City of Greater Sudbury Infrastructure Background Study

APPENDIX A.1

Guideline for Sewage and Water Services

GUIDELINE D-5

Planning for Sewage & Water Services

Legislative Authority:

Environmental Protection Act
Ontario Water Resources Act
Planning Act

Responsible Director:

Director, Environmental Planning & Analysis Branch

Last Revision Date:

August 1996

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SYNOPSIS

This document is intended to guide municipal planning for sewage and water servicing. It describes an approach for municipal planning for sewage and water services to ensure an acceptable quantity and quality of water supply and the proper collection, treatment and disposal of sewage wastewater for development. It is consistent with the Provincial goal to manage growth and change to foster communities that are socially, economically, environmentally, and culturally healthy, and that make efficient use of land, new and existing infrastructure and public service facilities.

1.0 INTRODUCTION

1.1 Purpose

This document is intended to guide municipal land use planning for sewage and water servicing such that planning decisions *shall have regard to* the Provincial Policy Statement under Section 3 of the Planning Act. This guideline describes an implementation approach for municipal planning for servicing and infrastructure with a particular focus on sewage and water services.

1.2 Rationale

The provincial interest in planning for services and infrastructure in land use planning is founded in the recognition that servicing and infrastructure provide support for development. In recognizing that servicing is inseparable from development, it follows that well-planned servicing leads to well-planned development and communities. Well-planned services can be built efficiently and used efficiently and avoid costs for later upgrading or rehabilitation that is common with poorly planned servicing. Planning for sewage and water services is particularly important to ensure that communities have a potable water supply and proper collection, treatment and disposal of sewage wastewater that protects the natural environment and public health. Planning for sewage and water services in land use planning allows the opportunity for servicing facilities to maintain or enhance the natural environment and accommodate expected growth in a manner that is cost effective and promotes efficient use of servicing facilities.

The Ministry of Environment and Energy has an interest in municipal

planning for sewage and water services which stems from the Ministry's mandate in administering the Environmental Protection Act, 1990, Ontario Water Resources Act, 1990, and Environmental Assessment Act, 1990. The Ministry's responsibilities under these Acts include the approval and compliance monitoring of sewage treatment and water supply facilities. In order to protect the natural environment and public health it is imperative that land use planning decisions be made in the knowledge that proposed development can be accommodated in the long-term with sufficient and appropriate sewage treatment and a sufficient potable water supply in accordance with standards under environmental legislation.

1.3 Objectives

The objectives of this implementation guideline are to advise municipalities to plan for sewage and water services which maintain or enhance the quality of the environment while accommodating expected growth by:

- planning for and directing development to areas where municipal water and sewage facilities are available, with sufficient uncommitted reserve capacity to service the proposed development or to areas where there has been a commitment to new services or the expansion of existing services (where services will be available at the time of development), in accordance with long-term planning as established through the principles of the Provincial Policy Statement;

- using communal water and sewage services where multi-lot/unit development is considered for areas without full municipal services to ensure the long-term viability of the services through municipal responsibility to protect the environment and public health; and

- determining, in the context of long-term planning and approved growth management objectives, that the consideration of development in areas without full municipal services is appropriate and site specific environmental and public health considerations are addressed.

2.0 POLICY EXPLANATION AND IMPLEMENTATION

2.1 Policy Explanation

2.1.1 Planning for Servicing and Infrastructure

Servicing and infrastructure are fundamental building blocks for development and have the potential to greatly impact the natural environment. "Infrastructure" refers to the physical structures that form the foundation for development including sewage and water works, waste management systems, electric power, communications, transit and transportation corridors and facilities, and oil and gas pipelines and associated facilities. "Servicing" describes the act or result of employing sewage and water facilities to meet the physical needs of development and the community.

It is important to anticipate servicing needs and potential environmental impacts when municipalities are making decisions about growth and how it should be accommodated. It is not only important for municipalities to consider the servicing needs within their own boundaries, but also to be aware and take into consideration the servicing needs of the Province as a whole. In reaching land use planning decisions municipalities should consider existing and planned provincially related infrastructure, such as hydroelectric, hydrocarbon, transit, transportation and communications corridors and facilities (see Policy Statements B5, B6, B16). For an explanation of the terms used in this guideline see the attached Appendix, *Glossary*.

2.1.2 Planning for Sewage and Water Services

An effective means of planning for sewage and water services used by many municipalities is the preparation of servicing strategies such as multi-year sewage and water servicing plans. The Ministry of the Environment and Energy recommends that municipalities with the responsibility for sewage and water servicing plan for such services by preparing multi-year sewage and water servicing plans as one component of planning for growth management and preparing official plan policy. It is recommended that servicing plans be done in support of revisions to, or in the creation of, an official plan or can be done in support of planning documents prepared for areas proposed for potential growth (eg.; secondary plan or subwatershed plan).

It is recommended that municipalities communicate with neighbouring municipalities, and their respective public utilities where applicable, to develop cooperative approaches to planning for and providing sewage and water services. In many circumstances the most appropriate planning scale for sewage and water servicing is the watershed and subwatershed. The better understood the interrelationship between sewage and water servicing and natural

water features and functions, the greater the efficiency of servicing over the long-term and the more effectively can the natural environment be maintained. In the interest of more comprehensive decision-making, municipalities may wish to take the opportunity to plan for servicing as one component of a broader planning exercise on a watershed/subwatershed scale.

Matters for consideration in the preparation of multi-year sewage and water servicing plans in conjunction with official plan policy include:

- investigate measures to resolve existing sewage or water problems within the municipality such as abatement of combined sewer overflows or addressing limitations to sewage collection/pumping stations and water distribution systems; and

- investigate servicing efficiency measures, such as the adoption of water conservation, toward reducing the demand on water supplies and treatment plant capacity; and

- address how the municipality intends to service anticipated growth and identify what the implications are for the sewage and water services and the need for new services; and

- account for the efficient use of available existing infrastructure by calculating and reporting on uncommitted reserve capacity for sewage and water treatment facilities and establish a monitoring program for future use of that capacity; and

- identify the physical and environmental constraints to development related to servicing; and

- adopt a hierarchy of servicing preferences as a guide for managing growth and settlement (see Section 2.1.3 of this guideline); and

- generally describe the type and level of water supply and sewage disposal services which would support municipal goals for environmental protection or enhancement, sustainability, urban intensification, and growth management in a manner which is efficient and cost effective; and

- draw conclusions regarding the principle of whether to permit development in areas outside existing full municipal services on the basis of:

- an evaluation of servicing options which includes the potential for full municipal services and communal services; and

- a determination of appropriate areas to target for growth on the basis of the servicing option available within the context of criteria outlined under the Provincial Policy Statement; and

! investigate and classify areas outside fully municipal serviced areas which may be targeted for growth by generally evaluating the potential growth areas according to their suitability for servicing. These servicing/environmental investigations (along with other planning concerns) should be the basis for municipalities to direct appropriate forms of development to areas least likely to suffer adverse environmental impacts. To confirm that the principle of development is appropriate, the investigations should be an overview based on a evaluation using existing information on environmental constraints which include soils, groundwater and surface water conditions and use, agricultural uses, storm water drainage, existing land uses, and environmental and physiographic features; and

! address the issue of residuals management including hauled sewage (septage) utilization/disposal in the case of septic tank systems and sludge utilization/disposal in the case of digested sludge.

NOTE 1: If a multi-year sewage and water servicing plan is completed according to the five key features of environmental planning (see Note 2, Procedure D-5-3) and the requirements of the municipal class environmental assessment process, MOEE will recognize and give credit for work done within the plan as part of future class environmental assessments (see Section 2.3, *Municipal Engineers Association Class Environmental Assessment for Water and Wastewater Projects*, 1993, and Section 16.1, *Planning Act*, 1995).

2.1.3 Hierarchy of Servicing Preferences

Official plans, in concert with sewage and water servicing plans, should adopt a hierarchy of servicing preferences which incorporate the principles in Section 2 of this guideline and are consistent with the Provincial Policy Statement as follows:

- development on full municipal services be the preferred mode of servicing where there is sufficient uncommitted reserve capacity or where there is the capability for full municipal services to be expanded;

- in areas lacking full municipal services, communal sewage and water services be the preferred mode of servicing multi-unit/lot development; and

- in areas lacking full municipal or communal services where development can be justified consistent with the Provincial Policy Statement, the use of individual on-site sewage and water services, may be considered subject to meeting environmental and public health requirements.

a) Full Municipal Services

- New development should be directed to settlement areas with existing full municipal services or to where there has been a commitment to new full municipal services consistent with the Provincial Policy Statement. Municipalities should anticipate and plan for needed sewage and water treatment capacity to accommodate municipal growth and development objectives through the adoption of conservation measures to extend existing capacity and/or the expansion of capacity.

- Accordingly, an integral part of planning for services is determining the status of uncommitted reserve capacity at water and sewage treatment facilities and monitoring this capacity on an on-going basis. Municipalities responsible for sewage and water servicing should assume responsibility for tracking, reporting and allocating uncommitted reserve capacity, in conjunction with water conservation measures to optimize the use of this capacity.

- Where a municipality has determined that it is appropriate, consistent with the Provincial Policy Statement, to accept the principle of multi-lot/unit development adjacent to settlement area boundaries or portions of hamlets, villages, towns, and cities which have existing full municipal sewage and water services, then full municipal services is the preferred method of servicing such development.[1](see Note 2)

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[1] Note: Development on partial services (eg.; the provision of municipal water services in the absence of municipal sewage services) will generally be discouraged. Local circumstances such as the existing means and quality of servicing and physical constraints to servicing will be considered in determining whether partial services may be appropriate.

b) Communal Sewage and Water Services

! Where a municipality has determined that it is appropriate, consistent with the Provincial Policy Statement, to accept the principle of planned development in areas without existing full municipal services, the preferred method of servicing multi-lot/unit development is public communal sewage and water servicing (see Note 2).

! In preparing servicing plans or reviewing planning documents proposing development on communal services, municipalities should:

- consider the potential, appropriateness and, if deemed necessary, the means of accommodating phased, multiple, or clustered development on communal services; and

- designate areas for development proposed to be served by communal services based on an evaluation of environmental constraints that confirms that the principle of development is appropriate; and

- plan to accept responsibility for public communal services for development proposing multi-lot/unit residential development (See Procedure D-5-2, *Application of Municipal Responsibility for Communal Sewage and Water Services*).

c) Individual On-site Sewage and Water Services

! In preparing servicing plans or reviewing proposals for development on individual on-site services in areas without full municipal services, municipalities should ensure that:

- planned development can be justified consistent with the Comprehensive Set of Policy Statements; and

- municipal official plans do not anticipate or identify the provision of municipal services; and

- areas for development proposed to be served by individual on-site sewage and water services are designated based on an evaluation of environmental constraints that confirms that the principle of development is appropriate.

NOTE 2: Limited infill development on individual water supply and individual on-site sewage services within a settlement area may be considered only where there is no suitable

receiver for effluent discharge from a full municipal or communal sewage facility, there are no existing or potential water quality or quantity problems, and site conditions permit.

2.2 Implementation

Within the context of the principles outlined in this guideline, the planning authority should review planning documents circulated under the Planning Act as follows:

2.2.1 Official Plans

The planning approval authority should not recommend approval of new or revised official plans, without official plans identifying areas for growth through official plan policies and designations based on multi-year sewage and water servicing plans which have evaluated servicing options consistent with Sections 2.1.2 and 2.1.3.

2.2.2 Site-Specific Official Plan Amendment/Individual Application Review

For site-specific official plan amendments/individual applications that are submitted within the context of approved municipal planning documents which have incorporated planning for sewage and water services (consistent with the Provincial Policy Statement and as described in Sections 2.1.2 & 2.1.3 of this guideline) the following should be met:

a) Full Municipal Services

! for site-specific official plan amendments, the municipality demonstrate (e.g.; the proposal is in keeping with a municipal servicing strategy) to the approval authority that there will be sufficient uncommitted reserve sewage and water capacity available to service the proposed development (see Procedure D-5-1, *Calculating and Reporting on Uncommitted Reserve Capacity at Sewage and Water Treatment Plants, Sections 4.0* & *5.0*). For individual applications, the Province considers capacity to be committed when draft approval is granted to a

development in a fully serviced municipality.[2] In circumstances where capacity is tied to the construction of new or expanded treatment facilities, the capacity will be considered available once:

- Environmental Assessment Act approval has been given[3]; and,
- the municipal council responsible for financial decisions regarding sewage and water services has passed a council resolution approving a specific budget item that dedicates capital for the completion of facilities (such that the facilities are completed prior to the commencement of construction of development).

If a municipality brings forward a specific proposal for alternative approaches for calculating and reporting uncommitted reserve capacity, the MOEE Regional Office will consider entering into alternative arrangements (eg.; a development control agreement) with the municipality based on the merit of the proposal. Alternative approaches may be in regard to, for example, how the MOEE calculation is applied, use of an alternative calculation, or how a municipality allocates capacity.

b) Communal Sewage and Water Services

- an agreement for municipal ownership/responsibility for public communal services has been entered into between the developer and municipality for development proposing multi-lot/unit residential development (See Procedure D-5-2, *Application of Municipal Responsibility for Communal Sewage and Water Services*); and
- a terrain analysis and hydrogeological report or an assimilation capacity study have been completed in accordance with the requirements of the Environmental Protection Act and

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[2] In accordance with section 51, Planning Act, 1995, the approval authority in giving approval to a draft plan of subdivision may provide that the approval lapse after a specified time period, and thus, the committed capacity be re-allocated. See also section 70.3, Planning Act, 1995, regarding municipal authority to pass by-laws to establish a system for allocating sewage and water services to land that is the subject of an application under section 51. It is appropriate that municipalities that wish to use this provision describe in official plan policy the process for lapsing and re-allocation.

[3] Municipalities may wish to combine planning processes. Under Section 16(1) of the Planning Act municipalities may prepare an official plan or official plan amendment that may be considered under the Environmental Assessment Act with respect to any requirements under the Environmental Assessment Act, including the Municipal Engineers Association Class Environmental Assessment for Water and Wastewater Projects, 1993.

Ontario Water Resources Act which demonstrate that the proposal will not have an adverse effect upon the environment or public health[4].

c) Individual On-site Sewage and Water Services

! a terrain analysis and hydrogeological report or an assimilation capacity study have been completed in accordance with the requirements of the Environmental Protection Act and Ontario Water Resources Act which demonstrate that the proposal will not have an adverse effect upon the environment or public health[5].

Many municipalities have been given responsibilities under contract with the Province under Part VIII, Environmental Protection Act, RSO 1990, with respect to septic tanks and certain other sewage systems, including communal sewage systems which discharge to the subsurface. These responsibilities include (1) arranging for adequate inspection to be made of all parcels of land with respect to which an application for consent, plan of subdivision, minor variance, or plan of condominium is made which are not or will not be served by adequate sanitary sewers and (2) commenting to the body or person to whom such application is made on the suitability of such lands for sewage disposal. These responsibilities are often exercised by the Board of Health.

2.2.3 Site-Specific Official Plan Amendment/Individual Application Review in the Absence of Planning for Sewage and Water Services in Approved Municipal Planning Documents

In the absence of municipal planning for sewage and water services (as described in this guideline), the planning authority should not recommend approval for site-specific official plan amendments/individual planning applications proposing multi-lot/unit development, unless it is demonstrated that servicing

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[4] See: (1) Manual of Policy, Procedures and Guidelines for Private Sewage Disposal Systems, 1982
(2) An Introduction to Communal Sewage Systems, 1994
(3) MOEE Guideline B-7, Incorporation of The Reasonable Use Concept into MOEE Groundwater Management Activities

[5] See: (1) Appendix E: Technical Guidelines for Septic Systems: Water Quality Impact Risk Assessment, March 1995
(2) Appendix F: Technical Guidelines for Private Wells: Water Supply Assessment, March 1995
(3) Manual of Policy, Procedures and Guidelines for Private Sewage Disposal Systems, 1982
(4) Ontario Regulation 358 under Part VIII, Environmental Protection Act, RSO 1990
(5) Ontario Regulation 903, Ontario Water Resources Act, RSO 1990

options have been investigated and reported by means of a Servicing Options Statement (see Procedure D-5-3, *Servicing Options Statement*). Servicing options include the potential for servicing development on full municipal services, communal sewage and water services, and individual on-site sewage and water services consistent with this policy.

For the purposes of this guideline multi-lot/unit development means more than five lots/units of residential, industrial, commercial or institutional development.

> "More than Five lots/units" has been chosen because it is consistent with how environmental legislation defines what constitutes communal services under Sections 52 & 53, Ontario Water Resources Act RSO 1990, or under Part VIII, Environmental Protection Act RSO 1990. It is recognized that individual applications for small multi-lot/unit development in isolation from any other existing or proposed development may not be feasible on communal services or that the density associated with a particular development on communal services may not be desired. In the absence of official plan policy based on planning for sewage and water services, a servicing options statement can address the fundamental planning and servicing options at hand and ensure that informed decisions are made for community development that are consistent with the Comprehensive Set of Policy Statements. The servicing options statement can demonstrate how a particular development proposal(s) (and associated servicing) can fit most effectively into the existing community planning/servicing scenario and into any potential growth scenarios for the community.

A *servicing options statement* is not necessary for:

- development proposing connection to existing full municipal services within a designated settlement area, when it can be demonstrated that there is sufficient reserve sewage and water capacity as described in Section 2.2.2 of this guideline, or

- development proposing a servicing option that conforms to the existing official plan, where the official plan was prepared and approved in consideration of the principles described in this guideline and is consistent with the Comprehensive Set of Policy Statements.

Where applicable, the requirements of the municipal class environmental assessment process must be met (see *Municipal Engineers Association Class Environmental Assessment for Water and Wastewater Projects*, 1993).

The attached Appendix and Procedures form a part of this implementation guideline and should be read with the body of the implementation guideline.

APPENDIX

GLOSSARY

Default:

For the purposes of this document default describes **the situation whereby communal services are not being operated or maintained in accordance with prescribed standards and the operator is unable or unwilling to comply with prescribed standards which may include non-compliance with the Terms and Conditions of the Certificate of Approval for the system or works.**

Freehold Development:

For the purposes of this guideline freehold development means **development proposals subject to Section 50 of the Planning Act and not subject to the Condominium Act.**

Infill:

For the purposes of this guideline infill means **development on vacant lots or undeveloped lots within a built-up area.**

Multi-lot/unit Development:

For the purposes of this guideline multi-lot/unit development means **more than five lots/units of residential, industrial, commercial or institutional development.**

Multi-Year Sewage and Water Servicing Plan:

For the purposes of this guideline multi-year sewage and water servicing plan means **a plan prepared by a municipality responsible for sewage and water servicing that recommends a framework for the servicing of future works and developments which are to be distributed geographically throughout a study area and implemented over an extended period of time. The plan should contain long-range servicing strategies and long-term growth management goals which can form a basis for the preparation of official plan policy. The plan should address the implications for existing services to serve anticipated growth, efficiency of existing infrastructure including conservation measures, physical and environmental constraints to development related to servicing, and ensure that new services support the goals of environmental protection, sustainability, urban intensification and growth management in an efficient and cost effective manner.**

Sewage and Water Services:

Full Municipal Sewage and Water Services:

Means piped sewage and water services that are connected to a centralized water or wastewater treatment facility and provided by the municipality or another public body.

Communal Sewage and Water Services:
Generally mean sewage works and sewage systems and water works that can be described as small-scale satellite wastewater collection, treatment, and disposal facilities and water distribution, and possibly treatment, facilities using ground or possibly surface water as a source. Communal sewage services are separated from and unconnected to full municipal services which are connected to large centralized treatment plants that may serve entire municipalities. Communal sewage facilities can be comprised of gravity, pressure, or vacuum sewer collection systems, septic tank, secondary, tertiary, or stabilization pond treatment technologies, and discharge treated wastewater to either the surface of the ground, surface water, or subsurface environment.

For the purposes of this guideline and in keeping with existing legislation, "communal services" or "communal systems" mean **those sewage works, water works and sewage systems to be approved, or approved under Sections 52 & 53, Ontario Water Resources Act RSO 1990, or under Part VIII, Environmental Protection Act RSO 1990 for the common use of more than five units [in the total development area] of full-time or seasonal residential or industrial/commercial occupancy or other occupancy as determined by MOEE staff.**

Individual On-Site Sewage and Water Services/Systems:
Individual autonomous water supply and sewage disposal systems, that are owned, operated and managed by the owner of the property upon which the system is located and which do not serve more than five residential units/lots.

Public Communal Services:
Means sewage works and sewage systems, and water works that provide for the distribution, collection or treatment of sewage and water but which:

- are not connected to full municipal sewage and water services;
- are for the common use of more than five residential units/lots; and
- are owned, operated, and managed by either:
  - the municipality; or
  - another public body; or
  - where ownership by a municipality or another public body can not be achieved, by a condominium corporation or single owner through a responsibility agreement with the municipality or public body, which requires municipal/public body assumption of the communal services in the event of default.

Uncommitted Reserve Capacity:
See: Procedure D-5-1, *Calculating and Reporting on Uncommitted Reserve Capacity at Sewage and Water Treatment Plants*

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1.0 INTRODUCTION

1.1 Purpose

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1.2 Rationale

The provincial interest in planning for services and infrastructure in land use planning is founded in the recognition that servicing and infrastructure provide support for development. In recognizing that servicing is inseparable from development, it follows that well-planned servicing leads to well-planned development and communities. Well-planned services can be built efficiently and used efficiently and avoid costs for later upgrading or rehabilitation that is common with poorly planned servicing. Planning for sewage and water services is particularly important to ensure that communities have a potable water supply and proper collection, treatment and disposal of sewage wastewater that protects the natural environment and public health. Planning for sewage and water services in land use planning allows the opportunity for servicing facilities to maintain or enhance the natural environment and accommodate expected growth in a manner that is cost effective and promotes efficient use of servicing facilities.

The Ministry of Environment and Energy has an interest in municipal

planning for sewage and water services which stems from the Ministry's mandate in administering the Environmental Protection Act, 1990, Ontario Water Resources Act, 1990, and Environmental Assessment Act, 1990. The Ministry's responsibilities under these Acts include the approval and compliance monitoring of sewage treatment and water supply facilities. In order to protect the natural environment and public health it is imperative that land use planning decisions be made in the knowledge that proposed development can be accommodated in the long-term with sufficient and appropriate sewage treatment and a sufficient potable water supply in accordance with standards under environmental legislation.

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The objectives of this implementation guideline are to advise municipalities to plan for sewage and water services which maintain or enhance the quality of the environment while accommodating expected growth by:

- planning for and directing development to areas where municipal water and sewage facilities are available, with sufficient uncommitted reserve capacity to service the proposed development or to areas where there has been a commitment to new services or the expansion of existing services (where services will be available at the time of development), in accordance with long-term planning as established through the principles of the Provincial Policy Statement;

- using communal water and sewage services where multi-lot/unit development is considered for areas without full municipal services to ensure the long-term viability of the services through municipal responsibility to protect the environment and public health; and

- determining, in the context of long-term planning and approved growth management objectives, that the consideration of development in areas without full municipal services is appropriate and site specific environmental and public health considerations are addressed.

2.0 POLICY EXPLANATION AND IMPLEMENTATION

2.1 Policy Explanation

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- investigate servicing efficiency measures, such as the adoption of water conservation, toward reducing the demand on water supplies and treatment plant capacity; and

- address how the municipality intends to service anticipated growth and identify what the implications are for the sewage and water services and the need for new services; and

- account for the efficient use of available existing infrastructure by calculating and reporting on uncommitted reserve capacity for sewage and water treatment facilities and establish a monitoring program for future use of that capacity; and

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- adopt a hierarchy of servicing preferences as a guide for managing growth and settlement (see Section 2.1.3 of this guideline); and

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- an evaluation of servicing options which includes the potential for full municipal services and communal services; and

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! address the issue of residuals management including hauled sewage (septage) utilization/disposal in the case of septic tank systems and sludge utilization/disposal in the case of digested sludge.

NOTE 1: If a multi-year sewage and water servicing plan is completed according to the five key features of environmental planning (see Note 2, Procedure D-5-3) and the requirements of the municipal class environmental assessment process, MOEE will recognize and give credit for work done within the plan as part of future class environmental assessments (see Section 2.3, *Municipal Engineers Association Class Environmental Assessment for Water and Wastewater Projects*, 1993, and Section 16.1, *Planning Act*, 1995).

2.1.3 Hierarchy of Servicing Preferences

Official plans, in concert with sewage and water servicing plans, should adopt a hierarchy of servicing preferences which incorporate the principles in Section 2 of this guideline and are consistent with the Provincial Policy Statement as follows:

- development on full municipal services be the preferred mode of servicing where there is sufficient uncommitted reserve capacity or where there is the capability for full municipal services to be expanded;

- in areas lacking full municipal services, communal sewage and water services be the preferred mode of servicing multi-unit/lot development; and

- in areas lacking full municipal or communal services where development can be justified consistent with the Provincial Policy Statement, the use of individual on-site sewage and water services, may be considered subject to meeting environmental and public health requirements.

a) Full Municipal Services

- New development should be directed to settlement areas with existing full municipal services or to where there has been a commitment to new full municipal services consistent with the Provincial Policy Statement. Municipalities should anticipate and plan for needed sewage and water treatment capacity to accommodate municipal growth and development objectives through the adoption of conservation measures to extend existing capacity and/or the expansion of capacity.

- Accordingly, an integral part of planning for services is determining the status of uncommitted reserve capacity at water and sewage treatment facilities and monitoring this capacity on an on-going basis. Municipalities responsible for sewage and water servicing should assume responsibility for tracking, reporting and allocating uncommitted reserve capacity, in conjunction with water conservation measures to optimize the use of this capacity.

- Where a municipality has determined that it is appropriate, consistent with the Provincial Policy Statement, to accept the principle of multi-lot/unit development adjacent to settlement area boundaries or portions of hamlets, villages, towns, and cities which have existing full municipal sewage and water services, then full municipal services is the preferred method of servicing such development.[1](see Note 2)

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[1] Note: Development on partial services (eg.; the provision of municipal water services in the absence of municipal sewage services) will generally be discouraged. Local circumstances such as the existing means and quality of servicing and physical constraints to servicing will be considered in determining whether partial services may be appropriate.

b) Communal Sewage and Water Services

! Where a municipality has determined that it is appropriate, consistent with the Provincial Policy Statement, to accept the principle of planned development in areas without existing full municipal services, the preferred method of servicing multi-lot/unit development is public communal sewage and water servicing (see Note 2).

! In preparing servicing plans or reviewing planning documents proposing development on communal services, municipalities should:

- consider the potential, appropriateness and, if deemed necessary, the means of accommodating phased, multiple, or clustered development on communal services; and

- designate areas for development proposed to be served by communal services based on an evaluation of environmental constraints that confirms that the principle of development is appropriate; and

- plan to accept responsibility for public communal services for development proposing multi-lot/unit residential development (See Procedure D-5-2, *Application of Municipal Responsibility for Communal Sewage and Water Services*).

c) Individual On-site Sewage and Water Services

! In preparing servicing plans or reviewing proposals for development on individual on-site services in areas without full municipal services, municipalities should ensure that:

- planned development can be justified consistent with the Comprehensive Set of Policy Statements; and

- municipal official plans do not anticipate or identify the provision of municipal services; and

- areas for development proposed to be served by individual on-site sewage and water services are designated based on an evaluation of environmental constraints that confirms that the principle of development is appropriate.

NOTE 2: Limited infill development on individual water supply and individual on-site sewage services within a settlement area may be considered only where there is no suitable

receiver for effluent discharge from a full municipal or communal sewage facility, there are no existing or potential water quality or quantity problems, and site conditions permit.

2.2 Implementation

Within the context of the principles outlined in this guideline, the planning authority should review planning documents circulated under the Planning Act as follows:

2.2.1 Official Plans

The planning approval authority should not recommend approval of new or revised official plans, without official plans identifying areas for growth through official plan policies and designations based on multi-year sewage and water servicing plans which have evaluated servicing options consistent with Sections 2.1.2 and 2.1.3.

2.2.2 Site-Specific Official Plan Amendment/Individual Application Review

For site-specific official plan amendments/individual applications that are submitted within the context of approved municipal planning documents which have incorporated planning for sewage and water services (consistent with the Provincial Policy Statement and as described in Sections 2.1.2 & 2.1.3 of this guideline) the following should be met:

a) Full Municipal Services

! for site-specific official plan amendments, the municipality demonstrate (e.g.; the proposal is in keeping with a municipal servicing strategy) to the approval authority that there will be sufficient uncommitted reserve sewage and water capacity available to service the proposed development (see Procedure D-5-1, *Calculating and Reporting on Uncommitted Reserve Capacity at Sewage and Water Treatment Plants, Sections 4.0* & *5.0*). For individual applications, the Province considers capacity to be committed when draft approval is granted to a

development in a fully serviced municipality.[2] In circumstances where capacity is tied to the construction of new or expanded treatment facilities, the capacity will be considered available once:

- Environmental Assessment Act approval has been given[3]; and,
- the municipal council responsible for financial decisions regarding sewage and water services has passed a council resolution approving a specific budget item that dedicates capital for the completion of facilities (such that the facilities are completed prior to the commencement of construction of development).

If a municipality brings forward a specific proposal for alternative approaches for calculating and reporting uncommitted reserve capacity, the MOEE Regional Office will consider entering into alternative arrangements (eg.; a development control agreement) with the municipality based on the merit of the proposal. Alternative approaches may be in regard to, for example, how the MOEE calculation is applied, use of an alternative calculation, or how a municipality allocates capacity.

b) Communal Sewage and Water Services

- an agreement for municipal ownership/responsibility for public communal services has been entered into between the developer and municipality for development proposing multi-lot/unit residential development (See Procedure D-5-2, *Application of Municipal Responsibility for Communal Sewage and Water Services*); and
- a terrain analysis and hydrogeological report or an assimilation capacity study have been completed in accordance with the requirements of the Environmental Protection Act and

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[2] In accordance with section 51, Planning Act, 1995, the approval authority in giving approval to a draft plan of subdivision may provide that the approval lapse after a specified time period, and thus, the committed capacity be re-allocated. See also section 70.3, Planning Act, 1995, regarding municipal authority to pass by-laws to establish a system for allocating sewage and water services to land that is the subject of an application under section 51. It is appropriate that municipalities that wish to use this provision describe in official plan policy the process for lapsing and re-allocation.

[3] Municipalities may wish to combine planning processes. Under Section 16(1) of the Planning Act municipalities may prepare an official plan or official plan amendment that may be considered under the Environmental Assessment Act with respect to any requirements under the Environmental Assessment Act, including the Municipal Engineers Association Class Environmental Assessment for Water and Wastewater Projects, 1993.

Ontario Water Resources Act which demonstrate that the proposal will not have an adverse effect upon the environment or public health[4].

c) Individual On-site Sewage and Water Services

! a terrain analysis and hydrogeological report or an assimilation capacity study have been completed in accordance with the requirements of the Environmental Protection Act and Ontario Water Resources Act which demonstrate that the proposal will not have an adverse effect upon the environment or public health[5].

Many municipalities have been given responsibilities under contract with the Province under Part VIII, Environmental Protection Act, RSO 1990, with respect to septic tanks and certain other sewage systems, including communal sewage systems which discharge to the subsurface. These responsibilities include (1) arranging for adequate inspection to be made of all parcels of land with respect to which an application for consent, plan of subdivision, minor variance, or plan of condominium is made which are not or will not be served by adequate sanitary sewers and (2) commenting to the body or person to whom such application is made on the suitability of such lands for sewage disposal. These responsibilities are often exercised by the Board of Health.

2.2.3 Site-Specific Official Plan Amendment/Individual Application Review in the Absence of Planning for Sewage and Water Services in Approved Municipal Planning Documents

In the absence of municipal planning for sewage and water services (as described in this guideline), the planning authority should not recommend approval for site-specific official plan amendments/individual planning applications proposing multi-lot/unit development, unless it is demonstrated that servicing

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[4] See: (1) Manual of Policy, Procedures and Guidelines for Private Sewage Disposal Systems, 1982
(2) An Introduction to Communal Sewage Systems, 1994
(3) MOEE Guideline B-7, Incorporation of The Reasonable Use Concept into MOEE Groundwater Management Activities

[5] See: (1) Appendix E: Technical Guidelines for Septic Systems: Water Quality Impact Risk Assessment, March 1995
(2) Appendix F: Technical Guidelines for Private Wells: Water Supply Assessment, March 1995
(3) Manual of Policy, Procedures and Guidelines for Private Sewage Disposal Systems, 1982
(4) Ontario Regulation 358 under Part VIII, Environmental Protection Act, RSO 1990
(5) Ontario Regulation 903, Ontario Water Resources Act, RSO 1990

options have been investigated and reported by means of a Servicing Options Statement (see Procedure D-5-3, *Servicing Options Statement*). Servicing options include the potential for servicing development on full municipal services, communal sewage and water services, and individual on-site sewage and water services consistent with this policy.

For the purposes of this guideline multi-lot/unit development means more than five lots/units of residential, industrial, commercial or institutional development.

> "More than Five lots/units" has been chosen because it is consistent with how environmental legislation defines what constitutes communal services under Sections 52 & 53, Ontario Water Resources Act RSO 1990, or under Part VIII, Environmental Protection Act RSO 1990. It is recognized that individual applications for small multi-lot/unit development in isolation from any other existing or proposed development may not be feasible on communal services or that the density associated with a particular development on communal services may not be desired. In the absence of official plan policy based on planning for sewage and water services, a servicing options statement can address the fundamental planning and servicing options at hand and ensure that informed decisions are made for community development that are consistent with the Comprehensive Set of Policy Statements. The servicing options statement can demonstrate how a particular development proposal(s) (and associated servicing) can fit most effectively into the existing community planning/servicing scenario and into any potential growth scenarios for the community.

A *servicing options statement* is not necessary for:

- development proposing connection to existing full municipal services within a designated settlement area, when it can be demonstrated that there is sufficient reserve sewage and water capacity as described in Section 2.2.2 of this guideline, or

- development proposing a servicing option that conforms to the existing official plan, where the official plan was prepared and approved in consideration of the principles described in this guideline and is consistent with the Comprehensive Set of Policy Statements.

Where applicable, the requirements of the municipal class environmental assessment process must be met (see *Municipal Engineers Association Class Environmental Assessment for Water and Wastewater Projects*, 1993).

The attached Appendix and Procedures form a part of this implementation guideline and should be read with the body of the implementation guideline.

APPENDIX

GLOSSARY

Default:

For the purposes of this document default describes **the situation whereby communal services are not being operated or maintained in accordance with prescribed standards and the operator is unable or unwilling to comply with prescribed standards which may include non-compliance with the Terms and Conditions of the Certificate of Approval for the system or works.**

Freehold Development:

For the purposes of this guideline freehold development means **development proposals subject to Section 50 of the Planning Act and not subject to the Condominium Act.**

Infill:

For the purposes of this guideline infill means **development on vacant lots or undeveloped lots within a built-up area.**

Multi-lot/unit Development:

For the purposes of this guideline multi-lot/unit development means **more than five lots/units of residential, industrial, commercial or institutional development.**

Multi-Year Sewage and Water Servicing Plan:

For the purposes of this guideline multi-year sewage and water servicing plan means **a plan prepared by a municipality responsible for sewage and water servicing that recommends a framework for the servicing of future works and developments which are to be distributed geographically throughout a study area and implemented over an extended period of time. The plan should contain long-range servicing strategies and long-term growth management goals which can form a basis for the preparation of official plan policy. The plan should address the implications for existing services to serve anticipated growth, efficiency of existing infrastructure including conservation measures, physical and environmental constraints to development related to servicing, and ensure that new services support the goals of environmental protection, sustainability, urban intensification and growth management in an efficient and cost effective manner.**

Sewage and Water Services:

Full Municipal Sewage and Water Services:

Means piped sewage and water services that are connected to a centralized water or wastewater treatment facility and provided by the municipality or another public body.

Communal Sewage and Water Services:
Generally mean sewage works and sewage systems and water works that can be described as small-scale satellite wastewater collection, treatment, and disposal facilities and water distribution, and possibly treatment, facilities using ground or possibly surface water as a source. Communal sewage services are separated from and unconnected to full municipal services which are connected to large centralized treatment plants that may serve entire municipalities. Communal sewage facilities can be comprised of gravity, pressure, or vacuum sewer collection systems, septic tank, secondary, tertiary, or stabilization pond treatment technologies, and discharge treated wastewater to either the surface of the ground, surface water, or subsurface environment.

For the purposes of this guideline and in keeping with existing legislation, "communal services" or "communal systems" mean **those sewage works, water works and sewage systems to be approved, or approved under Sections 52 & 53, Ontario Water Resources Act RSO 1990, or under Part VIII, Environmental Protection Act RSO 1990 for the common use of more than five units [in the total development area] of full-time or seasonal residential or industrial/commercial occupancy or other occupancy as determined by MOEE staff.**

Individual On-Site Sewage and Water Services/Systems:
Individual autonomous water supply and sewage disposal systems, that are owned, operated and managed by the owner of the property upon which the system is located and which do not serve more than five residential units/lots.

Public Communal Services:
Means sewage works and sewage systems, and water works that provide for the distribution, collection or treatment of sewage and water but which:

- are not connected to full municipal sewage and water services;
- are for the common use of more than five residential units/lots; and
- are owned, operated, and managed by either:
  - the municipality; or
  - another public body; or
  - where ownership by a municipality or another public body can not be achieved, by a condominium corporation or single owner through a responsibility agreement with the municipality or public body, which requires municipal/public body assumption of the communal services in the event of default.

Uncommitted Reserve Capacity:
See: Procedure D-5-1, *Calculating and Reporting on Uncommitted Reserve Capacity at Sewage and Water Treatment Plants*

City of Greater Sudbury Infrastructure Background Study

APPENDIX A.2

Guideline for Resource Capacity

PROCEDURE D-5-1
(FORMERLY APPENDIX A)

CALCULATING AND REPORTING UNCOMMITTED RESERVE CAPACITY AT SEWAGE AND WATER TREATMENT PLANTS

Last Revision

March 1995

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ADDENDUM

1.0 RATIONALE

It is the position of the Province that the number of lots in approved plans of subdivisions, developments committed by virtue of approved zoning, new official plans or site-specific official plan amendments, should not exceed the design capacity of the sewage and/or water system. In order to ensure that capacity is not exceeded it is necessary to determine what uncommitted reserve capacity is available. This procedure provides a means for determining uncommitted reserve capacity. As noted in Section 2.2.2 of the implementation guideline, if a municipality brings forward a specific proposal for alternative approaches for calculating and reporting uncommitted reserve capacity, the Ministry of Environment and Energy (MOEE) Regional Office will consider entering into alternative arrangements with the municipality.

Prior to calculating the uncommitted reserve capacity, it is important to recognize other factors which may limit new development, such as:

- limitations to the sewage collection/pumping stations (i.e.: basement floodings, overflow conditions, etc.);
- limitations to the water distribution system (ie: low pressure caused by small diameter mains), and other factors.

To this end, the "owner" is responsible for ensuring these factors, as well as any of the relevant plant performance characteristics listed in Section 3.2 below, are considered before calculating uncommitted reserve capacity for water and sewage works.[1]

Plant performance and hydraulic capacity should be closely related to municipal growth management objectives in order to produce environmentally sound decisions regarding servicing. Municipalities should recognize that plant expansion or upgrades typically require a minimum of 3 to 5 years to develop, and should therefore plan for their long term development needs accordingly.

Municipalities should not recommend approval, and approval authorities should not consider approval, for development proposals if the uncommitted reserve capacity calculation has not

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[1] The "owner" refers to the legal owner of the facility, or the person designated as owner in the Certificate of Approval for the works.

been prepared and submitted according to the principles set out in this document. Furthermore, if other factors which limit plant performance are not identified and addressed the application must be considered incomplete. MOEE is not able to process incomplete applications.

2.0 ROLE OF THE MINISTRY OF ENVIRONMENT AND ENERGY

MOEE, as the regulatory agency, is responsible for facilitating and promoting the compliance with the *Environmental Protection Act*, the *Ontario Water Resources Act*, and regulations enacted under those statutes. This mandate is fulfilled in part, through the issuance of Certificates of Approval, and based upon Ministry policies and guidelines. To this end, favourable comments from the MOEE on development proposals as they concern water and sewage treatment facilities, are contingent upon sufficient uncommitted hydraulic capacity and plant performance that is environmentally acceptable.

3.0 CALCULATING UNCOMMITTED RESERVE CAPACITY FOR SEWAGE AND WATER TREATMENT FACILITIES

In determining the uncommitted reserve capacity of sewage and water treatment plants, the following factors need to be considered: hydraulic capacity and plant performance in relation to environmental protection as set out in Ministry statutes, regulations and policies, and; the Certificate of Approval. Each of these matters must be considered by both the Municipality and the M.O.E.E. in assessing whether development proposals should be entertained.

3.1 Hydraulic Capacity

The uncommitted reserve hydraulic capacity should be calculated using the following formula:

$$Cu = Cr - \left[\frac{L \times F \times P}{H} \right]$$

Cu = uncommitted hydraulic reserve capacity (m^3/d)
Cr = hydraulic reserve capacity (m^3/d)
L = number of unconnected approved lots
P = existing connected population
H = number of households or residential connections
F Defined under:

Sewage Treatment Plants
F = average day flow per capita (m^3/capita/d)

Water Treatment Plants
F = maximum daily flow per capita (m^3/capita/d)

Please refer to the definitions provided in Section 6.0 to assist you with this calculation.

NOTE 1:

The Formula accounts for industrial, commercial, institutional and other flows by means of the per capita flow figure which includes flows from all types of land uses and other flow sources such as infiltration. In certain cases, such as where there is evidence of seasonal population fluctuations, rapid growth and/or the existence of large industries, or in cases where per capita water or sewage flows for proposed new developments will be substantially different from historical flows, etc., the Regional MOEE Director may consider it reasonable and appropriate to modify the manner in which the calculation is completed. Municipalities are advised to consult their Regional MOEE office in this regard.

In order to provide additional protection against the design capacity of the systems being overcommitted, municipalities may choose to apply separate allocations for uses such as industrial plans of subdivisions, site-specific industrial uses characterized by high water consumption, existing vacant residential lots and similar examples that could significantly reduce the calculated reserve capacity by increasing the per capita flow figure.

NOTE 2:

In calculating the uncommitted hydraulic reserve capacity, municipalities should ensure that the variable "L" represents all unconnected servicing commitments including:

- vacant lots/units in registered plans of subdivision and condominium
- lots/units in draft approved plans of subdivision/condominium;
- the maximum development potential of lands (i.e. scale and density) as permitted under existing zoning;
- registered plans of condominium;

- vacant lots created by consent in serviced areas.

NOTE 3:

For Water Treatment Plants:

- Maximum day flows to be subtracted from uncommitted reserve capacity should be calculated on the basis of those increased max day flows at the treatment plant - as opposed to a max day flow calculated for the development. The latter would be an unrealistic representation of the impact of a small development at the treatment plant in a large community.

The following are examples of calculations for sewage and water treatment plants, using the above formula:

For Sewage Treatment Plant

Cr = 12,000 m^3/day
L = 3,000 lots
F = .45 m^3/day
P = 25,000 people
H = 8,000

$$Cu = Cr - \frac{L \times F \times P}{H}$$

$$Cu = 12{,}000 - \frac{(3000 \times .45 \times 25{,}000)}{8{,}000}$$

$$Cu = 12{,}000 - 7{,}781.25 \text{ m}^3\text{/day}$$

For Water Treatment Plant

Cr = 20,000 m^3/day
L = 3,000 lots
F = 0.9 m^3/day
P = 25,000 people
H = 8,000

$$C_u = C_r - \left[\frac{L \times F \times P}{H}\right]$$

$$C_u = 20{,}000 - \left[\frac{3000 \times .9 \times 25000}{8{,}000}\right]$$

$$= 11{,}562.5 \text{ m}^3\text{/d}$$

3.2 Plant Performance Characteristics Which May Affect the Use of the Above Formula

For Sewage Treatment Plants

The following performance characteristics may be used as a basis for imposing limited or long term development constraints:

- the treatment facility is in poor condition, performing erratically or not in accordance with its design;
- the effluent quality parameters exceed or are near the limits specified in the plant's Certificate of Approval;
- the sewage strength (i.e. organic loading) varies significantly due to industrial discharges into municipal sewers.

For Water Treatment Plants

The following performance characteristics may be used as a basis for imposing limited or long term development constraints:

- the existing treatment facility is in poor condition and not capable in meeting the maximum day demands, limiting pressures, etc.
- existing water quality does not meet health related parameters of the Ontario Drinking Water Objectives as stipulated in the plant's Certificate of Approval;

3.3 Compliance with Certificate of Approval

Municipalities are responsible for ensuring that they are in compliance with Environmental Laws and the Certificates of Approval issued for their plants. Certificates of Approval typically identify effluent limits which must be met. Non-compliance for effluent quality must limit development in the same way as insufficient hydraulic capacity.

Typical examples of limiting factors established in Certificates of Approval for sewage works which must be complied with are: biochemical oxygen demand (BOD), suspended solids and phosphorus.

In many cases the Certificates of Approval also specify additional parameters which require monitoring (e.g., ammonia)

depending on plant process. As a result, it is of critical importance that municipalities be aware of the specific requirements of their certificates. If the Certificate of Approval specifies a sampling protocol, it must be followed. If not, please refer to the MOEE policy entitled "Policy to Govern Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works (Liquid Waste Streams Only)" (MOEE Policy 08-06).

3.4 Policies of the Ministry of Environment and Energy

In addition to the requirements of the Certificate of Approval, there are a number of MOEE policies that govern the operation of treatment facilities (e.g. Ontario Drinking Water Objectives, Treatment Requirements for Municipal and Communal Water Works Using Ground Water Sources). This Ministry recommends that these policies be followed. Failure to comply with these policies may result in development restrictions imposed by this Ministry. Please refer to the addendum for a listing of the policies. For copies of these policies please contact the nearest MOEE Regional or District Office.

4.0 ANNUAL REPORT

Municipalities should produce an annual report within 90 days of the end of each calender year, based on the calculation methods set out in this guideline. The annual report should address both hydraulic capacity and performance factors, and be retained by the municipality for a period of three (3) years. Under environmental legislation, these reports must be made available to Ministry personnel upon request.

The annual report must be authorized by an appropriate municipal official.[2] The date of the first annual report should be determined in consultation with the MOEE.

NOTE 4: Review and acceptance of an annual report by the MOEE should not be construed as confirmation of compliance with the requirements of the Certificate of Approval.

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[2] "Appropriate municipal official" should be someone with credentials qualifying him/her to certify the capacity calculation as being a true and accurate reflection of the status of the sewage and water works. In an organized municipality, this would most likely refer to either the CEO or the Clerk.

5.0 IMPLEMENTATION

Each development application circulated to the planning authority should be accompanied by written certification, prepared by the appropriate municipal official, which indicates that uncommitted capacity is available and has been allocated to the development.

6.0 EXPLANATION OF TERMS USED IN CALCULATIONS OF HYDRAULIC CAPACITY

Sewage Treatment Plants:

Design Capacity:

The design capacity may be defined in the Design Report or in the Certificate of Approval. The components of the wastewater flow may include:

- domestic wastewater;
- industrial wastewater;
- inflow/infiltration;
- storm water.

Average Daily Per Capita Flow:

The average daily per capita flow means the total sewage flow to the sewage works over twelve (12) consecutive calendar months, or during the period of operation upon which the report is based, divided by the number of days during the same period of time. Yearly average day flows are acceptable if the effluent compliance criteria for the defined parameters is based on average yearly concentration and loading limits.

NOTE 5: The use of 3 vs 5 year records in establishing representative average daily flows will be determined by the MOEE Regional Director.

Hydraulic Reserve Capacity:

The hydraulic reserve capacity is defined as the design capacity minus the actual existing recorded average day flow.

Uncommitted Hydraulic Reserve Capacity:

The uncommitted hydraulic reserve capacity is obtained by subtracting the previously committed flows of registered and draft approved residential, commercial and industrial lots, from the existing hydraulic reserve capacity.

Commercial/Industrial Lots:

Sewage flows for commercial/industrial lots must be determined by the municipality. Municipalities should do this by estimating the water consumption / sewage figures for similarly sized, similar type developments and factor this information into the calculation of the uncommitted reserve capacity. Moreover, it should be understood that in some cases organic loading, and not hydraulic loading, may be the limiting factor.

In exceptional circumstances it is not possible to estimate water consumption / sewage figures, municipalities may estimate the flow with the prior approval of the Ministry. If the Ministry agrees that this is acceptable in the specific situation, the following approach may be used:

> Industrial/institutional/commercial flows can be equated to an equivalent residential flow. A production/consumption rate of 100 gallons or 450 litres per capita per day of sewage flow or water demand should be used for designing sewage plants. This number will vary according to municipality. Once a specific industry is identified, the municipality will have a better indication of the amount of water the industry requires or the amount of sewage flows produced. The municipality will be able to determine whether its present sewage works can accommodate the industry.

Draft Approval:

Draft approved lots/units are those lots granted approval subject to certain conditions. These conditions must be fulfilled before the lots can receive final approval.

Draft approval is a commitment on behalf of the province and the municipality, and is interpreted by the proponent and the public as a reasonable assurance that development can proceed. Within a serviced municipality, the Province considers capacity to be committed to a development when draft approval is granted.

Water Treatment Plants

Design Capacity:

Design capacity of water treatment plants is defined as quantity of water which can be delivered to the distribution system when operating the plant under design conditions and is sufficient to meet the maximum day demand. (Greater capacities may be required depending on in-system fire flow requirements and storage capacity). The design capacity of

water treatment plants can be obtained from the Certificate of Approval, Water Taking Permit, the design documents or design/operating manuals.

Hydraulic Reserve Capacity:

The hydraulic reserve capacity is defined as the design capacity minus the actual existing recorded maximum day flow. In some instances, the capacity of ground water supply wells or the perennial yield of the aquifer must be determined in order to calculate the hydraulic reserve capacity for municipalities provided by such ground water supply systems.

Uncommitted Hydraulic Reserve Capacity:

The uncommitted hydraulic reserve capacity is obtained by subtracting the equivalent flow commitments to registered and draft approved residential, commercial and industrial lots from the existing hydraulic reserve capacity.

Commercial/Industrial Lots:

Water consumption for commercial/industrial lots must be determined by the municipality. Water demands for commercial/industrial establishments vary greatly with the type of water-using facilities present in the development, the number of people using it etc. Industrial water demands will vary greatly with the type of industry i.e. wet or dry operations.

In exceptional circumstances, municipalities may estimate the flow with the prior approval of the Ministry.

Draft Approval:

Draft approved lots/units are those lots granted approval subject to certain conditions. These conditions must be fulfilled before the lots can receive final approval.

Draft approval is a commitment on behalf of the province and the municipality, and is interpreted by the proponent and the public as a reasonable assurance that development can proceed. Within a serviced municipality, the Province considers capacity to be committed to a development when draft approval is granted.

Maximum Day Per Capita Flow:

The maximum day **per capita flow is based on the existing**

maximum day flow divided by the serviced population. Lower maximum day flow figures may be accepted if the data indicates the highest flow(s) to the system occurred on an isolated basis, or where the municipality has successfully attempted to reduce leakage from the system and has also installed flow reducing devices.

As an alternative, the maximum day flow per capita may be derived by multiplying the average daily per capita flow with the maximum day factor. The maximum day factor is available in the design report or determined by using the design manual.

NOTE 6: The use of 3 vs 5 year records in establishing representative maximum day flow will be determined by the MOEE Regional Director.

ADDENDUM

LISTING OF MINISTRY OF THE ENVIRONMENT AND ENERGY POLICIES GOVERNING THE OPERATION OF TREATMENT FACILITIES

Guideline B-1:
Water Management - Goals, Policies, Objectives and Implementation Procedures of the Ministry of the Environment

Guideline B-13:
Treatment Requirements for Municipal and Communal Water Works Using Surface Water Sources

Guideline B-14:
Treatment Requirements for Municipal and Communal Water Works Using Ground Water Sources

Guideline B-15:
Use of Pesticides In and Around Water Works

Guideline F-5:
Levels of Treatment for Municipal and Private Sewage Treatment Works Discharging to Surface Waters

Guideline F-7:
Minimum Accepted Level of Servicing for Municipally and Privately Owned Communal Systems

Procedure F-8-1:
Policy to Govern the Provision and Operation of Phosphorus Removal Facilities at Municipal, Institutional and Private Sewage Treatment Works

City of Greater Sudbury Infrastructure Background Study

APPENDIX B.1

Water Uncommitted Reserve

TABLE 1 — WATER - UNCOMMITTED RESERVE CAPACITY — 2001

Treatment Facility		Pc	Average Daily Flows (m³/day)				F	L	P	H	Cr	Cr	Cu	Cu
Plant Name	Type	m³/day	1999	2000	2001	3 yr avg	m³/day	2001 DATA			m³/day	Units	m³/day	Units
Sudbury														
	David St. PS	27,260	23,730	23,026	25,843	24,200								
	Wanapitei WTP	54,000	30,421	30,708	34,781	31,970								
	Coniston							672	2,129	840				
	Garson							233	1,869	738				
	Wahnapitae							93	1,215	479				
	Sudbury							13,131	85,041	40,421				
	Total	81,260	54,151	53,734	60,624	56,169	0.622	14,129	90,254	42,478	25,091	16,727	6,407	4,272
Capreol														
	Well Field	11,531	3,712	4,072	3,603	3,796	1.118	189	3,395	1,511	7,735	5,157	7,261	4,840
Dowling														
	Well Field	8,648	687	598	508	598	0.322	36	1,857	786	8,050	5,367	8,023	5,349
Garson					Note 1									
	Well Field	8,845	2,246	1,356	1,356	1,653	0.337	212	4,898	1,933	7,192	4,795	7,011	4,674
Valley East														
	Well Field	26,843	9,093	8,423	8,545	8,687	0.273							
	Azilda							421	4,986	1,983				
	Chelmsford Lagoon							0	0	0				
	Chelmsford STP							591	7,683	3,055				
	Valley East							3,596	19,145	6,956				
	Total							4,608	31,814	11,994	18,156	12,104	14,818	9,879

Note 1 Flow meter out of service, used flows from year 2000

Cr flow = Hydraulic Reserve Capacity = Pc - 3 yr. average

Cr units = Residential Reserve Capacity = Cr flow ÷ 1.5 m³/day

Design Flow = 1.5 m³ / day / residential unit

F = Plant Flow Per Capita

* FLOW DATA BASED ON 2001 WATER WASTE WATER TREATMENT ANNUAL REPORT

Cu flow = Uncommitted Hydraulic Reserve Capacity = Cr - L x F x P ÷ H Cu units = Uncommitted Residential Reserve Capacity = Cu flow ÷ 1.5 m³/day L = Vacant Lots P = Population H = Household

TABLE 2 — WATER - UNCOMMITTED RESERVE CAPACITY — 2001

Treatment Facility		Pc	Average Daily Flows (m³/day)				F	L	P	H	Cr	Cr	Cu	Cu
Plant Name	Type	m³/day	1999	2000	2001	3 yr avg	m³/day	2001 DATA			m³/day	Units	m³/day	Units
Falconbridge	(Falc. Ltd)													
	Well Field	5,451	n/a	n/a	n/a	0					5,451			
	Mine		n/a	n/a	n/a	0								
	Town		727	729	729	728	0.966	43	754	297		3,634	5,346	3,564
Levack	(Inco)													
	Well Field	15,800	n/a	n/a		0					15,800			
	Mine		n/a	n/a		0								
	Town		685	747	747	726	0.478	83	1,520	644		10,533	15,706	10,471
Onaping	(Falc. Ltd)													
	Well Field	6,540	n/a	n/a	n/a	0					6,540			
	Mine		n/a	n/a	n/a	0								
	Town		727	729	729	728	0.910	94	800	339		4,360	6,338	4,225
Vermilion	(Inco)													
	WTP	81,800	37,462			37,462					44,338			
	Mine		33,186	-4,658	-6,013	7,505								
	Copper Cliff		1,559	1,768	2,877	2,068		73	2,302	1,094				
	Lively		1,237	1,365	1,493	1,365		109	2,866	1,318				
	Walden		1,480	1,525	1,643	1,549		1,352	3,947	1,815				
	Towns		4,276	4,658	6,013	4,982	0.547	1,534	9,115	4,227		29,559	42,530	28,353

Cr flow = Hydraulic Reserve Capacity = Pc - 3 yr. average Cr units = Residential Reserve Capacity = Cr flow ÷ 1.5 m³/day Design Flow = 1.5 m³ / day / residential unit **F = Plant Flow Per Capita**

Cu flow = Uncommitted Hydraulic Reserve Capacity = Cr - L x F x P ÷ H Cu units = Uncommitted Residential Reserve Capacity = Cu flow ÷ 1.5 m³/day L = Vacant Lots P = Population H = Household

* FLOW DATA BASED ON 2001 WATER WASTE WATER TREATMENT ANNUAL REPORT

City of Greater Sudbury Infrastructure Background Study

APPENDIX B.2

Sewage Uncommitted Reserve

TABLE 3 — SEWAGE - UNCOMMITTED RESERVE CAPACITY — 2001

Treatment Facility			Effluent			Pc	Average Daily Flows (m3/day)				F	L	P	H	Cr	Cr	#	Cu	Cu
Name	Type		B.O.D.	S.S.	T. Phos	m³/day	1999	2000	2001	3 yr avg	m³/day	2001 DATA			m³/day	Units		m³/day	Units
Azilda	STP	*C of A*	*37.00*	*15.00*	*1.00*	*2,840*													
	Extended Aeration	Actual	4.70	8.50	0.49		2,667	2,012	3,054	2,578	0.627	392	4,112	1,635	262	175		-356	-237
Chelmsford	STP																		
	Extended Aeration																		
	Summer	*C of A*	*7.00*	*7.00*	*0.30*	*7,100*													
		Actual	*3.90*	*5.60*	*n/a*														
	Winter	*C of A*	*15.00*	*15.00*	*0.50*														
		Actual	4.60	10.80	n/a		4,127	3,287	4,435	3,950	0.539	576	7,322	2,911	3,150	2,100		2,369	1,579
Coniston	STP	*C of A*	*20.00*	*20.00*		*3,000*													
	Extended Aeration	Actual	11.10	8.70			1,232	1,175	1,600	1,336	0.627	591	2,129	840	1,664	1,109		724	483
Copper Cliff	INCO Vermillion STP																		
	Conventional	*C of A*				*6,800*													
	Activated Sludge	Actual					2,115			2,115	0.919	73	2,302	1,094	4,685	3,123		4,544	3,029
Dowling	STP	*C of A*	*25.00*	*25.00*		*3,200*													
	Extended Aeration	Actual	4.10	3.60			2,443	2,483	2,547	2,491	1.341	36	1,857	786	709	473		595	397
Falconbridge	STP	*C of A*	*25.00*	*25.00*		*909*													
	Trickling Filter	Actual	4.20	3.20			362	380	350	364	0.483	43	754	297	545	363		492	328
Levack	STP	*C of A*	*25.00*	*25.00*	*1.00*	*2,270*													
	Extended Aeration	Actual	6.30	7.80	0.51		1,047	1,037	1,132	1,072	0.462	177	2,320	983	1,198	799		1,005	670

Cr flow = Hydraulic Reserve Capacity = Pc - 3 yr. average **Cr units = Residential Reserve Capacity = Cr flow ÷ 1.5 m³/day** **Design Flow = 1.5 m³ / day / residential unit** **F = Plant Flow Per Capita**

Cu flow = Uncommitted Hydraulic Reserve Capacity = Cr - L x F x P ÷ H **Cu units = Uncommitted Residential Reserve Capacity = Cu flow ÷ 1.5 m³/day** **L = Vacant Lots** **P = Population** H = Household

* FLOW DATA BASED ON 2001 WATER WASTE WATER TREATMENT ANNUAL REPORT

TABLE 4 — SEWAGE - UNCOMMITTED RESERVE CAPACITY — 2001

Treatment Facility			Effluent			Pc	Average Daily Flows (m3/day)				F	L	P	H	Cr	Cr	Cu	Cu
Name	Type		B.O.D.	S.S.	T. Phos	m³/day	1999	2000	2001	3 yr avg	m³/day	2001 DATA			m³/day	Units	m³/day	Units
Lively	STP	*C of A*	*25.00*	*25.00*	*1.00*	*1,600*												
	Extended Aeration	Actual	6.40	8.00	0.67		1,036	1,045	1,186	1,089	0.394	98	2,763	1,271	511	341	427	285
Sudbury	STP	*C of A*	*25.00*	*25.00*	*1.00*	*79,625*												
	High Rate	Actual	7.90	12.70	0.48		57,113	58,163	70,302									
	Garson											152	546	215				
	Sudbury											12,699	84,330	40,083				
						79,625	57,113	58,163	70,302	61,859	0.729	12,851	84,876	40,298	17,766	11,844	-1,961	-1,307
Valley East	STP																	
	Conventional	*C of A*	*25.00*	*25.00*	*1.00*	*11,400*												
	Activated Sludge	Actual	5.40	9.20	0.61		5,758	5,555	6,886	6,066	0.348	1,745	17,415	6,328	5,334	3,556	3,661	2,441
Walden	STP	*C of A*	*25.00*	*25.00*	*1.00*	*4,500*												
	Extended Aeration	Actual	5.60	8.30	0.39		2,549	2,455	2,912	2,639	0.782	1,296	3,376	1,553	1,861	1,241	-340	-227
Capreol	Lagoon	*C of A*	*30.00*	*40.00*		*5,000*												
	Exfiltration	Actual	22.70	38.00	0.99	3.31	3,316	2,713	3,584	3,204	0.945	187	3,392	1,510	1,796	1,197	1,399	933
Chelmsford	Lagoon	*C of A*	*30.00*	*40.00*		*824*												
	Seasonal Retention	Actual					n/a	n/a	n/a			n/a	n/a	n/a				
OFFLINE since Dec 31, 1998																		
Garson	Lagoon	*C of A*	*30.00*	*40.00*		*3,506*												
	Seasonal Retention	Actual	6.20	6.00	0.69		773	705	761	746	0.133	245	5,628	2,221	2,760	1,840	2,677	1,785
Wahnapitae	Lagoon	*C of A*	*30.00*	*40.00*		*1,246*												
	Seasonal Retention	Actual	3.00	4.40	0.05		916	884	1,088	963	0.845	47	1,139	449	283	189	182	122

Cr flow = Hydraulic Reserve Capacity = Pc - 3 yr. average **Cr units = Residential Reserve Capacity = Cr flow ÷ 1.5 m³/day** **Design Flow = 1.5 m³ / day / residential unit** **F = Plant Flow Per Capita**

Cu flow = Uncommitted Hydraulic Reserve Capacity = Cr - L x F x P ÷ H **Cu units = Uncommitted Residential Reserve Capacity = Cu flow ÷ 1.5 m³/day** **L = Vacant Lots** **P = Population** H = Household

* FLOW DATA BASED ON 2001 WATER WASTE WATER TREATMENT ANNUAL REPORT

City of Greater Sudbury Infrastructure Background Study

APPENDIX C

Water Reserve Capacity

WATER - UNCOMMITTED RESERVE CAPACITY

Municipal Water Supplies

Treatment Facility		Rated Hyd.Cap.	Firm Cap.	Average Daily Flows (m³/day)				Avg. Day Flow	Recorded 2001 Max Day	Max Day Factor	Calculated Max Day	Max.Day Flow / Cap	2001 Population Current	Households Current	Density Current	Uncommitted Reserve Cap.	Lots Available	%age Capacity
Plant Name	**Type**	**m³/day**	**m³/day**	**1999**	**2000**	**2001**	**3 yr avg**	**m³/cap./day**	**m³/day**		**m³/day**	**m³/cap./day**				**m³/day**		
Sudbury																		
	David St. PS	40000	40,000	23,730	23,026	25,843	24,200		42229									
	Wanapitei WTP	54000	44,000	30,421	30,708	34,781	31,970		40360									
	Coniston												2,129	840				
	Garson												1,869	738				
	Wahnapitae												1,215	479				
	Sudbury												85,041	40,421				
	Total	94000	84,000	54,151	53,734	60,624	56,169	0.622	82,589			0.92	90,254	42,478	2.12	1,411	726	98.3%
Dowling	Lionel	3637	3,637															
	Riverside	3637	-															
	Well Field	7274	3637	687	598	508	598	0.322		2.500	1494	0.80	1,857	786	2.36	2,143	1,127	41.1%
Garson	Orell 1	1572	1572															
	Orell 3	3275	-															
	INCO 1	2981	2981															
	Well Field	7828	4553	2,246	1,356	1,356	1,653	0.337		2.000	3306	0.67	4,898	1,933	2.53	1,248	730	72.6%
Capreol	Well M	2946	2,946															
	Well J	3927	-															
	Well 6 (to be abandoned)	3273	-															
	Well Field	10146	2,946	3,712	4,072	3,603	3,796											
Valley East	Kenneth	2288	2288															
	Phillipe	2288	2288															
	Deschene	1797	1795															
	Frost	2288	2290															
	Michelle	2289	2290															
	Notre Dame	3105	3106															
	Linden	3268	3268															
	Pharand	2289	2290															
	Well I	1973	1973															
*	Proposed New Well	3100	3100															
	Well Field	24685	24,688	9,093	8,423	8,545	8,687											
	Capreol												3,395	1,511				
	Azilda												4,986	1,983				
	Chelmsford												7,683	3,055				
	Valley East												19,145	6,956				
Total System	Both Well Fields	34831	27634	12805	12495	12148	12483	0.355		1.800	22469	0.64	35,209	11,994	2.94	5,165	2,757	81.3%

Purchased Water Supplies

Treatment Facility		Rated Hyd.Cap.	Firm Cap.	Average Daily Flows (m³/day)				Avg. Day Flow	Recorded Max Day	Max Day Factor	Calculated max Day	Max.Day Flow / Cap	Population Current	Households Current	Density Current	Uncommitted	Lots Available	%age Capacity
Plant Name	**Type**	**m³/day**	**m³/day**	**1999**	**2000**	**2001**	**3 yr avg**	**m³/cap./day**	**m³/day**		**m³/day**	**m³/cap./day**				**m³/day**		
Falconbridge	Agreement to Purchase																	
	(Falc. Ltd) Well 1	2,617	2,617															
	(Falc. Ltd) Well 2	2,617	-	n/a	n/a	n/a												
	Mine			n/a	n/a	n/a												
	Town	5,234	2,617	727	729	729	728	0.966		2.750	2003	2.66	754	297	2.54	614	91	76.5%
Levack	Agreement to Purchase	1892																
	New Well 1	1555	-	n/a	n/a		0											
	New Well 2	1555	1,555	n/a	n/a		0											
	Town	3110	1555	685	747	747	726	0.478		2.000	1453	0.96	1,520	644	2.36	102	45	93.4%
Onaping	Agreement to Purchase																	
	Well Field	6540	6540	n/a	n/a	n/a	0											
	Mine			n/a	n/a	n/a	0											
	Town	6540	6540	727	729	729	728	0.910		2.750	2003	2.50	800	339	2.36	4,537	768	30.6%
Vermilion																		
Copper Cliff	Agreement to Purchase	7571	7,571															
Lively	Agreement to Purchase	12810	12,810															
	Copper Cliff			1,559	1,768	2,877	2,068						2,302	1,094	2.10			
	Lively			1,237	1,365	1,493	1,365						2,866	1,318	2.17			
	Walden			1,480	1,525	1,643	1,549						3,947	1,815	2.17			
	Towns	20381	20,381	4,276	4,658	6,013	4,982	0.547		2.000	9965	1.09	9,115	4,227	2.16	10,416	4,418	48.9%

City of Greater Sudbury Infrastructure Background Study

APPENDIX D

Wastewater Reserve Capacity

Wastewater - Uncommitted Reserve Capacity

Treatment Facility			Effluent			Pc	Average Daily Flows (m3/day)				F	L	P	H	Cap L/s	%age
Name	Type		BOD	SS	T.Phos.	m³/day	1999	2000	2001	3 yr avg	m³/day	2001 DATA			Q(exist) l/s	Capacity
Azilda	STP	*C of A*	*37.00*	*15.00*	*1.00*	*3,300*										
	Extended Aeration	Actual	4.70	8.50	0.49		2,667	2,012	3,054	2,578	0.627	392	4,112	1,635	38.19	78.11
															29.83	
Chelmsford	STP	*C of A*	*7.00*	*7.00*	*0.30*	*7,100*										
	Summer	Actual	3.90	5.60	n/a		4,127	3,287	4,435	3,950	0.539	576	7,322	2,911	82.18	55.63
		C of A	15.00	15.00	0.50										45.72	
	Winter		4.60	10.80	n/a											
Coniston	STP	*C of A*	*20.00*	*20.00*		*3,000*										
	Extended Aeration	Actual	11.10	8.70			1,232	1,175	1,600	1,336	0.627	591	2,129	840	34.72	44.53
															15.46	
Copper Cliff	INCO Vermillion STP	*C of A*				*6,800*										
	Activated Sludge	Actual					2,115			2,115	0.919	73	2,302	1,094	78.70	31.10
															24.48	
Dowling	STP	*C of A*	*25.00*	*25.00*		*3,200*										
	Extended Aeration	Actual	4.10	3.60			2,443	2,483	2,547	2,491	1.341	36	1,857	786	37.04	77.85
															28.83	
Falconbridge	STP	*C of A*	*25.00*	*25.00*		*909*										
	Trickling Filter	Actual	4.20	3.20			362	380	350	364	0.483	43	754	297	10.52	40.03
															4.21	
Levack	STP	*C of A*	*25.00*	*25.00*	*1.00*	*2,270*										
	Extended Aeration	Actual	6.30	7.80	0.51		1,047	1,037	1,132	1,072	0.462	177	2,320	983	26.27	47.23
															12.41	
Lively	STP	*C of A*	*25.00*	*25.00*	*1.00*	*1,600*										
	Extended Aeration	Actual	6.40	8.00	0.67		1,036	1,045	1,186	1,089	0.394	98	2,763	1,271	18.52	68.06
															12.60	
Sudbury	Garson	*C of A*	*25.00*	*25.00*	*1.00*	*79,625*						152	546	215		
	Sudbury	Actual	7.90	12.70	0.48							12,699	84,330	40,083	921.59	77.69
						79,625	57,113	58,163	70,302	61859		12,851	84,876	40,298	715.96	
Valley East	Conventional	*C of A*	*25.00*	*25.00*	*1.00*	*11,400*										
	Activated Sludge	Actual	5.40	9.20	0.61		5,758	5,555	6,886	6,066	0.348	1,745	17,415	6,328	131.94	53.21
															70.21	
Walden	STP	*C of A*	*25.00*	*25.00*	*1.00*	*4,500*										
	Extended Aeration	Actual	5.60	8.30	0.39		2,549	2,455	2,912	2,639	0.782	1,296	3,376	1,553	52.08	58.63
															30.54	
Capreol	Lagoon	*C of A*	*30.00*	*40.00*		*5,000*										
	Exfiltration	Actual	22.70	38.00	0.99	3.31	3,316	2,713	3,584	3,204	0.945	187	3,392	1,510	57.87	64.08
															37.08	
Garson	Lagoon	*C of A*	*30.00*	*40.00*		*3,506*										
	Seasonal Retention	Actual	6.20	6.00	0.69		773	705	761	746	0.133	245	5,628	2,221	40.58	21.29
															8.64	
Wahnapitae	Lagoon	*C of A*	*30.00*	*40.00*		*1,246*										
	Seasonal Retention	Actual	3.00	4.40	0.05		916	884	1,088	963	0.845	47	1,139	449	14.42	77.28
															11.14	

City of Greater Sudbury Infrastructure Background Study

APPENDIX E.1

Guide Land Use Development

GUIDELINE D-1
(formerly 07-03)

Land Use Compatibility

Legislative Authority:

Environmental Protection Act, RSO 1990, Section 14
Environmental Assessment Act, RSO 1990, Section 5(3)
The Planning Act, RSO 1990 Sections 2 (a) (b) (c) (f) (g) (h), 17(9), 22(3), 41(4) and 51(3)
The Condominium Act, RSO 1990, Section 50(3)
The Niagara Escarpment Planning & Development Act, RSO 1990, Section 9

Responsible Director:

Director, Environmental Planning Branch

Last Revision Date:

July 1995

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SYNOPSIS

This guideline identifies the direct interest of the Ministry in recommending separation distances and other control measures for land use planning proposals to prevent or minimize adverse effects from the encroachment of incompatible land uses where a facility either exists or is proposed. This guideline sets the context for all existing and new guidelines relating to land use compatibility.

The guideline is intended to apply only when a change in land use is proposed, however, compatibility concerns should be recognized and addressed at the earliest possible stage of the land use planning process for which each particular agency has jurisdiction. The intent is to achieve protection from off-site adverse effects, supplementing legislated controls.

The guideline encourages informed decision-making for Ministry staff, land use planning and approval authorities, and consultants. All land use planning and resource management agencies within the Province shall have regard for the implications of their actions respecting the creation of new, or the aggravation of existing, land use compatibility problems. The Ministry shall not be held liable for municipal planning decisions that disregard Ministry policies and guidelines. When there is a contravention of Ministry legislation, Ministry staff shall enforce compliance.

Nothing in this guideline is intended to alter or modify the definition of 'adverse effect' in the *Environmental Protection Act.*

1.0 INTRODUCTION

1.1 Legislative Authority

The primary legislative basis for this Guideline is Section 14(1) of the *Environmental Protection Act,* RSO, 1990. This Section states: "Despite any other provision of this Act or the regulations, no person shall discharge a contaminant or cause or permit the discharge of a contaminant into the natural environment that causes or is likely to cause an adverse effect".

1.2 Objective

The objective of this guideline is to minimize or prevent, through the use of buffers, the exposure of any person, property, plant or animal life to adverse effects associated with the

operation of specified facilities (see definition for "facility" in Procedure D-1-3, "Land Use Compatibility: Definitions).

1.3 Procedures

Procedure D-1-1, "Land Use Compatibility: Procedure for Implementation" identifies areas of responsibility for Ministry staff or the Delegated Authority, Municipalities and Other Planning Authorities and Proponents, and discusses various implementation approaches and tools. Procedure D-1-2, "Land Use Compatibility: Specific Applications" list Ministry and other agencies' documents which are specific applications of this guideline. Procedure D-1-3, "Land Use Compatibility: Definitions" provides definitions of terms.

2.0 APPLICATION

2.1 Dual Nature of Guideline

The guideline is applicable when:

(a) a new sensitive land use is proposed within the influence area or potential influence area of an existing facility; and/or

(b) a new facility is proposed where an existing sensitive land use would be within the facility's influence area or potential influence area.

2.2 Planning Activities

This guideline applies when a change in land use places or is likely to place sensitive land use within the influence area or potential influence area of a facility, for the various situations listed below:

2.2.1 Policies, Guidelines and Programs

This guidelines applies for the formulation and review of land use policies, guidelines or programs.

2.2.2 General Land Use Plans

This guideline applies for the review of municipal and other levels of government general plans and proposals (e.g. municipal official plans and official plan amendments, municipal secondary plans, provincial resource management plans and other land use planning related matters).

2.2.3 Site-Specific Plans

This guideline applies for the review of site-specific development plans (e.g. plans of subdivision, plans of condominium, severances) including redevelopment and/or infill proposals.

2.3 Non-Applicable Situations

2.3.1 Existing Incompatible Land Uses

This guideline does not apply to situations where incompatible land uses already exist, and there is no new land use proposal for which approval is being sought.

However, where feasible, the Ministry encourages the implementation of mitigation measures by the appropriate authority, at the earliest opportunity, to minimize existing compatibility problems.

NOTE: When there is a compatibility problem where both land uses already exist, matters may be subject to Ministry abatement activities if there is non-compliance with a Ministry issued Certificate of Approval (C of A) for the facility, or there is no C of A in place.

2.3.2 Compliance with Existing Zoning and Official Plan Designation

This guideline does not normally affect a change in land use, an expansion, or new development, for either a facility or a sensitive land use which is in compliance with existing zoning, and the official plan designation, except for plans of subdivision and condominium and/or severances. In these exceptional situations, Ministry staff may require studies (see Guideline D-6, "Compatibility Between Industrial Facilities and Sensitive Land Uses, Sections 4.6, "Studies" and 4.7, "Mitigation"), and the identification of any necessary mitigative measures to prevent or minimize any potential 'adverse effects'.

There may be additional exceptional circumstances brought to staff's attention if a Certificate of Approval or other planning approval is required, where the Ministry would object if a sensitive land use would be subjected to adverse effects which could not be mitigated (e.g., land use change from single family residential to high rise, which would affect the point of impingement for air emissions, or when a

change of industry is proposed with a completely different influence area).

If a proposed use is permitted in the official plan, but rezoning is required, or if both redesignation and rezoning are required, then this guideline shall apply.

NOTE: Although the guideline does not specifically address such matters, it is not intended to preclude the implementation of mitigation measures to minimize existing compatibility problems.

2.3.3 Emergency Situations

This guideline does not deal with emergency situations, such as process upsets, the breakdown or malfunction of technical controls and/or spills. These are dealt with through other practices and legislation.

2.3.4 Federal Jurisdiction

This guideline does not normally apply to lands owned or purchased by undertakings under federal jurisdiction. However, federal bodies may choose to comply with provincial laws and policies, or may be required to do so by federal law or by their own regulatory bodies.

A court may rule that there is no reason for federal facilities not to comply with local requirements, as long as these additional controls do not attempt to prohibit the undertaking.

As well, this guideline may apply to private undertakings on federal lands on a case-by-case basis.

2.4 Adverse Effects

Depending upon the particular facility, adverse effects may be related to, but not limited to, one or more of the following:

(a) noise and vibration;
(b) visual impact (only for landfills under O. Regulation 347);
(c) odours and other air emissions;
(d) litter, dust and other particulates; and
(e) other contaminants.

3.0 GUIDELINE

3.1 Preferred Approach

Incompatible land uses are to be protected from each other, in land use plans, proposals, policies and programs to achieve the Ministry's environmental objectives. Various buffers on either of the incompatible land uses or on intervening lands, as discussed in Section 4 of Procedure D-1-1, "Land Use Compatibility: Implementation", may be used to prevent or minimize 'adverse effects'. Distance is often the only effective buffer, however, and therefore adequate separation distance, based on a facility's influence area, is the preferred method of mitigating 'adverse effects'.

3.2 Purpose of Separation Distance

The separation distance should be sufficient to permit the functioning of the two incompatible land uses without an 'adverse effect' occurring. Separation of incompatible land uses should not result in freezing or denying usage of the intervening land. The distance shall be based on a facility's potential influence area or actual influence area if it is known. When development is proposed beyond a facility's potential influence area or actual influence area, the Ministry shall not normally object to development on the basis of land use compatibility. Exceptional situations may be identified in documents for specific facilities which are listed in Procedure D-1-2, "Land Use Compatibility: Specific Applications".

3.3 Use of Land Within Separation Distance

When the separation distance is the method of buffering, and the buffer area extends beyond a facility or sensitive land use site boundary, this Ministry encourages intervening land uses or activities that are compatible with both the facility and the sensitive land use(s).

Compatible land uses can vary on a case-by-case basis, and are identified for different facilities in documents listed in Procedure D-1-2, "Land Use Compatibility: Specific Applications".

Within the separation distance, municipal controls to increase zoning by-law setbacks for facilities or restrictions on location and use of outdoor storage could assist in achieving distance separation.

3.4 Irreconcilable Incompatibilities

When impacts from discharges and other compatibility problems cannot be reasonably mitigated or prevented to the level of a trivial impact (defined in Procedure D-1-3, "Land use Compatibility: Definitions") new development, whether it be a facility or a sensitive land use, shall not be permitted. More

details for specific facilities may be identified in other Ministry guidelines listed in Procedure D-1-2, "Land Use Compatibility: Specific Applications".

There may be situations and various means (see Procedure D-1-1, "Land Use Compatibility: Implementation", Section 7, "Methods") where development or redevelopment can be delayed or phased until such time that an 'adverse effect' would no longer exist (e.g. the facility ceases to operate or the problem is rectified by new technology).

City of Greater Sudbury Infrastructure Background Study

APPENDIX E.2

Guide Sensitivity Land Use

GUIDELINE D-2
(formerly 07-05)

Compatibility between Sewage Treatment and Sensitive Land Use

Legislative Authority:

Ontario Water Resources Act, Sections 10(1d) and 53
The Planning Act, S.O. 1995 c. 17(14) and 51(24)

Responsible Director:

Director, Environmental Planning & Analysis Branch

Last Revision Date:

August 1996

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4.0 COMMENTS ON SENSITIVE LAND USE APPLICATIONS

1.0 INTRODUCTION

The Ministry has identified its interest in recommending separation distances and other control measures for land use planning proposals in Guideline D-1 "Land Use Compatibility". This document, which is a specific application of the concepts contained in Guideline D-1, relates specifically to waste stabilization ponds and sewage treatment plants. For the purposes of this document, plants are categorized into three classes: those with a design capacity equal to or less than 500 cubic metres of sewage per day (m^3/d), those with a design capacity greater than 500 m^3/day but less than 25,000 m^3/day, and those with a capacity greater than 25,000 m^3/d.

The Guideline is not appropriate for dealing with the effects of major treatment plant upsets due to overloading or equipment breakdown.

2.0 APPLICATION

This Guideline applies to all applications for Certificate of Approval under the Ontario Water Resources Act RSO 1990, Section 53, and under the Environmental Protection Act, Section 9, for new and expanding municipal and private sewage treatment facilities.

Guideline D-2 also applies to the advice that the Ministry provides to the Ministry of Municipal Affairs & Housing (MMAH) and delegated approval authorities under the Planning Act. This relates to all development or redevelopment applications for residential or other sensitive land uses adjacent to sewage treatment facilities.

3.0 SEPARATION DISTANCES

3.1 Sensitive Land Uses

Where practical, sensitive land uses should not be placed adjacent to treatment facilities.

3.1.1 Measuring Separation Distance

Separation distances will be measured from the periphery of the noise/odour-producing source-structure, to the property/lot line of the sensitive land use.

Inquiries regarding the point(s) of reception for noise, or point(s) of impingement for odour, should be directed to MOEE Noise Assessment and MOEE Air Approvals respectively.

3.2 Acquisition of Buffer Areas

When new facilities (or enlargements to existing facilities) are proposed, an adequate buffer area should be acquired as part of the project.

Where acquisition of a buffer is not possible and further to item 3.3 below, future sensitive uses on adjacent lands should be discouraged through appropriate official plan and zoning constraints, or ownership by a responsible public authority.

3.3 Alternatives to Buffer Area Acquisition

In the case where an adequate buffer area has not been purchased, more effective noise and odour mitigation are necessary to provide an optimum level of protection between the sewage treatment facility(ies) and adjacent sensitive land uses.

Consideration should be given to silencing specific sources of noise, covering certain sections of the plant, and treating collected gases.

NOTE:
- Approval under the EPA Section 9 will be required for installation of noise mitigation measures.
- Sewage pumping stations may also be sources of odour and noise, thus requiring mitigation.

In some cases, a combination of distance, covering and treatment may be required.

3.4 Sewage Treatment Plants

3.4.1 Capacity Equal to or Less than 500 m^3/d

The recommended separation distance is 100 metres.

A separation distance of less than 100 metres may be permitted, however a qualified professional must produce a study showing the feasibility of the distance based on:

a) the application of noise reduction equipment to any potential noise source(s), and;
b) the degree and type of odour mitigation applied to the facility.
c) other contaminants of concern (i.e. aerosols) which may need to be addressed.

Preconsultation with the MOEE Regional Office is recommended under these circumstances.

In the course of reviewing a draft plan of subdivision, the Regional MOEE Director may request MOEE Approvals Branch to review any study which supports a separation distance of less than 100 metres. The proponent should be advised that any noise reduction measures will require approval under Section 9 of the EPA.

If the Regional Director feels a separation distance of less than 100 metres has been satisfactorily rationalized, approval for a proposed adjacent sensitive land use can be recommended.

[NOTE: The application for the Certificate of Approval under the OWRA or EPA for the sewage works shall include any mitigation measures which have been deemed necessary to coincide with the new separation distance.]

3.4.2 Capacity Greater than 500 m^3/d but Less than 25,000 m^3/d

The minimum separation distance shall be 100 metres. The recommended separation distance shall be 150 metres.

3.4.3 Capacity Greater than 25,000 m^3/d

These plants will be dealt with on an individual basis. A separation distance of greater than 150 metres may be required.

The determination of the required distance will depend on the type of noise sources (for example generators, blowers, etc...) and the type of noise / odour control measures being applied.

3.5 Waste Stabilization Ponds

Notwithstanding 3.4.1, 3.4.2, and 3.4.3, the recommended separation distance varies from 100 to 400 metres depending on the type of pond and characteristics of the waste.

4.0 COMMENTS ON SENSITIVE LAND USE APPLICATIONS

a) In commenting on sensitive land use applications, the Ministry will examine compliance with the guidelines described herein, as well as any noise and/or odour complaints attributed to the facility.[1]

b) Where a facility has been known to generate objectionable noise and/or odours, a larger separation distance and/or increased buffering may be required - at least until further

abatement work has remedied the problem.

Should either of the above conditions not be satisfied, the Ministry may advise against any proposal (i.e. new Official Plan, Official Plan Amendment, Draft Plan of Subdivision, etc) which would/could establish a sensitive use adjacent to a sewage treatment facility.

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[1] In cases where the level of odour nuisance is minimal, occurring sporadically and infrequently despite the application of all reasonable and practical on-site mitigation measures, the Ministry may request that the subdivision agreement for new developments require warnings in offers of purchase and sale for potentially affected building lots. Such warnings would advise prospective buyers of the presence of a sewage treatment plant in the area, and of the possible presence of related odours.

City of Greater Sudbury Infrastructure Background Study

APPENDIX F

DRAFT – GROWTH AND SETTLEMENT/DEVELOPMENT OPTIONS
Discussion Paper

CITY OF GREATER SUDBURY

DRAFT – GROWTH AND SETTLEMENT/DEVELOPMENT OPTIONS DISCUSSION PAPER

Introduction

The City of Greater Sudbury has a population of 155,225 persons living within a geographic area of approximately 3,627 square kilometers. Over this expanse of land there are twenty-two urban and non-urban of settlements, of which 15 are provided with piped water and sewer services.

Population in the communities that make up the City of Greater Sudbury reached a peak of approximately 170,000 persons in 1971. Since that time the population has gone through several cycles of decline and recovery but has shown a continued demand for new housing over the past thirty years. This demand is due to the reduction in average household sizes, both a national and local trend leading to more homes being required for the same population.

As part of the preparation of a new Official Plan it is important to understand the amount and nature of demand for land for urban uses that may be expected in the future. The current Official Plan designates areas of land for a variety of urban purposes, based upon assumptions made a number of years ago about anticipated growth rates. The Provincial Policy Statement provides that municipalities may plan to accommodate growth projected for a time horizon of up to 20 years. The analysis described in this paper determines if the existing urban boundaries are capable of accommodating the anticipated growth over that time frame. A separate analysis will determine if the existing urban boundary should be revised for other purposes, such as providing more suitable lands for employment purposes.

The growth and settlement analysis in this report examines population and household projections, and then determines the amount of urban residential land that the Official Plan designates to meet future demand.

In order to review the adequacy of existing infrastructure to accommodate development in the future and make the appropriate related planning decisions, assumptions must also be made about the range of development options for the distribution of future growth. As such, this document also provides the technical basis for assigning expected growth to specific geographical areas so that engineering and transportation modeling exercises can be undertaken.

Provincial Policy Statement

The Provincial Policy Statement outlines the following policies that the City must have regard for in determining the extent of urban development.

1.1 Developing Strong Communities

1.1.1 Subject to the provision of policy 1.1.2, cost-effective development patterns will be promoted. Accordingly:

a. Urban areas and rural settlement areas (cities, towns, villages and hamlets) will be the focus of growth;
b. Rural areas will generally be the focus of resource activity, resource-based recreational activity and other rural land uses;
c. Urban areas and rural settlement areas will be expanded only where existing designated areas in the municipality do not have sufficient land supply to accommodate the growth projected of the municipality. Land requirements will be determined in accordance with policy 1.1.2. The policies of Section 2: Resources, and Section 3: Public Health and Safety will be applied in the determination of the most appropriate direction for expansions. Expansions into prime agricultural areas are permitted only where:

1. There are no reasonable alternatives which avoid prime agricultural areas; and
2. There are no reasonable alternatives with lower priority agricultural lands in the prime agricultural area;

1.1.2 Land requirements and land use patterns will be based on:

a. the provision of sufficient land for industrial, commercial, residential, recreational, open space and institutional uses to promote employment opportunities, and for an appropriate range and mix of housing, to accommodate growth projected for a time horizon of up to 20 years. (However, where a longer time period has been established for specific areas of the Province as a result of a comprehensive provincial planning exercise, such as that coordinated by the Province in the Greater Toronto Area, that time frame may be used for upper and lower tier municipalities within the area);

This paper deals specifically with the technical analyses to address Section 1.1.2 a..

Demand – the population forecasts

In 2001 the population of the City of Greater Sudbury 2001 was 155,225, according to the Statistics Canada Census 2001 information. There were 63,020 households with an average household size of 2.46 persons.

The City has prepared three projections of population growth over the next twenty years based on varying scenarios of out-migration, natural increase and in-migration. An additional scenario considered by this analysis is based on a desire to achieve a population increase of 175,000 by 2014.

Each scenario was developed with an associated household projection based on current trends of decreasing average household size. The assumptions regarding decreasing household size varied slightly among the scenarios. The four scenarios assumed:

- out-migration exceeding natural increase and in-migration, resulting in a decline in population;
- out-migration and in-migration have no net effect, leaving natural increase to affect population levels;
- in-migration exceeding out-migration, resulting in a population increase; and,
- high in-migration exceeding out-migration, resulting in a population of 175,000.

The forecasts are detailed in Tables 1 and 2 in Appendix A of this report. The results are summarized below, showing the changes in population and the resulting demand for new housing units resulting from the formation of new households.

Summary of Population and Household Projection, Years 2006, 2011, 2021

Year 2006	Population	Households	Avg. Household Size
Out-migration	151,625	63,807	2.38
Natural Increase	154,983	64,993	2.38
In-migration	157,954	66,021	2.39
High in-migration	162,831	68,130	2.39

Year 2011	Population	Households	Avg. Household Size
Out-migration	147,103	64,128	2.29
Natural Increase	154,067	66,679	2.31
In-migration	162,307	69,662	2.33
High in-migration	170,437	73,149	2.33

Year 2021	Population	Households	Avg. Household Size
Out-migration	135,407	62,270	2.17
Natural Increase	150,012	67,857	2.21
In-migration	169,579	75,276	2.25
High in-migration (2014)	175,000	76,087	2.30

The out-migration scenario was based on the twenty-year historical trend for out-migration to outpace growth resulting from in-migration and natural increase of births exceeding deaths. Out-migration was averaged to be a net of 650 persons per year leaving the City. The twenty-year projection from this scenario is population at 135,407 and a demand for households 750 units lower than the current number of households in existence (built) in the City. The average household size is projected as 2.17 persons.

The natural increase scenario was projected with no migration effect and is based on the net of births and deaths. This scenario produces a twenty-year horizon population of 150,012, and an increase in number of households to 67,857, an increase of 4,837 households overall. Average household size was projected to be 2.21 persons.

The in-migration scenario assumes a return to the population peak of 1971 by 2021 with a population of 169,580. The number of households resulting from this population would be 75,276, an increase of 12,256 households overall, with an average household size of 2.25 persons.

The high in-migration scenario assumes in-migration will exceed out-migration from 2001 to 2021 and the City will grow to a population of 175,000 by 2014. The projection after 2014 was held constant so the same figures exist for 2021 to allow a comparison among the scenarios. The number of households needed for this population would be 76,087, an increase of 13,067 households from 2001. The average household size assumed at 2021 is 2.30 persons.

This data is summarized in the Table below.

Population and Net New Households, 2021

2021	Out-migration	Natural Increase	In-Migration	High In-Migration
Population	135,407	150,012	169,579	175,000
Net New Households	-750	4,837	12,256	13,067

Supply – vacant lot/designated land inventory

The current supply of land for future residential uses has been calculated. In this context the supply includes lots in draft-approved plans of subdivision, and land designated in the Official Plan for residential use. No survey of the potential for infilling or intensification was undertaken. Alternatively an assumption was made that 5% of the future demand will be met in this way.

In order to undertake this analysis the following assumptions have been made:

1. In the City the proportion of development outside of urban settlements has historically been 8% of the total. For the purposes of this analysis it has been assumed that the same percentage will continue.

2. It was assumed that land designated in the Official Plan, a combination of low and medium density, will build out at an average of 12 lots/units per hectare.

3. It was assumed that 5% of the future demand will be met by infill and intensification in existing urban areas, on vacant lots or redevelopment sites, or will fill those registered lots that have not yet been built.

A summary of supply of land for residential purposes is shown in the following Table. More detail is provided in Tables 3 and 4 in Appendix A of this report.

Capacity - 2003

	Potential Lots	Potential Units
Draft Approved Lot Supply	3584	4660
Designated Residential Land in Current OP (12 units/ha)	13,633	13,633
TOTAL	**17,217**	**18,293**

According to Active Subdivision Plans statistics from the City of Greater Sudbury the current draft-approved lot supply is 3,584, with an associated unit potential of 4,660. The lands designated for low and medium residential development in the existing Official Plan have the capacity to yield an additional 13,633 units for a combined total of 18,407 units.

Supply and demand

The result of the population and household projection (unit demand) was compared to the baseline designated land and potential units (unit supply). The results of the comparison are shown in Table 5 of the Appendix and summarized below.

Household Supply and Demand, 2021

Scenario	Pop. 2021	2021 Demand - Units	2001 No. of Units	Net Unit Demand	8% Outside Urban Areas	5% Infill	Capacity - Units	Net Requirement (excess)
Out-migration	135,407	62,270	63,020	-750	n/a	n/a	18,293	(19,043)
Nat. Increase	150,012	67,857	63,020	4837	387	242	18,293	(14,085)
In-migration	169,579	75,276	63,020	12,256	980	613	18,293	(7,630)
High In-migration	175,000	76,087	63,020	13,067	1,045	653	18,293	(6,924)

Note: There is an excess of supply over demand in all scenarios.

The out-migration scenario household demand is exceeded by the current supply of built units.

The natural increase scenario combined with the trend toward decreasing household size will create a demand for 4,837 more units than current supply. As there are 4,660 units currently in the draft-approved lot stage it can be assumed that the current lot inventory in the draft-approved stage plus infill will adequately meet this demand.

The in-migration scenario and the high in-migration scenario have the demand for new households (an addition of 12,256 and 13,067 units respectively). When all designated land is included in the potential supply and infill is accounted for, as seen in the above Table, the supply of land provides a potential for 18,293 new units, which is well above the demand. The potential supply exceeds the potential demand in all scenarios.

Development Options

(The following is provided for discussion purposes for the meeting of consultants and staff on January 22, 2004.)

In order to carry out a number of technical analyses, particularly the modeling of future transportation demand, it is necessary to prepare future 'development scenarios' which reflect alternative assumptions about the location and amount of development in the future.

Three alternative location or growth distribution assumptions have been prepared as described below:

1. Option One – development will occur in each settlement area in an amount proportionate to the current population distribution.

2. Option Two – development will occur in each settlement area proportionate to the distribution of growth from 1978 to 2002 inclusive.

3. Option Three – development will occur in each settlement area proportionate to the distribution of growth over the past decade.

4. Option Four – a fourth option based on the most efficient use of existing piped water and sewer service capacity should be prepared by the Consultant dealing with water and sewer infrastructure.

In addition to the alternative assumptions regarding location, four different growth assumptions are being considered. One of these involves decline and, as such, no technical analysis is needed. The remaining three growth scenarios pose twenty-year populations of 150,000, 169,000 and 175,000. The first scenario of 150,000 is an absolute decline of 5,000 but due to reduced household size, would generate a demand for 4,837 new housing units, thus changing the distribution of housing and travel patterns. These growth assumptions are shown in Tables 6-8 in Appendix A of this report and summarized in the Development Options Table.

The Table below demonstrates the range of location and growth options.

Development Options

	Natural Increase Scenario			In-Migration Scenario			175,000 Scenario		
	Option 1	Option 2	Option 3	Option 1	Option 2	Option 3	Option 1	Option 2	Option 3
Capreol	107	61	27	271	154	69	289	165	74
Nickel Centre	357	350	629	905	886	1593	964	944	1698
Onaping Falls	144	97	213	365	246	539	389	262	575
Rayside-Balfour	437	432	385	1107	1,095	974	1181	1168	1039
Sudbury	2870	2,810	2024	7272	7,119	5128	7753	7590	5467
Valley East	591	775	972	1497	1,963	2464	1597	2093	2627
Walden	293	310	571	742	786	1448	792	838	1544
New Townships	38	n/a	16	96	n/a	41	103	n/a	44
TOTAL	4837	4835	4837	12255	12249	12256	13068	13,060	13,068

Note: Where n/a is the data result there was no historic data available.

Based on the information in the foregoing analysis, phasing for intermediate years in any modeling can assume that the 'draft-approved' lots will be the first supply option to accommodate demand. These lots will be registered and built as demand dictates as they are further along in the development process.

APPENDIX A

TABLE 1: POPULATION PROJECTION, 2001 – 2021

(Source: Community & Strategic Planning Section, City of Greater Sudbury, 01-Mar-03)

Year	Out-Migration	Natural Increase	In-Migration	High In-Migration
2001	155,225	155,225	155,225	155,225
2002	154,602	155,251	155,251	156,746
2003	153,922	155,232	155,232	158,267
2004	153,193	155,175	156,149	159,788
2005	152,426	155,091	157,055	161,310
2006	**151,625**	**154,983**	**157,954**	**162,831**
2007	150,782	154,843	158,838	164,352
2008	149,905	154,679	159,713	165,873
2009	148,997	154,493	160,582	167,394
2010	148,063	154,289	161,447	168,915
2011	**147,103**	**154,067**	**162,307**	**170,437**
2012	146,106	153,814	163,149	171,958
2013	145,075	153,533	163,974	173,479
2014	144,008	153,222	164,778	175,000
2015	142,911	152,885	165,567	-
2016	141,778	152,516	166,331	-
2017	140,594	152,100	167,054	-
2018	139,367	151,645	167,745	-
2019	138,095	151,146	168,397	-
2020	136,778	150,605	169,012	-
2021	**135,407**	**150,012**	**169,579**	**175,000**

TABLE 2: HOUSEHOLD PROJECTION, 2001 –2021

(Source: Community & Strategic Planning Section, City of Greater Sudbury, 01-Mar-03)

	Out Migration		Natural Increase		In Migration		High In Migration	
Year	HHLDS	Ave. HHLD Size	HHLDS	Ave. HHLD Size	HHLDS	Ave. HHLD Size	HHLDS	Ave. HHLD Size
2001	63,020	2.46	63,020	2.46	63,020	2.46	63,020	2.46
2002	63,155	2.45	63,374	2.45	63,374	2.45	63,978	2.45
2003	63,288	2.43	63,735	2.44	63,735	2.44	64,864	2.44
2004	63,442	2.41	64,128	2.42	64,456	2.42	66,028	2.42
2005	63,604	2.40	64,537	2.40	65,208	2.41	66,934	2.41
2006	**63,807**	**2.38**	**64,993**	**2.38**	**66,021**	**2.39**	**68,130**	**2.39**
2007	63,936	2.36	65,384	2.37	66,782	2.38	69,055	2.38
2008	64,043	2.34	65,760	2.35	67,539	2.36	70,285	2.36
2009	64,095	2.32	66,085	2.34	68,257	2.35	71,231	2.35
2010	64,123	2.31	66,391	2.32	68,965	2.34	72,186	2.34
2011	**64,128**	**2.29**	**66,679**	**2.31**	**69,662**	**2.33**	**73,149**	**2.33**
2012	64,056	2.28	66,894	2.30	70,294	2.32	74,120	2.32
2013	63,961	2.27	67,090	2.29	70,915	2.31	75,099	2.31
2014	63,849	2.26	67,272	2.28	71,528	2.30	76,087	2.3
2015	63,738	2.24	67,460	2.27	72,152	2.29	-	-
2016	63,581	2.23	67,604	2.26	72,738	2.29	-	-
2017	63,398	2.22	67,726	2.25	73,306	2.28	-	-
2018	63,171	2.21	67,806	2.24	73,839	2.27	-	-
2019	62,914	2.19	67,863	2.23	74,351	2.26	-	-
2020	62,602	2.18	67,867	2.22	74,818	2.26	-	-
2021	**62,270**	**2.17**	**67,857**	**2.21**	**75,276**	**2.25**	**76,087**	**2.3**

Base year for population projections: 2001 Census population by single age for Greater Sudbury CSD (City of Greater Sudbury).

Notes:

Natural Increase Scenario: This is a basic projection to demonstrate natural population growth based on births and deaths alone. In this scenario, net migration is assumed to be zero for each year of the projection period from 2002 onwards. Area-specific birth and death rates are utilized (Sudbury RM census division).

Out-Migration Scenario: This scenario assumes that the out-migration trend between 1981 - 2001 will continue. An annual average net migration of -650 is calculated based on 1981-2001 net migration data for Sudbury RM census division and is assumed to be constant over the 20-year projection period.

In-Migration Scenario: This scenario is used as the upper end of population growth in order to assess the adequacy of infrastructure for planning purposes at a return to historic population peak.

High In-Migration Scenario: Scenario responds to stated desire to achieve 175,000 population in 2014. Declining average household size stabilizes at 2.3.

TABLE 3: ACTIVE PLANS OF SUBDIVISION: REMAINING DRAFT APPROVED LOTS AND POTENTIAL UNITS BY AREA, 16-JUL-03

(Source: Community & Strategic Planning Section, City of Greater Sudbury)

Area	R1 Lots/Units	R2 Lots/Units	R3-R4-R5 Lots/Units	Total Lots/Units
Nickel Centre	220/220	47/94	0/0	267/314
Rayside-Balfour	444/444	21/42	3/120	468/606
Sudbury-Minnow Lake	110/110	131/262	1/176	242/548
Sudbury – New Sudbury	180/180	237/474	5/51	422/705
Sudbury – Old City	0/0	0/0	26/220	26/220
Sudbury – South End	1256/1256	46/92	0/0	1302/1348
Valley East	467/467	37/74	4/19	508/560
Walden	339/339	10/20	0/0	349/359
TOTAL	**3016/3016**	**529/1058**	**39/586**	**3584/4660**

Notes: Potential residential units based on the number of remaining lots and zoning in place for active plans of subdivision. There are no active plans of subdivision in Capreol, Onaping Falls and the New Townships.

TABLE 4: CAPACITY BY OFFICIAL PLAN DESIGNATION IN EXISTING OP, 2003

(Source: City of Greater Sudbury Official Plan)

Area	Potential Lots (12 units/ha)
Capreol	210
Nickel Centre (Coniston, Garson, Falconbridge, Wahnapitae)	1422
Onaping Falls (Dowling, Levack, Onaping)	1182
Rayside-Balfour (Azilda/Chelmsford)	3300
Sudbury (Sudbury, Copper Cliff)	4033
Valley East	1944
Walden (Lively, Mikkola/Naughton)	1542
TOTAL	**13,633**

TABLE 5: PROJECTED DWELLING UNIT DEMAND AND SUPPLY, DRAFT APPROVED LOTS AND DESIGNATED LANDS, 2021

(Source: Community and Strategic Planning Data, City of Greater Sudbury Official Plan, City of Greater Sudbury)

Scenario	Pop. 2021	2021 Demand - Units	2001 No. of Units	Net Unit Demand	8% Outside Urban Areas	5% Infill	Capacity - Units	Net Requirement (excess)
Out-migration	135,407	62,270	63,020	-750	n/a	n/a	18,293	(19,043)
Nat. Increase	150,012	67,857	63,020	4837	387	242	18,293	(14,085)
In-migration	169,579	75,276	63,020	12,256	980	613	18,293	(7,630)
High In-migration	175,000	76,087	63,020	13,067	1,045	653	18,293	(6,924)

Note: Servicing capacity for growth has been assumed not be a constraint with the growth scenarios as they are projected to meet the demand of all lands designated residential in the Official Plan.

TABLE 6: DEVELOPMENT OPTION 1 – PERCENTAGE OF 2001 POPULATION

	% Of 2001 Population	Natural Increase	In- Migration	175,000
		Option 1	Option 1	Option 1
Capreol	2.21	107	271	289
Nickel Centre	7.38	357	905	964
Onaping Falls	2.97	144	365	389
Rayside-Balfour	9.03	437	1,107	1,181
Sudbury	59.33	2870	7,272	7,753
Valley East	12.21	591	1,497	1,597
Walden	6.05	293	742	792
New Townships	.78	38	96	103
TOTAL	100%*	4,837	12,255	13,068

(Source: Community and Strategic Planning Data, City of Greater Sudbury, 2003)

*Note: May not equal 100% due to rounding.

TABLE 7: DEVELOPMENT OPTION 2 – PERCENTAGE OF TOTAL GROWTH 1978-2002

	Total Growth 1978-2002 New Units	1978-2002 % of Total Growth	Natural Increase Option 2	In- Migration Option 2	175,000 Option 2
Capreol	252	1.3%	61	154	165
Nickel Centre	1446	7.2%	350	886	944
Onaping Falls	401	2.0%	97	246	262
Rayside-Balfour	1788	8.9%	432	1,095	1,168
Sudbury	11621	58.1%	2,810	7,119	7,590
Valley East	3204	16.0%	775	1,963	2,093
Walden	1283	6.4%	310	786	838
New Townships	*no*	*data*	*available*		
TOTAL	20,007	100.0%	4,835	12,249	13,060

(Source: Community and Strategic Planning Data, City of Greater Sudbury, 2003)

TABLE 8: DEVELOPMENT OPTION 3 – PERCENTAGE OF TOTAL GROWTH 1993-2002

	Total Growth 1993-2002 New Units	1993-2002 % of Total Growth	Natural Increase Option 3	In- Migration Option 3	175,000 Option 3
Capreol	20	0.6%	27	69	74
Nickel Centre	461	13.0%	629	1,593	1,698
Onaping Falls	156	4.4%	213	539	575
Rayside-Balfour	282	8.0%	385	974	1,039
Sudbury	1484	41.8%	2,024	5,128	5,467
Valley East	713	20.1%	972	2,464	2,627
Walden	419	11.8%	571	1,448	1,544
New Townships	12	0.3%	16	41	44
TOTAL	3,547	100.0%	4,837	12,256	13,068

(Source: Community and Strategic Planning Data, City of Greater Sudbury, 2003)

TABLE 9: POPULATION AND HOUSEHOLD PROJECTIONS BY AREA, CITY OF GREATER SUDBURY, 2003

Former Town of Capreol
Population and Household Projections 2001 - 2021

	Population			Households					
Year	Out-Migration Scenario	Natural Increase Scenario	In-Migration Scenario	Out-Migration Scenario		Natural Increase Scenario		In-Migration Scenario	
				Households	Avg Hhld Size	Households	Avg Hhld Size	Households	Avg Hhld Size
2001	3,486	3,486	3,486	1,390	2.51	1,390	2.51	1,390	2.51
2002	3,472	3,487	3,487	1,393	2.49	1,398	2.49	1,398	2.49
2003	3,457	3,486	3,486	1,396	2.48	1,406	2.48	1,406	2.48
2004	3,441	3,485	3,507	1,399	2.46	1,414	2.46	1,422	2.47
2005	3,423	3,483	3,527	1,403	2.44	1,423	2.45	1,438	2.45
2006	3,405	3,481	3,547	1,407	2.42	1,434	2.43	1,456	2.44
2007	3,386	3,478	3,567	1,410	2.40	1,442	2.41	1,473	2.42
2008	3,367	3,474	3,587	1,413	2.38	1,450	2.40	1,490	2.41
2009	3,346	3,470	3,606	1,414	2.37	1,458	2.38	1,506	2.40
2010	3,325	3,465	3,626	1,414	2.35	1,464	2.37	1,521	2.38
2011	3,304	3,460	3,645	1,414	2.34	1,471	2.35	1,537	2.37
2012	3,281	3,454	3,664	1,413	2.32	1,475	2.34	1,550	2.36
2013	3,258	3,448	3,683	1,411	2.31	1,480	2.33	1,564	2.35
2014	3,234	3,441	3,701	1,408	2.30	1,484	2.32	1,578	2.35
2015	3,210	3,434	3,718	1,406	2.28	1,488	2.31	1,591	2.34
2016	3,184	3,425	3,736	1,402	2.27	1,491	2.30	1,604	2.33
2017	3,158	3,416	3,752	1,398	2.26	1,494	2.29	1,617	2.32
2018	3,130	3,406	3,767	1,393	2.25	1,496	2.28	1,629	2.31
2019	3,101	3,395	3,782	1,388	2.23	1,497	2.27	1,640	2.31
2020	3,072	3,382	3,796	1,381	2.22	1,497	2.26	1,650	2.30
2021	3,041	3,369	3,808	1,373	2.21	1,497	2.25	1,660	2.29
			Net New Households	-17		107		270	

Source: Community & Strategic Planning Section, City of Greater Sudbury.

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TABLE 10: POPULATION AND HOUSEHOLD PROJECTIONS BY AREA, CITY OF GREATER SUDBURY, 2003

Former Town of Nickel Centre Population and Household Projections 2001 - 2021									
	Population			Households					
Year	Out-Migration Scenario	Natural Increase Scenario	In-Migration Scenario	Out-Migration Scenario		Natural Increase Scenario		In-Migration Scenario	
				Households	Avg Hhld Size	Households	Avg Hhld Size	Households	Avg Hhld Size
2001	12,672	12,672	12,672	4,650	2.73	4,650	2.73	4,650	2.73
2002	12,622	12,675	12,675	4,660	2.71	4,676	2.71	4,676	2.71
2003	12,566	12,673	12,673	4,670	2.69	4,703	2.69	4,703	2.69
2004	12,507	12,668	12,748	4,681	2.67	4,732	2.68	4,756	2.68
2005	12,444	12,662	12,822	4,693	2.65	4,762	2.66	4,811	2.66
2006	12,379	12,653	12,895	4,708	2.63	4,796	2.64	4,871	2.65
2007	12,310	12,641	12,967	4,718	2.61	4,824	2.62	4,928	2.63
2008	12,238	12,628	13,039	4,725	2.59	4,852	2.60	4,983	2.62
2009	12,164	12,613	13,110	4,729	2.57	4,876	2.59	5,036	2.60
2010	12,088	12,596	13,180	4,731	2.55	4,899	2.57	5,089	2.59
2011	12,009	12,578	13,251	4,732	2.54	4,920	2.56	5,140	2.58
2012	11,928	12,557	13,319	4,726	2.52	4,936	2.54	5,187	2.57
2013	11,844	12,534	13,387	4,719	2.51	4,950	2.53	5,233	2.56
2014	11,757	12,509	13,452	4,711	2.50	4,964	2.52	5,278	2.55
2015	11,667	12,481	13,517	4,703	2.48	4,978	2.51	5,324	2.54
2016	11,575	12,451	13,579	4,691	2.47	4,988	2.50	5,367	2.53
2017	11,478	12,417	13,638	4,678	2.45	4,997	2.48	5,409	2.52
2018	11,378	12,380	13,695	4,661	2.44	5,003	2.47	5,448	2.51
2019	11,274	12,339	13,748	4,642	2.43	5,007	2.46	5,486	2.51
2020	11,167	12,295	13,798	4,619	2.42	5,008	2.46	5,521	2.50
2021	11,055	12,247	13,844	4,595	2.41	5,007	2.45	5,554	2.49
			Net New Households	-55		357		904	
Source: Community & Strategic Planning Section, City of Greater Sudbury.									
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TABLE 11: POPULATION AND HOUSEHOLD PROJECTIONS BY AREA, CITY OF GREATER SUDBURY, 2003

Former Town of Onaping Falls
Population and Household Projections 2001 - 2021

	Population			Households					
Year	Out-Migration Scenario	Natural Increase Scenario	In-Migration Scenario	Out-Migration Scenario		Natural Increase Scenario		In-Migration Scenario	
				Households	Avg Hhld Size	Households	Avg Hhld Size	Households	Avg Hhld Size
2001	4,887	4,887	4,887	1,880	2.60	1,880	2.60	1,880	2.60
2002	4,868	4,888	4,888	1,884	2.58	1,891	2.59	1,891	2.59
2003	4,846	4,887	4,887	1,888	2.57	1,901	2.57	1,901	2.57
2004	4,823	4,886	4,916	1,893	2.55	1,913	2.55	1,923	2.56
2005	4,799	4,883	4,945	1,897	2.53	1,925	2.54	1,945	2.54
2006	4,774	4,880	4,973	1,903	2.51	1,939	2.52	1,970	2.53
2007	4,747	4,875	5,001	1,907	2.49	1,951	2.50	1,992	2.51
2008	4,720	4,870	5,028	1,911	2.47	1,962	2.48	2,015	2.50
2009	4,691	4,864	5,056	1,912	2.45	1,971	2.47	2,036	2.48
2010	4,662	4,858	5,083	1,913	2.44	1,981	2.45	2,057	2.47
2011	4,631	4,851	5,110	1,913	2.42	1,989	2.44	2,078	2.46
2012	4,600	4,843	5,137	1,911	2.41	1,996	2.43	2,097	2.45
2013	4,568	4,834	5,163	1,908	2.39	2,001	2.42	2,116	2.44
2014	4,534	4,824	5,188	1,905	2.38	2,007	2.40	2,134	2.43
2015	4,499	4,814	5,213	1,901	2.37	2,012	2.39	2,152	2.42
2016	4,464	4,802	5,237	1,897	2.35	2,017	2.38	2,170	2.41
2017	4,427	4,789	5,260	1,891	2.34	2,020	2.37	2,187	2.41
2018	4,388	4,774	5,281	1,884	2.33	2,023	2.36	2,203	2.40
2019	4,348	4,759	5,302	1,877	2.32	2,024	2.35	2,218	2.39
2020	4,306	4,742	5,321	1,868	2.31	2,025	2.34	2,232	2.38
2021	4,263	4,723	5,339	1,858	2.29	2,024	2.33	2,246	2.38
			Net New Households	-22		144		366	

Source: Community & Strategic Planning Section, City of Greater Sudbury.

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TABLE 12: POPULATION AND HOUSEHOLD PROJECTIONS BY AREA, CITY OF GREATER SUDBURY, 2003

Former Town of Rayside-Balfour
Population and Household Projections 2001 - 2021

	Population			Households					
Year	Out-Migration Scenario	Natural Increase Scenario	In-Migration Scenario	Out-Migration Scenario		Natural Increase Scenario		In-Migration Scenario	
				Households	Avg Hhld Size	Households	Avg Hhld Size	Households	Avg Hhld Size
2001	15,047	15,047	15,047	5,695	2.64	5,695	2.64	5,695	2.64
2002	14,986	15,049	15,049	5,707	2.63	5,727	2.63	5,727	2.63
2003	14,920	15,047	15,047	5,719	2.61	5,760	2.61	5,760	2.61
2004	14,850	15,042	15,136	5,733	2.59	5,795	2.60	5,825	2.60
2005	14,775	15,034	15,224	5,748	2.57	5,832	2.58	5,893	2.58
2006	14,698	15,023	15,311	5,766	2.55	5,873	2.56	5,966	2.57
2007	14,616	15,010	15,397	5,778	2.53	5,909	2.54	6,035	2.55
2008	14,531	14,994	15,482	5,787	2.51	5,943	2.52	6,103	2.54
2009	14,443	14,976	15,566	5,792	2.49	5,972	2.51	6,168	2.52
2010	14,352	14,956	15,650	5,795	2.48	6,000	2.49	6,232	2.51
2011	14,259	14,934	15,733	5,795	2.46	6,026	2.48	6,295	2.50
2012	14,163	14,910	15,815	5,789	2.45	6,045	2.47	6,352	2.49
2013	14,063	14,883	15,895	5,780	2.43	6,063	2.45	6,408	2.48
2014	13,959	14,852	15,973	5,770	2.42	6,079	2.44	6,464	2.47
2015	13,853	14,820	16,049	5,760	2.41	6,096	2.43	6,520	2.46
2016	13,743	14,784	16,123	5,746	2.39	6,109	2.42	6,573	2.45
2017	13,628	14,744	16,193	5,729	2.38	6,120	2.41	6,625	2.44
2018	13,509	14,700	16,260	5,709	2.37	6,128	2.40	6,673	2.44
2019	13,386	14,651	16,323	5,685	2.35	6,133	2.39	6,719	2.43
2020	13,258	14,599	16,383	5,657	2.34	6,133	2.38	6,761	2.42
2021	13,126	14,541	16,438	5,627	2.33	6,132	2.37	6,803	2.42
			Net New Households	-68		437		1,108	

Source: Community & Strategic Planning Section, City of Greater Sudbury.

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TABLE 13: POPULATION AND HOUSEHOLD PROJECTIONS BY AREA, CITY OF GREATER SUDBURY, 2003

Former City of Sudbury
Population and Household Projections 2001 - 2021

	Population			Households					
Year	Out-Migration Scenario	Natural Increase Scenario	In-Migration Scenario	Out-Migration Scenario		Natural Increase Scenario		In-Migration Scenario	
				Households	Avg Hhld Size	Households	Avg Hhld Size	Households	Avg Hhld Size
2001	85,357	85,357	85,357	37,395	2.28	37,395	2.28	37,395	2.28
2002	85,014	85,372	85,372	37,475	2.27	37,605	2.27	37,605	2.27
2003	84,641	85,361	85,361	37,554	2.25	37,819	2.26	37,819	2.26
2004	84,240	85,330	85,865	37,646	2.24	38,052	2.24	38,247	2.25
2005	83,818	85,283	86,364	37,742	2.22	38,295	2.23	38,693	2.23
2006	83,378	85,224	86,858	37,862	2.20	38,566	2.21	39,176	2.22
2007	82,914	85,147	87,344	37,938	2.19	38,798	2.19	39,627	2.20
2008	82,432	85,057	87,825	38,002	2.17	39,021	2.18	40,077	2.19
2009	81,932	84,955	88,303	38,033	2.15	39,214	2.17	40,503	2.18
2010	81,419	84,843	88,779	38,049	2.14	39,395	2.15	40,922	2.17
2011	80,891	84,720	89,252	38,052	2.13	39,566	2.14	41,336	2.16
2012	80,343	84,582	89,715	38,010	2.11	39,694	2.13	41,711	2.15
2013	79,776	84,427	90,168	37,953	2.10	39,810	2.12	42,080	2.14
2014	79,189	84,256	90,611	37,887	2.09	39,918	2.11	42,443	2.13
2015	78,586	84,071	91,044	37,821	2.08	40,030	2.10	42,814	2.13
2016	77,963	83,868	91,464	37,728	2.07	40,115	2.09	43,161	2.12
2017	77,312	83,639	91,862	37,620	2.06	40,187	2.08	43,499	2.11
2018	76,637	83,388	92,242	37,484	2.04	40,235	2.07	43,815	2.11
2019	75,938	83,114	92,601	37,332	2.03	40,269	2.06	44,119	2.10
2020	75,214	82,817	92,939	37,147	2.02	40,271	2.06	44,396	2.09
2021	74,460	82,491	93,250	36,950	2.02	40,265	2.05	44,667	2.09
			Net New Households	-445		2,870		7,272	

Source: Community & Strategic Planning Section, City of Greater Sudbury.

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TABLE 14: POPULATION AND HOUSEHOLD PROJECTIONS BY AREA, CITY OF GREATER SUDBURY, 2003

Former City of Valley East
Population and Household Projections 2001 - 2021

	Population			Households					
Year	Out-Migration Scenario	Natural Increase Scenario	In-Migration Scenario	Out-Migration Scenario		Natural Increase Scenario		In-Migration Scenario	
				Households	Avg Hhld Size	Households	Avg Hhld Size	Households	Avg Hhld Size
2001	22,375	22,375	22,375	7,695	2.91	7,695	2.91	7,695	2.91
2002	22,285	22,379	22,379	7,712	2.89	7,738	2.89	7,738	2.89
2003	22,187	22,376	22,376	7,728	2.87	7,782	2.88	7,782	2.88
2004	22,082	22,368	22,508	7,747	2.85	7,830	2.86	7,870	2.86
2005	21,971	22,356	22,639	7,766	2.83	7,880	2.84	7,962	2.84
2006	21,856	22,340	22,768	7,791	2.81	7,936	2.82	8,061	2.82
2007	21,734	22,320	22,896	7,807	2.78	7,984	2.80	8,154	2.81
2008	21,608	22,296	23,022	7,820	2.76	8,030	2.78	8,247	2.79
2009	21,477	22,269	23,147	7,826	2.74	8,069	2.76	8,334	2.78
2010	21,343	22,240	23,272	7,830	2.73	8,107	2.74	8,421	2.76
2011	21,204	22,208	23,396	7,830	2.71	8,142	2.73	8,506	2.75
2012	21,060	22,172	23,517	7,821	2.69	8,168	2.71	8,583	2.74
2013	20,912	22,131	23,636	7,810	2.68	8,192	2.70	8,659	2.73
2014	20,758	22,086	23,752	7,796	2.66	8,214	2.69	8,734	2.72
2015	20,600	22,038	23,866	7,783	2.65	8,237	2.68	8,810	2.71
2016	20,437	21,984	23,976	7,763	2.63	8,255	2.66	8,882	2.70
2017	20,266	21,924	24,080	7,741	2.62	8,270	2.65	8,951	2.69
2018	20,089	21,859	24,180	7,713	2.60	8,279	2.64	9,016	2.68
2019	19,906	21,787	24,274	7,682	2.59	8,286	2.63	9,079	2.67
2020	19,716	21,709	24,362	7,644	2.58	8,287	2.62	9,136	2.67
2021	19,518	21,623	24,444	7,603	2.57	8,286	2.61	9,192	2.66
			Net New Households	-92		591		1,497	

Source: Community & Strategic Planning Section, City of Greater Sudbury.

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TABLE 15: POPULATION AND HOUSEHOLD PROJECTIONS BY AREA, CITY OF GREATER SUDBURY, 2003

Former Town of Walden Population and Household Projections 2001 - 2021									
	Population			Households					
Year	Out-Migration Scenario	Natural Increase Scenario	In-Migration Scenario	Out-Migration Scenario		Natural Increase Scenario		In-Migration Scenario	
				Households	Avg Hhld Size	Households	Avg Hhld Size	Households	Avg Hhld Size
2001	10,101	10,101	10,101	3,815	2.65	3,815	2.65	3,815	2.65
2002	10,061	10,103	10,103	3,823	2.63	3,836	2.63	3,836	2.63
2003	10,017	10,102	10,102	3,831	2.61	3,858	2.62	3,858	2.62
2004	9,969	10,098	10,162	3,841	2.60	3,882	2.60	3,902	2.60
2005	9,919	10,093	10,220	3,850	2.58	3,907	2.58	3,947	2.59
2006	9,867	10,086	10,279	3,863	2.55	3,934	2.56	3,997	2.57
2007	9,812	10,077	10,337	3,870	2.54	3,958	2.55	4,043	2.56
2008	9,755	10,066	10,393	3,877	2.52	3,981	2.53	4,089	2.54
2009	9,696	10,054	10,450	3,880	2.50	4,001	2.51	4,132	2.53
2010	9,635	10,040	10,506	3,882	2.48	4,019	2.50	4,175	2.52
2011	9,573	10,026	10,562	3,882	2.47	4,036	2.48	4,217	2.50
2012	9,508	10,010	10,617	3,878	2.45	4,050	2.47	4,255	2.49
2013	9,441	9,991	10,671	3,872	2.44	4,061	2.46	4,293	2.49
2014	9,371	9,971	10,723	3,865	2.42	4,072	2.45	4,330	2.48
2015	9,300	9,949	10,774	3,858	2.41	4,084	2.44	4,368	2.47
2016	9,226	9,925	10,824	3,849	2.40	4,093	2.43	4,403	2.46
2017	9,149	9,898	10,871	3,838	2.38	4,100	2.41	4,438	2.45
2018	9,069	9,868	10,916	3,824	2.37	4,105	2.40	4,470	2.44
2019	8,987	9,836	10,959	3,809	2.36	4,108	2.39	4,501	2.43
2020	8,901	9,801	10,999	3,790	2.35	4,108	2.39	4,529	2.43
2021	8,812	9,762	11,035	3,770	2.34	4,108	2.38	4,557	2.42
			Net New Households	-45		293		742	
Source: Community & Strategic Planning Section, City of Greater Sudbury.									
31-Mar-03									

TABLE 16: POPULATION AND HOUSEHOLD PROJECTIONS BY AREA, CITY OF GREATER SUDBURY, 2003

Former Unorganized Townships
Population and Household Projections 2001 - 2021

	Population			Households					
Year	Out-Migration Scenario	Natural Increase Scenario	In-Migration Scenario	Out-Migration Scenario		Natural Increase Scenario		In-Migration Scenario	
				Households	Avg Hhld Size	Households	Avg Hhld Size	Households	Avg Hhld Size
2001	1,299	1,299	1,299	500	2.60	500	2.60	500	2.60
2002	1,294	1,299	1,299	501	2.58	503	2.58	503	2.58
2003	1,288	1,299	1,299	502	2.57	506	2.57	506	2.57
2004	1,282	1,299	1,307	503	2.55	509	2.55	511	2.56
2005	1,276	1,298	1,314	505	2.53	512	2.53	517	2.54
2006	1,269	1,297	1,322	506	2.51	516	2.52	524	2.52
2007	1,262	1,296	1,329	507	2.49	519	2.50	530	2.51
2008	1,255	1,294	1,337	508	2.47	522	2.48	536	2.49
2009	1,247	1,293	1,344	509	2.45	524	2.47	542	2.48
2010	1,239	1,291	1,351	509	2.44	527	2.45	547	2.47
2011	1,231	1,289	1,358	509	2.42	529	2.44	553	2.46
2012	1,223	1,287	1,365	508	2.41	531	2.43	558	2.45
2013	1,214	1,285	1,372	507	2.39	532	2.41	563	2.44
2014	1,205	1,282	1,379	507	2.38	534	2.40	567	2.43
2015	1,196	1,279	1,386	506	2.37	535	2.39	572	2.42
2016	1,187	1,276	1,392	504	2.35	536	2.38	577	2.41
2017	1,177	1,273	1,398	503	2.34	537	2.37	582	2.40
2018	1,166	1,269	1,404	501	2.33	538	2.36	586	2.40
2019	1,156	1,265	1,409	499	2.32	538	2.35	590	2.39
2020	1,145	1,260	1,414	497	2.30	538	2.34	594	2.38
2021	1,133	1,255	1,419	494	2.29	538	2.33	597	2.38
			Net New Households	-6		38		97	

Source: Community & Strategic Planning Section, City of Greater Sudbury.

31-Mar-03

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.1

Unreserved Capacity - Water

WATER - UNCOMMITTED RESERVE CAPACITY

Natural Increase Scenario

Assumed -3.358% Popoulation Growth

Municipal Water Supplies

Treatment Facility		Rated Hyd.Cap.	Firm Cap.	Average Daily Flows (m³/day)				Avg. Day Flow	Recorded 2001 Max Day	Max Day Factor	Calculated Max Day	Max.Day Flow / Cap	2001 Population Current	Households Current	Density Current	Uncommitted Reserve Cap.	Lots Availabl	20 Year Growth Projection: Calculated max Day	Max.Day Flow / Cap	Population Projected	Households Projected	Density Projected	Uncommitted Reserve Cap.	Lots Available
Plant Name	**Type**	**m³/day**	**m³/day**	**1999**	**2000**	**2001**	**3 yr avg**	**m³/cap./day**	**m³/day**		**m³/day**	**m³/cap./day**				**m³/day**		**m³/cap**	**m³/cap./day**				**m³/day**	
Sudbury																								
	David St. PS	40000	40,000	23,730	23,026	25,843	24,200		42229															
	Wanapitei WTP	54000	44,000	30,421	30,708	34,781	31,970		40360															
	Coniston												2,129	840						2,058	895			
	Garson												1,869	738						1,806	785			
	Wahnapitae												1,215	479						1,174	511			
	Sudbury												85,041	40,421						82,185	35,733			
	Total	94000	84,000	54,151	53,734	60,624	56,169	0.622	82,589			0.92	90,254	42,478	2.12	1,411	726	79816	0.92	87,223	37,923	2.30	4,184	1,988
Dowling	Lionel	3637	3,637																					
	Riverside	3637	-																					
	Well Field	7274	3637	687	598	508	598	0.322		2.500	1494	0.80	1,857	786	2.36	2,143	1,127	1444	0.80	1,795	780	2.30	2,193	1,185
Garson	Orell 1	1572	1572																					
	Orell 3	3275	-																					
	INCO 1	2981	2981																					
	Well Field	7828	4553	2,246	1,356	1,356	1,653	0.337		2.000	3306	0.67	4,898	1,933	2.53	1,248	730	3195	0.67	4,734	2,058	2.30	1,359	875
Capreol	Well M	2946	2,946																					
	Well J	3927	-																					
	Well 6 (to be abandoned)	3273	-																					
	Well Field	10146	2,946	3,712	4,072	3,603	3,796																	
Valley East	Kenneth	2288	2288																					
	Phillipe	2288	2288																					
	Deschene	1797	1795																					
	Frost	2288	2290																					
	Michelle	2289	2290																					
	Notre Dame	3105	3106																					
	Linden	3268	3268																					
	Pharand	2289	2290																					
	Well I	1973	1973																					
*	Proposed New Well	3100	3100																					
	Well Field	24685	24,688	9,093	8,423	8,545	8,687																	
	Capreol												3,395	1,511						3,281	1,427			
	Azilda												4,986	1,983						4,819	2,095			
	Chelmsford Lagoon												0	0						0	0			
	Chelmsford STP												7,683	3,055						7,425	3,228			
	Valley East												19,145	6,956						18,502	8,044			
Total System	Both Well Fields	34831	27634	12805	12495	12148	12483	0.355		1.800	22469	0.64	35,209	11,994	2.94	5,165	2,757	21715	0.64	34,027	14,794	2.30	5,919	4,033

Purchased Water Supplies

Treatment Facility		Rated Hyd.Cap.	Firm Cap.	Average Daily Flows (m³/day)				Avg. Day Flow	Recorded Max Day	Max Day Factor	Calculated max Day	Max.Day Flow / Cap	Population Current	Households Current	Density Current	Uncommitted	Lots Available	20 Year Growth Projection: Calculated max Day	Max.Day Flow / Cap	Population Projected	Households Projected	Density Projected	Uncommitted Reserve Cap.	Lots Available
Plant Name	**Type**	**m³/day**	**m³/day**	**1999**	**2000**	**2001**	**3 yr avg**	**m³/cap./day**	**m³/day**		**m³/day**	**m³/cap./day**				**m³/day**		**m³/cap**	**m³/cap./day**				**m³/day**	
Falconbridge	Agreement to Purchase																							
	(Falc. Ltd) Well 1	2,617	2,617																					
	(Falc. Ltd) Well 2	2,617	-	n/a	n/a	n/a																		
	Mine			n/a	n/a	n/a																		
	Town	5,234	2,617	727	729	729	728	0.966		2.750	2003	2.66	754	297	2.54	614	91	1936	2.66	729	317	2.30	681	112
Levack	Agreement to Purchase	1892																						
	New Well 1	1555	-	n/a	n/a		0																	
	New Well 2	1555	1,555	n/a	n/a		0																	
	Town	3110	1555	685	747	747	726	0.478		2.000	1453	0.96	1,520	644	2.36	102	45	1404	0.96	1,469	639	2.30	151	69
Onaping	Agreement to Purchase																							
	Well Field	6540	6540	n/a	n/a	n/a	0																	
	Mine			n/a	n/a	n/a	0																	
	Town	6540	6540	727	729	729	728	0.910		2.750	2003	2.50	800	339	2.36	4,537	768	1936	2.50	773	336	2.30	4,604	800
Vermilion																								
Copper Cliff	Agreement to Purchase	7571	7,571																					
Lively	Agreement to Purchase	12810	12,810																					
	Copper Cliff			1,559	1,768	2,877	2,068						2,302	1,094						2,225				
	Lively			1,237	1,365	1,493	1,365						2,866	1,318						2,770				
	Walden			1,480	1,525	1,643	1,549						3,947	1,815						3,814				
	Towns	20381	20,381	4,276	4,658	6,013	4,982	0.547		2.000	9965	1.09	9,115	4,227	2.16	10,416	4,418	9630	1.09	8,809	3,830	2.30	10,751	4,276

WATER - UNCOMMITTED RESERVE CAPACITY

Natural Increase Scenario

Assumed -3.358% Popoulation Growth

Municipal Water Supplies

Treatment Facility		Rated Hyd.Cap.	Firm Cap.	Average Daily Flows (m³/day)				Avg. Day Flow	Recorded 2001 Max Day	Max Day Factor	Calculated Max Day	Max.Day Flow / Cap	2001 Population Current	Households Current	Density Current	Uncommitted Reserve Cap.	Lots Availabl	20 Year Growth Projection: Calculated max Day	Max.Day Flow / Cap	Population Projected	Households Projected	Density Projected	Uncommitted Reserve Cap.	Lots Available
Plant Name	**Type**	**m³/day**	**m³/day**	**1999**	**2000**	**2001**	**3 yr avg**	**m³/cap./day**	**m³/day**		**m³/day**	**m³/cap./day**				**m³/day**		**m³/cap**	**m³/cap./day**				**m³/day**	
Sudbury																								
	David St. PS	40000	40,000	23,730	23,026	25,843	24,200		42229															
	Wanapitei WTP	54000	44,000	30,421	30,708	34,781	31,970		40360															
	Coniston												2,129	840						2,058	895			
	Garson												1,869	738						1,806	785			
	Wahnapitae												1,215	479						1,174	511			
	Sudbury												85,041	40,421						82,185	35,733			
	Total	94000	84,000	54,151	53,734	60,624	56,169	0.622	82,589			0.92	90,254	42,478	2.12	1,411	726	79816	0.92	87,223	37,923	2.30	4,184	1,988
Dowling	Lionel	3637	3,637																					
	Riverside	3637	-																					
	Well Field	7274	3637	687	598	508	598	0.322		2.500	1494	0.80	1,857	786	2.36	2,143	1,127	1444	0.80	1,795	780	2.30	2,193	1,185
Garson	Orell 1	1572	1572																					
	Orell 3	3275	-																					
	INCO 1	2981	2981																					
	Well Field	7828	4553	2,246	1,356	1,356	1,653	0.337		2.000	3306	0.67	4,898	1,933	2.53	1,248	730	3195	0.67	4,734	2,058	2.30	1,359	875
Capreol	Well M	2946	2,946																					
	Well J	3927	-																					
	Well 6 (to be abandoned)	3273	-																					
	Well Field	10146	2,946	3,712	4,072	3,603	3,796																	
Valley East	Kenneth	2288	2288																					
	Phillipe	2288	2288																					
	Deschene	1797	1795																					
	Frost	2288	2290																					
	Michelle	2289	2290																					
	Notre Dame	3105	3106																					
	Linden	3268	3268																					
	Pharand	2289	2290																					
	Well I	1973	1973																					
*	Proposed New Well	3100	3100																					
	Well Field	24685	24,688	9,093	8,423	8,545	8,687																	
	Capreol												3,395	1,511						3,281	1,427			
	Azilda												4,986	1,983						4,819	2,095			
	Chelmsford Lagoon												0	0						0	0			
	Chelmsford STP												7,683	3,055						7,425	3,228			
	Valley East												19,145	6,956						18,502	8,044			
Total System	Both Well Fields	34831	27634	12805	12495	12148	12483	0.355		1.800	22469	0.64	35,209	11,994	2.94	5,165	2,757	21715	0.64	34,027	14,794	2.30	5,919	4,033

Purchased Water Supplies

Treatment Facility		Rated Hyd.Cap.	Firm Cap.	Average Daily Flows (m³/day)				Avg. Day Flow	Recorded Max Day	Max Day Factor	Calculated max Day	Max.Day Flow / Cap	Population Current	Households Current	Density Current	Uncommitted	Lots Available	20 Year Growth Projection: Calculated max Day	Max.Day Flow / Cap	Population Projected	Households Projected	Density Projected	Uncommitted Reserve Cap.	Lots Available
Plant Name	**Type**	**m³/day**	**m³/day**	**1999**	**2000**	**2001**	**3 yr avg**	**m³/cap./day**	**m³/day**		**m³/day**	**m³/cap./day**				**m³/day**		**m³/cap**	**m³/cap./day**				**m³/day**	
Falconbridge	Agreement to Purchase																							
	(Falc. Ltd) Well 1	2,617	2,617																					
	(Falc. Ltd) Well 2	2,617	-	n/a	n/a	n/a																		
	Mine			n/a	n/a	n/a																		
	Town	5,234	2,617	727	729	729	728	0.966		2.750	2003	2.66	754	297	2.54	614	91	1936	2.66	729	317	2.30	681	112
Levack	Agreement to Purchase	1892																						
	New Well 1	1555	-	n/a	n/a		0																	
	New Well 2	1555	1,555	n/a	n/a		0																	
	Town	3110	1555	685	747	747	726	0.478		2.000	1453	0.96	1,520	644	2.36	102	45	1404	0.96	1,469	639	2.30	151	69
Onaping	Agreement to Purchase																							
	Well Field	6540	6540	n/a	n/a	n/a	0																	
	Mine			n/a	n/a	n/a	0																	
	Town	6540	6540	727	729	729	728	0.910		2.750	2003	2.50	800	339	2.36	4,537	768	1936	2.50	773	336	2.30	4,604	800
Vermilion																								
Copper Cliff	Agreement to Purchase	7571	7,571																					
Lively	Agreement to Purchase	12810	12,810																					
	Copper Cliff			1,559	1,768	2,877	2,068						2,302	1,094						2,225				
	Lively			1,237	1,365	1,493	1,365						2,866	1,318						2,770				
	Walden			1,480	1,525	1,643	1,549						3,947	1,815						3,814				
	Towns	20381	20,381	4,276	4,658	6,013	4,982	0.547		2.000	9965	1.09	9,115	4,227	2.16	10,416	4,418	9630	1.09	8,809	3,830	2.30	10,751	4,276

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.2

Unreserved Capacity - Water

WATER - UNCOMMITTED RESERVE CAPACITY

In-Migration Scenario

Municipal Water Supplies

Treatment Facility		Rated Hyd.Cap.	Firm Cap.	Average Daily Flows (m³/day)				Avg. Day Flow	Recorded 2001 Max Day	Max Day Factor	Calculated Max Day	Max.Day Flow / Cap	2001 Population Current	Households Current	Density Current	Uncommitted Reserve Cap.	Lots Available	20 Year Growth Projection: Calculated max Day	Max.Day Flow / Cap	Population Projected	Households Projected	Density Projected	Uncommitted Reserve Cap.	Lots Available
Plant Name	**Type**	**m³/day**	**m³/day**	**1999**	**2000**	**2001**	**3 yr avg**	**m³/cap./day**	**m³/day**		**m³/day**	**m³/cap./day**				**m³/day**		**m³/cap**	**m³/cap./day**				**m³/day**	
Sudbury																								
	David St. PS	40000	40,000	23,730	23,026	25,843	24,200		42229															
	Wanapitei WTP	54000	44,000	30,421	30,708	34,781	31,970		40360															
	Coniston												2,129	840						2,439	1,060			
	Garson												1,869	738						2,405	1,046			
	Wahnapitae												1,215	479						1,215	528			
	Sudbury												85,041	40,421						93,265	40,550			
	Total	94000	84,000	54,151	53,734	60,624	56,169	0.622	82,589			0.92	90,254	42,478	2.12	1,411	726	90889	0.92	99,324	43,184	2.30	-6,889	-3,273
Dowling	Lionel	3637	3,637																					
	Riverside	3637	-																					
	Well Field	7274	3637	687	598	508	598	0.322		2.500	1494	0.80	1,857	786	2.36	2,143	1,127	1695	0.80	2,106	916	2.30	1,942	1,049
Garson	Orell 1	1572	1572																					
	Orell 3	3275	-																					
	INCO 1	2981	2981																					
	Well Field	7828	4553	2,246	1,356	1,356	1,653	0.337		2.000	3306	0.67	4,898	1,933	2.53	1,248	730	3353	0.67	4,968	2,160	2.30	1,200	773
Capreol	Well M	2946	2,946																					
	Well J	3927	-																					
	Well 6 (to be abandoned)	3273	-																					
	Well Field	10146	2,946	3,712	4,072	3,603	3,796																	
Valley East	Kenneth	2288	2288																					
	Phillipe	2288	2288																					
	Deschene	1797	1795																					
	Frost	2288	2290																					
	Michelle	2289	2290																					
	Notre Dame	3105	3106																					
	Linden	3268	3268																					
	Pharand	2289	2290																					
	Well I	1973	1973																					
*	Proposed New Well	3100	3100																					
	Well Field	24685	24,688	9,093	8,423	8,545	8,687																	
	Capreol												3,395	1,511						3,582	1,557			
	Azilda												4,986	1,983						5,553	2,414			
	Chelmsford												7,683	3,055						8,393	3,649			
	Valley East												19,145	6,956						21,442	9,323			
Total System	Both Well Fields	34831	27634	12805	12495	12148	12483	0.355		1.800	22469	0.64	35,209	11,994	2.94	5,165	2,757	24869	0.64	38,970	16,943	2.30	2,765	1,884

Purchased Water Supplies

Treatment Facility		Rated Hyd.Cap.	Firm Cap.	Average Daily Flows (m³/day)				Avg. Day Flow	Recorded Max Day	Max Day Factor	Calculated max Day	Max.Day Flow / Cap	2001 Population Current	Households Current	Density Current	Uncommitted	Lots Available	20 Year Growth Projection: Calculated max Day	Max.Day Flow / Cap	Population Projected	Households Projected	Density Projected	Uncommitted Reserve Cap.	Lots Available
Plant Name	**Type**	**m³/day**	**m³/day**	**1999**	**2000**	**2001**	**3 yr avg**	**m³/cap./day**	**m³/day**		**m³/day**	**m³/cap./day**				**m³/day**		**m³/cap**	**m³/cap./day**				**m³/day**	
Falconbridge	Agreement to Purchase																							
	(Falc. Ltd) Well 1	2,617	2,617																					
	(Falc. Ltd) Well 2	2,617	-	n/a	n/a	n/a																		
	Mine			n/a	n/a	n/a																		
	Town	5,234	2,617	727	729	729	728	0.966		2.750	2003	2.66	754	297	2.54	614	91	2316	2.66	872	379	2.30	301	49
Levack	Agreement to Purchase	1892																						
	New Well 1	1555	-	n/a	n/a		0																	
	New Well 2	1555	1,555	n/a	n/a		0																	
	Town	3110	1555	685	747	747	726	0.478		2.000	1453	0.96	1,520	644	2.36	102	45	1489	0.96	1,558	677	2.30	66	30
Onaping	Agreement to Purchase																							
	Well Field	6540	6540	n/a	n/a	n/a	0																	
	Mine			n/a	n/a	n/a	0																	
	Town	6540	6540	727	729	729	728	0.910		2.750	2003	2.50	800	339	2.36	4,537	768	2003	2.50	800	348	2.30	4,537	788
Vermilion																								
Copper Cliff	Agreement to Purchase	7571	7,571																					
Lively	Agreement to Purchase	12810	12,810																					
	Copper Cliff			1,559	1,768	2,877	2,068						2,302	1,094	2.10					2418	1,051			
	Lively			1,237	1,365	1,493	1,365						2,866	1,318	2.17					3452	1,501			
	Walden			1,480	1,525	1,643	1,549						3,947	1,815	2.17					4280	1,861			
	Towns	20381	20,381	4,276	4,658	6,013	4,982	0.547		2.000	9965	1.09	9,115	4,227	2.16	10,416	4,418	11096	1.09	10,150	4,413	2.30	9,285	3,693

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.3

Unreserved Capacity - Water

WATER - UNCOMMITTED RESERVE CAPACITY

High In-Migration Scenario

Municipal Water Supplies

Treatment Facility		Rated Hyd.Cap.	Firm Cap.	Average Daily Flows (m³/day)				Avg. Day Flow	Recorded 2001 Max Day	Max Day Factor	Calculated Max Day	Max.Day Flow / Cap	2001 Population Current	Households Current	Density Current	Uncommitted Reserve Cap.	Lots Available	20 Year Growth Projection: Calculated max Day	Max.Day Flow / Cap	Population Projected	Households Projected	Density Projected	Uncommitted Reserve Cap.	Lots Available
Plant Name	**Type**	**m³/day**	**m³/day**	**1999**	**2000**	**2001**	**3 yr avg**	**m³/cap./day**	**m³/day**		**m³/day**	**m³/cap./day**				**m³/day**		**m³/cap**	**m³/cap./day**				**m³/day**	
Sudbury																								
	David St. PS	40000	40,000	23,730	23,026	25,843	24,200		42229															
	Wanapitei WTP	54000	44,000	30,421	30,708	34,781	31,970		40360															
	Coniston												2,129	840						2,556	1,111			
	Garson												1,869	738						2,608	1,134			
	Wahnapitae												1,215	479						1,215	528			
	Sudbury												85,041	40,421						95,497	41,520			
	Total	94000	84,000	54,151	53,734	60,624	56,169	0.622	82,589			0.92	90,254	42,478	2.12	1,411	726	93224	0.92	101,876	44,294	2.30	-9,224	-4,383
Dowling	Lionel	3637	3,637																					
	Riverside	3637	-																					
	Well Field	7274	3637	687	598	508	598	0.322		2.500	1494	0.80	1,857	786	2.36	2,143	1,127	1770	0.80	2,200	957	2.30	1,867	1,009
Garson	Orell 1	1572	1572																					
	Orell 3	3275	-																					
	INCO 1	2981	2981																					
	Well Field	7828	4553	2,246	1,356	1,356	1,653	0.337		2.000	3306	0.67	4,898	1,933	2.53	1,248	730	3371	0.67	4,994	2,171	2.30	1,183	762
Capreol	Well M	2946	2,946																					
	Well J	3927	-																					
	Well 6 (to be abandoned)	3273	-																					
	Well Field	10146	2,946	3,712	4,072	3,603	3,796																	
Valley East	Kenneth	2288	2288																					
	Phillipe	2288	2288																					
	Deschene	1797	1795																					
	Frost	2288	2290																					
	Michelle	2289	2290																					
	Notre Dame	3105	3106																					
	Linden	3268	3268																					
	Pharand	2289	2290																					
	Well I	1973	1973																					
*	Proposed New Well	3100	3100																					
	Well Field	24685	24,688	9,093	8,423	8,545	8,687																	
	Capreol												3,395	1,511						3,652	1,588			
	Azilda												4,986	1,983						5,767	2,507			
	Chelmsford Lagoon												0	0						0	0			
	Chelmsford STP												7,683	3,055						8,663	3,767			
	Valley East												19,145	6,956						22,309	9,700			
Total System	Both Well Fields	34831	27634	12805	12495	12148	12483	0.355		1.800	22469	0.64	35,209	11,994	2.94	5,165	2,757	25776	0.64	40,391	17,561	2.30	1,858	1,266

Purchased Water Supplies

Treatment Facility		Rated Hyd.Cap.	Firm Cap.	Average Daily Flows (m³/day)				Avg. Day Flow	Recorded Max Day	Max Day Factor	Calculated max Day	Max.Day Flow / Cap	Population Current	Households Current	Density Current	Uncommitted	Lots Available	Calculated max Day	Max.Day Flow / Cap	20 Year Growth Projection: Population Projected	Households Projected	Density Projected	Uncommitted Reserve Cap.	Lots Available
Plant Name	**Type**	**m³/day**	**m³/day**	**1999**	**2000**	**2001**	**3 yr avg**	**m³/cap./day**	**m³/day**		**m³/day**	**m³/cap./day**				**m³/day**		**m³/cap**	**m³/cap./day**				**m³/day**	
Falconbridge	Agreement to Purchase																							
	(Falc. Ltd) Well 1	2,617	2,617																					
	(Falc. Ltd) Well 2	2,617	-	n/a	n/a	n/a																		
	Mine			n/a	n/a	n/a																		
	Town	5,234	2,617	727	729	729	728	0.966		2.750	2003	2.66	754	297	2.54	614	91	2433	2.66	916	398	2.30	184	30
Levack	Agreement to Purchase	1852																						
	New Well 1	1555	-																					
	New Well 2	1555	1,555	n/a	n/a		0																	
	Town	3110	1555	685	747	747	726	0.478		2.000	1453	0.96	1,520	644	2.36	102	45	1503	0.96	1,572	683	2.30	52	24
Onaping	Agreement to Purchase																							
	Well Field	6540	6540	n/a	n/a	n/a	0																	
	Town	6540	6540	727	729	729	728	0.910		2.750	2003	2.50	800	339	2.36	4,537	768	2003	2.50	800	348	2.30	4,537	788
Vermilion																								
Copper Cliff	Agreement to Purchase	7571	7,571																					
Lively	Agreement to Purchase	12810	12,810																					
	Copper Cliff			1,559	1,768	2,877	2,068						2,302	1,094	2.10					2462	1,070			
	Lively			1,237	1,365	1,493	1,365						2,866	1,318	2.17					3674	1,597			
	Walden			1,480	1,525	1,643	1,549						3,947	1,815	2.17					4405	1,915			
	Towns	20381	20,381	4,276	4,658	6,013	4,982	0.547		2.000	9965	1.09	9,115	4,227	2.16	10,416	4,418	11524	1.09	10,541	4,583	2.30	8,857	3,523

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.4

Ureserved Capacity - Water

WATER - UNCOMMITTED RESERVE CAPACITY

In-Migration Scenario

Municipal Water Supplies

Treatment Facility		Rated Hyd.Cap.	Firm Cap.	Average Daily Flows (m³/day)				Avg. Day Flow	Recorded 2001 Max Day	Max Day Factor	Calculated Max Day	Max.Day Flow / Cap	2001 Population Current	Households Current	Density Current	Uncommitted Reserve Cap.	Lots Available	20 Year Growth Projection Calculated max Day	Max.Day Flow / Cap	Population Projected	Households Projected	Density Projected	Uncommitted Reserve Cap.	Lots Available
Plant Name	Type	m³/day	m³/day	1999	2000	2001	3 yr avg	m³/cap./day	m³/day		m³/day	m³/cap./day				m³/day		m³/cap	m³/cap./day				m³/day	
Capreol	Well M	2946	2,946																					
	Well J	3927	-																					
	Well 6 (to be abandoned)	3273	3,723																					
	Well Field	10146	6,669	3,712	4,072	3,603	3,796	1.118		2.000	7591	2.24	3,395	1,511	2.25	-922	-184	8009	2.24	3,582	1,557	2.30	-1,340	-261
Valley East	Kenneth	2288	2288																					
	Phillipe	2288	2288																					
	Deschene	1797	1795																					
	Frost	2288	2290																					
	Michelle	2289	2290																					
	Notre Dame	3105	3106																					
	Linden	3268	-																					
	Pharand	2289	2290																					
	Well I	1973	1973																					
*	Proposed New Well	3100	3100																					
	Well Field	24685	21,420	9,093	8,423	8,545	8,687																	
	Azilda												4,986	1,983						5,553	2,414			
	Chelmsford												7,683	3,055						8,393	3,649			
	Valley East												19,145	6,956						21,442	9,323			
Total System	Both Well Fields	24685	21420	9093	8423	8545	8687	0.273		1.800	15637	0.49	31,814	11,994	2.65	5,783	4,436	17394	0.49	35,388	15,386	2.30	4,026	3,562

WATER - UNCOMMITTED RESERVE CAPACITY

High In-Migration Scenario

Municipal Water Supplies

Treatment Facility		Rated Hyd.Cap.	Firm Cap.	Average Daily Flows (m³/day)				Avg. Day Flow	Recorded 2001 Max Day	Max Day Factor	Calculated Max Day	Max.Day Flow / Cap	2001 Population Current	Households Current	Density Current	Uncommitted Reserve Cap.	Lots Available	20 Year Growth Projection Calculated max Day	Max.Day Flow / Cap	Population Projected	Households Projected	Density Projected	Uncommitted Reserve Cap.	Lots Available
Plant Name	Type	m³/day	m³/day	1999	2000	2001	3 yr avg	m³/cap./day	m³/day		m³/day	m³/cap./day				m³/day		m³/cap	m³/cap./day				m³/day	
Capreol	Well M	2946	2,946																					
	Well J	3927	-																					
	Well 6 (to be abandoned)	3273	3,723																					
	Well Field	10146	6,669	3,712	4,072	3,603	3,796	1.118		2.000	7591	2.24	3,395	1,511	2.25	-922	-184	8166	2.24	3,652	1,588	2.30	-1,497	-291
Valley East	Kenneth	2288	2288																					
	Phillipe	2288	2288																					
	Deschene	1797	1795																					
	Frost	2288	2290																					
	Michelle	2289	2290																					
	Notre Dame	3105	3106																					
	Linden	3268	-																					
	Pharand	2289	2290																					
	Well I	1973	1973																					
*	Proposed New Well	3100	3100																					
	Well Field	24685	21,420	9,093	8,423	8,545	8,687																	
	Azilda												4,986	1,983						5,767	2,507			
	Chelmsford												7,683	3,055						8,663	3,767			
	Valley East												19,145	6,956						22,309	9,700			
Total System	Both Well Fields	24685	21420	9093	8423	8545	8687	0.273		1.800	15637	0.49	31,814	11,994	2.65	5,783	4,436	18058	0.49	36,739	15,973	2.30	3,362	2,974

WATER - UNCOMMITTED RESERVE CAPACITY

Natural Increase Scenario

Municipal Water Supplies

Treatment Facility		Rated Hyd.Cap.	Firm Cap.	Average Daily Flows (m³/day)				Avg. Day Flow	Recorded 2001 Max Day	Max Day Factor	Calculated Max Day	Max.Day Flow / Cap	2001 Population Current	Households Current	Density Current	Uncommitted Reserve Cap.	Lots Available	20 Year Growth Projection Calculated max Day	Max.Day Flow / Cap	Population Projected	Households Projected	Density Projected	Uncommitted Reserve Cap.	Lots Available
Plant Name	Type	m³/day	m³/day	1999	2000	2001	3 yr avg	m³/cap./day	m³/day		m³/day	m³/cap./day				m³/day		m³/cap	m³/cap./day				m³/day	
Capreol	Well M	2946	2,946																					
	Well J	3927	-																					
	Well 6 (to be abandoned)	3273	3,723																					
	Well Field	10146	6,669	3,712	4,072	3,603	3,796	1.118		2.000	7591	2.24	3,395	1,511	2.25	-922	-184	7336	2.24	3,281	1,427	2.30	-667	-130
Valley East	Kenneth	2288	2288																					
	Phillipe	2288	2288																					
	Deschene	1797	1795																					
	Frost	2288	2290																					
	Michelle	2289	2290																					
	Notre Dame	3105	3106																					
	Linden	3268	-																					
	Pharand	2289	2290																					
	Well I	1973	1973																					
*	Proposed New Well	3100	3100																					
	Well Field	24685	21,420	9,093	8,423	8,545	8,687																	
	Azilda												4,986	1,983						4,819	2,095			
	Chelmsford												7,683	3,055						7,425	3,228			
	Valley East												19,145	6,956						18,502	8,044			
Total System	Both Well Fields	24685	21420	9093	8423	8545	8687	0.273		1.800	15637	0.49	31,814	11,994	2.65	5,783	4,436	15112	0.49	30,746	13,368	2.30	6,308	5,580

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.5

Unreserved Capacity - Water

WATER - UNCOMMITTED RESERVE CAPACITY

In-Migration Scenario

Municipal Water Supplies

20 Year Growth Projection

Treatment Facility		Rated Hyd.Cap.	Firm Cap.	Max Day Flows (m³/day)				Max.Day Flow / Cap	Population Current	Households Current	Density Current	Uncommitted Reserve Cap.	Lots Available	Calculated max Day	Max.Day Flow / Cap	Population Projected	Households Projected	Density Projected	Uncommitted Reserve Cap.	Lots Available
Plant Name	Type	m³/day	m³/day	2002	2003	2004	3 yr avg	m³/cap./day				m³/day		m³/cap	m³/cap./day				m³/day	
Sudbury																				
	David St. PS	40000	40000	25392	28268	27285	26982													
	Wanapitei WTP	54000	44000	41129	42912	39579	41207													
	Coniston								2129	840						2,439	1,060			
	Garson								1869	738						2,405	1,046			
	Wahnapitae								1215	479						1,215	528			
	Sudbury								85041	40,421						93,265	40,550			
	Total	94000	84000	66521	71180	66864	68188	0.76	90254	42,478	2.12	15,812	9,850	75041	0.76	99,324	43,184	2.30	8,959	5,156

WATER - UNCOMMITTED RESERVE CAPACITY

High In-Migration Scenario

Municipal Water Supplies

20 Year Growth Projection

Treatment Facility		Rated Hyd.Cap.	Firm Cap.	Max Day Flows (m³/day)				Max.Day Flow / Cap	Population Current	Households Current	Density Current	Uncommitted Reserve Cap.	Lots Available	Calculated max Day	Max.Day Flow / Cap	Population Projected	Households Projected	Density Projected	Uncommitted Reserve Cap.	Lots Available
Plant Name	Type	m³/day	m³/day	2002	2003	2004	3 yr avg	m³/cap./day				m³/day		m³/cap	m³/cap./day				m³/day	
Sudbury																				
	David St. PS	40000	40000	25392	28268	27285	26982													
	Wanapitei WTP	54000	44000	41129	42912	39579	41207													
	Coniston								2129	840						2,556	1,111			
	Garson								1869	738						2,608	1,134			
	Wahnapitae								1215	479						1,215	528			
	Sudbury								85041	40,421						95,497	41,520			
	Total	94000	84000	66521	71180	66864	68188	0.76	90254	42,478	2.12	15,812	9,850	76969	0.76	101,876	44,294	2.30	7,031	4,046

WATER - UNCOMMITTED RESERVE CAPACITY

Natural Increase Scenario

Assumed -3.358% Popoulation Growth

Municipal Water Supplies

20 Year Growth Projection

Treatment Facility		Rated Hyd.Cap.	Firm Cap.	Recorded Max Day Flows (m³/day)				Max.Day Flow / Cap	Population Current	Households Current	Density Current	Uncommitted Reserve Cap.	Lots Available	Calculated max Day	Max.Day Flow / Cap	Population Projected	Households Projected	Density Projected	Uncommitted Reserve Cap.	Lots Available
Plant Name	Type	m³/day	m³/day	2002	2003	2004	3 yr avg	m³/cap./day				m³/day		m³/cap	m³/cap./day				m³/day	
Sudbury																				
	David St. PS	40000	40000	25392	28268	27285	26982													
	Wanapitei WTP	54000	44000	41129	42912	39579	41207													
	Coniston								2129	840						2,058	895			
	Garson								1869	738						1,806	785			
	Wahnapitae								1215	479						1,174	511			
	Sudbury								85041	40,421						82,185	35,733			
	Total	94000	84000	66521	71180	66864	68188	0.76	90254	42,478	2.12	15,812	9,850	65899	0.76	87,223	37,923	2.30	18,101	10,417

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.6

Unreserved Capacity - Wastewater

Wastewater - Uncommitted Reserve Capacity															Natural Increase Scenario			
Treatment Facility			Effluent			Pc	Average Daily Flows (m3/day)				F	L	P	H	Adj. Pop.	Cap L/s	%age	Capacity Check
Name	Type		BOD	SS	T.Phos.	m³/day	1999	2000	2001	3 yr avg	m³/day	2001 DATA			Adj.Avg Flow	Q(exist) l/s	Capacity	Pop. Only
Azilda	STP	*C of A*	*37.00*	*15.00*	*1.00*	*3,300*												
	Extended Aeration	Actual	4.70	8.50	0.49		2,667	2,012	3,054	2,578	0.627	392	4,112	1,635	3974	38.19	75.49	'ok'
															2,491	28.83		
Chelmsford	STP	*C of A*	*7.00*	*7.00*	*0.30*	*7,100*												
	Summer	Actual	3.90	5.60	n/a		4,127	3,287	4,435	3,950	0.539	576	7,322	2,911	7076	82.18	53.76	'ok'
		C of A	15.00	15.00	0.50										3,817	44.18		
	Winter		4.60	10.80	n/a													
Coniston	STP	*C of A*	*20.00*	*20.00*		*3,000*												
	Extended Aeration	Actual	11.10	8.70			1,232	1,175	1,600	1,336	0.627	591	2,129	840	2058	34.72	43.03	'ok'
															1,291	14.94		
Copper Cliff	NCO Vermillion STP	*C of A*				*6,800*												
	Activated Sludge	Actual					2,115			2,115	0.919	73	2,302	1,094	2225	78.70	30.06	'ok'
															2,044	23.66		
Dowling	STP	*C of A*	*25.00*	*25.00*		*3,200*												
	Extended Aeration	Actual	4.10	3.60			2,443	2,483	2,547	2,491	1.341	36	1,857	786	1795	37.04	75.23	'ok'
															2,407	27.86		
Falconbridge	STP	*C of A*	*25.00*	*25.00*		*909*												
	Trickling Filter	Actual	4.20	3.20			362	380	350	364	0.483	43	754	297	729	10.52	38.69	'ok'
															352	4.07		
Levack	STP	*C of A*	*25.00*	*25.00*	*1.00*	*2,270*												
	Extended Aeration	Actual	6.30	7.80	0.51		1,047	1,037	1,132	1,072	0.462	177	2,320	983	2242	26.27	45.64	'ok'
															1,036	11.99		
Lively	STP	*C of A*	*25.00*	*25.00*	*1.00*	*1,600*												
	Extended Aeration	Actual	6.40	8.00	0.67		1,036	1,045	1,186	1,089	0.394	98	2,763	1,271	2670	18.52	65.78	'ok'
															1,052	12.18		
Sudbury	Garson	*C of A*	*25.00*	*25.00*	*1.00*	*79,625*						152	546	215				
	Sudbury	Actual	7.90	12.70	0.48							12,699	84,330	40,083		921.59	75.08	'ok'
						79,625	57,113	58,163	70,302	61859	0.729	12,851	84,876	40,298	82026	691.92		
															59,782			
Valley East	Conventional	*C of A*	*25.00*	*25.00*	*1.00*	*11,400*												
	Activated Sludge	Actual	5.40	9.20	0.61		5,758	5,555	6,886	6,066	0.348	1,745	17,415	6,328	16830	131.94	51.43	'ok'
															5,862	67.85		
Walden	STP	*C of A*	*25.00*	*25.00*	*1.00*	*4,500*												
	Extended Aeration	Actual	5.60	8.30	0.39		2,549	2,455	2,912	2,639	0.782	1,296	3,376	1,553	3263	52.08	56.67	'ok'
															2,550	29.51		
Capreol	Lagoon	*C of A*	*30.00*	*40.00*		*5,000*												
	Exfiltration	Actual	22.70	38.00	0.99	3.31	3,316	2,713	3,584	3,204	0.945	187	3,392	1,510	3278	57.87	61.93	'ok'
															3,096	35.84		
Garson	Lagoon	*C of A*	*30.00*	*40.00*		*3,506*												
	Seasonal Retention	Actual	6.20	6.00	0.69		773	705	761	746	0.133	245	5,628	2,221	5439	40.58	20.58	'ok'
															721	8.35		
Wahnapitae	Lagoon	*C of A*	*30.00*	*40.00*		*1,246*												
	Seasonal Retention	Actual	3.00	4.40	0.05		916	884	1,088	963	0.845	47	1,139	449	1101	14.42	74.68	'ok'
															931	10.77		

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.7

Unreserved Capacity - Wastewater

Wastewater - Uncommitted Reserve Capacity																			In-Migration Scenario				
Treatment Facility			Effluent			Pc	Average Daily Flows (m3/day)				F	L	P	H	Cap L/s	%age		Projected Pop.	Q(d)	I&I	Total Flow	Capacity Check
Name	Type		BOD	SS	T.Phos.	m³/day	1999	2000	2001	3 yr avg	m³/day	2001 DATA			Q(exist) l/s	Capacity		In Scenario	pop'n only	growth only	pop & I/I	Pop. Only
Azilda	STP	*C of A*	*37.00*	*15.00*	*1.00*	*3,300*																
	Extended Aeration	Actual	4.70	8.50	0.49		2,667	2,012	3,054	2,578	0.627	392	4,112	1,635	38.19	78.11		567		20.54		'failed'
															29.83		HPK	3.946	9.321	5.359	44.514	
Chelmsford	STP	*C of A*	*7.00*	*7.00*	*0.30*	*7,100*																
	Summer	Actual	3.90	5.60	n/a		4,127	3,287	4,435	3,950	0.539	576	7,322	2,911	82.18	55.63		681		24.67		'ok'
		C of A	15.00	15.00	0.50										45.72		HPK	3.901	11.070	6.437	63.223	
	Winter		4.60	10.80	n/a																	
Coniston	STP	*C of A*	*20.00*	*20.00*		*3,000*																
	Extended Aeration	Actual	11.10	8.70			1,232	1,175	1,600	1,336	0.627	591	2,129	840	34.72	44.53		310		11.23		'ok'
															15.46		HPK	4.072	5.991	2.930	24.382	
Copper Cliff	INCO Vermillion STP	*C of A*				*6,800*																
	Activated Sludge	Actual					2,115			2,115	0.919	73	2,302	1,094	78.70	31.10		116		4.20		'ok'
															24.48		HPK	4.225	2.836	1.096	28.412	
Dowling	STP	*C of A*	*25.00*	*25.00*		*3,200*																
	Extended Aeration	Actual	4.10	3.60			2,443	2,483	2,547	2,491	1.341	36	1,857	786	37.04	77.85		249		9.02		'ok'
															28.83		HPK	4.112	4.266	2.354	35.452	
Falconbridge	STP	*C of A*	*25.00*	*25.00*		*909*																
	Trickling Filter	Actual	4.20	3.20			362	380	350	364	0.483	43	754	297	10.52	40.03		118		4.28		'ok'
															4.21		HPK	4.223	2.365	1.115	7.692	
Levack	STP	*C of A*	*25.00*	*25.00*	*1.00*	*2,270*																
	Extended Aeration	Actual	6.30	7.80	0.51		1,047	1,037	1,132	1,072	0.462	177	2,320	983	26.27	47.23		38		1.38		'ok'
															12.41		HPK	4.337	0.782	0.359	13.549	
Lively	STP	*C of A*	*25.00*	*25.00*	*1.00*	*1,600*																
	Extended Aeration	Actual	6.40	8.00	0.67		1,036	1,045	1,186	1,089	0.394	98	2,763	1,271	18.52	68.06		586		21.23		'failed'
															12.60		HPK	3.938	10.950	5.539	29.094	
Sudbury	Garson	*C of A*	*25.00*	*25.00*	*1.00*	*79,625*						152	546	215								
	Sudbury	Actual	7.90	12.70	0.48							12,699	84,330	40,083	921.59	77.69		8224		297.97		'ok'
						79,625	57,113	58,163	70,302	61859		12,851	84,876	40,298	715.96		HPK	3.039	118.581	77.735	912.276	
Valley East	Conventional	*C of A*	*25.00*	*25.00*	*1.00*	*11,400*																
	Activated Sludge	Actual	5.40	9.20	0.61		5,758	5,555	6,886	6,066	0.348	1,745	17,415	6,328	131.94	53.21		2297		83.22		'ok'
															70.21		HPK	3.538	33.864	21.712	125.786	
Walden	STP	*C of A*	*25.00*	*25.00*	*1.00*	*4,500*																
	Extended Aeration	Actual	5.60	8.30	0.39		2,549	2,455	2,912	2,639	0.782	1,296	3,376	1,553	52.08	58.63		332		12.03		'ok'
															30.54		HPK	4.059	6.395	3.138	40.072	
Capreol	Lagoon	*C of A*	*30.00*	*40.00*		*5,000*																
	Exfiltration	Actual	22.70	38.00	0.99	3.31	3,316	2,713	3,584	3,204	0.945	187	3,392	1,510	57.87	64.08		187		6.78		'ok'
															37.08		HPK	4.159	4.500	1.768	43.352	
Garson	Lagoon	*C of A*	*30.00*	*40.00*		*3,506*																
	Seasonal Retention	Actual	6.20	6.00	0.69		773	705	761	746	0.133	245	5,628	2,221	40.58	21.29		606		21.96		'ok'
															8.64		HPK	3.930	9.923	5.728	24.290	
Wahnapitae	Lagoon	*C of A*	*30.00*	*40.00*		*1,246*																
	Seasonal Retention	Actual	3.00	4.40	0.05		916	884	1,088	963	0.845	47	1,139	449	14.42	77.28		50		1.81		'ok'
															11.14		HPK	4.315	1.024	0.473	12.641	

Data sources			
	Per Capita Flow l/cap/day	Extran.Flow new l/ha/day	Density meridian
Azilda	360	22450	2.30
Capreol	500	33700	2.30
Chelmsford	360	33700	2.30
Coniston	410	33700	2.30
Copper Cliff	500	33700	2.30
Dowling	360	33700	2.30
Falconbridge	410	33700	2.30
Garson	360	11250	2.30
Levack	410	22450	2.30
Lively	410	33700	2.30
Mikkola	360	33700	2.30
Onaping	410	33700	2.30
Sudbury	410	17280	2.30
Valley East	360	33700	2.30
Walden	410	18050	2.30
Wahnapitae	410	33700	2.30

Hectares available from OP	
	ha avail.
Azilda	122.0
Capreol	17.5
Chelmsford	153.0
Coniston	35.5
Copper Cliff	5.5
Dowling	85.5
Falconbridge	13.5
Garson	97.0
Levack	13.0
Lively	82.0
Mikkola	x
Onaping	13.0
Sudbury	389.1
Valley East	162.0
Walden	46.5

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.8

Unreserved Capacity - Wastewater

Wastewater - Uncommitted Reserve Capacity

Treatment Facility			Effluent			Pc	Average Daily Flows (m3/day)				F	L	P	H	Cap L/s	%age		High In-Migration Scenario				
Name	Type		BOD	SS	T.Phos.	m³/day	1999	2000	2001	3 yr avg	m³/day	2001 DATA			Q(exist) l/s	Cap.		Projected Pop. In Scenario	Q(d) pop'n only	I&I growth only	Total Flow pop & I/I	Capacity Check Pop. Only
Azilda	STP	*C of A*	*37.00*	*15.00*	*1.00*	*3,300*																
	Extended Aeration	Actual	4.70	8.50	0.49		2,667	2,012	3,054	2,578	0.627	392	4,112	1,635	38.19	78.11		801	5.81	29.02		'failed'
															29.83		HPK	3.860	12.88	7.57	50.29	
Chelmsford	STP	*C of A*	*7.00*	*7.00*	*0.30*	*7,100*																
	Summer	Actual	3.90	5.60	n/a		4,127	3,287	4,435	3,950	0.539	576	7,322	2,911	82.18	55.63		959		34.75		'ok'
		C of A	15.00	15.00	0.50										45.72		HPK	3.812	15.23	9.06	70.01	
	Winter		4.60	10.80	n/a																	
Coniston	STP	*C of A*	*20.00*	*20.00*		*3,000*																
	Extended Aeration	Actual	11.10	8.70			1,232	1,175	1,600	1,336	0.627	591	2,129	840	34.72	44.53		359		13.01		'ok'
															15.46		HPK	4.044	6.89	3.39	25.74	
Copper Cliff	INCO Vermillion STF	*C of A*				*6,800*																
	Activated Sludge	Actual					2,115			2,115	0.919	73	2,302	1,094	78.70	31.10		160		5.80		'ok'
															24.48		HPK	4.182	3.87	1.51	29.86	
Dowling	STP	*C of A*	*25.00*	*25.00*		*3,200*																
	Extended Aeration	Actual	4.10	3.60			2,443	2,483	2,547	2,491	1.341	36	1,857	786	37.04	77.85		344	5.34	12.46		'failed'
															28.83		HPK	4.052	5.81	3.25	37.89	
Falconbridge	STP	*C of A*	*25.00*	*25.00*		*909*																
	Trickling Filter	Actual	4.20	3.20			362	380	350	364	0.483	43	754	297	10.52	40.03		137		4.96		'ok'
															4.21		HPK	4.204	2.73	1.29	8.24	
Levack	STP	*C of A*	*25.00*	*25.00*	*1.00*	*2,270*																
	Extended Aeration	Actual	6.30	7.80	0.51		1,047	1,037	1,132	1,072	0.462	177	2,320	983	26.27	47.23		52		1.88		'ok'
															12.41		HPK	4.311	1.06	0.49	13.96	
Lively	STP	*C of A*	*25.00*	*25.00*	*1.00*	*1,600*																
	Extended Aeration	Actual	6.40	8.00	0.67		1,036	1,045	1,186	1,089	0.394	98	2,763	1,271	18.52	68.06		696		25.22		'failed'
															12.60		HPK	3.896	12.87	6.58	32.05	
Sudbury	Garson	*C of A*	*25.00*	*25.00*	*1.00*	*79,625*						152	546	215									
	Sudbury	Actual	7.90	12.70	0.48							12,699	84,330	40,083	921.59	77.69		11330		410.51		'failed'
						79,625	57,113	58,163	70,302	61859		12,851	84,876	40,298	715.96		HPK	2.901	155.95	107.09	979.01	
Valley East	Conventional	*C of A*	*25.00*	*25.00*	*1.00*	*11,400*																
	Activated Sludge	Actual	5.40	9.20	0.61		5,758	5,555	6,886	6,066	0.348	1,745	17,415	6,328	131.94	53.21		3164		114.64		'failed'
															70.21		HPK	3.423	45.12	29.91	145.24	
Walden	STP	*C of A*	*25.00*	*25.00*	*1.00*	*4,500*																
	Extended Aeration	Actual	5.60	8.30	0.39		2,549	2,455	2,912	2,639	0.782	1,296	3,376	1,553	52.08	58.63		570		20.65		'ok'
															30.54		HPK	3.944	10.67	5.39	46.59	
Capreol	Lagoon	*C of A*	*30.00*	*40.00*		*5,000*																
	Exfiltration	Actual	22.70	38.00	0.99	3.31	3,316	2,713	3,584	3,204	0.945	187	3,392	1,510	57.87	64.08		257		9.31		'ok'
															37.08		HPK	4.106	6.11	2.43	45.62	
Garson	Lagoon	*C of A*	*30.00*	*40.00*		*3,506*																
	Seasonal Retention	Actual	6.20	6.00	0.69		773	705	761	746	0.133	245	5,628	2,221	40.58	21.29		928		33.62		'ok'
															8.64		HPK	3.821	14.77	8.77	32.18	
Wahnapitae	Lagoon	*C of A*	*30.00*	*40.00*		*1,246*																
	Seasonal Retention	Actual	3.00	4.40	0.05		916	884	1,088	963	0.845	47	1,139	449	14.42	77.28		60		2.17		'ok'
															11.14		HPK	4.298	1.22	0.57	12.94	

Data sources			
	Per Capita Flow l/cap/day	extran.Flow new l/ha/day	Density meridian
Azilda	360	22450	2.30
Capreol	500	33700	2.30
Chelmsford	360	33700	2.30
Coniston	410	33700	2.30
Copper Cliff	500	33700	2.30
Dowling	360	33700	2.30
Falconbridge	410	33700	2.30
Garson	360	11250	2.30
Levack	410	22450	2.30
Lively	410	33700	2.30
Mikkola	360	33700	2.30
Onaping	410	33700	2.30
Sudbury	410	17280	2.30
Valley East	360	33700	2.30
Walden	410	18050	2.30
Wahnapitae	410	33700	2.30

Hectares available from OP	
	ha avail.
Azilda	122.0
Capreol	17.5
Chelmsford	153.0
Coniston	35.5
Copper Cliff	5.5
Dowling	85.5
Falconbridge	13.5
Garson	97.0
Levack	13.0
Lively	82.0
Mikkola	x
Onaping	13.0
Sudbury	389.1
Valley East	162.0
Walden	46.5

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.9

Unreserved Capacity - Wastewater

Treatment Facility			Effluent			Pc	Average Daily Flows (m3/day)				F	L	P	H	Cap L/s	%age		Projected Pop.	Q(d)	I&I growth only	Total Flow	Capacity Check
Name	Type		BOD	SS	T.Phos.	m³/day	1999	2000	2001	3 yr avg	m³/day/cap	2001 DATA			Q(exist) l/s	Capacity		In Scenario	pop'n only		pop & I/I	Pop. Only
Azilda	STP	*C of A*	*37.00*	*15.00*	*1.00*	*3,300*									38.19	78.11		407.00		14.75		'failed'
	Extended Aeration	Actual	4.70	8.50	0.49		2,667	2,012	3,054	2,578	0.627	392	4,112	1,635	29.83		HPK	4.02	6.81	3.85	40.50	
							2001	**2002**	**2003**						38.19	88.01		407.00		14.75		'failed'
	2001-2003						3,054	2,863	2,796	2,904	0.702	381	4,140	1,646	33.61		HPK	4.02	6.81	3.85	44.28	
Chelmsford	STP	*C of A*	*7.00*	*7.00*	*0.30*	*7,100*									82.18	55.63		681.00		24.67		'ok'
	Summer	Actual	3.90	5.60	n/a		4,127	3,287	4,435	3,950	0.539	576	7,322	2,911	45.72		HPK	3.90	11.07	6.44	63.22	
	Winter		4.60	10.80	n/a																	
Coniston	STP	*C of A*	*20.00*	*20.00*		*3,000*									34.72	44.53		310.00		11.23		'ok'
	Extended Aeration	Actual	11.10	8.70			1,232	1,175	1,600	1,336	0.627	591	2,129	840	15.46		HPK	4.07	5.99	2.93	24.38	
Copper Cliff	INCO Vermillion STP	*C of A*				*6,800*									78.70	31.10		116.00		4.20		'ok'
	Activated Sludge	Actual					2,115			2,115	0.919	73	2,302	1,094	24.48		HPK	4.23	2.84	1.10	28.41	
Dowling	STP	*C of A*	*25.00*	*25.00*		*3,200*									37.04	77.85		249.00		9.02		'ok'
	Extended Aeration	Actual	4.10	3.60			2,443	2,483	2,547	2,491	1.341	36	1,857	786	28.83		HPK	4.11	4.27	2.35	35.45	
Falconbridge	STP	*C of A*	*25.00*	*25.00*		*909*									10.52	40.03		118.00		4.28		'ok'
	Trickling Filter	Actual	4.20	3.20			362	380	350	364	0.483	43	754	297	4.21		HPK	4.22	2.36	1.12	7.69	
Levack	STP	*C of A*	*25.00*	*25.00*	*1.00*	*2,270*									26.27	47.23		38.00		1.38		'ok'
	Extended Aeration	Actual	6.30	7.80	0.51		1,047	1,037	1,132	1,072	0.462	177	2,320	983	12.41		HPK	4.34	0.78	0.36	13.55	
Lively	STP	*C of A*	*25.00*	*25.00*	*1.00*	*1,600*																
	Extended Aeration	Actual	6.40	8.00	0.67		1,036	1,045	1,186	1,089	0.394	98	2,763	1,271	18.52	68.06		586.00		21.23		'failed'
															12.60		HPK	3.94	10.95	5.54	29.09	
Combined Totals						6,100				3,728	0.607	1,394	6,139	2,824	70.60	61.11		918.00		33.26		'ok'
															43.14		HPK	3.82	16.66	8.68	68.48	
Walden	STP	*C of A*	*25.00*	*25.00*	*1.00*	*4,500*																
	Extended Aeration	Actual	5.60	8.30	0.39		2,549	2,455	2,912	2,639	0.782	1,296	3,376	1,553	52.08	58.63		332.00		12.03		'ok'
															30.54		HPK	4.06	6.40	3.14	40.07	
Sudbury		*C of A*	*25.00*	*25.00*	*1.00*	*102,375*																
		Actual	7.90	12.70	0.48																	
Garson	Lagoon	*C of A*	*30.00*	*40.00*		*3,506*																
	Seasonal Retention	Actual	6.20	6.00	0.69																	
	Garson						773	705	761	746	0.121	397	6,174	2,436								
	Sudbury						57,113	58,163	70,302	61,859	0.734	12,699	84,330	40,083	1184.90	61.15		8,830.00		319.93		'ok'
	Total					*102,375*	57,886	58,868	71,063	62,606	0.692	13,096	90,504	42,519	724.60		HPK	3.01	126.05	83.46	934.11	
Valley East	Conventional	*C of A*	*25.00*	*25.00*	*1.00*	*11,400*									131.94	53.21		2,297.00		83.22		'ok'
	Activated Sludge	Actual	5.40	9.20	0.61		5,758	5,555	6,886	6,066	0.348	1,745	17,415	6,328	70.21		HPK	3.54	33.86	21.71	125.79	
Capreol	Lagoon	*C of A*	*30.00*	*40.00*		*5,000*									57.87	64.08		187.00		6.78		'ok'
	Exfiltration	Actual	22.70	38.00	0.99	3.31	3,316	2,713	3,584	3,204	0.945	187	3,392	1,510	37.08		HPK	4.16	4.50	1.77	43.35	
Wahnapitae	Lagoon	*C of A*	*30.00*	*40.00*		*1,246*									14.42	77.28		50.00		1.81		'ok'
	Seasonal Retention	Actual	3.00	4.40	0.05		916	884	1,088	963	0.845	47	1,139	449	11.14		HPK	4.31	1.02	0.47	12.64	

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.10

Lift Station Velocities

No.	Lift Station	outlet elev. in L.S. (m)	F.M. Size	Length	Inlet elev. In manhole (m)	Q m^3/s	V m/s
68	Spruce		350			0.19	2.00
59	Jeanne D'Arc		400			0.22	1.75
69	Helene		300			0.19	2.63
54	Tena		150			0.01	0.67
50	Vermillion		250			0.14	2.79
53	Landry		300			0.07	0.92
42	Charette		250	488		0.08	1.70
xx	Dowling STP LS		300			0.10	1.46
45	Fraser		200			0.04	1.24
27	Edward		300			0.05	0.68
56	O'Neil	275.7	250	703	287.11	0.12	2.47
63	Jacob		400			0.18	1.45
31	Fourth Ave.		150			0.02	1.29
12	Ramsey		250			0.06	1.30

MOE Velocity range for a Force Main: 0.8 to 2.5 m/s

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.11

Lift Stations without Backup Power

L.S. with No Stand by Power	
No.	**Lift Station**
Valley East	
49	Madeleine
71	Fleming
Capreol	
51	Lloyd St.
50	Vermillion
Azilda	
33	Maple
Chelmsford	
7	Radisson
32	Hazel
41	Brookside
43	Belanger
46	Whitson
Dowling	
70	Lionel
XX	Dowling STP LS
Garson	
57	Gar-Con
55	Penman
56	O'Neil
Walden	
74	Oja
65	Simon Lk West
64	Simon Lk East
62	Vagnini
61	Magill
Old Sudbury	
25	Moonight Beach
28	North Shore
10	Selkirk
4	Lagace
5	Dufferin
75	Bell Park
9	Lakeview
38	Kincora
20	Beverly
South End	
18	Cerilli
23	Loach's
22	Oriole
24	Helen's Point
15	Ester

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.12

Sudbury Sanitary Lift Station Capacity Review

Sudbury Sanitary Lift Station Capacity Review

Review Criteria's

1) Unit Density (units/ha)	**12**	units/ha	based on Meridian population projections
2) Pop Density (cap/unit)	**2.30**	cap/unit	based on Meridian population projections
3) Per Capita Flow (Existing)	**410**	L/cap/day	RMOS Engineering Design Manual (January 1994)
4) Extraneous flow: Infiltration Rate (Ex.)	**44900**	L/ha/day	RMOS Engineering Design Manual (January 1994)
5) Per Capita Flow (New)	**410**	L/cap/day	RMOS Engineering Design Manual (January 1994)
6) Extraneous flow: Infiltration Rate (New)	**44900**	L/ha/day	RMOS Engineering Design Manual (January 1994)

7) Pump rate capacity from Waste Water Lift Stations GCS O/M (appendix B Pump Drawdown Rate) (issued 03-01-06)

8) Lift Station capacity rated as the total pump drawdown rate.

9) Existing L.S. drainage areas taken from GCS Sanitary Utility Services Key Plans, extended 50' from approx P/L. (received 03-11-05))

10) Where lift stations collect flow from upstream lift stations the peak flow is taken as the total of all drainage areas.

		LIFT STATION CAPACITY						EXISTING CONDITION							SCENARIO #1 IN-MIGRATION																		SCENARIO #2 HIGH-IN MIGRATION									
															DRAFT APPROVED SUBDIVISIONS									DESIGNATED LAND										DESIGNATED LAND									
																					Lift Station								Lift Station								Lift Station			
No.	Lift Station	Pump #1 Rate-GPM	Pump #2 Rate-GPM	Pump #3 Rate-GPM	TOTAL Rate-GPM	Firm Capacity (GPM)	Firm Capacity (L/S)	Drainage Area (ha)	Units	Pop.	Peak Flow (L/S)	P/F	Reserve Cap. (L/S)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.
36	Moonlight	166.01	147.15	n/a	180.64	147.15	**11.149**	10.60	127	293	11.18	Fail	-0.03	100%		0	0.00	0	0.00	11.18	Fail	-0.03	100%		0	0.00	0	0.00	11.18	Fail	-0.03	100%		0	0.00	0	0.00	11.18	Fail	-0.03	100%
25	Moonlight Beach	*n/a*	*n/a*	*n/a*	*n/a*	*100.00*	**7.577**	2.70	32	75	2.92	Pass	4.66	38%		0	0.00	0	0.00	2.92	Pass	4.66	38%		0	0.00	0	0.00	2.92	Pass	4.66	38%		0	0.00	0	0.00	2.92	Pass	4.66	38%
35	Levesque	1779.60	1787.90	n/a	2257.10	1779.60	**134.837**	52.30	628	1443	52.47	Pass	82.37	39%	Lionsgate	244	20.33	561	21.08	73.55	Pass	61.29	55%	Designated Area Bancroft	624	52.00	1435	52.18	125.72	Pass	9.11	93%		0	0.00	0	0.00	125.72	Pass	9.11	93%
31	Fourth Ave.	107.70	100.80	n/a	195.20	100.80	**7.637**	17.60	211	486	18.32	Fail	-10.68	240%		0	0.00	0	0.00	18.32	Fail	-10.68	240%	Designated Area Greenwood	50	4.17	115	4.47	22.79	Fail	-15.16	298%		0	0.00	0	0.00	22.79	Fail	-15.16	298%
28	North Shore	214.00	154.00	n/a	241.00	154.00	**11.668**	6.00	72	166	6.40	Pass	5.27	55%		0	0.00	0	0.00	6.40	Pass	5.27	55%		0	0.00	0	0.00	6.40	Pass	5.27	55%		0	0.00	0	0.00	6.40	Pass	5.27	55%
10	Selkirk	467.00	502.00	n/a	530.00	467.00	**35.384**	11.40	137	315	12.00	Pass	23.38	34%		0	0.00	0	0.00	12.00	Pass	23.38	34%		0	0.00	0	0.00	12.00	Pass	23.38	34%		0	0.00	0	0.00	12.00	Pass	23.38	34%
3	St-Charles	5845.00	4122.00	n/a	5970.00	4122.00	**312.316**	131.60	1579	3632	126.48	Pass	185.83	40%		0	0.00	0	0.00	126.48	Pass	185.83	40%		0	0.00	0	0.00	126.48	Pass	185.83	40%		0	0.00	0	0.00	126.48	Pass	185.83	40%
4	Lagace	278.00	233.00	n/a	307.00	233.00	**17.654**	6.20	74	171	6.61	Pass	11.04	37%		0	0.00	0	0.00	6.61	Pass	11.04	37%		0	0.00	0	0.00	6.61	Pass	11.04	37%		0	0.00	0	0.00	6.61	Pass	11.04	37%
5	Dufferin	62.00	60.00	n/a	n/a	60.00	**4.546**	1.20	14	33	1.31	Pass	3.24	29%		0	0.00	0	0.00	1.31	Pass	3.24	29%		0	0.00	0	0.00	1.31	Pass	3.24	29%		0	0.00	0	0.00	1.31	Pass	3.24	29%
75	Bell Park	n/a	n/a	n/a	n/a	100.00	**7.577**	1.00	12	28	1.09	Pass	6.49	14%		0	0.00	0	0.00	1.09	Pass	6.49	14%		0	0.00	0	0.00	1.09	Pass	6.49	14%		0	0.00	0	0.00	1.09	Pass	6.49	14%
26	York	483.00	484.00	n/a	493.00	483.00	**36.596**	7.30	88	201	7.76	Pass	28.84	21%		0	0.00	0	0.00	7.76	Pass	28.84	21%		0	0.00	0	0.00	7.76	Pass	28.84	21%		0	0.00	0	0.00	7.76	Pass	28.84	21%
8	Mark	624.60	636.30	n/a	696.10	624.60	**47.325**	19.70	236	544	20.44	Pass	26.88	43%		0	0.00	0	0.00	20.44	Pass	26.88	43%		0	0.00	0	0.00	20.44	Pass	26.88	43%		0	0.00	0	0.00	20.44	Pass	26.88	43%
9	Lakeview	471.00	449.00	n/a	528.00	449.00	**34.020**	1.30	16	36	1.41	Pass	32.61	4%		0	0.00	0	0.00	1.41	Pass	32.61	4%		0	0.00	0	0.00	1.41	Pass	32.61	4%		0	0.00	0	0.00	1.41	Pass	32.61	4%
38	Kincora	123.00	133.00	n/a	144.00	123.00	**9.319**	4.30	52	119	4.61	Pass	4.71	49%		0	0.00	0	0.00	4.61	Pass	4.71	49%		0	0.00	0	0.00	4.61	Pass	4.71	49%		0	0.00	0	0.00	4.61	Pass	4.71	49%
20	Beverly	262.00	234.00	n/a	308.00	234.00	**17.730**	13.50	162	373	14.15	Pass	3.58	80%		0	0.00	0	0.00	14.15	Pass	3.58	80%		0	0.00	0	0.00	14.15	Pass	3.58	80%		0	0.00	0	0.00	14.15	Pass	3.58	80%
12	Ramsey	517.52	383.31	n/a	548.43	383.31	**29.043**	64.00	768	1766	63.66	Fail	-34.62	219%		0	0.00	0	0.00	63.66	Fail	-34.62	219%		0	0.00	0	0.00	63.66	Fail	-34.62	219%		0	0.00	0	0.00	63.66	Fail	-34.62	219%
19	Walford East	1802.86	2063.21	n/a	2541.43	1802.86	**136.599**	99.80	1198	2754	97.27	Pass	39.33	71%		0	0.00	0	0.00	97.27	Pass	39.33	71%		0	0.00	0	0.00	97.27	Pass	39.33	71%		0	0.00	0	0.00	97.27	Pass	39.33	71%
16	Southview	775.85	894.72	n/a	1006.23	775.85	**58.785**	52.40	629	1446	52.56	Pass	6.22	89%		0	0.00	0	0.00	52.56	Pass	6.22	89%		0	0.00	0	0.00	52.56	Pass	6.22	89%		0	0.00	0	0.00	52.56	Pass	6.22	89%

Note: Moonlight and Moonlight Beach Lift Stations pump to Levesque L.S.
Note: Pump drawdown rate not available for Moonlight Beach lift station.
Note: Selkirk Lift Station pumps to St-Charles L.S.
Note: Bell Park Lift Station pumps to York L.S.
Note: York Lift Station pumps to Mark L.S.
Note: Lakeview Lift Station pumps to Mark L.S.
Note: Ramsey Lift Station pumps to Walford East L.S. (see South End Capacity Review)

Note: Under existing conditions the following lift stations have a history of high flows and/or high well alarms.
(As per CGS Operations)

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.13

Sudbury Sanitary Lift Station Capacity Review

Sudbury Sanitary Lift Station Capacity Review

Review Criteria's

1) Unit Density (units/ha)	**12** units/ha	based on Meridian population projections
2) Pop Density (cap/unit)	**2.30** cap/unit	based on Meridian population projections
3) Per Capita Flow (Existing)	**410** L/cap/day	RMOS Engineering Design Manual (January 1994)
4) Extraneous flow: Infiltration Rate (Ex.)	**44900** L/ha/day	RMOS Engineering Design Manual (January 1994)
5) Per Capita Flow (New)	**410** L/cap/day	RMOS Engineering Design Manual (January 1994)
6) Extraneous flow: Infiltration Rate (New)	**44900** L/ha/day	RMOS Engineering Design Manual (January 1994)

7) Pump rate capacity from Waste Water Lift Stations GCS O/M (appendix B Pump Drawdown Rate) (issued 03-01-06)

8) Lift Station capacity rated as the total pump drawdown rate.

9) Existing L.S. drainage areas taken from GCS Sanitary Utility Services Key Plans, extended 50' from approx P/L. (received 03-11-05))

10) Where lift stations collect flow from upstream lift stations the peak flow is taken as the total of all drainage areas.

		LIFT STATION CAPACITY						EXISTING CONDITION							SCENARIO #1 IN-MIGRATION																		SCENARIO #2 HIGH-IN MIGRATION									
															DRAFT APPROVED SUBDIVISIONS									DESIGNATED LAND										DESIGNATED LAND									
No.	Lift Station	Pump #1 Rate-GPM	Pump #2 Rate-GPM	Pump #3 Rate-GPM	TOTAL Rate-GPM	Installed Capacity (GPM)	Installed Capacity (L/S)	Drainage Area (ha)	Units	Pop.	Peak Flow (L/S)	P/F	Reserve Cap. (L/S)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.
36	Moonlight	166.01	147.15	n/a	180.64	180.64	**13.687**	10.60	127	293	11.18	Pass	2.51	82%		0	0.00	0	0.00	11.18	Pass	2.51	82%		0	0.00	0	0.00	11.18	Pass	2.51	82%		0	0.00	0	0.00	11.18	Pass	2.51	82%
31	Fourth Ave.	107.70	100.80	n/a	195.20	195.20	**14.790**	17.60	211	486	18.32	Fail	-3.53	124%		0	0.00	0	0.00	18.32	Fail	-3.53	124%	Designated Area Greenwood	50	4.17	115	4.47	22.79	Fail	-8.00	154%		0	0.00	0	0.00	22.79	Fail	-8.00	154%
12	Ramsey	517.52	383.31	n/a	548.43	548.43	**41.554**	64.00	768	1766	63.66	Fail	-22.11	153%		0	0.00	0	0.00	63.66	Fail	-22.11	153%		0	0.00	0	0.00	63.66	Fail	-22.11	153%		0	0.00	0	0.00	63.66	Fail	-22.11	153%

Note: Moonlight and Moonlight Beach Lift Stations pump to Levesque L.S.
Note: Pump drawdown rate not available for Moonlight Beach lift station.
Note: Selkirk Lift Station pumps to St-Charles L.S.
Note: Bell Park Lift Station pumps to York L.S.
Note: York Lift Station pumps to Mark L.S.
Note: Lakeview Lift Station pumps to Mark L.S.
Note: Ramsey Lift Station pumps to Walford East L.S. (see South End Capacity Review)

Note: Under existing conditions the following lift stations have a history of high flows and/or high well alarms.
(As per CGS Operations)

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.14

New Sudbury Sanitary Lift Station Capacity Review

New Sudbury Sanitary Lift Station Capacity Review

Review Criteria's

1) Unit Density (units/ha)	**12**	units/ha	based on Meridian population projections
2) Pop Density (cap/unit)	**2.30**	cap/unit	based on Meridian population projections
3) Per Capita Flow (Existing)	**410**	L/cap/day	RMOS Engineering Design Manual (January 1994)
4) Extraneous flow: Infiltration Rate (Ex.)	**44900**	L/ha/day	RMOS Engineering Design Manual (January 1994)
5) Per Capita Flow (New)	**410**	L/cap/day	RMOS Engineering Design Manual (January 1994)
6) Extraneous flow: Infiltration Rate (New)	**44900**	L/ha/day	RMOS Engineering Design Manual (January 1994)

7) Pump rate capacity from Waste Water Lift Stations GCS O/M (appendix B Pump Drawdown Rate) (issued 03-01-06)

8) Lift Station capacity rated as the total pump drawdown rate.

9) Existing L.S. drainage areas taken from GCS Sanitary Utility Services Key Plans, extended 50' from approx P/L. (received 03-11-05))

10) Where lift stations collect flow from upstream lift stations the peak flow is taken as the total of all drainage areas.

		LIFT STATION CAPACITY						EXISTING CONDITION							SCENARIO #1 IN-MIGRATION														SCENARIO #2 HIGH-IN MIGRATION								
															DRAFT APPROVED SUBDIVISIONS									DESIGNATED LAND									DESIGNATED LAND								
														Lift Station							Lift Station							Lift Station							Lift Station			
No.	Lift Station	Pump #1 Rate-GPM	Pump #2 Rate-GPM	Pump #3 Rate-GPM	TOTAL Rate-GPM	Firm Capacity (GPM)	Firm Capacity (L/S)	Drainage Area (ha)	Units	Pop.	Peak Flow (L/S)	P/F	Reserve Cap. (L/S)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.
37	Don Lita	683.90	683.90	n/a	586.30	683.90	**51.818**	23.90	287	660	24.66	Pass	27.16	48%		0	0.00	0	0.00	24.66	Pass	27.16	48%		0	0.00	0	0.00	24.66	Pass	27.16	48%		0	0.00	0	0.00	24.66	Pass	27.16	48%
34	Sherwood	690.00	608.00	n/a	699.00	608.00	**46.067**	21.60	259	596	22.35	Pass	23.71	49%		0	0.00	0	0.00	22.35	Pass	23.71	49%		0	0.00	0	0.00	22.35	Pass	23.71	49%		0	0.00	0	0.00	22.35	Pass	23.71	49%

NOTE: Blue text denotes data entry required

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.15

Lively Sanitary Lift Station Capacity Review

Lively Sanitary Lift Station Capacity Review

Review Criterias

1) Unit Density (units/ha)	**12**	units/ha	based on Meridian population projections
2) Pop Density (cap/unit)	**2.30**	cap/unit	based on Meridian population projections
3) Per Capita Flow (Existing)	**410**	L/cap/day	`
4) Extraneaous flow: Infiltration Rate (Ex.)	**33700**	L/ha/day	RMOS Engineering Design Manual (January 1994)
5) Per Capita Flow (New)	**410**	L/cap/day	RMOS Engineering Design Manual (January 1994)
6) Extraneaous flow: Infiltration Rate (New)	**33700**	L/ha/day	RMOS Engineering Design Manual (January 1994)

7) Pump rate capacity from Waste Water Lift Stations GCS O/M (appendix B Pump Drawdown Rate) (issued 03-01-06)

8) Lift Station capacity rated as the total pump drawdown rate.

9) Existing L.S. drainage areas taken from GCS Sanitary Utility Services Key Plans, extended 50' from approx P/L. (received 03-11-05))

10) Where lift stations collect flow from upstream lift stations the peak flow is taken as the total of all drainage areas.

		LIFT STATION CAPACITY						EXISTING CONDITION							SCENARIO #1 IN-MIGRATION														SCENARIO #2 HIGH-IN MIGRATION								
															DRAFT APPROVED SUBDIVISIONS									DESIGNATED LAND									DESIGNATED LAND								
													Lift Station						Lift Station						Lift Station						Lift Station						Lift Station		
No.	Lift Station	Pump #1 Rate-GPM	Pump #2 Rate-GPM	Pump #3 Rate-GPM	TOTAL Rate-GPM	Firm Capacity (GPM)	Firm Capacity (L/S)	Drainage Area (ha)	Units	Pop.	Peak Flow (L/S)	P/F	Reserve Cap. (L/S)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.
60	Anderson	792.40	795.20	n/a	1222.30	792.40	**60.039**	**61.50**	738	1697	53.31	Pass	6.73	89%	Sugarbush	34	2.83	78	2.69	56.00	Pass	4.04	93%	Designated Area 2	221	18.40	508	16.75	72.74	Fail	-12.71	121%	Designated Area 2	96	8.00	221	7.45	80.19	Fail	-20.16	134%

Note: Under existing conditions the following lift stations have a history of high flows and/or high well alarms.
(As per CGS Operations)

NOTE: Blue text denotes data entry required

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.16

Lively Sanitary Lift Station Capacity Review

Lively Sanitary Lift Station Capacity Review

Review Criterias

1) Unit Density (units/ha)	**12**	units/ha	based on Meridian population projections
2) Pop Density (cap/unit)	**2.30**	cap/unit	based on Meridian population projections
3) Per Capita Flow (Existing)	**410**	L/cap/day	`
4) Extraneaous flow: Infiltration Rate (Ex.)	**33700**	L/ha/day	RMOS Engineering Design Manual (January 1994)
5) Per Capita Flow (New)	**410**	L/cap/day	RMOS Engineering Design Manual (January 1994)
6) Extraneaous flow: Infiltration Rate (New)	**33700**	L/ha/day	RMOS Engineering Design Manual (January 1994)

7) Pump rate capacity from Waste Water Lift Stations GCS O/M (appendix B Pump Drawdown Rate) (issued 03-01-06)

8) Lift Station capacity rated as the total pump drawdown rate.

9) Existing L.S. drainage areas taken from GCS Sanitary Utility Services Key Plans, extended 50' from approx P/L. (received 03-11-05))

10) Where lift stations collect flow from upstream lift stations the peak flow is taken as the total of all drainage areas.

		LIFT STATION CAPACITY						EXISTING CONDITION							SCENARIO #1 IN-MIGRATION													SCENARIO #2 HIGH-IN MIGRATION								
															DRAFT APPROVED SUBDIVISIONS									DESIGNATED LAND									DESIGNATED LAND								
														Lift Station							Lift Station							Lift Station							Lift Station		
No.	Lift Station	Pump #1 Rate-GPM	Pump #2 Rate-GPM	Pump #3 Rate-GPM	TOTAL Rate-GPM	Installed Capacity (GPM)	Installed Capacity (L/S)	Drainage Area (ha)	Units	Pop.	Peak Flow (L/S)	P/F	Reserve Cap. (L/S)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.
60	Anderson	792.40	795.20	n/a	1222.30	1222.30	**92.611**	61.50	738	1697	53.31	Pass	39.30	58%	Sugarbush	34	2.83	78	2.69	56.00	Pass	36.61	60%	Designated Area 2	221	18.40	508	16.75	72.74	Pass	19.87	79%	Designated Area 2	96	8.00	221	7.45	80.19	Pass	12.42	87%

Note: Under existing conditions the following lift stations have a history of high flows and/or high well alarms.
(As per CGS Operations)

NOTE: Blue text denotes data entry required

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.17

Wahnapitae Sanitary Lift Station Capacity Review

Wahnapitae Sanitary Lift Station Capacity Review

Review Criterias

1) Unit Density (units/ha)	**12** units/ha	based on Meridian population projections
2) Pop Density (cap/unit)	**2.30** cap/unit	based on Meridian population projections
3) Per Capita Flow (Existing)	**410** L/cap/day	RMOS Engineering Design Manual (January 1994)
4) Extraneaous flow: Infiltration Rate (Ex.)	**33700** L/ha/day	RMOS Engineering Design Manual (January 1994)
5) Per Capita Flow (New)	**410** L/cap/day	RMOS Engineering Design Manual (January 1994)
6) Extraneaous flow: Infiltration Rate (New)	**33700** L/ha/day	RMOS Engineering Design Manual (January 1994)

7) Pump rate capacity from Waste Water Lift Stations GCS O/M (appendix B Pump Drawdown Rate) (issued 03-01-06)

8) Lift Station capacity rated as the total pump drawdown rate.

9) Existing L.S. drainage areas taken from GCS Sanitary Utility Services Key Plans, extended 50' from approx P/L. (received 03-11-05))

10) Where lift stations collect flow from upstream lift stations the peak flow is taken as the total of all drainage areas.

		LIFT STATION CAPACITY						EXISTING CONDITION							SCENARIO #1 IN-MIGRATION												SCENARIO #2 HIGH-IN MIGRATION								
															DRAFT APPROVED SUBDIVISIONS									DESIGNATED LAND									DESIGNATED LAND							
													Lift Station							Lift Station							Lift Station							Lift Station		
No.	Lift Station	Pump #1 Rate-GPM	Pump #2 Rate-GPM	Pump #3 Rate-GPM	TOTAL Rate-GPM	Firm Capacity (GPM)	Firm Capacity (L/S)	Drainage Area (ha)	Units	Pop.	Peak Flow (L/S)	P/F	Reserve Cap. (L/S)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.
72	Riverside	789.00	745.00	n/a	877.00	745.00	**56.447**	67.10	805	1852	57.91	Fail	-1.46	103%		0	0.00	0	0.00	57.91	Fail	-1.46	103%		0	0.00	0	0.00	57.91	Fail	-1.46	103%		0	0.00	0	0.00	57.91	Fail	-1.46	103%

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.18

Wahnapitae Sanitary Lift Station Capacity Review

Wahnapitae Sanitary Lift Station Capacity Review

Review Criterias

1) Unit Density (units/ha)	**12** units/ha	based on Meridian population projections
2) Pop Density (cap/unit)	**2.30** cap/unit	based on Meridian population projections
3) Per Capita Flow (Existing)	**410** L/cap/day	RMOS Engineering Design Manual (January 1994)
4) Extraneaous flow: Infiltration Rate (Ex.)	**33700** L/ha/day	RMOS Engineering Design Manual (January 1994)
5) Per Capita Flow (New)	**410** L/cap/day	RMOS Engineering Design Manual (January 1994)
6) Extraneaous flow: Infiltration Rate (New)	**33700** L/ha/day	RMOS Engineering Design Manual (January 1994)

7) Pump rate capacity from Waste Water Lift Stations GCS O/M (appendix B Pump Drawdown Rate) (issued 03-01-06)

8) Lift Station capacity rated as the total pump drawdown rate.

9) Existing L.S. drainage areas taken from GCS Sanitary Utility Services Key Plans, extended 50' from approx P/L. (received 03-11-05))

10) Where lift stations collect flow from upstream lift stations the peak flow is taken as the total of all drainage areas.

		LIFT STATION CAPACITY						EXISTING CONDITION							SCENARIO #1 IN-MIGRATION													SCENARIO #2 HIGH-IN MIGRATION								
															DRAFT APPROVED SUBDIVISIONS									DESIGNATED LAND									DESIGNATED LAND								
														Lift Station							Lift Station							Lift Station							Lift Station			
No.	Lift Station	Pump #1 Rate-GPM	Pump #2 Rate-GPM	Pump #3 Rate-GPM	TOTAL Rate-GPM	Installed Capacity (GPM)	Installed Capacity (L/S)	Drainage Area (ha)	Units	Pop.	Peak Flow (L/S)	P/F	Reserve Cap. (L/S)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.
72	Riverside	789.00	745.00	n/a	877.00	877.00	**66.449**	67.10	805	1852	57.91	Pass	8.54	87%		0	0.00	0	0.00	57.91	Pass	8.54	87%		0	0.00	0	0.00	57.91	Pass	8.54	87%		0	0.00	0	0.00	57.91	Pass	8.54	87%

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.19

Copper Cliff Sanitary Lift Station Capacity Review

Copper Cliff Sanitary Lift Station Capacity Review

Review Criteria's

1) Unit Density (units/ha)	**12** units/ha	based on Meridian population projections
2) Pop Density (cap/unit)	**2.30** cap/unit	based on Meridian population projections
3) Per Capita Flow (Existing)	**500** L/cap/day	RMOS Engineering Design Manual (January 1994)
4) Extraneous flow: Infiltration Rate (Ex.)	**22450** L/ha/day	RMOS Engineering Design Manual (January 1994)
5) Per Capita Flow (New)	**500** L/cap/day	RMOS Engineering Design Manual (January 1994)
6) Extraneous flow: Infiltration Rate (New)	**33700** L/ha/day	RMOS Engineering Design Manual (January 1994)

7) Pump rate capacity from Waste Water Lift Stations GCS O/M (appendix B Pump Drawdown Rate) (issued 03-01-06)

8) Lift Station capacity rated as the total pump drawdown rate.

9) Existing L.S. drainage areas taken from GCS Sanitary Utility Services Key Plans, extended 50' from approx P/L. (received 03-11-05))

10) Where lift stations collect flow from upstream lift stations the peak flow is taken as the total of all drainage areas.

		LIFT STATION CAPACITY						EXISTING CONDITION							SCENARIO #1 IN-MIGRATION																SCENARIO #2 HIGH-IN MIGRATION								
															DRAFT APPROVED SUBDIVISIONS									DESIGNATED LAND									DESIGNATED LAND								
																					Lift Station							Lift Station							Lift Station			
No.	Lift Station	Pump #1 Rate-GPM	Pump #2 Rate-GPM	Pump #3 Rate-GPM	TOTAL Rate-GPM	Firm Capacity (GPM)	Firm Capacity (L/S)	Drainage Area (ha)	Units	Pop.	Peak Flow (L/S)	P/F	Reserve Cap. (L/S)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.
40	Orford	323.41	342.24	n/a	422.71	323.41	**24.504**	5.90	71	163	5.47	Pass	19.03	22%		0	0.00	0	0.00	5.47	Pass	19.03	22%		0	0.00	0	0.00	5.47	Pass	19.03	22%		0	0.00	0	0.00	5.47	Pass	19.03	22%
13	Nickel	*2535.00*	*2673.00*	*2598*	*2922.00*	2535.00	**192.072**	81.90	983	2260	67.64	Pass	124.43	35%		0	0.00	0	0.00	67.64	Pass	124.43	35%		0	0.00	0	0.00	67.64	Pass	124.43	35%		0	0.00	0	0.00	67.64	Pass	124.43	35%

Note: Orford Lift Station pumps to Nickel L.S.

Note: Under existing conditions the following lift stations have a history of high flows and/or high well alarms.

(As per CGS Operations)

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.20

Walden Sanitary Lift Station Capacity Review

Walden Sanitary Lift Station Capacity Review

Review Criterias

1) Unit Density (units/ha)	**12** units/ha	based on Meridian population projections
2) Pop Density (cap/unit)	**2.30** cap/unit	based on Meridian population projections
3) Per Capita Flow (Existing)	**450** L/cap/day	RMOS Engineering Design Manual (January 1994)
4) Extraneaous flow: Infiltration Rate (Ex.)	**18050** L/ha/day	RMOS Engineering Design Manual (January 1994)
5) Per Capita Flow (New)	**450** L/cap/day	RMOS Engineering Design Manual (January 1994)
6) Extraneaous flow: Infiltration Rate (New)	**18050** L/ha/day	RMOS Engineering Design Manual (January 1994)

7) Pump rate capacity from Waste Water Lift Stations GCS O/M (appendix B Pump Drawdown Rate) (issued 03-01-06)

8) Lift Station capacity rated as the total pump drawdown rate.

9) Existing L.S. drainage areas taken from GCS Sanitary Utility Services Key Plans, extended 50' from approx P/L. (received 03-11-05))

10) Where lift stations collect flow from upstream lift stations the peak flow is taken as the total of all drainage areas.

		LIFT STATION CAPACITY						EXISTING CONDITION							SCENARIO #1 IN-MIGRATION																		SCENARIO #2 HIGH-IN MIGRATION									
															DRAFT APPROVED SUBDIVISIONS										DESIGNATED LAND										DESIGNATED LAND									
																					Lift Station								Lift Station								Lift Station			
No.	Lift Station	Pump #1 Rate-GPM	Pump #2 Rate-GPM	Pump #3 Rate-GPM	TOTAL Rate-GPM	Firm Capacity (GPM)	Firm Capacity (L/S)	Drainage Area (ha)	Units	Pop.	Peak Flow (L/S)	P/F	Lift Station Reserve Cap. (L/S)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.
74	Oja	287.69	331.60	n/a	301.95	287.69	**21.798**	16.80	202	464	13.15	Pass	8.65	60%		0	0.00	0	0.00	13.15	Pass	8.65	60%		0	0.00	0	0.00	13.15	Pass	8.65	60%		0	0.00	0	0.00	13.15	Pass	8.65	60%
65	Simon Lk West	411.00	494.00	n/a	515.00	411.00	**31.141**	47.20	566	1303	35.12	Fail	-3.98	113%		0	0.00	0	0.00	35.12	Fail	-3.98	113%		0	0.00	0	0.00	35.12	Fail	-3.98	113%		0	0.00	0	0.00	35.12	Fail	-3.98	113%
64	Simon Lk East	617.00	699.00	n/a	785.00	617.00	**46.749**	75.90	911	2095	54.81	Fail	-8.06	117%		0	0.00	0	0.00	54.81	Fail	-8.06	117%		0	0.00	0	0.00	54.81	Fail	-8.06	117%		0	0.00	0	0.00	54.81	Fail	-8.06	117%
63	Jacob	*1187.00*	*1140.00*	*1199*	*2364.00*	1140.00	**86.376**	223.40	2681	6166	148.13	Fail	-61.76	171%	Jacobson Cavdon Polvi Southfield Hillcrest	144	12.03	332	9.53	157.66	Fail	-71.29	183%	Lively Designated Area #1	221	18.42	508	14.36	172.02	Fail	-85.65	199%	Jacobson Cavdon Polvi Southfield Hillcrest	149	12.42	343	9.83	181.85	Fail	-95.47	211%
62	Vagnini	355.00	469.00	n/a	582.00	355.00	**26.898**	31.30	376	864	23.82	Pass	3.08	89%		0	0.00	0	0.00	23.82	Pass	3.08	89%		0	0.00	0	0.00	23.82	Pass	3.08	89%		0	0.00	0	0.00	23.82	Pass	3.08	89%
61	Magill	233.17	246.88	n/a	333.37	233.17	**17.667**	27.60	331	762	21.13	Fail	-3.47	120%		0	0.00	0	0.00	21.13	Fail	-3.47	120%		0	0.00	0	0.00	21.13	Fail	-3.47	120%		0	0.00	0	0.00	21.13	Fail	-3.47	120%

Note: Oja L.S. pumps to Simon Lk West L.S.
Note: Simon Lk West lift stations pump to Simon Lk East L.S.
Note: Magill and Vagnini lift stations pump to Jacob L.S.

Note: Under existing conditions the following lift stations have a history of high flows and/or high well alarms.
(As per CGS Operations)

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.21

Walden Sanitary Lift Station Capacity Review

Walden Sanitary Lift Station Capacity Review

Review Criterias

1) Unit Density (units/ha)	**12** units/ha	based on Meridian population projections
2) Pop Density (cap/unit)	**2.30** cap/unit	based on Meridian population projections
3) Per Capita Flow (Existing)	**450** L/cap/day	RMOS Engineering Design Manual (January 1994)
4) Extraneaous flow: Infiltration Rate (Ex.)	**18050** L/ha/day	RMOS Engineering Design Manual (January 1994)
5) Per Capita Flow (New)	**450** L/cap/day	RMOS Engineering Design Manual (January 1994)
6) Extraneaous flow: Infiltration Rate (New)	**18050** L/ha/day	RMOS Engineering Design Manual (January 1994)

7) Pump rate capacity from Waste Water Lift Stations GCS O/M (appendix B Pump Drawdown Rate) (issued 03-01-06)

8) Lift Station capacity rated as the total pump drawdown rate.

9) Existing L.S. drainage areas taken from GCS Sanitary Utility Services Key Plans, extended 50' from approx P/L. (received 03-11-05))

10) Where lift stations collect flow from upstream lift stations the peak flow is taken as the total of all drainage areas.

		LIFT STATION CAPACITY						EXISTING CONDITION							SCENARIO #1 IN-MIGRATION																		SCENARIO #2 HIGH-IN MIGRATION									
															DRAFT APPROVED SUBDIVISIONS										DESIGNATED LAND										DESIGNATED LAND									
																					Lift Station								Lift Station								Lift Station			
No.	Lift Station	Pump #1 Rate-GPM	Pump #2 Rate-GPM	Pump #3 Rate-GPM	TOTAL Rate-GPM	Installed Capacity (GPM)	Installed Capacity (L/S)	Drainage Area (ha)	Units	Pop.	Peak Flow (L/S)	P/F	Reserve Cap. (L/S)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.
65	Simon Lk West	411.00	494.00	n/a	515.00	515.00	**39.021**	47.20	566	1303	35.12	Pass	3.90	90%		0	0.00	0	0.00	35.12	Pass	3.90	90%		0	0.00	0	0.00	35.12	Pass	3.90	90%		0	0.00	0	0.00	35.12	Pass	3.90	90%
64	Simon Lk East	617.00	699.00	n/a	785.00	785.00	**59.478**	75.90	911	2095	54.81	Pass	4.67	92%		0	0.00	0	0.00	54.81	Pass	4.67	92%		0	0.00	0	0.00	54.81	Pass	4.67	92%		0	0.00	0	0.00	54.81	Pass	4.67	92%
63	Jacob	*1187.00*	*1140.00*	*1199*	*2364.00*	2364.00	**179.116**	223.40	2681	6166	148.13	Pass	30.98	83%	Jacobson Cavdon Polvi Southfield Hillcrest	144	12.03	332	9.53	157.66	Pass	21.45	88%	Lively Designated Area #1	221	18.42	508	14.36	172.02	Pass	7.09	96%	Jacobson Cavdon Polvi Southfield Hillcrest	149	12.42	343	9.83	181.85	Fail	-2.73	102%
61	Magill	233.17	246.88	n/a	333.37	333.37	**25.259**	27.60	331	762	21.13	Pass	4.13	84%		0	0.00	0	0.00	21.13	Pass	4.13	84%		0	0.00	0	0.00	21.13	Pass	4.13	84%		0	0.00	0	0.00	21.13	Pass	4.13	84%

Note: Oja L.S. pumps to Simon Lk West L.S.
Note: Simon Lk West lift stations pump to Simon Lk East L.S.
Note: Magill and Vagnini lift stations pump to Jacob L.S.

Note: Under existing conditions the following lift stations have a history of high flows and/or high well alarms.

(As per CGS Operations)

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.22

Garson Sanitary Lift Station Capacity Review

Garson Sanitary Lift Station Capacity Review

Review Criteria's

1) Unit Density (units/ha)	**12**	units/ha	based on Meridian population projections
2) Pop Density (cap/unit)	**2.30**	cap/unit	based on Meridian population projections
3) Per Capita Flow (Existing)	**360**	L/cap/day	RMOS Engineering Design Manual (January 1994)
4) Extraneous flow: Infiltration Rate (Ex.)	**11250**	L/ha/day	RMOS Engineering Design Manual (January 1994)
5) Per Capita Flow (New)	**360**	L/cap/day	RMOS Engineering Design Manual (January 1994)
5) Extraneous flow: Infiltration Rate (New)	**11250**	L/ha/day	RMOS Engineering Design Manual (January 1994)

7) Pump rate capacity from Waste Water Lift Stations GCS O/M (appendix B Pump Drawdown Rate) (issued 03-01-06)

8) Lift Station capacity rated as the total pump drawdown rate.

9) Existing L.S. drainage areas taken from GCS Sanitary Utility Services Key Plans, extended 50' from approx P/L. (received 03-11-05))

10) Where lift stations collect flow from upstream lift stations the peak flow is taken as the total of all drainage areas.

		LIFT STATION CAPACITY						EXISTING CONDITION						SCENARIO #1 IN-MIGRATION														SCENARIO #2 HIGH-IN MIGRATION								
														DRAFT APPROVED SUBDIVISIONS									DESIGNATED LAND									DESIGNATED LAND								
													Lift Station							Lift Station							Lift Station							Lift Station			
No.	Lift Station	Pump #1 Rate-GPM	Pump #2 Rate-GPM	Pump #3 Rate-GPM	TOTAL Rate-GPM	Firm Capacity (GPM)	Firm Capacity (L/S)	Drainage Area (ha)	Units	Pop.	Peak Flow (L/S)	P/F	Reserve Cap. (L/S)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.
57	Gar-Con	227.40	240.50	n/a	233.50	227.40	**17.230**	26.30	316	726	15.18	Pass	2.05	88%		0	0.00	0	0.00	15.18	Pass	2.05	88%		0	0.00	0	0.00	15.18	Pass	2.05	88%		0	0.00	0	0.00	15.18	Pass	2.05	88%
55	Penman	272.97	n/a	n/a	272.97	272.97	**20.682**	8.20	98	226	4.96	Pass	15.72	24%		0	0.00	0	0.00	4.96	Pass	15.72	24%		0	0.00	0	0.00	4.96	Pass	15.72	24%	Designated Area 1	96	8.00	221	4.84	9.80	Pass	10.88	47%
56	O'Neil	1020.00	1032.00	n/a	1453.00	1020.00	**77.284**	220.80	2650	6094	109.10	Fail	-31.81	141%	Fabian Crescent Harrington	146	12.17	336	7.26	116.36	Fail	-39.08	151%		0	0.00	0	0.00	116.36	Fail	-39.08	151%	Fabian Crescent Harrington	3	0.28	8	0.18	121.38	Fail	-44.10	157%

Note: Gar-Con Lift Station pumps to O'Neil L.S.
Note: Penman Lift Station pumps to O'Neil L.S.

Note: Under existing conditions the following lift stations have a history of high flows and/or high well alarms.
(As per CGS Operations)

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.23

Garson Sanitary Lift Station Capacity Review

Garson Sanitary Lift Station Capacity Review

Review Criteria's

1) Unit Density (units/ha)	**12**	units/ha	based on Meridian population projections
2) Pop Density (cap/unit)	**2.30**	cap/unit	based on Meridian population projections
3) Per Capita Flow (Existing)	**360**	L/cap/day	RMOS Engineering Design Manual (January 1994)
4) Extraneous flow: Infiltration Rate (Ex.)	**11250**	L/ha/day	RMOS Engineering Design Manual (January 1994)
5) Per Capita Flow (New)	**360**	L/cap/day	RMOS Engineering Design Manual (January 1994)
5) Extraneous flow: Infiltration Rate (New)	**11250**	L/ha/day	RMOS Engineering Design Manual (January 1994)

7) Pump rate capacity from Waste Water Lift Stations GCS O/M (appendix B Pump Drawdown Rate) (issued 03-01-06)

8) Lift Station capacity rated as the total pump drawdown rate.

9) Existing L.S. drainage areas taken from GCS Sanitary Utility Services Key Plans, extended 50' from approx P/L. (received 03-11-05))

10) Where lift stations collect flow from upstream lift stations the peak flow is taken as the total of all drainage areas.

		LIFT STATION CAPACITY						EXISTING CONDITION						SCENARIO #1 IN-MIGRATION														SCENARIO #2 HIGH-IN MIGRATION								
														DRAFT APPROVED SUBDIVISIONS									DESIGNATED LAND									DESIGNATED LAND								
													Lift Station						Lift Station						Lift Station						Lift Station								
No.	Lift Station	Pump #1 Rate-GPM	Pump #2 Rate-GPM	Pump #3 Rate-GPM	TOTAL Rate-GPM	Installed Capacity (GPM)	Installed Capacity (L/S)	Drainage Area (ha)	Units	Pop.	Peak Flow (L/S)	P/F	Reserve Cap. (L/S)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.
56	O'Neil	1020.00	1032.00	n/a	1453.00	1453.00	**110.091**	220.80	2650	6094	109.10	Pass	0.99	99%	Fabian Crescent Harrington	146	12.17	336	7.26	116.36	Fail	-6.27	106%		0	0.00	0	0.00	116.36	Fail	-6.27	106%	Fabian Crescent Harrington	3	0.28	8	0.18	121.38	Fail	-11.29	110%

Note: Gar-Con Lift Station pumps to O'Neil L.S.
Note: Penman Lift Station pumps to O'Neil L.S.

Note: Under existing conditions the following lift stations have a history of high flows and/or high well alarms.
(As per CGS Operations)

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.24

Coniston Sanitary Lift Station Capacity Review

Coniston Sanitary Lift Station Capacity Review

Review Criteria's

1) Unit Density (units/ha)	**12** units/ha	based on Meridian population projections
2) Pop Density (cap/unit)	**2.30** cap/unit	based on Meridian population projections
3) Per Capita Flow (Existing)	**410** L/cap/day	RMOS Engineering Design Manual (January 1994)
4) Extraneous flow: Infiltration Rate (Ex)	**33700** L/ha/day	RMOS Engineering Design Manual (January 1994)
5) Per Capita Flow (New)	**410** L/cap/day	RMOS Engineering Design Manual (January 1994)
6) Extraneous flow: Infiltration Rate (New)	**33700** L/ha/day	RMOS Engineering Design Manual (January 1994)

7) Pump rate capacity from Waste Water Lift Stations GCS O/M (appendix B Pump Drawdown Rate) (issued 03-01-06)

8) Lift Station capacity rated as the total drawdown rate.

9) Existing L.S. drainage areas taken from GCS Sanitary Utility Services Key Plans, extended 50' from approx P/L. (received 03-11-05))

10) Where lift stations collect flow from upstream lift stations the peak flow is taken as the total of all drainage areas.

		LIFT STATION CAPACITY						EXISTING CONDITION						SCENARIO #1 IN-MIGRATION														SCENARIO #2 HIGH-IN MIGRATION								
														DRAFT APPROVED SUBDIVISIONS									DESIGNATED LAND									DESIGNATED LAND								
													Lift Station						Lift Station						Lift Station						Lift Station								
No.	Lift Station	Pump #1 Rate-GPM	Pump #2 Rate-GPM	Pump #3 Rate-GPM	TOTAL Rate-GPM	Firm Capacity (GPM)	Firm Capacity (L/S)	Drainage Area (ha)	Units	Pop.	Peak Flow (L/S)	P/F	Reserve Cap. (L/S)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.
27	Edward[1]	*102.30*	*280.70*	*282*	*318.90*	102.30	***7.751***	38.00	456	1049	33.67	Fail	-25.92	434%		0	0.00	0	0.00	33.67	Fail	-25.92	434%	Designated Area #1	135	11.23	310	10.37	44.04	Fail	-36.29	568%	Designated Area #1	51	4.25	117	4.01	48.05	Fail	-40.30	620%
30	Government	1586.00	1690.00	n/a	2327.00	1586.00	**120.168**	50.40	605	1391	44.10	Pass	76.07	37%		0	0.00	0	0.00	44.10	Pass	76.07	37%	Designated Area #2	135	11.23	310	10.37	54.47	Pass	65.69	45%	Designated Area #1	34	2.83	78	2.69	57.16	Pass	63.00	48%

Note: Under existing conditions the following lift stations have a history of high flows and/or high well alarms.
(As per CGS Operations)

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.25

Coniston Sanitary Lift Station Capacity Review

Coniston Sanitary Lift Station Capacity Review

Review Criteria's

1) Unit Density (units/ha)	**12**	units/ha	based on Meridian population projections
2) Pop Density (cap/unit)	**2.30**	cap/unit	based on Meridian population projections
3) Per Capita Flow (Existing)	**410**	L/cap/day	RMOS Engineering Design Manual (January 1994)
4) Extraneous flow: Infiltration Rate (Ex)	**33700**	L/ha/day	RMOS Engineering Design Manual (January 1994)
5) Per Capita Flow (New)	**410**	L/cap/day	RMOS Engineering Design Manual (January 1994)
6) Extraneous flow: Infiltration Rate (New)	**33700**	L/ha/day	RMOS Engineering Design Manual (January 1994)

7) Pump rate capacity from Waste Water Lift Stations GCS O/M (appendix B Pump Drawdown Rate) (issued 03-01-06)

8) Lift Station capacity rated as the total drawdown rate.

9) Existing L.S. drainage areas taken from GCS Sanitary Utility Services Key Plans, extended 50' from approx P/L. (received 03-11-05))

10) Where lift stations collect flow from upstream lift stations the peak flow is taken as the total of all drainage areas.

		LIFT STATION CAPACITY						EXISTING CONDITION						SCENARIO #1 IN-MIGRATION														SCENARIO #2 HIGH-IN MIGRATION								
														DRAFT APPROVED SUBDIVISIONS									DESIGNATED LAND									DESIGNATED LAND								
													Lift Station							Lift Station							Lift Station							Lift Station		
No.	Lift Station	Pump #1 Rate-GPM	Pump #2 Rate-GPM	Pump #3 Rate-GPM	TOTAL Rate-GPM	Installed Capacity (GPM)	Installed Capacity (L/S)	Drainage Area (ha)	Units	Pop.	Peak Flow (L/S)	P/F	Reserve Cap. (L/S)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.
27	Edward[1]	*102.30*	*280.70*	*282*	*318.90*	318.90	***24.162***	38.00	456	1049	33.67	Fail	-9.50	139%		0	0.00	0	0.00	33.67	Fail	-9.50	139%	Designated Area #1	135	11.23	310	10.37	44.04	Fail	-19.88	182%	Designated Area #1	51	4.25	117	4.01	48.05	Fail	-23.89	199%

Note: Under existing conditions the following lift stations have a history of high flows and/or high well alarms.
(As per CGS Operations)

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.26

Levack Sanitary Lift Station Capacity Review

Levack Sanitary Lift Station Capacity Review

Review Criterias

1) Unit Density (units/ha)	**12** units/ha	based on Meridian population projections
2) Pop Density (cap/unit)	**2.30** cap/unit	based on Meridian population projections
3) Per Capita Flow (Existing)	**410** L/cap/day	RMOS Engineering Design Manual (January 1994)
4) Extraneaous flow: Infiltration Rate (Ex.)	**22450** L/ha/day	RMOS Engineering Design Manual (January 1994)
5) Per Capita Flow (New)	**410** L/cap/day	RMOS Engineering Design Manual (January 1994)
6) Extraneaous flow: Infiltration Rate (New)	**22450** L/ha/day	RMOS Engineering Design Manual (January 1994)

7) Pump rate capacity from Waste Water Lift Stations GCS O/M (appendix B Pump Drawdown Rate) (issued 03-01-06)

8) Lift Station capacity rated as the total drawdown rate.

9) Existing L.S. drainage areas taken from GCS Sanitary Utility Services Key Plans, extended 50' from approx P/L. (received 03-11-05))

10) Where lift stations collect flow from upstream lift stations the peak flow is taken as the total of all drainage areas.

		LIFT STATION CAPACITY						EXISTING CONDITION							SCENARIO #1 IN-MIGRATION														SCENARIO #2 HIGH-IN MIGRATION								
															DRAFT APPROVED SUBDIVISIONS										DESIGNATED LAND										DESIGNATED LAND								
														Lift Station							Lift Station							Lift Station							Lift Station							Lift Station		
No.	Lift Station	Pump #1 Rate-GPM	Pump #2 Rate-GPM	Pump #3 Rate-GPM	TOTAL Rate-GPM	Firm Capacity (GPM)	Firm Capacity (L/S)	Drainage Area (ha)	Units	Pop.	Peak Flow (L/S)	P/F	Reserve Cap. (L/S)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.
45	Fraser	399.00	410.00	n/a	462.00	399.00	**30.232**	50.30	604	1388	37.47	Fail	-7.24	124%		0	0.00	0	0.00	37.47	Fail	-7.24	124%	Designated Area 1,2	17	1.38	38	1.14	38.61	Fail	-8.38	128%	Designated Area 1,2	6	0.50	14	0.42	39.03	Fail	-8.79	129%

NOTE: Blue text denotes data entry required

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.27

Levack Sanitary Lift Station Capacity Review

Levack Sanitary Lift Station Capacity Review

Review Criterias

1) Unit Density (units/ha)	**12**	units/ha	based on Meridian population projections
2) Pop Density (cap/unit)	**2.30**	cap/unit	based on Meridian population projections
3) Per Capita Flow (Existing)	**410**	L/cap/day	RMOS Engineering Design Manual (January 1994)
4) Extraneaous flow: Infiltration Rate (Ex.)	**22450**	L/ha/day	RMOS Engineering Design Manual (January 1994)
5) Per Capita Flow (New)	**410**	L/cap/day	RMOS Engineering Design Manual (January 1994)
6) Extraneaous flow: Infiltration Rate (New)	**22450**	L/ha/day	RMOS Engineering Design Manual (January 1994)

7) Pump rate capacity from Waste Water Lift Stations GCS O/M (appendix B Pump Drawdown Rate) (issued 03-01-06)

8) Lift Station capacity rated as the total drawdown rate.

9) Existing L.S. drainage areas taken from GCS Sanitary Utility Services Key Plans, extended 50' from approx P/L. (received 03-11-05))

10) Where lift stations collect flow from upstream lift stations the peak flow is taken as the total of all drainage areas.

		LIFT STATION CAPACITY						EXISTING CONDITION						SCENARIO #1 IN-MIGRATION																SCENARIO #2 HIGH-IN MIGRATION								
														DRAFT APPROVED SUBDIVISIONS									DESIGNATED LAND									DESIGNATED LAND								
													Lift Station							Lift Station							Lift Station							Lift Station							Lift Station		
No.	Lift Station	Pump #1 Rate-GPM	Pump #2 Rate-GPM	Pump #3 Rate-GPM	TOTAL Rate-GPM	Installed Capacity (GPM)	Installed Capacity (L/S)	Drainage Area (ha)	Units	Pop.	Peak Flow (L/S)	P/F	Reserve Cap. (L/S)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.
45	Fraser	399.00	410.00	n/a	462.00	462.00	**35.005**	50.30	604	1388	37.47	Fail	-2.46	107%		0	0.00	0	0.00	37.47	Fail	-2.46	107%	Designated Area 1,2	17	1.38	38	1.14	38.61	Fail	-3.60	110%	Designated Area 1,2	6	0.50	14	0.42	39.03	Fail	-4.02	111%

NOTE: Blue text denotes data entry required

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.28

Dowling Sanitary Lift Station Capacity Review

Dowling Sanitary Lift Station Capacity Review

Review Criteria's

1) Unit Density (units/ha)	**12**	units/ha	based on Meridian population projections
2) Pop Density (cap/unit)	**2.30**	cap/unit	based on Meridian population projections
3) Per Capita Flow (Existing)	**360**	L/cap/day	RMOS Engineering Design Manual (January 1994)
4) Extraneous flow: Infiltration Rate (Ex.)	**33700**	L/ha/day	RMOS Engineering Design Manual (January 1994)
5) Per Capita Flow (New)	**360**	L/cap/day	RMOS Engineering Design Manual (January 1994)
6) Extraneous flow: Infiltration Rate (New)	**33700**	L/ha/day	RMOS Engineering Design Manual (January 1994)

7) Pump rate capacity from Waste Water Lift Stations GCS O/M (appendix B Pump Drawdown Rate) (issued 03-01-06)

8) Lift Station capacity rated as the total pump drawdown rate

9) Existing L.S. drainage areas taken from GCS Sanitary Utility Services Key Plans, extended 50' from approx P/L. (received 03-11-05))

10) Where lift stations collect flow from upstream lift stations the peak flow is taken as the total of all drainage areas.

		LIFT STATION CAPACITY						EXISTING CONDITION							SCENARIO #1 IN-MIGRATION														SCENARIO #2 HIGH-IN MIGRATION								
															DRAFT APPROVED SUBDIVISIONS									DESIGNATED LAND									DESIGNATED LAND								
																					Lift Station							Lift Station							Lift Station		
No.	Lift Station	Pump #1 Rate-GPM	Pump #2 Rate-GPM	Pump #3 Rate-GPM	TOTAL Rate-GPM	Firm Capacity (GPM)	Firm Capacity (L/S)	Drainage Area (ha)	Units	Pop.	Peak Flow (L/S)	P/F	Reserve Cap. (L/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.
70	Lionel	291.91	299.05	n/a	369.59	291.91	**22.117**	19.40	233	535	16.40	Pass	5.72	74%		0	0.00	0	0.00	16.40	Pass	5.72	74%		0	0.00	0	0.00	16.40	Pass	5.72	74%		0	0.00	0	0.00	16.40	Pass	5.72	74%
XX	Dowling STP LS	*1064.00*	*1064.00*	*n/a*	*n/a*	1064.00	***80.617***	117.80	1414	3251	92.18	Fail	-11.56	114%		0	0.00	0	0.00	92.18	Fail	-11.56	114%	All Designated Areas	108	9.02	249	7.78	99.96	Fail	-19.34	124%	All Designated Areas	41	3.40	94	2.99	102.95	Fail	-22.33	128%

Note 1: Lionel Lift Station pump to Dowling STP L.S.

Note 2: No information for Dowling STP LS in GCS LS OM, pump rate capacity based on CofA. (#1-599-78-006)

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.29

Dowling Sanitary Lift Station Capacity Review

Dowling Sanitary Lift Station Capacity Review

Review Criteria's

1) Unit Density (units/ha)	**12**	units/ha	based on Meridian population projections
2) Pop Density (cap/unit)	**2.30**	cap/unit	based on Meridian population projections
3) Per Capita Flow (Existing)	**360**	L/cap/day	RMOS Engineering Design Manual (January 1994)
4) Extraneous flow: Infiltration Rate (Ex.)	**33700**	L/ha/day	RMOS Engineering Design Manual (January 1994)
5) Per Capita Flow (New)	**360**	L/cap/day	RMOS Engineering Design Manual (January 1994)
6) Extraneous flow: Infiltration Rate (New)	**33700**	L/ha/day	RMOS Engineering Design Manual (January 1994)

7) Pump rate capacity from Waste Water Lift Stations GCS O/M (appendix B Pump Drawdown Rate) (issued 03-01-06)

8) Lift Station capacity rated as the total pump drawdown rate

9) Existing L.S. drainage areas taken from GCS Sanitary Utility Services Key Plans, extended 50' from approx P/L. (received 03-11-05))

10) Where lift stations collect flow from upstream lift stations the peak flow is taken as the total of all drainage areas.

		LIFT STATION CAPACITY						EXISTING CONDITION							SCENARIO #1 IN-MIGRATION																SCENARIO #2 HIGH-IN MIGRATION								
															DRAFT APPROVED SUBDIVISIONS									DESIGNATED LAND									DESIGNATED LAND								
																					Lift Station							Lift Station							Lift Station		
No.	Lift Station	Pump #1 Rate-GPM	Pump #2 Rate-GPM	Pump #3 Rate-GPM	TOTAL Rate-GPM	Installed Capacity (GPM)	Installed Capacity (L/S)	Drainage Area (ha)	Units	Pop.	Peak Flow (L/S)	P/F	Reserve Cap. (L/S)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.
XX	Dowling STP LS	*1064.00*	*1064.00*	*n/a*	*n/a*	1064.00	***80.617***	117.80	1414	3251	92.18	Fail	-11.56	114%		0	0.00	0	0.00	92.18	Fail	-11.56	114%	All Designated Areas	108	9.02	249	7.78	99.96	Fail	-19.34	124%	All Designated Areas	41	3.40	94	2.99	102.95	Fail	-22.33	128%

Note 1: Lionel Lift Station pump to Dowling STP L.S.

Note 2: No information for Dowling STP LS in GCS LS OM, pump rate capacity based on CofA. (#1-599-78-006)

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.30

Chelmsford Sanitary Lift Station Capacity Review

Chelmsford Sanitary Lift Station Capacity Review

Review Criteria's

1) Unit Density (units/ha)	**12**	units/ha	based on Meridian population projections
2) Pop Density (cap/unit)	**2.30**	cap/unit	based on Meridian population projections
3) Per Capita Flow (Existing)	**360**	L/cap/day	RMOS Engineering Design Manual (January 1994)
4) Extraneous flow: Infiltration Rate (Ex.)	**33700**	L/ha/day	RMOS Engineering Design Manual (January 1994)
5) Per Capita Flow (New)	**360**	L/cap/day	RMOS Engineering Design Manual (January 1994)
6) Extraneous flow: Infiltration Rate (New)	**33700**	L/ha/day	RMOS Engineering Design Manual (January 1994)

7) Pump rate capacity from Waste Water Lift Stations GCS O/M (appendix B Pump Drawdown Rate) (issued 03-01-06)

8) Lift Station capacity rated as the total pump drawdown rate.

9) Existing L.S. drainage areas taken from GCS Sanitary Utility Services Key Plans, extended 50' from approx P/L. (received 03-11-05))

10) Where lift stations collect flow from upstream lift stations the peak flow is taken as the total of all drainage areas.

		LIFT STATION CAPACITY						EXISTING CONDITION							SCENARIO #1 IN-MIGRATION												SCENARIO #2 HIGH-IN MIGRATION								
															DRAFT APPROVED SUBDIVISIONS							Lift Station			DESIGNATED LAND							Lift Station			DESIGNATED LAND							Lift Station		
No.	Lift Station	Pump #1 Rate-GPM	Pump #2 Rate-GPM	Pump #3 Rate-GPM	TOTAL Rate-GPM	Firm Capacity (GPM)	Firm Capacity (L/S)	Drainage Area (ha)	Units	Pop.	Peak Flow (L/S)	P/F	Lift Station Reserve Cap. (L/S)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.
7	Radisson	108.00	101.00	n/a	120.00	101.00	**7.653**	1.00	12	28	0.89	Pass	6.76	12%		0	0.00	0	0.00	0.89	Pass	6.76	12%		0	0.00	0	0.00	0.89	Pass	6.76	12%		0	0.00	0	0.00	0.89	Pass	6.76	12%
32	Hazel	531.20	559.40	n/a	678.00	531.20	**40.248**	40.00	480	1104	32.95	Pass	7.30	82%		0	0.00	0	0.00	32.95	Pass	7.30	82%		0	0.00	0	0.00	32.95	Pass	7.30	82%		0	0.00	0	0.00	32.95	Pass	7.30	82%
29	Keith	570.20	494.90	n/a	600.80	494.90	**37.498**	4.00	48	110	3.51	Pass	33.99	9%		0	0.00	0	0.00	3.51	Pass	33.99	9%	Designated Area #6	93	7.75	214	6.71	10.22	Pass	27.28	27%	Designated Area #6	117	9.75	269	8.40	18.61	Pass	18.88	50%
42	Charette	720.70	931.60	n/a	918.60	720.70	**54.606**	74.50	894	2056	59.70	Fail	-5.09	109%	Belanger-Lacasse Subd	122	10.17	281	8.75	68.45	Fail	-13.84	125%	Designated Area #7	93	7.75	214	6.71	75.16	Fail	-20.55	138%	Designated Area #7	117	9.75	269	8.40	83.56	Fail	-28.95	153%
41	Brookside	155.40	137.70	n/a	161.80	137.70	**10.433**	12.40	149	342	10.62	Fail	-0.18	102%		0	0.00	0	0.00	10.62	Fail	-0.18	102%		0	0.00	0	0.00	10.62	Fail	-0.18	102%		0	0.00	0	0.00	10.62	Fail	-0.18	102%
44	Main	773.00	666.00	n/a	775.00	666.00	**50.462**	59.30	712	1637	48.03	Pass	2.43	95%		0	0.00	0	0.00	48.03	Pass	2.43	95%		0	0.00	0	0.00	54.74	Fail	-4.28	108%		0	0.00	0	0.00	58.68	Fail	-8.22	116%
43	Belanger	326.10	319.30	n/a	401.60	319.30	**24.193**	15.00	180	414	12.78	Pass	11.42	53%		0	0.00	0	0.00	12.78	Pass	11.42	53%	Designated Area #8	93	7.75	214	6.71	19.49	Pass	4.71	81%	Designated Area #8	54	4.50	124	3.94	23.42	Pass	0.77	97%
46	Whitson	114.22	111.30	n/a	128.71	111.30	**8.433**	10.20	122	282	8.78	Fail	-0.34	104%		0	0.00	0	0.00	8.78	Fail	-0.34	104%		0	0.00	0	0.00	8.78	Fail	-0.34	104%		0	0.00	0	0.00	8.78	Fail	-0.34	104%

Note: Belanger Lift Station pumps to Main L.S.
Note: Radisson Lift Station pumps to Hazel L.S.

Note: Under existing conditions the following lift stations have a history of high flows and/or high well alarms.
(As per CGS Operations)

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.31

Dowling Sanitary Lift Station Capacity Review

Dowling Sanitary Lift Station Capacity Review

Review Criteria's

1) Unit Density (units/ha)	**12**	units/ha	based on Meridian population projections
2) Pop Density (cap/unit)	**2.30**	cap/unit	based on Meridian population projections
3) Per Capita Flow (Existing)	**360**	L/cap/day	RMOS Engineering Design Manual (January 1994)
4) Extraneous flow: Infiltration Rate (Ex.)	**33700**	L/ha/day	RMOS Engineering Design Manual (January 1994)
5) Per Capita Flow (New)	**360**	L/cap/day	RMOS Engineering Design Manual (January 1994)
6) Extraneous flow: Infiltration Rate (New)	**33700**	L/ha/day	RMOS Engineering Design Manual (January 1994)

7) Pump rate capacity from Waste Water Lift Stations GCS O/M (appendix B Pump Drawdown Rate) (issued 03-01-06)

8) Lift Station capacity rated as the total pump drawdown rate

9) Existing L.S. drainage areas taken from GCS Sanitary Utility Services Key Plans, extended 50' from approx P/L. (received 03-11-05))

10) Where lift stations collect flow from upstream lift stations the peak flow is taken as the total of all drainage areas.

		LIFT STATION CAPACITY						EXISTING CONDITION							SCENARIO #1 IN-MIGRATION																SCENARIO #2 HIGH-IN MIGRATION								
															DRAFT APPROVED SUBDIVISIONS									DESIGNATED LAND									DESIGNATED LAND								
																					Lift Station							Lift Station							Lift Station		
No.	Lift Station	Pump #1 Rate-GPM	Pump #2 Rate-GPM	Pump #3 Rate-GPM	TOTAL Rate-GPM	Installed Capacity (GPM)	Installed Capacity (L/S)	Drainage Area (ha)	Units	Pop.	Peak Flow (L/S)	P/F	Reserve Cap. (L/S)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.
XX	Dowling STP LS	*1064.00*	*1064.00*	*n/a*	*n/a*	1064.00	***80.617***	117.80	1414	3251	92.18	Fail	-11.56	114%		0	0.00	0	0.00	92.18	Fail	-11.56	114%	All Designated Areas	108	9.02	249	7.78	99.96	Fail	-19.34	124%	All Designated Areas	41	3.40	94	2.99	102.95	Fail	-22.33	128%

Note 1: Lionel Lift Station pump to Dowling STP L.S.

Note 2: No information for Dowling STP LS in GCS LS OM, pump rate capacity based on CofA. (#1-599-78-006)

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.32

Chelmsford Sanitary Lift Station Capacity Review

Chelmsford Sanitary Lift Station Capacity Review

Review Criteria's

1) Unit Density (units/ha)	**12**	units/ha	based on Meridian population projections
2) Pop Density (cap/unit)	**2.30**	cap/unit	based on Meridian population projections
3) Per Capita Flow (Existing)	**360**	L/cap/day	RMOS Engineering Design Manual (January 1994)
4) Extraneous flow: Infiltration Rate (Ex.)	**33700**	L/ha/day	RMOS Engineering Design Manual (January 1994)
5) Per Capita Flow (New)	**360**	L/cap/day	RMOS Engineering Design Manual (January 1994)
6) Extraneous flow: Infiltration Rate (New)	**33700**	L/ha/day	RMOS Engineering Design Manual (January 1994)

7) Pump rate capacity from Waste Water Lift Stations GCS O/M (appendix B Pump Drawdown Rate) (issued 03-01-06)

8) Lift Station capacity rated as the total pump drawdown rate.

9) Existing L.S. drainage areas taken from GCS Sanitary Utility Services Key Plans, extended 50' from approx P/L. (received 03-11-05))

10) Where lift stations collect flow from upstream lift stations the peak flow is taken as the total of all drainage areas.

		LIFT STATION CAPACITY						EXISTING CONDITION							SCENARIO #1 IN-MIGRATION															SCENARIO #2 HIGH-IN MIGRATION								
															DRAFT APPROVED SUBDIVISIONS									DESIGNATED LAND									DESIGNATED LAND								
													Lift Station							Lift Station							Lift Station							Lift Station							Lift Station		
No.	Lift Station	Pump #1 Rate-GPM	Pump #2 Rate-GPM	Pump #3 Rate-GPM	TOTAL Rate-GPM	Installed Capacity (GPM)	Installed Capacity (L/S)	Drainage Area (ha)	Units	Pop.	Peak Flow (L/S)	P/F	Reserve Cap. (L/S)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.
42	Charette	720.70	931.60	n/a	918.60	918.60	**69.601**	**74.50**	894	2056	59.70	Pass	9.90	86%	Belanger-Lacasse Subd	122	10.17	281	8.75	68.45	Pass	1.15	98%	Designated Area #7	93	7.75	214	6.71	75.16	Fail	-5.56	**108%**	Designated Area #7	117	9.75	269	8.40	83.56	Fail	-13.95	**120%**
41	Brookside	155.40	137.70	n/a	161.80	161.80	**12.259**	**12.40**	149	342	10.62	Pass	1.64	87%		0	0.00	0	0.00	10.62	Pass	1.64	87%		0	0.00	0	0.00	10.62	Pass	1.64	87%		0	0.00	0	0.00	10.62	Pass	1.64	87%
44	Main	773.00	666.00	n/a	775.00	775.00	**58.720**	**59.30**	712	1637	48.03	Pass	10.69	82%		0	0.00	0	0.00	48.03	Pass	10.69	82%		0	0.00	0	0.00	54.74	Pass	3.98	93%		0	0.00	0	0.00	58.68	Pass	0.04	100%
46	Whitson	114.22	111.30	n/a	128.71	128.71	**9.752**	**10.20**	122	282	8.78	Pass	0.98	90%		0	0.00	0	0.00	8.78	Pass	0.98	90%		0	0.00	0	0.00	8.78	Pass	0.98	90%		0	0.00	0	0.00	8.78	Pass	0.98	90%

Note: Belanger Lift Station pumps to Main L.S.
Note: Radisson Lift Station pumps to Hazel L.S.

Note: Under existing conditions the following lift stations have a history of high flows and/or high well alarms.
(As per CGS Operations)

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.33

Azilda Sanitary Lift Station Capacity Review

Azilda Sanitary Lift Station Capacity Review

Review Criteria's

1) Unit Density (units/ha)	**12** units/ha	based on Meridian population projections
2) Pop Density (cap/unit)	**2.30** cap/unit	based on Meridian population projections
3) Per Capita Flow (Existing)	**360** L/cap/day	RMOS Engineering Design Manual (January 1994)
4) Extraneous flow: Infiltration Rate (Ex.)	**22450** L/ha/day	RMOS Engineering Design Manual (January 1994)
5) Per Capita Flow (New)	**360** L/cap/day	RMOS Engineering Design Manual (January 1994)
6) Extraneous flow: Infiltration Rate (New)	**22450** L/ha/day	RMOS Engineering Design Manual (January 1994)

7) Pump rate capacity from Waste Water Lift Stations GCS O/M (appendix B Pump Drawdown Rate) (issued 03-01-06)

8) Lift Station capacity rated as the total pump drawdown rate.

9) Existing L.S. drainage areas taken from GCS Sanitary Utility Services Key Plans, extended 50' from approx P/L. (received 03-11-05))

10) Where lift stations collect flow from upstream lift stations the peak flow is taken as the total of all drainage areas.

		LIFT STATION CAPACITY						EXISTING CONDITION							SCENARIO #1 IN-MIGRATION																		SCENARIO #2 HIGH-IN MIGRATION									
															DRAFT APPROVED SUBDIVISIONS										DESIGNATED LAND										DESIGNATED LAND									
														Lift Station							Lift Station							Lift Station							Lift Station									
No.	Lift Station	Pump #1 Rate-GPM	Pump #2 Rate-GPM	Pump #3 Rate-GPM	TOTAL Rate-GPM	Firm Capacity (GPM)	Firm Capacity (L/S)	Drainage Area (ha)	Units	Pop.	Peak Flow (L/S)	P/F	Reserve Cap. (L/S)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.
47	Principale	497.00	547.00	n/a	634.00	497.00	**37.657**	25.60	307	707	18.11	Pass	19.55	48%		0	0.00	0	0.00	18.11	Pass	19.55	48%		0	0.00	0	0.00	18.11	Pass	19.55	48%	Designated Area #1	87	7.28	201	5.36	23.47	Pass	14.19	62%
33	Maple	349.19	326.93	n/a	374.79	326.93	**24.771**	4.70	56	130	3.50	Pass	21.27	14%		0	0.00	0	0.00	3.50	Pass	21.27	14%		0	0.00	0	0.00	3.50	Pass	21.27	14%		0	0.00	0	0.00	3.50	Pass	21.27	14%
53	Landry	548.90	535.40	n/a	686.20	535.40	**40.566**	98.60	1183	2721	65.06	Fail	-24.49	160%		0	0.00	0	0.00	65.06	Fail	-24.49	160%		0	0.00	0	0.00	65.06	Fail	-24.49	160%		0	0.00	0	0.00	65.06	Fail	-24.49	160%
52	Marier	405.56	337.29	n/a	556.32	337.29	**25.556**	38.80	466	1071	26.95	Fail	-1.40	105%		0	0.00	0	0.00	26.95	Fail	-1.40	105%		0	0.00	0	0.00	26.95	Fail	-1.40	105%	Designated Area 2,3	87	7.28	201	5.36	32.31	Fail	-6.76	126%
48	Laurier	2387.00	2391.00	2507	3436.00	2387.00	**180.859**	193.50	2322	5341	121.90	Pass	58.96	67%	Spruce Meadows/ Bayside Estates	247	20.54	567	14.66	136.55	Pass	44.31	76%	Spruce Meadows/ Bayside Estates	6	0.47	13	0.36	136.91	Pass	43.95	76%	Spruce Meadows / Bayside Estates	6	0.47	13	0.36	142.63	Pass	38.23	79%

Note: Maple Lift Station pump into Landry L.S.

Note: Maple, Landry and Marier Lift Stations pump into Laurier L.S.

Note: Under existing conditions the following lift stations have a history of high flows and/or high well alarms.

(As per CGS Operations)

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.34

Azilda Sanitary Lift Station Capacity Review

Azilda Sanitary Lift Station Capacity Review

Review Criteria's

1) Unit Density (units/ha)	12 units/ha	based on Meridian population projections
2) Pop Density (cap/unit)	2.30 cap/unit	based on Meridian population projections
3) Per Capita Flow (Existing)	360 L/cap/day	RMOS Engineering Design Manual (January 1994)
4) Extraneous flow: Infiltration Rate (Ex.)	22450 L/ha/day	RMOS Engineering Design Manual (January 1994)
5) Per Capita Flow (New)	360 L/cap/day	RMOS Engineering Design Manual (January 1994)
6) Extraneous flow: Infiltration Rate (New)	22450 L/ha/day	RMOS Engineering Design Manual (January 1994)

7) Pump rate capacity from Waste Water Lift Stations GCS O/M (appendix B Pump Drawdown Rate) (issued 03-01-06)

8) Lift Station capacity rated as the total pump drawdown rate.

9) Existing L.S. drainage areas taken from GCS Sanitary Utility Services Key Plans, extended 50' from approx P/L. (received 03-11-05))

10) Where lift stations collect flow from upstream lift stations the peak flow is taken as the total of all drainage areas.

		LIFT STATION CAPACITY						EXISTING CONDITION							SCENARIO #1 IN-MIGRATION																		SCENARIO #2 HIGH-IN MIGRATION								
															DRAFT APPROVED SUBDIVISIONS										DESIGNATED LAND										DESIGNATED LAND								
														Lift Station								Lift Station								Lift Station												
No.	Lift Station	Pump #1 Rate-GPM	Pump #2 Rate-GPM	Pump #3 Rate-GPM	TOTAL Rate-GPM	Installed Capacity (GPM)	Installed Capacity (L/S)	Drainage Area (ha)	Units	Pop.	Peak Flow (L/S)	P/F	Reserve Cap. (L/S)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.
53	Landry	548.90	535.40	n/a	686.20	686.20	**51.992**	98.60	1183	2721	65.06	Fail	-13.07	125%		0	0.00	0	0.00	65.06	Fail	-13.07	125%		0	0.00	0	0.00	65.06	Fail	-13.07	125%		0	0.00	0	0.00	65.06	Fail	-13.07	125%
52	Marier	405.56	337.29	n/a	556.32	556.32	**42.151**	38.80	466	1071	26.95	Pass	15.20	64%		0	0.00	0	0.00	26.95	Pass	15.20	64%		0	0.00	0	0.00	26.95	Pass	15.20	64%	Designated Area 2,3	87	7.28	201	5.36	32.31	Pass	9.84	77%

Note: Maple Lift Station pump into Landry L.S.
Note: Maple, Landry and Marier Lift Stations pump into Laurier L.S.

Note: Under existing conditions the following lift stations have a history of high flows and/or high well alarms.
(As per CGS Operations)

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.35

Capreol Sanitary Lift Station Capacity Review

Capreol Sanitary Lift Station Capacity Review

Review Criteria's

1) Unit Density (units/ha)	**12** units/ha	based on Meridian population projections
2) Pop Density (cap/unit)	**2.30** cap/unit	based on Meridian population projections
3) Per Capita Flow (Existing)	**500** L/cap/day	RMOS Engineering Design Manual (January 1994)
4) Extraneous flow: Infiltration Rate (Ex.)	**33700** L/ha/day	RMOS Engineering Design Manual (January 1994)
5) Per Capita Flow (New)	**500** L/cap/day	RMOS Engineering Design Manual (January 1994)
6) Extraneous flow: Infiltration Rate (New)	**33700** L/ha/day	RMOS Engineering Design Manual (January 1994)

7) Pump rate capacity from Waste Water Lift Stations GCS O/M (appendix B Pump Drawdown Rate) (issued 03-01-06)

8) Lift Station capacity rated as the total pump drawdown rate.

9) Existing L.S. drainage areas taken from GCS Sanitary Utility Services Key Plans, extended 50' from approx P/L. (received 03-11-05))

10) Where lift stations collect flow from upstream lift stations the peak flow is taken as the total of all drainage areas.

		LIFT STATION CAPACITY						EXISTING CONDITION							SCENARIO #1 IN-MIGRATION																		SCENARIO #2 HIGH-IN MIGRATION									
															DRAFT APPROVED SUBDIVISIONS										DESIGNATED LAND										DESIGNATED LAND									
						Firm	Firm					Lift Station								Lift Station								Lift Station								Lift Station									
No.	Lift Station	Pump #1 Rate-GPM	Pump #2 Rate-GPM	Pump #3 Rate-GPM	TOTAL Rate-GPM	Capacity (GPM)	Capacity (L/S)	Drainage Area (ha)	Units	Pop.	Peak Flow (L/S)	P/F	Reserve Cap. (L/S)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.
51	Lloyd St	256.89	250.11	n/a	286.16	250.11	18.950	12.30	148	339	12.76	Pass	6.19	67%		0	0.00	0	0.00	12.76	Pass	6.19	67%		0	0.00	0	0.00	12.76	Pass	6.19	67%		0	0.00	0	0.00	12.76	Pass	6.19	67%
50	Vermillion	1208.00	1254.00	n/a	1534.00	1208.00	91.528	136.90	1643	3778	126.77	Fail	-35.24	138%		0	0.00	0	0.00	126.77	Fail	-35.24	138%	Designated Area #1	81	6.78	187	7.14	133.91	Fail	-42.38	146%	Designated Area #1	31	2.58	71	2.77	136.68	Fail	-45.15	149%

Note: Lloyd Lift Station pumps into Vermillion L.S.

Note: Under existing conditions the following lift stations have a history of high flows and/or high well alarms.
(As per CGS Operations)

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.36

Capreol Sanitary Lift Station Capacity Review

Capreol Sanitary Lift Station Capacity Review

Review Criteria's

1) Unit Density (units/ha)	**12** units/ha	based on Meridian population projections
2) Pop Density (cap/unit)	**2.30** cap/unit	based on Meridian population projections
3) Per Capita Flow (Existing)	**500** L/cap/day	RMOS Engineering Design Manual (January 1994)
4) Extraneous flow: Infiltration Rate (Ex.)	**33700** L/ha/day	RMOS Engineering Design Manual (January 1994)
5) Per Capita Flow (New)	**500** L/cap/day	RMOS Engineering Design Manual (January 1994)
6) Extraneous flow: Infiltration Rate (New)	**33700** L/ha/day	RMOS Engineering Design Manual (January 1994)

7) Pump rate capacity from Waste Water Lift Stations GCS O/M (appendix B Pump Drawdown Rate) (issued 03-01-06)

8) Lift Station capacity rated as the total pump drawdown rate.

9) Existing L.S. drainage areas taken from GCS Sanitary Utility Services Key Plans, extended 50' from approx P/L. (received 03-11-05))

10) Where lift stations collect flow from upstream lift stations the peak flow is taken as the total of all drainage areas.

		LIFT STATION CAPACITY						EXISTING CONDITION							SCENARIO #1 IN-MIGRATION																		SCENARIO #2 HIGH-IN MIGRATION								
															DRAFT APPROVED SUBDIVISIONS										DESIGNATED LAND										DESIGNATED LAND								
													Lift Station							Lift Station							Lift Station							Lift Station								
No.	Lift Station	Pump #1 Rate-GPM	Pump #2 Rate-GPM	Pump #3 Rate-GPM	TOTAL Rate-GPM	Installed Capacity (GPM)	Installed Capacity (L/S)	Drainage Area (ha)	Units	Pop.	Peak Flow (L/S)	P/F	Reserve Cap. (L/S)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.
50	Vermillion	1208.00	1254.00	n/a	1534.00	1534.00	116.228	136.90	1643	3778	126.77	Fail	-10.54	109%		0	0.00	0	0.00	126.77	Fail	-10.54	109%	Designated Area #1	81	6.78	187	7.14	133.91	Fail	-17.68	115%	Designated Area #1	31	2.58	71	2.77	136.68	Fail	-20.45	118%

Note: Lloyd Lift Station pumps into Vermillion L.S.

Note: Under existing conditions the following lift stations have a history of high flows and/or high well alarms.
(As per CGS Operations)

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.37

Valley East Sanitary Lift Station Capacity Review

Valley East Sanitary Lift Station Capacity Review

Review Criteria's

1) Unit Density (units/ha)	**12**	units/ha	based on Meridian population projections
2) Pop Density (cap/unit)	**2.30**	cap/unit	based on Meridian population projections
3) Per Capita Flow (Existing)	**360**	L/cap/day	RMOS Engineering Design Manual (January 1994)
4) Extraneous flow: Infiltration Rate (Ex.)	**33700**	L/ha/day	RMOS Engineering Design Manual (January 1994)
5) Per Capita Flow (New)	**360**	L/cap/day	RMOS Engineering Design Manual (January 1994)
6) Extraneous flow: Infiltration Rate (New)	**33700**	L/ha/day	RMOS Engineering Design Manual (January 1994)

7) Pump rate capacity from Waste Water Lift Stations GCS O/M (appendix B Pump Drawdown Rate) (issued 03-01-06)

8) Lift Station capacity rated as the total pump drawdown rate.

9) Existing L.S. drainage areas taken from GCS Sanitary Utility Services Key Plans, extended 50' from approx P/L. (received 03-11-05))

10) Where lift stations collect flow from upstream lift stations the peak flow is taken as the total of all drainage areas.

		LIFT STATION CAPACITY						EXISTING CONDITION							SCENARIO #1 IN-MIGRATION														SCENARIO #2 HIGH-IN MIGRATION									
															DRAFT APPROVED SUBDIVISIONS									DESIGNATED LAND									DESIGNATED LAND								
No.	Lift Station	Pump #1 Rate-GPM	Pump #2 Rate-GPM	Pump #3 Rate-GPM	TOTAL Rate-GPM	Firm Capacity (GPM)	Firm Capacity (L/S)	Drainage Area (ha)	Units	Pop.	Peak Flow (L/S)	P/F	Lift Station Reserve Cap. (L/S)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Lift Station Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Lift Station Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Lift Station Reserve Cap. (l/s)	Used Cap.
67	St. Isidore	470.90	498.70	n/a	804.40	470.90	35.679	25.80	310	712	21.61	Pass	14.07	61%		0	0.00	0	0.00	21.61	Pass	14.07	61%		0	0.00	0	0.00	21.61	Pass	14.07	61%		0	0.00	0	0.00	21.61	Pass	14.07	61%
66	Tupper	104.70	147.00	n/a	167.40	104.70	7.933	1.90	23	52	1.68	Pass	6.25	21%		0	0.00	0	0.00	1.68	Pass	6.25	21%		0	0.00	0	0.00	1.68	Pass	6.25	21%		0	0.00	0	0.00	1.68	Pass	6.25	21%
49	Madeleine	200.35	212.70	n/a	258.57	200.35	15.180	4.40	53	121	3.85	Pass	11.33	25%		0	0.00	0	0.00	3.85	Pass	11.33	25%		0	0.00	0	0.00	3.85	Pass	11.33	25%		0	0.00	0	0.00	3.85	Pass	11.33	25%
68	Spruce	994.05	975.89	n/a	1211.14	975.89	73.941	181.80	2182	5018	138.72	Fail	-64.78	188%	Leonard Ross	9	0.75	21	0.67	139.39	Fail	-65.45	189%	Designated Area 2,3	384	32.00	883	26.59	192.58	Fail	-118.63	260%		0	0.00	0	0.00	192.58	Fail	-118.63	260%
59	Jeanne D'Arc	1200.40	1206.90	n/a	2002.80	1200.40	90.952	239.80	2878	6618	179.85	Fail	-88.90	198%	Bonaventure 10 Katmic Subd.	114	9.50	262	8.19	188.04	Fail	-97.09	207%	Designated Area 4	457	38.08	1051	31.44	219.47	Fail	-128.52	241%		0	0.00	0	0.00	219.47	Fail	-128.52	241%
58	Hillsdale	670.40	690.10	n/a	857.20	670.40	50.795	70.30	844	1940	56.49	Fail	-5.70	111%	Confederation Subd.	106	8.83	244	7.63	64.12	Fail	-13.32	126%		0	0.00	0	0.00	64.12	Fail	-13.32	126%		0	0.00	0	0.00	64.12	Fail	-13.32	126%
69	Helene	904.30	868.10	n/a	1162.30	868.10	65.774	170.00	2040	4692	130.25	Fail	-64.47	198%		0	0.00	0	0.00	130.25	Fail	-64.47	198%	Designated Area #1	491	40.92	1129	33.68	163.92	Fail	-98.15	249%	Designated Area #1	317	26.42	729	22.10	186.03	Fail	-120.25	283%
54	Tena	109.01	91.63	n/a	139.82	91.63	6.943	13.80	166	381	11.78	Fail	-4.84	170%		0	0.00	0	0.00	11.78	Fail	-4.84	170%		0	0.00	0	0.00	11.78	Fail	-4.84	170%		0	0.00	0	0.00	11.78	Fail	-4.84	170%
71	Fleming	332.30	329.40	n/a	403.20	329.40	24.958	23.50	282	649	19.74	Pass	5.22	79%		0	0.00	0	0.00	19.74	Pass	5.22	79%		0	0.00	0	0.00	19.74	Pass	5.22	79%		0	0.00	0	0.00	19.74	Pass	5.22	79%

Note: St-Isidore, Tupper and Madeleine Lift Stations pump into Spruce L.S.
Note: Tena and Fleming Lift Stations pump into Helene L.S.

Note: Under existing conditions the following lift stations have a history of high flows and/or high well alarms.

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.38

Valley East Sanitary Lift Station Capacity Review

Valley East Sanitary Lift Station Capacity Review

Review Criteria's

1) Unit Density (units/ha)	**12** units/ha	based on Meridian population projections
2) Pop Density (cap/unit)	**2.30** cap/unit	based on Meridian population projections
3) Per Capita Flow (Existing)	**360** L/cap/day	RMOS Engineering Design Manual (January 1994)
4) Extraneous flow: Infiltration Rate (Ex.)	**33700** L/ha/day	RMOS Engineering Design Manual (January 1994)
5) Per Capita Flow (New)	**360** L/cap/day	RMOS Engineering Design Manual (January 1994)
6) Extraneous flow: Infiltration Rate (New)	**33700** L/ha/day	RMOS Engineering Design Manual (January 1994)

7) Pump rate capacity from Waste Water Lift Stations GCS O/M (appendix B Pump Drawdown Rate) (issued 03-01-06)

8) Lift Station capacity rated as the total pump drawdown rate.

9) Existing L.S. drainage areas taken from GCS Sanitary Utility Services Key Plans, extended 50' from approx P/L. (received 03-11-05))

10) Where lift stations collect flow from upstream lift stations the peak flow is taken as the total of all drainage areas.

		LIFT STATION CAPACITY						EXISTING CONDITION						SCENARIO #1 IN-MIGRATION																		SCENARIO #2 HIGH-IN MIGRATION								
														DRAFT APPROVED SUBDIVISIONS									DESIGNATED LAND									DESIGNATED LAND								
													Lift Station							Lift Station							Lift Station							Lift Station							Lift Station		
No.	Lift Station	Pump #1 Rate-GPM	Pump #2 Rate-GPM	Pump #3 Rate-GPM	TOTAL Rate-GPM	Installed Capacity (GPM)	Installed Capacity (L/S)	Drainage Area (ha)	Units	Pop.	Peak Flow (L/S)	P/F	Reserve Cap. (L/S)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.	Development	Units	Drainage Area (ha)	Pop.	Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Reserve Cap. (l/s)	Used Cap.
68	Spruce	994.05	975.89	n/a	1211.14	1211.14	91.766	181.80	2182	5018	138.72	Fail	-46.96	151%	Leonard Ross	9	0.75	21	0.67	139.39	Fail	-47.63	152%	Designated Area 2.3	384	32.00	883	26.59	192.58	Fail	-100.81	210%		0	0.00	0	0.00	192.58	Fail	-100.81	210%
59	Jeanne D'Arc	1200.40	1206.90	n/a	2002.80	2002.80	151.749	239.80	2878	6618	179.85	Fail	-28.10	119%	Bonaventure 10 Katmic Subd.	114	9.50	262	8.19	188.04	Fail	-36.29	124%	Designated Area 4	457	38.08	1051	31.44	219.47	Fail	-67.72	145%		0	0.00	0	0.00	219.47	Fail	-67.72	145%
58	Hillsdale	670.40	690.10	n/a	857.20	857.20	64.948	70.30	844	1940	56.49	Pass	8.46	87%	Confederation Subd.	106	8.83	244	7.63	64.12	Pass	0.83	99%		0	0.00	0	0.00	64.12	Pass	0.83	99%		0	0.00	0	0.00	64.12	Pass	0.83	99%
69	Helene	904.30	868.10	n/a	1162.30	1162.30	88.065	170.00	2040	4692	130.25	Fail	-42.18	148%		0	0.00	0	0.00	130.25	Fail	-42.18	148%	Designated Area #1	491	40.92	1129	33.68	163.92	Fail	-75.86	186%	Designated Area #1	317	26.42	729	22.10	186.03	Fail	-97.96	211%
54	Tena	109.01	91.63	n/a	139.82	139.82	10.594	13.80	166	381	11.78	Fail	-1.19	111%		0	0.00	0	0.00	11.78	Fail	-1.19	111%		0	0.00	0	0.00	11.78	Fail	-1.19	111%		0	0.00	0	0.00	11.78	Fail	-1.19	111%

Note: St-Isidore, Tupper and Madeleine Lift Stations pump into Spruce L.S.
Note: Tena and Fleming Lift Stations pump into Helene L.S.

Note: Under existing conditions the following lift stations have a history of high flows and/or high well alarms.

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.39

Sanitary Pipe Capacity Constrictions

Sanitary Pipe Capacity Constrictions

Location	Description	Sanitary Trunk Main Diameter
Valley East	Main St	400
	Herve Ave	500
	Jean D'Arc St	500
Chelmsford	Edna St	400
	Edna St	450
	Keith Ave	250
	Cote Ave	250
Garson	O'Neil Dr	250
	O'Neil Dr	300
Levack	High St	350
Lively	Anderson Dr	375
Sudbury	Mildred St	300
	Bancroft Dr	200
	Bancroft Dr	300
South End Sudbury	Loach's Trunk to Easement	300
	Easement/Millwood	450
	Stewart	450
	Stewart	450
	Stewart	300
	Rockwood	200
	Algonquin E	300
	Algonquin E	300
	At Green L.S. From Ida	200
	Paris	300
	Burwash to West Trunk	350
	Paris to East Trunk	375
	Paris to East Trunk	450
	East trunk on Regent	450
	East trunk on Regent	450
	East trunk on Regent	450
	East trunk on Regent	450
	East trunk on Regent	450
	East trunk on Regent	450
	East trunk on Regent	450
	trunk on Regent	600
	Yale	600
	Telstar/Skyward	200
	Marcel	750
	Trunk to Marcel Park	525
	Regent E	500
	Regent E	500
	Regent E & W combine	500
	Bouchard	450
	marcel st park	750
	Southview Esmt	300
	Trunk to Rock Tunnel	750

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.40

In-migration Designation

Valley East Sanitary Pipe Capacity Review

Valley East Sanitary Pipe Capacity Review

Review Criterias

1) Unit Density (units/ha)	**12**	
2) Pop Density (cap/unit)	**2.30**	
3) New Per Capita Flow (L/cap/day)	**360**	RMOS Engineering Design Manual (January 1994)
4) Existing Per Capita Flow (L/cap/day)	**650**	based on GCS Annual Wastewater Reports (2001, 2002, 2003)
5) Extraneaous flow; Infiltration Rate (L/ha/day)	**33700**	RMOS Engineering Design Manual (January 1994)

			Existing Condition						Designated Land									
Town	Street Location	Max capacity (L/S)	Drainage Area (ha)	Units	Pop.	Total Flow (L/S)	P/F	Pipe Capacity	Units	Drainage Area (ha)	Pop.	M	Design Flow Rate (L/S)	Extraneous Flow (L/S)	Total Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Pipe Capacity
Designated Land 1	200mm dia. San at RR 80	19.890	4.02	48.24	110.95	0.83	Pass	4.20%	490.69	40.89	1128.59	3.77	17.71	15.95	33.66	34.49	Fail	173.41%
PASS	250 mm dia. San at Fifth St	31.810	26.00	312.00	717.60	5.40	Pass	16.97%	490.69	40.89	1128.59	3.77	17.71	15.95	33.66	39.06	Fail	122.78%
	400mm dia San at Main St.	70.900	57.78	693.36	1594.73	12.00	Pass	16.92%	490.69	40.89	1128.59	3.77	17.71	15.95	33.66	45.65	Pass	64.39%
	500mm dia San at Herve Ave	99.840	92.14	1105.68	2543.06	19.13	Pass	19.16%	490.69	40.89	1128.59	3.77	17.71	15.95	33.66	52.79	Pass	52.87%
	600mm dia San at Helen St.	175.570	145.40	1744.80	4013.04	30.19	Pass	17.20%	490.69	40.89	1128.59	3.77	17.71	15.95	33.66	63.85	Pass	36.37%
Designated Land 2	200mm dia. San at Carina Dr	19.890	1.06	12.72	29.26	0.22	Pass	1.11%	275.16	22.93	632.87	3.92	10.34	8.94	19.28	19.50	Pass	98.03%
PASS	600mm dia San at Spruce St.	175.570	156.55	1878.60	4320.78	32.51	Pass	18.51%	275.16	22.93	632.87	3.92	10.34	8.94	19.28	51.78	Pass	29.50%
Designated Land 3	250mm dia. San at Spruce St.	31.810	6.14	73.68	169.46	1.27	Pass	4.01%	384.48	32.04	884.30	3.83	14.13	12.50	26.62	27.90	Pass	87.70%
PASS	250mm dia. San at Carman St.	31.810	7.13	85.56	196.79	1.48	Pass	4.65%	384.48	32.04	884.30	3.83	14.13	12.50	26.62	28.10	Pass	88.35%
	200mm dia. San at Laura St	19.890	2.13	25.56	58.79	0.44	Pass	2.22%	384.48	32.04	884.30	3.83	14.13	12.50	26.62	27.07	Fail	136.08%
	300mm dia. San at Carman St.	47.890	10.81	129.72	298.36	2.24	Pass	4.69%	384.48	32.04	884.30	3.83	14.13	12.50	26.62	28.87	Pass	60.28%
Designated Land 4	200mm dia. San at Colette St	19.890	2.39	28.68	65.96	0.50	Pass	2.50%	457.32	38.11	1051.84	3.79	16.59	14.86	31.46	31.95	Fail	160.65%
PASS	200mm dia. San at Gabrielle St	19.890	6.07	72.84	167.53	1.26	Pass	6.34%	457.32	38.11	1051.84	3.79	16.59	14.86	31.46	32.72	Fail	164.49%
	300mm dia. San at Francis St	47.890	5.05	60.60	139.38	1.05	Pass	2.19%	457.32	38.11	1051.84	3.79	16.59	14.86	31.46	32.50	Pass	67.87%
	400mm dia. San at Michellr Dr	70.900	45.49	545.88	1255.52	9.45	Pass	13.32%	457.32	38.11	1051.84	3.79	16.59	14.86	31.46	40.90	Pass	57.69%
	450mm dia. San at RR 80	99.840	80.74	968.88	2228.42	16.76	Pass	16.79%	457.32	38.11	1051.84	3.79	16.59	14.86	31.46	48.22	Pass	48.30%
	500mm dia. San atJean D'arc St	99.840	214.80	2577.60	5928.48	44.60	Pass	44.67%	457.32	38.11	1051.84	3.79	16.59	14.86	31.46	76.06	Pass	76.18%

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.41

High In-migration Designation

Valley East Sanitary Pipe Capacity Review

Valley East Sanitary Pipe Capacity Review

Review Criterias

1) Unit Density (units/ha)	**12**	
2) Pop Density (cap/unit)	**2.30**	
3) New Per Capita Flow (L/cap/day)	**360**	RMOS Engineering Design Manual (January 1994)
4) Existing Per Capita Flow (L/cap/day)	**650**	based on GCS Annual Wastewater Reports (2001, 2002, 2003)
5) Extraneaous flow; Infiltration Rate (L/ha/day)	**33700**	RMOS Engineering Design Manual (January 1994)

			Existing Condition									Designated Area									
Town	Street Location	Max capacity (L/S)	Drainage Area (ha)	Units	Pop.	M	Design Flow Rate (L/S)	Extraneous Flow (L/S)	Total Add Flow Rate (L/S)	P/F	Pipe Capacity	Units	Drainage Area (ha)	Pop.	M	Design Flow Rate (L/S)	Extraneous Flow (L/S)	Total Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Pipe Capacity
Designated Land 1	200mm dia. San at RR 80	19.890	4.02	48.24	110.95	4.23	1.96	1.57	3.52	Pass	17.72%	808.08	67.34	1858.58	3.61	27.96	26.27	54.22	57.75	Fail	290.34%
PASS	250 mm dia. San at Fifth St	31.810	26.00	312.00	717.60	3.89	11.63	10.14	21.77	Pass	68.43%	808.08	67.34	1858.58	3.61	27.96	26.27	54.22	75.99	Fail	238.89%
	400mm dia San at Main St.	70.900	57.78	693.36	1594.73	3.66	24.32	22.54	46.86	Pass	66.09%	808.08	67.34	1858.58	3.61	27.96	26.27	54.22	101.08	Fail	142.57%
	500mm dia San at Herve Ave	99.840	92.14	1105.68	2543.06	3.50	37.11	35.94	73.05	Pass	73.17%	808.08	67.34	1858.58	3.61	27.96	26.27	54.22	127.27	Fail	127.48%
	600mm dia San at Helen St.	175.570	145.40	1744.80	4013.04	3.33	55.72	56.71	112.43	Pass	64.04%	808.08	67.34	1858.58	3.61	27.96	26.27	54.22	166.65	Pass	94.92%
Designated Land 2	200mm dia. San at Carina Dr	19.890	1.06	12.72	29.26	4.36	0.53	0.41	0.94	Pass	4.75%	275.16	22.93	632.87	3.92	10.34	8.94	19.28	20.22	Fail	101.68%
PASS	600mm dia San at Spruce St.	175.570	156.55	1878.60	4320.78	3.30	59.47	61.06	120.53	Pass	68.65%	275.16	22.93	632.87	3.92	10.34	8.94	19.28	139.81	Pass	79.63%
Designated Land 3	250mm dia. San at Spruce St.	31.810	6.14	73.68	169.46	4.17	2.95	2.39	5.34	Pass	16.79%	384.48	32.04	884.30	3.83	14.13	12.50	26.62	31.96	Fail	100.49%
PASS	250mm dia. San at Carman St.	31.810	7.13	85.56	196.79	4.15	3.40	2.78	6.18	Pass	19.44%	384.48	32.04	884.30	3.83	14.13	12.50	26.62	32.81	Fail	103.14%
	200mm dia. San at Laura St	19.890	2.13	25.56	58.79	4.30	1.05	0.83	1.88	Pass	9.47%	384.48	32.04	884.30	3.83	14.13	12.50	26.62	28.51	Fail	143.32%
	300mm dia. San at Carman St.	47.890	10.81	129.72	298.36	4.08	5.07	4.22	9.29	Pass	19.39%	384.48	32.04	884.30	3.83	14.13	12.50	26.62	35.91	Pass	74.99%
Designated Land 4	200mm dia. San at Colette St	19.890	2.39	28.68	65.96	4.29	1.18	0.93	2.11	Pass	10.61%	457.32	38.11	1051.84	3.79	16.59	14.86	31.46	33.57	Fail	168.76%
PASS	200mm dia. San at Gabrielle St	19.890	6.07	72.84	167.53	4.18	2.91	2.37	5.28	Pass	26.56%	457.32	38.11	1051.84	3.79	16.59	14.86	31.46	36.74	Fail	184.71%
	300mm dia. San at Francis St	47.890	5.05	60.60	139.38	4.20	2.44	1.97	4.41	Pass	9.21%	457.32	38.11	1051.84	3.79	16.59	14.86	31.46	35.87	Pass	74.89%
	400mm dia. San at Michellr Dr	70.900	45.49	545.88	1255.52	3.73	19.53	17.74	37.28	Pass	52.58%	457.32	38.11	1051.84	3.79	16.59	14.86	31.46	68.73	Pass	96.94%
	450mm dia. San at RR 80	99.840	80.74	968.88	2228.42	3.55	32.95	31.49	64.44	Pass	64.55%	457.32	38.11	1051.84	3.79	16.59	14.86	31.46	95.90	Pass	96.05%
	500mm dia. San atJean D'arc St	99.840	214.80	2577.60	5928.48	3.18	78.45	83.78	162.23	Fail	162.49%	457.32	38.11	1051.84	3.79	16.59	14.86	31.46	193.68	Fail	193.99%

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.42

High In-migration Designation

Valley East Sanitary Pipe Capacity Review

Valley East Sanitary Pipe Capacity Review

Review Criterias

1) Unit Density (units/ha)	**12**	
2) Pop Density (cap/unit)	**2.30**	
3) New Per Capita Flow (L/cap/day)	**360**	RMOS Engineering Design Manual (January 1994)
4) Existing Per Capita Flow (L/cap/day)	**650**	based on GCS Annual Wastewater Reports (2001, 2002, 2003)
5) Extraneaous flow; Infiltration Rate (L/ha/day)	**33700**	RMOS Engineering Design Manual (January 1994)

		Maximun Pipe Capacity								Existing Condition									Designated Areas									
Town	Street Location	Pipe Diameter Nominal	Pipe Diameter Actual	Area (m2)	N	Slope %	R (m)	Velocity (m/s)	Max capacity (L/S)	Drainage Area	Units	Pop.	M	Design Flow Rate (L/S)	Extraneous Flow	Total Add Flow Rate (L/S)	P/F	Pipe Capacity	Units	Drainage Area (ha)	Pop.	M	Design Flow Rate (L/S)	Extraneous Flow (L/S)	Total Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Pipe Capacity
Designated Land 1	400mm dia San at Main St.	400	400	0.1257	0.015	0.1660	0.100	5.854	73.562	57.78	693.36	1594.73	3.66	24.32	22.54	46.86	Pass	63.70%	808.08	67.34	1858.58	3.61	27.96	26.27	54.22	101.08	Fail	137.41%
	500mm dia San at Herve Ave	500	500	0.1963	0.015	0.1200	0.125	5.775	113.401	92.14	1105.68	2543.06	3.50	37.11	35.94	73.05	Pass	64.42%	808.08	67.34	1858.58	3.61	27.96	26.27	54.22	127.27	Fail	112.23%
Designated Land 4	500mm dia. San atJean D'arc St	500	500	0.1963	0.015	0.0800	0.125	4.716	92.591	214.80	2577.60	5928.48	3.18	78.45	83.78	162.23	Fail	175.21%	457.32	38.11	1051.84	3.79	16.59	14.86	31.46	193.68	Fail	209.18%

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.43

In-migration Designation

Capreol Sanitary Pipe Capacity Review

Capreol Sanitary Pipe Capacity Review

Review Criterias

1) Unit Density (units/ha)	**12**	
2) Pop Density (cap/unit)	**2.30**	
3) New Per Capita Flow (L/cap/day)	**500**	RMOS Engineering Design Manual (January 1994)
4) Existing Per Capita Flow (L/cap/day)	**1096**	based on GCS Annual Wastewater Reports (2001, 2002, 2003)
5) Extraneaous flow; Infiltration Rate (L/ha/day)	**33700**	RMOS Engineering Design Manual (January 1994)

			Existing Condition						Designated Land						
Town	Street Location	Max capacity (L/S)	Drainage Area (ha)	Units	Pop.	Total Flow (L/S)	P/F	Pipe Capacity	Development	Units	Drainage Area (ha)	Pop.	Total Flow Rate (L/S)	P/F	Pipe Capacity
Capreol	250mm dia. San at Balsam Cres.	31.810	6.92	83.04	190.99	2.42	Pass	7.62%	Available Hectares	81.36	6.78	187.13	9.57	Pass	30.09%
PASS	200mm dia. San at Hanna Ave.	19.890	1.47	17.64	40.57	0.51	Pass	2.59%	Available Hectares	81.36	6.78	187.13	7.66	Pass	38.52%
	200mm dia. San at Coulson St.	19.890	4.86	58.32	134.14	1.70	Pass	8.55%	Available Hectares	81.36	6.78	187.13	8.85	Pass	44.49%
	250mm dia San at Hanna Ave	31.810	6.23	74.76	171.95	2.18	Pass	6.86%	Available Hectares	81.36	6.78	187.13	9.33	Pass	29.33%
	200mm dia San at Hanna St.	19.890	1.38	16.56	38.09	0.48	Pass	2.43%	Available Hectares	81.36	6.78	187.13	7.63	Pass	38.37%

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.44

High In-migration Designation

Capreol Sanitary Pipe Capacity Review

Capreol Sanitary Pipe Capacity Review

Review Criterias

1) Unit Density (units/ha)	**12**	
2) Pop Density (cap/unit)	**2.30**	
3) New Per Capita Flow (L/cap/day)	**500**	RMOS Engineering Design Manual (January 1994)
4) Existing Per Capita Flow (L/cap/day)	**1096**	based on GCS Annual Wastewater Reports (2001, 2002, 2003)
5) Extraneaous flow; Infiltration Rate (L/ha/day)	**33700**	RMOS Engineering Design Manual (January 1994)

			Existing Condition									Designated Area									
Town	Street Location	Max capacity (L/S)	Drainage Area (ha)	Units	Pop.	M	Design Flow Rate (L/S)	Extraneous Flow (L/S)	Total Add Flow Rate (L/S)	P/F	Pipe Capacity	Units	Drainage Area (ha)	Pop.	M	Design Flow Rate (L/S)	Extraneous Flow (L/S)	Total Add Flow Rate (L/S)	Total Flow Rate	P/F	Pipe Capacity
Capreol	250mm dia. San at Balsam Cres.	31.810	6.92	83.04	190.99	4.26	2.05	12.41	14.46	Pass	45.45%	111.72	9.31	256.96	4.11	6.11	3.63	9.74	24.19	Pass	76.06%
PASS	200mm dia. San at Hanna Ave.	19.890	1.47	17.64	40.57	4.39	0.45	7.76	8.21	Pass	41.26%	111.72	9.31	256.96	4.11	6.11	3.63	9.74	17.94	Pass	90.21%
	200mm dia. San at Coulson St.	19.890	4.86	58.32	134.14	4.30	1.45	7.76	9.21	Pass	46.30%	111.72	9.31	256.96	4.11	6.11	3.63	9.74	18.95	Pass	95.26%
	250mm dia San at Hanna Ave	31.810	6.23	74.76	171.95	4.28	1.85	12.41	14.26	Pass	44.82%	111.72	9.31	256.96	4.11	6.11	3.63	9.74	23.99	Pass	75.43%
	200mm dia San at Hanna St.	19.890	1.38	16.56	38.09	4.39	0.42	7.76	8.18	Pass	41.12%	111.72	9.31	256.96	4.11	6.11	3.63	9.74	17.92	Pass	90.08%

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.45

In-migration Designation

Rayside-Balfour Sanitary Pipe Capacity Review

Rayside-Balfour Sanitary Pipe Capacity Review

Review Criterias

1) Unit Density (units/ha)		**12**			
2) Pop Density (cap/unit)		**2.30**			
3) New Per Capita Flow (L/cap/day)	Chelmsford	**360**	Azilda	**360**	RMOS Engineering Design Manual (January 1994)
4) Existing Per Capita Flow (L/cap/day)		**1152**		**1421**	based on GCS Annual Wastewater Reports (2001, 2002, 2003)
5) Extraneaous flow; Infiltration Rate (L/ha/day)		**33700**		**22450**	RMOS Engineering Design Manual (January 1994)

			Existing Condition						Designated Land					
Town	Street Location	Max capacity (L/S)	Drainage Area (ha)	Units	Pop.	Total Flow (L/S)	P/F	Pipe Capacity	Units	Drainage Area (ha)	Pop.	Total Flow Rate (L/S)	P/F	Pipe Capacity
Chelmsford	200mm dia. San at Pauline st	19.890	3.28	39.36	90.53	1.21	Pass	6.07%	93.04	7.75	214.00	7.92	Pass	39.82%
Area 4	200mm dia. San at Shirley St	19.890	2.65	31.80	73.14	0.98	Pass	4.90%	93.04	7.75	214.00	7.69	Pass	38.65%
PASS	200mm dia. San at Shirley St	19.890	2.29	27.48	63.20	0.84	Pass	4.24%	93.04	7.75	214.00	7.56	Pass	37.99%
	200mm dia. San at Trottier	19.890	0.56	6.72	15.46	0.21	Pass	1.04%	93.04	7.75	214.00	6.92	Pass	34.79%
	400mm dia. San at Edna St	99.840	108.65	1303.80	2998.74	39.98	Pass	40.05%	93.04	7.75	214.00	46.70	Pass	46.77%
	450mm dia. San at Edna St	99.840	108.65	1303.80	2998.74	39.98	Pass	40.05%	93.04	7.75	214.00	46.70	Pass	46.77%
	500mm dia. San at Edna St	70.900	108.65	1303.80	2998.74	39.98	Pass	56.39%	93.04	7.75	214.00	46.70	Pass	65.86%
	600mm dia. San at Leroux St	175.570	108.65	1303.80	2998.74	39.98	Pass	22.77%	93.04	7.75	214.00	46.70	Pass	26.60%
	750mm dia. San at Laurette St	318.330	302.70	3632.40	8354.52	111.39	Pass	34.99%	93.04	7.75	214.00	118.11	Pass	37.10%
Area 5	200mm dia. San at Pauline st	19.890	4.03	48.36	111.23	1.48	Pass	7.46%	93.04	7.75	214.00	8.20	Pass	41.21%
PASS	200mm dia. San at Laurette	19.890	6.17	74.04	170.29	2.27	Pass	11.42%	93.04	7.75	214.00	8.98	Pass	45.17%
	200mm dia. San at Trottier	19.890	4.44	53.28	122.54	1.63	Pass	8.21%	93.04	7.75	214.00	8.35	Pass	41.97%
Area 6	150mm dia. San at Keith Ave	10.670	12.58	150.96	347.21	4.63	Pass	43.39%	93.04	7.75	214.00	11.34	Fail	106.30%
PASS	250mm dia. San at Keith Ave.	31.810	24.86	298.32	686.14	9.15	Pass	28.76%	93.04	7.75	214.00	15.86	Pass	49.86%
	200mm dia. San at Laura Ave	19.890	12.55	150.60	346.38	4.62	Pass	23.22%	93.04	7.75	214.00	11.33	Pass	56.97%
	300mm dia. San at Monique St	47.890	22.47	269.64	620.17	8.27	Pass	17.27%	93.04	7.75	214.00	14.98	Pass	31.28%
Area 7	200mm dia. San at Edward Ave	19.890	8.74	104.88	241.22	3.22	Pass	16.17%	93.04	7.75	214.00	9.93	Pass	49.92%
PASS	200mm dia. San at Pinellas	19.890	3.09	37.08	85.28	1.14	Pass	5.72%	93.04	7.75	214.00	7.85	Pass	39.47%
	250mm dia. San at Edward Ave	31.810	5.25	63.00	144.90	1.93	Pass	6.07%	93.04	7.75	214.00	8.65	Pass	27.18%
	250mm dia. San at Cote Ave	31.810	38.87	466.44	1072.81	14.30	Pass	44.97%	93.04	7.75	214.00	21.02	Pass	66.07%

Area 8 PASS	200mm dia. San at Laura Ave	19.890	0.51	6.12	14.08	0.19	Pass	0.94%	93.04	7.75	214.00	6.90	Pass	34.70%
Azilda	200mm dia. San at Placide St.	19.890	1.04	12.48	28.70	0.47	Pass	2.37%	93.04	7.75	214.00	6.18	Pass	31.05%
Area 1	150mm dia. San at Montee	10.670	0.00	0.00	0.00	0.00	Pass	0.00%	93.04	7.75	214.00	5.70	Pass	53.46%
PASS	250mm dia. San at Placide St.	31.810	7.21	86.52	199.00	3.27	Pass	10.29%	93.04	7.75	214.00	8.98	Pass	28.22%
	450mm dia. San at Montee	99.840	13.300	159.60	367.08	6.04	Pass	6.05%	93.04	7.75	214.00	11.74	Pass	11.76%
Area 2	200mm dia. San at Placide St.	19.89	26.800	321.60	739.68	12.17	Pass	61.16%	93.04	7.75	214.00	17.87	Pass	89.84%
PASS	250mm dia. San at Placide St.	31.81	26.800	321.60	739.68	12.17	Pass	38.24%	93.04	7.75	214.00	17.87	Pass	56.17%
	300mm dia. San at Placide St.	47.89	26.800	321.60	739.68	12.17	Pass	25.40%	93.04	7.75	214.00	17.87	Pass	37.31%
Area 3	200mm dia. San at Placide St.	19.89	26.800	321.60	739.68	12.17	Pass	61.16%	93.04	7.75	214.00	17.87	Pass	89.84%
PASS	250mm dia. San at Placide St.	31.81	26.800	321.60	739.68	12.17	Pass	38.24%	93.04	7.75	214.00	17.87	Pass	56.17%
	300mm dia. San at Placide St.	47.89	26.800	321.60	739.68	12.17	Pass	25.40%	93.04	7.75	214.00	17.87	Pass	37.31%

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.46

High In-migration Designation

Rayside-Balfour Sanitary Pipe Capacity Review

Rayside-Balfour Sanitary Pipe Capacity Review

Review Criterias

1) Unit Density (units/ha)		**12**			
2) Pop Density (cap/unit)		**2.30**			
3) New Per Capita Flow (L/cap/day)	Chelmsford	**360**	Azilda	**360**	RMOS Engineering Design Manual (January 1994)
4) Existing Per Capita Flow (L/cap/day)		**1152**		**1421**	based on GCS Annual Wastewater Reports (2001, 2002, 2003)
5) Extraneaous flow; Infiltration Rate (L/ha/day)		**33700**		**22450**	RMOS Engineering Design Manual (January 1994)

			Existing Condition									Designated Area									
Town	Street Location	Max capacity (L/S)	Drainage Area (ha)	Units	Pop.	M	Design Flow Rate (L/S)	Extraneous Flow (L/S)	Total Add Flow	P/F	Pipe Capacity	Units	Drainage Area (ha)	Pop.	M	Design Flow Rate (L/S)	Extraneous Flow (L/S)	Total Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Pipe Capacity
Chelmsford	200mm dia. San at Pauline st	19.890	3.28	39.36	90.53	4.26	1.61	1.28	2.88	Pass	14.50%	216.00	18.00	496.80	3.98	8.23	7.02	15.25	18.13	Pass	91.18%
Area 4	200mm dia. San at Shirley St	19.890	2.65	31.80	73.14	4.28	1.30	1.03	2.34	Pass	11.75%	216.00	18.00	496.80	3.98	8.23	7.02	15.25	17.59	Pass	88.43%
PASS	200mm dia. San at Shirley St	19.890	2.29	27.48	63.20	4.29	1.13	0.89	2.02	Pass	10.17%	216.00	18.00	496.80	3.98	8.23	7.02	15.25	17.27	Pass	86.85%
	200mm dia. San at Trottier	19.890	0.56	6.72	15.46	4.39	0.28	0.22	0.50	Pass	2.52%	216.00	18.00	496.80	3.98	8.23	7.02	15.25	15.75	Pass	79.19%
	400mm dia. San at Edna St	99.840	108.65	1303.80	2998.74	3.44	43.01	42.38	85.39	Pass	85.53%	216.00	18.00	496.80	3.98	8.23	7.02	15.25	100.64	Fail	100.80%
	450mm dia. San at Edna St	99.840	108.65	1303.80	2998.74	3.44	43.01	42.38	85.39	Pass	85.53%	216.00	18.00	496.80	3.98	8.23	7.02	15.25	100.64	Fail	100.80%
	500mm dia. San at Edna St	118.031	108.65	1303.80	2998.74	3.44	43.01	42.38	85.39	Pass	72.35%	216.00	18.00	496.80	3.98	8.23	7.02	15.25	100.64	Pass	85.27%
	600mm dia. San at Leroux St	175.570	108.65	1303.80	2998.74	3.44	43.01	42.38	85.39	Pass	48.64%	216.00	18.00	496.80	3.98	8.23	7.02	15.25	100.64	Pass	57.32%
	750mm dia. San at Laurette St	318.330	302.70	3632.40	8354.52	3.03	105.54	118.07	223.61	Pass	70.24%	216.00	18.00	496.80	3.98	8.23	7.02	15.25	238.86	Pass	75.03%
Area 5	200mm dia. San at Pauline st	19.890	4.03	48.36	111.23	4.23	1.96	1.57	3.53	Pass	17.76%	216.00	18.00	496.80	3.98	8.23	7.02	15.25	18.78	Pass	94.43%
PASS	200mm dia. San at Laurette	19.890	6.17	74.04	170.29	4.17	2.96	2.41	5.37	Pass	26.98%	216.00	18.00	496.80	3.98	8.23	7.02	15.25	20.62	Fail	103.66%
	200mm dia. San at Trottier	19.890	4.44	53.28	122.54	4.22	2.15	1.73	3.89	Pass	19.54%	216.00	18.00	496.80	3.98	8.23	7.02	15.25	19.14	Pass	96.21%
Area 6	150mm dia. San at Keith Ave	10.670	12.58	150.96	347.21	4.05	5.86	4.91	10.77	Fail	100.91%	216.00	18.00	496.80	3.98	8.23	7.02	15.25	26.02	Fail	243.84%
PASS	250mm dia. San at Keith Ave.	31.810	24.86	298.32	686.14	3.90	11.15	9.70	20.84	Pass	65.53%	216.00	18.00	496.80	3.98	8.23	7.02	15.25	36.10	Fail	113.47%
	200mm dia. San at Laura Ave	19.890	12.55	150.60	346.38	4.05	5.85	4.90	10.74	Pass	54.01%	216.00	18.00	496.80	3.98	8.23	7.02	15.25	25.99	Fail	130.68%
	300mm dia. San at Monique St	47.890	22.47	269.64	620.17	3.92	10.14	8.76	18.90	Pass	39.48%	216.00	18.00	496.80	3.98	8.23	7.02	15.25	34.16	Pass	71.32%
Area 7	200mm dia. San at Edward Ave	19.890	8.74	104.88	241.22	4.12	4.14	3.41	7.55	Pass	37.94%	216.00	18.00	496.80	3.98	8.23	7.02	15.25	22.80	Fail	114.62%
PASS	200mm dia. San at Pinellas	19.890	3.09	37.08	85.28	4.26	1.51	1.21	2.72	Pass	13.67%	216.00	18.00	496.80	3.98	8.23	7.02	15.25	17.97	Pass	90.35%
	250mm dia. San at Edward Ave	31.810	5.25	63.00	144.90	4.20	2.53	2.05	4.58	Pass	14.40%	216.00	18.00	496.80	3.98	8.23	7.02	15.25	19.83	Pass	62.34%
	250mm dia. San at Cote Ave	31.810	38.87	466.44	1072.81	3.78	16.90	15.16	32.06	Fail	100.78%	216.00	18.00	496.80	3.98	8.23	7.02	15.25	47.31	Fail	148.72%
Area 8 PASS	200mm dia. San at Laura Ave	19.890	0.51	6.12	14.08	4.40	0.26	0.20	0.46	Pass	2.30%	147.60	12.30	339.48	4.06	5.74	4.80	10.53	10.99	Pass	55.26%
Azilda	200mm dia. San at Placide St.	19.890	1.04	12.48	28.70	4.36	0.52	0.41	0.93	Pass	4.66%	96.00	8.00	220.80	4.13	3.80	2.08	5.88	6.81	Pass	34.22%
Area 1	150mm dia. San at Montee	10.670	0.00	0.00	0.00	4.50	0.00	0.00	0.00	Pass	0.00%	96.00	8.00	220.80	4.13	3.80	2.08	5.88	5.88	Pass	55.11%
PASS	250mm dia. San at Placide St.	31.810	7.21	86.52	199.00	4.15	3.44	2.81	6.25	Pass	19.65%	96.00	8.00	220.80	4.13	3.80	2.08	5.88	12.13	Pass	38.14%
	450mm dia. San at Montee	99.840	13.300	159.60	367.08	4.04	6.18	5.19	11.37	Pass	11.38%	96.00	8.00	220.80	4.13	3.80	2.08	5.88	17.25	Pass	17.27%
Area 2	200mm dia. San at Placide St.	19.89	26.800	321.60	739.68	3.88	11.96	10.45	22.41	Fail	112.69%	96.00	8.00	220.80	4.13	3.80	2.08	5.88	28.29	Fail	142.25%
PASS	250mm dia. San at Placide St.	31.81	26.800	321.60	739.68	3.88	11.96	10.45	22.41	Pass	70.46%	96.00	8.00	220.80	4.13	3.80	2.08	5.88	28.29	Pass	88.95%
	300mm dia. San at Placide St.	47.89	26.800	321.60	739.68	3.88	11.96	10.45	22.41	Pass	46.80%	96.00	8.00	220.80	4.13	3.80	2.08	5.88	28.29	Pass	59.08%
Area 3	200mm dia. San at Placide St.	19.89	26.800	321.60	739.68	3.88	11.96	10.45	22.41	Fail	112.69%	96.00	8.00	220.80	4.13	3.80	2.08	5.88	28.29	Fail	142.25%
PASS	250mm dia. San at Placide St.	31.81	26.800	321.60	739.68	3.88	11.96	10.45	22.41	Pass	70.46%	96.00	8.00	220.80	4.13	3.80	2.08	5.88	28.29	Pass	88.95%
	300mm dia. San at Placide St.	47.89	26.800	321.60	739.68	3.88	11.96	10.45	22.41	Pass	46.80%	96.00	8.00	220.80	4.13	3.80	2.08	5.88	28.29	Pass	59.08%

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.47

High In-migration Designation

Rayside-Balfour Sanitary Pipe Capacity Review

Rayside-Balfour Sanitary Pipe Capacity Review

Review Criterias

1) Unit Density (units/ha)		**12**			
2) Pop Density (cap/unit)		**2.30**			
3) New Per Capita Flow (L/cap/day)	Chelmsford	**360**	Azilda	**360**	RMOS Engineering Design Manual (January 1994)
4) Existing Per Capita Flow (L/cap/day)		**1152**		**1421**	based on GCS Annual Wastewater Reports (2001, 2002, 2003)
5) Extraneaous flow; Infiltration Rate (L/ha/day)		**33700**		**22450**	RMOS Engineering Design Manual (January 1994)

		Maximun Pipe Capacity							Existing Condition									Designated Areas									
Town	Street Location	Pipe Diameter Nominal	Pipe Diameter Actual	Area (m2)	N	Slope %	R (m)	Velocity (m/s)	Max capacity (L/S)	Drainage Area (ha)	Units	Pop.	M	Design Flow Rate (L/S)	Extraneous Flow (L/S)	Total Add Flow Rate (L/S)	P/F	Pipe Capacity	Units	Drainage Area (ha)	Pop.	M	Design Flow Rate (L/S)	Extraneous Flow (L/S)	Total Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Pipe Capacity
Area 4	400mm dia. San at Edna St	400	400	0.1257	0.015	0.1500	0.100	5.565	69.927	108.65	1303.80	2998.74	3.44	43.01	42.38	85.39	**Fail**	122.12%	216.00	18.00	496.80	3.98	8.23	7.02	15.25	100.64	**Fail**	143.93%
	450mm dia. San at Edna St	450	457.2	0.1642	0.015	0.0700	0.114	4.156	68.224	108.65	1303.80	2998.74	3.44	43.01	42.38	85.39	**Fail**	125.16%	216.00	18.00	496.80	3.98	8.23	7.02	15.25	100.64	**Fail**	147.52%
Area 6	250mm dia. San at Keith Ave.	250	254	0.0507	0.015	0.4300	0.064	6.960	35.269	24.86	298.32	686.14	3.90	11.15	9.70	20.84	**Pass**	59.10%	216.00	18.00	496.80	3.98	8.23	7.02	15.25	36.10	**Fail**	102.34%
Area 7	250mm dia. San at Cote Ave	250	254	0.0507	0.015	0.1000	0.064	3.357	17.008	38.87	466.44	1072.81	3.78	16.90	15.16	32.06	**Fail**	188.49%	216.00	18.00	496.80	3.98	8.23	7.02	15.25	47.31	**Fail**	278.15%

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.48

In-migration Designation

Garson Sanitary Pipe Capacity Review

Garson Sanitary Pipe Capacity Review In migration taken by subdivision

Review Criterias

1) Unit Density (units/ha)	**12**	
2) Pop Density (cap/unit)	**2.30**	
3) New Per Capita Flow (L/cap/day)	**360**	RMOS Engineering Design Manual (January 1994)
4) Existing Per Capita Flow (L/cap/day)	**295**	based on GCS Annual Wastewater Reports (2001, 2002, 2003)
5) Extraneaous flow; Infiltration Rate (L/ha/day)	**11250**	RMOS Engineering Design Manual (January 1994)

			Existing Condition								Designated Land					
Town	Street Location	Max capacity (L/S)	Drainage Area (ha)	Units	Pop.	Per Capita Flow (L/S)	Extraneous Flow (L/S)	Total Flow (L/S)	P/F	Pipe Capacity	Units	Drainage Area (ha)	Pop.	Total Flow Rate (L/S)	P/F	Pipe Capacity
Area 1	200mm dia. San at Penman Ave	19.890	14.51	174.12	400.48	1.37	1.89	1.37	Pass	6.87%	0.00		0.00	1.37	Pass	6.87%
PASS	150mm dia. San at Ellsmere Dr	10.670	14.33	171.96	395.51	1.35	1.87	1.35	Pass	12.66%	0.00		0.00	1.35	Pass	12.66%
	200mm dia. San at O'Neil Dr	19.890	20.30	243.60	560.28	1.91	2.64	1.91	Pass	9.62%	0.00		0.00	1.91	Pass	9.62%
	250mm dia. San at O'Neil Dr	31.810	204.00	2448.00	5630.40	19.22	26.56	19.22	Pass	60.43%	0.00		0.00	19.22	Pass	60.43%
	300mm dia. San at O'Neil Dr	47.890	204.00	2448.00	5630.40	19.22	26.56	19.22	Pass	40.14%	0.00		0.00	19.22	Pass	40.14%
Area 2	150mm dia. San at Cedargreen Dr	10.670	16.17	194.04	446.29	1.52	2.11	1.52	Pass	14.28%	0.00		0.00	1.52	Pass	14.28%
PASS	200mm dia. San at Cedargreen Dr	19.890	15.56	186.72	429.46	1.47	2.03	1.47	Pass	7.37%	0.00		0.00	1.47	Pass	7.37%

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.49

High In-migration Designation

Garson Sanitary Pipe Capacity Review

Garson Sanitary Pipe Capacity Review

Review Criterias

1) Unit Density (units/ha)	**12**	
2) Pop Density (cap/unit)	**2.30**	
3) New Per Capita Flow (L/cap/day)	**360**	RMOS Engineering Design Manual (January 1994)
4) Existing Per Capita Flow (L/cap/day)	**295**	based on GCS Annual Wastewater Reports (2001, 2002, 2003)
5) Extraneaous flow; Infiltration Rate (L/ha/day)	**11250**	RMOS Engineering Design Manual (January 1994)

			Existing Condition								Desiganted Areas									
Town	Street Location	Max capacity (L/S)	Drainage Area (ha)	Units	Pop.	M	Design Flow Rate (L/S)	Extraneous Flow (L/S)	Total Add Flow	P/F	Pipe Capacity	Units	Drainage Area (ha)	Pop.	M	Design Flow Rate (L/S)	Extraneous Flow (L/S)	Total Add Flow Rate (L/S)	Total Flow Rate	P/F	Pipe Capacity
Area 1	200mm dia. San at Penman Ave	19.890	14.51	174.12	400.48	4.02	6.71	1.89	8.60	Pass	43.24%	102.00	8.50	234.60	4.12	4.03	1.11	5.14	13.74	Pass	69.06%
PASS	150mm dia. San at Ellsmere Dr	10.670	14.33	171.96	395.51	4.02	6.63	1.87	8.50	Pass	79.64%	102.00	8.50	234.60	4.12	4.03	1.11	5.14	13.63	Fail	127.78%
	200mm dia. San at O'Neil Dr	19.890	20.30	243.60	560.28	3.95	9.22	2.64	11.86	Pass	59.63%	102.00	8.50	234.60	4.12	4.03	1.11	5.14	17.00	Pass	85.45%
	250mm dia. San at O'Neil Dr	31.810	204.00	2448.00	5630.40	3.20	75.00	26.56	101.56	Fail	319.27%	102.00	8.50	234.60	4.12	4.03	1.11	5.14	106.70	Fail	335.42%
	300mm dia. San at O'Neil Dr	47.890	204.00	2448.00	5630.40	3.20	75.00	26.56	101.56	Fail	212.07%	102.00	8.50	234.60	4.12	4.03	1.11	5.14	106.70	Fail	222.79%
Area 2	150mm dia. San at Cedargreen Dr	10.670	16.17	194.04	446.29	4.00	7.44	2.11	9.54	Pass	89.43%	102.00	8.50	234.60	4.12	4.03	1.11	5.14	14.68	Fail	137.56%
PASS	200mm dia. San at Cedargreen Dr	19.890	15.56	186.72	429.46	4.01	7.17	2.03	9.20	Pass	46.24%	102.00	8.50	234.60	4.12	4.03	1.11	5.14	14.33	Pass	72.06%

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.50

High In-migration Designation

Garson Sanitary Pipe Capacity Review

Garson Sanitary Pipe Capacity Review

Review Criterias

1) Unit Density (units/ha)	**12**	
2) Pop Density (cap/unit)	**2.30**	
3) New Per Capita Flow (L/cap/day)	**360**	RMOS Engineering Design Manual (January 1994)
4) Existing Per Capita Flow (L/cap/day)	**295**	based on GCS Annual Wastewater Reports (2001, 2002, 2003)
5) Extraneaous flow; Infiltration Rate (L/ha/day)	**11250**	RMOS Engineering Design Manual (January 1994)

		Maximun Pipe Capacity								Existing Condition									Designated Areas								
Town	Street Location	Pipe Diameter Nominal	Pipe Diameter Actual	Area (m2)	N	Slope %	R (m)	Velocity (m/s)	Max capacity (L/S)	Drainage Area (ha)	Units	Pop.	M	Design Flow Rate (L/S)	Extraneous Flow (L/S)	Total Add Flow Rate (L/S)	P/F	Pipe Capacity	Units	Drainage Area (ha)	Pop.	M	Design Flow Rate (L/S)	Extraneous Flow (L/S)	Total Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Pipe Capacity
Area 1	250mm dia. San at O'Neil Dr	250	254	0.0507	0.015	0.2900	0.064	5.716	28.964	204.00	2448.00	5630.40	3.20	75.00	26.56	101.56	**Fail**	350.64%	102.00	8.50	234.60	4.12	4.03	1.11	5.14	106.70	**Fail**	368.37%
	300mm dia. San at O'Neil Dr	300	304.8	0.0730	0.015	0.2100	0.076	5.493	40.079	204.00	2448.00	5630.40	3.20	75.00	26.56	101.56	**Fail**	253.40%	102.00	8.50	234.60	4.12	4.03	1.11	5.14	106.70	**Fail**	266.21%

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.51

In-migration Designation

Coniston Sanitary Pipe Capacity Review

Coniston Sanitary Pipe Capacity Review

Review Criterias

1) Unit Density (units/ha)	**12**	
2) Pop Density (cap/unit)	**2.30**	
3) New Per Capita Flow (L/cap/day)	**410**	RMOS Engineering Design Manual (January 1994)
4) Existing Per Capita Flow (L/cap/day)	**1210**	based on GCS Annual Wastewater Reports (2001, 2002, 2003)
5) Extraneaous flow; Infiltration Rate (L/ha/day)	**33700**	RMOS Engineering Design Manual (January 1994)

			Existing Condition								Designated Land					
Town	Street Location	Max capacity (L/S)	Drainage Area (ha)	Units	Pop.	Per Capita Flow (L/S)	Extraneous Flow (L/S)	Total Flow (L/S)	P/F	Pipe Capacity	Units	Drainage Area (ha)	Pop.	Total Flow Rate (L/S)	P/F	Pipe Capacity
Area 1	150mm dia. San at George St	10.670	0.68	8.16	18.77	0.26	0.27	0.26	Pass	2.46%	134.76	11.23	309.95	10.63	Pass	99.65%
PASS	200mm dia. San at Rideau Ave	19.890	1.91	22.92	52.72	0.74	0.74	0.74	Pass	3.71%	134.76	11.23	309.95	11.11	Pass	55.85%
	150mm dia. San at John Ave	10.670	0.00	0.00	0.00	0.00	0.00	0.00	Pass	0.00%	134.76	11.23	309.95	10.37	Pass	97.19%
	375mm dia. San at Caruso St	70.900	34.50	414.00	952.20	13.34	13.46	13.34	Pass	18.81%	134.76	11.23	309.95	23.71	Pass	33.43%
	350mm dia. San at Allan St	64.950	34.50	414.00	952.20	13.34	13.46	13.34	Pass	20.53%	134.76	11.23	309.95	23.71	Pass	36.50%
	450mm dia. San at Allan St	99.840	34.50	414.00	952.20	13.34	13.46	13.34	Pass	13.36%	134.76	11.23	309.95	23.71	Pass	23.74%
Area 2	200mm dia. San at North Ave	19.89	0.00	0.00	0.00	0.00	0.00	0.00	Pass	0.00%	134.76	11.23	309.95	10.37	Pass	52.14%
PASS	300mm dia. San at Caruso St	47.89	3.54	42.48	97.70	1.37	1.38	1.37	Pass	2.86%	134.76	11.23	309.95	11.74	Pass	24.51%

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.52

High In-migration Designation

Coniston Sanitary Pipe Capacity Review

Coniston Sanitary Pipe Capacity Review

Review Criterias

1) Unit Density (units/ha)	**12**	
2) Pop Density (cap/unit)	**2.30**	
3) New Per Capita Flow (L/cap/day)	**410**	RMOS Engineering Design Manual (January 1994)
4) Existing Per Capita Flow (L/cap/day)	**1210**	based on GCS Annual Wastewater Reports (2001, 2002, 2003)
5) Extraneaous flow; Infiltration Rate (L/ha/day)	**33700**	RMOS Engineering Design Manual (January 1994)

			Existing Condition									Designated Areas									
Town	Street Location	Max capacity (L/S)	Drainage Area (ha)	Units	Pop.	M	Design Flow Rate (L/S)	Extraneous Flow (L/S)	Total Flow (L/S)	P/F	Pipe Capacity	Units	Drainage Area	Pop.	M	Design Flow Rate (L/S)	Extraneous Flow (L/S)	Total Add Flow Rate (L/S)	Total Flow Rate	P/F	Pipe Capacity
Area 1	150mm dia. San at George St	10.670	0.68	8.16	18.77	4.38	0.39	0.27	0.66	Pass	6.15%	192.00	16.00	441.60	4.00	8.39	6.24	14.63	15.28	Fail	143.22%
PASS	200mm dia. San at Rideau Ave	19.890	1.91	22.92	52.72	4.31	1.08	0.74	1.82	Pass	9.17%	192.00	16.00	441.60	4.00	8.39	6.24	14.63	16.45	Pass	82.70%
	150mm dia. San at John Ave	10.670	0.00	0.00	0.00	4.50	0.00	0.00	0.00	Pass	0.00%	192.00	16.00	441.60	4.00	8.39	6.24	14.63	14.63	Fail	137.07%
	375mm dia. San at Caruso St	70.900	34.50	414.00	952.20	3.81	17.23	13.46	30.69	Pass	43.28%	192.00	16.00	441.60	4.00	8.39	6.24	14.63	45.31	Pass	63.91%
	350mm dia. San at Allan St	64.950	34.50	414.00	952.20	3.81	17.23	13.46	30.69	Pass	47.25%	192.00	16.00	441.60	4.00	8.39	6.24	14.63	45.31	Pass	69.77%
	450mm dia. San at Allan St	99.840	34.50	414.00	952.20	3.81	17.23	13.46	30.69	Pass	30.74%	192.00	16.00	441.60	4.00	8.39	6.24	14.63	45.31	Pass	45.39%
Area 2	200mm dia. San at North Ave	19.89	0.00	0.00	0.00	4.50	0.00	0.00	0.00	Pass	0.00%	169.20	14.10	389.16	4.03	7.44	5.50	12.94	12.94	Pass	65.05%
PASS	300mm dia. San at Caruso St	47.89	3.54	42.48	97.70	4.25	1.97	1.38	3.35	Pass	6.99%	169.20	14.10	389.16	4.03	7.44	5.50	12.94	16.29	Pass	34.01%

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.53

In-migration Designation

Falconbridge Sanitary Pipe Capacity Review

Falconbridge Sanitary Pipe Capacity Review

Review Criterias

1) Unit Density (units/ha)	**12**	
2) Pop Density (cap/unit)	**2.30**	
3) New Per Capita Flow (L/cap/day)	**410**	RMOS Engineering Design Manual (January 1994)
4) Existing Per Capita Flow (L/cap/day)	**860**	based on GCS Annual Wastewater Reports (2001, 2002, 2003)
5) Extraneaous flow; Infiltration Rate (L/ha/day)	**33700**	RMOS Engineering Design Manual (January 1994)

			Existing Condition								Designated Land					
Town	Street Location	Max capacity (L/S)	Drainage Area (ha)	Units	Pop.	Per Capita Flow (L/S)	Extraneous Flow (L/S)	Total Flow (L/S)	P/F	Pipe Capacity	Units	Drainage Area (ha)	Pop.	Total Flow Rate (L/S)	P/F	Pipe Capacity
Area 2 PASS	200mm dia. San at Franklin St.	19.890	11.07	132.84	305.53	3.04	4.32	3.04	Pass	15.29%	51.36	4.28	118.13	7.08	Pass	35.59%
Area 1 PASS	250mm dia. San at Hodge St	31.810	13.79	165.48	380.60	3.79	5.38	3.79	Pass	11.91%	51.36	4.28	118.13	7.83	Pass	24.60%

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.54

High In-migration Designation

Falconbridge Sanitary Pipe Capacity Review

Falconbridge Sanitary Pipe Capacity Review

Review Criterias

1) Unit Density (units/ha)	**12**	
2) Pop Density (cap/unit)	**2.30**	
3) New Per Capita Flow (L/cap/day)	**410**	RMOS Engineering Design Manual (January 1994)
4) Existing Per Capita Flow (L/cap/day)	**860**	based on GCS Annual Wastewater Reports (2001, 2002, 2003)
5) Extraneaous flow; Infiltration Rate (L/ha/day)	**33700**	RMOS Engineering Design Manual (January 1994)

			Existing Condition									Designated Land									
Town	Street Location	Max capacity (L/S)	Drainage Area (ha)	Units	Pop.	M	Design Flow Rate (L/S)	Extraneous Flow (L/S)	Total Flow (L/S)	P/F	Pipe Capacity	Units	Drainage Area	Pop.	M	Design Flow Rate (L/S)	Extraneous Flow (L/S)	Total Add Flow Rate (L/S)	Total Flow Rate	P/F	Pipe Capacity
Area 2 PASS	200mm dia. San at Franklin St.	19.890	11.07	132.84	305.53	4.08	5.91	4.32	10.23	Pass	51.41%	54.84	4.57	126.13	4.21	2.52	1.78	4.31	14.53	Pass	73.06%
Area 1 PASS	250mm dia. San at Hodge St	31.810	13.79	165.48	380.60	4.03	7.28	5.38	12.66	Pass	39.80%	60.24	5.02	138.55	4.20	2.76	1.96	4.72	17.38	Pass	54.64%

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.55

In-migration Designation

Dowling Sanitary Pipe Capacity Review

Dowling Sanitary Pipe Capacity Review

Review Criterias

1) Unit Density (units/ha)	**12**	
2) Pop Density (cap/unit)	**2.30**	
3) New Per Capita Flow (L/cap/day)	**360**	RMOS Engineering Design Manual (January 1994)
4) Existing Per Capita Flow (L/cap/day)	**1674**	based on GCS Annual Wastewater Reports (2001, 2002, 2003)
5) Extraneaous flow; Infiltration Rate (L/ha/day)	**33700**	RMOS Engineering Design Manual (January 1994)

			Existing Condition								Designated Land					
Town	Street Location	Max capacity (L/S)	Drainage Area (ha)	Units	Pop.	Per Capita Flow (L/S)	Extraneous Flow (L/S)	Total Flow (L/S)	P/F	Pipe Capacity	Units	Drainage Area (ha)	Pop.	Total Flow Rate (L/S)	P/F	Pipe Capacity
Area 3	150mm dia. San at IDA Cr	10.670	0.42	5.04	11.59	0.22	0.16	0.22	Pass	2.10%	108.24	9.02	248.95	8.01	Pass	75.05%
PASS	200mm dia. San at Pine Cr	19.890	7.26	87.12	200.38	3.88	2.83	3.88	Pass	19.52%	108.24	9.02	248.95	11.67	Pass	58.65%
Area 1A	200mm dia. San at Houle Ave	19.890	2.89	34.68	79.76	1.55	1.13	1.55	Pass	7.77%	108.24	9.02	248.95	9.33	Pass	46.90%
PASS	450mm dia. San at Houle Ave	99.840	32.32	387.84	892.03	17.28	12.61	17.28	Pass	17.31%	108.24	9.02	248.95	25.07	Pass	25.11%
Area 1B PASS	600mm dia. San at Riverside Dr	175.570	205.00	2460.00	5658.00	109.62	79.96	109.62	Pass	62.44%	37.20	3.10	85.56	112.35	Pass	63.99%
Area 2	200mm dia. San at Leonard	19.890	2.08	24.96	57.41	1.11	0.81	1.11	Pass	5.59%	108.24	9.02	248.95	8.90	Pass	44.72%
PASS	250mm dia. San at HWY 145	31.810	6.70	80.40	184.92	3.58	2.61	3.58	Pass	11.26%	108.24	9.02	248.95	11.37	Pass	35.73%
	300mm dia. San at Leonard Dr	47.890	32.32	387.84	892.03	17.28	12.61	17.28	Pass	36.09%	108.24	9.02	248.95	25.07	Pass	52.34%
	350mm dia. San at Arlington Dr	65.950	32.32	387.84	892.03	17.28	12.61	17.28	Pass	26.21%	108.24	9.02	248.95	25.07	Pass	38.01%

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.56

High In-migration Designation

Dowling Sanitary Pipe Capacity Review

Dowling Sanitary Pipe Capacity Review

Review Criterias

1) Unit Density (units/ha)	**12**	
2) Pop Density (cap/unit)	**2.30**	
3) New Per Capita Flow (L/cap/day)	**360**	RMOS Engineering Design Manual (January 1994)
4) Existing Per Capita Flow (L/cap/day)	**1674**	based on GCS Annual Wastewater Reports (2001, 2002, 2003)
5) Extraneaous flow; Infiltration Rate (L/ha/day)	**33700**	RMOS Engineering Design Manual (January 1994)

			Existing Condition									Designated Land									
Town	Street Location	Max capacity (L/S)	Drainage Area (ha)	Units	Pop.	M	Design Flow Rate (L/S)	Extraneous Flow (L/S)	Total Flow (L/S)	P/F	Pipe Capacity	Units	Drainage Area	Pop.	M	Design Flow Rate (L/S)	Extraneous Flow (L/S)	Total Add Flow Rate (L/S)	Total Flow Rate	P/F	Pipe Capacity
Area 3	150mm dia. San at IDA Cr	10.670	0.42	5.04	11.59	4.41	0.21	0.16	0.38	Pass	3.53%	112.80	9.40	259.44	4.10	4.44	3.67	8.10	8.48	Pass	79.48%
PASS	200mm dia. San at Pine Cr	19.890	7.26	87.12	200.38	4.15	3.46	2.83	6.29	Pass	31.65%	112.80	9.40	259.44	4.10	4.44	3.67	8.10	14.40	Pass	72.39%
Area 1A	200mm dia. San at Houle Ave	19.890	2.89	34.68	79.76	4.27	1.42	1.13	2.55	Pass	12.80%	150.00	12.50	345.00	4.05	5.82	4.88	10.70	13.25	Pass	66.60%
PASS	450mm dia. San at Houle Ave	99.840	32.32	387.84	892.03	3.83	14.24	12.61	26.85	Pass	26.89%	150.00	12.50	345.00	4.05	5.82	4.88	10.70	37.55	Pass	37.61%
Area 1B PASS	600mm dia. San at Riverside Dr	175.570	205.00	2460.00	5658.00	3.19	75.32	79.96	155.28	Pass	88.44%	150.00	12.50	345.00	4.05	5.82	4.88	10.70	165.98	Pass	94.54%
Area 2	200mm dia. San at Leonard	19.890	2.08	24.96	57.41	4.30	1.03	0.81	1.84	Pass	9.25%	150.00	12.50	345.00	4.05	5.82	4.88	10.70	12.54	Pass	63.05%
PASS	250mm dia. San at HWY 145	31.810	6.70	80.40	184.92	4.16	3.21	2.61	5.82	Pass	18.29%	150.00	12.50	345.00	4.05	5.82	4.88	10.70	16.52	Pass	51.93%
	300mm dia. San at Leonard Dr	47.890	32.32	387.84	892.03	3.83	14.24	12.61	26.85	Pass	56.06%	150.00	12.50	345.00	4.05	5.82	4.88	10.70	37.55	Pass	78.40%
	350mm dia. San at Arlington Dr	65.950	32.32	387.84	892.03	3.83	14.24	12.61	26.85	Pass	40.71%	150.00	12.50	345.00	4.05	5.82	4.88	10.70	37.55	Pass	56.93%

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.57

In-migration Designation

Levack and Onaping Sanitary Pipe Capacity Review

Levack and Onaping Sanitary Pipe Capacity Review

Review Criterias

1) Unit Density (units/ha)	**12**	
2) Pop Density (cap/unit)	**2.30**	
3) New Per Capita Flow (L/cap/day)	**410**	RMOS Engineering Design Manual (January 1994)
4) Existing Per Capita Flow (L/cap/day)	**601**	based on GCS Annual Wastewater Reports (2001, 2002, 2003)
5) Extraneaous flow; Infiltration Rate (L/ha/day)	**22450**	RMOS Engineering Design Manual (January 1994)

			Existing Condition								Designated Land					
Town	Street Location	Max capacity (L/S)	Drainage Area (ha)	Units	Pop.	Per Capita Flow (L/S)	Extraneous Flow (L/S)	Total Flow (L/S)	P/F	Pipe Capacity	Units	Drainage Area (ha)	Pop.	Total Flow Rate (L/S)	P/F	Pipe Capacity
Area 3	150mm dia. San at IDA Cr	19.890	8.19	98.28	226.04	1.57	2.13	1.57	Pass	7.91%	16.56	1.38	38.09	2.71	Pass	13.65%
PASS	250mm dia. San at RR#8	31.810	11.89	142.68	328.16	2.28	3.09	2.28	Pass	7.18%	16.56	1.38	38.09	3.43	Pass	10.77%
	350mm dia. San at High St	64.950	95.75	1149.00	2642.70	18.38	24.88	18.38	Pass	28.30%	16.56	1.38	38.09	19.53	Pass	30.06%
	375mm dia. San at High St	70.900	95.75	1149.00	2642.70	18.38	24.88	18.38	Pass	25.93%	16.56	1.38	38.09	19.53	Pass	27.54%
Area 2 & 1	200mm dia. San at Onaping Dr	19.890	4.38	52.56	120.89	0.84	1.14	0.84	Pass	4.23%	16.56	1.38	38.09	1.98	Pass	9.97%
PASS	250mm dia. San at Onaping Dr	31.810	49.10	589.20	1355.16	9.43	12.76	9.43	Pass	29.63%	16.56	1.38	38.09	10.57	Pass	33.23%
	200mm dia. San at Onaping Dr	19.890	49.10	589.20	1355.16	9.43	12.76	9.43	Pass	47.39%	16.56	1.38	38.09	10.57	Pass	53.14%
	300mm dia. San at High Cliff Lake	47.890	49.10	589.20	1355.16	9.43	12.76	9.43	Pass	19.68%	16.56	1.38	38.09	10.57	Pass	22.07%

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.58

High In-migration Designation

Levack and Onaping Sanitary Pipe Capacity Review

Levack and Onaping Sanitary Pipe Capacity Review

Review Criterias

1) Unit Density (units/ha)	**12**	
2) Pop Density (cap/unit)	**2.30**	
3) New Per Capita Flow (L/cap/day)	**410**	RMOS Engineering Design Manual (January 1994)
4) Existing Per Capita Flow (L/cap/day)	**601**	based on GCS Annual Wastewater Reports (2001, 2002, 2003)
5) Extraneaous flow; Infiltration Rate (L/ha/day)	**22450**	RMOS Engineering Design Manual (January 1994)

			Existing Condition									Designated Land									
Town	Street Location	Max capacity (L/S)	Drainage Area (ha)	Units	Pop.	M	Design Flow Rate (L/S)	Extraneous Flow (L/S)	Total Add Flow Rate (L/S)	P/F	Pipe Capacity	Units	Drainage Area (ha)	Pop.	M	Design Flow Rate (L/S)	Extraneous Flow (L/S)	Total Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Pipe Capacity
Area 3	150mm dia. San at IDA Cr	19.890	8.19	98.28	226.04	4.13	4.43	2.13	6.56	Pass	32.96%	24.00	2.00	55.20	4.31	1.13	0.52	1.65	8.20	Pass	41.25%
PASS	250mm dia. San at RR#8	31.810	11.89	142.68	328.16	4.06	6.32	3.09	9.41	Pass	29.60%	24.00	2.00	55.20	4.31	1.13	0.52	1.65	11.06	Pass	34.77%
	350mm dia. San at High St	64.950	95.75	1149.00	2642.70	3.49	43.75	24.88	68.63	Fail	105.66%	24.00	2.00	55.20	4.31	1.13	0.52	1.65	70.28	Fail	108.20%
	375mm dia. San at High St	70.900	95.75	1149.00	2642.70	3.49	43.75	24.88	68.63	Pass	96.80%	24.00	2.00	55.20	4.31	1.13	0.52	1.65	70.28	Pass	99.12%
Area 2 & 1	200mm dia. San at Onaping Dr	19.890	4.38	52.56	120.89	4.22	2.42	1.14	3.56	Pass	17.89%	24.00	2.00	55.20	4.31	1.13	0.52	1.65	5.21	Pass	26.18%
PASS	250mm dia. San at Onaping Dr	31.810	49.10	589.20	1355.16	3.71	23.86	12.76	36.62	Fail	115.13%	24.00	2.00	55.20	4.31	1.13	0.52	1.65	38.27	Fail	120.31%
	200mm dia. San at Onaping Dr	19.890	49.10	589.20	1355.16	3.71	23.86	12.76	36.62	Fail	184.13%	24.00	2.00	55.20	4.31	1.13	0.52	1.65	38.27	Fail	192.41%
	300mm dia. San at High Cliff Lake	47.890	49.10	589.20	1355.16	3.71	23.86	12.76	36.62	Pass	76.47%	36.00	3.00	82.80	4.27	1.68	0.78	2.46	39.08	Pass	81.60%

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.59

High In-migration Designation

Levack and Onaping Sanitary Pipe Capacity Review

Levack and Onaping Sanitary Pipe Capacity Review

Review Criterias

1) Unit Density (units/ha)	**12**	
2) Pop Density (cap/unit)	**2.30**	
3) New Per Capita Flow (L/cap/day)	**410**	RMOS Engineering Design Manual (January 1994)
4) Existing Per Capita Flow (L/cap/day)	**601**	based on GCS Annual Wastewater Reports (2001, 2002, 2003)
5) Extraneaous flow; Infiltration Rate (L/ha/day)	**22450**	RMOS Engineering Design Manual (January 1994)

		Maximun Pipe Capacity								Existing Condition									Designated Areas									
Town	Street Location	Pipe Diameter Nominal	Pipe Diameter Actual	Area (m2)	N	Slope %	R (m)	Velocity (m/s)	Max capacity (L/S)	Drainage Area (ha)	Units	Pop.	M	Design Flow Rate (L/S)	Extraneous Flow (L/S)	Total Add Flow Rate (L/S)	P/F	Pipe Capacity	Units	Drainage Area (ha)	Pop.	M	Design Flow Rate (L/S)	Extraneous Flow (L/S)	Total Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Pipe Capacity
Area 3 (1)	350mm dia. San at High St	350	355.6	0.0993	0.015	0.2500	0.089	6.642	65.964	95.75	1149.00	2642.70	3.49	43.75	24.88	68.63	**Fail**	104.04%	24.00	2.00	55.20	4.31	1.13	0.52	1.65	70.28	**Fail**	106.54%

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.60

In-migration Designation

Lively Sanitary Pipe Capacity Review

Lively Sanitary Pipe Capacity Review

Review Criterias

1) Unit Density (units/ha)	**12**	
2) Pop Density (cap/unit)	**2.30**	
3) New Per Capita Flow (L/cap/day)	**410**	RMOS Engineering Design Manual (January 1994)
4) Existing Per Capita Flow (L/cap/day)	**568**	based on GCS Annual Wastewater Reports (2001, 2002, 2003)
5) Extraneaous flow; Infiltration Rate (L/ha/day)	**33700**	RMOS Engineering Design Manual (January 1994)

			Existing Condition								Designated Land					
Town	Street Location	Max capacity (L/S)	Drainage Area (ha)	Units	Pop.	Per Capita Flow (L/S)	Extraneous Flow (L/S)	Total Flow (L/S)	P/F	Pipe Capacity	Units	Drainage Area (ha)	Pop.	Total Flow Rate (L/S)	P/F	Pipe Capacity
Area 2	150mm dia. San at Deborah St.	10.670	0.00	0.00	0.00	0.00	0.00	0.00	Fail	0.00%	220.80	18.40	507.84	16.75	Fail	156.94%
PASS	200mm dia. San at Lake Rd	20.890	0.00	0.00	0.00	0.00	0.00	0.00	Pass	0.00%	220.80	18.40	507.84	16.75	Fail	80.16%
	250mm dia. San at Birchglen Ave	31.810	3.00	36.00	82.80	0.54	1.17	0.54	Pass	1.71%	220.80	18.40	507.84	17.29	Pass	54.35%
	300mm dia. San at Anderson Dr	47.890	3.00	36.00	82.80	0.54	1.17	0.54	Pass	1.14%	220.80	18.40	507.84	17.29	Pass	36.10%
	375mm dia. San at Anderson Dr	70.900	79.690	956.28	2199.44	14.46	31.08	14.46	Pass	20.39%	220.80	18.40	507.84	31.21	Pass	44.01%

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.61

High In-migration Designation

Lively Sanitary Pipe Capacity Review

Lively Sanitary Pipe Capacity Review

Review Criterias

1) Unit Density (units/ha)	**12**	
2) Pop Density (cap/unit)	**2.30**	
3) New Per Capita Flow (L/cap/day)	**410**	RMOS Engineering Design Manual (January 1994)
4) Existing Per Capita Flow (L/cap/day)	**568**	based on GCS Annual Wastewater Reports (2001, 2002, 2003)
5) Extraneaous flow; Infiltration Rate (L/ha/day)	**33700**	RMOS Engineering Design Manual (January 1994)

			Existing Condition									Designated Land									
Town	Street Location	Max capacity (L/S)	Drainage Area (ha)	Units	Pop.	M	Design Flow Rate (L/S)	Extraneous Flow (L/S)	Total Add Flow	P/F	Pipe Capacity	Units	Drainage Area (ha)	Pop.	M	Design Flow Rate (L/S)	Extraneous Flow (L/S)	Total Add Flow Rate (L/S)	Total Flow Rate	P/F	Pipe Capacity
Area 2	150mm dia. San at Deborah St.	10.670	0.00	0.00	0.00	4.50	0.00	0.00	0.00	Fail	0.00%	318.00	26.50	731.40	3.88	13.48	10.34	23.81	23.81	Fail	223.20%
PASS	200mm dia. San at Lake Rd	20.890	0.00	0.00	0.00	4.50	0.00	0.00	0.00	Pass	0.00%	318.00	26.50	731.40	3.88	13.48	10.34	23.81	23.81	Fail	114.00%
	250mm dia. San at Birchglen Ave	31.810	3.00	36.00	82.80	4.27	1.68	1.17	2.85	Pass	8.95%	330.00	27.50	759.00	3.87	13.95	10.73	24.68	27.53	Pass	86.53%
	300mm dia. San at Anderson Dr	47.890	3.00	36.00	82.80	4.27	1.68	1.17	2.85	Pass	5.94%	342.00	28.50	786.60	3.86	14.43	11.12	25.54	28.39	Pass	59.28%
	375mm dia. San at Anderson Dr	70.900	79.690	956.28	2199.44	3.55	37.09	31.08	68.17	Pass	96.15%	318.00	26.50	731.40	3.88	13.48	10.34	23.81	91.98	Fail	129.74%

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.62

High In-migration Designation

Lively Sanitary Pipe Capacity Review

Lively Sanitary Pipe Capacity Review

Review Criterias

1) Unit Density (units/ha)	**12**	
2) Pop Density (cap/unit)	**2.30**	
3) New Per Capita Flow (L/cap/day)	**410**	RMOS Engineering Design Manual (January 1994)
4) Existing Per Capita Flow (L/cap/day)	**568**	based on GCS Annual Wastewater Reports (2001, 2002, 2003)
5) Extraneaous flow; Infiltration Rate (L/ha/day)	**33700**	RMOS Engineering Design Manual (January 1994)

		Maximun Pipe Capacity								Existing Condition									Designated Areas								
Town	Street Location	Pipe Diameter Nominal	Pipe Diameter Actual	Area (m2)	N	Slope %	R (m)	Velocity (m/s)	Max capacity (L/S)	Drainage Area (ha)	Units	Pop.	M	Design Flow Rate (L/S)	Extraneous Flow (L/S)	Total Add Flow Rate (L/S)	P/F	Pipe Capacity	Units	Drainage Area (ha)	Pop.	M	Design Flow Rate (L/S)	Extraneous Flow (L/S)	Total Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Pipe Capacity
Area 2	375mm dia. San at Anderson Dr	375	381	0.1140	0.015	0.0900	0.095	4.173	47.573	79.690	956.28	2199.44	3.55	37.09	31.08	68.17	Fail	143.29%	318.00	26.50	731.40	3.88	13.48	10.34	23.81	91.98	Fail	193.35%

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.63

In-migration Designation

Sudbury Sanitary Pipe Capacity Review

Sudbury Sanitary Pipe Capacity Review

Review Criterias

1) Unit Density (units/ha)		**12**			
2) Pop Density (cap/unit)		**2.30**			
3) New Per Capita Flow (L/cap/day)		**410**			RMOS Engineering Design Manual (January 1994)
4) Existing Per Capita Flow (L/cap/day)		**411**			based on GCS Annual Wastewater Reports (2001, 2002, 2003)
5) Existing Extraneaous flow; Infiltration Rate (L/ha/day)		**17280**			RMOS Engineering Design Manual (January 1994)
6) New Extraneaous flow; Infiltration Rate (L/ha/day)	over 40ha	**33700**	under 40ha	**44900**	RMOS Engineering Design Manual (January 1994)

			Existing Condition											
Town	Street Location	Max capacity (L/S)	Drainage Area (ha)	Units	Pop.	Total Flow (L/S)	P/F	Pipe Capacity	Units	Drainage Area (ha)	Pop.	Total Flow Rate (L/S)	P/F	Pipe Capacity
Area 1 (McKinnon)	200mm dia San at First Ave	19.890	1.46	17.52	40.30	0.19	Pass	0.96%	302.40	25.20	695.52	18.09	Pass	90.96%
PASS	300mm dia San at Mildred St	47.890	82.30	987.60	2271.48	10.81	Pass	22.56%	302.40	25.20	695.52	28.70	Pass	59.94%
Area 2 (Torbay Rd) PASS	200mm dia San at Second Ave	19.890	9.10	109.20	251.16	1.19	Pass	6.01%	69.60	5.80	160.08	5.53	Pass	27.81%
Area 3 (Greenwood) PASS	200mm dia San at Fourth Ave	19.890	6.20	74.40	171.12	0.81	Pass	4.09%	333.60	27.80	767.28	20.47	Fail	102.91%
Area 4 (Dorsett)	200mm dia San at Bancroft dr	19.890	7.08	84.96	195.41	0.93	Pass	4.67%	624.00	52.00	1435.20	36.48	Fail	183.43%
PASS	300mm dia San at Bancroft dr	47.890	101.34	1216.08	2796.98	13.31	Pass	27.78%	624.00	52.00	1435.20	48.86	Fail	102.02%
	450mm dia. San at Bancroft Dr (force mains within dranage area)	99.840	101.34	1216.08	2796.98	13.31	Pass	13.33%	984.00	82.00	2263.20	67.76	Pass	67.87%
Area 5 (Bancroft)	200mm dia. San at Autumnwood Cres	19.890	8.60	103.20	237.36	1.13	Pass	5.68%	360.00	30.00	828.00	22.26	Fail	111.92%
PASS	200mm dia. San at Bancroft Dr	19.890	7.07	84.84	195.13	0.93	Pass	4.67%	360.00	30.00	828.00	22.06	Fail	110.91%
	450mm dia. San at Bancroft Dr (force mains within dranage area)	99.840	101.34	1216.08	2796.98	13.31	Pass	13.33%	360.00	30.00	828.00	34.44	Pass	34.49%
Area 6 (Kirkwood) PASS	200mm dia San at Kirkwood Dr	19.890	6.38	76.56	176.09	0.84	Pass	4.21%	0.00	0.00	0.00	0.84	Pass	4.21%

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.64

High In-migration Designation

Sudbury Sanitary Pipe Capacity Review

Sudbury Sanitary Pipe Capacity Review

Review Criterias

1) Unit Density (units/ha)		**12**			
2) Pop Density (cap/unit)		**2.30**			
3) New Per Capita Flow (L/cap/day)		**410**			RMOS Engineering Design Manual (January 1994)
4) Existing Per Capita Flow (L/cap/day)		**411**			based on GCS Annual Wastewater Reports (2001, 2002, 2003)
5) Existing Extraneaous flow; Infiltration Rate (L/ha/day)		**17280**			RMOS Engineering Design Manual (January 1994)
6) New Extraneaous flow; Infiltration Rate (L/ha/day)	over 40ha	**33700**	under 40ha	**44900**	RMOS Engineering Design Manual (January 1994)

			Existing Condition									Designated Areas									
Town	Street Location	Max capacity (L/S)	Drainage Area (ha)	Units	Pop.	M	Design Flow Rate (L/S)	Extraneous Flow (L/S)	Total Flow (L/S)	P/F	Pipe Capacity	Units	Drainage Area (ha)	Pop.	M	Design Flow Rate (L/S)	Extraneous Flow (L/S)	Total Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Pipe Capacity
Area 1 (McKinnon)	200mm dia San at First Ave	19.890	1.46	17.52	40.30	4.33	0.83	0.29	1.12	Pass	5.63%	302.40	25.20	695.52	3.90	12.86	5.04	17.90	19.02	Pass	95.62%
PASS	300mm dia San at Mildred St	47.890	82.30	987.60	2271.48	3.54	38.18	16.46	54.64	Fail	114.10%	302.40	25.20	695.52	3.90	12.86	5.04	17.90	72.54	Fail	151.47%
Area 2 (Torbay Rd) PASS	200mm dia San at Second Ave	19.890	9.10	109.20	251.16	4.11	4.90	1.82	6.72	Pass	33.78%	69.60	5.80	160.08	4.18	3.18	1.16	4.34	11.06	Pass	55.58%
Area 3 (Greenwood) PASS	200mm dia San at Fourth Ave	19.890	6.20	74.40	171.12	4.17	3.39	1.24	4.63	Pass	23.27%	333.60	27.80	767.28	3.87	14.10	5.56	19.66	24.28	Fail	122.09%
Area 4 (Dorsett)	200mm dia San at Bancroft dr	19.890	7.08	84.96	195.41	4.15	3.85	1.42	5.27	Pass	26.47%	624.00	52.00	1435.20	3.69	25.15	10.40	35.55	40.82	Fail	205.23%
PASS	300mm dia San at Bancroft dr	47.890	101.34	1216.08	2796.98	3.47	46.03	20.27	66.30	Fail	138.44%	624.00	52.00	1435.20	3.69	25.15	10.40	35.55	101.85	Fail	212.68%
	450mm dia. San at Bancroft Dr (force mains within dranage area)	99.840	101.34	1216.08	2796.98	3.47	46.03	20.27	66.30	Pass	66.41%	984.00	82.00	2263.20	3.54	38.06	16.40	54.46	120.75	Fail	120.95%
Area 5 (Bancroft)	200mm dia. San at Autumnwood Cres	19.890	8.60	103.20	237.36	4.12	4.64	1.72	6.36	Pass	31.98%	360.00	30.00	828.00	3.85	15.13	6.00	21.13	27.49	Fail	138.23%
PASS	200mm dia. San at Bancroft Dr	19.890	7.07	84.84	195.13	4.15	3.84	1.41	5.26	Pass	26.44%	360.00	30.00	828.00	3.85	15.13	6.00	21.13	26.39	Fail	132.69%
	450mm dia. San at Bancroft Dr (force mains within dranage area)	99.840	101.34	1216.08	2796.98	3.47	46.03	20.27	66.30	Pass	66.41%	360.00	30.00	828.00	3.85	15.13	6.00	21.13	87.43	Pass	87.57%
Area 6 (Kirkwood) PASS	200mm dia San at Kirkwood Dr	19.890	6.38	76.56	176.09	4.17	3.48	1.28	4.76	Pass	23.92%	0.66	7.90	1.51	4.47	0.03	1.58	1.61	6.37	Pass	32.03%

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.65

High In-migration Designation

Sudbury Sanitary Pipe Capacity Review

Sudbury Sanitary Pipe Capacity Review

Review Criterias

1) Unit Density (units/ha)		**12**			
2) Pop Density (cap/unit)		**2.30**			
3) New Per Capita Flow (L/cap/day)		**410**			RMOS Engineering Design Manual (January 1994)
4) Existing Per Capita Flow (L/cap/day)		**411**			based on GCS Annual Wastewater Reports (2001, 2002, 2003)
5) Existing Extraneaous flow; Infiltration Rate (L/ha/day)		**17280**			RMOS Engineering Design Manual (January 1994)
6) New Extraneaous flow; Infiltration Rate (L/ha/day)	over 40ha	**33700**	under 40ha	**44900**	RMOS Engineering Design Manual (January 1994)

		Maximun Pipe Capacity								Existing Condition									Designated Areas								
Town	Street Location	Pipe Diameter Nominal	Pipe Diameter Actual	Area (m2)	N	Slope %	R (m)	Velocity (m/s)	Max capacity (L/S)	Drainage Area (ha)	Units	Pop.	M	Design Flow Rate (L/S)	Extraneous Flow (L/S)	Total Flow (L/S)	P/F	Pipe Capacity	Units	Drainage Area (ha)	Pop.	M	Design Flow Rate (L/S)	Extraneous Flow (L/S)	Total Add Flow Rate (L/S)	Total Flow Rate (L/S)	P/F	Pipe Capacity
Area 1	300mm dia San at Mildred St	300	304.8	0.0730	0.015	0.1200	0.076	4.152	30.297	82.30	987.60	2271.48	3.54	38.18	16.46	54.64	**Fail**	180.35%	302.40	25.20	695.52	3.90	12.86	5.04	17.90	72.54	**Fail**	239.43%
Area 4 (Dorsett)	200mm dia San at Bancroft dr	200	203.2	0.0324	0.015	1.0000	0.051	9.147	29.664	7.08	84.96	195.41	4.15	3.85	1.42	5.27	**Pass**	17.75%	624.00	52.00	1435.20	3.69	25.15	10.40	35.55	40.82	**Fail**	137.60%
	300mm dia San at Bancroft dr	300	304.8	0.0730	0.015	0.4700	0.076	8.218	59.960	101.34	1216.08	2796.98	3.47	46.03	20.27	66.30	**Fail**	110.57%	624.00	52.00	1435.20	3.69	25.15	10.40	35.55	101.85	**Fail**	169.87%
	450mm dia. San at Bancroft Dr (force mains within dranage area)	450	457.2	0.1642	0.015	1.0500	0.114	16.095	264.230	101.34	1216.08	2796.98	3.47	46.03	20.27	66.30	**Pass**	25.09%	984.00	82.00	2263.20	3.54	38.06	16.40	54.46	120.75	**Pass**	45.70%

City of Greater Sudbury Infrastructure Background Study

APPENDIX G.66

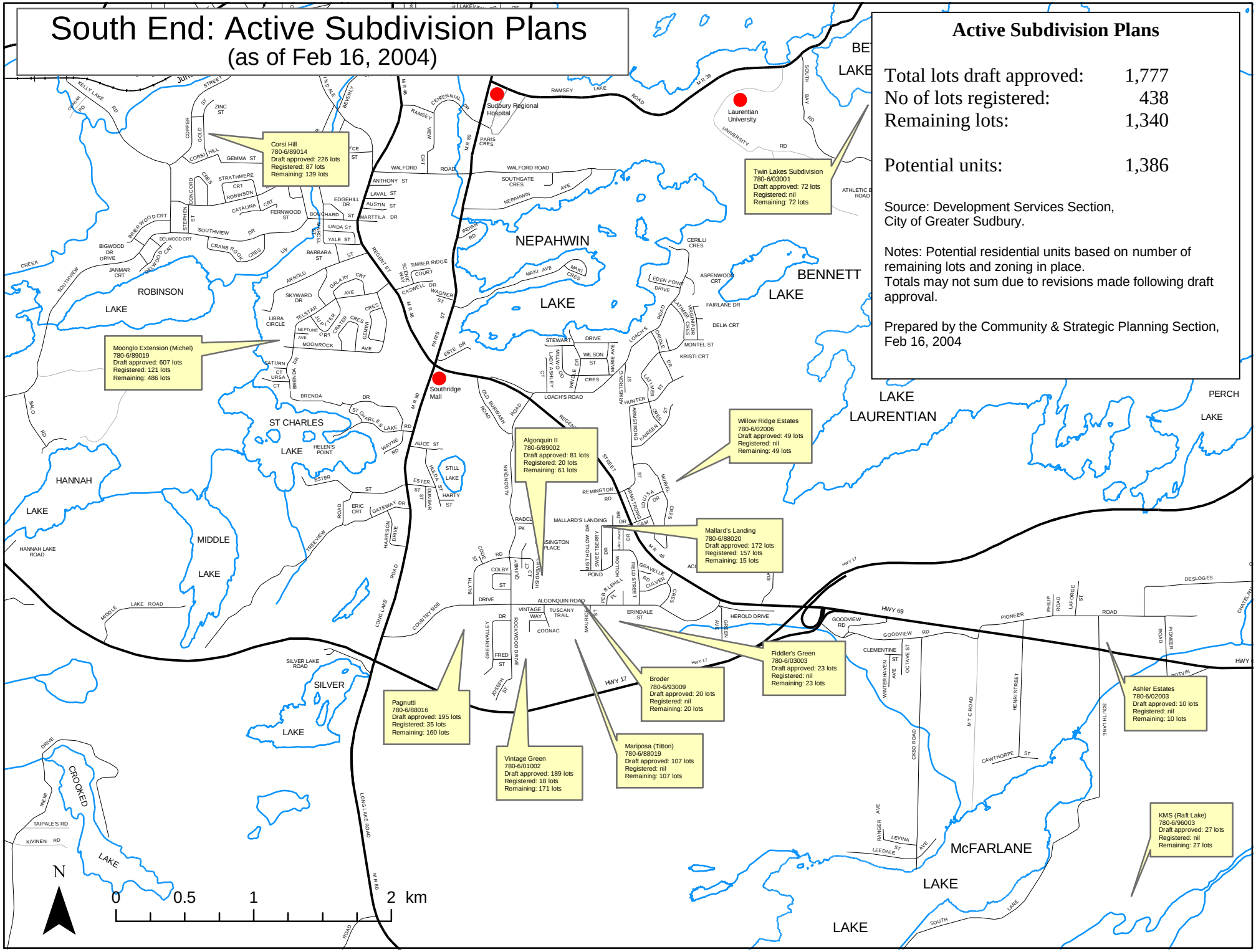
Subdivision Activity Maps

Subdivision Activity Maps

The following maps indicate active plans of subdivision only and are organized by area. The potential number of units by area is based on the number of remaining lots (draft approved lots minus registered lots) and the zoning in place. The activity maps are updated as changes in the status of individual subdivision plans occur. Each map indicates the last date of revision.

Prepared by the Community & Strategic Planning Section
City of Greater Sudbury

South End: Active Subdivision Plans
(as of Feb 16, 2004)



Active Subdivision Plans

Total lots draft approved:	1,777
No of lots registered:	438
Remaining lots:	1,340
Potential units:	1,386

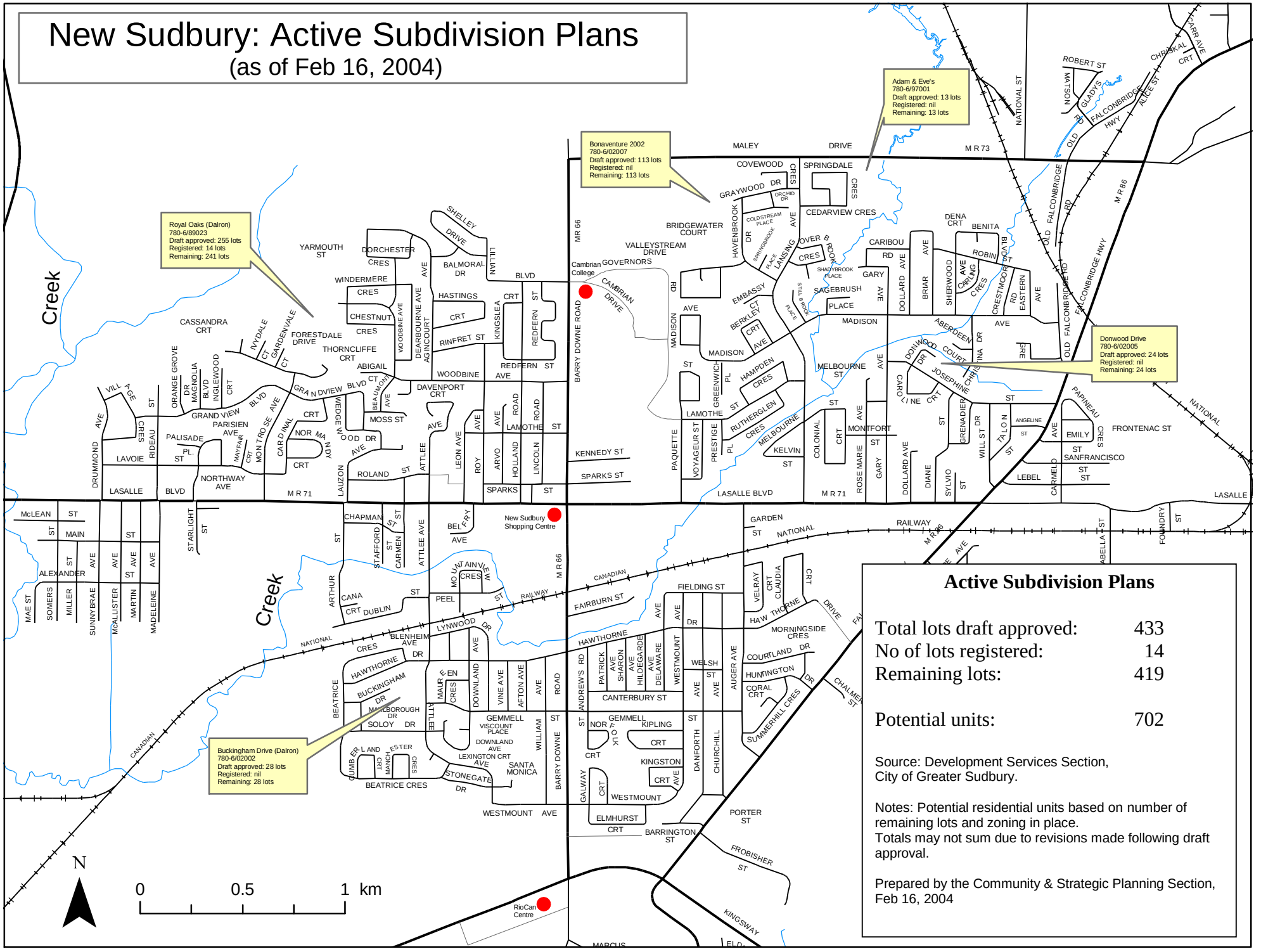
Source: Development Services Section,
City of Greater Sudbury.

Notes: Potential residential units based on number of remaining lots and zoning in place.
Totals may not sum due to revisions made following draft approval.

Prepared by the Community & Strategic Planning Section,
Feb 16, 2004

New Sudbury: Active Subdivision Plans

(as of Feb 16, 2004)



Active Subdivision Plans

Total lots draft approved:	433
No of lots registered:	14
Remaining lots:	419
Potential units:	702

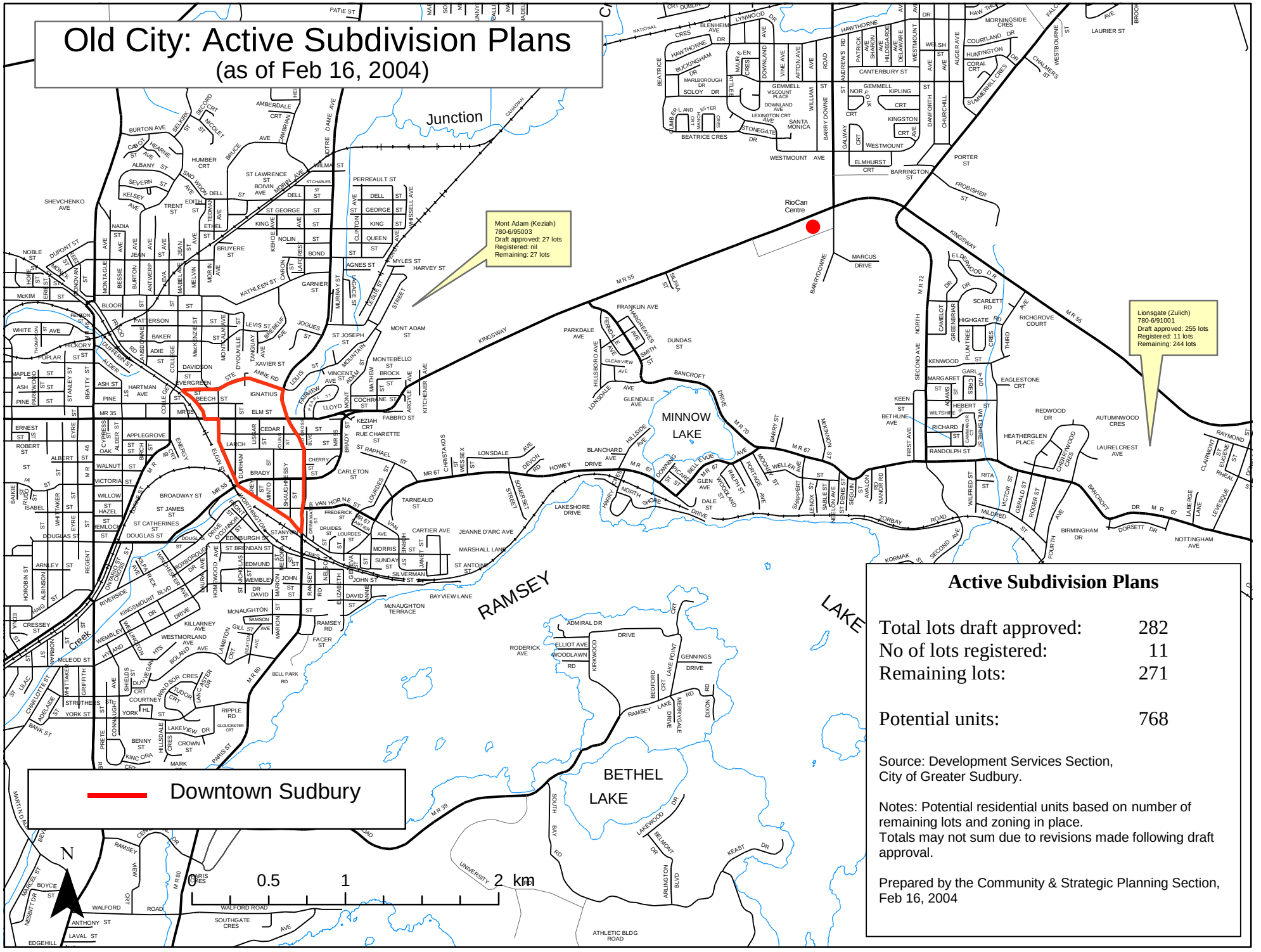
Source: Development Services Section,
City of Greater Sudbury.

Notes: Potential residential units based on number of remaining lots and zoning in place.
Totals may not sum due to revisions made following draft approval.

Prepared by the Community & Strategic Planning Section,
Feb 16, 2004

Old City: Active Subdivision Plans

(as of Feb 16, 2004)



Active Subdivision Plans

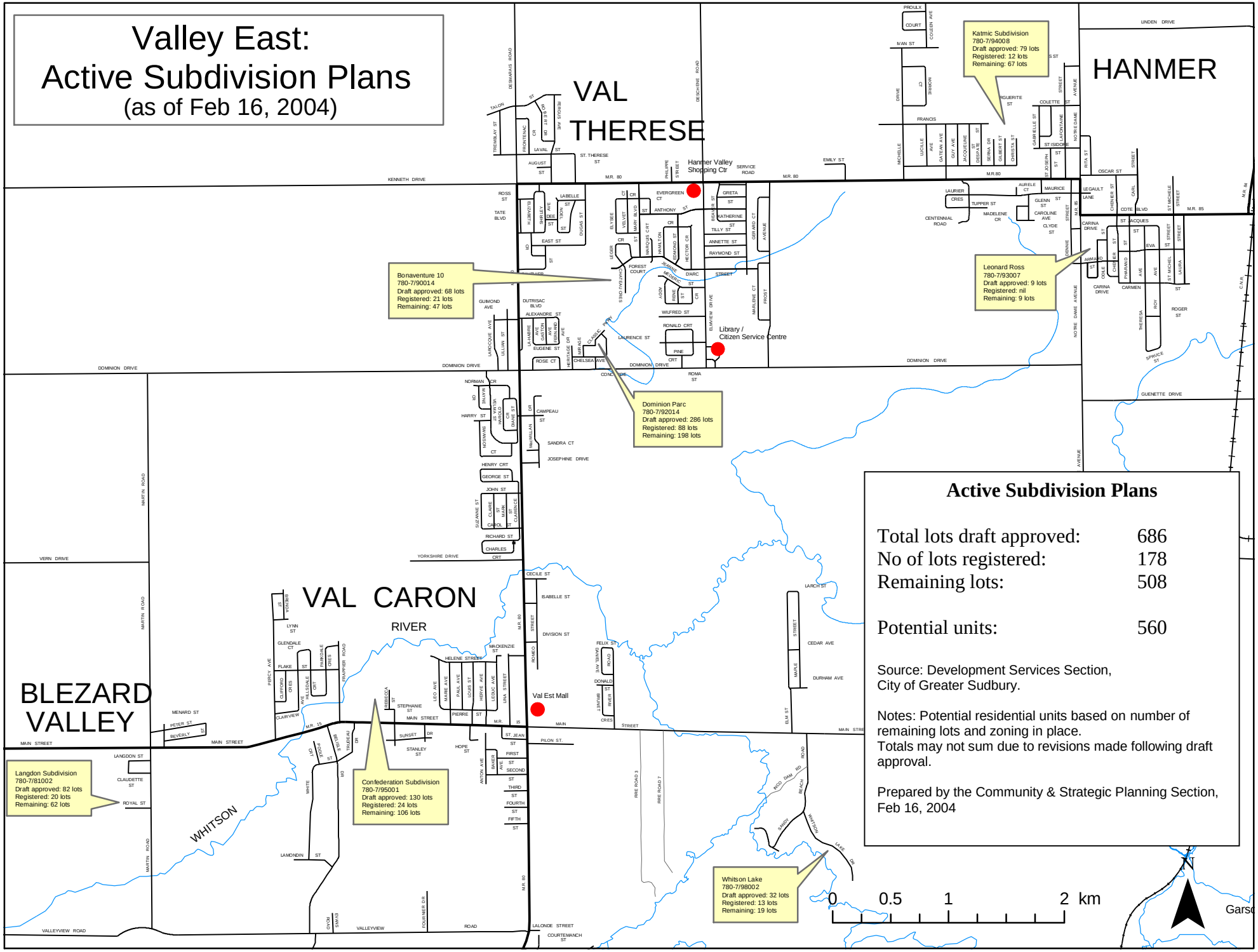
Total lots draft approved:	282
No of lots registered:	11
Remaining lots:	271
Potential units:	768

Source: Development Services Section,
City of Greater Sudbury.

Notes: Potential residential units based on number of remaining lots and zoning in place.
Totals may not sum due to revisions made following draft approval.

Prepared by the Community & Strategic Planning Section,
Feb 16, 2004

Valley East:
Active Subdivision Plans
(as of Feb 16, 2004)



Active Subdivision Plans

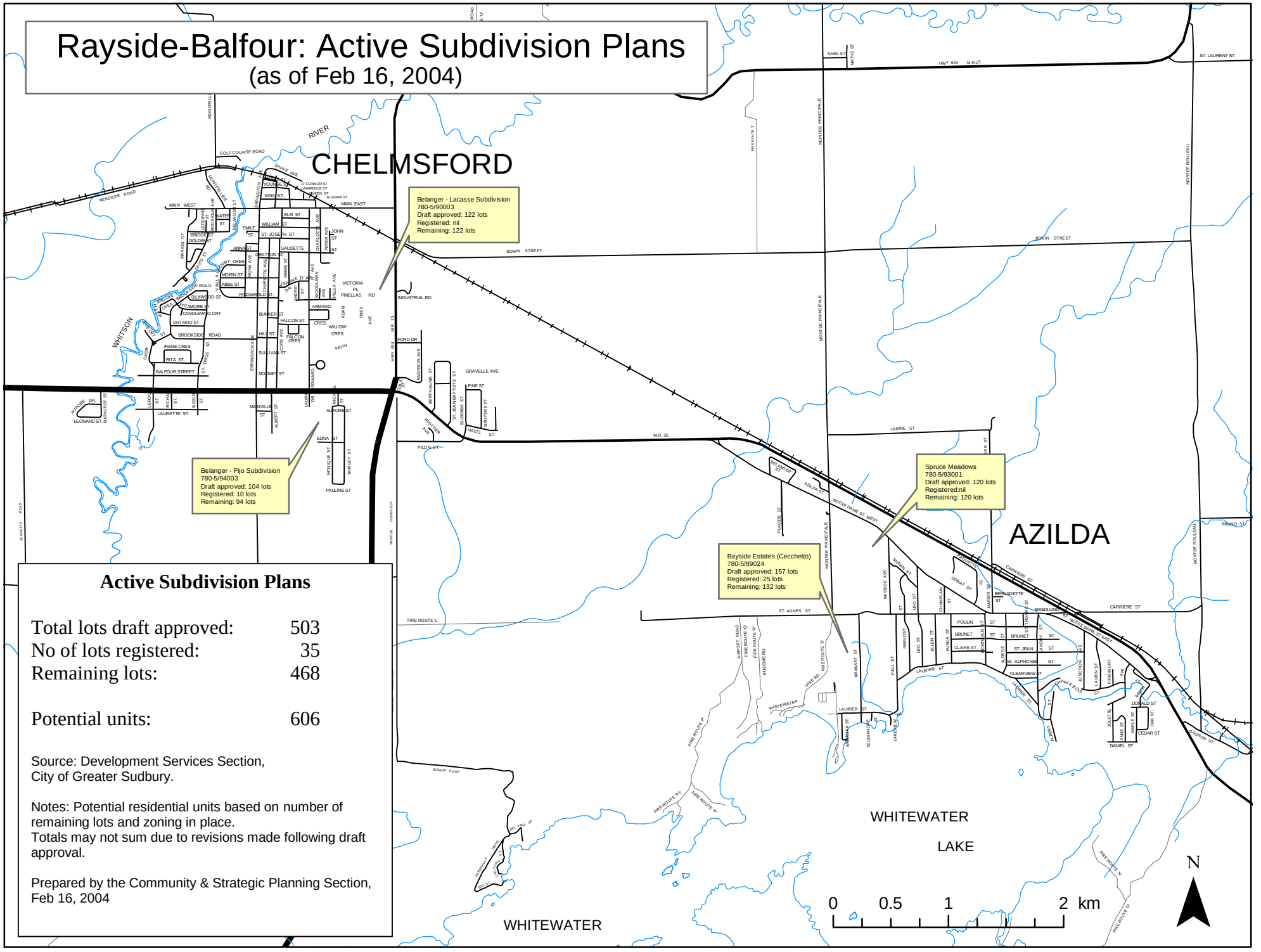
Total lots draft approved:	686
No of lots registered:	178
Remaining lots:	508
Potential units:	560

Source: Development Services Section,
City of Greater Sudbury.

Notes: Potential residential units based on number of remaining lots and zoning in place.
Totals may not sum due to revisions made following draft approval.

Prepared by the Community & Strategic Planning Section,
Feb 16, 2004

Rayside-Balfour: Active Subdivision Plans
(as of Feb 16, 2004)



Active Subdivision Plans

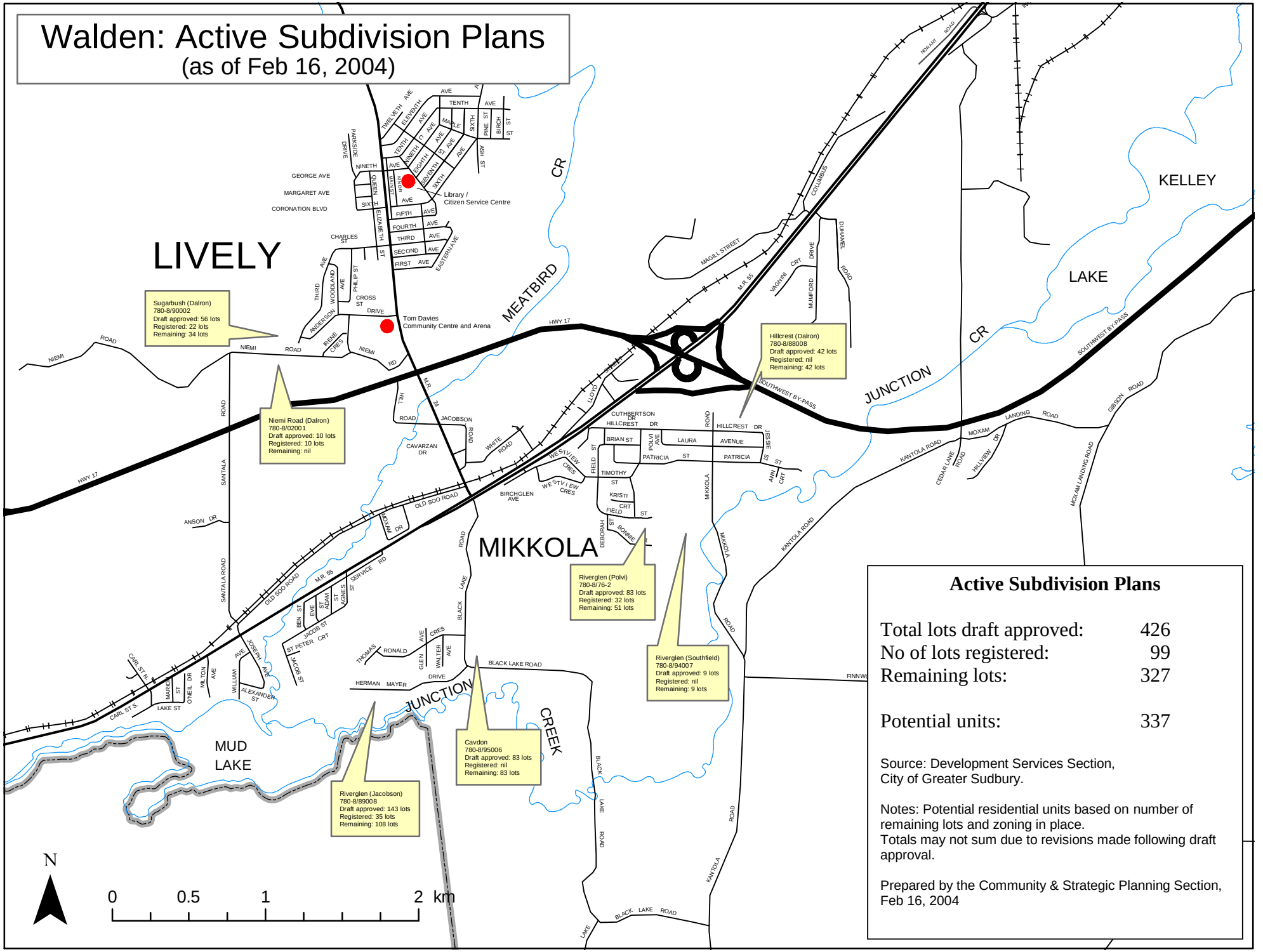
Total lots draft approved:	503
No of lots registered:	35
Remaining lots:	468
Potential units:	606

Source: Development Services Section,
City of Greater Sudbury.

Notes: Potential residential units based on number of remaining lots and zoning in place.
Totals may not sum due to revisions made following draft approval.

Prepared by the Community & Strategic Planning Section,
Feb 16, 2004

Walden: Active Subdivision Plans
(as of Feb 16, 2004)



Active Subdivision Plans

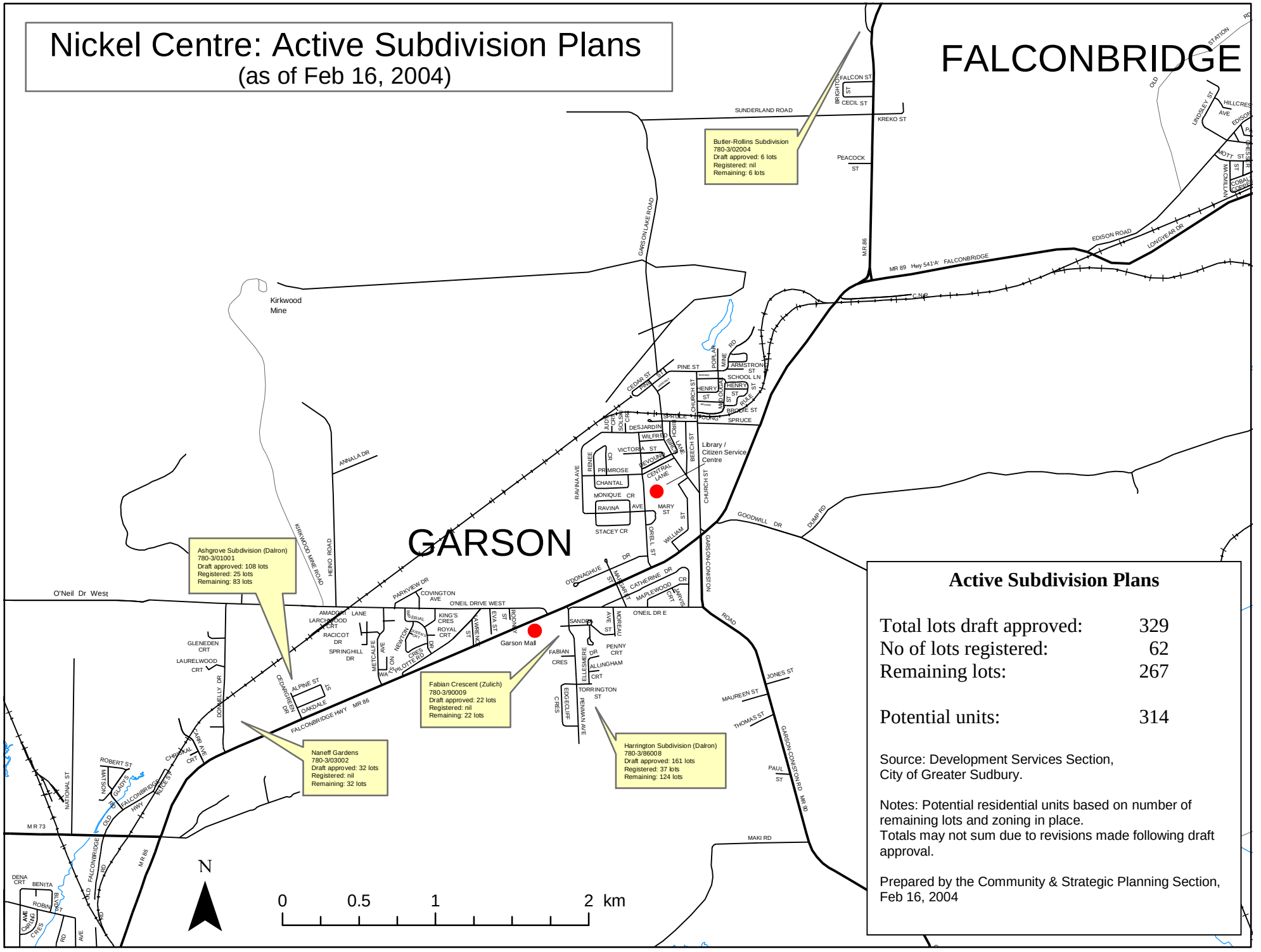
Total lots draft approved:	426
No of lots registered:	99
Remaining lots:	327
Potential units:	337

Source: Development Services Section,
City of Greater Sudbury.

Notes: Potential residential units based on number of remaining lots and zoning in place.
Totals may not sum due to revisions made following draft approval.

Prepared by the Community & Strategic Planning Section,
Feb 16, 2004

Nickel Centre: Active Subdivision Plans
(as of Feb 16, 2004)



Active Subdivision Plans

Total lots draft approved:	329
No of lots registered:	62
Remaining lots:	267
Potential units:	314

Source: Development Services Section,
City of Greater Sudbury.

Notes: Potential residential units based on number of remaining lots and zoning in place.
Totals may not sum due to revisions made following draft approval.

Prepared by the Community & Strategic Planning Section,
Feb 16, 2004

City of Greater Sudbury Infrastructure Background Study

Water Rate Revenue Forecasts

Water Rate / Revenue Review

	Water rates		Sewer rates -115%						
	$/cu.m.	$/Year	$/Year	Total $/Yr.	Existing	In Migration	High In Migration		
2001 base	(assume 240m3/yr & $10.92 serv.charge)				Residential	Residential	Residential		
rate					Accounts	Accounts	Accounts		
	0.59		0.15		42079	42079	42079		
2002	0.61	158.04	181.75	339.79	$14,297,855	$14,378,488	$14,522,587	Inc. Pop.	
2003	0.64	163.56	188.09	351.65	$14,797,249	$14,964,147	$15,262,410	# of Accts.	
2004	0.66	169.08	194.44	363.52	$15,296,642	$15,555,438	$16,017,933	Av.new accts./yr	
2005	0.68	174.60	200.79	375.39	$15,796,036	$16,152,363	$16,789,155		
2006	0.71	180.12	207.14	387.26	$16,295,429	$16,754,919	$17,576,075		
2007	0.73	185.64	213.49	399.13	$16,794,823	$17,388,792	$18,325,905		
2008	0.75	191.16	219.83	410.99	$17,294,217	$18,029,824	$19,088,295		
2009	0.77	196.68	226.18	422.86	$17,793,610	$18,678,017	$19,863,244		
2010	0.80	202.20	232.53	434.73	$18,293,004	$19,333,369	$20,650,752		
2011	0.82	207.72	238.88	446.60	$18,792,397	$19,995,882	$21,450,820	Inc. Pop.	
2012	0.84	213.62	245.67	459.29	$19,326,531	$20,692,624	$22,263,002	# of Accts.	
2013	0.87	219.71	252.66	472.37	$19,876,689	$21,413,727	$23,105,003	Av.new accts./yr	
2014	0.90	225.97	259.86	485.83	$20,443,352	$22,160,031	$23,977,890		
2015	0.92	232.42	267.28	499.70	$21,027,015	$22,932,405	$24,662,465		
2016	0.95	239.07	274.92	513.99	$21,628,187	$23,731,747	$25,367,576		
2017	0.98	245.91	282.80	528.71	$22,247,395	$24,558,987	$26,093,842		
2018	1.01	252.96	290.90	543.86	$22,885,179	$25,415,084	$26,841,895		
2019	1.04	260.22	299.25	559.47	$23,542,096	$26,301,032	$27,612,389		
2020	1.07	267.70	307.85	575.55	$24,218,721	$27,217,856	$28,405,999		
2021	1.10	275.40	316.71	592.12	$24,915,645	$28,166,619	$29,223,417		
2022	1.14	283.34	325.84	609.18	$25,633,476	$28,978,112	$30,065,357		
2023	1.17	291.51	335.24	626.75	$26,372,843	$29,813,950	$30,932,556		
2024	1.20	299.93	344.92	644.84	$27,134,390	$30,674,864	$31,825,770		

Note 1 - figures in blue - rates with basic 3% cola increase

Note 2 - Forecasted revenues include average new accounts / year and rate increases

Population/Growth Forecasts

Year	In-Migration	High In-Migration
2001	155225	155225
2002	155251	156746
2003	155232	158267
2004	156149	159788
2005	157055	161310
2006	157954	162831
	2729	7606
	1187	3307
	237	661
2007	158838	164352
2008	159713	165873
2009	160582	167394
2010	161447	168915
2011	162307	170437
	3469	6085
	1508	2646
	302	529
2012	163149	171958
2013	163974	173479
2014	164778	175000
2015	165567	-
2016	166331	-
2017	167054	-
2018	167745	-
2019	168397	-
2020	169012	-
2021	169579	175000
	6430	3042
	2796	1323
	280	441

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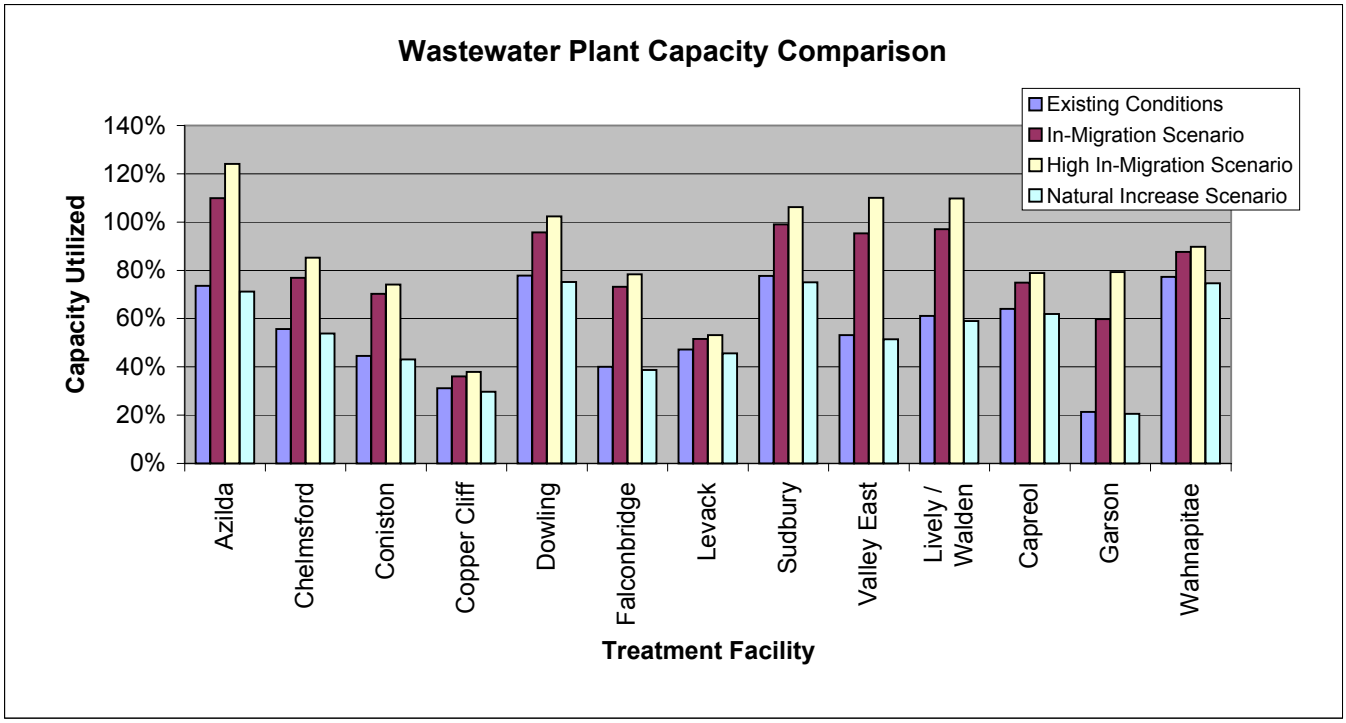
Plant Capacity Comparison - Wastewater

Table 4.2.1	Wastewater Plant Capacity Comparison								
	Rated	Existing Condition		In - Migration		High In-migration		Natural Migration	
Treatment Facility	Capacity	3 Yr. Avg.	% Capacity	Proj. Flow	% Capacity	Proj. Flow	% Capacity	Proj. Flow	% Capacity
Azilda	40.5	29.8	0.7	44.5	1.1	50.3	1.2	28.8	0.7
Chelmsford	82.2	45.7	0.6	63.2	0.8	70.0	0.9	44.2	0.5
Coniston	34.7	15.5	0.4	24.4	0.7	25.7	0.7	14.9	0.4
Copper Cliff	78.7	24.5	0.3	28.4	0.4	29.9	0.4	23.4	0.3
Dowling	37.0	28.8	0.8	35.5	1.0	37.9	1.0	27.9	0.8
Falconbridge	10.5	4.2	0.4	7.7	0.7	8.2	0.8	4.1	0.4
Levack	26.3	12.4	0.5	13.6	0.5	14.0	0.5	12.0	0.5
Sudbury	921.6	716.0	0.8	912.3	1.0	979.0	1.1	691.9	0.8
Valley East	131.9	70.2	0.5	125.8	1.0	145.2	1.1	67.9	0.5
Lively / Walden	70.6	43.1	0.6	68.5	1.0	77.5	1.1	41.7	0.6
Capreol	57.9	37.1	0.6	43.4	0.7	45.6	0.8	35.8	0.6
Garson	40.6	8.6	0.2	24.3	0.6	32.2	0.8	8.4	0.2
Wahnapitae	14.4	11.1	0.8	12.6	0.9	12.9	0.9	10.8	0.7



City of Greater Sudbury Infrastructure Background Study

Plant Capacity Comparison - Water

2002 - 2004 Data

Water Treatment Facility	Firm Pc	Existing Condition Max.Day	Existing Condition % Capacity	Natural Increase Proj. Flow	Natural Increase % Capacity	In - Migration Proj. Flow	In - Migration % Capacity	High In-migration Proj. Flow	High In-migration % Capacity
Sudbury	84000	68188	81.2%	65899	78.5%	75041	89.3%	76969	91.6%
Dowling	3637	1494	41.1%	1444	39.7%	1695	46.6%	1770	48.7%
Garson	4553	3306	72.6%	3195	70.2%	3353	73.6%	3371	74.0%
Capreol / Valley East	27634	22469	81.3%	21715	78.6%	24869	90.0%	25776	93.3%
Falconbridge	2617	2003	76.5%	1936	74.0%	2316	88.5%	2433	93.0%
Levack	1555	1453	93.4%	1404	90.3%	1489	95.8%	1503	96.7%
Onaping	6540	2003	30.6%	1936	29.6%	2003	30.6%	2003	30.6%
Vermilion WTP	20381	9965	48.9%	9630	47.2%	11096	54.4%	11524	56.5%