Appendix A
Formal Inspection Checklist

INSTRUCTIONS FOR COMPLETING THIS FORMAL INSPECTION CHECKLIST

1. **Complete all items that are applicable; if not applicable, write in "N/A".**

2. Use the next page to determine ratings of each dam component.

3. Please either type or write legibly and concisely.

4. The inspection personnel shall review the "Guidelines for Inspection of Dams" available on the MDEQ website prior to conducting the inspection. Failure to comply with the requirements of this guideline may result in the inspection being rejected by MDEQ.

5. If the ratings of the components of the dam have changed since the last inspection, please explain the change in condition under the appropriate section. If a rating has improved, dam repairs, improvements, analyses, or maintenance must have been performed and documented.

6. The inspection report including this form shall be submitted to MDEQ including pictures in an appendix section.

7. Please sign and date this page in the space below to verify that you have read and understand these instructions.

Inspector's Signature: _____ Date: 3-6-18

GUIDELINES FOR DETERMINING CONDITIONS

CONDITIONS OBSERVED - APPLIES TO UPSTREAM SLOPE, CREST, DOWNSTREAM SLOPE, PRINCIPAL SPILLWAY, AUXILIARY SPILLWAY

SATISFACTORY	FAIR	POOR	UNSATISFACTORY
In general, this part of the structure has a good appearance, and conditions observed in this area do not appear to threaten the safety of the dam.	Although general cross-section is maintained, surfaces may be irregular, eroded, rutted, spalled, or otherwise not in like new condition. Conditions in this area do not currently appear to threaten the safety of the dam.	Continued deterioration and/or unusual loading may threaten the safety of the dam.	Conditions observed in this area appear to threaten the safety of the dam. Conditions observed in this area are unacceptable.

CONDITIONS OBSERVED – APPLIES TO SEEPAGE

SATISFACTORY (NONE)	FAIR	POOR	UNSATISFACTORY
No evidence of uncontrolled seepage. No unexplained increase in flows from designed drains. All seepage is clear. Seep- age conditions do not appear to threaten the safety of the dam.	Some seepage exists at areas other than the drain outfalls, or other designed drains. No unexplained increase in flows from designed drains. All seepage is clear. Seepage conditions observed do not currently appear to threaten the safety of the dam.	Excessive seepage exists at areas other than drain outfalls and other designed drains. Seepage needs to be evaluated. Increased flow and/or continued deterioration in seepage conditions may threaten the safety of the dam.	Excessive seepage conditions observed appear to threaten the safety of the dam and is unacceptable. Examples: 1) Designed drain or seepage flows have increased without increase in reservoir level. 2) Drain or seepage flows contain sediment. i.e., muddy water or particles in jar samples. 3) Widespread seepage, concentrated seepage or ponding appears to threaten the safety of the dam.

Formal Inspection Checklist

(For Engineers)

DAM NAME: *Lake Tiak-O'Khata Dam*

DAM INVENTORY NO: *MS00189*

OWNER:

Land Owners Name (Per Deed): Mr. Steve White, Owner

Address: Lake Tiak O'Khata Resort, P.O. Box 160, Louisville, MS 39339

Phone #: 662-803-8477

Email: steve@ltok.com / steve.ltok@gmail.com

Primary Contact Person (if different from above):

Address:

Phone #:

Email:

OPERATOR (if different from Owner):

Name:

Address:

Phone #:

Email:

DATE(S) OF INSPECTION: *January 11 & 20, 2018 (Crowder Engineering and Surveying, Inc.)*

INSPECTION PERSONNEL (include contact information)

Mississippi Licensed Professional Engineer(s):

Name	Affiliation	Area of Expertise
Thomas M. "Marty" Crowder, P.E., P.S.	*Crowder Engineering & Surveying, Inc.*	*Professional Civil Engineer* / *Professional Land Surveyor*
	662-285-2062 mcrowder@crowderengineering.com	

MULTIDISCIPINARY: I am experienced in the technical disciplines or I am working with other professionals experienced in the technical disciplines to properly inspect this dam and appurtenant works. Technical disciplines, in additional to the general civil engineering, may include geotechnical, geological, hydrologic, structural, and mechanical.

■ Yes ☐ No Comment:

Other technical expert(s) and advisors(s):

Name	Affiliation	Area of Expertise
N/A		

State Representative(s):

Name	Affiliation
N/A	

Dam Owner Representative(s):

Name	Affiliation
N/A	

Others:

Name	Affiliation
Jeremiah Glasz, E.I.	*Crowder Engineering & Surveying, Inc.*

GENERAL INFORMATION

Weather Conditions (including rainfall within previous 14 days):
January 11, 2018: Cloudy; Approx. 5" rain over 14 day period; wet site conditions
January 20, 2018: Partly Cloudy; Approx. 7" rain over 14 day period;

County: *Winston*

Stream Name: *Un-named*

Tributary of: *Hughes Creek*

Latitude (N): *33° 05' 44.2"*

Longitude (W): *89° 04' 23.1"*

Purpose of Dam: *Recreation/ Resort*

Hazard Classification: *High Hazard*

Drainage Area (sq. mi.): *0.49*

Height of Dam (ft): *33*

Length (ft): *1150***

Normal Surface (ac): *67**

Normal Capacity (ac-ft): *600 (Elev. – 536.5 ft)**

Maximum Surface (ac): *67**

Maximum Capacity (ac-ft): *650 (Elev. – 540.5 ft)**

Normal Reservoir Elevation (ft): *536.5 (535.7**)*

Reservoir Elevation at time of inspection (ft): *Approx. 1' below Normal Pool (354.7)*

SPILLWAY SYSTEM

Type of spillway (riser and conduit, concrete chute, vegetated earthen, etc.)

Principal: *29-ft bottom width concrete weir (crest elev- 536.5 ft* (535.7 ft**)) in northerly abutment with concrete rubble exit chute*

Auxiliary (Emergency): *70-ft bottom-width vegetated earth spillway in southerly abutment*

Principal Spillway Capacity (inches/24 hours & storm distribution): *100-yr storm, 8.8"/24-hr, Type 2 storm, routed crest elev. 537.6 ft* (539.4 ft**); 1.1 feet pool depth above PS weir crest*

Auxiliary (Emergency) Spillway Capacity (inches/24 hours & storm distribution): *43.4"/24-hr storm, PMP Distribution, routed crest elev. 539.9-ft*(540.0 ft**); Top of dam elevation 540.5-ft*

**The Information above is referenced from Aqua Engineering Services, LTD Formal Inspection 2011*
*** From Civil Construction Drawings of the Lake Tiak-O'Khata Dam Rehabilitation Project, 8-13-15.*
Note: If you do not understand what is meant by the above questions please engage the services of a professional who can assist you. These questions are not meant to capture the spillway capacity in cfs,

as this data is irrelevant in determining the dams overall ability to pass the extreme precipitation event (% of the PMP) as required by the Regulations. If there are more than two spillways, please add an additional item. **A formal inspection will not be approved by the Dam Safety Division unless this section is completed.**

Are the spillway(s) adequate for this classification of dam (see the dam safety regulations 11 Miss. Admin. Code Pt. 7, Ch. 3 for definition of Probable Maximum Precipitation – PMP – and what amount of PMP must be handled by the different spillways)?

Principal:	Yes	☒*	No	☐
Auxiliary (Emergency):	Yes	☒*	No	☐

If not, what percent of the total PMP will the combined spillways pass (%)?

Or, note date and author of hydrologic and hydraulic report evaluating spillway capacity:
Capacity Evaluation by Aqua Engineering Services, LTD (2011)

**The Information above is referenced from Aqua Engineering Services, LTD Formal Inspection 2011; Capacity Evaluation by Aqua Engineering Services, LTD (2011)*

Major changes to the dam or watershed since preparation of last report that may affect spillway adequacy? (Yes / No, if yes then describe changes): *No. It should be noted that a portion of the dam crest and the levee downstream slope (approximately 300 feet of the 1150 feet long levee) have been rehabilitated since the last formal inspection.*

HISTORY

Date Constructed: *1954 (Per Owner)*

Date(s) Reconstructed:

Designer:
Original- Unknown
Repairs (Level Control Piping)- Burns, Cooley, Dennis (2010)
Rehabilitation – Crest and DS Slope (South End)- CES (2015)

Constructed by:
Unknown
Burns Cooley Dennis (2010)
Baker Ready Mix & Const., LLC (2015)

PREVIOUS INSPECTIONS (date of)

Last Owner's Inspection: *November 3, 2015 (on record)*

Last Formal Inspection: *August 2, 2011 (on record)*

EMERGENCY ACTION PLAN

Date of Last Approved Plan (when the plan was last distributed to the EAP holders): *January 13, 2015*

Date of Last Revision: *N/A*

Is the notification flowchart complete and current? *Yes*

Is the emergency materials and equipment information current? *N/A*

When was the plan last tested? Was this test a table top exercise or a full scale exercise?
EAP sequenced March 11, 2016 for reported ongoing seepage/piping issue. No official tests documented.

DOWNSTREAM HAZARD CLASSIFICATIONS

Present Hazard Classification: *High Hazard*

Changes in Downstream Land Use and Habitation since last inspection: *No Changes Observed*

Is present Classification appropriate? *Yes*

OPERATION AND MAINTENANCE

Date of Operation and Maintenance Plan: *No plan observed*

Are instructions adequate? *N/A*

Do operating personnel follow instructions? *N/A*

What are operating personnel capabilities? *Tony Owen is the maintenance manager employed by the Owner (662-617-2233). The dam is mowed regularly. The four inch valve on the level control pipe is operated/exercised approximately three times per year.*

PROJECT RECORD REVIEW

Date of file review: *January 8, 2018*

Description of previous deficiencies noted and corrective actions taken (if so, when?):

- *In September of 2010, Burns Cooley Dennis, Inc. commenced work to resolve an issue of leaking corrugated metal pipe (CMP) that was previously used to lower the pool level which had deteriorated. The work consisted of inserting a 4" PVC pipe with outlet valve and grouting the existing CMP.*
- *In April of 2015, Crowder Engineering & Surveying, Inc. prepared plans and specifications for a rehabilitation project to reconstruct the dam crest and downstream slope to meet current design criteria. The design was completed and a permit issued by MDEQ – Dam Division for the project. The Owner hired Baker Ready Mix and Construction, LLC to perform construction/rehabilitation of the south 300 feet of the 1150 feet long dam embankment.*

EXAMINATION OF EMBANKMENT DAMS

DESCRIPTION OF STRUCTURE

Embankment Material: *Unknown in original structure. Rehabilitated portion of embankment downstream slope on south 300 feet of levee constructed with silty clay (CL).*

Cutoff Type (If Known): *Unknown*

Impervious Core (If Known): *Unknown*

Internal Drainage System (Yes / No?) If yes, describe: *No*

Any Signs of Movement (Horizontal and Vertical Alignment)?: *None observed*

Miscellaneous: *N/A*

CREST

Width of Crest: *8' to 11.5' (Constructed to 14' wide at newly rehabilitated embankment on south end of dam*)

Problems:
☐ None ☐ Ruts or Puddles ☒ Erosion ☐ Cracks with Displacement ☐ Sinkholes ☒ Not Wide Enough ☐ Low Area ☐ Misalignment ☐ Inadequate Surface Drainage ☐ Trees, Brush, Briars ☒ Other:

- *No established vegetation on south end at rehabilitated embankment*
- *Small Rills beginning to form*
- *Current design criteria requires crest to be constructed a minimum of 14' wide.*

If Trees, Brush, Briars is checked above please describe the nature and extent of vegetation on the dam?
A single 30 inch diameter tree is growing on the north end of the levee (station 12+20) next to the primary spillway.

Comments: *N/A*

Overall Condition:
☐ Satisfactory
☒ Fair
☐ Poor
☐ Unsatisfactory

UPSTREAM SLOPE

Slope (H:V): *Varies from 2:1 to 1:1 in some areas*

Problems:

☐ None ☒ Riprap - Missing, Sparse, Displaced, Weathered ☒ Wave Erosion-with Scarps

☐ Cracks-with Displacement ☐ Sinkhole ☐ Appears Too Steep ☐ Depressions or Bulges

☐ Slides ☒ Animal Burrows ☐ Trees, Brush, Briars

☐ Other:

If Trees, Brush, Briars is checked above please describe the nature and extent of vegetation on the dam?
N/A

Comments:
Rip-rap (mostly comprised of old brick) sparse on southern end. Minor wave erosion and scarps. Holes along top of banks indicate rodent activity.

Overall Condition:
☐ Satisfactory
☒ Fair
☐ Poor
☐ Unsatisfactory

DOWNSTREAM SLOPE (including groins and toe area)

Slope (H:V): *Varies from 2:1 to 3:1; benched; Slopes at newly rehabilitated embankment were constructed to 3:1 (H:V).*

Problems:

☐ None ☐ Livestock Damage ☒ Erosion or Gullies ☐ Cracks with Displacement

☐ Sinkholes ☒ Appears too Steep ☒ Depression or Bulges ☐ Slide(s) ☐ Soft Areas

☒ Trees, Brush, Briars on dam or within 50 feet of toe ☐ Animal Burrows

☐ Other:

If Trees, Brush, Briars is checked above please describe the nature and extent of vegetation on the dam?
Trees are growing on lower elevation of downstream embankment from the toe of slope to 30-40 feet up the slope (horizontally) between levee station 4+00 to 10+50 (650 feet).

Comments:

Rehabiliation of the downstream slope of the dam between levee stations 1+00 and 4+00 was completed in 2016. Vegetation is light on the slope of the rehabilitated area resulting in rill and minor gully erosion.

The downstream slope of the dam between stations 4+00 and 12+50 has benched slopes that range in slope from 2:1 to 3:1 (H:V).

Overall Condition:
☐ Satisfactory
☒ Fair
☐ Poor
☐ Unsatisfactory

UTILITIES

Utilities Installed in Embankment or Toe?

☐ Phone/Cable ☒ Water ☐ Electrical ☐ Sewer ☐ Gas

Small water line just east of, and beyond the toe, of the dam.

Does the location of all utilities appear on the as-built plans for the dam? *Yes*

SEEPAGE

Problems:
☐ None ☐ Saturated Embankment Area ☐ Seepage Exits on Embankment ☐ Seepage Exits at Point Source ☒ Seepage Area at Toe ☐ Flow Adjacent to Outlet
☒ Other: *Seepage is entering ditch downstream of the embankment toe approximately due east of levee station 1+00.*

Comments:
Seepage is entering ditch downstream of the embankment toe approximately due east of levee station 1+00. Seepage in ditch has an orange color with an oily sheen; it may be elevated levels of iron in the groundwater and from iron feeding bacteria that produces the oily sheen.

Some seepage exists at points along the toe of slope between levee station 5+00 to 6+00 and between levee station 7+75 to 9+50. Seepage was also observed on the lower bench of the downstream slope in the vicinity of station 7+75, 8+40, 8+95 and 9+15. Seepage velocity observed was very low at all locations. No sediment deposits were observed in the seep locations and all water was clear. The seep at station 7+75 is adjacent to a sandbagged area that had moderate flows during a storm event.

Overall Condition:
☐ Satisfactory (None)
☒ Fair
☐ Poor
☐ Unsatisfactory

Does the location of all drainage systems/filters appear on the as-built plans for the dam? *N/A*

SEEPAGE AND TOE DRAIN/RELIEF WELL FLOW

Location	Estimated Flow	Color (Turbidity)
N/A		

No toe drain or relief well exists.

EXAMINATION OF SPILLWAYS AND OUTLET WORKS

PRIMARY SPILLWAY

(Fill out those sections that apply)

ENTRANCE CHANNEL

Description: *None; weir is located at edge of normal pool*

Vegetation (Trees, Bushes): none

Debris: *none*

Channel Side-Slope Stability: *Stable*

Slope Protection/Erosion: *good condition*

Unusual Conditions: *N/A*

Overall Condition:

- [x] Satisfactory
- [ ] Fair
- [ ] Poor
- [ ] Unsatisfactory

SPILLWAY CREST

Description: *Trapezoidal Concrete Weir, 29' Bottom Width*

Condition of Material: *Weathered/Aged*

Signs of Movement: *None observed, cracking observed from aged concrete*

Joints: *none*

Unusual Conditions: *none observed*

Overall Condition:

- [x] Satisfactory
- [ ] Fair
- [ ] Poor
- [ ] Unsatisfactory

CHUTES

Description: *Concrete Rubble Chute Downstream of Primary Spillway Weir*

Condition of Material: *Good; stable*

Signs of Movement: *Minimal*

Joints: *N/A*

Unusual Conditions: *none*

Overall Condition:

- [ ] Satisfactory
- [x] Fair
- [ ] Poor
- [ ] Unsatisfactory

SPILLWAY WING WALLS

Description: *N/A*

Condition of Material: *N/A*

Signs of Movement: *N/A*

Joints: *N/A*

Drains: *N/A*

Unusual Conditions: *N/A*

Overall Condition:

- [ ] Satisfactory
- [ ] Fair
- [ ] Poor
- [ ] Unsatisfactory

DOWNSTREAM APRON

Description: *N/A*

Condition of Material: *N/A*

Signs of Movement: *N/A*

Unusual Conditions: *N/A*

Overall Condition:
☐ Satisfactory
☐ Fair
☐ Poor
☐ Unsatisfactory

INLET RISER

Description and Material Type (i.e. HDPE, Concrete, Steel, CMP, etc.): *N/A*

Condition of Material: *N/A*

Signs of Movement: *N/A*

Joints: *N/A*

Floor: *N/A*

Unusual Conditions: *N/A*

Overall Condition:
☐ Satisfactory
☐ Fair
☐ Poor
☐ Unsatisfactory

CONDUIT(S)

Description and Material Type (i.e. HDPE, Concrete, Steel, CMP, etc.): *4" PVC pipe (reference low level outlet section)*

When was the last video inspection of the conduit? *N/A*

Condition of Material: *good. Installed in 2010 to rehabilitate a deteriorated Corrugated Metal Pipe conduit.*

Signs of Movement: *none observed*

Joints: *unknown*

Seepage into conduit(s): *unknown*

Location	Estimated Flow	Turbidity
Midway of Dam at levee station 6+15 below ground	*None (valve controlled)*	*N/A*

Unusual Conditions: *N/A*

Overall Condition:
- [x] Satisfactory
- [ ] Fair
- [ ] Poor
- [ ] Unsatisfactory

TRASH RACKS

Description: *N/A*

Condition of Material: *N/A*

Unusual Conditions: *N/A*

Overall Condition: *N/A*
- [ ] Satisfactory
- [ ] Fair
- [ ] Poor
- [ ] Unsatisfactory

GATES

Description/Type: *N/A*

Condition: *N/A*

Protective Coating: *N/A*

Leakage when gate is closed (Yes / No?): *N/A*

Exercising Frequency: *N/A*

Gates operated at time of Inspection? *N/A*

Condition of seals: *N/A*

Condition of gate controls and hoists: *N/A*

Overall Condition:
☐ Satisfactory
☐ Fair
☐ Poor
☐ Unsatisfactory

STILLING BASIN

Description: *N/A*

Condition of Material: *N/A*

Signs of Movement: *N/A*

Erosion: *N/A*

Unusual Conditions: *N/A*

Overall Condition: *N/A*
☐ Satisfactory
☐ Fair
☐ Poor
☐ Unsatisfactory

OUTLET CHANNEL

Vegetation (Trees, Bushes): *Trees and vegetation along channel*

Debris: *minimal*

Channel Side-Slope Stability: *Generally Stable. Some bank erosion observed.*

Erosion: *Some bank erosion observed*

Unusual Conditions: *N/A*

Overall Condition:
☐ Satisfactory
☒ Fair
☐ Poor
☐ Unsatisfactory

LOW LEVEL OUTLET

Description: *4" Diameter PVC through pipe used for water level management. This 4" conduit was installed in a 12" Corrugated Metal Pipe (CMP) conduit in 2010. It installed during grouting and sealing of the deteriorated CMP.*

Condition: *good*

Trash Rack: *N/A*

Leakage: *none observed*

Location	Estimated Flow
Midway of Dam at levee station 6+15	*Not free-flowing. Valve Controlled*

Unusual Conditions: *none observed*

Was the low-level outlet operated during the inspection? *No.*

Were there difficulties operating the low-level outlet? N/A

When was the low-level outlet last operated and did this conform with the Operation and Maintenance Procedures? *The Owner reports that the 4" valve is exercised approximately 3 times per year. Unknown*

Overall Condition:
☒ Satisfactory
☐ Fair
☐ Poor
☐ Unsatisfactory

VALVES

Description: *At downstream end of 4" PVC pool drain (low level output)*

General Condition: *good*

Protective Coating: *N/A*

Evidence of Cavitation or Abrasion: *none observed*

Leakage (Yes / No?): *none observed*

Frequency of Use: *The Owner reports that the 4" valve is exercised approximately 3 times per year.*

Valve operated during inspection (Yes / No?): *No*

Overall Condition:
- [x] Satisfactory
- [ ] Fair
- [ ] Poor
- [ ] Unsatisfactory

AUXILIARY (EMERGENCY) SPILLWAY

Note: For Earthen Spillways Only. If the auxiliary (emergency) spillway is not earthen please duplicate the above sections for the primary spillway here as needed. If there are more than one earthen and/or other spillway besides the primary please duplicate the appropriate sections in this report.

Description: *70' bottom-width vegetated earth spillway in southerly abutment. Earthen*

Vegetation (Trees, Bushes): *2-24" diameter pine trees are located on the crest of the emergency spillway. Large trees, trees and brush along exit channel. Grass vegetation on crest of spillway control section is sparse.*

Debris: *none observed*

Channel Side-Slope Stability: *Stable*

Slope Protection/Erosion: *Minor erosion where exit channel intercepts with maintenance trail.*

Unusual Conditions: *Benching/scarping at water line upstream of the spillway control section.*

Overall Condition:
- [ ] Satisfactory
- [x] Fair
- [ ] Poor
- [ ] Unsatisfactory

EXAMINATION OF OTHER FEATURES

INSTRUMENTATION

List all instrumentation (i.e. weirs, piezometers, flow gauges): *N/A*

(A separate report including instrument location, instrument readings, instrument condition, normal readings, observations, and conclusions based upon the collected data shall be attached.) *N/A*

RESERVOIR

Slopes: *Stable*

Sedimentation: *None observed, water is clear*

Unusual Conditions Which May Affect Dam: *none observed*

Any Other Unusual Conditions:

APPURTENANT STRUCTURES (Power House, Gatehouse, Penstocks, Water Supply, Other) *N/A*

Description and Condition of each: *N/A*

FOUNDATION AND GEOLOGY

Unusual Conditions Which May Affect Dam: *none observed or noted*

Cracks, Joints, Bedding Planes Which May Affect Dam Or Provide Seepage Paths: *none observed*

CONCLUSIONS

I certify that the above dam was personally inspected by me and the conditions described herein are correct to the best of my knowledge and belief.

The following maintenance concerns should be addressed (to be done as soon as possible) (in order of importance):

- *Revegetate failed grass vegetation on crest of dam on southern end (approximately 400 linear feet of crest). Includes re-grading rills where required.*
- *Improve Grass vegetation stand on downstream slope of rehabilitated section on southern end of levee.*
- *Fill and repair rodent holes on upstream slope of dam, as well as downstream slope.*
- *Continue to monitor seepage during owner's inspections*
- *Plug 6" black steel pipe located near crest of dam at station 9+00 with concrete grout. The original purpose of this pipe is unknown.*
- *Continue to monitor primary spillway and exit chute for undermining or loss of armor protection.*

I recommend the following changes in maintenance(in order of importance):

- *None*

I recommend the following repairs be made within one year (in order of importance) :

- *Rip-rap/bank protection needed on upstream slope of levee at southern end of dam where wave action has created a scarp / eroded the bank.*
- *Establish healthy grass vegetation on crest of emergency spillway.*

The following long-term improvements should also be undertaken:

- *Continue rehabilitation of downstream levee slope and crest widening.*

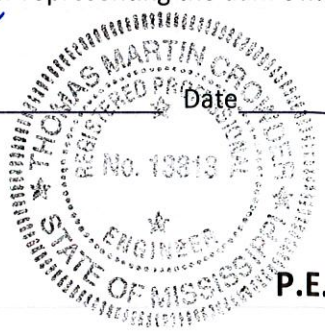
The following studies should also be undertaken (in order of importance): *none noted*

Have the recommendations above included those from previous Inspections?
Yes. The November 2011 inspection recommended that levee back slope be flattened to facilitate maintenance. This has only been partially completed. All other previous recommendations have been addressed adequately.

Does the Emergency Action Plan or the Operation and Maintenance Procedures require revision?
The Emergency Action Plan requires revision to update contact persons and contact information. The Operation and Maintenance plan has not been prepared.

Mississippi Licensed Professional Engineer representing the dam owner in responsible charge of the inspection:

Signature _____ Date 3-6-18

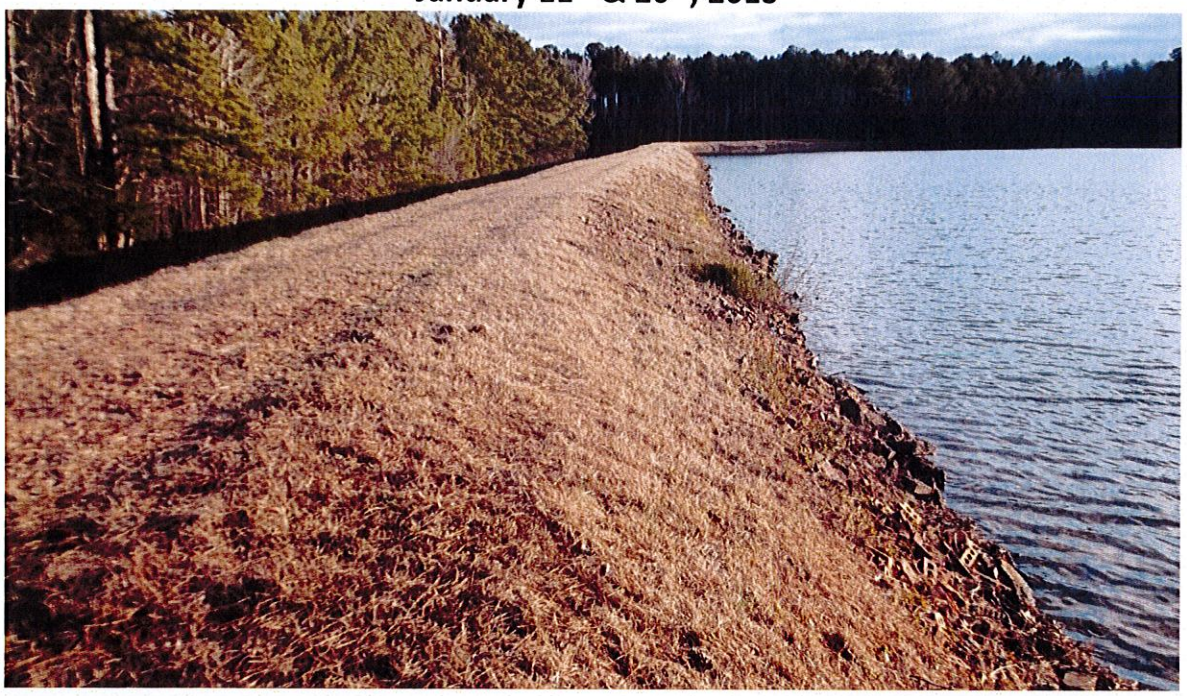


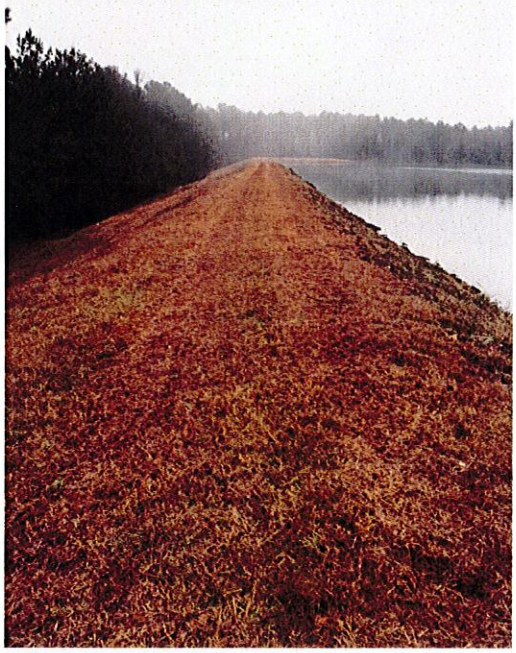
P.E. SEAL

Appendix B
Field Inspection Photos

Appendix C
Maps and Drawings

Field Inspection Photos – Lake Tiak-O'Khata Dam
January 11th & 20th, 2018

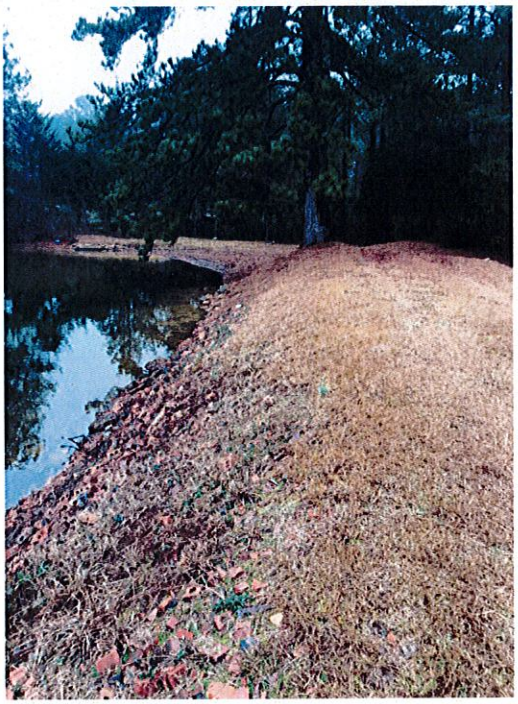




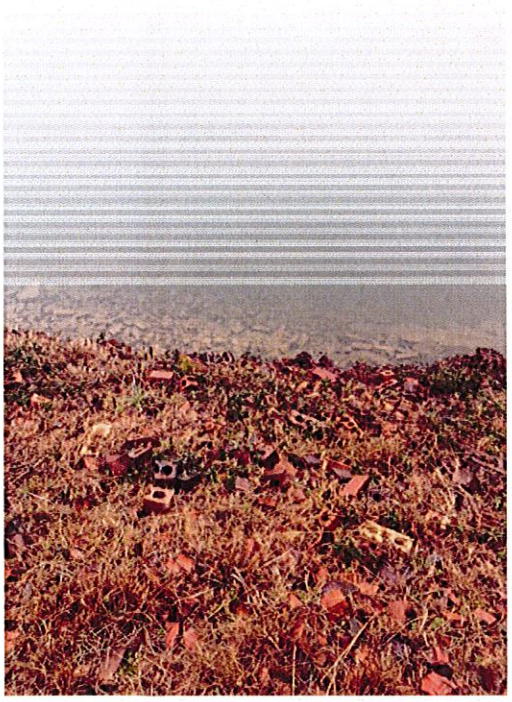
Dam Crest looking south from Station 12+00

Upstream slope looking south from Station 12+00

Upstream slope looking south from the Primary Spillway



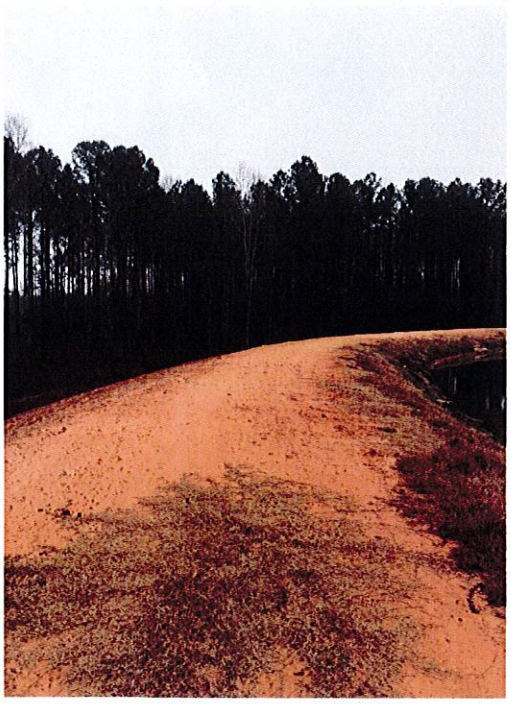
Looking North toward Primary Spillway
From Station 11+00



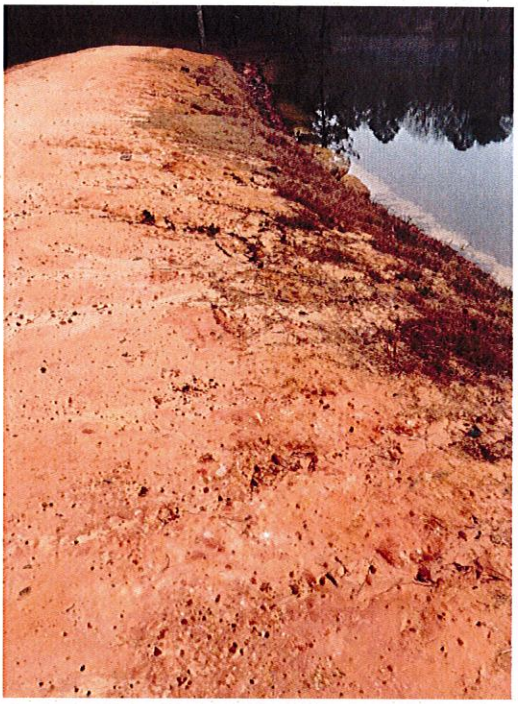
Brick erosion/wave protection

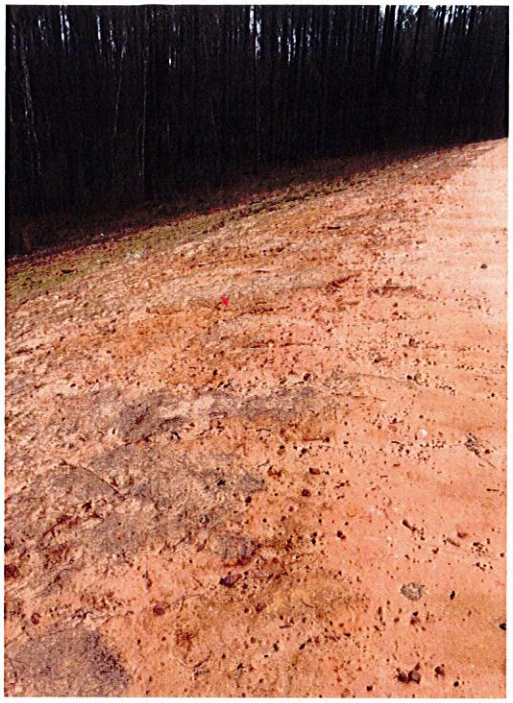
Looking South from Station 5+00 - South end of levee and Emergency Spillway beyond

Vegetation wearing on dam crest; Station 6+50



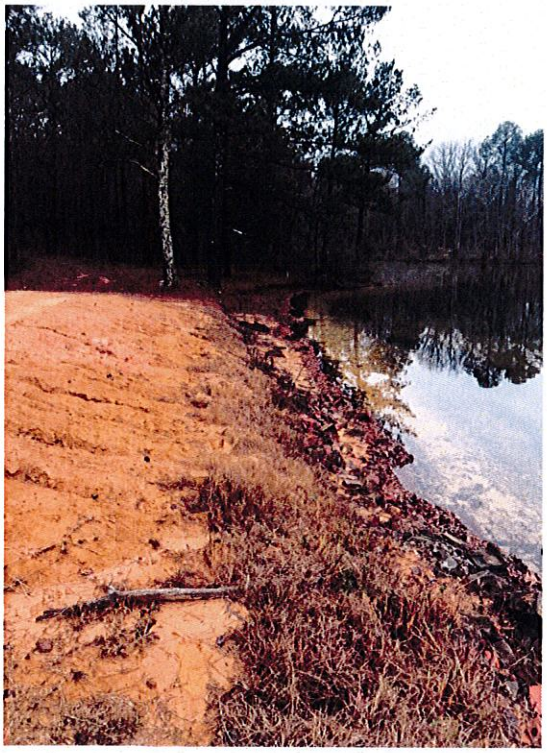
Looking South from Station 4+00; Dam Crest on south end; recently rehabilitated; Vegetation Required





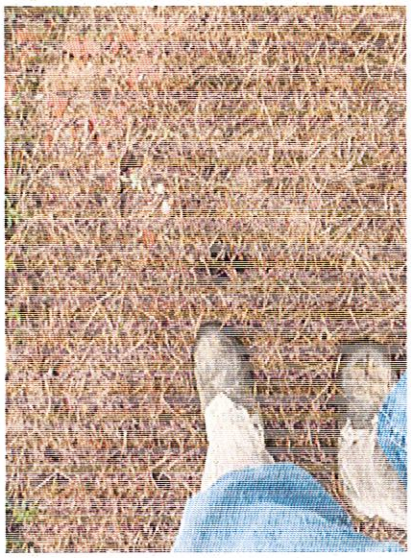
Rill and gully erosion forming on crest and upstream/downstream slopes at south end of levee

Looking North - Station 1+50

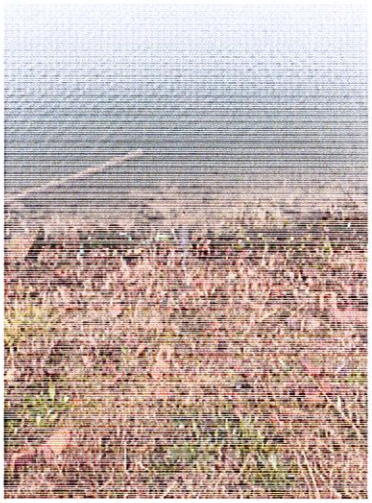


Looking South – Station 1+50 South end of Levee. Emergency Spillway beyond.

Multiple rodent burrows/holes on upstream slope all along the levee



Multiple rodent burrows/holes on upstream slope all along the levee



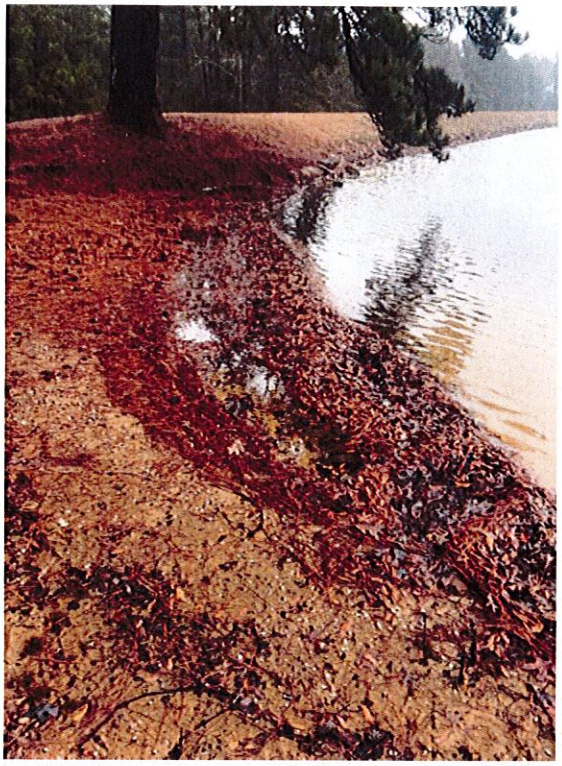
Black steel pipe protruding out of upstream slope – Station 9+00; unknown purpose

Emergency Spillway, south end of levee

Scarp - wave action eroding bank at Emergency Spillway

Emergency Spillway - downstream exit channel

Primary Spillway – Looking north from Station 12+00



Primary Spillway – Looking south from Station 3+00

Primary Spillway - weir and concrete control section

Primary Spillway - weir and concrete control section

Primary Spillway – joint in weir

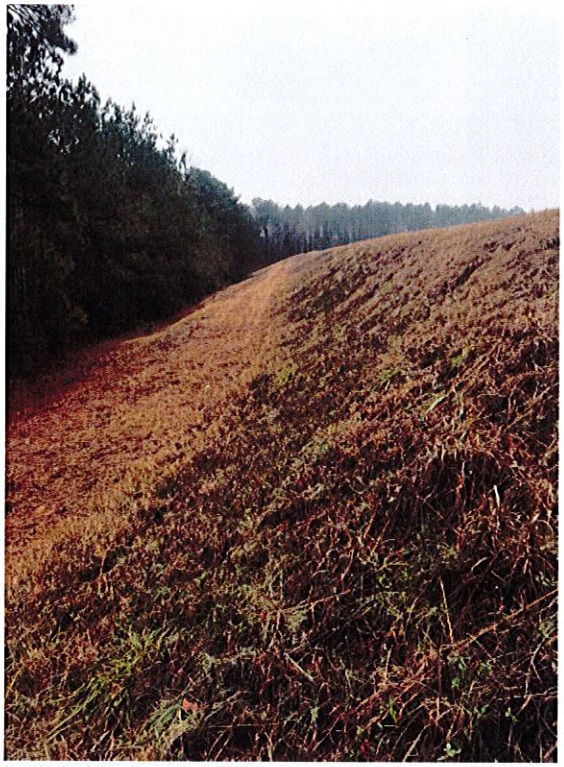
Primary Spillway - concrete rubble exit chute

Primary Spillway -Chute at exit channel outfall

Primary Spillway Exit Channel

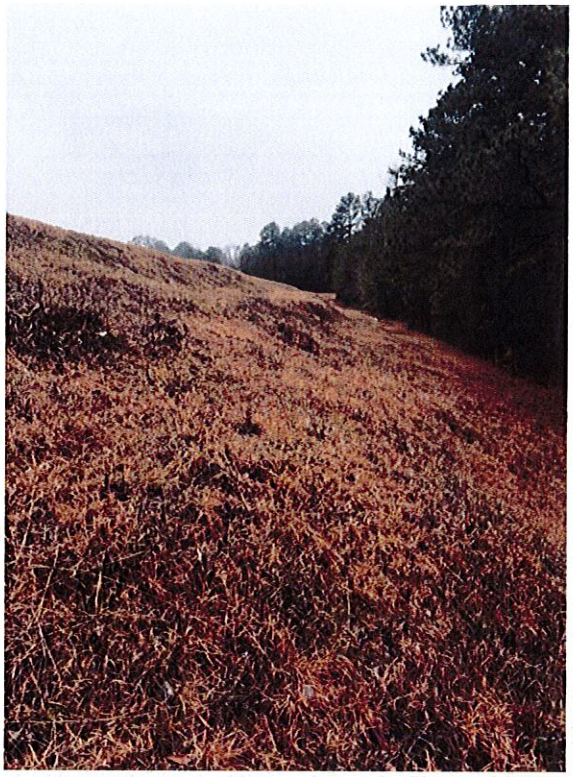
Primary spillway exit channel

Station 12+00 – Looking South along ownstream slope



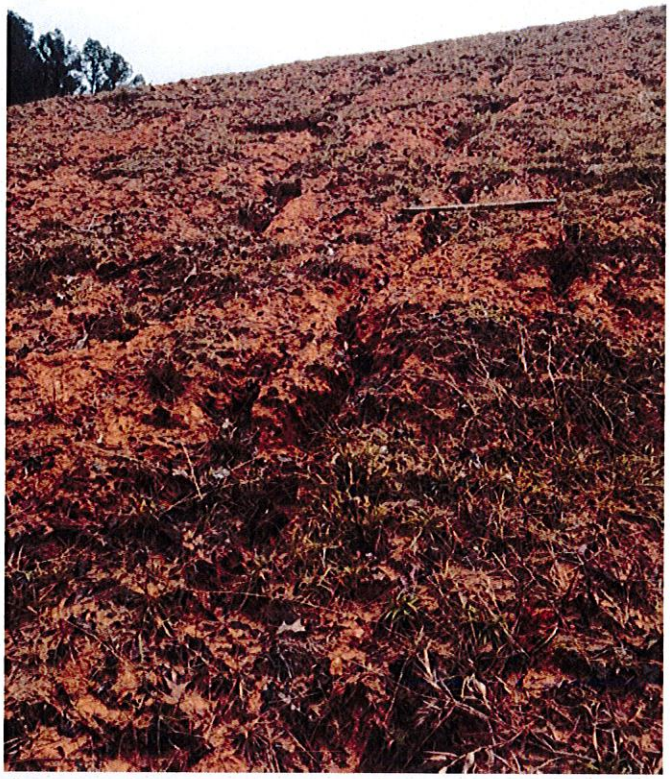
Station 10+00 – Looking South along downstream slope

Station 5+00 – Looking south along downstream slope



Station 4+50 – Looking north along downstream slope - uneven slopes

Station 2+00 – Looking northeasterly along rehabilitated (2016) downstream slope



Station 3+00 - Erosion including rills and on rehabilitated downstream slope

Station 3+00 – Looking southwest along rehabilitated (2016) downstream slope

Downstream Slope Right of Station 9+00 - Seepage on the lower bench next to sandbagged area

Seepage / flow in stream beyond downstream slope right of Station 2+00

Seepage in stream beyond downstream slope – Right of Station 3+00. Iron bacteria results in orange water and oily sheen.

Downstream Slope Right of Station 8+50 - Seepage on the lower bench

Level Control Piping Valve - 4" PVC pipe with brass valve – At downstream slope toe right of Station 6+15.