

# LBWID Operations Director Report

(May 2010 – July 2010)

## Engineering/Projects

### **Concrete restoration for the dam (update)**

- On June 30<sup>th</sup> the LBWID Concrete Restoration Committee met with the engineers from WR&A to review the preliminary engineering report that they had developed for this project.
  - All in all the committee was satisfied with approach that WR&A developed for restoring the surface of the concrete abutments, the concrete piers that support the walk-bridge to the dam-house, and for replacing some of the grouting and missing stones on the surface of the dam below the bascule gate.
  - The committee did however request that some of the actual design specifications be changed (see below) and WR&A agreed with the reasoning behind the requests.
    - Increasing the thickness of the new layer of concrete for the abutments from 6” to 8”.
    - Installing horizontal reinforcing bars (re-bar) in addition the welded wire fabric.
    - The position of the L shaped anchors, the L will be pointing up instead of down
    - Choosing a concrete mixture that can be pumped into place to give the contractor more flexibility in choosing how they will get concrete to the face off the dam.
  - In addition to the aforementioned the committee requested clarification on how deteriorated concrete was being defined and who was going to be determining how much of the deteriorated concrete had to be removed before the new concrete layer could be applied
    - WR&A explained their definition of deteriorated concrete and stated that they would like to be on-site during construction to advise the contractor on how much of the existing concrete surface needs to be removed.
- The next phase of the project is for WR&A to develop the detailed design drawings and specification and to apply for an alteration permit from Virginia’s Division of Dam Safety.
- LBWID and WR&A will also soon start jointly working on the task of developing the bid documents for this project.
  - As it stands LBWID would like to have the project officially advertised for bid by Dec. 1, 2010 and the project awarded to a contractor by no later than Feb. 15, 2011.

### **Maintenance of the dam’s lake level sensors (update)**

- After a failed attempt to service the faulty lake level sensor #1 LBWID decided to replace both lake level sensor #1 and #2 with new sensors.
  - Lake level sensor #2 also started to show signs of generating unstable data.
- These two sensors are key components of the control system and are used to determine what % open the dam’s bascule gate should be at.
- This project was completed in March, 2010 by LBWID staff
- The cost of the 2 new sensors was \$2,200.00

## **Dam hydraulic cylinder testing program (update)**

- Since April 16<sup>th</sup> the LBWID has performed 5 hydraulic cylinder testing sessions.
  - Each test session lasts 6 hours.
  - The data from these tests will help LBWID and WR&A determine the condition of the hydraulic cylinders internal piston rings.
- The LBWID will continue conducting these tests every few weeks throughout the rest of this year and then send all collected data to WR&A for analysis.

## **Dam control system upgrades (new)**

- Due to finding that 1 of the dam's 3 electro-mechanical pressure switches (for the system pressure side of the hydraulic system) had internal oil leakage LBWID decided to replace it with what is considered to be a more reliable and accurate solid state pressure sensor. The new solid state sensor will do the job of all 3 of the electro-mechanical pressure switches.
  - 1 of the electro-mechanical pressure switches was used to generate a low system pressure alarm.
  - The other 2 monitored the system pressure and would active the hydraulic pumps to turn on and off when an increase in system pressure was needed.
  - The down side to the electro-mechanical pressure switches was that it was hard to calibrate the switching set point and they also had a rubber diaphragm that would rupture over time.
- The internal oil leakage in the electro-mechanical pressure switches was causing a drop in system pressure which required the pumps to activate more often to maintain the desired system pressure; this was causing unneeded wear on the hydraulic pumps.
- By upgrading to the new solid state pressure sensors we no longer have to worry about the potential for internal oil leakage.
- The new pressure sensors are also wired directly into the dam's computerized control system (PLC/HMI).
  - We can now use the HMI (Human Machine Interface) to easily and accurately adjust the high and low system pressure alarm set points and at what PSI we want the hydraulic pumps to turn on and off when maintaining system pressure.
- For the purpose of redundancy we elected to install 2 of the solid state pressure sensors on the same circuit.
  - We will normally operate on the average of the two sensors but if one fails we can easily switch to operate from the remaining properly operating sensor.
- Along with removing the 3 electro-mechanical pressure switches we were able to remove a considerable amount of hydraulic piping and electrical conduit from inside the dam house and simplify the physical layout of the system.
- Applied Control Engineering with assistance from LBWID staff completed this project in July, 2010.
- The cost of this project was just under \$7,000.00

## **Operations**

### **Erosion and drainage repairs at Beach 3 (new)**

- In response to considerable erosion at Beach 3 caused by severe rain storms during the week of May 23<sup>rd</sup>, LBWID installed a drainage system at the end of the beach entrance path to collect the storm water and route it away from the beach.
- In addition, LBWID reshaped the ditch line along Waterway Drive to reduce the amount of storm water run-off from the street that was washing across the Beach 3 common ground and ultimately across the beach.
- The cost of materials for this project was about \$600.00 and was paid for by the Lake Barcroft Association.
  - LBWID supplied the tools/equipment and labor.

### **In-house dredging program, spring dredge season (update)**

- LBWID had a successful spring dredging season and was able to remove 1,266 cubic yards of sediment from the Tripps Run side of the lake.
  - The spring dredging season consisted of 22 days of dredging, averaging 57.5 cubic yards per day.
  - LBWID most productive day resulted in 96 cubic yards of sediment removed.
- LBWID will start the fall dredging season in late September and will be focusing on the Holmes Run side of the Lake (the equipment will be staged at Beach 3).
  - We will also be aiming to remove 1,250 + cubic yards of sediment from that side of the Lake as well.

### **Dredge spoil disposal (update)**

- Due to severe snow storms this past winter and the busy work load during the spring and early summer LBWID had to delay the trucking and disposal of the dredge spoils that were removed from the lake during 2009.
- LBWID is now expecting to truck away the dredge spoils removed from the lake during 2009 and spring of 2010 sometime between mid August and mid September.
  - The dredge spoils will be hauled to Lorton Construction Landfill.

### **Annual lake bathymetry survey (update)**

- On June 22<sup>nd</sup> Princeton Hydro engineers conducted the 2010 annual bathymetry survey of the Lake.
  - The survey include boat the Tripps Run and Holmes Run sides for the lake.
  - The larger/deeper main area off the lake is not surveyed every year because it experiences a very slow rate of change in depth.
- LBWID will be receiving the updated bathymetry maps within the next week or so.
- The cost of this year's survey is \$7,600.00.
  - This survey was the 1<sup>st</sup> of a 3 year survey contract with Princeton Hydro.

## **Holmes Run stream bank repair *(update)***

- During late May and early June a crew from Fairfax County Storm Water Maintenance worked repairing several hundred feet of stream bank erosion along both sides of the Holmes Run stream.
  - They installed over a hundred tons of class I and II rip-rap stone on top of filter cloth.
  - Most of this work required an incredible amount of manual labor because there was very limited access for equipment to get to the stream banks.
- This repair/maintenance project was in response to Tropical Storm Hanna in September of 2008 that caused previously installed gabion baskets (shoreline protection devices) to be swept away from the shore line leaving them vulnerable to further erosion.
- Since the completion of installing the rip-rap and filter cloth we have had several moderate sized storm events and everything seems to be holding up as planned.
  - LBWID will continue to monitor the performance of the repair work and notify the county if modifications are needed.

## **Dredging demonstration –Ice-cream social *(new)***

- On Saturday June 12, 2010 LBWID demonstrated the use of the LBWID's recently acquired dredging equipment and debris removal equipment during the community's ice-cream social at Beach 5.
  - It gave residents an opportunity to see how the equipment works, to meet the LBWID staff members, and to understand how LBWID is using the tax revenue it collects from the community.
- During this event I was pleased to receive compliments from several residents supporting the LBWID's dredging and debris removal programs.
  - The children at the event had a fun time eating their ice cream and watching the equipment scoop up mud and debris, many of them had great questions about why we have to dredge and remove trash from the lake.

## **Storm events/debris removal *(new)***

- So far this spring and summer we have had several storm events that each time washed thousands upon thousands of pounds of debris/trash into the lake.
  - On most occasions LBWID was able to remove the debris and restore the lake to a clean and orderly condition within 24 to 48 hours after the storm.
- The collected storm debris is stockpiled at the Beach 5 decanting basin and then is hauled away by Fairfax County's Solid Waste Division at no cost to LBWID.
  - This assistance from the County saves the LBWID and Lake Barcroft community about \$7,000.00 to \$10,000.00 a year, depending on the amount of debris that is removed.

Respectfully,  
Davis Grant  
LBWID Operations Director