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**WETLAND JURISDICTIONAL DETERMINATION AND  
DELINEATION STUDY**

**BEATRIZ DAM AND INTAKE/OUTWARD  
PIPES ALIGNMENTS**

**BEATRIZ WARD, CAGUAS, PUERTO RICO**

**PREPARED FOR:**

**GLM ENGINEERING**

**PRESENTED TO:**

**U.S. ARMY CORPS OF ENGINEERS  
ANTILLES REGULATORY SECTION**

**PREPARED BY:**



**AMBIENTA INC.**

*ENVIRONMENTAL CONSULTANTS*

**MARCH 2006**

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## EXECUTIVE SUMMARY

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The Puerto Rico Aqueduct and Sewer Authority of Puerto Rico (the Proponent) (AAA, by its Spanish acronym) is proposing the construction of the Beatriz Water dam (the Project). The Project would be located in the Beatriz Ward in the Municipality of Caguas, P.R., as shown on **Figure 1**.

**AMBIENTA INC.** was contracted by the Proponent's Environmental Management Firm, GLM Engineering, to conduct a Wetland Jurisdictional Determination and Delineation Study (JD) within the proposed Project limits. This document constitutes the described wetland JD Study and includes the evaluation of the Beatriz Water Dam (hence forth, the Dam) construction area and the intake/outward pipes alignments.

According to the provided information, the site on Quebrada Beatriz where the Dam is proposed to be located, was identified by the United States Corps of Engineers (USACE, by its English acronym) in 1997, and examined by the United States Geological Service (USGS, by its English acronym) in 2001. **Figure 1** shows the location of the Dam's components displayed above the USGS topographic quadrangle.

The proposed site for the Dam is located at approximately six kilometers (6 km) southwest (SW) of downtown Caguas, in the Beatriz Ward. The contemplated strategy is the construction of the Dam on land inside the Quebrada Beatriz at 2.2 Km upriver from the confluence with the Río Turabo.

The methodology employed for this study consisted at first in a preliminary screening process to determine the potential jurisdictional wetlands at the Project site. Later, to specifically identify the wetland areas under the jurisdiction of the United States Army Corps of Engineers (USACE) at the Projects site, a detailed screening was performed using



Geographic Information System (GIS) and data collected at the field by wetland specialists and with a differential positioning system.

U.S. Waters and wetland areas were found within the proposed dam location and pipe alignment locations. The wetlands are associated to the Quebrada Beatriz and to the Río Turabo flood plains. All wetlands found correspond to herbaceous areas. Detailed impacts to aquatic resources should be calculated after the final project design is performed.

Given the imminent possibility of impacting some of these wetlands during the construction phase of the proposed Projects, a formal permitting process may need to be initiated with the Regulatory Division of the Antilles Regulatory Section of the USACE. It is the policy of the USACE and the Environmental Protection Agency (EPA), through a Memorandum of Understanding, that a sequence of steps has to be considered during the design of any project impacting jurisdictional wetlands. First, an attempt to develop a design that avoids the impact on the wetland area should be made. If impact to the wetland is unavoidable, an attempt to minimize it to a practicable extent should be made, followed by the mitigation actions for the wetlands that are going to be inevitably impacted.



## INTRODUCTION

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The Puerto Rico Aqueduct and Sewer Authority of Puerto Rico (the Proponent) (AAA, by its Spanish acronym) is proposing the construction of the Beatriz Water dam (the Project). The Project would be located in the Beatriz Ward in the Municipality of Caguas, P.R., as shown on **Figure 1**.

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According to the provided information, the site on Quebrada Beatriz where the Dam is proposed to be located, was identified by the United States Corps of Engineers (USACE, by its English acronym) in 1997, and examined by the United States Geological Service (USGS, by its English acronym) in 2001. **Figure 1** shows the location of the Dam's components displayed above the USGS topographic quadrangle.

The proposed site for the Dam is located at approximately six kilometers (6 km) southwest (SW) of downtown Caguas, in Bo. Beatriz. The contemplated strategy is the construction of the Dam on land inside the Quebrada Beatriz at 2.2 km upriver from the confluence with the Río Turabo.

To acquire the necessary water level inside the Dam for it to function to capacity, a complete water supply is being proposed. Different Project components are described as follows:



- Dam dimensions: The stored water will reach a normal water level of one hundred and fifty two meters above mean sea level (152m amsl). The Dam will have a storing capacity of nine million square meters (9Mm<sup>3</sup>). The top of the Dam will be at one hundred and fifty six meters above mean sea level (156m amsl), and its bottom at one hundred and twenty meters above mean sea level (120m amsl). The Dam's depth will be thirty six meters (36m), and it will occupy approximately fifty six hectares (56ha).
- Raw water intake: The extraction of water from the Río Turabo is proposed to be via a new water intake to be located at approximately four kilometers (3.8km) upriver from where the bridge from state road PR-765 crosses the Río Turabo. The construction of a transmission pipeline that will flow by gravity from the water intake point to the Dam, and will have sixty six inches (66") in diameter and approximately five kilometers [4.9km (3.04 mi)] in length is being proposed. The pipeline that will be installed coming from the Río Turabo will run parallel to state road PR-765.
- Raw water transmission pipeline: A forty eight inch (48") diameter raw water transmission pipeline will be directed from the Dam to the existing filtration plant, known by the name of "Las Quebradillas".
- "Las Quebradillas" Treatment Plant: The Treatment Plant will have to be expanded to manage the change in the amount of raw water that will arrive from the Dam, estimated at approximately fourteen million gallons per day (13.8 MGD).
- Finished Water Distribution Pipeline: A thirty inch (30") diameter finished water distribution pipeline will be directed from the "Las Quebradillas" Treatment Plant to an existing connection point known as "Caguas Sur".
- Impacts to land use: It is expected that the Dam's construction will cause some impact to residences, businesses, or roads currently in use. It will also impact forested areas, pasture lands and thickets currently located on the Dam's proposed

site and its adjacent areas. Other impacts will be determined on the environmental document for the proposed Project.

This report is organized into four sections: a site description, methodology technical approach, results and discussion, conclusions and recommendations. **Appendix A** contains the Data Forms from the *1987 Corps of Engineers Wetland Delineation Manual*. **Appendix B** includes the Photographic documentation of the wetland areas. The Jurisdictional Determination Study for this Project was performed during the months of September and October 2005; and February 2006.

The methodology employed for this study consisted at first in a preliminary screening process to determine the potential jurisdictional wetlands found at the Projects site. Later, to specifically identify the wetland areas under the jurisdiction of the United States Army Corps of Engineers (USACE) at the Projects site, a detailed screening was performed using Geographic Information System (GIS) and data collected at the field by wetland specialists and with a differential positioning system. .



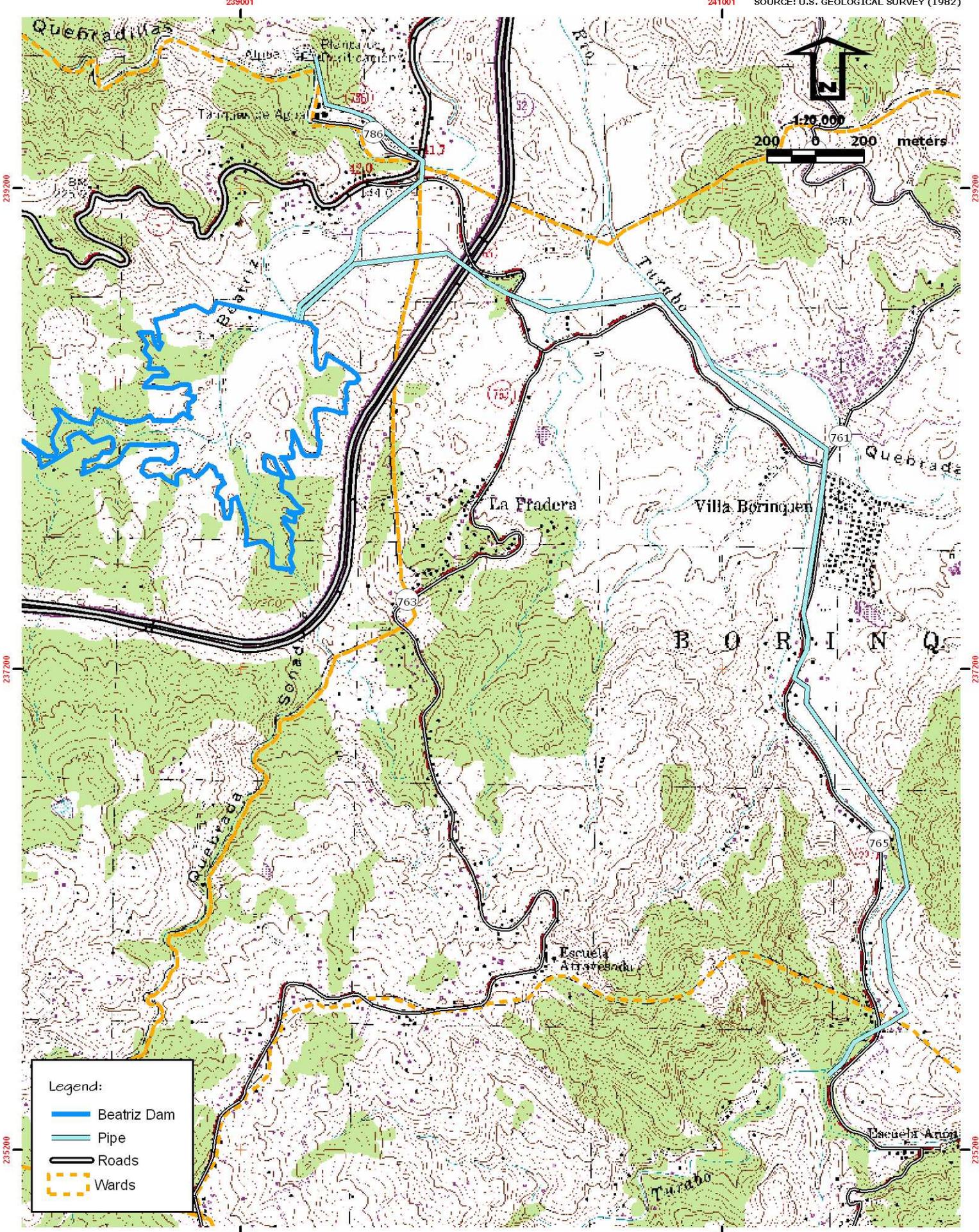
## SITE DESCRIPTION

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The site description is essential to properly assess and evaluate the Property in order to confirm the presence of jurisdictional wetland areas within its limits. This information combined with a detailed field investigation and analysis that takes into account the three (3) jurisdictional wetland criteria [(1) presence of hydrophytic vegetation, (2) wetland hydrology and (3) hydric soils] is fundamental in the determination of jurisdictional wetlands.

1. Location: The proposed site for the Dam is located at approximately six kilometers (6 km) southwest (SW) of downtown Caguas, in the Beatriz Ward. The contemplated strategy is the construction of the Dam on land inside the Quebrada Beatriz at 2.2 km upriver from the confluence with the Río Turabo. Project reference coordinates in Puerto Rico Datum are 18°10'55" N; 66°03'45" W.
2. Topography: The topography is irregular. The Dam will occupy hill and valley areas.
3. Vegetative communities: The Project's vegetative communities consist of forested areas, pasture lands and thickets. The dominant species found within the upland areas adjacent to wetland areas were *Panicum maximum*, *Pennisetum purpureum*, *Spathodea campanulata*, *Albizia procera*, and *Bambusa vulgaris*. The dominant species found within the wetland areas were *Brachearia purpuracens*, *Colocasia esculenta* and *Mimosa pigra*. All wetland areas found within Project foot print are herbaceous wetlands.





Legend:

- Beatriz Dam
- Pipe
- Roads
- Wards



Figure 1: Site Location Map

Beatriz Dam and Intake/Outward Pipes Alignments-Beatriz Ward-Caguas, PR

4. Soils: Based on the Soil Survey of the San Juan Area of Puerto Rico, from the U.S. Department of Agriculture Soil Conservation Service, the Project contains twelve (12) soil series. The soil series found within Project foot print are shown in **Figure 2**. **Table 1** contains the description of the soil series found at the wetland areas.

**Table 1: Soil Series Description\* within wetland areas.**

Soil Series	Description
Caguabo clay loam (CaF) 40% to 60% Slopes	This is a very steep well drained soil on side slopes and mountain tops of strongly dissected uplands. Permeability is moderate, and the available water capacity is low.
Estacion silty clay loam (Es)	This is a nearly level, well drained soil on river flood plains. Permeability is moderate, and available water capacity is low.
Toa silty clay loam (To)	This is a nearly level, moderately well drained to well drained soil on flood plains. Permeability and available water capacity are moderate.

\* Soil description from USDA NRCS Soil Survey of San Juan Area of Puerto Rico (1969).

Even though, the *Caguabo* soil series is not likely to occur in wetland areas, this soil series was found in a portion of the Río Turabo near by the water intake area. The wetland area found at this site can be classified based in the Cowardin (1979) classification as *R2USC*, which describes Riverine, lower perennial, unconsolidated shore, seasonally flooded wetlands. The *Estacion* and *Toa* soil series are more likely to occur in wetlands since they are nearly level soils associated to flood plains.



5. National Wetland Inventory Map: The National Wetland Inventory Map from the USFWS does not possess information for the Project area, since its location corresponds to an area that was not photographed during the preparation of those maps. Even though there is not information of wetland areas to project site, according to Cowarding classification (1979), the wetland areas found can be classified as *PEMIC* and *R2USC*. The classification *PEMIC*, describes Palustrine, emergent, persistent, seasonally flooded wetlands; while the classification *R2USC* describes Riverine, lower perennial, unconsolidated shore, seasonally flooded wetlands.
  
6. Aquatic resources functions and values: The aquatic resources of the Project area consists of palustrine and riverine herbaceous wetlands, the Río Turabo and the Quebrada Beatriz. The functions and values are presented in **Table 2**.

**Table 2: Aquatic Resource Functions and Values.**

<b>Function</b>	<b>Value</b>
1. Surface water storage.	Reduced damage from floodwaters; sediment deposition.
2. Groundwater recharge.	Replenishment of resources.
3. Transformation and cycling of elements.	Replenishment of resources
4. Retention and removal of dissolved substances.	Maintenance of water quality
5. Accumulation of inorganic sediments.	Maintenance of water quality
6. Maintenance of characteristic plant communities.	Maintenance of biodiversity
7. Maintenance of characteristic energy flow.	Maintenance of biodiversity

7. Flood Zones and Hydrography: Based on the Flood Zones Maps of the Planning Board of Puerto Rico (2000), some sections of the Project areas lays within Zone 2 of the 100 Year Old Rain (not detailed). **Figure 3** contains the information on flood zones and hydrography.

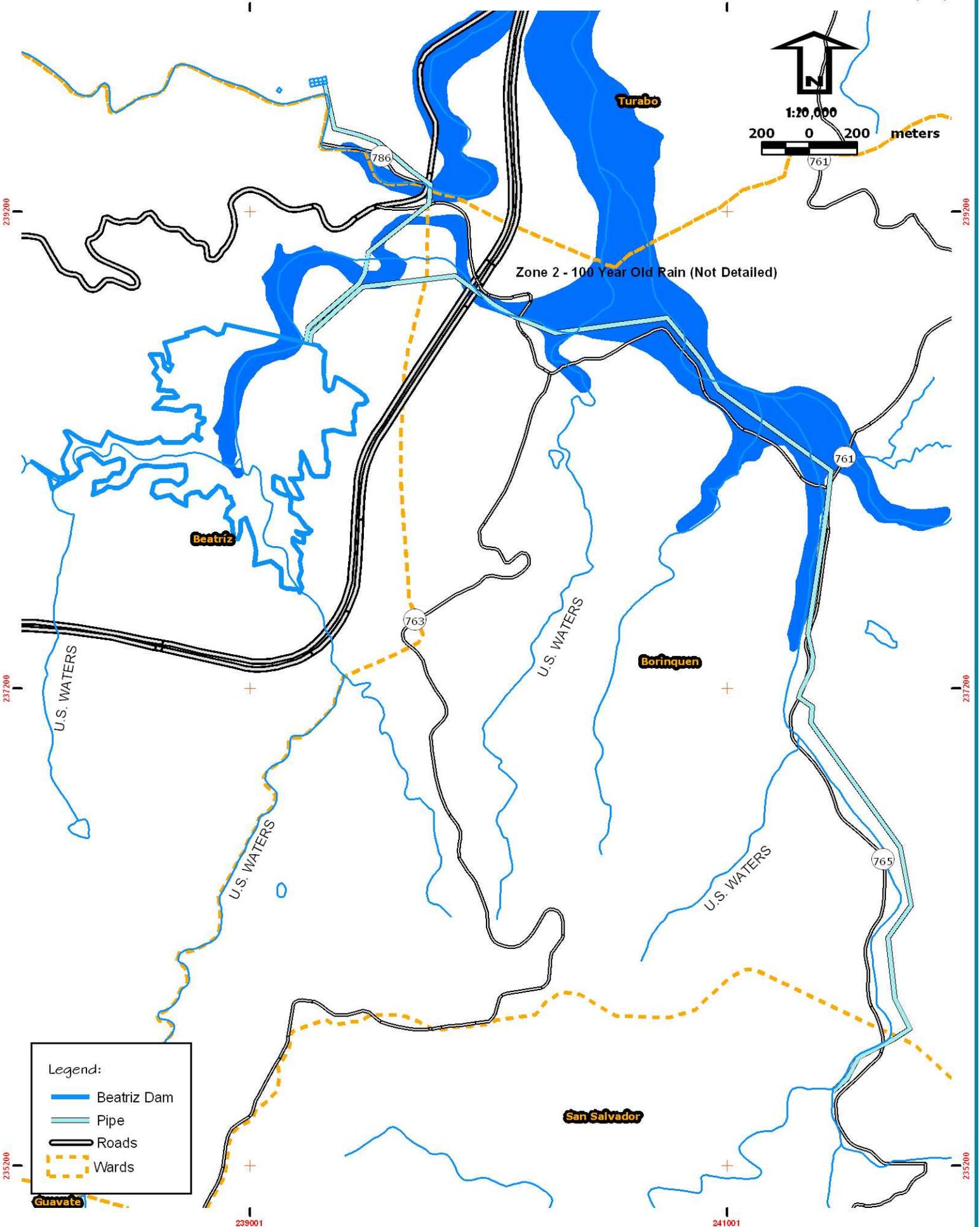


Figure 3: Flood Zones and Hydrography Map

Beatriz Dam and Intake/Outward Pipes Alignments-Beatriz Ward-Caguas, PR



## **TECHNICAL APPROACH AND METHODOLOGY**

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A four-phase approach was used for the Wetland Jurisdictional Determination (JD) and Delineation performed at the Project area. The technical approach followed the Routine Determination method described in the *1987 Corps of Engineers Wetland Delineation Manual*.

During phase 1 of the study a screening level analysis was performed to identify those areas within the Project regarded as potential jurisdictional wetlands under Section 404 of the Clean Water Act. The screening level analysis was performed using Geographic Information System (GIS) loaded with the following data of the site:

- Topography;
- Soil Survey;
- National Wetland Inventory (NWI) Map;
- Flood Zones and Hydrography; and,
- Aerial Photographs.

The results from this phase of the investigation provided specific and important information for the design of the field data collection effort.

Phase 2 of the study consisted of a series of preliminary site visits, including the inspection of the previously identified, potential wetland areas. These visits helped validate data that was gathered during the previous phase. They also contributed to a better understanding of the environmental conditions at the site in order to develop a fieldwork plan.

Phase 3 of the study included the delineation field visits to map any and all jurisdictional wetlands within the Project area. Each delineation visit included a description of hydrology, soil and dominant vegetation at representative sampling locations. Since the



Project possesses long distance linear components, referring to the intake/outward pipes alignments, these alignments were chosen as transects. Based on the information obtained and field inspections during the previous phases, a total of sixteen (16) sampling points were chosen for soil, hydrology and vegetation characterization along the proposed pipes alignments. Each sampling point was circular in shape, with a radius of twenty feet (20'). **Appendix A** includes the transcripts of the Data Forms for the Routine Wetland Determination.

The following tasks were carried out during this phase:

- Visual inspection of the site and, identification of landscape features;
- Sampling point establishment;
- Identification of plant communities;
- Selection of a representative area within each plant community to dig a soil pit;
- Identification of dominant plant species from the various strata within a 20-foot radius of the soil pit;
- Classification of plant species using the 1995 Revision to the National List of Plant Species that Occur in Wetlands (Region C);
- Description of hydrology around and within the soil pit;
- Soil pit excavation and characterization of soil using the Munsell Soil Color Chart;
- Fill in gathered data on each *Data Form* for the Routine Wetland Determination;
- Photographic documentation of the site, soil pit and surrounding vegetation;
- Collection of soil and plant samples for future reference; and,



- Field delineation of wetland areas using a Differential Global Positioning System (DGPS) for land surveying and delineation over aerial photograph based on the Routine Determination and plant communities found at wetland sites. The DGPS used for field delineation was a LEICA GS-20, which acquires data with an error of less than one meter (< 1m error). The DGPS was loaded with graphical data of Project components in order to determine the locations of proposed sites for pipes and dam.

Phase 4 of the study comprised the final analysis of data gathered during the inspection and delineation visits, and the drafting of this Wetland Jurisdictional Determination and Delineation Report. Final wetland boundary determination was based on the combination of all the available evidence. After the jurisdictional determination was performed, the wetland delineation was marked on the field with stake flags and flagging.



## RESULTS AND DISCUSSION

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During the Property assessment and delineation field visits, wetland areas and U.S. waters were found along intake/outward pipes alignments and water dam location. Even though the National Wetland Inventory Map does not possess information for the Project area, since its location corresponds to an area that was not photographed during the preparation of those maps, the wetlands found within the Property can be classified according to Cowardin classification (1979) as *PEMIC* and *R2USC*.

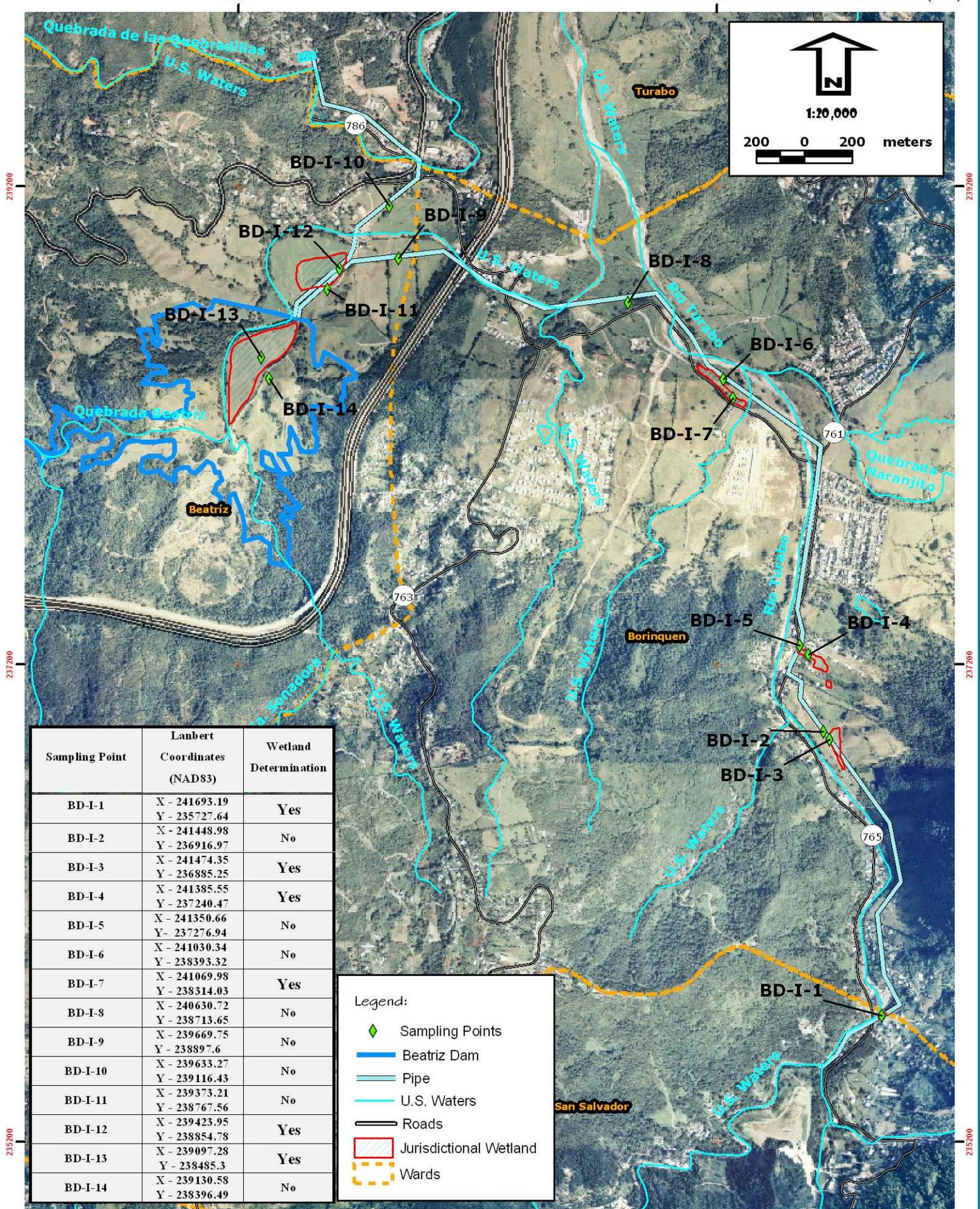
The wetlands found can be classified as: *PEMIC*, describes Palustrine, emergent, persistent, seasonally flooded wetlands; and *R2USC*, describes Riverine, lower perennial, unconsolidated shore, seasonally flooded wetlands. There was only one riverine wetland area identified, which is located near the water intake area and within the bank of the Río Turabo (within a US Waters). **Figure 4** and **Figure 6** show the location of sampling points, delineated wetland, and US Waters over the aerial photograph.

As described in the above mentioned classification, the wetlands found within the Project area are seasonally flooded, which means, that the inundation period of the wetland area varies with each rainy season. Even though, these wetland areas are not inundated all year round, the period of inundation or ponding is sufficient to create hydric soils and maintain or support hydrophytic vegetation.

The dominant plant species found at the upland areas, adjacent to wetland areas, were *Panicum maximum*, *Pennisetum purpureum*, *Spathodea campanulata*, *Albizia procera*, and *Bambusa vulgaris*. The dominant species found within the wetland areas were *Brachearia purpuracens* (FACW), *Colocasia esculenta* (OBL) and *Mimosa pigra* (FACW). Other vegetative communities as secondary forest, shrub/scrub land and pasture land were observed in other areas of the Project components.

**Appendix A** contains the transcriptions of the Data Forms filled in during the Project assessment for the Routine Wetland Determination. The photographic documentation of the studied area is shown in **Appendix B**.





Sampling Point	Lambert Coordinates (NAD83)	Wetland Determination
BD-I-1	X - 241693.19 Y - 235727.64	Yes
BD-I-2	X - 241448.98 Y - 236916.97	No
BD-I-3	X - 241474.35 Y - 236885.25	Yes
BD-I-4	X - 241385.55 Y - 237240.47	Yes
BD-I-5	X - 241350.66 Y - 237276.94	No
BD-I-6	X - 241030.34 Y - 238393.32	No
BD-I-7	X - 241069.98 Y - 238314.03	Yes
BD-I-8	X - 240630.72 Y - 238713.65	No
BD-I-9	X - 239669.75 Y - 238897.6	No
BD-I-10	X - 239633.27 Y - 239116.43	No
BD-I-11	X - 239373.21 Y - 238767.56	No
BD-I-12	X - 239423.95 Y - 238854.78	Yes
BD-I-13	X - 239097.28 Y - 238485.3	Yes
BD-I-14	X - 239130.58 Y - 238396.49	No

**Legend:**

- Sampling Points
- Beatriz Dam
- Pipe
- U.S. Waters
- Roads
- Jurisdictional Wetland
- Wards



Figure 4: Wetland Jurisdictional Determination and Delineation  
 Beatriz Dam and Intake / Outward Pipes Alignments-Beatriz Ward-Caguas, PR

Various sampling points within the Projects limits meet the three (3) criteria of a jurisdictional wetland. **Table 3** summarizes the Jurisdictional Wetland criteria that each sampling point met and the final decision on whether the area should be considered or not as a jurisdictional wetland.

**Table 3: Wetland Criteria Status for the Sampling Points\*.**

<b>Sampling Point s</b>	<b>Hydrophitic Vegetation</b>	<b>Wetland Hydrology</b>	<b>Hydric Soils</b>	<b>Wetland Determination</b>
BD-I-1	Yes	Yes	Yes	Yes
BD-I-2	No	No	No	No
BD-I-3	Yes	Yes	Yes	Yes
BD-I-4	Yes	Yes	Yes	Yes
BD-I-5	No	No	No	No
BD-I-6	No	No	No	No
BD-I-7	Yes	Yes	Yes	Yes
BD-I-8	No	No	No	No
BD-I-9	No	No	No	No
BD-I-10	No	No	No	No
BD-I-11	No	No	No	No
BD-I-12	Yes	Yes	Yes	Yes
BD-I-13	Yes	Yes	Yes	Yes
BD-I-14	No	No	No	No
BD-II-1	No	No	No	No
BD-II-2	No	No	No	No
BD-II-3	No	No	No	No

\* Sampling point location, wetland delineation and US Waters are shown in **Figure 4** and **Figure 6**.

The Projects layouts are overlaying some of the delineated jurisdictional wetlands and U.S. Waters. After the performance of the JD and overlaying of the Project layout over the delineated wetlands and U.S. Waters, impacts are expected to occur. A preliminary impact analysis was performed in order to quantify wetland impacts. This analysis was performed using a construction right-of-way of 20 meters. Preliminary wetland impact areas are shown in **Figure 5**. Detailed impacts to aquatic resources should be calculated after the final project design is performed.

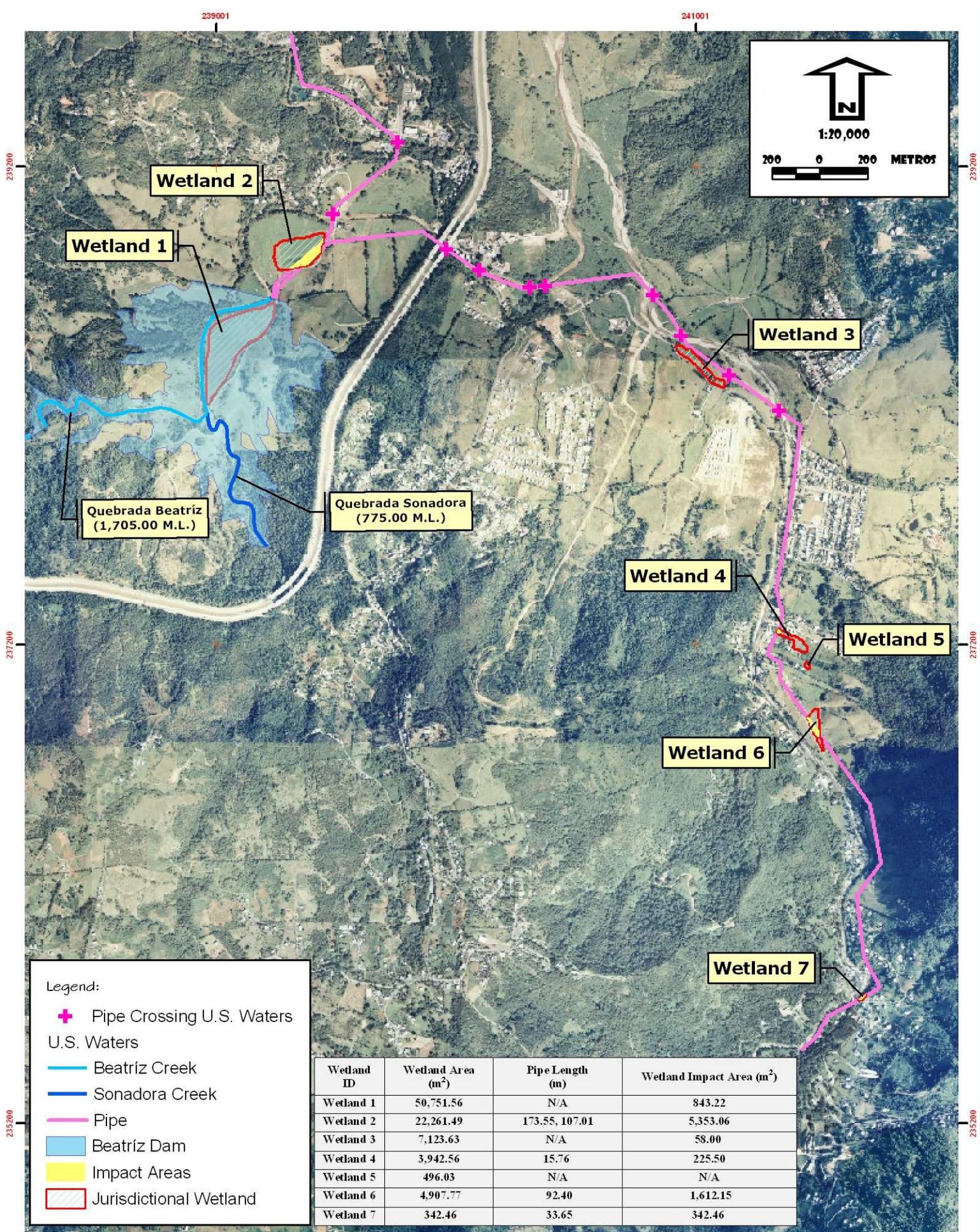
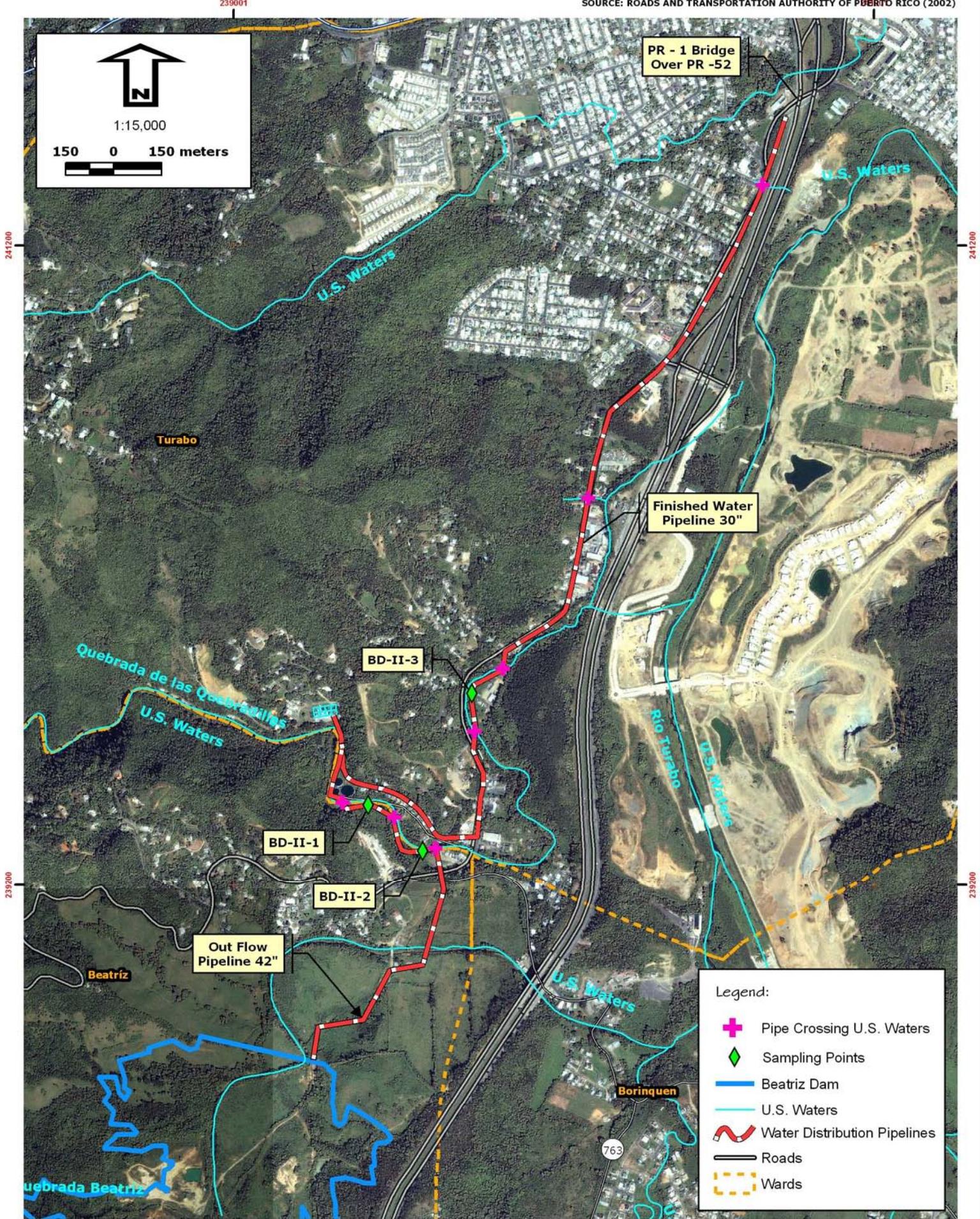


Figure 5: Wetland Impact Areas  
 Beatriz Dam and Intake / Outward Pipes Alignments-Beatriz Ward-Caguas, PR



  
 1:15,000  
 150 0 150 meters  


Legend:

-  Pipe Crossing U.S. Waters
-  Sampling Points
-  Beatriz Dam
-  U.S. Waters
-  Water Distribution Pipelines
-  Roads
-  Wards



239001 241001

**Figure 6: Water Distribution Pipelines**  
 Beatriz Dam and Intake / Outward Pipes Alignments-Beatriz Ward-Caguas, PR

## **CONCLUSIONS AND RECOMMENDATIONS**

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The Wetland Jurisdictional Determination and Delineation Study conducted by AMBIENTA INC. shows that within the study area there are wetlands and aquatic resources under the jurisdiction of the U.S. Army Corps of Engineers, by virtue of Section 404 of the Clean Water Act of 1972, as amended. This conclusion is supported by:

- ❖ The presence of hydrophytic vegetation, hydric soils and wetland hydrology indicators,
- ❖ Superficial hydrological connection with other wetlands and/or U. S. Waters,
- ❖ Photographic documentation, and
- ❖ Data forms.

Impacts to jurisdictional wetlands can be avoided through comprehensive planning incorporating these areas within the Project design. Wetlands and U.S. Waters provide functions and possess attributes that may well enhance the Project landscape and can offer areas for recreation and education, among other services.

Given the imminent possibility of impacting some of these wetlands during the construction phase of the proposed Projects, a formal permitting process may need to be initiated with the Regulatory Division of the Antilles Regulatory Section of the USACE. It is the policy of the USACE and the Environmental Protection Agency (EPA), through a Memorandum of Understanding, that a sequence of steps has to be considered during the design of any project impacting jurisdictional wetlands. First, an attempt to develop a design that avoids the impact on the wetland area should be made. If impact to the wetland is unavoidable, an attempt to minimize it to a practicable extent should be made, followed by the mitigation actions for the wetlands that are going to be inevitably impacted.



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## APPENDIXES

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**APPENDIX A:**

**TRANSCRIPTS OF SAMPLING POINTS DATA FORMS  
FOR ROUTINE WETLAND DETERMINATION**

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Beatriz Dam</u> Applicant/Owner: <u>AFI</u> Investigators: <u>Walter E. Soler-Figueroa</u>	Date: <u>September 15, 2005</u> County: <u>Caguas</u> State: <u>PR</u>
Do Normal Circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is the site significantly disturbed (Atypical Situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is the area a potential Problem Area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If needed, explain on reverse.)	Community ID: <u>BD</u> Transect ID: <u>1</u> Plot ID: <u>1</u>

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Colocasia esculenta</u>	<u>Herb</u>	<u>OBL</u>	9. _____	_____	_____
2. <u>Gynerium sagittatum</u>	<u>Herb</u>	<u>OBL</u>	10. _____	_____	_____
3. _____	_____	_____	11. _____	_____	_____
4. _____	_____	_____	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of dominant species that are OBL, FACW, or FAC (excluding FAC-): **100%**

Remarks: Dominant plant species in percentages of cover area. Indicator based on 1995 Revision to the National List of Plant Species that Occur in Wetlands.

<i>Colocasia esculenta</i>	75%
<i>Gynerium sagittatum</i>	25%

**HYDROLOGY**

<input checked="" type="checkbox"/> Recorded Data (Described in Remarks) <input type="checkbox"/> Stream, Lake, or Tide Gauge <input checked="" type="checkbox"/> Aerial Photographs <input checked="" type="checkbox"/> Others <input type="checkbox"/> No Recorded Data Available	<b>Wetland Hydrology Indicators:</b> <b>Primary Indicators</b> <input checked="" type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input checked="" type="checkbox"/> Water Marks <input checked="" type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands <b>Secondary Indicators (2 or more required):</b> <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input checked="" type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
<b>Field Observations</b>  Depth of Surface Water <u>  4  </u> (in)  Depth to Free Water in Pit      _____ (in)  Depth to Saturated Soil      _____ (in)	
Remarks: Recorded data on Soils, National Wetland Inventory Maps, Flood Zones, Hydrography and Color Aerial Photography also available. Sampling point is a vegetated area located within U.S. Waters.	

**DATA FORM  
ROUTINE WETLAND DETERMINATION  
(1987 COE Wetlands Delineation Manual)**

**Beatriz Dam Wetland JD, Caguas, P.R. (BD-I-1)**

**SOILS**

Map Unit Name (Series and Phase):		<u>Caguabo Clay Loam (CaF)</u>	Drainage Class:		-----
Taxonomy (Subgroup):		<u>Lithic Eutropepts</u>	Confirm Mapped Type?		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>Profile Description</b>					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance / Contrast	Texture, Concretions Structure, etc
<b>Hydric Soil Indicators:</b>					
<input type="checkbox"/> Histosol		<input type="checkbox"/> Concretions			
<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils			
<input type="checkbox"/> Sulfidic Odor		<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Listed on Local Hydric Soils List			
<input type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Listed on National Hydric Soils List			
<input type="checkbox"/> Gleyed or Low-Chroma Colors		<input type="checkbox"/> Other (Explain in Remarks)			
Remarks: No soil pit was performed since the area was flooded and is within the banks of the Río Turabo which is considered as U.S. Waters.					

**WETLAND DETERMINATION**

Hydrophitic Vegetation Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Wetland Hydrology Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Hydric Soils Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Remarks: The area was located nearby the boundary of the U.S. Water, between the Río Turabo riverbanks.		

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Beatriz Dam</u> Applicant/Owner: <u>AFI</u> Investigators: <u>Walter E. Soler-Figueroa</u>	Date: <u>September 15, 2005</u> County: <u>Caguas</u> State: <u>PR</u>
Do Normal Circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is the site significantly disturbed (Atypical Situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is the area a potential Problem Area? (If needed, explain on reverse.) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Community ID: <u>BD</u> Transect ID: <u>1</u> Plot ID: <u>2</u>

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <i>Panicum maximum</i>	Herb	FACU-	9. _____	_____	_____
2. <i>Pennisetum purpureum</i>	Herb	FAC	10. _____	_____	_____
3. <i>Paspalum conjugatum</i>	Herb	FAC	11. _____	_____	_____
4. _____	_____	_____	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of dominant species that are OBL, FACW, or FAC (excluding FAC-): **40%**

Remarks: Dominant plant species in percentages of cover area. Indicator based on 1995 Revision to the National List of Plant Species that Occur in Wetlands.	<i>Panicum maximum</i> 60% <i>Pennisetum purpureum</i> 20% <i>Paspalum conjugatum</i> 20%
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**HYDROLOGY**

<input checked="" type="checkbox"/> Recorded Data (Described in Remarks) <input type="checkbox"/> Stream, Lake, or Tide Gauge <input checked="" type="checkbox"/> Aerial Photographs <input checked="" type="checkbox"/> Others <input type="checkbox"/> No Recorded Data Available	<b>Wetland Hydrology Indicators:</b> <b>Primary Indicators</b> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands <b>Secondary Indicators (2 or more required):</b> <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
<b>Field Observations</b>  Depth of Surface Water      _____ (in)  Depth to Free Water in Pit      _____ (in)  Depth to Saturated Soil      _____ (in)	
Remarks: Recorded data on Soils, National Wetland Inventory Maps, Flood Zones, Hydrography and Color Aerial Photography also available. Sampling point is a vegetated area use for pasture within an upland area. No hydrology indicators found within the sampling point.	

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
(1987 COE Wetlands Delineation Manual)

Beatriz Dam Wetland JD, Caguas, P.R. (BD-I-2)

**SOILS**

Map Unit Name (Series and Phase):		Estacion Silty Clay Loam (Es)		Drainage Class: -----													
Taxonomy (Subgroup):		Fluentic Hapludolls		Confirm Mapped Type? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No													
<b>Profile Description</b>																	
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance / Contrast	Texture, Concretions Structure, etc												
0-18	A	10YR 4/3			loamy												
Hydric Soil Indicators: <table style="width: 100%; border: none;"> <tr> <td><input type="checkbox"/> Histosol</td> <td><input type="checkbox"/> Concretions</td> </tr> <tr> <td><input type="checkbox"/> Histic Epipedon</td> <td><input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils</td> </tr> <tr> <td><input type="checkbox"/> Sulfidic Odor</td> <td><input type="checkbox"/> Organic Streaking in Sandy Soils</td> </tr> <tr> <td><input type="checkbox"/> Aquic Moisture Regime</td> <td><input type="checkbox"/> Listed on Local Hydric Soils List</td> </tr> <tr> <td><input type="checkbox"/> Reducing Conditions</td> <td><input type="checkbox"/> Listed on National Hydric Soils List</td> </tr> <tr> <td><input type="checkbox"/> Gleyed or Low-Chroma Colors</td> <td><input type="checkbox"/> Other (Explain in Remarks)</td> </tr> </table>						<input type="checkbox"/> Histosol	<input type="checkbox"/> Concretions	<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils	<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils	<input type="checkbox"/> Aquic Moisture Regime	<input type="checkbox"/> Listed on Local Hydric Soils List	<input type="checkbox"/> Reducing Conditions	<input type="checkbox"/> Listed on National Hydric Soils List	<input type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Histosol	<input type="checkbox"/> Concretions																
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils																
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils																
<input type="checkbox"/> Aquic Moisture Regime	<input type="checkbox"/> Listed on Local Hydric Soils List																
<input type="checkbox"/> Reducing Conditions	<input type="checkbox"/> Listed on National Hydric Soils List																
<input type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Other (Explain in Remarks)																
Remarks: Soil pit was located within an upland area near the wetland boundary.																	

**WETLAND DETERMINATION**

Hydrophitic Vegetation Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Wetland Hydrology Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Hydric Soils Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Remarks: The area was located nearby the boundary of an herbaceous wetland area. The wetland boundary is located to the East of the sampling point.	

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Beatriz Dam</u>	Date: <u>September 15, 2005</u>
Applicant/Owner: <u>AFI</u>	County: <u>Caguas</u>
Investigators: <u>Walter E. Soler-Figueroa</u>	State: <u>PR</u>
Do Normal Circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: <u>BD</u>
Is the site significantly disturbed (Atypical Situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: <u>1</u>
Is the area a potential Problem Area? (If needed, explain on reverse.) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: <u>3</u>

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <i>Sporobolus virginatus</i>	Herb	FACW	9. _____	_____	_____
2. <i>Sida rhombifolia</i>	Herb	FAC	10. _____	_____	_____
3. <i>Paspalum conjugatum</i>	Herb	FAC	11. _____	_____	_____
4. _____	_____	_____	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of dominant species that are OBL, FACW, or FAC (excluding FAC-): **100%**

Remarks: Dominant plant species in percentages of cover area. Indicator based on 1995 Revision to the National List of Plant Species that Occur in Wetlands.	<i>Sporobolus virginatus</i> 60% <i>Sida rhombifolia</i> 20% <i>Paspalum conjugatum</i> 20%
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**HYDROLOGY**

<input checked="" type="checkbox"/> Recorded Data (Described in Remarks) <input type="checkbox"/> Stream, Lake, or Tide Gauge <input checked="" type="checkbox"/> Aerial Photographs <input checked="" type="checkbox"/> Others <input type="checkbox"/> No Recorded Data Available	<b>Wetland Hydrology Indicators:</b> <b>Primary Indicators</b> <input checked="" type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input checked="" type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands <b>Secondary Indicators (2 or more required):</b> <input checked="" type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input checked="" type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
<b>Field Observations</b>  Depth of Surface Water <u>  3  </u> (in)  Depth to Free Water in Pit     _____ (in)  Depth to Saturated Soil     _____ (in)	
Remarks: Recorded data on Soils, National Wetland Inventory Maps, Flood Zones, Hydrography and Color Aerial Photography also available. Sampling point is a vegetated depression which receives water from an intermittent unnamed creek and is used for pasture activities. No permanent hydrology connection to other wetlands or US Waters.	

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
**(1987 COE Wetlands Delineation Manual)**

Beatriz Dam Wetland JD, Caguas, P.R. (BD-I-3)

**SOILS**

Map Unit Name (Series and Phase):		<u>Estacion Silty Clay Loam (Es)</u>	Drainage Class:		-----
Taxonomy (Subgroup):		<u>Fluventic Hapludolls</u>	Confirm Mapped Type?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Profile Description					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance / Contrast	Texture, Concretions Structure, etc
0-6	A	10YR 6/4			loamy clay
6-18	B	10YR 6/1			loamy clay
Hydric Soil Indicators:					
<input type="checkbox"/> Histosol		<input type="checkbox"/> Concretions			
<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils			
<input type="checkbox"/> Sulfidic Odor		<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input checked="" type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Listed on Local Hydric Soils List			
<input checked="" type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Listed on National Hydric Soils List			
<input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors		<input type="checkbox"/> Other (Explain in Remarks)			
Remarks: Soil pit was located within an inundated wetland area.					

**WETLAND DETERMINATION**

Hydrophitic Vegetation Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Wetland Hydrology Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Hydric Soils Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Remarks: Sampling point is a vegetated depression which receives water from an intermittent unnamed creek and is used for pasture activities. No permanent hydrology connection to other wetlands or US Waters, but the wetland boundary is adjacent to Río Turabo, thus considered jurisdictional.		

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
**(1987 COE Wetlands Delineation Manual)**

Project/Site: <u>Beatriz Dam</u> Applicant/Owner: <u>AFI</u> Investigators: <u>Walter E. Soler-Figueroa</u>	Date: <u>September 15, 2005</u> County: <u>Caguas</u> State: <u>PR</u>
Do Normal Circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is the site significantly disturbed (Atypical Situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is the area a potential Problem Area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If needed, explain on reverse.)	Community ID: <u>BD</u> Transect ID: <u>1</u> Plot ID: <u>4</u>

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <i>Sporobolus virginatus</i>	Herb	FACW	9. _____	_____	_____
2. <i>Sida rhombifolia</i>	Herb	FAC	10. _____	_____	_____
3. <i>Paspalum conjugatum</i>	Herb	FAC	11. _____	_____	_____
4. <i>Colocasia esculenta</i>	Herb	OBL	12. _____	_____	_____
5. <i>Brachearia purpuracens</i>	Herb	FACW-	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of dominant species that are OBL, FACW, or FAC (excluding FAC-): **100%**

Remarks: Dominant plant species in percentages of cover area. Indicator based on 1995 Revision to the National List of Plant Species that Occur in Wetlands.	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border: none;"><i>Sporobolus virginatus</i></td> <td style="border: none; text-align: right;">5%</td> <td style="border: none;"><i>Brachearia purpuracens</i></td> <td style="border: none; text-align: right;">35%</td> </tr> <tr> <td style="border: none;"><i>Sida rhombifolia</i></td> <td style="border: none; text-align: right;">5%</td> <td style="border: none;"></td> <td style="border: none;"></td> </tr> <tr> <td style="border: none;"><i>Paspalum conjugatum</i></td> <td style="border: none; text-align: right;">5%</td> <td style="border: none;"></td> <td style="border: none;"></td> </tr> <tr> <td style="border: none;"><i>Colocasia esculenta</i></td> <td style="border: none; text-align: right;">50%</td> <td style="border: none;"></td> <td style="border: none;"></td> </tr> </table>	<i>Sporobolus virginatus</i>	5%	<i>Brachearia purpuracens</i>	35%	<i>Sida rhombifolia</i>	5%			<i>Paspalum conjugatum</i>	5%			<i>Colocasia esculenta</i>	50%		
<i>Sporobolus virginatus</i>	5%	<i>Brachearia purpuracens</i>	35%														
<i>Sida rhombifolia</i>	5%																
<i>Paspalum conjugatum</i>	5%																
<i>Colocasia esculenta</i>	50%																

**HYDROLOGY**

<input checked="" type="checkbox"/> Recorded Data (Described in Remarks) <input type="checkbox"/> Stream, Lake, or Tide Gauge <input checked="" type="checkbox"/> Aerial Photographs <input checked="" type="checkbox"/> Others <input type="checkbox"/> No Recorded Data Available	<b>Wetland Hydrology Indicators:</b> <b>Primary Indicators</b> <input checked="" type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input checked="" type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input checked="" type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands <b>Secondary Indicators (2 or more required):</b> <input checked="" type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input checked="" type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
<b>Field Observations</b>  Depth of Surface Water <u>  4  </u> (in)  Depth to Free Water in Pit     _____ (in)  Depth to Saturated Soil     _____ (in)	
Remarks: Recorded data on Soils, National Wetland Inventory Maps, Flood Zones, Hydrography and Color Aerial Photography also available. Sampling point is a vegetated depression which collects waters from runoff. A remnant of a culvert under state road PR 765 drains the wetland to Río Turabo.	

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
**(1987 COE Wetlands Delineation Manual)**

Beatriz Dam Wetland JD, Caguas, P.R. (BD-I-4)

**SOILS**

Map Unit Name (Series and Phase):		<u>Estacion Silty Clay Loam (Es)</u>	Drainage Class:		-----
Taxonomy (Subgroup):		<u>Fluventic Hapludolls</u>	Confirm Mapped Type?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>Profile Description</b>					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance / Contrast	Texture, Concretions Structure, etc
0-6	A	10YR 6/4			loamy clay
6-18	B	10YR 6/1			loamy clay
<b>Hydric Soil Indicators:</b> <input type="checkbox"/> Histosol <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> Sulfidic Odor <input checked="" type="checkbox"/> Aquic Moisture Regime <input checked="" type="checkbox"/> Reducing Conditions <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors <input type="checkbox"/> Concretions <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils <input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric Soils List <input type="checkbox"/> Other (Explain in Remarks)					
Remarks: Soil pit was located within an inundated wetland area.					

**WETLAND DETERMINATION**

Hydrophitic Vegetation Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Wetland Hydrology Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Hydric Soils Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Remarks: The area was located nearby the boundary of an herbaceous seasonal wetland area.		

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
**(1987 COE Wetlands Delineation Manual)**

Project/Site: <u>Beatriz Dam</u> Applicant/Owner: <u>AFI</u> Investigators: <u>Walter E. Soler-Figueroa</u>	Date: <u>September 15, 2005</u> County: <u>Caguas</u> State: <u>PR</u>
Do Normal Circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is the site significantly disturbed (Atypical Situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is the area a potential Problem Area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If needed, explain on reverse.)	Community ID: <u>BD</u> Transect ID: <u>I</u> Plot ID: <u>2</u>

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <i>Panicum maximum</i>	Herb	FACU-	9. _____	_____	_____
2. <i>Pennisetum purpureum</i>	Herb	FAC	10. _____	_____	_____
3. <i>Paspalum conjugatum</i>	Herb	FAC	11. _____	_____	_____
4. _____	_____	_____	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of dominant species that are OBL, FACW, or FAC (excluding FAC-): **40%**

Remarks: Dominant plant species in percentages of cover area. Indicator based on 1995 Revision to the National List of Plant Species that Occur in Wetlands.	<i>Panicum maximum</i> 60% <i>Pennisetum purpureum</i> 20% <i>Paspalum conjugatum</i> 20%
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**HYDROLOGY**

<input checked="" type="checkbox"/> Recorded Data (Described in Remarks) <input type="checkbox"/> Stream, Lake, or Tide Gauge <input checked="" type="checkbox"/> Aerial Photographs <input checked="" type="checkbox"/> Others <input type="checkbox"/> No Recorded Data Available	<b>Wetland Hydrology Indicators:</b> <b>Primary Indicators</b> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands <b>Secondary Indicators (2 or more required):</b> <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
<b>Field Observations</b>  Depth of Surface Water      _____ (in)  Depth to Free Water in Pit      _____ (in)  Depth to Saturated Soil      _____ (in)	
Remarks: Recorded data on Soils, National Wetland Inventory Maps, Flood Zones, Hydrography and Color Aerial Photography also available. No hydrology indicators found within the sampling point.	

**DATA FORM  
ROUTINE WETLAND DETERMINATION  
(1987 COE Wetlands Delineation Manual)**

Beatriz Dam Wetland JD, Caguas, P.R. (BD-I-5)

**SOILS**

Map Unit Name (Series and Phase):		<u>Estacion Silty Clay Loam (Es)</u>	Drainage Class:		<u>-----</u>												
Taxonomy (Subgroup):		<u>Fluventic Hapludolls</u>	Confirm Mapped Type?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No												
<b>Profile Description</b>																	
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance / Contrast	Texture, Concretions Structure, etc												
0-18	A	10YR 4/3			loamy												
<b>Hydric Soil Indicators:</b> <table style="width: 100%; border: none;"> <tr> <td><input type="checkbox"/> Histosol</td> <td><input type="checkbox"/> Concretions</td> </tr> <tr> <td><input type="checkbox"/> Histic Epipedon</td> <td><input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils</td> </tr> <tr> <td><input type="checkbox"/> Sulfidic Odor</td> <td><input type="checkbox"/> Organic Streaking in Sandy Soils</td> </tr> <tr> <td><input type="checkbox"/> Aquic Moisture Regime</td> <td><input type="checkbox"/> Listed on Local Hydric Soils List</td> </tr> <tr> <td><input type="checkbox"/> Reducing Conditions</td> <td><input type="checkbox"/> Listed on National Hydric Soils List</td> </tr> <tr> <td><input type="checkbox"/> Gleyed or Low-Chroma Colors</td> <td><input type="checkbox"/> Other (Explain in Remarks)</td> </tr> </table>						<input type="checkbox"/> Histosol	<input type="checkbox"/> Concretions	<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils	<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils	<input type="checkbox"/> Aquic Moisture Regime	<input type="checkbox"/> Listed on Local Hydric Soils List	<input type="checkbox"/> Reducing Conditions	<input type="checkbox"/> Listed on National Hydric Soils List	<input type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Histosol	<input type="checkbox"/> Concretions																
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils																
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils																
<input type="checkbox"/> Aquic Moisture Regime	<input type="checkbox"/> Listed on Local Hydric Soils List																
<input type="checkbox"/> Reducing Conditions	<input type="checkbox"/> Listed on National Hydric Soils List																
<input type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Other (Explain in Remarks)																
Remarks: Soil pit was located within an upland area near the wetland boundary at a higher elevation, at the edge of state road PR 765.																	

**WETLAND DETERMINATION**

Hydrophitic Vegetation Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Wetland Hydrology Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Hydric Soils Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Remarks: The area was located nearby the boundary of an herbaceous wetland area. The wetland boundary is located to the East of the sampling point.		

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
**(1987 COE Wetlands Delineation Manual)**

Project/Site: <u>Beatriz Dam</u> Applicant/Owner: <u>AFI</u> Investigators: <u>Walter E. Soler-Figueroa</u>	Date: <u>September 15, 2005</u> County: <u>Caguas</u> State: <u>PR</u>
Do Normal Circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is the site significantly disturbed (Atypical Situation)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is the area a potential Problem Area? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (If needed, explain on reverse.)	Community ID: <u>BD</u> Transect ID: <u>1</u> Plot ID: <u>6</u>

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Panicum maximum</u>	<u>Herb</u>	<u>FACU-</u>	9. _____	_____	_____
2. <u>Pennisetum purpureum</u>	<u>Herb</u>	<u>FAC</u>	10. _____	_____	_____
3. <u>Brachearia purpuracens</u>	<u>Herb</u>	<u>FACW-</u>	11. _____	_____	_____
4. _____	_____	_____	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of dominant species that are OBL, FACW, or FAC (excluding FAC-): **40%**

Remarks: Dominant plant species in percentages of cover area. Indicator based on 1995 Revision to the National List of Plant Species that Occur in Wetlands.

<i>Panicum maximum</i>	60%
<i>Pennisetum purpureum</i>	20%
<i>Brachearia purpuracens</i>	20%

**HYDROLOGY**

<input checked="" type="checkbox"/> Recorded Data (Described in Remarks) <input type="checkbox"/> Stream, Lake, or Tide Gauge <input checked="" type="checkbox"/> Aerial Photographs <input checked="" type="checkbox"/> Others <input type="checkbox"/> No Recorded Data Available	<b>Wetland Hydrology Indicators:</b> <b>Primary Indicators</b> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands <b>Secondary Indicators (2 or more required):</b> <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
<b>Field Observations</b>  Depth of Surface Water      _____ (in)  Depth to Free Water in Pit      _____ (in)  Depth to Saturated Soil      _____ (in)	
Remarks: Recorded data on Soils, National Wetland Inventory Maps, Flood Zones, Hydrography and Color Aerial Photography also available. Sampling point is a vegetated area use for pasture within an upland area. No hydrology indicators found within the sampling point.	

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
**(1987 COE Wetlands Delineation Manual)**

Beatriz Dam Wetland JD, Caguas, P.R. (BD-I-6)

**SOILS**

Map Unit Name (Series and Phase):		<u>Estacion Silty Clay Loam (Es)</u>		Drainage Class:	-----
Taxonomy (Subgroup):		<u>Fluventic Hapludolls</u>		Confirm Mapped Type?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>Profile Description</b>					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance / Contrast	Texture, Concretions Structure, etc
0-18	A	10YR 6/6			loamy
<b>Hydric Soil Indicators:</b>					
<input type="checkbox"/> Histosol		<input type="checkbox"/> Concretions			
<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils			
<input type="checkbox"/> Sulfidic Odor		<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Listed on Local Hydric Soils List			
<input type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Listed on National Hydric Soils List			
<input type="checkbox"/> Gleyed or Low-Chroma Colors		<input type="checkbox"/> Other (Explain in Remarks)			
Remarks: Soil pit was located within an upland area near the wetland boundary at a higher elevation, at the edge of state road PR 765. Scrap metals and debris were found semi buried in the soil and under vegetation.					

**WETLAND DETERMINATION**

Hydrophitic Vegetation Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Wetland Hydrology Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Hydric Soils Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is this Sampling Point Within a Wetland?	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Remarks: The area was located nearby the boundary of an herbaceous wetland area. The wetland boundary is located to the East of the sampling point. The area was classified as atypical situation and a problem area since it appears that it was subject to filling activities in the past. Scrap metals and debris were found semi buried in the soil and under vegetation. Even thou the area is very close to Río Turabo, it does not show wetland indicators.	

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
**(1987 COE Wetlands Delineation Manual)**

Project/Site: <u>Beatriz Dam</u> Applicant/Owner: <u>AFI</u> Investigators: <u>Walter E. Soler-Figueroa</u>	Date: <u>September 15, 2005</u> County: <u>Caguas</u> State: <u>PR</u>
Do Normal Circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is the site significantly disturbed (Atypical Situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is the area a potential Problem Area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If needed, explain on reverse.)	Community ID: <u>BD</u> Transect ID: <u>1</u> Plot ID: <u>7</u>

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u><i>Paspalum conjugatum</i></u>	<u>Herb</u>	<u>FAC</u>	9. _____	_____	_____
2. <u><i>Brachearia purpuracens</i></u>	<u>Herb</u>	<u>FACW-</u>	10. _____	_____	_____
3. <u><i>Cyperus iria</i></u>	<u>Herb</u>	<u>FACW</u>	11. _____	_____	_____
4. <u><i>Ipomea setifera</i></u>	<u>Vine</u>	<u>FACW</u>	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of dominant species that are OBL, FACW, or FAC (excluding FAC-): **100%**

Remarks: Dominant plant species in percentages of cover area. Indicator based on 1995 Revision to the National List of Plant Species that Occur in Wetlands.	<i>Paspalum conjugatum</i> 5% <i>Brachearia purpuracens</i> 75% <i>Cyperus iria</i> 10% <i>Ipomea setifera</i> 10%
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**HYDROLOGY**

<input checked="" type="checkbox"/> Recorded Data (Described in Remarks) <input type="checkbox"/> Stream, Lake, or Tide Gauge <input checked="" type="checkbox"/> Aerial Photographs <input checked="" type="checkbox"/> Others <input type="checkbox"/> No Recorded Data Available	<b>Wetland Hydrology Indicators:</b> <b>Primary Indicators</b> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input checked="" type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands <b>Secondary Indicators (2 or more required):</b> <input checked="" type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input checked="" type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
<b>Field Observations</b>  Depth of Surface Water _____ (in)  Depth to Free Water in Pit _____ (in)  Depth to Saturated Soil <u>12</u> (in)	
Remarks: Recorded data on Soils, National Wetland Inventory Maps, Flood Zones, Hydrography and Color Aerial Photography also available. Sampling point is a vegetated depression which seasonally collects waters from runoff and floods from Río Turabo.	

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
**(1987 COE Wetlands Delineation Manual)**

Beatriz Dam Wetland JD, Caguas, P.R. (BD-I-7)

**SOILS**

Map Unit Name (Series and Phase):		<u>Estacion Silty Clay Loam (Es)</u>	Drainage Class:		<u>-----</u>
Taxonomy (Subgroup):		<u>Fluventic Hapludolls</u>	Confirm Mapped Type?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>Profile Description</b>					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance / Contrast	Texture, Concretions Structure, etc
0-6	A	10YR 4/			silty loamy
6-18	B	10YR 4/1			silty loamy
<b>Hydric Soil Indicators:</b>					
<input type="checkbox"/> Histosol		<input checked="" type="checkbox"/> Concretions			
<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils			
<input type="checkbox"/> Sulfidic Odor		<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Listed on Local Hydric Soils List			
<input checked="" type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Listed on National Hydric Soils List			
<input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors		<input type="checkbox"/> Other (Explain in Remarks)			
Remarks: Soil pit was located within a depression isolated from Río Turabo by an upland area possibly formed by the deposition of filling material and buried scrap metal and debris.					

**WETLAND DETERMINATION**

Hydrophitic Vegetation Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Wetland Hydrology Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Hydric Soils Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Remarks: The area was located nearby the boundary of an herbaceous seasonal wetland area.		

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
**(1987 COE Wetlands Delineation Manual)**

Project/Site: <u>Beatriz Dam</u> Applicant/Owner: <u>AFI</u> Investigators: <u>Walter E. Soler-Figueroa</u>	Date: <u>September 15, 2005</u> County: <u>Caguas</u> State: <u>PR</u>
Do Normal Circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is the site significantly disturbed (Atypical Situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is the area a potential Problem Area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If needed, explain on reverse.)	Community ID: <u>BD</u> Transect ID: <u>1</u> Plot ID: <u>8</u>

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Panicum maximum</u>	Herb	FACU-	9. _____	_____	_____
2. <u>Pennisetum purpureum</u>	Herb	FAC	10. _____	_____	_____
3. <u>Albizia procera</u>	Tree	N/I-UPL*	11. _____	_____	_____
4. <u>Spathodea campanulata</u>	Tree	FACU	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of dominant species that are OBL, FACW, or FAC (excluding FAC-): **40%**

Remarks: Dominant plant species in percentages of cover area. Indicator based on 1995 Revision to the National List of Plant Species that Occur in Wetlands.	<i>Panicum maximum</i> 40% <i>Pennisetum purpureum</i> 40% <i>Albizia procera</i> * 10% <i>Spathodea campanulata</i> 10%	*UPL indicator based on professional judgment.
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**HYDROLOGY**

<input checked="" type="checkbox"/> Recorded Data (Described in Remarks) <input type="checkbox"/> Stream, Lake, or Tide Gauge <input checked="" type="checkbox"/> Aerial Photographs <input checked="" type="checkbox"/> Others <input type="checkbox"/> No Recorded Data Available	<b>Wetland Hydrology Indicators:</b> <b>Primary Indicators</b> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands <b>Secondary Indicators (2 or more required):</b> <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
<b>Field Observations</b>  Depth of Surface Water _____ (in)  Depth to Free Water in Pit _____ (in)  Depth to Saturated Soil _____ (in)	
Remarks: Recorded data on Soils, National Wetland Inventory Maps, Flood Zones, Hydrography and Color Aerial Photography also available. Sampling point is a vegetated area use for pasture within an upland area. No hydrology indicators found within the sampling point.	

**DATA FORM  
ROUTINE WETLAND DETERMINATION  
(1987 COE Wetlands Delineation Manual)**

Beatriz Dam Wetland JD, Caguas, P.R. (BD-I-8)

**SOILS**

Map Unit Name (Series and Phase):		<u>Estacion Silty Clay Loam (Es)</u>		Drainage Class:	-----
Taxonomy (Subgroup):		<u>Fluentic Hapludolls</u>		Confirm Mapped Type?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Profile Description					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance / Contrast	Texture, Concretions Structure, etc
0-18	A	10YR 6/4			loamy
Hydric Soil Indicators:					
<input type="checkbox"/> Histosol		<input type="checkbox"/> Concretions			
<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils			
<input type="checkbox"/> Sulfidic Odor		<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Listed on Local Hydric Soils List			
<input type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Listed on National Hydric Soils List			
<input type="checkbox"/> Gleyed or Low-Chroma Colors		<input type="checkbox"/> Other (Explain in Remarks)			
Remarks: Soil pit was located within an upland area.					

**WETLAND DETERMINATION**

Hydrophitic Vegetation Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Wetland Hydrology Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Hydric Soils Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Remarks: The area was located nearby the Rio Turabo approximately ten feet higher.		

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Beatriz Dam</u> Applicant/Owner: <u>AFI</u> Investigators: <u>Walter E. Soler-Figueroa</u>	Date: <u>September 15, 2005</u> County: <u>Caguas</u> State: <u>PR</u>
Do Normal Circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is the site significantly disturbed (Atypical Situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is the area a potential Problem Area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If needed, explain on reverse.)	Community ID: <u>BD</u> Transect ID: <u>1</u> Plot ID: <u>2</u>

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <i>Panicum maximum</i>	Herb	FACU-	9. _____	_____	_____
2. <i>Pennisetum purpureum</i>	Herb	FAC	10. _____	_____	_____
3. _____	_____	_____	11. _____	_____	_____
4. _____	_____	_____	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of dominant species that are OBL, FACW, or FAC (excluding FAC-): **40%**

Remarks: Dominant plant species in percentages of cover area. Indicator based on 1995 Revision to the National List of Plant Species that Occur in Wetlands.	<i>Panicum maximum</i> 60% <i>Pennisetum purpureum</i> 40%
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**HYDROLOGY**

<input checked="" type="checkbox"/> Recorded Data (Described in Remarks) <input type="checkbox"/> Stream, Lake, or Tide Gauge <input checked="" type="checkbox"/> Aerial Photographs <input checked="" type="checkbox"/> Others <input type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: <b>Primary Indicators</b> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands <b>Secondary Indicators (2 or more required):</b> <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
<b>Field Observations</b>  Depth of Surface Water      _____ (in)  Depth to Free Water in Pit      _____ (in)  Depth to Saturated Soil      _____ (in)	
Remarks: Recorded data on Soils, National Wetland Inventory Maps, Flood Zones, Hydrography and Color Aerial Photography also available. Sampling point is a vegetated area use for pasture within an upland area. No hydrology indicators found within the sampling point.	

**DATA FORM  
ROUTINE WETLAND DETERMINATION  
(1987 COE Wetlands Delineation Manual)**

**Beatriz Dam Wetland JD, Caguas, P.R. (BD-I-9)**

**SOILS**

Map Unit Name (Series and Phase):		Naranjito silty clay loam (Es)		Drainage Class: .....	
Taxonomy (Subgroup):		Typic Eutropepts		Confirm Mapped Type? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<b>Profile Description</b>					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance / Contrast	Texture, Concretions Structure, etc
0-18	A	10YR 4/3			loamy
<b>Hydric Soil Indicators:</b>					
<input type="checkbox"/> Histosol		<input type="checkbox"/> Concretions			
<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils			
<input type="checkbox"/> Sulfidic Odor		<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Listed on Local Hydric Soils List			
<input type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Listed on National Hydric Soils List			
<input type="checkbox"/> Gleyed or Low-Chroma Colors		<input type="checkbox"/> Other (Explain in Remarks)			
Remarks: Soil pit was located within an upland area in a hill side.					

**WETLAND DETERMINATION**

Hydrophitic Vegetation Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Wetland Hydrology Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Hydric Soils Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Remarks: The area was located in a hillside.		

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
**(1987 COE Wetlands Delineation Manual)**

Project/Site: <u>Beatriz Dam</u> Applicant/Owner: <u>AFI</u> Investigators: <u>Walter E. Soler-Figueroa</u>	Date: <u>September 15, 2005</u> County: <u>Caguas</u> State: <u>PR</u>
Do Normal Circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is the site significantly disturbed (Atypical Situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is the area a potential Problem Area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If needed, explain on reverse.)	Community ID: <u>BD</u> Transect ID: <u>1</u> Plot ID: <u>10</u>

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Panicum maximum</u>	Herb	FACU-	9. _____	_____	_____
2. <u>Pennisetum purpureum</u>	Herb	FAC	10. _____	_____	_____
3. _____	_____	_____	11. _____	_____	_____
4. _____	_____	_____	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of dominant species that are OBL, FACW, or FAC (excluding FAC-): 40%

Remarks: Dominant plant species in percentages of cover area. Indicator based on 1995 Revision to the National List of Plant Species that Occur in Wetlands.

<i>Panicum maximum</i>	60%
<i>Pennisetum purpureum</i>	40%

**HYDROLOGY**

<input checked="" type="checkbox"/> Recorded Data (Described in Remarks) <input type="checkbox"/> Stream, Lake, or Tide Gauge <input checked="" type="checkbox"/> Aerial Photographs <input checked="" type="checkbox"/> Others <input type="checkbox"/> No Recorded Data Available	<b>Wetland Hydrology Indicators:</b> <b>Primary Indicators</b> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands <b>Secondary Indicators (2 or more required):</b> <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
<b>Field Observations</b>  Depth of Surface Water _____ (in)  Depth to Free Water in Pit _____ (in)  Depth to Saturated Soil _____ (in)	
Remarks: Recorded data on Soils, National Wetland Inventory Maps, Flood Zones, Hydrography and Color Aerial Photography also available. Sampling point is a vegetated area use for pasture within an upland area. No hydrology indicators found within the sampling point.	

**DATA FORM  
ROUTINE WETLAND DETERMINATION  
(1987 COE Wetlands Delineation Manual)**

**Beatriz Dam Wetland JD, Caguas, P.R. (BD-I-10)**

**SOILS**

Map Unit Name (Series and Phase):		<u>Toa silty clay loam (Es)</u>	Drainage Class:		.....
Taxonomy (Subgroup):		<u>Fluentic Hapludolls</u>	Confirm Mapped Type?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>Profile Description</b>					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance / Contrast	Texture, Concretions Structure, etc
0-18	A	10YR 6/4			loamy
<b>Hydric Soil Indicators:</b>					
<input type="checkbox"/> Histosol		<input type="checkbox"/> Concretions			
<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils			
<input type="checkbox"/> Sulfidic Odor		<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Listed on Local Hydric Soils List			
<input type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Listed on National Hydric Soils List			
<input type="checkbox"/> Gleyed or Low-Chroma Colors		<input type="checkbox"/> Other (Explain in Remarks)			
Remarks: Soil pit was located within an upland area in a hill side.					

**WETLAND DETERMINATION**

Hydrophitic Vegetation Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Wetland Hydrology Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Hydric Soils Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Remarks: The area was located in a hillside.		

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
**(1987 COE Wetlands Delineation Manual)**

Project/Site: <u>Beatriz Dam</u> Applicant/Owner: <u>AFI</u> Investigators: <u>Walter E. Soler-Figueroa</u>	Date: <u>September 15, 2005</u> County: <u>Caguas</u> State: <u>PR</u>
Do Normal Circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is the site significantly disturbed (Atypical Situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is the area a potential Problem Area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If needed, explain on reverse.)	Community ID: <u>BD</u> Transect ID: <u>I</u> Plot ID: <u>11</u>

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u><i>Panicum maximum</i></u>	Herb	FACU-	9. _____	_____	_____
2. <u><i>Pennisetum purpureum</i></u>	Herb	FAC	10. _____	_____	_____
3. <u><i>Paspalum conjugatum</i></u>	Herb	FAC	11. _____	_____	_____
4. _____	_____	_____	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of dominant species that are OBL, FACW, or FAC (excluding FAC-): 40%

Remarks: Dominant plant species in percentages of cover area. Indicator based on 1995 Revision to the National List of Plant Species that Occur in Wetlands.

<i>Panicum maximum</i>	60%
<i>Pennisetum purpureum</i>	20%
<i>Paspalum conjugatum</i>	20%

**HYDROLOGY**

<input checked="" type="checkbox"/> Recorded Data (Described in Remarks) <input type="checkbox"/> Stream, Lake, or Tide Gauge <input checked="" type="checkbox"/> Aerial Photographs <input checked="" type="checkbox"/> Others <input type="checkbox"/> No Recorded Data Available	<b>Wetland Hydrology Indicators:</b> <b>Primary Indicators</b> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands <b>Secondary Indicators (2 or more required):</b> <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
<b>Field Observations</b>  Depth of Surface Water _____ (in)  Depth to Free Water in Pit _____ (in)  Depth to Saturated Soil _____ (in)	
Remarks: Recorded data on Soils, National Wetland Inventory Maps, Flood Zones, Hydrography and Color Aerial Photography also available. No hydrology indicators found within the sampling point.	

**DATA FORM  
ROUTINE WETLAND DETERMINATION  
(1987 COE Wetlands Delineation Manual)**

**Beatriz Dam Wetland JD, Caguas, P.R. (BD-I-11)**

**SOILS**

Map Unit Name (Series and Phase):		<u>Naranjito silty clay loam (Es)</u>	Drainage Class:		-----
Taxonomy (Subgroup):		<u>Typic Eutropepts</u>	Confirm Mapped Type?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>Profile Description</b>					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance / Contrast	Texture, Concretions Structure, etc
0-18	A	10YR 6/4			loamy
<b>Hydric Soil Indicators:</b>					
<input type="checkbox"/> Histosol		<input type="checkbox"/> Concretions			
<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils			
<input type="checkbox"/> Sulfidic Odor		<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Listed on Local Hydric Soils List			
<input type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Listed on National Hydric Soils List			
<input type="checkbox"/> Gleyed or Low-Chroma Colors		<input type="checkbox"/> Other (Explain in Remarks)			
Remarks: Soil pit was located within an upland area near the wetland boundary at a higher elevation, at the edge of a dirt road.					

**WETLAND DETERMINATION**

Hydrophitic Vegetation Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Wetland Hydrology Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Hydric Soils Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Remarks: The area was located nearby the boundary of an herbaceous wetland area. The wetland boundary is located to the Northwest of the sampling point.		

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
**(1987 COE Wetlands Delineation Manual)**

Project/Site: <u>Beatriz Dam</u> Applicant/Owner: <u>AFI</u> Investigators: <u>Walter E. Soler-Figueroa</u>	Date: <u>September 15, 2005</u> County: <u>Caguas</u> State: <u>PR</u>
Do Normal Circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is the site significantly disturbed (Atypical Situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is the area a potential Problem Area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If needed, explain on reverse.)	Community ID: <u>BD</u> Transect ID: <u>I</u> Plot ID: <u>12</u>

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Paspalum conjugatum</u>	Herb	FAC	9. _____	_____	_____
2. <u>Colocasia esculenta</u>	Herb	OBL	10. _____	_____	_____
3. <u>Brachearia purpuracens</u>	Herb	FACW-	11. _____	_____	_____
4. <u>Mimosa pigra</u>	Shrub	FACW	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of dominant species that are OBL, FACW, or FAC (excluding FAC-): **100%**

Remarks: Dominant plant species in percentages of cover area. Indicator based on 1995 Revision to the National List of Plant Species that Occur in Wetlands.	<i>Paspalum conjugatum</i> 5% <i>Colocasia esculenta</i> 30% <i>Brachearia purpuracens</i> 50% <i>Mimosa Pigras</i> 15%
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**HYDROLOGY**

<input checked="" type="checkbox"/> Recorded Data (Described in Remarks) <input type="checkbox"/> Stream, Lake, or Tide Gauge <input checked="" type="checkbox"/> Aerial Photographs <input checked="" type="checkbox"/> Others <input type="checkbox"/> No Recorded Data Available	<b>Wetland Hydrology Indicators:</b> <b>Primary Indicators</b> <input checked="" type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input checked="" type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input checked="" type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands <b>Secondary Indicators (2 or more required):</b> <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input checked="" type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
<b>Field Observations</b>  Depth of Surface Water <u>  6  </u> (in)  Depth to Free Water in Pit      _____ (in)  Depth to Saturated Soil      _____ (in)	
Remarks: Recorded data on Soils, National Wetland Inventory Maps, Flood Zones, Hydrography and Color Aerial Photography also available. Sampling point is a vegetated depression which collects waters from runoff and possibly overflows from Quebrada Beatriz. The wetland area is adjacent to Quebrada Beatriz.	

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
(1987 COE Wetlands Delineation Manual)

Beatriz Dam Wetland JD, Caguas, P.R. (BD-I-12)

**SOILS**

Map Unit Name (Series and Phase):		Toa Silty Clay Loam (Es)		Drainage Class: -----	
Taxonomy (Subgroup):		Fluventic Hapludolls		Confirm Mapped Type? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Profile Description					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance / Contrast	Texture, Concretions Structure, etc
Hydric Soil Indicators:					
<input type="checkbox"/> Histosol		<input type="checkbox"/> Concretions			
<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils			
<input type="checkbox"/> Sulfidic Odor		<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Listed on Local Hydric Soils List			
<input type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Listed on National Hydric Soils List			
<input type="checkbox"/> Gleyed or Low-Chroma Colors		<input type="checkbox"/> Other (Explain in Remarks)			
Remarks: No soil pit was performed due to flooded conditions and water depth. All previous indicators and aerial photographs suggest the area is a wetland.					

**WETLAND DETERMINATION**

Hydrophitic Vegetation Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Wetland Hydrology Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Hydric Soils Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Remarks: The area was located nearby the boundary of an herbaceous seasonal wetland area which collects waters from runoff and possibly overflows from Quebrada Beatriz.		

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Beatriz Dam</u> Applicant/Owner: <u>AFI</u> Investigators: <u>Walter E. Soler-Figueroa</u>	Date: <u>September 15, 2005</u> County: <u>Caguas</u> State: <u>PR</u>
Do Normal Circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is the site significantly disturbed (Atypical Situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is the area a potential Problem Area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If needed, explain on reverse.)	Community ID: <u>BD</u> Transect ID: <u>I</u> Plot ID: <u>13</u>

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Paspalum conjugatum</u>	Herb	FAC	9. _____	_____	_____
2. <u>Brachearia purpuracens</u>	Herb	FACW-	10. _____	_____	_____
3. <u>Mimosa pigra</u>	Shrub	FACW	11. _____	_____	_____
4. <u>Ipomea setifera</u>	Vine	FACW	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of dominant species that are OBL, FACW, or FAC (excluding FAC-): **100%**

Remarks: Dominant plant species in percentages of cover area. Indicator based on 1995 Revision to the National List of Plant Species that Occur in Wetlands.	<i>Paspalum conjugatum</i> 5% <i>Brachearia purpuracens</i> 70% <i>Mimosa Pigras</i> 15% <i>Ipomea setifera</i> 10%
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**HYDROLOGY**

<input checked="" type="checkbox"/> Recorded Data (Described in Remarks) <input type="checkbox"/> Stream, Lake, or Tide Gauge <input checked="" type="checkbox"/> Aerial Photographs <input checked="" type="checkbox"/> Others <input type="checkbox"/> No Recorded Data Available	<b>Wetland Hydrology Indicators:</b> <b>Primary Indicators</b> <input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches <input checked="" type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input checked="" type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands <b>Secondary Indicators (2 or more required):</b> <input checked="" type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input checked="" type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
<b>Field Observations</b>  Depth of Surface Water _____ (in)  Depth to Free Water in Pit _____ (in)  Depth to Saturated Soil <u>4</u> (in)	
Remarks: Recorded data on Soils, National Wetland Inventory Maps, Flood Zones, Hydrography and Color Aerial Photography also available. Sampling point is a vegetated depression which collects waters from runoff and possibly overflows from Quebrada Beatriz. The wetland area is adjacent to Quebrada Beatriz.	

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
(1987 COE Wetlands Delineation Manual)

Beatriz Dam Wetland JD, Caguas, P.R. (BD-I-13)

**SOILS**

Map Unit Name (Series and Phase):		<u>Toa Silty Clay Loam (Es)</u>	Drainage Class:		-----
Taxonomy (Subgroup):		<u>Fluentic Hapludolls</u>	Confirm Mapped Type?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>Profile Description</b>					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance / Contrast	Texture, Concretions Structure, etc
0-6	A	10YR 4/3			silty loam
6-20	B	10 YR 3/2	2.5YR 4/6	10%	silty loam
<b>Hydric Soil Indicators:</b>					
<input type="checkbox"/> Histosol		<input type="checkbox"/> Concretions			
<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils			
<input type="checkbox"/> Sulfidic Odor		<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input checked="" type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Listed on Local Hydric Soils List			
<input checked="" type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Listed on National Hydric Soils List			
<input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors		<input type="checkbox"/> Other (Explain in Remarks)			
Remarks:					

**WETLAND DETERMINATION**

Hydrophitic Vegetation Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Wetland Hydrology Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Hydric Soils Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Remarks: The area was located nearby the boundary of an herbaceous seasonal wetland area which collects waters from runoff and possibly overflows from Quebrada Beatriz.		

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
**(1987 COE Wetlands Delineation Manual)**

Project/Site: <u>Beatriz Dam</u> Applicant/Owner: <u>AFI</u> Investigators: <u>Walter E. Soler-Figueroa</u>	Date: <u>September 15, 2005</u> County: <u>Caguas</u> State: <u>PR</u>
Do Normal Circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is the site significantly disturbed (Atypical Situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is the area a potential Problem Area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If needed, explain on reverse.)	Community ID: <u>BD</u> Transect ID: <u>1</u> Plot ID: <u>14</u>

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <i>Panicum maximum</i>	Herb	FACU-	9. _____	_____	_____
2. <i>Pennisetum purpureum</i>	Herb	FAC	10. _____	_____	_____
3. <i>Paspalum conjugatum</i>	Herb	FAC	11. _____	_____	_____
4. _____	_____	_____	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of dominant species that are OBL, FACW, or FAC (excluding FAC-): 25%

Remarks: Dominant plant species in percentages of cover area. Indicator based on 1995 Revision to the National List of Plant Species that Occur in Wetlands.	<i>Panicum maximum</i> 75% <i>Pennisetum purpureum</i> 20% <i>Paspalum conjugatum</i> 5%
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**HYDROLOGY**

<input checked="" type="checkbox"/> Recorded Data (Described in Remarks) <input type="checkbox"/> Stream, Lake, or Tide Gauge <input checked="" type="checkbox"/> Aerial Photographs <input checked="" type="checkbox"/> Others <input type="checkbox"/> No Recorded Data Available	<b>Wetland Hydrology Indicators:</b> <b>Primary Indicators</b> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands <b>Secondary Indicators (2 or more required):</b> <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
<b>Field Observations</b>  Depth of Surface Water      _____ (in)  Depth to Free Water in Pit      _____ (in)  Depth to Saturated Soil      _____ (in)	
Remarks: Recorded data on Soils, National Wetland Inventory Maps, Flood Zones, Hydrography and Color Aerial Photography also available. Sampling point is a vegetated area use for pasture within an upland area. No hydrology indicators found within the sampling point.	

**DATA FORM  
ROUTINE WETLAND DETERMINATION  
(1987 COE Wetlands Delineation Manual)**

Beatriz Dam Wetland JD, Caguas, P.R. (BD-I-14)

**SOILS**

Map Unit Name (Series and Phase):		<u>Toa silty clay loam (Es)</u>	Drainage Class:		-----
Taxonomy (Subgroup):		<u>Fluventic Hapludolls</u>	Confirm Mapped Type?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>Profile Description</b>					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance / Contrast	Texture, Concretions Structure, etc
0-18	A	10YR 6/4			loamy
<b>Hydric Soil Indicators:</b>					
<input type="checkbox"/> Histosol		<input type="checkbox"/> Concretions			
<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils			
<input type="checkbox"/> Sulfidic Odor		<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Listed on Local Hydric Soils List			
<input type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Listed on National Hydric Soils List			
<input type="checkbox"/> Gleyed or Low-Chroma Colors		<input type="checkbox"/> Other (Explain in Remarks)			
Remarks: Soil pit was located within an upland area near the wetland boundary at a higher elevation, at the edge of a dirt road.					

**WETLAND DETERMINATION**

Hydrophitic Vegetation Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Wetland Hydrology Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Hydric Soils Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Remarks: The area was located nearby the boundary of an herbaceous wetland area. The wetland boundary is located to the Northwest of the sampling point.		

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
**(1987 COE Wetlands Delineation Manual)**

Project/Site: <u>Beatriz Dam</u> Applicant/Owner: <u>AFI</u> Investigators: <u>Walter E. Soler-Figueroa</u>	Date: <u>February 18, 2006</u> County: <u>Caguas</u> State: <u>PR</u>
Do Normal Circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is the site significantly disturbed (Atypical Situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is the area a potential Problem Area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If needed, explain on reverse.)	Community ID: <u>BD</u> Transect ID: <u>II</u> Plot ID: <u>1</u>

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Panicum maximum</u>	<u>Herb</u>	<u>FACU-</u>	9. _____	_____	_____
2. <u>Pennisetum purpureum</u>	<u>Herb</u>	<u>FAC</u>	10. _____	_____	_____
3. <u>Paspalum conjugatum</u>	<u>Herb</u>	<u>FAC</u>	11. _____	_____	_____
4. _____	_____	_____	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of dominant species that are OBL, FACW, or FAC (excluding FAC-): **40%**

Remarks: Dominant plant species in percentages of cover area. Indicator based on 1995 Revision to the National List of Plant Species that Occur in Wetlands.	<i>Panicum maximum</i> 60% <i>Pennisetum purpureum</i> 20% <i>Paspalum conjugatum</i> 20%
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**HYDROLOGY**

<input checked="" type="checkbox"/> Recorded Data (Described in Remarks) <input type="checkbox"/> Stream, Lake, or Tide Gauge <input checked="" type="checkbox"/> Aerial Photographs <input checked="" type="checkbox"/> Others <input type="checkbox"/> No Recorded Data Available	<b>Wetland Hydrology Indicators:</b> <b>Primary Indicators</b> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands <b>Secondary Indicators (2 or more required):</b> <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
<b>Field Observations</b>  Depth of Surface Water      _____ (in)  Depth to Free Water in Pit      _____ (in)  Depth to Saturated Soil      _____ (in)	
Remarks: Recorded data on Soils, National Wetland Inventory Maps, Flood Zones, Hydrography and Color Aerial Photography also available. Sampling point is a vegetated area at the northern side of Quebrada Quebradillas bank, at an elevation of approximately 4 meters higher than the creek. No hydrology indicators found within the sampling point.	

**DATA FORM  
ROUTINE WETLAND DETERMINATION  
(1987 COE Wetlands Delineation Manual)**

**Beatriz Dam Wetland JD, Caguas, P.R. (BD-II-I)**

**SOILS**

Map Unit Name (Series and Phase):		<u>Estacion Silty Clay Loam (Es)</u>		Drainage Class:	-----
Taxonomy (Subgroup):		<u>Fluventic Hapludolls</u>		Confirm Mapped Type?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>Profile Description</b>					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance / Contrast	Texture, Concretions Structure, etc
0-18	A	10YR 4/2			loamy
<b>Hydric Soil Indicators:</b>					
<input type="checkbox"/> Histosol		<input type="checkbox"/> Concretions			
<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils			
<input type="checkbox"/> Sulfidic Odor		<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Listed on Local Hydric Soils List			
<input type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Listed on National Hydric Soils List			
<input type="checkbox"/> Gleyed or Low-Chroma Colors		<input type="checkbox"/> Other (Explain in Remarks)			
Remarks: Soil pit was located within an upland area at the northern side of Quebrada Quebradillas Bank.					

**WETLAND DETERMINATION**

Hydrophitic Vegetation Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Wetland Hydrology Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Hydric Soils Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Remarks: The area was located within an upland area at the northern side of Quebrada Quebradillas Bank.		

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
**(1987 COE Wetlands Delineation Manual)**

Project/Site: <u>Beatriz Dam</u> Applicant/Owner: <u>AFI</u> Investigators: <u>Walter E. Soler-Figueroa</u>	Date: <u>February 18, 2006</u> County: <u>Caguas</u> State: <u>PR</u>
Do Normal Circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is the site significantly disturbed (Atypical Situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is the area a potential Problem Area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If needed, explain on reverse.)	Community ID: <u>BD</u> Transect ID: <u>II</u> Plot ID: <u>2</u>

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <i>Panicum maximum</i>	Herb	FACU-	9. _____	_____	_____
2. <i>Pennisetum purpureum</i>	Herb	FAC	10. _____	_____	_____
3. <i>Commelina diffusa</i>	Ground	FAC	11. _____	_____	_____
4. _____	_____	_____	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of dominant species that are OBL, FACW, or FAC (excluding FAC-): **30%**

Remarks: Dominant plant species in percentages of cover area. Indicator based on 1995 Revision to the National List of Plant Species that Occur in Wetlands.	<i>Panicum maximum</i> 60% <i>Pennisetum purpureum</i> 10% <i>Commelina diffusa</i> 20%
--	---

**HYDROLOGY**

<input checked="" type="checkbox"/> Recorded Data (Described in Remarks) <ul style="list-style-type: none"> <li><input type="checkbox"/> Stream, Lake, or Tide Gauge</li> <li><input checked="" type="checkbox"/> Aerial Photographs</li> <li><input checked="" type="checkbox"/> Others</li> </ul> <input type="checkbox"/> No Recorded Data Available	<b>Wetland Hydrology Indicators:</b> <b>Primary Indicators</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Inundated</li> <li><input type="checkbox"/> Saturated in Upper 12 Inches</li> <li><input type="checkbox"/> Water Marks</li> <li><input type="checkbox"/> Drift Lines</li> <li><input type="checkbox"/> Sediment Deposits</li> <li><input type="checkbox"/> Drainage Patterns in Wetlands</li> </ul> <b>Secondary Indicators (2 or more required):</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Oxidized Root Channels in Upper 12 inches</li> <li><input type="checkbox"/> Water-Stained Leaves</li> <li><input type="checkbox"/> Local Soil Survey Data</li> <li><input type="checkbox"/> FAC-Neutral Test</li> <li><input type="checkbox"/> Other (Explain in Remarks)</li> </ul>
<b>Field Observations</b>  Depth of Surface Water      _____ (in)  Depth to Free Water in Pit      _____ (in)  Depth to Saturated Soil      _____ (in)	
Remarks: Recorded data on Soils, National Wetland Inventory Maps, Flood Zones, Hydrography and Color Aerial Photography also available. Sampling point is a vegetated area at the southern side of Quebrada Quebradillas bank, at an elevation of approximately 3 meters higher than the creek. No hydrology indicators found within the sampling point.	

**DATA FORM  
ROUTINE WETLAND DETERMINATION  
(1987 COE Wetlands Delineation Manual)**

Beatriz Dam Wetland JD, Caguas, P.R. (BD-II-2)

**SOILS**

Map Unit Name (Series and Phase):		Estacion Silty Clay Loam (Es)		Drainage Class: -----	
Taxonomy (Subgroup):		Fluventic Hapludolls		Confirm Mapped Type? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Profile Description					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance / Contrast	Texture, Concretions Structure, etc
0-18	A	10YR 4/3			loamy
Hydric Soil Indicators:					
<input type="checkbox"/> Histosol		<input type="checkbox"/> Concretions			
<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils			
<input type="checkbox"/> Sulfidic Odor		<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Listed on Local Hydric Soils List			
<input type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Listed on National Hydric Soils List			
<input type="checkbox"/> Gleyed or Low-Chroma Colors		<input type="checkbox"/> Other (Explain in Remarks)			
Remarks: Soil pit was located within an upland area at the southern side of Quebrada Quebradillas Bank.					

**WETLAND DETERMINATION**

Hydrophitic Vegetation Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Wetland Hydrology Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Hydric Soils Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Remarks: The area was located within an upland area at the southern side of Quebrada Quebradillas Bank.		

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
**(1987 COE Wetlands Delineation Manual)**

Project/Site: <u>Beatriz Dam</u> Applicant/Owner: <u>AFI</u> Investigators: <u>Walter E. Soler-Figueroa</u>	Date: <u>February 18, 2006</u> County: <u>Caguas</u> State: <u>PR</u>
Do Normal Circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is the site significantly disturbed (Atypical Situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is the area a potential Problem Area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If needed, explain on reverse.)	Community ID: <u>BD</u> Transect ID: <u>II</u> Plot ID: <u>3</u>

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <i>Panicum maximum</i>	Herb	FACU-	9. _____	_____	_____
2. <i>Pennisetum purpureum</i>	Herb	FAC	10. _____	_____	_____
3. <i>Paspalum conjugatum</i>	Herb	FAC	11. _____	_____	_____
4. _____	_____	_____	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of dominant species that are OBL, FACW, or FAC (excluding FAC-): **20%**

Remarks: Dominant plant species in percentages of cover area. Indicator based on 1995 Revision to the National List of Plant Species that Occur in Wetlands.

<i>Panicum maximum</i>	80%
<i>Pennisetum purpureum</i>	10%
<i>Paspalum conjugatum</i>	10%

**HYDROLOGY**

<input checked="" type="checkbox"/> Recorded Data (Described in Remarks) <input type="checkbox"/> Stream, Lake, or Tide Gauge <input checked="" type="checkbox"/> Aerial Photographs <input checked="" type="checkbox"/> Others <input type="checkbox"/> No Recorded Data Available	<b>Wetland Hydrology Indicators:</b> <b>Primary Indicators</b> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands <b>Secondary Indicators (2 or more required):</b> <input type="checkbox"/> Oxidized Root Channels in Upper 12 inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
<b>Field Observations</b>  Depth of Surface Water      _____ (in)  Depth to Free Water in Pit      _____ (in)  Depth to Saturated Soil      _____ (in)	
Remarks: Recorded data on Soils, National Wetland Inventory Maps, Flood Zones, Hydrography and Color Aerial Photography also available. Sampling point is a vegetated area at the eastern side of Quebrada Quebradillas bank, at an elevation of approximately 3 meters higher than the creek. No hydrology indicators found within the sampling point.	

**DATA FORM  
ROUTINE WETLAND DETERMINATION  
(1987 COE Wetlands Delineation Manual)**

**Beatriz Dam Wetland JD, Caguas, P.R. (BD-II-3)**

**SOILS**

Map Unit Name (Series and Phase):		<u>Acetitunas Clay (AaC)</u>	Drainage Class:		-----
Taxonomy (Subgroup):		<u>Typic Palehumults</u>	Confirm Mapped Type?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>Profile Description</b>					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance / Contrast	Texture, Concretions Structure, etc
0-18	A	5YR 5/4			loamy
<b>Hydric Soil Indicators:</b>					
<input type="checkbox"/> Histosol		<input type="checkbox"/> Concretions			
<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils			
<input type="checkbox"/> Sulfidic Odor		<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Listed on Local Hydric Soils List			
<input type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Listed on National Hydric Soils List			
<input type="checkbox"/> Gleyed or Low-Chroma Colors		<input type="checkbox"/> Other (Explain in Remarks)			
Remarks: Soil pit was located within an upland area at the eastern side of Quebrada Quebradillas Bank.					

**WETLAND DETERMINATION**

Hydrophitic Vegetation Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Wetland Hydrology Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Hydric Soils Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Remarks: The area was located within an upland area at the eastern side of Quebrada Quebradillas Bank.		

## **APPENDIX B:**

### **PHOTOGRAPHIC DOCUMENTATION**

**APPENDIX B: PHOTOGRAPHIC DOCUMENTATION**



Photo 1: Wetland area within Río Turabo.



Photo2: Herbaceous upland area within sampling point BD-I-2

**APPENDIX B: PHOTOGRAPHIC DOCUMENTATION**



Photo 3: Soil sample of sampling point BD-I-2, upland area.

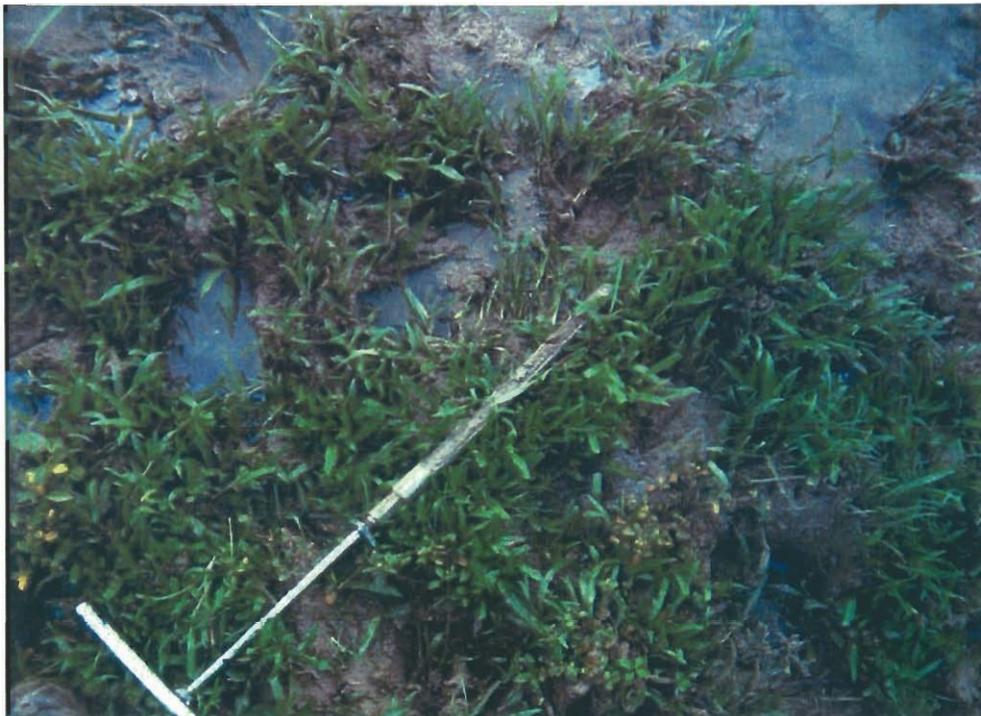


Photo 4: Sampling point BD-I-3, wetland area.

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*Wetland Jurisdictional Determination and Delineation Study-Beatriz Dam and Intake/Outward Pipes Alignments-Caguas, P.R.*

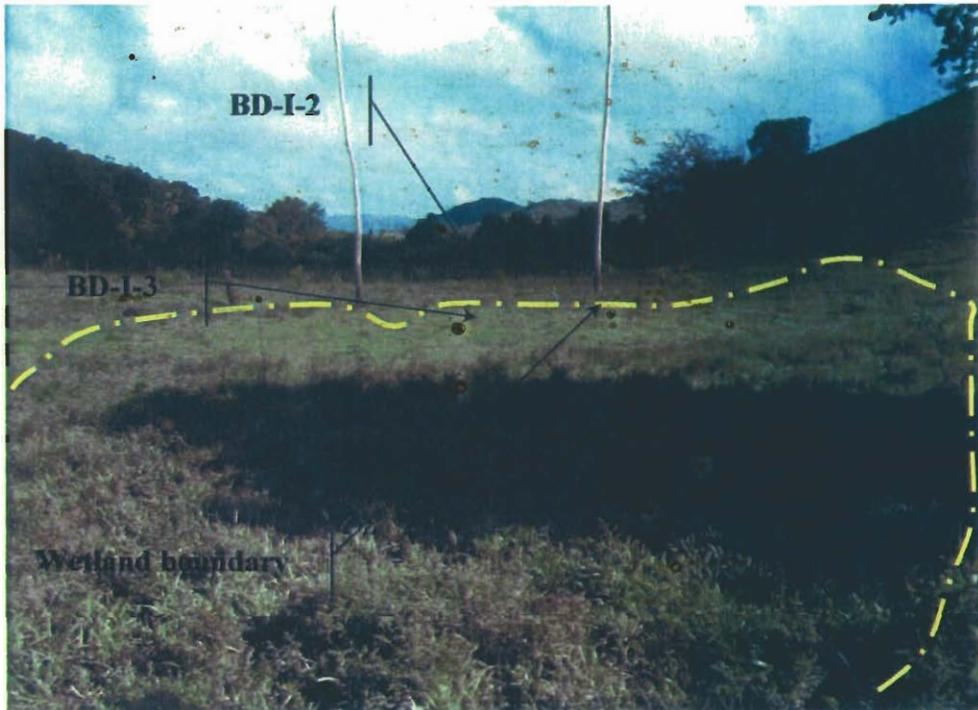
 **AMBIENTA INC.**

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**TEL. (787) 510-7031**

**FAX (787) 732-0907**

**APPENDIX B: PHOTOGRAPHIC DOCUMENTATION**



**Photo 5: Wetland area within sampling point BD-I-3.**



**Photo 6: Wetland area within sampling point BD-I-4.**

**APPENDIX B: PHOTOGRAPHIC DOCUMENTATION**



Photo 7: Wetland area within sampling point BD-I-7.



Photo 8: Wetland area within sampling point BD-I-7.

*Wetland Jurisdictional Determination and Delineation Study-Beatriz Dam and Intake/Outward Pipes Alignments-Caguas, P.R.*

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**APPENDIX B: PHOTOGRAPHIC DOCUMENTATION**



**Photo 9: Wetland area within sampling point BD-I 12.**



**Photo 10: Seasonal wetland area within sampling point BD-I-13.**

**APPENDIX B: PHOTOGRAPHIC DOCUMENTATION**



Photo 11: Sampling point BD-II-1 (upland), Quebrada Quebradillas northern bank.



Photo 12: Sampling point BD-II-2 (upland), Quebrada Quebradillas southern bank.

**APPENDIX B: PHOTOGRAPHIC DOCUMENTATION**



**Photo 13: Treatment Tanks of Las Quebradillas Filtering Plant.**



**Photo 14: Sampling point BD-II-3 (upland), Quebrada Quebradillas eastern bank.**

*Wetland Jurisdictional Determination and Delineation Study-Beatriz Dam and Intake/Outward Pipes Alignments-Caguas, P.R.*

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