

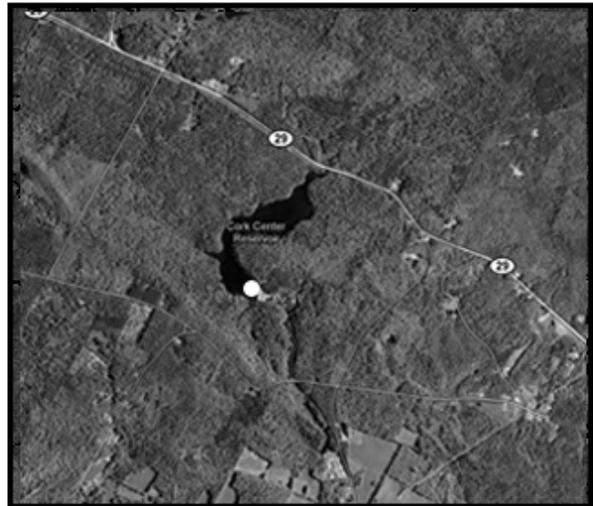
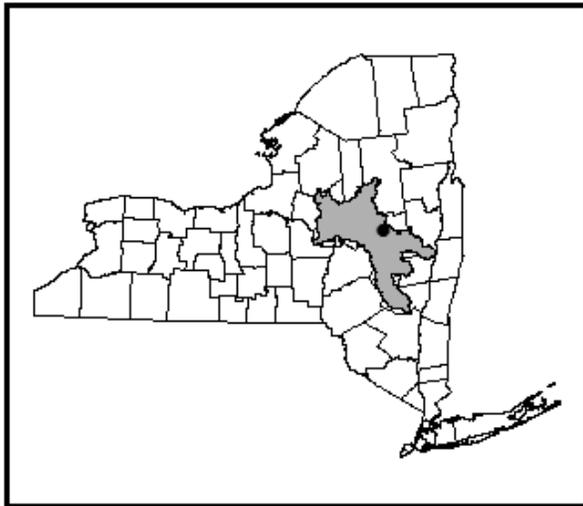
# LCI Lake Water Quality Summary

## General Information

<b>Lake Name:</b>	<b>Cork Center Reservoir</b>
<b>Location:</b>	Town of Johnstown, Fulton County, NY
<b>Basin:</b>	Mohawk River Basin
<b>Size:</b>	15.6 hectares (38 acres)
<b>Lake Origins:</b>	Earthen dam built in 1919
<b>Major Tributaries:</b>	Kecks Center Creek
<b>Lake Tributary to?:</b>	Kecks Center Creek
<b>Water Quality Classification:</b>	AA(T) (best intended use: potable water supply) (T) designation refers to support for trout survival
<b>Sounding Depth:</b>	9 meters (29.5 feet)
<b>Sampling Coordinates:</b>	43.0374, -74.79442
<b>Sampling Access Point:</b>	Near dam (City of Johnstown's gated access road)
<b>Monitoring Program:</b>	Lake Classification and Inventory (LCI) Survey
<b>Sampling Date:</b>	July 28, 2010
<b>Samplers:</b>	David Newman, NYSDEC Division of Water, Albany Dan Hayes, NYSDEC Division of Water, Albany
<b>Contact Information:</b>	David Newman, NYSDEC Division of Water <a href="mailto:djnewman@gw.dec.state.ny.us">djnewman@gw.dec.state.ny.us</a> ; 518-402-8201

## Lake Map

(sampling location marked with a circle)



## Background and Lake Assessment

Cork Center Reservoir is a 38 acre waterbody used as a drinking water supply by the City of Johnstown. There is no public access to the reservoir, although city employees indicated that occasionally people trespass onto the city's property to fish in the reservoir. The shoreline of the reservoir is completely forested, and the greater watershed is almost entirely forested with just a handful of homes. The NYSDEC Division of Water's lake water quality database had no previous data for the reservoir, and thus the lake was included in the 2010 Lake Classification and Inventory (LCI) screening program. A Source (Drinking) Water Assessment was previously conducted through the NYSDOH Source Water Assessment Program (SWAP) and found "no noteworthy risk to water quality (NYSDEC, 2010)". At this time there are no perceived water quality issues that would make this reservoir a candidate for additional monitoring in 2011.

Cork Center Reservoir can be characterized as *oligotrophic*, or unproductive. The water clarity reading taken in late July (TSI = 39, typical of oligotrophic waterbodies) was slightly lower than expected given the total phosphorus reading (TSI = 33, typical of *oligotrophic* waterbodies) and the chlorophyll *a* reading (TSI < 37, typical of *oligotrophic* waterbodies). These data indicate that baseline nutrients do not support persistent algal blooms in the reservoir. This also suggests that water clarity is limited by dissolved color, suspended matter, or other non-algal material.

In late July, the reservoir's surface water had a slight brown or tannic color, with the water clarity reading being greater than 4 meters. Four native aquatic plant species were found near the dam: *Brasenia schreberi* (watershield), *Elodea nuttallii* (Nuttall's waterweed), *Potamogeton natans* (floating brown-leaf pondweed), and *Potamogeton foliosus* (leafy pondweed). All are plant species commonly found in this region of New York State. A more thorough plant specific survey may yield additional aquatic plants; however, it is unlikely there would be any exotic invasive species present due to the limited access to the lake.

Cork Center Reservoir exhibited thermal stratification, in which depth zones (warm water on top, cold water on the bottom during the summer) are established, as in most NYS water bodies greater than 6 meters in depth. The thermocline in the reservoir was around 7 meters in depth at the time of sampling. Dissolved oxygen levels remained high throughout the water column including the hypolimnion (bottom waters), where oxygen levels were in the range that would support coldwater fish survival. Despite the low alkalinity measurement (buffering capacity), pH readings of the surface water indicated slightly alkaline conditions, which indicates there is little impact to the reservoir from acid rain. The pH values of the surface water were similar to those reported by the City of Johnstown in 2009. Conductivity readings indicate soft water (low ionic strength), the occurrence of watershield (typically in soft water lakes) supports this finding.

Cork Center Reservoir appears to be typical of soft water, weakly colored, highly oxygenated, and neutral to slightly alkaline waterbodies. Other water bodies with similar water quality characteristics support warm and coldwater fisheries. However, fisheries habitat cannot be fully evaluated by the LCI. A fisheries survey would need to be conducted to evaluate the fisheries of the reservoir.

Nutrient (nitrogen and phosphorus) levels were low both in the surface and bottom waters. Chloride levels were slightly elevated which may be due to road salting in the watershed, but due

to the highly forested nature of the watershed, this may represent natural readings. The chloride values were within the range of values reported by the City of Johnstown in 2009. All of the other parameters evaluated through the LCI showed no water quality issues.

## **Evaluation of Lake Condition Impacts to Lake Uses**

### ***Potable Water (Drinking Water)***

Cork Center Reservoir is classified for potable water use and is currently used by the City of Johnstown for this purpose. The LCI data collected are not sufficient to fully evaluate potable water use; however, these data did not find any issues that would impact drinking water supplies. This finding is consistent with the previously cited “no noteworthy risk to water quality” finding of the NYSDOH SWAP.

### ***Contact Recreation (Swimming)***

Class “AA” waters shall also be suitable for swimming and bathing. Due to the restricted access to the reservoir, individuals are unable to swim in the reservoir. Bacteria data are needed to evaluate the safety of the reservoir for swimming, these data are not collected through the LCI. The data collected the LCI did not indicate any water quality parameters that would impact swimming, should the reservoir eventually be opened up for contact recreation.

### ***Non-Contact Recreation (Boating and Fishing)***

Class “AA” waters shall also be suitable for boating and fishing. Due to the restricted access to the reservoir, boating is currently precluded and the only fishing that takes place is from people trespassing on the city’s property and is therefore very limited. There were no water quality parameters that would indicate impacts to boating or fishing.

### ***Aquatic Life***

Class “AA(T)” waters shall support aquatic life including trout survival. None of the parameters analyzed through the LCI indicated impacts to aquatic life, and in addition, dissolved oxygen and temperate reading should be supportive of cold water fish species including trout. Additional biological studies would be needed to fully evaluate any impacts to aquatic life in the reservoir.

### ***Aesthetics***

These data indicate that aesthetics should be fully supported.

## **Additional Comments**

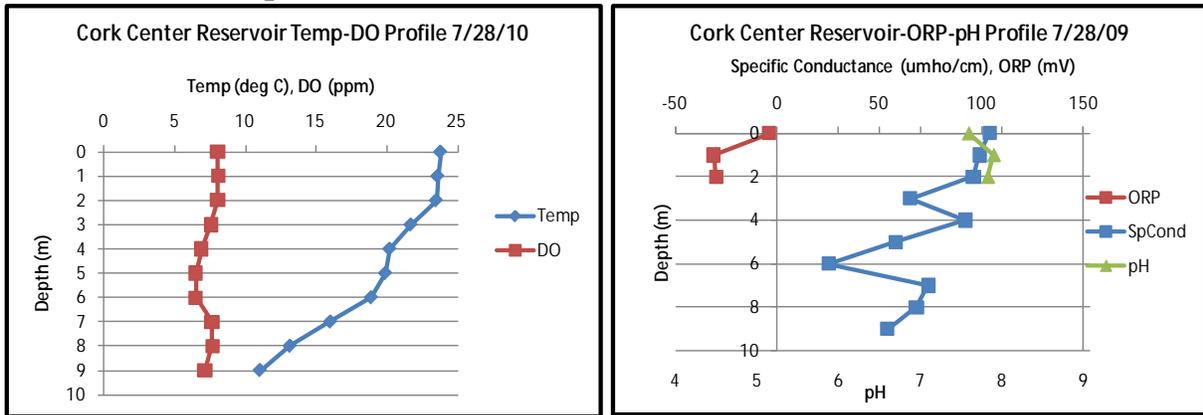
- The highly forested watershed and restricted access, aid in preserving the lake
- Periodic surveillance for invasive exotic plant species may help to prevent the establishment and spread of any new invaders, given the escalating problems with exotic aquatic weeds.

## Aquatic Plant IDs

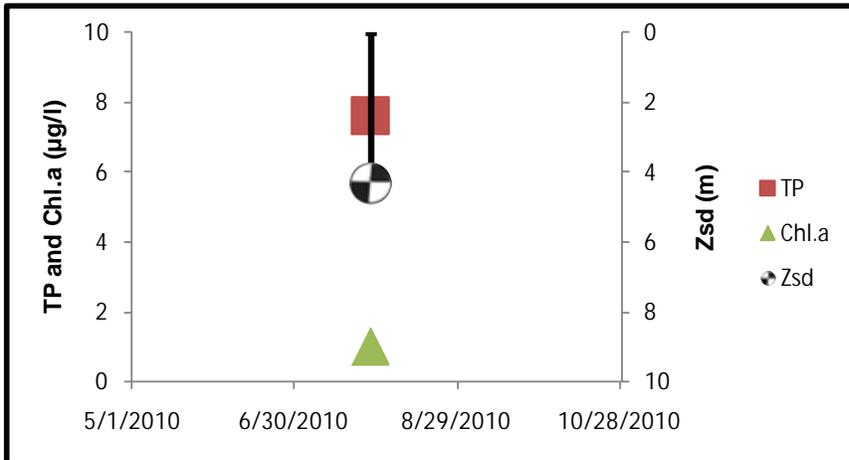
Exotic Plants: None observed

Native Plants: *Brasenia schreberi* (watershield)  
*Elodea nuttallii* (Nuttall's waterweed)  
*Potamogeton natans* (brown-leaf pondweed)  
*Potamogeton foliosus* (leafy pondweed)

## Time Series: Depth Profiles



## Time Series: Trophic Indicators



## WQ Sampling Results

### Surface Samples

	UNITS	Reading	Scientific Classification	Regulatory Comments
SECCHI	meters	4.3	Mesotrophic	Readings does not violate DOH guidance value
TSI-Secchi		39.0	Oligotrophic	No pertinent water quality standards
TP	mg/l	0.0076	Oligotrophic	Reading does not violate DEC guidance values
TSI-TP		33.4	Oligotrophic	No pertinent water quality standards
TSP	mg/l	0.0046	Little available phosphorus	No pertinent water quality standards
NOx	mg/l	0.0043	Low nitrate	Reading does not violate guidance
NH4	mg/l	0.016	Low ammonia	Reading does not violate guidance
TKN	mg/l	0.34	Low organic nitrogen	No pertinent water quality standards
TN/TP	mg/l	99.67	Phosphorus Limited	No pertinent water quality standards
CHLA	ug/l	ND	Oligotrophic	No pertinent water quality standards
TSI-CHLA		< 37.4	Oligotrophic	No pertinent water quality standards
Alkalinity	mg/l	48.7	Poorly Buffered	No pertinent water quality standards
TCOLOR	ptu	15	Weakly Colored	No pertinent water quality standards
TOC	mg/l	4.2		No pertinent water quality standards
Ca	mg/l	17.8	Minimally Supports Zebra Mussels	No pertinent water quality standards
Fe	mg/l	0.0834		Reading does not violate water quality standards
Mn	mg/l	0.0097		Reading does not violate water quality standards
Mg	mg/l	2.19		Reading does not violate water quality standards
K	mg/l	0.349		No pertinent water quality standards
Na	mg/l	8.71		Reading does not violate water quality standards
Cl	mg/l	12.6	Moderate road salt runoff	Reading does not violate water quality standards
SO4	mg/l	3.9		Reading does not violate water quality standards

### Bottom Samples

	UNITS	Reading	Scientific Classification	Regulatory Comments
TP-bottom	mg/l	0.011		No pertinent water quality standards
TSP-bottom	mg/l	0.0068	High % soluble phosphorus	No pertinent water quality standards
NOx-bottom	mg/l	0.0034	No evidence of DO depletion	Reading does not violate water quality standards
NH4-bottom	mg/l	0.043	No evidence of DO depletion	Reading does not violate water quality standards
TKN-bottom	mg/l	0.19		No pertinent water quality standards
Alk-bottom	mg/l	37.3	Poorly Buffered	No pertinent water quality standards
TCOLOR-bottom	ptu	10	Uncolored	No pertinent water quality standards
TOC-bottom	mg/l	3.1		No pertinent water quality standards
Ca-bottom	mg/l	13.9	Minimally Supports Zebra Mussels	No pertinent water quality standards
Fe-bottom	mg/l	0.0741		Reading does not violate water quality standards

### **Bottom Samples (Continued)**

	<b>UNITS</b>	<b>Reading</b>	<b>Scientific Classification</b>	<b>Regulatory Comments</b>
Mn-bottom	mg/l	0.023		Reading does not violate water quality standards
Mg-bottom	mg/l	1.74		Reading does not violate water quality standards
K-bottom	mg/l	0.341		No pertinent water quality standards
Na-bottom	mg/l	7.22		Reading does not violate water quality standards
Cl-bottom	mg/l	10.4		Reading does not violate water quality standards
SO4-bottom	mg/l	4.4		Reading does not violate water quality standards

### **Lake Perception**

	<b>UNITS</b>	<b>Reading</b>	<b>Scientific Classification</b>	<b>Regulatory Comments</b>
WQ Assessment	1-5, 1 best	1	Crystal Clear	No pertinent water quality standards
Weed Assessment	1-5, 1 best	2	Plants Visible Below Surface	No pertinent water quality standards
Recreational Assessment	1-5, 1 best	1	Could Not Be Nicer	No pertinent water quality standards

## **References**

NYSDEC. 2010. The Mohawk River Basin Waterbody Inventory and Priority Waterbodies List.  
Available at [http://www.dec.ny.gov/docs/water\\_pdf/pwlmhkw10.pdf](http://www.dec.ny.gov/docs/water_pdf/pwlmhkw10.pdf) .

## **Legend Information**

### **General Legend Information**

Surface Samples = integrated sample collected in the first 2 meters of surface water  
 Bottom Samples = grab sample collected from a depth of approximately 1 meter from the lake bottom  
 SECCHI = Secchi disk water transparency or clarity - measured in meters (m)  
 TSI-SECCHI = Trophic State Index calculated from Secchi, =  $60 - 14.41 * \ln(\text{Secchi})$

### **Laboratory Parameters**

ND = Non-Detect, the level of the analyte in question is at or below the laboratory's detection limit  
 TP = total phosphorus- milligrams per liter (mg/l)  
 Detection limit = 0.003 mg/l; NYS Guidance Value = 0.020 mg/l  
 TSI-TP = Trophic State Index calculated from TP, =  $14.42 * \ln(\text{TP} * 1000) + 4.15$   
 TSP = total soluble phosphorus, mg/l  
 Detection limit = 0.003 mg/l; no NYS standard or guidance value  
 NOx = nitrate + nitrite nitrogen, mg/l  
 Detection limit = 0.01 mg/l; NYS WQ standard = 10 mg/l  
 NH4 = total ammonia, mg/l  
 Detection limit = 0.01 mg/l; NYS WQ standard = 2 mg/l

TKN	= total Kjeldahl nitrogen (= organic nitrogen + ammonia), mg/l Detection limit = 0.01 mg/l; no NYS standard or guidance value
TN/TP	= Nitrogen to Phosphorus ratio (molar ratio), = (TKN + NO <sub>x</sub> )*2.2/TP > 30 suggests phosphorus limitation, < 10 suggests nitrogen limitation
CHLA	= chlorophyll <i>a</i> , micrograms per liter (µg/l) or parts per billion (ppb) Detection limit = 2 µg/l; no NYS standard or guidance value
TSI-CHLA	= Trophic State Index calculated from CHLA, = 9.81*ln(CHLA) + 30.6
ALKALINITY	= total alkalinity in mg/l as calcium carbonate Detection limit = 10 mg/l; no NYS standard or guidance value
TCOLOR	= true (filtered or centrifuged) color, platinum color units (ptu) Detection limit = 5 ptu; no NYS standard or guidance value
TOC	= total organic carbon, mg/l Detection limit = 1 mg/l; no NYS standard or guidance value
Ca	= calcium, mg/l Detection limit = 1 mg/l; no NYS standard or guidance value
Fe	= iron, mg/l Detection limit = 0.1 mg/l; NYS standard = 0.3 mg/l
Mn	= manganese, mg/l Detection limit = 0.01 mg/l; NYS standard = 0.3 mg/l
Mg	= magnesium, mg/l Detection limit = 2 mg/l; NYS standard = 35 mg/l
K	= potassium, mg/l Detection limit = 2 mg/l; no NYS standard or guidance value
Na	= sodium, mg/l Detection limit = 2 mg/l; NYS standard = 20 mg/l
Cl	= chloride, mg/l Detection limit = 2 mg/l; NYS standard = 250 mg/l
SO <sub>4</sub>	= sulfate, mg/l Detection limit = 2 mg/l; NYS standard = 250 mg/l
As	=arsenic, mg/l Detection limit = 3.2 mg/l; NYS standard = 10 mg/l

### ***Field Parameters***

Depth	= water depth, meters
Temp	= water temperature, degrees Celsius
D.O.	= dissolved oxygen, in milligrams per liter (mg/l) or parts per million (ppm) NYS standard = 4 mg/l; 5 mg/l for salmonids
pH	= powers of hydrogen, standard pH units (S.U.) Detection limit = 1 S.U.; NYS standard = 6.5 and 8.5
SpCond	= specific conductance, corrected to 25°C, micromho per centimeter (µmho/cm) Detection limit = 1 µmho/cm; no NYS standard or guidance value
ORP	= Oxygen Reduction Potential, millivolts (MV) Detection limit = -250 mV; no NYS standard or guidance value

### ***Lake Assessment***

WQ Assessment	= <b>water quality assessment</b> , 5 point scale, 1= crystal clear, 2 = not quite crystal clear, 3 = definite algae greenness, 4 = high algae levels, 5 = severely high algae levels
Weed Assessment	= <b>weed coverage/density assessment</b> , 5 point scale, 1 = no plants visible, 2 = plants below surface, 3 = plants at surface, 4 = plants dense at surface, 5 = plants cover surface
Recreational Assessment	= <b>swimming/aesthetic assessment</b> , 5 point scale; 1 = could not be nicer, 2 = excellent, 3= slightly impaired, 4 = substantially impaired, 5 = lake not usable