Anejo 4:

Estudio de Flora y Fauna

INFORME DE FLORA Y FAUNA

June 3 2008

Este informe ha sido preparado con el propósito de cumplir con los requisitos que puedan exigir las agencias que regulan los recursos naturales en nuestro país. El presente documento describe los tipos de asociaciones de vegetación y fauna observada al momento del estudio, y el tipo de hábitat natural según la Nueva Ley de Vida Silvestre #241.

Carr #156 Barrio Cañabón Caguas, Puerto Rico

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INTRODUCCIÓN

Memorial explicativo

La acción propuesta consiste en un desarrollo mixto en el que su componente comercial incluye la construcción de un supermercado, farmacia, banco, (2) dos restaurantes de comida rápida y un área de servicios. El área total de construcción será de 99,000 pies cuadrados. Dicho componente comercial se desarrollará en 17.41 cuerdas del total de la finca. De otra parte, el componente industrial consiste de un almacén para las farmacias El Amal. El mismo ocupará un área de 190,000 pies cuadrados, además de un área para oficina de otros 20,000 pies cuadrados adicionales, para un total de 200,000 pies cuadrados de construcción. El componente industrial se desarrollará en las restantes 16.5 cuerdas restantes del total de la finca.

El estudio de flora y fauna comprende del estudio de campo de campo realizado durante los semanas del 23 al 31 de mayo del 2008. El informe presenta un resumen de las observaciones más relevantes de la flora y la fauna terrestre, y los ecosistemas que estos representan.

Este informe ha sido preparado con el propósito de cumplir con los requisitos que puedan exigir las agencias que regulan los recursos naturales en nuestro país. El presente documento describe los tipos de asociaciones de vegetación y fauna observada al momento del estudio, y el tipo de hábitat natural según la Nueva Ley de Vida Silvestre #241.

Localización del área

El área propuesta para desarrollo se ubica en la Carretera Estatal PR-156, en el Barrio Cañabón del Municipio de Caguas. El predio está delimitado por el Norte con el Río Caguitas, por el Sur con La Carretera Estatal PR-156, por el Este con terrenos de la sucesión N.M Cartagena y por el Oeste con la calle municipal de Las Carolinas. Utuado. El proyecto propuesto tendrá una cabida de 32.734 cuerdas de las cuales

16.975 cuerdas serán dedicadas al componente comercial, mientras que 15.759 cuerdas serán dedicadas al componente industrial.

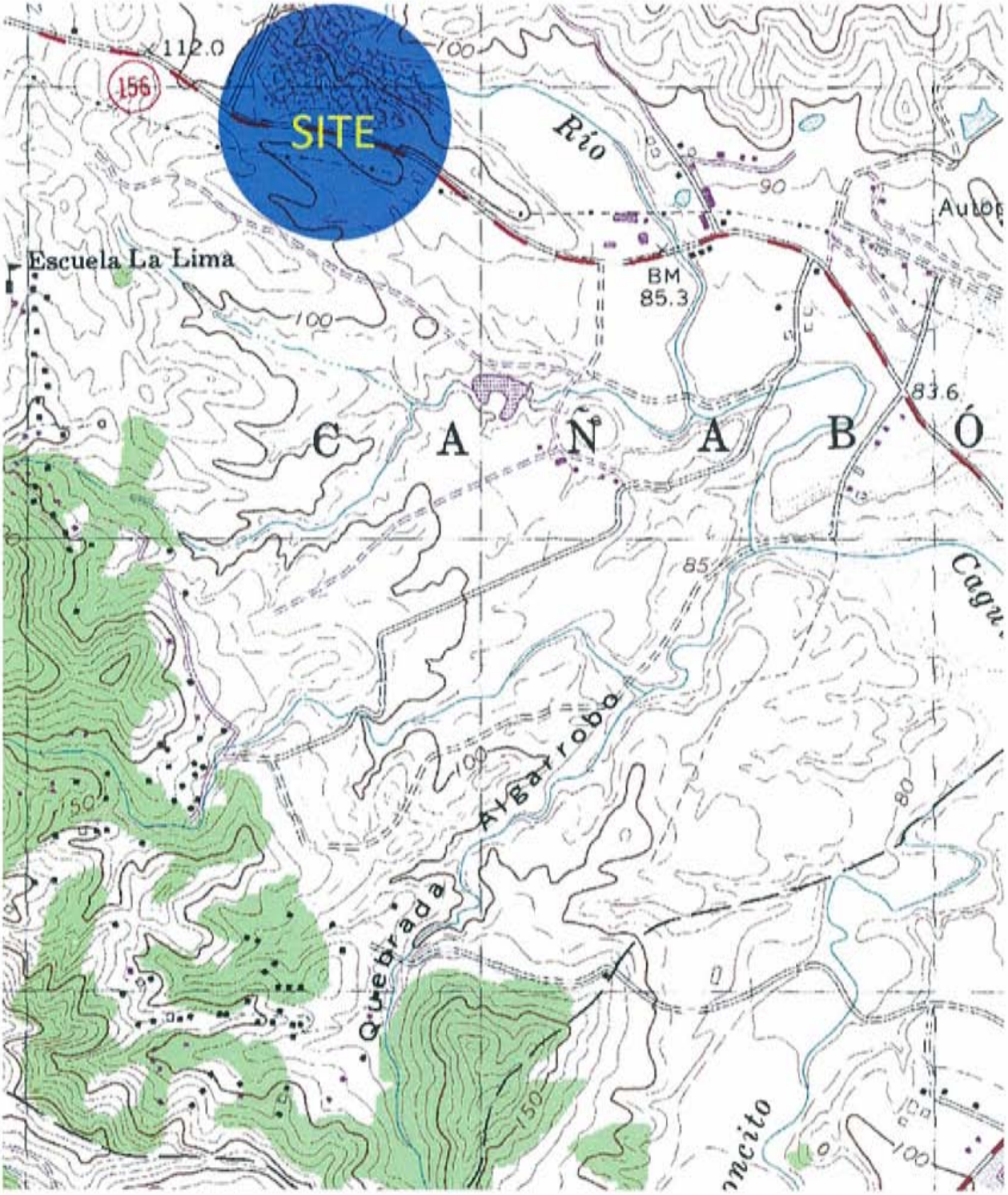

Figura 1. Localización de la propiedad, barrio Cañabon, Caguas

MARCO ECOLÓGICO AMBIENTAL

Descripción regional

El municipio de Caguas se localiza en las inmediaciones de la clasificación de zona de vida de Bosque Húmedo Subtropical según Ewel y Whitmore (1973). Esta zona de vida presenta una precipitación promedio anual que oscila entre los 1,000 a 2,000-2,100 mm. La temperatura promedio de 18°C a 24°C es moderada por los vientos procedentes del Océano Atlántico, siendo la dirección de los vientos predominantemente del noreste. La mayoría de las áreas de la zona de vida de Bosque Húmedo Subtropical han sido deforestadas debido a que las condiciones de humedad y temperatura son adecuadas para una variedad de usos de terrenos.

Descripción general del área de estudio

El predio propuesto para la construcción de las facilidades comerciales se localizan entre la carretera estatal PR 156 y la carretera de acceso a la comunidad de las Carolinas. El paisaje que se observa es uno mixto donde se observan áreas bien definidas según los usos actuales que tienen los terrenos bajo estudio. El predio actualmente fue desprovisto del material vegetativo por un movimiento de tierra anterior a este estudio. Se pudo notar la nivelación de varios puntos dentro del solar así como la utilización de agregado grueso Esto debido a que el mismo fue utilizado como cantera. Se notaron varias poblaciones de acacias ***Albizia procera*** a lo largo de la carretera 156. En segundo plano se observa un llano cubierto en algunas partes por vegetación herbácea de baja altura. Se noto que parte del solar se utiliza como depósito clandestino de basura y escombros. Al norte del solar como a 10 metros transcurre el Río Caguitas.

METODOLOGÍA

Para la identificación de la flora y fauna se dividió el predio en transectos para definir y ubicar los elementos bióticos observados. Además de los recorridos lineales trazados, se recorrió el perímetro de esta zona en su totalidad y los espacios interiores entre los transectos. Esto fue posible debido a que la mayoría de la propiedad se encuentra sin cobertura vegetal arbórea lo que permitía un recorrido de toda el área llana con una visibilidad total de la propiedad prácticamente desde cualquier punto de muestreo. Los terrenos han sido impactados por pasadas extracciones de material de la corteza terrestre, y actualmente el mismo fue utilizado como material de nivelación. Durante los recorridos de la propiedad se identificó la mayoría de las especies vegetativas observadas en el predio. Para la nomenclatura y determinación de la forma de crecimiento (Tipo) de la flora se utilizó a Lioger (1985-1997), Lioger & Martorell, (1982, 2000)

Se realizaron dos viajes al predio para la observación de aves. Se realizaron en horas tempranas 6:00am 9:30am, y uno al atardecer 5:00pm-7:00pm Para la realización de los censos se establecieron 5 estaciones de observación en toda la propiedad utilizando una fotografía aérea luego de la visita preliminar Se recorrieron las estaciones permaneciendo un tiempo de 10 minutos, antes de proceder al siguiente punto. Para la identificación de aves en las estaciones de censo se utilizó el método de Recuentos en punto sin estimación de distancia (Wunderle, 1994). Este método es útil para medir la riqueza de especies y el hábitat usado durante un evento de observación con un tiempo establecido. Se tuvo en cuenta la temporada de aves migratorias para obtener mayor información sobre las especies migratorias que visitan la región.

Los reptiles fueron identificados por observación directa durante los recorridos para la caracterización de la flora. Se inspeccionó visualmente la vegetación arbórea y herbácea.

Luego de identificar las especies de flora y fauna presentes en la propiedad, se revisó nuevamente la lista de Elementos Críticos de la División de Patrimonio Natural del DRNA para corroborar la presencia o ausencia, de especies críticas, raras, o en peligro de extinción.

RESULTADOS

En las siguientes tablas se detallan las especies de la flora y la fauna observada en ambas zonas descritas en la sección de metodología.

Tabla 1: Flora

Nombre Científico	Nombre Común
Albizia procera	Albizia
Spathodea campanulata	Tulipán Africano
Cestrum diurnum	Dama de Día
Ipomea alba	Bejuco de Puerco
Bidens pilosa	Margarita Silvestre
Mimosa pudica	Moriviví
Melochia pyramidata	Bretónica Piramidal
Pothomorphe peltata	Baquiña
Lantana camara	Cariaquillo
Piper aduncum	Higuillo
Bambusa vulgaris	Bambú
Momordica charantia	Cundeamor
Ricinus communis	Higuereta
Veitchia merrillii	Palma adonidea
Ochroma pyramidale	Balsa
Passiflora edulis	Parcha
Tillandsia recurvata	Tillandsia
Cyperus rotundus	Coquí
Chloris inflata	Paragüita

Nombre Científico	Nombre Común
Dactyloctenium aegyptium	Yerba de Egipto

Tabla 1: Flora

Nombre Científico	Nombre Común
Forsteronia portoricensis	Bejuco de San Juan
Centrosema pubescens	Flor de Pito
Myrcia deflexa	Cieneguillo
Digitaria sanguinalis	Pendejuelo
Piper amalago	Higuillo
Cecropia schreberiana	Yagrumo

Tabla 2: Fauna

Nombre Científico	Nombre Común
Insectos	
Solenopsis germinata	Hormiga Roja
Xylocopa virginica	Cigarra
Acheta domestica	Grillo
Apis mellifera	Abeja

Nombre Científico	Nombre Común
Aves	
Zenaida aurita	Tórtola Cardosantera
Coereba flaveola	Reinita
Tiaris bicolor	Gorrión negro
Tyrannus dominicensis	Pitirre
Columba livia	Paloma Común
Buteo jamaicensis	Guaraguao
Quiscalus niger	Chango
Margarops fuscatus	Zorzal Pardo
Passer domesticus	Gorrión Ingles
Columbina passerina	Rolita
Lonchura punctulata	Gorrión Nuez moscada
Estrilda melpoda	Veterano
Estrilda troglodytes	Diablito
Melanerpes portoricensis	Carpintero de PR*
Vidua macroura	Viuda Colicinta
Lonchura punctulata	Gorrión canela
Anthracotorax dominicus	Zumbador verde
Loxigilla portoricensis	Comeñame*
Myiarchus antillarum	Jui
Pterochelidon fulva	Golondrina
Vireo altiloquus	Julián-chivi

***Endémicas**

Nombre Científico	Nombre Común
Spindalis portoricensis	Reina Mora*
Charadrius vociferus	Playero sabanero
Reptiles	
Anolis pulchellus	Lagartijo Jardín
Anolis cristatellus	Lagartijo común
Ameiva exsul	Siguana
Iguana Iguana	Iguana verde

Elementos endémicos, críticos y especies en peligro de extinción

Previo a los viajes de campo, se visitó la División de Patrimonio Natural y la División de Recursos Terrestres del Departamento de Recursos Naturales y Ambientales (DRNA) para cotejar los elementos críticos identificados en o cerca del predio bajo estudio. En la División de Patrimonio Natural (DPN) se cotejó el Banco de Datos Biológicos y de Conservación, el cual es un inventario continuo, constantemente actualizado, sobre la condición, el status, localidad y distribución de los elementos que componen la diversidad biológica y ecológica de Puerto Rico.

Las especies de flora y fauna catalogadas como elementos críticos incluyen especies de interés para el DRNA por su rareza, endemismo, o baja población. Hasta el momento se han identificaron nueve (3) especies endémicas en el predio, correspondientes al grupo de las aves. Las especies de aves endémicas observadas en el predio no se catalogan como especies críticas debido a su amplia distribución. El Reglamento # 6766 del 11 de febrero de 2004, Reglamento para Regir las Especies Vulnerables y en Peligro de Extinción en el Estado Libre Asociado de Puerto Rico particulariza otras clasificaciones adicionales a las tradicionales de especies

vulnerables o en peligro de extinción (DRNA, 2004b). Muchas de las especies consideradas como Vulnerables o En Peligro de Extinción se encuentran clasificadas en este reglamento en nuevas categorías como En Peligro y En Peligro Crítico, respectivamente. Nuevas especies han sido añadidas a este reglamento por la falta de datos y preocupación del DRNA sobre el estado poblacional de las mismas. Además de las especies identificadas en la propiedad bajo estudio, el DRNA reporta otras especies críticas catalogadas.

A la fecha de este informe durante las visitas realizadas no se observaron en las inmediaciones del predio las especies antes mencionadas y reportadas para la región.

DISCUSIÓN

Actualmente el uso de suelos es uno primordialmente urbano donde la vegetación original ha sido alterada completamente dando paso a la proliferación de especies exóticas y colonizadoras en las partes llanas. Esto ha traído como consecuencia un mosaico en el paisaje y la cobertura de vegetación asociada a los usos de los suelos.

Comunidades ecológicas

En la zona de Vida de Bosque Húmedo Subtropical pueden existir varias comunidades ecológicas dependiendo de las formaciones geológicas, suelos y vegetación predominante. Como se mencionó anteriormente, debido a los usos de la propiedad, se observa un paisaje donde domina una vegetación compuesta por plantas no indígenas de especies mayormente de sucesión secundaria.

Composición de flora

La flora está compuesta en su mayoría de especies invasoras de crecimiento rápido y alta mortalidad. Estas especies dominan en las primeras etapas del la sucesión secundaria.

Composición de fauna

Las aves observadas corresponden a especies comunes residentes que se observan durante todo el año en el área. Las tórtolas cardosanteras, tórtolas aliblancas, reinita común, changos y pitirres fueron las aves más comunes y abundantes en la zona También entre los reptiles más abundantes fueron: el lagartijo común Anolis cristatellus, y la siguana común Ameiva exsul. Estos reptiles se concentran en número en la zona norte .En el área de sur cerca de la carretera 156 se observan en abundancia gorriones como el gorrión negro; y finches de especies exóticas establecidas exitosamente en toda la isla (veteranos y diablitos). Estos gorriones y finches se alimentan de las semillas de las yerbas, principalmente de las especies de la familia Poaceae. De las

aves residentes, las especies más abundantes fueron las tórtolas cardosanteras, la reinita común y los gorriones negros.

CONCLUSIÓN

Se propone para un área que actualmente esta desocupada dos componentes principales uno Comercial y uno Industrial. La propiedad se compone de un área baldía utilizada como cantera. En estas áreas se realizaron los inventarios de flora y fauna, identificando los hábitats presentes según los elementos bióticos observados. En la propiedad se identificaron un total de 26 especies de plantas la mayoría de la flora identificada presenta un tipo de crecimiento herbáceo.

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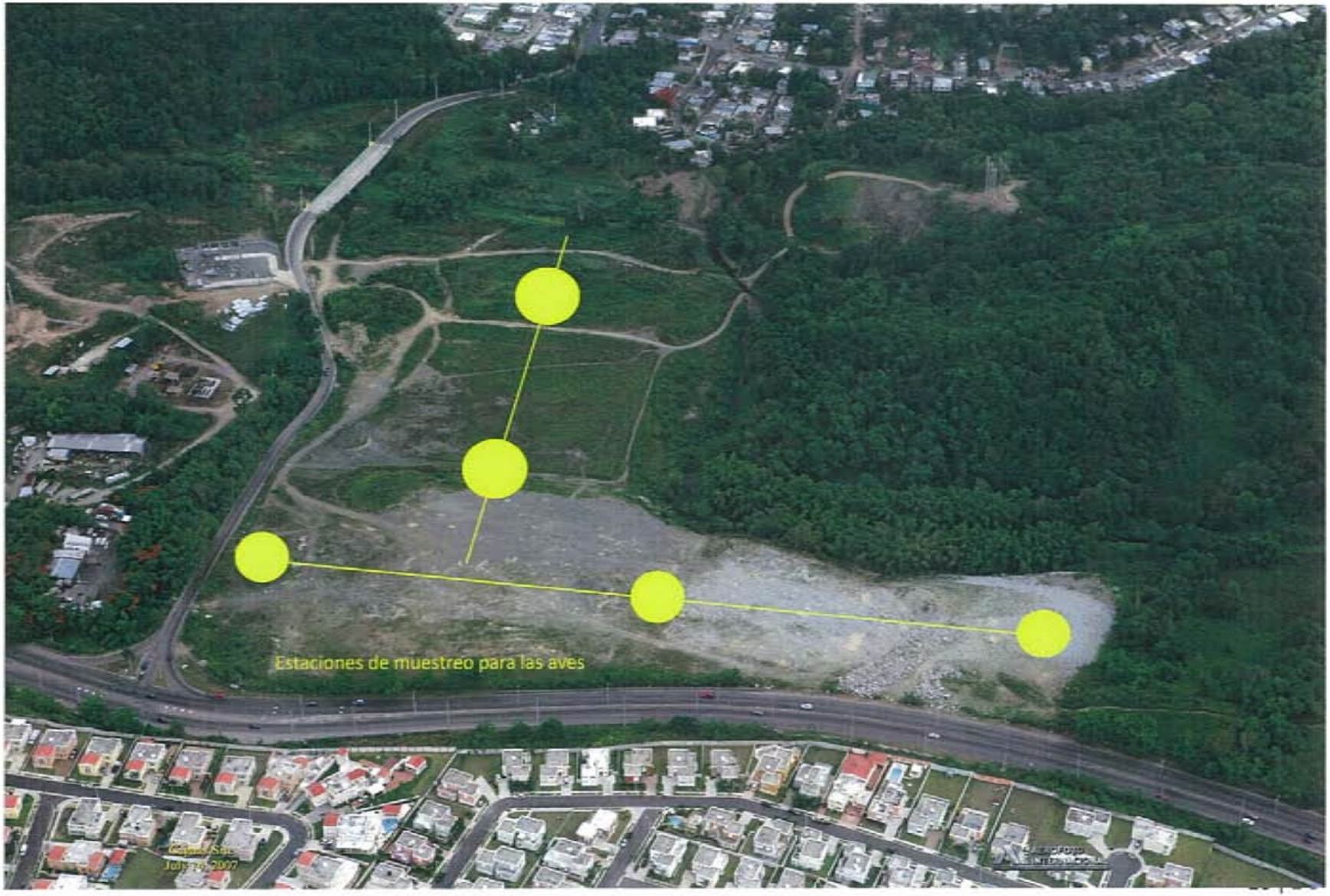
Estaciones de muestreo para las aves

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CERTIFICACIÓN

Yo, Nestor L Lopez, Biólogo, certifico que he preparado el Estudio de Flora y Fauna para un predio de 32 cuerdas, localizado en la carretera PR#156 del barrio Cañabón del Municipio de Caguas.

Y que la información que el mismo contiene es cierta, correcta y completa, a mi mayor saber y entender.

Afirmo y reconozco las consecuencias de incluir y someter información incompleta, inconclusa o falsa en dicho documento.

Y para que así conste, firmo la presente certificación en Caguas, Puerto Rico, Hoy martes, 3 de junio de 2008.

Nestor L Lopez-Flores

Anejo 5:

Determinación Jurisdiccional

Determination of Jurisdictional Wetland and Waters of U.S.

Las Carolinas Towne Center Development

Las Carolinas Ward
Municipality of Caguas Puerto Rico

Prepared for

U.S. Army Corps of Engineers
Antilles Section
Jacksonville District
San Juan, PR

Prepared by

NAI Environmental, Inc.
Athens, GA

and

BioImpact, Inc.
KingsHill St Croix

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Figure 3. Soil boring locations, ordinary high water mark, and isolated wetland boundary, Las Carolinas Towne Center.

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Plate 2. View of right bank (at W1) of upper 100 m reach of stream, facing Northwest.

Plate 3. View of vegetation at W2.

Plate 4. View of vegetation at first bend in the stream, facing North.

Plate 5. South facing view of vegetation between first and second stream bends.

Plate 6. View of vegetation of final 100 m reach of stream, facing South.

Plate 7. Isolated depression.

1.0 BACKGROUND

The Las Carolinas Towne Center is a mixed industrial and commercial/retail development proposed for a 31.79-acre (32.73 cdas, 12.86 ha) tract located at the intersection of PR-156 to the south, Municipal Road Las Carolinas to the west, Rio Cagüitas to the north/northeast, and private property to the east. The tract is located in Las Carolinas Ward, Municipality of Caguas, P.R. The site was graded by the previous owner, Berwind Realty, prior to acquisition by Yasscar Caguas Development Corporation (the Developer) on October 5, 2007. The site engineer is ALRM Engineering Consultants, and NAI Environmental, Inc. is the environmental consultant.

Industrial development will occupy approximately 12.5 acres (5.1 ha) of the site, including buildings and paved driveways and parking, and commercial/retail development will occur on approximately 15.5 acres (6.27 ha), including buildings and paved areas. Approximately 2.2 acres (0.89 ha) will be maintained as green space, and there will be a 1.6-acre (0.65 ha) storm water detention pond (Figures 1a and 1b). The Lambert coordinates of the site are N 245,800, E 283,200.

There is a minimum 5.0 meter set back dedicated to public use along the south bank (right bank) of Rio Cagüitas. No construction or disturbance will occur in the 5.0 m set back area adjacent to Rio Cagüitas. It is the intention of the developer to avoid all impacts to wetlands and waters of the U.S. by extending the set back to include all jurisdictional waters not already within the minimum 5.0 meter set back area.

2.0 SITE DESCRIPTION

2.1 General

The development tract has been graded, and more grading is planned to achieve final grade for the planned development. Examination of the USGS topo indicates that no crenulations in the contours were present to suggest intermittent or perennial stream channels (Figure 2). The topo quad also indicates the area of disturbance from previous grading/rock quarrying as a magenta-shaded photo update within the proposed project boundary (Figure 2).

2.2 Vegetation

There is a prominent stand of giant bamboo (Bambusa vulgaris) along the northern end of Rio Cagüitas between Wetlands W1 and W2 (Figure 3; Plate 1). Two small wetland areas lying within the Rio Cagüitas channel on the northern boundary of the project site are vegetatively dominated by taro (Colocasia esculenta), Mallojillo grass (Brachiaria mutica) (Plates 2 and 3).

A second stand of giant bamboo lies at the first major meander bend in the stream (Plate 4), where Rio Cagüitas splits into two channels. The majority of the flow goes around the northern (left bank) side of this giant bamboo stand, and the channels reconverge just downstream of the meander.

Giant bamboo lines the remainder of the Rio Cagüitas streambank on the project site, with scattered large almond (Terminalia catappa), mango (Mangifera indica), yagrumo (Cecropia peltata), Erythinas spp., and African tulip trees (Spathodea campanulata) distributed along the last 150 to 215 m of the surveyed portion of the stream (Plate 5). In some areas, the bamboo has created large mounds of leaves from 0.6 to 1 m thick (Plate 6).

Upland portions of the project site are dominated by graceful mimosa (Mimosa casta). Within the upland area there is a small, isolated excavation adjacent to a construction roadway that has been colonized by danglepod (Sesbania emerus) and Mallojillo grass (Plate 7).

2.3 Soils

Soils throughout the region are generally silt loam to silty clay loam textured, dark brown to red Inceptisols or Ultisols in upland areas, or Mollisols or Entisols along stream channels (Boccheciamp, 1978). Soils on the Las Carolinas Towne Center site have been heavily modified by historic grading and quarry work and were classified as either the Caguabo (Inseptisol) or Estacion (Mollisol) (Boccheciamp, 1978). In both cases, soils are shallow, gravelly, and are underlaid by rock and/or gravel. The vast majority of

soils adjacent to the stream channel were not distinguished in the soil survey, but are typical of those associated with floodplains (Entisols) and contain alternating layers of deposited silt and sand. This was confirmed by several soil borings advanced within the floodplain (Figure 3).

2.4 Hydrology

The field investigation included approximately 795 m of stream bank along Rio Cagüitas. The stream is well defined, and exhibits the riffle, glide, pool, run complex commonly seen in streams with similar gradients.

Rio Cagüitas shows evidence of frequent seasonal flooding. Beginning at the Las Carolinas Municipal Road bridge, the stream is wide with cobble and point bars deposited throughout the channel corridor along the subject development tract boundary. Point bars and stream banks are vegetated with native grasses and herbs, and include thick woody vegetation in places. The point bars show evidence of frequent scouring and redeposition as frequent storm flows move through the channel during the rainy season.

The area along the right bank of the stream has been highly altered in the past with disturbance due to grading and perhaps grazing along the bank. Such disturbances have evidently occurred within the channel itself in some places. The height of the stream bank (along the project boundary) varies from 0.5 to over 2.0 m.

3.0 WETLANDS AND WATERS DELINEATION

3.1 Methods

NAI Environmental, Inc. delineated wetlands and waters of the U.S. on the Las Carolinas Towne Center property on February 4 and 5, 2008. Field criteria for potentially jurisdictional wetlands are defined in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual, with subsequent clarifications and modifications to the Manual issued 1991, 1992, and 1997. Recent regulatory directives regarding jurisdictional determinations in light of the U.S. Supreme Court decision in Rapanos v. United States were also consulted, and all applicable information was obtained.

USACE regulations extend jurisdiction of waters of the U.S. to the "ordinary high water mark" in non-tidal waters of the U.S. where wetlands are not present (33 CFR 32.84(c)). Potentially jurisdictional streams were delineated in the field using criteria and indicators found in USACE regulations, including the definition of the term "ordinary high water mark," which is defined as "the line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas," (33 CFR 328.3(e)). Additional guidance for making ordinary high water determinations is provided in Regulatory Guidance Letter 05-05, dated December 7, 2005.

Delineation flags were numbered alphanumerically in the field, and location coordinates were determined using a Trimble GeoXT GPS unit with sub-meter accuracy. The flag locations were also subsequently surveyed by the site surveyor (Figure 2).

3.2 Stream

The ordinary high water mark on the right bank of Rio Cagüitas was demarcated in the field based primarily on the highest scour line and back portions of point bars (Figure 3). These indicators are generally synonymous with "the natural line impressed on the bank" and "shelving" described as indicators of OHWM at 33 CFR 328.3(e). Additional indicators of OHWM include breaks in slope, changes in vegetation, changes in soil characteristics, the presence of litter or debris, and in some cases the top of the stream bank itself (33 CFR 328.3(e); Leopold, 1994). A traditional land survey of the OHWM on the right bank of the Rio Cagüitas is presented in Figure 2.

Soils along the right bank of the channel were typical floodplain soils in most cases, confirmed by five floodplain soil borings at locations S2, S4, S9, S10, and S11 (Figure 3). However, much of the sand and silt had washed away at two soil boring locations (labeled W1 and W2 on Figure 3),and the remaining soils exhibited hydric characteristics. Soils within these wetland areas have a finer texture than the general

floodplain soils (silt loam and silty clay loam), are more red and grey in color, and contain many more fine roots than other soils adjacent to the stream. Additionally, both of these small areas are within the ordinary high water mark of the stream channel. Vegetation in these areas includes mainly taro and Mallojillo grass.

3.3 Wetlands Within the Rio Cagüitas Channel

There are two small wetlands that lie in the Rio Cagüitas channel, below the OHWM. Wetland W1 abuts the stream and has been densely colonized by taro (Colocasia esculenta) (Figure 3; Plate 2). Further downstream, Wetland W2 also lies with the channel, but is vegetatively characterized by both taro and Mallojillo grass (Brachiaria mutica) (Figure 3; Plate 3). Both of these wetlands also included hydric soils and positive indicators of wetland hydrology, consistent with the 1987 Manual (Appendix A).

3.4 Upland area, Isolated Depression

Soil borings S7, S8, and S12 confirmed that rutted and ponded areas on the site contained non-hydric soils (Figure 3). However, Wetland W3 is a small ,isolated depression where hydric soils, hydrophytic vegetation, and wetland hydrology indicators consistent with the 1987 Manual were observed (Plate 7; Appendix A). However, there is no evidence that the depression is connected to the stream, and therfore, under current regulatory guidance, this isolated depression is classified as a non-jurisdictional isolated wetland.

4.0 RAPANOS FORMS

Two Rapanos wetland forms were completed for the site (Appendix B). One of the forms includes the stream and associated wetlands adjacent to the stream (Wetlands W1 and W2). The other form includes only the isolated depression created by excavation.

5.0 CONCLUSIONS

Rio Cagüitas and its associated wetlands were delineated by NAI Environmental, Inc. on February 4 and 5, 2008. Wetlands satisfied the three-parameter criteria outlined in the 1987 Manual: wetland hydrology, hydric soil, and hydrophytic vegetation. Wetlands W1 and W2 are connected to Rio Cagüitas, and in fact lie within the river corridor defined by the ordinary high water mark of the stream.

One small isolated depression that was created by excavation up slope from the stream was found to have hydric soils, hydrophytic vegetation, and hydrology. There is no evidence that the depression is connected to the stream. Therefore, under the current guidance, this isolated depression area is classified as a non-jurisdictional isolated wetland.

All construction, grading, and other types of disturbance for The Las Carolinas Towne Center development will completely avoid jurisdictional wetlands and Rio Cagüitas, and no impacts to these jurisdictional waters of the U.S. will occur.

6.0 CITATIONS

Boccheciamp, R.A. 1978. Soil Survey of San Juan Area of Puerto Rico. United States Department of Agriculture, Soil Conservation Service. 141 pp. + plates.

Leopold, L.B. 1994. A View of the River. Harvard University Press. Cambridge, MA. 312 pp.

Plate 1. View of vegetation of upper 100 m reach of stream, facing Northwest.

Plate 2. View of right bank (at W1) of upper 100 m reach of stream, facing Northwest.

Plate 3. View of vegetation at W2.

Plate 4. View of vegetation at first bend in the stream, facing North.

Plate 5. South facing view of vegetation between first and second stream bends.

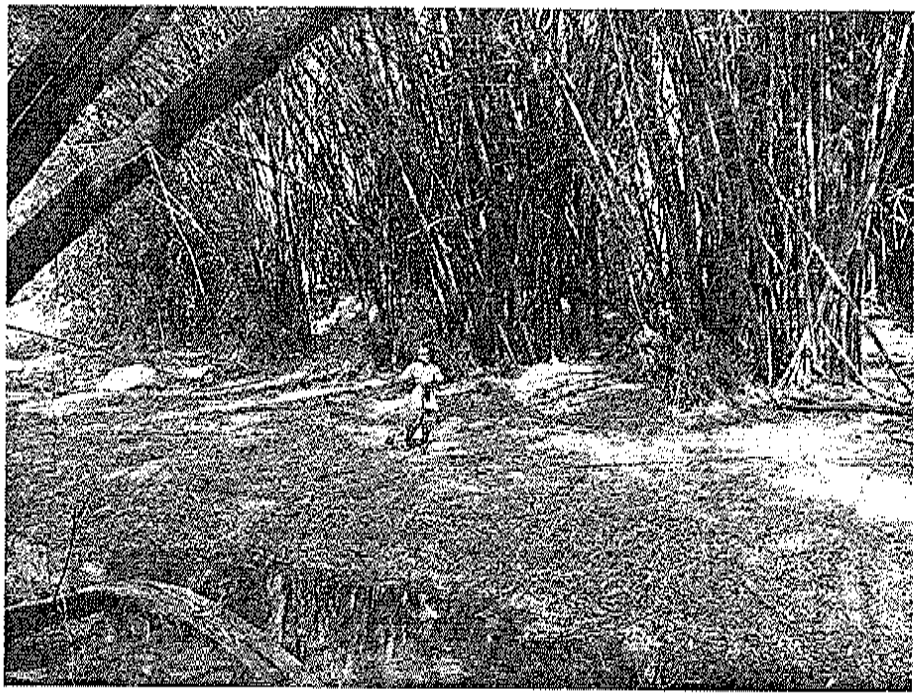

Plate 6. View of vegetation of final 100 m reach of stream, facing South.

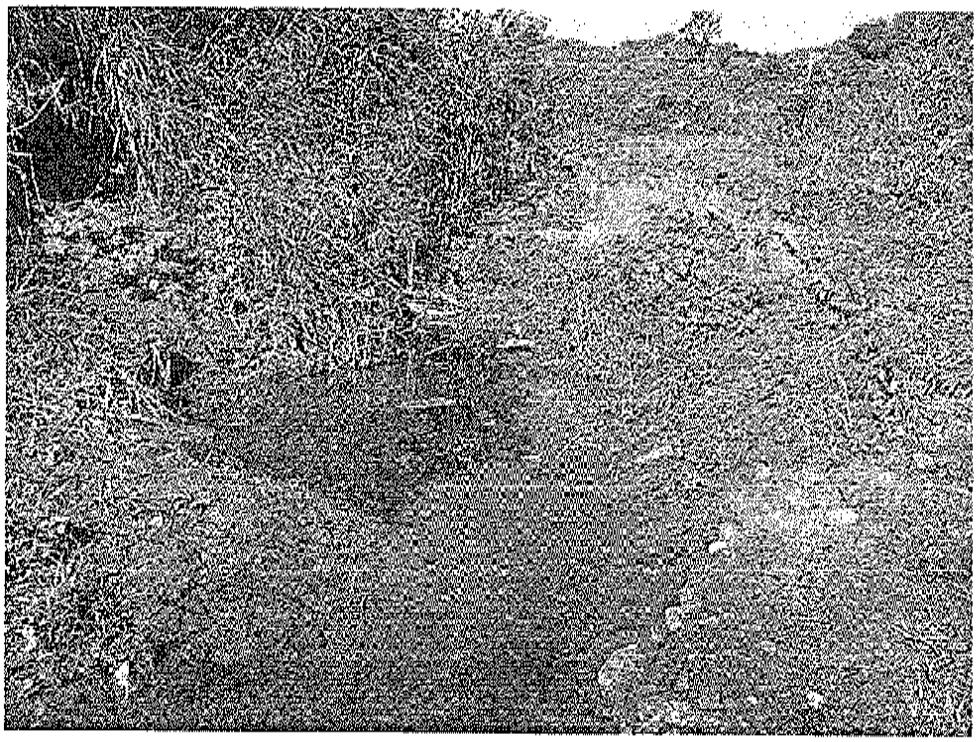

Plate 7. Isolated depression.

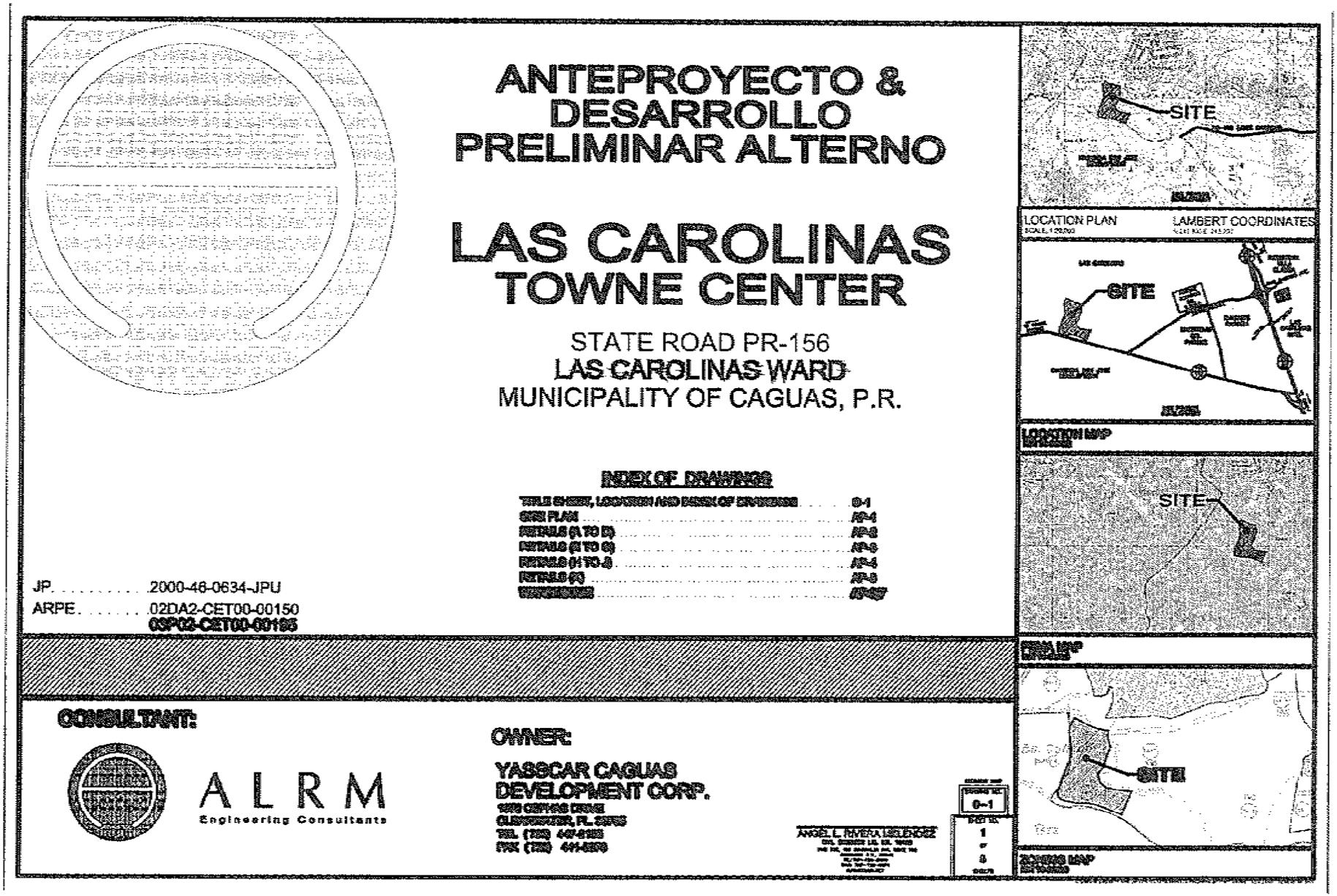

Figure 1a. Site plan title page.

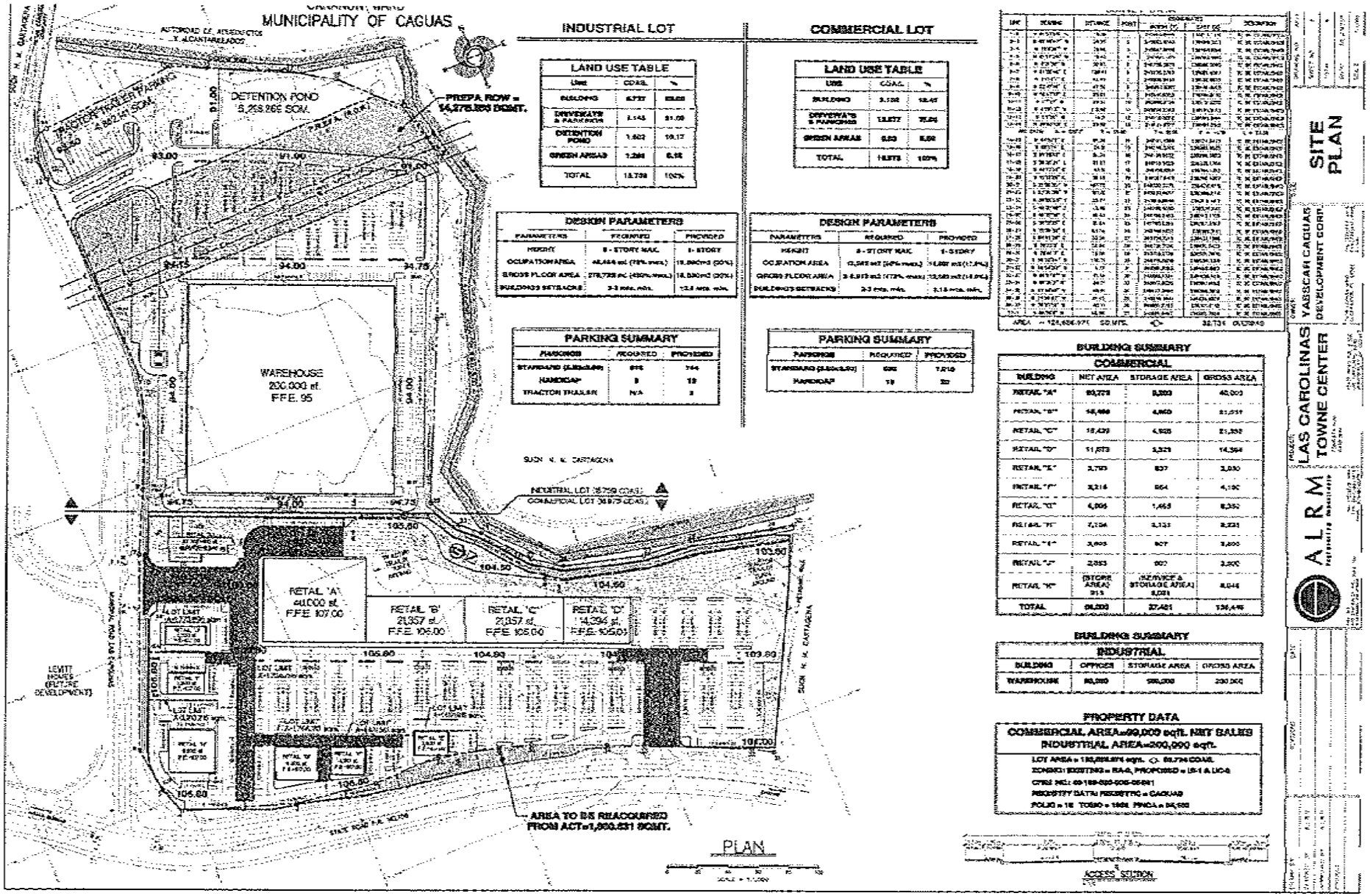

Figure 1b. Site Plan

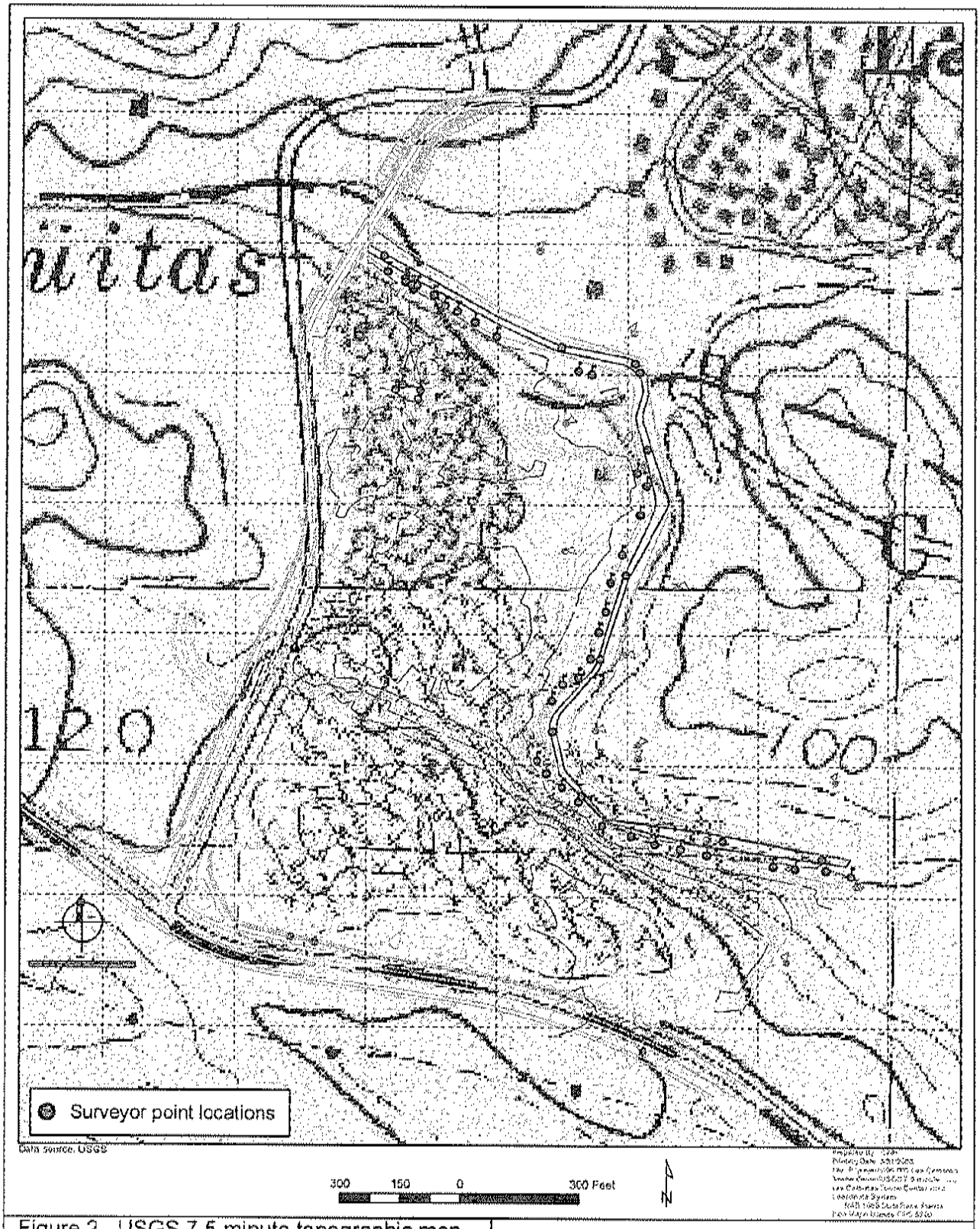

Figure 2. USGS 7.5 minute topographic map showing surveyor point locations of ordinary high water and the isolated wetland, Las Carolinas Towne Center.

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Environmental Consultants

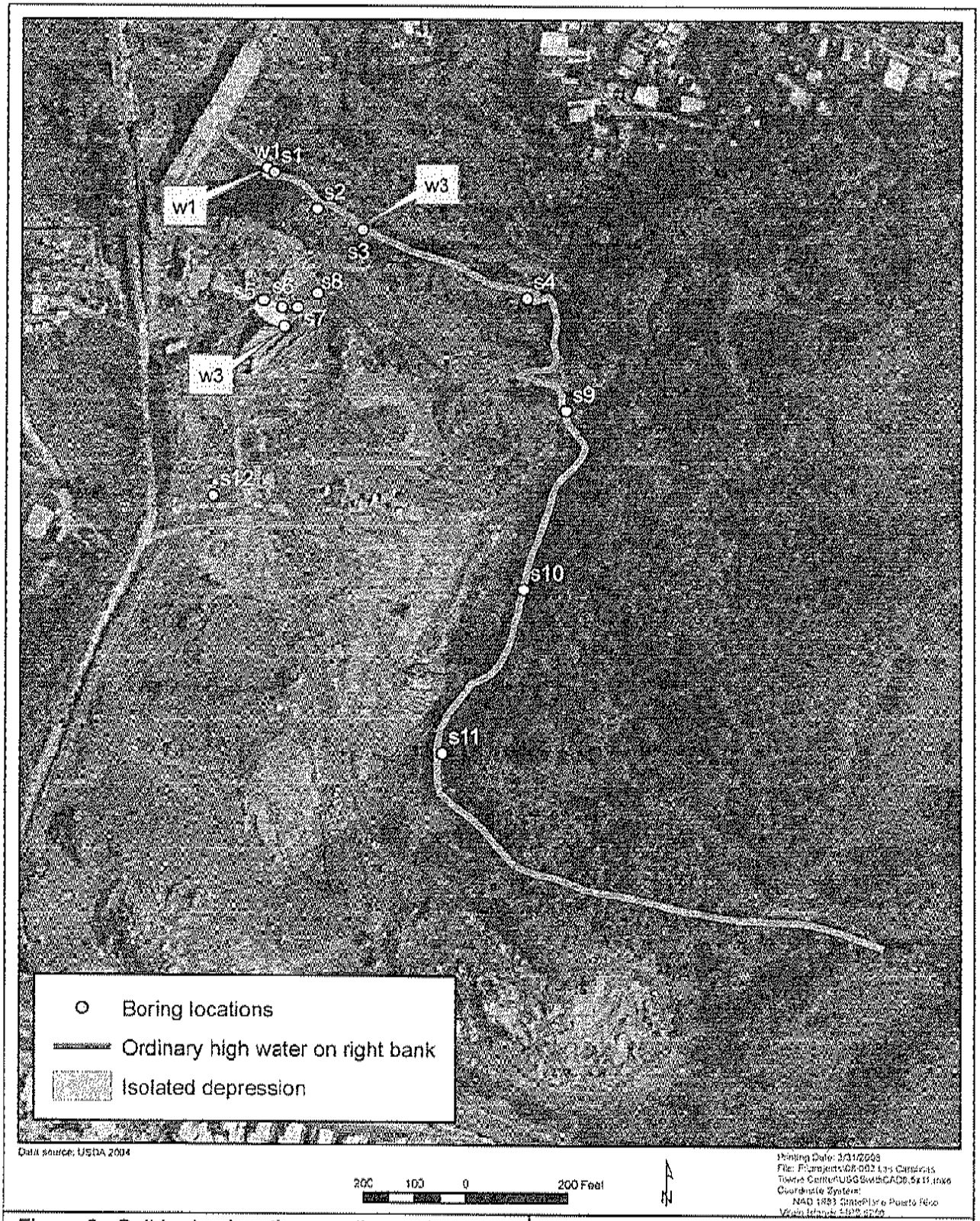

Figure 3. Soil boring locations, ordinary high water mark, and isolated wetland boundary, Las Carolinas Towne Center (aerial photograph taken in 2004)

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Environmental Consultants

APPENDIX A

Routine Wetland Determination Forms

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

Project Site: Las Carolinas Towne Center	Date: 2/4/08
Applicant/Owner: Yasscar Caguas Development Corp.	County: Caguas
Investigator: Amy Claire Dempsey/Lane Rivenbark	State: Puerto Rico
Do normal circumstances exist on the site? **Yes** No	Community ID: Wetland
Is the site significantly disturbed (atypical situation)? Yes **No**	Transect ID: Wetland 1
Is the area a potential problem area? Yes **No** (If needed, explain on reverse.)	Plot ID: W1

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Colocasia esculenta*	herb	OBL	9.		
2. *Brachiaria mutica*	grass	FACW	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% — 100%

Remarks:

HYDROLOGY

x Recorded Data (describe in remarks):
- ___ Stream, Lake, or Tide Gauge
- X Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water 4 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators
- x Inundated
- x Saturated in Upper 12 Inches
- x Water Marks
- x Drift Lines
- x Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- x Oxidized Root Channels in Upper 12 inches
- x Water-Stained Leaves
- x Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series and Phase): _____

Drainage Class: PD

Field Observations
Confirm Mapped Type Yes No

Taxonomy (Subgroup): _____

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concentrations Structure, etc.
0-4		10 YR 4/1			Silt Loam, many fine roots
4-13		10 YR 6/1	10 YR 4/6	common (around root channels)	Silty Clay Loam, many fine roots
13+					Rock

Hydric Soil Indicators:

- ____ Histosol
- ____ Histic Epipedon
- x Sulfidic Odor
- ____ Aquic Moisture Regime
- x Reducing Conditions
- x Gleyed or Low-Chrome Colors
- ____ Concretions
- ____ High Organic Content in Surface Layer in Sandy Soils
- ____ Organic Streaking in Sandy Soils
- ____ Listed on Local Hydric Soils List
- ____ Listed on National Hydric Soils List
- ____ Other (Explain in Remarks)

Remarks:
May actually be in the stream not just abutting

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No	(Circle)
Wetland Hydrology Present?	Yes	No	
Hydric Soils Present?	Yes	No	

(Circle)
Is this Sampling Point Within a Wetland? Yes No

Remarks:

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

Project Site: Las Carolinas Towne Center	Date: 2/4/08
Applicant/Owner: Yasscar Caguas Development Corp.	County: Caguas
Investigator: Amy Claire Dempsey/Lane Rivenbark	State: Puerto Rico

Do normal circumstances exist on the site?	**Yes**	No	Community ID: Wetland
Is the site significantly disturbed (atypical situation)?	Yes	**No**	Transect ID: Wetland 2
Is the area a potential problem area? (If needed, explain on reverse.)	Yes	**No**	Plot ID: W2

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Colocasia esculenta*	herb	OBL	9.		
2. *Brachiaria mutica*	grass	FACW	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% — 100%

Remarks:

HYDROLOGY

x Recorded Data (describe in remarks):
- ___ Stream, Lake, or Tide Gauge
- X Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0 (in.)

Depth to Free Water in Pit: 3 (in.)

Depth to Saturated Soil: 3 (in.)

Wetland Hydrology Indicators:

Primary Indicators
- x Inundated
- x Saturated in Upper 12 Inches
- x Water Marks
- x Drift Lines
- x Sediment Deposits
- x Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- x Oxidized Root Channels in Upper 12 Inches
- x Water-Stained Leaves
- x Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: PD

Taxonomy (Subgroup): _____ Field Observations Confirm Mapped Type Yes No

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concentrations Structure, etc.
0-3		10 YR 3/2			Silty Loam, Many fine Roots
3-14+		10YR 4/1	10 YR 4/6	Many along root channels	Silty Clay Loam, Many Fine Roots

Hydric Soil Indicators:

- ____ Histosol
- ____ Histic Epipedon
- x Sulfidic Odor
- ____ Aquic Moisture Regime
- x Reducing Conditions
- x Gleyed or Low-Chrome Colors
- ____ Concretions
- ____ High Organic Content in Surface Layer in Sandy Soils
- ____ Organic Streaking in Sandy Soils
- ____ Listed on Local Hydric Soils List
- ____ Listed on National Hydric Soils List
- ____ Other (Explain in Remarks)

Remarks:
May actually be in the stream not just abutting

WETLAND DETERMINATION

			(Circle)
Hydrophytic Vegetation Present?	Yes	No	(Circle)
Wetland Hydrology Present?	Yes	No	
Hydric Soils Present?	Yes	No	

Is this Sampling Point Within a Wetland? Yes No

Remarks:

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

Project Site: Las Carolinas Towne Center	Date: 2/5/08
Applicant/Owner: Yasscar Caguas Development Corp.	County: Caguas
Investigator: Amy Claire Dempsey/Lane Rivenbark	State: Puerto Rico
Do normal circumstances exist on the site? Yes **No**	Community ID: Wetland
Is the site significantly disturbed (atypical situation)? **Yes** No	Transect ID: Wetland 3
Is the area a potential problem area? Yes **No** (If needed, explain on reverse.)	Plot ID: W3

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Sesbania*	herb	FACW	9.		
2. *Brachiaria mutica*	grass	FACW	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% 100%

Remarks:

HYDROLOGY

x Recorded Data (describe in remarks):
- ___ Stream, Lake, or Tide Gauge
- X Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water 1-24 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators
- x Inundated
- x Saturated in Upper 12 Inches
- x Water Marks
- x Drift Lines
- x Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 inches
- x Water-Stained Leaves
- x Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:
N18 14.964 W66 04.315

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: PD

Taxonomy (Subgroup): _____ Field Observations
Confirm Mapped Type Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concentrations Structure, etc.
0–2		7.5 YR 4/0	7.5YR 4/6	Common	Silty Clay Loam
2-10		2.5 YR 6/4	7.5 YR 4/6 7.5 YR 4/0	Common	Silty Clay, 5%+ gravel
10-14		7.5YR 4/0	7.5YR 4/6	Few	Silt Loam, gravelly

Hydric Soil Indicators:

- ____ Histosol
- ____ Histic Epipedon
- x Sulfidic Odor
- ____ Aquic Moisture Regime
- x Reducing Conditions
- x Gleyed or Low-Chrome Colors
- ____ Concretions
- ____ High Organic Content in Surface Layer in Sandy Soils
- ____ Organic Streaking in Sandy Soils
- ____ Listed on Local Hydric Soils List
- ____ Listed on National Hydric Soils List
- ____ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No	(Circle)
Wetland Hydrology Present?	Yes	No	
Hydric Soils Present?	Yes	No	

Is this Sampling Point Within a Wetland? (Circle) Yes No

Remarks:
site has been altered during excavation

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

Project Site: Las Carolinas Towne Center Applicant/Owner: Yasscar Caguas Development Corp. Investigator: Amy Claire Dempsey/Lane Rivenbark	Date: 2/5/08 County: Caguas State: Puerto Rico
Do normal circumstances exist on the site? Yes **No** Is the site significantly disturbed (atypical situation)? **Yes** No Is the area a potential problem area? Yes **No** (If needed, explain on reverse.)	Community ID: ____ Transect ID: ____ Plot ID: S7

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Mimosa Caste*	Plant	FAC	9.		
2.			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% 100%

Remarks:

HYDROLOGY

x Recorded Data (describe in remarks):
- ___ Stream, Lake, or Tide Gauge
- X Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water ___ (in.)

Depth to Free Water in Pit: ___ (in.)

Depth to Saturated Soil: ___ >12 in.)

Wetland Hydrology Indicators:

Primary Indicators
- ___ Inundated
- ___ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- x Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- x Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:
N18 14.964 W66 04.315

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: SPD

Taxonomy (Subgroup): _____ Field Observations
Confirm Mapped Type Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concentrations Structure, etc.
0-13		10YR 4/3			Silt Loam, Many 2-4 mm gravel

Hydric Soil Indicators:

- ____ Histosol
- ____ Histic Epipedon
- ____ Sulfidic Odor
- ____ Aquic Moisture Regime
- ____ Reducing Conditions
- ____ Gleyed or Low-Chroma Colors
- ____ Concretions
- ____ High Organic Content in Surface Layer in Sandy Soils
- ____ Organic Streaking in Sandy Soils
- ____ Listed on Local Hydric Soils List
- ____ Listed on National Hydric Soils List
- ____ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	**No**	(Circle)
Wetland Hydrology Present?	Yes	**No**	
Hydric Soils Present?	Yes	**No**	

(Circle)
Is this Sampling Point Within a Wetland? Yes **No**

Remarks:
site has been graded

APPENDIX B

Rapanos Forms

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 3/31/2008

B. DISTRICT OFFICE, FILE NAME, AND NUMBER:

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: Puerto Rico County/parish/borough: City: Caugas
Center coordinates of site (lat/long in degree decimal format): Lat. 18 15.014° N, Long. 66 04.317° W.
Universal Transverse Mercator:
Name of nearest waterbody: Rio Cagüitas

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows:
Name of watershed or Hydrologic Unit Code (HUC):

- ☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
- ☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

- ☒ Office (Desk) Determination. Date:
- ☒ Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There Pick List *"navigable waters of the U.S."* within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [*Required*]

- ☐ Waters subject to the ebb and flow of the tide.
- ☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There Are *"waters of the U.S."* within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [*Required*]

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):** [1]
   - ☐ TNWs, including territorial seas
   - ☐ Wetlands adjacent to TNWs
   - ☐ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
   - ☐ Non-RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
   - ☐ Impoundments of jurisdictional waters
   - ☒ Isolated (interstate or intrastate) waters, including isolated wetlands

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
   Non-wetland waters: linear feet: width (ft) and/or acres.
   Wetlands: acres.

   c. **Limits (boundaries) of jurisdiction** based on: 1987 Delineation Manual
   Elevation of established OHWM (if known):

2. **Non-regulated waters/wetlands (check if applicable):**[3]
   - ☒ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain: **Isolated pond, created during excavation of the upland portion of project site.**

---

[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. **TNW**
   Identify TNW: .

   Summarize rationale supporting determination: .

2. **Wetland adjacent to TNW**
   Summarize rationale supporting conclusion that wetland is "adjacent": .

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. **Characteristics of non-TNWs that flow directly or indirectly into TNW**

   (i) **General Area Conditions:**
   Watershed size: Pick List
   Drainage area: Pick List
   Average annual rainfall: inches
   Average annual snowfall: inches

   (ii) **Physical Characteristics:**
   (a) Relationship with TNW:
   ☐ Tributary flows directly into TNW.
   ☐ Tributary flows through Pick List tributaries before entering TNW.

   Project waters are Pick List river miles from TNW.
   Project waters are Pick List river miles from RPW.
   Project waters are Pick List aerial (straight) miles from TNW.
   Project waters are Pick List aerial (straight) miles from RPW.
   Project waters cross or serve as state boundaries. Explain: .

   Identify flow route to TNW[5]: .
   Tributary stream order, if known: .

---

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☒ Natural
☐ Artificial (man-made). Explain: .
☐ Manipulated (man-altered). Explain: .

Tributary properties with respect to top of bank (estimate):
Average width: 100 feet
Average depth: 4 feet
Average side slopes: 2:1.

Primary tributary substrate composition (check all that apply):

☒ Silts ☒ Sands ☐ Concrete
☒ Cobbles ☒ Gravel ☐ Muck
☒ Bedrock ☐ Vegetation. Type/% cover:
☐ Other. Explain: .

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: .
Presence of run/riffle/pool complexes. Explain: .
Tributary geometry: Pick List
Tributary gradient (approximate average slope): %

(c) Flow:
Tributary provides for: Pick List
Estimate average number of flow events in review area/year: Pick List
Describe flow regime: .
Other information on duration and volume: .

Surface flow is: Pick List. Characteristics: .

Subsurface flow: Pick List. Explain findings: .
☐ Dye (or other) test performed: .

Tributary has (check all that apply):
☐ Bed and banks
☐ OHWM[6] (check all indicators that apply):
☐ clear, natural line impressed on the bank
☐ changes in the character of soil
☐ shelving
☐ vegetation matted down, bent, or absent
☐ leaf litter disturbed or washed away
☐ sediment deposition
☐ water staining
☐ other (list):
☐ the presence of litter and debris
☐ destruction of terrestrial vegetation
☐ the presence of wrack line
☐ sediment sorting
☐ scour
☐ multiple observed or predicted flow events
☐ abrupt change in plant community
☐ Discontinuous OHWM.[7] Explain: .

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):
☒ High Tide Line indicated by:
☐ oil or scum line along shore objects
☐ fine shell or debris deposits (foreshore)
☐ physical markings/characteristics
☐ tidal gauges
☐ other (list):
☒ Mean High Water Mark indicated by:
☐ survey to available datum;
☐ physical markings;
☐ vegetation lines/changes in vegetation types.

(iii) Chemical Characteristics:
Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: .
Identify specific pollutants, if known: .

[6] A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7] Ibid.

(iv) **Biological Characteristics. Channel supports (check all that apply):**

- ☐ Riparian corridor. Characteristics (type, average width): .
- ☐ Wetland fringe. Characteristics: .
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: .
  - ☐ Fish/spawn areas. Explain findings: .
  - ☐ Other environmentally-sensitive species. Explain findings: .
  - ☐ Aquatic/wildlife diversity. Explain findings: .

2. **Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW**

(i) **Physical Characteristics:**

(a) General Wetland Characteristics:

Properties:

Wetland size: acres

Wetland type. Explain: .

Wetland quality. Explain: .

Project wetlands cross or serve as state boundaries. Explain: .

(b) General Flow Relationship with Non-TNW:

Flow is: Pick List. Explain: .

Surface flow is: Pick List

Characteristics: .

Subsurface flow: Pick List. Explain findings: .

- ☐ Dye (or other) test performed: .

(c) Wetland Adjacency Determination with Non-TNW:

- ☐ Directly abutting
- ☐ Not directly abutting
  - ☐ Discrete wetland hydrologic connection. Explain: .
  - ☐ Ecological connection. Explain: .
  - ☐ Separated by berm/barrier. Explain: .

(d) Proximity (Relationship) to TNW

Project wetlands are Pick List river miles from TNW.

Project waters are Pick List aerial (straight) miles from TNW.

Flow is from: Pick List.

Estimate approximate location of wetland as within the Pick List floodplain.

(ii) **Chemical Characteristics:**

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: .

Identify specific pollutants, if known: .

(iii) **Biological Characteristics. Wetland supports (check all that apply):**

- ☐ Riparian buffer. Characteristics (type, average width): .
- ☐ Vegetation type/percent cover. Explain: .
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: .
  - ☐ Fish/spawn areas. Explain findings: .
  - ☐ Other environmentally-sensitive species. Explain findings: .
  - ☐ Aquatic/wildlife diversity. Explain findings: .

3. **Characteristics of all wetlands adjacent to the tributary (if any)**

All wetland(s) being considered in the cumulative analysis: Pick List

Approximately ( ) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)

Summarize overall biological, chemical and physical functions being performed: .

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: .

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   - ☐ TNWs: linear feet width (ft), Or, acres.
   - ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   - ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: .
   - ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: .

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**
☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**
☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**
☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**
☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

7. **Impoundments of jurisdictional waters.[9]**
As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
☐ Demonstrate that impoundment was created from "waters of the U.S.," or
☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. **ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]**
☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
☐ which are or could be used for industrial purposes by industries in interstate commerce.
☐ Interstate isolated waters. Explain: .
☐ Other factors. Explain: .

Identify water body and summarize rationale supporting determination: .

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[8] See Footnote # 3.
[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.
[10] **Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.***

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 3/31/2008

B. DISTRICT OFFICE, FILE NAME, AND NUMBER:

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State:Puerto Rico County/parish/borough: City: Caugas
Center coordinates of site (lat/long in degree decimal format): Lat. 18 15.014° N. Long. 66 04.317° W.
Universal Transverse Mercator:
Name of nearest waterbody: Rio Cagüitas

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows:
Name of watershed or Hydrologic Unit Code (HUC):

- ☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
- ☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

- ☒ Office (Desk) Determination. Date:
- ☒ Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There Pick List "*navigable waters of the U.S.*" within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [*Required*]

- ☐ Waters subject to the ebb and flow of the tide.
- ☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain: .

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There Are "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [*Required*]

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):** [1]
   - ☒ TNWs, including territorial seas
   - ☒ Wetlands adjacent to TNWs
   - ☐ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
   - ☐ Non-RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
   - ☐ Impoundments of jurisdictional waters
   - ☐ Isolated (interstate or intrastate) waters, including isolated wetlands

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
   Non-wetland waters: 2600 linear feet: width (ft) and/or acres.
   Wetlands: <.1 acres.

   c. **Limits (boundaries) of jurisdiction** based on: 1987 Delineation Manual
   Elevation of established OHWM (if known): .

2. **Non-regulated waters/wetlands (check if applicable):**[3]
   - ☐ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain: .

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[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. **TNW**
   Identify TNW: **Rio Cagüitas.**

   Summarize rationale supporting determination: Project includes the delineation of the ordinary high water mark of the stream using standard bankfull indicators.

2. **Wetland adjacent to TNW**
   Summarize rationale supporting conclusion that wetland is "adjacent": Wetlands are located within the ordinary high water mark of stream.

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. **Characteristics of non-TNWs that flow directly or indirectly into TNW**

   (i) **General Area Conditions:**
   Watershed size: Pick List
   Drainage area: Pick List
   Average annual rainfall: inches
   Average annual snowfall: inches

   (ii) **Physical Characteristics:**
   (a) Relationship with TNW:
   ☐ Tributary flows directly into TNW.
   ☐ Tributary flows through Pick List tributaries before entering TNW.

   Project waters are Pick List river miles from TNW.
   Project waters are Pick List river miles from RPW.
   Project waters are Pick List aerial (straight) miles from TNW.
   Project waters are Pick List aerial (straight) miles from RPW.
   Project waters cross or serve as state boundaries. Explain:

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

Identify flow route to TNW[5]:
Tributary stream order, if known:

(b) General Tributary Characteristics (check all that apply):
Tributary is: ☒ Natural
☐ Artificial (man-made). Explain:
☐ Manipulated (man-altered). Explain:

Tributary properties with respect to top of bank (estimate):
Average width: 100 feet
Average depth: 4 feet
Average side slopes: 2:1.

Primary tributary substrate composition (check all that apply):
☒ Silts ☒ Sands ☐ Concrete
☒ Cobbles ☒ Gravel ☐ Muck
☒ Bedrock ☐ Vegetation. Type/% cover:
☐ Other. Explain:

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain:
Presence of run/riffle/pool complexes. Explain:
Tributary geometry: Pick List
Tributary gradient (approximate average slope): %

(c) Flow:
Tributary provides for: Pick List
Estimate average number of flow events in review area/year: Pick List
Describe flow regime:
Other information on duration and volume:

Surface flow is: Pick List. Characteristics:

Subsurface flow: Pick List. Explain findings:
☐ Dye (or other) test performed:

Tributary has (check all that apply):
☐ Bed and banks
☐ OHWM[6] (check all indicators that apply):
☐ clear, natural line impressed on the bank
☐ changes in the character of soil
☐ shelving
☐ vegetation matted down, bent, or absent
☐ leaf litter disturbed or washed away
☐ sediment deposition
☐ water staining
☐ other (list):
☐ the presence of litter and debris
☐ destruction of terrestrial vegetation
☐ the presence of wrack line
☐ sediment sorting
☐ scour
☐ multiple observed or predicted flow events
☐ abrupt change in plant community

☐ Discontinuous OHWM.[7] Explain:

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):
☐ High Tide Line indicated by:
☐ oil or scum line along shore objects
☐ fine shell or debris deposits (foreshore)
☐ physical markings/characteristics
☐ tidal gauges
☐ other (list):
☐ Mean High Water Mark indicated by:
☐ survey to available datum;
☐ physical markings;
☐ vegetation lines/changes in vegetation types.

(iii) Chemical Characteristics:
Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain:
Identify specific pollutants, if known:

---

[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.
[6] A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7] Ibid.

(iv) **Biological Characteristics. Channel supports (check all that apply):**
- ☐ Riparian corridor. Characteristics (type, average width): .
- ☐ Wetland fringe. Characteristics: .
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: .
  - ☐ Fish/spawn areas. Explain findings: .
  - ☐ Other environmentally-sensitive species. Explain findings: .
  - ☐ Aquatic/wildlife diversity. Explain findings: .

2. **Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW**

(i) **Physical Characteristics:**

(a) General Wetland Characteristics:
Properties:
Wetland size: acres
Wetland type. Explain: .
Wetland quality. Explain: .
Project wetlands cross or serve as state boundaries. Explain: .

(b) General Flow Relationship with Non-TNW:
Flow is: Pick List. Explain: .

Surface flow is: Pick List
Characteristics: .

Subsurface flow: Pick List. Explain findings: .
- ☐ Dye (or other) test performed: .

(c) Wetland Adjacency Determination with Non-TNW:
- ☐ Directly abutting
- ☐ Not directly abutting
  - ☐ Discrete wetland hydrologic connection. Explain: .
  - ☐ Ecological connection. Explain: .
  - ☐ Separated by berm/barrier. Explain: .

(d) Proximity (Relationship) to TNW
Project wetlands are Pick List river miles from TNW.
Project waters are Pick List aerial (straight) miles from TNW.
Flow is from: Pick List.
Estimate approximate location of wetland as within the Pick List floodplain.

(ii) **Chemical Characteristics:**
Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: .
Identify specific pollutants, if known: .

(iii) **Biological Characteristics. Wetland supports (check all that apply):**
- ☐ Riparian buffer. Characteristics (type, average width): .
- ☐ Vegetation type/percent cover. Explain: .
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: .
  - ☐ Fish/spawn areas. Explain findings: .
  - ☐ Other environmentally-sensitive species. Explain findings: .
  - ☐ Aquatic/wildlife diversity. Explain findings: .

3. **Characteristics of all wetlands adjacent to the tributary (if any)**
All wetland(s) being considered in the cumulative analysis: Pick List
Approximately ( ) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)

Summarize overall biological, chemical and physical functions being performed: .

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: .

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   - ☒ TNWs: 2600 linear feet width (ft), Or, acres.
   - ☒ Wetlands adjacent to TNWs: <.1 acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   - ☒ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: .
   - ☒ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: .

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**
☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**
☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**
☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**
☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

7. **Impoundments of jurisdictional waters.[9]**
As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
☐ Demonstrate that impoundment was created from "waters of the U.S.," or
☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. **ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]**
☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
☐ which are or could be used for industrial purposes by industries in interstate commerce.
☐ Interstate isolated waters. Explain: .
☐ Other factors. Explain: .

Identify water body and summarize rationale supporting determination: .

---

[8] See Footnote # 3.
[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.
[10] **Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.***

Provide estimates for jurisdictional waters in the review area (check all that apply):
- ☐ Tributary waters: linear feet width (ft).
- ☐ Other non-wetland waters: acres.
  - Identify type(s) of waters: .
- ☐ Wetlands: acres.

F. **NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):**
- ☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- ☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
  - ☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- ☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: .
- ☐ Other: (explain, if not covered above): .

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):
- ☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- ☐ Lakes/ponds: acres.
- ☐ Other non-wetland waters: acres. List type of aquatic resource: .
- ☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):
- ☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
- ☐ Lakes/ponds: acres.
- ☐ Other non-wetland waters: acres. List type of aquatic resource: .
- ☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. **SUPPORTING DATA. Data reviewed for JD (check all that apply** - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
- ☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: .
- ☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  - ☐ Office concurs with data sheets/delineation report.
  - ☐ Office does not concur with data sheets/delineation report.
- ☐ Data sheets prepared by the Corps: .
- ☐ Corps navigable waters' study: .
- ☐ U.S. Geological Survey Hydrologic Atlas: .
  - ☐ USGS NHD data.
  - ☐ USGS 8 and 12 digit HUC maps.
- ☒ U.S. Geological Survey map(s). Cite scale & quad name: 7.5 minute.
- ☒ USDA Natural Resources Conservation Service Soil Survey. Citation:Soil Survey of Sand Juan Area of Puerto Rico, 1978.
- ☐ National wetlands inventory map(s). Cite name: .
- ☐ State/Local wetland inventory map(s): .
- ☐ FEMA/FIRM maps: .
- ☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
- ☒ Photographs: ☒ Aerial (Name & Date):USDA 2004.
  - or ☐ Other (Name & Date): .
- ☐ Previous determination(s). File no. and date of response letter: .
- ☐ Applicable/supporting case law: .
- ☐ Applicable/supporting scientific literature: .
- ☐ Other information (please specify): .

B. **ADDITIONAL COMMENTS TO SUPPORT JD:** .

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .
☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):
☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
☒ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
☒ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: .
☐ Other: (explain, if not covered above): .

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☒ Wetlands: <0.1acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. **Data reviewed for JD (check all that apply** - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: .
☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
☐ Office concurs with data sheets/delineation report.
☐ Office does not concur with data sheets/delineation report.
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☐ U.S. Geological Survey Hydrologic Atlas: .
☐ USGS NHD data.
☐ USGS 8 and 12 digit HUC maps.
☒ U.S. Geological Survey map(s). Cite scale & quad name: 7.5 minute.
☒ USDA Natural Resources Conservation Service Soil Survey. Citation:Soil Survey of Sand Juan Area of Puerto Rico, 1978.
☐ National wetlands inventory map(s). Cite name: .
☐ State/Local wetland inventory map(s): .
☐ FEMA/FIRM maps: .
☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
☒ Photographs: ☒ Aerial (Name & Date):USDA 2004.
or ☐ Other (Name & Date): .
☐ Previous determination(s). File no. and date of response letter: .
☐ Applicable/supporting case law: .
☐ Applicable/supporting scientific literature: .
☐ Other information (please specify): .

B. ADDITIONAL COMMENTS TO SUPPORT JD: .

Anejo 6:

Estudio de Recursos Arqueológicos Fase IB

Centro de Investigaciones Arqueológicas
Bieque
APDO.10987, CAPARRA STA., SAN JUAN, PUERTO RICO 00922

EVALUACION DE RECURSOS CULTURALES
FASE -1B
CENTRO DE DISTRIBUCION
FARMACIAS EL AMAL
BARRIO CAÑABÓN CAGUAS, PUERTO RICO

SOMETIDO A:

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Abril 2003

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I. INTRODUCCION

La Firma **Archicorp**, ha propuesto la construcción del proyecto **Centro De Distribución Farmacias El Amal.** El predio donde se construirá dicho proyecto se encuentra localizado en la Carretera Estatal PR-156, esquina calle Las Carolinas en el barrio Cañabón del municipio de Caguas. El lote de 33.91 cuerdas se divide en 16.5 cuerdas industrial y 17.41 cuerdas comercial.

Los terrenos a evaluarse están delimitados por el norte; con el río Cagüitas, por el sur; con la Carretera Estatal PR-156, por el este; con terrenos de la Sucesión N.M. Cartagena y por el oeste; con la calle municipal de las Carolinas. Los terrenos están zonificados RA-3 (Rústico Rural General) según el mapa 49 y 51 de Ordenamiento Urbano Municipio de Caguas.

En el mes de julio de 2002, la arqueóloga Raquel del C. Camacho Hernández, sometió al Instituto de Cultura Puertorriqueña para su evaluación, el estudio **Centro de Distribución Farmacias el Amal** Barrio Cañabón, Caguas, Puerto Rico Fase 1A. En su informe se recomienda llevar a cabo una Evaluación Arqueológica Fase 1B, en la sección norte de los terrenos.

Para poder continuar con la evaluación y determinación de éste proyecto, el Instituto de Cultura Puertorriqueña, a través de su **Programa de Arqueología y Etnohistoria** solicita mediante su carta fechada el 20 de noviembre de 2002, llevar a cabo una **Evaluación de Recursos Culturales Fase 1B.**

La **Oficina Estatal de Conservación Histórica y el Instituto de Cultura Puertorriqueña,** solicitan una Evaluación de Recursos Culturales en lugares considerados de alto potencial arqueológico o en terrenos donde previamente han

sido identificado sitios arqueológicos. Este requerimiento tiene su base legal conforme a las disposiciones de la Sección 10 de la Ley 112 del 20 de julio de 1988, conocida como la **Ley de Arqueología Terrestre de Puerto Rico,** y en virtud de los requerimientos del Reglamento para la **Redacción y Evaluación Arqueológica de Proyectos de Construcción y Desarrollo (Departamento de Estado #4643).**

Debido a que los trabajos a realizarse son de índole científica, se tomarán en cuenta las guías utilizadas en la elaboración de dicho estudio y se adaptará a la situación particular y específica del proyecto a realizarse.

II. FASES DE ESTUDIO

Fase 1A

Como parte de los estudios **Fase 1A**, solo presentaremos la información necesaria para este proyecto, debido a que el estudio realizado para el proyecto **Centro de Distribución Farmacias El Amal Fase 1A**, incluye la investigación documental, ambiental y arqueológica de la zona en cuestión.

Entendemos será necesario llevar a cabo una prospección ocular sobre la sección norte, por medio de la cual revisaremos los cortes, y áreas errosionadas, con el propósito de establecer las áreas de mayor sensitividad arqueológica para poder llevar a cabo las catas de sondeo. Además como parte de nuestra investigación se revisarán todas las piedras ubicadas en la porción del río que acoge el proyecto. Mediante este trabajo se podrá identificar evidencias tales como petroglifos en las rocas.

B. Fase 1B

El estudio **Fase 1B** , requiere una investigación de campo que será realizada por los arqueólogos del proyecto junto a los técnicos de campo. Se realizarán las pruebas de pala que se consideren necesarias para poder establecer con mayor seguridad la presencia o ausencia de recursos culturales de tipo histórico o prehistórico dentro de los límites del área de desarrollo. La cantidad, intervalos a realizarse, y la profundidad y distribución de las pruebas dependerán del potencial arqueológico de la zona, las condiciones del terreno y otras consideraciones específicas que la arqueóloga determine en el campo. En adición a las pruebas se deberán examinar todas las superficies expuestas del terreno en busca de alguna evidencia cultural.

El informe que resumirá los hallazgos de ambas fases de evaluación deberá incluir mapas del proyecto indicando la localización exacta, plano indicando la localización de las pruebas de pala realizadas durante la **Fase 1B,** copia del cuadrángulo del área evaluada, indicando los sitios arqueológicos cercanos al proyecto, un catálogo de pozos de sondeo, fotografías señalando las condiciones de los terrenos, el trabajo de campo realizado, hallazgos de valor cultural, de identificarse alguno y cualquier otra ayuda visual que permita una evaluación rápida y precisa del estudio arqueológico.

III. LOCALIZACION

El municipio de Caguas se encuentra situado en el centro este de la isla, limita con San Juan, Río Piedras y Trujillo Alto por el norte; con Cayey y San Lorenzo por el sur; con Gurabo y San Lorenzo por el este; y con Aguas Buenas, Cidra y Cayey por el oeste **(Figura 1).**

Las colindancias de los terrenos evaluados son las siguientes; por su lado norte; con el río Cagüitas**(Foto 1)**, por el sur; con la Carretera Estatal PR-156, por el este; con terrenos de la Sucesión N.M Cartagena y por su lado oeste; con la Calle Municipal de las Carolinas **(Figura 2).**

IV. CONDICIONES ACTUALES

Según el informe Fase 1A, se menciona que los terrenos han sido severamente modificados, debido a la extracción de terreno realizada en la década del 1970, cuando la finca fue utilizada como cantera. En la actualidad la finca es irregular y es posible observar remanentes de colinas que no fueron cortadas totalmente durante la operación de la cantera. También menciona que el lado norte corresponde a una parcela llana y que no fue afectada por la operación de la cantera, razón por la cual recomiendan llevar a cabo una Evaluación de Recursos Culturales en la sección norte de los terrenos.

Durante nuestro recorrido observamos que el lado norte de los terrenos sufrió los mismos impactos que el lado sur. Observamos cortes bastantes abruptos realizados por maquinaria pesada. Identificamos áreas que fueron acondicionadas con equipo pesado para utilizarse como caminos de acceso. Finalmente en las áreas donde observamos áreas altas y cimas de colinas, en éstas, fueron removidas las capas superiores, exponiendo las capas del subsuelo las cuales presentaban rocas descompuestas, toscas y arcillas **(Foto 2).**

Durante nuestro recorrido observamos restos de árboles cortados hace ya algún tiempo, y terrenos acumulados hacia las laderas de las colinas. Al centro del área llana encontramos un camino de tierra que atraviesa toda el área norte **(Foto 3).**

Durante el recorrido a lo largo del río identificamos un camino de tierra que bordea todo el río **(Foto 4)**. Observamos una gran pared de grandes rocas. En ciertas áreas las rocas fueron cortadas y empujadas hacia el río, mientras que en otras observamos que habían sido modificadas, y alteradas durante la extracción de piedras **(Foto 5)**.

La vegetación existente en los terrenos corresponde a una de plantas de espinas como la salsa, enredaderas, pica pica, acacias, mangó, Tulípan de las Indias y en la colindancia del río bambúas, malangas y pastos. La vegetación es una reciente, la cual comienza a crecer luego de la deforestación creada por la cantera **(Foto 6)**.

El área donde observamos menos impacto, comprende el camino a lo largo del río, en ciertas áreas. Sobre la superficie y en los terrenos observamos los efectos de la erosión, notamos fragmentos de gravilla y fragmentos de rocas granolíticas. Según observamos, este material proviene de las estratas más profundas del subsuelo.

V. TRABAJO DE CAMPO (FASE 1B)

A. Metodología

El equipo de trabajo arqueológico estuvo compuesto por el arqueotécnico Hailie Rivera, bajo la supervisión y coordinación de la arqueóloga que subscribe dicho informe.

Previo a realizar las pruebas, fueron considerados varios factores. Entre ellos se revisaron los terrenos del área norte, fuera del área de la cantera. Luego de llevar a cabo una prospección sobre esta porción de los terrenos identificamos un área pequeña donde las modificaciones e impactos eran menos

observables **(Foto 7)**. En esta se llevaría a cabo los trabajos de Evaluación Arqueológica Fase 1B.

También se revisaron las rocas del río, localizadas en la porción que comprende nuestra evaluación. Estas se revisarían con sumo cuidado en busca de petroglifos **(Foto 8)**.

Finalmente revisamos todos los cortes y áreas erosionadas en busca de evidencias culturales, expuestas sobre la superficie.

Luego de establecer las áreas de mayor sensitividad arqueológica, se comenzó a trazar dos corredores paralelos orientados de este / oeste. Los corredores se establecieron a una distancia de cincuenta metros entre ellos **(Foto 9)**. Procedimos entonces con la excavación de las catas de sondeo **(Foto 10)**. El diámetro de las catas fue de aproximadamente 30 centímetros. Las catas se encuentran a una distancia de cincuenta metros. Para establecer la distancia se utilizó una cinta métrica plástica.

En la excavación de las catas utilizamos palas dobles (post hole digger) una barra de hierro, palustres, un cernidor con malla de 1/8", cintas métricas y demás equipo necesario. Se revisaron todas las áreas expuestas en busca de cualquier evidencia arqueológica.

Una vez finalizada la excavación de las catas se procedió a tomar la profundidad, grosor de cada capa y consistencia de cada estrata y el resultado en términos de restos arqueológicos **(ver apéndice A)**, **(Foto 11)**. Se amarró una cinta plástica para la identificación de las catas excavadas **(Foto 12)**. Finalmente se someterá el plano del proyecto con la ubicación de cada cata excavada **(Figura 3)**. La información y resultado de cada cata excavada se encuentra en la hoja de cata **(Apéndice A)**.

Luego de llevar a cabo la excavación de las catas de sondeo y la prospección en los terrenos de la porción norte, comenzamos

con el recorrido por la sección del río que abarca el proyecto **(Foto 13)**.

Comenzamos los trabajos cerca del puente y la Carretera Las Carolinas, ciertas áreas no tenián piedras. Cada piedra fue revisada en busca de petroglifos **(Foto 14)**.

B. Resultados

El área donde se llevó a cabo los trabajos de Fase 1B, corresponden a la sección norte de los terrenos. Aunque observamos que en su gran mayoría éstos presentaban modificaciones tanto de extracción como de nivelación. También observamos durante la excavación de las catas que la estrata superior había sido removida, posiblemente para la venta.

Las catas excavadas en su inmensa mayoría presentaron estratas arcillosas, rocas en descomposición y toscas. Las rocas correspondían a gravas y rocas granolíticas. Las catas se excavaron hasta hacer contacto con la estrata esteril representada por rocas granolíticas. La profundidad mayor de las catas excavadas fue de 60 centímetros.

En total se excavaron **6** catas de sondeo en los terrenos del área norte del proyecto. **Todas las catas excavadas resultaron negativas en cuanto a la identificación de evidencias culturales se refiere.** Los terrenos de cada una de las catas excavadas se procesaron a través de un cernidor.

La profundidad mayor de las catas excavadas fue de 60 centímetros, esta profundidad fue el resultado luego de atravesar estratas de arcilla, roca en descomposición y finalmente identificar una estrata de rocas natural. Con esta profundidad aseguramos hasta donde posible, la ausencia o presencia de evidencias arqueológicas.

VI. CONCLUSIONES Y RECOMENDACIONES

Todos Los sitios de valor cultural conocidos en el municipio de Caguas se encuentran a una distancia aproximada de tres kilómetros del área del propuesto proyecto, razón por la cual no serán afectados por el proyecto de referencia **(Figura 4)**.

El trabajo de campo realizado cubrió el área norte del proyecto. El área sur de los terrenos se encuentran totalmente alterada, a causa de la cantera que operó en esta finca por un período de muchos años. También fueron revisadas las rocas en el río en busca de petroglifos.

Finalizada la fase de trabajo de campo, por medio de la cual llevamos a cabo una minuciosa inspección ocular, y del subsuelo mediante la excavación de 6 catas de sondeo, podemos concluir la ausencia de evidencias culturales en la porción norte de los terrenos. Además de las catas excavadas, revisamos todos los cortes, acumulaciones de tierra, y áreas expuestas en los terrenos.

Mediante la excavación de las catas de sondeo identificamos varias estratas, éstas se encontraban en ocasiones mezcladas, alteradas e impactadas. Sobre todo las estratas correspondían a suelos rocosos y roca en descomposición.

Tomando en consideración todo lo antes expuesto, no se recomienda llevar a cabo trabajos arqueológicos adicionales. Por lo tanto, recomendamos a las agencias evaluadoras endosar el proyecto **Centro de Distribución Farmacias El Amal,** la cual se encuentra localizado en el municpio de Caguas.

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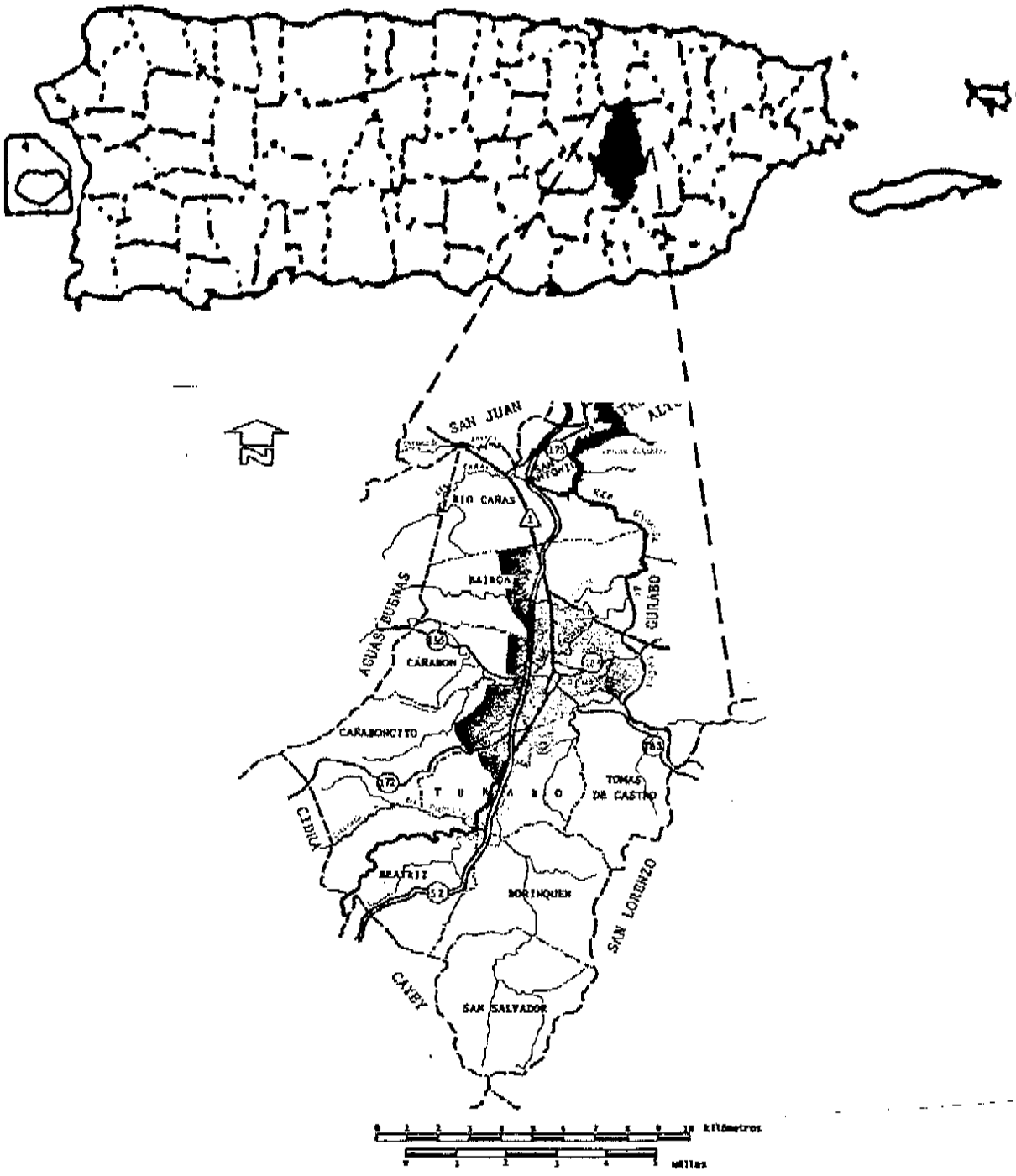

FIGURA -1- Mapa de Puerto Rico y Municipio de Caguas

- Centro de Investigaciones Arqueológicas Bieque -

RIO CAGUITAS
CALLE MUNICIPAL LAS CAROLINAS
PR-156
SUCN. N.M. CARTAGENA

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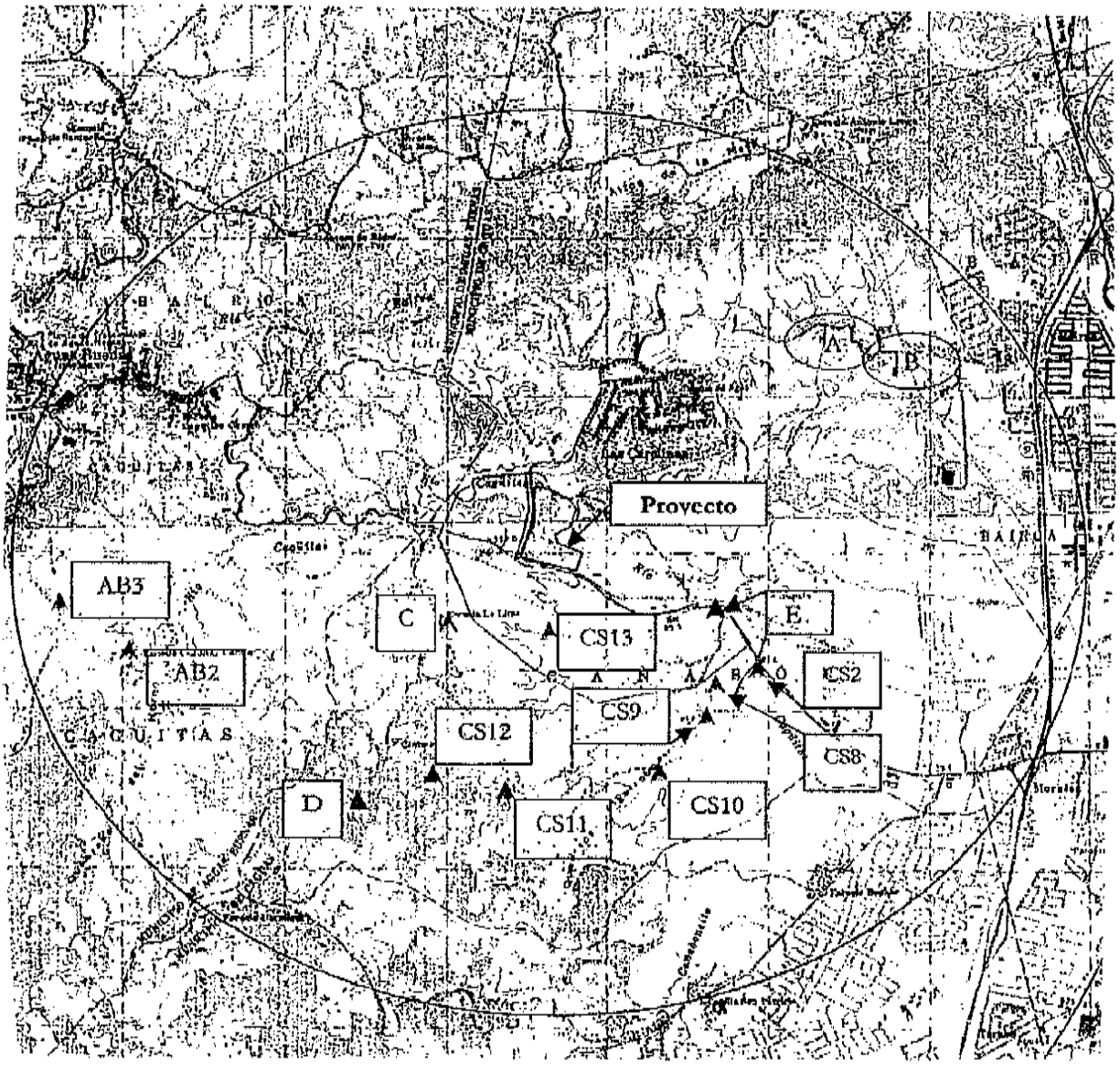

FIGURA -4- Segmento guadrángulo de Caguas
Señalando la ubicacion de sitios arqueológicos

FOTO-1- Vista parcial del río Cagüitas y terrenos sección norte .

FOTO-2- Sección llana mostrando remosión de la capa superior .

FOTO-3- Vista parcial del camino de tierra .

FOTO-4- Vista parcial del camino que bordea el rio .

FOTO-5- Corte de roca colindante al río .

FOTO-6- Vista del tipo de vegetación .

FOTO-7- Arqueotécnico revisando terrenos expuesto.

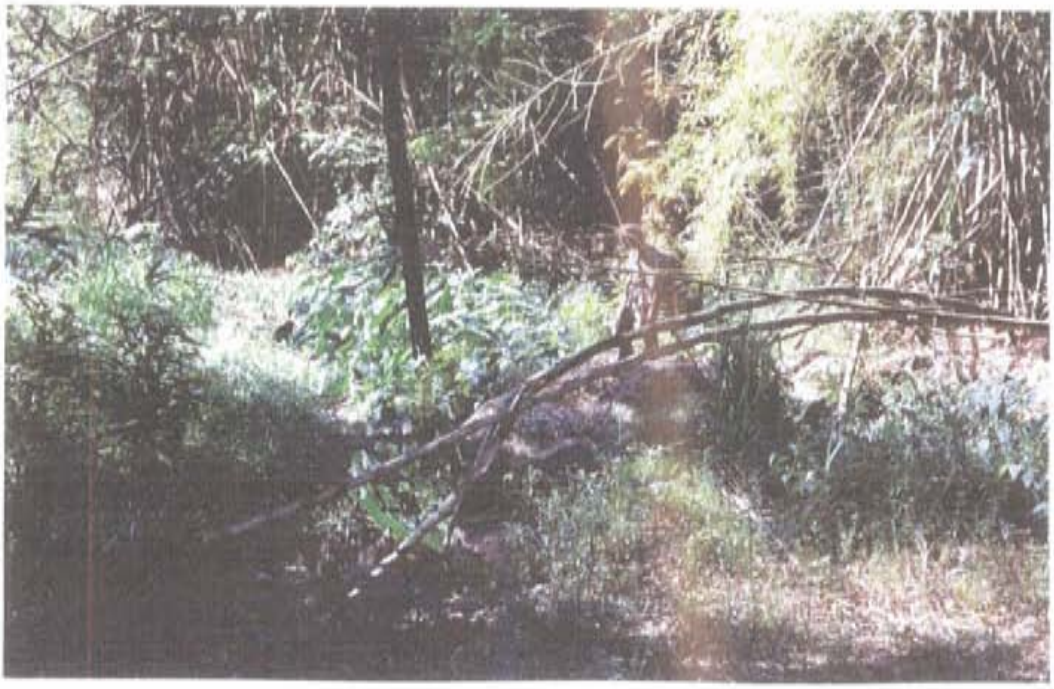

FOTO-8- Arqueotécnico revisando rocas en el río Cagüitas

FOTO-9- Arqueotécnico ubicando los corredores.

FOTO-10- Arqueotécnico excavando cata en cima de colina .

FOTO-11- Ejemplo de cata excavada.

FOTO-12- Arqueotécnico amarrando cinta para identificar cata.

FOTO-13- Vista del río Cagüitas.

FOTO-14- Arqueotécnico revisando las piedras cercanas al río .

CATALOGO PRUEBAS DE SONDEO

PROYECTO :Centro Dist. Farmacias El Amal

FASE :1A/1B

PUEBLO :Caguas

CORREDOR :

FECHA : Abril 2003

TECNICO :H.RIVERA

APENDICE -A-

CATA	CAPA	PROUNDIDAD	TEXTURA	COLOR MUNCELL	OBSERVACIONES
1	I	0-15	LIMOSA	10YR4/4	NEGATIVO
	II	15-25	ROCA DESC	10YR4/6	NEGATIVO
	III	25-45	ARC/ROCA	10YR5/2	NERGATIVO
2	I	0-20	ARCILLA	10YR4/3	NEGATIVO
	II	20-40	ARCILLA	7.5YR5/3	NEGATIVO
	III	40-55	ROCA/ARC	10YR5/2	NEGATIVO
3	I	0-10	ROCA/DESC	10YR6/2	NEGATIVO
	II	10-30	ARC/ROCA	10YR4/3	NEGATIVO
4	I	0-15	ROCA/DESC	10YR6/2	NEGATIVO
	II	15-25	ARC/ROCA	10YR4/3	NEGATIVO
5	I	0-15	ROCA/DESC	10YR6/3	NEGATIVO
	II	15-40	ARC/ROCA	10YR4/3	NEGATIVO
6	I	0-35	ROCA/DESC	10YR4/3	NERGATIVO
	II	35-45	LIMOSO	10YR4/2	NEGATIVO
	III	45-50	ARCILLA	7.5YR4/6	NEGATIVO
	IV	50-60	ARC/ROCA	10YR4/6	NEGATIVO

Departamento de Agricultura

SEP 18 2000

GOBIERNO DE PUERTO RICO
Departamento de Agricultura
PO Box 10163
San Juan, Puerto Rico 00908-1163

12 de septiembre del 2000

Sra. Nelly Vilá Vázquez
Secretaria Interina
Junta de Planificación
P. O. Box 41119
San Juan, Puerto Rico 00940-1119

ASUNTO: 2000-46-0634-JPU
PROPONENTE: Arq. Héctor L. Torres
BARRIO: Cañabón
PUEBLO: Caguas

Propuesta: Ubicar proyecto comercial e industrial en dos predios con cabidas de 17.41 y 16.5 cuerdas respectivamente, en una finca de 33.91 cuerdas

Localización: Carr. PR 156, Int. Camino Las Colinas, Caguas

Uso Propuesto: Comercial-Industrial

Suelos:

%	Serie	Declive	Capacidad
35	Estación limo arcilloso	0-2%	IIIs
20	Vía arcilloso lómico	(5-12%)	IIIe
15	Múcara arcilloso	(40-60%)	VIIe
15	Caguabo arcilloso	(40-60%)	VIIe
10	Toa Alta limo arcilloso lómico	(0-2%)	I
5	Juncos arcilloso	(5-12%)	IIIe

Descripción de los Suelos: Suelos quer varían de llanos a inclinados, de buen drenaje, permeabilidad moderada, fertilidad natural varía de alta a mediana y son adecuados para la producción de pastos naturales o mejorados.

Descripción General de la Finca y el Area Aledaña. La finca objeto de consulta se encuentra en pastos naturales, árboles y arbustos. Su cabida es amplia, la topografía varía de llana a inclinada y los suelos poseen características físico-químicas adecuadas para la producción de pastos a nivel comercial o para la crianza de ganado bovino, entre otros. En sus inmediaciones se observan terrenos con propiedades similares, ganado en pastoreo, la carretera estatal, un camino municipal y el Río Caguitas. Tomando en consideración el alto potencial agropecuario de los terrenos solicitados, este Departamento se opone a ambos proyectos. Además, el uso propuesto no es cónsono con las políticas públicas de desarrollo agrícola número 7, 8, 9, y 10, aprobadas el 1 de marzo de 1995.

Recomendación del Departamento de Agricultura Sobre la Consulta de Referencia:

No Objetada ____ Objetada __X__ Estudiada ____

AGRO. IVAN LOCKWARD
DIRECTOR
OFICINA DE PRESERVACION
DE TERRENOS AGRICOLAS

DVC/IL/wit

A toda honra, produciendo para ti.

ESTADO LIBRE ASOCIADO DE PUERTO RICO
DEPARTAMENTO DE AGRICULTURA
P.O. BOX 10163, SAN JUAN, PR 00908-1163

21 DIC 2007

19 de diciembre de 2007

Ing. Julio E. Colón
Gibraltar construction, Co., Inc.
1055 Ave. Kennedy
Edif. ILA, Suite 705
San Juan, PR 00920-1707

Estimado ingeniero Colón:

Actualización
Consulta 2004-46-0634-JPU
Berwin Realty, S.E.
Bo. Cañabón, Caguas

En su comunicación solicita se actualice la recomendación vertida por este Departamento para esta consulta. Sobre el particular procedemos a emitir nuestros comentarios.

En comunicación del 12 de septiembre de 2000 (adjunto copia), este Departamento recomendó objetar la consulta, debido al alto potencial agropecuario de los terrenos en cuestión y las fincas aledañas. Además, se observó actividad agrícola, específicamente, ganado en pastoreo.

Luego de evaluar nuestros expedientes y la documentación sometida, entendemos que las condiciones descritas en nuestra comunicación anterior no han variado. Por lo tanto, este Departamento reitera su recomendación inicial y objeta el uso propuesto.

Cordialmente,

Agro. Yolanda Flores Santos
Directora
Oficina de Preservación
de Terrenos Agrícolas

chh

Anejo 7:

Market Study and Economic Impact for a Shopping Center in Caguas

Estudios
Técnicos
Inc.

Market Study and Economic Impact for a Shopping Center in Caguas

FINAL REPORT (Revised)

Submitted to:
Gibraltar Development Corp.

August 12, 2008

Ave. Domenech 113, Hato Rey, Puerto Rico, 00918-3501
Apartado 12144, San Juan, Puerto Rico, 00914-0144

Tel. (787) 751-1675 • Fax (787) 767-2117
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I. INTRODUCTION

Gibraltar Development Corp. is proposing the development of a 162,256 of retail development in a 16.975 "cuerdas" (1 cuerda = 0.97 acre) lot located in the municipality of Caguas near the municipality of Aguas Buenas.

The objective of this study is to evaluate the project following the guidelines and procedures of the Puerto Rico Planning Board. In this context the following tasks were completed:

1) Market area definition;

2) A socio-economic overview of the market area;

3) An assessment of the retail market;

4) An estimate of the need for commercial space;

5) An assessment of the impact of the proposed project on the retail market; and,

6) An estimate of the economic impact of the project.

The following is a summary of findings and conclusions of the whole evaluation.

Key Findings & Conclusions

- The market area defined included the municipalities of Caguas and Aguas Buenas.
- The population in the market area is projected to be 177,641 and the number of households 61,884 in 2010.
- The construction of the project should begin in 2009 and end in 2010. Operations should begin in 2011.
- The estimated commercial space needed in the market area in 2011 was estimated using the Residual Analysis.

- The Residual Analysis concludes that the estimated commercial space needed in the market area will amount to approximately 1.57 million of square feet in 2011. This exceeds the total space proposed in the project. This is also an indication that the proposed project will serve a growing need for retail space in the market area and that its development will not saturate the market.

- The total investment project is estimated at $25 million which is equivalent to $150 per sq. ft.

During its construction the project will have the following economic impact:

- A total of 152 direct jobs and 142 indirect and induced jobs for a total of 294 jobs.

- Direct income of $3.1 million and indirect and induced income of $3.5 million for a total of $6.6 million.

- Fiscal revenues totaling $1.45 million.

During its operational phase, the project will have the following economic impact:

- An average of 1,006 direct jobs and 1,811 indirect and induced jobs, for an annual average of 2,816 jobs.

- An annual average of $18.4 million on direct personal income and $17.1 million on indirect and induced income annually for a total of $35.6 million annually.

- An average fiscal impact of $2.5 million annually during the operational phase of the project. From this total, $2 million will go the state government and $508,000 to the municipality.

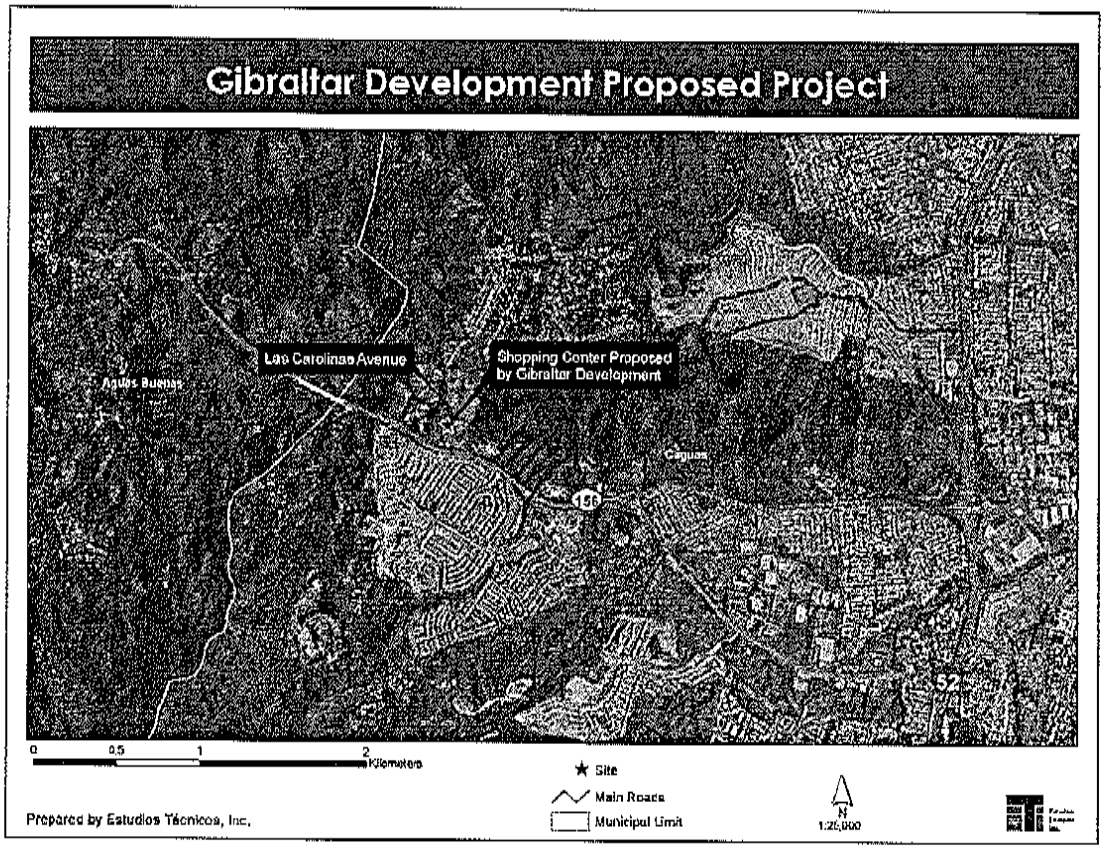
Conclusions – The study concludes that there is enough room for additional commercial space in the market area and that the proposed development will not have any negative impacts on existing commercial activities in the area. Even though the Caguas urban center has a wide variety of retail establishments and services, with more than 50 categories, the type of offering with presence in the urban center caters to a

different type of consumer than that of a shopping center comparable to the proposed development on this study. Demand is expected to grow in the market area, while no new commercial projects are being developed which may impact the above estimate. Thus, we do not see any obstacle to the development of the proposed shopping center in Caguas.

II. PROJECT DESCRIPTION

Gibraltar Development Corp. proposes the development of a 162,256 sq. ft shopping center located on PR-156, Las Carolinas Street in the Caguas Cañabon Ward near the municipality of Aguas Buenas. PR-156 is the main road providing access between Aguas Buenas and Caguas and PR-52 (San Juan-Ponce Expressway). Activity generators in the area include the significant number of new housing projects that have been developed in the area during recent years and other long time existing neighborhoods such as Bonneville, Jardines de Caguas, and Turabo Heights.

The following map shows the location of the project.



III. OVERVIEW OF THE LOCAL ECONOMY

A. Macroeconomic Performance and Medium-Term Outlook

B. 1.2. Recent economic trends – 2007 and fiscal 2008

Table 1 presents a selection of key economic indicators on a quarterly basis for 2007 and for the first half of fiscal year 2008 (consisting of quarters 3 and 4).

Table 1

Selected Economic Indicators by Quarters				
	2007 (a)			
Indicator	Q1	Q2	Q3	Q4
Total employment (Household Survey)	1.3%	1.9%	-2.3%	-4.6%
Nonfarm employment (Establishment Survey)	-1.8%	-1.7%	-0.8%	-1.5%
Private employment	-1.8%	-2.2%	-1.1%	-1.5%
Manufacturing (Establishment Survey)	-6.6%	-7.1%	-5.9%	-5.5%
Public employment	-2.3%	-1.1%	-0.6%	-1.6%
Unemployment rate (b)	10.2%	10.7%	11.7%	11.1%
Hotel registry	-6.5%	-4.6%	NA	NA
Retail sales (c)	-1.4%	-1.1%	-1.2%	NA
New auto sales	-18.7%	-13.4%	-19.1%	-0.4%
Consumer price index (1984 = 100) (d)	9.9%	19.3%	NA	NA
Commercial electricity consumption (Mkv)	2.0%	2.8%	0.7%	NA
Industrial electricity consumption (Mkv)	-1.5%	-5.7%	-6.7%	NA
Vehicles registration	-18.5%	NA	NA	NA
Cement sales (94 pounds bags equivalent)	-14.6%	-11.7%	-10.4%	NA
# contruction permits	-13.3%	4.9%	-13.3%	NA
# of private construction permits	-13.7%	3.1%	-11.4%	NA
Value of construction permits	-29.5%	-12.0%	24.3%	NA
Value of private construction permits	-30.0%	-7.0%	19.5%	NA
# of new housing units to be built	-29.0%	-11.1%	-16.2%	NA
Value of construction permits for new housing units	-30.2%	-2.4%	-18.8%	NA
Net revenues to the General Fund (e)	-10.3%	24.1%	-8.8%	NA
Exports of merchandise	6.1%	-2.0%	4.6%	NA
Imports of merchandise	4.8%	9.0%	-6.5%	NA
Average retail price of gasoline (¢/liter)	60.7	77.1	73.8	77.2

Sources: P. R. Planning Board; Department of Consumer Affairs; U.S. Bureau of Labor Statistics; Plaza Motors.
(a) Growth with respect to same quarter previous year, except unemployment rate and average price of gasoline.
(b) Starting January 2006 changes in the definition of unemployment were introduced.
(c) Deflated with the U.S. CPI.
(d) In August a new CPI was introduced which is not comparable to the previous one. Monthly data for the new price index is available only since January. Rates for the first two quarters of 2007 correspond to the old CPI.
(e) Data for the second quarter of 2007 include $269.0 million in non-recurrent revenues fom the special provisional tax laws enacted in 2006 for 2007. These revenues represented 64.2% of the total increase in net revenues in June. Starting in the third quarter of 2007, part of the monthly revenues from the sales and consumption tax in July and August of each year will be consigned to the fund for the repayment of the extra-constitutional debt. Thus, they are not included as part of the ne revenues to the General Fund.
N/A - Data for some months not available.

In summary, these economic indicators indicate the following:

- Economic activity, which began to decelerate during the second quarter of 2006 and until the end of 2006, turning into a recession, continued its slowdown trend by the end of 2007. Expectations for signs of recuperation during the last quarter of 2007 disappeared.

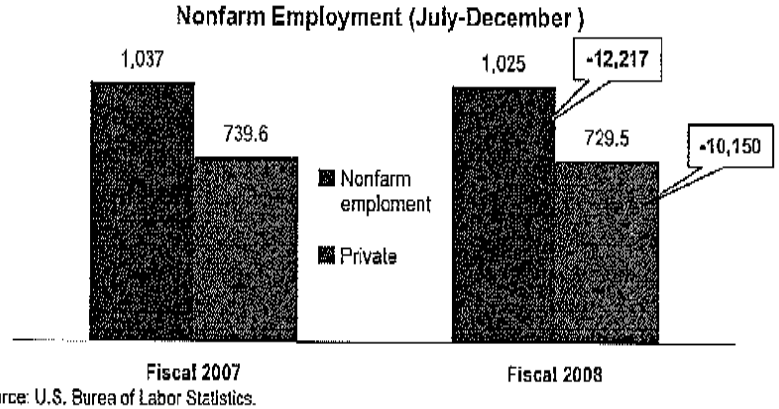
- As in the previous two quarters, non-farm employment, private consumption, fiscal revenues and construction activity, have been hit the hardest. The lack of improvement in employment and private consumption suggests continuing deterioration in personal disposable income by the end of 2007 and mid-fiscal 2008.

1. Employment and unemployment

Employment creation continued its lackluster performance. For the fifth consecutive quarter, non-farm employment (Establishment Survey) went down at an annual rate of -1.5%. Overall, during the first half of fiscal 2008 non-farm employment declined by 12,217 jobs compared to fiscal 2007. Losses in private employment have led the decline, with 10,150 jobs lost, a 1.4% decrease. For all 2007, net job losses were 15,000, a 1.4% decline, with private jobs falling 1.6%.

Job losses in manufacturing employment continue to account for a big share in the reductions in non-farm employment. Employment in the sector continued to edge down further during the last two quarters of 2007 (first half of fiscal 2008), when it declined by 5.1% or 6,217 less jobs from the same period of fiscal 2007. At least since the first quarter of 2006 employment in manufacturing has been posting negative growth rates. During all 2007 the sector lost 6,892 jobs. This loss represented 46% of the total job losses in non-farm employment.

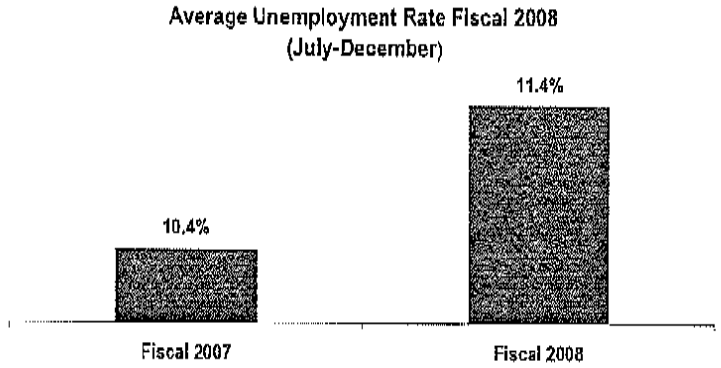
Figure 4



Source: U.S. Burea of Labor Statistics.

The unemployment rate has been edging up, averaging 11.4% during the last two quarters of fiscal 2008, up from the 10.4% rate of last fiscal year 2007.

Figure 5



Source: DTRH, Bureau of Labor Statistics.

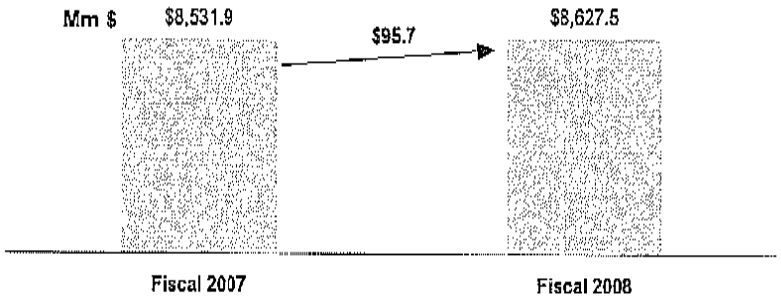
2. Personal consumption – retail sales and auto sales

3. Retail sales

A slight improvement took place in retail sales during the first quarter of fiscal 2008, with sales increasing by a nominal amount of $95.7 million from same period of fiscal 2007. Declines in durable goods consumption, including autos and household goods, items that are normally less prone to be acquired in periods of economic uncertainty or when there is less disposable income available, are responsible for the poor performance of total sales.

Figure 6

Retail Sales (July-September)

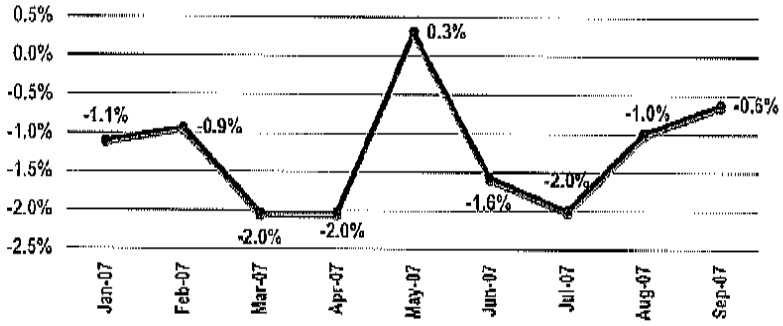


Source: COCEX.

On an inflation-adjusted basis, sales during fiscal 2008 declined at an annual average rate of -1.2% (see Figure 6). The trend moderated somewhat during September, when they declined by -0.6%. The rate of reduction in real growth has been slowing since December 2006, when they fell by 6.6%.

Figure 7

Retail Sales Adjusted by Inflation
(Annual % change)



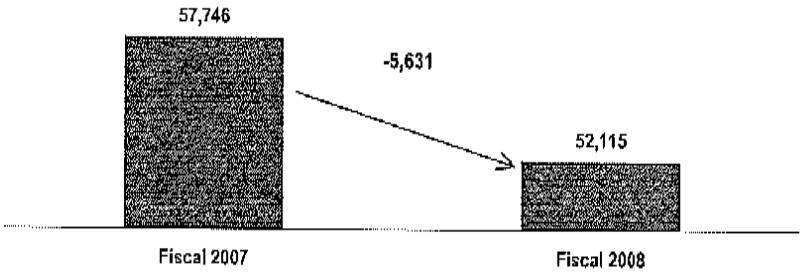
Note: Deflated with the U.S. CPI. NSA.

4. Sales of new automobiles

Sales have not shown improvement during the first half of fiscal 2008, after dismal results in 2006 and 2007. New auto sales went down by 5,631 units, a 9.8% fall. Most recent data for December showed an increase of 22.7% from previous month and 8.9% from last year. Yet, for 2007, sales exceeded 102,554 units sold, but still they were 13% below the level of the previous year, (FY 2006).

Figure 8

Sales of New Automobiles (July-December)



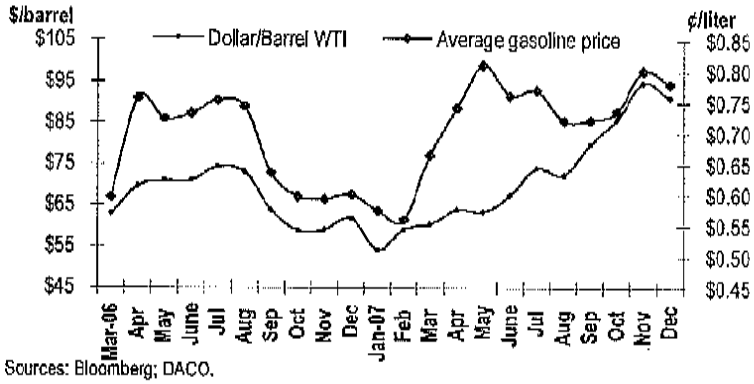
Source: Puerto Rico Automobile Retail Sales Report.

5. **Gasoline prices**

The first half of fiscal 2008 saw an increase in gasoline prices of 15.4% from same period of fiscal 2007. A surge in oil prices contributed to this increase. In December 2007, although lower from November, gasoline prices were 30% higher than in December 2006.

Figure 9

Average Retail Gasoline Price in P.R.



Sources: Bloomberg; DACO.

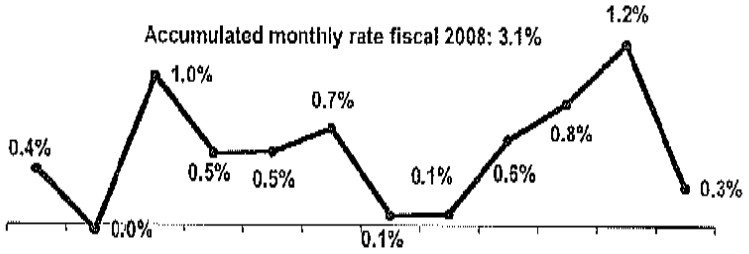
6. **Inflation**

On accumulated monthly basis, inflation has been running during fiscal 2008 at 3.1% and 6.1% during calendar 2007. In December, inflation increased at an annual rate of 6.3%. High inflation is still reflected on three items; food, gasoline and electricity. During December the price indexes for these groups increased at an annual rate of 8.4%, 36.1% and 26.3%

respectively. Small reductions, or lower growth in the price indexes for food, housing, clothing and medical care in December, contributed to the small monthly growth from November.

Figure 12

Monthly Increase in Rate of Inflation - New CPI
(December 2006 = 100)



Source: Bureau of Labor Statistics, P.R. Department of Labor and Human Resources.

7. Construction activity

Data from the Puerto Rico Planning Board on construction permits shows an unfavorable negative trend since the third quarter of 2006 that has been sustained for the whole fiscal 2007. During the first quarter of fiscal 2008 (Q3 of 2007), even the number of constructions fell by 13.3% on a year-to-year basis, and of private permits by 11.4%, their value increased. Since the number of new housing units to be built and their value also declined, the increase in the value of the permits reflects an increase in public permits of 44%, corresponding to an investment of $143.5 million and an increase in private investment other than housing.

As indicated in the previous report, given the high level of inventories (particularly in the high-end of the market), the current recession and the sector's lackluster performance during fiscal 2007, its outlook should not be positive until at least the first half of 2008.[1]

[1] Since construction permits are a sort of short - term indicator of the sector's activity. In general, permits last for one year; at the end of which if the projects are not started the permits can be renewed for another year. Usually it takes from 12 to 18 months for a project to be started after the permit is issued.

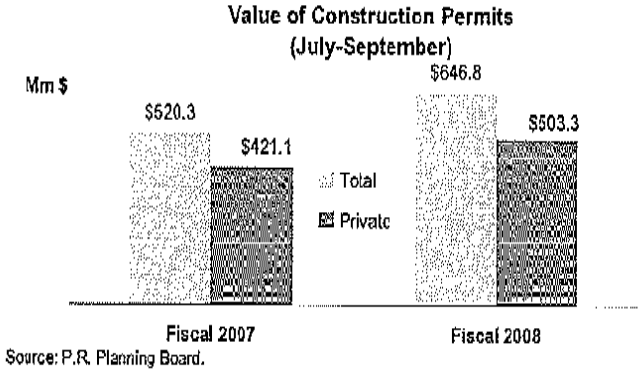
Table 2

Indicators of Construction Activity by Quarters: Fiscal 2007 and First Quarter Fiscal 2008

Indicator	Q3-06	Q4-06	Q1-07	Q2-07	Q3-07
# of construction permits	-8.7%	-1.1%	-13.3%	4.9%	-13.3%
# of private construction permits	-10.6%	-3.2%	-13.7%	3.1%	-11.4%
Value of construction permits	-29.0%	-18.1%	-29.5%	-12.0%	24.3%
Value of private construction permits	-22.8%	-21.3%	-30.0%	-7.0%	19.5%
# of new housing units to be built	-17.9%	-30.5%	-29.0%	-11.1%	-16.2%
Value of construction permits for new housing units	-16.7%	-24.8%	-30.2%	-2.4%	-18.8%

Source: P.R. Planning Board.

Figure 13



Source: P.R. Planning Board.

C. Risks and challenges facing the economy

There are two sets of factors, of an exogenous and endogenous nature, that the local economy will face (or is facing) during 2008 and will impact short and medium-term economic developments. The first is related to the economic performance or outlook for the U.S economy and increases in oil prices:

- Recent developments in the financial markets of the U.S. and internationally, housing sector, an increase in unemployment and poor results in retail sales during December, indicate that the U.S. economy is a "shock" away from recession. The panorama for 2008 (and 2009) points to a profound moderation in economic growth either through a recession or an extended period of poor growth:
  - ✓ Banks will continue to be very conservative in lending (after four consecutive reductions in the Fed's benchmark rate since September, and in the discount window. They are still not increasing lending at a

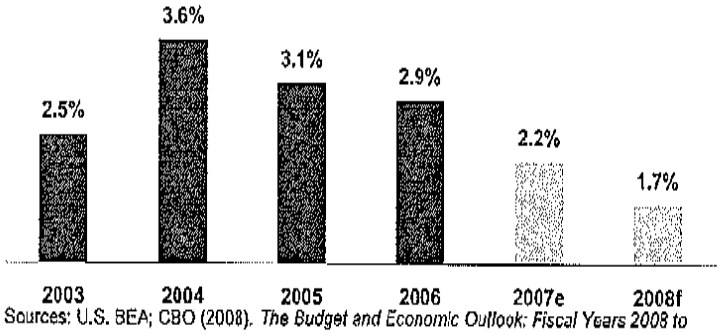
faster pace). Therefore, if the turmoil of financial markets does not go away, this could lead to more severe curtailment of lending.

- ✓ The housing slump will continue, with housing prices declining further.
- ✓ Households will be less inclined to spend money they do not have.
- ✓ Investor will be more alert to risk.

- Slower growth in the U.S. economy will definitely pull down further growth possibilities for the local economy. For 2008, the CBO forecasts that GDP will increase by 1.7%, and a slight rebound to 2.8% in 2009, as the negative effects of the turmoil in the housing and financial markets subside.[2] Still, the average growth rate forecasted for 2008-2009 (2.3%) would be lower than that for the previous two years (2.6%).

Figure 17

Annual GDP Growth: Historic and Expected for 2007 and 2008



Sources: U.S. BEA; CBO (2008). *The Budget and Economic Outlook: Fiscal Years 2008 to 2018* (January). F = Forecast

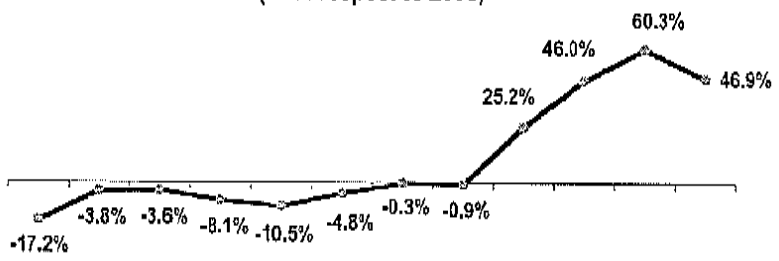
- Even when during all 2007 the average price of WTI increased 9.4% from 2006, the second half of 2007 saw significant increases in oil prices, on average 23%

[2] CBO (2008). *The Budget and Economic Outlook: Fiscal Years 2008 to 2018*. Washington DC (January 23), pp. 21-22, available at http://www.cbo.gov/ftpdoc.cfm?index=8917.

from same period of fiscal 2007. By December 2007, the average price for a barrel of WTI was $91.08, an increase of 47% from last year.

Figure 18

Annual Growth of WTI
(With respect to 2006)

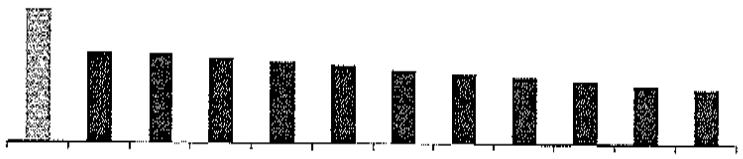


Source: Bloomberg

- For 2008, it is expected that average prices will be higher than those in 2007 ($72.26) but will rise at a slower pace than during the second half of 2007, According to futures prices (as of January 15, 2008), prices will be higher but by the end of the year could arrive at levels lower than those between November and December. Still, the average price for 2008 would be 26% higher than that in 2007.

Figure 19

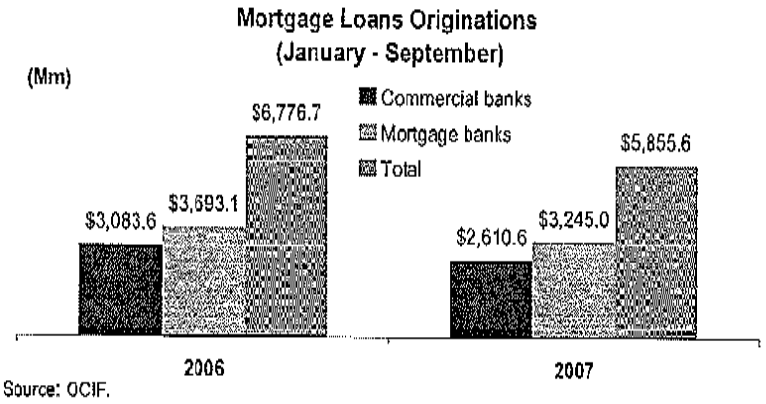
Futures Prices (Spot) Light Crude Oil, 2008



Source: www.barchart.com; Prices at 1/15/2008. January is average price for the first two weeks of market spot price.

The second set of factors has to do with domestic dynamics, related to the possibilities of expansion in construction investment and public spending that would stimulate the economy:

- There have been expectations that construction investment would have started to pick-up by the last quarter of 2007 (fiscal 2008), under a resurgence of public investment. Yet, this has not happened.
- As examined previously, construction activity since the second half of 2006 has been on a downward trend according to the indicators of construction permits. This reduction in construction permits, which are a sign of future construction point to a very modest continuing of activities during 2008.
- The housing market has shown signs of weaknesses. The number of new housing units sold during the last quarter of 2007 declined by 21.4% and 18.4% for the whole year.[3] This is important since 63% of private investment in construction is in housing.
- The above development was reflected in mortgage activity. Between January and September of 2007, mortgage loans originations fell by $921.1 million, a reduction of 14%.



Source: OCIF.

It is expected that the new law recently enacted, providing two types of tax credits to commercial and mortgage banks to incentive the buying of housing units will stimulate the housing sector, reducing the existing inventory of unsold units. Yet,

[3] Estudios Técnicos, Inc. (2008). *Construction and Sales Activity Report, Fourth Quarter 2007 and Annual.*

the amount of the total credits is $150.0 million which is not much to compensate for the $921 million reduction in mortgage loans so its impact will be limited.[4]

- Nothing can be expected of an increase in public spending for the balance of fiscal 2008. The financial situation of the central government remains weak, with revenues to the General Fund being $163.0 million lower than estimated (for period July-November). This indicate a shortfall in revenues that, together with the budget deficit of $241 million for fiscal 2007 still to be paid, point to another budget deficit of $400 million.
- Prospective public investment is not showing. The number of public construction permits declined by 36% during the first quarter of fiscal 2008 from last year. The amount of new money available for investment in construction is about $2.0 billion, of which it is estimated that between 50% and 66% is for investment to take place during the next two years (2008 – 2009).

[4] Law #197 of December 14, 2007.

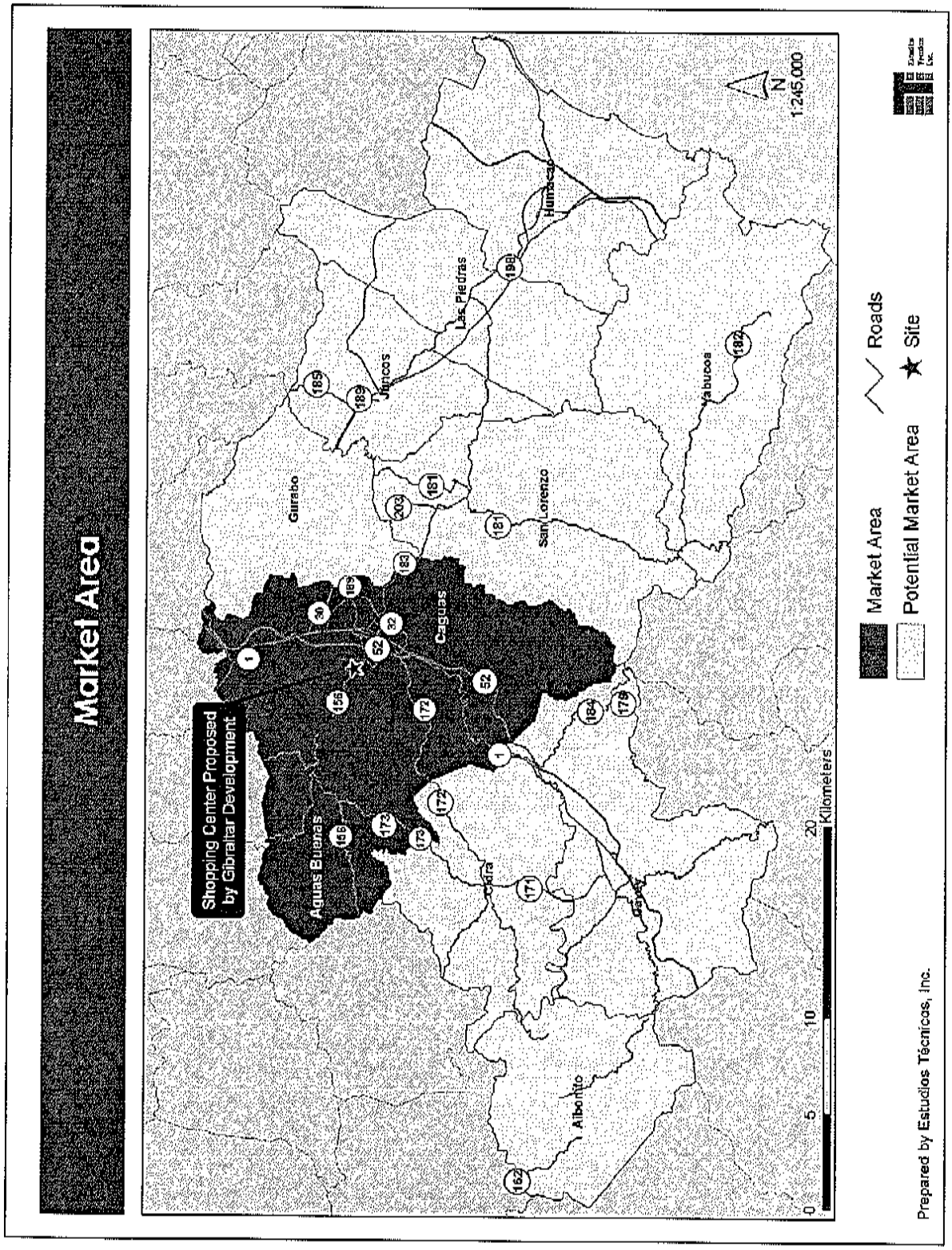
IV. MARKET AREA DEFINITION

The market area, or the geographic sector from which much of the patronage for the proposed development will be obtained, was defined as the municipalities of Caguas and Aguas Buenas. These two municipalities are part of the Caguas Commercial Region, of which Caguas is the center of economic and commercial activity.

To define the market area of the proposed development the following factors were taken into account:

- The project size and concept:
- The access to the site; and,
- The potential retail competition.

The shopping centers market area was limited to the municipalities of Aguas Buenas and Caguas taking into consideration that the proposed center is comprised of 200,000 sq. ft. GLA community shopping center – or sub-regional center according to the Puerto Rico Planning Board's regulations- with little capacity to attract customers from a regional market. Furthermore, there are a number of similar shopping centers serving different sub-markets within the region and the municipality of Caguas, as shown on section VI-B of this report. There is a lack of this type of facility in the municipality of Aguas Buenas. Thus, the proposed center will serve the retail needs of this community, which will have access through PR-156, the main road of access between Caguas and Aguas Buenas. The retail center will also serve the needs of the communities located on the west of the municipality of Caguas, where there is lack of community shopping centers as well. Additionally, the proposed center will also serve the retail needs in Caguas – to a level that will be ultimately determined by the tenant mix - since the shopping center has direct access through PR-52 and PR-156. The following map shows a definition of the market area for the project.


Market Area
Shopping Center Proposed by Gibraltar Development
Aguas Buenas
Caguas
Gurabo
Juncos
Las Piedras
San Lorenzo
Humacao
Yabucoa
Cayey
Cidra
Albonito
0
5
10
20
Kilometers
N
1:245,000
Market Area
Potential Market Area
Roads
Site
Prepared by Estudios Técnicos, Inc.

V. SOCIO-ECONOMIC ANALYSIS OF THE MARKET AREA

The economic base of the market area shows that there is an ample potential for the development of the proposed shopping center.

A. Population

The Population Census reported that in 2000 the population of the market area was 169,534, most of which live in a five mile radius of the proposed shopping center. The Census also reported 56,177 households. The Puerto Rico Planning Board projected that the population should reach 177,641 of which, 145,893 people are expected to be living in the municipality of Caguas, where population density is expected to climb to 2,485 inhabitants per square mile in 2010. Populations projections suggest that population growth in the market area will be similar to that in Puerto Rico, a trend considered extremely conservative when compared to housing development.

Population-age groups in the market area are distributed in similar patterns as Puerto Rico as a whole. In that regard, the majority, 53%, of the population, is between 20 and 59 years of age.

Population

	1980	1990	2000	2010
Caguas	117,959	133,447	140,502	145,893
Aguas Buenas	22,429	25,424	29,032	31,748
Market Area	**140,388**	**158,871**	**169,534**	**177,641**
Puerto Rico	**3,196,720**	**3,522,037**	**3,808,610**	**4,022,446**

Source: Census 2000 & ETI Estimates

Population Growth

	1980-90	1990-00	2000-10
Caguas	1.2%	0.5%	0.4%
Aguas Buenas	1.3%	1.3%	0.9%
Market Area	**1.2%**	**0.7%**	**0.5%**
Puerto Rico	**1.0%**	**0.8%**	**0.5%**

Source: PR Planning Board

Population Density

	1990	2000	2010	Area Sq. Mi
Caguas	2,273	2,394	2,485	59
Aguas Buenas	831	949	1,038	31
Market Area	**1,779**	**1,898**	**1,989**	**89**
Puerto Rico	**1,028**	**1,112**	**1,174**	**3,426**

Source: Census 2000 and National Accounts

Population by Age Groups

	0-19 years	20-59 years	> 60 years
Caguas	31.0%	53.0%	16.0%
Aguas Buenas	32.8%	53.1%	14.0%
Market Area	**31.3%**	**53.0%**	**15.7%**
Puerto Rico	**32.0%**	**52.6%**	**15.4%**

Source: Census 2000

The number of households in the market area is expected to climb to almost 62,000. Based on population projections, the number of households is estimated to grow 1.0% annually. This estimate is below the average annual growth in Puerto Rico, a trend that is also considered conservative.

Households

	1990	2000	2010	Growth
Caguas	40,104	46,937	51,161	0.9%
Aguas Buenas	7,096	9,240	10,723	1.5%
Market Area	**47,200**	**56,177**	**61,884**	**1.0%**
Puerto Rico	**1,054,924**	**1,261,325**	**1,495,907**	**1.7%**

Source: Census 2000 & ETI Estimates

For example, the trend in the number of housing permits – which only shows potential developments with all the required permits - shows that housing permits in the municipality of Caguas increased from an annual average of 420 units during the first five years of the 1990s decade to 892 during the first six years of the current decade. This is an indication that the number of households and population is increasing at a much faster rate than the growth reported during the 1990s decade. The same occurred in the municipality of Aguas Buenas.

Avg. Annual Number of Housing Permits

	1990-1994	1995-1999	2000-06
Caguas	420	518	892
Aguas Buenas	50	52	81
Market Area	**470**	**570**	**973**
Puerto Rico	**10,123**	**14,655**	**18,944**

Source: PR Planning Board

Sales of new housing units also indicate that household and population growth in the market area is increasing at a faster rate than during the 1990s decade. More than 5,000 new housing units were sold in Caguas and Aguas Buenas during the 2000-2007 period. This is similar to the projected increase in the number of households for the decade, which usually is twice as much as the sale of new housing. Thus, we estimate that the 2010 Census will show that population in the market area will increase by twice as much as that projected by the Puerto Rico Planning Board.

NEW HOUSING SALES BY PRICE BRACKET IN AGUAS BUENAS & CAGUAS

Price Bracket	1999	2000	2001	2002	2003	2004	2005	2006	2007	Total
01. Less than $70,000	0	72	24							96
02. $70,001-$89,999			0	73	0		60			133
03. $90,001-$119,999	241	85	122	141	179	94	1			863
04. $120,001-$159,999		0	96	21	61	242	67	79	13	579
05. $160,001-$209,999	107	146	66	11	95	89	315	129	86	1,044
06. $210,001-$259,999		142	110	323	49	32	7	0	98	761
07. $260,001-$309,999			9	109	68	139	165	365	24	879
08. $310,001-$359,999			0	118	36	154	4	1		313
09. $360,001-$419,999		0	0	13	26	151	(24)		13	179
10. $420,001-$479,999			0	2	20	18	143	181	13	377
11. $480,001-$539,999					13	31			4	48
12. $540,001-$599,999						12	0	18	9	39
13. more than $600,000			131		0	0	13	42	96	282
Grand Total	**348**	**445**	**558**	**811**	**547**	**962**	**751**	**815**	**356**	**5,593**

B. Employment and Income

Indicators show that the income base of the market area grew during the first half of the current decade.

Based on the Census 2000 and adjusted by the Puerto Rico Planning Board, the average income per household in the market area amounted to $31,440 in 2000. It increased at 4.1% annually during the 1990s decade. Based on new housing sales our appreciation is that household income will grow at a rate that will exceed the average on the Island, as the median value of new construction housing in the market area increased significantly during the current decade.

Household Income

	1990	2000	Growth
Caguas	$21,704	$32,207	4.0%
Aguas Buenas	$17,721	$27,547	4.5%
Market Area	**$21,105**	**$31,440**	**4.1%**
Puerto Rico	**$20,006**	**$30,806**	**4.4%**

Source: Census & PR Planning Board

Salary data also suggests that income in the market area increased. According to the Industrial Composition by Municipality issued by the Labor and Human Resources Department of Puerto Rico, the average salary per worker in Caguas was $20,688 in 2005, and showed an increase of 5.1% annually during the 2001-2005 period.

Average Salary per Worker

	2001	2005	Growth
Caguas	$16,944	$20,688	5.1%
Aguas Buenas	$16,296	$16,936	1.0%
Market Area	**$16,906**	**$20,558**	**4.0%**
Puerto Rico	**$12,976**	**$22,600**	**11.7%**

Source: PR Labor Dpt., Comp. Industrial

Although, employment in the market area grew at a rate below the average for the Island, 3.3% annually, the municipality of Caguas, however, employment growth was similar to the average in the Island. During the 2001-2005 employment in the municipality grew by more than 8,300 jobs, but job losses occurred in Aguas Buenas associated to the closing of manufacturing plants.

Employment

	2001	2005	Growth
Caguas	39,761	47,955	4%
Aguas Buenas	2,508	1,723	-7%
Market Area	**42,269**	**49,678**	**3.3%**
Puerto Rico	**855,817**	**1,040,374**	**4.0%**

Source: PR Labor Dpt.

VI. RETAIL MARKET IN THE STUDY AREA

A. Market Size

According to the 2002 Economic Census, retail sales in the market area, excluding sales of vehicles, gasoline and miscellaneous reached $1,087 million. This represented 7% of the retail sales of this type in Puerto Rico. The most relevant categories were Miscellaneous, and Food and Beverages, with sales of $270 and $163 million, respectively. The largest number of establishments fell on the category of Eating and Drinking with 210 establishments, followed by Clothing and Accessories stores with 151 establishments.

The following table presents a detailed breakdown of the number of establishments and amount of sales by municipality, according to the 2002 Census. Note that Caguas is the most important market given that the municipality is the center of economic activity of the Region. In turn, Aguas Buenas is a small municipality that does not play an important role in commercial activity, but that is becoming increasingly important as a dormitory of Caguas and the San Juan Metropolitan Area.

Retail Sales in the Market Area

NAICS	Aguas Buenas	Caguas	Market Area	Puerto Rico
Retail Sales ($1,000)				
Furniture	-	13,790	13,790	406,746
Electrical Equipment	-	27,251	27,251	652,901
Construction & Gardening Materials	3,504	150,445	153,949	1,695,958
Food & Beverage	24,124	139,072	163,196	3,457,669
Eating & Drinking Places	-	160,674	160,674	2,475,908
Health & Personal Care	4,084	89,663	93,747	1,736,202
Clothing & Accessories	4,105	77,299	81,404	1,689,982
Sports & Entertainment	1,413	103,161	104,574	329,810
General Merchandise	-	17,420	17,420	2,880,334
Miscellaneous	-	270,910	270,910	451,348
Total	$ 37,230	$ 1,049,685	$ 1,086,915	$ 15,776,853
Establishments				
Furniture	1	19	20	465
Electrical Equipment	-	21	21	491
Construction & Gardening Materials	4	45	49	1,137
Food & Beverage	7	64	71	1,463
Eating & Drinking Places	14	196	210	3,883
Health & Personal Care	6	73	79	1,345
Clothing & Accessories	4	147	151	2,219
Sports & Entertainment	-	32	32	492
General Merchandise	1	23	24	466
Miscellaneous	-	38	38	700
Total	37	658	695	12,661

B. Shopping Centers in the Market Area

The market area is served by 18 shopping centers having 2.8 million square feet, most of which are located in the municipality of Caguas. Of this total, sixteen (16) are neighborhood and community shopping centers offering 1.1 million square feet of shopping center space. The following table includes the inventory of shopping centers in the market area.

Shopping Centers in the Market Area

Name	Municipality	Size Range	Approx. Size (sq. ft.)	Anchor Tenants	Category (1)
Pitusa Aguas Buenas	Aguas Buenas	0 - 50,000	25,000	Pitusa, National Hardware	Neighborhood
"Ave José Gautier Benitez 230"	Caguas	0 - 50,000	25,000	Denny's, Video Ave	Neighborhood
American Plaza	Caguas	0 - 50,000	25,000	Centro Piezas Plus/American Plastics/Integram	Neighborhood
Consolidated Mall	Caguas	0 - 50,000	25,000	Todo a Peso, oficinas de médicos y hospital	Neighborhood
EM Plaza	Caguas	0 - 50,000	25,000	Popular Finance, Dry Clean USA, WIC	Neighborhood
Farmacia Jayni	Caguas	0 - 50,000	25,000	Feia., sastreria, sportsbar	Neighborhood
PD Plaza	Caguas	0 - 50,000	25,000	Pedero Auto Parts/Laundry	Neighborhood
Plaza Bairoa	Caguas	0 - 50,000	40,600	Doral, Gym, Kelly Services	Communal
Plaza San Alfonzo	Caguas	50,000 - 100,000	75,000	BPPR, Pitusa, Berrios	Communal
Ralph's Food Warehouse Caguas	Caguas	50,000 - 100,000	75,000	Supermercado, BPPR	Communal
Bairoa Shopping Center	Caguas	100,000 - 250,000	66,804	Pueblo, Feia Bairoa, Gym	Communal
Villa Blanca Shopping Center	Caguas	100,000 - 250,000	139,118	Pitusa, Marshall's, Grande	Sub-Regional
Plaza Los Prados	Caguas	100,000 - 250,001	150,000	Grande, Capri, Massó Express, BPPR, Starbuck's	Sub-Regional
Centro Comercial Villa del Carmen	Caguas	100,000 - 250,000	175,000	Capri, Amigo	Sub-Regional
Plaza del Carmen Mall	Caguas	100,000 - 250,000	175,000	n/a	Sub-Regional
Wal-Mart Supercenter Caguas	Caguas	100,000 - 250,000	175,000	Caribbean Cinemas	Sub-Regional
Las Catalinas Mall	Caguas	500,000 - 1,000,000	569,109	Sam's, Walgreen's	Regional
Plaza Centro I, II Shopping Center	Caguas	1,000,000 - 2,000,000	980,000	El Amal, BPPR	Regional
TOTAL			2,795,631		

Source: Estudios Técnicos, Inc. Database

(1) Category: For the PR Planning Board, shpping centers from 100,000 to 249,999 are considered "sub-regional", and from 35,000 to 99,999 are considered "communal"

C. Selected Anchor Tenant Presence in Neighborhood and Community Shopping Centers

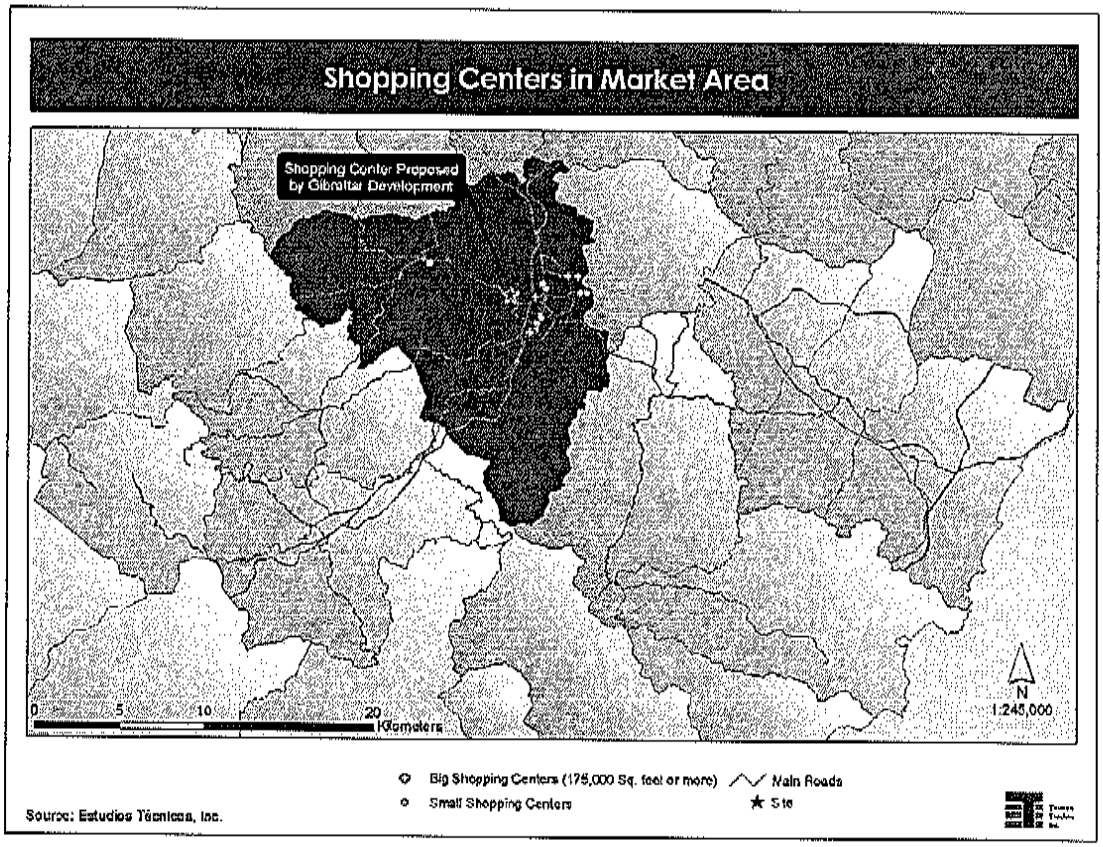
The following table shows the anchor tenants in neighborhood and community shopping centers located in the market area and its respective line of business.

Anchor Tenants in Competitive Facilities			
Line of Business	**Stores**	**# of Establishments**	**% from Total**
Thrift Department Stores	Capri, National Discount, Sedeco	6	21%
Department Stores	Marshall's, K-mart, Sears, JC Penney	4	14%
Supermarket	Pueblo, Amigo, Pérez Hnos, Grande	4	14%
Banking	Scotiabank, Westernbank, BPPR	3	10%
Club Stores	Sam's, Costco	2	7%
Entertainment	Cine Vista, Caribbean Cinemas	2	7%
Hardware	Home Depot, Masó Express	2	7%
Auto Parts	Western Auto	1	3%
Pharmacies	Walgreen's	1	3%
Video Rental	Blockbuster	1	3%
Supercenters	Wal-mart	1	3%
Beauty Salon	Supercuts	1	3%
Coffee	Starbuck's	1	3%
Total		29	100%

Source: Estudios Técnicos, Inc. Database

Among the lines of business mostly found in the area are: thrift department stores (21%), department stores (14%) and supermarkets (14%). By the same token, the brand mostly found in the competitive facilities is Pitusa with 3 establishments. Following Pitusa there is Pueblo Supermarkets, Amigo Supermarkets, Sam's Club, Blockbuster Video, Wal-mart, K-mart and Capri, with two facilities each.

On *appendixes 1 and 2*, there is a detailed profile of some of the shopping centers referred to herein. The following map presents the location of the shopping centers in the market area, as previously defined. It is worth noting that there is not much retail alternatives towards the west of the municipality of Caguas or in Aguas Buenas.


Shopping Centers in Market Area
Shopping Center Proposed by Gibraltar Development
0
5
10
20
Kilometers
N
1:245,000
Big Shopping Centers (175,000 Sq. feet or more)
Small Shopping Centers
Main Roads
Site
Source: Estudios Técnicos, Inc.

VII. EVALUATION OF CAGUAS TRADITIONAL URBAN CENTER

This section portrays an overview of the Caguas traditional urban center. This analysis is based on information collected through a survey conducted by Estudios Técnicos, Inc during the month of March, 2008.

Some of the main problems found in the Caguas urban center were traffic congestion, lack of parking facilities, and the physical deterioration of various structures.

This urban center is comprised of approximately 973 structures occupying an area of 1.9 million square feet. Sixty-one percent of the structures are housing units, warehouses, or empty or abandoned structures. The following table presents a summary of the aforementioned structures by type and area.

Description of Caguas Urban Center

Total # of Structures by Type

Type of Structure	# of Structures	% of Total
Retail	206	21%
Services	127	13%
Government	21	2%
Institutional Use	27	3%
Other Uses	592	61%

Total Square Footage by Type of Structure

Type of Structure	Total Square Feet by Type of Structure	% of Total
Retail	569,802	29%
Services	330,550	17%
Government	76,800	4%
Institutional Use	205,500	10%
Other Uses	780,952	40%
Total Structures in Caguas Urban Center	**973**	
Total Square Footage of Structures in the Urban Center	**1,963,604**	

Source: Estudios Técnicos, Inc. Caguas Urban Center Inventory March 2008.
Note: Other uses may include housing, warehouse, empty and abandoned structures.

In terms of retail, only 21% of the structures fall into this category. These facilities account for 569,802 square feet, representing 29% of the total space in the urban center. Within the retail category, forty percent of the facilities fall into the "unknown category", as shown on the next table. The following table presents a summary of the retail establishments in the urban center by type and the total number of establishments by category.

Description of Retail Establishments in Caguas Urban Center		
Type of Retail	# of Establishments	Percent
Unknown	83	40%
Clothing	11	5%
Cafeteria	9	4%
Restaurant	8	4%
Discount Store	7	3%
Shoes	6	3%
Bank	5	2%
Pharmacy	5	2%
Furniture	5	2%
Gallery	4	2%
Music	4	2%
Beauty Supply	3	1%
Enterteinment	3	1%
Book Store	3	1%
Bakery	3	1%
Beauty Salon	3	1%
Department Store	3	1%
Botanical Shop	2	1%
Groceries	2	1%
Dance School	2	1%
Health Food	2	1%
Automobile Parts	2	1%
Linen	2	1%
Miscellaneous	2	1%
Farming	1	0%
Antiques	1	0%
Bar	1	0%
Bycicles	1	0%
Money Orders and Checks	1	0%
Butchery	1	0%
Cellular Phones	1	0%
Day Care	1	0%
Home Décor	1	0%
Candies	1	0%
Electrical Appliances	1	0%
Flowers	1	0%
Photography	1	0%
Fruits	1	0%
Gas Station	1	0%
Gym	1	0%
Jewelry	1	0%
Laundry	1	0%
Museum	1	0%
Brides	1	0%
Eyeware	1	0%
Tailor's Shop	1	0%
Automobile Services	1	0%
Medical Services	1	0%
Souvenirs	1	0%
Nails	1	0%
Uniforms	1	0%
Total	**206**	**100%**

Source: Estudios Técnicos, Inc. Caguas Urban Center Inventory March 2008.

Some recognized retail chains with presence in the urban center are presented on the following table. The retail category with the largest representation is "shoes" with 6 retail chains including: (1) Payless Shoes, (2) La Gloria, (3) Humberto Vidal, (4) La Defensa, (5) Champs, and (6) Foot Locker.

Recognized Chains with Pressence in Caguas Urban Center	
Chain	**Type of Retail**
City Financial	Bank
Banco Popular	Bank
Banco Santander	Bank
Popular Finace	Bank
Island Finance	Bank
Sally	Beauty Supply
OPEN	Cellular Phones
El Amal	Pharmacy
Shell	Gas Station
Subway	Restaurant
Kress	Clothing
Donato	Clothing
Rainbow	Clothing
Gatsby	Clothing
Pitusa	Discount Store
Me Salvé	Discount Store
Always 99	Discount Store
Topeka	Discount Store
1 2 3	Discount Store
Payless Shoes	Shoes
La Gloria	Shoes
Humberto Vidal	Shoes
La Defensa	Shoes
Champs	Shoes
Foot Locker	Shoes

Source: Estudios Técnicos, Inc. Caguas Urban Center Inventory March 2008.

In summary, Caguas urban center has a wide variety of retail establishments and services, with more than 50 categories. Nonetheless, the type of offering with presence in the urban center caters a different type of consumer than that of a shopping center comparable to the proposed development on this study. The type of consumer that typically visits the retail establishments of urban centers is a low to medium income individual that lives within the premises of the urban center and usually walks to the

surrounding establishments. Therefore, parking facilities are not in great demand in these areas.

To the contrary, the retail offering at shopping centers like the one proposed is more catered to the medium to high income segments that depend that live in the suburban areas of the municipalities and rely on a private car to commute to retail establishments and places of work. Therefore, it is not foreseeable that the proposed shopping center will affect the existing retail establishments in the Caguas urban center.

VIII.THE NEED FOR COMMERCIAL SPACE IN THE MARKET AREA

This section evaluates if the market area can support additional retail development as a basis to evaluate the potential impact of the proposed development on the market. If the market can support additional retail development, the conclusion is that the proposed shopping center will supply a market need and should not have a negative or saturating impact upon the market.

The analysis is based on the previously discussed socioeconomic profile and the retail information presented on the prior sections of the report. This was used to estimate the market area sales potential and the overall market situation. The applied method is the *residual sales approach*. The approach identifies projected unsatisfied sales potential by projecting sales and allocating sales to existing facilities.

Residual Analysis

Methodology and Parameters

The residual analysis is used in land use planning as a tool to identify a current or future need for retail space. The objective is to measure the need for retail space using a base year. Typically the base year is the year of the latest data published by the US Economic Census. In this case 2002[5].

The method followed was the following:

1. Data on population was obtained from the Population Census 2000 and from the population projections prepared by the Puerto Rico Planning Board. Inter-year population estimates were conducted based on these projections using the population growth assumption presented on the table of parameters.

2. Data on personal income in the market area was also obtained from the Census, which according to the source was $1.4 billion in 2000. Personal income was adjusted upward based on an estimated 25% income underreporting between the Census and Puerto Rico's National Accounts.

[5] Economic Census of 2002.

3. Personal income was projected based on the growth of personal income in Puerto Rico and estimates for the market area. The growth in the market area was computed based on the relationship between the average growth of personal income in the Island and that in the market area, as derived from the Census data for 1990 and 2000. Income in the market area grew 1.27 times faster than in the Island as a whole during the 1990s decade. The assumed growth rates for each relevant period are presented in the table of parameters.

4. Effective sales in the market area were obtained from the Economic Census 2002, which amounted to $839 million. Retail sales supported by the market area population were estimated based on the *ratio of personal income to retail sales* in the region of Caguas (43%) and the income base on the market area. This estimate was necessary because – effective sales - are associated to the patronage of consumers residing outside the market area.

6. Retail sales were projected based on the personal income projection and the *ratio of personal income to retail sales*.

7. The supply of retail sales was equated to the estimated demand - retail sales supported by the population base of the market area. Hence, the analysis assumed that in the base year there is no unsatisfied demand.

8. The supply was projected using an inflation rate based on the implicit price deflator used by the Puerto Rico Planning Board to deflate personal income growth. Hence, the allocated supply to existing establishments is the level of sales reported in 2002 adjusted forward by inflation.

9. The supply was adjusted to account for 300,000 square feet of approved and new retail facilities developed or approved on or after 2002. A level of sales was allocated to new developments proposed (actual development and those having approved permits) based on an average sales-per-square-foot in shopping malls within the market area of $310 per sq. ft. of GLA in 2002, as reported in the Economic Census and adjusted using the inflation rate mentioned above.

Developed Commercial Space in the Market Area 2002 to present

NAME	MUNICIPALITY	APROX SIZE	YEAR
Pitusa Aguas Buenas	Aguas Buenas	25,000	2002
American Plaza	Caguas	25,000	2003
Wal-Mart Supercenter Caguas	Caguas	175,000	2005
Ralph's Food Warehouse Caguas	Caguas	75,000	2004
		300,000	

10. Residual Demand was computed subtracting demand, as measured by the estimated level of retail sales supported by the market area's income base, from the projected supply. The difference is a growth on retail sales in the market area after allocating sales in nominal prices associated to existing businesses and new commercial developments.

Parameters		
Market Area	Caguas & Aguas Buenas	
Population base 2000	169,534	
Population growth	0.47%	
Income as per Census 2000	$1,417,024,352	
Per capita income 2000	$8,358	
Income Parameters	PR (National Acc)	Market Area
Per capita income growth 1990-2000	5.46%	6.96%
Per capita income growth 2000-2002	3.46%	4.95%
Per capita income growth 2002-2007	4.32%	5.81%
Assumed long term growth	4.07%	5.56%
Retail Sales Growth		5.56%
	2002-2007	**2008-2012**
Inflation (annual)	2.90%	3.72%
Consumption pattern - Region (expenditures in retail sales as a % income)	42.74%	

Basically, the analysis shows the amount of additional retail development that the market area can sustain to supply the growth in retail sales associated to the growth in the income base of the existing population in the market area.

Results

The following table shows the results of the residual analysis. The results show that the adjusted personal income in the market area is projected to increase to $3.7 billion in 2011 and $3.99 billion in 2012. Considering that retail sales account for approximately 43% of the personal income in the Caguas Commercial Region, retail sales associated to the population in the market area are projected to increase to $1.6 billion on 2011 and to $1.7 billion in 2012. On the other hand, total supply was estimated at $1.31 billion on 2011 and $1.36 billion in

2012. Including the commercial space under evaluation, supply estimates took into account 462,256 square feet of commercial space that was or will be developed in the market area during the period for which $191.2 million were allocated to sales in the new proposed developments (additional supply). The comparison between projected demand and supply provides an estimate of $287.4 million of Residual Demand in 2011, which increases to $343.5 million in 2012. This is equivalent to a need for additional retail space of 1.57 million square feet of commercial space in 2011, the first year of operations of the proposed development. To get to these quantities of square footage, the analysis uses an average conversion factor of $182.2 of sales per square foot in the market area on 2011 and $189 on 2012. It is worth noting, that this conversion factor was obtained from the Economic Census 2002 ($131.2) and adjusted for inflation during the projection year.

Demand & Supply Analysis - Need for Retail Space	2002	2007	2011	2012
Population	171,125	175,169	176,813	178,473
Per capita income	$ 9,206	$ 13,671	$ 16,978	$ 17,923
Personal Income	$ 1,575,423,722	$ 2,394,800,503	$ 3,001,916,148	$ 3,198,702,289
Underreported Income as per PR Planning Board	25%	25%	25%	25%
Adjusted personal income (PR National Accounts)	$ 1,963,662,882	$ 2,984,962,578	$ 3,741,692,619	$ 3,986,973,704
Expenditures in retail sales in Region as a % income	43%	43%	43%	43%
Potential retail sales supported by the income in the market area	$ 839,184,095	$ 1,275,643,158	$ 1,599,036,659	$ 1,703,859,125
Existing supply: Retail Sales in the Market Area (1)	$ 839,184,095	$ 968,130,980	$ 1,120,377,006	$ 1,162,041,677
Retail sales per capita	$ 4,904	$ 5,527	$ 6,337	$ 6,511
Proposed Developments (accu. sq. ft.)	0	300,000	462,256	462,256
Sales per sq ft (Shopping Centers)	$ 310	$ 357	$ 414	$ 429
Sales in new proposed developments	0	$ 107,249,242	$ 191,243,024	$ 198,354,985
Total Supply: existing and new sales	$ 839,184,095	$ 1,075,380,222	$ 1,311,620,031	$ 1,360,396,662
Residual Demand ($ dollars)	$ -	$ 200,262,936	$ 287,416,628	$ 343,462,463
Average Sales per Square Foot (all space)	$ 131.2	$ 157.4	$ 182.2	$ 189.0
Residual Demand in sq. ft.	0	1,271,925	1,577,403	1,817,409

(1) From Economic Census 2002, projected by inflation. Include Retail Sales plus Food Services less Motor Vehicles & Parts Dealers, and Gasoline Stations.

IX. ECONOMIC IMPACT EVALUATION

On this chapter, we estimate the economic impact of the project. The economic impact estimation is based on the construction phase lasting two years. It was estimated that the construction phase will take place during between 2009 and 2010 and the operational phase on 2011.

- The project components and its relevant cost (according to information provided by proponent) used for the economic impact evaluation is approximately $25 million.

It is worth noting, that the analysis considers the inflationary pressures to the costs of the project provided by the proponent. The construction inflation rate is 5.5%.

The economic impact of the project has two main components: (1) the effect of the investment during construction, and (2) the effect of the project once in operation. The first of these effects is temporary, although it does have a significant effect in employment and income during this phase (construction). The second carries a recurrent effect also quantified herein.

The economic impact on both phases can be divided in two parts. The first is the direct impact on employment and salaries. The second is the indirect and induced effects of the project on employment and salaries. Both are added in order to reckon the aggregate impact during the construction and operational phases.

The parameters used to perform the economic impact model during the aforementioned phases are presented on the following tables. The multipliers developed by the Puerto Rico Planning Board (PRPB) were applied to the inception date of each phase in order to estimate the indirect effects in terms of employment and investment. The analysis also uses the multipliers of induced impact from the PRPB. These multipliers are widely used for estimating the relationship between various industrial sectors of the economy, by calculating the impact that the growth in one sector will have in other sectors of the economy at large.

Economic Impact Assumptions-Las Carolinas Towne Center	
Inflation	
Projected General Inflation	2.9%
Inflation for construction	5.5%
Assumptions about Direct Employment	
Direct Employment in Operational Phase	
Retail Sales (employment per million $ of revenue)	13.91
Assumptions on Salaries per Employee	
Retail	$16,747
Assumptions on Tax Rates	
Tax Rates for Construction	
Construction permit cost ($5.00 per $1,000 construction inv	0.50%
Municipal construction patents ($5.00 per $1,000 constructi	0.50%
Municipal Construction Excise Tax	3.50%
Average net income before taxes per $ construction revenu	5.00%
Average rate of corporate tax	9.43%
Tax Rate for Operational Phase	
Municipal excise tax	0.50%
Property Tax Rate (at 1954 values)	9.3%
Tax Rate for Individual Income Tax	8.0%

Assumptions on Economic Multipliers	
Construction Multipliers	
Employment Coefficients (Jobs per million $ in investment, 2007 dollars)	
Coefficient of direct employment	10.49
Coefficient of direct & indirect employment	16.09
Coefficient of direct, indirect & induced employment	20.29
Income Multipliers for Construction	
Direct & indirect income multiplier (Type I)	1.73
Direct, indirect & induced income multiplier (Type II)	2.14
Multipliers for the Operational Phase	
Production Multipliers	
Employment Multipliers	
Direct & Indirect (Type I)	
Retail	1.34
Direct, Indirect & Induced (Type II)	
Retail	1.80
Income Multipliers	
Direct & indirect	
Retail	$1.41
Direct, indirect & induced	
Retail	$1.93

Assumptions on Revenues and Income	
Retail Sales	
Total annual sales per square foot ($)	$414
NIBT (net income before tax)	3.0%
Average corporate tax rate	9.4%
Hotel	
Average occupancy rate	70%
NIBT (net income before tax)	6.4%
Average corporate tax rate	1.0%
Growth in room rate	1.0%
Discount rate for present value	6.0%
Retail Sales	
NIBT (net income before tax)	4.00%
Salaries as % of Convention Center Revenues	45.00%

A. Employment and Income - Construction Phase

The construction cost of the project was estimated at $24.3 million. The construction phase will last approximately two years starting on 2009. Therefore, the first year of operations is expected to be 2011. The following table summarizes all the impacts during the construction phase.

Economic Impact of Construction-Las Carolinas Towne Center

Construction Investment

Thousand dollars	2009	2010	Total	Average
Commercial	$12,169	$12,169	$24,338	$12,169
Investment in contruction	**$12,169**	**$12,169**	**$24,338**	**$12,169**

Jobs Generated by Construction Activity

Number of Annual Jobs	2009	2010	Total	Average
Commercial	222	72	294	147
Jobs generated from Construction	**222**	**72**	**294**	**147**
Construction- Direct jobs (#)	115	37	152	76
Construction- Indirect and Induced Jobs	107	35	142	71

Income Generated by Contruction Activity

Thousands of dollars	2009	2010	Total	Average
Direct income	$2,331	$779	$3,110	$1,555
Indirect and Induced Income	$2,652	$886	$3,538	$1,769
Income generated by contruction activity	**$4,983**	**$1,665**	**$6,648**	**$3,324**

Fiscal Revenues to Government Generated by Construction Activity

Thousands of dollars	2009	2010	Total	Average
State construction permit	$61	$61	$122	$61
Municipal construction taxes	$61	$61	$122	$61
Municipal excise tax	$426	$426	$852	$426
Personal Income taxes from Construction Workers	$186	$62	$249	$124
Corporate taxes from Contractors	$57	$57	$115	$57
Total Fiscal Revenues	**$791**	**$667**	**$1,459**	**$729**
Fiscal Revenue to Municipal Government	$487	$487	$974	$487
Fiscal Revenue to State Government	$305	$181	$486	$243

During its construction the project will be able to generate the following:

- A total of 152 direct jobs and 142 indirect and induced jobs for a total of 294 jobs during the estimated construction period.
- Direct income of $3.1 million and indirect and induced income of $3.5 million, for a total of $6.6 million during the construction period.
- Fiscal revenues totaling $1.45 million, from which $974,000 will go to the municipality and $485,000 to the central government during the construction period.

B. Employment and Income – Operational Phase

The economic impacts on direct employment and income were estimated using various sources of information such as the 2002 Economic Census and the employment data issued by the Puerto Rico Department of Labor and Human Resources. Also, estimates from ETI were used.

The indirect and induced impacts were estimated with the multipliers provided by the Puerto Rico Planning Board in 1987. These vary depending on the different types of development. The type I and II multipliers were used to estimate the indirect and induced impacts of a direct impact. The results of the operational phase presented in the following tables include the results for the first 5 years of operations, except that the averages presented in the last column encompass a longer period.

Economic Impact of Operations-Las Carolinas Towne Center

Jobs from Operations

(Number of Annual Jobs)	2010	2011	2012	2013	2014	Average
Commercial - Direct Jobs	934	968	1,004	1,042	1,081	1,006
Commercial - Indirect & induced	1,681	1,743	1,808	1,875	1,945	1,811
Commercial Direct, Indirect and Induced Jobs	**2,614**	**2,712**	**2,813**	**2,917**	**3,026**	**2,816**

Personal Income from Operations

Thousand dollars	2010	2011	2012	2013	2014	Average
Retail - Direct income	$16,087	$17,166	$18,317	$19,546	$20,857	$18,395
Retail - Indirect & induced income	$15,019	$16,026	$17,102	$18,249	$19,473	$17,174
Retail - Direct, Indirect and Induced Income	**$31,105**	**$33,192**	**$35,419**	**$37,795**	**$40,330**	**$35,568**

Total Fiscal Revenues from Operations of Las Carolinas Towne Center

Thousand dollars	2010	2011	2012	2013	2014	Average
Room Tax (9% of room revenues)	$00	$00	$00	$00	$00	$00
Municipal excise tax	$336	$348	$361	$374	$388	$362
Property taxes	$00	$82	$77	$73	$69	$60
Municipal Sales Tax	$81	$84	$87	$90	$93	$87
State Sales Tax (IVU)	$295	$306	$318	$330	$342	$318
Personal income taxes	$1,287	$1,373	$1,465	$1,564	$1,669	$1,472
Corporate taxes	$189	$196	$204	$211	$219	$204
Total Fiscal Revenues	**$2,188**	**$2,389**	**$2,512**	**$2,642**	**$2,780**	**$2,502**
Destination of fiscal revenues						
State government.- Fiscal revenues	$1,772	$1,876	$1,987	$2,104	$2,229	$1,994
Municipal govemment.- Fiscal revenues	$416	$513	$525	$537	$550	$508

During its operational phase, the project will generate the following:

- An average of 1,006 direct jobs and 1,811 indirect and induced jobs, for an annual average of 2,816 jobs during this phase.
- An annual average of $18.4 million on direct personal income and $17.1 million on indirect and induced income annually, for a total of $35.6 million annually during this phase.
- An average fiscal impact of $2.5 million annually. From this total, $2 million will go the state government and $508,000 to the municipality. The fiscal income estimated contemplates the municipal excise tax, property taxes, sales

tax (municipal and state), personal income taxes and corporate taxes that the operation of the retail will generate.

APPENDIX

Profile of the Similar Shopping Centers in the Caguas Commercial Region

SHOPPING CENTER PROFILE

Name	**Aibonito Shopping Center**
Municipality	**Aibonito**
ETI ID	15
Aprox Size	175,000
Category Size	
Mall Or Strip	Lineal
Road	PR3/PR54
Location Observations	
Address	
Anchor Tenants	
Free-standing Number	
Government Offices No	
Year Construction	2005
Remodeling Year	
Urban or Rural	
Observations	
Administrator	

SHOPPING CENTER PROFILE

Name	**Centro Comercial Villa del Carmen**
Municipality	**Caguas**
ETI ID	63
Aprox Size	175,000
Category Size	Comunal
Mall Or Strip	Lineal
Road	PR1
Location Observations	Se complementa con Plaza del Carmen
Address	
Anchor Tenants	Pueblo, Scotiabank,Supercuts, Blokbuster
Free-standing Number	
Government Offices No	
Year Construction	1980
Remodeling Year	
Urban or Rural	Suburbio
Observations	
Administrator	

SHOPPING CENTER PROFILE

Name	**Plaza del Carmen Mall**
Municipality	**Caguas**
ETI ID	64
Aprox Size	175,000
Category Size	Comunal
Mall Or Strip	Mall
Road	PR1/PR172
Location Observations	
Address	PR 172 Int. PR 1
Anchor Tenants	Pitusa Amigo
Free-standing Number	
Government Offices No	
Year Construction	1980
Remodeling Year	
Urban or Rural	Vial
Observations	
Administrator	Downtown Development Corporation

SHOPPING CENTER PROFILE

Name	**Wal-Mart Supercenter Caguas**
Municipality	**Caguas**
ETI ID	69
Aprox Size	175,000
Category Size	
Mall Or Strip	Lineal
Road	
Location Observations	
Address	
Anchor Tenants	
Free-standing Number	
Government Offices No	
Year Construction	2005
Remodeling Year	
Urban or Rural	
Observations	
Administrator	

SHOPPING CENTER PROFILE

Name	**Plaza Humacao**
Municipality	**Humacao**
ETI ID	159
Aprox Size	175,000
Category Size	Comunal
Mall Or Strip	Freestanding
Road	PR3/PR53
Location Observations	
Address	
Anchor Tenants	Sams,Walgreens
Free-standing Number	4
Government Offices No	0
Year Construction	2000
Remodeling Year	
Urban or Rural	Vial
Observations	
Administrator	

SHOPPING CENTER PROFILE

Name	**Plaza Yabucoa**
Municipality	**Yabucoa**
ETI ID	300
Aprox Size	175,000
Category Size	Comunal
Mall Or Strip	Lineal
Road	PR182
Location Observations	
Address	
Anchor Tenants	Pitusa,National Discount,Sedeco
Free-standing Number	0
Government Offices No	0
Year Construction	2004
Remodeling Year	
Urban or Rural	
Observations	
Administrator	Downtown Development Corporation

SHOPPING CENTER PROFILE

Name	**Humacao Plaza Shopping Center**
Municipality	**Humacao**
ETI ID	157
Aprox Size	207,206
Category Size	Comunal
Mall Or Strip	Lineal
Road	PR3/PR30/PR909
Location Observations	
Address	Calle Font Martelo esq. Calle Francisco Vega
Anchor Tenants	Pitusa,WesternAuto,
Free-standing Number	0
Government Offices No	0
Year Construction	1994
Remodeling Year	
Urban or Rural	Suburbio
Observations	
Administrator	Downtown Development Corporation

SHOPPING CENTER PROFILE

Name	**Perez Hermanos Plaza**
Municipality	**Cayey**
ETI ID	99
Aprox Size	235,000
Category Size	Comunal
Mall Or Strip	Lineal,BB
Road	PR1/PR738/local
Location Observations	
Address	
Anchor Tenants	PerezHnos,Marshalls,Blockbuster
Free-standing Number	1
Government Offices No	0
Year Construction	1997
Remodeling Year	2002
Urban or Rural	Suburbio
Observations	
Administrator	Perez Hermanos

SHOPPING CENTER PROFILE

Name	**Juncos Plaza**
Municipality	**Juncos**
ETI ID	167
Aprox Size	235,343
Category Size	Regional
Mall Or Strip	Lineal
Road	PR31
Location Observations	Cierre de Kmart
Address	PR 31, Km. 24.0
Anchor Tenants	Capri,Amigo
Free-standing Number	3
Government Offices No	0
Year Construction	
Remodeling Year	2004
Urban or Rural	Zona industrial
Observations	
Administrator	

SHOPPING CENTER PROFILE

Name	**Plaza Cayey**
Municipality	**Cayey**
ETI ID	100
Aprox Size	236,598
Category Size	Comunal
Mall Or Strip	Lineal,BB
Road	PR1
Location Observations	Contigua a Perez Hermanos
Address	
Anchor Tenants	WalMart (181,290pc).
Free-standing Number	5
Government Offices No	0
Year Construction	1998
Remodeling Year	
Urban or Rural	Suburbio
Observations	
Administrator	Developers Diversified Realty Corp (DDR)

SHOPPING CENTER PROFILE

Name	**Plaza Palma Real**
Municipality	**Humacao**
ETI ID	155
Aprox Size	436,440
Category Size	Regional
Mall Or Strip	Lineal
Road	PR3/PR923/PR53
Location Observations	
Address	PR 3, Km. 78.10
Anchor Tenants	WallMart,Pueblo,CineVista
Free-standing Number	5+
Government Offices No	0
Year Construction	1995
Remodeling Year	0
Urban or Rural	Vial
Observations	

SHOPPING CENTER PROFILE

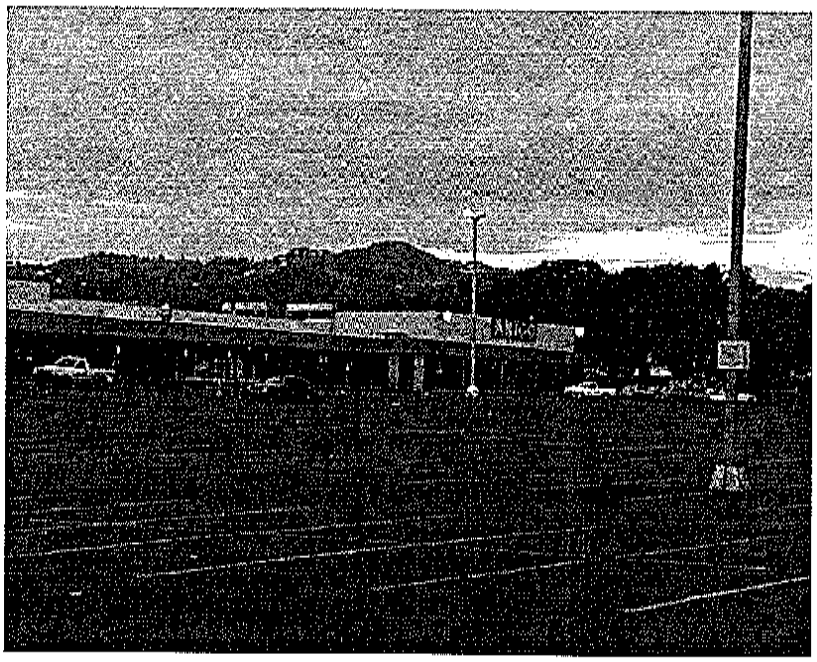
Name	**Las Catalinas Mall**
Municipality	**Caguas**
ETI ID	61
Aprox Size	569,109
Category Size	Nacional
Mall Or Strip	Mall, lineal, freestanding
Road	PR52/PR156/PR33/avenida
Location Observations	Dos proyectos divididos por Río Caguitas
Address	0
Anchor Tenants	Kmart,Sears,Caribbean Cinemas,HomeDepot
Free-standing Number	5
Government Offices No	0
Year Construction	1997
Remodeling Year	2000
Urban or Rural	Vial
Observations	Ubicado sobre antigua central azucarera
Administrator	Manley-Benson

SHOPPING CENTER PROFILE

Name	**Plaza Centro I, II Shopping Center**
Municipality	**Caguas**
ETI ID	68
Aprox Size	980,000
Category Size	Nacional
Mall Or Strip	Mall,BB,freestandig,lineal
Road	PR30/PR189
Location Observations	Son dos centros comercialesPCII-311922pc y PCI-280366pc
Address	
Anchor Tenants	Sams,Kmart,JCPenney,COSCO
Free-standing Number	5+
Government Offices No	0
Year Construction	0
Remodeling Year	2000
Urban or Rural	Vial
Observations	
Administrator	RD Management Corporation

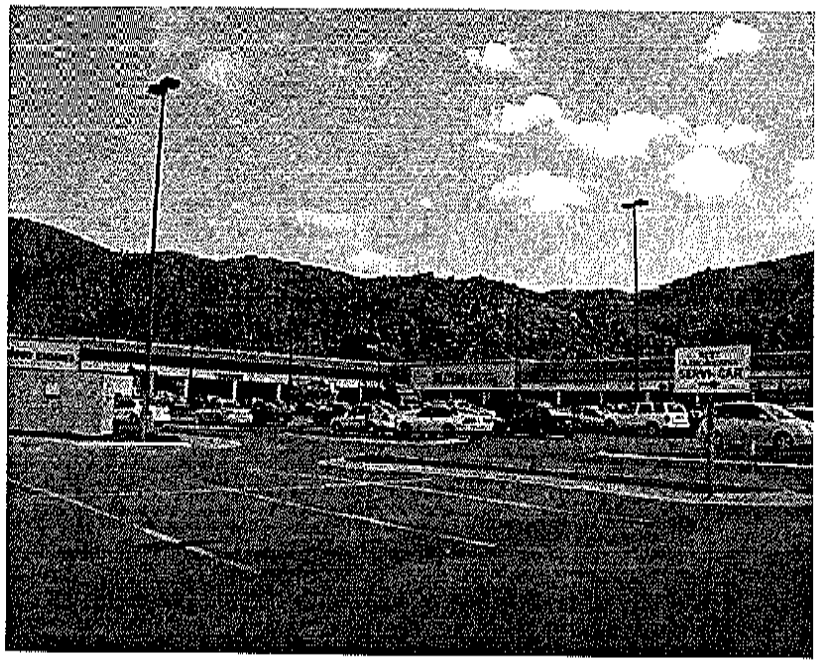
Pictures of Some of the Competitive Shopping Centers

Villa del Carmen Shopping Center



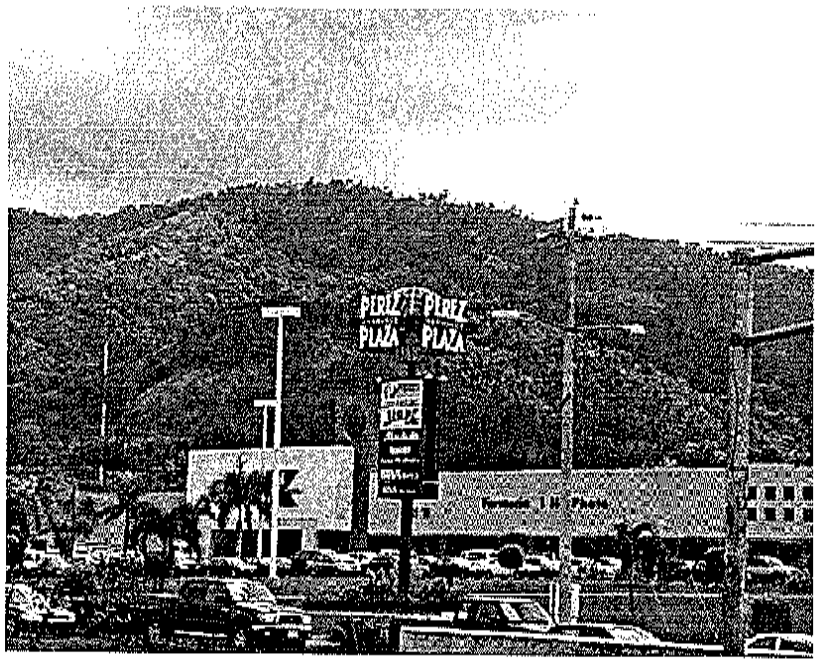
Plaza del Carmen Mall

Plaza Humacao



Plaza Yabucoa

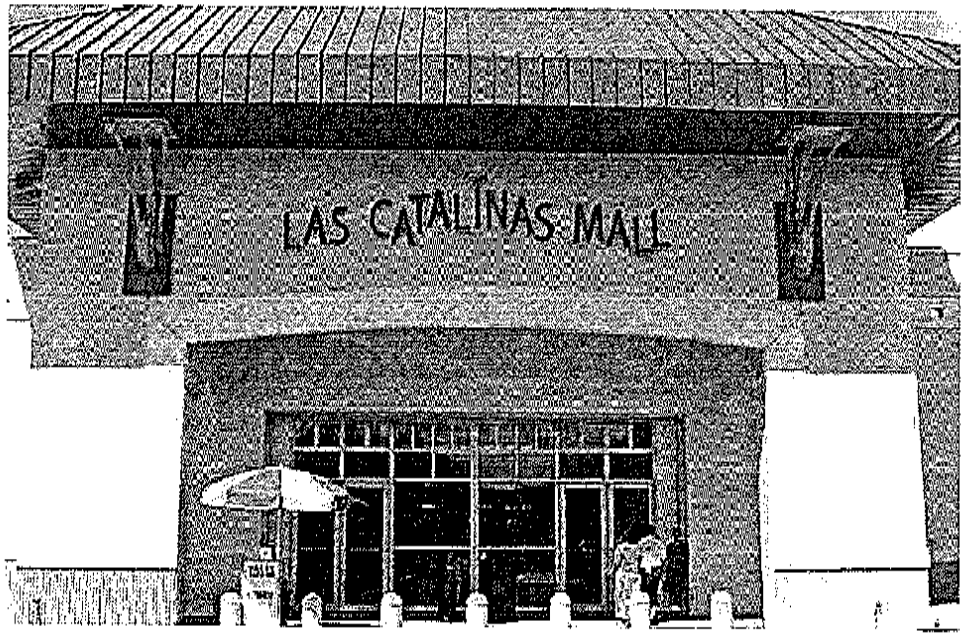
Humacao Plaza



Pérez Hnos. Plaza

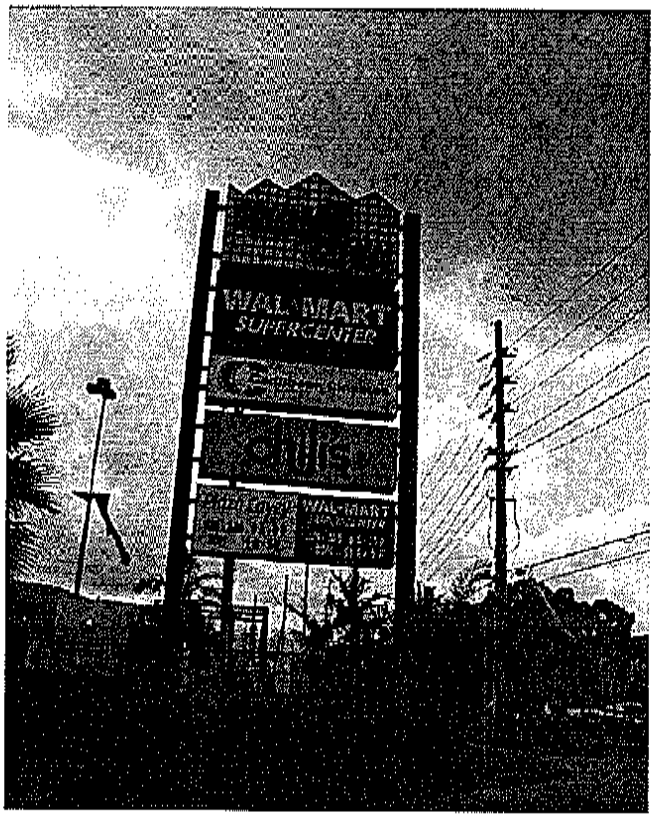
Juncos Plaza

Plaza Palma Real



Las Catalinas Mall

Plaza Centro



Plaza Cayey

Anejo 8:

Resolución R-11-2-1 de la Junta de Calidad Ambiental

GOBIERNO DE PUERTO RICO
OFICINA DEL GOBERNADOR
JUNTA DE CALIDAD AMBIENTAL

IN RE: COMPAÑÍA DE COMERCIO Y EXPORTACIÓN DE PR AGENCIA PROPONENTE	R-11-2-1 PROYECTO COMERCIAL INDUSTRIAL LAS CAROLINAS TOWN CENTER BO. CAÑABÓN, CAGUAS, PR DIA-P JCA 09-0005(CCE)

RESOLUCIÓN INTERLOCUTORIA

En reunión celebrada el 18 de febrero de 2011 se sometió ante la consideración de la Junta de Gobierno de la Junta de Calidad Ambiental la Declaración de Impacto Ambiental Preliminar (DIA-P) presentada por la agencia proponente, Compañía de Comercio y Exportación de PR, así como el expediente administrativo para la acción propuesta proyecto Comercial-Industrial Las Carolinas Town Center, a desarrollarse en la Carretera PR-156, Km. 56.0, en el Barrio Cañabón del Municipio de Caguas, Puerto Rico.

I. ACCION PROPUESTA

La acción propuesta consiste en el desarrollo de un proyecto mixto, comercial-industrial en un predio de 32.734 cuerdas. Se propone la construcción de 200,000 pies cuadrados en el área industrial liviano que incluye un edificio de almacén y oficina (4.27 cuerdas) y 720 espacios para estacionamiento y áreas verdes (1,455 cuerdas), en un área con cabida de unas 15.759 cuerdas y 162,256 pies cuadrados en el área comercial (3,878 cuerdas) que incluye ocho (8) edificios de un nivel, para la venta al detal, 969 espacios para estacionamiento y áreas verdes en unas 16.975 cuerdas. Se contempla además una charca de retención en 1.592 cuerdas, que estará localizada en el área industrial y trabajos relacionados al ensanche a la Ave. Las Carolinas. Se estima un movimiento de tierra de 165,000 metros cúbicos. El mismo ubica dentro de un distrito UI-1 y UC-2 y fuera de zona inundable.

II. TRASFONDO PROCESAL

1- El 18 de febrero de 2009, la agencia proponente, **Compañía de Comercio y Exportación de PR**, sometió ante la consideración de la Junta de Calidad Ambiental la Declaración de Impacto Ambiental Preliminar (DIA-P) para el proyecto propuesto de conformidad con el Artículo 4-(B)(3) de la Ley Número 416 del 22 de septiembre de 2004, según enmendada, mejor conocida como Ley Sobre Política Pública Ambiental. De esta manera la agencia proponente dio inicio al proceso de evaluación y trámite de la Declaración de Impacto Ambiental del proyecto propuesto, de conformidad con las disposiciones de la Ley sobre Política Pública Ambiental, *supra*, y el Reglamento para el Proceso de Presentación, Evaluación y Trámite de Documentos Ambientales (RPPETDA) de la JCA.

2- El 23 de febrero de 2009 se publicó en al red de internet la DIA-P.

3- El 5 de marzo de 2009, la JCA envió una carta a la Compañía de Comercio y Exportación de PR acusando recibo de la DIA-P, incluyendo copia del Aviso Público y requiriendo la publicación del mismo.

4- El 11 de mayo de 2009 se publicó un Aviso Público informando al público y personas interesadas la disponibilidad de la DIA-P, según se dispone en la Regla 254(C) del (RPPETDA). En dicho Aviso se concedieron treinta (30) días para someter comentarios e información que pudiera ser útil en la preparación de la DIA-Final, así como el derecho de solicitar una vista pública.

5- En el presente caso no fue solicitada la celebración de vista pública durante el periodo de comentarios, como tampoco se recibieron comentarios del público sobre el proyecto propuesto.

6- Se recibieron comentarios a la DIA-P de las siguientes agencias estatales: Departamento de Recursos Naturales y Ambientales, Autoridad de

Carreteras y Transportación, Autoridad de Energía Eléctrica, Instituto de Cultura Puertorriqueña, Autoridad de Desperdicios Sólidos y el Municipio de Caguas.

III. RESOLUCIÓN

Luego de revisado y analizado el expediente administrativo, y discutidos todos los méritos de la DIA-P, al amparo de los poderes y facultades que le confiere a esta Junta de Calidad Ambiental la Ley Número 416, *supra*, y sus Reglamentos esta Junta **RESUELVE**:

- La Declaración de Impacto Ambiental Preliminar (DIA-P) presentada por la Agencia Proponente, Compañía de Comercio y Exportación de PR, en esta etapa cumple con la mayoría de los requisitos establecidos en la Ley Núm. 416, supra, y el RPPETDA.
- Por tanto, la Agencia Proponente deberá presentar una Declaración de Impacto Ambiental Final (DIA-F) a tenor con las disposiciones de la Regla 254 (H)(2) del RPPETDA, donde se indiquen y atiendan las recomendaciones y requerimientos establecidos en esta Resolución, las cuales son especificadas mediante las siguientes determinaciones:

  1- Se deberán incluir y discutir las recomendaciones y requerimientos de las agencias consultas que así lo expresaron en sus comentarios.

- La Agencia Proponente deberá presentar a la Junta de Calidad Ambiental la DIA-Final dentro del término de un (1) año siguiente a la notificación de la presente resolución interlocutoria conforme lo dispuesto en la Regla 254 (K) del RPPETDA. De no presentarse la DIA-Final en este término, la Junta procederá a archivar el caso.

IV. APERCIBIMIENTO

Se apercibe a todas las partes interesadas que la presente Resolución Interlocutoria es una de carácter parcial, la cual no pone fin al procedimiento de referencia. Por tanto, la presente Resolución Interlocutoria no es susceptible

de reconsideración ante la Junta de Calidad Ambiental, ni de revisión ante el Tribunal de Apelaciones, sin embargo, la misma podrá ser objeto de un señalamiento de error en el recurso de revisión que pueda ser incoado una vez se expida la orden o resolución final que emita la Junta de Calidad Ambiental en su día. Esto es cónsono a lo dispuesto en la Sección 2172 de la Ley de Procedimiento Administrativo Uniforme, Ley Número 170 de 12 de agosto de 1988, según enmendada, 3 L.P.R.A., Subsección 2101, et seq., que dispone que: "*Una orden o resolución interlocutoria de una agencia, incluyendo aquellas que se emitan en procesos que se desarrollen por etapas, no serán revisables directamente. La disposición interlocutoria de la agencia podrá ser objeto de un señalamiento de error en el recurso de revisión de la orden o resolución final de la agencia.*"

NOTIFÍQUESE: Por correo certificado con acuse de recibo a: Sr. Javier Matos Vázquez, PO Box 195009, San Juan, PR 00919-5009; y personalmente a los siguientes funcionarios de la Junta de Calidad Ambiental: Sr. Reynaldo Matos, Miembro Asociado; Ing. Wanda García, Miembro Alterno; Lcda. Johanna Rivera, Gerente Oficina de Servicios Legales; y a la Oficina de Revisión de Documentos Ambientales.

DADA en San Juan, Puerto Rico, a 18 de febrero de 2011.

PEDRO J. NIEVES MIRANDA
PRESIDENTE

CERTIFICO: Que he notificado, por correo certificado con acuse de recibo copia de la Resolución **R-11-2-1** al Sr, Javier Matos Vázquez a la dirección que aparece en el Notifíquese y mediante mensajero interno a los funcionarios de la Junta de Calidad Ambiental, habiendo archivado el original en autos.

En San Juan, Puerto Rico, a 3/ de marzo de 2011.

SECRETARIA
JUNTA DE GOBIERNO