

REPORT  
on a  
WATER WORKS SYSTEM  
for  
THE PROPOSED NORTH CREEK WATER DISTRICT  
at  
NORTH CREEK AND HOLCOMBVILLE, N.Y.

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## PREAMBLE

The purpose of this report is to set forth such information as may be helpful in the selection of a suitable source of water supply for North Creek and Holcombville, N.Y., also to suggest a plan for developing the source or sources which appear best to meet the present and future requirements of the proposed water district.

Plans and estimates for the recommended supply are included herewith.

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**NORTH CREEK AND HOLCOMBVILLE**

North Creek and Holcombville are unincorporated communities in the Town of Johnsburg, Warren County, N. Y., lying along the State Highway for 1½ miles near the point where North Creek discharges into the Hudson River. Holcombville is adjacent to and south of North Creek.

North Creek is the northern terminal of the Adirondack division of the D & H Railroad, and is the commercial center for a large section of the Adirondacks. It is an important shipping point for pulp wood but aside from a saw mill and nearby garnet mines there are no other industries.

No special effort has been made to cater to summer tourists but the country for many miles in all directions is dotted with hotels and summer colonies which use North Creek as a trading center. During the summer months an unusually large volume of business is transacted for a village of this size.

Most of the buildings are of frame construction and homes as a rule are of the one family type. The business buildings along Main Street at the north end of the village are in close contact and constitute a decided fire risk.

The population is estimated to be about 800. A count shows that 327 families reside in the two villages.

Water is obtained in North Creek from individual wells, a small privately owned water system which serves about 50 families and a small community system which supplies about 20 families. There are no fire hydrants or any mains larger than 4 inches. Much trouble has been experienced through the failure of wells and the small village system in dry seasons and the necessity for an adequate supply of water is keenly felt. At Holcombville all water is obtained from wells.

## TOPOGRAPHY

The topography is rugged and mountainous and only a comparatively narrow strip along the state road has been developed. The greater part of North Creek lies between elevations 1030 and 1100 feet above sea level while Holcombville is between 1100 and 1200. The variation of nearly 300 feet in elevation between the north and south sections of the area to be served tends to complicate the arranging of suitable pressures for fire protection and consumers. North creek flows north easterly through the village to the Hudson and receives the major portion of the drainage from both villages. The north end of the Village of North Creek lies along the south bank of the river and drains directly to it. Map #1 shows the location of the district and topography.

## SANITARY CONDITIONS

The disposition of sanitary wastes is provided for through drains to the river, cesspools and individual septic tanks. The soil through the built up section is mostly of a sandy character and not much trouble has been experienced in the operation of small septic tanks. There is always present, however, the possibility of contamination of local well supplies and this in connection with the frequent summer shortages, the necessity for an adequate supply for the new and attractive school, as well as for fire protection makes the construction of an adequate water system advisable.

## PRESENT SUPPLIES

The present water system now serving part of North Creek is owned by The North Creek Water Works Company. It was built about 40 years ago and consists of a small reservoir fed by a very small brook immediately west of North Creek.

Water is brought to the village through a four inch main and distributed through 3640 feet of four inch pipe, 800 feet of two inch pipe and 1000 feet of 1½ inch and some smaller pipe.

There are no fire hydrants.

About 50 families are connected to the mains.

The four inch mains are reported to be in bad order. The source of supply is inadequate and not suitable for enlargement.

In addition to the public supply there is a small community system serving about 30 families. It is operated by subscription and obtains its supply from a spring. The water is pumped to a small masonry reservoir and distributed to consumers through galvanized iron pipe. The service is poor and inadequate and a larger supply is preferred by the subscribers.

## WATER DISTRICT

The Water District will include a strip along the south bank of the Hudson River about 6 miles long and from 2 to 3 miles wide. The area is the same as that in the Barton Fire District except that the 30 town lots in the western section of the fire District are not included in the Water District. The limits are shown on Map #2 attached to this report. Water mains will be laid only in the built up area as shown on the plans.

## BASIS FOR DESIGN

The present population is estimated to be 800. There is a slight increase in the summer but it is not sufficient to warrant any additions being made for it. It appears that an immediate supply for 1000 people with provision for increasing the supply to 2000 in the future should be ample. An allowance of 100 gallons per capita per day was made in estimating the quantity of water necessary. There are no manufacturing requirements of any consequence and aside from adequate provision for fire protection there are no conditions which require other than ordinary allowances.

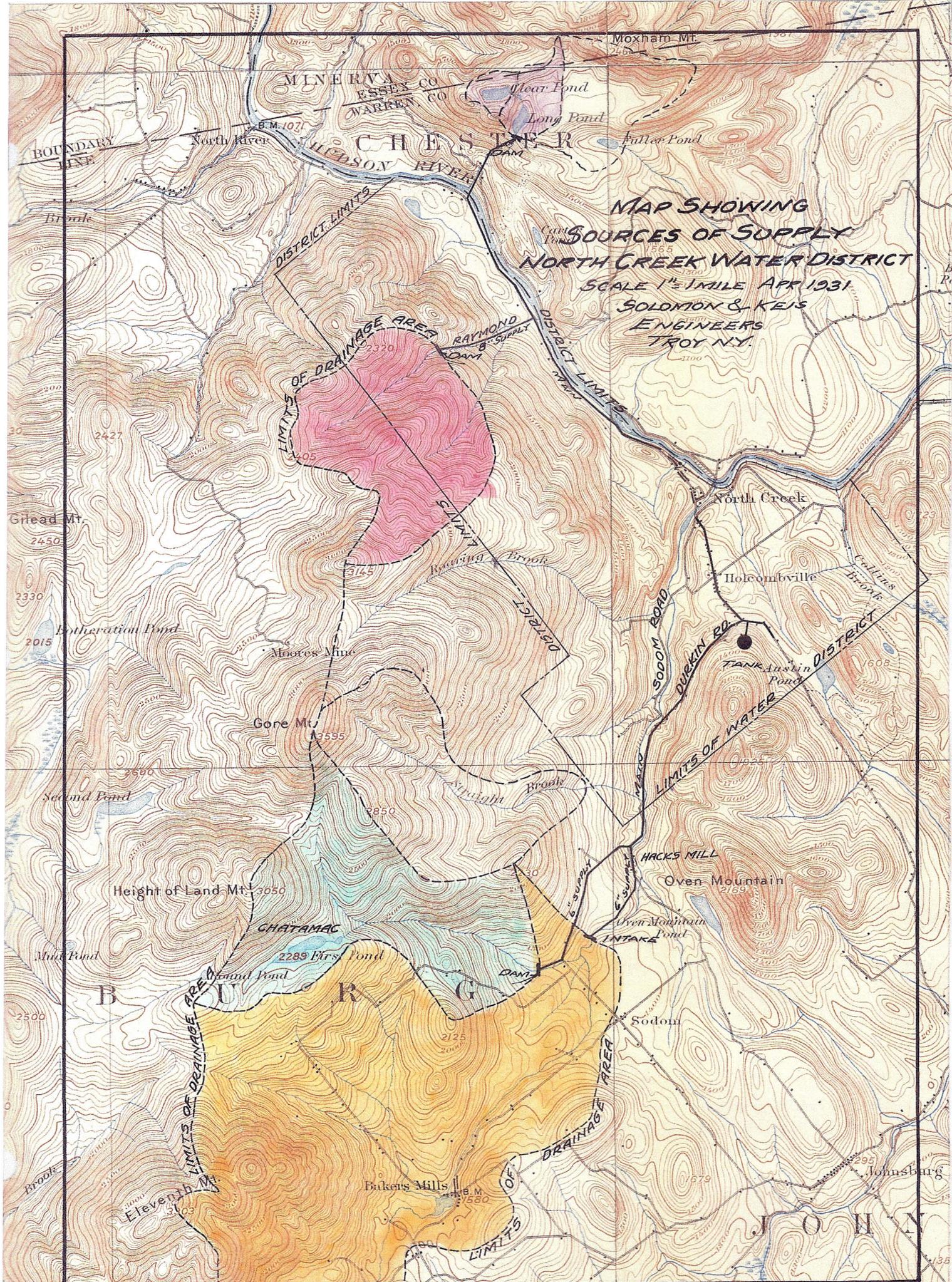
Sufficient altitude is available in all the sources considered, except the Hudson River, to afford ample pressure without pumping. It is planned to store at least one days supply in a standpipe on the mountainside near the south end of the District to act as a reserve for emergency and to reinforce the supply for fire protection.

## SURVEYS

Surveys of possible dam sites and storage reservoirs were made on Raymond Brook, Straight Brook, North Creek, and Chatamac Brook to determine cost of construction and the storage possibilities on these streams.

Long and Clear Ponds were also investigated and surveys have been made for a supply main from Long Pond to the State Highway on the South bank of the Hudson.

Elevations are based on the datum used by the State Highway Department and the County Engineer of Warren County, and have been carried by us to control points to determine elevations of proposed structures and the pressures that would be available in the distribution system.



POSSIBLE SOURCES OF WATER SUPPLY

Several streams to the south and northeast as well as Clear and Long Ponds and the Hudson River offer potential supplies. Because of the limited sum which may be expended it is evident that the distance of the source from the District must necessarily be limited.

RAYMOND BROOK

This stream is located 3 miles west of the village and discharges into the Hudson. It is spring fed and the entire watershed above the site selected for development is in forest. At a point three-fourths of a mile from the state highway the brook forks and each branch has about one square mile of drainage area.

The stream has the reputation of having a large yield even during the driest periods. We made our first inspection in the middle of February when the temperature was 15 degrees below zero and the flow, from observation, appeared to be not less than 250,000 gallons per day. The past winter has been unusually deficient in precipitation and there had been no thawing of snow for a long time previous to our visit to cause run off. While it is recognized that stronger proof of this stream's performance during drought periods is desirable it is believed that the run off as observed during February and early March is at least indicative of what may be expected. From information obtained from residents who have been familiar with this stream for many years it appears that the flow is well maintained during droughts and that the many springs along the water course never fail. The soil is mostly sandy loam with boulders and gravel. Not much ledge rock is evident. This together with the well forested slopes probably accounts for its uniform flow. Between the base of the mountain and the river the surface soil is underlain with boulders and gravel into which the stream sometimes disappears when the river and ground water levels are low.

The stream has the advantage of being near the District and is in addition high enough to afford a gravity flow. The plan suggested for bringing this water to the villages consists of building a dam below the forks of the two brooks about 25 feet in height. This would impound about 2 million gallons of water with its surface at elevation 1345. From the reservoir an eight inch cast iron main would lead to the state highway and thence along same to North Creek. The eight inch main would continue along Main Street to Holcombville where it would discharge into a 100,000 gallon steel tank. The distribution system otherwise would be the same as for Chatacac or North Creek plans.

The supply main could deliver about 300,000 gallons per day and with the Holcombville reservoir would maintain adequate pressures.

The water is of excellent quality and because there are no homes or buildings on the water shed and because a comparatively large proportion of the water shed would be purchased by the District outright it is our opinion that the water would be suitable for domestic consumption without filtration, if chlorinated.

Owing to the steep gradient of the stream valley it is not possible to construct a reservoir of large capacity within the means available. While from the information obtained it appears that the stream would yield an adequate supply for the present, it would be advisable to reinforce the supply from this source with another.

We have accordingly considered the use of water from the Hudson for emergency and during times of low flow. This would place the District in a position of having two sources, one or both of which could be used as occasion demands.

For the auxiliary river supply we have decided upon a location north of the mouth of Raymond Brook. The pumping station would be built upon the river bank and be equipped with 2 - 100 gpm motor driven centrifugal pumps. The water would be filtered and chlorinated and then delivered into the supply main.

The cost of the supply from Raymond Brook would be \$81,350 and for the Auxiliary supply from the Hudson \$12,000 or a total of \$94,000.

#### CLEAR AND LONG PONDS

These lakes are located  $3\frac{1}{2}$  miles northwest of North Creek. Long Pond is at elevation 1570.5 and Clear Pond is at 1677.0. They are about  $\frac{1}{8}$  mile apart and are situated in crater like depressions on the mountains. Clear Pond is a natural lake while Long Pond is partly artificial, its water surface having been raised by a masonry dam 21 feet high built about 1900 by the North Creek Electric Company as a part of its hydro-electric development. The lakes are nearly equal in size and have a combined area of about 52 acres. (Clear Pond and Long Pond are reported to be 150 feet and 125 feet deep respectively). The combined drainage area of the two lakes taken from the U.S. Geological Survey is 0.35 square miles. We believe, however, from an inspection of the water shed that it is larger and probably not less than 0.5 square miles.

For many years these lakes were used for power purposes. A 14 inch steel flume carried the water to an impulse wheel at the river and a 200 K.W. Generator furnished power to the village for lighting and the saw mill. The plant was operated continuously and during 2 years the plant carried a load ranging

from 30 to 130 K.W. A six inch steel siphon is reported to have been operating under nearly full head for the past two years from Clear Pond with valves wide open and the lake is now only about five feet below normal. It appears from these performances that more than an ample supply is available for the Water District.

The drainage area is rocky and very rugged. The percentage of run off is undoubtedly greater than usual and as the storage capacity of the two lakes is large in proportion to the water sheds an exceptionally large part of the rainfall can be made available for water supply purposes.

A minimum annual precipitation of 33" for the water shed is conservative. By allowing 50% of same for run off and 30% of the run off as being available for use, the lakes could deliver 180,000 gallons per day to the District. This is two and one-fourth times the estimated daily consumption based on a population of 800 and a per capita consumption of 100 gallons per day. For a 20 foot draw down in the lakes the storage is about 250,000,000 gallons, or sufficient for over 8 years use at the present estimated demand if the rainfall was adequate to take care of evaporation only.

The plan for developing these lakes contemplates a six inch supply main from Long Pond to be laid along the line of the present flume. A short distance below the dam the water can be aerated under natural head, collected in a small reservoir and then discharged into the supply main. In addition a six inch main would be connected with the siphon from Clear Pond and the chamber now in the Long Pond dam. Water would be taken from Clear Pond as long as available and then from Long Pond. Automatic valves would be installed at the dam to draw water from Long Pond in event the main from Clear Pond should stop functioning and also to meet rates of draft in excess of the capacity of the siphon. The river crossing would be made with 6 inch flexible joint cast iron pipe laid in a trench in the river bed. After crossing the river a six inch cast iron main would continue along the state highway to North Creek and along Main Street to Holcombville to a 100,000 gallon tank erected on the side hill. Due to the great head available a six inch main can be used and some of the surplus head can be dissipated in friction. The distribution system would, except for the six inch pipe on Main Street, be the same as in the other plans.

Pressure reducing valves and relief valves would be built into the supply main to regulate pressures and maintain it within desired limits in the villages.

At Clear Pond a six inch steel siphon is used to carry the water over its rim to Long Pond. This siphon is now in working order and with some minor repairs and replacements can be used for some years to come.

A small pond between the lakes is located in a marsh which can be easily drained. To improve this swamp condition it is proposed to construct a drainage ditch about 200 feet long. This would give the water a free access to Long Pond, eliminate the swamp, and decrease the color in the water which is now in large part due to this area.

There are no homes or buildings on the water shed and it is so difficult of access that there is not much chance for pollution. The water is of excellent quality and if chlorinated would be safe for domestic use.

There is ample water available for the present and for many years to come and the supply can be augmented if necessary. About 500 acres of land around the lakes is for sale and if this is purchased practically the entire water shed will be owned by the District.

The water in Clear Pond is practically colorless while that of Long Pond has more than usual. The color is due to the great amount of timber, branches, etc. which remained from the raising of the water level, storms, and from several colonies of Beavers which have dragged in immense quantities of logs and branches. Clear Pond contains a considerable amount of timber but not nearly as much as Long Pond.

Analyses showed the water of Clear Pond to be free of B. Coli while that of Long Pond showed B. Coli present in 1 of 5 samples. It is believed that the large number of beavers in Long Pond account for the presence of Coli in the sample. When the lakes are cleaned up the beavers will undoubtedly migrate to another stream or lake.

It is proposed to remove all of the timber, trash and Beaver houses from the Lakes, also the trees standing close to the water. The dam at Long Pond is in need of repairs and when the water is lowered to do this work all of the material now collected around the lake shore can be removed.

The cost of this project would be \$89850.00

#### CHATAMAC BROOK

This brook is one of the main tributaries of North Creek and rises in the mountains south west of First Pond. It flows in an easterly direction entering North Creek about  $1\frac{1}{4}$  miles north of Sodom. The site considered for development is about 4 miles south west of Holcombville.

The drainage area comprises about 3 square miles of wooded, rough mountain country. About one mile of poor mountain road, on which are located 4 homes, passes through the water shed. The road is about 0.3 miles from the stream. The Chatamac Club is

located at First Pond and is used by a small group during the summer months. The population in the summer time is reported not to exceed 10 per square mile. The Sanitary conditions on the water shed are good and the analysis of the water indicates it to be excellent quality. See Appendix.

The drainage area is ample to afford an adequate supply of water and the stream may be developed by the construction of a dam about  $\frac{1}{4}$  mile west of the highway running northwest from Sodom. A dam 25 feet high to spillway would create a reservoir of 17 million gallons capacity, with an average elevation of 1458 or 258 feet above Holcombville. The proposed plan includes a dam as above, a six inch main to Holcombville, a pressure filter and chlorinating plant one mile west of Holcombville, a 100,000 gallon tank on the mountainside west of the State Highway near Durkin Road and an 8 inch main from the reservoir through Holcombville to the business center of North Creek. Six inch mains would be placed on side streets, hydrants would be spaced from 400 to 500 feet apart in the distribution system and valves would be located to permit the easy cutting out of any section of the system for repairs.

The main from the dam could supply about 375,000 gallons of water per day or about three times the present requirements. The reservoir in the District would serve as a reserve supply and to maintain reserves at times of fire or heavy draft.

Because the available head in the North Creek Village area would be greater than necessary it is proposed to place a pressure reducing valve in the main between North Creek and Holcombville to maintain a pressure of about 80 pounds in the lower section.

Chatamoc Brook would afford an ample supply of good potable water. The storage reservoir would hold a reserve ample for nearly six months. The filters and chlorinating plant would protect the District against danger from possible pollution. The pressures in the District would range from 60 to 80 pounds and greater if desired.

The cost of this project would be, without lands and rights of way \$105,000. They should not exceed \$2,000.

### HUDSON RIVER

The Hudson affords an abundant supply of comparatively good water. Only a very short supply main would be required and the cost of development would be less than that of any other available source.

The water would, however, have to be pumped and filtered. In addition to this there exists a popular prejudice against the use of river water. In a country where a gravity supply is possible and where purer water is available it seems expedient to choose a higher and purer source even though the quantity available is smaller.

## NORTH CREEK

The headwaters of North creek rise about 9 miles southwest of the Village and are adjacent to the source of the Sacandaga River. The stream flows in a general northerly direction and discharges into the Hudson at North Creek. Most of its water shed is in forest growth and is typical Adirondack mountain country. Two small hamlets, Bakers Mills with about 25 homes and Sodom with about a dozen together with a few scattered farm houses constitute the development in the drainage area above the point considered for the Intake.

The water from this source would require filtration and chlorination and several unsanitary conditions now existing on the water shed would have to be corrected.

The drainage area above stream elevation 1340, north of the mouth of Chatamae Brook is 13 square miles. The stream flow throughout the year is adequate to supply sufficient water without the aid of a storage reservoir.

The plan considered for developing this stream consists of a small intake dam about 5 feet in height at about elevation 1340 an eight inch supply main over the Sodom Road and Durkin Road to Holcombville, a pressure filter and chlorinating plant, a 100,000 gallon reservoir at Holcombville, and a distribution system the same as in the Chatamae plan.

The supply would afford about 275,000 gallons per day and maintain a static head at Holcombville (El. 1300) of 50 pounds.

The water from this creek is more liable to pollution than that of the other creek sources considered. The stream, however, has the advantage of not requiring a large dam and the development cost would be somewhat less than that of Chatamae. A filter plant treating this water should be carefully operated, and sanitary supervision should be maintained on the water shed. It appears that the advantages of an ample supply of water at a smaller cost of development are offset by the sanitary considerations and the constant supervision that would be advisable to insure the continuance of a safe water shed.

The cost of this plan would be \$90,000.

## STRAIGHT BROOK

This stream has an available drainage area of 2.1 square miles. It lies adjacent to the Chatamae area and the brook enters North Creek  $\frac{3}{4}$  miles from the Hudson. The water shed has no population, is well timbered, and desirable for water supply purposes. It is, however, not possible to secure adequate storage to insure a supply over an extended drought and unless it can be shown by gaugings covering a sufficiently long period that this stream will afford enough water it will not be safe to depend on it alone. The largest storage that can be developed at a cost within funds available will not exceed 3 million gallons. This would be adequate for only one month if the stream should fail.

## RECOMMENDATIONS

The water in Clear pond is of exceptional quality and that in Long Pond can be made so by removing the trees and improving the conditions about the Lake. Both lakes are so difficult of access as to make them unattractive to the general public and are rarely visited. The water shed is ample and the storage capacity is greater than necessary for the District.

The dam at Long Pond and the siphon at Clear Pond have been built and other parts of the former power plant can be used for the proposed water system. The New York Power & Light Corporation have offered the property at a reasonable rental and the Water District can be assured of a sufficient quantity of good water at a smaller cost than from any of the other sources considered.

We therefore recommend that these lakes be selected as the source of supply for the Water District, that Clear Pond be connected directly to the supply main, and that Clear Pond be used as the principal source of supply with Long Pond as a standby. That both lakes be cleared of timber and trash, that the water be aerated and chlorinated and the pressure be controlled by pressure regulating valves between the lakes and the village to maintain a pressure of about 100 pounds. That a 100,000 gallon tank be erected at Holcombville and that you acquire as much property around the source of supply as possible.

A water system using the above source would supply you with abundant water of good quality, at a good pressure and at a very low cost for operation and maintenance.

\$ 2,900.00

Steel Standpipe

100,000 gallon tank on foundation	\$3,250.00	
8" main to Tank	<u>1,250.00</u>	4,500.00

Chlorinator

Chlorinator with small piping etc. in place		1,200.00
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Drainage Trench between Small and Long Ponds

Earth Excavation 125 cu. yds. @ \$1.50	188.00	
Rock " " 50 " " @ 5.00	<u>250.00</u>	438.00

Clear Pond Siphon

Replacements, repairs, filling trench over pipe and rubble cut-off wall		750.00
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Removal of Trees, trash, etc. from Long and Clear Ponds

Cleaning up at Clear Pond	1,000.00	
Cleaning up at Long Pond	<u>2,000.00</u>	3,000.00

Repairs to Long Pond Dam

Concrete, and miscellaneous repairs		1,250.00
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Contingencies Legal and Engineering		<u>11,712.00</u>
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TOTAL COST \$59,850.00

The New York Power and Light Corporation owns the dam at Long Pond, the Clear Pond Siphon, water rights of both Ponds and rights-of-way and the Power House. They will lease all of the above to the Water District for \$200 per year, until such time as they may develop the water power at these Ponds. Should they develop the power, the rental per year would be figured on the basis of 1 $\frac{1}{4}$ ¢ per kilowatt hour of electric energy which might or could be generated at the Power Plant with the water drawn from the Pond, with a minimum charge of \$400.00 per year.

The District is therefore not compelled to purchase lands or rights of way.

The only land and right of way to be secured is for the Tank site and right of way thereto; it is estimated that the cost of same should not exceed \$350.

About 500 acres of land at the Ponds is available for \$3000 and the District may purchase this property if it so elects.

SCHEDULE OF PROPOSED WATER RATES

**Flat Rates Per Year**

Kitchen Faucet.....	\$4.00	Toilet.....	\$5.00
Bath Tub.....	4.00	Wash Basin.....	3.00
Laundry Tubs.....	4.00	Lawn Sprinkler.....	6.00
Garage, one car.....		\$10.00	
Garage, each additional car		\$5.00	

**Commercial Per Year**

Small Stores	-	Fixtures same as Dwellings	
Single Offices	-	Fixtures same as Dwellings	
Physicians.....	\$8.50	Dentist Office.....	\$12.50
Barber Shops - First Chair	\$8.00		
Additional chairs	3.00		
Soda Fountains.....	\$10.00	Yard Hydrants.....	5.00
Filling Stations.....	10.00		
Barn - 2 Horses or Cows.....	\$6.00		
Additional Horses or Cows	3.00		
Fire Hydrants.....	50.00		

Charges to all manufacturing establishments, commercial enterprises of any character, hotels, public garages, shops, green houses, schools, churches, printing houses, photograph galleries, restaurants, public stables and for building purpose will be based on meter rates.

The minimum rate for dwellings or for commercial use will be Ten Dollars per year.

**Meter Rates - Six Months**

First	50,000	gallons.....	.30¢	per 1000	gallons
Second	50,000	"	.25¢	"	"
Second	100,000	"	.23¢	"	"
Third	100,000	"	.19¢	"	"
Second	300,000	"	.18¢	"	"
Second	600,000	"	.17¢	"	"
Third	600,000	"	.16¢	"	"
Fourth	600,000	"	.15¢	"	"
All over 2,400,000		"	.12¢	"	"

The minimum rate for Meter Service is \$20.00 per year.