

## **APPENDIX 2**

### **HISTORY OF THE SWALEY DRAIN AND ADJACENT DRAINS**

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### HISTORY OF THE SWALEY DRAIN (AND ADJACENT DRAINAGE)

**a) What it was when first reported on (1898)**

From data provided, it is evident the Swaley Drain was initially constructed pursuant to a report of Mr. Gaviller, CE, PLS dated May 1898. At that time, it was called the Swaley Creek Drainage. This report provided for work from the southeast terminus of the Ninth Line Award Drain in the Swaley Creek (in Lot 7, Concession 8) downstream to the 11<sup>th</sup> Line in Lot 10.

The upper portion of channel was to have a 3' bottom, 3' depth and 10' top, and the downstream part was to have a 4' bottom, 3.5' depth and 12' top (all imperial measurements at that time and now much larger as will be noted). This Report would have legal status pursuant to the Drainage Act.

The original report is on file. The 1898 drawings were not found but a drawing of the outlet portion prepared by the same Engineer for the next Bylaw three years later is on file.

**b) What work was done on the Swaley Drain (and near to it) from the time of the original construction until 1948?**

Shortly after construction of the work recommended by the report of 1898, Mr. Gaviller had to issue five further reportings to the Municipality in the period of 1900 to 1901. The last of these was considered a Report pursuant to the Drainage Act and was adopted as a Bylaw and thus also has legal status. These reportings dealt in part with an illegal connection of the Willow Creek to the Swaley Creek (which was subsequently rectified) and also with the need for more work at, and downstream of, the outlet of the Swaley.

None of these reports/reportings are fully available, but the text for two and the downstream drawings for one were provided.

Copies of the bylaws that were passed for the initial 1898 report and also for the last of the five further reportings/reports, which was in October 1901 are on file with the Municipality. It is from the latter bylaw that the drawing attached to this Appendix.

herein originates. This drawing shows the outlet of the Swaley Creek drainage as done in 1901.

Indeed, the October 1901 Bylaw provided for four areas of work:

- a) To extend the Swaley outlet from the 11<sup>th</sup> Line downstream to the Muskrat Creek as per the drawing attached here
- b) To do work in the Muskrat itself as per prior reportings in 1901
- c) To do the 30 rod cut at the east River bank
- d) To extend the Swaley further upstream in Concession 8.

With respect to the downstream extension of the Swaley outlet, it was extended three quarters of the way across the north part of Lot 10, Concession 11 to the Muskrat as the enclosed drawing shows.

With respect to the work on the Muskrat Creek, the bylaw stated that the Muskrat Creek works were to be as per the Engineer's prior reportings.

The prior reports to Council referred to would include one in August 1901 for which a drawing is available and one submitted six months before the August report for which only text is available. This early 1901 reporting stated, amongst other recommendations, that there should be the construction of an improved Muskrat Creek channel where it discharged to the Nottawasaga River. It said the channel improvement should have a 20 foot (6 metre) wide top, a 10 foot (3m) wide bottom, a depth of 3.5 feet (1m±) and a length of 30 rods (500 feet±/150m±)<sup>1</sup>. It is believed this construction was done since the remnants of such channel were found by the Engineer's surveyors, and it does show in photographs provided to the Engineer by NVCA staff.

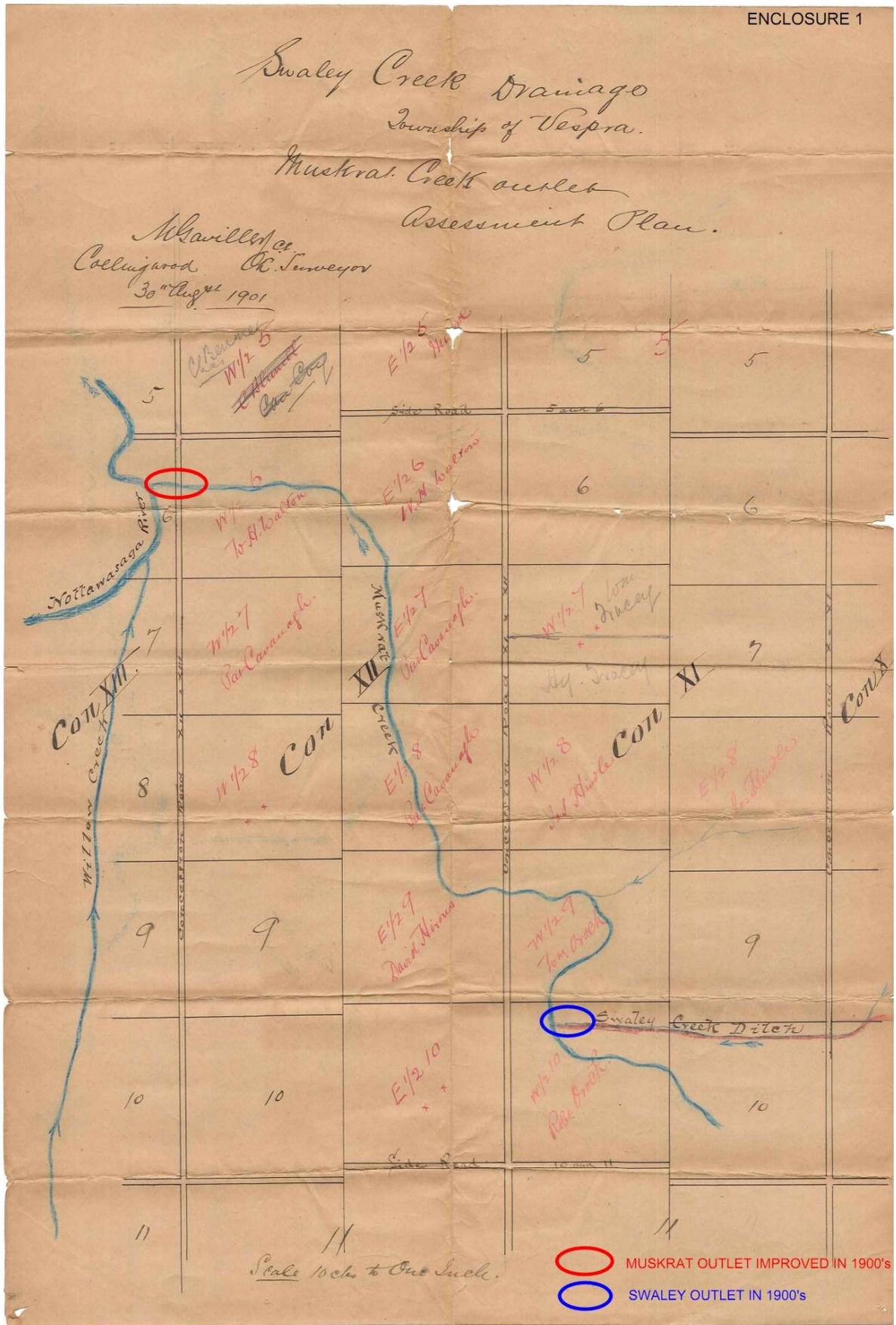
The early 1901 reporting to Council also recommended that fallen brush and sediment areas in the Muskrat Creek were also to be removed from the creek between its improved outlet at the River and the location to where the Swaley was to be extended.

Since the bylaw that adopted the October 1901 report did provide for the extension of the Swaley to the Muskrat and since the channel work at the river (the cut) was constructed, it most likely also provided for the brush and sediment work along the Muskrat. The Muskrat brushing work was not sufficiently shown or described in the

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<sup>1</sup> This is called the "cut" in this Preliminary Report.

ENCLOSURE 1



Bylaw however, to be considered part of the Swaley Creek Drainage. The Swaley Extension in Concession 1 was by comparison made and shown part of the Swaley work and is deemed to be a legal extension.<sup>2</sup>

With respect to the 1901 bylaw's upstream extension of the Swaley, the original 1898 construction provided for the head of the Swaley to be at the junction with the 9<sup>th</sup> Line Award Drain but the 1901 bylaw extended the Swaley upstream to the line between Lots 3 and 4, Concession 8 (and perhaps even into Lot 3 as later documents suggest may have occurred).

There is no record of further legal changes to the Swaley outlet after the 1901 bylaw. The 1948 Bylaw, which will be next discussed, provided work from the 1901 outlet upstream. Also it should be noted the lands on which the Swaley was extended in 1901 are now part of the Minesing wetlands but they were then (1901) privately owned and no doubt remained privately owned into the 1970's.

Although such was not directly related to the Swaley, it should be noted that a further Drainage Act works in 1903 was constructed into the Muskrat Creek as per an Award Drain of A. Cavana, OLS. This award was called the Tracy Davis Award Drain and it was constructed into the Muskrat through Lot 7 to the north which is in a location on the Muskrat route close to midway between the River and the Swaley.

This 1903 Award had two open ditch components, one on the north and one on the south boundary of Lot 7, Concession 11 running from the Muskrat Creek upstream to and along the Eleventh Line Road in part. The Muskrat Creek condition would have been favourable for the outlet of such award drain since it would have been improved in the 1901 period as discussed above.

The next data on file in the Swaley area was a Report prepared by the same A. Cavana, OLS in 1930. This Report proposed to improve, and reconstruct in part, the Muskrat Creek channel fully from the then current Swaley outlet all the way to the River. The drawing accompanying the 1930 Report still showed the Swaley

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<sup>2</sup> *There is a 1940's era letter in the Township file that stated that the Engineer at the time, when asked, advised that the 1901 era brushing work done on Muskrat Creek itself from the River into Concession 11 was, or was similar to, an award drain and that the Municipality could not, by itself, initiate repair work on it. It is this Engineer's opinion that the "cut" itself could be also determined to be a component of the Swaley Drain due to the detail to which it was described and due to the fact it is existent.*

outlet into the Muskrat three quarters of the way across Concession 11 as shown by the 1901 drawing (although on the wrong lot).

The route of the Muskrat work to be done was shown by this 1930 drawing to be revised in part to follow the route of what was then being called a Government Ditch (and what is now a significant part of the Downey Drain) as excavated in the depression years, from a River outlet to three quarters of the way across Concession 12, and then to follow along the existing Muskrat Creek route from there to the Swaley.

This 1930 Report was not adopted as a bylaw and it is not known why. It is not known if the referred to Government Ditch was either in place or was about to be built and therefore voided the main need for the 1930 Report.

The undersigned Engineer believes this Government Ditch (now part of the Downey Drain channel) was indeed dug to replace the Muskrat Creek. It certainly parallels the Muskrat Creek remnants along much of its length but it did go to a more downstream outlet into the Nottawasaga River. It is expected the reason it went more downstream was because of a rise in the River water levels between this 1930's proposed connection location (in Lot 4, Concession 13) and the historic Muskrat connection location (in Lot 6, Concession 13). (This rise has been noted by the Engineer's survey staff to be now  $400\text{mm} \pm (16'' \pm)$ .) Perhaps even then levees also existed (as they exist now) along the River in the area of the original Muskrat route and such was also a factor in outletting further downstream.

This Engineer believes the 1930's Government Ditch work which so closely paralleled the Muskrat then provided an improved outlet for the balance of the Muskrat and thus to the Swaley. As a result of this improved creek outlet there would have been no or less need at that time to improve the Swaley outlet. The need for upstream work in the Swaley may have remained however.

It is interesting to note that the 1930 Government Ditch was incorporated with repair, improvements and extensions to become the Downey Drain in 1961. It is further of note that when this ditch became the Downey Drain, the Muskrat Creek or Swaley watersheds were not "assessed" any costs towards the Downey Drain and were not shown to be in the watershed of the Downey even though Muskrat Creek waters (and thus the Swaley waters) outletted at least in part, if not in full, into the Government Ditch.

It is also interesting to note that the 1903 Tracy Davis Award Drain initially outletted into the Muskrat Creek close to and just south of the route of the 1930 Government Ditch. Documentation in the file refers to, and landowners have confirmed, that a ditch (called the Coleman ditch) was dug during or after the 1930's work to shift the outlet of both components of the Tracy Davis Award Drain from the Muskrat Creek into this new Government Ditch. This ditch is evident on aerials and the Engineer has viewed it on site.

It is further of note that only parts of the lands served by the Tracy Davis Award were assessed into the Downey Drain when it incorporated this Government Ditch. Lands served by Branch B of the Award were not included for some reason.

This Coleman ditch would have provided even a further improved outlet to the Swaley since it in effect replaced even more of the Muskrat in its southerly route towards the Swaley.

It is not known why the Muskrat Creek watershed including the full Tracy Davis Award Drain watershed were not included in the 1961 Downey Drain report. Perhaps there were disagreements between the landowners in the various watersheds or perhaps even agreements amongst the landowners not to do such. Perhaps it was strictly the decision of the Engineer.

There is no further data in the Municipal files regarding the Swaley Drain/Swaley Creek Drainage and/or its outlet until the 1945± period. Data from 1945± indicates the landowners were then quite concerned with the condition of the Swaley and made presentations to the Township. No works were done immediately at that time but it is believed the concerns of the landowners led to the 1948 report on the Swaley by E. Rawson that was then adopted as a bylaw and that is discussed in the next section of this Appendix.

**c) What was the Swaley Drain when it was last reported on for Construction by an Engineer pursuant to the Drainage Act? (1948)**

The next (and last) report on the Swaley Creek Drainage (as it was called in 1901) that provided for any construction on the Swaley pursuant to the Drainage Act was the report by E. Rawson, PE, dated July 1948. This report provided for work in the channel from its outlet (that was still described to be in Concession 11) upstream.

The channel was to be deepened and widened throughout but drawings that would describe and/or show the extent of widening and deepening are not available. The 1948 Report used the name “Swaley Creek Municipal Drain”.

The 1948 Report not only provided for a cleanout/repair/enlargement of the full Swaley Drain from its outlet upstream but also provided for the incorporation of two upstream award drains known as the Binnie Award and the J. A. Donnelly Award.

The 1948 Report also altered the Binnie Award so that its outlet was shifted from the Willow Creek into the Swaley, so that the Binnie route was moved in part to be within the CNR railroad right-of-way (now a Municipal trail), across parts of Lots 6 & 7, Concession 7 and so that its route to the 7<sup>th</sup> Line Road (Wilson Drive) was to be the north side ditch of Hendrie Road.

This 1948 Report changed the outlet of the Binnie by providing for “blocking” of culverts that would allow for flow to the south to the Willow and by providing for culverts across the 8<sup>th</sup> Line and railroad to allow flow to the Swaley.

The 1948 Report never indicated what names were to be given to the award drains once they were incorporated as part of the Swaley Drain but it did refer to them as the Binnie Drain and Donnelly Drain. Since they are parts of the Swaley Drain, this Preliminary Report will refer to them as the Binnie Branch and the Donnelly Branch.

**d) What other work has been done on the Swaley Drain according to Municipal Records (1948 to Present)**

Two other sets of documents on the now called Swaley Drain were made available for review:

- The first of these is dated January 1970 and was an Engineer’s Report prepared by C. Grant, P.Eng. of Ainley and Associates, pursuant to the Drainage Act, but only to revise the drain’s maintenance schedule. This report could be argued to contain the applicable schedule to bill out any new maintenance activities on the Swaley Drain. The drain name retained in 1970 was still the Swaley Creek Municipal Drain.
- The drawing accompanying the 1970 report showed the Swaley channel commencing in the Muskrat channel in Concession 11 and continuing upstream to and along the original route in Concession 8 and including the previously incorporated Binnie and Donnelly channels (Donnelly upstream to Lot 3-4 Line). The text said that the only access culverts that were to be

maintained as part of the Swaley project were those on the Donnelly branch on the east side of the 8<sup>th</sup> Line.

- It is not known if repair work was done in or around 1970 but it would be reasonable to presume such did occur since the maintenance schedule for billing out costs was updated then.
- The Municipality (Drainage Superintendent) has noted that records in the files indicate work was done on the Swaley in the 1982 era. It is believed the work done was primarily a cleanout of the lower end of the existing channel but no details of the work are available except that payments were made for hours worked by an excavator and a bulldozer.
- The next set of reportings made available are assessment schedules and dialogue with environmental agencies, and pertain only to maintenance of the Swaley Drain in the 2000/2001 period. These reportings were prepared by D.McNalty, P.Eng. of Burnside Associates. It appears the 2001 reportings provided for maintenance by the Drainage Superintendent on the Swaley Drain, in various portions upstream of Highway 26 including the Donnelly Branch. The drain name used in 2001 was Swaley Drain. The drawings prepared in this period showed that the Swaley Drain outlet was “blocked” in the same area as now found to be still “blocked” (750m± downstream on the diagonal route). The 2000/2001 data indicated the necessary outlet work was not to be done at that time however.
- The maintenance costs of the 2001 era work were proportioned out using a new schedule dated 2003 which maintained the 1970 schedule with modifications but only on a limited number of properties.

**e) What known changes have occurred on the components (primarily the outlet) of the Swaley Drain since 1948?**

This Engineer is primarily aware of the changes at its outlet and to a lesser extent is aware of culvert and minor channel changes that occurred upstream in the area of the former CNR (now the trail). None of these changes occurred pursuant to a Drainage Act type of report. If other minor changes have also occurred, and the Engineer is made aware of such changes, such further changes can also be described in a Final Report if prepared.

***i) Changes At the Outlet***

It is not possible to tell exactly how, why or when the outlet of the Swaley Drain in Concession 11 was altered. There is no written description – just aerials and some Engineering Drawings related to maintenance proceedings.

As already noted, the 1901 outlet of the Swaley was three quarters of the way across Concession 11 into the Muskrat Creek.

The 1930's drawings showed the outlet still as three quarters of the way across Concession 11 (but in the wrong lot).

Even the text of the 1948 report said work on the Swaley was to begin at its outlet in the Eleventh Concession.

Aerials from 1954 that were obtained and reviewed show the Swaley still outletting into the Muskrat at close to the same location as shown by 1901 and 1930 drawings but the Muskrat Creek had migrated from being three quarters of the way across the Concession to being two-thirds of the way across. The connection was still in the north limits of Lot 10.

Drawings available from a 1970 report that was prepared to provide for new maintenance schedules (presumably to bill out repair costs) then showed the Swaley outlet to be closer to where it is now – just one quarter or less of the way across the Concession and hooking north into Lot 9 as shown by Drawing 1 of this Preliminary Report.

The next vintage of aerials reviewed (1989) show both the remnants of the Muskrat route as it was in 1954 and also possibly a new route of the Muskrat more to the east to lead to the Swaley where it is now. The 1989 aerial shows remnants of the original Swaley route to the west and also the outlet shown by plans in 1970. Although neither outlet is highly visible, the easterly Swaley outlet is more prominent.

The next vintage aerial (2002) shows the Muskrat starting to visually disappear in Lot 9, Concession 11 and 2007 vintage aerials appear to show no route of the Muskrat Creek in Lot 9, Concession 11. The Swaley outlet, in the location as it exists now, is visible in 2002 and later aerials.

The route of the Muskrat near the Swaley is less distinguishable with time.

It is presumed the wetland grasses and higher wetlands water levels have gradually obliterated the ability to view the Muskrat channel remnants from the 1954 period on.

An Engineer's drawing from 2000 (related to maintenance work on the Swaley) shows the Swaley Drain joining to the Muskrat Creek almost in the centre of Lot 9, Concession 11 and, as previously noted, describes that the Swaley is blocked from that location upstream. That location shown in 2000, not surprisingly, is to where this Engineer's surveys indicate the Swaley should be now legally extended. Although this Preliminary Report prefers a route along the original route south of the Lot 9-10 line and then northwesterly to the area of the start of the "blocked" location (950m in length), the new outlet could be reached, but perhaps by slightly more difficult construction (perhaps more sediments and old tree roots), by just continuing the Swaley outlet northwesterly from where its existing outlet is (A lesser work length being the 750m± would be involved).

It is not known why there are no documented repair or improvement works on the Swaley between 1948 and possibly the 1970's and even into the 1980's. Perhaps there was no immediate need after the work on the Downey Drain in 1961 since that work would have improved the outlet of the Muskrat Creek and thus of the Swaley.

It is most likely repair work was done in the 1970's since a revised schedule to bill out repair costs was done at that period. It is possible the outlet was altered by the repairs in 1970 but no documentation exists.

Documentation/communication exists that the Swaley was repaired in the early 1980's near its outlet and then in the early 2000's along its upstream components (as previously noted herein). However, few details of the work done are available.

As will be noted in another section, a channel breaching (now filled in) of the Willow Creek to the Swaley at the time of Hurricane Hazel in the 1954 period (based on aerials and in part on communication) may have contributed to the change in the Swaley outlet due to a deposition of sediments in the route of the Muskrat. Such can not be easily confirmed but such would be a logical explanation as to why wetland water levels rise abruptly in the 750m± (diagonal length) downstream of the existing Swaley Drain. Aerials also indicate lighter coloured areas in the interval which could be because of sediments in the wetlands.

All of the above describes the change in the Swaley outlet but as said, there is no documentation as to exactly how, when or why the change occurred.

ii) Changes At the Golf Course Road (8<sup>th</sup> Line)/Original Railway Corridor Crossing

There is data in the file that indicates the Township of Springwater in the 1994/1995 period did a survey of the various culverts across the old railroad embankment, and made recommendations as to work to be done. It is believed various culvert repairs and replacements then did occur on the old embankment in the area of the Binnie Branch crossing. It is now noted that the Swaley Drain Binnie Branch crosses the old embankment with a new culvert approximately 50m north of the line between Lots 7 & 8. It is believed the municipal culvert across the 8<sup>th</sup> Line has also been replaced in recent years.

iii) Other Changes

There may have been other minor alterations or modifications in the Swaley upstream of its outlet but this Engineer was not made aware of such. Comments have been made to the Engineer re the structure on Highway 26 through which the Swaley Drain crosses, to the effect that it is this structure that controls the channel bottom elevation upstream.

**f) A summary of what the Swaley Drain is now**

Based on the reviewed reports, aerial photography and field observations, it appears the now called Swaley Drain Main Drain (main channel) as reported on, from 1898 to 1948, excluding the miscellaneous Muskrat Creek work and the “cut” done in 1901, is an open channel with a length of 7,500m± (25,000± feet) (from the current outlet west of the 11<sup>th</sup> Line up to Lot 3, Concession 8). The profile from the unadopted 1930 report (which is the only profile of the Swaley Drain in the files) showed 25'± of rise from the 11<sup>th</sup> Line to the top end (most of which rise is in Concessions 8 & 9).

The Binnie Branch would add in a further 3,000m± (9,900± feet) of channel and the Donnelly Branch would add in a further 2,200m± (7,200± feet) of channel to the Swaley Drain. The cut would be 150m (500'±).

Unfortunately, the design/required dimensions of the Swaley channels, the design/required gradients of the Swaley channels and the appropriate specifications for the Swaley channels are missing/not available.

**g) How does the Swaley Drain visually and historically relate to the other area watercourses - the Willow Creek, the Muskrat Creek, the Nottawasaga River and the Downey Drain)?**

Attached to this report is an aerial drawing at a large scale (1:100,000) (**Drawing 7**) that shows the Nottawasaga River from its outlet in Georgian Bay southerly past the Willow Creek area, and the watershed of the Willow Creek easterly from the Nottawasaga River to the Barrie area. This aerial shows the relative locations of the Willow Creek channel, the Swaley Drain, the historic remnants of the Muskrat Creek and also the Downey Drain and Giffen Drain.

The full watershed of the Nottawasaga River is not shown but documentation indicates that its total watershed could be in the magnitude of 1,300 square miles or 336,000 hectares.

It is evident from this aerial that the Willow Creek has a substantial watershed and it has been noted in the Scoping Report that its watershed is 30,700± ha. This puts it at approximately 10% of the Nottawasaga's watershed. The Swaley watershed would be approximately 6% the size of the Willow Creek watershed.

It is also evident that the Willow Creek approaches very close to the Swaley Drain from Lot 9, Concession 8 downstream through to Lot 10, Concession 10 in locations.

**Appendices 13 and 14** briefly discuss the history of the relationships of the watercourses and the Willow Creek in the area of the Swaley, to the Engineer's knowledge.