

Grand River Conservation Authority

Report number: GM-12-17-135

Date: December 15, 2017

To: Members of the Grand River Conservation Authority

Subject: Montrose Reservoir Project Update

Recommendation:

That Report GM-12-17-135 Montrose Reservoir Project Update be received as information.

Summary:

The Montrose reservoir project has been a proposed project since the 1930's as an option to provide flow augmentation and reduce flood damages. A number of studies in the 1930's, 1950's, 1960's, 1970's and 1980's evaluated the cost effectiveness of a new dam near West Montrose for water supply, water quality enhancement and flood damage reduction.

The 1982 Grand River Water Management Study included a detail technical and social economic analysis of water management plan options. The recommended Plan, Plan A4, recommended that the Montrose reservoir lands be protected for possible future water management purposes.

The history of the Montrose reservoir and future water management considerations was presented to the Grand River watershed Water Managers Working Group on December 6th 2017.

A Montrose reservoir is currently not in the Region of Waterloo master water supply plan, as it is considered to be beyond their current planning horizon of 2050. However, there was strong consensus with the Water Managers Working Group that it is prudent to maintain the Montrose Reservoir as a future water management option, given the uncertainties associated with climate change and the continued growth of the watershed population.

Report:

This report provides a history and status of the project that proposed to build a reservoir between Elora and the Village of West Montrose on the Grand River for low flow augmentation and flood management. The project is commonly referred to as the Montrose Dam or Montrose Reservoir in many reports.

There have been several studies since the 1930's that investigated flood reduction, water supply and water quality options for the Grand River watershed.

The initial water management plan was the Report on Grand River Drainage in 1932 by the Honourable William Finlayson, Minister of the Department of Lands and Forests, Province of Ontario, prepared for the Grand River Commission. Several recommendations from that report were implemented, most notably the construction of the Shand Dam in 1942 and the Luther Dam 1954.

The Grand River Hydraulics report was first issued in 1954 by the Ontario Department of Lands and Forests, Conservation Authorities Branch. It was updated in 1962. This report guided decision making by the Grand River Conservation Commission and the Grand Valley Conservation Authority. Various water management options were considered, to reduce flooding and improve water quality. The design objective of the 1954 report was to provide flood reduction capacity throughout the watershed to protect to a level of 1-1/3 times the magnitude of the 1947 flood. Two reservoir systems were proposed:

1. The Montrose System and
2. The Freeport System.

A summary of the proposed reservoir and dike system recommended in the 1954 report is presented by table 1. The Montrose dam was included in the Montrose Group option.

Table 1 Recommended Reservoir and Dyke Systems 1954 Hydraulics Report

Reservoirs	System 1 Montrose Group	System 3 Freeport Group	Diking and/or Channel Improvements
Conestogo	X	X	Cambridge-Galt
Guelph	X	X	Drayton
Everton	X	X	Hespeler (a)
Ayr	X	X	Paris (b)
Hespeler	X	X	New Hamburg
Montrose	X		Guelph (a)
Freeport		X	
St. Jacobs		X	Plattsville
Wallenstein		X	Dunnville
Nithburg	X	X	
			Clearing River Bed

The Grand River Conservation Commission prepared a report titled Plan for Flood Control and Water Conservation in the Grand River Watershed in June 1964. This report provided the basis for a request to the provincial government for financial assistance to build the Ayr Dam on the Nith and the Montrose Dam on the Grand River.

The Grand Valley Conservation Authority studied the construction of six dams between 1947 and 1966 which included: Everton, Guelph and Hespeler dams on the Speed River and the Collas, Lake, Princeton and Vandecar Dams on Whitemans Creek. Kilborn Engineering completed the Speed River Basin Report on Flood Control and Water Conservation in June of 1965. The Kilborn report included a detailed analysis of reservoir and channelization options for the Speed River to reduce flooding and improve water quality.

The Grand River Conservation Commission and Grand Valley Conservation Authority were amalgamated into the modern day Grand River Conservation Authority in April 1966. Following this amalgamation, a technical brief on Flood Control and Water Conservation for the Grand River Watershed was prepared by the Grand River

Conservation Authority August 1966. This brief consolidated previous flood control and water conservation studies, completed by the Grand River Conservation Commission and the Grand Valley Conservation Authority. The brief was submitted to the Federal and Provincial governments, requesting financial support to complete flood control, pollution abatement and water conservation projects. This brief included the Montrose Dam project. At that time, the Montrose Dam had the highest benefit cost ratio of any of the proposed dams. The recommended works from the 1966 report are presented by table 2.

Table 2 Brief on Flood Control and Water Conservation for the Grand River Watershed Recommended Works

Reservoir	River	Benefit Cost Ratio
Montrose	Grand River	1.38
Ayr	Nith River	1.01
Guelph Everton Hespeler	Speed and Eramosa	1.05

The Provincial Treasury Board prepared a 1971 report titled Review of Planning for the Grand River Watershed. This report investigated future water demands in the Grand River watershed, based on forecasted population growth. Water supply options to manage water quality and flood control were all investigated. The Montrose reservoir was omitted from the report recommendations, since the flood control and flow augmentation benefits were less when compared to other recommended reservoirs considered in the Treasury Board report. Other recommendations in the treasury board report included Guelph Dam, Woolwich Dam and acquisition of lands for the Everton, Hespeler and Ayr reservoirs.

Following the May 1974 flood, a provincial inquiry into the flood was completed by Judge Leach. The Royal Commission Inquiry into to Grand River Flood 1974 was published in February 1975. Judge Leach made a total of twenty-one recommendations. The first four recommendations were specific to dam construction and are included in the following:

1. That the GRCA embark immediately upon the construction of the Montrose Reservoir. This will control the Irvine River and provide flash flood storage in the system of 20,000 acre feet. This reservoir has been recommended by experts for the past twenty years, and had it been in existence in May, would have substantially decreased the flood damage in Cambridge-Galt.
2. That the GRCA carry out an exhaustive analysis of alternatives before proceeding with the construction of the other reservoirs recommended in the 1966 Grand River Conservation Authority Brief.
3. Recommendations 1 and 2 should be carried out with a view to terminating, as soon as possible, the interim policy of having full reservoirs by the end of May.
4. That some flood storage be maintained at all times in the new dams constructed.

Recommendation 1 specifically recommended construction of the Montrose Reservoir.

The Grand River Conservation Authority Water Management Advisory Board, after considering Judge Leach's recommendations, referred study of the Montrose Dam project to the Grand River Implementation Committee (GRIC) on May 28th 1975.

The Environmental Assessment of Water Control Structures in the Grand River Basin was commissioned in June 1975. The scope of the environmental assessment included

completing a review of the Montrose reservoir option and flood control options contained in the 1966 GRCA brief. The reservoir systems included for discussion and assessment are presented by Figure 1 and include both the Montrose and Freeport groups of reservoirs.

The flood reduction assessment included consideration of providing flood protection to the Regulatory Flood based on the Hurricane Hazel Regional storm. The environmental assessment was completed in June 1979 and generated four alternatives:

- Alternative A: Montrose Dam Completed by 1984
- Alternative B: Montrose Dam Completion delayed until 1996
- Alternative C: Montrose Dam Completion delayed until 2013
- Alternative D: Montrose Dam not built before 2030

Alternative A was recommended as the preferred alternative. The results of the Environmental Assessment were approved by the GRCA Board by resolution at the September 19th 1979 special board meeting. Actions to begin assembling land and completed final designs of the reservoir were initiated. Construction of the reservoir was not initiated, pending the outcome of the Grand River Basin Study. Detailed social and economic analysis of the four alternatives was delegated to the Grand River Basin Water Management Study.

The Grand River Basin Water Management Study was commissioned in 1977 by the Provincial Ministry of the Environment. This study was in response to the 1974 flood inquiry and the 1971 Treasury Board Report *Review of Planning for the Grand River Watershed*. The purpose study was to define the water management problems confronting the Grand River basin, and develop a viable set of alternative water management plans. The alternatives were designed to meet three water management objectives which included:

1. Reduce flood damages
2. Provide adequate water supply
3. Maintain adequate water quality

The investigation period for the study extended from 1977 to 1981. This study included a comprehensive analysis of the costs and benefits of various alternatives and included extensive public consultation. The study was completed in 1982. The final study recommended Plan A4 and included 21 recommendations.

Plan A4 was put forward by the Grand River Implementation Committee as cost-effective in meeting the three water management objectives, including future water supply and water quality considerations in addition to flood reduction. Plan A4 recommended major dike and channelization works in Brantford and Cambridge to reduced flood damages, increased levels of sewage treatment to improve water quality and withdrawals from the Grand River to supply a portion of Waterloo Region's drinking water supply.

Plan B2 recommended the Montrose Reservoir, advanced sewage treatment and withdrawals from the Grand River to supply a portion of Waterloo Region's drinking water supply. Water quality improvements were achieved by increased flow augmentation from the Montrose Reservoir and advanced sewage treatment. Flood reduction was achieved by flood regulation by the Montrose reservoir.

Plan A4 was preferred plan for the following reason:

- a) it is approximately \$25M cheaper than Plan B2

- b) its environmental and social impacts are moderate. The public participation program indicated that there would be opposition to the selection of Plan B2
- c) it maintains future flexibility by preserving the option of constructing the Montrose dam if future water quality or water supply problems require it.**
- d) It provides a high degree of flood protection for urban areas
- e) It provides for population growth by fully meeting projected municipal water demands and improving water quality in the central Grand River
- f) It improves water quality in the central Grand River, although the dissolved oxygen levels will not fully meet the provincial water quality objectives. While Plan A4 does not provide as high a water quality as Plan B2, it provides a reasonable level of protection for most water uses at a substantially lower cost.

A recommendation, E1, was specific to the Montrose Reservoir:

E. Recommendation to Protect the Montrose Reservoir Site

1. It is recommended that the Montrose reservoir site be protected for possible future water management purposes.

Protection of the Montrose reservoir site can be achieved by land acquisition and planning controls. Acquisition can be carried out over time by purchasing the land at the prevailing market price. Planning controls can be utilized in the form of land use and regulations and zoning.

At some time in the future the land can be either be sold, used for construction of a dam and reservoir, or preserved for other uses. In the meantime, the existing agricultural land use can be maintained and the site protected from development.

Recommendation E1 from the 1982 Grand River Basin Water Management Study was approved by GRCA Board resolution 443-82, which read as follows:

“THAT the Township of Pilkington and the Township of Woolwich be requested to enact local municipal zoning regulations for the protection of the Montrose Reservoir Site; and,

THAT, failing the accomplishment of the above, the Ministry of Municipal Affairs and Housing be requested to enact zoning orders for the protection of the Montrose Reservoir Site; and,

FURTHER THAT the Authority continue its present policy of acquiring land within the Montrose site within budgetary limitations.”

The GRCA completed an updated Water Management Plan in 2014. This updated plan was presented to the GRCA in board report GM-06-14-59 June 2014 and approved by resolution 73-14.

The updated water management plan included an action specific to the Montrose Reservoir,

“GRCA will continue to protect existing lands and acquire new lands, where appropriate, for future water management options near West Montrose and Everton”.

The acquisition limit for the Montrose reservoir is presented in Figure 2. This figure also presents the land acquired to date. The total area within the acquisition limit is 6 km² and the GRCA owns 2.8 km², 47.4% of that area.

The Montrose reservoir option was presented to the Grand River watershed Municipal Water Managers committee on December 6th 2017. There was consensus of municipal water managers that it is prudent to maintain the Montrose Reservoir in the future range of water management options. The recommendations of previous reports noted above, uncertainties associated with climate change, the continued growth of the watershed population and to maintain flexibility for future water management options all lead to consensus to maintain the Montrose Reservoir project as a future option

A Montrose reservoir is currently not in the Region of Waterloo master water supply plan since it is beyond the current plan horizon of 2050. GRCA staff consulted with Region of Waterloo staff regarding this initiative, and it was determined that it is prudent to continue to preserve the Montrose reservoir in the future range of options.

If building the Montrose Reservoir was pursued in the future, an Environmental Assessment would be required.

Land owned by GRCA beyond the acquisition limit will be not required for the Montrose reservoir may be disposed of over time as opportunities arise.

Financial implications:

Expenses related to this project in the foreseeable future would relate to land acquisition and preparing for disposal of surplus land beyond the acquisition limit. These expenses could be funded from the land sale reserve.

Other department considerations:

Not applicable

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Figure 1 Reservoirs Considered in 1979 EA of Water Control Structures

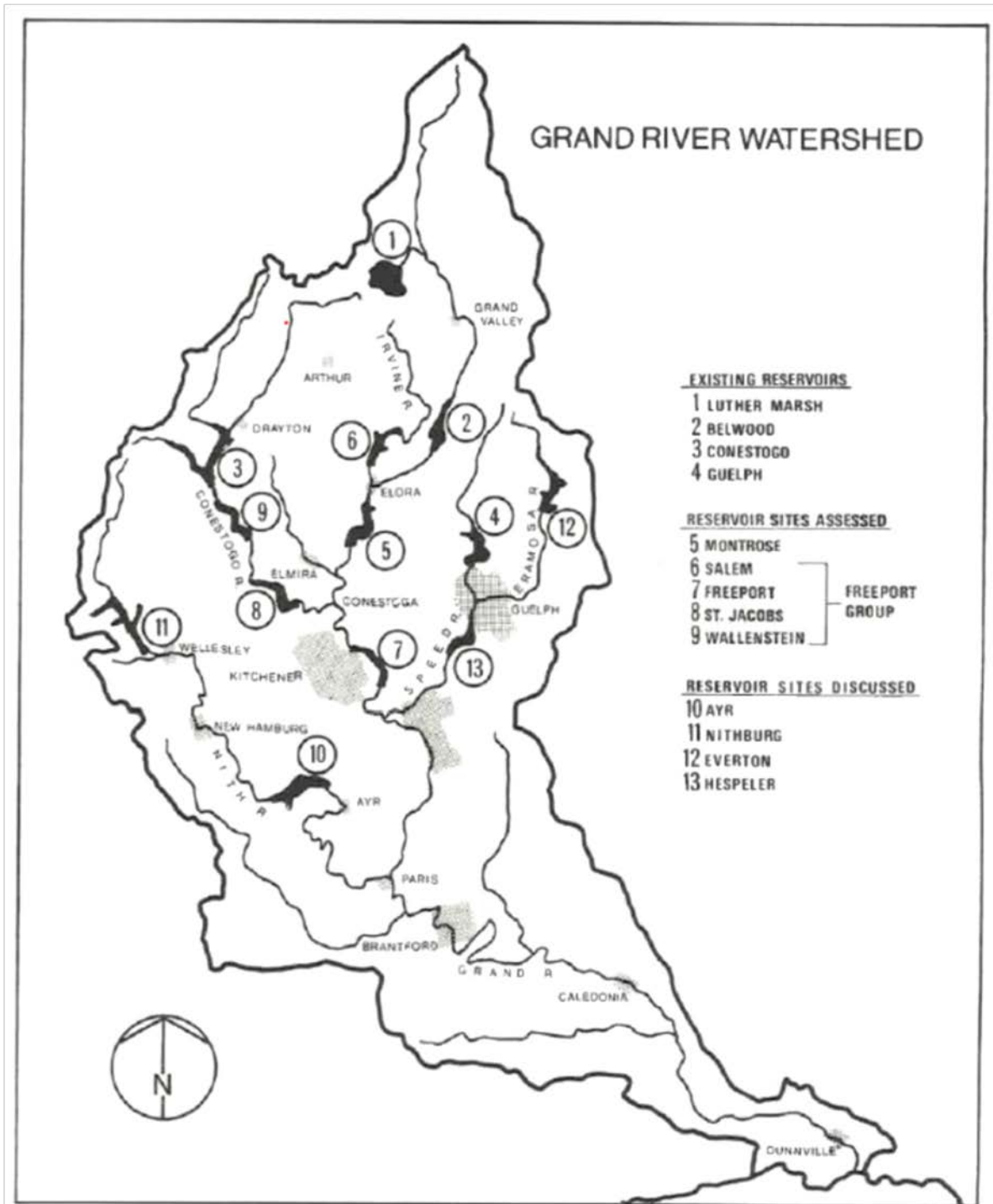


Figure 4-1

The Grand River Basin Sites of Montrose, Freeport and Nithburg Reservoir Groups

Figure 2 Montrose Reservoir Acquisition Limit and Current GRCA Property Holdings

