

# Lake Arrowhead Community Meeting

October 13, 2016



## Background

- Platted in the early 1960's
  - Includes just over 600 lots on over 600 acres
  - Initially had private roads
  - Two private lakes
- Roads
- Most of the roads were improved to state standards and accepted into the state system for maintenance in the early 1990's
- Funded with the help of the County through a sanitary district
- Property owners repaid the County with an annual levy
- The Lake Arrowhead Sanitary District is still in place





# Lake Arrowhead Stafford County

Produced by the Stafford County GIS Office 540-658-4033 | [www.StaffordCountyGIS.org](http://www.StaffordCountyGIS.org)



## Legend

-  Public Roads
-  Private Roads
-  Parcels

Coordinate System: NAD 1983 HARN StatePlane Virginia North FIPS 4501 Feet

Produced: 3/4/2016

MXD Path: \\s1\filedata\users\gis\Brad\Misc\Projects\Public Works\Lake Arrowhead Roads\LakeArrowheadRoads.mxd

Data layers are compiled from various sources and are not to be construed or used as a "legal description". Data layers are believed to be accurate, but accuracy is not guaranteed.

0 375 750 1,500 Feet



## Lake Arrowhead Dams

- Little Lake Arrowhead
  - ~6.5 acres
  - Top of dam – 280' above MSL
  - Height of dam - 22'
  - Max. storage – 65.07 ac-ft
  - Boundary Drive crosses crest of dam
  - By 1997 regulations likely a Class III hazard class
- Lake Arrowhead
  - ~28.3 acres
  - Top of dam – 304' above MSL
  - Height of dam - 29'
  - Max. storage – 607.36 ac-ft
  - Lakeview Dr. crosses crest of dam
  - By 1997 regulations likely a Class I hazard class



## Dams

- The two private lakes are impounded by dams subject to regulation by the Virginia Dept. of Conservation & Recreation (DCR)
- Records indicate the Lake Arrowhead Civic Association disbanded May 2005 and the dams have fallen out of compliance
- The state has gone on record that in the absence of the Association, “ownership appears to remain with former Association members in equal shares”
- They have also stated that upon a determination that there is an unsafe condition at one or both lakes, they can cause the lowering or complete draining of either or both lakes



## Dam Safety Study

- County staff has participated in previous meetings with the community and with DCR
- DCR has consistently expressed the need to show forward progress getting the dams into compliance
- The community has voiced multiple concerns about this effort, including the need to have more information about the extent and cost of the renovations needed
- The County funded a study of both dams to determine the hazard class under current regulations, examine alternatives for repair, and estimate the cost of those repairs



## Study Results-Little Lake Arrowhead

- Small impoundment with minimal risk
- Low Hazard Class
- Adequate spillway capacity (100 year storm event)
- No dam modifications required for flood safety
- There is a deteriorated outlet pipe which must be replaced to pass a safety inspection



## Study Results-Lake Arrowhead

- High hazard class dam
- Failure under all studied scenarios cause flooding of multiple downstream residential structures
- Inadequate spillway capacity (must pass 0.9 probable maximum precipitation)
- Must enlarge spillway or provide overtopping protection

**Study results have been accepted by DCR**



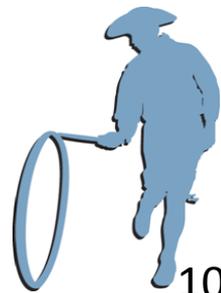
# Cost Estimate (Const.)

<b>Big Lake Arrowhead Dam</b>	
Preliminary Engineering	\$ 25,600
Final Design	\$ 39,691
Construction Cost	\$ 360,250
Construction Engineering Support	\$ 9,457
	SUBTOTAL \$ 434,998
Contingency (10%)	\$ 43,500
	TOTAL \$ 478,498
<b>Little Lake Arrowhead Dam</b>	
Final Design	\$ 23,876
Construction Cost	\$ 158,840
Construction Engineering Support	\$ 6,334
	SUBTOTAL \$ 189,050
Contingency (20%)	\$ 37,810
	TOTAL \$ 226,860
	GRAND TOTAL \$ 705,358



# Cost Estimate (Maint.)

Annual Maintenance Costs - Lake Arrowhead Dam			
Mowing	\$ 4,900	HydroTurf Downstream	
Spillway Maintenance	\$ 3,000		
Other	\$ 3,000		
Insurance	\$ 1,000	Liability only	
Bi-annual Inspection	\$ 1,713	\$ 3,425	2-year inspection
Permit Renewal Support	\$ 967	\$ 5,800	6-year interval
EAP & Innundation Map Updates	\$ 2,770	\$ 16,620	6-year interval
Subtotal	\$ 17,349		
Annual Maintenance Costs - Little Lake Arrowhead Dam			
Mowing	\$ 6,000		
Spillway Maintenance	\$ 1,000		
Other	\$ 3,000		
Insurance	\$ 1,000	Liability only	
Annual Inspection	\$ -		
6 Year Permit Renewal	\$ 867	\$ 5,200	
Permit Renewal Engineering	\$ -		
EAP & Innundation Map Updates	\$ -		
Subtotal	\$ 11,867		
TOTAL	\$ 29,216		



# Funding Source

## ➤ VDOT?

- Boundary Dr. over Little Lake Arrowhead Dam is private
- Lakeview Dr. over Lake Arrowhead Dam is maintained by VDOT but easement agreement states VDOT “has no obligation to maintain, repair, or replace the dam”

## ➤ County?

- Stafford has not previously assumed responsibility for repairs to other private dams

## ➤ Commonwealth of Virginia?

- DCR has maintained that the residents of Lake Arrowhead are responsible for maintenance of these dams, but have advised of available grant programs
- The state has provided some funding for public dams elsewhere in Virginia to assist communities in bringing their dams into compliance
- This would likely exclude Little Lake Arrowhead Dam



## Lake Arrowhead Community?

- A funding plan has been developed to allow the dam repairs to be initiated immediately, with repayment by the community

<u>Funding Sources</u>	
State Grant	\$ 25,000
Lake Arrowhead Sanitary District	\$ 138,348
County Loan	<u>\$ 542,010</u>
<b>TOTAL</b>	<b>\$ 705,358</b>



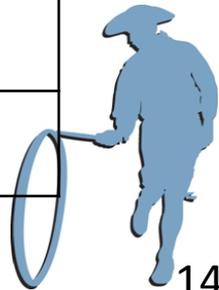
## Repayment Plan

- Establish a Lake Arrowhead Service District
- County provides a loan to the LASD
- Possible Provisions
  - Principle amount - \$542,010
  - Interest - 2.5%
  - Term - 10 years
  - Estimated Additional Tax Rate – 9¾¢
- Rate drops after 10 years to support an estimated annual maintenance program cost of ~\$29,000



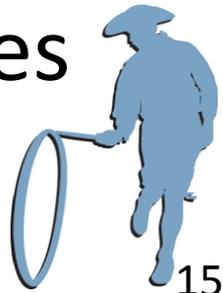
# Estimated Tax Assessment

Property Value Range	Avg. Annual Pmt.	Pmt. Range	# Properties Affected
\$0 to \$59,999	\$8.79	0 to 13	83
\$60,000 to \$104,899	\$60.77	59 to 95	48
\$104,999 to \$149,999	\$135.40	102 to 146	42
\$150,000 to \$199,999	\$168.88	146 to 195	220
\$200,000 to \$249,999	\$219.79	195 to 244	140
\$250,000 to \$299,999	\$260.82	244 to 292	65
\$300,000 to \$399,999	\$317.91	295 to 374	11



## Schedule

- Fast Track
  - Design start – 2016
  - Design complete – mid-2017
  - Complete Lake Arrowhead Dam – end-2017
  - Complete Little Lake Arrowhead Dam – end-2017
  
- Results in two fully compliant dams with operation and maintenance certificates



## Consequences of Inaction

- State drains lakes/removes dams
- State has the authority to charge dam owners for this
- Reduced fire protection (increased insurance)
- Loss of Lakeview Drive and Boundary Drive over dams (longer drive times)
- Reduced public safety protection
- Reduced property values
  - Andy Shannon



Questions?

