autorización aquí emitida no tiene el propósito ni alcance de anular cualquier restricción privada (servidumbre en equidad) que resulten inconsistentes con el permiso aquí concedido La parte que se sienta así agraviada, podrá radicar un procedimiento civil de sentencia declaratoria e injunction en el Tribunal de Primera Instancia con competencia.

Toda decisión favorable o autorización sobre cualquier consulta sobre conformidad de proyecto, anteproyecto o proyecto final relacionada con un proyecto de construcción, quedará sin efecto si dentro del término de un (1) año de haberse rendido la misma, no se hubiese obtenido el correspondiente permiso de construcción; si luego de haberse obtenido el permiso de construcción las obras autorizadas en este no fuesen comenzadas dentro del término de un (1) año a partir de la fecha de su expedición; o si dichas obras una vez comenzadas, de acuerdo con lo anteriormente establecido no fuesen terminadas dentro del término prescrito en el permiso expedido, según lo establece en la Sección 3.18.1 del Reglamento de Zonificación de Puerto Rico y la Sección 106.4.4 - Parte 2, Enmiendas al UBC-97, Código de Construcción de Puerto Rico, vigente desde el 8 de diciembre de 1999

ESTADO LIBRE ASOCIADO DE PUERTO RICO
ADMINISTRACION DE REGLAMENTOS Y PERMISOS
CENTRO DE SERVICIOS TECNICOS
APROBADO

Ing. Luis Velez Roche
ADMINISTRADOR

Autorizado por
Ing. Carlos J. Quiñones Gonzalez
Gerente
CENTRO EXPRESO DE TRAMITE

Fecha de Aprobación : **12-14-2006**

Fecha Expedido:

Administración de Reglamentos y Permisos

ESTADO LIBRE ASOCIADO DE PUERTO RICO
ADMINISTRACION DE REGLAMENTOS Y PERMISOS
CENTRO EXPRESO DE TRAMITE

Núm de Radicación
06CX2-CET00-02383

PERMISO DE CONSTRUCCION

Número de Catastro
51-304-028-119-00-700

COMMUNITY AND TOURIST INFORMATION CENTER

Estimado(s) :
Orig.. $ 1,184,700.00 / Sellos CIAPR/CAPR . $ 1,185

De conformidad con las disposiciones legales y reglamentarias, se expide el presente Permiso de Construcción - **Certificado / Institucional / Gobierno** para la propiedad ubicada en :

ESQUINA TURQUESA, CALLE CRUZ ORTIZ STELA
HUMACAO, PR

Dueño(s)
1 MUNICIPIO DE HUMACAO (Primario)

Proponente / Contacto(s)
1 Proyectista - Orval E. Sifontes Fontan

Casos de Referencia :

Datos Geográficos / Zonificación:
Zonificación 1 : R-3
Cabida Mensura . 2,979.80 m.c

Certificado por
1. Arq. Orval E. Sifontes Fontan, Lic No. 3313
2. Ernesto Camacho Burgos , Lic. No. 8225

Atributos / Características

Tipo de Proyecto
Reconstrucción/Modernización

Materiales
Hormigon Armado y Bloques
Acero Estructural

Fondos
Fondos Públicos 100 %

Plantas
Número de Plantas : 2 plantas

Estacionamientos
Estacionamientos Impedidos . 2 unidades
Estacionamientos Regulares : 21 unidades

Uso
No Residencial - Institucional

Area
Area Bruta de Piso : 798.79 m.c
Area de Ocupacion . 794 m.c.

Dimensiones
Alto : 8.25 metros

Patio
Patio Delantero . 7.77 metros
Patio Lateral Derecho : 36 metros
Patio Lateral Izq. : 4 metros

Condiciones Especiales :

A. Deberá cumplir con todas las disposiciones de la Junta de Calidad Ambiental y la Ley Sobre Politica Pública Ambiental para este tipo de obra, asi como obtener los permisos correspondientes.
B. Es responsabilidad del contratista para las obras autorizadas en este permiso obtener la correspondiente poliza del Fondo del Seguro del Estado previo a comenzar las obras
C. La solicitud para permiso de uso incluira:
   a. Certificados Inspeccion.
      1. Servicio de Bomberos
      2. Departamento de Salud
   b. Recibo pago arbitrios municipales por contratista y de la póliza del FSE
   c. Formulario ARPE 15-9-A (Maestro plomero)
   d. Informes de inspección periódicos del progreso de la obra hasta su terminación.

---------- Final de Condiciones Especiales ----------

Este permiso debe cumplir con las siguientes condiciones generales:

El inspector designado para inspeccionar las obras de construcción de proyecto deberá someter a esta Oficina copia de informes periódicos del progreso de las obras segun lo establece la Sección 4.00 del Reglamento de Planificación Núm 12 para la Certificación de Proyectos de Construcción No se expedirá permiso de uso sin esta información

Cumplir con los requerimientos de la Administración de Reglamentos y Permisos no exime a una parte de cumplir con las leyes federales, "Fair Housing Act" y "Americans with Disabilities Act" Entendiendose que este permiso tampoco releva al peticionario de cumplir con los requerimientos del Departamento de Salud Se cumplira con los requisitos del Cuerpo de Bomberos de Puerto Rico.

A tenor con la Ley 288 del 4 de diciembre de 1998, será responsabilidad del desarrollador la instalación de rótulo o cartel en un lugar visible que exprese la obra que se realiza en el lugar, el numero del caso aprobado, nombre del dueño del proyecto y nombre del contratista que realiza la obra

La autorización aquí emitida no tiene el propósito ni alcance de anular cualquier restricción privada (servidumbre en equidad) que resulten inconsistentes con el permiso aquí concedido. La parte que se sienta así agraviada, podrá radicar un procedimiento civil de sentencia declaratoria e injunction en el Tribunal de Primera Instancia con competencia

Toda decisión favorable o autorización sobre cualquier consulta sobre conformidad de proyecto, anteproyecto o proyecto final relacionada con un proyecto de construccion, quedará sin efecto si dentro del termino de un (1) año de haberse rendido la misma, no se hubiese obtenido el correspondiente permiso de construcción, si luego de haberse obtenido el permiso de construcción las obras autorizadas en este no fuesen comenzadas dentro del término de un (1) año a partir de la fecha de su expedición, o si dichas obras una vez comenzadas, de acuerdo con lo anteriormente establecido, no fuesen terminadas dentro del término prescrito en el permiso expedido, según lo establece en la Sección 3.18.1 del Reglamento de Zonificación de Puerto Rico y la Sección 106.4.4 - Parte 2, Enmiendas al UBC-97, Código de Construcción de Puerto Rico, vigente desde el 8 de diciembre de 1999

Ing. Luis Velez Roche
ADMINISTRADOR

Autorizado por
Ing. Carlos J. Quiñones Gonzalez
Gerente
CENTRO EXPRESO DE TRAMITE

Fecha de Aprobación : **08-01-2006**

Fecha Expedido: 1 AUG 2006

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ESTADO LIBRE ASOCIADO DE PUERTO RICO
ADMINISTRACION DE REGLAMENTOS Y PERMISOS

CENTRO EXPRESO DE TRAMITE

Núm. de Radicación:
05CX2-CET01-04069

PERMISO DE CONSTRUCCION

Número de Catastro:
51-304-000-640-01-000

CENTRO DE BELLAS ARTES, HUMACAO
(FASE II) ESTRUCTURA PRINCIPAL E INSTALACIONES DE CAMPO

Estimado(s) :
Orig.: $ 12,541,125 77 / Sellos CIAPR/CAPR : $ 12,542

De conformidad con las disposiciones legales y reglamentarias, se expide el presente Permiso de Construcción - **Certificado / Institucional / Gobierno** para la propiedad ubicada en :

-, BLVD NICANOR VAZQUEZ
BO., PUEBLO
HUMACAO, PR

Dueño(s)
1. Marcelo Trujillo Panisse (Primario)
MUNICIPIO DE HUMACAO

Proponente / Contacto(s)
1 Proyectista - . Carlos E. Betancourt - AGRAIT
BETANCOURT ARQUITECTOS

Casos de Referencia :

Datos Geográficos / Zonificación:
Zona Inundable 1 : 1
Zonificación 1 . R-1
Cabida Escritura : 6 1098 cuerdas
Cabida Mensura : 6. 1098 cuerdas
Servidumbre 1 : AEE

Certificado por
1. Arq Carlos E. Betancourt , Lic. No. 9088 - AGRAIT
BETANCOURT ARQUITECTOS

Atributos / Características

Plantas
Número de Plantas : 3 plantas

Estacionamientos
Estacionamientos Regulares : 228 unidades

Area
Area Bruta de Piso : 7,820 81 m.c.
Area de Ocupación . 5,485.80 m.c.

Dimensiones
Alto : 29.51 metros

Patio
Patio Delantero : 26 pies - 10 pulg
Patio Lateral Derecho : 75 pies
Patio Lateral Izq : 15 pies
Patio Posterior : 561 pies

Condiciones Especiales :

1-Será responsabilidad de la parte proponente cumplir con los requerimientos de las agencias concernidas a este proyecto.
2-Es responsabilidad del contratista para las obras autorizadas en este permiso obtener la correspondiente poliza del Fondo del Seguro del Estado previo a comenzar las obras
La solicitud para permiso de uso para este proyecto incluira:
a. Formulario ARPE 15-9-A (Maestro plomero)
b. Recibo pago arbitrios municipales por contratista.
c. Endoso de la agencias concernidas.
3-Debera cumplir con todas las disposiciones de la Junta de Calidad Ambiental y la Ley Sobre Politica Publica Ambiental para este tipo de uso.
4- Previo al inicio de las obras debe notificar a esta agencia el inspector designado,cumplimentando la forma ARPE 15.6, atenor con la sección 4 00 del Reglamento # 12.

---------- Final de Condiciones Especiales ----------

Este permiso debe cumplir con las siguientes condiciones generales:

El inspector designado para inspeccionar las obras de construcción de proyecto deberá someter a esta Oficina copia de informes periódicos del progreso de las obras según lo establece la Sección 4 00 del Reglamento de Planificación Núm. 12 para la Certificación de Proyectos de Construcción. No se expedirá permiso de uso sin esta información.

Cumplir con los requerimientos de la Administración de Reglamentos y Permisos no exime a una parte de cumplir con las leyes federales, "Fair Housing Act" y "Americans with Disabilities Act". Entendiendose que este permiso tampoco releva al peticionario de cumplir con los requerimientos del Departamento de Salud. Se cumplira con los requisitos del Cuerpo de Bomberos de Puerto Rico

A tenor con la Ley 288 del 4 de diciembre de 1998, será responsabilidad del desarrollador la instalación de rótulo o cartel en un lugar visible que exprese la obra que se realiza en el lugar, el numero del caso aprobado, nombre del dueño del proyecto y nombre del contratista que realiza la obra.

La autorización aquí emitida no tiene el propósito ni alcance de anular cualquier restricción privada (servidumbre en equidad) que resulten inconsistentes con el permiso aquí concedido. La parte que se sienta así agraviada, podrá radicar un procedimiento civil de sentencia declaratoria e injunction en el Tribunal de Primera Instancia con competencia.

Toda decisión favorable o autorización sobre cualquier consulta sobre conformidad de proyecto, anteproyecto o proyecto final relacionada con un proyecto de construcción, quedará sin efecto si, dentro del término de un (1) año de haberse rendido la misma, no se hubiese obtenido el correspondiente permiso de construcción; si luego de haberse obtenido el permiso de construcción las obras autorizadas en éste no fuesen comenzadas dentro del término de un (1) año a partir de la fecha de su expedición; o si dichas obras una vez comenzadas, de acuerdo con lo anteriormente establecido, no fuesen terminadas dentro del término prescrito en el permiso expedido, según lo establece en la Sección 3 18 1 del Reglamento de Zonificación de Puerto Rico y la Sección 106 4.4 - Parte 2, Enmiendas al UBC-97, Código de Construcción de Puerto Rico, vigente desde el 8 de diciembre de 1999.

Ing. Luis Velez Roche
ADMINISTRADOR

ESTADO LIBRE ASOCIADO DE PUERTO RICO
ADMINISTRACION DE REGLAMENTOS Y PERMISOS
CENTRO DE SERVICIOS TECNICOS
APROBADO
ARPE

Autorizado por: Ing. Carlos D. Quiñones Gonzalez
Gerente Interino
CENTRO EXPRESO DE TRAMITE

Fecha de Aprobación : **06-05-2006**

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APPENDIX B

SCHEDULE FOR EDUCATION: OUTREACH PROGRAMS

SCHEDULE FOR ILLICIT DISCHARGE, CONSTRUCTION: POST CONSTRUCTION PROGRAMS, GOOD HOUSEKEEPING

ILLICIT DISCHARGE,
CONSTRUCTION,
POST CONSTRUCTION,
GOOD HOUSEKEEPING PROGRAM
COMBINED SCHEDULE OF EVENTS

ACTIVITY	MONTH AND YEAR
Screening and sampling of critical manholes (this procedure will commerce individually as critical manholes are identified)	February 2009
Completion of Municipality storm sewer outfall map	October 2007
Complete sampling of six (6) first priority outfalls	February 2008
Identification of receiving bodies of water or (6) unidentified outfalls	August 2008
Illicit discharges municipal ordinances in place	March 2008
Visual inspection of critical industrial facilities completed	May 2008
Correct all problem areas related to overflowing sanitary sewer system	March 2009
Determine if septic systems area a significant source of pollution	March 2009
Screen and sample 7 of 14 second priority outfalls (if necessary)	March 2009
Correct illicit connections related to industrial problem areas	August 2009
Identify all critical manholes in the urban area	September 2009
Create plan to correct critical septic systems producing polluted discharges	May 2010
Complete screening and sampling of remaining second priority outfalls (if necessary)	May 2010
Eliminate 60% of all detected illicit discharges	February 2011
Eliminate 100% of all detected illicit discharges	March 2012
Construction municipal ordinances in place	April 2008
Procedure for public information management in place	February 2008
Procedure for site inspection implemented	Mach 2009
Improvement of compliance by contractors due to established regulations	August 2010
Improved clarity and reduced sedimentation levels in local water bodies	September 2011
Identify potential locations for detention,	March 2009

infiltration, and/or bioretention areas	
Installation of any detention, infiltration, and/or bioretention areas if potentials sites were identified	May 2011
Improved clarity and reduced sedimentation of local water bodies due to applied post construction program	March 2012
Training of key employees completed	November 2008
Plan & Procedures in place for storm drain and catch basin maintenance	February 2009
Plan & procedures in place for parking lots & street sweeping	February 2009
Plan & Procedures in place for municipal automobile fleet maintenance	February 2009
Automobile & septic system public outreach programs completed	October 2009
Automobile & septic system public outreach programs implemented	November 2010
Municipal procedures in place for hazardous material management	April 2010
Municipal procedures in place for spill prevention control	April 2010
Municipal procedures in place for used oil recycling	April 2010
Development of educational materials, press kit, etc.	August 2007
Establishment of storm water community task force	February 2008
Establishment of storm water management interagency committee	April 2008
Conduct community interviews	March 2008
Launch public service announcement radio campaign	August 2008
Conduct “Humacao Protégé sus Aguas” kick off press conference	May 2008
Conduct public hearing for storm water management plan	August 2008
Launch newspaper campaign	August 2008
Execute storm water drains stenciling campaign	September 2008
Conduct storm water educational brochure distribution campaign – supermarkets	October 2008
Start ¿Y la lluvia a dónde va? – school –age educational campaign	January 2009
Conduct Humacao River Cleanup activity	November 2008
Conduct municipal workers goodhouse keeping and illicit discharges training	December 2008

Establish and recruit for storm water volunteers group	October 2008
Conduct community storm water awareness survey	May 2009
Establish storm water hotline	April 2008
Finalize storm water poster board display	November 2008

APPENDIX C

HUMACAO MS-4 OUTFALL REPORT

APPENDIX D

STORM SEWER OUTFALL LOCATION MAPS