PURPOSE:
WETLAND DELINEATION

CMA No. 05201 1:5,000

HISTORICAL AERIAL PHOTO
AUGUST 2006

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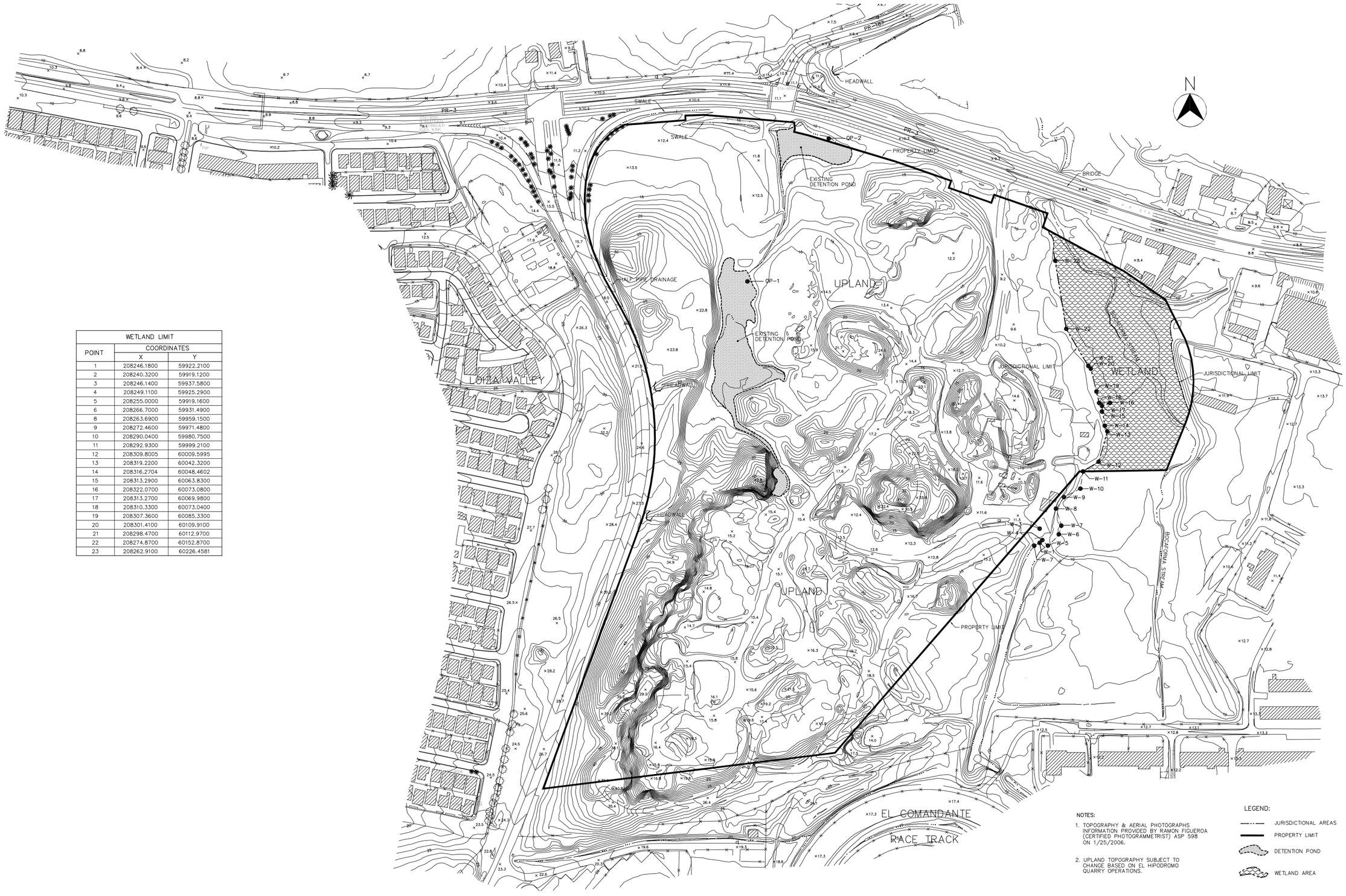
PROJECT:
EL NUEVO COMANDANTE

CANOVANAS PUERTO RICO
FIGURE 16 OCT 2, 2006

3.0 CONCLUSIONS AND RECOMMENDATIONS

The vegetation, soil and hydrology obtained from the published data and during the site visits to the studied area meet the three wetland criteria required by the U.S. Corps of Engineers (USCOE) to declare an area as a wetland in those areas delineated as wetlands. The areas delineated as uplands do not meet the three-wetland criteria. The wetland area was delineated by the lower elevation. This wetland area comprises 5.5 acres approximately. The surrounding upland areas are higher and well defined on the eastern and southern part by the unvegetated area.

The boring locations and wetland boundaries were located using a photogrammetry survey prepared by surveyor Ramón Figueroa. Enclosed please find the Wetland Delineation Plan W-1.



WETLAND LIMIT		
POINT	COORDINATES	
	X	Y
1	208246.1800	59922.2100
2	208240.3200	59919.1200
3	208246.1400	59937.5800
4	208249.1100	59925.2900
5	208255.0000	59919.1600
6	208266.7000	59931.4900
8	208263.6900	59959.1500
9	208272.4600	59971.4800
10	208290.0400	59980.7500
11	208292.9300	59999.2100
12	208309.8005	60009.5995
13	208319.2200	60042.3200
14	208316.2704	60048.4602
15	208313.2900	60063.8300
16	208322.0700	60073.0800
17	208313.2700	60069.9800
18	208310.3300	60073.0400
19	208307.3600	60085.3300
20	208301.4100	60109.9100
21	208298.4700	60112.9700
22	208274.8700	60152.8700
23	208262.9100	60226.4581

NOTES:

1. TOPOGRAPHY & AERIAL PHOTOGRAPHS INFORMATION PROVIDED BY RAMON FIGUEROA (CERTIFIED PHOTOGRAMMETRIST) ASP 598 ON 1/25/2006.

2. UPLAND TOPOGRAPHY SUBJECT TO CHANGE BASED ON EL HIPODROMO QUARRY OPERATIONS.

LEGEND:

- JURISDICTIONAL AREAS
- PROPERTY LIMIT
- DETENTION POND
- WETLAND AREA

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EL NUEVO COMANDANTE

QUARRY SITE

CANOVANAS PUERTO RICO

DATE	REVISIONS	BY	DATE	REVISIONS	BY	DATE	REVISIONS	BY

Job No.	05201
SCALE	1:1,500
DATE	09/05/06
DRAWN BY	M.GOMEZ
CHECKED BY	J.A.S.

WETLAND DELINEATION PLAN

TITLE

WD-1

REVISION No. 0

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

Project/Site:	El Nuevo Comandante	Date:	April 20, 2006
Applicant/Owner:	Land Development Associates	County:	Canóvanas
Investigator:	CMA Architects & Engineers LLP	State:	PR
Do Normal Circumstances exist on the site?	☒Yes ☐No	Community ID:	
Is the site significantly disturbed (Atypical Situation)?	☐Yes ☒No	Transect ID:	
Is the area a potential Problem Area?	☐Yes ☒No	Plot ID:	OP-1
(If needed, explain on reverse.)			

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Sesbania sericea	HERB	FACW	9.		
2. Urochloa maxima	HERB	UPL	10.		
3. Paspalum fasciculatum	HERB	FACW	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100

Remarks: The observation point was located on toe of slope of the detention pond or settling basin.This pond was created by excavating from dry land and used exclusively as a settling basins, or detention pond.

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0 (in.)

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

Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

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

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

Remarks:

SOILS

Map Unit Name
(Series and Phase): Caguabo Series (CbF2) Caguabo Clay Loam

Drainage Class: Well drained

Field Observations Confirm Mapped Type? ☐Yes ☐ No

Taxonomy (Subgroup): Lithic Eutrudepts

Profile Descriptions:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc,
0-2		10YR 4/3			sandy
2-10		3/10Y & 4/N		distinct	sandy
10 -					rock, hard

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: This pond was created by excavating from dry land and used exclusively as a settling basins, or detention pond. the hydric soils indicators were observed due to the function of the pond.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? ☒Yes ☐No (Check)
Wetland Hydrology Present? ☒Yes ☐No
Hydric Soils Present? ☒Yes ☐No

(Check)
Is this Sampling Point Within a Wetland? ☐Yes ☒No

Remarks This pond was created by excavating from dry land and used exclusively as a settling basins, or detention pond.The upland area do not show hydric soils. The hydrology comes primarily from stormwater runoff during rain events.

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

Project/Site:	El Nuevo Comandante	Date:	September 21, 2006
Applicant/Owner:	Land Development Associates	County:	Canóvanas
Investigator:	CMA Architects & Engineers LLP	State:	PR
Do Normal Circumstances exist on the site?	☒Yes ☐No	Community ID:	
Is the site significantly disturbed (Atypical Situation)?	☐Yes ☒No	Transect ID:	
Is the area a potential Problem Area? (If needed, explain on reverse.)	☐Yes ☒No	Plot ID:	OP-2

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Brachiaria purpurascens	HERB	FACW	9.		
2. Urochloa maxima	HERB	UPL	10.		
3. Paspalum fasciculatum	HERB	FACW	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100

Remarks: The B. purpurascens covers the area. The information of this observation point is located at the bottom of the detention pond.

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0 (in.)

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

Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

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

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

Remarks: The information of this observation point is located at the bottom of the detention pond.

SOILS

Map Unit Name
(Series and Phase): Caguabo Series (CbF2) Caguabo Clay Loam

Drainage Class: well drained

Field Observations
Confirm Mapped Type? ☐Yes ☐ No

Taxonomy (Subgroup): Lithic Eutrudepts

Profile Descriptions:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc,
0-6		10YR 3/3			sandy
6-14		10YR 3/3	2.5Y5/2	distinct	sandy, clay

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: This pond was created by excavating from dry land and used exclusively as a settling basins, or detention pond. The upland area do not show hydric soils.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	☒Yes	☐No	(Check)
Wetland Hydrology Present?	☐Yes	☒No	
Hydric Soils Present?	☐Yes	☒No	

(Check)

Is this Sampling Point Within a Wetland? ☐Yes ☒No

Remarks This pond was created by excavating from dry land and used exclusively as a settling basins, or detention pond. The upland area do not show hydric soils.

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

Project/Site:	El Nuevo Comandante	Date:	April 12, 2006
Applicant/Owner:	Land Development Associates	County:	Canóvanas
Investigator:	CMA Architects & Engineers LLP	State:	PR
Do Normal Circumstances exist on the site?	☒Yes ☐No	Community ID:	
Is the site significantly disturbed (Atypical Situation)?	☐Yes ☒No	Transect ID:	
Is the area a potential Problem Area? (If needed, explain on reverse.)	☐Yes ☒No	Plot ID:	W-1@ 13

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Brachiaria purpurascens	HERB	FACW	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

Remarks: The wetland limit was located on toe of slope. The B. purpurascens covers wetland and upland areas. The information of this observation point is located approximately 1 - 2 meters from the limit.

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0 (in.)

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

Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

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

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

Remarks:

SOILS

Map Unit Name
(Series and Phase): Mabí Series (MaB, MaD2) Mabí Clay

Drainage Class: Somewhat poorly drained

Field Observations
Confirm Mapped Type? ☐Yes ☐ No

Taxonomy (Subgroup): Aquic Hapluderts

Profile Descriptions:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc,
0-6		2.5Y4/2			clay
6-16		2.5Y4/2	10Y3/1 & N4/0	distinct	clay

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: The point is located at the limit of the wetland and the upland area (at the toe of slope). The wetland area shows some hydric soil conditions. The upland area do not show hydric soils.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? ☒Yes ☐No (Check)
Wetland Hydrology Present? ☒Yes ☐No
Hydric Soils Present? ☒Yes ☐No

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

Remarks The point is located at the limit of the wetland and the upland area (at the toe of slope). The wetland area shows some hydric soil conditions. The upland area do not show hydric soils.

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

Project/Site:	El Nuevo Comandante	Date:	April 20, 2006
Applicant/Owner:	Land Development Associates	County:	Canóvanas
Investigator:	CMA Architects & Engineers LLP	State:	PR
Do Normal Circumstances exist on the site?	☒Yes ☐No	Community ID:	
Is the site significantly disturbed (Atypical Situation)?	☐Yes ☒No	Transect ID:	
Is the area a potential Problem Area?	☐Yes ☒No	Plot ID:	W-14 @ 22
(If needed, explain on reverse.)			

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Brachiaria purpurascens	HERB	FACW	9.		
2. Mimosa casta	HERB	FACW	10.		
3. Ipomoea tiliacea	HERB	FACW	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100

Remarks: The wetland limit was located on toe of slope. The B. purpurascens covers wetland and upland areas. The information of this observation point is located approximately 1 - 2 meters from the limit.

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0 (in.)

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

Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

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

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

Remarks:

SOILS

Map Unit Name
(Series and Phase): Mabí Series (MaB, MaD2) Mabí Clay

Drainage Class: Somewhat poorly drained

Field Observations
Confirm Mapped Type? ☐Yes ☐ No

Taxonomy (Subgroup): Aquic Hapluderts

Profile Descriptions:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc,
0-6		2.5Y4/2			clay
6-16		4/N	10Y3/1 & 4/N	distinct	clay

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: The point is located at the limit of the wetland and the upland area (at the toe of slope). The wetland area shows some hydric soil conditions. The upland area do not show hydric soils.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? ☒Yes ☐No (Check)
Wetland Hydrology Present? ☒Yes ☐No
Hydric Soils Present? ☒Yes ☐No

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

Remarks The point is located at the limit of the wetland and the upland area (at the toe of slope). The wetland area shows some hydric soil conditions. The upland area do not show hydric soils.

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

Project/Site:	El Nuevo Comandante	Date:	April 20, 2006
Applicant/Owner:	Land Development Associates	County:	Canóvanas
Investigator:	CMA Architects & Engineers LLP	State:	PR
Do Normal Circumstances exist on the site?	☒Yes ☐No	Community ID:	
Is the site significantly disturbed (Atypical Situation)?	☐Yes ☒No	Transect ID:	
Is the area a potential Problem Area? (If needed, explain on reverse.)	☐Yes ☒No	Plot ID:	W-23

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Brachiaria purpurascens	HERB	FACW	9.		
2. Mimosa casta	HERB	FACW	10.		
3. Ipomoea tiliacea	HERB	FACW	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100

Remarks: The wetland limit was located on toe of slope. The B. purpurascens covers wetland and upland areas. The information of this observation point is located approximately 1 - 2 meters from the limit.

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0 (in.)

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

Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

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

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

Remarks:

SOILS

Map Unit Name
(Series and Phase): Mabí Series (MaB, MaD2) Mabí Clay

Drainage Class: Somewhat poorly drained

Field Observations
Confirm Mapped Type? ☐Yes ☐ No

Taxonomy (Subgroup): Aquic Hapluderts

Profile Descriptions:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc,
0-6		10YR 3/2			clay
6-16		10YR 3/2	10YR5/6	distinct	clay
			4/N	distinct	clay
			2.5Y5/4	distinct	clay
			2.5Y4/4	distinct	clay

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: The point is located at the limit of the wetland and the upland area (at the toe of slope). The wetland area shows some hydric soil conditions. The upland area do not show hydric soils.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? ☒Yes ☐No (Check)
Wetland Hydrology Present? ☒Yes ☐No
Hydric Soils Present? ☒Yes ☐No

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

Remarks The point is located at the limit of the wetland and the upland area (at the toe of slope). The wetland area shows some hydric soil conditions. The upland area do not show hydric soils.

4.0 BIBLIOGRAPHY

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