Golden Environmental Corp.

Consulting Division

144 Calle Zirconia Urb. Los Prados Sur Dorado PR 00646

JURISDICTIONAL DETERMINATION

MONTE ELVIRA DEVELOPMENT
2002-66-0287-JPU
ROAD PR-14 Km. 30
MUNICIPALITY OF COAMO, PUERTO RICO

SUBMITTED TO:

US ARMY CORPS OF ENGINEERS
ANTILLES REGULATORY SECTION
400 FERNANDEZ JUNCOS AVE.
SAN JUAN, PR OO901-3299

SUBMITTED BY:

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August, 2005

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1. INTRODUCTION

Monte Elvira Corp. is proposing the development of approximately 208 cuerdas parcel of land for the construction of the "Monte Elvira Development". The proposed parcel is located at Road PR – 14 Km. 30 Hm. 07 of San Ildefonso Ward in the Municipality of Coamo (see Appendix 1. Topographic Map). The Monte Elvira master plan project consists in the development of 478 single family units, 138 multifamily units "walk up" type and a commercial area.

The developer requested Golden Environmental Corp. to perform a Jurisdictional Determination for the south-western area of the above referenced parcel as recommended by the US Corps of Engineers (COE).

2. SITE DESCRIPTION

Currently, the land is abandoned and used mainly by locals for grazing horses and cattle. The parcel abutting to the west, north and south was developed for residential purposes several years ago and to the east lays a commercial location and an industrial park. The parcel is covered mainly by leguminous vegetation (mostly ***Acacia farnesiana* (L.) Willd** and ***Acacia retusa (Jacq.) Howard***), there is also present ***Tamarindus indica (L.)***, ***Hymenaea courbaril (L.)*** and ***Calotropis procera (Ait) Ait f.***. The parcel topography is generally abrupt with contour lines from 110 to 230 meters above mean sea level (MSL) (see Appendix 2. Topography). A small area of the parcel lies within flood zones.

3. METHODOLOGY

a. Base Line Data

Following the steps set forth in the U.S. Corps of Engineers Wetlands Delineation Manual (1987) essential baseline data was gathered for the referenced parcel. The following available data was compiled and analyzed:

- **i.** U.S.G.S. Topographical Quadrangle (Coamo Municipality)
- **ii.** U.S. Fish and Wildlife Service National Wetlands Inventory Maps (GIS).
- **iii.** U.S.G.S. Soil Survey Maps (GIS).
- **iv.** U.S.G.S. Hidryc Soils of Puerto Rico.
- **v.** Flood Maps (FIRMS G.I.S.)
- **vi.** Available aerial photographs.
- **vii.** Flora and Fauna Study

b. Field Data Gathering Design

Based on the information encountered during the baseline data analysis we decided to perform a Routine Determination with a simple onsite inspection and designed a field data gathering design as follows:

- **i.** The study area was analyzed based on the gathered data and several walk trough sessions.

- **ii.** The available information was confirmed with an onsite inspection.

iii. The parcel was observed for any wetland indicators; the compiled data was analyzed by itself and compared with the baseline data for a final wetland determination. The upland and jurisdictional waters boundaries were then plotted on the development drawings for COE's review and approval.

4. BASELINE DATA

a. Topographical Quadrangle (TQ)

(see Appendix 1. Topographic Map)

The U.S.G.S Topographic Quadrangle for the Municipality of Coamo shows the elevation contours for the parcel as lines within 100 to 230 meters above MSL. In terms of water bodies the TQ shows a "Río de la Mina" running north to southeast at around 50 meters from the western property line. In addition an unnamed creek is running north to southeast in the center of the parcel. No other significant features can be observed on the TQ (see Appendix 1. Topographic Map).

b. U.S. Fish and Wildlife National Wetland Inventory (NWI)

(see Appendix 3. NWI Map)

The NWI shows that there are no wetland areas in the proposed parcel.

c. U.S.G.S. Soil Survey Maps (SS)

(see Appendix 4. USGS Soil Survey Map)

The soil survey map for the parcel includes two types of soil "Callabo Silty Clay Loam" and "Llanos Clay". **These soil types are not included in the list of hydric soils of Puerto Rico as revised December 15th, 1995. Both soils types are well drained and moderate to moderately slow permeability.**

i. Callabo Series

The Callabo series consists of moderately deep, well drained, moderately permeable soils on strongly dissected uplands. They formed in moderately fine-textured residuum that weathered from basic volcanic rock. Near the type location, the mean annual temperature is about 77 degrees F., and the mean annual precipitation is about 40 inches. Slopes range from 12 to 60 percent.

TAXONOMIC CLASS: Clayey, mixed, superactive, isohyperthermic, shallow Typic Dystrustepts.

TYPICAL PEDON: Callabo silty clay loam--guineagrass (Colors are for moist soil unless otherwise stated).

Ap--0 to 5 inches; very dark grayish brown (10YR 3/2) silty clay loam; moderate medium granular structure; friable; slightly sticky, slightly plastic; many fine roots; about 10 percent, by volume, angular volcanic fragments; few wormholes; slightly acid; clear smooth boundary (4 to 5 inches thick).

Bw1--5 to 13 inches; brown (10YR 4/3) silty clay loam; weak medium and coarse subangular blocky structure; firm; slightly sticky, slightly plastic; common fine roots; about 10 percent, by volume, angular volcanic fragments; few wormholes; many medium distinct very dark grayish brown (10YR 3/2) areas of Ap material; neutral; clear wavy boundary.

Bw2--13 to 19 inches; dark yellowish brown (10YR 4/4) clay loam; weak coarse subangular blocky structure; friable; slightly sticky, slightly plastic; few fine roots; about 15 percent, by volume, angular volcanic fragments; neutral; clear wavy boundary (Combined thickness of the Bw horizons range from 10 to 18 inches).

C--19 to 27 inches; highly weathered volcanic rock; few stringers and tonguing of Bw horizon material; neutral; clear wavy boundary (6 to 12 inches thick).

R--27 to 40 inches; hard, semiconsolidated volcanic rock.

TYPE LOCATION: Caribe SCD, Puerto Rico; approximately 100 meters west of kilometer marker 2.3 of P.R. Highway 512.

RANGE IN CHARACTERISTICS: Thickness of the solum ranges from 14 to 24 inches. Depth to the semiconsolidated rock ranges from 20 to 40 inches. Reaction is slightly acid or neutral throughout.

The A or Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 to 4. Texture is silty clay loam.

The Bw horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. In some pedons, there is some mixing of Ap material in the upper part. Texture is clay loam or silty clay loam.

The C horizon consists of highly weathered and partially weathered volcanic rock. In some pedons, there is tonguing of Bw material.

The R horizon consists of hard consolidated volcanic rock that is rippable by heavy machinery.

COMPETING SERIES: There are no known series in the same family.

GEOGRAPHIC SETTING: Callabo soils are on side slopes of strongly dissected uplands. Slopes range from 12 to 60 percent. They formed in moderately fine-textured residuum that weathered from basic volcanic rocks. The climate is semiarid tropical. The average annual rainfall ranges from 30 to 50 inches and the average annual temperature is 75 to 80 degrees F.

GEOGRAPHICALLY ASSOCIATED SOILS: These include the Jacana, Juana Diaz, and Llanos soils. Jacana soils are on lower positions, are Mollisols, and have cracks when dry. Juana Diaz soils are on similar positions, have less clay in the subsoil, and are shallow to weathered sandstone. Llanos soils are on lower terrace positions, are very deep, and are Vertisols.

DRAINAGE AND PERMEABILITY: Well drained; moderate permeability.

USE AND VEGETATION: Most areas of Callabo soils are used as pasture. A few acres are cultivated. The vegetation consists of native and introduced grasses.

DISTRIBUTION AND EXTENT: Semiarid sections of Puerto Rico. The series is of moderate extent.

ii. Llanos Series

The Llanos series consists of very deep, well drained, moderately slowly permeable soils on foot slopes and alluvial fans. They formed in material that weathered from basic volcanic rock. Near the type location, the mean annual temperature is about 79 degrees F., and the mean annual precipitation is about 35 inches. Slopes range from 2 to 12 percent.

TAXONOMIC CLASS: Fine, smectitic, isohyperthermic Entic Haplusterts

TYPICAL PEDON: Llanos clay - native pasture. (Colors are for moist soil unless otherwise stated.)

A1--0 to 5 inches; very dark brown (10YR 2/2) clay; moderate fine and medium granular structure; firm, slightly sticky, plastic; many fine roots; neutral; clear smooth boundary.

A2--5 to 10 inches; black (10YR 2/1) clay; weak medium subangular blocky structure; firm; slightly sticky, plastic; many

fine roots; neutral; clear smooth boundary. (Total thickness of the A horizons range from 8 to 12 inches)

Bt--10 to 15 inches; very dark brown (10YR 2/2) and black (10YR 2/1) clay; weak course subangular blocky structure; very firm, sticky, plastic; few fine roots; many pressure faces on ped surfaces; about 10 percent, by volume, volcanic fragments; few faint clay films on ped faces; neutral; clear smooth boundary. (4 to 6 inches thick)

Btss--15 to 23 inches; brown (10YR 4/3) clay; moderate coarse subangular blocky structure; very firm, sticky, plastic; few fine roots; many pressure faces on ped surfaces; common medium intersecting slickensides having polished and grooved surfaces; about 5 percent, by volume, volcanic fragments; few faint clay films on faces of peds; neutral; clear wavy boundary.

Bss--23 to 29 inches; brown (10YR 4/3) clay; weak medium subangular blocky structure; firm; slightly sticky, plastic; few fine roots; many coarse intersecting slickensides having polished and grooved surfaces; about 10 percent, by volume, pebbles; neutral; clear wavy boundary. (Total thickness of the Btss and Bss horizons range from 15 to 24 inches)

C1--29 to 38 inches; brown (10YR 4/3) clay loam; massive; firm, slightly sticky, plastic; about 10 percent, by volume, pebbles; slightly alkaline; gradual wavy boundary.

C2--38 to 50 inches; brown (10YR 4/3) sandy clay loam; massive; friable, nonsticky, slightly plastic; about 10 percent, by volume, pebbles; slightly alkaline; gradual wavy boundary.

2C--50 to 60 inches; brown (10YR 4/3) sandy loam; single grained; very friable; slightly alkaline.

TYPE LOCATION: Caribe SCD, Puerto Rico. Approximately 250 meters south of kilometer marker 15.8 of P.R. Highway 150.

RANGE IN CHARACTERISTICS: Thickness of the solum ranges from 23 to 36 inches. Reaction is neutral or slightly alkaline throughout.

The A or Ap horizon has hue of 10YR, value of 2 or 3, and chroma of 1 to 3. Texture is clay loam or clay.

The upper Bt horizon has hue of 10YR, value of 2 or 3, and chroma of 2 or 3. The lower Bt horizon includes value of 4. Content of fragments range from 0 to 10 percent, by volume. Texture is clay.

The Btss and/or Bss horizons have hue of 10YR, value of 4, and chroma of 3 or 4. Content of fragments range from 0 to 10 percent, by volume. Texture is clay.

The upper C horizons have hue of 10YR, value of 4 and chroma of 4 to 6. Texture is clay loam or sandy clay loam. The lower C horizons have hue of 10YR, value of 4 to 6, and chroma of 4 to 6. Texture is loamy sand or sandy loam. Content of pebbles range from 0 to 10 percent, by volume.

COMPETING SERIES: There are no known series in the same family.

GEOGRAPHIC SETTING: Llanos soils are on foot slopes and alluvial fans. They formed in fine and moderately fine textured sediments that weathered from basic volcanic rocks. The climate is tropical semiarid. Slopes range from 2 to 12 percent. The average annual rainfall ranges from 25 to 45 inches and the average annual temperature ranges from 78 to 80 degrees F.

GEOGRAPHICALLY ASSOCIATED SOILS: These include the Callabo and Jacana series. Callabo and Jacana soils are moderately deep and have mixed mineralogy. In addition, Callabo soils are on higher positions and Jacana soils are on similar positions.

DRAINAGE AND PERMEABILITY: Well drained; moderately slow permeability.

USE AND VEGETATION: Most areas are used for native pasture, cut grasses, tobacco, and subsistence crops. The vegetation consists of native and introduced grasses and shrubs.

DISTRIBUTION AND EXTENT: Semiarid areas of southern Puerto Rico. The series is of minor extent.

d. Flood Maps (FM)

(see Apendix 5. Flooding Zones Map)

The flooding map for the area shows that a small portion of the parcel is classified as a flood area with a determined base flood elevation.

e. Aerial photograph

(see Appendix 6. 2004 Aerial Photograph)

A 2004 aerial photograph shows "Río de la Mina" running north to southeast abutting the western property line. In addition an unnamed creek is running north to southeast in the center of the parcel. Moreover, the aerial photograph shows several residential developments abutting the northern, western and southern property line.

f. Environmental Sensitivity Index

The Environmental Sensitivity Index Map do not shows the presence of any threatened or endangered species for the proposed site or near this one (see Appendix 7. Environmental Sensitivity Index Map).

g. Flora and Fauna Study

The flora and fauna study performed by **USR** for the proposed development confirms that there is no wetland vegetation present on the parcel (Appendix 8. Flora and Fauna Study). The study identified 98 species of vegetation on the parcel, mainly leguminous vegetation (mostly ***Acacia farnesiana*** and ***Acacia retusa***), there is also present ***Tamarindus indica***, ***Hymenaea courbaril*** and ***Calotropis procera***; from these just 4 were

classified as wetland facultative species, these are: ***Fimbristylis dichomata, Leptochloa mucronata, Panicum laxum*** and ***Brugmansia suaveolens***. In summary 95.92% of the vegetation found on the parcel is considered upland vegetation.

5. FIELD GATHERED DATA

The information gathered was confirmed in the field through several walk through sessions. Since the vegetation found on the parcel is characteristic of upland areas, the soils are not considered hydric and no hydrology indicators were found outside of the unnamed creek, no detailed study was necessary.

6. CONCLUSION

No significant hydrophytic vegetation was identified in the study area and the parcel to be developed fails to meet the required hydrology and hydric soils wetland indicators therefore the parcel is considered upland (see Appendix 8. Study Determination). The jurisdictional waters of the unnamed creek will be protected by a mandatory conservation fringe of 5 meters to each side (see Appendix 9. Site Plan).

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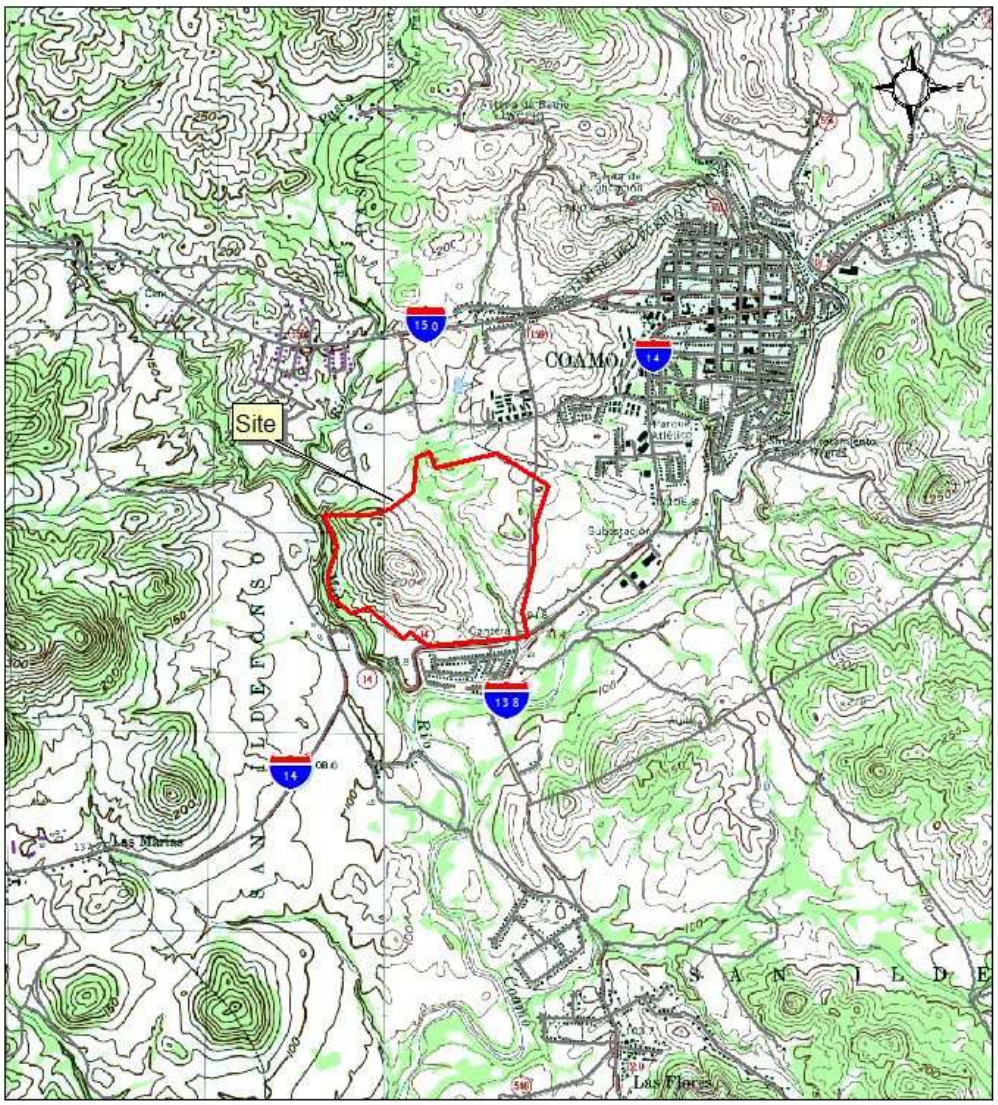
Appendix 1. Topographic Map

Golden Environmental Corp.

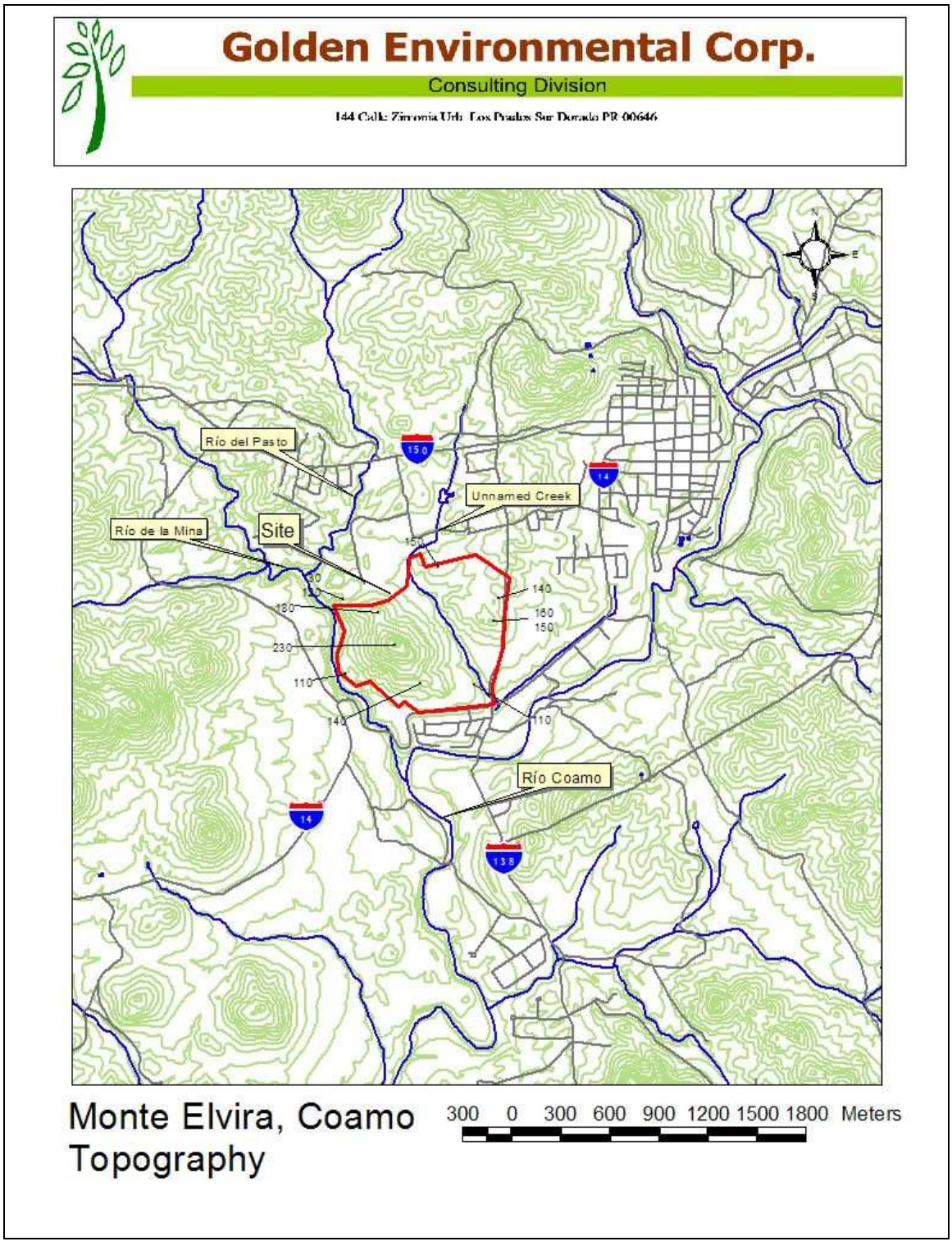
Consulting Division

144 Calle Zirconia Urb. Los Prados Sur Dorado PR 00646



Monte Elvira, Coamo
Location and Roads

Appendix 2. Topography

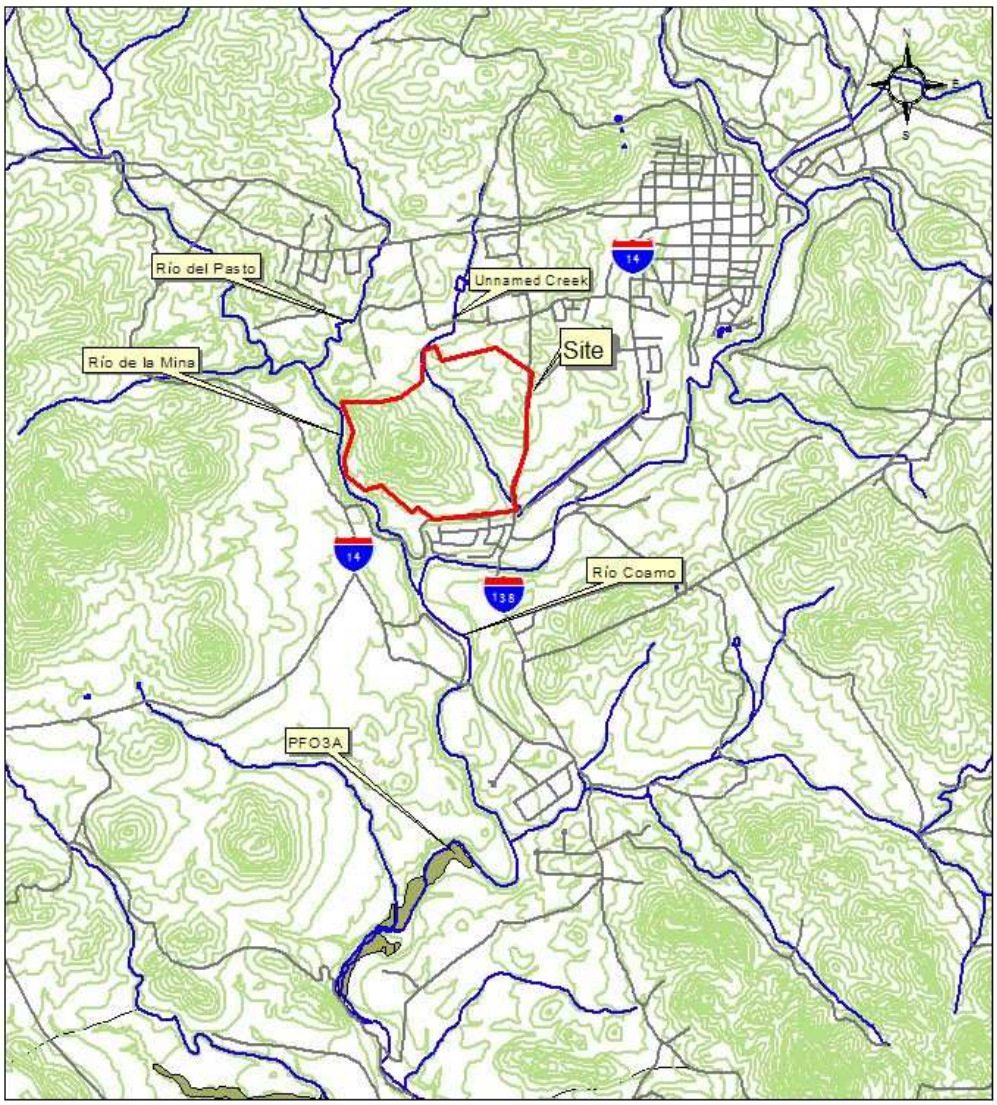


Appendix 3. NWI Map

Golden Environmental Corp.

Consulting Division

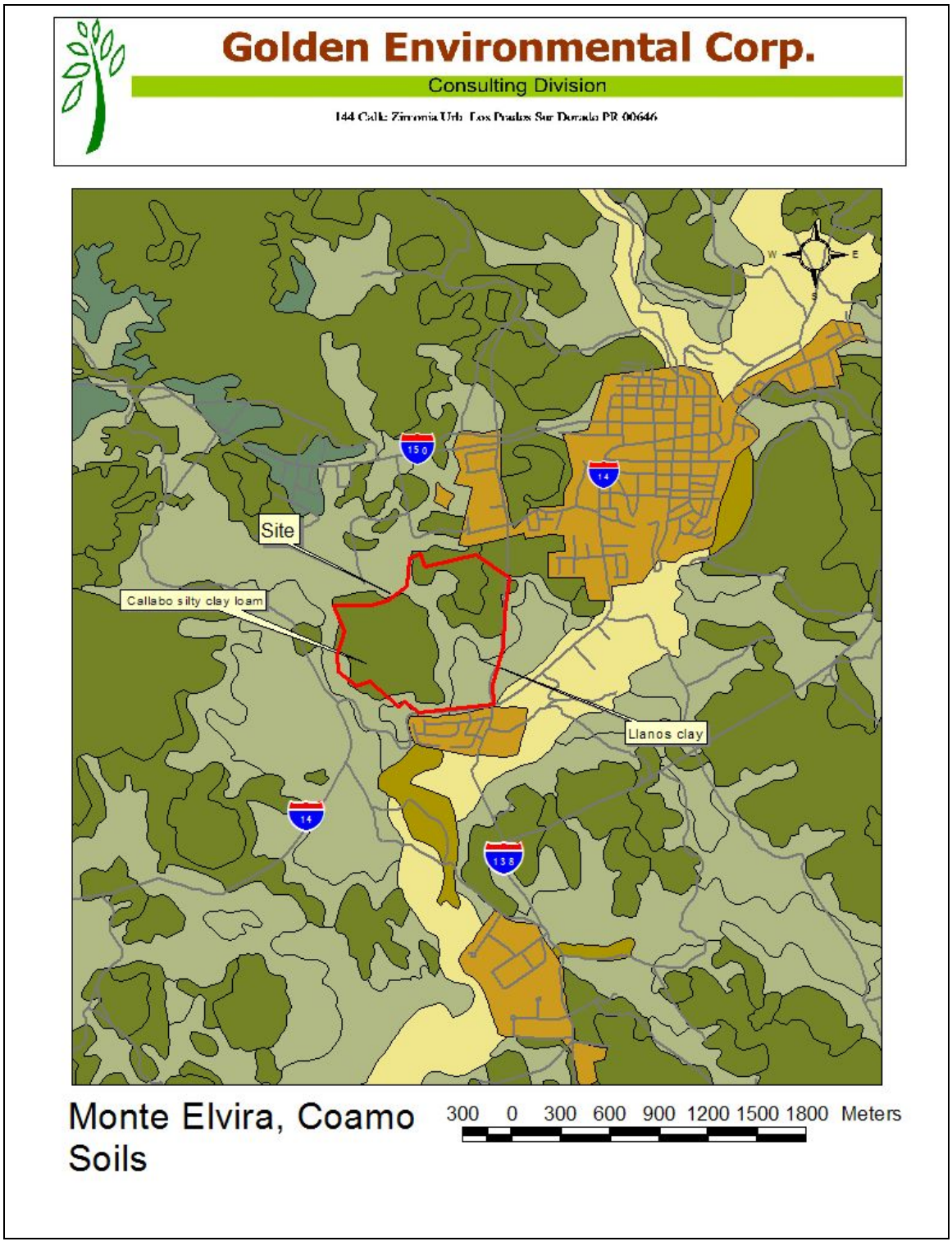
144 Calle Zirconia Urb. Los Prados Sur Dorado PR 00646



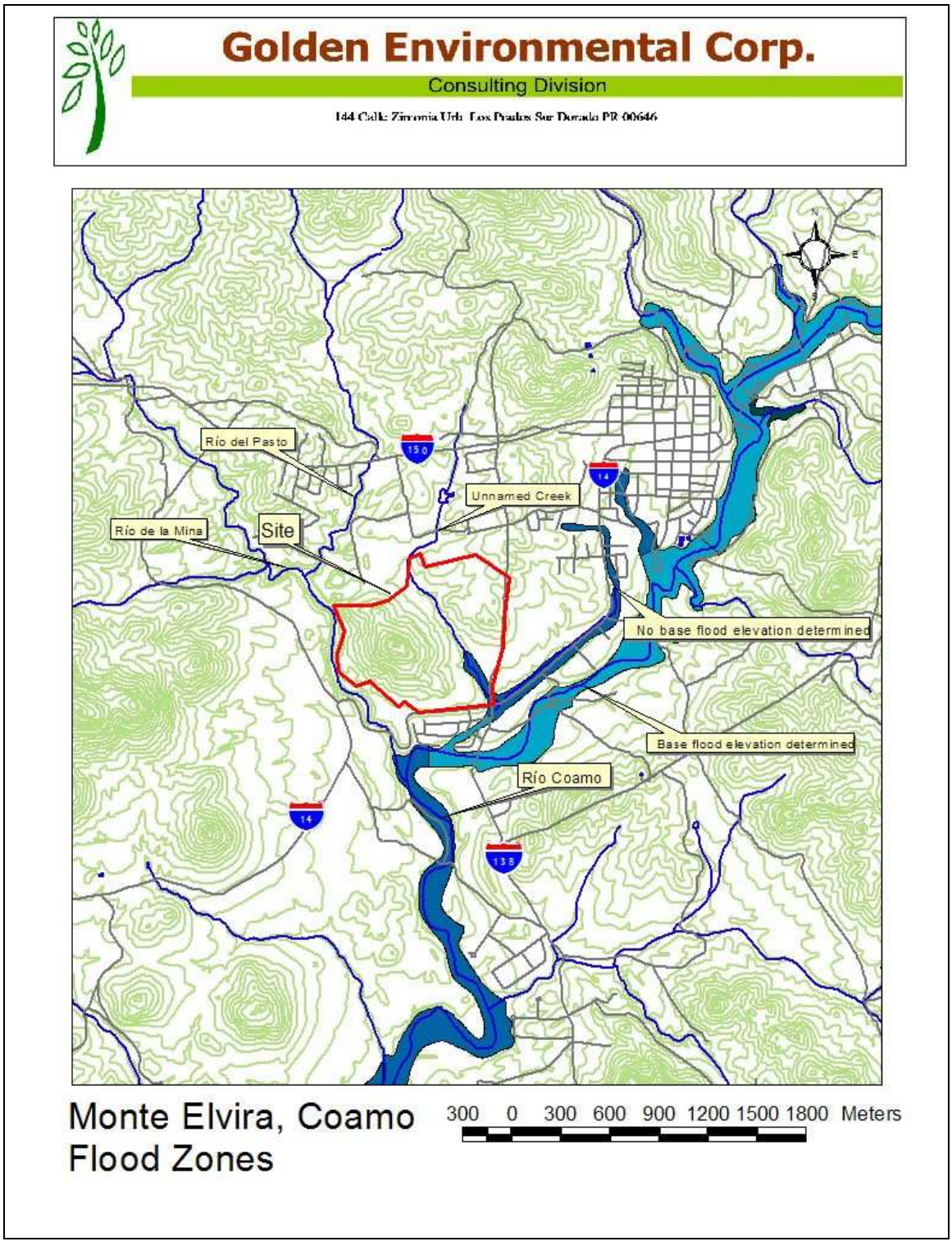
Monte Elvira, Coamo
NWI Map

400 0 400 800 1200 1600 2000 Meters

Appendix 4. USGS Soil Survey Map



Appendix 5. Flooding Zones Map



Appendix 6. 2004 Aerial Photograph

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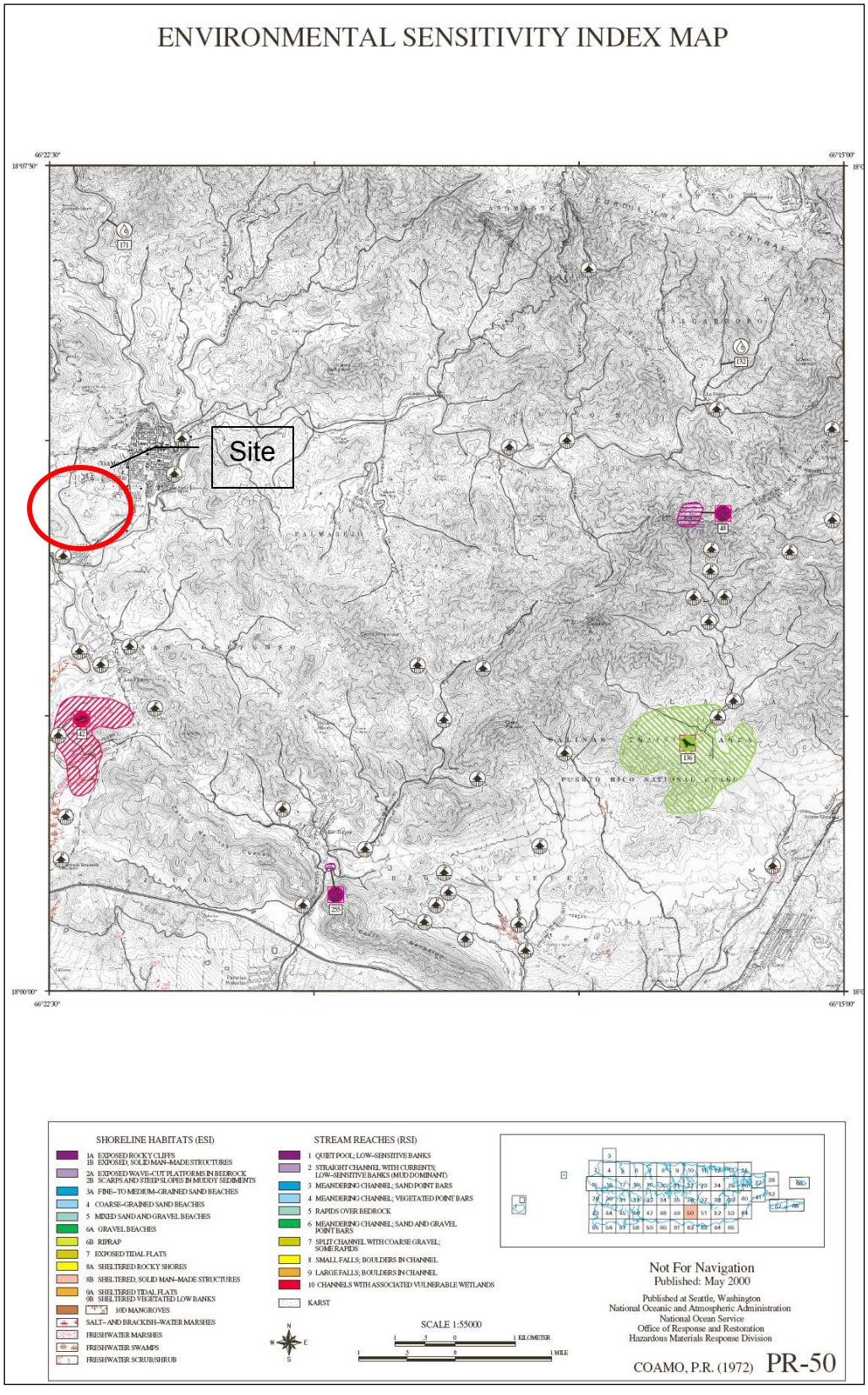
Consulting Division

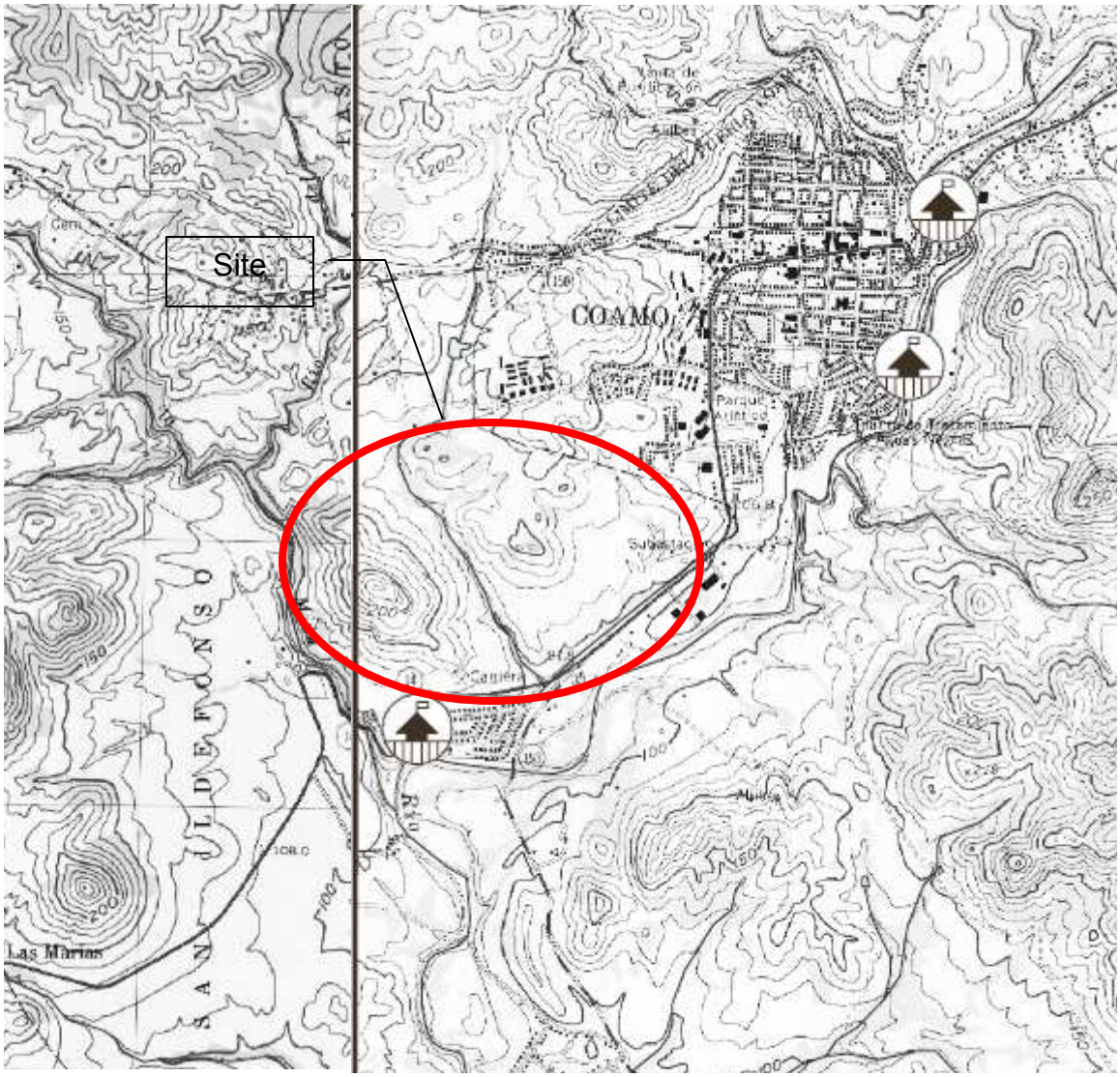
144 Calle Zirconia Urb. Los Prados Sur Dorado PR 00646

Monte Elvira, Coamo
Aerial Photograph

ACT, May 2004

Appendix 7. Environmental Sensitivity Index Map




Site
COAMO
SAN ILDEFONSO
Las Marías

PUERTO RICO - ESIMAP 50

BIOLOGICAL RESOURCES:

BIRD:

RAR#	Species	S/F	T/E	Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Nesting
136	Puerto Rican plain pigeon	S/F	E/E		X	X	X	X	X	X	X	X	X	X	X	X	FEB-JUN

PLANT:

RAR#	Species	S/F	T/E	Conc.	J	F	M	A	M	J	J	A	S	O	N	D
48	Zanthoxylum thomasianum	S/F	E/E		X	X	X	X	X	X	X	X	X	X	X	X
255	Solanum drymophilum	S/F	E/E		X	X	X	X	X	X	X	X	X	X	X	X

REPTILE:

RAR#	Species	S/F	T/E	Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Nesting	Hatching	Internesting	Juveniles	Adults
42	Puerto Rican crested toad	S/F	T/T		X	X	X	X	X	X	X	X	X	X	X	X	MAY-DEC	MAY-DEC	-	MAY-JAN	JAN-DEC

HUMAN USE RESOURCES:

WATER INTAKE:

HUN#	Name	Owner/Manager	Location	Phone
132	ALGARROBO AIBONITO CHLORINATION PLANT	PRASA		
171	COAMO FILTER PLANT	PRASA		

Biological information shown on the maps represents known concentration areas or occurrences, but does not necessarily represent the full distribution or range of each species. This is particularly important to recognize when considering potential impacts to protected species.

Appendix 8. Flora and Fauna Study

TABLA 1
FLORA

Familia	Nombre Científico	Nombre Común
AMARANTHACEAE	*Amaranthus dubius*	Bledo
ANACARDIACEAE	*Mangifera indica* FAC-	Mangó
ARALIACEAE	*Brassaia actinophylla*	Schefflera
ASCLEPIADACEAE	*Asclepias curassavica* FACU+	Algodoncillo
	Calotropis procera	Algodón de seda
BIGNONIACEAE	*Spathodea campanulata* FACU	Tulipán africano
	Tabebuia haemantha *	Roble bobo
	Tecoma stans	Roble amarillo
BOMBACEAE	*Ceiba pentandra*	Ceiba
BORAGINACEAE	*Cordia laevigata* NI	Capá colorado
BROMELIACEAE	*Tillandsia recurvata*	Nidos de gungulén
BURSERACEAE	*Bursera simaruba*	Almácigo
CACTACEAE	*Pilosocereus royenii*	Sebucán
CAPPARACEAE	*Cleome viscosa*	---
CARICACEAE	*Carica papaya*	Lechosa
COMBRETACEAE	*Terminalia catappa* FAC-	Almendra
COMMELINACEAE	*Commelina diffusa* FAC	Cohitre azul
COMPOSITAE	*Bidens alba*	Margarita
	Emilia fosbergii	Clavelillo colorado
	Melanthera aspera var. glabriscula FAC	Cariaquillo blanco
CONVOLVULACEAE	*Ipomoea triloba*	Bejuco de puerco
	Jacquemontia tamnifolia	Aguinaldo peludo
	Merremia quinquefolia	Batatilla blanca
	Merremia umbellata	Aguinaldo amarillo
CUCURBITACEAE	*Cucumis anguria*	Cohombro
	Momordica charantia FAC	Cundeamor
CYPERACEAE	*Cyperus alternifolius*	Paraguita
	Fimbristylis dichotoma FACW	Junquito
	Rhynchospora nervosa	Botoncillo
EUPHORBIACEAE	*Argythamnia candicans*	---
	Chamaesyce hypericifolia FAC	Yerba niña
	Codiaeum variegatum	Crotón de jardín
	Comocladia dodonea	Chicharrón
	Euphorbia heterophylla FAC	Leche vana
	Jatropha gossypifolia	Tuatúa
FLACOURTIACEAE	*Casearia arborea* FAC	Cabrilla
	Casearia guianensis FAC	Cafeíllo
LAURACEAE	*Persea americana*	Aguacate
LEGUMINOSAE		

Familia	Nombre Científico	Nombre Común
CAESALPINIOIDEAE	*Cassia javanica*	Acasia rosada
	Delonix regia	Flamboyán rojo
	Hymenaea courbaril — FACU	Algarroba
	Tamarindus indica	Tamarindo
MIMOSOIDEAE	*Acacia farnesiana* — NI	Aroma
	Acacia retusa	Zarza
	Albizia procera	Albicia
	Leucaena glauca	Zarcilla
	Leucaena leucocephala — FAC	Acacia
	Mimosa pudica — FAC	Morivivi
	Pithecellobium dulce - FAC-	Guamá americano
PAPILIONOIDEAE	*Centrosema virginiannum* — UPL	Conchita de Virginia
	Crotalaria retusa	Cascabelillo
	Desmodium tortuosum	Cadillo
	Gliricidia sepium	Mata ratón
	Macroptilium lathyroides — FACU	Habichuela parada
	Pictetia aculeata	Tachuelo
	Stizolobium pruriens	Pica-pica
	Vigna luteola FAC+	Frijol silvestre
MALVACEAE	*Gossypium barbadense* FACU	Algodón del país
	Sida acuta	Escoba blanca
	Urena lobata FAC	Cadillo
MELIACEAE	*Swietenia mahagoni*	Caoba dominicana
MORACEAE	*Artocarpus altilis*	Panapén
	Ficus benjamina	Laurel benjamín
MUSACEAE	*Heliconia psittacorum*	---
	Musa sapientum	Guineo
NYCTAGINACEAE	*Boerhavia scandens*	Pegapollo
	Bouganvillea glabra	Trinitaria
	Pisonia albida	Corcho
OLEACEAE	*Jasminum fluminense*	Jasmín de canario
OXALIDACEAE	*Oxalis debilis*	Vinagrillo morado
PAPAVERACEAE	*Argemona mexicana*	Cardo santo
PALMAE	*Cocos nucifera* FACU	Coco
	Chrysalidocarpus lutescens	Areca
	Roystonea borinquena FAC	Palma real
	Veitchia merrilli	Palma de adonidia
POACEAE	*Brachiaria purpurascens*	Malojillo
	Chloris inflata	Horquetilla morada
	Eleusine indica FAC	Yerba de ganso
	Leptochloa mucronata FACW	Yerba de hilo

Familia	Nombre Científico	Nombre Común
	Panicum laxum FACW	Malojillo de monte
	Tricholaena repens	Yerba rosada
	Urochloa maxima	Yerba de guinea
POLYGONACEAE	*Coccoloba uvifera* FACU	Uva de playa *
POLYPODIACEAE	*Nephrolepis biserrata*	(Helecho Cola de pescado)
RUBIACEAE	*Ixora coccinea*	Cruz de Malta
	Randia aculeata FAC	Escambrón
	Spermacoce verticillata	Botón blanco
SAPOTACEAE	*Chrysophyllum pauciflorum*	Caimito de perro
SOLANACEAE	*Brugmansia suaveolens* FACW	Campana
	Solanum americanum FAC	Mata gallina
STERCULIACEAE	*Guazuma ulmifolia*	Guácima
	Melochia tomentosa	Bretónica afelpada
	Waltheria indica	Malvavisco
TILIACEAE	*Triumfetta semitriloba* FAC	Cadillo de perro
VERBENACEAE	*Citharexylum fruticosum*	Péndula
	Lantana camara var. camara	Cariaquillo
	Lippia micromera FACU-	Orégano
	Priva lappulacea	Pegapega
VISCACEAE	*Phoradendron anceps*	Pata de gallina
VITACEAE	*Cissus verticillata* FAC	Bejuco de caro
ZYGOPHYLLACEAE	*Tribulus cistoides*	Abrojo

Nota:

* Endémico

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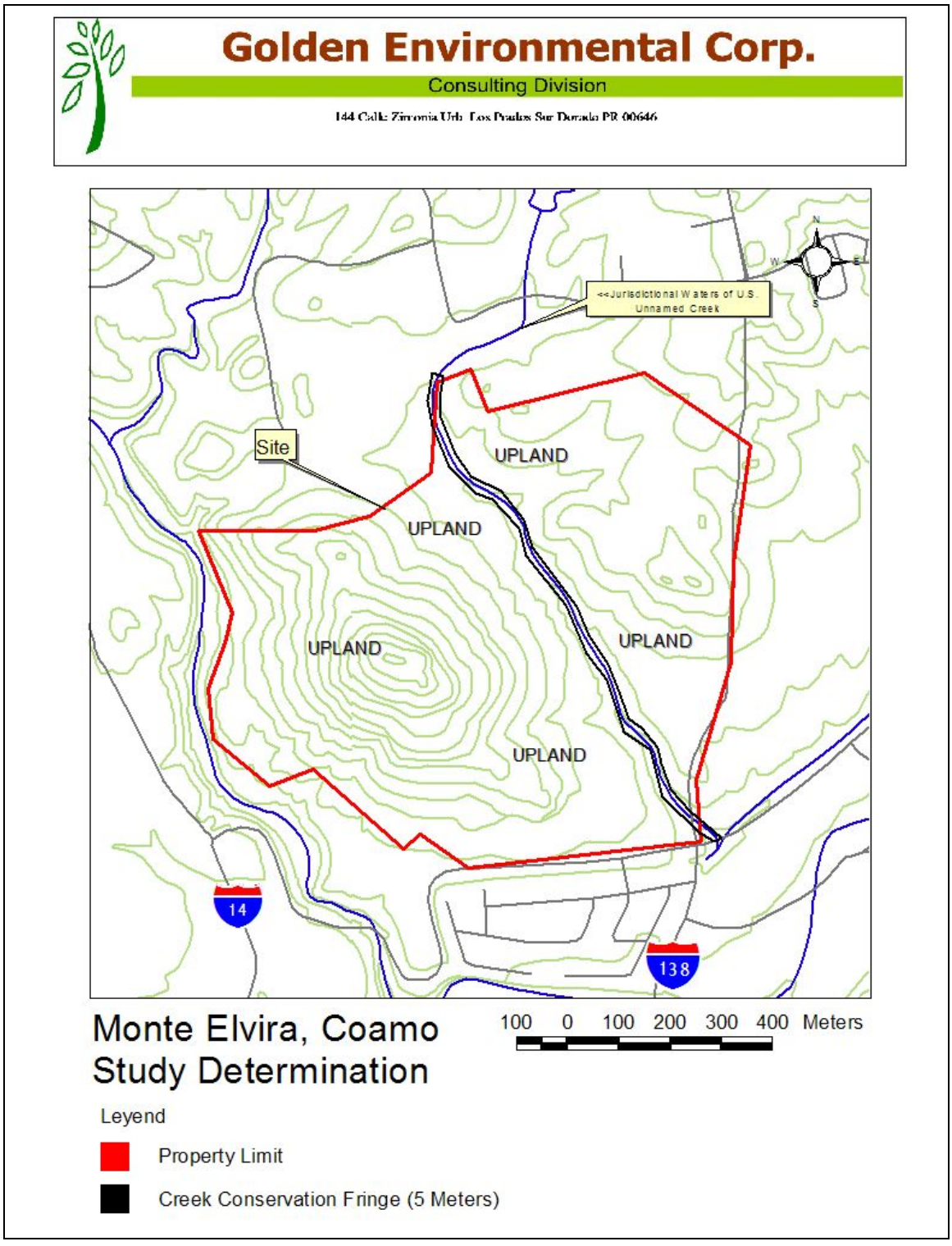
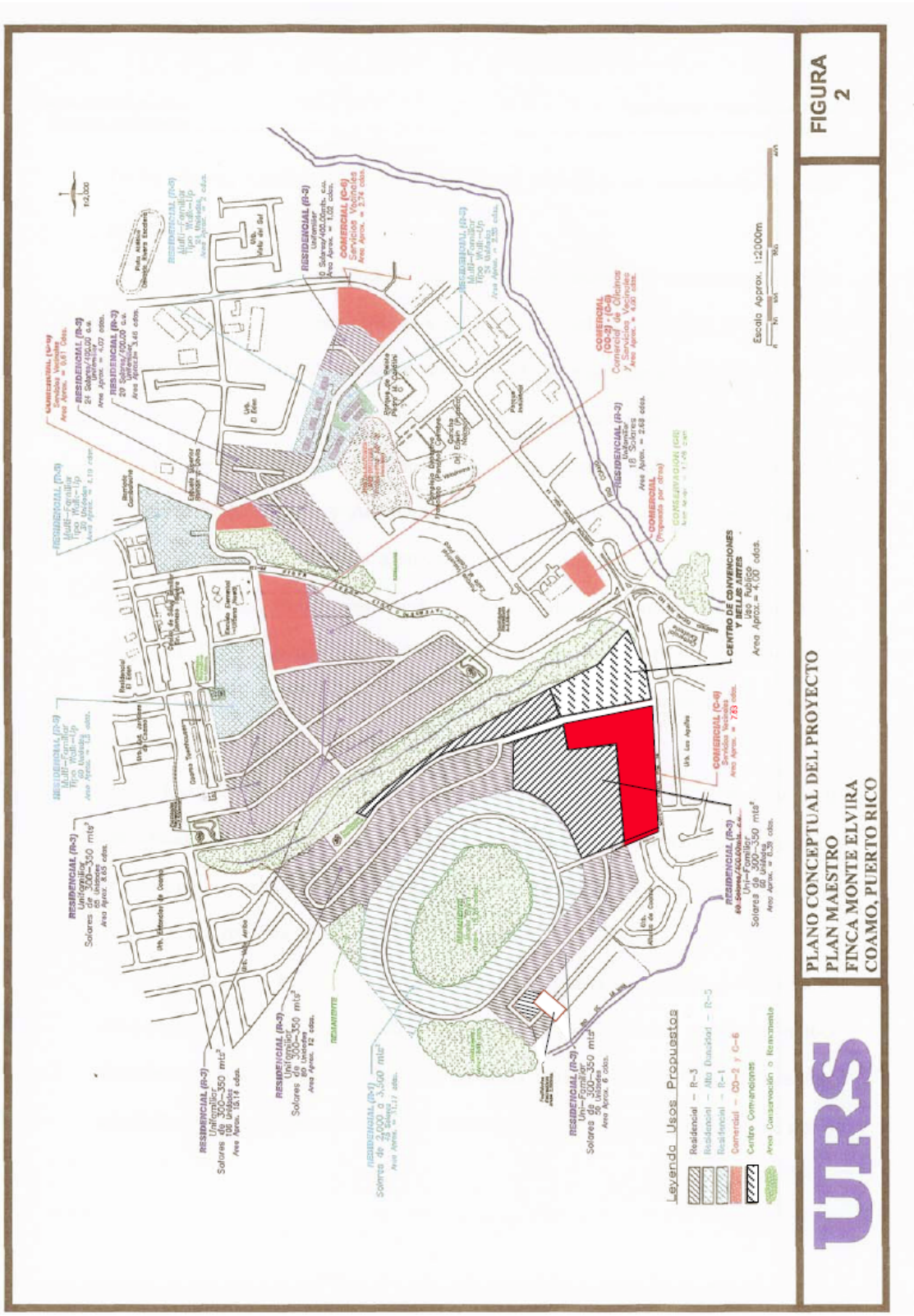
Appendix 9. Study Determination



Appendix 10. Site Plan



Appendix 11. Data Form