SECONDARY PLAN STUDY

FENWICK VILLAGE AREA - TOWN OF PELHAM

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C O N T E N T S

J.O. WELDON MAYOR

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1. PURPOSE

The purpose of this Secondary Plan is to provide development guidelines for the Fenwick Village Area in terms of the staging, location and neighbourhood design concept of future residential growth. The growth guidelines and strategy will set out an orderly and environmentally sound staging of development in Fenwick by means of large lot severances, large lot splitting, and registered plans of subdivision.

2. STUDY AREA

In view of the status of Fenwick as an unincorporated Hamlet with no municipal boundaries, the planning area for this Secondary Plan was delineated by overlapping the following boundaries and utilizing the resulting composite area as a guide for defining the study area.

- former Police Village of Fenwick
- Village Residential designation in the Pelham Official Plan
- Development 'D' Zone in the Pelham Zoning By-law
- Pelham Water Area No. 1

3. LAND USE CONTROLS

The Policy Plan for the Region of Niagara was adopted in 1973 and additional policies have since been added at intervals. The Policy Plan encourages the designation of growth Hamlets in local Official Plans and encourages the development of such Hamlets on the basis of Secondary Plans.

The Town of Pelham Official Plan was approved by the Minister of Housing in 1974 and has been subsequently amended by Town Council to refer to development in the Fenwick designated area as Village Residential rather than Rural Residential. The Official Plan limits the growth of Fenwick to 1000 persons on lots of not less than one acre in size and requires that a Secondary Plan be prepared for the Village if municipal hard services are supplied. The 1978 population of Fenwick is approximately 775 persons.

3. LAND USE CONTROLS (CONT'D)

The Town of Pelham Rural Area Zoning By-law No. 450 (1978) recognizes existing land uses in Fenwick and zones as Development 'D' Zone those lands which most closely approximate the Village Residential designation in the Official Plan of the Town.

4. EXISTING LAND USES

The existing Fenwick community comprises an area of predominantly single family residences situated in linear patterns along Canboro Road, Welland Road, Memorial Drive, Sunset Drive, Balfour Street, Maple Street and Church Street. With no "side streets" or land subdivision by registered plans in the Area, much of the internal area of the Fenwick Study Area north of Welland Road has been broken into small fruit farming holdings.

The intersection of Canboro Road, Maple Street and Church Street has been developed as a small "village core" with limited commercial facilities on small frontage lots. Community facilities in Fenwick are limited to St. Anne's Separate School, E. W. Farr Memorial School, a Fire Station, a library branch, and Centennial Park with a lighted ball diamond, two tennis courts, and a children's playground.

5. POPULATION TRENDS

The population of Fenwick has varied between 600 and 800 persons since 1951. The following statistics give population estimates in Fenwick over a significant time period but the boundaries used vary between the sources for 1966, 1975 and 1976.

5. POPULATION TRENDS (CONT'D)

YEAR	FENWICK POPULATION	DATE SOURCES
1941	476	Census of Canada
1951	672	Census of Canada
1956	655	Census of Canada
1961	685	Census of Canada
1966	722	Census of Canada
1975	775	Assessment Office for R. Main's Study
1976	662	Polling Area for Kumove Study of Pelham South

For the purposes of this Secondary Plan, the figure of 775 persons will be used for the existing population of Fenwick. This figure is considered to be the most appropriate because it was calculated by the Regional Assessment Office for use in the 1975 "Study of Municipal Services for The Fenwick Community". The latter study, prepared by the former Assistant Clerk, Mr. Roy Main, utilized a study area almost identical to that of this Plan.

6. SURFICIAL GEOLOGY

The Fenwick Secondary Plan area is located within the Haldimand Clay Plain physiographic region of Ontario. Most of the Haldimand Clay Plain is characterized by almost impermeable soils with very slow drainage. The Fenwick-Fonthill-Effingham area of the clay plain, however, is overlain by a large Kame Moraine consisting of mixed sands and gravels which are of sufficient depth in the Fonthill area to support several commercial gravel pits.

The Kame was created during the meltwater conditions of the last glacial period and because it was deposited under water and later covered by glacial Lake Warren, its western ridges have generally subdued relief. The ridges in the Kame are composed of shaly till derived from the red and grey shale beds below the Niagara Escarpment. The troughs between the ridges are floored with lacustrine silt or clay and are imperfectly drained.

6. SURFICIAL GEOLOGY

The light-textured sandy soils of the high, well-drained sections of the Kame are exceptionally well-suited for fruit farming and form a "horticultural island in the clay plain" where most of the crops of the Niagara fruit belt may be grown.(1) Fenwick is situated on the western fringe of this "island" where the limitations of poor drainage and less moderate climate restrict fruit farmers to the hardier crops such as apples, pears and some sour cherries.

The western edge of the Kame deposit passes slightly to the west of Fenwick, then runs through the Village towards Pelham Corners in an easterly direction. Lying to the south of Fenwick is a sand plain overlying the clay till. The sand plain is not as significant to the west of Fenwick where the clays are at or very close to the surface.

"The Kame Moraine is considerably higher than the surrounding land and, consequently, water falling on the area is partially stored in the granular materials and gradually penetrates down to the underlying impervious clay. Upon reaching this clay, it cannot travel further downwards and, consequently, it seeps out sideways. The Southern and Central sections of Fenwick are in this seepage zone". (2)

7. SOIL CHARACTERISTICS

North of Welland Street and east of Maple Street in Fenwick the soil consists of Pelham Sandy Loam. The Pelham Sandy Loam is a light brownish sandy loam over yellowish and reddish sand. This soil is occasionally stoney and rolling to hilly with good natural drainage.

South of Welland Street and east of Church Street in Fenwick the soil consists of Berrien Sandy Loam. Berrien Sandy Loam is a brown sandy loam over yellow and then mottled sand with clay occurring at depths of one to

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(1) L. J. Chapman and D. F. Putnam, The Physiography of Southern Ontario, 1966, p. 260.

(2) McGlone and Associates Ltd., Geotechnical Survey, Village of Fenwick, Town of Pelham, June, 1976, p. 4.

7. SOIL CHARACTERISTICS (CONT'D)

six feet. This soil is stonefree with smooth to rolling topography and good to poor drainage depending upon the depth to clay. In effect, the Berrien Sandy Loam in Fenwick consists of a thin layer of sand over clay.

West of Maple and Church Streets the dominant soil type changes to Caistor Clay Loam as one moves to the west away from Fenwick. The Caistor Clay Loam soils are imperfectly drained with gently undulating to almost level topography. Drainage of these soils is fair to poor and ponds and small depressions are a common occurrence.

8. GROUNDWATER AND SURFACE DRAINAGE

The central area of the Kame Moraine deposit is located just west of Fonthill at an elevation of approximately 825 feet above sea level. The Kame deposit slopes gently downward from the central high area until it becomes a thin sandy layer above clay-bearing deposits and clay soils below. This situation occurs at various distances in all directions from Fonthill and is generally in and around the elevation of 650 feet above sea level. The "village core" in Fenwick is at 642 feet above sea level. In these areas water emerges from the outer edges of the Kame in the form of seepage and artesian springs to form the headwater source areas of many local creeks - the largest of which is the Twelve Mile Creek in the vicinity of Effingham and St. John's West to the north of Fonthill.

Precipitation falling in the central high area of the Kame percolates to a considerable depth before being contained in a sand and gravel aquifer which conducts groundwater to the outer lower slopes of the Kame where it is forced to seep out as the granular deposits become thinner. Fenwick is located on the outer southwestern margin of the Kame where considerable seepage does occur as the granular material contacts the underlying impervious clay complex.

8. GROUNDWATER AND SURFACE DRAINAGE (CONT'D)

In Fenwick the groundwater recharge is from the north-east and the flow is generally in a southwesterly direction. This flow is restricted by the lower impermeable clay deposits and consequently, at the edges of the Kame and in several areas of the side slopes, where the granular deposits become thinner, groundwater emerges as a series of streams and waterlogged areas.

Because of the rapid decrease in the depth of the Pelham Sandy Loam soils and related subsurface sandy deposits between northeastern Fenwick and the "village core" area, the water table depth at eastern Memorial Drive is 70 to 90 feet deep, while at the highest elevation along Maple Street it is only at a depth of 12 feet. Behind the United Church on Church Street the water table is only 1 to 2 feet deep and in some places it surfaces.

Groundwater seepage and local surface runoff is carried away by many small ditches and streams which flow in a southwesterly direction away from Fenwick. The "village core" area has two small underground storm sewers which conduct runoff under Welland Road to the east and west of Church Street where it is discharged into small existing streams which carry it away to the southwest. In short, surface water occurrences become increasingly more common as one travels from the northeast to the southwest in Fenwick. These physical constraints must therefore be taken into account in the formulation of a suitable Secondary Plan.

9. DEVELOPMENT CONSTRAINTS

In 1976-77 municipal piped water was supplied to Fenwick by the Region of Niagara with a 12-inch main coming from the Shoalts Drive Reservoir near Fonthill, along Canboro Road (Regional Road 63) to Balfour Street. From Balfour Street, local distribution mains supply water to users in Fenwick along Canboro Road, Gardner Street, Welland Road (west of Gardner), Maple Street (half-way to Memorial Drive), and Church Street South to the T. H. & B. Railway.

9. DEVELOPMENT CONSTRAINTS (CONT'D)

The reason for the major effort to supply treated municipal water to Fenwick was the history of chronic problems arising from well water contamination by local subsurface sewage effluent disposal systems (septic tanks). Studies by the Health Unit in 1967 and 1975 discovered the following problems which are almost exclusively related to the unique hydrogeological character of the edge areas of the Kame Moraine which underlies Fenwick:

(a) Samples of effluent collected for bacteriological analysis at the outfall of the storm sewers and from the various manholes in the storm sewer system indicate pollution from septic tank effluent and household sewage.

(b) As of 1975, the Health Unit had construction details of only four recently constructed septic tank systems in Fenwick. The remainder are all older premises which have tanks constructed of concrete, steel and even railway ties.

(c) There is visible evidence of serious tile field malfunctioning by the amount of raw sewage in the core area storm sewer system producing constantly foul-smelling manholes and outfalls.

(d) During and after heavy rains there are polluted wells and strong offensive sewage odours in and about homes in the areas of poor drainage.

(e) In 1975, 78% of the drinking water samples collected from 129 premises indicated the water to be of unsatisfactory quality for human consumption.

(f) Cases of nitrate poisoning in Fenwick were reported to the Health Unit in 1924, 1947 and 1976.[3] The high levels of nitrate in the

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(3) Telephone conversation with Mr. E. G. Meyer, Senior Consultant with the Niagara Regional Area Health Unit, June 16, 1978.

9. DEVELOPMENT CONSTRAINTS (CONT'D)

Fenwick groundwater are dangerous and can be fatal if consumed by infants under six months of age.

The principal development constraint in Fenwick occurs in those areas of the Hamlet, primarily along Church Street and Welland Road, where the groundwater is very near or at the surface and has become highly enriched with nitrate from malfunctioning septic systems. The health hazard has been partially solved for many of the premises in these areas through the provision of piped water but many residences still use dug wells along Church Street south of the T. H. & B. Railway.

Nitrate is a very stable substance which is not taken out of sewage through the average septic tank tile bed filtration. Nitrate can be removed effectively, however, under laboratory conditions using properly designed septic systems where the tank is large enough to provide sufficient sewage retention time under anaerobic (no oxygen) conditions, before entering the tile field. Unfortunately, the fluids coming from the majority of the septic systems in Fenwick have not been digested for long enough periods under anaerobic conditions and when exposed to oxygen in the tile fields and ditches, aerobic decomposition results with significant odours and algae growth. The high levels of nitrate in the associated groundwater tend to further complicate the problem because nitrate is a staple plant nutrient, highly favoured by algae in the presence of sunlight.

"The existing sewage disposal systems in Fenwick feed fluids from the septic tile systems into the groundwater table. Except for the North-East section, these fluids have not passed through sufficient thickness of soil to allow bacterial action to purify them. Moving in a South and West direction, each bed feeding into the groundwater table increases the pollution. The polluted water is drained off to the surface via the storm system and flows as surface water in the ditches and fields along Foss Road and to the South." (4)

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(4) Ibid.,McGlone and Associates Ltd., p. 8.

9. DEVELOPMENT CONSTRAINTS (CONT'D)

"When municipal water becomes available, increased sewage loading of the antiquated, sometimes non-existing septic tank and tile bed disposal systems, will result in more environmental pollution from small lots with high water tables in fine sand over clay underlain strata."(5)

10. DEVELOPMENT OPPORTUNITIES

The results of several studies by engineers and health inspectors, quoted in earlier sections of the Plan, conclude that the northeastern area of Fenwick exhibits the best development opportunities in terms of septic system capabilities and potential for additional single family residences. In the southern and western sectors of Fenwick there may be an occasional lot on a localized high point which has sufficient depth to the groundwater table but the vast majority of the properties have too high a water table to permit effective use of leaching tile systems.

The northern and eastern areas of Fenwick are highly suited for residential uses, but these well-drained areas have been used extensively for fruit farming on varying scales. The problem in this area for fruit farming, however, is the weather, which only permits the growing of hardier fruits and makes it virtually impossible to make a full-time living from fruit farming - although some are doing so. The large number of small holdings and part-time farms verify the low viability of most fruit farms in Fenwick, in contrast to the prime tender fruit areas below the escarpment.

The deep water table and well-drained granular soils north of Canboro Road and east of Maple Street provide the basis for future development in Fenwick. In addition there are numerous opportunities for infilling in the northern half of the Hamlet without immediately jeopardizing the best fruit farms or ground and surface water quality. Further, properties in the

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(5) Niagara Regional Area Health Unit, Sanitary Survey of Fenwick September 27, 1975, p. 5.

10. DEVELOPMENT OPPORTUNITIES (CONT'D)

northern and northeastern sectors of the Hamlet are readily serviced by the 12-inch Regional watermain which enters Fenwick from the northeast along Canboro Road.

11. RECOMMENDED FUTURE DEVELOPMENT

In determining the type and amount and staging of future development in Fenwick, several key factors were taken into consideration as follows:

- the existing character of the community with a predominance of single family residences
- the significant number of fruit farms within the community
- soil capabilities to assimilate septic wastes
- depth of the water table and surface drainage characteristics
- availability of Town water
- growth limitations set down by the Official Plan as amended
- lot size requirements of the Niagara Regional Area Health Unit
- lot dimensions suitable for future splitting as Town water is extended and if sanitary sewers are ever provided in the distant future

Examination of Maps 1 and 2 to this Plan shows the relationship between the existing occupied space in Fenwick and key physical constraints to extending residential development in the Village. As shown on Maps 2 and 3, it is recommended that future residential development in Fenwick be staged as follows:

11. RECOMMENDED FUTURE DEVELOPMENT (CONT'D)

(a) Stage 1

(i) Infilling in areas on deep soils which were serviced by Town water by 1978, and

(ii) Infilling in areas on deep soils but which were not serviced by Town water as of 1978.

(b) Stage 2

(i) Subdivision of lands on deep soils which would be readily serviced with Town water, and

(ii) Infilling by means of splitting existing lots on deep soils at such time as the existing Town water system is extended to these lots.

(c) Stage 3

Infilling by means of splitting existing lots on deep soils which have Town water only if and when sanitary sewers are ever provided to these lots in the distant future.

In reviewing Maps 2 and 3 to this Plan, the recommended areas of future infilling and subdivision can be readily identified and related to the above staging sequence. In order for the future splitting of lots to take place in an orderly fashion as municipal services are extended to the deep soil areas, it is recommended that new residential lots in Fenwick be created in such a manner that the following dimensions are utilized as closely as individual circumstances permit. It should be noted, however, that this Plan sets no specific standards for future development in areas of poor drainage or high water table because all such development must meet all requirements of the Niagara Regional Health Unit on an individual basis.

11. RECOMMENDED FUTURE DEVELOPMENT (CONT'D)

STANDARDS FOR DEEP SOIL AREAS

LOT SERVICES	MINIMUM LOT AREA	MINIMUM LOT FRONTAGE	MAXIMUM LOT DEPTH
Private well and septic tank	40,000 sq. ft.	240 ft.	165 ft.
Town water and septic tank	20,000 sq. ft.	120 ft.	165 ft.
Town water and hypothetical sanitary sewer	10,000 sq. ft.	60 ft.	165 ft.

In addition to the above standards, this Plan stipulates that infilling development will only be permitted to a maximum depth of one lot on the north side of Memorial Street, the west side of Maple Street and the east side of Cream Street.

The following is a projection of the number of single family residential units which could be added to the Fenwick Area assuming the aforementioned staging and the above lot standards. Notwithstanding the following projections, it is recommended that Council monitor the growth in Fenwick in view of the limitation of 1,000 persons set out in the Official Plan, as amended. With the present population of 775 persons, an increase of 75 units would meet the limits set down by the Official Plan, assuming the Pelham average of three persons per household.

	STAGE	ADDITIONAL UNITS	AVAILABLE AREA	MINIMUM LOT SIZE
1.(a)	. Infilling . Deep soil areas for septic tanks . Town water by 1978	7	3.2 acres	20,000 sq. ft.
(b)	. Infilling . Deep soil areas for septic tanks . Private wells	38	34.9 acres	40,000 sq. ft.
(c)	. Infilling in shallow soil areas with high water table	Development based upon the merits of individual sites and proposals with specific regulations set by the Health Unit.		
2.(a)	. Subdivisions . Deep soil areas for septic tanks . Town water	351	157.3 acres	20,000 sq. ft.

	STAGE	ADDITIONAL UNITS	AVAILABLE AREA	MINIMUM LOT SIZE
2.(b)	. Splitting lots . Deep soil areas for septic tanks . Town water	38	17.5 acres	20,000 sq. ft.
3.	. Splitting lots . Deep soil areas . Town water . Sanitary sewers (distant future)	434	100 acres	10,000 sq. ft.

It is evident from the foregoing projections of development that combinations of the proposed stages (i.e. with provisions for lot splitting) could allow for considerable growth in Fenwick in the distant future. Following is an estimate of the growth potential in Fenwick carried to the ultimate in the well drained areas with full Town water and hypothetical sanitary sewer facilities throughout.

	DEVELOPMENT	ADDITIONAL UNITS	EXISTING POPULATION	PROJECTED POPULATION (3 PERSONS/UNIT)
1.	Large lot infilling along existing roads of all deep soil areas without extending Town water.	38	775	889
2.	All permitted infilling, subdivision and lot splitging on deep soil areas if Town water is extended.	434	775	2,077
3.	Infilling, subdivision and lot splitting on deep soil areas if both Town water and sanitary sewers are provided in the distant future.	868	775	3,379
4.	Infilling and lot splitting in shallow soil areas with high water table.	Very limited development based upon the merits of individual sites and proposals and regulations set by the Health Unit.		

12. FUTURE DEVELOPMENT IN POORLY-DRAINED AREAS

As described in previous sections of this Plan, and shown on Map 1, much of the southern and western area of the Fenwick Study Area is unacceptable for new development because of hydrogeological limitations. Map 2, however, shows that a significant amount of residential development already exists in this area especially along Church Street South.

Because of the significant problems with drainage, high water table, artesian springs and sometimes quicksand in the southern and western portions of the Fenwick Study Area, this Secondary Plan, in general, does not encourage new growth in these areas. This is not to say, however, that certain portions of the southwestern area could not meet acceptable development standards on the basis of their own localized merits. For this reason, the Plan will recognize limited additional new development in the southwestern areas but only where such development can meet all of the requirements of the Niagara Regional Area Health Unit; and only where in the opinion of Council, it does not endanger the health, safety, or welfare of the existing or proposed new residents; and only where such development can take place on developed roads existing at the time of adoption of this Plan.