THE CITY OF Edmonton ASSET MANAGEMENT AND PUBLIC WORKS

SANITARY SERVICING STRATEGY FUND

REPORT

SANITARY SERVICING STRATEGY

December 1998

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1.0 INTRODUCTION

The Sanitary Servicing Strategy was approved by City Council on July 21, 1998 through an amendment to the Sewers Bylaw No. 9425. The Sanitary Servicing Strategy is a long range plan, and a funding strategy to provide sanitary servicing for the City of Edmonton over the next 75 years.

The Sanitary Servicing Strategy Fund (SSSF) will be created to pool the financial resources of the building industry, the development industry, and the sanitary utility for the construction of major sanitary trunks to service growth within the City and in new development areas. This document introduces the fund, describes the basis for it, and describes how it will be managed.

The SSSF does not replace the PAC's

The SSSF does not replace the Permanent Area Contribution (PAC) system. The SSSF takes care of the major trunk system that the PAC system never addressed. The PAC system continues to look after on site and off site sewers servicing local areas.

2.0 HISTORY OF THE SSSF

2.1 Why is the fund needed

The City built all sewers before the 1970's

For most of Edmonton's history, up to about 1970, the City built all major sanitary trunks. In the development boom of the 1970's, the private development industry took on more of the responsibility for trunk sewer construction. In the 1970's and early 1980's, major trunk sewer construction was financed by the provincially administered revolving trunk fund. The construction of major sanitary trunks ended in the early 1980's with the end of the development boom.

Very few new trunk sewers have been built for new development since 1980

Ongoing developments have used up most of the available capacity in existing sewers. This resulted in an end to new development in the northend of the City in 1988. Although a solution for north Edmonton was developed during 1992 to 1995, without the construction of other new trunk sewers, development in other areas of the City could be restricted as well.

Major new trunk sewer projects need the support of Developers, Home Builders and the Utility to be built

The City conducted numerous studies between 1995 and 1998 that developed plans for new sewers to overcome these problems. However, the front-end costs for these projects are too high for the City's sanitary utility or any individual developers to finance. The Sanitary Servicing Strategy Fund is a mechanism for combining the resources of the developers, the new home construction industry and the City to build the needed trunk sewers.

2.2 Technical Studies

18 Studies over the past 5 years have established the system of trunks needed to service new development

The technical component of the Sanitary Servicing Strategy, that is deciding on what trunks are needed where, and when, has been established through a series of technical studies over the past five years. A total of 18 of these studies are listed in Table 1.

The technical studies have resulted in 3 major trunk systems being recommended for implementation. These include the North Edmonton Sanitary Trunk (NEST), the South Edmonton Sanitary Sewer (SESS), and the West Edmonton Sanitary Sewer (WESS). In addition, servicing for the Terwillegar and University Farms will require future upgrading of existing sewers (TUFS). These recommended trunk systems are shown in Figures 1, 2 3, and 4.

2.3 The Urban Development Institute (UDI) Proposal

UDI recommended an alternative to PAC's for the major trunk system

When the technical aspect of the strategy was completed, the sanitary utility was faced with developing a method to pay for the large anticipated expenditures. Drainage Services was preparing to develop "remote offsite PACs" to cover these costs, but the initial estimates of the expected charges needed to cover the costs were very large. Discussions with UDI indicated that implementing these charges would make the cost of developing land too high, resulting in the development industry moving its focus to the surrounding municipalities.

In September of 1997 the UDI recommended to the City an outline for a series of development charges and the development of a fund that they felt would be able to finance the necessary construction. These development charges were fundamentally different from PAC charges in the following way:

- they would delay some of the payment to a time when recovery of the money from the customer is imminent (i.e. Building Permit stage). This delay frees the developer from the need to carry these costs from the time of subdivision to lot sale.
- they would extend the funding responsibility to include infill development and redevelopments that increase the land use intensity. These types of redevelopments and infill had not been charged in the past. Inclusion of infill developments results in all developments paying for their increased impact on the sewer system in an equitable way.

Upgrading fees will be charged to each new building built

An Expansion Assessment will be charged for land developed

UDI's proposal included two separate charges that would replace the remote off-site PAC for all new developments. The first was referred to as an "Upgrading Assessment", which would be charged on a per unit basis. The second charge was referred to as an "Expansion Assessment", which essentially is the same as the current off-site PAC. In addition, the City's sanitary utility would contribute to the fund to pay for areas diverted into new sewer systems.

The Expansion Assessment would be charged to all new developments that have not yet contributed to a downstream sanitary trunk. At the time, UDI did not suggest an amount for the Expansion Assessment. UDI originally set a target date for implementation of the Expansion Assessment by January 1, 1998.

The proposal was assessed by a business consultant in the late 1997 and early 1998 and was found to be feasible

Drainage Services agreed to review UDI's proposal but determined that extensive work was required to complete an assessment, and develop details. It was agreed that a financial consultant would be required to complete an assessment for this proposal. Drainage Services retained a private business consultant in October 1997 to evaluate the proposal, and provide guidance for assessment, collection, and implementation of the proposed charges.

The consultant determined that proposed PAC rates for all of the major basins would not generate sufficient funds to complete construction. Given the planned costs and schedule (based on completed studies for these areas) a large funding shortfall will result if current funding methods were continued.

Upon determining that this new method of financing sanitary trunk sewers was feasible, it would require support from various stakeholder groups and Council approval for implementation. Although the Expansion Assessment was basically a PAC, and would not require the approval of City Council, the Upgrading Assessment (or Sanitary Sewer Trunk Charge as it was later called) would require implementation through the Sewers Bylaw. Therefore, a Council report was submitted by Drainage Services requesting approval for a revision to the Sewers Bylaw that would include the Sanitary Sewer Trunk Charge.

2.4 Council Decision

Council approved the new proposal for development charges on July 21, 1998

The Sanitary Servicing Strategy was approved and the Sewers Bylaw No. 9425 amended by City Council on July 21, 1998. This decision included the approval of an annual contribution to the fund by the utility starting at $2.6 million in 1998. Leading up to this decision Drainage Services and the UDI worked closely together to develop support for the proposal from those affected.

Stakeholders were informed and brought on-side prior to Council deliberations and decision

In order to implement this new funding proposal, presentations and meetings were held with the various stakeholders that would be affected. Table 2 contains a list of significant events that eventually led to Utility and Public Works Committee and Council review and approval of the report.

3.0 SOURCES OF REVENUE

3.1 Sanitary Sewer Trunk Charge (SSTC)

The SSTC is a new charge that will be paid when Development Permits are issued, and will be applied to:

a) all new developments
b) all re-developments that increase the land use intensity and sewage generated from an area.

The rates for the charge for 1999 will be as follows:

New charges for all buildings built in the City

- Premise with one or two dwellings: $700/dwelling
- Premise with three or more dwellings: $500/dwelling
- Commercial/Industrial/Institutional: $3,500/ha

For the redevelopment or expansion of a residential, commercial, industrial or institutional development site, the Sanitary Sewer Trunk Charge will equal the result of the calculation **A minus B** (zero if negative).

Redevelopment pays only for additional units or area

Where:

A is sanitary sewer trunk charge that would be paid for the development site based on the above-noted rates for residential, commercial, industrial, and institutional development.

B is the sanitary sewer trunk charge previously paid for the development site (if the development site has paid a sanitary sewer trunk charge in the past), or the sanitary sewer trunk charge that would have been paid for the development that existed on the premise prior to the date of the redevelopment or expansion.

For residential redevelopments, the builder will pay for the units being built and, upon application to the City, receive a reimbursement for the units that were removed. For example, a 15 suite apartment being built on the site of three former residential homes would pay $7,500 (15 x $500). Upon application to the City, the proponent would be reimbursed $2,100 (3x$700) for the 3 homes that were removed by the development.

For commercial, Industrial or Institutional redevelopments, the SSTC would apply in cases where:

- land has never been built on, or
- land zoned for other, lower intensity purposes is added to the site and re-zoned

All monies collected are deposited in the SSSF for trunk sewer construction

All monies paid in Sanitary Sewer Trunk Charges will be deposited into the SSSF and used to build new major trunk sewers.

3.2 Expansion Assessment

The Expansion Assessment is normally paid when applying for a Development Agreement

The Expansion Assessment will be applied to those developments that do not currently have Neighbourhood Structure Plan (NSP) approval (as of January 1 1998). However, the NSP must have identified a downstream receiving system or the area will be charged the Expansion Assessment.

It will also be applied to any undeveloped areas requiring additional sewer capacity to enable development. The developers will be required to pay at the time of Development Agreement and will pay an amount based on the sector of City. The assessment will be collected by the Planning & Development Department. The areas required to pay the Expansion Assessment are shown on Figure 5.

Expansion Assessment rates are much less than the PAC rates would have been

The rationale behind the Expansion Assessment was to put less burden on the development industry by collecting some of the funding closer to the sale of new homes being constructed (through the Sanitary Sewer Trunk Charge). The 1999 Expansion Assessment rates are as follows:

Expansion Assessments paid are deposited into the SSSF for trunk sewer construction

NEST/CST	$10,000/ha
SESS	$10,000/ha
TUFS	$10,000/ha
WESS	$12,500/ha

Upon collection of the Expansion Assessment, the money will be transferred to the Sanitary Sewer Trunk Fund to be used for construction of major sanitary trunk sewers throughout the City. The Expansion Assessment rates will increase with inflation and will be reviewed along with the Sanitary Sewer Trunk Charge in the years 2005, 2010, and 2020. Increases are expected for the rates in these years to meet the needs for trunk construction.

3.3 Utility Contribution

The Sanitary Utility (existing ratepayers) will pay into the SSSF to divert Castle Downs, the Lake District and Mill Woods

The sanitary utility will contribute to the fund to pay for the reconnection of existing developments to the new trunk sewer systems. Re-directing the flows from existing developments in the Palisades, Castle Downs, the Lake District, Mill Woods and the Meadows will relieve older sewer systems from heavy loading, and make them better able to cope with rain-related flows.

The utility contribution is based on the Sanitary Sewer Trunk Charge assessed against an estimate of the number of lots that will be diverted. In order to make the SSSF work, the city will pay its share early, before seeing the benefit of reduced flows. Payments will begin at $2.6 million in 1999, and continue until 2014.

4.0 ANTICIPATED EXPENDITURES

Four systems are currently identified as requiring new sanitary sewer systems to handle growth, and these are identified below. Other areas may be redeveloped and require new systems in the future (e.g. Griesbach, Municipal Airport, J.B. Little Brickyard, etc.), and these will be incorporated into the strategy as they arise.

4.1 North Edmonton Sanitary Trunk (NEST)/Clareview Sanitary Trunk (CST)

NEST/CST is a trunk system proposed to meet new development demands in North and Northeast Edmonton

The NEST/CST system consists of a large trunk extending along 153 Avenue from 127 Street east to the river and a branch extending south of 153 Avenue along the river. From 153 Avenue, near the river, the trunk extends northeast to the Capital Region Sewage Commission Treatment Plant (CRSTP).

The total length of this system is 28.0km, it would cost $59.2 million (1998 dollars) to build, and will have a capacity of 2.1 m^3/s. Several pieces of this trunk have already been built or will be built next year:

- segment NL1 (completed in 1995), providing storage for Lake District flows in wet weather;
- segment N6 a 750mm, forcemain (completed in 1995), provides additional capacity for flows draining from the river crossing to the CRSTP; and
- segment C8 (to be built in 2000), diverting flows from south Clareview away from a corroded pipe with capacity problems.

The segments of the NEST system are shown in Figure 1, and listed in Table 3 along with the anticipated diameter and slope. The next segments of NEST to be built are:

Segment NC1 of NEST will be built for the Palisades in 2002

- segment NC1 (planned for construction between 2000 and 2002), to provide storage for wet weather sewer flows originating from the initial developments in the Palisades.

- segment NL2 (planned for construction in 2006), this sewer will meet growing storage needs for the Lake District.

4.2 South Edmonton Sanitary Sewer (SESS)

SESS is a trunk sewer system proposed to meet development demand in South Edmonton

This trunk sewer extends through south Edmonton from west of the river to Calgary Trail, through Mill Woods in a northeasterly direction and then north to the CRSTP. This sewer system is shown in Figure 2. The SESS system is 57.1km long, includes 4 major pumping stations, will cost $267.0 million (1998 dollars) to build, and will have the capacity to carry 12 m^3/s in sewage flows.

Segments SA3 and SA4 of this trunk have already been built, in the center of Mill Woods. These segments provide storage for rain related flows from Mill Woods, protecting local sewer systems and homes from flooding. These segments have been constructed at a depth and alignment that will allow them to be used as part of SESS.

Segment SW1 will be built in 1999 for developments south of the RDA and West of Calgary Trail

The next segments of SESS to be built are:

- Segment SW1, (expected to be built in 1999), which will open up lands south of the RDA and west of Calgary Trail for development.
- Segment SE1 (expected to be built in 2000), which will provide service to lands east of Calgary Trail.

The individual segments are listed in Table 4 along with segment descriptions.

4.3 West Edmonton Sanitary Sewer (WESS)

WESS is a trunk sewer system to meet new development demands in West Edmonton

This trunk system consists of a forcemain extending eastward along 100 Avenue from west of the RDA to 163 Street, and a trunk extending further east on 107 Avenue that crosses the river to meet up with the South Highlands Interceptor at 84 Street and 106 Avenue. The WESS system is shown on Figure 3, and the segments and their descriptions are shown on Table 5.

As can be seen from Figure 3, many trunks in west Edmonton have the capacity to be used as part of the WESS system. The forcemain on 100 Avenue from the RDA to 163 Street is needed to bypass a low capacity sewer, and the trunk from 149 Street eastward is needed to bypass the combined sewers.

Connections to WESS will be installed by developers using the PAC system for funding.

The WESS system is to be paid for from the SSSF and consists of 16.9km of trunk sewer construction, 4.4km of forcemain, a river crossing and a 2700m^3 storage tank. It will cost $83.6 million (1998 dollars) to build, and will have the capacity to carry 3.0m^3/s in sewage flows. Smaller sewers feeding the main WESS will not be paid for by the SSSF, but through onsite and offsite Permanent Area Contributions.

The initial construction for this system will be the storage and forcemain system on 100 Avenue. This will be built in 2003, but may be built earlier by developers.

4.4 Terwillegar and University Farms Sewer (TUFS)

Future developments in Riverbend, Terwillegar and the University of Alberta Farms will continue to drain through existing City sewers to the GBWWTP. However, many of these sewers do not have the capacity to accommodate all of these new flows, and certain existing lines in the City may have to be twinned. Figure 4 shows the lines that have presently been identified as requiring twinning to accommodate all future development.

More investigation is required to better define the specific capacity needs for the TUFS system

The TUFS system consists of 4.1km of trunk sewer through the heart of Edmonton, and will cost $22.0 (1998 dollars) million to build. Table 6 lists the segments of the trunk and their descriptions. Timing for the TUFS system has not been analyzed in the same detail as for other systems, but it is felt that any construction for this system is well beyond the 10 year time frame. Future modeling of the TUFS and SESS systems may show that accelerating the completion of SESS and the diversion of Mill Woods may significantly reduce the upgrading needs in the system. Modeling to analyze this system will be completed in the next few years. (?)

4.5 Construction Scheduling

Scheduling for the segments of the Sanitary Servicing Strategy's trunk system was based on population growth

Population forecasts were developed for the various areas based on those done for the Transportation Master Plan. From these projections, flows and required storage volumes were calculated in 5 year increments. Segments of the systems were added as additional capacity was needed for storage, conveyance and/or treatment.

In most areas, storage was an initial concern and segments would be built to meet this need. Eventually, outlet capacity becomes the issue, and new segments will need to be built to reach outlets with a higher capacity.

Details of the analysis used to arrive at the construction schedule are contained in a separate report (Sanitary Servicing Strategy for the 21st Century - Technical Report, December, 1998).

5.0 FINANCIAL ANALYSIS

The financial aspects of the expenditures and revenues were analysed by an independent business consultant

Drainage Services retained a private business consultant in October 1997, to evaluate the UDI proposal and provide guidance for assessment, collection, and implementation of the proposed charges. The consultant developed a financial model that would account for all future development, population growth, and construction of major sanitary sewer trunks.

The model was flexible in that it could assess individual basins (e.g. WESS/SESS) or the entire City. The North Edmonton Sanitary Trunk and Clareview Sanitary Trunk (NEST/CST), and Terwillegar and University Farms Sanitary Trunk (TUFS) were included in the model, to enable an assessment of the entire City. The model included an allowance for infill developments for Edmonton's "Inner City" as part of the Upgrading Assessment.

The PAC system would not have worked for major trunk sewers

The model determined that proposed PAC rates for all of the major basins would not generate sufficient funds to complete construction. Given the planned costs and schedule (based on completed studies for these areas) a large funding shortfall will result if current funding methods are continued.

The model assessed the new funding proposal submitted by UDI and determined that sufficient funding could be generated if construction schedules are amended to more closely reflect basin development requirements. In some cases, the proposed construction schedule was much too ambitious and would have caused the fund to fall into a deficit situation.

The City's share for diverting existing areas was calculated by the financial model

The City's share must be added to the fund early to keep the fund balance positive

The model calculated a share of the cost recovery that is attributable to the City based on the existing developed areas within the four basins that will be off-loaded into the new trunk system. The City's share will be injected into the fund over a 10-12 year period beginning with $2.6 million in 1999. This injection is necessary to kick start the fund and sustain it through the initial construction period. Once the City has completed paying its share, the fund will generate enough income through private development to sustain itself.

Figure 6 illustrates the predicted fund balance with the expected expenditures. The figure shows a shortfall in 2000 that will need to be eliminated through adjustments to project schedules.

6.0 CONTROL OF THE FUND: THE SSSF MANAGEMENT COMMITTEE

6.1 Role of the Management Committee

The role of the Sanitary Servicing Strategy Fund Management Committee is to make decisions regarding fund revenues and expenditures that best meet the community's needs for development. The "Sanitary Servicing Strategy Fund Management and Operational Committee Terms of Reference, November 1998" describes these committees fully. Specifically, the Committee will:

The Management Committee manages the fund

- manage the revenue generated by the Expansion Assessment fees, the Sanitary Sewer Trunk Charges, the utility's contribution, interest income, and debt payment (if any),
- recommend changes to the Sanitary Sewer Trunk Charges to City Council as part of the annual budgeting process,
- authorize expenditures from the fund,
- define guidelines for allowable expenditures from the fund,
- establish criteria for selecting the next project to build,
- approve the proposed construction program, and method of delivery (i.e. City or private forces) for the next construction project,
- control the timing for new trunk sewer projects,
- notify stakeholders about construction projects and schedule,

- prepare and distribute annual reports containing:
  - a list of projects constructed;
  - status of projects under construction;
  - a schedule of projects to be constructed in future years;
  - a statement of the current SSSF financial status;
  - a projection of the fund balance for future years, and
- appoint the SSSF Operational Committee members as needed.

6.2 Structure and Membership

The Management Committee has 2 development industry representatives and 3 City representatives

The SSSF Management Committee will be chaired by the Director of Drainage Planning. The committee will include the Director of Drainage Design and Construction, the Director of Development Coordination from the Planning and Development Department and two members from the Urban Development Institute (i.e. the chair of the UDI Drainage Committee, and a member of the UDI Executive).

6.3 Restrictions to Development

The establishment of this fund through the City Council decision of July 21, 1998 ensures that development will continue in much the same manner as in the past. The necessary major trunk sewers will be built in the developing areas of the City through the SSSF, ensuring uninterrupted growth in those areas.

The SSSF Management Committee will attempt to meet continuing development demands wherever possible. However, funds are limited, and it is unlikely that the fund will be used to provide service to leapfrog development. As is the case in the past, Drainage Services will not object to any developments provided that all necessary permanent servicing systems are built.

If the development is far away from City sewers or extensions proposed within the SSS, the developer must bear all of the costs. The developer will be repaid his costs for the trunk sewers at the time when the SSSF Management Committee decides, based on when contiguous development will reach the areas.

7.0 FORECASTING FUND EXPENDITURES AND REVENUES: SSSF OPERATIONAL COMMITTEE

7.1 Role of the Operational Committee

The Operational Committee monitors the need for new stages and the use of existing stages

The role of the Sanitary Servicing Strategy Fund Operational Committee is to predict the need for new trunk sewer facilities, and to recommend to the SSSF Management Committee a construction schedule for these facilities. This Committee is described fully in the "Sanitary Servicing Strategy Fund Management and Operational Committee Terms of Reference, November 1998".

Specifically the committee will:

- monitor the operation of existing facilities including:
  - flows (average and peak, wet and dry);
  - impact of new flows on the downstream system;
  - storage used and homes connected,
- obtain updated population projections for new development areas annually,
- convert the population projections from the traffic district base to a drainage basin base,
- project the time when capacity in existing systems will be used up and new facilities will be needed in each area,
- update the cost estimates for future construction projects, including appropriate allowance for engineering and overheads,
- develop a schedule for future project construction and expenditures, using appropriate interest, inflation, and construction price index values,
- update the financial model,
- recommend to the SSSF Management Committee the projects to be built and associated expenditures to be made in the next year, the next five years, and future years, and justify the recommendation.

- monitor the design, construction activities and expenditures for approved projects and report to the Management Committee.
- monitor the revenues and overall balance of the fund.

7.2 Structure and Membership

The Operational Committee will have 2 development industry members and 5 City members

The SSSF Operational Committee will be appointed by the SSSF Management Committee. The Committee will include:

- 2 members from the Development industry
- 2 members from Drainage Services, Drainage Planning Section (one will be chair)
- 1 member from Drainage Services, Design and Construction Section
- 1 member from Drainage Financial Services
- 1 member from Development Coordination Section, Planning and Development Department

8.0 ANNUAL REPORTING

A report on the fund's past and future expenditures and revenues will be prepared annually

The SSSF Management Committee will, with the help of the Operational Committee, prepare an annual report containing:

- a detailed accounting of the financial status of the Sanitary Servicing Strategy Fund (SSSF), including all sources of income and all expenditures for the past year, and a summary of previous years records,
- a forecast of the expenditures, income and fund balance expected for the next 5 years,
- a list of projects that have been constructed using the SSSF and their final cost,
- a schedule of projects to be built in the future using the fund,
- committee meeting minutes, detailing the decisions made and the reasons for those decisions.

This report will be distributed to the UDI, the Greater Edmonton Home Builders Association and will be made available upon request at the offices of Drainage Services.

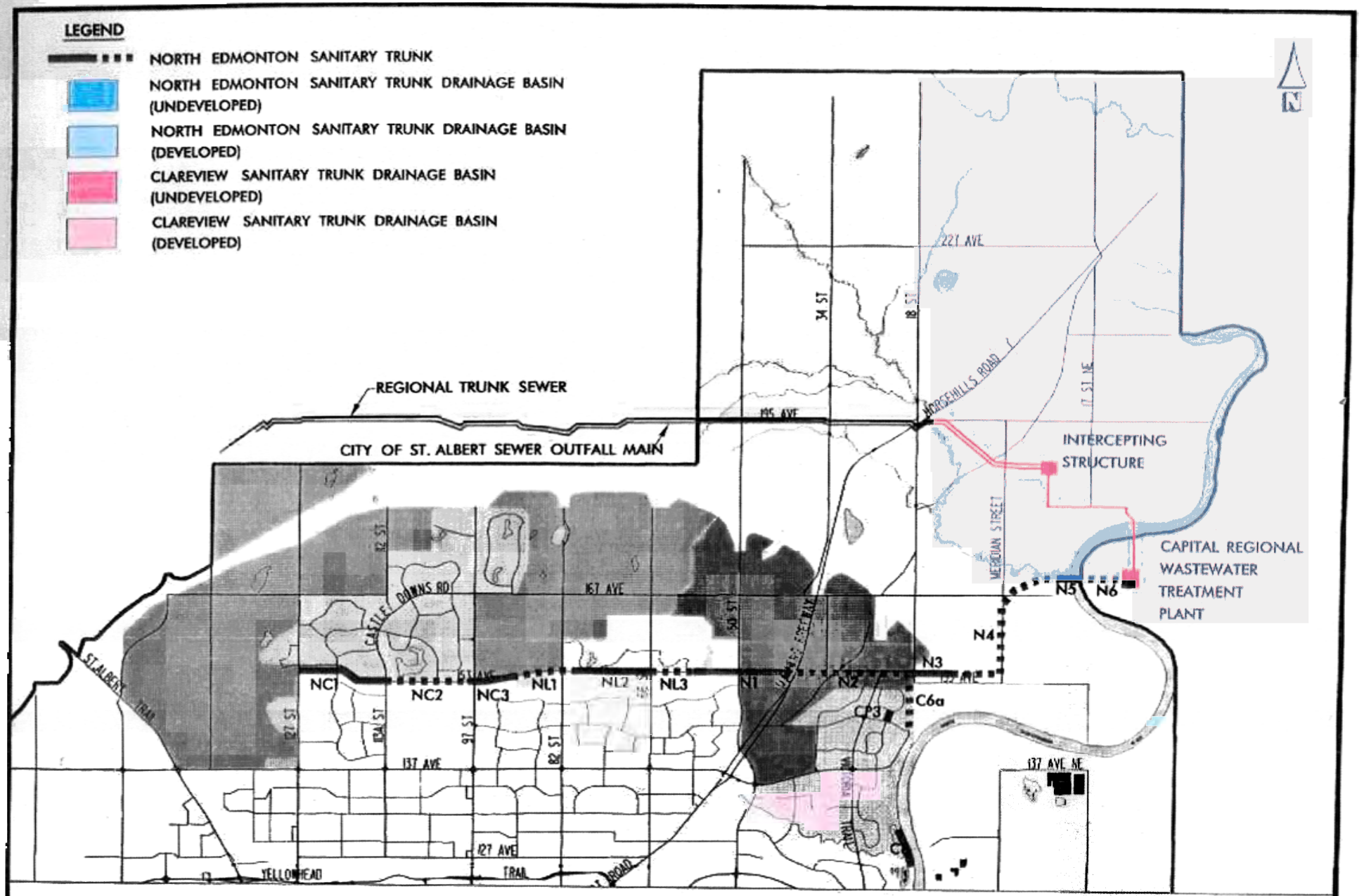
Table 1: Studies Completed to Develop the Sanitary Servicing Strategy

Date	Presentation/Event
City Wide	
	Drainage Strategic Planning, City of Edmonton, Transportation Department City of Edmonton Wastewater Treatment Plant Service Area Study, July 1995.
	Drainage Strategic Planning, City of Edmonton Transportation Department, City wide Sewage Flow Projections for the City of Edmonton, July 1995.
	Drainage Strategic Planning, City of Edmonton, Transportation Department Analysis of the Gold Bar Wastewater Treatment Plant Operation, July 19 to August 5, 1996 May 1996.
	Reid Crowther & Partners Ltd., Sanitary Servicing Plan for New Development Areas - Phase I, November 1997.
	UMA Engineering Ltd. Sanitary Servicing Plan for New Development Areas - Phase II, to be completed in December 1998.
South Edmonton	
	Reid Crowther Ltd., South Edmonton Sanitary Sewerage Servicing Study - Final Report Volume I (Executive Summary), March 1996.
	Reid Crowther & Partners Ltd., South Edmonton Sanitary Sewerage Servicing Study (SESS), Final Report - Volume II, March 1996.
	Thurber Engineering Ltd., South Edmonton Sanitary Sewerage Servicing Study (SESS) - Preliminary Geotechnical Evaluation for Plans A,B and C, March 1996.
	Drainage Strategic Planning, City of Edmonton Transportation Department, Assessment of the Impacts of development in Terwillegar, Heritage, and the University Farms on the Existing Sewer System Serving Southwest Edmonton During Dry Weather, October, 1997.

North Edmonton	
	Drainage Strategic Planning, The City of Edmonton, Transportation Department, North Edmonton Sanitary Trunk Study, January 1994.
	I.D. Engineering Ltd. and UMA Engineering Ltd., North Edmonton Sanitary Trunk (NEST): Conceptual Design Report, April 1994.
	I.D. Engineering Ltd. and UMA Engineering Ltd., North Edmonton Sanitary Trunk, Preliminary Design Report, Stage L1 153 Avenue - 76 to 88 Streets, May 1994.
	Reid Crowther & Partners Ltd: Clareview Sanitary Sewer System Hydraulic Assessment, April 1993.
	Thurber Engineering Ltd., Northeast Sanitary Trunk (NEST) Tunnel: Geotechnical Investigation, May 1994.
	Hanscombe Consultant Inc., Clareview, NEST: Value Analysis Sturdy for the Clareview Sanitary Trunk and the North Edmonton Sanitary Trunk (NEST): Final Report, December 1995.
	Cochrane Engineering Ltd., Clareview Sanitary Trunk/North Edmonton Sanitary Trunk Conceptual Design Refinement, December 1997.
West Edmonton	
	UMA Engineering Ltd., West Edmonton Sanitary Serving Study, Final Report, March 1997.
	UMA Engineering Ltd., West Edmonton Sanitary Servicing Study Value Engineering Report, May 1996.

Table 2: Presentations on the Sanitary Servicing Strategy

Date	Presentation/Event
March 11, 1998	City of Edmonton - Corporate Services
March 13, 1998	City of Edmonton - Senior Management Team
April 8, 1998	Greater Edmonton Home Builders Association - Residential Builders
April 15, 1998	City Council (Informal)
April 29, 1998	Urban Development Institute
May 6, 1998	Industrial/Commercial/Institutional Developers, APEGGA, Architects Assoc.
May 7, 1998	Greater Edmonton Home Builders - Builder Council/Multi Family Builders
May 15, 1998	NEST Owners Group
May 19, 1998	Consulting Engineers of Alberta
May 26, 1998	Utility and Public Works Committee - Bylaw Review (Referred to Council)
June 2, 1998	City Council Meeting - Bylaw Review (Referred to Special Meeting)
July 9, 1998	Special City Council Meeting - Bylaw Review (Passed 2nd Reading)
July 21, 1998	City Council Meeting - Bylaw Review (Passed 3rd Reading)

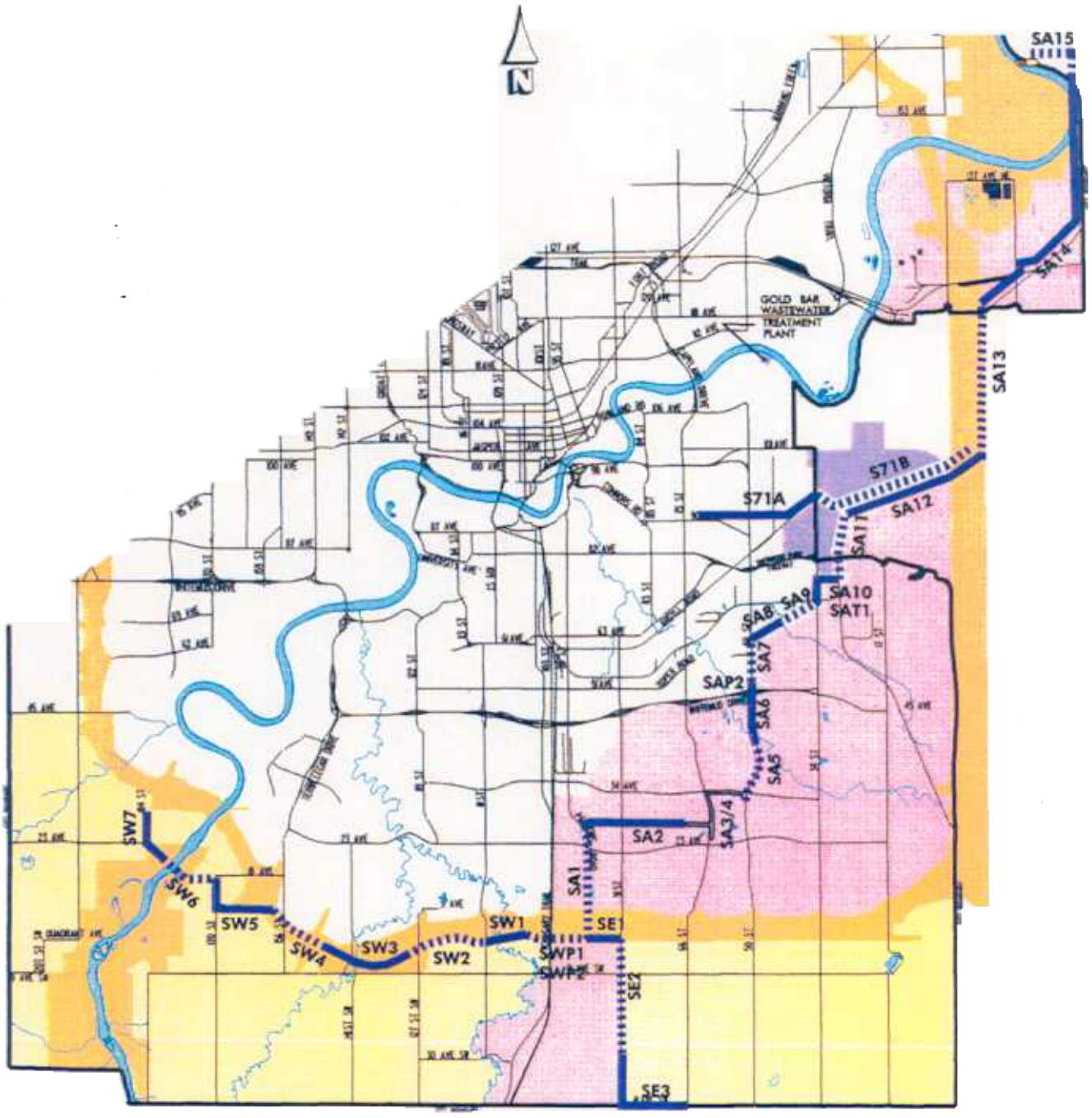


NORTH EDMONTON SANITARY TRUNK (NEST) & CLAREVIEW SANITARY TRUNK (CST) STAGING PLAN

FIGURE 1

PROJECT NO. 23-9089

DSP :NTKSTAGE .DGN NOV 1998



LEGEND

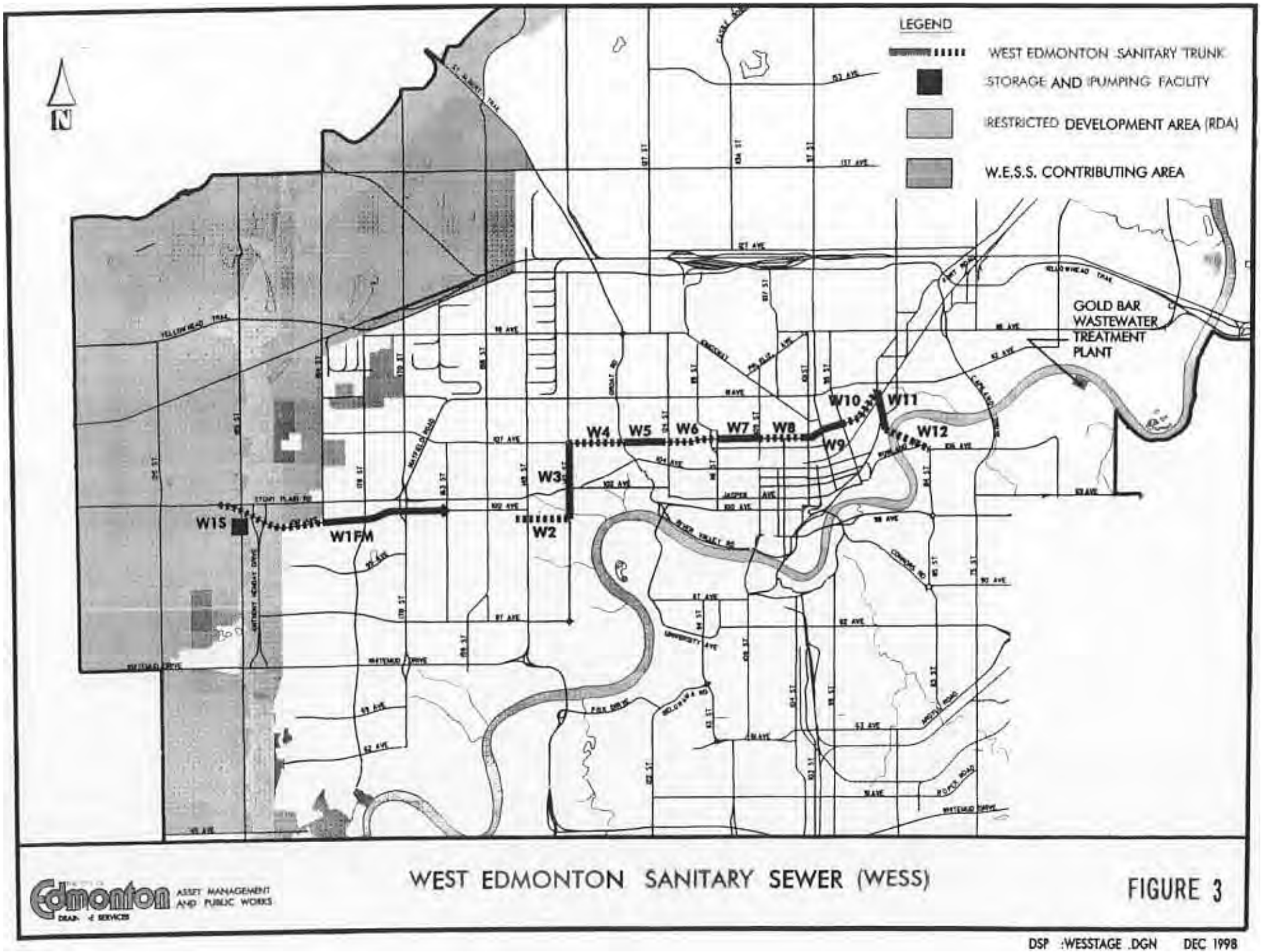
- SANITARY TRUNK
- S.E.S.S. CONTRIBUTING AREA
- CONTRIBUTING AREA INTERCEPTED BY S.E.R.T.
- CONTRIBUTING AREA SERVED BY 34 STREET LIFT STATION
- RESTRICTED DEVELOPMENT AREA (RDA)

Edmonton DRAINAGE SERVICES ASSET MANAGEMENT AND PUBLIC WORKS

SOUTH EDMONTON SANITARY SEWER (SESS)

FIGURE 2

DSP :SESSTAGE .DGN DEC 1998

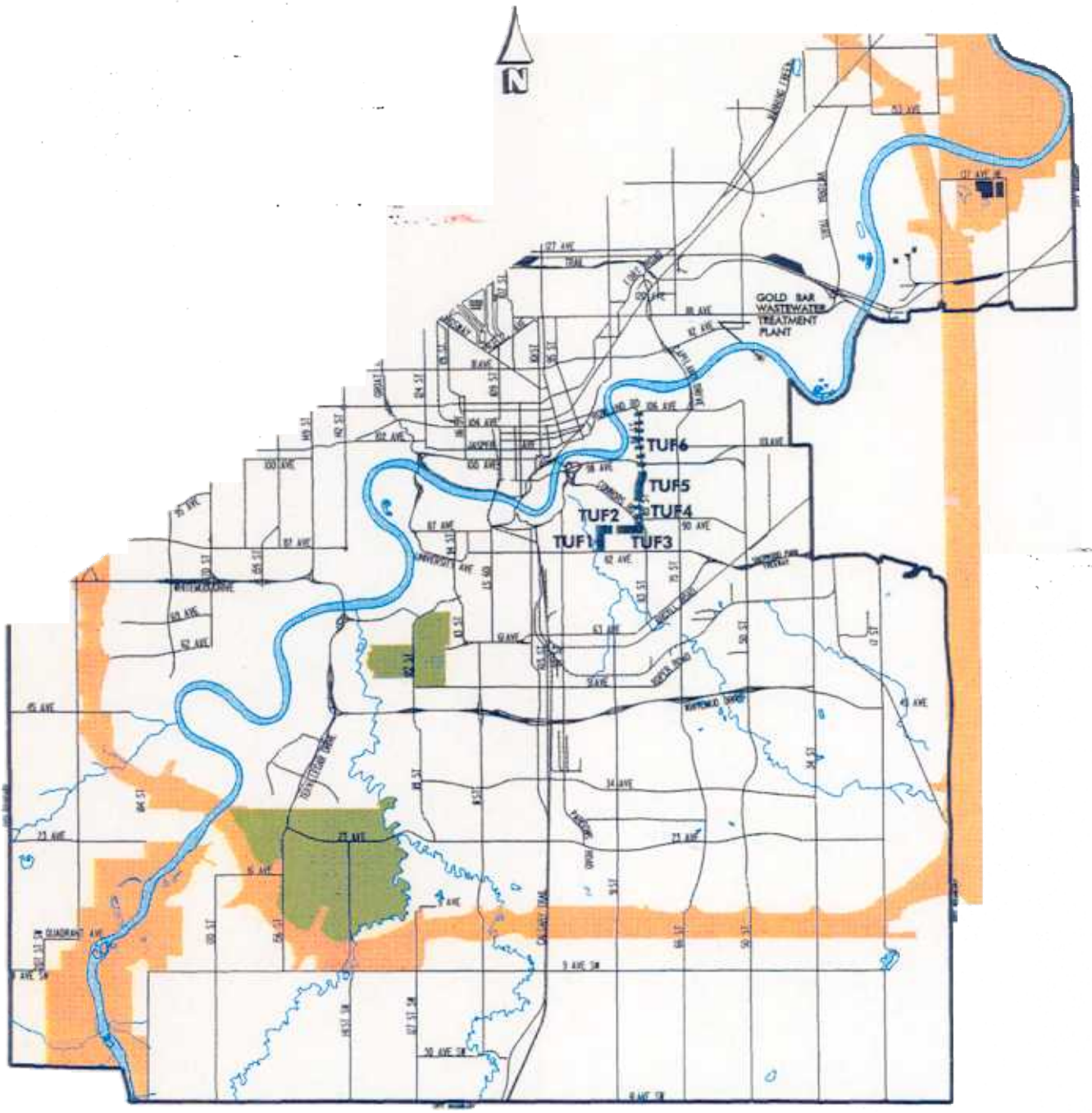


Edmonton ASSET MANAGEMENT AND PUBLIC WORKS

WEST EDMONTON SANITARY SEWER (WESS)

FIGURE 3

DSP :WESSTAGE .DGN DEC 1998



LEGEND

SANITARY TRUNK

RESTRICTED DEVELOPMENT AREA (RDA)

T.U.F.S. CONTRIBUTING AREA

THE CITY OF Edmonton ASSET MANAGEMENT AND PUBLIC WORKS
DRAINAGE SERVICES

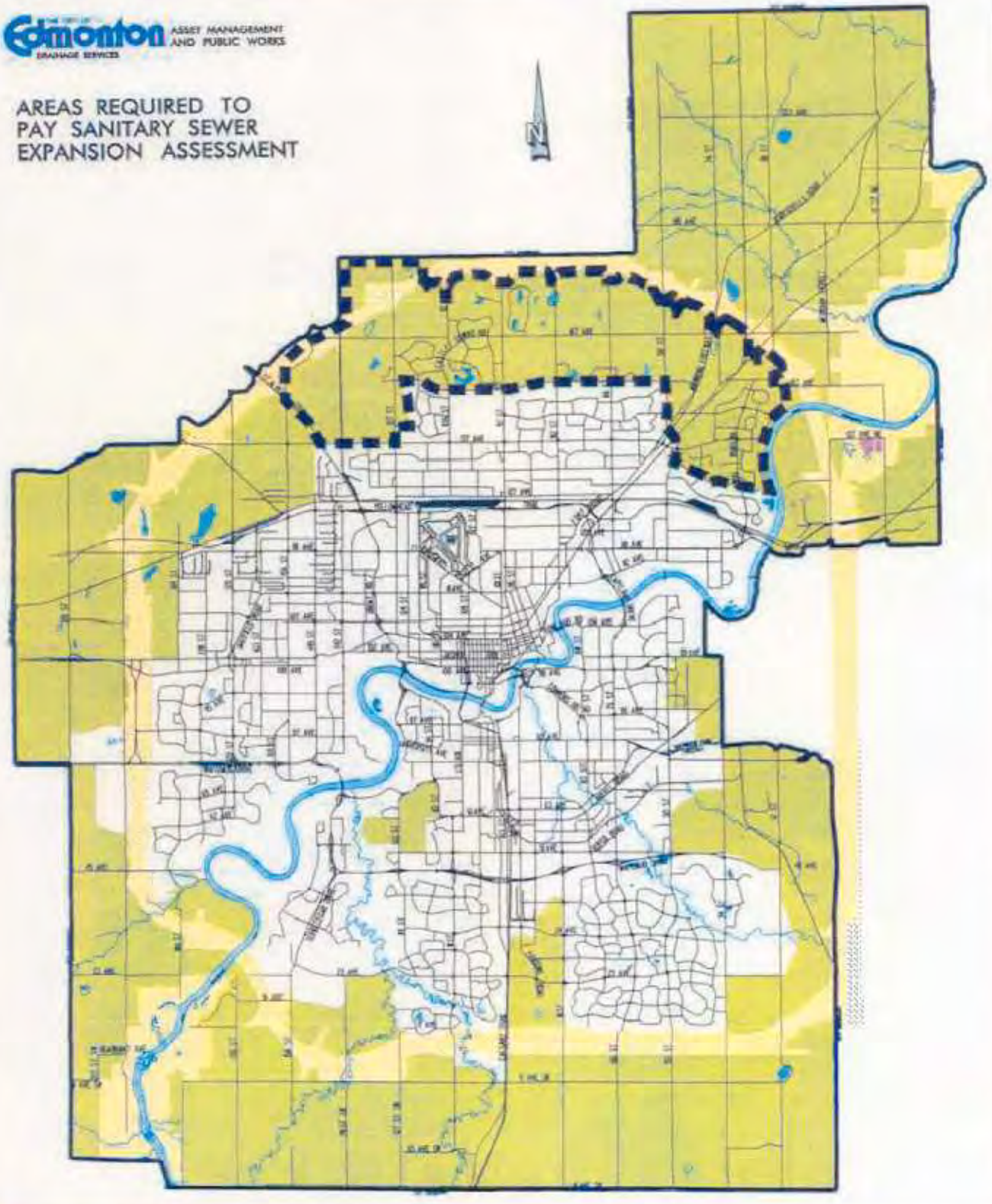
TERWILLEGAR / UNIVERSITY FARM SEWER (TUFS)

FIGURE 4

DSP :TUFSTAGE .DGN DEC 1998

Edmonton ASSET MANAGEMENT AND PUBLIC WORKS
DRAINAGE SERVICES

AREAS REQUIRED TO PAY SANITARY SEWER EXPANSION ASSESSMENT



RESTRICTED DEVELOPMENT AREA (RDA)

EXPANSION ASSESSMENT AREAS (EXCEPT CURRENTLY SERVICED LOTS)

SPECIAL CONSIDERATION AREA (NEST /CST)

FIGURE 5

DPD :PAYSANSW .DGN DEC 1998