Cross Creek West Dam

MS - 03408

Located in
City of Hernando
DeSoto County, Mississippi

Formal Inspection Report

Rainfall Data (Memphis Int Airport Gage)

July 2021

Jones-Davis & Associates, Inc.
Consulting Engineers / Land Surveyors
8849 Centre Street
Southaven, Mississippi 38671

GUIDELINESFORDETERMININGCONDITIONS

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

SATISFACTORY

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.

FAIR

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.

POOR

Continued deterioration and/or unusual loading may threaten the safety of the dam.

UNSATISFACTORY

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)

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.

FAIR

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.

POOR

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.

UNSATISFACTORY

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: Cross Creek West Dam
DAM INVENTORY NO: MS -03408
OWNER:
Land Owners Name (Per Deed): Cross Creek Home Owners Association
Address: P.O. Box 238, Hernando, Mississippi 36632
Phone #:
Email:
Primary Contact Person (if different from above): Krisite Adcock
Address: Cross Creek HOA / Keith Collins Co. 3036 Centre Oak Way Germanton, TN 38138
Phone #: 901-457-4804
Email: kadcock@kiethcollinsco.com
OPERATOR (if different from Owner):
Name:
Address:
Phone #:
Email:
DATE(S) OF INSPECTION: 5 June 2021

INSPECTION PERSONNEL (include contact information)

Mississippi Licensed Professional Engineer(s): Name **Affiliation** Area of Expertise Dewey L. Jones, P.E., P.L.S. Jones-Davis & Associates, Inc. Hydraulics, Hydrology & **Design Water Control Structures** Ph cell (901)-232-2022 (e-mail: deweyleejones1948@gmail.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** State Representative(s): <u>Name</u> Affiliation Dam Owner Representative(s): Name **Affiliation**

Affiliation

Others:

<u>N</u>ame

GENERAL INFORMATION

Weather Conditions (including rainfall within previous 14 days): Warm and Sunny. Previous rainfall occurred on the 26th, 28 th and 29th in the amounts of 0.19 and 0.38 inches and a trace respectively, additional rainfall occurred on the 1st and 2nd of June in the amounts of 1.18 and 0.04 inches respectively with traces of rain on the 3rd and 4 th. See attached National Weather Service Memphis Climate Data sheets in NWS Climate Data appendix.

County: DeSoto

Stream Name: Un-Named Trib to Hurricane Cr.

Tributary of: Coldwater River

Latitude (N):

34°-50'-41"

Longitude (W): 89°-59'-34"

Purpose of Dam: Recreation and Development Enhancement

Hazard Classification: High

Drainage Area (sq. mi.): 0.088

Height of Dam (ft): 19.2

Length (ft): 350

Normal Surface (ac): 5.6

Normal Capacity (ac-ft): 44

Maximum Surface (ac): 6.1

Maximum Capacity (ac-ft): 50

Normal Reservoir Elevation (ft): 322.2

Reservoir Elevation at time of inspection (ft): 322.2+/-

SPILLWAY SYSTEM

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

Principal: Concrete weir with earthen side slopes and grouted riprap chute

Auxiliary (Emergency): N/A

Principal Spillway Capacity (inches/24 hours & storm distribution): 221⁽¹⁾, No information available on 24-hour volume or distribution

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

(1) Reference MDEQ Letter dated 30 January 2009, "Those dams which have a Hydrologic and Hydraulic (H&H) analysis that has been approved by the Division of Dam Safety will not require any additional H&H analysis in subsequent Formal Inspections unless the

dam or lake have been significantly modified." Therefore, all reference to H&H data in this Inspection Report are based on the 2007 Inspection Report.

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	\boxtimes	No	
Auxiliary(Emergency): Above indication base			No spectio	☐ n Report

If not, what percent of the total PMP will the combined spillways pass (%)? 95% noted in 2007 Formal Inspection Report as acceptable.

Or, note date and author of hydrologic and hydraulic report evaluating spillway capacity: 14 September 2007 by John S. Wilson, P.E.

Major changes to the dam or watershed since preparation of last report that may affect spillway adequacy? (Yes / No, if yes then describe changes): Unknown, the levee grade was increased as part of deficiencies noted in the 2007 Formal Inspection. It is unknown as to whether the H&H data in the 2007 Formal Inspection reflected this change.

HISTORY

Date Constructed: 1997 +/-

Date(s) Reconstructed: 2007

Modified per Inspection Report

Designer: Smith Engineering, Southaven, MS

Constructed by: Unknown

PREVIOUS INSPECTIONS (date of)

Last Owner's Inspection: Unknown

Last Formal Inspection: March 2016

EMERGENCY ACTION PLAN

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

Date of Last Revision: February 2016, Updated to new Format, Reviewed this Inspection

Is the notification flowchart complete and current? Yes

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? Unknown

DOWNSTREAM HAZARD CLASSIFICATIONS

Present Hazard Classification: High

Changes in Downstream Land Use and Habitation since last inspection: None noted based on GIS data (2019) and limits noted in 2016 EAP.

Is present Classification appropriate? Yes

OPERATION AND MAINTENANCE

Date of Operation and Maintenance Plan: 2007

Are instructions adequate? Yes

Do operating personnel follow instructions? Unknown

What are operating personnel capabilities? Removal of minor debris at spillways, other maintenance is contracted for.

PROJECT RECORD REVIEW

Date of file review: July 2021

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

2016 Inspection

Maintenance:

 Area of thin or bare vegetative cover should be re-seeded and fertilized or sodded on the upstream slope east and wet of the spillway. The downed trees on the west upstream slope should be removed along with downed trees on the lower end of the spillway chute. Downed trees have been removed bare areas still exist.

Changes in maintenance:

 No recommended changes continue to monitor for seepage along the downstream embankment toe of embankment and encroachment of vegetative growth at lower end of spillway chute. Ongoing by HOA.

Repairs within one year:

- None noted other than the maintenance items noted above. Ongoing by HOA,
 Studies:
 - None at the present time.

2013 Inspection

Items noted included that adequate maintenance was being performed. Next formal inspection should address woody growth along the toe of the dam. Also, the original hydrologic and hydraulic analysis should be reviewed to determine if the depressed area at the east end of the was included in the analysis. Actions by the HOA are unknown as to checking the original analysis. Maintenance activities have been maintained.

2010 Inspection

Items noted included the establishment of vegetative cover on the upstream slope east of the spillway, removal of two tree trunks at the spillway entrance and removal of vegetation along the downstream toe of the embankment west of the spillway.

Actions by the HOA addressed the first two items. Removal of the tree growth is still in future. Establishment of vegetative remains to be completed.

2007 Inspection

Immediate actions noted were downstream area of the spillway should be repaired as soon as possible, top of the dam should be raised 1.6 feet, trees along the waterline and in the embankment area should be removed, trees on the downstream slope within 20 LF of the toe should be removed and continue monitoring of the toe area for seepage is recommended. Long term items moted were the construction of a stilling basin/scour pad. Also, the additional studies were in regard to the incorporation of any changes in downstream conditions. Action

taken by the HOA include, raising the top of dam elevation, removal of upstream trees and vegetation, repair and refurbishment of the spillway chute with riprap and grouted sections, removal of trees affecting the spillway chute. Monitoring of the embankment slope for seepage is ongoing.

EXAMINATION OF EMBANKMENT DAMS

DESCRIPTION OF STRUCTURE

Embankment Material: Earthen Embankment of native materials.
Cutoff Type (If Known): Unknown
Impervious Core (If Known): <u>):</u> Unknown
Internal Drainage System (Yes / No?) If yes, describe:): Unknown
Any Signs of Movement (Horizontal and Vertical Alignment)?: None Observed
Miscellaneous: Top of levee was raised following the 2007 Inspection Report.
CREST
Width of Crest: 10 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: Embankment ties into natural ground, no seepage was noted. No visible settlement was noted. See Photos No's 3,8,9 and 10. Private ownership across part of the dam embankment.
Overall Condition: Satisfactory Fair Poor Unsatisfactory

UPSTREAM SLOPE

Slope (H:V): 2:1
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: Bare areas exist on upstream slope and are in need of re-seeding or sodding
If Trees, Brush, Briars is checked above please describe the nature and extent of vegetation on the dam?
Comments: Bare areas exist on upstream slope and are in need of re-seeding or sodding. See Photo's No.1,3,7,9 and 10. Erosion protection from wave wash has been installed.
Overall Condition: Satisfactory Fair Poor Unsatisfactory
DOWNSTREAM SLOPE (including groins and toe area)
Slope (H:V): 4:1
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:
Trees, Brush, Briars on dam or within 50 feet of toe Animal Burrows

Overall Condition: Satisfactory Fair Poor Unsatisfactory		
UTILITIES		
Utilities Installed in Embankme Phone/Cable Water	ent or Toe? None visible Electrical Sewer Gas	
Does the location of all utilitie	s appear on the as-built plans for the d	lam?
SEEPAGE		
Problems: None Saturated Embank Source Seepage Area at Toe Other:	kment Area Seepage Exits on Emban e Flow Adjacent to Outlet	kment Seepage Exits at Point
Comments: No utilities visible).	
Overall Condition: Satisfactory (None) Fair Poor Unsatisfactory		
Does the location of all drainage	ge systems/filters appear on the as-bui	It plans for the dam?
SEEPAGE AND TOE DRAI	N/RELIEF WELL FLOW	
Location	Estimated Flow	Color (Turbidity)
No seepage along toe of the	embankment was observed. No relie	of wells exist

EXAMINATION OF SPILLWAYS AND OUTLET WORKS

PRIMARY SPILLWAY

(Fill out those sections that apply)

ENTRANCE CHANNEL

Description: No formal entrance channel is present. Lake outflows enter directly into principal spillway. See Photo No. 7.
Vegetation (Trees, Bushes):
Debris:
Channel Side-Slope Stability:
Slope Protection/Erosion:
Unusual Conditions:
Overall Condition: Satisfactory Fair Poor Unsatisfactory
SPILLWAY CREST
Description: Concrete weir section of trapezoidal shape. See photo's No. 9 & 10.
Condition of Material: Fair, concrete is showing it's age. Joints should be refurbished.
Signs of Movement: Some see Photo No. 6
Joints: Joints remain tight; however, the joints should be re-sawed and re-caulked due to age of concrete. See Photo's No. 5 and 6.
Unusual Conditions: Debris on spillway should be removed. See Photo No.5 and 7.
Overall Condition:
Satisfactory Fair Poor Unsatisfactory

CHUTES Description: Grouted riprap chute, see photo's 2 & 4. Condition of Material: Good. Signs of Movement: None visible. Joints: N/A Unusual Conditions: Vegetation at lower end should be removed, see photo No. 2. **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: No apron is present, outflows directly enter outlet channel, no significant was observed. 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 Condition of Material: Signs of Movement: Joints: Floor: **Unusual Conditions:** Overall Condition: Satisfactory Fair Poor] Unsatisfactory

CONDUIT(S)

Description and Material Type (i.e. HE	PPE, 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		

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: N/A, outflows directly enter outlet channel, no significant was observed. Condition of Material: Signs of Movement: Erosion: **Unusual Conditions: Overall Condition:** Satisfactory Fair Poor] Unsatisfactory

GATES

OUTLET CHANNEL

Vegetation (Trees, Bushes): Outlet channel is overgrown with vegetation as would be expected in a natural channel There appears to be adequate capacity to convey outflows from the lake. Debris: No significant blockages were observed during the inspection. Channel Side-Slope Stability: Channel banks appear stable. Erosion: No significant erosion was observed. **Unusual Conditions: None Observed 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?

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.

(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: Natural slopes

Sedimentation: Presently watershed has stabilized with no new construction ongoing. Water quality was good at the time of the inspection, see Photo No. 10.

Unusual Conditions Which May Affect Dam: None noted.

Any Other Unusual Conditions: Water quality is considered good; turbidity fluctuates during wet periods.

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: Unknown, no subsurface investigations were made as part of this inspection.

Cracks, Joints, Bedding Planes Which May Affect Dam or Provide Seepage Paths: Unknown, no subsurface investigations made as part of this inspection.

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):

Bare areas on upstream slope should be re-seeded and fertilized or sodded.

I recommend the following changes in maintenance:

 No recommended changes continue monitoring for seepage along toe of the embankment.

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

 Remove woody growth from lower end of spillway chute and treat remaining woody stumps.

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

- Develop plan and implement for the removal of vegetation along toe of dam embankment to create a 50-foot buffer.
- Monitor any changes in downstream conditions.

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

None identified at this time.

Have the recommendations above included those from previous Inspections? Yes

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

Reviewed and updated as part of this inspection.

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

Signature

Date

2 Aug 2021

P.E. SEAL

MISC ---> 31 340

38 340

NOTES:

LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

STATION: **MEMPHIS** MONTH: MAY YEAR: 2021 LATITUDE: 35 3 N LONGITUDE: 89 59 W

[TEMPERATURE DATA] [PRECIPITATION DATA] SYMBOLS USED IN COLUMN 16 AVERAGE MONTHLY: 69.5 TOTAL FOR MONTH: 1 = FOG OR MIST 4.01 DPTR FM NORMAL: -2.6 DPTR FM NORMAL: -1.26 HIGHEST: 89 ON 27,25 GRTST 24HR 1.53 ON 2-3

LOWEST: 49 ON 7

> SNOW, ICE PELLETS, HAIL TOTAL MONTH: 0.0 INCH

GRTST 24HR 0.0 GRTST DEPTH: 0

[NO. OF DAYS WITH] [WEATHER - DAYS WITH]

MAX 32 OR BELOW: 0.01 INCH OR MORE: 10 MAX 90 OR ABOVE: 0.10 INCH OR MORE: 0 MIN 32 OR BELOW: 0 0.50 INCH OR MORE: 2 MIN 0 OR BELOW: 0 1.00 INCH OR MORE:

[HDD (BASE 65)] TOTAL THIS MO. 30 CLEAR (SCALE 0-3) 5 DPTR FM NORMAL 9 PTCLDY (SCALE 4-7) 20 TOTAL FM JUL 1 2888 CLOUDY (SCALE 8-10) 6 DPTR FM NORMAL

[CDD (BASE 65)] TOTAL THIS MO. 175

DPTR FM NORMAL -65 [PRESSURE DATA]

16

TOTAL FM JAN 1 248 HIGHEST SLP 30.36 ON 22 DPTR FM NORMAL -89 LOWEST SLP 29.59 ON 3

[REMARKS] #FINAL-05-21# 2 = FOG REDUCING VISIBILITY

TO 1/4 MILE OR LESS 3 = THUNDER

4 = ICE PELLETS

5 = HAIL

6 = FREEZING RAIN OR DRIZZLE 7 = DUSTSTORM OR SANDSTORM; VSBY 1/2 MILE OR LESS

8 = SMOKE OR HAZE 9 = BLOWING SNOW

X = TORNADO

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Photographic Documentation

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Cross Creek West Dam - MS 03408

5 June 2021

View of downstream end of principal spillway where it enters the Also shown is the upstream slope, top of Dam and downstream grouted riprap flume. Accumulated debris should be removed. slope. Tree growth is evident along toe of the Dam.



Cross Creek West Dam – MS 03408

5 June 2021

View of joint separation on concrete section of principal spillway. Spillway is aging and joints should be refurbished.





Cross Creek West Dam – MS 03408

5 June 2021



Photo No. 7



Cross Creek West Dam – MS 03408

5 June 2021

vegetative cover exists and is well maintained. Tree growth exists View of downstream slope east of principal spillway. Good along toe of Dam.



Cross Creek West Dam – MS 03408

5 June 2021

View of upstream slop, top of dam and downstream slope on the west end of Dam. Erosion has been previously placed on upstream slope. Tree growth along toe is also shown.

Photo No. 9

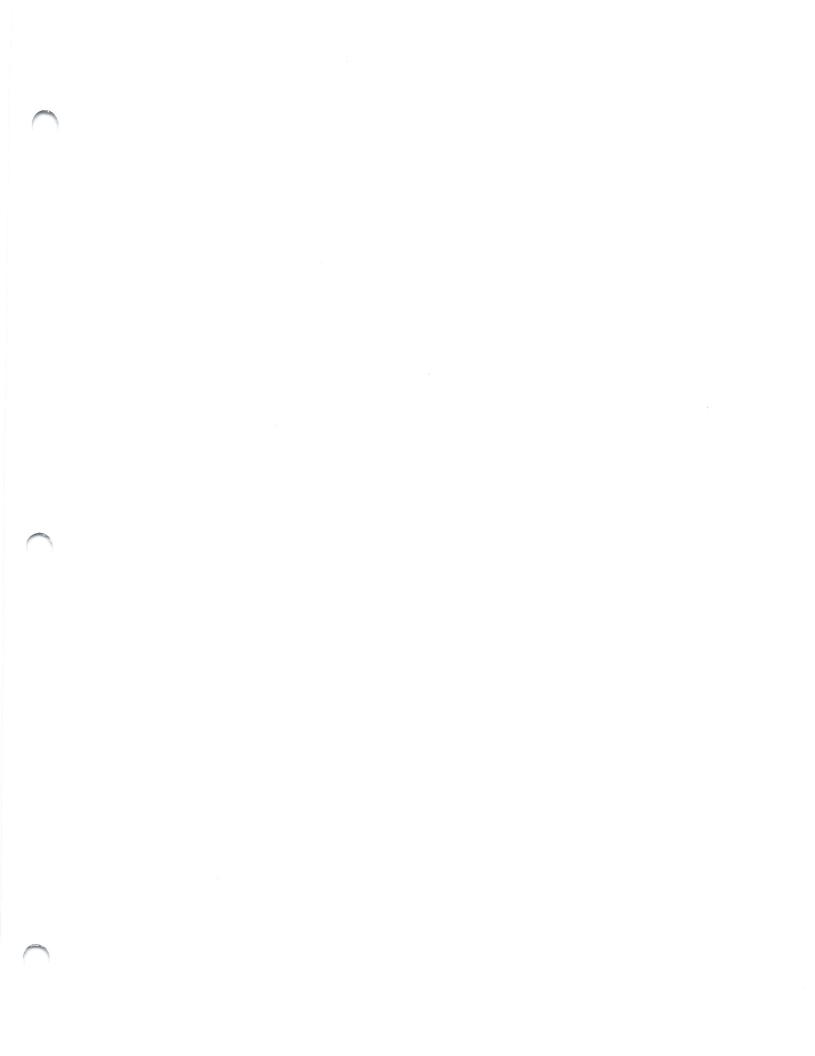


Cross Creek West Dam – MS 03408

View of lake area showing good water quality.

5 June 2021

Photo No. 10



Cross Creek West Dam MS - 03408

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RECEIVED
AUG 03 2021
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