EMERGENCY ACTION PLAN
FOR PETIT LAKE DAM
STATE ID NO. 112-009-00462;
NID NO. GA00685
Revision 3

PETIT LAKE – BIG CANOE
PICKENS COUNTY, GEORGIA

Submitted to

BIG CANOE PROPERTY OWNER'S ASSOCIATION

10586 Big Canoe

Jasper, Georgia 30143

Submitted by

Geosyntec consultants
engineers | scientists | innovators

May 2018

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1. INTRODUCTION

1.1 Statement of Purpose

The purpose of the Emergency Action Plan (EAP) is to establish procedures for warning, evacuating and protecting persons and property which would be endangered in the event of a failure of the Petit Lake Dam, in Big Canoe, Georgia, as well as taking timely action to notify the appropriate emergency management agencies, law enforcement bodies, and/or governing officials of possible, impending, or actual failure of the dam.

1.2 History of Document

The EAP for Petit Lake Dam was originally created and revised by another consultant (Jordan, Jones, and Goulding) in 1998 and 2007, respectively. A summary of known dates of revision of this EAP is provided in Appendix E and future revisions and modifications should be added to this table.

This EAP was revised by Geosyntec Consultants, Inc. (Geosyntec), and relies upon information and analyses developed by others as identified in the Plan. Geosyntec has developed this plan in good faith for use by the Big Canoe Property Owner's Association (POA) and the Emergency Management Agencies responsible for Petit Lake Dam. This plan may not be relied upon by other parties and may not be modified without the express written permission of Geosyntec.

Geosyntec updated the EAP for Petit Lake Dam based on guidance from the Georgia Safe Dams Program document *Engineer Guidelines* (2015), and templates referred to in *Engineer Guidelines* created by the North Carolina Department of Environmental Quality (2016) and the Association of State Dam Safety Officials (2010).

The inundation mapping and calculations provided in Appendix B were original created by Jordan, Jones, and Goulding and have not been updated by Geosyntec. The Figures provided of inundation maps and Big Canoe property parcels, and the names and addresses provided in Tables 1 and 2 were provided by Big Canoe. The property parcels and addresses for properties downstream of Big Canoe in Table 3 were provided by the Pickens County Emergency Management Agency (EMA).

2. NOTIFICATION FLOWCHART

The Notification Flowcharts (Figure 1 and 2) summarize the following information which is applicable during an impending or imminent failure of the Petit Lake Dam:

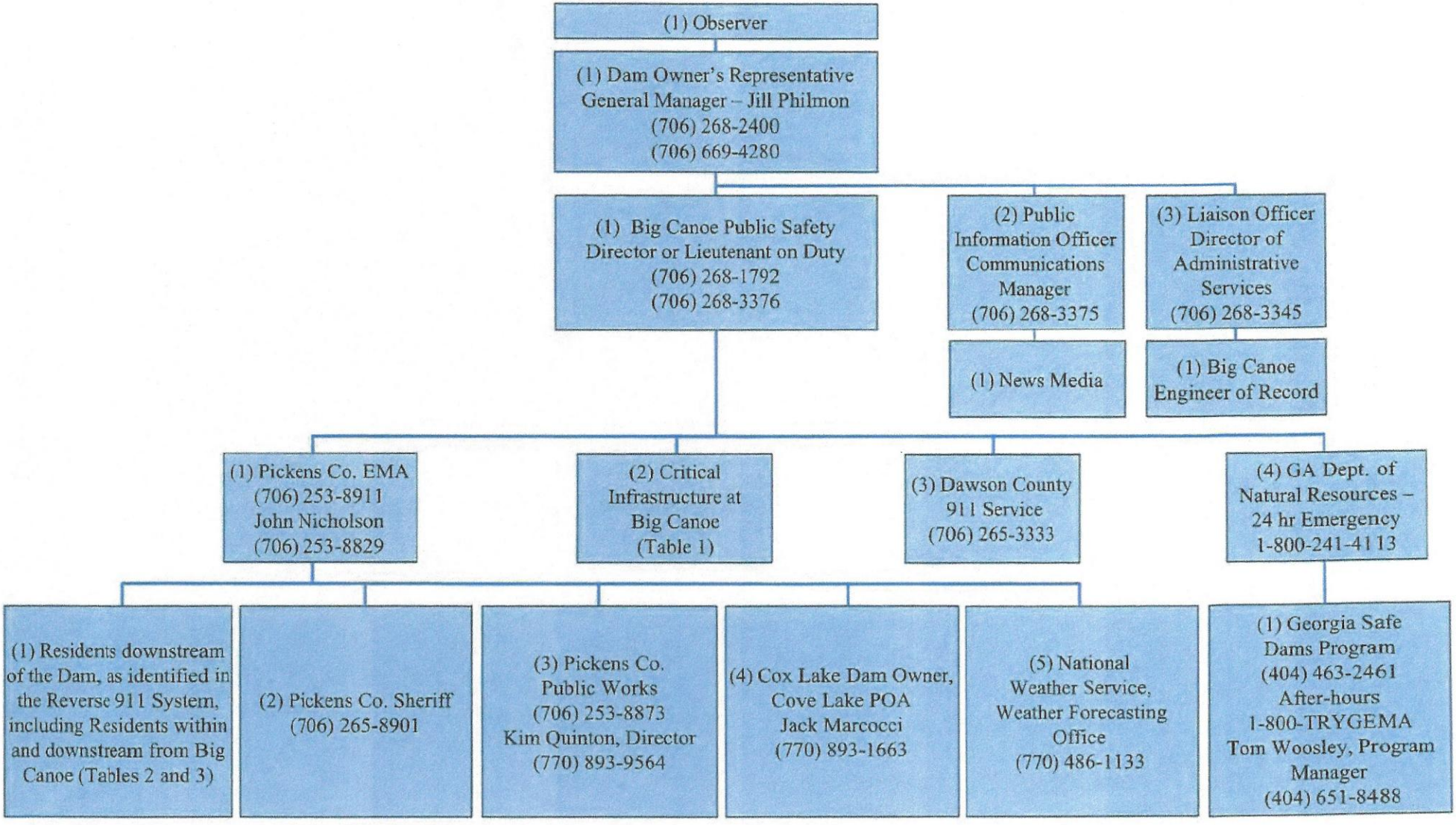
- Who is responsible for notifying Petit Lake Dam owner representative(s) and/or emergency management official(s);
- Who is to be notified; and
- What is the priority order in which individuals are to be notified.

All residents and employees of Big Canoe can and should be observers of unusual events at Petit Lake Dam. This observer group will be educated through the local newsletter regarding what are symptoms of impeding or imminent failure, and who at the POA should be contacted to initiate the Notification Process.

The Dam Owner's Representative or his designee is responsible for initiating the Notification Process. The Dam Owner' s Representative or his designee will verify the condition of Petit Lake Dam which the observer has identified and initiate the notification. The Dam Failure Notification Flow Charts (Figures 1 and 2 and Tables 1, 2, and 3) identify the residents, emergency management agencies, government agencies and Big Canoe Property Owners Association that should be contacted immediately and in what order. Subsequent contacts by each of these individuals are shown in priority order.

Figure 1: Petit Lake Dam

Dam Failure Notification Flowchart for Conditions C (Level 1) & B (Level 2) Emergencies

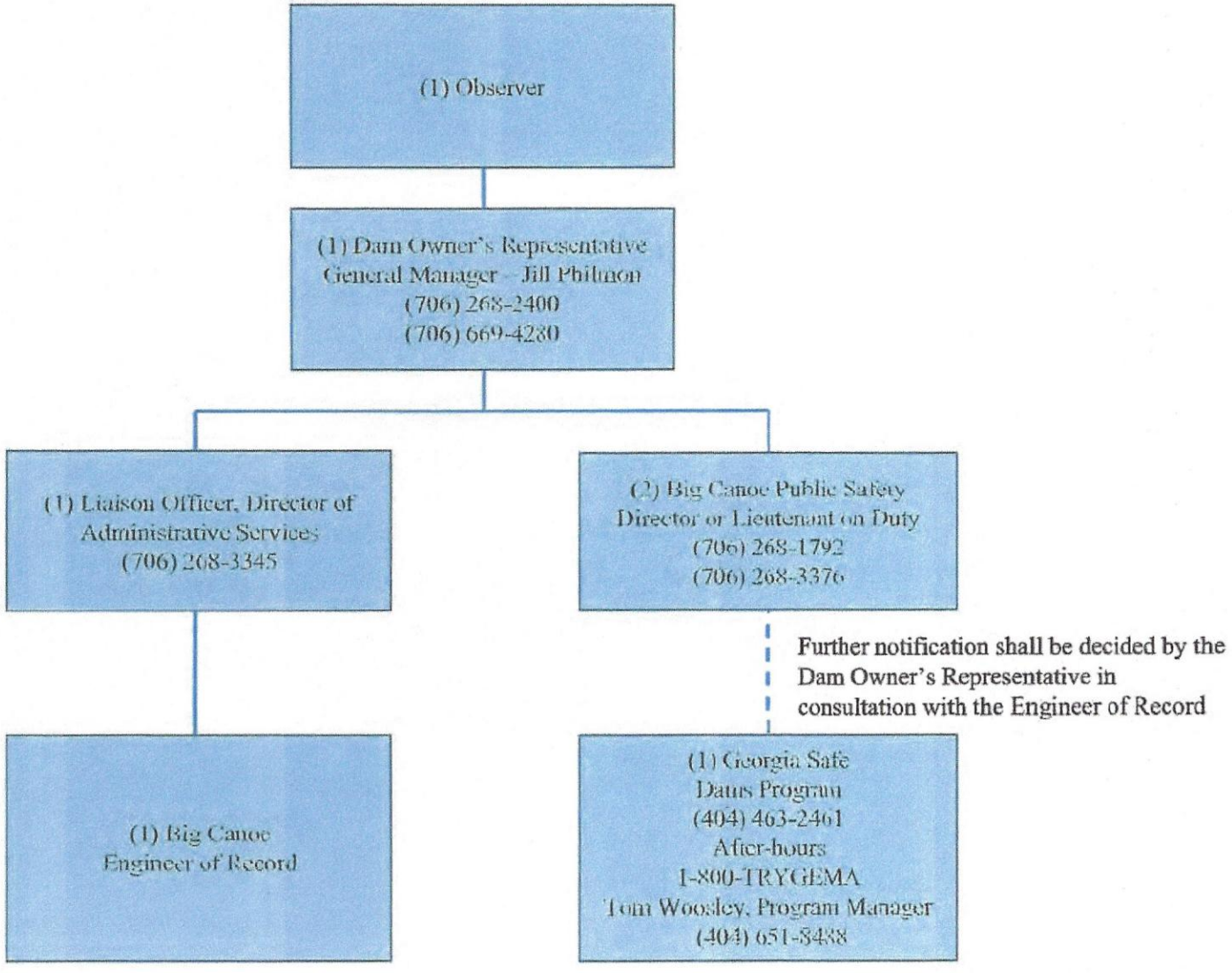


(#) = Order of Priority of Notification

Note: Flowchart and contact information provided by Big Canoe Property Owner's Association on 9, 19 and 19 June 2017.

Figure 2: Petit Lake Dam

Dam Failure Notification Flowchart for Condition A (Level 3) Emergencies



(#) = Order of Priority of Notification

Note: Flowchart and contact information provided by Big Canoe Property Owner's Association.

TABLE 1[(1)]
DAM FAILURE NOTIFICATION OF BIG CANOE CRITICAL INFRASTRUCTURE JUST BELOW THE DAM

EMERGENCY ACTION PLAN FOR PETIT LAKE DAM
PETIT LAKE DAM, BIG CANOE, GEORGIA

FACILITY	ADDRESS/LOT NUMBER	PHONE NUMBER
Utilities Office	Highland Trail/Wolfscratch Drive	706/268-3400
Swim Club	Wolfscratch Drive	706/268-3317
Fitness Center	Wolfscratch Drive	706/268-3441
Chapel	Wolfscratch Drive	706/268-3203
Tennis Center	Wolfscratch Drive	706/268-3367
IGA Express	Wolfscratch	706/268-3326
Lakewatch Village	Golf Club Drive	706/268-3326
Clubhouse	Golf Club Drive	706/268-3326
Fire Station #3	Wolfscratch Drive	706/268-1792
Duffers	Golf Club Drive	706/268-3273
Golf Shop	Golf Club Drive	706/268-3323
Cart Barn	Golf Club Drive	706/268-3323

Note:

[(1)] Facilities and contact information provided by Big Canoe Property Owner's Association on 26 April 2017 based on Inundation Mapping conducted by Jones, Jordan, and Goulding

TABLE 2[1]
DAM FAILURE NOTIFICATION OF BIG CANOE RESIDENTS AND OTHER FACILITIES

EMERGENCY ACTION PLAN FOR PETIT LAKE DAM
PETIT LAKE DAM, BIG CANOE, GEORGIA

#	Street Name Address	Owner's Name	Email address 1	Email address 2	BC Home Number	Phone Number 1	Phone Number 2	Phone Number 3
2569	Wilderness Parkway	Campbell, Douglas & Shannon	[redacted]					
5888	Wilderness Parkway	Williams, Sally						
87	Tanager Way	Farias, Fran & Phillip						
216	Indigo Bunting Trail	Turner, Jeffrey						
254	Indigo Bunting Trail	Harper, David						
270	Indigo Bunting Trail	Risoldi, Ciro						
288	Indigo Bunting Trail	Honeycutt, Boyce						
289	Indigo Bunting Trail	Lacey, Claude						
255	Indigo Bunting Trail	Rozeboom, Loren						
0	Bluebird Court	Reynolds, David & Patsy						
18	Bluebird Court	Reynolds, David & Patsy						
172	Canada Geese Point	Pepper, Ralph						
230	Canada Geese Point	Ebbeskotte, Carolyn						
205	Canada Geese Point	May, Randy						
121	Goldfinch Point	Perkel, Karen and Ralph						
36	Petit Ridge Drive	Huffstetler, Mark & Rachel						
84	Flycatcher Point	Clough, Gerald & Anne						
190	Swallow Point	Leff, Steven						
181	Swallow Point	Malgeri, Linda						
115	Swallow Point	Arthurs, Lee						
95	Swallow Point	Kelly, David and Laura						
0	Swallow Point	Bradley Family Trust						
18	Thrush Turn	Coleman, William						
56	Thrush Turn	Reisinger, Ralf & Daniela						
74	Thrush Turn	#47 Holding LLC						
40	Holly Point	Young, Alden						
287	Willow Drive	Roberson, Ellen						

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DAM FAILURE NOTIFICATION OF BIG CANOE RESIDENTS AND OTHER FACILITIES

EMERGENCY ACTION PLAN FOR PETIT LAKE DAM
PETIT LAKE DAM, BIG CANOE, GEORGIA

#	Street Name Address	Owner's Name	Email address 1	Email address 2	BC Home Number	Phone Number 1	Phone Number 2	Phone Number 3
135	Chestnut Rise	Collins, Norma	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
135	Chestnut Rise	Abernathy, MaryAnn						
135	Chestnut Rise	Scott, Norman & Jonny						
145	Chestnut Rise	Milles, Purtell						
145	Chestnut Rise	Faust, Richard & Wendy						
145	Chestnut Rise	Moser, Nancy						
145	Chestnut Rise	Ferrini, Joseph						
155	Chestnut Rise	House, Jerry						
155	Chestnut Rise	Eaves, Dennis						
155	Chestnut Rise	Doll, Herman						
20	Sconti Ridge	Manning, Joyce						
20	Sconti Ridge	Parks, William						
20	Sconti Ridge	Collier, Daryl & Linda						
20	Sconti Ridge	Hanson/Shaw						
34	Sconti Ridge	Brown, Donald & MaryAnn						
34	Sconti Ridge	Hayes, Jr., Mark						
34	Sconti Ridge	Young, Shelia						
34	Sconti Ridge	Verell, William & Susan						
48	Sconti Ridge	Wagner, William & Patricia						
48	Sconti Ridge	Sherman, Karen						
48	Sconti Ridge	Hacker & Ramsey						
86	Sconti Ridge	Campbell,Mark						
86	Sconti Ridge	McCann, Debra and Ronald						
86	Sconti Ridge	Captan, Mohamed & Marcia						
86	Sconti Ridge	Wood, Barbara						
116	Sconti Ridge	Mullins, Jr. B.A.						
116	Disharoon	Floyd, Greg						

TABLE 2[0]
DAM FAILURE NOTIFICATION OF BIG CANOE RESIDENTS AND OTHER FACILITIES

EMERGENCY ACTION PLAN FOR PETIT LAKE DAM
PETIT LAKE DAM, BIG CANOE, GEORGIA

#	Street Name Address	Owner's Name	Email address 1	Email address 2	BC Home Number	Phone Number 1	Phone Number 2	Phone Number 3
116	Sconti Ridge	Capone & Rutledge	[redacted]					
140	Sconti Ridge	Riley, Ronald						
40	Treetop Lane	Chait, Susan						
104	Treetop Lane	Paynter, Fredrick						
309	Buckskull Hollow Drive	Brown, Carolyn						
301	Buckskull Hollow Drive	Warren, Claude						
57	Buckskull Hollow Drive	Henil & Brennan						
41	Buckskull Hollow Drive	Dollar, Dari & David						
11	Buckskull Hollow Drive	Bassett, Robert & Jolyne						
22	Buckskull Hollow	McCardel, James & Dora Jean						
26	Buckskull Hollow	Davis, James						
84	Highland Court	Nicholson						
110	Highland Court	Lundstrom						
0	Highland Court	BC LLC						
196	Sconti Knoll Drive	Cody, Gail						
200	Sconti Knoll Drive	Horsley, Rosemarie						
193	Sconti Knoll Drive	Kowalski, George						
191	Sconti Knoll Drive	Tanner, Caroll						
60	Sconti Ridge	Hackney						
86	Sconti Point	Crawford, Howard Wayne						
0	Sconti Point	Rhodus, Gary and Marsha						
0	Sconti Point	Bhold, Adriana						
0	Sconti Point	Bhold, Adriana						
62	Sconti View Drive	Slade, David						
34	Sconti Ct.	Landreth, Porter						
21	Chestnut Knoll Point	Rees, James						
5	Chestnut Knoll Point	Moon, Jacqueline						

TABLE 2[1]
DAM FAILURE NOTIFICATION OF BIG CANOE RESIDENTS AND OTHER FACILITIES

EMERGENCY ACTION PLAN FOR PETIT LAKE DAM
PETIT LAKE DAM, BIG CANOE, GEORGIA

#	Street Name Address	Owner's Name	Email address 1	Email address 2	BC Home Number	Phone Number 1	Phone Number 2	Phone Number 3
7	Chestnut Rise	Bowers, Joanne	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
9	Chestnut Knoll Point	Leardini, Paolo						
11	Chestnut Knoll Point	Gurusamy & Subbannan						
31	Chestnut Knoll	Genone, Terry and Loretta						
41	Chestnut Knoll Point	Nelson, Ronald						
28	Tanager Way	Beraha, Dan & Ellen						
226	Wolfscratch Village Cir.	Chapel						
51	Clubhouse Drive	Apgar, Cindy & Dan						
79	Clubhouse Drive	Fargason, Charles & Gail						
65	Clubhouse Drive	Dubose Calvin Jr. & Mary ann						
1944	Wilderness PKWY	Mcclure, William & Nancy						
	Clubhouse Drive	Bowers-Mcclure, Mark & Joanne						
29	Clubhouse Drive	Bell, Pamela & Kerry						
1944	Wilderness Parkway	Hecht, Bruce and Rosemary						
1944	Wilderness Parkway	Tillery, Roger & Patty						
1944	Wilderness Parkway	Prince,Bruce & Judith						
1944	Wilderness Parkway	Chu, Kathleen and Norman						
1944	Wilderness Parkway	Gregg, Fredrick & Sue						
1944	Wilderness Parkway	Kadechuk, Barry & Linda						
1944	Wilderness Parkway	Delashmutt, R. E.						
1944	Wilderness Parkway	Hyland, Keith and Lauren						
1944	Wilderness Parkway	Lehmberg, Bill & Peggy						
1944	Wilderness Parkway	Zamborsky, Joe and Lis						
1944	Wilderness Parkway	Salcedo, Cesar & Anna						
1944	Wilderness Parkway	Dicus, Patti & Frank						
1944	Wilderness Parkway	Farias, Fran & Phillip						
315	Choctaw Pass	Anne Bopp						

TABLE 2[(1)]
DAM FAILURE NOTIFICATION OF BIG CANOE RESIDENTS AND OTHER FACILITIES

EMERGENCY ACTION PLAN FOR PETIT LAKE DAM
PETIT LAKE DAM, BIG CANOE, GEORGIA

#	Street Name Address	Owner's Name	Email address 1	Email address 2	BC Home Number	Phone Number 1	Phone Number 2	Phone Number 3
333	Choctaw Pass	Auchter, Barbara and Thorne	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
126	Sinti trail	Tiller, Micheal D. & Valerie						
140	Sinti Trail	Albritton, Jeffery						
190	Sinti trail	Fellows, Henry & Pamela						
204	Sinti trail	Heller, Steve & Carol						
220	Sinti trail	Morris, William and Margie						
75	Twin Creek Drive	Back, Stephen and Susan						
101	Twin Creek Drive	Psalmond, Phillip and Tami						
115	Twin Creek Drive	Clark, Brandon and Monica						
131	Twin Creek Drive	Boudreau, Bill and Cindy						
151	Twin Creek Drive	Creel, Lynda and Micheal						
185	Twin Creek Drive	Santoro, Ann and Peter						
104	Twin Creek Drive	Willett, Roy & Weslie						
80	Twin Creek Drive	Cetrino, Carol/Piccirillo, Mark						

Note:
(1) Contact information provided by Big Canoe Property Owner's Association on 25 April 2017.

TABLE 3[1]
DAM FAILURE NOTIFICATION OF PROPERTIES DOWNSTREAM OF BIG CANOE

EMERGENCY ACTION PLAN FOR PETIT LAKE DAM
PETIT LAKE DAM, BIG CANOE, GEORGIA

#	Street Name Address	Parcel ID
295	Blackwell Creek Way	049A 064
121	Chastain Court	049 024
59	Clint Court	050 022
916	Cove Lake Drive	049 090 112
976	Cove Lake Drive	049 090 113
968	Cove Lake Drive	049 090 114
903	Cove Lake Drive	049 090 115
141	Cove Lake Drive	049 090 116
779	Cove Lake Drive	049 090 117
661	Cove Lake Drive	049 090 118
543	Cove Lake Drive	049 090 119
112	Cove Lake Drive	049 090 120
459	Cove Lake Drive	049 090 121
391	Cove Lake Drive	049 090 122
351	Cove Lake Drive	049 090 123
303	Cove Lake Drive	049 090 124
249	Cove Lake Drive	049 090 125
8822	Cove Road	049 090
385	Del Moore Road	049 021
11117	Highway 53 East	050 023
10322	Highway 53 East	050 029
100	Hunters Trace	049A 003
1065	Hunters Trace	049A 031
1109	Hunters Trace	049A 032

Note:
[1] Property information provided by the Pickens County EMA on 21 February 2018. Personal names and contact information for residents outside of Big Canoe are not accessible outside of the Pickens County EMA CodeRED system.

TABLE 3[1]
DAM FAILURE NOTIFICATION OF PROPERTIES DOWNSTREAM OF BIG CANOE

EMERGENCY ACTION PLAN FOR PETIT LAKE DAM
PETIT LAKE DAM, BIG CANOE, GEORGIA

#	Street Name Address	Parcel ID
30	Justice Way	049 030
43	Justice Way	049 031 001
16	Limestone Trail	050 028 001
44	MacKenzie Lane	049 089
533	Old Mill White Road	049 013
1493	Old Mill White Road	049 017
1543	Old Mill White Road	049 020
1985	Old Mill White Road	050 026
2192	Old Mill White Road	050 027
2164	Old Mill White Road	050 027 002
40	Overlook Court	049 090 128
27	Overlook Court	049 090 129
520	Partain Road	049 119
638	Partain Road	049 121
54	Pendley Woods Road	049 124
24	Pony Lane	049A 017
584	Redbud Pass	049A 051
451	Redbud Pass	049A 053
874	Sparkling Springs Road	049 019 001 & 049 019 002
189	Timber Creek	049 089 008
87	Trotters Lane	049A 001
125	Trotters Lane	SEWER PLANT

Note:
[1] Property information provided by the Pickens County EMA on 21 February 2018. Personal names and contact information for residents outside of Big Canoe are not accessible outside of the Pickens County EMA CodeRED system.

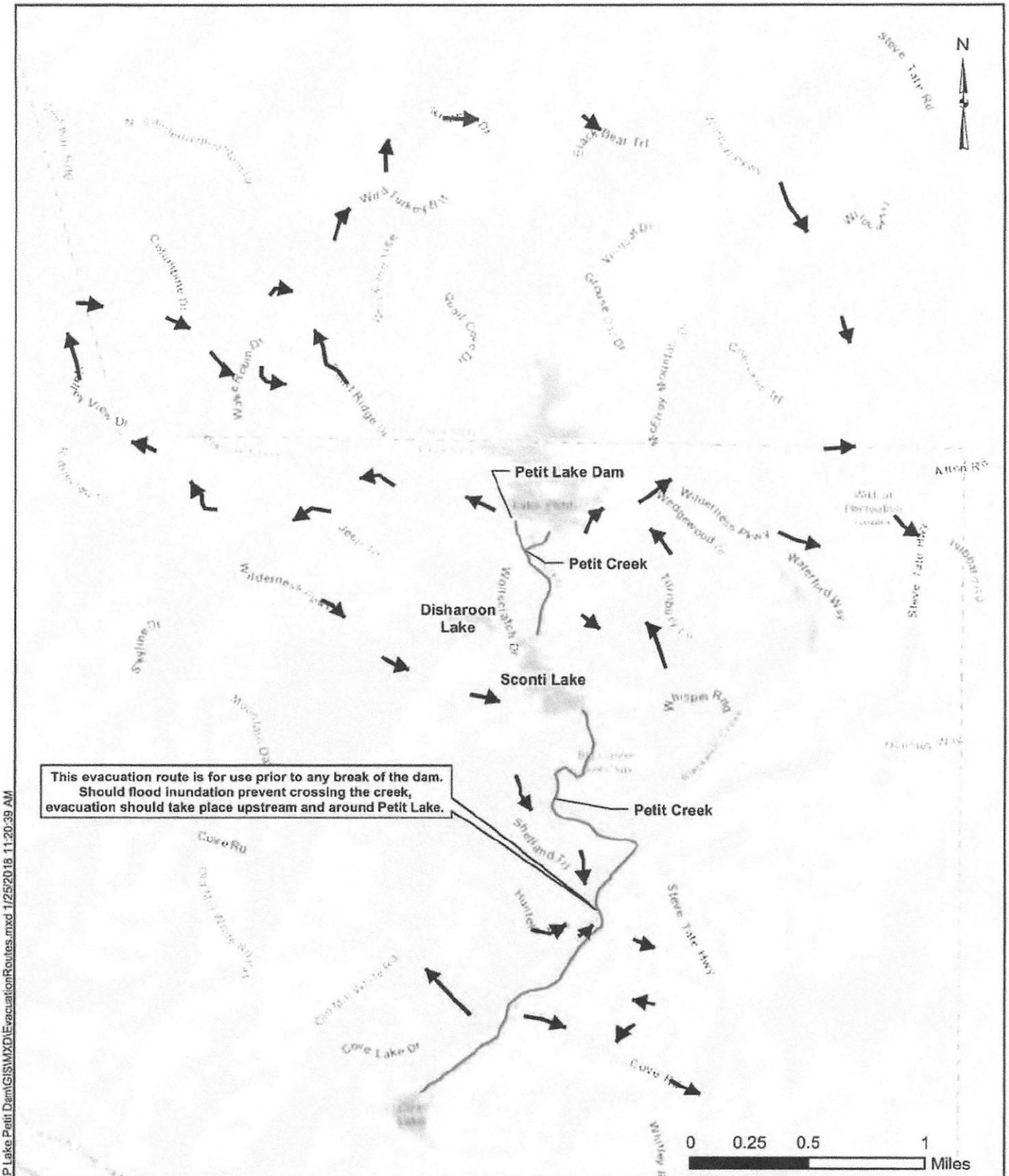
3. PROJECT DESCRIPTION

Petit Lake Dam is located within the Big Canoe Development on Petit Creek about 5.8 miles upstream of Marble Hill, in Pickens County, north central Georgia. The reservoir formed by the dam has a surface area of 104 acres at a normal pool elevation of 1635.0 and extends up Petit Creek approximately 0.70 miles. The total storage for the reservoir is approximately 7,500 ac-ft, according to the Georgia Safe Dams database. The drainage area upstream of Big Canoe Dam is 1.53 square miles. The topography around the dam consists of very steep, wooded, mountainous foothills.

Petit Lake Dam is listed in the Georgia State Safe Dams Program and the National Inventory of Dams under the following identification numbers, respectively: 112-009-00462 and GA00685. The earth dam has a maximum height of 126 feet according to the Georgia Safe Dams database, a length of 880 feet, and a top width of 35 feet. The dam has a 15-foot wide concrete cascading channel spillway on the east side of the earth dam's abutment. The spillway discharge is controlled by a concrete crest underneath a bridge located on the roadway (i.e. Wilderness Parkway) running along the crest of the dam (See Dam Features Map provided in Appendix C). The dam has a 36-inch low level drain which is the only permanent means of lowering the lake level short of structural excavation of an abutment area or the use of temporary pumps or siphons. The low-level drain can be operated by a sluice gate operator located near the center top of the dam. Lake Sconti, owned by Big Canoe, is located some 1.0 miles downstream of Petit Lake. This earth dam has a maximum height 40 feet, a length of 190 feet and a top width of 20 feet. The dam has a 10-foot wide concrete spillway on the eastern abutment. Cox Lake Dam is located some 3.5 miles downstream from Petit Lake Dam south of Cove Road, and is not owned or operated by Big Canoe.

Big Canoe has two permanent roadway access points: (1) the main entrance off Steve Tate Highway is Wilderness Parkway, which crosses Petit Creek some 2.3 miles downstream of Petit Lake Dam, and (2) the secondary entrance off Steve Tate Highway (also Wilderness Parkway) which crosses over the top of Petit Lake Dam, as well as connecting to the main entrance road via a road at the base of Petit Lake Dam (See Inundation Map provided in Appendix B). A third access route utilizes a gravel maintenance road adjacent to the Sconti Golf Clubhouse. These three (3) connections to Steve Tate Highway are the only evacuation routes from the impacted areas of Big Canoe. The use of these evacuation routes will be controlled by the Big Canoe Department of Public Safety to prevent endangerment of evacuees in case of an imminent failure. As shown in Figure 3, two (2) of these evacuation routes would be cut off west of Petit Creek in case of a dam failure of Petit Lake Dam, and evacuation would need to take place via roads upstream of Petit Lake (i.e., Valley View Drive, Petit Ridge Drive, and Quail Cove Drive) and connecting back to the northern intersection of Wilderness Parkway and Steve Tate Road. A small portion of Steve Tate Highway could also be inundated in the event of a major dam failure.

An additional road downstream and outside of the Big Canoe Development would be impacted by failure of Petit Lake Dam. Cove Road is some 3.0 miles downstream of the dam. Petit Creek flows through three (3) 10-foot x 10-foot box culverts under Cove Road.



Notes:
1. This evacuation map is for use prior to any break of the dam. Should flood inundation prevent crossing of Petit Creek by those residents of Big Canoe west of the creek, evacuation should take place upstream and around Petit Lake via Valley View Drive, Petit Ridge Drive, and Quail Cove Drive before connecting to the northern portion of Wilderness Parkway and Steve Tate Road.
2. Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the GIS User Community
Approximate Image Date: March 2015

Petit Lake Dam
Emergency Action Plan - Evacuation Routes Prior to Dam Failure
Big Canoe Property Owner's Association
Jasper, Georgia

Geosyntec consultants

Chattanooga, TN | May 2018

Figure 3

N:\B\Big Canoe\Projects\TN6338 - 2017 EAP Lake Petit Dam\GIS\MXD\EvacuationRoutes.mxd 1/25/2018 11:20:39 AM

4. EMERGENCY DETECTION, EVALUATION, AND CLASSIFICATION

Detection and Evaluation of Petit Lake Dam Failure:

Once the observer notifies the Dam Owner's Representative or his designee about a condition of concern, the Dam Owner's Representative or his designee will immediately proceed to Petit Lake Dam and personally inspect the dam for any signs of failure condition. The Dam Owner's Representative or his designee will evaluate the severity of the condition of concern utilizing the guidelines in Table 4 to determine the appropriate Emergency Action Classification. Petit Lake Dam Failure Emergencies will be classified according to their severity and urgency. For the purposes of this EAP, three emergency classifications are provided. Conditions C, B, and A are consistent with other Big Canoe action plans, while Levels 1, 2, and 3 are consistent with Georgia Department of Natural Resources (DNR) Safe Dams Program. For clarity, both nomenclatures are provided throughout this EAP and are defined as follows:

- Condition C (Level 1): Failure is imminent or has occurred

  This is a situation where a failure either has occurred, is occurring, or obviously is just about to occur. It is impossible to determine how long it will take for a failure to occur or for a complete breach to occur once failure begins. Therefore, once the Dam Owner's Representative determines that there is no longer time available to attempt corrective measures to prevent failure, the "failure is imminent or has occurred" warning, as suggested in Section 5.1, should be issued. Emergency management officials will interpret the phrase "failure is imminent" to mean that the dam is failing. For evacuation purposes, "failure is imminent" and "failure has occurred" should be interpreted as the same condition.

- Condition B (Level 2): Potential failure situation is developing

  This is a situation where a failure may eventually occur, but preplanned actions taken during certain events (such as major floods, earthquakes, evidence of piping, etc.) may alleviate failure. Recommended methods and steps to alleviate the risk of failure are provided in Table 5. Even if failure is inevitable, more time is generally available than in a "failure has occurred" situation to issue warnings and/or take preparedness actions. When a dam safety situation is observed that may lead to a failure if left unattended, but there is no immediate danger, the Dam Owner's Representative will issue a warning that a "potential failure situation is developing". The Dam Owner's Representative will assess the situation and determine the urgency of the emergency situation. Based on the Dam Owner's Representative's assessment, the first series of notifications should be made and it is up to the Pickens County EMA to determine the subsequent course of action to follow.

NOTE: It should be remembered that it may be appropriate to declare a Condition C (Level 1). However, there should be a smooth transition from Condition B (Level 2) to Condition C (Level 1) when using both conditions.

- Condition A (Level 3): Unusual, slowly developing event

  This is a condition where a situation is developing, but has not yet threatened the operation or the structural integrity of the dam. The situation should be investigated by the Dam Owner's Representative for development of a potential or imminent dam failure situation. The Dam Owner's Representative will assess the situation and determine a path forward approach. Warnings shall not be issued unless the situation develops into a Condition B (Level 2) situation.

To assist the Emergency Management Agency in selecting their appropriate course of action and to provide a proper transition from Condition A (Level 3) to Condition B (Level 2) or Condition B (Level 2) to Condition C (Level 1), the Big Canoe Public Safety Director will clearly communicate the situation to the EMA. For Condition A (Level 3) and Condition B (Level 2) situations, the Big Canoe Public Safety Director will place the first series of notifications on initial alert, and provide periodic updates on the situation as it develops so that the EMA can assess when they should implement their evacuation procedures. For example, the Dam Owner's Representative will issue an initial warning and periodic updates on the lake level as it rises during flooding conditions and eventually overtops the dam. As the lake rises, a "potential failure situation is developing" warning should be issued with periodic updates on how much time is available before overtopping occurs. Once the dam overtops, a "failure is imminent or has occurred" warning should be issued, as suggested in Section 5.1.

Preplanned actions will be initiated once a Condition B (Level 2) Emergency has been declared and the initial notifications have been completed. The preplanned operations that should be undertaken are shown in Table 5.

TABLE 4[1]
DETECTION OF DAM FAILURE AND CLASSIFICATION OF EMERGENCY

EMERGENCY ACTION PLAN FOR PETIT LAKE DAM
PETIT LAKE DAM, BIG CANOE, GEORGIA

EVENT	DAM FAILURE MECHANISM	EVALUATION OF FAILURE	CLASSIFICATION OF FAILURE MECHANISM[2]
Unexpected Failure	• Unknown	Dam unexpectedly and without warning begins to fail	Condition C (Level 1)
Major Flood/ Embankment Overtopping	• Overtopping of dam	Erosion and removal of the road and embankment occurring	Condition C (Level 1)
		Flood pool rapidly approaching top of dam and embankment still intact	Condition B (Level 2)
Global Earthquake or Seismic Activity	• Settlement of dam crest • Slope movement • Evidence of seepage or piping	Settlement of more than a few inches	Condition C (Level 1)
		Slope movement larger than the size of a car	
		Flowing water from downstream face of dam	
		Settlement of less than a few inches	Condition B (Level 2)
		Slope movement of less that the size of a car	
		Wet areas on downstream face of dam that continue to increase in size and intensity of flow	
		Measurable earthquake felt or reported near the dam and dam appears to be stable.	Condition A (Level 3)
Embankment Movement	• Settlement of dam crest • Slope movement	Settlement of more than a few inches	Condition C (Level 1)
		Slope movement larger than the size of a car	
		Settlement of less than a few inches	Condition B (Level 2)
		Slope movement of less than the size of a car	
		New cracks in the embankment greater than 1/4-inch wide without seepage	Condition A (Level 3)
Embankment Seepage	• Evidence of seepage or piping	Flowing water greater than 10 gallons per minute from downstream face of dam	Condition C (Level 1)
		Wet areas with cloudy discharge on downstream face of dam that continue to increase in size and intensity of flow	Condition B (Level 2)
		New seepage areas in or near the dam, water flowing clear	Condition A (Level 3)
Spillway Flow	• Spillway overflow • Spillway erosion	Spillway overflowing with an advancing head cut that is threatening the control section or that is already flooding people downstream	Condition C (Level 1)
		Spillway overflowing with active gully erosion	Condition B (Level 2)
		Spillway overflowing with no active erosion	Condition A (Level 3)
		Normal flow with erosion under, beneath, or at edges of the spillway	Condition A (Level 3)
Sinkholes	• Observed sinkhole	Rapidly enlarging sinkhole on dam or appurtenances	Condition C (Level 1)
		Observation of new sinkhole in reservoir area or on embankment	Condition B (Level 2)
		Observation of sinkhole downgradient of the dam	Condition A (Level 3)
Routine Instrumentation Readings	• Significant change in piezometer readings • Rapid decrease in lake level	Increase in piezometer readings of more than 10 feet and flowing water from downstream face of dam	Condition C (Level 1)
		Rapid decrease in lake level and flowing water from downstream face of dam	
		Increase in piezometer readings of more than 10 feet and no flowing water from downstream face of dam	Condition B (Level 2)
		Rapid decrease in lake level with no apparent reason and no flowing water from downstream face of dam	
		Piezometer readings vary beyond predetermined values and no flowing water from downstream face of dam	Condition A (Level 3)
Security Threat	• Bomb threat	Detonated bomb that has results in damage to the dam or appurtenances	Condition C (Level 1)
		Verified bomb threat that, if carried out, could result in damage to the dam or appurtenances with no impacts to the functioning of the dam	Condition B (Level 2)
		Reported bomb threat, unverified	Condition C (Level 1)
Sabotage/ Vandalism	• Damage to dam or appurtenances	Damage to dam or appurtenances that has resulted in uncontrolled water release	Condition A (Level 3)
		Damage to dam or appurtenances that has resulted in seepage flow	Condition B (Level 2)
		Damage or modification to the dam or appurtenances with no impacts to the function of the dam	Condition C (Level 1)
Blocked culverts	• Blockage	Debris is blocking a spillway pipe, causing lake level to rise	Condition C (Level 1)

Notes:
[1] This table was based on a similar table from the North Carolina Department of Environmental Quality, 2016.

[2] Conditions C, B, and A are consistent with other Big Canoe action plans while Levels 1, 2, and 3 are consistent with Georgia Department of Natural Resources (GA DNR) Safe Dams Program. For clarity, both nomenclatures are provided.

TABLE 5
PREPLANNED OPERATIONS FOR CONDITION B (LEVEL 2) EMERGENCY

EMERGENCY ACTION PLAN FOR PETIT LAKE DAM
PETIT LAKE DAM, BIG CANOE, GEORGIA

EVENT	IMPENDING DAM FAILURE MECHANISM	PREPLANNED OPERATIONS IN PRIORITY ORDER
Major Flood/Embankment Overtopping	Overtopping of dam	1. Make a reasonable attempt to open the sluice gate on the low level drain, or bring in pumps and discharge outflow to spillway or directly into Petit Creek, to lower level of lake. 2. Open the bypass valve on the water supply line to the water treatment plant (if available). 3. If lake levels continue to rise dangerously close to top of the dam crest, excavate emergency channel in abutment area adjacent to concrete chute spillway. Also bring in emergency pumps and discharge outflow to spillway or directly into Petit Creek. *Do not excavate channel on top of dam, or discharge pump outflow on face of dam*
Earthquake or Seismic Activity	Slope Failure	1. Make a reasonable attempt to open the sluice gate on the low level drain, or bring in pumps and discharge outflow to spillway or directly into Petit Creek, to lower level of lake. 2. Open the bypass valve on the water supply line to the water treatment plant (if available). 3. Monitor piezometer readings daily and plot readings to identify significant changes in readings. Also record lake levels. 4. Survey elevation along top of dam daily at 50' intervals. Plot elevations of each point to identify significant changes in readings. 5. Obtain input from Georgia Safe Dams Program and Owner's Engineer as to emergency repairs to be constructed (if any).
Embankment Movement, Embankment Seepage, Spillway Flow, or Sinkhole	Slope Failure	1. Make a reasonable attempt to open the sluice gate on the low level drain, or bring in pumps and discharge outflow to spillway or directly into Petit Creek, to lower level of lake. 2. Open the bypass valve on the water supply line to the water treatment plant (if available). 3. Monitor piezometer readings daily and plot reading to identify significant changes in readings. Also record lake levels. 4. Survey elevation along top of dam daily at 50' intervals. Plot elevations of each point to identify significant changes in readings. 5. Obtain input from Georgia Safe Dams Program and Owner's Engineer as to emergency repairs to be constructed (if any).
Routine Instrumentation	Slope Failure	1. Make a reasonable attempt to open the sluice gate on the low level drain, or bring in pumps and discharge outflow to spillway or directly into Petit Creek, to lower level of lake. 2. Open the bypass valve on the water supply line to the water. 3. Monitor piezometer readings daily and plot reading to identify significant changes in readings. Also record lake levels. 4. Survey elevation along top of dam daily at 50' intervals. Plot elevations of each point to identify significant changes in readings. 5. Obtain input from Georgia Safe Dams program or Owner's Engineer as to emergency repairs to be constructed (if any).
Security Threat or Sabotage	Slope Failure	1. Make a reasonable attempt to open the sluice gate on the low level drain, or bring in pumps and discharge outflow to spillway or directly into Petit Creek, to lower level of lake. 2. Open the bypass valve on the water supply line to the water treatment plant (if available).

5. GENERAL RESPONSIBILITIES UNDER THE PLAN

The EAP contains preplanned actions designed to prevent a failure to dam structures or to minimize the impact of a dam failure on life and property. It establishes and documents procedures for notifying state and local emergency management agencies, law enforcement bodies, and downstream residents affected by a dam failure. All responsible parties responsible for implementing the EAP shall verify their responsibilities with their signature in Appendix D.

5.1 Dam Owner's Responsibilities:

The person responsible for performing the tasks required under the EAP is the Dam Owner's Representative and the Public Safety Director. If the Public Safety Director is absent, the responsible person will be the Public Safety Director Lieutenant on duty at that time.

The duties of the Public Safety Director under the EAP should be as follows:

1. The responsibility for making the initial assessment of the emergency - Condition C (Level 1), Condition B (Level 2), or Condition A (Level 3).

2. The responsibility for initiating the notification process (see Notification Flowchart). All warning messages should be brief and to the point. For example, for a Condition C (Level 1) Emergency, the message should be as follows: **"This is Public Safety Director at Big Canoe. I have verified overtopping of Petit Lake dam and believe dam failure is imminent. I request that you immediately activate the Petit Lake Dam Emergency Action Plan. This is an actual emergency and not a drill."** Note that a warning message shall not be issued for a Condition A (Level 1) emergency.

3. The responsibility for initiating the preplanned actions in case of a Condition B (Level 2) emergency.

5.2 Responsibility for Notification:

For a Condition C (Level 1) or Condition B (Level 2) emergency, the Dam Owner's Representative, the General Manager of the Big Canoe POA, is responsible for contacting the Public Safety Director at Big Canoe, the Public Information Officer Communications Manager, and the Liaison Officer, Director of Administrative Services.

The Public Safety Director at Big Canoe is responsible for notifying Pickens County EMA, Critical Infrastructure at Big Canoe (Table 1), Dawson County 911 Services, and the Georgia DNR 24-Hour Emergency Contact in the event of an emergency. If time allows, he should seek advice and assistance.

The Public Information Officer, Communications Manager is responsible for notifying the News Media (including radio and television media). The Liaison Officer, Director of Administrative Services is responsible for notifying Big Canoe's Engineer of Record.

The Pickens County EMA is responsible for notification of the residents below the dam as identified in the Reverse 911 System, including: (i) Big Canoe residents (Table 2) and residents downstream from Big Canoe (Table 3), (ii) Pickens County Sheriff's Department, (iii) Pickens County Public Works, (iv) the Cox Lake Dam Owner (Cove Lake Property Owner's Association, Inc.), and the (v) National Weather Service Weather Forecasting Office.

The Georgia DNR 24 Hour Emergency Contact is responsible for notification of the Georgia Safe Dams Program.

For a Condition A (Level 3) emergency, the Dam Owner's Representative, the General Manager of the Big Canoe POA, is responsible for contacting the Public Safety Director at Big Canoe and the Liaison Officer, Director of Administrative Services.

The Liaison Officer, Director of Administrative Services is responsible for contacting the Big Canoe Engineer of Record. The Public Safety Director at Big Canoe is responsible for contacting the Georgia Safe Dams Program, if required by the Dam Owner's Representative.

5.3 Responsibility for Evacuation:

Warning and evacuation planning are the responsibilities of the Pickens County EMA who have the statutory obligation. Under the EAP, the Big Canoe Public Safety Director is responsible for notifying the Pickens County EMA when a failure is imminent or has occurred (Condition C or Level 1), or a potential failure situation is developing (Condition B or Level 2). Big Canoe will not assume the responsibility of government entities for evacuation of people. This procedure should be coordinated with the appropriate public officials prior to an emergency situation developing.

5.4 Responsibility for Duration, Security Termination, and Follow-Up:

The Pickens County EMA is responsible for monitoring the situation at the dam and keeping local authorities informed of developing conditions at the dam from the time that an emergency starts until the emergency has been terminated. Security measures at the dam should be implemented by the Pickens County Sheriff's Department.

The Pickens County EMA is responsible for declaring that the emergency at the dam is terminated.

A follow-up evaluation after an emergency by all participants will be conducted. The Big Canoe POA is responsible for coordinating this effort and generating a written report which will detail the extent to which the EAP was followed, and what changes, additions or improvements need to be made to the EAP.

5.5 EAP Coordinator Responsibility

The Dam Owner's Representative or his designee will be the designated EAP coordinator who will be responsible for EAP related activities, including preparing revisions to the EAP, establishing training activities, coordinating EAP exercise, etc. They will also be the EAP contact if any of the involved parties have questions about the plan. The EAP will be reviewed annually with contacts, phone numbers, verified for accuracy. Documentation of the annual review is provided in Appendix E. As infrastructure and homes are built in the inundation map hazard areas, contact information (i.e., resident's names, addresses, and phone numbers) will be added to Tables 1, 2, and 3, as appropriate and available.

6. PREPAREDNESS

The following actions should be taken in preparation of an emergency:

- Initiation of a dam inspection and surveillance program. The dam should be formally inspected annually, at minimum, and readings from the dam instrumentation should be taken and interpreted quarterly, at minimum. During quarterly readings, basic observations of the dam can also be made.

- Preparation of a systematic warning and evacuation plan. A formal notification system should be coordinated with residents and businesses in the inundation area, and evacuation routes should be discussed/provided to those residents.

- Preparations should be made for evacuation on weekends, weekdays, and any time of day or night, including holidays. The emergency responders should have backup ways of communicating and a way to respond to the emergency in case of power outages.

- Community awareness programs for emergency response procedures. The community should be made aware of the possible emergencies and procedures associated with the possible failure of the dam.

- Establishment of emergency flood operating procedures.

- Organization of equipment, labor, and materials for use in emergency situations. A list of locally available resources that could be used in the event of an emergency are provided in Appendix F. These businesses can supply pumps, power generators, divers for inspections, and materials for temporary repair, depending on the emergency. Also the Pickens County EMA has provided a list of equipment that may be available during a dam failure.

- Conduct emergency exercises. At minimum, an orientation meeting should be held with key people so that those playing key roles and those having responsibilities outlined in this EAP can become familiar with it. A drill or tabletop exercise can be held, and coordinated with the Pickens County EMA. Documentation of reviews, tests, and revisions of this EAP should be documented in the forms provided in Appendix E.

7. REFERENCES

Association of State Dam Safety Officials [2010]. "EAPWG Final EAP Template," available online at http://www.damsafety.org/community/owners/?p=3a95437d-1876-46d6-843b-d65d45beb46a , accessed March 2017.

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North Carolina Department of Environmental Quality [2016]. "Guidelines for Owner Completion of the Emergency Action Plan (EAP) Template," Division of Energy, Mineral and Land Resources, available online at https://deq.nc.gov/about/divisions/energy-mineral-land-resources/energy-mineral-land-permits/dam-safety, accessed March 2017.

APPENDIX A

DEFINITIONS

APPENDIX A - DEFINITIONS

ABUTMENT	The part of the valley side against with the dam is constructed. Right and left abutments are those on respective sides as an observer when looking downstream.
APPURTENANCES	Structures around a dam that are necessary to the operation of the dam project (i.e., spillways).
BREACH	An opening through the dam resulting in partial or total failure of the dam.
CATEGORY I DAM	A dam that is either 25 feet tall or impounds 100 acre-feet of water and where improper operation or dam failure would result in the probable loss of human life.
COMPREHENSIVE EAP EXERCISE	An in-depth exercise of an EAP that involves the interaction of the dam owner with the state and local emergency management agencies in a stressful environment with time constraints. Functional and full scale EAP exercises are considered comprehensive EAP exercises.
DAM FAILURE	Catastrophic type of failure characterized by the sudden, rapid, and uncontrolled release of impounded water. It is recognized that there are lesser degrees of failure and that any malfunction or abnormality outside the design assumptions and parameters which adversely affect a dam's primary function of impounding water is properly considered a failure. Such lesser degrees of failure can progressively lead to or heighten the risk of a catastrophic failure. They are, however, normally amendable to corrective action.
EMBANKMENT	Fill material, usually earth or rock, placed with sloping sides.
EMERGENCY ACTION PLAN (EAP) EXERCISE	An activity designed to promote emergency preparedness; test or evaluate emergency action plans, procedures or facilities; train personnel in emergency management duties; and demonstrate operational capability. Exercises consist to the performance of duties, tasks or operations very similar to the way they would be performed in a real emergency. However, the exercise performance is in response to a simulated event.
EMERGENCY MANAGEMENT AGENCY	The State and local agencies responsible for emergency operations, planning, mitigation, preparedness, response, and recovery for all hazards.
EMERGENCY OPERATIONS CENTER	The location or facility where responsible officials gather during an emergency to direct and coordinate emergency operations, to communicate with other jurisdictions and with field emergency forces, and to formulate protective action decisions and recommendations during an emergency.
FLOOD ROUTING	A process of determining progressively over time the amplitude of a flood wave as it moves past a dam or downstream to successive points along a river or stream.
HAZARD	A situation which creates the potential for adverse consequences such as loss of life, property damage or other adverse impacts. Impacts may be for a defined area downstream of a dam from flood-waters released through spillways and outlet works of the dam or waters released by partial or complete failure of the dam.
HEADWATER	The water immediately upstream from a dam. The water surface elevation varies due to fluctuations in inflow and the amount of water passed through the dam.
INUNDATION MAP	A map delineating areas that would be flooded as a result of a dam failure or other unusually large spillway release.
OVERTOP	Flow of an embankment dam beyond its spillway capacity and over the top of the dam crest, or containment elevation.

PIPING	Internal erosion caused by seepage.
PROJECT DESIGN FLOOD	The maximum rate of rainfall in which the dam could safely pass or store without overtopping.
SEEPAGE	The continuous movement of water from the upstream face of the dam toward its downstream face.
SETTLEMENT	The downward movement of the ground due to forces (i.e., buildings and other structures) applied to the surface.
SPILLWAY	A structure over or through which flood flows are discharged.
TAIL WATER	The water downstream from the dam.