Coastal Protection and Restoration Authority of Louisiana

Office of Coastal Protection and Restoration

2008/2009 Annual Inspection Report

for

HWY. 384 HYDROLOGIC RESTORATION PROJECT (CS-21)

State Project Number CS-21
Priority Project List 2

October 14, 2008
Cameron Parish

Prepared by:

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I. I. Introduction

The Hwy. 384 Hydrologic Restoration project (State Project No. CS-21) is located in the Calcasieu-Sabine Basin on the northeast side of Calcasieu Lake in Cameron Parish. The 1,125 acre project area extends from the northeast shore of Calcasieu Lake in a southeasterly direction to the Gulf Intracoastal Waterway and generally parallels LA Hwy. 384 in the vicinity of the Grand Lake community. The area is bounded on the north and south by higher elevation prairie formations. (See Appendix A).

The Hwy. 384 Hydrologic Restoration Project was authorized by Section 303(a) of Title III Public Law 101-646, the Coastal Wetlands Planning Protection and Restoration Act (CWPPRA) enacted on November 29, 1990 as amended and approved on the second Priority Project List. The Hwy. 384 Project has a twenty –year (20 year) economic life, which began in January 2000.

II. Inspection Purpose and Procedures

The purpose of the annual inspection of the Hwy. 384 Hydrologic Restoration Project (CS-21) is to evaluate the constructed project features to identify any deficiencies and prepare a report detailing the condition of project features and recommended corrective actions needed. Should it be determined that corrective actions are needed, OCPR shall provide, in the report, a detailed cost estimate for engineering, design, supervision, inspection, and construction contingencies, and an assessment of the urgency of such repairs (O&M Plan, 2003). The annual inspection report also contains a summary of maintenance projects, if any, which were completed since completion of constructed project features and an estimated projected budget for the upcoming three (3) years for operation, maintenance and rehabilitation. The three (3) year projected operation and maintenance budget is shown in Appendix C.

In 2003, the CWPPRA Task Force determined, due to the fact that OCPR was responsible for the operation and maintenance phase of the vast majority of CWPPRA projects, that OCPR would be the responsible party for all Post Storm/Hurricane Assessments. After Hurricane Ike, every project appeared to have been impacted by the storms; therefore, OCPR determined that all projects should be assessed for damages (Broussard, 2006). With concurrence from the federal sponsor, OCPR has decided to use the information obtained during this post hurricane assessment in this Annual Maintenance Inspection.

An inspection of the Hwy. 384 Hydrologic Restoration Project (CS-21) was held on October 14, 2008 under partly cloudy skies and warm temperatures. In attendance were Dewey Billodeau, Darrell Pontiff, Pat Landry and Stan Aucoin of OCPR and Dale Garber representative of NRCS. Parties left the Lafayette Field Office of CED, and proceeded to the CS-21 project area in the community of Grand Lake, LA. The annual inspection began at approximately 11:00 a.m. at Structure #1.

The field inspection included a complete visual inspection of all features. Staff gauge readings where available were used to determine approximate elevations of water, rock weirs,

earthen embankments, and other project features. Photographs were taken at each project feature (see Appendix B) and Field Inspection notes were completed in the field to record measurements and deficiencies (see Appendix D).

III. Project Description and History

Historically, the western portion of the project area was intermediate marsh with slightly brackish marsh immediately adjacent to Calcasieu Lake (U. S. Department of Agriculture, Natural Resources Conservation Service [USDA/NRCS] 1995, 1996a, 1996b). The eastern portion of the project area was fresh marsh up to the GIWW. In the late 1980's, Chabreck and Linscombe (1988) characterized the La. Highway 384 wetlands as brackish and intermediate.

Increased tidal volumes, enlargement of tidal exchange routes, and salt water intrusion resulting from human-induced changes to the area's hydrology are the primary causes of wetland loss in the project area (Louisiana Coastal Wetlands Conservation and Restoration Task Force [LCWCRTF] 1993). The Calcasieu Ship Channel was constructed in 1941 and redredged to its current depth of 40 ft (12.2 m) and bottom width of 400 ft (122 m) in 1968 (Good et al. 1995). This channel radically altered the area's hydrology by increasing the height and duration of tidal fluctuations, which in turn increased water levels and saltwater intrusion into the low salinity marshes surrounding Calcasieu Lake (Suhayda et al. 1988). Spoil banks along the GIWW, which was constructed in the 1940's, have effectively blocked the project area's historical connection to the Mermentau River Basin, and now block off the major source of freshwater for the project area, the GIWW east of Calcasieu Lock. Construction of a drainage canal through the project area prior to 1940, and construction of an oil field road before 1963 both provided hydrologic exchange points connecting the fragile interior marsh soils of the project area to Calcasieu Lake (USDA/NRCS 1995, 1996a, 1996b).

Hydrologic exchange between the project area and Calcasieu Lake allowed salt water to eradicate much of the non-salt tolerant emergent vegetation, exposing the fragile organic surface layer of the marsh soil to erosion and tidal scour. As a result, the organic surface layer has been largely transported out of the project area and into Calcasieu Lake. The loss in elevation of the soil surface provided by the organic surface layer of the soil has led to prolonged inundation of the emergent vegetation, which causes die-back of many wetland plant species (Mendelssohn and McKee 1988), and finally, the conversion of emergent marsh to open water (Gosselink et al. 1979).

Construction of the Hwy. 384 Hydrologic Restoration Project was completed in January 2000. Maintenance was performed on the road between La. Hwy. 384 and Calcasieu Lake in November 2000. Another maintenance project was completed in May 2002. The rock dam at Site 8 was covered with dirt to seal off leakage from Calcasieu Lake into the project area. Also, rock was placed around Structure #1 to prevent further erosion around the structure and a hyacinth barrier was constructed between the Gulf Intracoastal Waterway and the structure. The project has a 20-year economic life which began in January 2000.

In 2005 Hurricane Rita totally inundated the project area and the structural components of the project features sustained no adverse effects.

The principal project features include:

- Structure #1/Freshwater Introduction Structure - 3-24"Aluminum culverts with Interior 24" Flapgates and Exterior 24" Sluice Gates.
- Structure #12/Salinity Control Structure - 2-48" Aluminum culverts, each w/ an Interior 10'Variable-Crested Weir Inlet with a 4" vertical slot and an Exterior 48" Flapgate.
- Site #8 - Approximately 100 linear feet of earth fill and rock plug on the eastern shore of Calcasieu Lake.
- An existing access road, approximately 6,000 linear feet in length, which serves as a hydrologic boundary on the southeastern edge of the project boundary between La. Hwy. 384 and the Gulf Intracoastal Waterway.
- An existing access road, approximately 4,000 linear feet in length, which serves as a hydrologic boundary on the northwestern edge of the project boundary between La. Hwy 384 and Calcasieu Lake.

IV. Summary of Past Operation and Maintenance Projects

General Maintenance: Several maintenance projects have been completed since the original project's construction completion. Engineering and design as well as construction oversight on some of these maintenance projects were provided by Abbeville/Lafayette field office personnel so no exact costs related to these activities are available. The maintenance projects that were performed were as follows:

Nov. 2000- Glenn Lege Construction

-placed 40.32 cy. of #610 limestone on the road near Structure #12 due to some overtopping of the road during high tidal events

-placed 12 cy. of man size rip-rap on the inlet side of Structure #12 due to some scouring of the bankline around the structure

TOTAL CONSTRUCTION COST- $3,461.14

June 2002- Glenn Lege Construction

-provided labor and materials to construct a "hyacinth fence" on the inlet side of Structure #1. The fence is constructed of galvanized woven wire and CCA treated timber piles and whalers.

-provided labor and materials to reinforce the existing levee around Structure #1 with graded crushed stone.

-provided labor and materials to repair an existing rock plug that had been leaking and also had been vandalized. The plug was repaired by hauling in earth fill from an off-site location and pushing it over the

existing rock plug with a bulldozer. The earthen plug was then planted under separate contract by DNR plantings group.

TOTAL CONSTRUCTION COST- $14,386.87

May 2005- Bertucci Construction

Provided labor, material and equipment to repair thirteen linear feet of the rock plug at site #8. The rock was removed by vandals. 39.9 tons of 1200# rip rap stone was used to repair the thirteen foot gap. A four foot thick layer of 150# stone was applied to the marsh side slope of the plug to prevent water flow through the plug. This required 343.4 tons of rock. Completion and final acceptance was on May 15, 2005.

TOTAL CONSTRUCTION COST- $45,090.00

May 2006- F. Miller & Sons

Provided labor, material and equipment to repair the existing access roads to permit elevations (+3.0 on Roadway No.1 West side of Hwy 384, +2.5 on Roadway No. 2, East side of Hwy 384). Approximately 3,225 tons of recycled concrete were used to elevate the roadways. Two Portable Multi-Parameter Water Quality Troll 9500 units were provided through this contract and installed by Simon & DeLany for operation of Structures No. 1 and No. 12. Completion and final acceptance was on June 28, 2006.

Engineering, Design ,Surveying,	
Construction Oversight & As-Builts	$ 26,705.00
Construction Cost	$150,000.00

TOTAL CONSTRUCTION COST $176,705.00

June 2006 – F. Miller & Sons

Provide labor, material and equipment to refurbish and install flap gate on west culvert of Structure No. 12. This flap gate was vandalized during spring of 2006. Completion and final acceptance was on June 28, 2006.

TOTAL CONSTRUCTION COST $1,600.00

March 2007 – Simon & Delany

Provide labor necessary to remove and dispose of trash and debris which has accumulated within the hyacinth fence and adjacent to the sluice gates at Structure No.1

TOTAL CONSTRUCTION COST $900.00

Structure Operations: In accordance with the operation schedule outlined in the Operation and Maintenance Plan and USACE Permit, structures were manipulated as required by Simon & DeLany, Resource Management personnel who are under contract with DNR. Copies of the quarterly reports that are provided as well as a copy of the operations contract between DNR and Simon & DeLany are attached in the "Structure Operations" section of the CS-21 Hwy. 384 Operation & Maintenance Plan. The original operating procedures for the #1 Structure was based on water level only, there was no provision for salinity control. Records for the structure showed salinities of 9+ ppt. The operational plan was modified to close the #1 Structure sluice gates when salinities reach or exceed 7 ppt. Operations for the #12 Structure was not changed. To view the real time conditions at #1 or #12 Structures log on to www.romcomm.net and use ldnr for both the username and pass word. 15r is for structure #12 and 29r for structure #1.

V. Inspection Results

Structure #1

The structure is in good condition and does not appear to have sustained any major damage from Hurricane Ike. Water level on the outside was elevation +1.7 NAVD88 and the level inside could not be determined because the staff gage was not readable. The inside staff gage will need to be replaced. Rock placed on the bank during the maintenance event of June 2002 is stable and in no need of repair. The hyacinth fence is in good condition; however there is trash accumulating on the outside of the fence which needs to be removed. The road/levee leading up to the structure is in good condition since it was repaired in June 2006. The recently installed Portable Multi-Parameter Water Quality Troll 9500 – 29r operation sonde has been removed and will need to be replaced due to storm damage. The solar panel should be cleaned and bird excluder devices installed. (Photos: Appendix B, Photos 1-3).

Structure #12

The structure is in good shape and the inlet and outlet sides appear undamaged from the storm. Water level on the outside was elevation +1.6 NAVD88 and the level inside could not be determined because the staff gage was not readable. Pile caps on the outlet side and the padlocks on the stop log locking devices have rusted and will eventually need to be replaced. Rock that was placed during the maintenance of Nov. 2000 is stable. A bird excluder device should be installed on solar panel and operation sonde replaced. The road/levee leading up to the structure is in good condition since it was repaired in June 2006. (Photos: Appendix B, Photos 4-5).

Site #8

The rock plug is in good condition and appears undamaged from the storm surge. Water levels could not be determined because the outside staff gage is missing and the inside staff gage was leaning and not readable. Both staff gages will need to be replaced. The recently completed maintenance work in May 2005 to repair the plug from vandalism held up well under the high storm surge waters. The interior area of the rock plug is showing signs of new vegetative growth in locations that were previously open water. (Photos: Appendix B, Photo 6).

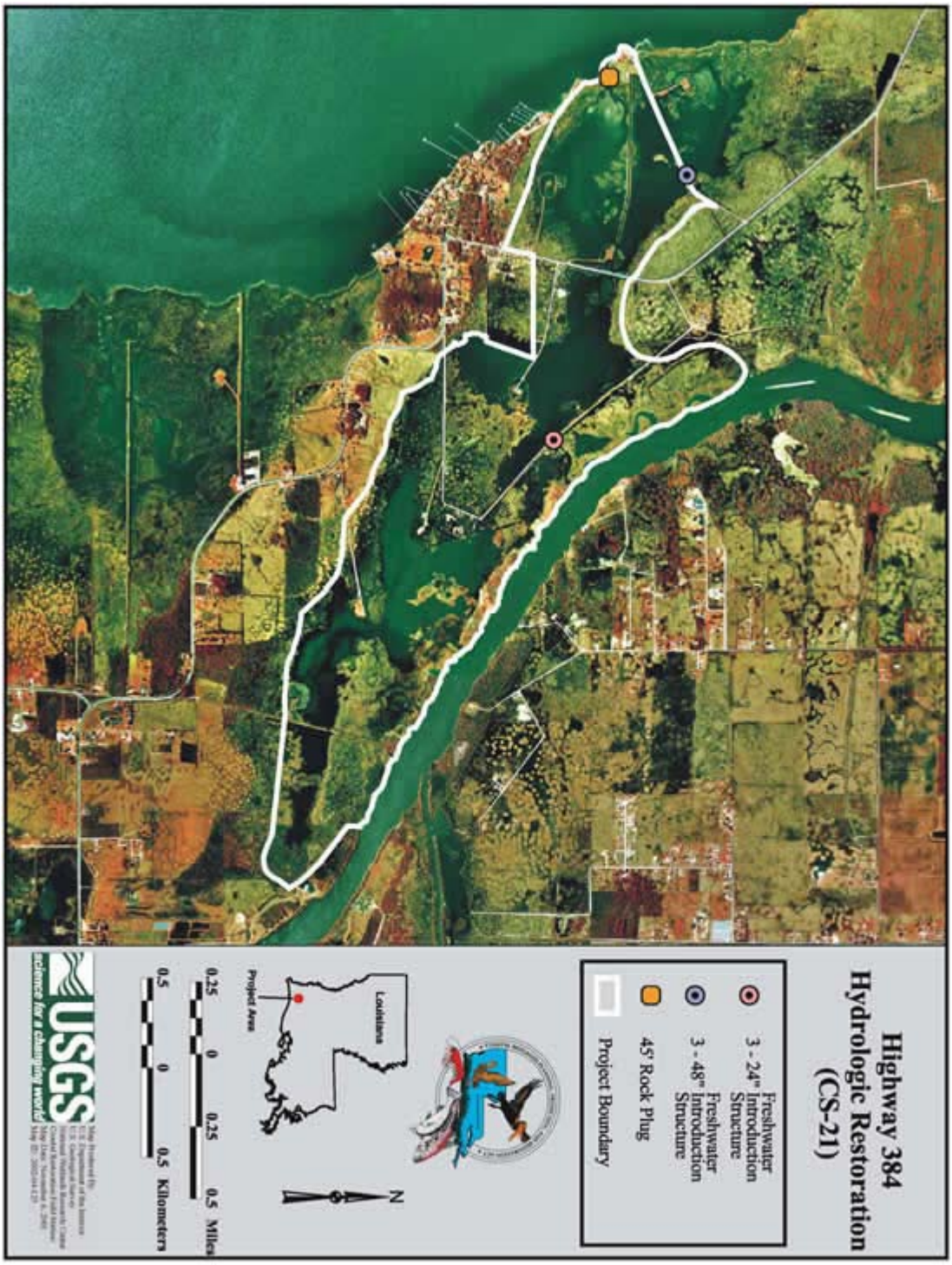
VI. Conclusions and Recommendations

Overall, the Hwy. 384 Hydrologic Restoration Project is in good condition and functioning as designed with only minor problems noted. The hyacinth fence that was installed during the maintenance project of June 2002 as well as the rock reinforcement of the bankline is performing well and should be incorporated into all structures of this type in the future. The earthen cap and plantings at Site 8 completed during a previous O&M event are performing well. The access road repair with recycled concrete material turned out well and was economical. The two Portable Multi-Parameter Water Quality Troll 9500 units used for operation of this project work very well and should be considered for future projects. A maintenance event is planned during 2008/2009 for the items listed below.

- Structure No. 1 – install bird excluder device on solar panel, replace inside staff gage, remove trash from outside of the hyacinth fence, replace operation sonde.
- Structure No. 12 – replace metal pile cap covers, install bird excluder device on solar panel, replace operation sonde, replace padlocks and inside staff gage.
- Structure No. 8 (Rock Plug) – install staff gauges both lake and marsh sides.

Appendix A

Project Features Map


Highway 384
Hydrologic Restoration
(CS-21)
Freshwater Introduction Structure
Freshwater Introduction Structure
45' Rock Plug
Project Boundary
Louisiana
Project Area
N
0.25 0 0.25 0.5 Miles
0.5 0 0.5 Kilometers
USGS
science for a changing world

Appendix B

Photographs

Photo No. 1, Structure No.1, inlet side.

Photo No. 2, Structure No.1, trash along fence and operational sonde.

Photo No.3, Structure No.1, outlet side.

Photo No. 4, Structure No. 12, inlet side.

Photo No. 5, Structure No. 12, outlet side.

Photo No. 6, Structure No. 8, rock plug showing accretion occurring on lake side.

Appendix C

Three Year Budget Projection

HWY 384/ CS-21 / PPL 2

Three-Year Operations & Maintenance Budgets 07/01/2009 - 06/30/2012

Project Manager	O & M Manager	Federal Sponsor	Prepared By
Pat Landry	*Dewey Billodeau*	*NRCS*	*Dewey Billodeau*

	2009/2010	2010/2011	2011/2012
Maintenance Inspection	$ 5,737.00	$ 5,909.00	$ 6,086.00
Structure Operation	$ 10,800.00	$ 11,600.00	$ 12,600.00
Administration	$ 2,000.00		$ -
Maintenance/Rehabilitation			

09/10 Description: Replace pile caps, sondes, install bird excluder devices and staff gages.

E&D	$ 7,000.00
Construction	$ 25,000.00
Construction Oversight	$ 1,000.00
Sub Total - Maint. And Rehab.	$ 33,000.00

10/11 Description:

E&D		$ -
Construction		
Construction Oversight		$ -
	Sub Total - Maint. And Rehab.	$ -

11/12 Description:

E&D			$ -
Construction			$ -
Construction Oversight			$ -
		Sub Total - Maint. And Rehab.	$ -

	2009/2010	2010/2011	2011/2012
Total O&M Budgets	**$ 51,537.00**	**$ 17,509.00**	**$ 18,686.00**

O &M Budget (3 yr Total)	**$ 87,732.00**
Unexpended O & M Budget	**$ 63,438.00**
Remaining O & M Budget (Projected)	**$ (24,294.00)**

Appendix D

Field Inspection Form

Annual Inspection Report
HWY. 384 HYDROLOGIC RESTORATION PROJECT
State Project No. CS-21

MAINTENANCE INSPECTION REPORT CHECK SHEET

Project No. / Name: CS-21 Hwy. 384

Date of Inspection: October 14, 2008 Time: 11:00 am

Structure No. 1

Inspector(s): Dewey Billodeau, Darrell Pontiff, Pat Landry -(OCPR)
Stan Aucoin (LDNR), Dale Garber - NRCS

Structure Description: 3-24" Culverts

Water Level: Inside Outside 1.7

Type of Inspection: Annual

Weather Conditions: Partly Cloudy

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Steel Bulkhead / Caps	N/A				
Flapgates/Outlet Pipe	Good			3	
Stop Logs	N/A				
Hardware/Sluicegates	Good			1	
Hyacinth Fence	Fair			1	Trash accumulating on outside of hyacinth fence.
Timber Piles	N/A				
Timber Wales	N/A				
Galv. Pile Caps	N/A				
Cables	N/A				
Signage /Supports	N/A				
Staff Gages	Poor				Staff gage outlet side of structure not readable.
Rip Rap (fill)	Good				
WQ Troll 9500 - 29r	Poor			2	Needs to be replaced.
Earthen Embankment Access Roadway	Good				

What are the conditions of the existing levees?
Are there any noticeable breaches?
Settlement of rock plugs and rock weirs?
Position of stoplogs at the time of the inspection?
Are there any signs of vandalism?

Annual Inspection Report
HWY. 384 HYDROLOGIC RESTORATION PROJECT
State Project No. CS-21

MAINTENANCE INSPECTION REPORT CHECK SHEET

Project No. / Name: CS-21 Hwy. 384

Date of Inspection: October 14, 2008 Time: 11:20 am

Structure No. 8

Inspector(s): Dewey Billodeau,Darrell Pontiff, Pat Landry - (OCPR)
Stan Aucoin (LDNR), Dale Garber - (NRCS)

Structure Description: Rock plug

Water Level: Inside Outside

Type of Inspection: Annual

Weather Conditions: Partly Cloudy

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Steel Bulkhead / Caps	N/A				
Steel Grating	N/A				
Stop Logs	N/A				
Hardware	N/A				
Timber Piles	N/A				
Timber Wales	N/A				
Galv. Pile Caps	N/A				
Cables	N/A				
Signage /Supports	N/A				
Staff Gages	Poor				Outside staff gage missing, inlet staff gage not readable.
Rip Rap (fill) (foreshore dike)	Good			6	The plug appears to be in good shape.
Earthen Embankment					The earthen levee that was rebuilt as part of the June '02 maintenance is in excellent condition beyond the limits of the channel.

What are the conditions of the existing levees?
Are there any noticeable breaches?
Settlement of rock plugs and rock weirs?
Position of stoplogs at the time of the inspection?
Are there any signs of vandalism?

Annual Inspection Report
HWY. 384 HYDROLOGIC RESTORATION PROJECT
State Project No. CS-21

MAINTENANCE INSPECTION REPORT CHECK SHEET

Project No. / Name: CS-21 Hwy. 384

Date of Inspection: October 14, 2008 Time: 11:30 am

Structure No. 12

Inspector(s): Dewey Billodeau, Darrell Pontiff, Pat Landry -(OCPR) Stan Aucoin (LDNR), Dale Garber - NRCS

Structure Description: 2-48" Culverts

Water Level: Inside Outside 1.6

Type of Inspection: Annual

Weather Conditions: Partly Cloudy

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Steel Bulkhead / Caps	N/A				
Steel Grating	Good			4	
Stop Logs	Good				Replace padlocks.
Hardware/Flapgates	Good				
Timber Piles	Good				
Timber Wales	N/A				
Galv. Pile Caps	Good			5	Pile caps on outlet structure are corroded and will eventually need to be replaced.
Cables	N/A				
Signage /Supports	N/A				
Staff Gages	Fair				Staff gage on inlet side not readable.
Rip Rap (fill)	Good				
WQ Troll 9500 - 15r	Good				
Earthen Embankment					
Access Roadway	Good				

What are the conditions of the existing levees?
Are there any noticeable breaches?
Settlement of rock plugs and rock weirs?
Position of stoplogs at the time of the inspection?
Are there any signs of vandalism?

Appendix E

Locations to be Monitored