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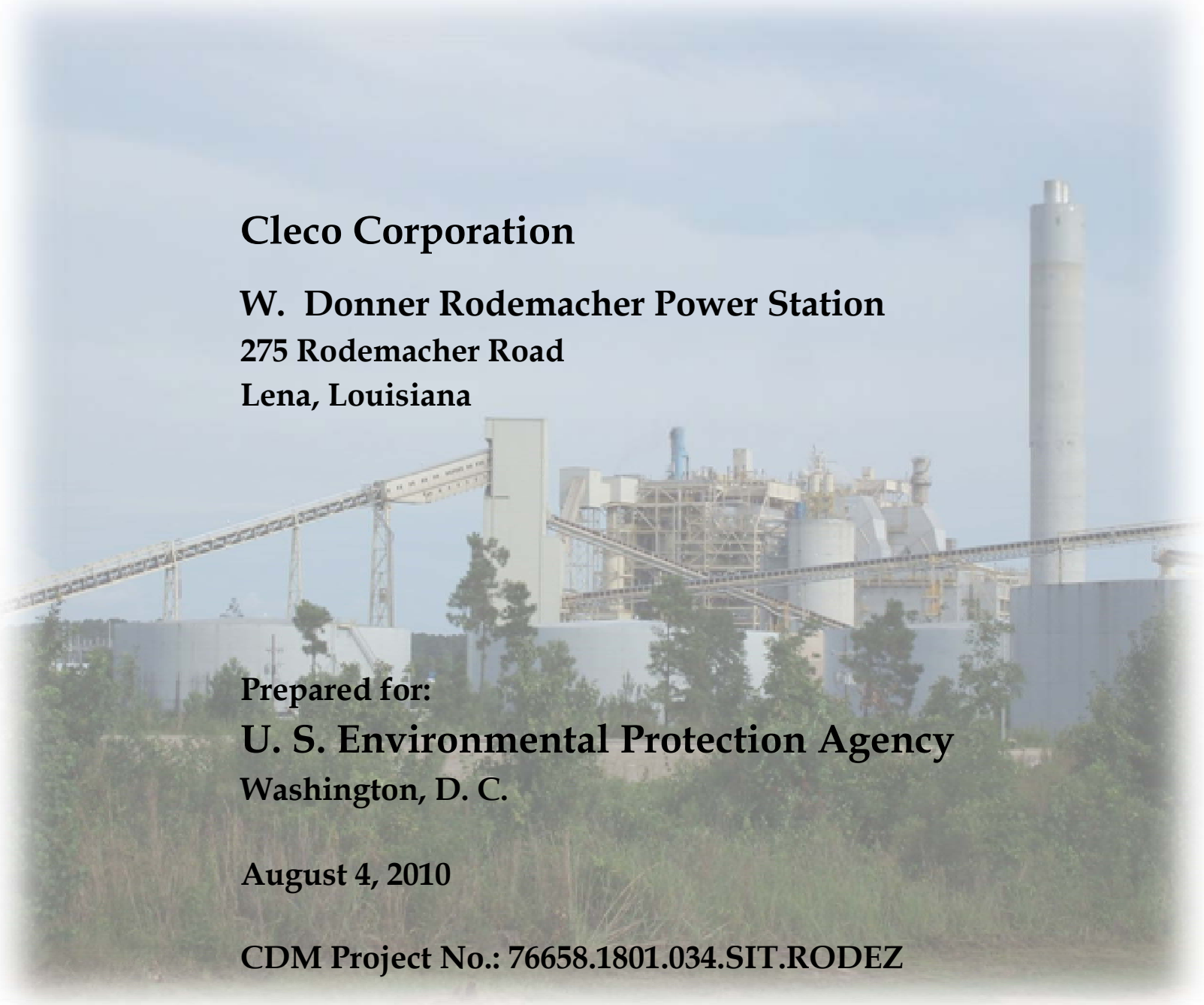
Assessment of Dam Safety of Coal Combustion Surface Impoundments



Cleco Corporation

W. Donner Rodemacher Power Station
275 Rodemacher Road
Lena, Louisiana

Prepared for:
U. S. Environmental Protection Agency
Washington, D. C.

August 4, 2010

CDM Project No.: 76658.1801.034.SIT.RODEZ

Draft Report

Preface

The assessment of the general condition of the impoundments is based upon available data and visual observations. Detailed investigations and analyses involving topographic mapping, subsurface investigations, testing and detailed computational evaluations are beyond the scope of this report.

In reviewing this report, it should be realized that the reported condition of the impoundments is based on observations of field conditions at the time of assessment, along with data made available to the assessment team. In cases where an impoundment may have been lowered or drained prior to the assessment, such action, while improving the stability and safety of the impoundment, removes the normal load on the structure and may obscure certain conditions, which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is critical to note that the condition of impoundments depends on numerous and constantly changing internal and external conditions and is evolutionary in nature. It would be incorrect to assume that the present condition of the impoundment at the time of the assessment is representative of the condition of the impoundment at some point in the future. Only through continued care and assessment can there be any chance that unsafe conditions will be detected.

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Prepared By:

CDM

I certify that the management unit (s) referenced herein have been assessed on June 28 and 29, 2010:

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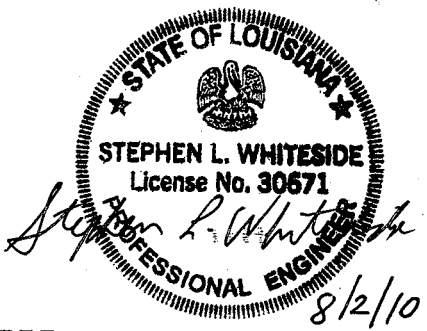

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Geotechnical Engineer

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Section 1
Introduction and Project Description

1.1 Introduction

CDM was contracted by the United States Environmental Protection Agency (USEPA) to perform dam safety assessments of selected coal combustion waste (CCW) surface impoundments. As part of this contract, CDM performed a dam safety assessment at the W. Donner Rodemacher Power Station (Power Station), owned by Cleco Power LLC (Cleco).

CDM made a site visit to the Power Station on June 28 and 29, 2010 to collect relevant information, inventory the impoundments, and perform visual assessments of the impoundments.

CDM representatives William Friers, P.E. and Bevin A. Barringer, P.E. were accompanied by the following individuals:

Company	Name and Title
Cleco	Brent Croom, Environmental Services Manager
Cleco	Ricky Nguyen, Sr. Environmental Op. Specialist
Cleco	Robert Knott

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1.2 State Regulation

The Public Works & Water Resources Division of the Louisiana Department of Transportation and Development (LADOTD) is responsible for the State's dam safety program. It is our understanding that, to date, LADOTD has not been actively involved in the regulation of CCW impoundments. Based on information provided by Cleco, the Louisiana Department of Environmental Quality (LDEQ) does actively regulate the CCW impoundments as Type I Industrial Landfills. LDEQ regulations pertaining to the CCW Impoundments are included in Title 33, Part VII, Subpart 1 Solid Waste Regulations. Cleco provided CDM with field interview forms completed by LDEQ in 2004, 2006, 2007, 2009, and 2010, which are included in **Appendix A**. The forms include the results of an annual inspection of the solid waste impoundments and monitoring wells and a review of documents related to the spill prevention control and counter measure (SPCC) plan, groundwater monitoring data, safety meetings, and permits. Cleco also provided the original *Application for Solid Waste Disposal Facilities Permit* (Permit) dated 1981 which is on file with LDEQ. The Permit included a summary of how the original impoundments were constructed. LDEQ Solid Waste Permits require renewal every 10 years.

1.2.1 Permits

The Power Station was issued a permit authorizing discharge under the National Pollutant Discharge Elimination System (NPDES) into Rodemacher Lake in accordance with effluent limitations, monitoring requirements, and other conditions

set forth in the permit. The station's current permit will expire March 31, 2011. The permit number is LA0008036.

1.3 Datum

Elevations are referenced to the North American Vertical Datum of 1988 (NAVD 88). Directional coordinates are referenced to magnetic north.

1.4 Site Description and Location

The Power Station is located in Lena, Louisiana in Rapides Parish on Lake Rodemacher as shown on **Figure 1.** The area around the Power Station showing critical infrastructure within approximately five miles down gradient of the impoundments is shown on **Figure 2.** An aerial view of the impoundments is shown on **Figure 3.**

1.4.1 CCW Impoundment Construction and Historical Information

The Power Station began operation in 1975. The CCW is generated by Unit 1 (online since 1975) and Unit 2 (online since 1982).

Based on information provided by Cleco, the Bottom Ash and Fly Ash impoundments are used for separating bottom ash and fly ash from the water used to extract the materials from the Power Station.

Based on information provided by Cleco, the Bottom Ash Pond was commissioned 1982. Based on construction drawings included on **Figures 4** and **5**, the Bottom Ash Pond was constructed with slopes at 3H:1V, and included a 3-foot-thick clay liner placed in horizontal lifts of 8 to 10 inches and compacted with "sheeps foot" compaction equipment. According to the Permit, the liner was constructed with high-plasticity clay having an average Plasticity Index of 41 and average Liquid Limit of 62. A permeability of 1.1×10^{-7} to 2.1×10^{-8} cm / sec was measured in laboratory permeability tests performed on remolded samples of the clay used for liner material. The interior of the pond was constructed to El. 85.0. The 20-foot-wide crest was constructed to elevations ranging from El. 122.0 at the west embankment to El. 108.0 at the east embankment.

Based on subsurface soil profiles included in the Power Station's Permit, the Bottom Ash Pond embankments were constructed on very soft to medium stiff clay and silty clay with organics that extended at least to 20 feet below the bottom of the pond. Silty sand and sandy silt were encountered in one of the test borings at a depth of 12 feet below the bottom of the pond. The subsurface soil profiles are included in **Appendix B**.

As shown on Figure 3, the Bottom Ash Pond shares a common embankment with the Fly Ash Pond.

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The Fly Ash Pond, also commissioned in 1982, was originally constructed as a larger pond than currently exists with a total area of approximately 109 acres, as shown on Figure 5. Additional embankments have been constructed to create the current Fly Ash Pond and Leachate Pond, but no information regarding the construction of these embankments was provided. Based on information provided in the Permit, the north, west, and east embankments of the Fly Ash Pond, and the east and south embankments of the current Leachate Pond were constructed with slopes at 3H:1V, and includes a 3-foot-thick clay liner constructed with material excavated from within the pond. According to the Permit, the liner was constructed with material having a minimum Plasticity Index of 15 and a minimum of 60 percent passing the #200 sieve, and was compacted to 95 percent of maximum dry density measured in modified Proctor compaction test. The average Plasticity Index and Liquid Limit of the clay used to construct the liner was reported as 29 and 49, respectively. A permeability of $1.1x10^{-8}$ cm / sec was measured in laboratory permeability tests on remolded samples of the clay used for liner material. The interior of the pond was constructed to El. 85.0. The 20-foot-wide crest was constructed to an elevation of El. 105.0 at all embankments except the west (divider) embankment that was constructed to El. 108.0.

Based on subsurface soil profiles included in the Permit dated 1981, portions of the Fly Ash Pond and Leachate Pond embankments were constructed on very soft to medium stiff clay and silty clay with layers of silt and sand which extended at least to 50 feet below the bottom of the pond. The subsurface profiles are included in Appendix B.

As shown in Figure 3, the Fly Ash Pond and Leachate Pond share a common embankment.

No information was provided regarding the Leachate Pond construction, with the exception of the south and east embankments that were constructed as part of the original Fly Ash Pond, as discussed above.

1.4.2 Current CCW Impoundment Configuration

The impoundments at the W. Donner Rodemacher Power Station currently are used as settling ponds for CCW waste. CCW sluiced into the impoundments include:

- Bottom ash;
- Fly ash;
- Leachate from coal ash landfill.

Other plant wastes sluiced into the ash ponds include liquids from:

- Stormwater runoff.

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There are currently three CCW Impoundments at the Power Station as shown on Figure 3. They include the Bottom Ash Pond, Fly Ash Pond, and Leachate Pond. The approximate lowest crest elevations of the embankments and pond areas are shown on **Table 1.**

Table 1 – Approximate Ash Pond Lowest Crest Elevations and Areas

Pond	Approximate Lowest Crest Elevation	Approximate Pond Area[1] (Acres)
Bottom Ash	108.0	43
Fly Ash	105.0	28
Leachate	105.0	8

1 – Pond areas measured at low crest elevation.

The Bottom Ash Pond is used to process CCW from Units 1 and 2. CCW enters the pond by two 12-inch-diameter and one 14-inch-diameter steel pipe near the southeast corner of the pond. Water exits the Bottom Ash Pond through a 24-inch-diameter corrugated metal pipe located at the west embankment and is discharged into a channel located at the exterior toe of the west embankment. The water is pH-treated in the channel and discharged into Rodemacher Lake in accordance with the NPDES permit. A pump and associated piping are located on the south embankment of the Bottom Ash Pond to allow pumping of water into water trucks to be used for dust control.

Fly ash produced by the Power Station is transported to the Fly Ash Pond by truck. No inlet pipes were observed in the Fly Ash Pond during the assessment. Water contained in the pond includes rainfall and water used as dust control. Water is pumped from the Fly Ash Pond through a 4-inch-diameter HDPE pipe near the northwest corner of the pond, and into the Bottom Ash Pond Water through a 4-inch diameter steel pipe.

Stormwater and leachate from the adjacent ash landfill enter the Leachate Pond through an approximately 6-inch-diamter and 8-inch diameter HDPE pipes. Water is pumped from the Leachate Pond through a 12-inch-diamter HDPE pipe. Water from the Leachate Pond is sent back to the plant for use in ash hydration processes, used on-site for dust control, or discharged into Rodemacher Lake in accordance with the NPDES permit.

1.4.3 Other Impoundments

Other impoundments identified at the W. Donner Rodemacher Power Station include metal waste cleaning ponds and a coal sedimentation pond. These ponds are not used for storage or processing of CCW.

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1.5 Previously Identified Dam Safety Issues

Based on our review of the information provided to CDM by plant personnel and the USEPA, there have been no identified dam safety issues at the Power Station in the last 10 years.

1.6 Site Geology

The Power Station is located on the eastern bank of Lake Rodemacher. The natural ground surface elevation in the area of the impoundments ranges from approximately El. 85.0 to 130.0. According to the Geologic Map of Louisiana, the Plant site is underlain by Holocene deposits consisting of alluvium. The alluvium deposits consist of sandy and gravelly channel deposits mantled by sandy to muddy natural levee deposits, with organic-rich muddy back-swamp deposits.

Based on subsurface soil information provided in the Permit, existing soils present below the embankments consist of clay with layers of sand and silt. The boring location plan is shown on **Figure 6** and the subsurface profiles are included in **Appendix B**.

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Section 2
Field Assessment

2.1 Visual Observations

CDM performed a visual assessment of dam safety of the CCW impoundments at the W. Donner Rodemacher Power Station (Power Station). The perimeter embankments of the impoundments total approximately 12,780 feet in length and are up to 37 feet high. The assessments were completed following the general procedures and considerations contained in Federal Emergency Management Agency's (FEMA's) Federal Guidelines for Dam Safety (April 2004) relative to observations concerning settlement, movement, erosion, seepage, leakage, cracking, and deterioration. A Coal Combustion Dam Inspection Checklist and CCW Impoundment Inspection Form, developed by USEPA, were completed on-site for each impoundment during the site visit. Copies of these forms are included in **Appendix C**. Photograph location plans are shown on **Figures 7a** through **7c**, and photographs are included in **Appendix D.** Photograph locations were logged using a GPS device. The photograph coordinates are listed in **Appendix E.**

CDM visited the site on June 28, 2010 and June 29, 2010 to make visual assessments of the impoundments. The weather was generally clear, except for an evening thunderstorm on the 28th, with daytime high temperatures between 90 and 95 degrees Fahrenheit. The daily total precipitation prior to the site visit is shown in **Table 2**. The data were recorded at the Alexandria, Louisiana airport, which is approximately ten miles southeast of the Power Station.

Table 2 – Approximate Precipitation Prior to Site Visit

Dates of Site Visits - June 28, 2010 & June 29, 2010		
Day	**Date**	**Precipitation (inches)**
Monday	June 21	0.0
Tuesday	June 22	0.0
Wednesday	June 23	1.10
Thursday	June 24	0.0
Friday	June 25	0.0
Saturday	June 26	0.0
Sunday	June 27	0.22
Monday	June 28	0.58
Tuesday	June 29	0.0
Total	**Week Prior to Site Visit**	**1.90**
Total	**Month Prior to Site Visit**	**5.54**

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2.2 Bottom Ash Pond

An overview of the Bottom Ash Pond photograph locations is shown on Figure 7a. The Bottom Ash Pond had standing water at the time of the assessment, with approximately 4 feet of freeboard. The southern two-thirds of the west embankment is incised, having been cut out from original grade (Photograph 54). The pond's east embankment serves as a divider embankment with the Fly Ash Pond and the south embankment serves as a divider embankment with the fly ash storage area. No evidence of prior releases, failures, or repairs was observed at the time of the assessment. Based on information provided by Cleco, the Bottom Ash Pond was commissioned in 1982.

2.2.1 Exterior Slope

The embankment exterior slopes of the Bottom Ash Pond appeared to be in fair condition. The exterior slopes were approximately 4H:1V. The upper two-thirds of the north embankment exterior slope was generally covered with grass approximately 4 inches in height (Photographs 13, 14 and 35). The lower third of the north embankment slope, extending to the toe, was heavily vegetated with shrubs, brush and trees up to 18 inches in diameter (Photographs 20, 22, 25 and 42). Several rodent burrows were observed along the edge of the heavily vegetated area of the north embankment slope (Photographs 21 and 34). In addition, numerous holes up to 16 inches in depth and 4 inches in diameter were observed on the north embankment exterior slope, which Cleco personnel speculated was evidence of wild boar rooting (Photographs 15, 16, 23, 24, 34 and 37).

Evidence of beavers was observed along the base of the north embankment exterior slope, including numerous tree cuttings (Photographs 26, 27 and 28). An area of ponded water was observed which extended more than 300 feet along the toe of the exterior slope of the north embankment (Photographs 28, 30 and 31). Although not observed due to the depth of the water and the dense vegetation, it was presumed that beavers had constructed a dam on a small stream that runs parallel to the embankment. The presence of heavy vegetation precluded observation of erosion features, additional animal burrows, or seepage on the lower third of the exterior slope of the north embankment.

The west embankment exterior slope was well vegetated with various species of grasses, ranging in height from 3 to 12 inches (Photograph 41). Surface erosion was observed at the 24-inch-diameter CMP discharge (Photograph 47). At a separate location, riprap had formerly been downstream of a stormwater drainage discharge outlet on the west embankment exterior slope. Bank erosion, with a maximum depth of approximately 40 inches and a maximum width of approximately five feet, was observed at the outer edge of the riprap, apparently created by historic discharges from these pipes (Photographs 48 and 49).

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The east embankment exterior slope was covered with ash product and could not be observed (Photographs 3, 9, 10 and 73). The south (divider) embankment exterior slope was backfilled with ash product hauled by trucks and deposited in the fly ash storage and could not be observed (Photograph 66).

2.2.2 Crest

The crest of the Bottom Ash pond embankments appeared to be in good condition (Photographs 17, 40, and 54). The north embankment crest is approximately 20 feet wide and the west embankment crest is approximately 30 feet wide. Included in Figure 5, drawings prepared by Sargent & Lundy, last revised in April 1981, show the south and east embankment crests 20 feet wide. Fill material has been placed along the south and east embankment's exterior slopes and graded to top of crest, effectively increasing the width of the crests to nearly 100 feet (Photographs 3, 9, 10 and 66).

The south half of the west embankment crest, and the entire south and east embankment crests serve as primary haul roads for plant vehicles. The crests surface used as haul roads consists of compacted granular soils (Photographs 54 and 60). The north half of the west embankment's crest and the north embankment crest have compacted granular material placed over a width of approximately eight feet to accommodate vehicle traffic. The balance of the crest is well vegetated with grass generally less than 4 inches in height.

2.2.3 Interior Slope

The embankment interior slopes appear to be in good condition. The interior slope was approximately 3H:1V, with cast-in-place concrete armoring (Photographs 4, 7, 8, 39 and 58). Areas of the concrete armoring were observed to be undercut and cracked longitudinally, apparently due to wave action (Photographs 6, 7, and 52). A section, approximately 50 feet long, of the west embankment interior slope was observed where armoring had been undermined and was displaced into the pond (Photograph 52). The embankment interior slopes were generally well vegetated with grass, typically less than 6 inches in height (Photographs 1, 2, 12 and 64). Several areas were observed where grass is sparse or missing and rutting has occurred from mowing operations (Photographs 5, 12, 18, 51 and 69).

Several minor erosion features were observed on the south embankment interior slope. An erosion rill, approximately 20 inches wide by 10 inches deep, was observed on the south embankment interior slope at the point where sluice lines from Unit 2 passed under the haul road (Photograph 63). Minor surface erosion was observed below a (leaking) joint in piping used for drawing water from the Bottom Ash Pond to fill tank trucks used in dust control on plant haul roads (Photograph 68). An area depression, approximately 3 feet wide by 2 feet deep, was observed beneath an elevated 30-inch-diameter CMP stormwater discharge pipe. The depression was located near a steel pipe support and an observed pipe joint and is likely the result of leakage through the joint (Photograph 57).

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A possible rodent burrow or a localized sink hole was observed at the edge of the concrete / steel frame outlet structure on the west embankment (Photograph 44).

2.2.4 Outlet Structures

The outlet, a 24-inch-diameter CMP with an invert elevation of 102.6, appeared to be in fair condition (Photographs 43, 45 and 46). The inlet was free of debris and water was flowing freely through the pipe.

2.3 Fly Ash Pond

An overview of the Fly Ash Pond photograph locations is shown on Figure 7b. The Fly Ash Pond was impounding water at the time of the assessment with approximately 8 feet of freeboard. The pond's west embankment serves as a divider embankment with the Bottom Ash Pond. Based on information provided by Cleco, the Fly Ash Pond was commissioned in 1982.

2.3.1 Exterior Slope

The embankment exterior slopes appear to be in fair condition. The embankment exterior slopes of the Fly Ash Pond are approximately 4H:1V. The upper two-thirds of the north embankment exterior slope were generally covered with grass approximately 4 inches in height (Photographs 79 and 103). The lower third of the north embankment slope, extending to the toe, was heavily vegetated with shrubs, brush and trees up to 18 inches in diameter (Photographs 78, 80, 81, 84 and 88). The toe of the east embankment exterior slope was heavily vegetated with dense brush and trees (Photographs 102 and 103). A drainage ditch, running along the north embankment was observed (Photograph 81).

A rodent burrow was observed along the edge of the heavily vegetated area of the north embankment exterior slope (Photograph 75). A downed tree was observed near the exterior toe of the north embankment. Active erosion and possible animal burrowing were observed near the base of the tree (Photograph 100). An erosion rill, approximately 10 inches deep by 12 inches wide, was observed on the north embankment exterior slope (Photograph 74). An erosion rill just outside the north embankment exterior slope, approximately 5 feet wide and 3 feet deep, was observed (Photograph 94). The rill is not impacting the embankment slope at this time. Isolated areas of rutting and loss of grass cover, apparently due to mowing operations were observed on the north and south embankment exterior slopes (Photographs 79 and 121). The presence of heavy vegetation precluded observation of any additional erosion features, animal burrows, or potential seepage on the lower portions of the exterior slope of the north and east embankments. The south embankment exterior slope had been re-seeded recently and grass had not yet been reestablished. Turf reinforcement matting (TRM) placed on the exposed soil for erosion protection appeared to be effective (Photograph 118).

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An area of possible seepage was observed near the toe of the north embankment exterior slope. The area was poorly vegetated, and the soil surface was spongy and wet (Photograph 89).

2.3.2 Crest

The crest of the Fly Ash pond embankments appeared to be in good condition (Photographs 82, 103 and 107). The north and south embankment crests are approximately 20 feet wide and the east embankment crest is approximately 30 feet wide. As shown in Figure 5, drawings prepared by Sargent & Lundy, last revised in April 1981, show the west (divider) embankment crest 20 feet wide. Fill material has been placed along portions of the west embankment's interior slope and graded to the top of crest, effectively increasing the width of the crests to nearly 100 feet (Photograph 128). The crest's surface, where used as a haul road on the south and west embankments, consists of compacted granular soils (Photographs 107 and 122). The balance of the crest is well vegetated with grass generally less than 4 inches in height (Photographs 77, 82 and 103).

2.3.3 Interior Slope

The interior slopes appear to be in fair condition. The embankment interior slopes range from approximately 4H:1V to 5H:1V. In general, the embankment's north and east interior slopes are well vegetated with various species of grass, typically 3 to 5 inches in height (Photographs 73, 77, and 90). The eastern 700 feet of the south embankment interior slope had been re-seeded recently and grass had not yet been reestablished. TRM placed on the exposed soil for erosion protection appeared to be effective (Photographs 103, 105, 106, 112 and 115).

The interior embankment did not have erosion protection or armoring along the waterline (Photographs 76, 90, 114, 116 and 117). Erosion of the unprotected north and south embankment interior slope was observed (Photographs 76,111, and 117). Numerous cracks, approximately 1 inch wide and extending approximately 15 inches below grade, were observed on the north and east embankment interior slopes (Photographs 92, 93, 96, 97 and 101). The cracks appeared to be located in fill material placed over the original embankment cross section.

Ash product has been placed along the west (divider) embankment's interior slope and graded to top of crest, effectively increasing the width of the crests to nearly 100 feet (Photographs 127 and 128). Ash product has also been placed along approximately half of the south embankment's interior slope (Photograph 120 and 122). In this area, over-excavation of dry ash product near the west end of the south embankment appeared to have infringed on the south embankment interior slope, over a distance of approximately 60 feet (Photograph 124).

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2.3.4 Outlet Structures

The outlet pipe in the Fly Ash Pond appears to be in good condition. Water is pumped from the Fly Ash Pond through a 4-inch-diameter HDPE pipe into the Bottom Ash Pond (Photographs 11, 73 and 131). The intake and outlet are free of debris.

2.4 Leachate Pond

An overview of the Leachate Pond photograph locations is shown on Figure 7c. The Leachate Pond had standing water at the time of the assessment, with approximately 22 feet of freeboard. The pond's north embankment serves as a divider embankment with the Fly Ash Pond and the west embankment serves as a divider with the fly ash storage area. No evidence of prior releases, failures, or repairs was observed at the time of the assessment. Based on information provided by Cleco, the Leachate Pond was commissioned in 2009.

2.4.1 Exterior Slope

The embankment exterior slopes appear to be in poor condition. The embankment exterior slopes of the Leachate Pond are approximately 3H:1V. The exterior slope of the north (divider) embankment was covered in grass up to 3 inches tall (Photograph 105). Several minor erosion features were observed on the north embankment exterior slope, such as bare soils, and erosion near the toe (Photograph 111). The north (divider) embankment exterior slope had been re-seeded recently and grass had not yet been reestablished. TRM placed on the exposed soil for erosion protection appeared to be effective (Photograph 112). Heavy vegetation with trees up to 16 inches in diameter covers the exterior slope of the east and south embankments (Photographs 132, 133, 135, and 138). The presence of heavy vegetation precluded observation of any erosion features, animal burrows, or potential seepage on the exterior slope of the east and south embankments. The west embankment exterior slope was covered with a woven geotextile fabric (Photograph 141). An area of localized dampness was observed about mid-length of the east embankment slope, near the toe of the slope. Due to recent rainfall, it was not clear if the observed dampness is due to seepage or precipitation.

2.4.2 Crest

The embankment crest appeared to be in good condition (Photographs 132, 136, 138 and 143). The embankment crest is approximately 30 feet wide, consisting of a compacted gravel access road around the entire perimeter of the impoundment. Sparse vegetation was observed on the outer edges of the crest, consisting primarily of grasses less than 3 inches in height (Photograph 140). Significant cracking, approximately 1 inch wide and 20 inches deep, was observed in several locations along the west embankment crest (Photographs 113 and 142).

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2.4.3 Interior Slope

The embankment interior slope was approximately 3H:1V. A 60-mil-thick HPDE membrane liner covers the entire embankment interior.

2.4.4 Outlet Structures

The outlet pipe in the Leachate Pond appears to be in good condition (Photograph 144). Outflow from the Leachate Pond is through the pump station located on the north embankment of the pond. Water pumped from the Leachate pond is either discharged into Lake Rodemacher in accordance with the Power Station's NPDES Permit, reused in the ash hydration process or used for on-site dust control.

2.5 Monitoring Instrumentation

The water surface elevations for the Bottom Ash Pond, the Fly Ash Pond, and the Leachate Pond do not appear to be monitored on a regular basis. Based on the documents reviewed by CDM, there are a total of four monitoring wells in the vicinity of the CCW impoundments. The approximate location of the wells is shown in **Figure 8.** The stand-pipes for some of the wells were observed during the site visit (Photographs 14, 99 and 104). Based on conversations with Cleco personnel and information reviewed, groundwater levels are recorded and analytical samples are taken at least semi-annually.

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Section 3
Data Evaluation

3.1 Design Assumptions

Cleco provided some construction drawings related to the original construction of the Bottom Ash Pond and portions of the Fly Ash Pond. CDM was not provided with the original design assumptions for the Plant's CCW impoundments. LADOTD is responsible for the State's dam safety program; however, LADOTD has not been actively involved in the regulation of Coal Combustion Waste Impoundments to date.

3.2 Hydrologic and Hydraulic Design

LDEQ requires surface impoundments to have the capacity to store the 24-hour, 25-year storm event. The Permit completed by Cleco in 1981 included surface drainage information stating that the Bottom Ash Pond and original Fly Ash Pond would require a storage capacity of 9 inches, based on the 25-hour, 25-year maximum rainfall for the area. Based on information provided by the Weather Bureau, CDM also determined the 24-hour, 25-year rainfall for the Plant site is approximately 9 inches. Based on the LDEQ requirements, the Bottom Ash, Fly Ash, and Leachate Ponds are adequately sized to store or pass the design storm event.

LADOTD does not currently have requirements related to the hydrologic or hydraulic design of coal ash impoundments, but uses Probable Maximum Floods (PMFs) to design and analyze dams. The Probable Maximum Flood is the flood that is a direct result of the Probable Maximum Precipitation (PMP). However, PMF depends on the characteristics of the particular drainage basin draining into the impoundment or dam. CDM proposes, because the drainage area contributing to the impoundments is limited to the storage area within the impoundment, the PMP - not the PMF, is a more appropriate design criterion for the Power Station impoundments.

Federal guidelines state that impoundments should have the capacity to store the PMP for a 6-hour storm event over a 10-square-mile area in the vicinity of the site. Significant and high hazard structures are required to store 50% PMP and 100% PMP, respectively. CDM performed a preliminary evaluation of the hydraulic capacity of the impoundments to estimate if the ponds are adequately sized to store or pass the design storm event. The PMP obtained from the Weather Bureau Technical Paper No. 40 "Rainfall Frequency Atlas of the United States" is approximately 31.5 inches at the Plant site. The drainage area contributing to the ponds at this site is limited to the storage area within the impoundments. Preliminary evaluations indicate that there is enough storage capacity and freeboard in the Bottom Ash Pond at the current operating pools to safely store a 50% of the PMP event without being overtopped. Preliminary evaluation of the Fly Ash Pond and Leachate Pond indicates that there is enough storage capacity and freeboard at the current operating pool to safely store 100% of the PMP event without being overtopped.

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3.3 Structural Adequacy and Stability

LADOTD requires new and existing dams to be evaluated under design guidelines outlined in the Louisiana Administrative Code (LAC) Title 70, Part XIII, Chapter 21 Dam Safety Rules Program. Minimum required factors of safety outlined by LADOTD in LAC, Table 2 (pgs. 350, December 2001) are provided in **Table 3**.

Table 3 - Minimum Safety Factors Required

Load Case	Minimum Required Factor of Safety
Rapid Drawdown	1.25
Partial Pool	1.40
Steady Seepage	1.40
After Construction	1.30
Earthquake	1.15

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The factors of safety reported above are equal to or more stringent than generally accepted industry standards established by the United States Army Corps of Engineers (USACE), the United States Bureau of Reclamation, the Federal Energy Regulatory Commission, the Federal Emergency Management Agency, and the Natural Resources Conservation Service.

3.3.1 Ash Pond Impoundments

CDM was not provided with any information regarding the structural adequacy and stability of the W. Donner Rodemacher Power Station ash ponds. CDM was not able to perform stability analyses for the embankments because CDM was not provided with any information on the properties of the embankment or foundation soils.

3.4 Foundation Conditions

Based on our review of the drawings provided it is not clear how the embankment foundations were constructed. Construction drawings supplied by Cleco showed portions of the embankment subgrade were to be “stripped as required”, but no details were provided. The construction drawings show that the embankments were constructed of “CCF-1” or “CCF-2” material. Based on the Permit and construction drawings, the CCF-2 material was specified for the 3-foot-thick liner that consisted of high-plasticity clays with plasticity indices ranging from 29 to 41 and average liquid limits ranging from 49 to 62. No details were provided on the CCF-1 material.

Based on test soil boring information included in the Permit, the embankments were constructed over a surface deposit of clay with layers of silt and sand. The soils were classified according to Unified Soil Classification System as CH, CL, OH, SP, SC, ML, and SM and extended to the bottom of the explorations. Test soils boring locations are shown on Figure 6. Subsurface soil profiles are included in Appendix A.

3.5 Operations and Maintenance

Daily and weekly inspection checklists are completed for the impoundments by Plant Personnel. The daily checklists include yes or no responses for the following questions:

- Levees in good condition?
- Any erosions or breaches?
- Water overtopping levees?
- Excessive vegetative growth that prevents proper access, inspection, or operation?

LDEQ requires weekly inspections for proper leachate collection, evidence of leaks, and condition of structural integrity. Cleco completes weekly checklists that document whether or not the level of leachate in the collection system is less than 12 inches, and the general condition of the embankment. Examples of completed daily and weekly checklists are included in **Appendix F**.

Groundwater levels are recorded in the monitoring wells and analytical samples are obtained semi-annually to evaluate the quality of the seepage water to determine if the groundwater quality is within limits of the NPDES permit. Monitoring of the groundwater is also required by LDEQ regulations for impoundments classified as Type I Industrial Landfills.

W. Donner Rodemacher Power Station has a general plant emergency action plan. However, there is no emergency action plan specific to the impoundments.

Routine maintenance performed includes mowing grass on embankment slopes, and other activities as needed to address observed deficient conditions such as erosion and need for re-vegetation. Roadways on the embankment crests are also maintained.

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Section 4
Conclusions and Recommendations

4.1 Hazard Classification

The W. Donner Rodemacher impoundments currently do not have a LADOTD-developed Hazard Potential Classification. Based on the USEPA classification system as presented on page 2 of the USEPA checklist (**Appendix C**) and our review of the site and downstream areas, recommended hazard ratings have been assigned to the impoundments as summarized in **Table 4** below:

Table 4 – Recommended Impoundment Hazard Classification Ratings

Impoundment	Recommended Hazard Rating	Basis
Bottom Ash Pond	Significant Hazard	• A breach could reach residences on State Route 121 and cause property damage. • A breach could have an environmental impact on Rodemacher Lake. • A breach could result in the failure of the Fly Ash Pond
Fly Ash Pond	Significant Hazard	• A breach could reach a residence located approximately 0.6 miles south on James Road and cause property damage. • A breach could have an environmental impact on Rodemacher Lake. • A breach could cause the failure of the Leachate Pond.
Leachate Pond	Low Hazard	• A breach could have an environmental impact on Rodemacher Lake.

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4.2 Acknowledgement of CCW Impoundment Unit Condition

CDM acknowledges that the management units (Bottom Ash Pond, Fly Ash Pond, and Leachate Pond) referenced herein were assessed by William J. Friers, P.E., and Bevin A. Barringer, P.E. The Bottom Ash, Fly Ash, and Leachate Ponds appeared to be in fair condition based on site observations. However, there is a lack of documentation relative to the design and construction of these facilities. It is not known if critical studies or investigations (stability, hydrologic, hydraulic, seismic) have been performed to confirm that potential safety deficiencies do not exist. Therefore, the Bottom Ash, Fly Ash, and Leachate Ponds are judged to be in **POOR** condition. Additional documentation and future studies performed to confirm the condition and performance of these impoundments may be sufficient to substantiate an improved condition assessment. An assessment of POOR for these ponds is due to

conditions at the time of the assessment and the need for additional studies or investigations to confirm that other potential safety deficiencies do not exist. Observations at the time of the site assessment revealed eroded pond embankments, excessive vegetation, and possible seepage concerns.

As described in the following sections, further studies, maintenance, and monitoring may improve the condition of these impoundments.

4.3 Maintaining and Controlling Vegetation Growth

Large trees and/or uncontrolled vegetation have established themselves on the bottom of the exterior slopes along the Bottom Ash Pond north embankments and Fly Ash Pond north embankment, and on the majority of the exterior slopes along the Leachate Pond east and south embankments. Tree roots can concentrate seepage through the embankments, which could lead to internal erosion. Internal erosion would weaken the embankment, reduce stability, and could result in a slope failure and potential release of stored water and ash. In addition, uprooting of trees during storms or other adverse conditions can create voids in the embankment that are then susceptible to erosion. Brush also obscures the embankment surface limiting visual observations, provides a haven for burrowing animals, and retards growth of desirable grass vegetation.

CDM recommends that all trees and brush be cleared from the exterior slopes of all ash pond embankments under the supervision of a Professional Engineer in accordance with the procedures outlined in "FEMA 534 Technical Manual for Dam Owners – Impacts of Plants on Earthen Dams". CDM further recommends that stumps and all roots greater than 1 inch in diameter be removed. Disturbed areas should then be graded to adjacent contours, using compacted structural fill and reseeded with desirable grass vegetation. CDM also recommends that vegetation be cut on a regular basis to ensure that adequate visual observations can be made during scheduled inspections.

Areas of sparse vegetation were observed on the interior slopes of the Bottom Ash Pond and Fly Ash Pond. CDM recommends performing reseeding maintenance as required yearly to maintain a good grass cover in these areas.

4.4 Erosion Protection and Repair

Erosion rills, surface cracks, and cracked and missing concrete armoring were observed on multiple embankment slopes as discussed in Section 2. CDM recommends Cleco take the following corrective actions:

- Waterline erosion – Provide protection of the interior slopes of the Fly Ash Pond embankments against wave erosion by placement of a layer of rock riprap over a layer of bedding and a filter material. Other material such as concrete facing, soil-cement, fabriform bags, slush-grouted rocks, steel sheet piling, and articulated

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concrete blocks can also be used. Extend armoring at least 3 feet below lowest anticipated pool elevation and at least 2 feet above normal pool elevation.

- Erosion rills – Erosion rills were observed on the interior and exterior slopes of the Bottom Ash Pond and Fly Ash Pond. Place and compact structural fill in the rills and grade to adjacent existing contours.

- Surface cracks – Excavate cracked soils to neat lines down to competent undisturbed materials. Place and compact structural fill to restore the embankment slope, grading to adjacent existing contours. The area should be reseeded with desirable grass vegetation.

- Cracked concrete armoring – Replace cracked or missing concrete armoring in the Bottom Ash Pond. Extend armoring at least 3 feet below lowest anticipated pool elevation and at least 2 feet above normal pool elevation.

All repairs should be designed by a professional engineer familiar with earthen dam construction.

4.5 Over Excavation

CDM observed portions of the south embankment interior slope of Fly Ash Pond that had been over excavated during product harvesting. CDM recommends in the future a buttress of deposited fly ash be left in place after each removal operation. CDM also recommends survey control and monitoring of contractor activities to help ensure excavation operations do not alter the slope angles needed to meet the required factors of safety with regard to slope stability.

4.6 Seepage

Areas of possible seepage were observed on embankment slopes of the Bottom Ash Pond and Fly Ash Pond, as discussed in Section 2. Vegetation on the east and south embankments of the Leachate Pond precluded observations of possible seepage, though the HDPE liner installed is expected to reduce the potential for seepage. Regular monitoring is essential to detect and monitor seepage and to reduce the potential for failure. Without knowledge of the dam's history, the owner may not be able to evaluate whether a seepage condition is in a steady or changing state. To monitor the nature of the possible seepage conditions, CDM recommends Cleco take the following actions:

- develop a regular surveillance program to monitor areas of seepage and potential seepage to evaluate the rate, volume, and turbidity of flow emerging from the embankment slopes;

- develop and execute a geotechnical exploration program that includes additional test borings and installation of piezometers and other

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instrumentation to analyze and regularly monitor embankment seepage and stability; and

- read groundwater levels in existing groundwater monitoring wells (W-3, W-4, W-18, W-19, and W-21) at a minimum of a quarterly basis to establish an adequate base of seasonal water level fluctuations for use in stability analyses and to evaluate potential development of unstable embankment conditions and changes that may be indicative of seepage.

4.7 Animal Control

Evidence of rodent burrows and wild boar rooting was observed on the north embankment exterior slopes of the Bottom Ash Pond and Fly Ash Pond. Although not observed on other embankments, vegetation cover may have hidden additional animal activity. CDM recommends Cleco accurately document burrows and other areas disturbed by animal activity, remove the animals, and backfill the burrows and holes with compacted structural fill to protect the integrity of the embankments.

4.8 Instrumentation

Cleco provided CDM the most recent 2 years of water level readings from the 21 monitoring wells located at the Plant site. Five of the 21 monitoring wells (W-3, W-4, W-18, W-19, and W-21) are within the vicinity of the CCW impoundments, as shown on Figure 8. No information regarding further instrumentation was available to CDM.

An earth embankment that is safe under current conditions may not be safe in the future if conditions change. Conditions that may change include changes in the phreatic surface, embankment deformation, or changes in seepage patterns. CDM recommends the installation of staff gauges to all outlet structures to monitor the water levels in all active impoundments and routinely monitoring water levels in the monitoring wells as recommended in Section 4.5 of this report.

4.9 Impoundment Hydraulic and Stability Analysis

LDEQ requires surface impoundments to have the capacity to store the 24-hour, 25-year storm event. The Permit completed by Cleco in 1981 included surface drainage information stating that the Bottom Ash Pond and original Fly Ash Pond had adequate storage capacity to accommodate the 25-hour, 25-year maximum rainfall for the area under normal operating conditions (9 inches).

A preliminary evaluation performed by CDM suggests there is enough storage capacity at the current operating pool levels to safely store 100% of the PMP event (31.5 inches) in the Fly Ash Pond and Leachate Pond, and 50% of the PMP event (15.8 inches) in the Bottom Ash Pond. CDM recommends Cleco perform a complete study to confirm this opinion and update the study if operating parameters of the ponds change in the future.

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CDM was not provided with information regarding stability analyses performed prior to or following construction of the CCW surface impoundments or information regarding properties of the embankment and foundation materials. It is recommended that detailed stability analyses be performed for these embankments utilizing the results of the subsurface program noted Section 4.5 above. The geotechnical investigation should also evaluate the existing soil conditions and engineering characteristics in the embankments and their supporting foundation soils.

Stability analyses should consider all appropriate operating and loading conditions including flood conditions, rapid drawdown if applicable, and a seismic stability and liquefaction potential analysis of the upstream and downstream embankment slopes and foundation. CDM recommends that all analyses be performed by a registered professional engineer experienced in earthen dam design.

4.10 Inspection Recommendations

Based on the information reviewed by CDM, Cleco performs documented daily and weekly inspections. CDM recommends that plant personnel be trained in dam inspection techniques. CDM also recommends that Cleco develop more-detailed inspection documentation procedures that include a sketch of relevant features observed, and the documentation should be periodically reviewed to identify if conditions are worsening and/or if significant changes are occurring that could lead to additional maintenance issues or safety concerns.

Inspections should be made following heavy rainfall and/or high water events on Lake Rodemacher and the Red River, and the occurrence of these events should be documented. It is recommended that inspection records be retained at the facility for a minimum of three years.

4.11 Emergency Preparedness Plan

According to the LADOTD Dam Safety Rules Program, Emergency Preparedness Plans (EPP) are required for all dams and reservoirs, both existing and new construction. Cleco does not have an EPP for the Bottom Ash, Fly Ash, and Leachate Ponds, judged by CDM to be Low to Significant Hazard structures. CDM recommends that Cleco develop an EPP for the Bottom Ash Pond, Fly Ash Pond, and Leachate Pond compliant with the LADOTD Dam Safety Rules Program.

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Section 5
Closing

The information presented in this report is based on visual field observations and review of reports and data provided to CDM by Cleco for the W. Donner Rodemacher Power Station surface impoundments. The conclusions and recommendations presented are based, in part, on limited information available at the time of this report. This report has been prepared in accordance with generally accepted engineering practices. No warranty, expressed or implied, is made. Should additional information become available or changes in field conditions occur, the conclusions and recommendations provided in this report should be re-evaluated by a qualified professional engineer.

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Section 6
Reports and References

The following is a list of reports and drawings that were provided by Cleco and were utilized during the preparation of this report and the development of the conclusions and recommendations presented herein.

1. Cleco May 2009 response to "Rodemacher Power Station –Request for Information Under Section 104(e) of the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. 9604(2)", by Steve Carter.

2. Visual Inspection of the Rodemacher Ash Pond Dams at Rodemacher Power Station, Boyce, Louisiana, prepared by TRC Engineers, Inc., March 25, 2009

3. W. Donner Rodemacher Power Station Unit 2 Permit Application Solid Waste Disposal Facilities, prepared by Cleco, signature dated October 11, 1981

4. Louisiana Department of Environmental Quality Field Interview Forms, prepared by LDEQ, dated December 2, 2004

5. Louisiana Department of Environmental Quality Field Interview Forms, prepared by LDEQ, dated June 14, 2006

6. Louisiana Department of Environmental Quality Field Interview Forms, prepared by LDEQ, dated October 24, 2007

7. Louisiana Department of Environmental Quality Field Interview Forms, prepared by LDEQ, dated July 22, 2009

8. Louisiana Department of Environmental Quality Field Interview Forms, prepared by LDEQ, dated May 18, 2010

9. Table 1 – Summary of Groundwater Monitoring Systems, prepared by Cleco

10. Attachment A – Monitoring Well Location Map, prepared by EAGLE Environmental Services, Inc., dated November 19, 2009

11. Summary of Water Elevations, prepared by Cleco, results from April 29, 2008 to May 17, 2010

12. Table 2 – Monitoring Well Construction Data, prepared by Cleco

13. Drawing No. S-238, "Ash Pond Bottom Ash Pond Area Discharge Structure Plans and Details", prepared by Sargent & Lundy, May 7, 1982

14. Drawing No. M-281 Sheet 1 of 4, "Outdoor Piping Ash Handling", prepared by Sargent & Lundy, October 2, 1980

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15. Drawing No. M-281 Sheet 3 of 4, "Outdoor Piping Ash Handling", prepared by Sargent & Lundy, November 11, 1980

16. Weekly Inspection Checklist Ash Management Area, prepared by Cleco, completed for March 1, 2010 through May 17, 2010

17. Solid Waste Impoundments Daily Inspection, prepared by Cleco, completed for May 17, 2010 through May 20, 2010

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Figures

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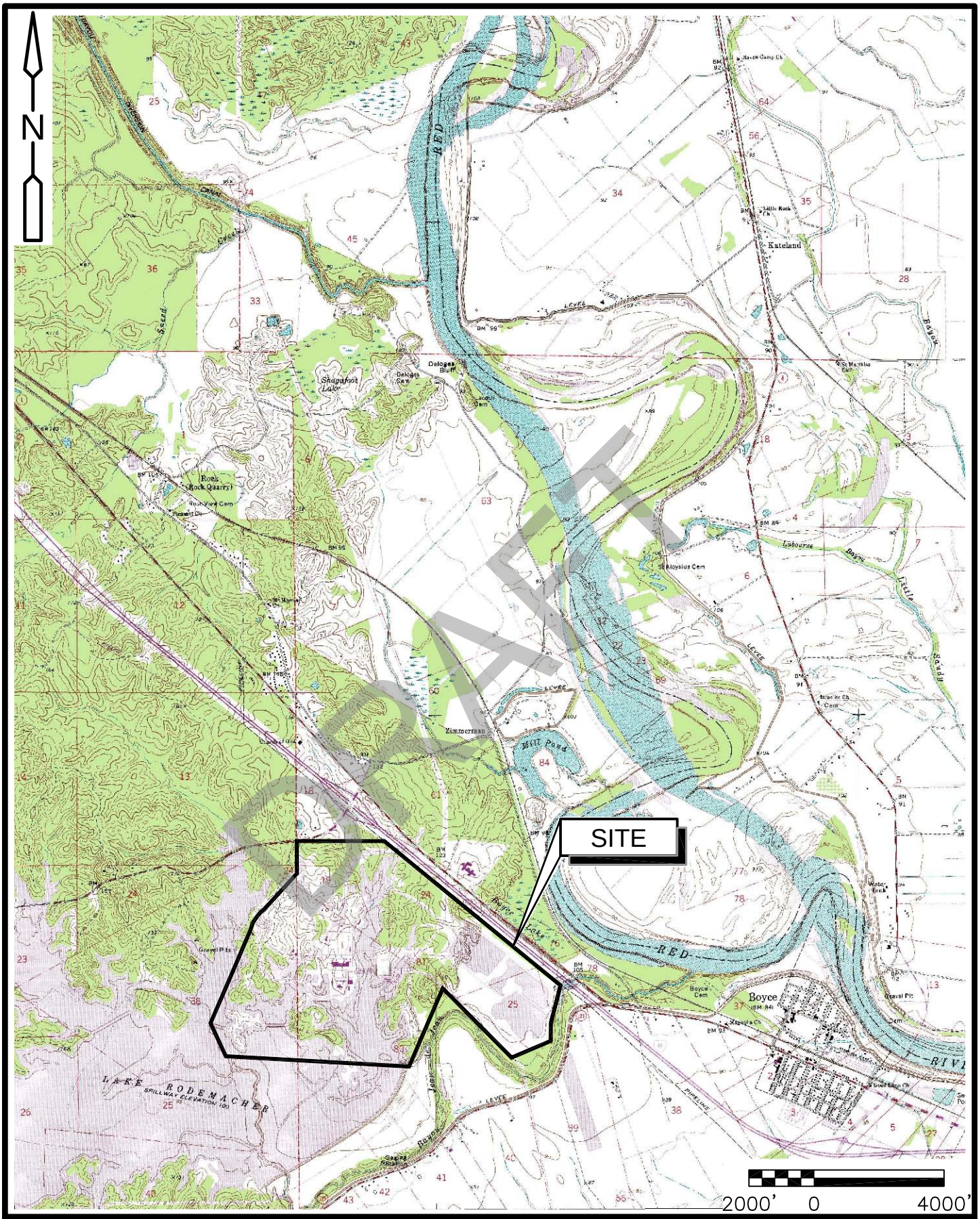

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USGS TOPOGRAPHIC MAPS
BOYCE QUADRANGLE MAP
CONTOURS AND ELEVATIONS IN FEET

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LOCUS PLAN
JULY 2010
FIGURE 1

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AERIAL PHOTOGRAPH SOURCE:
GOOGLE EARTH PRO.

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CRITICAL INFRASTRUCTURE PLAN
JULY 2010
FIGURE 2

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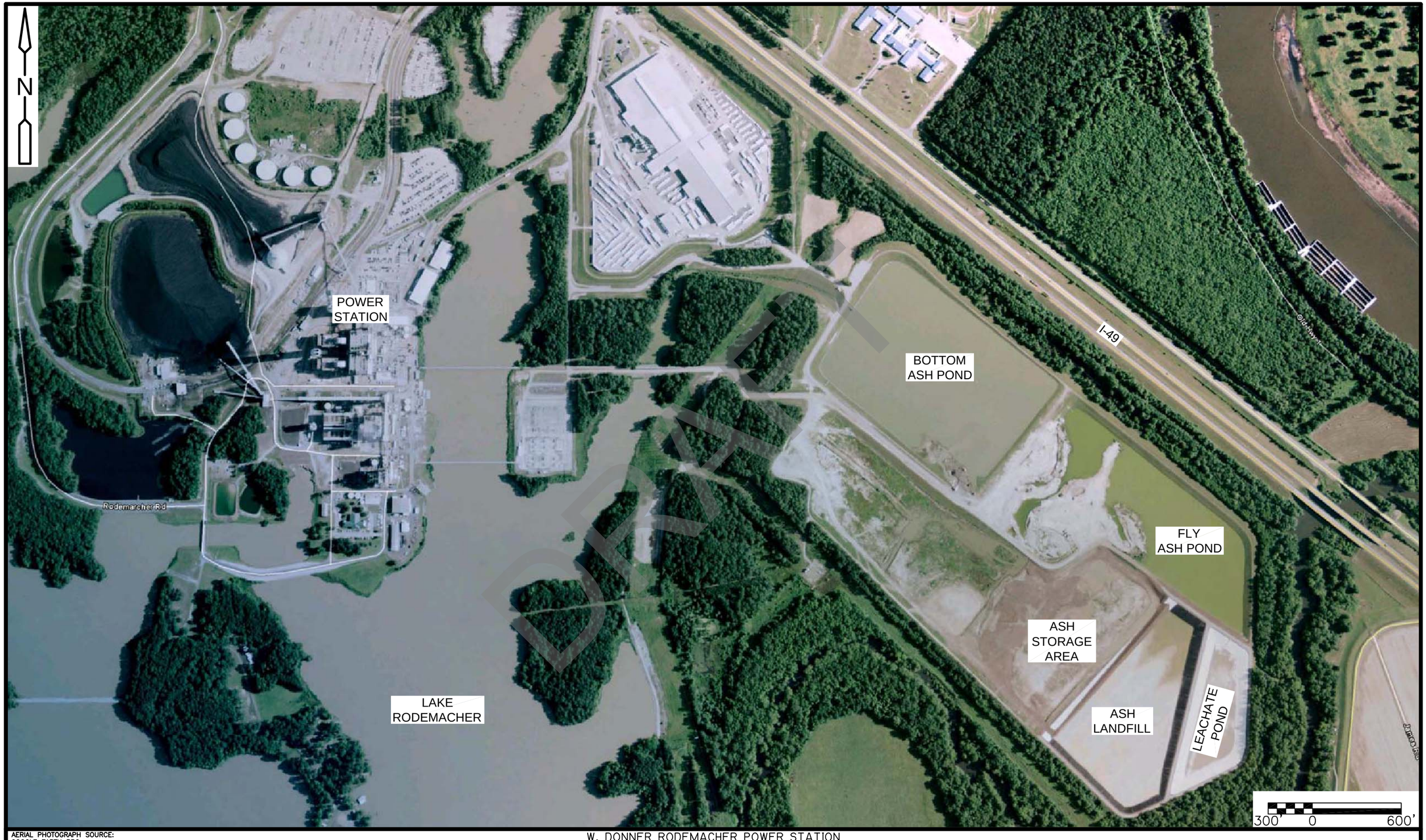

AERIAL PHOTOGRAPH SOURCE:
GOOGLE EARTH PRO.

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AERIAL MAP
JULY 2010 FIGURE 3

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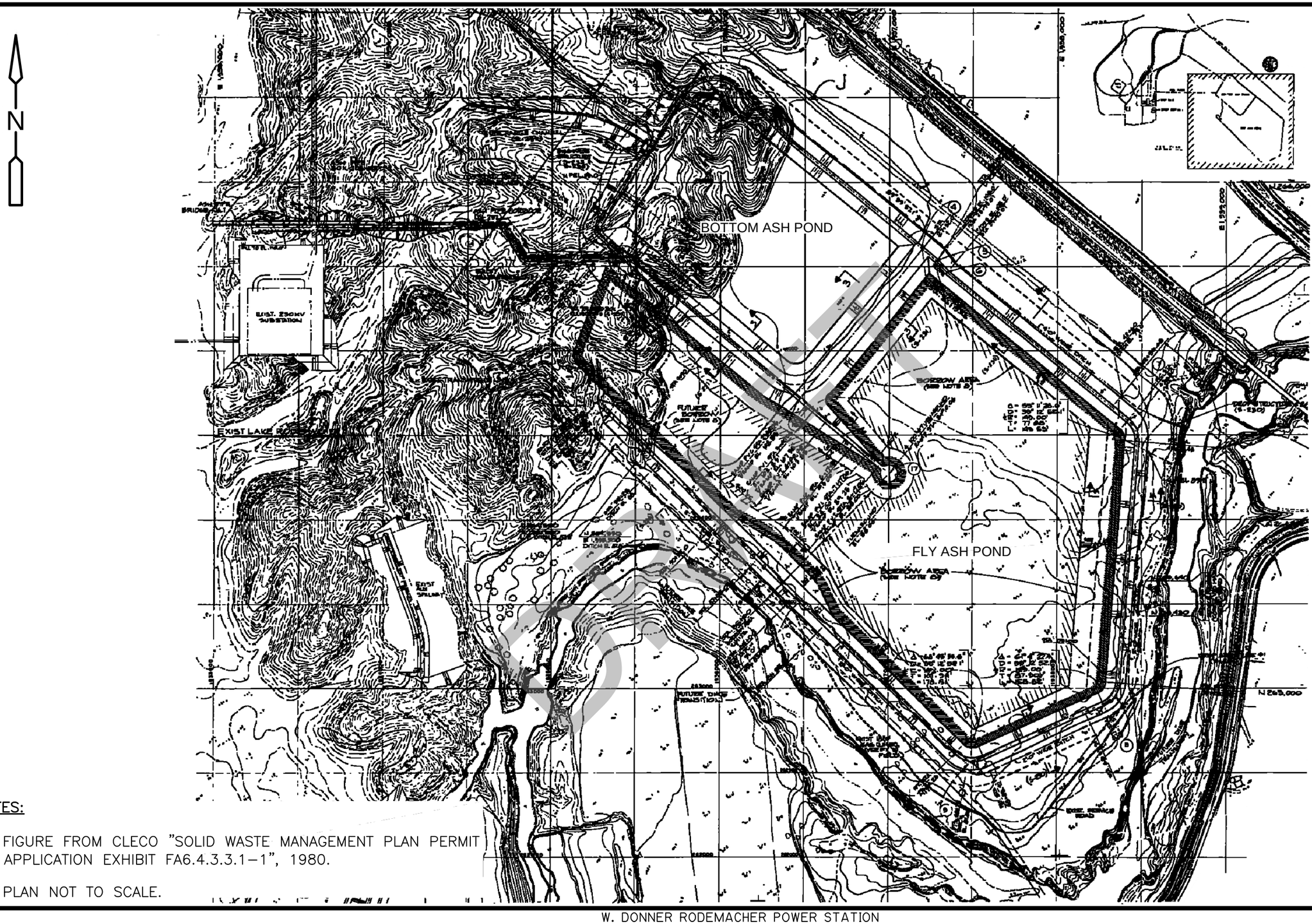

NOTES:

1. FIGURE FROM CLECO "SOLID WASTE MANAGEMENT PLAN PERMIT APPLICATION EXHIBIT FA6.4.3.3.1–1", 1980.
2. PLAN NOT TO SCALE.

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BOTTOM ASH AND FLY ASH POND
PLAN VIEW - 1982 CONSTRUCTION
FIGURE 4

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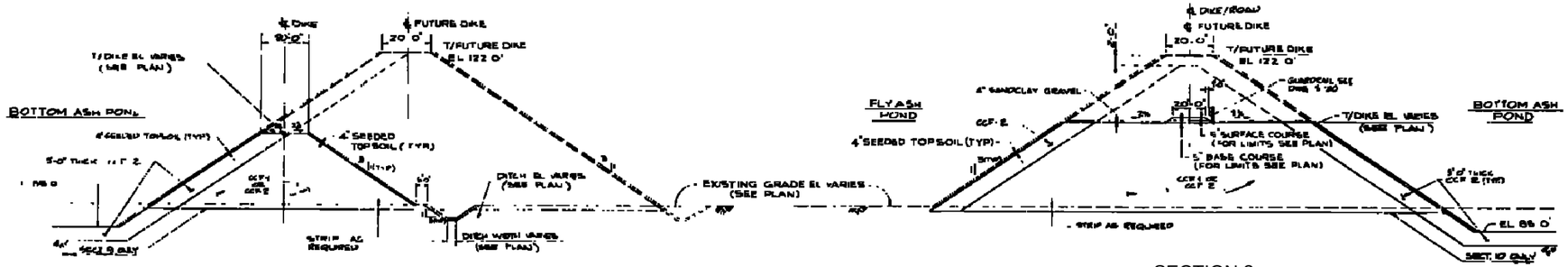
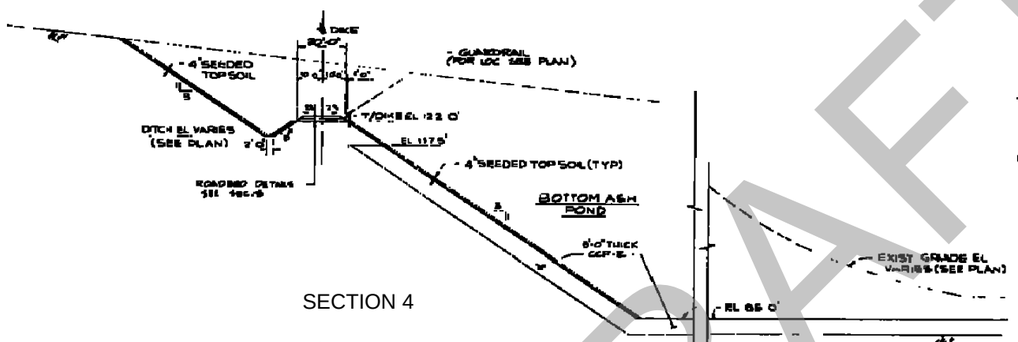
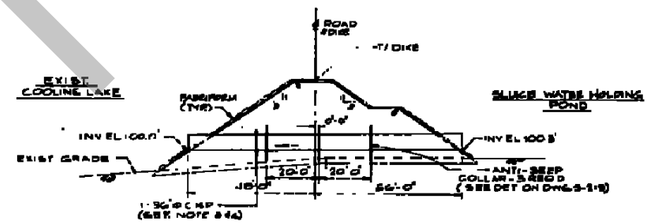


SECTION 2
SECTION 9

SECTION 3
SECTION 10



SECTION 4



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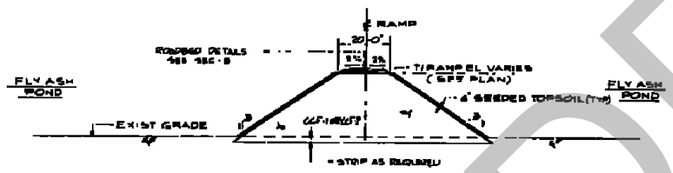
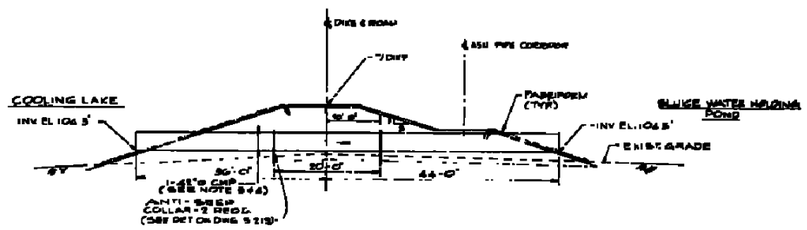


SECTION 6



SECTION 7

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NOTES:

1. FIGURE FROM CLECO "SOLID WASTE MANAGEMENT PLAN PERMIT APPLICATION EXHIBIT BA6.4.3.3.1–2", 1980.

2. DETAILS NOT TO SCALE.

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BOTTOM ASH AND FLY ASH POND
DETAILS - 1982 CONSTRUCTION
FIGURE 5

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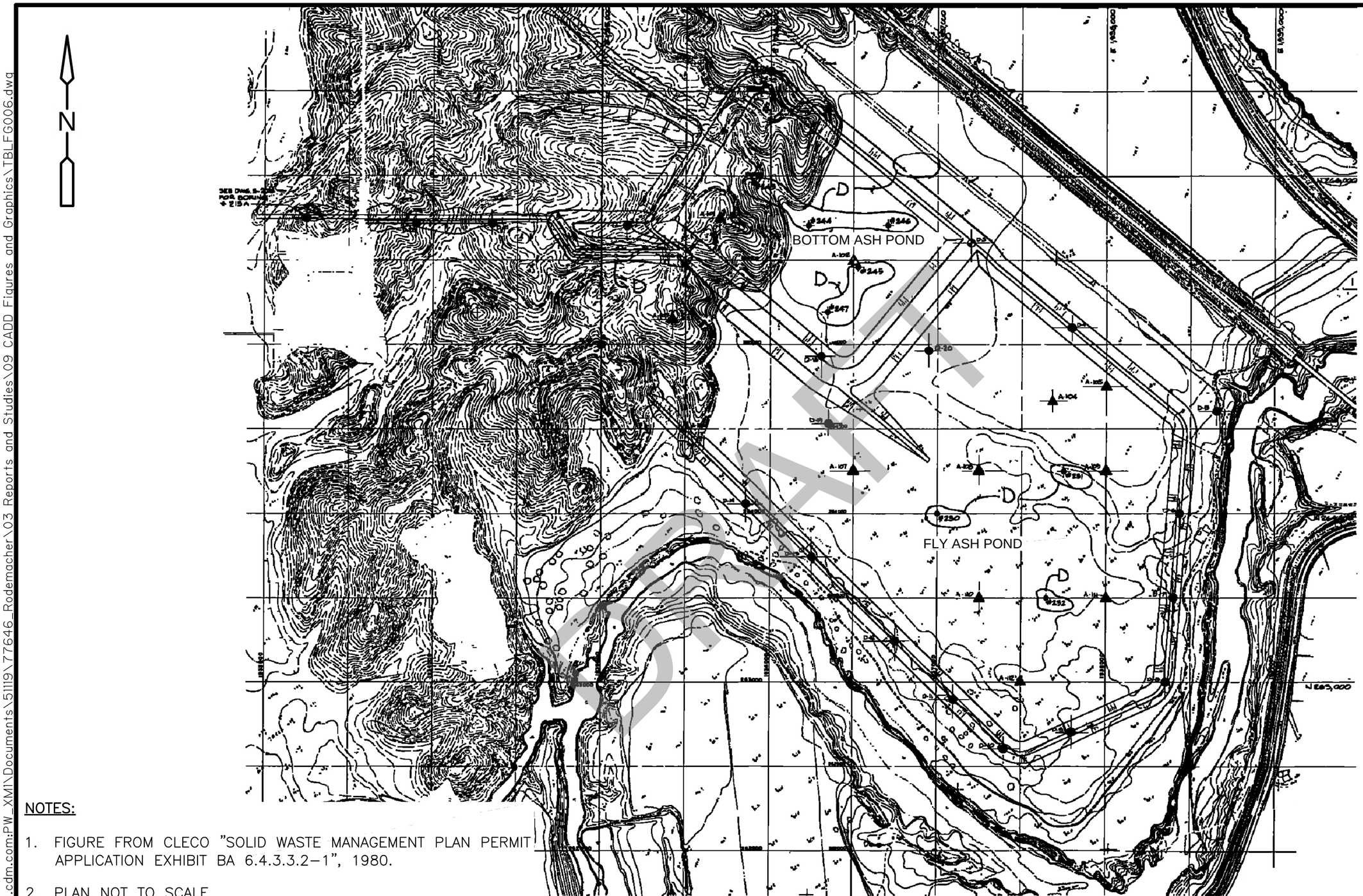

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NOTES:

1. FIGURE FROM CLECO "SOLID WASTE MANAGEMENT PLAN PERMIT APPLICATION EXHIBIT BA 6.4.3.3.2–1", 1980.

2. PLAN NOT TO SCALE.

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BORING LOCATION PLAN

FIGURE 6

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Ash Haul Road

Ash Pipe Corridor

BOTTOM ASH POND

MATCH LINE (SEE FIGURE 7B)

N

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LEGEND:

2 PHOTOGRAPH NUMBER AND ORIENTATION

NOTES:

1. BASE PLAN DEVELOPED FROM CLECO "MONITORING WELL LOCATION MAP" DATED NOVEMBER 19. 2009.

100' 0 200'

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PHOTOGRAPH LOCATION PLAN
FIGURE 7A

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MATCH LINE (SEE FIGURE 7A)

FLY ASH POND

MATCH LINE (SEE FIGURE 7C)

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LEGEND:

2 PHOTOGRAPH NUMBER AND ORIENTATION

NOTES:

1. BASE PLAN DEVELOPED FROM CLECO "MONITORING WELL LOCATION MAP" DATED NOVEMBER 19. 2009.

100' 0 200'

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PHOTOGRAPH LOCATION PLAN
FIGURE 7B

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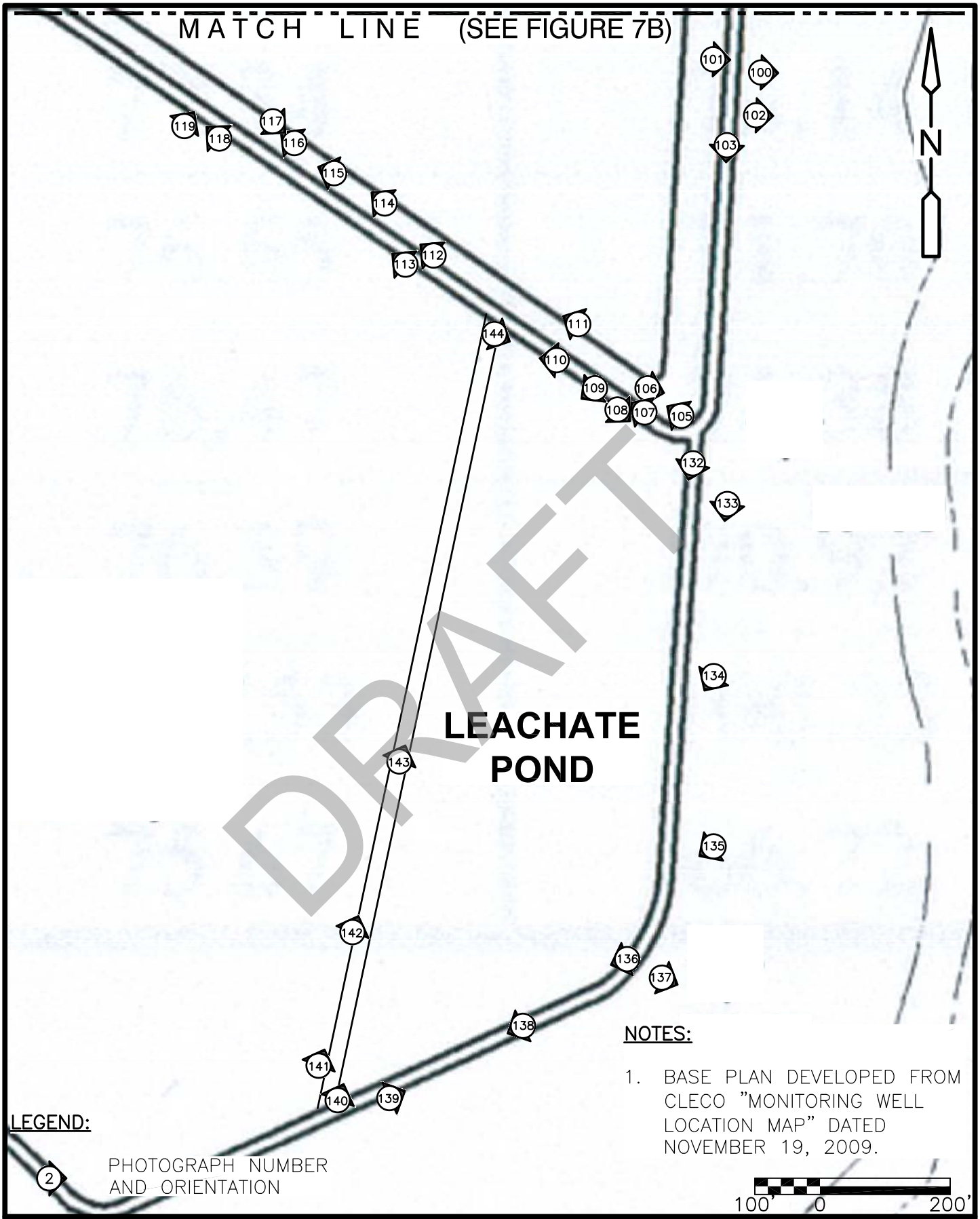

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PHOTOGRAPH LOCATION PLAN
FIGURE 7C

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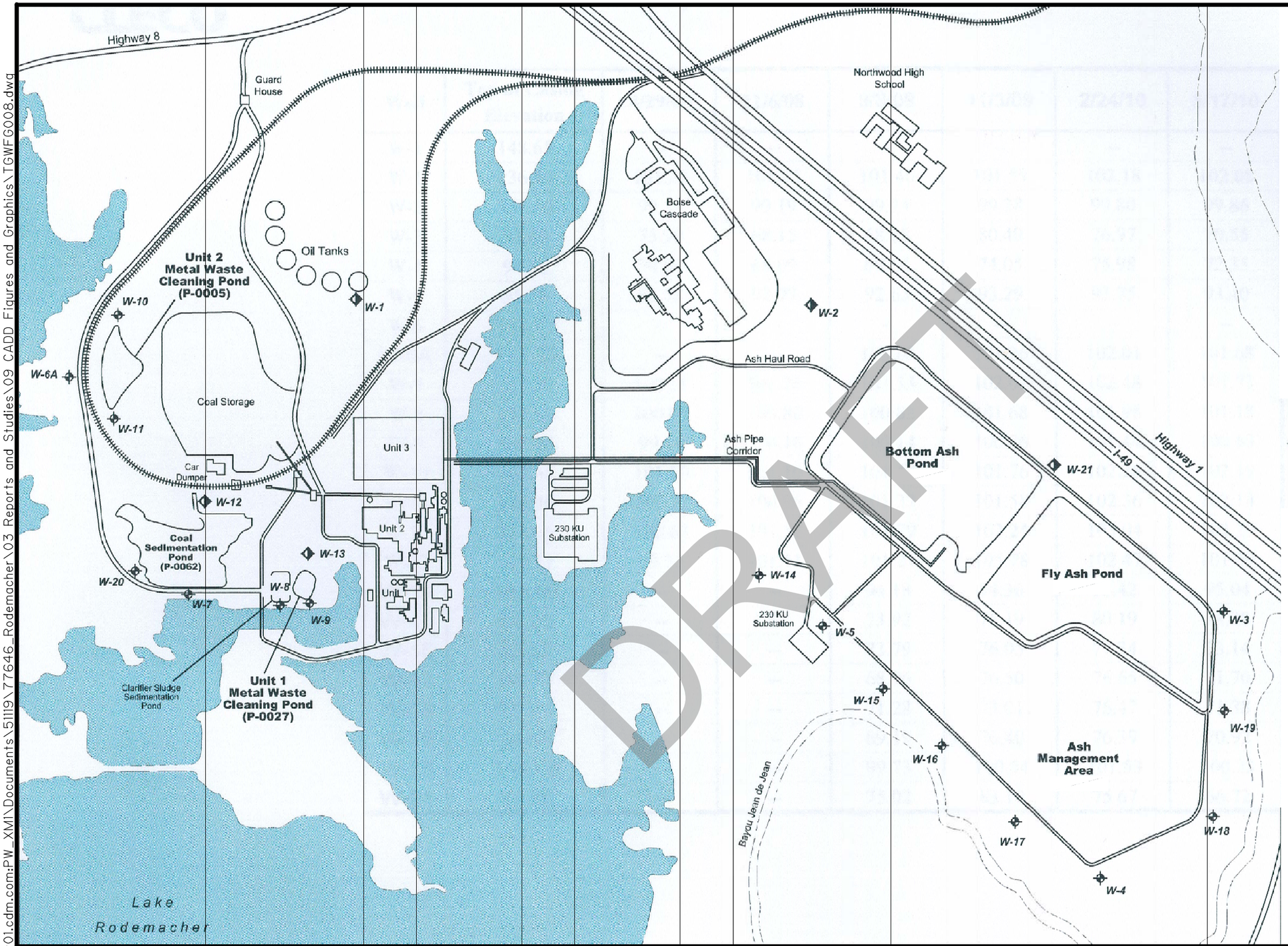

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GROUNDWATER MONITORING WELL LOCATIONS

FIGURE 8

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Appendix A
LDEQ Field Interview Forms

US EPA ARCHIVE DOCUMENT

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
FIELD INTERVIEW FORM

GD-079-0390

AGENCY INTEREST#: 2922 INSPECTION DATE: 5-18-10 TIME OF ARRIVAL: 10:00 AM

ALTERNATE ID#: P0062 (ID Type/Number) DEPARTURE DATE: 5-18-10 TIME OF DEPARTURE: 2:45 PM

FACILITY NAME: Cleco Rodemacher Power Station PH #: 318 793 1135

LOCATION: 275 Rodemacher Road Lena, LA 71447

PARISH NAME: Rapides

RECEIVING STREAM (BASIN/SUBSEGMENT):

MAILING ADDRESS: (Street/P.O. Box) (City) (State) (ZIP)

FACILITY REPRESENTATIVE: TITLE:

FACILITY REPRESENTATIVE PHONE NUMBER:

NAME, TITLE, ADDRESS and TELEPHONE of RESPONSIBLE OFFICIAL (if different from above):

INSPECTION TYPE: CEI PROGRAM INVOLVED: AIR SW WASTE WATER OTHER

INSPECTOR'S OBSERVATIONS: (e.g. AREAS AND EQUIPMENT INSPECTED, PROBLEMS, DEFICIENCIES, REMARKS, VERBAL COMMITMENTS FROM FACILITY REPRESENTATIVES)

The following solid waste units are in operation
P0062 Coal Sedimentation Pond
P0027 RPS-1 Metal Waste Cleaning Pond
P0379 Ash Management Area Landfill and leachate run-off pond.
P0005 RPS-2 Metal Waste Cleaning Pond, Bottom Ash Pond, Fly Ash Pond
Industrial solid waste coal is removed from the coal sedimentation pond and reused. (0390-008). Other industrial solid waste generated include refractory brick (0390-014) and Asbestos (0390-002).

AREAS OF CONCERN:

REGULATION	EXPLANATION	CORRECTED?
		YES NO
		YES NO

PHOTOS TAKEN: ☐ YES ☑ NO SAMPLES TAKEN: ☐ YES ☑ NO (Attach Chain-of-custody)

RECEIVED BY: SIGNATURE: Ricky Nguyen

PRINT NAME: Ricky Nguyen

(NOTE: SIGNATURE DOES NOT NECESSARILY INDICATE AGREEMENT WITH INSPECTOR'S STATED OBSERVATIONS)

INSPECTOR(S): Theron J Magee CROSS REFERENCE:

ATTACHMENTS:

REVIEWER: [signature]

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LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
INSPECTOR OBSERVATIONS (cont'd)

AGENCY INTEREST#: 2922 ALTERNATE ID#: GD-079-0390 INSPECTION DATE: 5-18-10

FACILITY NAME: Cleco Rodemacher Power Station

INSPECTOR OBSERVATIONS CONT'd:

Annual reports are submitted for the period July 1 - June 30.
Inspections are conducted daily.
This facility is notified as a small quantity generator of hazardous waste. (LAD 071 941 611) The only hazardous waste generated are waste paint related materials.
2 55-gallon drums are in use at this time storing waste paint related materials. The solvents are shipped to Safety Kleen in Denton, Tx as F003, F005, D001, D035, D005 hazardous waste, and the paint also go to Denton Tx as D001, D005, D006, D007, D008 hazardous waste.

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REVISED: 02/03/2003

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LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
FIELD INTERVIEW FORM

AGENCY INTEREST#: 2922 INSPECTION DATE: 7-22-09 TIME OF ARRIVAL: 9:30AM

ALTERNATE ID#: GD-079-0390 (ID Type/Number) DEPARTURE DATE: 7-22-09 TIME OF DEPARTURE: 12:35 PM

FACILITY NAME: Cleco Rodemacher Power Station PH #:

LOCATION: 275 Rodemacker Rd Lena, LA 71447

PARISH NAME: Rapides

RECEIVING STREAM (BASIN/SUBSEGMENT):

MAILING ADDRESS: (Street/P.O. Box) (City) (State) (ZIP)

FACILITY REPRESENTATIVE: Ricky Nguyen TITLE: Senior Environmental

FACILITY REPRESENTATIVE PHONE NUMBER:

NAME, TITLE, ADDRESS and TELEPHONE of RESPONSIBLE OFFICIAL (if different from above):

INSPECTION TYPE: Start-up PROGRAM INVOLVED: AIR (WASTE) WATER OTHER

INSPECTOR'S OBSERVATIONS: (e.g. AREAS AND EQUIPMENT INSPECTED, PROBLEMS, DEFICIENCIES, REMARKS, VERBAL COMMITMENTS FROM FACILITY REPRESENTATIVES)

A start-up inspection was conducted this date for a solid waste permit renewal for Unit 2 metal cleaning waste pond, bottom ash pond, Fly Ash Pond (P-005), Unit 1 metal cleaning waste pond (P0027), and the Coal Sedimentation Pond (P-0062). These facilities are being operated in accordance with their permit and solid waste Permit Renewal Application.

AREAS OF CONCERN:

REGULATION	EXPLANATION	CORRECTED?
		YES NO
		YES NO

PHOTOS TAKEN: ☐ YES ☑ NO SAMPLES TAKEN: ☐ YES ☑ NO (Attach Chain-of-custody)

RECEIVED BY: SIGNATURE: [signature]

PRINT NAME: Ricky Nguyen

(NOTE: SIGNATURE DOES NOT NECESSARILY INDICATE AGREEMENT WITH INSPECTOR'S STATED OBSERVATIONS)

INSPECTOR(S): [signature], Jason Meyers, Dorian Hecomarfe, [signature] Amanda Dail

CROSS REFERENCE:

ATTACHMENTS:

REVIEWER:

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LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
FIELD INTERVIEW FORM

AGENCY INTEREST#: 2922 INSPECTION DATE: 10/[illegible] TIME OF ARRIVAL: 1000

ALTERNATE ID#: 60-079-0390 (ID Type/Number) DEPARTURE DATE: 10/24/07 TIME OF DEPARTURE: 1115

FACILITY NAME: Cleco Power, LLC PH #: 318 793 1138

LOCATION: Rodemacher Plant 275 Rodemacher Road Lena La.

PARISH NAME: Rapides

RECEIVING STREAM (BASIN/SUBSEGMENT): Lake Rodemacher

MAILING ADDRESS: 275 Rodemacher Road (Street/P.O. Box) Lena (City) La (State) 71447 (ZIP)

FACILITY REPRESENTATIVE: Greg Bennett TITLE: Manager Plant Operations

FACILITY REPRESENTATIVE PHONE NUMBER: Same

NAME, TITLE, ADDRESS and TELEPHONE of RESPONSIBLE OFFICIAL (if different from above): Paul Turregano Environmental - Director 318 484-7413

INSPECTION TYPE: CEI PROGRAM INVOLVED: AIR (WASTE) WATER OTHER

INSPECTOR'S OBSERVATIONS: (e.g. AREAS AND EQUIPMENT INSPECTED, PROBLEMS, DEFICIENCIES, REMARKS, VERBAL COMMITMENTS FROM FACILITY REPRESENTATIVES)

A routine solid waste impoundment inspection was conducted at the above facility. The following concerns were noted: Inspected all impoundment areas & all containment ponds had at least 2 feet freeboard & stable levee integrity. Monitoring wells were secured. Reviewed SPCC Plan, Ground H2O Monitoring data, Permits, safety meeting, & Dmr's. All paperwork was in order. There were no areas of concern noted during inspection.

AREAS OF CONCERN:

REGULATION	EXPLANATION	CORRECTED?
		YES NO
		YES NO

PHOTOS TAKEN: ☐ YES ☑ NO SAMPLES TAKEN: ☐ YES ☑ NO (Attach Chain-of-custody)

RECEIVED BY: SIGNATURE: Greg Bennett

PRINT NAME: Greg Bennett

(NOTE: SIGNATURE DOES NOT NECESSARILY INDICATE AGREEMENT WITH INSPECTOR'S STATED OBSERVATIONS)

INSPECTOR(S): [signature] CROSS REFERENCE:

ATTACHMENTS:

REVIEWER: [signature]

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LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
FIELD INTERVIEW FORM

AGENCY INTEREST#: 2922 INSPECTION DATE: 6-14-06 TIME OF ARRIVAL: 0945

ALTERNATE ID#: 6D-079-0390 (ID Type/Number) DEPARTURE DATE: 6-14-06 TIME OF DEPARTURE: 1130

FACILITY NAME: Cleco Power, LLC PH #: 318-793-1136

LOCATION: Rodemacher Plant 275 Rodemacher Road LENA LA

PARISH NAME: Rapides

RECEIVING STREAM (BASIN/SUBSEGMENT): Lake Rodemacher

MAILING ADDRESS: 275 Rodemacher Road (Street/P.O. Box) LENA (City) LA (State) 71447 (ZIP)

FACILITY REPRESENTATIVE: George Stafford TITLE: Chemist

FACILITY REPRESENTATIVE PHONE NUMBER: same

NAME, TITLE, ADDRESS and TELEPHONE of RESPONSIBLE OFFICIAL (if different from above): same

INSPECTION TYPE: CEI PROGRAM INVOLVED: AIR (WASTE) WATER OTHER

INSPECTOR'S OBSERVATIONS: (e.g. AREAS AND EQUIPMENT INSPECTED, PROBLEMS, DEFICIENCIES, REMARKS, VERBAL COMMITMENTS FROM FACILITY REPRESENTATIVES)

A routine Solid Waste Impoundment inspection was conducted at the above facility. The following concerns were noted: Facility was issued an NOP in 2005 concerning deficiencies in the solid waste permit application for Geological & Technical portions of the permit. This issue has been addressed by Cleco. Visual Inspections were conducted on POODS UNIT 2 Cleaning Waste pond (Ash Pond & Fly Ash pond), Unit 1 clean Waste pond & coal sedimentation pond. All Levees had satisfactory integrity. Reviewed SPCC plan, Ground H2O monitoring data, Permits, tank inspections & safety records. All Paperwork was in order. There were no areas of concern Noted during inspection.

AREAS OF CONCERN:

REGULATION	EXPLANATION	CORRECTED?
		YES NO
		YES NO

PHOTOS TAKEN: ☐ YES ☐ NO SAMPLES TAKEN: ☐ YES ☐ NO (Attach Chain-of-custody)

RECEIVED BY: SIGNATURE: George A. Stafford

PRINT NAME: George A. Stafford

(NOTE: SIGNATURE DOES NOT NECESSARILY INDICATE AGREEMENT WITH INSPECTOR'S STATED OBSERVATIONS)

INSPECTOR(S): [signature] CROSS REFERENCE:

ATTACHMENTS:

REVIEWER:

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REVISED: 02/03/2003

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LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
FIELD INTERVIEW FORM

AGENCY INTEREST#: 2922 INSPECTION DATE: 12/2/04 TIME OF ARRIVAL: 12:30

ALTERNATE ID#: D-079-0390 (ID Type/Number) DEPARTURE DATE: 12/2/04 TIME OF DEPARTURE: 1:30

FACILITY NAME: CLECO (Rodemacher Power Station) PH #: 318-484-7623

LOCATION: 275 Rodemacher Road, LENA (Ricky Nguyen)

RECEIVING STREAM (BASIN/SUBSEGMENT): N/A PARISH NAME: Rapides Parish

MAILING ADDRESS: P.O. Box 5000 (2030 Donahue Ferry Rd) Pineville 71361
(Street/P.O. Box) (City) (State) (ZIP)

FACILITY REPRESENTATIVE: Ricky H. Nguyen TITLE: ENVIRO. SPECIALIST

FACILITY REPRESENTATIVE PHONE NUMBER:

NAME, TITLE, ADDRESS and TELEPHONE of RESPONSIBLE OFFICIAL (if different from above): 318-484-7623
Same

INSPECTION TYPE: Annual PROGRAM INVOLVED: AIR (WASTE) WATER OTHER Groundwater

INSPECTOR'S OBSERVATIONS: (e.g. AREAS AND EQUIPMENT INSPECTED, PROBLEMS, DEFICIENCIES, REMARKS, VERBAL COMMITMENTS FROM FACILITY REPRESENTATIVES)

I MET ON SITE WITH CLECO STAFF TO DISCUSS GROUNDWATER AND PERMIT ISSUES. A MEETING WITH DEQ'S PERMIT GROUP IS PLANNED FOR NEXT WEEK. I INSPECTED THE BOTTOM ASH POND AREA — THE LEVEE WAS WALKED AND NO BREACH OF THE LEVEE WAS SEEN. THE MONITORING WELLS NOTED DURING MY TIME ON SITE WERE IN GOOD REPAIR.

AREAS OF CONCERN:

REGULATION	EXPLANATION	CORRECTED?
	See File	YES NO
		YES NO

PHOTOS TAKEN: ☐ YES ☑ NO SAMPLES TAKEN: ☐ YES ☑ NO (Attach Chain-of-custody)

RECEIVED BY: SIGNATURE: Ricky Nguyen

PRINT NAME: Ricky NGUYEN, ENVIR. Specialist.

(NOTE: SIGNATURE DOES NOT NECESSARILY INDICATE AGREEMENT WITH INSPECTOR'S STATED OBSERVATIONS)

INSPECTOR(S): D M McQueen DAVID McQUEEN CROSS REFERENCE:

ATTACHMENTS:

REVIEWER: Darrell Franklin

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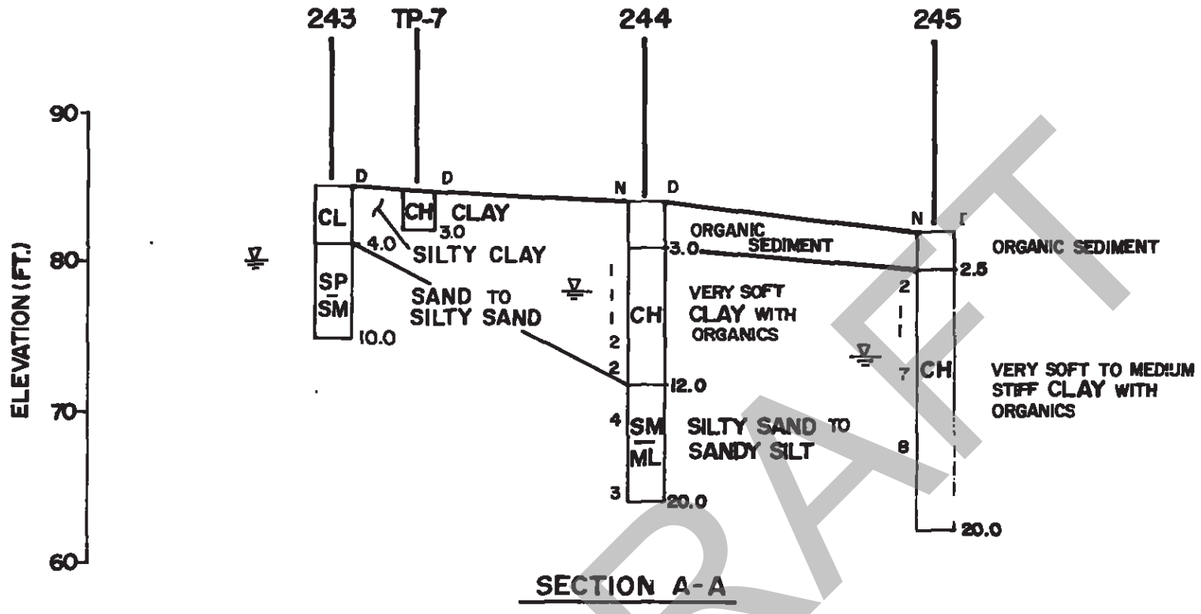
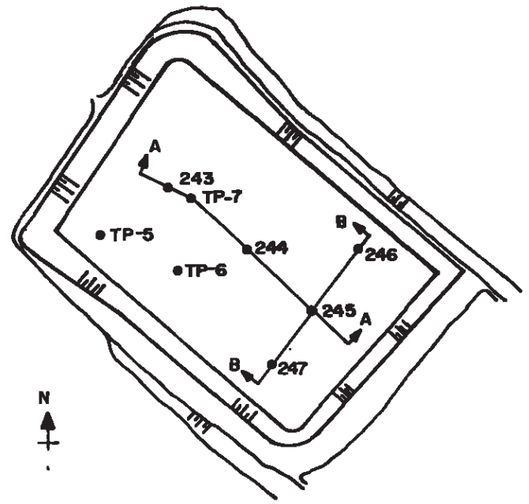
Appendix B
Subsurface Soil Profiles

US EPA ARCHIVE DOCUMENT



SECTION A-A

0 200'
HORIZONTAL
SCALE IN FEET



PLAN
N.T.S.

LEGEND

TP = TEST PIT
D = DEPT IN FEET
N = STANDARD PENETRATION TEST, BLOWS PER FOOT
▽ = GROUND WATER LEVEL

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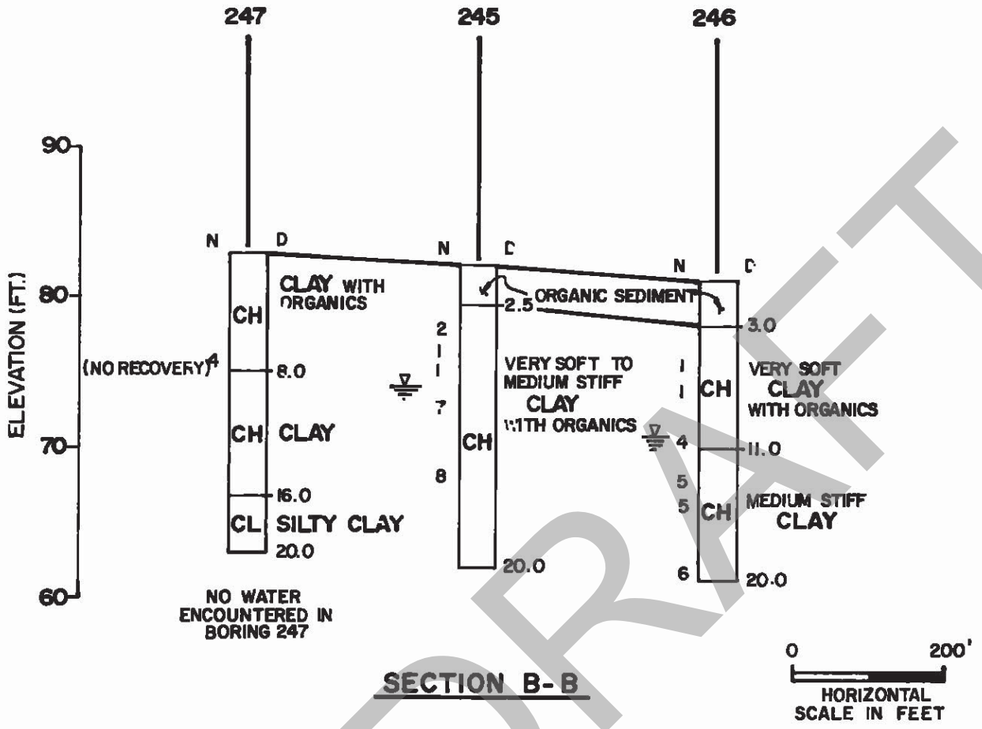
GENERALIZED SUBSURFACE DIAGRAM - SECTION A-A
BOTTOM ASH POND

RODEMACHER POWER STATION UNIT 2
SOLID WASTE MANAGEMENT PLAN
PERMIT APPLICATION

EXHIBIT BA 6.4.3.B.2-2



SECTION B-B

LEGEND

D = DEPTH IN FEET

N = STANDARD PENETRATION TEST, BLOWS PER FOOT

⏚ = GROUND WATER LEVEL

NOTE

1. FOR BORING LOCATION PLAN, SEE SECTION A-A.

GENERALIZED SUBSURFACE DIAGRAM - SECTION B-B
BOTTOM ASH POND

RODEMACHER POWER STATION UNIT 2
SOLID WASTE MANAGEMENT PLAN
PERMIT APPLICATION

EXHIBIT BA 6.4.3.B.2-3

US EPA ARCHIVE DOCUMENT
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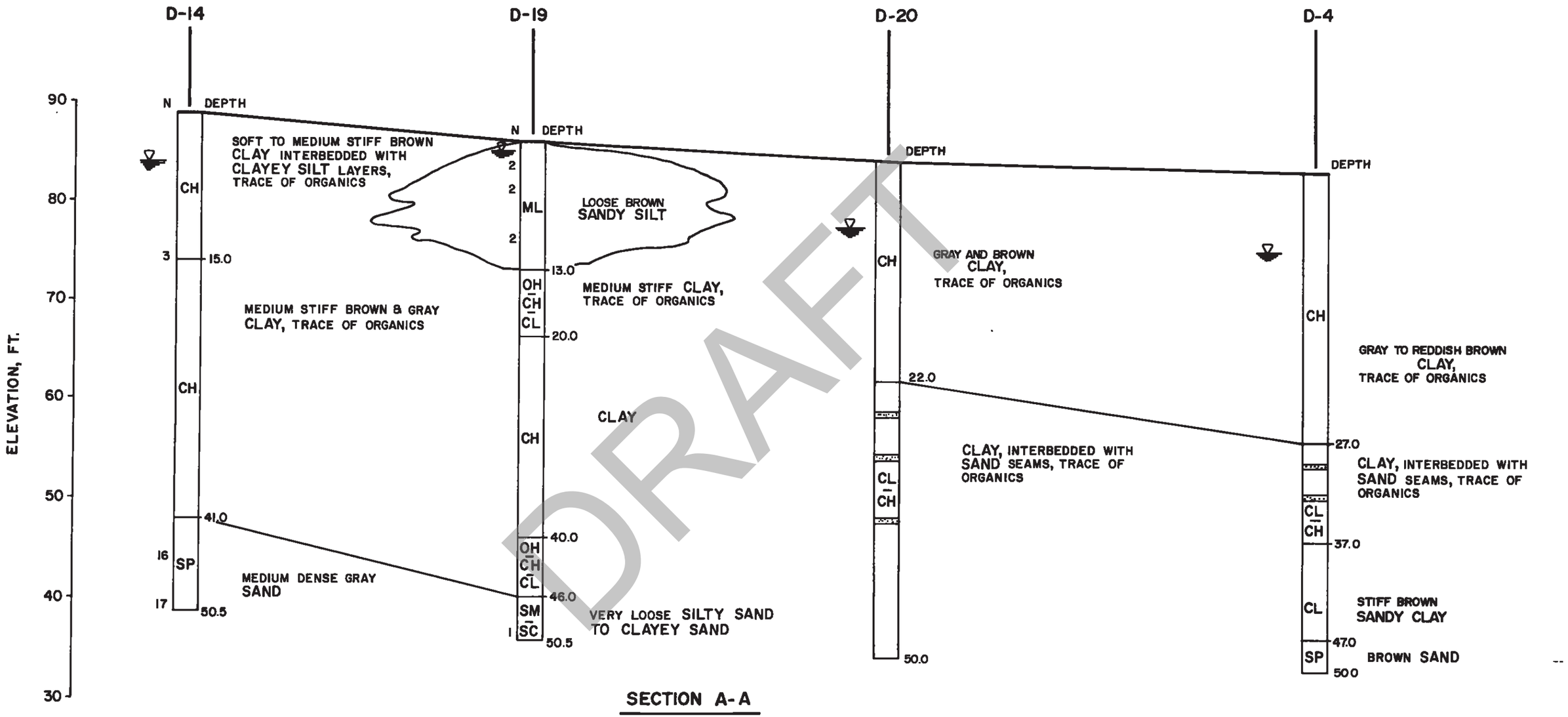

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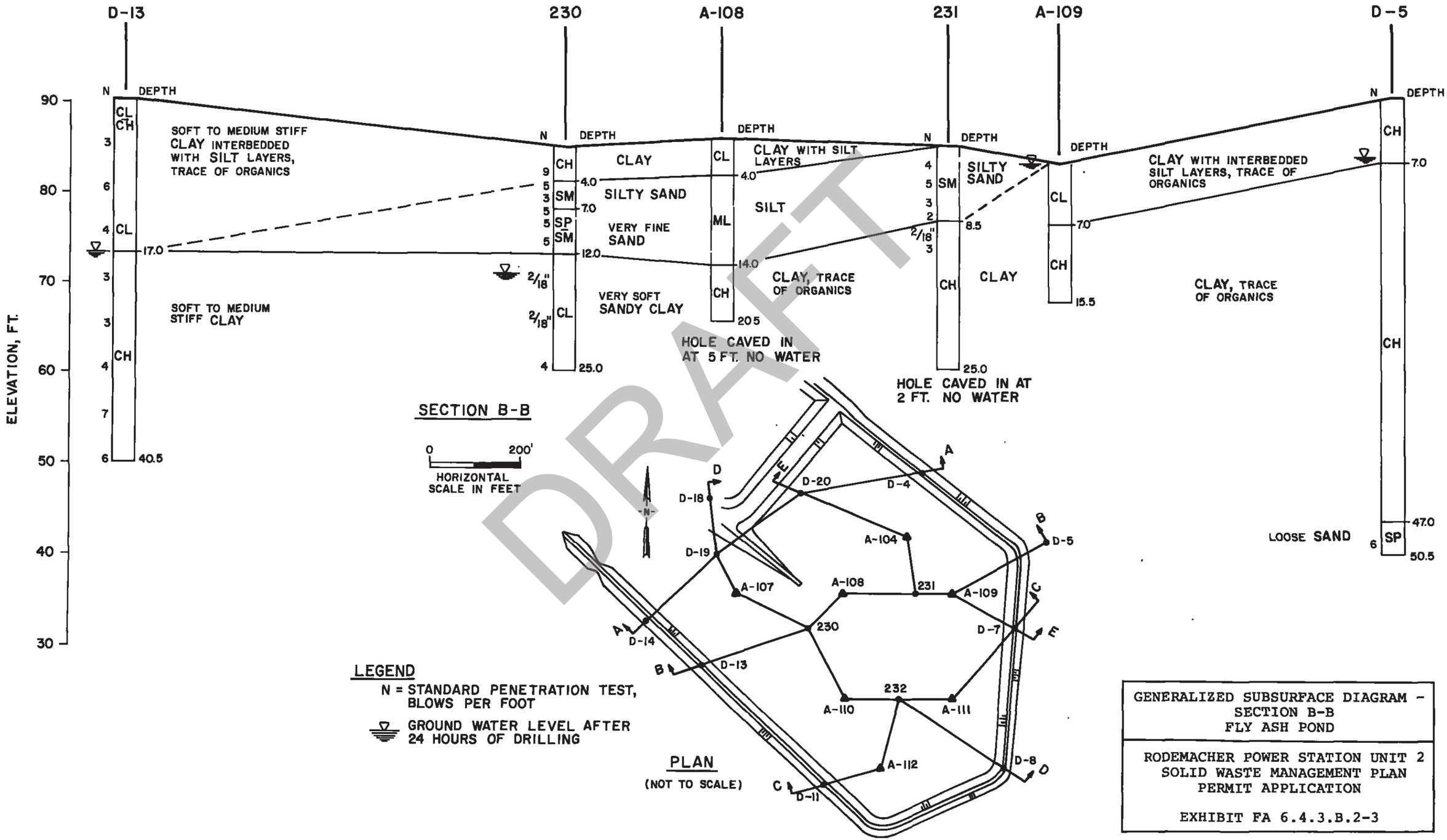
GENERALIZED SUBSURFACE DIAGRAM - SECTION A-A
FLY ASH POND

RODEMACHER POWER STATION UNIT 2
SOLID WASTE MANAGEMENT PLAN
PERMIT APPLICATION

EXHIBIT FA 6.4.3.B.2-2

US EPA ARCHIVE DOCUMENT



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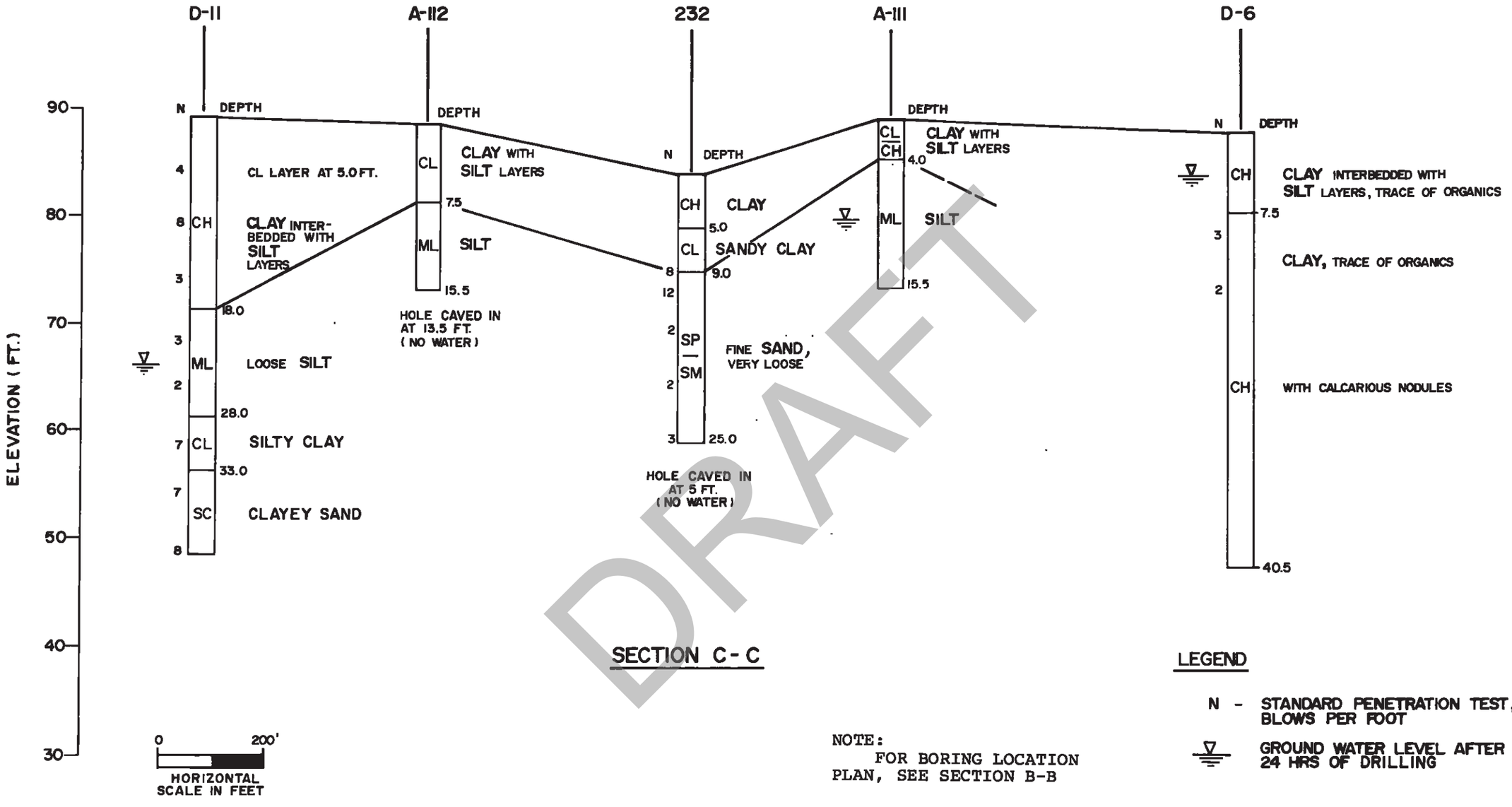
GENERALIZED SUBSURFACE DIAGRAM - SECTION B-B
FLY ASH POND

RODEMACHER POWER STATION UNIT 2
SOLID WASTE MANAGEMENT PLAN
PERMIT APPLICATION

EXHIBIT FA 6.4.3.B.2-3

US EPA ARCHIVE DOCUMENT



SECTION C-C

NOTE:
FOR BORING LOCATION PLAN, SEE SECTION B-B

LEGEND

N - STANDARD PENETRATION TEST, BLOWS PER FOOT

GROUND WATER LEVEL AFTER 24 HRS OF DRILLING

GENERALIZED SUBSURFACE DIAGRAM - SECTION C-C
FLY ASH POND

RODEMACHER POWER STATION UNIT 2
SOLID WASTE MANAGEMENT PLAN
PERMIT APPLICATION

EXHIBIT FA 6.4.3.B.2-4

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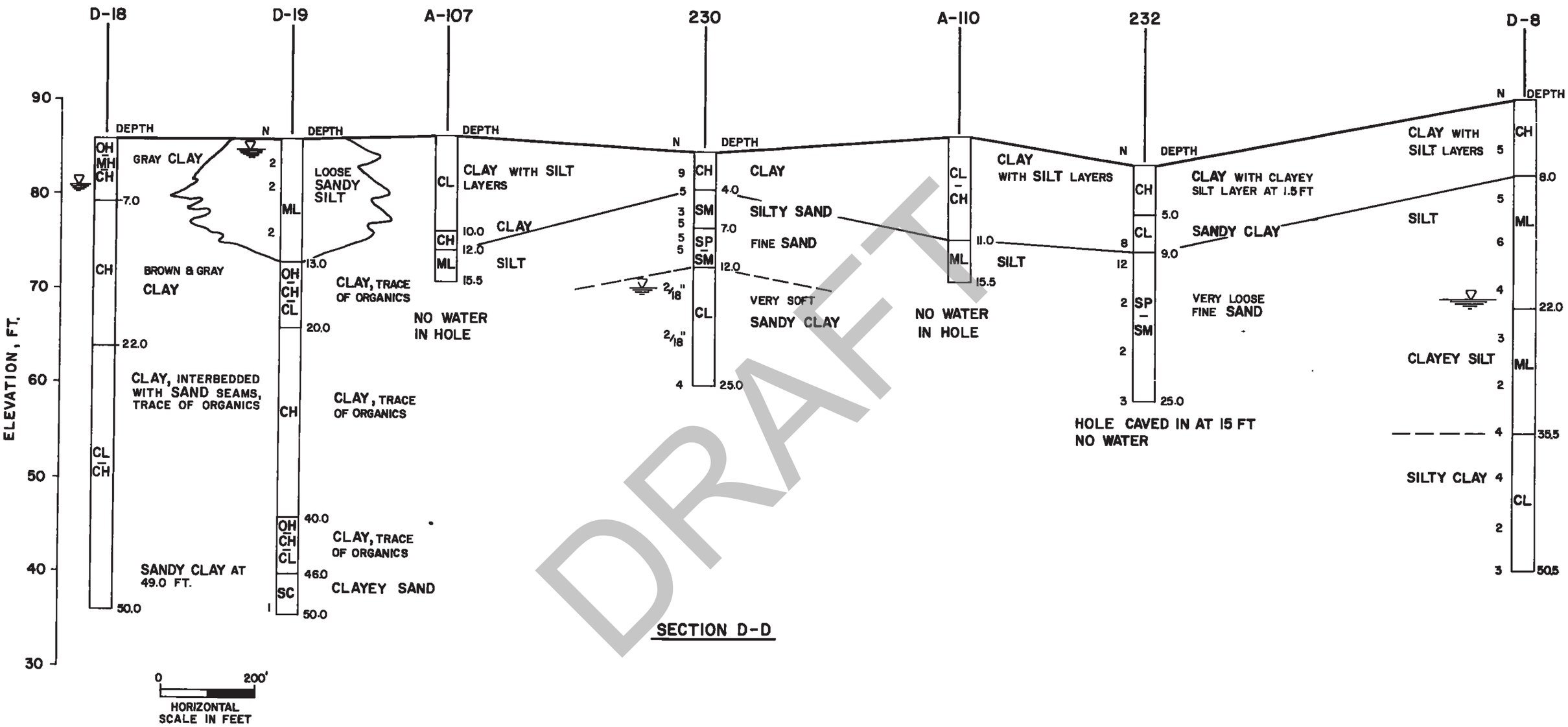

SECTION D-D

LEGEND

N = STANDARD PENETRATION TEST, BLOWS PER FOOT

GROUND WATER LEVEL AFTER 24 HOURS OF DRILLING

NOTE:
FOR BORING LOCATION PLAN, SEE SECTION B-B

GENERALIZED SUBSURFACE DIAGRAM - SECTION D-D
FLY ASH POND

RODEMACHER POWER STATION UNIT 2
SOLID WASTE MANAGEMENT PLAN
PERMIT APPLICATION

EXHIBIT FA 6.4.3.B.2-5

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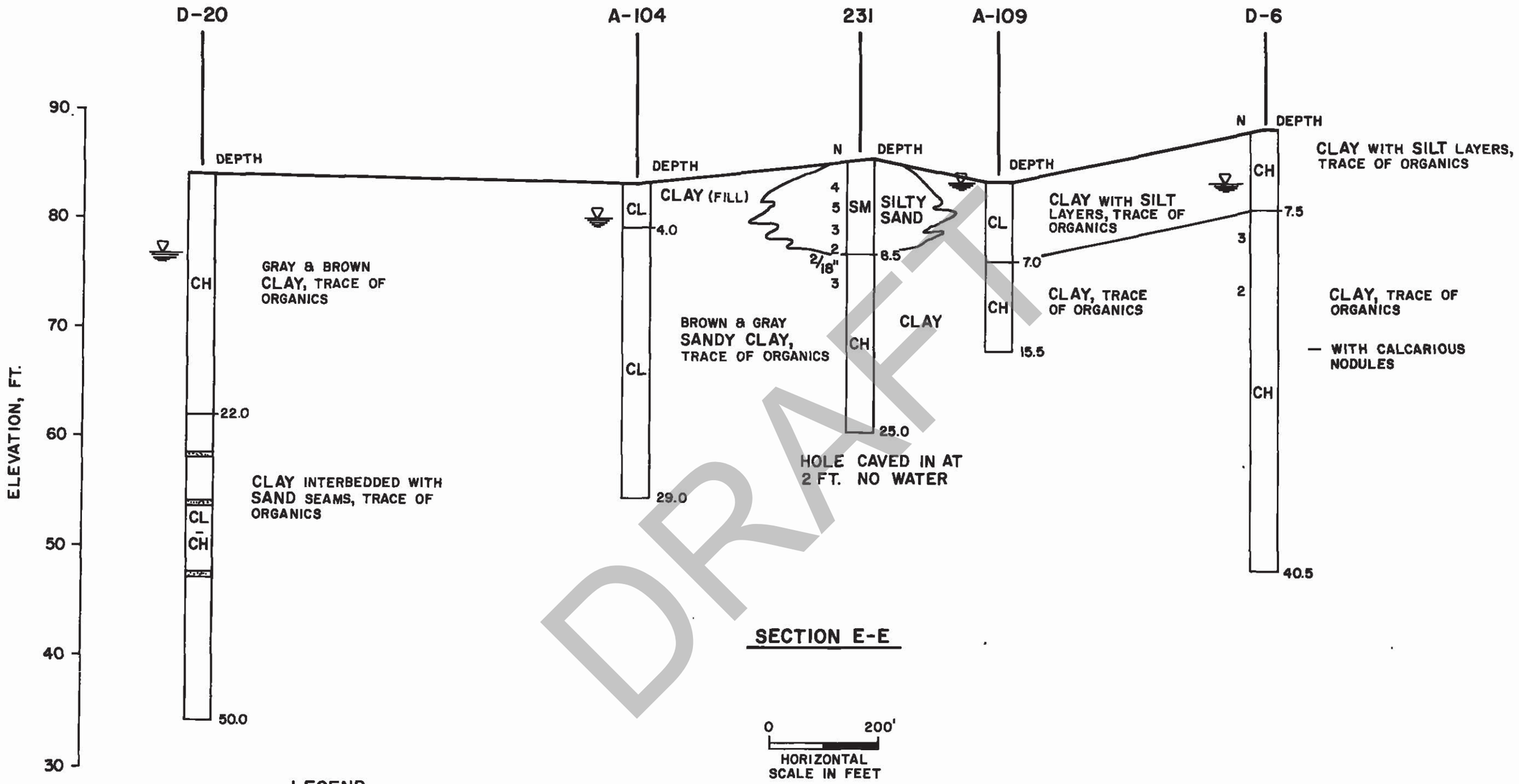

SECTION E-E

LEGEND

N = STANDARD PENETRATION TEST, BLOWS PER FOOT

▽ GROUND WATER LEVEL AFTER 24 HOURS OF DRILLING

NOTE:
FOR BORING LOCATION PLAN, SEE SECTION B-B

GENERALIZED SUBSURFACE DIAGRAM - SECTION E-E
FLY ASH POND

RODEMACHER POWER STATION UNIT 2
SOLID WASTE MANAGEMENT PLAN
PERMIT APPLICATION

EXHIBIT FA 6.4.3.B.2-6

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Appendix C

USEPA Coal Combustion Dam Inspection Checklist Forms

Coal Combustion Dam Inspection Checklist Form

US Environmental Protection Agency

Site Name: Rodemacher Power Station	Date: June 28 & 29, 2010
Unit Name: Bottom Ash Pond	Operator's Name: Cleco Corporation
Unit I.D.: n/a	Hazard Potential Classification: High (Significant) Low
Inspector's Name: Bill Friers, Bevin Barringer	

Check the appropriate box below. Provide comments when appropriate. If not applicable or not available, record "N/A". Any unusual conditions or construction practices that should be noted in the comments section. For large diked embankments, separate checklists may be used for different embankment areas. If separate forms are used, identify approximate area that the form applies to in comments.

	Yes	No		Yes	No
1. Frequency of Company's Dam Inspections?	see note		18. Sloughing or bulging on slopes?		x
2. Pool elevation (operator records)?	104.0		19. Major erosion or slope deterioration?		x
3. Decant inlet elevation (operator records)?	108.0		20. Decant Pipes:		
4. Open channel spillway elevation (operator records)?	d/n/a		Is water entering inlet, but not exiting outlet?		x
5. Lowest dam crest elevation (operator records)?	108.0		Is water exiting outlet, but not entering inlet?		x
6. If instrumentation is present, are readings recorded (operator records)?	x		Is water exiting outlet flowing clear?	x	
7. Is the embankment currently under construction?		x	21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
8. Foundation preparation (remove vegetation,stumps, topsoil in area where embankment fill will be placed)?	d/n/a		From underdrain?	d/n/a	
9. Trees growing on embankment? (If so, indicate largest diameter below)	x		At isolated points on embankment slopes?		x
10. Cracks or scarps on crest?		x	At natural hillside in the embankment area?		x
11. Is there significant settlement along the crest?		x	Over widespread areas?		x
12. Are decant trashracks clear and in place?	d/n/a		From downstream foundation area?		x
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		x	"Boils" beneath stream or ponded water?		x
14. Clogged spillways, groin or diversion ditches?		x	Around the outside of the decant pipe?		x
15. Are spillway or ditch linings deteriorated?	d/n/a		22. Surface movements in valley bottom or on hillside?		x
16. Are outlets of decant or underdrains blocked?		x	23. Water against downstream toe?		x
17. Cracks or scarps on slopes?	x		24. Were Photos taken during the dam inspection?	x	

Major adverse changes in these items could cause instability and should be reported for further evaluation. Adverse conditions noted in these items should normally be described (extent, location, volume, etc.) in the space below and on the back of this sheet.

Inspection Issue #	Comments

1. The impoundment is visually examined daily by plant personnel.
2., 3., 5. Elevations shown reference NAVD 88.
6. Monitoring wells are read at a minimum semi-annually.
9. Heavy vegetation and trees (up to 16" in diameter) on the exterior slope of the north embankment.
17. Scarp located on the west embankment interior slope. Crack located on the south embankment interior slope.

n/a = Not Available
d/n/a = Does Not Apply

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Coal Combustion Waste (CCW)
Impoundment Inspection

Impoundment NPDES Permit # LA0008036 INSPECTOR Bill Friers, Bevin Barringer

Date June 28 & 29, 2010

Impoundment Name Bottom Ash Pond

Impoundment Company CLECO Power LLC

EPA Region 4

State Agency (Field Office) Addresss 602 N. Fifth Street
Baton Rouge, LA 70802

Name of Impoundment Bottom Ash Pond

(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New X Update _____

	Yes	No
Is impoundment currently under construction?	_____	X
Is water or ccw currently being pumped into the impoundment?	X	_____

IMPOUNDMENT FUNCTION: Processes CCW (Bottom Ash and water) from Unit #2

Nearest Downstream Town : Name Boyce, LA

Distance from the impoundment 2.5 Miles

Impoundment Location:
Longitude 92 Degrees 42 Minutes 05 Seconds W
Latitude 31 Degrees 23 Minutes 48 Seconds N
State Louisiana County Rapides

Does a state agency regulate this impoundment? YES x NO _____

If So Which State Agency? Louisiana Dept of Transportation, Public Works & Water Resources Division

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HAZARD POTENTIAL (In the event the impoundment should fail, the following would occur):

_____ **LESS THAN LOW HAZARD POTENTIAL:** Failure or misoperation of the dam results in no probable loss of human life or economic or environmental losses.

_____ **LOW HAZARD POTENTIAL:** Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

__X__ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

_____ **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

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DESCRIBE REASONING FOR HAZARD RATING CHOSEN:

1)A breach could reach residences on State Route 121 and cause property damage.
2)A breach could have an environmental impact on Rodemacher Lake.
3)A breach could result in the failure of the Fly Ash pond.

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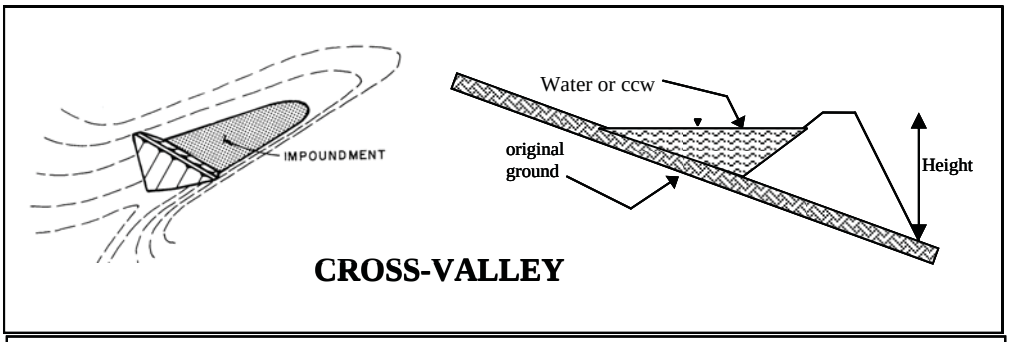
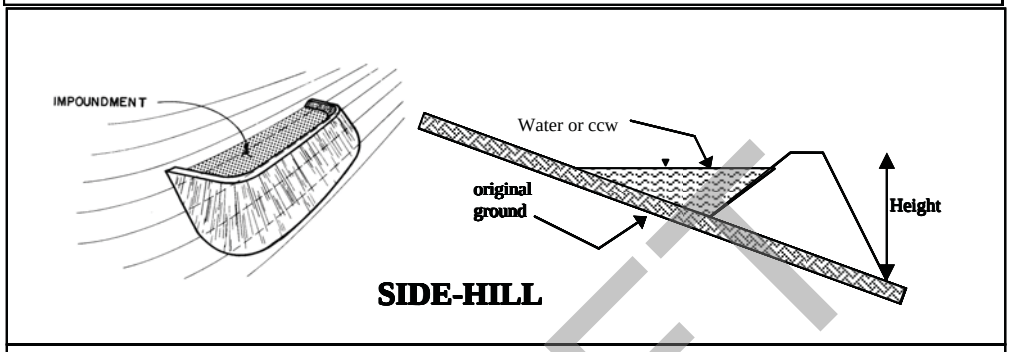
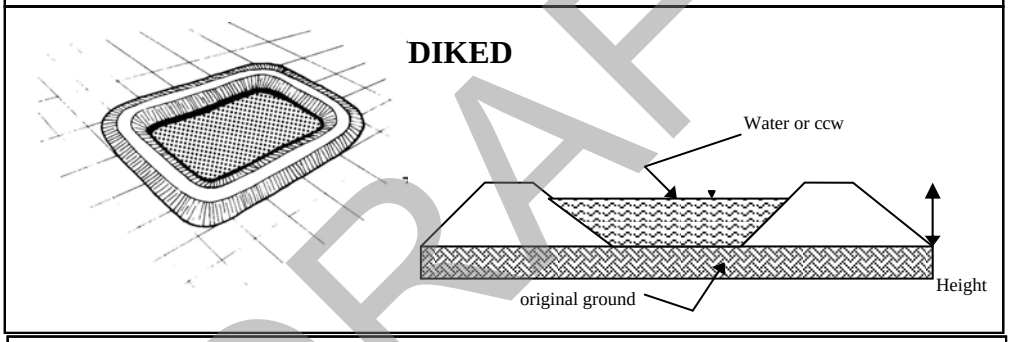
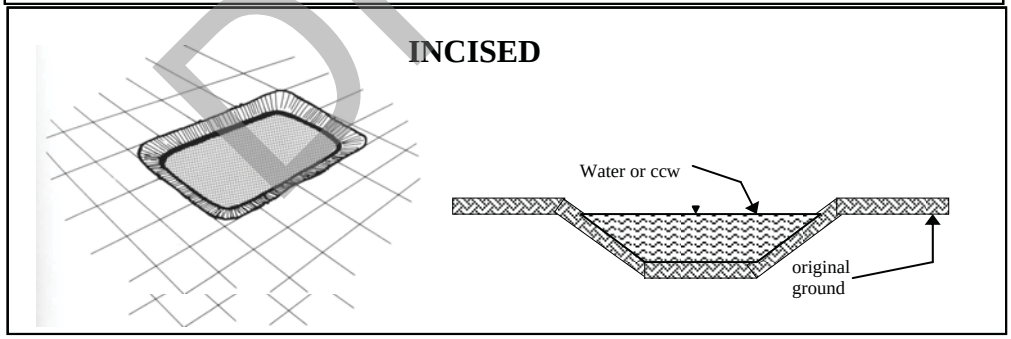
CONFIGURATION:









DRAFT

_____ Cross-Valley
_____ Side-Hill
__X__ Diked
_____ Incised (form completion optional)
_____ Combination Incised/Diked

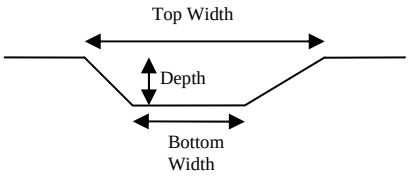
Embankment Height __22__ feet Embankment Material __Earthen__
Pool Area __43__ acres Liner __None__
Current Freeboard __4__ feet Liner Permeability __d/n/a__

d/n/a = Does Not Apply

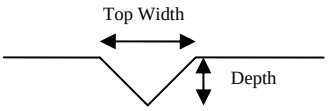
TYPE OF OUTLET (Mark all that apply)

_____ **Open Channel Spillway**
_____ Trapezoidal
_____ Triangular
_____ Rectangular
_____ Irregular

TRAPEZOIDAL

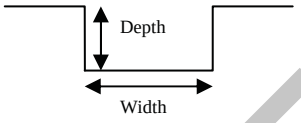


TRIANGULAR

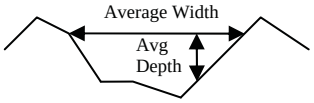


_____ depth
_____ bottom (or average) width
_____ top width

RECTANGULAR

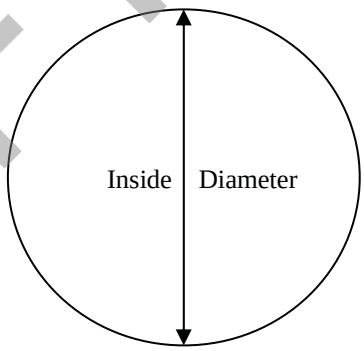


IRREGULAR



__X__ **Outlet**

__24"__ inside diameter



Material
__x__ corrugated metal
_____ welded steel
_____ concrete
_____ plastic (hdpe, pvc, etc.)
_____ other (specify) _____

Is water flowing through the outlet? YES __x__ NO _____

_____ **No Outlet**

_____ **Other Type of Outlet** (specify) _____

The Impoundment was Designed By Sargent & Lundy, LLC

DRAFT

US EPA ARCHIVE DOCUMENT

Has there ever been a failure at this site? YES _____ NO ____X_____

If So When? _____

If So Please Describe : _____

DRAFT

US EPA ARCHIVE DOCUMENT

Has there ever been significant seepages at this site? YES _____ NO __X__

If So When? _____

IF So Please Describe: _____

DRAFT

US EPA ARCHIVE DOCUMENT

Has there ever been any measures undertaken to monitor/lower Phreatic water table levels based on past seepages or breaches at this site? YES _____NO ___x__

If so, which method (e.g., piezometers, gw pumping,...)? _____

If so Please Describe : _____

DRAFT

US EPA ARCHIVE DOCUMENT

Coal Combustion Dam Inspection Checklist Form

US Environmental Protection Agency

Site Name: Rodemacher Power Station	Date: June 29, 2010
Unit Name: Fly Ash Pond	Operator's Name: Cleco Corporation
Unit I.D.: n/a	Hazard Potential Classification: High (Significant) Low
Inspector's Name: Bill Friers, Bevin Barringer	

Check the appropriate box below. Provide comments when appropriate. If not applicable or not available, record "N/A". Any unusual conditions or construction practices that should be noted in the comments section. For large diked embankments, separate checklists may be used for different embankment areas. If separate forms are used, identify approximate area that the form applies to in comments.

	Yes	No		Yes	No
1. Frequency of Company's Dam Inspections?	see note		18. Sloughing or bulging on slopes?		x
2. Pool elevation (operator records)?	n/a		19. Major erosion or slope deterioration?		x
3. Decant inlet elevation (operator records)?	n/a		20. Decant Pipes:		
4. Open channel spillway elevation (operator records)?	d/n/a		Is water entering inlet, but not exiting outlet?	n/a	
5. Lowest dam crest elevation (operator records)?	105.0		Is water exiting outlet, but not entering inlet?	n/a	
6. If instrumentation is present, are readings recorded (operator records)?	see note		Is water exiting outlet flowing clear?	x	
7. Is the embankment currently under construction?		x	21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
8. Foundation preparation (remove vegetation,stumps, topsoil in area where embankment fill will be placed)?	d/n/a		From underdrain?	d/n/a	
9. Trees growing on embankment? (If so, indicate largest diameter below)	x		At isolated points on embankment slopes?	x	
10. Cracks or scarps on crest?		x	At natural hillside in the embankment area?		x
11. Is there significant settlement along the crest?		x	Over widespread areas?		x
12. Are decant trashracks clear and in place?	d/n/a		From downstream foundation area?		x
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		x	"Boils" beneath stream or ponded water?		x
14. Clogged spillways, groin or diversion ditches?		x	Around the outside of the decant pipe?		x
15. Are spillway or ditch linings deteriorated?	d/n/a		22. Surface movements in valley bottom or on hillside?		x
16. Are outlets of decant or underdrains blocked?		x	23. Water against downstream toe?		x
17. Cracks or scarps on slopes?	x		24. Were Photos taken during the dam inspection?	x	

Major adverse changes in these items could cause instability and should be reported for further evaluation. Adverse conditions noted in these items should normally be described (extent, location, volume, etc.) in the space below and on the back of this sheet.

Inspection Issue #	Comments

1. The impoundment is visually examined daily by plant personnel.
5. Elevation shown references NAVD 88.
6. Monitoring wells are read at a minimum semi-annually.
9. Heavy vegetation and trees (up to 16" in diameter) are on the exterior slope of the north and east embankments.
17. Cracks located on north, east, and south embankment interior slopes.
20. Inlet was not observed during assessment.
21. Possible area of minor seepage located on the east embankment exterior slope.

n/a = Not Available
d/n/a = Does Not Apply

US EPA ARCHIVE DOCUMENT

DRAFT

US EPA ARCHIVE DOCUMENT

U. S. Environmental Protection Agency

Coal Combustion Waste (CCW)
Impoundment Inspection

Impoundment NPDES Permit # LA0008036 INSPECTOR Bill Friers, Bevin Barringer

Date June 29, 2010

Impoundment Name Fly Ash Pond

Impoundment Company CLECO Power LLC

EPA Region 4

State Agency (Field Office) Addresss 602 N. Fifth Street
Baton Rouge, LA 70802

Name of Impoundment Fly Ash Pond

(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New X Update _____

	Yes	No
Is impoundment currently under construction?	_____	X
Is water or ccw currently being pumped into the impoundment?	X	_____

IMPOUNDMENT FUNCTION: Processes CCW (Fly Ash & water) from Unit #2

Nearest Downstream Town : Name Boyce, LA

Distance from the impoundment 2.5 Miles

Impoundment Location:
Longitude 92 Degrees 40 Minutes 38 Seconds W
Latitude 31 Degrees 23 Minutes 16 Seconds N
State Louisiana County Rapides

Does a state agency regulate this impoundment? YES x NO _____

If So Which State Agency? Louisiana Dept of Transportation, Public Works & Water Resources Division

DRAFT

US EPA ARCHIVE DOCUMENT

HAZARD POTENTIAL (In the event the impoundment should fail, the following would occur):

_____ **LESS THAN LOW HAZARD POTENTIAL:** Failure or misoperation of the dam results in no probable loss of human life or economic or environmental losses.

_____ **LOW HAZARD POTENTIAL:** Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

__X__ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

_____ **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

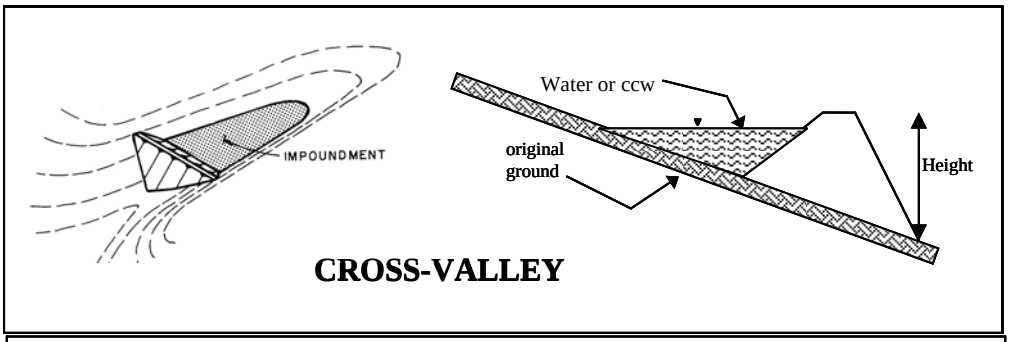
DRAFT

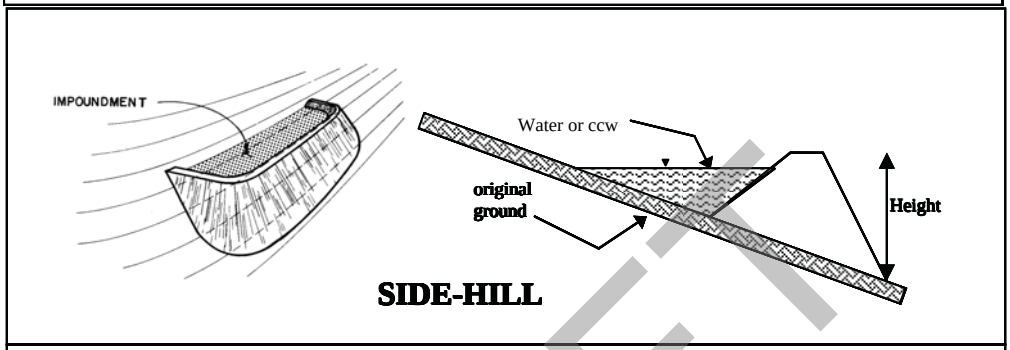
DESCRIBE REASONING FOR HAZARD RATING CHOSEN:

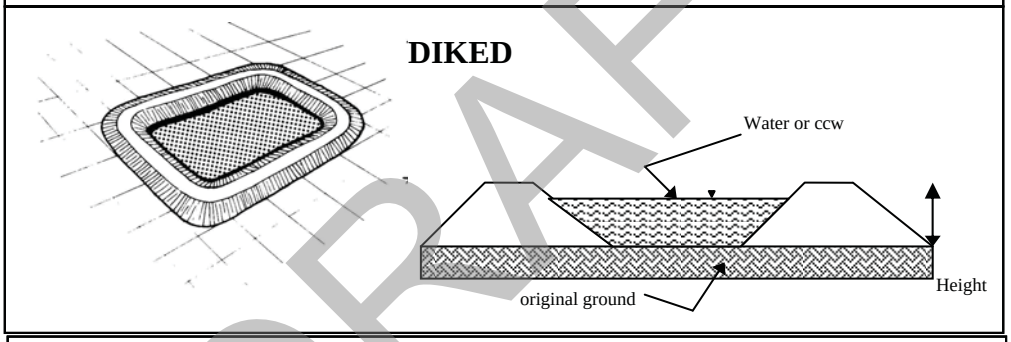
1) A breach could reach a residence located approximately 0.6 mile south on James Road and cause property damage.
2) A breach could have an environmental impact on Rodemacher Lake.
3) A breach could cause the failure of the Leachate Pond.

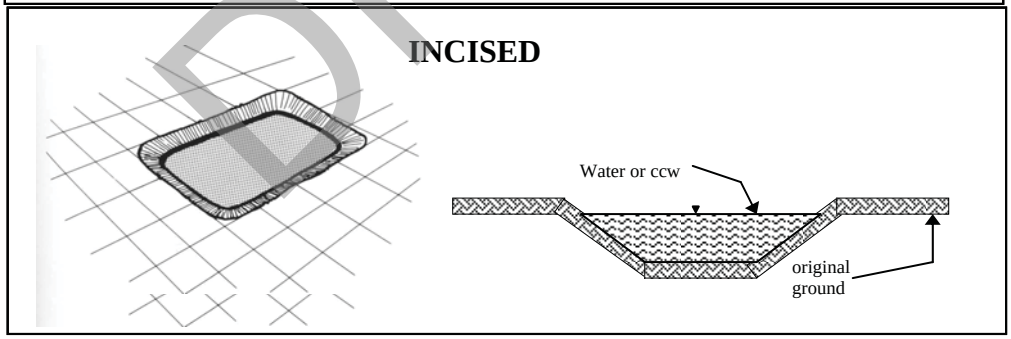
US EPA ARCHIVE DOCUMENT

CONFIGURATION:









DRAFT

_____ Cross-Valley
_____ Side-Hill
__X__ Diked
_____ Incised (form completion optional)
_____ Combination Incised/Diked

Embankment Height __28__ feet
Pool Area __42__ acres
Current Freeboard __8__ feet

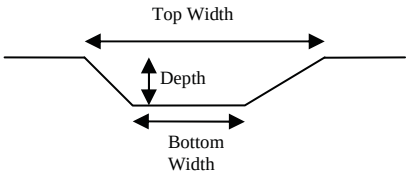
Embankment Material __Earthen__
Liner __None__
Liner Permeability __d/n/a__

d/n/a = Does Not Apply

TYPE OF OUTLET (Mark all that apply)

_____ **Open Channel Spillway**
_____ Trapezoidal
_____ Triangular
_____ Rectangular
_____ Irregular

TRAPEZOIDAL



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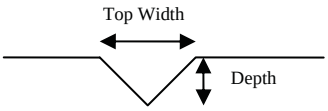
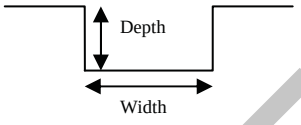


_____ depth
_____ bottom (or average) width
_____ top width

RECTANGULAR



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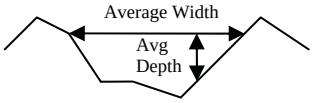
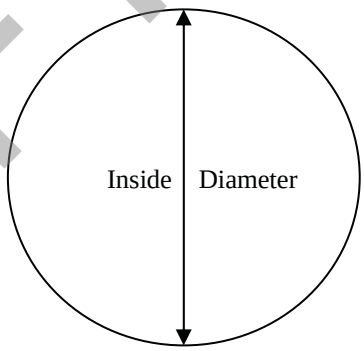


__X__ **Outlet**

__4"__ inside diameter



Material
_____ corrugated metal
_____ welded steel
_____ concrete
__x__ plastic (hdpe, pvc, etc.)
_____ other (specify) _____

Is water flowing through the outlet? YES __X__ NO _____

_____ **No Outlet**

_____ **Other Type of Outlet** (specify) _____

The Impoundment was Designed By Sargent & Lundy, LLC

DRAFT

US EPA ARCHIVE DOCUMENT

Has there ever been a failure at this site? YES _____ NO ____X_____

If So When? _____

If So Please Describe : _____

DRAFT

US EPA ARCHIVE DOCUMENT

Has there ever been significant seepages at this site? YES _____ NO __X__

If So When? _____

IF So Please Describe: _____

DRAFT

US EPA ARCHIVE DOCUMENT

Has there ever been any measures undertaken to monitor/lower Phreatic water table levels based on past seepages or breaches at this site? YES _____NO ___x__

If so, which method (e.g., piezometers, gw pumping,...)? _____

If so Please Describe : _____

DRAFT

US EPA ARCHIVE DOCUMENT

Coal Combustion Dam Inspection Checklist Form

US Environmental Protection Agency

Site Name: Rodemacher Power Station	Date: June 29, 2010
Unit Name: Leachate Pond	Operator's Name: Cleco Corporation
Unit I.D.: n/a	Hazard Potential Classification: High Significant (Low)
Inspector's Name: Bill Friers, Bevin Barringer	

Check the appropriate box below. Provide comments when appropriate. If not applicable or not available, record "N/A". Any unusual conditions or construction practices that should be noted in the comments section. For large diked embankments, separate checklists may be used for different embankment areas. If separate forms are used, identify approximate area that the form applies to in comments.

	Yes	No		Yes	No
1. Frequency of Company's Dam Inspections?	see note		18. Sloughing or bulging on slopes?		x
2. Pool elevation (operator records)?	n/a		19. Major erosion or slope deterioration?		x
3. Decant inlet elevation (operator records)?	n/a		20. Decant Pipes:		
4. Open channel spillway elevation (operator records)?	d/n/a		Is water entering inlet, but not exiting outlet?	n/a	
5. Lowest dam crest elevation (operator records)?	105.0		Is water exiting outlet, but not entering inlet?	n/a	
6. If instrumentation is present, are readings recorded (operator records)?	see note		Is water exiting outlet flowing clear?	n/a	
7. Is the embankment currently under construction?		x	21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
8. Foundation preparation (remove vegetation,stumps, topsoil in area where embankment fill will be placed)?	d/n/a		From underdrain?	d/n/a	
9. Trees growing on embankment? (If so, indicate largest diameter below)	x		At isolated points on embankment slopes?		x
10. Cracks or scarps on crest?	x		At natural hillside in the embankment area?		x
11. Is there significant settlement along the crest?		x	Over widespread areas?		x
12. Are decant trashracks clear and in place?	d/n/a		From downstream foundation area?		x
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		x	"Boils" beneath stream or ponded water?		x
14. Clogged spillways, groin or diversion ditches?		x	Around the outside of the decant pipe?		x
15. Are spillway or ditch linings deteriorated?	d/n/a		22. Surface movements in valley bottom or on hillside?		x
16. Are outlets of decant or underdrains blocked?		x	23. Water against downstream toe?		x
17. Cracks or scarps on slopes?		x	24. Were Photos taken during the dam inspection?	x	

Major adverse changes in these items could cause instability and should be reported for further evaluation. Adverse conditions noted in these items should normally be described (extent, location, volume, etc.) in the space below and on the back of this sheet.

Inspection Issue #	Comments

1. The impoundment is visually examined daily by plant personnel.
2. Elevation shown references NAVD 88.
6. Monitoring wells are read at a minimum semi-annually.
9. Heavy vegetation and trees (up to 16" in diameter) on the exterior slope of the east and south embankments.
10. Surface cracks located on west embankment crest.
20. Water was not entering inlets during assessment. The outlet pipe was submerged and it could not be determined if water was exiting the outlet.

US EPA ARCHIVE DOCUMENT

DRAFT

n/a = Not Available
d/n/a = Does Not Apply

US EPA ARCHIVE DOCUMENT

U. S. Environmental Protection Agency

Coal Combustion Waste (CCW)
Impoundment Inspection

Impoundment NPDES Permit # LA0008036 INSPECTOR Bill Friers, Bevin Barringer

Date June 29, 2010

Impoundment Name Leachate Pond

Impoundment Company CLECO Power LLC

EPA Region 4

State Agency (Field Office) Addresss 602 N. Fifth Street
Baton Rouge, LA 70802

Name of Impoundment Leachate Pond

(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New X Update _____

	Yes	No
Is impoundment currently under construction?	_____	X
Is water or ccw currently being pumped into the impoundment?	X	_____

IMPOUNDMENT FUNCTION: Processes CCW, leachate collection & removal from Unit #2

Nearest Downstream Town : Name Boyce, LA

Distance from the impoundment 2.5 Miles

Impoundment Location:
Longitude 92 Degrees 40 Minutes 38 Seconds W
Latitude 31 Degrees 23 Minutes 16 Seconds N
State Louisiana County Rapides

Does a state agency regulate this impoundment? YES x NO _____

If So Which State Agency? Louisiana Dept of Transportation, Public Works & Water Resources Division

DRAFT

US EPA ARCHIVE DOCUMENT

HAZARD POTENTIAL (In the event the impoundment should fail, the following would occur):

_____ **LESS THAN LOW HAZARD POTENTIAL:** Failure or misoperation of the dam results in no probable loss of human life or economic or environmental losses.

__x__ **LOW HAZARD POTENTIAL:** Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

_____ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

_____ **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

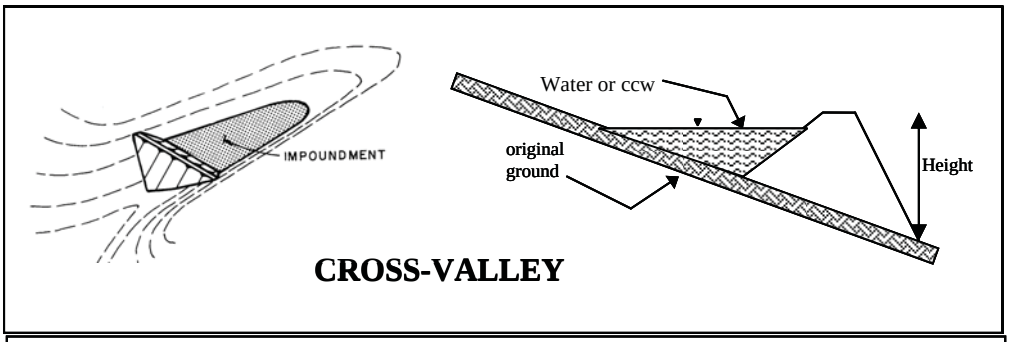
DRAFT

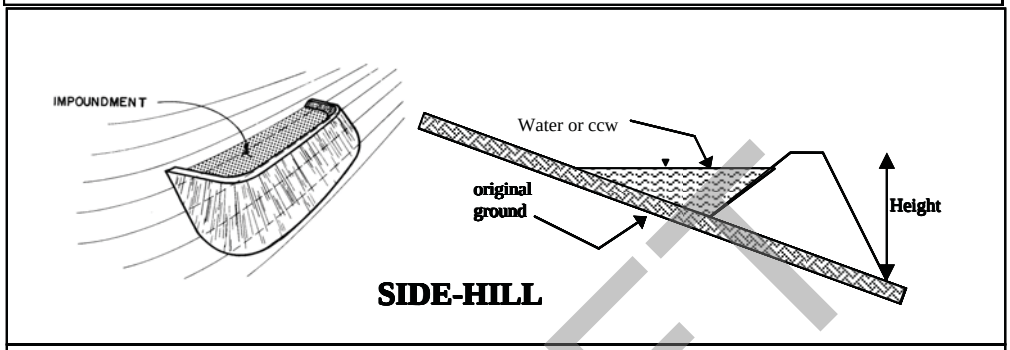
DESCRIBE REASONING FOR HAZARD RATING CHOSEN:

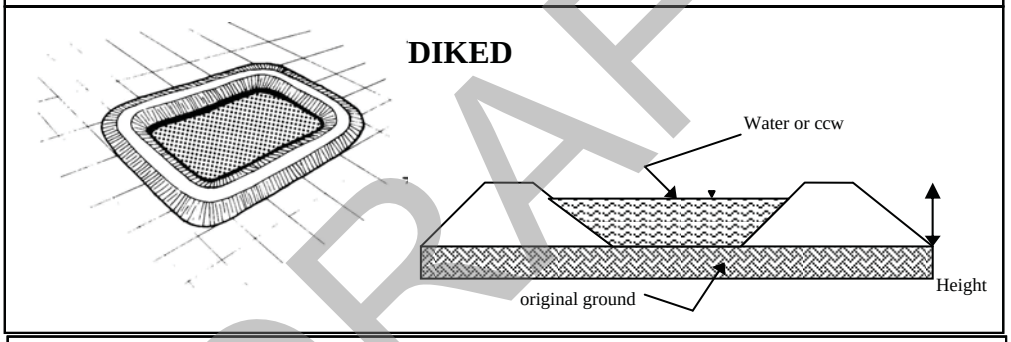
1. A breach would have an environmental impact on Rodemacher Lake.

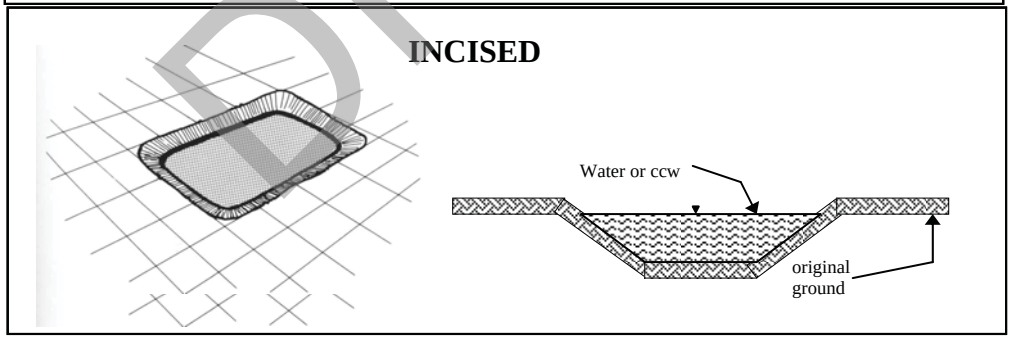
US EPA ARCHIVE DOCUMENT

CONFIGURATION:









DRAFT

_____ Cross-Valley
_____ Side-Hill
__X__ Diked
_____ Incised (form completion optional)
_____ Combination Incised/Diked

Embankment Height 28 feet
Pool Area 8 acres
Current Freeboard 22 feet

Embankment Material Earthen
Liner Yes. 60-mil HDPE membrane
Liner Permeability 1 x 10-7 cm/sec

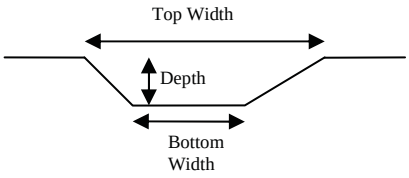
d/n/a = Does Not Apply

US EPA ARCHIVE DOCUMENT

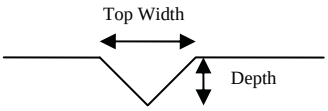
TYPE OF OUTLET (Mark all that apply)

_____ **Open Channel Spillway**
_____ Trapezoidal
_____ Triangular
_____ Rectangular
_____ Irregular

TRAPEZOIDAL

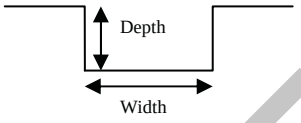


TRIANGULAR

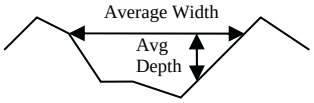


_____ depth
_____ bottom (or average) width
_____ top width

RECTANGULAR

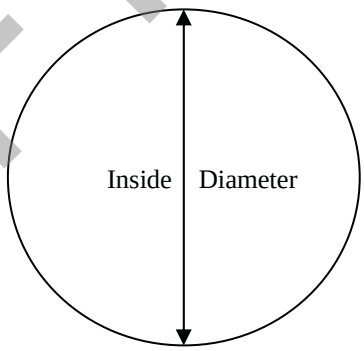


IRREGULAR



__x__ **Outlet**

__12"__ inside diameter



Material
_____ corrugated metal
_____ welded steel
_____ concrete
__x__ plastic (hdpe, pvc, etc.)
_____ other (specify) _____

Is water flowing through the outlet? YES __n/a__ NO _____

_____ **No Outlet**

_____ **Other Type of Outlet** (specify) _____

The Impoundment was Designed By __Sargent & Lundy, LLC__
_____

DRAFT

Has there ever been a failure at this site? YES _____ NO ____X_____

If So When? _____

If So Please Describe : _____

DRAFT

US EPA ARCHIVE DOCUMENT

Has there ever been significant seepages at this site? YES _____ NO __X__

If So When? _____

IF So Please Describe: _____

DRAFT

US EPA ARCHIVE DOCUMENT

Has there ever been any measures undertaken to monitor/lower Phreatic water table levels based on past seepages or breaches at this site? YES _____NO ___x__

If so, which method (e.g., piezometers, gw pumping,...)? _____

If so Please Describe : _____

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Appendix D
Photographs

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Photo No. 1: Bottom Ash Pond – East embankment interior slope from southeast corner, looking northeast.

Photo No. 2: Bottom Ash Pond –East embankment interior slope from southeast corner, looking northeast.

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CDM	Cleco Corporation W. Donner Rodemacher Power Station Lena, LA
CDM Project No.: 77646.1801.035.SIT.RODEZ	June 28 and 29, 2010

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Photo No. 3: Fly Ash Pond – West embankment interior slope, looking northeast. Fill material covering slope.

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Photo No. 4: Bottom Ash Pond – East embankment interior slope, looking at typical concrete armor.

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Photo No. 5: Bottom Ash Pond – East embankment interior slope, looking at sparse vegetation and surface cracks.

Photo No. 6: Bottom Ash Pond – East embankment interior slope, fracture of concrete armor.

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Photo No. 7: Bottom Ash Pond – East embankment interior slope, concrete armor.

Photo No. 8: Close-up of fracture in concrete armor below waterline, at east embankment interior slope.

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Photo No. 9: Bottom Ash Pond – East embankment crest, looking southwest.

Photo No. 10: Fly Ash Pond – West embankment interior slope, looking southwest. Fill material covering slope.

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Photo No. 11: Bottom Ash Pond – Inlet pipe from Fly Ash Pond on west embankment.

Photo No. 12: Bottom Ash Pond – Northeast corner interior slope. Note ruts and areas void of vegetation/protective cover.

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Photo No. 13: Bottom Ash Pond – North embankment exterior slope, looking northwest.

Photo No. 14: Monitoring Well W-21, located near Bottom Ash Pond northeast corner exterior toe.

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Photo No. 15: Bottom Ash Pond – North embankment exterior slope. 6″x6″ area of bare soil.

Photo No. 16: Bottom Ash Pond – North embankment exterior slope, typical vegetation.

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Photo No. 17: Bottom Ash Pond – North embankment crest, looking northwest.

Photo No. 18: Bottom Ash Pond – North embankment interior slope, looking northwest.

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Photo No. 19: Bottom Ash Pond – North embankment exterior slope, looking north. Note vegetation growing on bottom of slope.

Photo No. 20: Bottom Ash Pond – North embankment exterior slope. Tree stump located on slope.

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Photo No. 21: Bottom Ash Pond – North embankment exterior slope. Looking at rodent burrow.

Photo No. 22: Bottom Ash Pond – North embankment exterior slope. Vegetation growing on bottom of slope.

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Photo No. 23: Bottom Ash Pond – North embankment exterior slope. Looking at two areas of animal burrowing/rooting.

Photo No. 24: Bottom Ash Pond – North embankment exterior slope. Looking at 3-inch-diameter, 6-inch-deep animal burrow hole.

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Photo No. 25: Bottom Ash Pond – North embankment exterior slope, looking north. Standing water near toe.

Photo No. 26: Bottom Ash Pond – North embankment exterior toe, looking north. Standing water at toe. Note beaver activity on tree in foreground.

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Photo No. 27: Bottom Ash Pond – North embankment exterior toe, looking southwest. Possible beaver dam activity.

Photo No. 28: Bottom Ash Pond – North embankment exterior toe, looking north. Standing water near toe. Note beaver activity on downed tree.

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Photo No. 29: Bottom Ash Pond – North embankment interior slope, looking northwest. Looking at concrete armor.

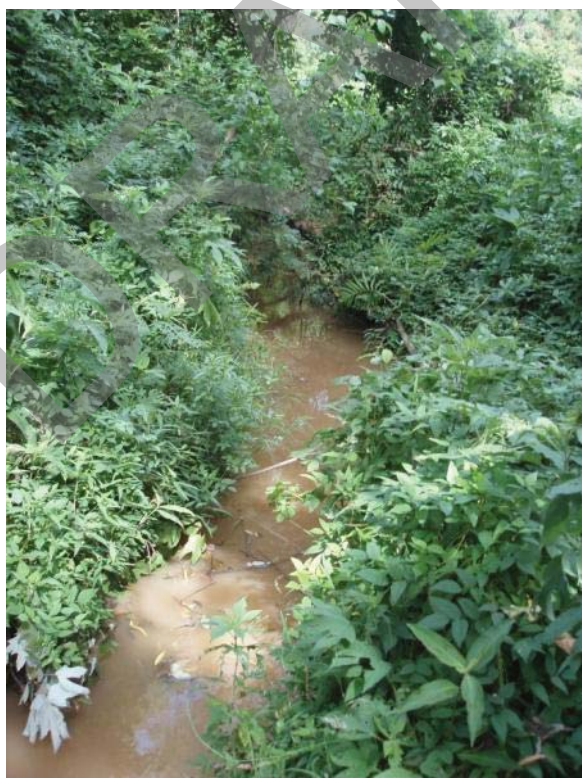

Photo No. 30: Bottom Ash Pond – North of north embankment toe, looking southeast. Looking at standing water or drainage ditch.

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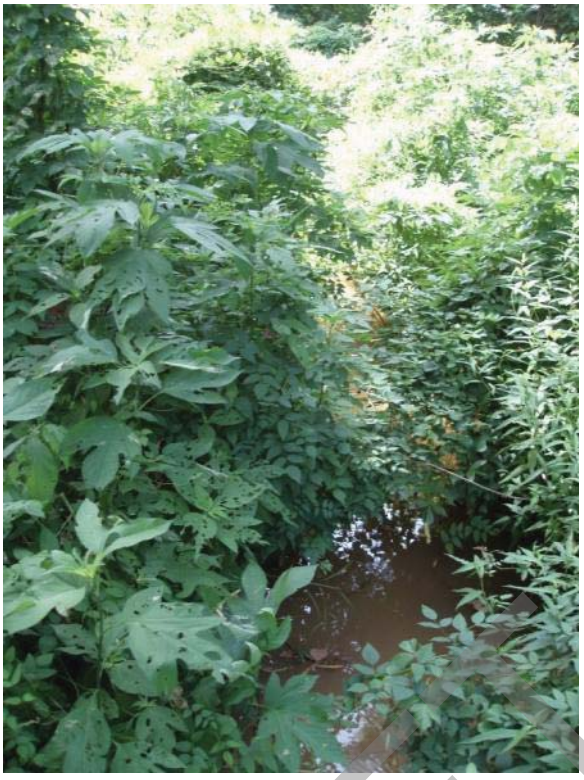

Photo No. 31: Bottom Ash Pond – North of north embankment toe, looking northwest. Looking at standing water or drainage ditch.

Photo No. 32: Bottom Ash Pond – North embankment exterior slope, looking southeast.

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Photo No. 33: Bottom Ash Pond – North of north embankment toe, looking at damp area of soil approximately 4′x3′.

Photo No. 34: Bottom Ash Pond – North embankment exterior slope. 2-inch-diameter, 16-inch-deep rodent burrow.

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Photo No. 35: Bottom Ash Pond – North embankment exterior slope, looking at northwest corner.

Photo No. 36: Bottom Ash Pond – North embankment exterior slope, looking southeast. Note change in vegetation near toe.

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Photo No. 37: Bottom Ash Pond – North embankment exterior slope. Looking at 2'x1.5' area of damp, bare soil excavated from animal rooting/burrowing.

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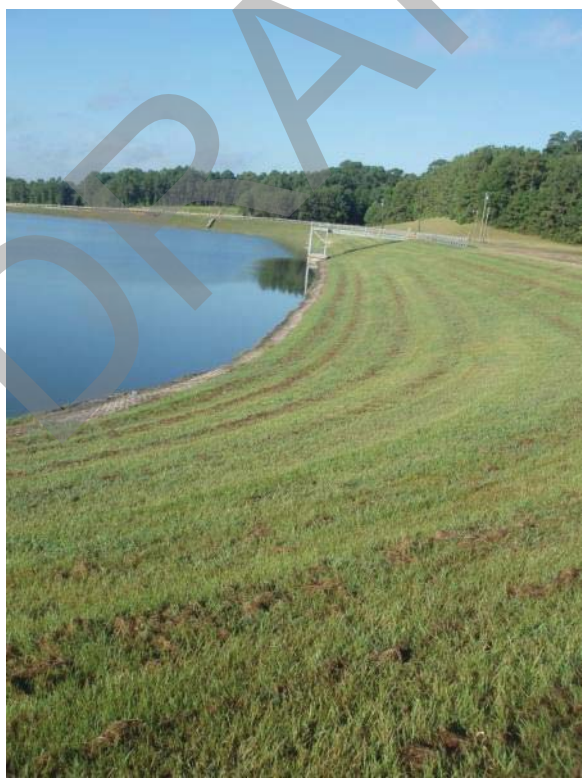

Photo No. 38: Bottom Ash Pond – West embankment interior slope, looking southwest. Outlet structure in background.

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Photo No. 39: Bottom Ash Pond – West embankment interior slope. Typical concrete armor.

Photo No. 40: Bottom Ash Pond – West embankment crest, looking southwest. Haul vehicles in background.

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Photo No. 41: Bottom Ash Pond – West embankment exterior slope, looking northeast.

Photo No. 42: Bottom Ash Pond – West of west embankment toe, looking northeast. Trees growing approximately 50 feet west of crest

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Photo No. 43: Bottom Ash Pond – West embankment interior slope, looking southwest at outlet structure.

Photo No. 44: Bottom Ash Pond – Outlet structure, looking at erosion hole 24 inches deep on northwest side of outlet structure.

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Photo No. 45: Bottom Ash Pond – 24-inch-diameter corrugated metal pipe outlet on west embankment. Outlet discharges to channel on exterior slope of west embankment.

Photo No. 46: Bottom Ash Pond – West embankment interior slope, looking at outlet structure.

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Photo No. 47: Discharge channel located at west embankment exterior toe. Water discharged into channel from Bottom Ash Pond.

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Photo No. 48: Bottom Ash Pond – West embankment exterior slope, looking at riprap protection and outlet pipes discharging into channel.

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Photo No. 49: Bottom Ash Pond – West embankment exterior slope. Looking at erosion around edges of riprap.

Photo No. 50: Primary Bottom Ash Pond – West embankment interior slope. Looking at discharge pipe (unknown origin) and discontinuation of concrete armor.

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Photo No. 51: Bottom Ash Pond – West embankment interior slope, looking southwest. Looking at patch of bare soils.

Photo No. 52: Bottom Ash Pond – West embankment interior slope, looking southwest. Looking at surface erosion above concrete armor.

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Photo No. 53: Bottom Ash Pond – West embankment interior slope. Looking at close-up of bare patch of soils (also shown in Photo No. 51)

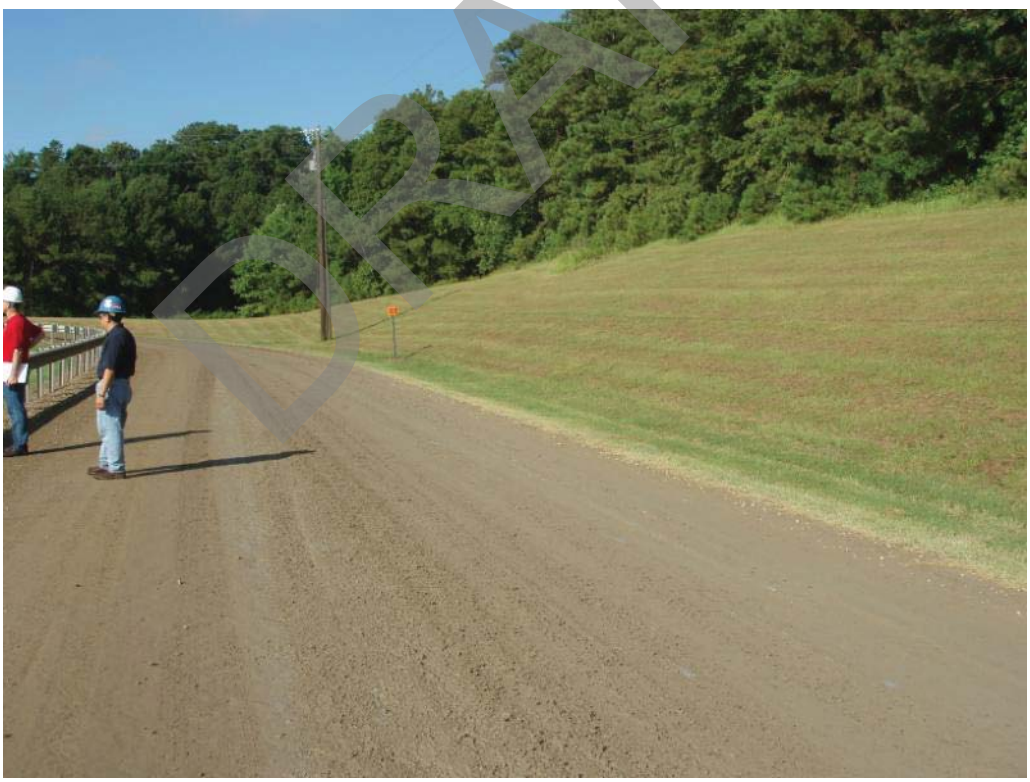

Photo No. 54: Bottom Ash Pond – West embankment crest, looking south.

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Photo No. 55: Bottom Ash Pond – South embankment interior slope, looking southeast.

Photo No. 56: Bottom Ash Pond – South embankment interior slope. Looking at small crack (less than 1/2 inch wide).

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Photo No. 57: Bottom Ash Pond – South embankment interior slope. Looking at depression (approximately 3 feet wide and 2 feet deep) beneath pipe supports.

Photo No. 58: Bottom Ash Pond – South embankment interior slope, looking southeast. Looking at concrete armor on pond slope and at pipe discharge.

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Photo No. 59: Bottom Ash Pond – South embankment interior slope, looking southwest. Looking at surface erosion near sluice piping.

Photo No. 60: Bottom Ash Pond – South embankment exterior slope. Looking at sluice lines passing under haul road at embankment crest.

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Photo No. 61: Bottom Ash Pond – South embankment exterior slope, looking west. Looking at sluice lines from Power Station.

Photo No. 62: Bottom Ash Pond – South embankment interior slope, looking southeast at sluice lines to pond discharge.

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Photo No. 63: Bottom Ash Pond – South embankment interior slope. Looking at erosion rill (approximately 20 inches wide and 10 inches deep) near sluice lines.

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Photo No. 64: Bottom Ash Pond – South embankment interior slope, looking southeast.

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Photo No. 65: Bottom Ash Pond – South embankment interior slope. Looking at surface erosion near sluice lines.

Photo No. 66: Bottom Ash Pond – South embankment exterior slope, looking northwest. Note exterior slope has been backfilled up to crest elevation.

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Photo No. 67: Bottom Ash Pond – South embankment interior slope, looking southeast. Sluice lines in foreground, piping to fill water trucks in background.

Photo No. 68: Bottom Ash Pond – South embankment interior slope, looking at minor surface erosion at piping for water truck filling.

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Photo No. 69: Bottom Ash Pond – South embankment interior slope. Looking at rut on slope.

Photo No. 70: Bottom Ash Pond – South embankment interior slope, looking east.

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Photo No. 71: Bottom Ash Pond – Discharge sluice lines near southeast corner.

Photo No. 72: Bottom Ash Pond – East embankment interior slope, looking northeast. Note concrete armoring missing from the slope.

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Photo No. 73: Fly Ash Pond – West embankment interior slope, looking southwest. Looking at outlet pump and piping.

Photo No. 74: Fly Ash Pond – North embankment exterior slope. Looking at erosion rill.

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Photo No. 75: Fly Ash Pond – North embankment exterior slope. Rodent burrow (approximately 4 inches in diameter and 24 inches deep).

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Photo No. 76: Fly Ash Pond – North embankment interior slope, looking northwest.

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Photo No. 77: Fly Ash Pond – North embankment crest, looking northwest.

Photo No. 78: Fly Ash Pond – North embankment exterior slope. Vegetation located on bottom third of slope.

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Photo No. 79: Fly Ash Pond – North embankment exterior slope, looking southeast. Note vegetation growing on bottom third of slope.

Photo No. 80: Fly Ash Pond – North embankment exterior slope. Tree stump (approximately 18 inches in diameter).

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Photo No. 81: Fly Ash Pond – Outside toe of north embankment. Looking at drainage ditch running parallel to the north embankment.

Photo No. 82: Fly Ash Pond – North embankment crest, looking southeast.

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Photo No. 83: Fly Ash Pond – North embankment interior slope. West embankment interior slope in distance.

Photo No. 84: Fly Ash Pond – North embankment exterior slope. Looking at vegetation on bottom third of slope.

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Photo No. 85: Fly Ash Pond – North embankment exterior toe. Looking at area with change in vegetation near toe.

Photo No. 86: Fly Ash Pond – North embankment interior slope. Looking at area of animal rooting/burrowing.

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Photo No. 87: Fly Ash Pond – North embankment exterior slope, looking southeast.

Photo No. 88: Fly Ash Pond – North embankment exterior slope. Looking at area of surface erosion located outside the slope toe.

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Photo No. 89: Fly Ash Pond – North embankment exterior slope. Looking at small depression in area of spongy, damp soils.

Photo No. 90: Fly Ash Pond - Northeast corner interior slope, looking south.

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Photo No. 91: Fly Ash Pond – North embankment interior slope. Looking at crack in soils (approximately 2 inches wide and 15 inches deep).

Photo No. 92: Fly Ash Pond – North embankment interior slope. Looking at crack in soils (also shown in Photo No. 91).

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Photo No. 93: Fly Ash Pond – North embankment interior slope. Second location of cracks in soil (approximately 2 inches wide and 14 inches deep).

Photo No. 94: Fly Ash Pond – Drainage ditch north of the north embankment exterior toe.

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Photo No. 95: Fly Ash Pond – North embankment exterior slope, looking north.

Photo No. 96: Fly Ash Pond – North embankment interior slope. Looking at crack in soils (approximately 2 inches wide and 12 inches deep).

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Photo No. 97: Fly Ash Pond – North embankment interior slope. Looking at crack in soils (approximately 2 inches wide and 11 inches deep).

Photo No. 98: Fly Ash Pond – North embankment exterior slope. Looking at minor rutting and loss of grass cover.

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Photo No. 99: Groundwater Monitoring Well W-3, located near the northeast corner of the Fly Ash Pond.

Photo No. 100: Fly Ash Pond – East embankment exterior slope, downed tree near toe created depression and erodible soils.

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Photo No. 101: Fly Ash Pond – East embankment interior slope. Looking at crack in soils (approximately 2 inches wide and 11 inches deep).

Photo No. 102: Fly Ash Pond – East embankment exterior slope. Looking at vegetation growing on lower third of slope.

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Photo No. 103: Fly Ash Pond – East embankment crest, looking south.

Photo No. 104: Groundwater Monitoring Well W-19, located near the southeast corner of the Fly Ash Pond.

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Photo No. 105: Fly Ash Pond – South embankment interior slope, looking northwest. Looking at TRM at location recently re-seeded.

Photo No. 106: Fly Ash Pond – Southeast corner interior slope, looking southeast. Note surface erosion.

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Photo No. 107: Fly Ash Pond – South embankment crest, looking northwest.

Photo No. 108: Fly Ash Pond – South (divider) embankment exterior slope. Leachate Pond lined with 60-mil-thick HDPE liner.

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Photo No. 109: Fly Ash Pond – South embankment exterior slope. Looking at cracks in soils (approximately 1 inch wide and 6 inches deep).

Photo No. 110: Fly Ash Pond – South (divider) embankment exterior slope, looking at northwest corner of Leachate Pond. Inlet pipes into Leachate Pond.

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Photo No. 111: Fly Ash Pond – South embankment interior slope. Looking at erosion near water line. Note TRM on slope where recently re-seeded.

Photo No. 112: Fly Ash Pond – South embankment interior slope, looking northwest.

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Photo No. 113: Fly Ash Pond – South embankment exterior slope. Looking at cracks in soil (approximately 2 inches wide and 21 inches deep).

Photo No. 114: Fly Ash Pond – South embankment interior slope, looking northwest. Note erosion near water line and ruts on slope.

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Photo No. 115: Fly Ash Pond – South embankment interior slope, looking northwest. Note area recently re-seeded and covered with TRM.

Photo No. 116: Fly Ash Pond – South embankment interior slope, looking northwest.

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Photo No. 117: Fly Ash Pond – South embankment interior slope, looking southeast. Note erosion near water line.

Photo No. 118: Fly Ash Pond – South embankment exterior slope, looking northwest. Note missing vegetation.

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Photo No. 119: Fly Ash Pond – South embankment exterior slope, looking northeast. Note missing vegetation and ruts.

Photo No. 120: Fly Ash Pond – South embankment interior slope, looking northwest. Note ash material placed on slope.

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Photo No. 121: Fly Ash Pond – South embankment exterior slope, looking southwest. Note ruts and missing vegetation.

Photo No. 122: Fly Ash Pond – South embankment interior slope, looking northwest. Note ash material placed on slope.

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Photo No. 123: Fly Ash Pond – South embankment exterior slope, looking west. Note area of standing water within ash storage area.

Photo No. 124: Fly Ash Pond – South embankment interior slope, looking northwest. Note slope has been excavated into during removal of ash material.

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Photo No. 125: Fly Ash Pond – South embankment exterior slope, looking southeast.

Photo No. 126: Fly Ash Pond – South embankment exterior slope, looking south. Unknown pipe discharging into ash storage area.

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Photo No. 127: Fly Ash Pond – Near southwest corner of pond. Note ash material has been placed up to the crest elevation.

Photo No. 128: Fly Ash Pond – Near southwest corner of pond. Note ash material has been placed up to the crest elevation.

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Photo No. 129: Fly Ash Pond – West embankment interior slope, looking northeast. Outlet pump and piping in distance.

Photo No. 130: Fly Ash Pond – West embankment interior slope, looking east. Outlet pump and piping.

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Photo No. 131: Fly Ash Pond – Outlet piping near northwest corner.

Photo No. 132: Leachate Pond – East embankment interior slope and crest.

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Photo No. 133: Leachate Pond – East embankment exterior slope, looking southeast. Note dense vegetation covering slope.

Photo No. 134: Leachate Pond – East embankment exterior slope. Looking at dense vegetation covering slope.

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Photo No. 135: Leachate Pond – East embankment exterior slope. Looking at dense vegetation covering slope.

Photo No. 136: Leachate Pond – South embankment interior slope, looking southwest.

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Photo No. 137: Groundwater Monitoring Well W-18, located near the southeast corner of the Leachate Pond.

Photo No. 138: Leachate Pond – South embankment crest, looking southeast.

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Photo No. 139: Leachate Pond – South embankment exterior slope. Looking at extent of granular surfacing on crest.

Photo No. 140: Leachate Pond – Southwest corner of pond, looking northeast.

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Photo No. 141: Leachate Pond – West embankment exterior slope, looking north. Divider embankment with coal ash landfill covered with geotextile fabric.

Photo No. 142: Leachate Pond – West embankment exterior slope. Note cracks in soil (approximately 2 inches wide and 14 inches deep).

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Photo No. 143: Leachate Pond – West embankment crest, looking north.

Photo No. 144: Leachate Pond – Northwest corner, looking east. Two discharge pipes into pond. Outlet pump and piping in background.

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Appendix E
Photo GPS Locations

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Appendix E
Photo GPS Locations

Site: W. Donner Rodemacher
Datum: NAD 1983
Coordinate Units: Decimal Degrees

Photo No.	Latitude	Longitude
1	31.394988	-92.703544
2	31.395019	-92.703482
3	31.394826	-92.703158
4	31.395197	-92.703256
5	31.395381	-92.703059
6	31.395793	-92.702613
7	31.396080	-92.702380
8	31.396122	-92.702338
9	31.396480	-92.701960
10	31.396347	-92.701606
11	31.396696	-92.701794
12	31.396802	-92.701640
13	31.397021	-92.701553
14	31.397050	-92.701443
15	31.397238	-92.701829
16	31.397350	-92.701982
17	31.397346	-92.702141
18	31.397392	-92.702283
19	31.397513	-92.702255
20	31.397628	-92.702342
21	31.397670	-92.702437
22	31.397751	-92.702588
23	31.397807	-92.702650
24	31.397819	-92.702692
25	31.397930	-92.702834
26	31.398281	-92.703176
27	31.398326	-92.703156
28	31.398387	-92.703182
29	31.398284	-92.703563
30	31.399217	-92.704114
31	31.399258	-92.704153
32	31.399381	-92.704593
33	31.399580	-92.704617
34	31.399652	-92.704878
35	31.399733	-92.705072
36	31.399759	-92.704974
37	31.399710	-92.704965
38	31.399524	-92.705494
39	31.399411	-92.705533
40	31.399350	-92.706051
41	31.399268	-92.706497
42	31.399613	-92.706354
43	31.398834	-92.706288
44	31.398425	-92.706479
45	31.398409	-92.706492
46	31.398438	-92.706529

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Appendix E
Photo GPS Locations

Site: W. Donner Rodemacher
Datum: NAD 1983
Coordinate Units: Decimal Degrees

Photo No.	Latitude	Longitude
47	31.398605	-92.706836
48	31.398577	-92.706835
49	31.398565	-92.706851
50	31.398148	-92.706631
51	31.397983	-92.706776
52	31.397879	-92.706828
53	31.397840	-92.706885
54	31.397923	-92.707075
55	31.397175	-92.707368
56	31.397022	-92.707181
57	31.396959	-92.707075
58	31.396989	-92.707031
59	31.396783	-92.706998
60	31.396704	-92.707173
61	31.396705	-92.707202
62	31.396727	-92.706979
63	31.396773	-92.706988
64	31.396373	-92.706263
65	31.395825	-92.705669
66	31.395572	-92.705687
67	31.395730	-92.705351
68	31.395698	-92.705291
69	31.395623	-92.705241
70	31.395628	-92.705182
71	31.394950	-92.704252
72	31.394861	-92.703752
73	31.396575	-92.701307
74	31.396702	-92.701055
75	31.396626	-92.700950
76	31.396308	-92.700896
77	31.396291	-92.700648
78	31.396344	-92.700416
79	31.396218	-92.700352
80	31.396150	-92.700193
81	31.396163	-92.700002
82	31.395847	-92.699986
83	31.395751	-92.699970
84	31.395611	-92.699377
85	31.395281	-92.698836
86	31.395068	-92.698708
87	31.394733	-92.698189
88	31.394724	-92.697797
89	31.394380	-92.697638
90	31.394210	-92.697829
91	31.394300	-92.697947
92	31.394295	-92.697957

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Appendix E
Photo GPS Locations

Site: W. Donner Rodemacher
Datum: NAD 1983
Coordinate Units: Decimal Degrees

Photo No.	Latitude	Longitude
93	31.394391	-92.698088
94	31.394169	-92.697239
95	31.394093	-92.697501
96	31.394095	-92.697664
97	31.394037	-92.697596
98	31.394008	-92.697693
99	31.393839	-92.696836
100	31.393364	-92.697217
101	31.393419	-92.697453
102	31.393183	-92.697241
103	31.393058	-92.697368
104	31.391882	-92.697365
105	31.391879	-92.697565
106	31.391925	-92.697577
107	31.391905	-92.697822
108	31.391869	-92.697833
109	31.391965	-92.698027
110	31.392093	-92.698233
111	31.392231	-92.698151
112	31.392555	-92.698873
113	31.392534	-92.698990
114	31.392785	-92.699093
115	31.392936	-92.699323
116	31.393063	-92.699519
117	31.393091	-92.699527
118	31.393121	-92.699794
119	31.393163	-92.699870
120	31.393678	-92.700459
121	31.393572	-92.701226
122	31.393451	-92.701748
123	31.393584	-92.702632
124	31.393782	-92.702680
125	31.393912	-92.703137
126	31.393941	-92.703191
127	31.394329	-92.703310
128	31.394383	-92.703405
129	31.396065	-92.701839
130	31.396474	-92.701490
131	31.396448	-92.701401
132	31.391716	-92.697550
133	31.391536	-92.697238
134	31.390817	-92.697444
135	31.390098	-92.697443
136	31.389638	-92.697753
137	31.389543	-92.697703
138	31.389284	-92.698358

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Appendix E
Photo GPS Locations

Site: W. Donner Rodemacher
Datum: NAD 1983
Coordinate Units: Decimal Degrees

Photo No.	Latitude	Longitude
139	31.388991	-92.699003
140	31.388915	-92.699433
141	31.389185	-92.699468
142	31.389728	-92.699199
143	31.390449	-92.698995
144	31.392137	-92.698404

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Appendix F

Cleco Daily and Weekly Impoundment Inspection Checklists

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WEEKLY INSPECTION CHECKLIST
ASH MANAGEMENT AREA

Per Louisiana Solid Waste Rules and Regulations, the Ash Management Area must be inspected weekly for proper leachate collection, evidence of leaks, and condition of structural integrity.

Report necessary repairs to Environmental Services.

File Board ?

Date	Inspector	Is The Level of Leachate in the Collection System Less Than 12 inches?	Levee Condition	Comments
3/1/10	KN	Yes	Good	None
3/8/10	KN	Yes	Good	None
3/15	KN	Yes	Good	None
3/22/10	KN	Yes	Good	None
3/29/10	KN	Yes	Good	None
4/6/10	KN	Yes	Good	None
4/12/10	KN	Yes	Good	None
4-19/10	KN	Yes	Good	None
4/27/10	KN	Yes	Good	None
5/3/10	KN	Yes	Good	None
5/10/10	KN	Yes	Good	None
5-17-10	KN	Yes	Good	None

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CLECO

Rodemacher Power Station
Solid Waste Surface Impoundments
Daily Inspection

CONFIDENTIAL

Time: 5-17-10	Levees in good condition?	Any erosions or breaches?	Water overtopping Levees?	Excessive vegetative growth that prevents proper access, inspection, or operation?
Unit 1 Metal Cleaning Waste Pond	Yes ✓ No	Yes No ✓	Yes No ✓	Yes No ✓
Coal Sedimentation Pond	Yes ✓ No	Yes No ✓	Yes No ✓	Yes No ✓
Unit 2 Metal Cleaning Waste Pond	Yes ✓ No	Yes No ✓	Yes No ✓	Yes No ✓
Bottom Ash Pond	Yes ✓ No	Yes No ✓	Yes No ✓	Yes No ✓
Fly Ash Pond	Yes ✓ No	Yes No ✓	Yes No ✓	Yes No ✓
Clarifier Sludge Sedimentation Pond	Yes ✓ No	Yes No ✓	Yes No ✓	Yes No ✓

The following area was found to require action:
If so, contact : Rudy Bordelon @ Coal Yard Ext. 1152
Corrective action was taken as follows:
Completed by: Capt Franks

5-18-10	Levees in good condition?	Any erosions or breaches?	Water overtopping Levees?	Excessive vegetative growth that prevents proper access, inspection, or operation?
1 Metal Cleaning Waste Pond	Yes ✓ No	Yes No ✓	Yes No ✓	Yes No ✓
Sedimentation Pond	Yes ✓ No	Yes No ✓	Yes No ✓	Yes No ✓
2 Metal Cleaning Waste Pond	Yes ✓ No	Yes No ✓	Yes No ✓	Yes No ✓
m Ash Pond	Yes ✓ No	Yes No ✓	Yes No ✓	Yes No ✓
sh Pond	Yes ✓ No	Yes No ✓	Yes No ✓	Yes No ✓
ier Sludge Sedimentation	Yes ✓ No	Yes No ✓	Yes No ✓	Yes No ✓

The following area was found to require action:
If so, contact : Rudy Bordelon @ Coal Yard Ext. 1152
Corrective action was taken as follows:
Completed by: Capt Franks

5-19-10	Levees in good condition?	Any erosions or breaches?	Water overtopping Levees?	Excessive vegetative growth that prevents proper access, inspection, or operation?
Metal Cleaning Waste Pond	Yes ✓ No	Yes No ✓	Yes No ✓	Yes No ✓
Sedimentation Pond	Yes ✓ No	Yes No ✓	Yes No ✓	Yes No ✓
Metal Cleaning Waste Pond	Yes ✓ No	Yes No ✓	Yes No ✓	Yes No ✓
n Ash Pond	Yes ✓ No	Yes No ✓	Yes No ✓	Yes No ✓
sh Pond	Yes ✓ No	Yes No ✓	Yes No ✓	Yes No ✓
er Sludge Sedimentation	Yes ✓ No	Yes No ✓	Yes No ✓	Yes No ✓

The following area was found to require action:
If so, contact : Rudy Bordelon @ Coal Yard Ext. 1152
Corrective action was taken as follows:
Completed by: Capt Franks

5-20-10	Levees in good condition?	Any erosions or breaches?	Water overtopping Levees?	Excessive vegetative growth that prevents proper access, inspection, or operation?
Metal Cleaning Waste Pond	Yes ✓ No	Yes No ✓	Yes No ✓	Yes No ✓
edimentation Pond	Yes ✓ No	Yes No ✓	Yes No ✓	Yes No ✓
Metal Cleaning Waste Pond	Yes ✓ No	Yes No ✓	Yes No ✓	Yes No ✓
n Ash Pond	Yes ✓ No	Yes No ✓	Yes No ✓	Yes No ✓
n Pond	Yes ✓ No	Yes No ✓	Yes No ✓	Yes No ✓
er Sludge Sedimentation	Yes ✓ No	Yes No ✓	Yes No ✓	Yes No ✓

The following area was found to require action:
If so, contact : Rudy Bordelon @ Coal Yard Ext. 1152
Corrective action was taken as follows:
Completed by: Capt Franks

Please return this form to Ricky Nguyen (ROPS Ext. 1171) for filing.

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