John S. (Steve) Wilson, P.E., 895 Swinnea Lake Drive, Southaven, MS 38672
Telephone: (662) 449-1827 Cell: (662) 404-2583 Fax: (662) 449-1827
Email: jswilson9@comcast.net

June 10, 2020

Mr. William McKercher
Mississippi Department of Environmental Quality
Office of Land and Water Resources
P. O. Box 2309
Jackson, MS 39225-2309

RE: Massey South Lake Dam
MS00071
Panola County, MS

Dear Mr. McKercher:

Attached for your review and comment are the completed Formal Inspection Checklist and revised EAP for this dams. The Emergency Action Plan has been updated to the current format and a revised Breach Inundation map is included. Upon your tentative approval of the EAP, the Plan will be distributed to plan holders and signatures will be obtained.

Please note the dam is in Panola County, but primary access is in Tate County. The Panola County EMA Coordinator advise me that since Panola County only would be affected, they were the county of responsibility. However, I have included the Tate County EMA office as a plan holder also.

Please advise should you desire additional information.

Sincerely,

John S. Wilson, P. E.

Cc: Gary Mills, Senatobia, MS w/copies of the EAP and Formal Inspection

Enclosures

FORMAL INSPECTION CHECKLIST
MASSEY SOUTH LAKE DAM

Panola County, MS
Dam Inventory MS00071

June 10, 2020

Prepared for

Gary Mills (Owner)
1032 Como Trace Drive
Senatobia, MS 38668

By
John S. Wilson, P. E., LLC
895 Swinnea Lake Drive
Southaven, MS 38672

Formal Inspection Checklist
(For Engineers)

DAM NAME: Massey South Lake Dam

DAM INVENTORY NO: MS 00071

OWNER:

Land Owners Name (Per Deed): **Gary Mills**

Address: **1032 Como Trace Drive, Senatobia, MS 38668**

Phone #: **662-689-1093**

Email: **garymills1032@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: March 27, 2020; June 10., 2020

INSPECTION PERSONNEL (include contact information)

Mississippi Licensed Professional Engineer(s):

Name	Affiliation	Area of Expertise
John S. Wilson	**John S. Wilson, P.E., LLC**	**Dam construction** **Dam Inspection** **Erosion Control**

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

Others:

Name	Affiliation

GENERAL INFORMATION

Weather Conditions (including rainfall within previous 14 days):
Clear and warm, 3 inches rain

County: **Panola**

Stream Name: **Tributary of West Creek** Tributary of: **Hickahala Creek**

Latitude (N): **34°32'59"** Longitude (W): **89°55'50.3"**

Purpose of Dam: **Recreation**

Hazard Classification: **High** Drainage Area (sq. mi.): **0.23**

Height of Dam (ft): **19.5** Length (ft): **780**

Normal Surface (ac): **19.8** Normal Capacity (ac-ft): **90**

Maximum Surface (ac): **32** Maximum Capacity (ac-ft): **188**

Normal Reservoir Elevation (ft): **322.1**

Reservoir Elevation at time of inspection (ft): **322.4**

SPILLWAY SYSTEM

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

Principal: **HDPE Pipe 24" diameter**

Auxiliary (Emergency): **Earthen, 100 feet bottom width, somewhat irregular but smooth; side slopes flatter than 15:1**

Principal Spillway Capacity (inches/24 hours & storm distribution): **30 CFS; PMP 41.4 inches rainfall, 24 hour duration, MDEQ distribution**

Auxiliary (Emergency) Spillway Capacity (inches/24 hours & storm distribution): **374 CFS. PMP 41.4 inches rainfall, 24 hour duration, MDEQ distribution**

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:

Major changes to the dam or watershed since preparation of last report that may affect spillway adequacy? (Yes / No, if yes then describe changes):

HISTORY

Date Constructed: **2005-2006**

Date(s) Reconstructed:

Designer: **Unknown**

Constructed by: **MRM Farms**

PREVIOUS INSPECTIONS (date of)

Last Owner's Inspection: **Unknown**

Last Formal Inspection: **April 10, 2014**

EMERGENCY ACTION PLAN

Date of Last Approved Plan (when the plan was last distributed to the EAP holders): **November 2007**

Date of Last Revision: **None known**

Is the notification flowchart complete and current? **Revised EAP submitted with this Inspection**

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?

None known

DOWNSTREAM HAZARD CLASSIFICATIONS

Present Hazard Classification: **High**

Changes in Downstream Land Use and Habitation since last inspection: **None**

Is present Classification appropriate? **Yes**

OPERATION AND MAINTENANCE

Date of Operation and Maintenance Plan: **Submitted with this Inspection**

Are instructions adequate? **Yes**

Do operating personnel follow instructions?

What are operating personnel capabilities? **Adequate experience to follow plan**

PROJECT RECORD REVIEW

Date of file review: **03/2020**

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

Beaver control initiated, maintenance improved

EXAMINATION OF EMBANKMENT DAMS

DESCRIPTION OF STRUCTURE

Embankment Material: **Earth fill**

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

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

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

Any Signs of Movement (Horizontal and Vertical Alignment)?: **No**
Miscellaneous:

CREST

Width of Crest: **16 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?

Small trees and brush present on upstream crown of levee

Comments:

Overall Condition:
☑ Satisfactory
☐ Fair
☐ Poor
☐ Unsatisfactory

UPSTREAM SLOPE

Slope (H:V):

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?

Small trees and brush present on slope

Comments: **Old beaver activity present in a few locations; no recent activity observed**

Overall Condition:
☐ Satisfactory
☑ Fair
☐ Poor
☐ Unsatisfactory

DOWNSTREAM SLOPE (including groins and toe area)

Slope (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?

Comments: **One isolated sinkhole or old beaver activity noted about 200 feet from north end of dam**

Overall Condition:
☑ Satisfactory
☐ Fair
☐ Poor
☐ Unsatisfactory

UTILITIES

Utilities Installed in Embankment or Toe? **No**

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

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

SEEPAGE

Problems:

☑ None ☐ Saturated Embankment Area ☐ Seepage Exits on Embankment ☐ Seepage Exits at Point Source ☐ Seepage Area at Toe ☐ Flow Adjacent to Outlet
☐ Other:

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?

SEEPAGE AND TOE DRAIN/RELIEF WELL FLOW

Location	Estimated Flow	Color (Turbidity)

EXAMINATION OF SPILLWAYS AND OUTLET WORKS

PRIMARY SPILLWAY

(Fill out those sections that apply)

ENTRANCE CHANNEL

Description: **N/A**

Vegetation (Trees, Bushes):

Debris:

Channel Side-Slope Stability:

Slope Protection/Erosion:

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: **N/A**

Condition of Material:

Signs of Movement:
Joints:

Unusual Conditions:

Overall Condition:
☐ Satisfactory
☐ Fair
☐ Poor
☐ Unsatisfactory

SPILLWAY WING WALLS

Description: **N/A**

Condition of Material:

Signs of Movement:

Joints:

Drains:

Unusual Conditions:

Overall Condition:
☐ Satisfactory
☐ Fair
☐ Poor
☐ Unsatisfactory

DOWNSTREAM APRON

Description: **N/A**

Condition of Material:

Signs of Movement:

Unusual Conditions:

Overall Condition:
☐ Satisfactory
☐ Fair
☐ Poor
☐ Unsatisfactory

INLET RISER

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

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.):

24" diameter HDPE Pipe, no inlet section

When was the last video inspection of the conduit? **None performed**

Condition of Material: **Satisfactory**

Signs of Movement: **None**

Joints: **Appear satisfactory**

Seepage into conduit(s): **None observed**

Location	Estimated Flow	Turbidity

Unusual Conditions:

Overall Condition:

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

TRASH RACKS

Description: **None**

Condition of Material:

Unusual Conditions:

Overall Condition:

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

GATES

Description/Type: **None**

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: **Earthen with some rock riprap**

Condition of Material: **Satisfactory**

Signs of Movement: **None**

Erosion: **None observed**

Unusual Conditions:

Overall Condition:

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

OUTLET CHANNEL

Vegetation (Trees, Bushes): **Trees and brush present**

Debris: **No**

Channel Side-Slope Stability: **Satisfactory**

Erosion: **None present**

Unusual Conditions:

Overall Condition:

- [x] 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: **Vegetated earth spillway, appears to be natural ground, 100 feet wide with 15:1 side slopes following natural ground**

Vegetation (Trees, Bushes): **None, satisfactory grass sod**

Debris: **None**

Channel Side-Slope Stability: **Satisfactory**

Slope Protection/Erosion: **None**

Unusual Conditions:

Overall Condition:

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

EXAMINATION OF OTHER FEATURES

INSTRUMENTATION

List all instrumentation (i.e. weirs, piezometers, flow gauges):
(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: **Normal, natural ground**

Sedimentation: **None observed**

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

Any Other Unusual Conditions:

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

Description and Condition of each:

FOUNDATION AND GEOLOGY

Unusual Conditions Which May Affect Dam:

Cracks, Joints, Bedding Planes Which May Affect Dam Or Provide Seepage Paths:

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):

Remove trees and brush from upstream slope
Repair old beaver damage to upstream slope
Repair one sinkhole/beaver damage on downstream slope

I recommend the following changes in maintenance:

Increase frequency of maintenance (mowing, tree removal, etc.) on upstream slope

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

The following long-term improvements should also be undertaken (in order of importance):

The following studies should also be undertaken (in order of importance):

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

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

Yes, revision submitted with this Inspection

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

Signature John S Wilson Date 06/10/2020

JOHN S. WILSON
LICENSED PROFESSIONAL ENGINEER
7135
STATE OF MISSISSIPPI

06/10/2020

SITES OUTPUT TABLE

	Gary Mills PMP
Site Identification	02
Watershed Runoff Curve Number	80
Total Watershed Drainage Area (Sq Miles)	0.11
Watershed Time of Concentration (Hours)	0.27
SDH Rainfall Total (Inches)	N/A
SDH Rainfall Duration (Hours)	N/A
FBH or Storm Rainfal Total (Inches)	41.20
FBH or Storm Rainfal Duration (Hours)	24.0
SDH Inflow Peak (CFS)	N/A
FBH or Storm Inflow Peak (CFS)	571.9
Initial Reservoir Elevation (Feet)	322.10
Maximum WS SDH (Feet)	N/A
Maximum WS FBH or Storm (Feet)	325.80
Storage at Max. WS FBH or Storm (Acre-Ft)	97.7
Top Dam (Feet)	N/A
Storage, Top Dam (Acre-Ft)	N/A
Emb. Yardage (CY)	N/A
PSH Drawdown (Days)	N/A
378 Drawdown (Days)	N/A
PS Crest (Feet)	322.00
PS Number of Conduits	N/A
PS Conduit Diameter (Inches)	N/A
PS Conduit Height (Feet)	N/A
PS Conduit Width (Feet)	N/A
PS Conduit Area (Sq. Feet)	N/A
Storage, PS Crest (Acre-Ft)	N/A
PS Discharge at AS Crest (CFS)	18.0
PS Discharge for SDH (CFS)	N/A
PS Discharge FBH or Storm (CFS)	27.1
AS Crest (Feet)	324.70
Storage, AS Crest (Acre-Ft)	64.0
AS Width (Feet)	N/A
AS Exit Slope (%)	N/A
AS Ret. Curve Index	N/A
AS Veg. Cover Factor	N/A
AS Maintenance Code	N/A
AS Max. Head SDH (Feet)	N/A
AS Peak Discharge SDH/Storm (CFS)	N/A
AS Exit Velocity SDH or Storm (FPS)	N/A
AS Stress SDH or Storm (Lb./Sq.Ft.)	N/A
Hp FBH or Storm (Feet)	1.10
AS Peak Discharge FBH/Storm (CFS)	374.
AS Integ. Dist. FBH or Storm (Feet)	N/A
Oe/B FBH or Storm (Acre-FUFt)	N/A
Uncontrolled Drainage Area (Sq Miles)	0.11
Number of Errors	0
Number of Warnings	0

Reservoir routing at normal pool elevati0n 322.0
Storage volume shown is above 322.0

RATING TABLE NUMBER 2

	ELEV. FEET	Q-TOTAL CFS	Q-PS CFS	Q-AUX. CFS	VOLUME AC-FT	AREA ACRE	
1	322.00	0.00	0.00	0.00	0.00	19.80	PS normal pool elevation 322.0
2	323.00	4.00	4.00	0.00	20.90	22.00	
3	324.00	12.00	12.00	0.00	44.90	26.00	
4	324.70	18.00	18.00	0.00	63.98	28.50	Emergency Spillway elevation 324.7
5	325.00	71.00	20.00	51.00	72.67	29.50	FBH maximum water elevation 325.8
6	326.00	489.00	29.00	460.00	103.97	33.10	
7	327.00	1111.00	30.00	1081.00	139.22	37.40	
8	327.40	1562.00	31.00	1531.00	154.46	38.80	
9	328.00	1890.00	32.00	1858.00	178.25	40.50	
10	330.00	3815.00	33.00	3782.00	268.75	50.00	

ROUTING OF STORM HYDROGRAPH STARTS AT ELEVATION 322.10

Maximum water elevation = 325.8 - see SITES OUTPUT TABLE

Q-PS at elevation 325.8 =18 CFS

Storage at elevation 325.8 = 90 acre-feet (field measured and hand computed)

Storage at elevation 325.8 = 154 acre-feet

Storage volumes shown above are volume above normal pool elevation of 322.0

Surface area 325.8 = 32 acres

Page 1

Top of dam

Upstream slope

Upstream slope

Downstream slope

PHOTOGRAPHS 03/2020

Emergency spillway control section

Emergency spillway inlet section

PHOTOGRAPHS 03/2020

Emergency spillway outlet

Old beaver activity

PHOTOGRAPHS 03/2020

Principle spillway inlet

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:_____

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. Seepage 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.