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: Richard Lowe Date: 1-16-19

Formal Inspection Checklist
(For Engineers)

DAM NAME: Robinhood Lake No. 1 Dam

DAM INVENTORY NO: MS01270

OWNER:

Land Owners Name (Per Deed): **Robinhood Lake #1 Homeowners Association**

Address: **331 Robinhood Trail, Brandon, MS 39042**

Phone #: **(601) 594-5200**

Email: **jwhatley@scottcompanies.com**

Primary Contact Person (if different from above): **Joey Whatley, President**

Address: **same**

Phone #: **same**

Email: **same**

OPERATOR (if different from Owner):

Name:

Address:

Phone #:

Email:

DATE(S) OF INSPECTION: 12-18-2018

INSPECTION PERSONNEL (include contact information)

Mississippi Licensed Professional Engineer(s):

Name	Affiliation	Area of Expertise
Matthew Miller, P.E., P.L.S.	**Guest Consultants, Inc.**	**General Civil**
Richard Love, P.E.	**Guest Consultants, Inc.**	**General Civil**

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

State Representative(s):

Name	Affiliation

Dam Owner Representative(s):

Name	Affiliation
Joey Whatley	**President – Robinhood Lake Homeowners Association**

Others:

Name	Affiliation

GENERAL INFORMATION

Weather Conditions (including rainfall within previous 14 days): **Cloudy, approximately 2.31" of rainfall in the last 14 days**

County: **Rankin**

Stream Name: **Richland Creek**

Tributary of: **Tumbaloo Creek**

Latitude (N): **32◦ 12' 42"**

Longitude (W): **89◦ 57' 40"**

Purpose of Dam: **Recreation, water supply for sod farm**

Hazard Classification: **High**

Drainage Area (sq. mi.): **.300**

Height of Dam (ft): **28**

Length (ft): **1,260**

Normal Surface (ac): **56**

Normal Capacity (ac-ft): **856**

Maximum Surface (ac): **72**

Maximum Capacity (ac-ft): **1,116**

Normal Reservoir Elevation (ft): **400.01**

Reservoir Elevation at time of inspection (ft): **approximately 400**

SPILLWAY SYSTEM

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

Principal: **Double 3' x 12' Box Culvert**

Auxiliary (Emergency): **N/A**

Principal Spillway Capacity (inches/24 hours & storm distribution): **44.8"/24 hr ; MS Commission on Environmental Quality Dam Safety Regulation (LW-4) (PMP)**

Auxiliary (Emergency) Spillway Capacity (inches/24 hours & storm distribution): **N/A**

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:
River Science, LLC – June 2012
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**

HISTORY

Date Constructed: **Unknown**

Date(s) Reconstructed: **December 2012**

Designer: **Guest Consultants, Inc.**
(Slope repair in 2011)

Constructed by: **Thrash Commercial**
(Slope repair in 2012)

PREVIOUS INSPECTIONS (date of)

Last Owner's Inspection:

Last Formal Inspection: **December 3, 2013**

EMERGENCY ACTION PLAN

Date of Last Approved Plan (when the plan was last distributed to the EAP holders): **July 2013**

Date of Last Revision: **Currently being revised**

Is the notification flowchart complete and current? **Currently being updated**

Is the emergency materials and equipment information current? **Yes**

When was the plan last tested? Was this test a table top exercise or a full scale exercise? **Not aware of plan being tested**

DOWNSTREAM HAZARD CLASSIFICATIONS

Present Hazard Classification: **High**

Changes in Downstream Land Use and Habitation since last inspection: **N/A**

Is present Classification appropriate? **Yes**

OPERATION AND MAINTENANCE

Date of Operation and Maintenance Plan: **July 2013**

Are instructions adequate? **Yes**

Do operating personnel follow instructions? **N/A**

What are operating personnel capabilities? **N/A**

PROJECT RECORD REVIEW

Date of file review: **N/A**

Description of previous deficiencies noted and corrective actions taken (if so, when?):
The Formal Inspection Report done in December 2013 mentioned that the downstream slope of the reconstructed dam needed a better coverage of grass, and more specifically a perennial grass.

The 2013 Formal Inspection Report also mentioned that there was undermining on the downstream end of the stilling basin, where water flows into the exit channel.

While making the current inspection, it appeared that these deficiencies were not addressed and the conditions have gotten worse.

EXAMINATION OF EMBANKMENT DAMS

DESCRIPTION OF STRUCTURE

Embankment Material: **Earthen**

Cutoff Type (If Known): **Unknown**

Impervious Core (If Known): **Unknown**

Internal Drainage System (Yes / No?) If yes, describe: **None**

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

Miscellaneous:

CREST

Width of Crest: **Approximately 30 feet**

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

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

Comments: **Only cracks are typical asphalt surface deterioration**

Overall Condition:
☒ Satisfactory
☐ Fair
☐ Poor
☐ Unsatisfactory

UPSTREAM SLOPE

Slope (H:V): **Exact slope unknown. Appears to be approximately 2 to 3:1**

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?

Comments:

Overall Condition:
☒ Satisfactory
☐ Fair
☐ Poor
☐ Unsatisfactory

DOWNSTREAM SLOPE (including groins and toe area)

Slope (H:V): **3:1**

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?

Comments:

Overall Condition:
☐ Satisfactory
☐ Fair
☒ Poor
☐ Unsatisfactory

UTILITIES

Utilities Installed in Embankment or Toe?

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

Water line along the toe of the downstream slope

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

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 along Golfview Drive near west groin

Comments:

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)
West groin	**N/A**	**Clear with iron stains in sediment**
Toe near west end of down-stream slope	**N/A**	**Clear with iron stains in sediment**

EXAMINATION OF SPILLWAYS AND OUTLET WORKS

PRIMARY SPILLWAY

(Fill out those sections that apply)

ENTRANCE CHANNEL

Description: **Concrete box culvert (3 x 12 double barrel), apron in good condition**

Vegetation (Trees, Bushes):

Debris: **None**

Channel Side-Slope Stability: **Good**

Slope Protection/Erosion: **Good**

Unusual Conditions:

Overall Condition:
☒ Satisfactory
☐ Fair
☐ Poor
☐ Unsatisfactory

SPILLWAY CREST

Description: **N/A**

Condition of Material:

Signs of Movement:

Joints:

Unusual Conditions:

Overall Condition:

☐ Satisfactory
☐ Fair
☐ Poor
☐ Unsatisfactory

CHUTES

Description: **Grouted Riprap**

Condition of Material: **Good**

Signs of Movement: **None noted**

Joints: **N/A**

Unusual Conditions: **None**

Overall Condition:
☒ Satisfactory
☐ Fair
☐ Poor
☐ Unsatisfactory

SPILLWAY WING WALLS

Description: **Box culvert wing walls**

Condition of Material: **Good**

Signs of Movement: **None noted**

Joints: **N/A**

Drains: **N/A**

Unusual Conditions:

Overall Condition:
☒ Satisfactory
☐ Fair
☐ Poor
☐ Unsatisfactory

DOWNSTREAM APRON

Description: **Concrete box culvert apron**

Condition of Material: **Good**

Signs of Movement: **None noted**

Unusual Conditions: **None**

Overall Condition:
☒ Satisfactory
☐ Fair
☐ Poor
☐ Unsatisfactory

INLET RISER

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

Condition of Material:

Signs of Movement:

Joints:

Floor:

Unusual Conditions:

Overall Condition:
☐ Satisfactory
☐ Fair
☐ Poor
☐ Unsatisfactory

CONDUIT(S)

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

When was the last video inspection of the conduit?

Condition of Material:

Signs of Movement:

Joints:

Seepage into conduit(s):

Location	Estimated Flow	Turbidity

Unusual Conditions:

Overall Condition:
☐ Satisfactory
☐ Fair
☐ Poor
☐ Unsatisfactory

TRASH RACKS

Description: **N/A**

Condition of Material:

Unusual Conditions:

Overall Condition:
☐ Satisfactory
☐ Fair
☐ Poor
☐ Unsatisfactory

GATES

Description/Type: **N/A**

Condition:

Protective Coating:

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

Exercising Frequency:

Gates operated at time of Inspection?

Condition of seals:

Condition of gate controls and hoists:

Overall Condition:
☐ Satisfactory
☐ Fair
☐ Poor
☐ Unsatisfactory

STILLING BASIN

Description: **Grouted riprap**

Condition of Material: **Fairly good condition. The stilling basin needs repairs due to water flow getting under grouted surface and causing undermining**

Signs of Movement: **None noted**

Erosion: **Water flow under grouted surface has caused erosion and undermining beneath the downstream end of the stilling basin**

Unusual Conditions:

Overall Condition:
☐ Satisfactory
☒ Fair
☐ Poor
☐ Unsatisfactory

OUTLET CHANNEL

Vegetation (Trees, Bushes): **The channel consists of a natural bank with natural growth along the slope**

Debris: **None noted that caused flow to be impeded at the time of the inspection**

Channel Side-Slope Stability: **Fair**

Erosion: **None noted**

Unusual Conditions:

Overall Condition:
☒ Satisfactory
☐ Fair
☐ Poor
☐ Unsatisfactory

LOW LEVEL OUTLET

Description: **N/A**

Condition:

Trash Rack:

Leakage:

Location | Estimated Flow

Unusual Conditions:

Was the low-level outlet operated during the inspection?

Were there difficulties operating the low-level outlet?

When was the low-level outlet last operated and did this conform with the Operation and Maintenance Procedures?

Overall Condition:
- ☐ Satisfactory
- ☐ Fair
- ☐ Poor
- ☐ Unsatisfactory

VALVES

Description: **N/A**

General Condition:

Protective Coating:

Evidence of Cavitation or Abrasion:

Leakage (Yes / No?):

Frequency of Use:

Valve operated during inspection (Yes / No?):

Overall Condition:
☐ 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: **N/A**

Vegetation (Trees, Bushes):

Debris:

Channel Side-Slope Stability:

Slope Protection/Erosion:

Unusual Conditions:

Overall Condition:
☐ Satisfactory
☐ 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.)

RESERVOIR

Slopes: **The slopes around the reservoir appear to be stable. The entire length of the slopes around the reservoir was not inspected**

Sedimentation: **None noted**

Unusual Conditions Which May Affect Dam: **None noted**

Any Other Unusual Conditions: **None noted**

APPURTENANT STRUCTURES (Power House, Gatehouse, Penstocks, Water Supply, Other)

Description and Condition of each: **N/A**

FOUNDATION AND GEOLOGY

Unusual Conditions Which May Affect Dam: **None noted**

Cracks, Joints, Bedding Planes Which May Affect Dam Or Provide Seepage Paths: **None noted**

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 (in order of importance):

- **There is a large area of erosion on the downstream slope of the dam that is approximately 260 feet in length. As soon as weather permits, this area needs to be graded, repaired, compacted and grassed to be stabilized. Appropriate BMP's should be used, such as erosion control blanket, to protect seed and ensure the establishment of a good permanent vegetative cover.**

- **Areas of seepage near the groin on the west end of the dam, as well as areas along the toe near the west end of the downstream slope, should be closely monitored.**

- **A section of ditch on the south side of Golfview Drive, near the toe on the west end of the downstream slope, had clear water running in it at the time of the inspection. During the inspection a small sand boil was found in the bottom of this ditch in clear standing water. This area should be monitored on a regular basis. Spoke to the nearest homeowner and to Joey Whatley of the Robinhood Lake H.O.A., and both indicated that the seepage has been present for years. Because this seepage is not located directly at the toe but rather on the south side of Golfview Drive, and considering head pressure based on elevation change, it is possible that this seepage is from groundwater rather than the lake.**

- **The section of the stilling basin at the downstream side that has been undermined needs to be repaired. The surface of the stilling basin should be checked and repairs made to prevent water from flowing under the grouted riprap. The material lost due to erosion should be replaced.**

I recommend the following changes in maintenance: **More frequent inspection and maintenance of the permanent grass cover on the slopes of the dam**

I recommend the following repairs be made within one year (in order of importance): **The above listed repairs to the downstream slope should be made as soon as the weather allows. A clay material that has been verified as non-dispersive should be used to make the repairs to the erosion gullies. After repairs are made, the area should be plated with topsoil and grassed. The repaired slope should then be protected with erosion control blanket until establishment of a permanent vegetative cover.**

The undermined grouted riprap at the outlet of the stilling basin should be repaired as soon as possible.

The seepage area south of Golfview Drive should be regularly monitored and any changes in turbidity or flow reported.

The following long-term improvements should also be undertaken (in order of importance): **None at this time**

The following studies should also be undertaken (in order of importance): **The small sand boil should be monitored closely on a regular basis as a precaution to ensure that a problem does not develop that could cause damage to the dam structure.**

Have the recommendations above included those from previous Inspections? **Yes**

Does the Emergency Action Plan or the Operation and Maintenance Procedures require revision? **Yes**

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

Signature Richard Love Date 1-16-19

P.E. SEAL