Hewitt

Actuarial Report

Northwest Territories
Legislative Assembly
Supplementary
Retiring Allowances
Act

As of
April 1, 2000

Hewitt

Hewitt Associates

Actuarial Report

Northwest Territories Legislative Assembly Supplementary Retiring Allowances Act

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Argentina	China	Ireland	Philippines	Switzerland
Australia	Czech Republic	Italy	Poland	Thailand
Austria	France	Japan	Puerto Rico	United Kingdom
Belgium	Germany	Malaysia	Singapore	United States
Brazil	Hong Kong SAR	Mexico	Slovenia	Venezuela
Canada	India	Netherlands	Spain	
Chile	Indonesia	New Zealand	Sweden	

Preparation of this Actuarial Valuation

Northwest Territories Legislative Assembly
Supplementary Retiring Allowances Act

This report on the actuarial valuation of the Northwest Territories Legislative Assembly Supplementary Retiring Allowances Act ('the Plan') as of April 1, 2000 has been prepared for the Board of Management of the Northwest Territories Legislative Assembly, who is the Administrator, for the purpose of determining the Plan's:

1. going concern financial position; and

2. wind–up position.

In conducting the valuation, we have used personnel information obtained from the Board of Management of the Northwest Territories Legislative Assembly as of April 1, 2000, the financial statements prepared by CIBC Mellon as of March 31, 2000, and the actuarial assumptions and methods described in the actuarial assumptions section of this report.

It is our opinion that:

1. the latest date on which the next valuation should be performed is April 1, 2004;

2. the data on which this report is based are sufficient and reliable for the purposes of the valuation;

3. the assumptions used are, in aggregate, appropriate for the purpose of the going concern valuation; emerging experience differing from assumptions will result in gains or losses which will be revealed in future valuations and may cause changes in future contribution levels;

4. the value of the Plan assets would be greater than the actuarial liabilities if the Plan were wound up on the valuation date; and

5. the methods employed in the valuation are appropriate for the purposes of the going concern valuation.

This report has been prepared, and our opinions given, in accordance with accepted actuarial practice.

Hewitt Associates

Michael Y. Masuhara
Fellow of the Canadian Institute of Actuaries

Robert J.W. Vandersanden
Fellow of the Canadian Institute of Actuaries

September 2000

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Definition of Terms

Accrued Liability	The actuarial present value of the benefits earned by participants in respect of their service prior to the valuation date.
Actuarial Value of Assets	The actuarial value of assets equals the smoothed market value of assets adjusted for amounts payable and receivable at the valuation date. The smoothed market value is calculated by adjusting the market value to recognize the difference between actual and expected investment earnings each year over a four year period. Expected investment earnings are calculated by assuming the fund assets and cash flows will earn the going–concern valuation interest rate each year.
Surplus	Amount by which the Actuarial Value of Assets exceeds the Accrued Liability. Results from experience gains arising when actual results are more favourable than those expected under the actuarial assumptions.
Unfunded Accrued Liability	Amount by which the Accrued Liability exceeds the Actuarial Value of Assets. Results from liabilities established at the time the plan is amended and from experience deficiencies arising from the difference between actual and expected experience under the plan according to actuarial assumptions.
Participant Salary Base	The salary for those participants who are under the assumed retirement age.
Current Service Cost	The actuarial present value of the benefits expected to be earned in respect of service during the year following the valuation date. For funding purposes, the Current Service Cost is expressed as a percentage of the Participant Salary Base. The Current Service Cost is also known as the Normal Cost.

Definition of Terms (continued)

Personnel	
Active Participants	Members of the Legislative Assembly who have accrued a benefit under this plan and who have not retired.
Retired Participants	Members who have retired as of the valuation date and are in receipt of a pension from the trust fund.
Terminated Vested Participants	Members who are no longer members of the Legislative Assembly as of the valuation date and who are entitled to a monthly pension commencing at normal retirement age.

Summary

Going Concern Valuation Results	As of April 1, 2000	As of April 1, 1996
Past Service		
Actuarial Value of Assets	$ 21,155,400	$ 16,191,700
Less: Accrued Liability	13,442,200	13,197,000
Surplus (Unfunded Accrued Liability)	$ 7,713,200	$ 2,994,700
As a % of Actuarial Value of Assets	36.5%	18.5%
Current Service		
Total Current Service Cost	$ 0	$ 233,900
As a % of Participant Salary Base	0%	46.4%
Participant Salary Base	n/a	$ 504,400

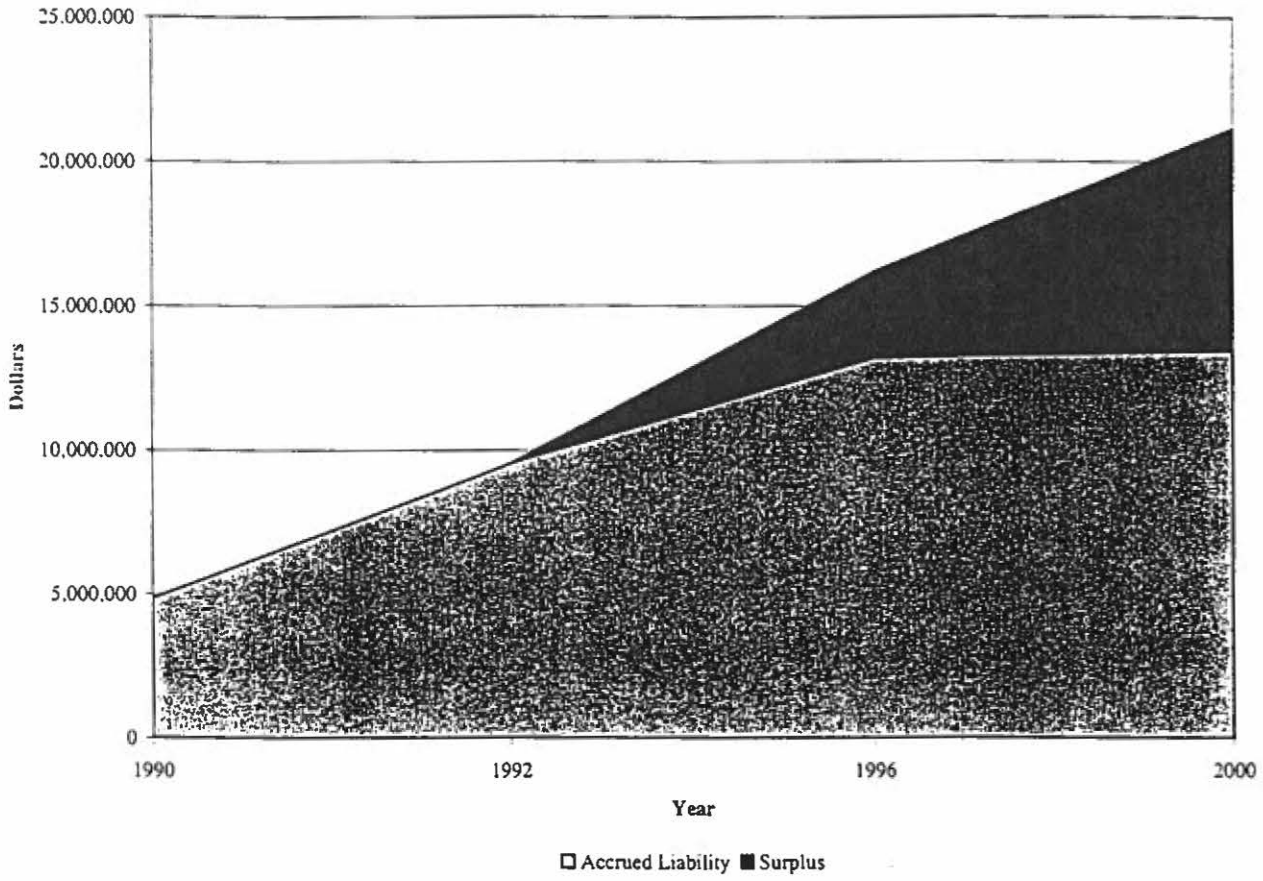
Summary (continued)

Personnel Data	As of April 1, 2000	As of April 1, 1996
Active Participants	3*	24
Retired Participants	29**	23
Terminated Non–Vested	–	7
Total	32	54

* All active participants have ceased to accrue benefits under the Plan.
** Includes one child receiving a dependent benefit payable to age of majority or to age 25 if attending school.

Summary (continued)

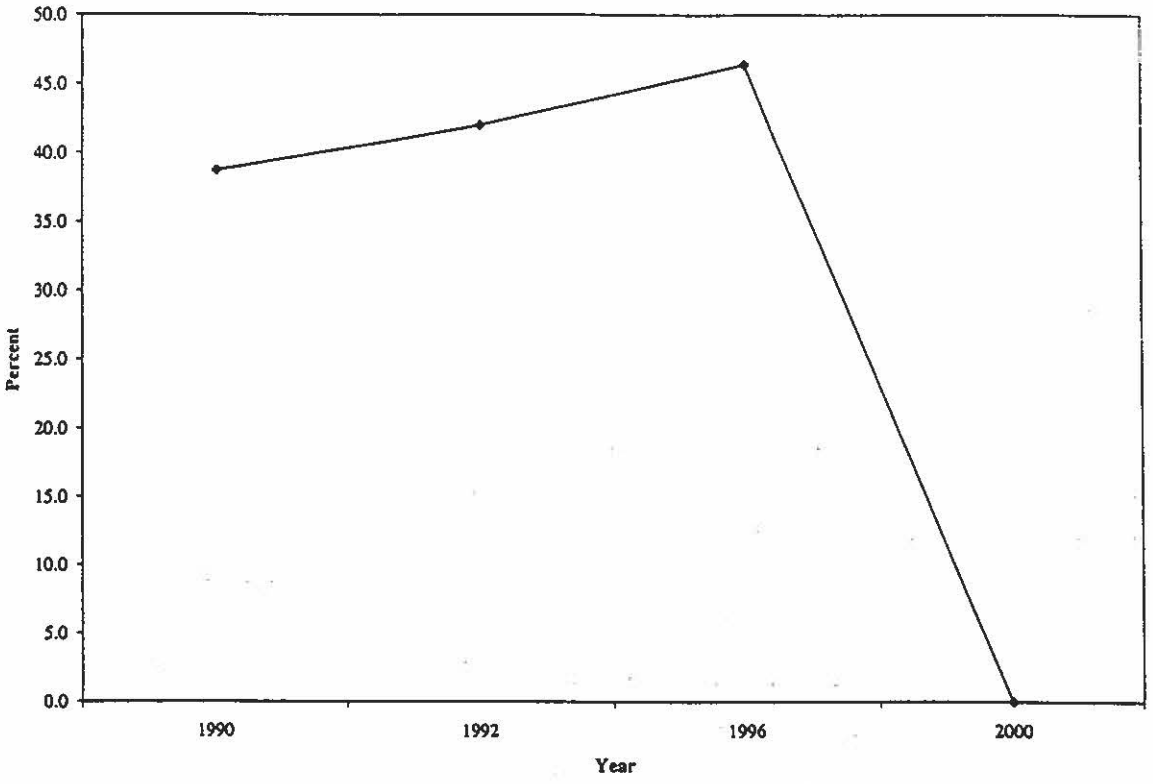
History of Accrued Liability and Surplus



Year	Actuarial Value of Assets (AVA)	Accrued Liability	Surplus	Surplus as a Percentage of AVA
1990	$ 271,000	$ 4,872,000	$ 0	0%
1992	$ 6,551,000	$ 9,549,000	$ 0	0%
1996	$ 16,191,700	$ 13,197,000	$ 2,994,700	18.5%
2000	$ 21,155,400	$ 13,442,200	$ 7,713,200	36.5%

Summary (continued)

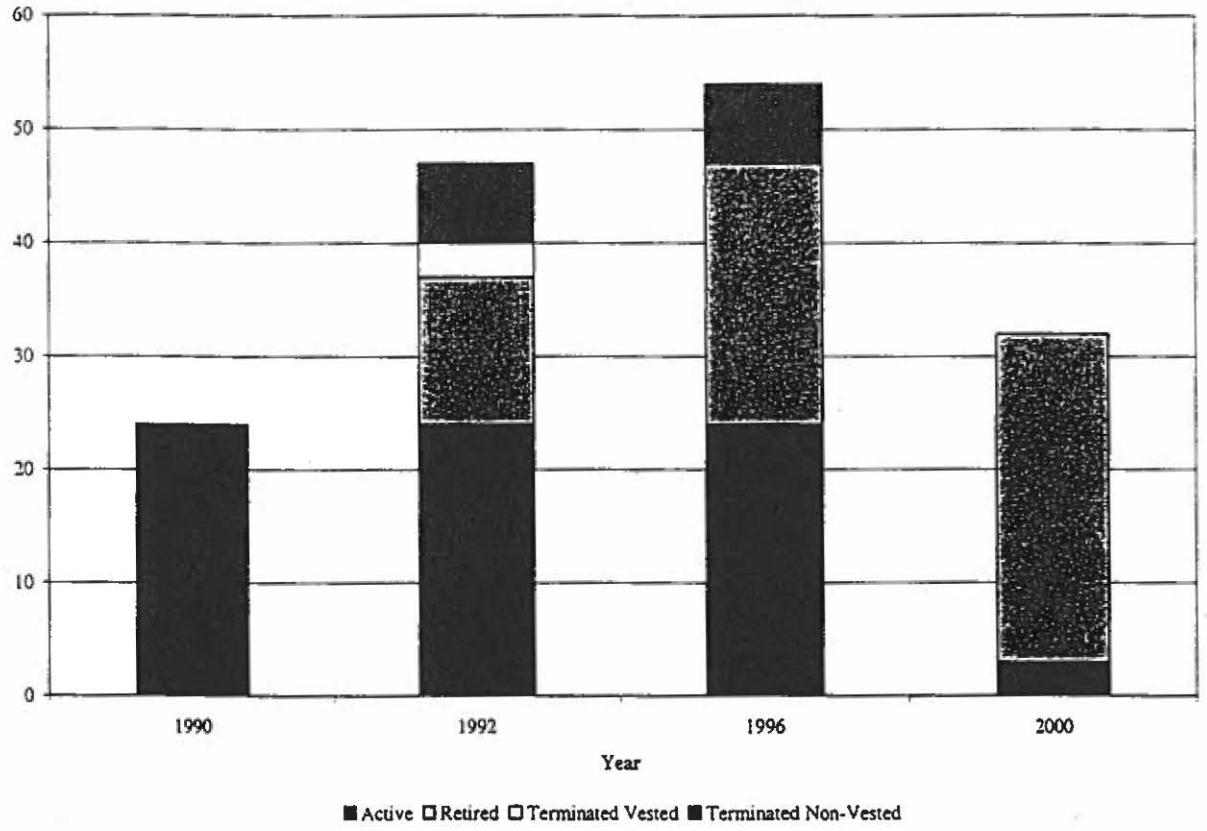
History of Current Service Cost as a Percent of Participant Salary Base



Year	Current Service Cost	Participant Salary Base	Percent
1990	$ 705,000	$ 1,824,000	38.7%
1992	$ 810,600	$ 1,928,400	42.0%
1996	$ 233,900	$ 504,400	46.4%
2000	$ 0	n/a	0.0%

Summary (continued)

History of Distribution of Participants



Year	Active	Retired	Terminated Vested	Terminated Non-Vested	Total
1990	24	0	0	0	24
1992	24	13	3	7	47
1996	24	23	0	7	54
2000	3	29	0	0	32

Assets and Liabilities

Going Concern Valuation Results

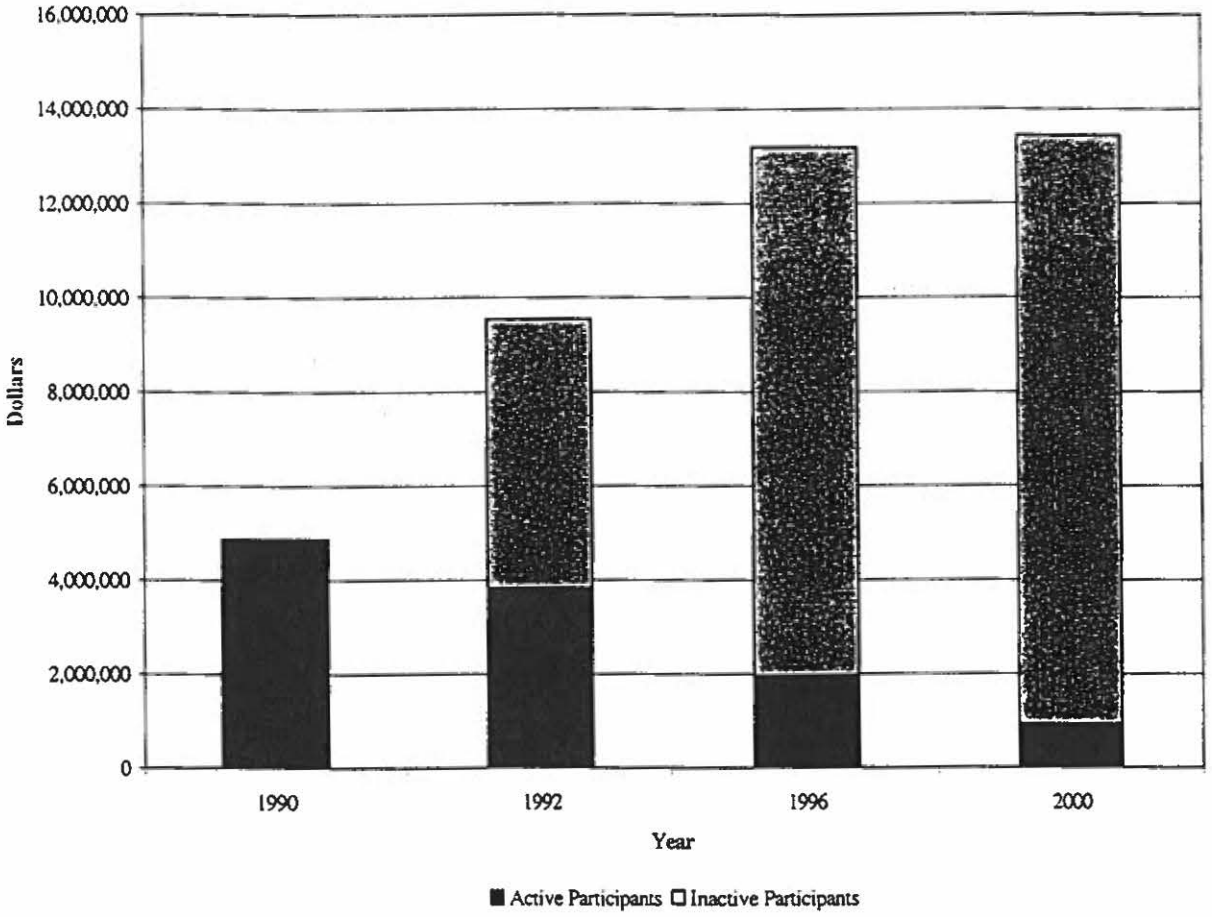
Following are the going-concern valuation results for the Plan as at April 1, 2000

Actuarial Value of Assets		$ 21,155,400
Less: Accrued Liability		
Active Participants	$ 934,800	
Retired Participants	12,488,300	
Contribution balance for Members elected for the first time in the 13th Assembly	19,100	
Total		13,442,200
Surplus (Unfunded Accrued Liability)		$ 7,713,200
As a % of Actuarial Value of Assets		36.5%
Current Service		
Total Current Service Cost		$ 0
As a % of Participant Salary Base		0%
Participant Salary Base		n/a

Assets and Liabilities (continued)

History of Distribution of Accrued Liability

The liabilities have been divided into liabilities for inactive participants (terminated vested, non–vested participants and pensioners) and active participants.



Year	Active Participants	Inactive Participants	Total
1990	$ 4,872,000	$ 0	$ 4,872,000
1992	$ 3,826,000	$ 5,723,000	$ 9,549,000
1996	$ 1,964,900	$ 11,232,100	$ 13,197,000
2000	$ 934,800	$ 12,507,400*	$ 13,442,200

* Includes contribution balance for those Members elected for the first time in the 13th Assembly.

Assets and Liabilities (continued)

Description of Plan Assets

The Plan assets are held by CIBC Mellon and invested by Watt Carmichael Inc. Information in this section of the report is based on financial reports prepared by CIBC Mellon, the Plan custodian. Subsequent to the valuation date, the investment manager, Watt Carmichael Inc., has been replaced by McLean Budden.

Assets appropriated by the Legislative Assembly for the purpose of providing benefits under the Supplementary Retiring Allowances Act constitute part of the Government of the Northwest Territories Consolidated Revenue Fund. While in this report the assets are treated as being Plan assets, the Assembly does not in fact have a beneficial ownership in the assets and the assets could, in theory, be used at any time for any other purpose.

Asset Category	April 1, 2000		April 1, 1996	
Equities:				
• Canadian	$ 5,016,815	23%	$ 2,607,731	16%
• Foreign	1,933,559	9%	1,565,002	9%
Fixed Income	13,347,445	63%	11,554,208	70%
Short Term	1,136,637	5%	809,421	5%
Accrued Income	–	–	77,114	–
	$ 21,434,456	100%	$ 16,603,476	100%

Assets and Liabilities (continued)

Changes to Plan Assets

	1999/2000	1998/1999	1997/1998	1996/1997
Market Value at April 1	$ 20,058,523	$ 20,258,415	$ 17,939,883	$ 16,603,476
Plus:				
Member Contributions	0	0	0	0
Assembly Contributions	0	0	0	0
Other	149	(16,853)	66,250	23,897
Investment Income	2,094,518	421,524	3,047,704	1,897,998
Less:				
Benefit Payments	(616,549)	(540,377)	(743,244)	(536,418)
Lump Sum Payments	(35,517)	0	0	0
Administrative and Other Expenses	(20,689)	(18,404)	(19,452)	(19,161)
Investment Management Fees	(45,979)	(45,282)	(32,726)	(29,909)
Market Value at March 31	$ 21,434,456	$ 20,058,523	$ 20,258,415	$ 17,939,883

Assets and Liabilities (continued)

Determination of Actuarial Value of Assets

In determining the Plan's funded position, we use an asset valuation method which smoothes the impact of short term fluctuations in the market value of the assets. The method does this by recognizing the difference between the fund's actual and expected investment earnings gradually over a four year period.

The fund's investment earnings net of investment and plan expenses (including realized and unrealized gains and losses) are compared below to expected investment earnings:

	1999/2000	1998/1999	1997/1998
Net investment earnings:			
Actual	$ 2,027,850	$ 357,838	$ 2,995,526
Expected	1,480,384	1,498,844	$ 1,320,563
Excess of actual over expected	$ 547,466	$(1,141,006)	$ 1,674,963

The actuarial asset value is then obtained by deducting from the current market value the portion of the investment gains (losses) which our method has not yet recognized:

Market value at April 1, 2000			$ 21,434,456
Adjustment investment gains and losses not yet fully recognized			
1997/1998:	¼ x	$1,674,963	(418,741)
1998/1999:	½ x	($1,141,006)	570,503
1999/2000:	¾ x	$547,466	(410,599)
Smoothed value at April 1, 2000			$ 21,175,619

Therefore $258,837 of the last three years' investment gains have not yet been recognized in the smoothed actuarial asset value. The smoothed asset value equals 98.8% of the market value.

For this valuation, the actuarial value of assets equals the smoothed market value of assets adjusted for amounts payable and receivable at the valuation date.

The following table shows the calculation of the actuarial value of assets:

Smoothed Market Value at April 1, 2000	$ 21,175,600
Benefits Payable at the Valuation Date	$ (20,200)
Actuarial value of assets	$ 21,155,400

Assets and Liabilities (continued)

Changes to Plan Assets

	1999/2000	1998/1999	1997/1998	1996/1997
Market Value at April 1	$ 20,058,523	$ 20,258,415	$ 17,939,883	$ 16,603,476
Plus:				
Member Contributions	0	0	0	0
Assembly Contributions	0	0	0	0
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Less:				
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Lump Sum Payments	(35,517)	0	0	0
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Investment Management Fees	(45,979)	(45,282)	(32,726)	(29,909)
Market Value at March 31	$ 21,434,456	$ 20,058,523	$ 20,258,415	$ 17,939,883

Assets and Liabilities (continued)

Determination of Actuarial Value of Assets

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The following table shows the calculation of the actuarial value of assets:

Smoothed Market Value at April 1, 2000	$ 21,175,600
Benefits Payable at the Valuation Date	$ (20,200)
Actuarial value of assets	$ 21,155,400

Assets and Liabilities (continued)

History of Asset Returns

The following table shows the history of asset returns, based on market values, net after investment management fees and other expenses charged to the fund.

Year Ending March 31	Return on Market Value
1997	11.3%
1998	17.0%
1999	1.8%
2000	10.3%

The returns (after expenses) on market value have been calculated assuming contributions and benefit payments take place in the middle of each year.

Contributions

Cost of Accruing Benefits

The following table shows the estimated going–concern annual cost of accruing benefits for the current and previous valuations:

	For the Year Following April 1, 2000	For the Year Following April 1, 1996
Current Service Cost	$0	$233,900
As a % of Participant Salary Base	0%	46.4%

As active members have ceased accruing benefits under the Plan and the Plan is in a surplus position on a going–concern basis, there are no contributions currently required under the Plan.

Subsequent Events

Subsequent events are events that transpire after the valuation date and before the date the valuation was completed. Subsequent events also include events which, as of the date the valuation was completed, are fully committed to occur in the future.

To the best of our knowledge, there are no subsequent events which materially affect the results of the valuation.

Experience

Reconciliation of Funded Position

Surplus at April 1, 1996		$ 2,994,700
Plus:	Interest at 7.5% per annum	1,004,600
Equals:	Expected Surplus at April 1, 2000	$ 3,999,300
Plus:	Increase/(Decrease) in funded position at April 1, 2000 due to gains/(losses):	
	Return on Assets	$ 2,419,800
	Contributions	(635,800)
	Retirements	(226,400)
	Mortality	145,200
	Other Decrements	257,900
	Data Adjustments	(37,600)
	Cost of Living Increases	1,512,400
	Assumption Changes	190,800
	Other Factors	87,600
Equals: Surplus at April 1, 2000		$ 7,713,200

Experience (continued)

Comments Regarding Experience

Return on Assets

The assumed rate of return for actuarial valuation purposes was 7.5% per annum. The average annual total return based on the actual market value of assets after allowing for the full amount of capital appreciation during the four year period was approximately 10.0% per annum, assuming contributions and benefit payments took place in the middle of the year. This resulted in an actuarial gain of $2,419,800.

Contributions

Due to the surplus in the Plan as of April 1, 1996, no contributions were made during the period from April 1, 1996 to April 1, 2000. The cost of accruing benefits during that period was paid out of the surplus of the Plan, and this resulted in an actuarial loss of $635,800.

Cost of Living Increases in Pensions

The increase in the cost of living during the inter–valuation period was less than the 5.0% annual increase anticipated by the assumptions. This deviation from expected experience generated an actuarial gain of $1,512,400.

Assumption Changes

The interest rate and inflation rate assumptions were each reduced by 1.0% to 6.5% and 4.0% respectively, to better reflect the long–term expectations under the plan. This resulted in an actuarial loss of $3,400. In addition, the impact of removing the reserve for terminated non–vested members who might be re–elected in the future resulted in an actuarial gain of $194,200.

Miscellaneous

Other factors such as personnel changes, retirements earlier than assumed, mortality among retirees and data adjustments, etc., deviated from expected experience resulting in a net actuarial gain of $226,700.

Appendices

Appendix I—Personnel Information

Personnel Information

Description of Membership Data

Active membership data as at April 1, 2000 was obtained from the Board of Management of the Northwest Territories Legislative Assembly. Information on the other membership groups was taken from the administrative records of Hewitt Associates. We reviewed the data to ensure its completeness, accuracy and consistency with the data used in the previous valuation.

The main tests of reliability and sufficiency we conducted on the data include:

- member–by–member reconciliation of records with records used for the prior valuation;
- checks to determine reasonableness of individual data elements both on an absolute basis and relative to the same data elements provided for the prior valuation; and
- checks to ensure consistency between the membership information provided and the information contained in the Plan's financial statements.

The results of these tests were satisfactory and in our opinion the data is sufficient and reliable for the purpose of the valuation.

Summary of Membership Data

The following tables summarize the key characteristics of the data used for the valuation. Comparative information has been provided for the previous valuation. Detailed summaries of the valuation data are provided in the following sections of this Appendix I.

	April 1, 2000	April 1, 1996
Active Members		
• number	3*	9
• average age	49.5	45.1
• average accrued monthly entitlement	$1,661	1,317
Pensioners		
• number	29**	23
• average age	55.2	54.6
• average monthly pension	$1,788	$1,874

* All active participants have ceased to accrue benefits under the Plan.
** Includes one child receiving a dependent benefit payable to age of majority or age 25 if attending school.

Personnel Information (continued)

Changes in Plan Membership

The following schedule shows the changes in Plan Membership since the previous valuation of the Plan at April 1, 1996.

	Active Members	Terminated Non–Vested Members	Pensioners
Number at April 1, 1996	9	7	23
New Additions			2*
Deletions			
• Retirements	(6)		6
• Deaths			(2)
• Deferred Non–Vested Members not re–elected in the last two elections		(3)	
Adjustments	—	(4)	—
Number at April 1, 2000	3	0	29

* Surviving spouse and dependent child.

Personnel Information (continued)

Active Participant Summary

The following table summarizes relevant data items for the active Plan membership.

Sex	Date of Birth	Accrued Monthly Pension
M	29-Aug-1949	$ 1,364.05
M	20-Jul-1951	1,335.04
M	07-Nov-1950	2,285.18
Total		$ 4,984.27
Average		$ 1,661.42

Terminated Vested Participant Summary

There were no terminated vested Members in the Plan at April 1, 2000.

Personnel Information (continued)

Pensioner Summary

The following table summarizes relevant data items for pensioners.

Sex	Date of Birth	Spouse's Date of Birth	Pension Start Date	Monthly Pension	Form of Pension
M	12-Oct-1953	12-Apr-1957	01-Nov-1995	$ 1,330.11	Joint—75%
M	26-Jun-1939	11-Jan-1941	01-Nov-1991	1,848.30	Joint—75%
M	27-Feb-1945	15-Jan-1948	01-Nov-1995	2,737.96	Joint—75%
M	27-Jun-1925	16-Jun-1920	01-Nov-1991	4,081.28	Joint—75%
F	04-Mar-1940	04-Mar-1942	01-Nov-1995	3,653.13	Joint—75%
M	01-Feb-1947	12-May-1946	01-Dec-1991	983.61	Joint—75%
M	25-Jun-1921	04-May-1935	01-Dec-1983	1,096.11	Joint—75%
F	12-May-1955	02-Jul-1944	01-Nov-1995	1,180.62	Joint—75%
M	26-Sep-1936	31-Aug-1939	01-Nov-1995	1,461.27	Joint—75%
M	10-Jan-1935	n/a	01-May-1990	1,193.52	Single Life
M	23-Apr-1931	25-Dec-1931	01-Nov-1987	3,480.11	Joint—75%
M	15-Jan-1946	n/a	01-Nov-1991	1,849.03	Single Life
M	04-Jun-1953	06-Jun-1961	01-Nov-1995	2,518.16	Joint—75%
M	30-Dec-1948	08-Sep-1949	01-Nov-1995	3,447.56	Joint—75%
M	19-Nov-1935	n/a	01-Nov-1991	2,016.27	Single Life
M	23-Aug-1943	07-Oct-1952	01-Nov-1995	1,734.69	Joint—75%
M	31-Jan-1943	19-Apr-1943	01-Nov-1995	2,464.17	Joint—75%
M	21-Nov-1943	01-Jun-1946	01-Nov-1991	2,169.09	Joint—75%
M	11-Jun-1941	10-Jun-1942	01-Nov-1995	1,404.38	Joint—75%
M	21-Sep-1951	14-Mar-1954	01-Feb-1992	1,304.78	Joint—75%
M	01-Nov-1958	20-Aug-1960	01-Nov-1995	859.10	Joint—75%
M	19-Feb-1948	22-Mar-1951	01-Jan-2000	2,103.52	Joint—75%
M	18-Jul-1954	09-May-1955	01-Jan-2000	1,330.20	Joint—75%
M	10-Nov-1958	27-Jan-1963	01-Apr-1999	842.36	Joint—75%
M	08-Jul-1944	20-Jul-1945	01-Aug-1999	1,223.56	Joint—75%
M	22-Nov-1946	20-Feb-1952	01-Apr-1999	1,404.53	Joint—75%
M	09-Nov-1987	n/a	01-Apr-2000	196.81	*
F	28-Feb-1930	n/a	01-Nov-1991	1,476.05	Single Life
M	18-Feb-1937	06-Jul-1936	01-Apr-1999	461.71	Joint—75%
Total				$ 51,851.99	
Average				$ 1,788.00	

* Dependent benefit payable to age of majority or to age 25 if attending school.

Personnel Information (continued)

Confirmation Certificate

I, Myles Moreside of the Northwest Territories Legislative Assembly, hereby certify that to the best of my knowledge, the data submitted to Hewitt Associates for the purpose of performing an actuarial valuation for the Northwest Territories Legislative Assembly Supplementary Retiring Allowances Act as at April 1, 2000 is accurate and complete. I also certify that to the best of my knowledge, I have responded to any requests for additional information regarding the actuarial valuation.

M. Moreside

Myles Moreside
Northwest Territories Legislative Assembly

October 4, 2000

Date

Appendix II—Plan Provisions

Plan Provisions

This summary contains the main provisions of the Northwest Territories Legislative Assembly Supplementary Retiring Allowances Act (the "Plan") as at April 1, 2000. For a complete description of the Plan, reference should be made to the Legislative Assembly Supplementary Retiring Allowances Act.

Effective Date	February 6, 1990
Eligibility	The Plan is closed to new Members.
Credited Service	Service after March 10, 1975 and before: 1. April 1, 1996 where the Member ceased to be a Member or has given at least 6 years of service prior to April 1, 1996, or 2. the earlier of 6 years of service and the end of the 13th Legislative Assembly for a returning Member to the 13th Legislative Assembly. In no event shall credited service exceed 15 years.
Contributions	Members are not required to contribute to the fund.
Normal Retirement Age	Age 55.
Early Retirement	At any time upon ceasing to be a Member of the Assembly.
Late Retirement	Up to age 71.
Retirement Pension	Three percent of the average best earnings over four consecutive years as an MLA multiplied by Credited Service as an MLA PLUS Three percent of the average best earnings over four consecutive years in each of the positions of Minister, Speaker or Chairperson multiplied by Credited Service for each position. A position must be held for at least one year for a pension to be paid, and the pension for each position is calculated separately. Members who retire before or after age 55 receive a pension which is actuarially equivalent to the pension calculated as if they were 55

Plan Provisions (continued)

Form of Pension	The normal form of payment is a joint and 75% survivor pension reducing on the death of a Member. If a Member is not married, a lifetime annuity guaranteed for 10 years will be paid. Each dependent will receive a pension of 10% of the retirement pension (to a maximum total of 25%) if the spouse survives. If there is no surviving spouse, a benefit of 25% of the retirement pension (to a maximum total of 100%) will be paid to each dependent.
Increases in Pension	Pensions in pay and deferred pensions are increased every January 1 based on increases in the Consumer Price Index up to the preceding September 30.
Pre-Retirement Death Benefits	If a Member or Former Member dies before retirement and is not eligible to receive a pension, his accumulated contributions with interest will be returned to the beneficiary. If he was eligible to receive a pension, the spouse will receive a lifetime annuity of 75% of the retirement pension.
Withdrawal Benefits	A Member who terminates with four or more years of service or serves at least one full term as a Member of the Assembly is entitled to a retirement pension.
Payout from Plan	A Member who first becomes a Member during the 13th Legislative Assembly shall on ceasing to be a Member, be paid an amount equal to the amount contributed by the Member to the Legislative Assembly Retiring Allowances Act before April 1, 1996 plus interest.

Appendix III—Actuarial Assumptions

Actuarial Assumptions

Going–Concern Valuation

Retirement assumptions for members	Later of age 55, or four years of service or end of current session.
Mortality Rates	
• before retirement	None
• after retirement	1983 Group Annuity Mortality Table
Withdrawal Rates	None assumed
Disability Rates	None assumed
Percentage with spouse	100%; female spouse assumed to be 2 years younger than male spouse
Dependent Children's Death Benefit	Payable to age 25.
Increase in Revenue Canada Maximum Benefit	n/a
Salary Scale	n/a
Inflation	4.0% per annum
Interest Rate	6.5% per annum net of expenses.

Actuarial Assumptions (continued)

Valuation of Assets	The actuarial value of assets is equal to the smoothed market value of assets adjusted by amounts receivable and payable at the valuation date. The smoothed market value is calculated by adjusting the market value to gradually recognize the difference between each year's actual and expected investment earnings over a four–year period. Expected investment earnings are calculated by assuming the fund assets and cash flows will earn the prior valuation's going–concern valuation interest rate.
Actuarial Cost Method	Projected unit credit actuarial cost method.

Actuarial Assumptions (continued)

Wind–Up Valuation

Retirement Age	Retirement age that produces the highest value.
Mortality Rates	1983 Group Annuity Mortality Table.
Interest Rates	
• Non–Indexed Benefits	6.5% per annum for 15 years; 6.0% per annum thereafter.
• Indexed Benefit	4.25% per annum for 15 years 3.25% per annum thereafter
	Interest rates are based on the Canadian Institute of Actuaries Recommendations for the Computation of Transfer Values from Registered Pension Plans ("Transfer Value Basis").
Termination	All members are assumed to terminate on the valuation date.
Valuation of Assets	The actuarial value of assets used for wind–up purposes is the market value of assets adjusted by amounts receivable and payable at the valuation date, less an allowance for estimated wind–up expenses.
Actuarial Cost Method	Accrued benefit actuarial cost method.

Actuarial Assumptions (continued)

Discussion of Actuarial Assumptions and Methods

Ultimate Cost

The ultimate cost of a pension plan can be measured only when the obligation to all participants has been fully discharged. The cost will then be:

The benefits paid from the plan
plus
administrative expenses
less
investment gains
plus
investment losses.

The actuarial process assigns pension costs to the current year by estimating, based on both current and future service, the benefits to be paid to current plan participants. These estimates are determined through an actuarial valuation which uses three basic elements to project payments from the plan:

- Benefit provisions of the plan.
- Data on the present workforce, terminated vested, and retired employees.
- Certain predictions (actuarial assumptions) about the future as it applies to this workforce.

Actuarial Assumptions

The first step in the actuarial process is to determine the magnitude of the pension liability by determining the benefits expected to be paid. To determine how many employees will become eligible for benefits, what benefits will be paid, and how long benefits will be paid, it is necessary to make some economic and demographic predictions (usually called actuarial assumptions) such as:

- Assumed retirement rates predicting when employees will begin to receive retirement benefits.
- Mortality rates predicting the number of employees who will die before retirement and the duration of benefit payments after retirement.
- Withdrawal rates predicting the number of employees who will leave the workforce before retirement. (Sometimes certain kinds of withdrawal such as disabilities are predicted separately.)
- An assumed rate of pay increases predicting employees' compensation in future years.

Actuarial Assumptions (continued)

These assumptions are applied to the data for each employee to predict the amount of benefits expected to be paid each year in the future. The total future benefit payments in each year are then discounted at a selected interest rate to determine the current amount which with future investment return, will be sufficient to pay the expected benefits as they become payable. The discounted payments are usually called the present value of future benefits.

Total Future Benefit Payments	
Future Investment Return	**Present Value of Future Benefits**

Actuarial Method

The actuarial method is the mathematical process which determines the contributions required to pay for the present value of future benefits, by allocating costs to the years of an employee's career. Some costs are allocated to future years in an employee's career (*future service liability*) and other costs are allocated to past years (*past service liability*).

Total Future Benefit Payments		
Future Investment Return	**Present Value of Future Benefits**	
	Future Service Liability	**Past Service Liability**

There is a fair amount of flexibility in this allocation of costs between future and past. Some methods assign relatively little cost to past years in an employee's career, others assign a more significant portion to the past. All methods produce allocations of contributions which will accumulate to an amount sufficient to provide the benefits at retirement. However, the various methods produce widely different allocation of contributions to past and future employment.

Usual terminology refers to the future allocation as the *present value of future normal costs* and the past allocation as the *accrued liability*.

Actuarial Assumptions (continued)

The portion of the accrued liability which is not covered by the assets of the plan is called the *unfunded accrued liability*. The value of the assets used in the actuarial process must take into account fair market value, but this may be done in a way which eliminates much of the short–term fluctuation of market value from one valuation to the next.

Total Future Benefit Payments	
Future Investment Return	Present Value of Future Benefits

Future Service Liability	Past Service Liability

Present Value of Future Normal Costs	Unfunded Accrued Liability	Assets

For the current year, the method produces a *normal cost*. Payment of the normal cost each year would eventually discharge all future service liability.

The unfunded accrued liability must also be discharged, and this is done by an *amortization payment*. The amortization payment is flexible, and may be increased or decreased within certain allowable bounds. The sum of both the normal cost and the amortization payment is the current year's pension cost.

Total Future Benefit Payments	
Future Investment Return	Present Value of Future Benefits

Future Service Liability	Past Service Liability

Present Value of Future Normal Costs	Unfunded Accrued Liability	Assets

Normal Cost | | | Amortization Payment

Current Year's Contribution