CAMP SPELMAN LAKE DAM

CONDITIONS AND RECOMMENDATIONS REPORT

Portage Park District

Environmental Design Group Project No. 21-00430-010

ODNR File No. 1112-071

Prepared for:
Portage Park District
705 Oakwood St. Suite G-4
Ravenna, Ohio 44266

Prepared By:
Environmental Design Group
450 Grant St.
Akron, Ohio 44311

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Environmental Design Group
The community impact people.

CAMP SPELMAN LAKE DAM

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Portage Park District

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INTRODUCTION

The Camp Spelman Lake Dam is an earthfill dam located at 7650 Ferguson Road in Kent, Ohio which lies in Portage County. The dam embankment is located on property owned by the Portage Park District while the principal and emergency spillways are located on a private property owned by Martha and Arden Sommers (Figure 1). The reservoir's purpose is recreational.

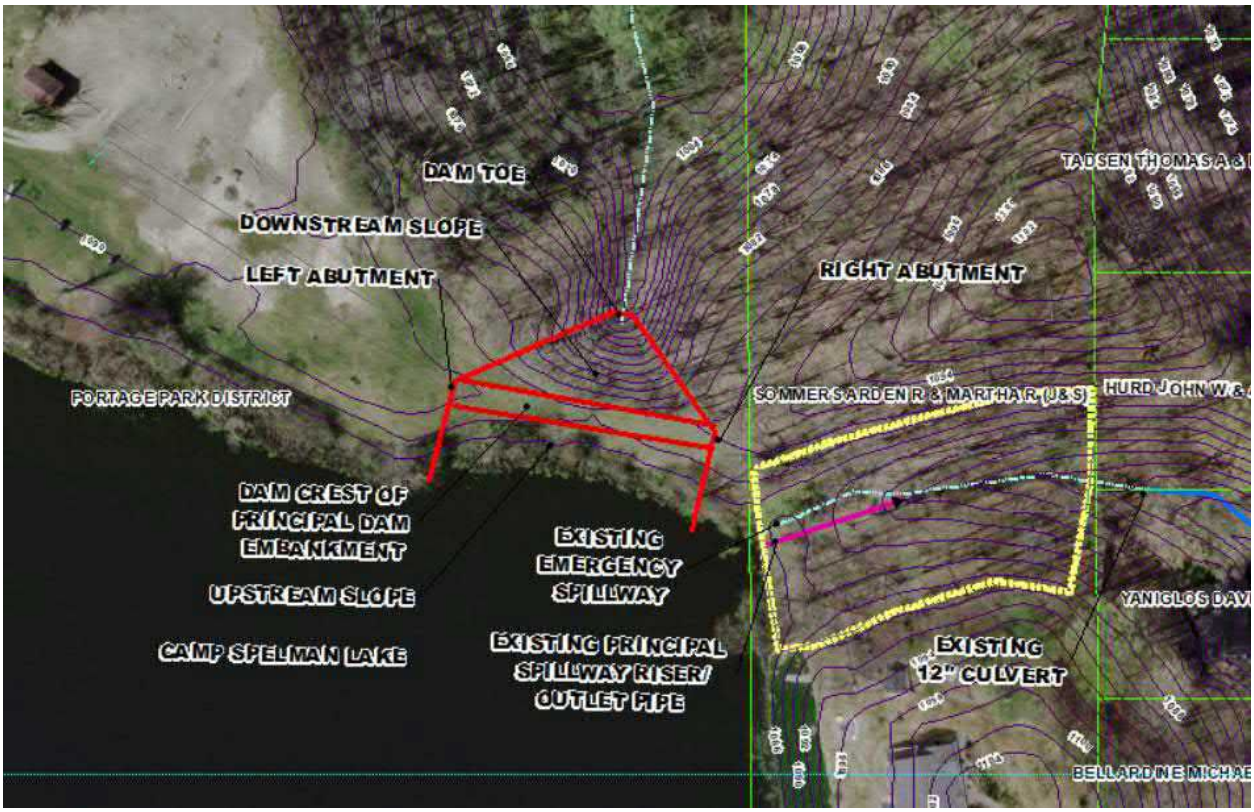


FIGURE 1 – DAM LOCATION

The purpose of this report is to verify the findings from the Ohio Department of Natural Resources (ODNRs) initial site visit and provide alternative solutions (with estimated costs) to address the deficiencies listed by ODNR so that the Portage Park District (and others) can ensure dam safety and compliance with Ohio Law and best practices.

DAM CONDITIONS ASSESSMENT

The goal of this assessment was to verify ODNR's dam inventory, classification, and found deficiencies and determine if additional deficiencies are present. This goal was accomplished through a review of available data, a site survey, an engineering site visit, and hydrologic and hydraulic analyses.

REVIEW OF AVAILABLE DATA

The Camp Spelman Lake Dam was visited by ODNR on May 29, 2019. The purpose of their site visit was to inventory and survey the dam and to assess for potential downstream hazards to help classify the dam. ODNR's report stated that their visit did not include a full inspection of the dam and its appurtenances, and the full inspection is scheduled for fall (2021). However, during the site visit, ODNR observed multiple deficiencies that must be address by law. ODNR determined that Camp Spelman Lake Dam is a Class I, high hazard, dam due to the potential for structural collapse of at least one residence and/or probable loss of human life if the dam were to fail. ODNR also performed hydrologic and hydraulic modeling to assess the stage-discharge relationship of Camp Spelman Lake Dam. The correspondence provided from ODNR's site visit is included in Appendix A. Our team reviewed the information, which listed the following required remedial measures:

Engineer Repairs and Investigations

The owner must retain the services of a registered professional engineer to address the following items. Plans, specifications, investigative reports, and other supporting documentation, as necessary, must be submitted to the Division of Water Resources for review and approval prior to construction. The owner must complete these items and implement all engineered plans for improvement within 5 years unless otherwise stated. Please refer to the fact sheets included in the Dam Safety Fact Sheet Booklet for additional information.

1. This dam must have a dam failure inundation study and map included in an Emergency Action Plan (EAP) in accordance with OAC Rule 1501:21-21-04. A registered professional engineer must prepare the inundation map and Section IV (Emergency Detection, Evaluation, and Classification) of the EAP. It is recommended that your engineer contact the Division of Water Resources prior to undertaking the engineering study for the inundation map. The inundation study and supporting calculations, including computer modeling, must be submitted to the Division of Water Resources for review and approval. See the owner Dam Safety Program section of this report for additional information.

2. Every dam shall have a spillway system which will safely operate during the design flood without endangering the safety of the dam in accordance with OAC Rule 1501:21-13-03 and OAC Rule 1501:21-13-04(F). Investigate the frequency of flow and the alignment of the emergency spillway and, as necessary, prepare plans for additional information. See the "Open Channel Spillways (Earth and Rock)" fact sheet for additional information.

3. This dam must have a device to permit draining of the reservoir within a reasonable period of time in accordance with OAC Rule 1501:21-13-06. Prepare plans and specifications for the installation of such a device. See the "Lake Drains" fact sheet for additional information.

4. The embankment crest alignment must be uniform. Investigate the variable vertical alignment of the crest and, as necessary, prepare plans and specifications for the correction of any problems.

Owner Repairs and Monitoring

The dam owner must address the items below as part of the required dam maintenance. The owner may perform the work or hire a contractor. The owner must implement all owner repairs and monitoring items within a timely manner. Repair activities should be documented in the Operation, Maintenance, and Inspection Manual (OMI). Please refer to the fact sheets included in the Dam Safety Fact Sheet Booklet for additional information.

1. Remove the trees and brush from the upstream slope, downstream slope, and emergency spillway. Seed all disturbed areas to establish a proper grass cover. See the "Trees and Brush" fact sheet for additional information.
2. Replace the trashrack with an acceptable device and install an anti-vortex device at the inlet of the principal spillway. See the "Design and Maintenance of Trashracks" fact sheet for additional information.
3. Prepare an Emergency Action Plan (EAP) and submit for approval. A registered Professional engineer must prepare a dam failure inundation map and Section IV (Emergency Detention, Evaluation, and Classification) of the EAP. Guidelines for the preparation of this document can be found online at: http://water.ohiodnr.gov/safety/dam-safety#Add. The fillable EAP is not appropriate for Camp Spelman Lake Dam because of its Class I designation.
4. Prepare an Operation, Maintenance, Inspection Manual (OMI) and submit for approval. Guidelines for the preparation of this document can be found online at: http://water.ohiodnr.gov/safety/dam-safety#ADD.
5. Monitor the erosion at the principal spillway outlet. See the 'Open Channel Spillways (Earth and Rock)" fact sheet for additional information. Please note that engineered repairs may be needed if this problem worsens.

No surveys, historical information, construction plans and permits, correspondence with other regulatory agencies, or other documents related to design, operation, maintenance, improvement, condition and performance of the dam or appurtenant works were available for review.

SITE VISIT AND SURVEY

On June 6, 2019, a Site Visit was held on site with:

- Kellie Pike, PE, Project Manager for Environmental Design Group
- Andrew Long, PE, Project Engineer for Environmental Design Group
- Christine Craycroft, Executive Director for Portage Park District
- Craig Alderman, Operations Manager for Portage Park District
- Arden Sommers, private landowner

During this Site Visit, Environmental Design Group (EDG):

- Spoke with Portage Park District and Arden Sommers.
- Performed an inspection of the dam and its appurtenances (Appendix B).
- Investigated areas downstream of the dam and downstream of the principal and emergency spillways.
- Collected limited survey points for the dam and its appurtenances using a Spectra Geospatial GNSS Receiver and its corresponding Survey Pro software, which is connected to the Ohio Department of Transportation's Virtual

Reference Station (VRS) system. Measurements were also performed using a tape measure where satellite coverage was inadequate to collect survey points with the Spectra Geospatial GNSS Receiver.

Portage Park District personnel and adjacent landowner, Arden Sommers, provided information regarding Camp Spelman and the lake, including its use and some brief history. Camp Spelman and the lake has always been used for recreational purposes. The property was used extensively by various clubs and civic groups, including the Boy Scouts and Girl Scouts, the City of Kent's Summer Day Care program, Kent Kiwanis, the Garden Club of Kent and other church groups. The purchase of the property by the Portage Park District was facilitated by a reduction in the sale price by the seller Carrie Martin, and a generous donation of over half the purchase price from Richard E. and Sue C. Abbott who wanted to protect greenspaces for future Portage County generations. According to Portage County Auditor website, this purchase occurred in 2005. Camp Spelman is available for permitted civic and community group camping; groups must provide their own portable toilet and assist with site preparation and cleanup. There are approximately 4 to 5 private landowners whose property extends into the Lake and several of these owners appear to have docks into the lake. The date of dam construction is unknown and there are no plans or other information on file at Portage Parks District or at ODNR.

No specific discrepancies from the ODNR site visit and findings were conveyed by the Portage Park District to EDG. Portage Park District indicated that their goal is to get an understanding of their Alternatives to comply with dam laws and the cost associated with these Alternatives.

Based on measurements performed by ODNR, the earthfill dam embankment is approximately 12-foot wide and 195-feet long. The upstream face of the dam embankment was densely vegetated during our site visit, so EDG was not able to survey or measure it, but it is estimated to be at a slope of 3H:1V. The surveyed downstream face of the dam embankment has a slope that varies from 3H:1V near the upper portion to 2H:1V near the lower portion (**Figure 2**). The trees located along this downstream face were cut down by Portage Park District, but the stumps of these trees remain within the dam embankment. EDG observed a small open channel drainage feature running along the downstream dam face near where the dam meets the right abutment (**Figure 3**). The feature is shallow in depth and appears to be relatively stable with little erosion. The survey points collected along the top of dam had elevations ranging from 1090.30-feet to 1088.09-feet (**Figure 4**). A survey point collected at the toe of dam had an elevation of 1065.48-feet. The vertical inconsistency of the dam crest elevation creates a dam height range of 22.6 feet to 24.8 feet.

The principal spillway was found to be a pipe and riser system (**Figure 5**). The riser is a 24-inch-square concrete box riser, and the outlet pipe is 90 feet of 12-inch-diameter PVC pipe. The principal spillway rim elevation was surveyed at 1084.66-feet while the emergency spillway elevation starts activating at 1085.35-feet. The spillway outlet did not have an erosion control structure; however, little erosion was found (**Figure 6**). The riser includes a trash rack with flat bars laying directly on the orifice. An anti-vortex device was not found. Arden Sommers stated that beavers obstruct the principal spillway riser grate with debris and that he is frequently cleaning the existing grate.

The emergency spillway was found to be a two-stage, trapezoidal-shaped open channel and a portion of this cross section was surveyed (**Figure 7**). Looking downstream, the left side slope of this cross-section is 4.5H:1V (according to EDG's

survey data) while the right-side slope is estimated to be 6H:1V (according to topographic contours generated from OSIP LiDAR data). The first stage was found to be approximately 8-feet wide, while the second stage was found to be approximately 74-feet wide, which is similar to the dimensions found by ODNR. Brush was found at the channel inlet and mature trees were located throughout the channel. The channel discharges in the direction of homes located on Westlake Blvd.

FIGURE 2 – PRINCIPAL DAM, DOWNSTREAM FACE

FIGURE 3 – SMALL SWALE LOOKING DOWNSTREAM FROM DAM CREST


FIGURE 4 – PRINCIPAL DAM, DAM CREST

FIGURE 5 – PRINCIPAL SPILLWAY RISER

FIGURE 6 – PRINCIPAL SPILLWAY DISCHARGE PIPE OUTLET

FIGURE 7 – SURVEYED PORTION OF EXISTING EMERGENCY SPILLWAY SECTION

After assessing the dam and its appurtenant structures, EDG investigated the areas downstream of the dam embankment and downstream of the spillway outlets. If a dam breach were to occur, the flood wave from this breach would flow north through the existing valley/open channel until it reaches an existing 36-inch diameter culvert inlet located just behind the house at 7723 W Lake Blvd (**Appendix C**). The opening of this existing 36-inch culvert was clogged approximately halfway with debris and an interview with the property owner indicates that this culvert is owned and operated by local authorities (**Figure 8**). Engineering judgement suggests that the severity and magnitude of dam breach flows would likely overwhelm this existing 36" culvert, and the floodwaters from a dam breach would likely impact the house located at this property and possibly other houses within the area. This potential impact creates a probable loss of life situation and per OAC 1501:21-13-01, a dam shall

be placed in Class I when sudden failure of the dam would result in probable loss of human life.

FIGURE 8 – 36-INCH DIAMETER CULVERT BEHIND 7723 W LAKE BLVD

CONFERENCE CALL WITH ODNR

EDG had a conference call with ODNR Dam Safety staff on August 26, 2021, to discuss:

- The project and EDG's participation
- EDG's site visit, including survey data collection efforts
- H&H modeling and ODNR model review efforts
- Dam deficiencies and how to get the dam into compliance

The important portions of this discussion are as follows:

- ODNR would accept EDG's surveyed elevations for the dam and its appurtenances because the survey methods used by EDG are more detailed than the methods used by ODNR.
- ODNR would not require that the existing principal spillway pipe (12-inch PVC pipe) be upgraded to meet the minimum diameter requirements per OAC 1501:21-13-05 unless repairs or modification to the existing 12-inch pipe are required.
- ODNR agreed that a siphon type of lake drain is appropriate for this dam and the design recommendations provided by ODNR were:
    - Drain should be able to dewater the lake level to be at least ½ of the distance between normal pool and bottom of lake.
    - For non-emergency drawdowns, lake should dewater at a rate of 1-feet or less per week.
    - For emergency drawdowns, lake should dewater at a rate of 2-feet or more per week.
- ODNR would be willing to review and provide comments on EDG's hydrologic/HEC-HMS modeling (existing conditions, proposed conditions and dam breach analyses) prior to EDG performing a hydraulic analysis and/or inundation mapping. ODNR has 45 days to review and respond to a submittal package.
- ODNR would accept level-pool routing for the hydraulic analysis required for the EAP.
- Loans are available for dam improvements through ODWA; a grant is also available through ODNR, but this grant is typically awarded to dams requiring significant improvements/restoration.
- Grant funding through H20 Ohio is something to consider if the lake would be converted to a wetland.

HYDROLOGIC AND HYDRAULIC CALCULATIONS

EDG performed preliminary hydrologic and hydraulic calculations for Camp Spelman Lake Dam using HEC-HMS. EDG performed existing conditions calculations utilizing the survey data collected during our Site Visit on August 11, 2021. The elevation storage curve used in the existing conditions model is shown in Table 1. EDG's estimated storage volume to the top of dam is nearly the same as what ODNR previously estimated. Like ODNR's calculations, EDG's existing conditions calculations indicate that the emergency spillway is activating more frequently than allowed by law, which is less than once in fifty years for Class I dams (OAC 1501:21-13-04). EDG's preliminary calculations indicate that the emergency spillway invert should be above an elevation of 1086.00-feet to meet this requirement unless additional storage volume is provided, or the principal spillway capacity is increased. The calculations also indicate that the dam does not overtop during either the 24-hr duration Probable Maximum Precipitation (PMP) event, which resulted in a peak WSE of 1088.00-feet, or the 6-hr duration PMP event, which resulted in a peak water surface elevation of 1087.70-feet. Therefore, the 24-hour duration PMP event will be defined as the Probable Maximum Flood (PMF)/design storm since it produces higher water surface elevations. However, this does not account for the fact that the emergency spillway activates too frequently. Once the emergency spillway elevation is raised from existing condition, and the existing top of dam elevation is raised to 1088.50-feet the calculations indicate that the dam does not overtop during the 24-

hr PMP event, and results in a peak WSE of 1088.30-feet. This HEC-HMS model still needs to be reviewed by ODNR to gain concurrence of these calculations.

TABLE 1 – ELEVATION-STORAGE CURVE FOR CAMP SPELMAN LAKE DAM

Description	Elevation (feet)	Area (acre)	Incremental Storage (acre-feet)	Cumulative Storage (acre-feet)	Notes
Below PS	1065.48	-	0	0	Used EDG surveyed toe.
Below PS	1081.34	-	55.0	55.0	Volumes below PS estimated using conical method.
PS/Norm Pool	1084.66	12.5	14.0	69.0	Used EDG surveyed rim elevation.
ES	1085.35	13.0	8.80	77.8	Used EDG surveyed invert.
n/a	1086.00	31.5	14.5	92.2	Used LiDAR created topo.
n/a	1087.00	34.7	33.1	125.3	Used LiDAR created topo.
Top Dam	1088.09	37.1	39.1	164.4	Used EDG surveyed elevation.
Above Dam	1089.00	39.4	34.8	199.2	Used LiDAR created topo.

FINDINGS AND POTENTIAL ALTERNATIVES

EDG's surveyed height of the dam falls within a Class IV dam and EDG's calculated storage volume to the top of the dam falls within a Class III dam. EDG concurs with ODNR's classification of the Camp Spelman Lake Dam as a Class I, high hazard dam, based on downstream hazard potential for loss of life if the dam were to breach. EDG also concurs with the deficiencies discovered by ODNR. EDG investigated various Alternatives to get Camp Spelman Lake Dam into compliance with Ohio regulations (Table 2). Alternative 1 does not change the classification of the dam, but rather brings the dams into compliance with improvements. Alternatives 2 and 3 exempt the dam while Alternative 4 reclassifies, but does not exempt the dam, which would still require dam improvements to be performed.

TABLE 2 – POTENTIAL ALTERNATIVES

Alternative	Description
1	Bring Dam into Compliance as Class 1 Dam
2	Create a Wetland to Exempt Dam
3	Reduce Lake Footprint to Exempt Dam
4	Acquire Downstream Properties to Re-classify Dam

ALTERNATIVE 1

The following work items 1-6 would correct the deficiencies noted by ODNR (Appendix D):

1. Replace Trash Rack and Add Anti-vortex Device:

   Replace the trashrack at the inlet of the principal spillway and install a suitable anti-vortex plate similar to that shown in Figure 9. See ODNR fact sheet "Design and Maintenance of Trashracks for Pipe and Riser Spillways". For this

dam's 24-inch x 24-inch structure with a 12-inch outlet pipe, the openings in the trashrack bar mesh openings should be at least 6 inches x 6 inches. The trashrack should be securely fastened to the inlet so that it can withstand the hydrostatic and dynamic forces exerted on the trashrack during periods of high flow. The anti-vortex plate increases the capacity of the spillway by preventing the formation of a flow inhibiting vortex during periods of high flow. This is a repair that does not require the services of a professional engineer; however, EDG recommends that this new trashrack and anti-vortex plate be coordinated with ODNR staff prior to installation so that they confirm the proposed device(s) would be acceptable.

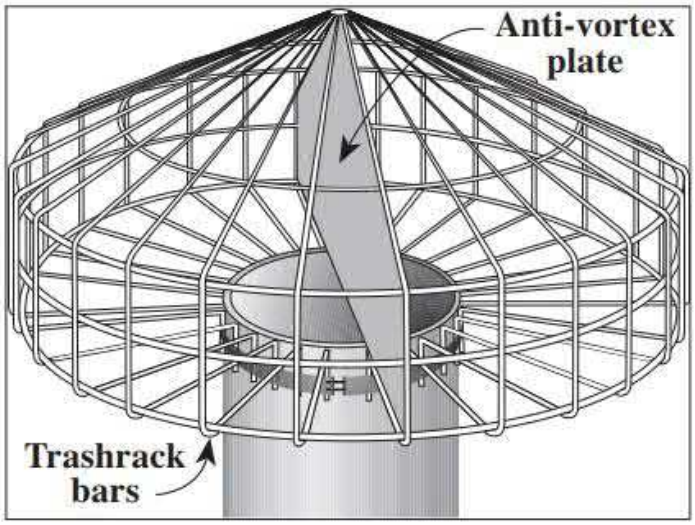


FIGURE 9 – COMMON TRASHRACK & ANTI-VORTEX DESIGN

2. Add Siphon Lake Drain: There is no lake drain for this dam currently, but a lake drain is required to comply with ODNR regulations. A siphon drain is often used for retrofitting dams that do not currently have a lake drain and ODNR agrees that a siphon drain seems reasonable for this dam. See ODNR fact sheets for more information on "Lake Drains". Figure 10 and Figure 11 show an example of a siphon drain that was used on an earthen dam embankment. The specific components of the siphon drain will be determined during detailed design along with the location/elevation of the drain, which can also be buried shallow under the ground. The outlet will need a headwall and may need to be protected from erosive forces with hard armoring, such as riprap. This lake drain system must be designed by a registered professional engineer and have plans/specifications reviewed and approved by ODNR. The design of this lake drain will require a bathymetric survey to be performed so that the natural lake bottom surface can be determined for the design of this system.

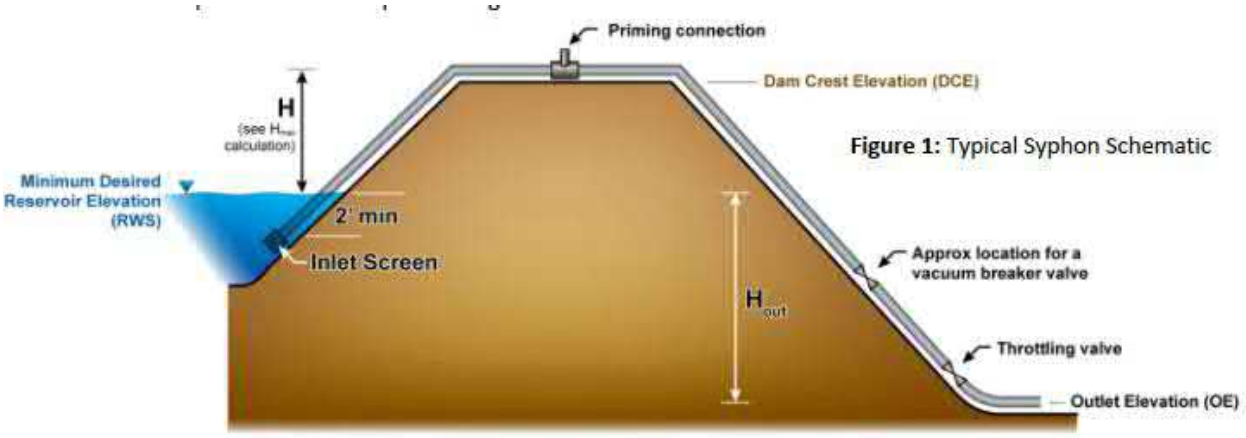


FIGURE 10 – SIPHON DRAIN EXAMPLE

FIGURE 11 – PHOTO OF SIPHON DRAIN ON DAM

3. Remove Trees/Brush from the Dam Embankment: Remove the trees and brush from the entire main embankment and seed all disturbed and bare areas to establish a proper grass cover. Although the existing trees on the downstream dam face have been cut down, the stumps and roots still need to be removed to at least 6" below grade then the cavities backfilled with well-compacted soil and vegetated with grass (See ODNR Fact Sheet "Trees and Brush"). To establish the grass, additional trees near the dam abutments may need to be cleared.

4. Modify/Clear/Revegetate the Existing Emergency Spillway: Based on our preliminary H&H calculations, the existing emergency spillway could be raised to create a trapezoidal-shaped opening that passes the design storm. This trapezoidal-shaped opening would have a 20-foot-breadth level crest section at an elevation of 1086.50 feet that is approximately 74 feet wide and has side slopes ranging from ~4.5H:1V to ~6H:1V. (Figure 12). This would raise the emergency spillway elevation enough so that it does not activate during the 100-year design storm event. This type of modification to the emergency

spillway must be designed by a registered professional engineer (PE) as well as be constructed under the supervision of a registered PE and have the construction certified by a registered PE. A registered geotechnical PE that is hired by the owner, not the contractor, will need to perform material and compaction testing for fill placed during this modification as well. The final size and elevation may be refined during detailed design or based upon ODNR's comments but based on our current modeling results this is appropriate to pass 100% of the PMF/design flood without overtopping the proposed top of dam elevation discussed below.

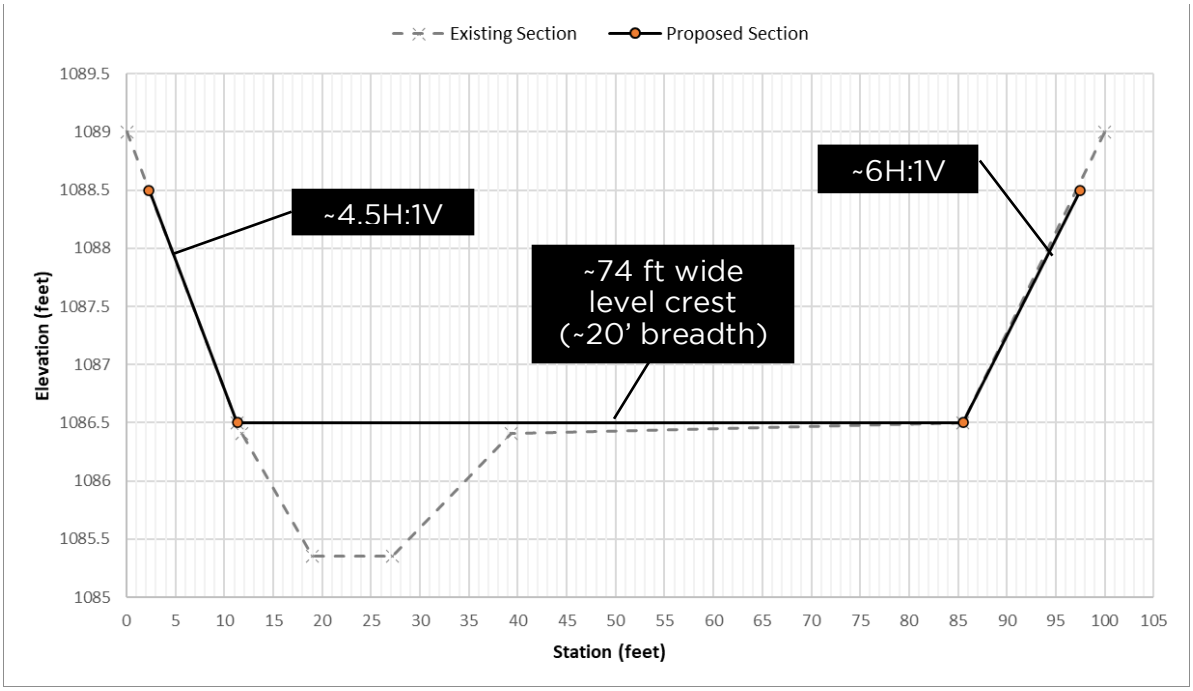


FIGURE 12 – POTENTIAL EMERGENCY SPILLWAY MODIFICATION

5. Reshape/Level Top of Dam Embankment: Reshape the top of dam to an elevation of 1088.50 feet. Based on EDG's survey and preliminary H&H calculations for the proposed emergency spillway modification described above, this elevation would pass the design storm without the dam overtopping. This involves reshaping (raising and lowering) the crest of the main embankment to maintain a uniform elevation. As necessary, suitable/ properly compacted fill material will be required to fill-in low portions of the dam and any unsuitable material (sand, gravel, etc.) will need to be removed from the embankment surface before placing and compacting this fill. This type of modification to the dam embankment must be designed by a registered PE, be constructed under the supervision of a registered PE, and have the construction certified by a registered PE. A registered geotechnical PE that is hired by the owner, not the contractor, will need to perform material and compaction testing for fill placed during this modification as well. The final top of dam elevation may be refined during detailed design or based upon ODNR's comments.

6. Repair/Regrade Downstream Dam Face: EDG also recommends that the downstream dam face be regraded/modified so that it has a consistent slope of 3:1 and that the small drainage swale that discharges towards the dam face be diverted away from the dam. A registered geotechnical PE should be hired

by the owner to analyze the existing dam's stability and design the necessary benching requirements to construct this modification. ODNR typically requires a stability analysis for dams that have a slope steeper than 3H:1V, but given that this is an existing dam, ODNR may only require this stability analysis if they have concerns with this dam's stability based on their field safety inspections. ODNR also may require the engineered removal and regrading of downstream face because there is a larger number of trees/stumps that need to be removed. For these reasons, EDG assumes a stability analysis would be required and that regrading the downstream dam face will also be required. This repair work would also assist in preventing erosion and ease maintenance/mowing requirements.

New Emergency Spillway Option: Another option to modifying and using the existing emergency spillway would be to relocate this spillway onto Portage Park District Property (Appendix D) left of the dam. This would require filling the existing emergency spillway to at least an elevation of 1088.50-feet to abandon it. This new spillway would no longer require clearing of numerous trees on private property but instead would require tree clearing mostly on Portage Park District property down to the valley floor. The steepness of this outlet channel down to the valley floor is estimated to be 5H:1V, which may require a higher level of erosion protection. EDG did not cost this option as we expect it would be more costly than the first option of raising the existing emergency spillway.

Additional Storage Volume Option: EDG also investigated potentially removing the existing 24-inch by 24-inch square riser to gain additional storage volume by lowering the normal pool elevation from 1084.66-feet to the surveyed invert of the 12-inch PVC outlet pipe (1081.34-feet). EDG estimated that doing so may provide an additional 14 acre-feet of storage; however, this still does not prevent the existing emergency spillway from activating. Currently, EDG does not think this is a viable option since it does not preclude having to modify the existing spillway or install a new spillway.

Alternative 1 involves bringing the Camp Spelman Dam into compliance with ODNR regulations and we estimate that will require performing the repairs for items 1 through 6 listed above. A preliminary Conceptual Opinion of Probable Costs (OPC) was developed for Alternative 1 using the Association for the Advancement of Cost Engineering (AACE). These costs are consistent with an AACE Class 5 for conceptual design where the design is 0% to 2% completed. The estimated construction costs to perform these 6 items is $66,000 to $123,000. This includes approximately $40,000 for survey, design, and geotechnical services.

Much of the required repair work involves clearing trees/brush and re-vegetating the cleared area(s) with grass. Most of the anticipated clearing work would occur for the emergency spillway (estimated 0.5 acre). These clearing limits are the engineer's best estimate of what might be required by ODNR so they may need to be adjusted based on ODNR's input after they perform their inspection this fall. Recommended sections are included in the cost; however, item 6 may not be required to be completed to be complaint with ODNR regulations.

ALTERNATIVES 2-4

Alternatives 2, 3, and 4 would re-classify Camp Spelman Lake Dam, but only two of them would make the dam exempt from ODNR regulation. Alternative 2 and 3 would no longer require inspection and maintenance activities or the development of an

EAP for the site. Alternative 2 would be to lower the dam water elevation and breach the Camp Spelman Dam embankment completely to create a wetland. Alternative 3 would be to maintain a reduced lake footprint by one of the following two options:

1. Lower the dam embankment to less than 10-feet and reduce the volume of the dam to less than 50-acre feet or
2. Lower the dam embankment height to less than 6-feet.

Alternative 2 and 3 would provide for some wetland and a significantly reduced pond extent. These Alternatives are going to have more initial capital funds required but will reduce the long-term costs of inspections, maintenance, and repairs to the dam if it stays regulated by ODNR. Both Alternatives will include a significant amount of earthwork, sludge removal and management, and re-vegetation of the area's no longer below the water surface elevation. Using the AACE Class 5 cost estimating procedures, the conceptual OPC for the creating of a wetland (Alternative 2) is $460,000 to $830,000 and the conceptual OPC for lowering the dam embankment (Alternative 3) is $370,000 to $670,000.

Alternative 4 would be to acquire the potentially impacted properties downstream from the dam that are making it a Class I structure. Once acquired any buildings and structures would be vacated, demolished, and the area restored with a vegetative cover. This Alternative does not exempt the dam from regulation, but EDG anticipates it could potentially reduce Camp Spelman Lake Dam to a Class III structure. This Alternative would still also require improvements to be done to meet ODNR requirements. EDG currently estimates this would require the purchase of at least three properties based on our previous dam breach modeling experience, but this amount could decrease/increase based on actual modeling results. EDG reviewed property cost estimates from Zillow for these properties and found that one of them was sold in 2020 for $340,000 but would be expected to cost even more given current market conditions (Zillow estimates at least $394,000). Based on the high initial costs, continued O&M costs, and other complications expected with this Alternative EDG does not see this as a feasible Alternative and does not recommend this approach.

EDG developed the alternative comparison chart (Table 3) that follows to assist the Portage Park District and other interested stakeholders in selecting the preferred alternative for Camp Spelman Lake Dam.

TABLE 3 – ALTERNATIVE COMPARISON CHART

	ALT 1 ODNR Compliant Dam (Class 1)	ALT 2 Create Wetland	ALT 3 Reduced Lake Footprint	ALT 4 ODNR Complaint Dam (pot. Class III)
Initial Project Cost (avg.)	$95K	$650K	$520K	$1.5M
O&M Cost	MOST	LEAST	LEAST	MODERATE
ODNR Jurisdiction	YES	NO	NO	YES
Lake Size Potential Change	+0%	-80%	-50%	+0%
Amount of Trees	LESS	MORE	SAME	LESS

Appendix A

ODNR Site Visit Memorandum

APPENDIX A

Camp Spelman Site Information
and ODNR Dam Inspection Report

Camp Spelman is a ~58-acre undeveloped park property located at 7650 Ferguson Road in Franklin Township, Portage County. The lake was created prior to Park District ownership, and the park district has no record of the construction or plans. The outlet structure and a portion of the embankment are located on private property. Drainage flows to the east and eventually into West Twin Lake.

★ Outlet location

Ohio Department of Natural Resources

MIKE DEWINE, GOVERNOR | MARY MERTZ, DIRECTOR

Division of Water Resources
Rodney J. Tornes, Chief
2045 Morse Road/Building B-3
Columbus, Ohio 43229
614-265-6620
dswc@dnr.state.oh.us

December 2, 2019

Portage Park District
Christine Craycroft, Executive Director
705 Oakwood St, Suite G-4
Ravenna, Ohio 44266

Martha & Arden Sommers
7598 Birkner Drive
Kent, Ohio 44240

Re: Camp Spelman Lake Dam
File No: 1112-071
Portage County

Dear Dam Owners:

The Division of Water Resources is responsible for regulating dams throughout Ohio. A jurisdictional dam located at the "Camp Spelman" property in Portage County, Franklin Township was brought to the Division's attention. A site map showing the dam and its appurtenant structures and their location relative to the county parcel map has been enclosed. If you believe that you are not an owner of this dam and/or appurtenant structure(s) or believe that there are additional owners not addressed in this communication, please contact our office at 614/265-6731.

A site visit was made to the structure on May 29, 2019, to inventory the size and potential downstream hazard in order to classify the dam in accordance with Ohio Administrative Code 1501:21-13-01. Based on information found during this site visit the dam has been determined to be a Class I, high hazard, dam due to the potential for structural collapse of at least one residence and/or probable loss of human life if the dam were to fail.

Under the provisions of Ohio Revised Code Section 1521.063, all owners of a dam that is classified as a class I, class II, or class Ill dam shall pay an annual fee which is based upon the classification, the height of the dam, the linear foot length of the dam, and the volume of water impounded by the dam. The fee shall be paid to the Division of Water Resources on or before the thirtieth day of June of each year. An invoice shall be sent to you beginning in 2020.

The Chief of the Division of Water Resources has the responsibility to ensure that human life, health, and property are protected from dam failures. Conducting periodic safety inspections and working with dam owners to maintain and improve the overall condition of Ohio dams are vital aspects of achieving this purpose. Dams are inspected by watershed on a 5-year cycle. The next periodic inspection of this watershed is scheduled to occur in Spring 2021.

While this site visit did not include a full inspection and assessment of the dam and appurtenances, the enclosed site visit memo includes several repair, maintenance, and monitoring items that as a dam owner you are required by law to perform. Completion of these required items will improve the safety and overall condition of the dam. The Chief must approve any plans for modifications or repairs to any dam. Following approval of the engineered plans, all necessary repairs must be implemented by the owner under the supervision of a registered professional engineer. A copy of the laws and administrative rules for dam safety is available on the division's web site at http://water.ohiodnr.gov/safety/dam-safety or by request.

All dam owners are required to have an Emergency Action Plan (EAP) and an Operation, Maintenance and Inspection Manual (OMI). An approved EAP results in a 10% reduction in the annual fee. For your information, we have enclosed guidelines for preparing an OMI and an EAP.

Your cooperation in improving the overall condition of this dam is appreciated. Please contact our office at 614/265-6731 if you have any questions.

Sincerely,

Matthew J. Hook, P.E.
Program Manager
Dam Safety Program
Division of Water Resources

Enclosures

SITE VISIT MEMORANDUM

Project Name:	Camp Spelman Lake Dam	Date of Visit:	5-29-19
File Number:	1112-071	County:	Portage
Site Conditions:	75 Degrees, Raining		
Inspectors:	Matthew Hook, P.E., Program Manager Ryan Heskett, E.I., Project Engineer Josh Garland, Construction Inspector		

Introduction:

The Division was made aware of a potentially jurisdictional dam in Portage County. This site visit was made to inventory and survey the structure and assess the potential for downstream hazard.

Observations:

Upstream Slope: The upstream slope was covered with brush and saplings making visual inspection difficult. It appeared that the slope gradient was approximately 3H:1V.

Crest: The crest was measured at 195 feet long. The crest was found to have a satisfactory grass cover. However, the vertical alignment of the crest varies by 1-2 feet.

Downstream Slope: The downstream slope was covered with brush and mature trees making visual inspection difficult. It appeared that the slope gradient was approximately 3H:1V.

Principal Spillway: The principal spillway was found to be a pipe and riser system. The riser was a 24-in-square concrete box riser and the outlet pipe was found to be 90-ft of 12-in-diameter PVC pipe. The riser included a trashrack with flat bars laying directly on the orifice. An anti-vortex device was not found. Some debris was building up on the trashrack. A visual inspection of the interiors of the pipe and riser were unable to be made due to flow through the system. The spillway outlet did not have an erosion control structure; however, little erosion was found.

Emergency Spillway: The emergency spillway was found to be a two-stage open channel with the first stage being 10-ft-wide at elevation 1084.5 and the second stage being an additional 75-ft-wide at elevation 1085.8. The side slopes were estimated at 4H:1V. Brush was found at the channel inlet and mature trees were located throughout the channel. It appears that the channel discharges in the direction of some homes located on Westlake Blvd.

Lake Drain: A lake drain was not found during this site visit.

Downstream Hazard Assessment: The downstream hazard was visually assessed and was found to include two houses located of the west side of Westlake Blvd. and Westlake Blvd. itself.

Discussion:

Both owners were present during this visit. It was discussed that the dam embankment sits on the Park

Districts property and the spillways are located on the Sommers property. This was verified using the online parcel maps for Portage County.

Based on the survey of the dam, aerial mapping, and topographic information, the dam is 22.9 ft. tall (Class IV) with a top of dam storage volume of 166 acre-ft. (Class III). The potential downstream hazard includes two homes that could experience structural failure and/or loss of life (Class I). Therefore, the classification of Camp Spelman Lake Dam is Class I.

Hydrologic and Hydraulic modeling was completed to assess the flood capacity of Camp Spelman Lake Dam. The modeling concluded that while the dam experiences a very small and very brief amount of overtopping, failure from an overtopping event would be unlikely. Therefore, Camp Spelman Lake Dam is considered to pass its design storm. However, the modeling also shows that the emergency spillway flows more often than allowed by Ohio Administrative Code 1501:21-13-04 (F).

Conclusions:

Camp Spelman Lake Dam was found to be a Class I dam and as such is subject to the requirements of Ohio Revised Code Chapter 1521 and Ohio Administrative Code Chapter 1501:21.

While several required remedial measures are included below, the first periodic inspection for Camp Spelman is currently scheduled for Spring of 2021. The inspection will include a more detailed assessment of the dam and its appurtenances.

Required Remedial Measures:

Engineer Repairs and Investigations

The owner must retain the services of a registered professional engineer to address the following items. Plans, specifications, investigative reports, and other supporting documentation, as necessary, must be submitted to the Division of Water Resources for review and approval prior to construction. The owner must complete these items and implement all engineered plans for improvement within 5 years unless otherwise stated. Please refer to the fact sheets included in the Dam Safety Fact Sheet Booklet for additional information.

1. This dam must have a dam failure inundation study and map included in an Emergency Action Plan (EAP) in accordance with OAC Rule 1501:21-21-04. A registered professional engineer must prepare the inundation map and Section IV (Emergency Detection, Evaluation, and Classification) of the EAP. It is recommended that your engineer contact the Division of Water Resources prior to undertaking the engineering study for the inundation map. The inundation study and supporting calculations, including computer modeling, must be submitted to the Division of Water Resources for review and approval. See the Owner Dam Safety Program section of this report for additional information.

2. Every dam shall have a spillway system which will safely operate during the design flood without endangering the safety of the dam in accordance with OAC Rule 1501:21-13-03 and OAC Rule 1501:21-13-04 (F). Investigate the frequency of flow and the alignment of the emergency spillway and, as necessary, prepare plans and specifications for repairs. See the "Open Channel Spillways (Earth and Rock)" fact sheet for additional information.

3. This dam must have a device to permit draining of the reservoir within a reasonable period of time in accordance with OAC Rule 1501:21-13-06. Prepare plans and specifications for the installation of such a device. See the "Lake Drains" fact sheet for additional information.

4. The embankment crest alignment must be uniform. Investigate the variable vertical alignment of the crest and, as necessary, prepare plans and specifications for the correction of any problems.

Owner Repairs and Monitoring

The dam owner must address the items below as part of the required dam maintenance. The owner may perform the work or hire a contractor. The owner must implement all owner repairs and monitoring items within a timely manner. Repair activities should be documented in the Operation, Maintenance, and Inspection Manual (OMI). Please refer to the fact sheets included in the Dam Safety Fact Sheet Booklet for additional information.

1. Remove the trees and brush from the upstream slope, downstream slope, and emergency spillway. Seed all disturbed areas to establish a proper grass cover. See the "Trees and Brush" fact sheet for additional information.

2. Replace the trashrack with an acceptable device and install an anti-vortex device at the inlet of the principal spillway. See the "Design and Maintenance of Trashracks" fact sheet for additional information.

3. Prepare an Emergency Action Plan (EAP) and submit for approval. A registered professional engineer must prepare a dam failure inundation map and Section IV (Emergency Detection, Evaluation, and Classification) of the EAP. Guidelines for the preparation of this document can be found online at: http://water.ohiodnr.gov/safety/dam-safety#ADD. The fillable EAP is not appropriate for Camp Spelman Lake Dam because of its Class I designation.

4. Prepare an Operation, Maintenance, and Inspection Manual (OMI) and submit for approval. Guidelines for the preparation of this document can be found online at: http://water.ohiodnr.gov/safety/dam-safety#ADD.

5. Monitor the erosion at the principal spillway outlet. See the "Open Channel Spillways (Earth and Rock)" fact sheet for additional information. Please note that engineered repairs may be needed if this problem worsens.

Matt Hook

Inspector's Signature

12/2/2019

Date

Administrative Alert: Welcome to Portage County Online Auditor [x]

Janet Esposito

PORTAGE COUNTY AUDITOR | PORTAGE COUNTY, OHIO

Home Search Map Reports Forms

Map

Parcel | Basemap | Aerials

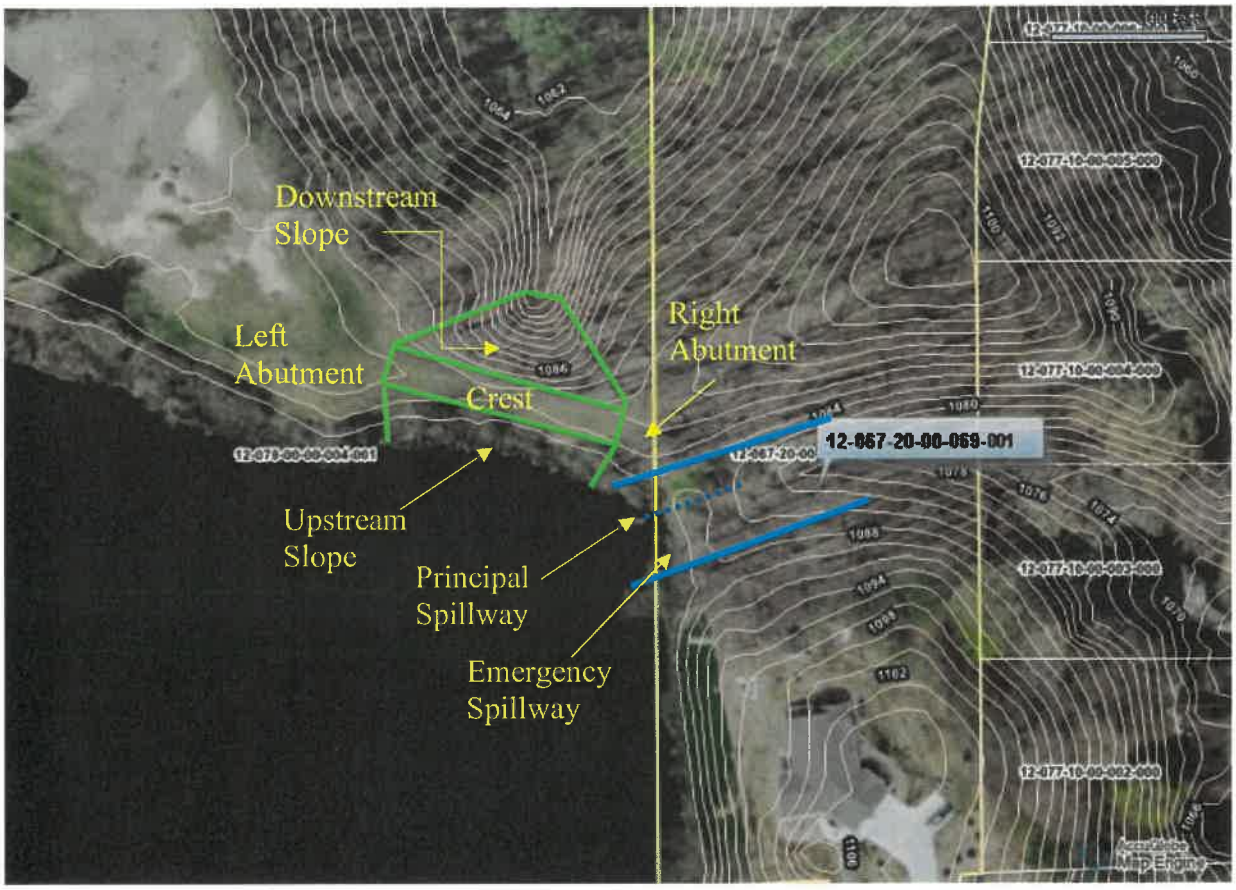
- Addresses
- Parcels
- Acreage 100
- Acreage 150
- Acreage 200
- Dimensions 100
- Dimensions 150
- Dimensions 200
- Landmarks
- NPDES
- Neighborhoods
- 2007 Sales
- 2008 Sales
- 2009 Sales
- 2010 Sales

Selection

	Parcel Number	Owner Name
Zoom To	12-067-20-00-069-001	SOMMERS ARDEN P & MARTHA R (J&S)
Zoom To	12-078-00-00-004-001	PORTAGE PARK DISTRICT

2 feature(s) selected

GIS parcel shapefile last updated 9/10/2019 11:04:24 PM.
The CAMA data presented on this website is current as of 12/2/2019 3:39:39 AM.


Downstream
Slope
Left
Abutment
Crest
Right
Abutment
Upstream
Slope
Principal
Spillway
Emergency
Spillway
12-067-20-00-069-001

Camp Spelman Lake Dam

File Number: 1112-071, Portage County

May 29, 2019

Trees and brush along the upstream slope.

View of the dam crest from the left abutment. Note the dense trees and brush on upstream and downstream slopes.

View of the upstream slope and crest from the right abutment. Again notice the trees and brush on the slopes.

View of the principal spillway riser.

Close-up of the principal spillway trashrack. Note the debris collection of the flat bars.

View of the principal spillway outlet.

Camp Spelman Lake Dam

File Number: 1112-071, Portage County

May 29, 2019

	
Another view of the principal spillway outlet.	View of the emergency spillway. Note the trees and brush at the inlet.

Dam Inventory Sheet

Name: CAMP SPELMAN LAKE DAM
File No: 1112-071
National #:
Reservoir:
Permit No.:
Class (Ht-Vol): I (IV - III)

Owner Information

Owner: Multiple Owners - 1112-071
Owner Type: Private
Address:
Multi-Dams: -
Parcel No.:
City: **State:** **Zip:**
Contact: Christine Craycroft
Phone No.: 330-297-7728

Location Information

County: Portage
Latitude Deg.: 41 **Min.:** 11 **Sec.:** 55
Township: Franklin
Longitude Deg.: 81 **Min.:** 21 **Sec.:** 0
Stream: Tributary To Cuyahoga River
USGS Quad.: Kent
USGS Basin No.: 04110002

Design/Construction Information

Designed By:
Constructed By:
Completed: **Plan Available:** **At:**
Failure/Incident/Breach:

Structure Information

Purpose: Recreation
Type of Impound.: Dam And Spillway
Type of Structure: Earthfill
Drainage Area (sq. miles): 0.18 **or (acres):** 115

Embankment Data

Length (ft): 195
Upstream Slope: 3H:1V
Height (ft): 22.9
Downstream Slope: 3H:1V
Top Width (ft): 12
Volume of Fill (cub. yds.):

Spillway Outlet Works Data

Lake Drain: UNKNOWN
Principal: 24-IN-SQ CONCRETE RISER W/ 12-IN-DIA PVC OUTLET
Emergency: 2 STAGE OPEN CHANNEL W/ 4:1 SS: 1ST, 10-FT-WD; 2ND, 85-FT-WD
Maximum Spillway Discharge (cfs): **Design Flood:** 1.0 **Flood Capacity:** 1.0

Dam Reservoir Data

	Elevation (ft-MSL)*	Area (acres)	Storage (acre-feet)
Top of Dam:	1088.3	37	166
Emergency Spillway:	1084.5	13	75
Principal Spillway:	1084	12.5	69
Streambed:	1065.4		
Foundation:			

*Elevations are not necessarily related to a USGS benchmark

Inspection Information

Inspection History:
Phase I:
Other Visits: 5/29/2019 INV - MJH
Inspection Year: E

Operation Information/Remarks

Emergency Action Plan: Not Approved
Format: No Plan
OMI: Not Approved
Last Entry: 11/26/2019

Appendix B

EDG Inspection Report

Dam Safety Inspection Checklist

Complete All Portions of This Section (Pre-inspection)
Date of Inspection: 8/11/2021
Name of Dam: Camp Spelman Lake Dam File Number: 1112-071
EAP: (yes, no) OM&I: (yes, no)

Review Inventory - Highlight missing information (Pre -inspection)
Owner=s Name(s): Portage County Park District/Arden Sommers
Address: 705 Oakwood st Suite G-4/7598 Birkner Dr
City: Ravenna/Kent State: OH Zip (+4): 44266

Telephone (Home): Telephone (Work):
Contact Person: Telephone:
Designed By: UNK
Constructed By: UNK
Year Completed: UNK Plans Available (Yes, No) (location):
Purpose of dam: Recreation

Interview with Owner (at the site):
Owner/Representative present: (Yes, No) Name(s): Christine Craycroft (PPD Exec Direc)
Craig Alderman (PPD Operations), Arden Sommers (Private Owner)
Double check address, telephone #, purpose (check ->) G
How long have you owned dam - previous name/owner? Carrie Ann Martin sold to PPD in 2005

EAP/OM&I: up-dated-(yes, no) & location:
Operate lake drain (times per year, accessibility): No lake drain exists

Mowing (times per year):
Prior problems (wet areas, erosion, slides): beavers, ice buildup at principal spillway can cause higher flows and debris issues for downstream neighbor

Repair or modification (what & when):
AGGREGATE ADDED TO INVERT OF EMERGENCY SPILLWAY CHANNEL; EXCAVATED EARTHEN MATERIAL APPEARS TO HAVE BEEN LEFT IN SPILLWAY AREA - 2021

Failure/Incident/Breach (max. pool):

Downstream hazard status (recent changes):
CLASS I BASED ON DOWNSTREAM HAZARD

Do you know the in-depth details of the construction of your dam? (If yes - ask next three questions, if no - go to Field Information Section)
Core trench material and location: No prior Boy/Girls Scout Camp, Maybe KOI, Seems to indicate primary spillway was put in the 70's after dam was already in place.
Volume of fill (earth or rock) in dam: Possibly started as a glacial lake
Foundation (earth or rock) of dam:

Field Information (while at site)
Pool Elevation (during inspection): normal pool Time: 1:00 (a.m. p.m.)
Site Conditions(temp., weather, ground moisture): overcast, minor sun, 72 degrees, humid, slight rain

Inspection Party: KEP & AL
Maximum Height: 22.6ft(EDG survey) (measured or inventory appears correct)
Normal Pool Surface Area: 12.5 ac (measured or inventory appears correct)
(ODNR)

Required Action

UPSTREAM SLOPE

Gradient: Horizontal: 3' Vertical: 1' (est, meas.) per ODNR

None Monitor Maintenance Engineer

☐ ***VEGETATION*** [no problem]

☐ Trees: Quantity: (<5, sparse, dense) dense ☐ ☐ ☒ ☐

Diameter: (<6", 6-12", >12") mainly <6", Sporatic 6-12", Sparce >12"

Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg)

Notes:

☐ Brush: Quantity: (sparse, dense) dense ☐ ☐ ☒ ☐

Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg) entire slope

Notes:

☐ Ground Cover: Type: (grass, crown vetch) Other: ☐ ☐ ☒ ☐

Quantity: (bare, sparse, adequate, dense)

Appearance: (too tall, too short, good)

Notes: Could not inspect

☐ ***SLOPE PROTECTION*** [no problem, could not inspect thoroughly] ☐ ☐ ☒ ☐

☒ None

☐ Riprap: Average Diameter: ☐ ☐ ☐ ☐

(adequate, sparse, displaced, weathered, vegetation) (bedding/fabric noted - yes, no)

Notes:

☐ Wave Berm: ☐ ☐ ☐ ☐

Vegetation: (adequate, bare, sparse, improper vegetation)

Notes:

☐ Concrete Slabs: (cracked, settlement, undermined, voids, deteriorated, vegetation) ☐ ☐ ☐ ☐

Notes:

☐ Other: ☐ ☐ ☐ ☐

Notes:

☐ ***EROSION*** [no problem, could not inspect thoroughly]

☐ Wave Erosion (Beaching): Scarp: Length: Height: ☐ ☐ ☐ ☐

Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg)

Notes:

☐ Runoff Erosion (Gullies): Quantity: ☐ ☐ ☐ ☐

Depth: Width: Length:

Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg)

Notes/Causes:

☐ ***INSTABILITIES*** [no problem, could not inspect thoroughly]

☐ Slides: Transverse Length: Longitudinal Length: ☐ ☐ ☐ ☐

Scarp: Width: Length:

Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg)

Crack: Width: Depth:

Notes/Causes:

☐ Cracks: ☐ Transverse ☐ Longitudinal ☐ Other ☐ ☐ ☐ ☐

Quantity: Length: Width: Depth:

Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg)

Notes/Causes:

None Monitor Maintenance Engineer

Required Action

Required Action

None Monitor Maintenance Engineer

☐ Cracks: ☐ Transverse ☐ Longitudinal ☐ Other ☐ ☐ ☐ ☐
Quantity: _____ Length: _____ Width: _____ Depth: _____
Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg) _____
Notes/Causes: _____

☐ Bulges ☐ Depressions ☐ Hummocky ☐ ☐ ☐ ☐
Size: _____ Height: _____ Depth: _____
Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg) _____
Notes/Causes: _____

☐ Bulges ☐ Depressions ☐ Hummocky ☐ ☐ ☐ ☐
Size: _____ Height: _____ Depth: _____
Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg) _____
Notes/Causes: _____

☐ ***OTHER*** [no problem, could not inspect thoroughly]
☐ Rodent Burrows: (few, numerous) _____ ☐ ☐ ☐ ☐
Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg) _____
Notes: _____

☐ Ruts: ☐ ☐ ☐ ☐
Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg) _____
Depth: _____ Width: _____ Length: _____
Notes/Causes: (truck/auto, motorcycle, ATV, animals, pedestrian) _____

☐ Other: _____ ☐ ☐ ☐ ☐
Notes: _____

CREST Length: 195ft Width: 12ft (est, meas.)

☐ ***VEGETATION*** [no problem]
☐ Trees: Quantity: (<5, sparse, dense) ☒ ☐ ☐ ☐
Diameter: (<6", 6-12", >12") _____
Location: (adj. to structure, entire crest, lt end, rt end, middle, see dwg) _____
Notes: _____

☐ Brush: Quantity: (sparse, dense) _____ ☒ ☐ ☐ ☐
Location: (adj. to structure, entire crest, lt end, rt end, middle, see dwg) _____
Notes: _____

☐ Ground Cover: Type: (grass, crown vetch) Other: mowed grass ☒ ☐ ☐ ☐
Quantity: (bare, sparse, adequate, dense) adequate
Appearance: (too tall, too short, good) good
Notes: _____

☐ ***EROSION*** [no problem, could not inspect thoroughly]
☐ Runoff Erosion (Gullies): Quantity: _____ Depth: _____ Width: _____ Length: _____ ☒ ☐ ☐ ☐
Location: (adj. to structure, entire crest, lt end, rt end, middle, see dwg)
Notes/Causes: _____

None Monitor Maintenance Engineer

Required Action

Crest (cont)

Required Action: None | Monitor | Maintenance | Engineer

☐ ***ALIGNMENT*** [no problem, could not inspect thoroughly]

☒ Vertical: ☒ Low Area: ☐ ☐ ☐ ☒
Location: (adj. to structure, entire crest, lt end, rt end, middle, see dwg) entire crest
Elevation Difference: Couple feet Length: full length
Notes/Causes: should be level, probably never constructed level

☒ ☐ ☐ ☐

☐ Horizontal: none
Notes/Causes:

☐ ***WIDTH*** [no problem]

☐ Too Narrow ☒ ☐ ☐ ☐
Location: (adj. to structure, entire crest, lt end, rt end, middle, see dwg)
Notes/Causes:

☐ ***INSTABILITIES*** [no problem, could not inspect thoroughly]

☐ Cracks: ☐ Transverse ☐ Longitudinal ☐ Other ☒ ☐ ☐ ☐
Quantity: Length: Width: Depth:
Location: (adj. to structure, entire crest, lt end, rt end, middle, see dwg)
Notes/Causes:

☐ Cracks: ☐ Transverse ☐ Longitudinal ☐ Other ☒ ☐ ☐ ☐
Quantity: Length: Width: Depth:
Location: (adj. to structure, entire crest, lt end, rt end, middle, see dwg)
Notes/Causes:

☐ Bulges ☐ Depressions ☐ Hummocky ☒ ☐ ☐ ☐
Size: Height: Depth:
Location: (adj. to structure, entire crest, lt end, rt end, middle, see dwg)
Notes/Causes:

☐ Bulges ☐ Depressions ☐ Hummocky ☒ ☐ ☐ ☐
Size: Height: Depth:
Location: (adj. to structure, entire crest, lt end, rt end, middle, see dwg)
Notes/Causes:

☐ ***OTHER*** [no problem, could not inspect thoroughly]

☐ Rodent Burrows: (few, numerous) ☒ ☐ ☐ ☐
Location: (adj. to structure, entire crest, lt end, rt end, middle, see dwg)
Notes:

☐ Ruts: ☒ ☐ ☐ ☐
Location: (adj. to structure, entire crest, lt end, rt end, middle, see dwg)
Depth: Width: Length:
Notes/Causes: (truck/auto, motorcycle, ATV, animals, pedestrian)

☐ Other: ☒ ☐ ☐ ☐
Notes:

None | Monitor | Maintenance | Engineer
Required Action

Required Action

DOWNSTREAM SLOPE Gradient: Horizontal: 2'-3' Vertical: 1' (est, meas.)

None Monitor Maintenance Engineer

☐ ***VEGETATION*** [no problem]

☒ Trees: Quantity: (<5, sparse, dense) abutement sides need additional trees removed ☐ ☐ ☒ ☒
Diameter: (<6", 6-12", >12") various size stumps
Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg)
Notes: Density of trees may require engineered removal and regrading

☒ Brush: Quantity: (sparse, dense) sparce ☐ ☐ ☒ ☐
Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg)
Notes:

☒ Ground Cover: Type: (grass, crown vetch) Other: ☐ ☐ ☒ ☐
Quantity: (bare, sparse, adequate, dense) mainly bare
Appearance: (too tall, too short, good)
Notes: need to establish grass cover that is maintainable, potentially adjust slope to ensure mowable

☐ ***EROSION*** [no problem, could not inspect thoroughly]

☒ Runoff Erosion (Gullies): Quantity: 1 Depth: 8-9" Width: 2.5ft Length: 75% of slope length (measure from survey) ☐ ☐ ☒ ☒
Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg)
Notes/Causes: sheet flow coming off NE hillside

☐ ***INSTABILITIES*** [no problem, could not inspect thoroughly]

☐ Slides: Transverse Length: Longitudinal Length: ☒ ☐ ☐ ☐
Scarp: Width: Length:
Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg)
Crack: Width: Depth:
Notes/Causes:

☐ Cracks: ☐ Transverse ☐ Longitudinal ☐ Other ☒ ☐ ☐ ☐
Quantity: Length: Width: Depth:
Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg)
Notes/Causes:

☐ Cracks: ☐ Transverse ☐ Longitudinal ☐ Other ☒ ☐ ☐ ☐
Quantity: Length: Width: Depth:
Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg)
Notes/Causes:

☐ Bulges ☐ Depressions ☐ Hummocky ☒ ☐ ☐ ☐
Size: Height: Depth:
Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg)
Notes/Causes:

☐ Bulges ☐ Depressions ☐ Hummocky ☒ ☐ ☐ ☐
Size: Height: Depth:
Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg)
Notes/Causes:

None Monitor Maintenance Engineer

Required Action

Required Action

None Monitor Maintenance Engineer

☒ ***OTHER*** [no problem, could not inspect thoroughly]

☐ Rodent Burrows: (few, numerous) ☒ ☐ ☐ ☐

Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg)

Notes:

☐ Ruts: ☒ ☐ ☐ ☐

Location: (adj. to structure, entire slope, lt end, rt end, middle, see dwg)

Depth: Width: Length:

Notes/Causes: (truck/auto, motorcycle, ATV, animals, pedestrian)

☒ Other: small erosion gully on right side near end/abutement ☐ ☐ ☐ ☒

Notes: inconsistent slope; slope greater than 3:1 may require stability analysis

---

☐ ***SEEPAGE*** [no problem, could not inspect thoroughly]

☐ Wet Area ☐ Flow ☐ Boil ☐ Sinkhole ☒ ☐ ☐ ☐

Flow Rate Size:

Location:

☐ Aquatic Vegetation ☐ None

☐ Rust Colored Deposits ☐ None

☐ Sediment in Flow ☐ None

☐ Other:

Notes/Causes:

☐ Wet Area ☐ Flow ☐ Boil ☐ Sinkhole ☒ ☐ ☐ ☐

Flow Rate Size:

Location:

☐ Aquatic Vegetation ☐ None

☐ Rust Colored Deposits ☐ None

☐ Sediment in Flow ☐ None

☐ Other:

Notes/Causes:

☐ ***EMBANKMENT DRAINS*** [none, none found, no problem, could not inspect thoroughly]

Type: ☐ Toe Drain ☐ Relief Wells ☐ Other: ☒ ☐ ☐ ☐

Flow Rate: Size: Number:

Location:

Notes:

☐ ***MONITORING INSTRUMENTATION*** [none, none found, no problem, could not inspect thoroughly]

☐ None Found ☐ Piezometers ☐ Weirs/Flumes ☐ Other ☒ ☐ ☐ ☐

☐ Periodic Inspections by:

Notes:

None Monitor Maintenance Engineer

Required Action

PRINCIPAL SPILLWAY

Required Action: None | Monitor | Maintenance | Engineer

☒ ***GENERAL INLET*** [no problem, could not inspect thoroughly] ☐ ☐ ☐ ☐

☐ Anti-Vortex Plate [None] Dimensions:_____ (adequate, too small,)
Type: (steel, concrete, aluminum, stainless steel, corrugated metal wood, other):_____
Deterioration: (missing sections, rusted, collapsed)_____
Notes:_____

☐ Flash Boards [None] ☐ ☐ ☐ ☐
Type: (metal, wood):_____
Deterioration:_____
Notes:_____

☒ Trashrack [None] Opening Size:_____ (adequate, too small, too large) 2'1"x2'1" (outside) ☐ ☐ ☒ ☐
Type: (metal bars, fence, screen, concrete, baffle, other): ~6" opening + 7" openings
Deterioration: (broken bars, missing sections, rusted, collapsed)_____
Notes: Collects debris

☒ ***INLET OBSTRUCTION*** [no problem, could not inspect thoroughly]

☒ Debris: (leaves, trash, logs, branches, ice) ☐ ☐ ☒ ☐
☐ Trees: Quantity: (<5, sparse, dense) ☐ ☐ ☐ ☐
Diameter: (<6", 6-12", >12")
Location: (entire inlet, lt side, rt side, middle, see dwg)
Notes:

☐ Brush: Quantity: (sparse, dense) ☒ ☐ ☐ ☐
Location: (entire inlet, lt side, rt side, middle, see dwg)
Notes:

☒ Other:(beaver activity, trashrack opening too small, partially/completely blocked, i.e.) ☐ ☒ ☐ ☐
beaver activity - observed beaver, soft sediment around P-spillway up to 2 ft.
Notes:

☒ ***INLET MATERIALS*** [no problem, could not inspect thoroughly]

☐ Metal
(loss of coating/paint, surface rust, corrosion (pitting, scaling), rusted out, pipe deformation) ☐ ☐ ☐ ☐
Dimensions:_____
Location:_____
Notes/Causes:_____

☒ Concrete
(bug holes, hairline crack, efflorescence) ☒ ☐ ☐ ☐
(spalling, popouts, honeycombing, scaling, craze/map cracks) ☒ ☐ ☐ ☐
(isolated crack, exposed rebar, disintegration, other) ☒ ☐ ☐ ☐
Dimensions/Location:_____
Notes/Causes:_____

(bug holes, hairline crack, efflorescence) ☐ ☐ ☐ ☐
(spalling, popouts, honeycombing, scaling, craze/map cracks) ☐ ☐ ☐ ☐
(isolated crack, exposed rebar, disintegration, other) ☐ ☐ ☐ ☐
Dimensions/Location:_____
Notes/Causes:_____

☒ Plastic
(deterioration, cracking, deformation) ☒ ☐ ☐ ☐
Dimensions:_____
Location:_____
Notes/Causes: 12" pipe going out ~2'3" from top of spillway
EDG concurs with ODNRs length measured

{Upstream Slope, Crest, Downstream Slope, Seepage, **Principal Spillway-Inlet**, Emergency Spillway, Lake Drain}

Required Action: None | Monitor | Maintenance | Engineer

Required Action

None Monitor Maintenance Engineer

☐ Earthen

☐ Ground Cover: Type: (grass, crown vetch) Other: ☐ ☐ ☐ ☐

Quantity: (bare, sparse, adequate, dense)

Appearance: (too tall, too short, good)

Notes:

☐ Erosion: (wave, surface runoff) ☐ ☐ ☐ ☐

Description (height/depth/length/etc):

Notes:

☐ Ruts: ☐ ☐ ☐ ☐

Location: (entire inlet, lt side, rt side, middle, see dwg)

Depth: Width: Length:

Notes/Causes: (truck/auto, motorcycle, ATV, animals, pedestrian):

☐ Riprap: Average Diameter: ☐ ☐ ☐ ☐

(adequate, sparse, displaced, weathered, vegetation) (bedding/fabric noted - yes, no)

Notes:

☐ Rock-Cut (weathered, erosion) ☐ ☐ ☐ ☐

Description:

Notes:

☐ Other: ☐ ☐ ☐ ☐

☐ ***OTHER INLET PROBLEMS*** [no problem, could not inspect thoroughly]

☐ Mis-Alignment:(pipe, chute, sidewall, headwall) ☐ Pipe Deformation ☐ ☐ ☐ ☐

Location/Description:

Notes/Causes:

☐ Separated Joint ☐ Loss of Joint Material ☐ ☐ ☐ ☐

Location/Description:

Notes/Causes:

☐ Undermining: ☐ ☐ ☐ ☐

Location/Description:

Notes/Causes:

☐ Other: no camera/video inspection of conduit was performed ☐ ☐ ☐ ☐

☐ ***OPEN CHANNEL CONTROL SECTION*** [no problem, could not inspect] **Width** (est., ms.) **Brdth** (est., ms.)

Notes: ☐ ☐ ☐ ☐

☐ ***OUTLET OBSTRUCTION*** [no problem, could not inspect thoroughly]

☐ Debris: (leaves, trash, logs, branches, ice) ☒ ☐ ☐ ☐

☐ Trees: Quantity: (<5, sparse, dense) ☒ ☐ ☐ ☐

Diameter: (<6", 6-12", >12")

Location: (entire outlet, lt side, rt side, middle, see dwg)

Notes:

☐ Brush: Quantity: (sparse, dense) ☒ ☐ ☐ ☐

Location:(entire outlet, lt side, rt side, middle, see dwg)

Notes:

Required Action

☐ Other:(beaver activity, partially/completely blocked, i.e.) ☒ ☐ ☐ ☐

Notes:

None Monitor Maintenance Engineer

{Upstream Slope, Crest, Downstream Slope, Seepage, **Principal Spillway-Inlet/Outlet**, Emergency Spillway, Lake Drain}

Required Action

None Monitor Maintenance Engineer

☒ ***OUTLET MATERIALS*** [no problem, could not inspect thoroughly]

☐ Metal (loss of coating/paint, surface rust, corrosion (pitting, scaling), rusted out, pipe deformation)
Dimensions:
Location:
Notes/Causes:

☐ Concrete
(bug holes, hairline crack, efflorescence)
(spalling, popouts, honeycombing, scaling, craze/map cracks)
(isolated crack, exposed rebar, disintegration, other)
Dimensions/Location:
Notes/Causes:

(bug holes, hairline crack, efflorescence)
(spalling, popouts, honeycombing, scaling, craze/map cracks)
(isolated crack, exposed rebar, disintegration, other)
Dimensions/Location:
Notes/Causes:

☒ Plastic (deterioration, cracking, deformation)
Dimensions:
Location:
Notes/Causes:

☒ Earthen
☐ Ground Cover: Type: (grass, crown vetch) Other:
Quantity: (bare, sparse, adequate, dense)
Appearance: (too tall, too short, good)
Notes:

☐ Erosion: (other, surface runoff)
Description (width/depth/length/etc):
Notes:

☐ Ruts:
Location: (entire inlet, lt side, rt side, middle, see dwg)
Depth: Width: Length:
Notes/Causes: (truck/auto, motorcycle, ATV, animals, pedestrian):

☐ Riprap: Average Diameter:
(adequate, sparse, displaced, weathered, vegetation) (bedding/fabric noted - yes, no)
Notes:

☐ Rock-Cut (weathered, erosion)
Description/Notes:

☐ Other:

☐ ***OTHER OUTLET PROBLEMS*** [no problem, could not inspect thoroughly]

☐ Mis-Alignment:(pipe, chute, sidewall, headwall) ☐ Pipe Deformation
Location/Description:
Notes/Causes:

None Monitor Maintenance Engineer

☐ Separated Joint ☐ Loss of Joint Material
Location/Description:
Notes/Causes:

☐ Undermining:
Location/Description:
Notes/Causes:

☐ Other:

{Upstream Slope, Crest, Downstream Slope, Seepage, **Principal Spillway-Outlet**, Emergency Spillway, Lake Drain}

Required Action

Required Action

None Monitor Maintenance Engineer

OUTLET EROSION CONTROL STRUCTURE (Stilling Basins) not applicable

☐ None ☐ ☐ ☐ ☐

☐ (endwall/headwall, plunge pool, impact basin, flip bucket, USBR, baffled chute, rock lined channel) ☐ ☐ ☐ ☐

Notes:

Components (baffle blocks, chute blocks, endsill)

☐ ***MATERIAL*** [no problem, could not inspect thoroughly]

☐ Riprap: Average Diameter: ☐ ☐ ☐ ☐

(adequate, sparse, displaced, weathered, vegetation) (bedding/fabric noted - yes, no)

Notes:

☐ Concrete

(bug holes, hairline crack, efflorescence) ☐ ☐ ☐ ☐

(spalling, popouts, honeycombing, scaling, craze/map cracks) ☐ ☐ ☐ ☐

(isolated crack, exposed rebar, disintegration, other) ☐ ☐ ☐ ☐

Dimensions/Location:

Notes/Causes:

(bug holes, hairline crack, efflorescence) ☐ ☐ ☐ ☐

(spalling, popouts, honeycombing, scaling, craze/map cracks) ☐ ☐ ☐ ☐

(isolated crack, exposed rebar, disintegration, other) ☐ ☐ ☐ ☐

Dimensions/Location:

Notes/Causes:

☐ ***OTHER*** [no problem, could not inspect thoroughly] ☐ ☐ ☐ ☐

☐ Mis-Alignment:(sidewall, headwall, entire struct.)

Location:

Description:

Notes/Causes:

☐ Separated Joint ☐ Loss of Joint Material ☐ ☐ ☐ ☐

Location:

Description:

Notes/Causes:

☐ Undermining: ☐ ☐ ☐ ☐

Location:

Description:

Notes/Causes:

☐ Other: ☐ ☐ ☐ ☐

☐ ***DRAINS*** [none, none found, no problem, could not inspect thoroughly] (See ***SEEPAGE*** Section for Toe Drains & Relief Wells)

Type: ☐ Weep Holes ☐ Relief Drains ☐ Other: ☐ ☐ ☐ ☐

Flow Rate: Size: Number:

Location:

Notes:

Type: ☐ Weep Holes ☐ Relief Drains ☐ Other: ☐ ☐ ☐ ☐

Flow Rate: Size: Number:

Location:

Notes:

None Monitor Maintenance Engineer

Required Action

EMERGENCY SPILLWAY

Required Action: None | Monitor | Maint. | Engineer

☐ None Found ☐ ☐ ☐ ☐

☐ ***GENERAL INLET*** [no problem, could not inspect thoroughly]

☐ Anti-Vortex Plate [None] Dimensions:_____ (adequate, too small,) ☐ ☐ ☐ ☐

Type: (steel, concrete, aluminum, stainless steel, corrugated metal wood, other):_____

Deterioration: (missing sections, rusted, collapsed)_____

Notes:_____

☐ Flash Boards [None] ☐ ☐ ☐ ☐

Type: (metal, wood):_____

Deterioration:_____

Notes:_____

☐ Trashrack [None] Opening Size:_____ (adequate, too small, too large) ☐ ☐ ☐ ☐

Type: (metal bars, fence, screen, concrete, baffle, other):_____

Deterioration: (broken bars, missing sections, rusted, collapsed)_____

Notes:_____

☐ ***INLET OBSTRUCTION*** [no problem, could not inspect thoroughly]

☒ Debris: (leaves, trash, logs, branches, ice)_____ ☐ ☐ ☒ ☐

☒ Trees: Quantity: (<5, sparse, dense)_____ ☐ ☐ ☒ ☐

Diameter: (<6", 6-12", >12")

Location: (entire inlet, lt side, rt side, middle, see dwg)

Notes:

☒ Brush: Quantity: (sparse, dense)_____ ☐ ☐ ☒ ☐

Location: (entire inlet, lt side, rt side, middle, see dwg)

Notes:

☐ Other:(beaver activity, trashrack opening too small, partially/completely blocked, i.e.)_____ ☐ ☐ ☐ ☐

Notes:

☐ ***INLET MATERIALS*** [no problem, could not inspect thoroughly]

☐ Metal

(loss of coating/paint, surface rust, corrosion (pitting, scaling), rusted out, pipe deformation)_____ ☐ ☐ ☐ ☐

Dimensions/Location:_____

Notes/Causes:_____

☐ Concrete

(bug holes, hairline crack, efflorescence)_____ ☐ ☐ ☐ ☐

(spalling, popouts, honeycombing, scaling, craze/map cracks) ☐ ☐ ☐ ☐

(isolated crack, exposed rebar, disintegration, other) ☐ ☐ ☐ ☐

Dimensions/Location:_____

Notes/Causes:_____

(bug holes, hairline crack, efflorescence)_____ ☐ ☐ ☐ ☐

(spalling, popouts, honeycombing, scaling, craze/map cracks) ☐ ☐ ☐ ☐

(isolated crack, exposed rebar, disintegration, other) ☐ ☐ ☐ ☐

Dimensions/Location:_____

Notes/Causes:_____

☐ Plastic ☐ ☐ ☐ ☐

(deterioration, cracking, deformation)_____

Dimensions/Location:_____

Notes/Causes:_____

None | Monitor | Maintenance | Engineer
Required Action

Required Action

None Monitor Maintenance Engineer

☒ Earthen
- ☐ Ground Cover: Type: (grass, crown vetch) Other: ☐ ☐ ☐ ☐
  - Quantity: (bare, sparse, adequate, dense)
  - Appearance: (too tall, too short, good)
  - Notes:
- ☐ Erosion: (wave, surface runoff) ☐ ☐ ☐ ☐
  - Description (height/depth/length/etc):
  - Notes:
- ☐ Ruts: ☐ ☐ ☐ ☐
  - Location: (entire inlet, lt side, rt side, middle, see dwg)
  - Depth: Width: Length:
  - Notes/Causes: (truck/auto, motorcycle, ATV, animals, pedestrian):
- ☐ Riprap: Average Diameter: ☐ ☐ ☐ ☐
  - (adequate, sparse, displaced, weathered, vegetation) (bedding/fabric noted - yes, no)
  - Notes:
- ☐ Rock-Cut (weathered, erosion) ☐ ☐ ☐ ☐
  - Description:
  - Notes:
- ☒ Other: activates too frequently per modeling results ☐ ☐ ☐ ☒

☐ ***OTHER INLET PROBLEMS*** [no problem, could not inspect thoroughly]
- ☐ Mis-Alignment:(channel, chute, sidewall, headwall) ☐ Pipe Deformation ☐ ☐ ☐ ☐
  - Location/Description:
  - Notes/Causes:
- ☐ Separated Joint ☐ Loss of Joint Material ☐ ☐ ☐ ☐
  - Location/Description:
  - Notes/Causes:
- ☐ Undermining: ☐ ☐ ☐ ☐
  - Location/Description:
  - Notes/Causes:
- ☐ Other: ☐ ☐ ☐ ☐

☐ ***OPEN CHANNEL CONTROL SECTION*** [no problem, could not inspect] **Width** 7'-74' (est. ms.) **Brdth** 20' (est. ms.)
Notes: two stage open channel surveyed portion of cross section ☐ ☐ ☐ ☒

☐ ***OUTLET OBSTRUCTION*** [no problem, could not inspect thoroughly]
- ☒ Debris: (leaves, trash, logs, branches, ice) ☐ ☐ ☒ ☐
- ☒ Trees: Quantity: (<5, sparse, dense) ☐ ☐ ☒ ☐
  - Diameter: (<6", 6-12", >12")
  - Location: (entire outlet, lt side, rt side, middle, see dwg)
  - Notes:
- ☒ Brush: Quantity: (sparse, dense) ☐ ☐ ☒ ☐
  - Location: (entire outlet, lt side, rt side, middle, see dwg)
  - Notes:

Required Action

- ☐ Other:(beaver activity, partially/completely blocked, i.e.) ☐ ☐ ☐ ☐
  - Notes:

None Monitor Maintenance Engineer

{Upstream Slope, Crest, Downstream Slope, Seepage, Principal Spillway, **Emergency Spillway-Inlet/Outlet**, Lake Drain}

Required Action — None | Monitor | Maint. | Engineer

☐ ***OUTLET MATERIALS*** [no problem, could not inspect thoroughly]

☐ Metal (loss of coating/paint, surface rust, corrosion (pitting, scaling), rusted out, pipe deformation)
Dimensions:
Location:
Notes/Causes:

☐ Concrete (bug holes, hairline crack, efflorescence)
(spalling, popouts, honeycombing, scaling, craze/map cracks)
(isolated crack, exposed rebar, disintegration, other)
Dimensions/Location:
Notes/Causes:

(bug holes, hairline crack, efflorescence)
(spalling, popouts, honeycombing, scaling, craze/map cracks)
(isolated crack, exposed rebar, disintegration, other)
Dimensions/Location:
Notes/Causes:

☐ Plastic (deterioration, cracking, deformation)
Dimensions:
Location:
Notes/Causes:

☒ Earthen
☒ Ground Cover: Type: (grass, crown vetch) Other: none
Quantity: (bare) sparse, adequate, dense)
Appearance: (too tall, too short, good)
Notes:

☐ Erosion: (other, surface runoff)
Description (width/depth/length/etc):
Notes:

☐ Ruts:
Location: (entire inlet, lt side, rt side, middle, see dwg)
Depth: Width: Length:
Notes/Causes: (truck/auto, motorcycle, ATV, animals, pedestrian):

☐ Riprap: Average Diameter:
(adequate, sparse, displaced, weathered, vegetation) (bedding/fabric noted - yes, no)
Notes:

☐ Rock-Cut (weathered, erosion)
Description:
Notes:

☐ Other:

☐ ***OTHER OUTLET PROBLEMS*** [no problem, could not inspect thoroughly]

☐ Mis-Alignment:(channel, chute, sidewall, headwall) ☐ Pipe Deformation
Location/Description:
Notes/Causes:

Required Action — None | Monitor | Maintenance | Engineer

☐ Separated Joint ☐ Loss of Joint Material
Location/Description:
Notes/Causes:

☐ Undermining:
Location/Description:
Notes/Causes:

☐ Other:

{Upstream Slope, Crest, Downstream Slope, Seepage, Principal Spillway, **Emergency Spillway-Outlet**, Lake Drain}

Required Action — None | Monitor | Maintenance | Engineer

Required Action

None Monitor Maint. Engineer

OUTLET EROSION CONTROL STRUCTURE (Stilling Basins) not applicable ☐ ☐ ☐ ☐

☐ None ☐ ☐ ☐ ☐

☐ (endwall/headwall, plunge pool, impact basin, flip bucket, USBR, baffled chute, rock lined channel)

Notes:

Components (baffle blocks, chute blocks, endsill)

☐ ***MATERIAL*** [no problem, could not inspect thoroughly]

☐ Riprap: Average Diameter: ☐ ☐ ☐ ☐

(adequate, sparse, displaced, weathered, vegetation) (bedding/fabric noted - yes, no)

Notes:

☐ Concrete

(bug holes, hairline crack, efflorescence) ☐ ☐ ☐ ☐

(spalling, popouts, honeycombing, scaling, craze/map cracks) ☐ ☐ ☐ ☐

(isolated crack, exposed rebar, disintegration, other) ☐ ☐ ☐ ☐

Dimensions/Location:

Notes/Causes:

(bug holes, hairline crack, efflorescence) ☐ ☐ ☐ ☐

(spalling, popouts, honeycombing, scaling, craze/map cracks) ☐ ☐ ☐ ☐

(isolated crack, exposed rebar, disintegration, other) ☐ ☐ ☐ ☐

Dimensions/Location:

Notes/Causes:

☐ ***OTHER*** [no problem, could not inspect thoroughly] ☐ ☐ ☐ ☐

☐ Mis-Alignment:(sidewall, headwall)

Location:

Description:

Notes/Causes:

☐ Separated Joint ☐ Loss of Joint Material ☐ ☐ ☐ ☐

Location:

Description:

Notes/Causes:

☐ Undermining: ☐ ☐ ☐ ☐

Location:

Description:

Notes/Causes:

☐ Other: ☐ ☐ ☐ ☐

☐ ***DRAINS*** [none, none found, no problem, could not inspect thoroughly] (See ***SEEPAGE*** Section for Toe Drains & Relief Wells)

Type: ☐ Weep Holes ☐ Relief Drains ☐ Other: ☐ ☐ ☐ ☐

Flow Rate: Size: Number:

Location:

Notes:

Type: ☐ Weep Holes ☐ Relief Drains ☐ Other: ☐ ☐ ☐ ☐

Flow Rate: Size: Number:

Location:

Notes:

None Monitor Maintenance Engineer

Required Action

{Upstream Slope, Crest, Downstream Slope, Seepage, Principal Spillway, **Emergency Spillway-Outlet Erosion Control Structure**, Lake Drain}

LAKE DRAIN

Required Action: None | Monitor | Maint. | Engineer

☐ ***GENERAL***

☒ None Found ☒ Does not have one — ☐ ☐ ☐ ☒

☐ Type of Lake Drain (isolated control/intake tower, valve vault w/ outlet conduit, valve in riser/drop inlet, siphon) — ☐ ☐ ☐ ☐

Notes:

☐ Operated During Inspection (yes, no) — ☐ ☐ ☐ ☐

Notes:

☐ ***ACCESS TO VALVE/SLUICE GATE*** [no problem, could not inspect thoroughly] — ☐ ☐ ☐ ☐

☐ Type (not accessible, from shore, boat, walkway, other)

Notes:

☐ Walkway/Platform:

☐ Concrete Deterioration ☐ Cracks (platform, piers, end supports, railing) — ☐ ☐ ☐ ☐

Location:

Notes:

☐ Wood Deterioration — ☐ ☐ ☐ ☐

Notes:

☐ Metal Deterioration — ☐ ☐ ☐ ☐

(minor, moderate, extensive, other)

Notes:

☐ ***LAKE DRAIN COMPONENTS*** [no problem, could not inspect thoroughly]

☐ Concrete Structure — ☐ ☐ ☐ ☐

Location:

Description: (deterioration, misalignment, cracks):

Notes/Causes:

☐ Valve Control (Operating Device)

☐ No Operating Device ☐ No Stem ☐ Bent/Broken Stem ☐ Other — ☐ ☐ ☐ ☐

Notes/Operability:

☐ Valve / Sluice Gate — ☐ ☐ ☐ ☐

☐ Metal Deterioration: (surface rust, minor, moderate, extensive, other)

Location:

Flow Rate:

Notes/Causes:

☐ Misalignment — ☐ ☐ ☐ ☐

Notes/Causes:

☐ Leakage - Flow Rate: — ☐ ☐ ☐ ☐

Notes/Causes:

☐ Valve / Sluice Gate — ☐ ☐ ☐ ☐

☐ Metal Deterioration: (surface rust, minor, moderate, extensive, other)

Location:

Flow Rate:

Notes/Causes:

☐ Misalignment **-** Notes/Causes: — ☐ ☐ ☐ ☐

☐ Leakage - Flow Rate: — ☐ ☐ ☐ ☐

Notes/Causes:

Required Action: None | Monitor | Maintenance | Engineer

Required Action

None Monitor Maintenance Engineer

☐ Outlet Conduit

☐ Metal:(loss of coating/paint, surface rust, corrosion (pitting, scaling), rusted out) ☐ ☐ ☐ ☐

Location:

Notes/Causes:

☐ Concrete (bug holes, hairline crack, efflorescence) ☐ ☐ ☐ ☐

(spalling, popouts, honeycombing, scaling, craze/map cracks) ☐ ☐ ☐ ☐

(isolated crack, exposed rebar, disintegration, other) ☐ ☐ ☐ ☐

Dimensions/Location:

Notes/Causes:

☐ Plastic:(deterioration, cracking) ☐ ☐ ☐ ☐

Location:

Notes/Causes:

☐ Conduit Deformation ☐ Mis-Alignment: ☐ ☐ ☐ ☐

Location:

Notes/Causes:

☐ Separated Joint ☐ Loss of Joint Material ☐ ☐ ☐ ☐

Location/Description:

Notes/Causes:

☐ Undermining: ☐ ☐ ☐ ☐

Location/Description:

Notes/Causes:

☐ Vegetation (trees, brush) ☐ ☐ ☐ ☐

Notes:

☐ Other: ☐ ☐ ☐ ☐

Notes:

☐ Energy Dissipator

☐ Type (endwall, plunge pool, impact basin, stilling basin, rock-lined channel, none) ☐ ☐ ☐ ☐

Notes:

☐ Riprap: Average Diameter: ☐ ☐ ☐ ☐

(adequate, sparse, displaced, weathered, vegetation) (bedding/fabric noted - yes, no))

Notes:

☐ Concrete (bug holes, hairline crack, efflorescence) ☐ ☐ ☐ ☐

(spalling, popouts, honeycombing, scaling, craze/map cracks) ☐ ☐ ☐ ☐

(isolated crack, exposed rebar, disintegration, other) ☐ ☐ ☐ ☐

Dimensions/Location:

Notes/Causes:

☐ Mis-Alignment: ☐ ☐ ☐ ☐

Location/Description:

Notes/Causes:

☐ Separated Joint ☐ Loss of Joint Material ☐ ☐ ☐ ☐

Location/Description:

Notes/Causes:

☐ Undermining: ☐ ☐ ☐ ☐

Location/Description:

Notes/Causes:

Required Action

☐ Other: ☐ ☐ ☐ ☐

Notes:

None Monitor Maintenance Engineer

Appendix C

Potential Downstream Hazards

LEGEND

Parcel Line

Pipe

Open Channel

PS Pipe

0 125 250 500 750 1,000 Feet

CAMP SPELMAN LAKE DAM
PORTAGE COUNTY, OHIO

DAM ASSESSMENT
POTENTIAL DOWNSTREAM HAZARDS

Notes:
1) Parcels obtained from Portage County GIS.

2) 2017 aerial from OSIP.

3) Properties at risk based on engineering judgement and are subject to increase/decreased based up dam breach inundation study results.

Drawn By: Andy Long
Date: 9/7/2021

DAM CLASSIFICATION CHECKLIST

Name of Dam: Camp Spelman Lake Dam **File Number:** 1112-071 **Permit Number:** _____

County: Portage **Date:** 5-29-2019 **Engineer:** KP & AL

HEIGHT

Hei ht of dam as measured = 22.9 feet

- ☐ >60' - Class I
- ☐ >40' - Class II
- ☐ >25' - Class III
- ☒ ≤25' - Class IV

STORAGE

Stora e volume at top of dam = 166 acre-feet

- ☐ >5000 acre-feet - Class I
- ☐ > 500 acre-feet - Class II
- ☒ > 50 acre-feet - Class III
- ☐ ≤ 50 acre-feet - Class IV

EXEMPT

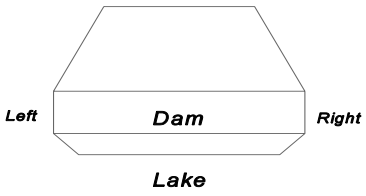
- ☐ Hei ht ≤ 6 feet
- ☐ Stora e ≤ 15 acre-feet
- ☐ 6 feet < Hei ht < 10 feet & Volume < 50 acre-feet

POTENTIAL DOWNSTREAM HAZARD

I	II				III		IV	X			
Loss of human life (plausible circumstances envisioned to cause loss of life)	A possible health hazard (loss of public water, wastewater treatment facility)	Loss of high-value property (flooding of homes & business, damage to Class I, II & III dams)	Damage to interstates & state routes and only access to homes/critical facilities	Damage to railroads or public utilities	Damage rural bldgs. & not otherwise high-valued property, Class IV dams/levees	Damage to local roads (county & township)	Losses restricted mainly to the dam and agricultural/rural	No hazard to structure noted	Distance downstream from dam to affected structure (feet)	Vertical distance from streambed to base of affected structure (feet)	Horizontal distance from stream to affected structure (feet)
A											
						B					
C											

Sketch in Developments Downstream of Dam

SEE MAP, APPENDIX C



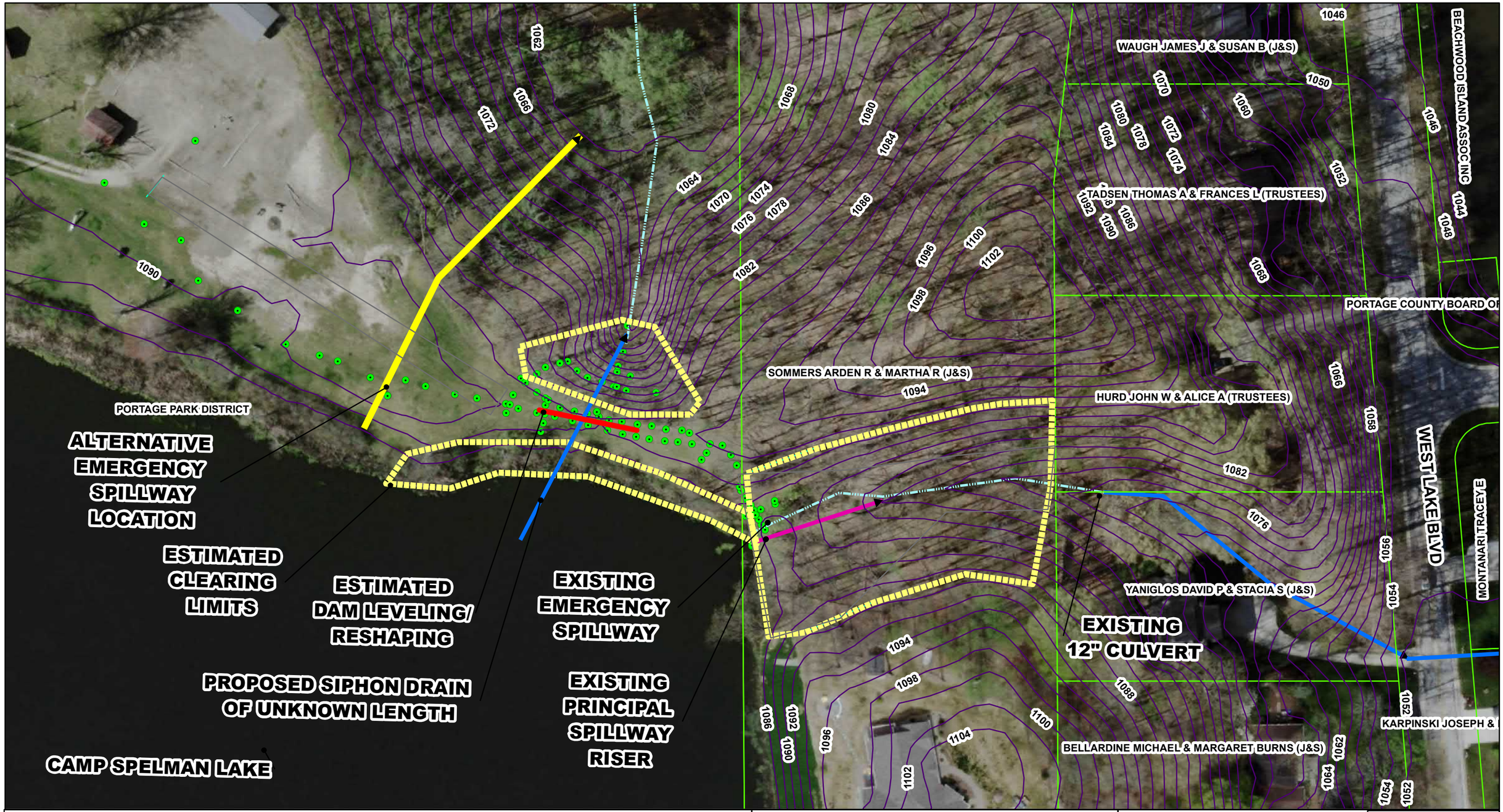
Estimated Population at Risk at least 1

Hei ht Class IV Stora e Class III Hazard Class I

Final Class: Exempt (I) II III IV circle one Class Chan ed Yes, No

Appendix D

Repairs for Compliance



LEGEND

- 2016 County Topo
- Open Channel
- Parcel Line
- Pipe
- PS Pipe

0 25 50 100 150 200 Feet

CAMP SPELMAN LAKE DAM
PORTAGE COUNTY, OHIO

DAM ASSESSMENT COMPLIANCE REPAIRS

Notes:
1) 2016 contours obtained from Portage County GIS.

2) 2017 aerial from OSIP.

Drawn By: Andy Long
Date: 8/31/2021