BRADY CANAL HYDROLOGIC RESTORATION PTE-26B

Candidate Project for the Third Priority List of the

Coastal Wetlands Planning, Protection and Restoration Act

Project Information Sheet
for
Wetland Value Assessment

Proposed by:

Soil Conservation Service

COPY

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COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

Proposed Project Information Sheet

Project Name: Brady Canal Hydrologic Restoration PTE-26B
Submitted by: Soil Conservation Service
Project Area: 7653 acres
Marsh Type: Fresh/Intermediate

Project Features

Install three 60-inch diameter one-way flapgated structures at the existi Brady Canal structure at the confluence with Bayou Penchant. 9,650 feet bank along Brady Canal, Bayou Little Carencro, and Voss Canal will be modified to allow overbank flow into the project area. Rock weirs will b installed at four locations along the banks of the above-noted watercours to increase freshwater introduction into the project area. A one-way flapgated structure will be installed at the end of an oil field access canal originating from Bayou Penchant and terminating in the center of th area. Along the downstream boundary of the area, 21,513 feet of banks along Superior Canal, Bayou DeCade, and Turtle Bayou will be maintained a three existing outlets will be sized and armored with rock to accommodate oil field navigation and/or tidal exchange.

V_1 Emergent Vegetation

Present Conditions

1. Acres of vegetated marsh and listing of most common plant species.

5222 acres (68%) based on LDNR 1990 GIS data. June 1993 field investigations indicate that approximately 44% of the area is vegetat marsh since the passage of Hurricane Andrew.

Bulltongue	*Sagittaria lancifolia*
Marshhay Cordgrass	*Spartina patens*
Olney Bulrush	*Scirpus olneyi*
Spikerush	*Eleocharis* sp.
Pennywort	*Hydrocotyle* sp.

2. Brief summary of significant historical hydrological changes.

Significant hydrological changes include:
1) Subsidence and erosion of the Bayou DeCade shoreline.
2) Subsidence and erosion of the Mauvais Bois Ridge.
3) Construction of oilfield canals.

The natural levee ridge of Bayou DeCade has eroded to below marsh level over several thousand feet along the southern project boundary. This has provided a direct hydrological connection to higher salinity waters from the south and protection from storm surges and tidal scouring has been lost. Oilfield canals from Bayou DeCade have also increased the tidal exchange and provided direct routes for saltwater intrusion. Subsidence of the

Mauvais Bois ridge, which protected fragile, flotants to the north, has now exposed this area to daily tidal exchange. These processes have eroded fragile areas of flotant marsh and created an open, bay-like system with small "islands" of marsh across the southern half of the project area. Benefits from freshwater and sediments from the north are lost because of the rapid water exchange rates. This rapid deterioration will continue on a northward trend through fresh, flotant marshes.

3. **Historical information on marsh loss trends.**

Time Period	Average % Land Loss (Britsch, COE)
1932-58	0.25
1958-74	0.948
1974-83	0.286
1983-90	0.564

4. **Shoreline erosion rate (provide reference if available).**

Not applicable. This area is an interior marsh.

5. **Estimated subsidence rate (provide references if available).**

USACE Tide Gage Results

1.06 cm/yr (corrected for Gulf of Mexico sea level rise)

(Penland et al. 1989)

Future Conditions

1. **Acres of emergent marsh predicted to be gained/lost without the project.**

TY 0: 7653 acres total, 5222 (68%) acres marsh, 2431 (32%) acres open water.
TY 1: 29 acres lost, leaving 5193 (68%) acres marsh
TY 20: 589 acres lost, leaving 4633 (60%) acres marsh

Assuming marsh loss continues at 1983-90 rate of 0.564% per year.
5222 ac X .00564 X 20 yr = **-589 acres over project life**

2. **Acres of emergent marsh predicted to be gained/lost with the project.**

TY 1: 6 acres lost, leaving 5216 (68%) acres marsh
TY 20: 115 acres lost, leaving 5107 (67%) acres marsh

Assuming land loss reduced by 70% to 0.169% per year
5222 ac X .00169 X 20 = **-176 acres**

Assuming 10% of shallow open water will be revegetated.
(2431 ac. open water X .25 shallow open water) = 608 ac.
608 ac. X .10 = **61 ac of emergent marsh**
Future Land Loss: **-115 acres over project life**

3. **Predicted plant species composition of marsh <u>without</u> project.**

Plant communities are expected to shift to more salt-tolerant vegetation dominated by *Spartina patens* and *Scirpus olneyi*. As salinity and tidal energy increase, areas of flotant marsh may be unable to shift to a community which is more tolerant of the rapidly changing conditions. These areas will likely revert to open water.

4. **Predicted plant species compostion of marsh <u>with</u> project.**

Plant communities are expected to diversify with an increase in vegetation typical of intermediate marsh. Colonization of mudflats and shallow-water areas will occur through improved hydrologic conditions. Expected plant communities are:

Bulltongue	*Sagittaria lancifolia*
Marshhay Cordgrass	*Spartina patens*
Cattail	*Typha* sp.
Walter's Millet	*Echinochloa walteri*
Roseau	*Phragmites australis*
Olney Bulrush	*Scirpus olneyi*
Spikerush	*Eleocharis* sp.
Pennywort	*Hydrocotyle* sp.

V_2 Aquatic Vegetation

1. **Acres of open water.**

2431 acres (32%) based on 1990 (LDNR GIS data). June 1993 field investigations indicate that considerably more (56%) of the area is open water since the passage of Hurricane Andrew.

2. **Percent of open water area (listed in Item 1) dominated (greater than 50% canopy coverage) by aquatic plants .**

June 1993 field investigations indicate that **50%** (1216 ac) of the 2431 acres of open water is dominated by aquatic plants. Most of the protected ponds and open water in the northern half of the project area are dominated by *Eichhornia crassipes* or *Salvinia rotundifolia*. These two species are of minimal value to wildlife and have shaded out more desirable submerged vegetation. Most of the open water in the southern half of the project area is dominated by *Myriophyllum spicatum*. Some open water bodies do contain stands of the following:

Najas quadalupensis	Southern naiad
Myriophyllum spicatum	Eurasian watermilfoil
Utricularia sp.	Bladderwort
Potamogeton pectinatus	Sago pondweed
Hydrilla verticillata	Hydrilla

3. **Acres of open water aquatic vegetation predicted to be gained/lost <u>without</u> the project.**

30% of the open water would be dominated by aquatics. Salinity increases and tidal scour would continue to reduce aquatic plant populations.

4. **Acres of open water aquatic vegetation predicted to be gained/lost <u>with</u> the project.**

65% of the open water would be dominated by aquatics. Greater freshwater retention and reduced tidal energy would allow SAV populations to expand.

V_3 Interspersion

Existing	Without Project	With Project
20% - Class 1	15% - Class 1	20% - Class 1
35% - Class 2	15% - Class 2	40% - Class 2
30% - Class 3	20% - Class 3	30% - Class 3
15% - Class 4	50% - Class 4	10% - Class 4

V_4 Water Depth

1. **Percent of open water area ≤ 1.5 feet in depth relative to marsh.**

25%. Based on June 1993 field investigations.

2. **Estimate of open water area ≤ 1.5 feet <u>without</u> project.**

Rapid water exchange rates and increased tidal scouring would deepen existing shallow-water areas and increase soil erosion. Areas ≤ 1.5 feet deep are predicted to be only **15%** of the entire open water area.

3. **Estimate of open water area ≤ 1.5 feet <u>with</u> project.**

The proposed hydrologic changes will allow greater freshwater retention which will promote sedimentation in open water areas and increase aquatic plant productivity. Areas ≤ 1.5 feet deep are predicted to be **35%** of the entire open water area.

V_5 Salinity

1. **Historical salinity data.**

Readings from USFWS monitoring stations during July-Aug. 1992 indicate average salinities in the **1.0-2.0 ppt** range. However, salinities did reach 12.0 ppt during the passage of Hurricane Andrew and remained above 8.0 ppt for several days (Lee Foote, USFWS). Salinities are now able to sharply increase during storm surges due to the openness of the system.

2. **Predicted future salinities, <u>without</u> project.**

Average annual salinities are expected to increase into the **3-6 ppt** range as wetland loss continues and the area receives greater tidal influxes from higher salinity areas to the south.

3. **Predicted future salinities, <u>with</u> project.**

Average annual salinities are not expected to significantly change. However, the frequency of rapid salinity increases is expected to be reduced.

V_6 Aquatic Organism Access

1. **Location, type, and operation schedule of existing permitted and unpermitted structures.**

All permitted and unpermitted structures are indicated on the plan map.

The USFWS is conducting research on two units owned by FINA Oil and Chemical Company. These two units are under management using variable-crest weir inlets and flap-gated, 42" culvert outlets. The management scheme is as follows:

March 15-July 15: Crest 12" below marsh level (BML), flapgate operating
July 15-October: Flapgate locked open, crest 12" BML
October-March 15: Crest 6" BML, flapgate locked open

(Lee Foote, USFWS)

2. **Is there an existing permitted management plan for the area?**

The USDA Soil Conservation Service has prepared two marsh conservation plans for the project area. One plan is for the FINA property and the other for the LL&E property.

<u>Permitted Structures</u>
CUP #P880338 COE #SW Terrebonne Wetlands 877(fixed-crest weirs)
LMOD-SP(Terrebonne Parish Wetlands)58 - fixed-crest weir
LMOD-SP(Terrebonne Parish Wetlands)104 - variable-crest weir

3. **Location of structures, culverts, breaks in spoil banks, etc. that serve as hydrologic connections and are <u>not</u> identified above or are not easily seen by examination of aerial photography.**

<u>Present conditions</u>
594 .66 66% of area - 1.0 open system
.048 16% of area - 0.4 .13 variable/crest weir
.014 14% of area - 0.1 fixed/crest weir
.01 4% of area - 0.35 .25 flap-gated variable crest weir
.732

Project conditions
66% of area - 0.8 rock weir
16% of area - 0.4 variable/crest weir
14% of area - 0.1 fixed/crest weir
4% of area - 0.35 flap-gated variable crest weir

4. Location, type, and operation of proposed structures and water control systems, including plugs.

All proposed structures will involve passive management. See project description and attached map.

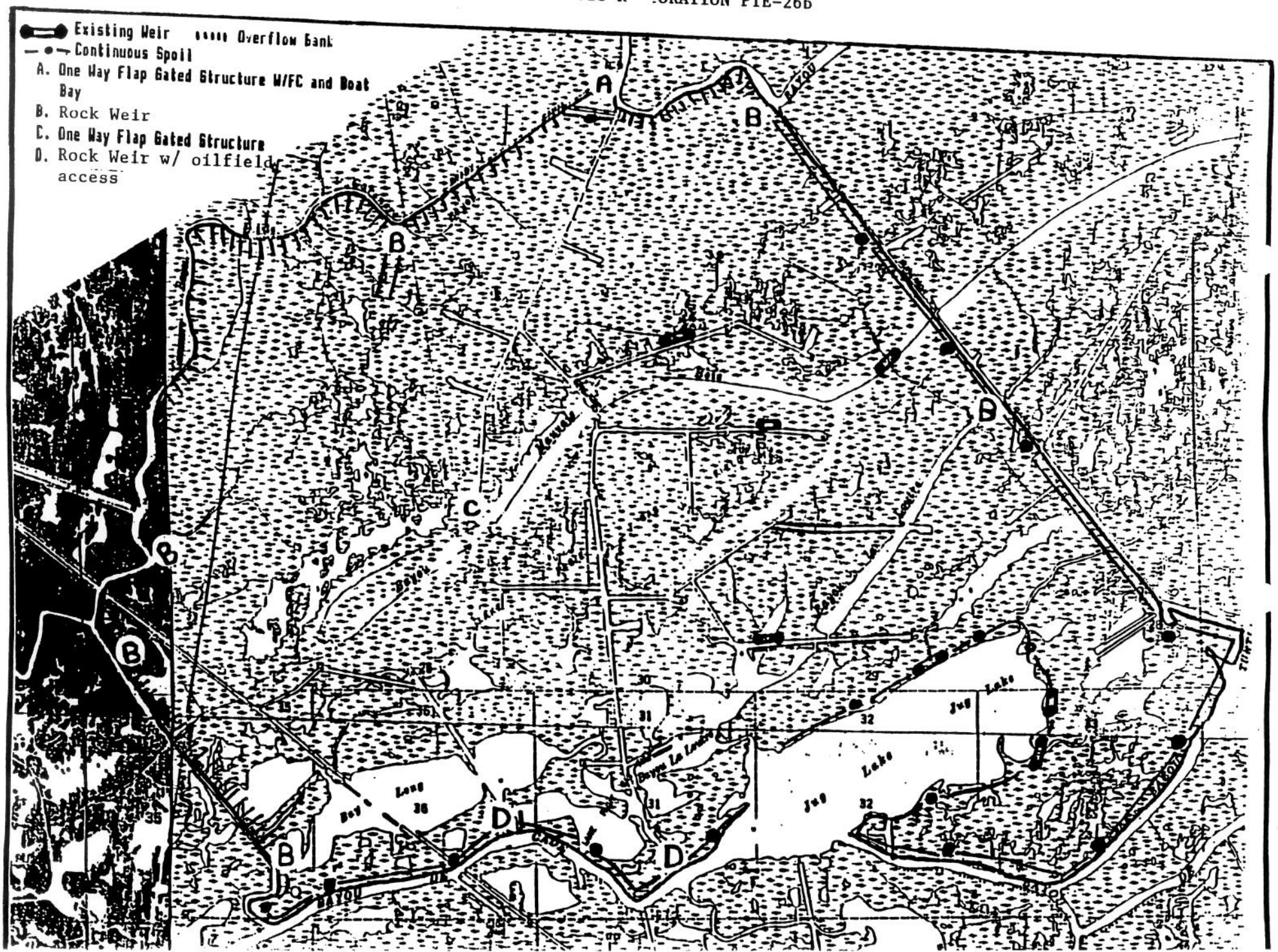
5. Proposed hydrologic changes (water introductions, circulation routes, etc.) due to the project.

Project implementation is expected to reduce tidal energies and water velocities by decreasing cross-sectional areas on major water exchange routes. The project will also promote freshwater introduction from Bayou Penchant and Brady Canal. Increased freshwater retention will be achieved through the improved hydrologic regime allowing accretion in shallow-water areas and nutrient enrichment of the plant community.

REFERENCES

Penland, S., K.E. Ramsey, R.A. McBride, T.F. Moslow, and K.S. Westphal. 1989. Relative sea level rise and subsidence in Louisiana and the Gulf of Mexico. Coastal Geology Tech. Rep. No. 3, Louisiana Geological Survey, Baton Rouge. 65 pp.

BRADY CANAL HYDROLOGIC R :ORATION PTE-26b



WETLAND VALUE ASSESSMENT COMMUNITY MODEL
Fresh/Intermediate Marsh

Project..... Brady Canal Hydrologic Restoration (PTE-26b) Marsh type acres:

Fresh.....

Condition: Future Without Project Intermediate.. 7653

Variable		TY 0 Value	TY 0 SI	TY 1 Value	TY 1 SI	TY 20 Value	TY 20 SI
V1	% Emergent	44	0.50	44	0.50	39	0.45
V2	% Aquatic	50	0.55	49	0.54	35	0.42
V3	Interspersion	%		%		%	
	Class 1	20	0.51	20	0.51	20	0.50
	Class 2	25		25		25	
	Class 3	25		25		20	
	Class 4	30		30		35	
	Class 5						
V4	%OW <= 1.5ft	25	0.38	25	0.38	15	0.27
V5	Salinity (ppt)						
	fresh		1.00		1.00		0.80
	intermediate	3		3		5	
V6	Access Value	0.732	0.81	0.732	0.81	0.732	0.81
		HSI =	0.56	HSI =	0.56	HSI =	0.48

Condition: Future With Project Intermediate.. 7653

Variable		TY 0 Value	TY 0 SI	TY 1 Value	TY 1 SI	TY 20 Value	TY 20 SI
V1	% Emergent	44	0.50	44	0.50	43	0.49
V2	% Aquatic	50	0.55	51	0.56	62	0.66
V3	Interspersion	%		%		%	
	Class 1	20	0.51	20	0.51	20	0.51
	Class 2	25		25		25	
	Class 3	25		25		25	
	Class 4	30		30		30	
	Class 5						
V4	%OW <= 1.5ft	25	0.38	25	0.38	30	0.44
V5	Salinity (ppt)						
	fresh		1.00		1.00		1.00
	intermediate	3		3		3	
V6	Access Value	0.732	0.81	0.666	0.77	0.666	0.77
		HSI =	0.56	HSI =	0.56	HSI =	0.57

AAHU CALCULATION

Project: Brady Canal Hydrologic Restoration (PTE–26b)

Future Without Project			Total	Cummulative
TY	Acres	x HSI	HU's	HU's
0	7653	0.56	4266.79	
1	7653	0.56	4253.36	4260.07
20	7653	0.48	3687.19	75435.26
			AAHU's =	3984.77

Future With Project			Total	Cummulative
TY	Acres	x HSI	HU's	HU's
0	7653	0.56	4266.79	
1	7653	0.56	4260.14	4263.46
20	7653	0.57	4388.92	82166.06
			AAHU's	4321.48

NET CHANGE IN AAHU'S DUE TO PROJECT	
A. Future With Project AAHU's =	4321.48
B. Future Without Project AAHU's =	3984.77
Net Change (FWP – FWOP) =	336.71

Coastal Wetlands Planning Protection and Restoration Act
Wetland Value Assessme Worksheet

Project: PTE-268 Brody Canal Hydrologic Restoration

Date: 28 July 1993

Wetland Type:

Land Loss Rate:

Marsh acreage: 3367 ac

Water acreage: 4286 ac

Total acreage: 7653 ac

	Target Year	V1 % Marsh	V2 % SAV	V3 Marsh edge	V4 Water ≤ 1.5'	V5 Salinity	V6 Fish access
	TY0	3367 ac 44%	50%	20% - 1 25% - 2 25% - 3 30% - 4	25%	3 ppt	0.732
FWOP	1	3348 44%	49%	20% - 1 25% - 2 25% - 3 30% - 4	25%	3 ppt	0.732
	20	2987 39%	35%	20% - 1 25% - 2 20% - 3 35% - 4	15%	5 ppt	0.732
FWP	1	3363 ac 44%	51%	20% - 1 25% - 2 25% - 3 30% - 4	25%	3 ppt	0.666
	20	3284 ac 43%	62%	20% - 1 25% - 2 25% - 3 20% - 4	30%	3 ppt	0.666

Remarks:

CWPPRA STATUS REPORT FOR MARCH 1995

Project Name:	Brady Canal Hydrologic Restoration.
State Abbreviation:	TE-28.
Fed. Abbreviation:	PTE-26b.
Priority Project List:	3.
State Mngr./Num.:	James R. Buchtel @ (504) 342-6738.
Federal Mngr./Num.:	Faye Talbot @ (318) 896-8503.
Cost Sharing Agreement:	The Cost Sharing Agreement was executed by Secretary McClanahan on October 13, 1994. Approval of the Division of Administration's Office of Contractural Review was issued on February 2, 1995.
Escrow Agreement:	Not yet initiated.
Preliminary Engineering:	NRCS is currently preparing a Plan/Environmental Assessment.
Permitting:	Not yet initiated.
Landrights:	Landrights ownership identification process was initiated on June 15, 1994.
Final Engineering:	Not yet initiated.
Construction:	Start Scheduled For: March,1997 Completion Scheduled: August, 1999
Monitoring Plan:	Not yet initiated.
Operations & Mngt. Plan:	Not yet initiated.

HANG LOOSE
— PROBLEMS
CEI > In → Out
not same.
per Leland Broussard