Ex. B to Affidavit of Douglas G. Hildebrand dated March 23, 2000

Preliminary Report

Cost-Benefit Analysis of Lovaas Treatment For Autism and Autism Spectrum Disorder (ASD)

This is Exhibit "B" referred to in the affidavit of Douglas G. Hildebrand sworn before me, at Vancouver, BC this 23rd day of March 2000

A COMMISSIONER FOR TAKING AFFIDAVITS FOR BRITISH COLUMBIA

Prepared for
Harper Grey Easton
Barrister and Solicitors

Submitted by
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December 7, 1999

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1.0 Introduction and Summary

Columbia Pacific Consulting was retained by Harper Grey Easton to undertake a preliminary cost-benefit analysis of the Lovaas treatment. The primary objective of the study is to determine if the Lovaas treatment represents an efficient allocation of government health care expenditures.

Columbia Pacific developed the analytical framework for the study including a computerized cost-benefit model which is capable of efficiently producing results for a range in key assumptions. The basic methodology applied in this analysis is consistent with cost-benefit studies[1] conducted in the United States. The key "cost" assumptions which essentially drive the model were developed through discussion with Harper Grey Easton and, in turn, extensive material provided to Harper Grey Easton by the provincial government.

Principal benefits of Lovaas treatment is the avoided cost of care services which may persist over the individual's lifetime if no such treatment is received in the individual's early childhood. In addition to the cost savings, an additional benefit from the Lovaas treatment is the increased expected lifetime earnings an individual with autism or ASD may enjoy over his/her lifetime.

The cost-benefit analysis is carried out in constant 2000 Canadian dollars over a hypothetical 3-year-old's lifetime. The cost-benefit model has been applied to a Base Case ("most likely" case) as well as various other cases where key assumptions in the Base Case are altered for purposes of sensitivity analysis. Parameters subject to sensitivity test include:

- the outcome distributions in both "with" and "without" Lovaas treatment scenarios;
- the cost of Lovaas early intensive intervention;
- the actual current provincial government funding for care and services relative to the Base Case level;
- the cost level assumed in the analysis;
- the effectiveness of the Lovaas treatment;

[1] John W. Jacobson et al (1996), *Financial Cost and Benefits of Intensive Early Intervention for Young Children with Autism – Pennsylvania Model Achieving Cost Savings.*

- the discount rate.

Two evaluation criteria are employed to assess the results: net benefits and internal rate-of-return[2].

The results of our preliminary study indicate substantial per capita cost savings from the Lovaas treatment over a 3-year-old's lifetime. A listing of some preliminary results is provided below relative to our valuation date of April 1, 2000:

- In the Base Case, the cost savings per child are estimated at $1,005,600 excluding labour income and $1,150,000 including labour income, assuming the Law and Equity Act real discount rate of 3.5% for service costs and 2.5% for labour income; the estimated internal rate-of-return is approximately 42%[3];

- In the case where the lowest success rate in "with" Lovaas treatment scenario is obtained, the cost savings per child are estimated at $642,200 excluding labour income and $761,300 including labour income; the estimated internal rate-of-return is approximately 31%;

- In the case where the cost for Lovaas early intensive intervention is 30% higher than the assumed level in the Base Case, the cost savings per child are estimated at $950,000 excluding labour income and $1,094,400 including labour income; the estimated internal rate-of-return is approximately 25%;

- In the case where the success rate in "with" Lovaas treatment is 50% higher than the assumed rate in the Base Case, the cost savings per child are estimated to be $1,368,900 excluding labour income and $1,538,700 including labour income; the estimated internal rate-of-return is approximately 52%;

- In the case where actual current government expenditure on care services is 20% below the assumed level in the Base Case, the cost savings per child is estimated at $767,400 excluding labour income and $911,800 including labour income; the estimated internal rate-of-return is approximately 27%;

- With a real discount rate at 8%, the cost savings per child are estimated at $369,800 excluding labour income and $395,600 including labour income.

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[2] Net benefits are discounted to present value at a specified discount rate (cost of capital). Internal rate-of-return is the real discount rate that equates benefits and costs.

[3] This internal rate-of-return is calculated based on cost savings excluding wage income. Including wage income increases this return by less than one percentage point.

This preliminary report consists of four sections. Section 2.0 outlines the analytical framework that was used in the cost-benefit analysis. Section 3.0 presents the main results from the Base Case as well as those from the sensitivity analysis. Section 4.0 provides the cost-benefit study conclusion.

2.0 Cost-Benefit Analysis Framework

2.1 Overview

The general framework is one of comparing the expected lifetime costs for a child afflicted by autism or autism spectrum disorder (ASD) under two alternative scenarios: (i) "with" Lovaas treatment; (ii) "without" Lovaas treatment.

In order to determine expected lifetime costs, annual cost estimates are developed from age 3 (the assumed optimum age to commence Lovaas treatment) over the lifetime. A normal life expectancy is assumed for both the "with" and "without" treatment scenarios.

In the "with" treatment scenario, the candidate child is assumed to undergo intensive Lovaas treatment for three years (age 3 to 6), and to require no other services concurrent with treatment. The annual cost of and need for services following treatment depends on the treatment outcome: normal, semi-dependent and very dependent. Cost estimates are made for each outcome as the candidate progresses through childhood, adolescence and adulthood. Service costs pertain to health care, education and residential care.

In the "without" treatment scenario, annual cost estimates for health care, education and residential care are made from age 3 onwards relative to two potential outcomes; semi-dependent and very-dependent. Normal functioning is not assumed as a possible outcome "without" treatment.

Lovaas treatment is assumed to improve the candidate child's functioning. Without treatment the outcomes are assumed to be 50:50[4] in terms of semi-dependent and very-dependent. With treatment, a certain percentage chance is attributed to normal functioning and the probability of semi-dependent and very-dependent outcomes are assumed to decrease relative to the without treatment scenarios.

It can be envisioned, therefore, that the focus of the cost-benefit analysis is essentially comparing the front-end investment at an early age of intensive Lovaas treatment, on the one hand, and cost savings triggered by the treatment due to improved functioning, on the other.

[4] This is the assumed outcome distribution for the "without" treatment scenario in the Base Case.

In addition to cost savings as the primary benefit of investing in Lovaas treatment, the cost-benefit analysis also explores and quantifies the benefit of added labour income due to improved functioning with Lovaas treatment. Labour income is a key component of Gross Domestic Product (GDP) of British Columbia, and the analysis estimates the additional labour income (earnings) triggered by Lovaas treatment relative to the without treatment scenario. Basically, the added labour income can be viewed as an "opportunity cost" without treatment (forgone income) which is now captured with treatment.

The analysis provides for gender distributions as the incidence rate of autism and ASD is heavily skewed. Differential mortality rates for men and women (Statistics Canada's Life Table, 1990-1992) are incorporated into the analysis. Differential earnings for men and women (by assumed education level) are also incorporated into the analysis. No gender distinction, however, is made in respect of the annual cost of services.

All costs and benefits (expressed in constant 2000 dollars) are discounted to present value applying real, pre-tax discount rate in accordance with the Law and Equity Act, at your direction. The cost-benefit model calculates net benefits and internal-rate-of-return, the key measures of efficiency. These key measures are calculated for a Base Case, which reflects "most likely" estimates for costs and outcomes. Sensitivity analysis then explores the effect of altering key assumptions in terms of costs, outcomes and discount rates.

The analytical framework is generally consistent with the provincial government's Guidelines for Benefit-Cost Analysis (1977).

2.2 Costs "With" Lovaas Treatment

The costs for the "with" Lovaas treatment scenario are identified in Table 1, attached. These costs are allocated to three broad categories as follows:

(i). Child Care

(ii). Education

(iii). Adult Care

Each major category is further broken down into detailed service items. Estimates of the annual amount of these cost items were prepared by Columbia Pacific based on information from several sources. Data sources include information provided by Harper Grey Easton and reports prepared by various private and public sector organizations both in Canada and the United States. All the costs are assumed to be mutually exclusive.

The need for services following treatment depends on the treatment outcomes. Three possible Lovaas treatment outcomes are listed as follows:

Outcome 1: children who achieve normal functioning, participate in regular education with little or no support, and are vocationally productive as adults;

Outcome 2: children who derive sufficient benefit from early intensive intervention that they are then able to participate in nonintensive special education, and evidence persisting but reduced dependency in adulthood;

Outcome 3: children who achieve meaningful functional improvements but still require specialized and intensive educational and adult services.

U.S. research has demonstrated that significant proportions of children with autism or ASD who participate in Lovaas treatment achieved normal (Outcome 1) or near-normal functioning (Outcome 2), whereas a small proportion (about 10% across several studies) appeared to continue to need intensive intervention beyond the early childhood years (i.e., Outcome 3). In any group of children with autism or ASD who receive Lovaas treatment, between 20% to 60% will achieve normal functioning. Ten percent (10%) will continue to require intensive special education and intensive adult care, and the remainder will evidence benefit sufficient to reduce the intensity of educational and adult care requirements.

For purposes of Base Case analysis, we assume 40% will achieve normal functioning (Outcome 1), 50% will achieve semi-dependent (Outcome 2) and 10% remains very dependent (Outcome 3). In the sensitivity analysis, we explore the effect of changing the percentage of outcome distributions[5].

2.3 Cost "Without" Lovaas Treatment

The costs for the "without" Lovaas treatment scenario are identified in Table 2, attached. Although cost items are categorized similarly in both "with" and "without" treatment scenarios, there are two major differences in terms of (i) outcome types and (ii) cost duration within the Child Care category.

The first difference is that in the "without" treatment scenario, only two potential outcomes are assumed to be possible; semi-dependent (Outcome 2) and very dependent (Outcome 3). Normal functioning (Outcome 1) is not assumed as a possible outcome "without" treatment.

[5] In the sensitivity analysis, while the percentages of Outcome 1 and Outcome 2 may vary, the percentage of Outcome 3 is assumed to remain at 10% in all cases.

The second difference is that under the "without" treatment scenario, the cost duration for certain cost items in the Child Care starts from age 3 instead of age 6, as there is no Lovaas early intensive intervention between age 3 to 6.

For purposes of Base Case analysis, we assume 50% will achieve semi-dependent functioning (Outcome 2) and 50% remain very dependent (Outcome 3). In the sensitivity analysis, we explore the effect of changing the percentage of outcome distributions.

With regard to annual cost amount, except for Lovaas early intensive intervention and service costs for Outcome 1 in the "with" treatment scenario, service costs for Outcome 2 (or 3) are assumed to be the same in both "with" and "without" treatment scenarios in the Base Case. In terms of cost relationship between Outcomes 2 and 3, all costs for Outcome 2 are assumed to be 70% of those for Outcome 3. In sensitivity analysis, we examine the effect of changing the cost percentage of Outcome 2 relative to Outcome 3. In addition, we will also test the results by increasing the effectiveness of Lovaas treatment (i.e., for the same outcome, required service will be less in the "with" treatment scenario than in the "without" scenario).

2.4 Benefits of Lovaas Treatment

2.4.1 Cost Savings of Lovaas Treatment

The primary benefit of the Lovaas treatment is the expected cost savings in health, education and care expenditures.

Table 3 summaries the annual cost by age group for both "with" and "without" treatment scenarios in the Base Case, it also provides the cost savings in the Base Case.

Table 3 indicates that expected costs over an individual's lifetime in the "with" treatment scenario differ from those in the "without" treatment scenario. Due to its intensive early treatment cost and higher expected success rate, expected annual costs incurred by an individual receiving the treatment tend to be higher during the treatment period, but substantially lower for the remaining lifetime. The cost savings from the Lovaas treatment is reflected in the difference in net present value of lifetime care costs incurred in the "without" and "with" treatment scenarios. If this difference is positive, it indicates a net cost savings from the Lovaas treatment to the society.

In deriving the net present values of cost for both scenarios, we have applied discount rate[6] and normal survival rates for Canadian male/female (based on Statistics Canada's 1990-92 Life Tables) to the cost items listed in Tables 1 and 2.

2.4.2 Increases in Labour Income and GDP from the Lovaas Treatment

In addition to the cost savings, an added benefit from the Lovaas treatment is that it may increase the expected labour income that an individual with autism or ASD can earn over his/her lifetime. As labour income is a key component of Gross Domestic Product (GDP) of British Columbia, an increase in the expected lifetime earnings triggered by the Lovaas treatment tend to increase the net gain from the treatment.

The lifetime labour income projections are conducted under the following assumptions:

Outcome 1: Individuals who achieve normal functioning may participate in the labour market as independent employees. To be conservative, we assume that their full-time full-year earnings are commensurate with 90%[7] of average BC male/female with all levels of schooling. Labour market contingencies are in line with the educational referent group average. Labour market entry is assumed to occur in the mid-year when the individual turns age 19;

U.S. research indicates that individuals who derive sufficient benefits from early treatment but still require on-going adult care (Outcome 2) and individuals who achieve limited functional improvement (Outcome 3) cannot function as independent employees but may enjoy "supported employment wages". As such, our corresponding labour income assumptions are listed below:

Outcome 2: Full-time full-year earnings are commensurate with average BC male/female in low skill jobs and are adjusted for contingencies of average BC male/female with grade 9-10 education. Labour market entry is assumed to occur in the mid-year when the individual turns age 21;

Outcome 3: Full-time full-year earnings are commensurate with 75% of average BC male/female in minimum wage jobs and are adjusted for contingencies of average BC male/female with grade 9-10 education. Labour market entry is assumed to occur in the mid-year when the individual turns age 21;

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[6] The discount rate applied in the future care cost estimates is 3.5% per annum (as specified under the Law and Equity Act).

[7] Lovaas (1993) and Lovaas (1987) clearly indicate that "certain residual deficits may remain in the normal functioning group that cannot be detected by teachers and parents and can only be isolated on closer psychological assessment, particularly as these children grow older."

In all three cases, we assume a retirement age of 65.

The lifetime earnings projections include normal survival rates for Canadian males/females (based on Statistics Canada's 1990-92 Life Tables), and discounting at 2.5% per annum (as specified under the Law and Equity Act).

Our projections include estimates of Employment Insurance (EI) benefits net of the individual's own contributions. In addition, we also include a 6% allowance for other non-wage benefits in our estimates[8].

We note that we have delayed the labour market entry ages for all three scenarios to allow the possibility that individuals with autism may spend longer time to obtain the assumed education level.

2.5 Discount Rate

At your direction, in estimating the present value of the lifetime cost of care and education, we have applied a real discount rate of 3.5 percent per annum compound pursuant to the Law and Equity Act. In estimating the present value of lifetime employment income, we have applied a real discount rate of 2.5 percent per annum compound pursuant to the Law and Equity Act.

In Section 2.8.2 below, we discuss our calculation of the internal rate-of-return, which is to be compared with other hurdle rates.

2.6 Study Period

The period of analysis is the hypothetical 3-year-old candidate's remaining lifetime. For purposes of calculation, we assume a normal life expectancy in our study in accordance with the Statistics Canada Life Table, 1990-1992.

2.7 Incidence Rate by Gender

Recent epidemiological studies indicate that autism occurs in approximately 1 of 1000 people, with males outnumbering females by approximately 4 to 1. There is also evidence that there may be an equal number of "autistic-like" individuals[9]. As such, in our study, we have assumed the incidence ratio between male and female as 4:1.

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[8] Earnings projections on this basis are provided in Tables 15 - 20 in the appendix.

[9] Individuals with many features of autism, but not enough to meet standard diagnostic criteria.

2.8 Cost-Benefits Measures

2.8.1 Net Benefits Per Candidate Child

The cost-benefit analysis is conducted on a per candidate child basis. Three criteria can be employed in the cost-benefit analysis: net benefits, benefit-cost ratio and internal rate-of-return. Each of these three criteria is a good measure of the efficiency of resource allocation and will yield complementary results.

Net benefits are the present value of the difference between the costs from the "without" and "with" treatment scenarios. In this analysis, net benefits are also reflected in the additional expected labour income enjoyed by those who have received Lovaas treatment.

The benefit-cost ratio is the ratio of discounted benefits to discounted costs. It indicates the relative size of the benefits in comparison to the costs. The decision criterion is that the benefit-cost ratio should exceed unity.

The internal rate-of-return is the discount rate that equates the present value of net benefits to zero. It measures the rate of return of resources invested in a particular option, and the decision criterion is that the internal rate-of-return should exceed the social opportunity cost of capital.

In choosing between alternatives directed at a specific objective, it is important to consider more than one criterion since different criteria provide complementary information about the efficiency of a particular alternative. In this analysis, we focus on two of these three criteria: net benefits and internal rate-of-return.

2.8.2 Internal Rate-of-Return Comparisons

The Base Case analysis resulted in an internal rate-of-return (IRR) of approximately 42%. This IRR result can be compared with the following hurdle (discount) rates:

i). Law and Equity Act Specified Discount Rates

Under the Law and Equity Act, the real discount rate applied to future care costs is 3.5% per annum, and the real discount rate applied to wage income is 2.5% per annum, with an 1% allowance for real wage growth.

ii). British Columbia Bond Rate

The cost of new borrowing by the provincial government can be approximated by the yield on long term British Columbia Government Bonds. In real terms, the yield on long term BC Government Bonds is currently about 4.5%[10].

iii). BC Government's Discount Rate for Capital Investments

In assessment of major capital projects, the BC Government and its crown corporations typically apply a real, pre-tax discount rate of 8%. The Multiple Account Evaluation Guidelines prepared by the BC Government's Crown Corporations Secretariat (February 1993) indicates that an 8% real discount rate "... should be used for purposes of a base case analysis" (page 11). Similarly, BC Hydro's policy is to apply an 8% real, pre-tax discount rate in evaluation of future investment options, as set out in its Resource Acquisition Policy (June, 1994). The 8% real discount rate is generally consistent with the discount rate concept set out in the provincial guidelines on cost-benefit analysis.

Discount rates under the Law and Equity Act are applied in personal injury and fatal accident cases before the Courts. The 3.5% real discount rate is intended to reflect the long-term rate-of-return on secure investments in the economy. The BC Government Bond yield (currently about 4.5% real) is intended to reflect the cost of new borrowing to the Province. The 8% real discount rate for capital projects (e.g., highways and ferries, hydroelectric dams, etc.) sets a stringent standard for capital-intensive use of government resources, based on the social opportunity cost of capital in the private sector (i.e., highest alternative use of investment capital).

2.9 Sensitivity Analysis

Sensitivity analysis is important because it examines the changes in cost-benefit results when key assumptions underlying the analysis are varied. Sensitivity analysis is usually structured in order to assess the project's "upside" and "downside" potential or risk.

In this study, the thrust of sensitivity analysis is to determine how alternative assumptions affect overall net benefits from Lovaas treatment. The principal sensitivity parameters in this analysis include the outcome distributions in both "with" and "without" Lovaas treatment scenarios, the cost of Lovaas early intensive intervention, the actual current

[10] The nominal yield on BC Government Bonds (maturing June, 2029) is currently 6.55% (Global and Mail, December 7, 1999). Canada's long term inflation rate, taken as the difference between long term nominal and real return bonds, is about 2%. This provides for a real BC Government Bond yield of about (1.0655) ÷ (1.02) = 4.5% (rounded).

provincial government funding for services relative to Base Case level, the cost level, the effectiveness of the Lovaas treatment and the discount rate.

2.10 Potential Benefits of Lovaas Treatment Excluded from Cost-Benefit Analysis

You have advised that untreated autism and ASD can give rise to a number of social impacts and social costs, including the following:

(i). withdrawal of parent(s) from workforce (and reduction in labour income and GDP) in order to care for the child;

(ii). high incidence rate of marital breakdown;

(iii). significant numbers of homeless people;

(iv). high crime rates;

(v). high health care costs for parents (i.e., due to stress, migraines, depressions, etc.)

Lovaas intensive treatment has the potential to significantly improve the functioning of individuals with autism or ASD. As a result, Lovaas treatment can potentially reduce the above-noted social impacts and social costs.

At this time, the cost-benefit analysis has not attempted to quantify the potential social cost savings with Lovaas treatment for the above noted effects.

3.0 Cost-Benefit Results

3.1 Base Case

The preceding sections have outlined the approach to and estimation of net benefits or costs from the Lovaas treatment. This section presents cost-benefit results and tests the sensitivity of these results to varying key assumptions.

The cost-benefit analysis estimates net benefits (cost savings) from the Lovaas treatment to British Columbia. These include future cost savings and additional lifetime labour income.

Present values of per capita service costs under the "with" and "without" treatment scenarios are provided in Tables 4 and 5, attached. These are the building blocks for this cost-benefit analysis.

The Base Case results of the cost-benefit analysis are summarized in Table 6. Results are presented for the analysis using two measures of project efficiency: net benefits and internal rate-of-return with the former measure calculated at discount rates specified in the Law and Equity Act.

In the Base Case, net benefits per child from the Lovaas treatment in 2000 constant dollars are estimated to be $1,005,600 excluding wage income and $1,150,000 including wage income. The internal rate-of-return is estimated to be 42% excluding wage income[11].

3.2 Sensitivity Analysis

Sensitivity testing has been undertaken to examine the impact on net benefits from Lovaas treatment of changing assumptions made about certain variables. Results from altering various assumptions are provided in Tables 7 to 12, attached.

The sensitivity testing procedure has been to adjust each of the key assumptions made in the Base Case and then re-run the model to examine the impact of each change in assumptions on the net benefits from Lovaas treatment. It must be emphasized that the primary focus of the sensitivity analysis was to identify variables that could reduce project net benefits. Emphasis on scenarios that reduce net benefits should not be taken to mean that such scenarios are more probable than alternate scenarios which would increase net benefits. Indeed, numerous plausible scenarios could be developed that would result in higher net benefits than have been reported herein. The focus on "downward" sensitivity testing addresses the "robustness" of Base Case results under less favourable conditions.

Each of the sensitivity tests, with the exception of discount rate, has been discounted at the rates specified in the Law and Equity Act.

Sensitivity analyses in Tables 7 to 12 include the following:

(a) Cost Savings of Lovaas Treatment By Outcome Distributions (Table 7)

Table 7 calculates the cost savings (benefits) of Lovaas treatment by changes in the outcome distribution for the "with" treatment scenario, the "without" treatment scenario and both scenarios simultaneously.

[11] Including lifetime wage income only increases the internal rate-of-return by less than one percentage point, as such, all internal rate-of-returns calculated in this study are based on cost savings excluding wage income.

Variation in the "with" treatment outcome distributions explores the range in success rate of the treatment. Variation in the "without" treatment outcomes explores the range of condition that untreated individuals will likely experience. Combination sensitivities explore both issues simultaneously.

(b) Cost Savings of Lovaas Treatment By Variation in Lovaas Early Intervention Cost (Table 8)

Table 8 explores the sensitivity of cost savings and internal rate-of-return to increased/decreased investment in early intensive Lovaas treatment.

(c) Cost Savings of Lovaas Treatment By Variation in Government Funding Relative to The Base Case Level (Table 9)

Table 9 explores the sensitivity of cost savings and internal rate-of-return to increased/decreased government funding for services relative to the assumed level in Base Case.

(d) Cost Savings of Lovaas Treatment By Variation in Cost Percentage of Outcome 2 Relative to Outcome 3 (Table 10)

Table 10 explores the sensitivity of cost savings and internal rate-of-return to decreased/increased relative cost between Outcome 2 and Outcome 3 in both "with" and "without" treatment scenarios.

(e) Cost Savings of Lovaas Treatment By Variation in The Effectiveness of Lovaas Treatment (Table 11)

Table 11 explores the sensitivity of cost savings and internal rate-of-return to increased effectiveness of the Lovaas treatment in terms of service required following the treatment.

(f) Cost Savings of Lovaas Treatment By Variation in The Discount Rate (Table 12)

Table 12 explores the sensitivity of cost savings to various real discount rates.

3.3 Supplementary Estimates

Tables 13 to 20 in the Appendix provide supplementary information with regard to some fundamental estimates used in our cost-benefit analysis. Tables 13 and 14 provide multipliers used in the present value estimates of future cost of services (health and education) for male and female, respectively. Tables 15 to 20 provide earnings

projections for the average BC male/female with various education attainments or alternate specifications. For analysis purposes, we have assumed reference dates (i.e., date of birth, date of valuation[12]) such that the hypothetical candidate is exactly 3-year-old at the valuation date.

4.0 Conclusions

The principal conclusion from this preliminary cost-benefit analysis is that the cost savings from Lovaas treatment substantially exceed the early intensive treatment cost for a candidate 3-year old child with autism or ASD. This conclusion holds for a wide range of cost assumptions and discount rates.

Columbia Pacific has developed a computerized cost-benefit model for this assignment. The model can be applied to alternative key assumptions at your request.

We trust this assessment is useful in addressing the efficiency associated with Lovaas treatment for autism and ASD.

Yours truly,

Douglus G. Hildebrand
Director

Att.

[12] You have advised us that the trial date is in April, 2000, as such, we assume a valuation date of April 1, 2000 in our calculation .

APPENDIX A
Index of Tables 1- 20

Table 1 Estimated Costs For The "With" Lovaas Treatment Scenario

Cost Item	Outcome 1: Normal			Outcome 2: Semi-dependent			Outcome 3: Very Dependent		
	Annual Amount	Starting Age	Ending Age	Annual Amount	Starting Age	Ending Age	Annual Amount	Starting Age	Ending Age
Child Care									
Early Intensive Intervention	$65,000	3	6	$65,000	3	6	$65,000	3	6
Respite Services	$0	N/A	N/A	$2,590	6	19	$3,700	6	19
Behaviour Support	$0	N/A	N/A	$5,810	6	19	$8,300	6	19
Supported Childcare	$0	N/A	N/A	$6,720	6	12	$9,600	6	18
Placement (after age 6)	$0	N/A	N/A	$22,680	N/A	N/A	$32,400	6	19
Education									
Normal	$4,000	6	19	$0	N/A	N/A	$0	N/A	N/A
Low incidence/high cost	$0	N/A	N/A	$27,650	6	19	$0	N/A	N/A
Intensive Special	$0	N/A	N/A	$0	N/A	N/A	$39,500	6	19
Adult Care									
Day Program	$0	N/A	N/A	$18,480	19	LFT	$36,400	19	LFT
Residential (Family Home)	$0	N/A	N/A	$71,820	19	LFT	$0	N/A	N/A
Residential (Group Home)	$0	N/A	N/A	$0	N/A	N/A	$102,600	19	LFT

LFT: lifetime

Table 2 Estimated Costs For The "Without" Lovaas Treatment Scenario

Cost Item	Outcome 2: Semi-dependent			Outcome 3: Very Dependent		
	Annual Amount	Starting Age	Ending Age	Annual Amount	Starting Age	Ending Age
Child Care						
Respite Services	$2,590	3	19	$3,700	3	19
Behaviour Support	$5,810	3	19	$8,300	3	19
Supported Childcare	$6,720	3	12	$9,600	3	18
Placement	$22,680	3	19	$32,400	3	19
Education						
Normal	$0	N/A	N/A	$0	N/A	N/A
Low incidence/high cost	$27,650	6	19	$0	N/A	N/A
Intensive Special	$0	N/A	N/A	$39,500	6	19
Adult Care						
Day Program	$18,480	19	LFT	$26,400	19	LFT
Residential (Family Home)	$71,820	19	LFT	$0	N/A	N/A
Residential (Group Home)	$0	N/A	N/A	$102,600	19	LFT

LFT: lifetime

Table 3 Expected Annual Costs and Cost Savings - Base Case

	Costs for With Lovaas Treatment				Costs for Without Lovaas Treatment			Annual Cost Savings
	Annual Amount				Annual Amount			
Age Range	Normal	Semi-Dependent	Very Dependent	Expected Annual Cost	Semi-Dependent	Very Dependent	Expected Annual Cost	
	40%	50%	10%	100%	50%	50%	100%	
3 - 6	65,000	65,000	65,000	65,000	37,800	54,000	45,900	-19,100
6 - 12	4,000	65,450	93,500	43,675	65,450	93,500	79,475	35,800
12 - 18	4,000	58,730	93,500	40,315	58,730	93,500	76,115	35,800
18 - 19	4,000	58,730	83,900	39,355	58,730	83,900	71,315	31,960
19 +	0	90,300	129,000	58,050	90,300	129,000	109,650	51,600

Table 4 Present Value of Service Costs By Sex and Outcome - "With" Lovaas Treatment Scenario

Incidence Ratio	Male 80%					Female 20%					Both Sex 100%
Outcome 1: Normal											
	Annual Amount	Starting Age	Ending Age	Multiplier	Present Value	Annual Amount	Starting Age	Ending Age	Multiplier	Present Value	Present Value
Child Care											
Early Intensive Intervention	65,000	3	6	2.849	185,185	65,000	3	6	2.8494	185,208	185,189
Education											
Normal	4,000	6	19	9.433	37,732	4,000	6	19	9.4399	37,760	37,738
Adult Care	0	N/A	N/A			0	N/A	N/A			
Wage, Net EI and Other Non-Wage Benefits	29,731	19	65	17.587	522,877	16,219	19	65	17.970	291,454	476,592
Total (Excluding Wage and Benefits)					222,917					222,968	222,927
Total (Including Wage and Benefits)					(299,960)					(68,486)	(253,665)
Outcome 2: Semi-dependent											
		Starting Age	Ending Age	Multiplier	Present Value		Starting Age	Ending Age	Multiplier	Present Value	Present Value
Child Care											
Early Intensive Intervention	65,000	3	6	2.849	185,185	65,000	3	6	2.849	185,208	185,189
Respite Services	2,590	6	19	9.433	24,431	2,590	6	19	9.440	24,449	24,435
Behaviour Support	5,810	6	19	9.433	54,806	5,810	6	19	9.440	54,846	54,814
Supported Childcare	6,720	6	12	4.884	32,817	6,720	6	12	4.885	32,827	32,819
Placement	22,680	6	19	9.433	213,940	22,680	6	19	9.440	214,097	213,972
Education											
Special	27,650	6	19	9.433	260,822	27,650	6	19	9.440	261,013	260,860
Adult Care											
Day Program	18,480	19	107	13.919	257,229	18,480	19	107	14.522	268,372	259,457
Residential (Family Home)	71,820	19	107	13.919	999,684	71,820	19	107	14.522	1,042,993	1,008,346
Wage, EI and Other Non-Wage Benefits	24,347	21	65	16.291	396,637	9,814	21	65	16.668	163,585	350,027
Total (Excluding Wage and Benefits)					2,028,915					2,083,805	2,039,893
Total (Including Wage and Benefits)					1,632,277					1,920,220	1,689,866
Outcome 3: Very Dependent											
	Annual Amount	Starting Age	Ending Age	Multiplier	Present Value	Annual Amount	Starting Age	Ending Age	Multiplier	Present Value	Present Value
Child Care											
Early Intensive Intervention	65,000	3	6	2.849	185,185	65,000	3	6	2.849	185,208	185,189
Respite Services	3,700	6	19	9.433	34,902	3,700	6	19	9.440	34,928	34,907
Behaviour Support	8,300	6	19	9.433	78,294	8,300	6	19	9.440	78,351	78,305
Supported Childcare	9,600	6	18	8.850	84,956	9,600	6	18	8.855	85,007	84,966
Placement	32,400	6	19	9.433	305,629	32,400	6	19	9.440	305,853	305,674
Education											
Intensive Special	39,500	6	19	9.433	372,603	39,500	6	19	9.440	372,876	372,658
Adult Care											
Day Program	26,400	19	107	13.919	367,470	26,400	19	107	14.522	383,389	370,653
Residential (Group Home)	102,600	19	107	13.919	1,428,120	102,600	19	107	14.522	1,489,989	1,440,494
Wage, EI and Other Non-Wage Benefits	7,674	21	65	16.291	125,019	4,649	21	65	16.668	77,486	115,512
Total (Excluding Wage and Benefits)					2,857,159					2,935,601	2,872,847
Total (Including Wage and Benefits)					2,732,140					2,858,116	2,757,335

Table 5 Present Value of Service Costs By Sex and Outcome - "Without" Lovaas Treatment Scenario

Incidence Ratio	Male 80%					Female 20%					Both Sex 100%
Outcome 2: Semi-dependent											
		Starting Age	Ending Age	Multiplier	Present Value		Starting Age	Ending Age	Multiplier	Present Value	Present Value
Child Care											
Respite Services	2,590	3	19	12.282	31,810	2,590	3	19	12.289	31,829	31,814
Behaviour Support	5,810	3	19	12.282	71,358	5,810	3	19	12.289	71,401	71,367
Supported Childcare	6,720	3	12	7.732	51,962	6,720	3	12	7.734	51,975	51,965
Placement	22,680	3	19	12.282	278,556	22,680	3	19	12.289	278,720	278,589
Education											
Special	27,650	6	19	9.433	260,822	27,650	6	19	9.440	261,013	260,860
Adult Care											
Day Program	18,480	19	107	13.919	257,229	18,480	19	107	14.522	268,372	259,457
Residential (Family Home)	71,820	19	107	13.919	999,684	71,820	19	107	14.522	1,042,993	1,008,346
Wage, EI and Other Non-Wage Benefits	24,347	21	65	16.291	396,637	9,814	21	65	16.668	163,585	350,027
Total (Excluding Wage and Benefits)					1,951,422					2,006,303	1,962,398
Total (Including Wage and Benefits)					1,554,785					1,842,718	1,612,371
Outcome 3: Very Dependent											
	Annual Amount	Starting Age	Ending Age	Multiplier	Present Value	Annual Amount	Starting Age	Ending Age	Multiplier	Present Value	Present Value
Child Care											
Respite Services	3,700	3	19	12.282	45,443	3,700	3	19	12.289	45,470	45,449
Behaviour Support	8,300	3	19	12.282	101,941	8,300	3	19	12.289	102,001	101,953
Supported Childcare	9,600	3	18	11.699	112,306	9,600	3	18	11.704	112,361	112,317
Placement	32,400	3	19	12.282	397,937	32,400	3	19	12.289	398,172	397,984
Education											
Intensive Special	39,500	6	19	9.433	372,603	39,500	6	19	9.440	372,876	372,658
Adult Care											
Day Program	26,400	19	107	13.919	367,470	26,400	19	107	14.522	383,389	370,653
Residential (Group Home)	102,600	19	107	13.919	1,428,120	102,600	19	107	14.522	1,489,989	1,440,494
Wage, EI and Other Non-Wage Benefits	7,674	21	65	16.291	125,019	4,649	21	65	16.668	77,486	115,512
Total (Excluding Wage and Benefits)					2,825,820					2,904,259	2,841,507
Total (Including Wage and Benefits)					2,700,801					2,826,773	2,725,995

Table 6 Cost Savings of Lovaas Treatment - Base Case

	Excluding Wage Income			Including Wage Income		
	Male	Female	Both Sex	Male	Female	Both Sex
Incidence Ratio	80%	20%	100%	80%	20%	100%
PV of "without" Lovass Treatment	2,388,621	2,455,281	2,401,953	2,127,793	2,334,745	2,169,183
PV of "with" Lovaas Treatment	1,389,340	1,424,650	1,396,402	969,369	1,218,527	1,019,201
Cost Savings	999,281	1,030,631	1,005,551	1,158,424	1,116,218	1,149,983
Internal Rate of Return			42.28%			42.31%

Note: In Base Case, the assumed outcome distribution for "with" Lovaas treatment is:
40% Normal (Outcome 1), 50% Semi-dependent (Outcome 2),10% Very Dependent (Outcome 3)
the assumed outcome distribution for "without" treatment scenario is:
50% Semi-dependent (Outcome 2) and 50% Very Dependent (Outcome 3)

Table 7 Cost Savings of Lovaas Treatment By Outcome Distributions

	Excluding Wages				
"With" Lovaas	"Without" Lovaas Outcome 2 (Semi-dependent)				
Outcome 1 (Normal)	40%	50%	60%	75%	80%
20%	730,069	642,158	554,247	422,380	378,425
30%	911,765	823,854	735,943	604,077	560,121
40%	1,093,462	1,005,551	917,640	785,774	741,818
50%	1,275,158	1,187,247	1,099,336	967,470	923,515
60%	1,456,855	1,368,944	1,281,033	1,149,167	1,105,211

	Including Wages				
"With" Lovaas	"Without" Lovaas Outcome 2 (Semi-dependent)				
Outcome 1 (Normal)	40%	50%	60%	75%	80%
20%	872,639	761,277	649,914	482,871	427,189
30%	1,066,992	955,630	844,267	677,224	621,542
40%	1,261,345	1,149,983	1,038,620	871,577	815,896
50%	1,455,698	1,344,336	1,232,973	1,065,930	1,010,249
60%	1,650,051	1,538,689	1,427,326	1,260,283	1,204,602

Note: Shaded cells correspond to results in the Base Case Scenario

In "with" Lovaas treatment scenario, the percentage of Outcome 3 (Very Dependent) remains at 10% while the percentage of the other two outcomes vary

In "without" Lovaas treatment scenario, the percentage of both outcomes vary

Table 8 Cost Savings of Lovaas Treatment By Variation in Lovaas Early Intervention Cost

	Lovaas Investment		Cost Savings		IRR
Lovaas Intervention Cost	Annual Amount	Present Value	Excluding Wage	Including Wage	Excluding Wage
130%	84,500	240,746	949,994	1,094,426	24.87%
120%	78,000	222,228	968,513	1,112,945	28.68%
110%	71,500	203,708	987,032	1,131,464	34.06%
100%	65,000	185,189	1,005,551	1,149,983	42.28%
90%	58,500	166,670	1,024,070	1,168,502	56.62%

Note: Shaded cells correspond to results in the Base Case
IRR is calculated when wage income is not included, including wage income tends to increase IRR slightly.

Table 9 Cost Savings of Lovaas Treatment By Variation in Government Funding Relative to The Base Case Level

	Cost Savings		IRR
Funding Percentage of Each Services	Excluding Wage	Including Wage	Excluding Wage
110% of Childcare, 110% of Education, 110% of Adult Care	1,124,625	1,269,057	54.88%
100% of Childcare, 100% of Education, 100% of Adult Care	1,005,551	1,149,938	45.28%
90% of Childcare, 90% of Education, 90% of Adult Care	886,477	1,030,909	33.35%
80% of Childcare, 80% of Education, 80% of Adult Care	767,403	911,835	26.63%
70% of Childcare, 70% of Education, 70% of Adult Care	648,329	792,761	21.34%
90% of Childcare, 80% of Education, 110% of Adult Care	1,017,972	1,162,404	32.48%

Note: Shaded cells correspond to results in the Base Case
IRR is calculated when wage income is not included, including wage income tends to increase IRR slightly

Table 10 Cost Savings of Lovaas Treatment By Variation in Cost Percentage of Outcome 2 Relative to Outcome 3

Cost Percentage of Outcome 2 Relative to Outcome 3	Cost Savings		IRR
	Excluding Wage	Including Wage	Excluding Wage
50%	990,166	1,134,598	35.20%
60%	997,858	1,142,290	38.38%
70%	1,005,551	1,149,983	42.28%
80%	1,013,243	1,157,675	47.15%

Note: In this sensitivity analysis, service costs for Outcome 2 (or 3) in both scenarios are set at the same level. While service costs for Outcome 3 remain at 100%, the cost percentage of Outcome 2 relative to Outcome 3 vary simultaneously in both scenarios

Shaded cells correspond to results in the Base Case

IRR is calculated when wage income is not included, including wage income tends to increase IRR slightly.

Table 11 Cost Savings of Lovaas Treatment By Variation in The Effectiveness of Lovaas Treatment

Service Costs Level	Cost Savings		IRR
	Excluding Wage	Including Wage	Excluding Wage
"With" Lovaas Outcome 2 @ 70%, "With" Lovaas Outcome 3 @ 100%, "Without" Lovaas Outcome 2 @ 70%, "Without" Lovaas Outcome 3 @ 100%,	1,005,[illegible]	1,149,[illegible]	40.28%
"With" Lovaas Outcome 2 @ 65%, "With" Lovaas Outcome 3 @ 95%, "Without" Lovaas Outcome 2 @ 70%, "Without" Lovaas Outcome 3 @ 100%,	1,085,229	1,229,660	44.62%
"With" Lovaas Outcome 2 @ 60%, "With" Lovaas Outcome 3 @ 95%, "Without" Lovaas Outcome 2 @ 70%, "Without" Lovaas Outcome 3 @ 100%,	1,151,468	1,295,900	46.51%
"With" Lovaas Outcome 2 @ 55%, "With" Lovaas Outcome 3 @ 95%, "Without" Lovaas Outcome 2 @ 70%, "Without" Lovaas Outcome 3 @ 100%,	1,217,707	1,362,139	48.37%
"With" Lovaas Outcome 2 @ 50%, "With" Lovaas Outcome 3 @ 90%, "Without" Lovaas Outcome 2 @ 70%, "Without" Lovaas Outcome 3 @ 100%,	1,297,385	1,441,817	50.53%

Note: In this sensitivity analysis, the service costs of "with" Lovaas vary while those of "without" remain at the Base Case level. The service costs for Outcome 3 in the "without" Lovaas treatment scenario is set at 100%, and the service costs in the other outcomes ("with" Lovaas Outcome 2 and Outcome 3, "without" Lovass Outcome 2) are all at a certain percentage of service costs for "without" Lovaas Outcome 3.

Shaded cells correspond to results in the Base Case

IRR is calculated when wage income is not included, including wage income tends to increase IRR slightly.

Table 12 Cost Savings of Lovaas Treatment By Variation in The Discount Rate

Discount Rate	Cost Savings	
	Excluding Wage	Including Wage
3.5%/2.5%*	1,006,351	1,149,983
4.5%	772,893	848,087
8.0%	369,768	395,612

Note: * These are the discount rates specified in the Law and Equity Act.
Shaded cells correspond to results in the Base Case.

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Table 13
Cost of Care Multipliers - Male
Assuming a Normal Life Expectancy

Age	Year	Annual Cost Of $1000 (1)	Mid-Year Calculated Survival Ratio (2)	Mid-Year Discount Factor @ 3.5%	Adjusted & Discounted Cost	Cumulative Adjusted & Discounted Cost	Multiplier: From Trial To Birthday	Multiplier: From Birthday To L.E.
3	2000 (3)	$1,000	0.9998	0.9829	983	$983	$0	26,201
4	2001	1,000	0.9995	0.9497	949	1,932	983	25,219
5	2002	1,000	0.9993	0.9176	917	2,849	1,932	24,269
6	2003	1,000	0.9991	0.8866	886	3,735	2,849	23,352
7	2004	1,000	0.9990	0.8566	856	4,590	3,735	22,467
8	2005	1,000	0.9988	0.8276	827	5,417	4,590	21,611
9	2006	1,000	0.9987	0.7996	799	6,216	5,417	20,784
10	2007	1,000	0.9986	0.7726	771	6,987	6,216	19,986
11	2008	1,000	0.9984	0.7465	745	7,732	6,987	19,214
12	2009	1,000	0.9982	0.7212	720	8,452	7,732	18,469
13	2010	1,000	0.9979	0.6968	695	9,148	8,452	17,749
14	2011	1,000	0.9975	0.6733	672	9,819	9,148	17,053
15	2012	1,000	0.9970	0.6505	649	10,468	9,819	16,382
16	2013	1,000	0.9962	0.6285	626	11,094	10,468	15,733
17	2014	1,000	0.9954	0.6072	604	11,699	11,094	15,107
18	2015	1,000	0.9944	0.5867	583	12,282	11,699	14,503
19	2016	1,000	0.9934	0.5669	563	12,845	12,282	13,919
20	2017	1,000	0.9924	0.5477	544	13,389	12,845	13,356
21	2018	1,000	0.9913	0.5292	525	13,913	13,389	12,813
22	2019	1,000	0.9902	0.5113	506	14,419	13,913	12,288
23	2020	1,000	0.9890	0.4940	489	14,908	14,419	11,782
24	2021	1,000	0.9879	0.4773	472	15,380	14,908	11,293
25	2022	1,000	0.9868	0.4611	455	15,835	15,380	10,822
26	2023	1,000	0.9856	0.4456	439	16,274	15,835	10,367
27	2024	1,000	0.9845	0.4305	424	16,698	16,274	9,928
28	2025	1,000	0.9834	0.4159	409	17,107	16,698	9,504
29	2026	1,000	0.9822	0.4019	395	17,501	17,107	9,095
30	2027	1,000	0.9810	0.3883	381	17,882	17,501	8,700
31	2028	1,000	0.9798	0.3751	368	18,250	17,882	8,319
32	2029	1,000	0.9785	0.3625	355	18,604	18,250	7,952
33	2030	1,000	0.9772	0.3502	342	18,947	18,604	7,597
34	2031	1,000	0.9759	0.3384	330	19,277	18,947	7,255
35	2032	1,000	0.9745	0.3269	319	19,595	19,277	6,924
36	2033	1,000	0.9730	0.3159	307	19,903	19,595	6,606
37	2034	1,000	0.9714	0.3052	296	20,199	19,903	6,298
38	2035	1,000	0.9698	0.2949	286	20,485	20,199	6,002
39	2036	1,000	0.9681	0.2849	276	20,761	20,485	5,716
40	2037	1,000	0.9663	0.2753	266	21,027	20,761	5,440
41	2038	1,000	0.9645	0.2659	257	21,283	21,027	5,174
42	2039	1,000	0.9625	0.2570	247	21,531	21,283	4,918
43	2040	1,000	0.9604	0.2483	238	21,769	21,531	4,670
44	2041	1,000	0.9581	0.2399	230	21,999	21,769	4,432
45	2042	1,000	0.9556	0.2318	221	22,221	21,999	4,202
46	2043	1,000	0.9528	0.2239	213	22,434	22,221	3,981

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Table 13
Cost of Care Multipliers - Male
Assuming a Normal Life Expectancy

Age	Year	Annual Cost Of $1000 (1)	Mid-Year Calculated Survival Ratio (2)	Mid-Year Discount Factor @ 3.5%	Adjusted & Discounted Cost	Cumulative Adjusted & Discounted Cost	Multiplier: From Trial To Birthday	Multiplier: From Birthday To L.E.
47	2044	1,000	0.9498	0.2163	205	22,639	22,434	3,767
48	2045	1,000	0.9464	0.2090	198	22,837	22,639	3,562
49	2046	1,000	0.9427	0.2020	190	23,028	22,837	3,364
50	2047	1,000	0.9387	0.1951	183	23,211	23,028	3,174
51	2048	1,000	0.9342	0.1885	176	23,387	23,211	2,991
52	2049	1,000	0.9293	0.1822	169	23,556	23,387	2,814
53	2050	1,000	0.9240	0.1760	163	23,719	23,556	2,645
54	2051	1,000	0.9180	0.1700	156	23,875	23,719	2,482
55	2052	1,000	0.9114	0.1643	150	24,025	23,875	2,326
56	2053	1,000	0.9042	0.1587	144	24,168	24,025	2,177
57	2054	1,000	0.8962	0.1534	137	24,306	24,168	2,033
58	2055	1,000	0.8874	0.1482	132	24,437	24,306	1,896
59	2056	1,000	0.8778	0.1432	126	24,563	24,437	1,764
60	2057	1,000	0.8671	0.1383	120	24,683	24,563	1,638
61	2058	1,000	0.8555	0.1337	114	24,797	24,683	1,518
62	2059	1,000	0.8428	0.1291	109	24,906	24,797	1,404
63	2060	1,000	0.8290	0.1248	103	25,009	24,906	1,295
64	2061	1,000	0.8142	0.1206	98	25,108	25,009	1,192
65	2062	1,000	0.7983	0.1165	93	25,201	25,108	1,094
66	2063	1,000	0.7813	0.1125	88	25,288	25,201	1,001
67	2064	1,000	0.7630	0.1087	83	25,371	25,288	913
68	2065	1,000	0.7435	0.1051	78	25,450	25,371	830
69	2066	1,000	0.7227	0.1015	73	25,523	25,450	752
70	2067	1,000	0.7005	0.0981	69	25,592	25,523	678
71	2068	1,000	0.6771	0.0948	64	25,656	25,592	610
72	2069	1,000	0.6522	0.0915	60	25,715	25,656	546
73	2070	1,000	0.6260	0.0885	55	25,771	25,715	486
74	2071	1,000	0.5983	0.0855	51	25,822	25,771	430
75	2072	1,000	0.5694	0.0826	47	25,869	25,822	379
76	2073	1,000	0.5393	0.0798	43	25,912	25,869	332
77	2074	1,000	0.5080	0.0771	39	25,951	25,912	289
78	2075	1,000	0.4756	0.0745	35	25,987	25,951	250
79	2076	1,000	0.4425	0.0720	32	26,018	25,987	215
80	2077	1,000	0.4087	0.0695	28	26,047	26,018	183
81	2078	1,000	0.3746	0.0672	25	26,072	26,047	154
82	2079	1,000	0.3404	0.0649	22	26,094	26,072	129
83	2080	1,000	0.3066	0.0627	19	26,113	26,094	107
84	2081	1,000	0.2734	0.0606	17	26,130	26,113	88
85	2082	1,000	0.2412	0.0585	14	26,144	26,130	71
86	2083	1,000	0.2104	0.0566	12	26,156	26,144	57
87	2084	1,000	0.1813	0.0546	10	26,166	26,156	45
88	2085	1,000	0.1542	0.0528	8	26,174	26,166	36
89	2086	1,000	0.1292	0.0510	7	26,181	26,174	27
90	2087	1,000	0.1067	0.0493	5	26,186	26,181	21

Table 13
Cost of Care Multipliers - Male
Assuming a Normal Life Expectancy

Age	Year	Annual Cost Of $1000 (1)	Mid-Year Calculated Survival Ratio (2)	Mid-Year Discount Factor @ 3.5%	Adjusted & Discounted Cost	Cumulative Adjusted & Discounted Cost	Multiplier: From Trial To Birthday	Multiplier: From Birthday To L.E.
91	2088	1,000	0.0867	0.0476	4	26,190	26,186	16
92	2089	1,000	0.0692	0.0460	3	26,193	26,190	11
93	2090	1,000	0.0542	0.0445	2	26,196	26,193	8
94	2091	1,000	0.0416	0.0429	2	26,197	26,196	6
95	2092	1,000	0.0313	0.0415	1	26,199	26,197	4
96	2093	1,000	0.0230	0.0401	1	26,200	26,199	3
97	2094	1,000	0.0165	0.0387	1	26,200	26,200	2
98	2095	1,000	0.0115	0.0374	0	26,201	26,200	1
99	2096	1,000	0.0078	0.0362	0	26,201	26,201	1
100	2097	1,000	0.0051	0.0349	0	26,201	26,201	0
101	2098	1,000	0.0033	0.0338	0	26,201	26,201	0
102	2099	1,000	0.0020	0.0326	0	26,201	26,201	0
103	2100	1,000	0.0012	0.0315	0	26,201	26,201	0
104	2101	1,000	0.0007	0.0304	0	26,201	26,201	0
105	2102	1,000	0.0002	0.0294	0	26,201	26,201	0
106	2103	1,000	0.0002	0.0284	0	26,201	26,201	0
107	2104	1,000	0.0002	0.0275	0	26,201	26,201	0

Total: Trial to Age 55	**$23,875**
Total: Trial to Age 60	**$24,563**
Total: Trial to Age 65	**$25,108**
Total: Trial to Life Expectancy	**$26,201**
Age At Trial Date	**3.0**
Life Expectancy At Trial (Remaining Years)	**72.2**

(1) Constant 2000 Dollars.
(2) Based on Canadian Male Survival Rates
(3) Period From April 1, 2000 (Trial Date).

Table 14
Cost of Care Multipliers - Female
Assuming a Normal Life Expectancy

Age	Year	Annual Cost Of $1000 (1)	Mid-Year Calculated Survival Ratio (2)	Mid-Year Discount Factor @ 3.5%	Adjusted & Discounted Cost	Cumulative Adjusted & Discounted Cost	Multiplier: From Trial To Birthday	Multiplier: From Birthday To L.E.
3	2000 (3)	$1,000	0.9999	0.9829	983	$983	$0	26,812
4	2001	1,000	0.9997	0.9497	949	1,932	983	25,829
5	2002	1,000	0.9995	0.9176	917	2,849	1,932	24,879
6	2003	1,000	0.9994	0.8866	886	3,735	2,849	23,962
7	2004	1,000	0.9992	0.8566	856	4,591	3,735	23,076
8	2005	1,000	0.9991	0.8276	827	5,418	4,591	22,220
9	2006	1,000	0.9990	0.7996	799	6,217	5,418	21,393
10	2007	1,000	0.9989	0.7726	772	6,989	6,217	20,595
11	2008	1,000	0.9988	0.7465	746	7,734	6,989	19,823
12	2009	1,000	0.9986	0.7212	720	8,455	7,734	19,077
13	2010	1,000	0.9985	0.6968	696	9,150	8,455	18,357
14	2011	1,000	0.9983	0.6733	672	9,822	9,150	17,661
15	2012	1,000	0.9980	0.6505	649	10,472	9,822	16,989
16	2013	1,000	0.9977	0.6285	627	11,099	10,472	16,340
17	2014	1,000	0.9974	0.6072	606	11,704	11,099	15,713
18	2015	1,000	0.9970	0.5867	585	12,289	11,704	15,107
19	2016	1,000	0.9966	0.5669	565	12,854	12,289	14,522
20	2017	1,000	0.9963	0.5477	546	13,400	12,854	13,957
21	2018	1,000	0.9959	0.5292	527	13,927	13,400	13,412
22	2019	1,000	0.9956	0.5113	509	14,436	13,927	12,885
23	2020	1,000	0.9952	0.4940	492	14,928	14,436	12,376
24	2021	1,000	0.9948	0.4773	475	15,402	14,928	11,884
25	2022	1,000	0.9944	0.4611	459	15,861	15,402	11,409
26	2023	1,000	0.9940	0.4456	443	16,304	15,861	10,951
27	2024	1,000	0.9936	0.4305	428	16,732	16,304	10,508
28	2025	1,000	0.9932	0.4159	413	17,145	16,732	10,080
29	2026	1,000	0.9928	0.4019	399	17,544	17,145	9,667
30	2027	1,000	0.9923	0.3883	385	17,929	17,544	9,268
31	2028	1,000	0.9918	0.3751	372	18,301	17,929	8,883
32	2029	1,000	0.9913	0.3625	359	18,660	18,301	8,511
33	2030	1,000	0.9908	0.3502	347	19,007	18,660	8,151
34	2031	1,000	0.9902	0.3384	335	19,342	19,007	7,804
35	2032	1,000	0.9896	0.3269	324	19,666	19,342	7,469
36	2033	1,000	0.9889	0.3159	312	19,978	19,666	7,146
37	2034	1,000	0.9881	0.3052	302	20,280	19,978	6,833
38	2035	1,000	0.9873	0.2949	291	20,571	20,280	6,532
39	2036	1,000	0.9864	0.2849	281	20,852	20,571	6,241
40	2037	1,000	0.9854	0.2753	271	21,123	20,852	5,960
41	2038	1,000	0.9844	0.2659	262	21,385	21,123	5,688
42	2039	1,000	0.9833	0.2570	253	21,638	21,385	5,427
43	2040	1,000	0.9821	0.2483	244	21,881	21,638	5,174
44	2041	1,000	0.9807	0.2399	235	22,117	21,881	4,930
45	2042	1,000	0.9791	0.2318	227	22,344	22,117	4,695
46	2043	1,000	0.9774	0.2239	219	22,562	22,344	4,468

Table 14
Cost of Care Multipliers - Female
Assuming a Normal Life Expectancy

Age	Year	Annual Cost Of $1000 (1)	Mid-Year Calculated Survival Ratio (2)	Mid-Year Discount Factor @ 3.5%	Adjusted & Discounted Cost	Cumulative Adjusted & Discounted Cost	Multiplier: From Trial To Birthday	Multiplier: From Birthday To L.E.
47	2044	1,000	0.9755	0.2163	211	22,773	22,562	4,249
48	2045	1,000	0.9734	0.2090	203	22,977	22,773	4,038
49	2046	1,000	0.9711	0.2020	196	23,173	22,977	3,835
50	2047	1,000	0.9686	0.1951	189	23,362	23,173	3,639
51	2048	1,000	0.9658	0.1885	182	23,544	23,362	3,450
52	2049	1,000	0.9628	0.1822	175	23,720	23,544	3,267
53	2050	1,000	0.9595	0.1760	169	23,888	23,720	3,092
54	2051	1,000	0.9558	0.1700	163	24,051	23,888	2,923
55	2052	1,000	0.9519	0.1643	156	24,207	24,051	2,761
56	2053	1,000	0.9476	0.1587	150	24,358	24,207	2,604
57	2054	1,000	0.9429	0.1534	145	24,502	24,358	2,454
58	2055	1,000	0.9377	0.1482	139	24,641	24,502	2,309
59	2056	1,000	0.9321	0.1432	133	24,775	24,641	2,170
60	2057	1,000	0.9261	0.1383	128	24,903	24,775	2,037
61	2058	1,000	0.9195	0.1337	123	25,026	24,903	1,909
62	2059	1,000	0.9123	0.1291	118	25,144	25,026	1,786
63	2060	1,000	0.9046	0.1248	113	25,256	25,144	1,668
64	2061	1,000	0.8962	0.1206	108	25,364	25,256	1,555
65	2062	1,000	0.8870	0.1165	103	25,468	25,364	1,447
66	2063	1,000	0.8772	0.1125	99	25,567	25,468	1,344
67	2064	1,000	0.8665	0.1087	94	25,661	25,567	1,245
68	2065	1,000	0.8549	0.1051	90	25,751	25,661	1,151
69	2066	1,000	0.8424	0.1015	86	25,836	25,751	1,061
70	2067	1,000	0.8289	0.0981	81	25,917	25,836	976
71	2068	1,000	0.8143	0.0948	77	25,994	25,917	894
72	2069	1,000	0.7985	0.0915	73	26,068	25,994	817
73	2070	1,000	0.7814	0.0885	69	26,137	26,068	744
74	2071	1,000	0.7627	0.0855	65	26,202	26,137	675
75	2072	1,000	0.7426	0.0826	61	26,263	26,202	610
76	2073	1,000	0.7208	0.0798	58	26,321	26,263	548
77	2074	1,000	0.6973	0.0771	54	26,374	26,321	491
78	2075	1,000	0.6719	0.0745	50	26,425	26,374	437
79	2076	1,000	0.6447	0.0720	46	26,471	26,425	387
80	2077	1,000	0.6157	0.0695	43	26,514	26,471	341
81	2078	1,000	0.5850	0.0672	39	26,553	26,514	298
82	2079	1,000	0.5525	0.0649	36	26,589	26,553	259
83	2080	1,000	0.5183	0.0627	32	26,621	26,589	223
84	2081	1,000	0.4827	0.0606	29	26,651	26,621	190
85	2082	1,000	0.4459	0.0585	26	26,677	26,651	161
86	2083	1,000	0.4082	0.0566	23	26,700	26,677	135
87	2084	1,000	0.3700	0.0546	20	26,720	26,700	112
88	2085	1,000	0.3318	0.0528	18	26,738	26,720	92
89	2086	1,000	0.2939	0.0510	15	26,753	26,738	74
90	2087	1,000	0.2569	0.0493	13	26,765	26,753	59

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Table 14
Cost of Care Multipliers - Female
Assuming a Normal Life Expectancy

Age	Year	Annual Cost Of $1000 (1)	Mid-Year Calculated Survival Ratio (2)	Mid-Year Discount Factor @ 3.5%	Adjusted & Discounted Cost	Cumulative Adjusted & Discounted Cost	Multiplier: From Trial To Birthday	Multiplier: From Birthday To L.E.
91	2088	1,000	0.2214	0.0476	11	26,776	26,765	46
92	2089	1,000	0.1877	0.0460	9	26,784	26,776	36
93	2090	1,000	0.1565	0.0445	7	26,791	26,784	27
94	2091	1,000	0.1279	0.0429	5	26,797	26,791	20
95	2092	1,000	0.1025	0.0415	4	26,801	26,797	15
96	2093	1,000	0.0802	0.0401	3	26,804	26,801	11
97	2094	1,000	0.0613	0.0387	2	26,807	26,804	7
98	2095	1,000	0.0456	0.0374	2	26,808	26,807	5
99	2096	1,000	0.0329	0.0362	1	26,810	26,808	3
100	2097	1,000	0.0230	0.0349	1	26,810	26,810	2
101	2098	1,000	0.0155	0.0338	1	26,811	26,810	1
102	2099	1,000	0.0101	0.0326	0	26,811	26,811	1
103	2100	1,000	0.0063	0.0315	0	26,811	26,811	0
104	2101	1,000	0.0037	0.0304	0	26,811	26,811	0
105	2102	1,000	0.0013	0.0294	0	26,812	26,811	0
106	2103	1,000	0.0013	0.0284	0	26,812	26,812	0
107	2104	1,000	0.0013	0.0275	0	26,812	26,812	0

Total: Trial to Age 55	**$24,051**
Total: Trial to Age 60	**$24,775**
Total: Trial to Age 65	**$25,364**
Total: Trial to Life Expectancy	**$26,812**
Age At Trial Date	**3.0**
Life Expectancy At Trial (Remaining Years)	**78.4**

(1) Constant 2000 Dollars.
(2) Based on Canadian Female Survival Rates
(3) Period From April 1, 2000 (Trial Date).

Table 15
Earnings Projection for the Average BC Male with All Levels of Schooling
Adjusted for: Labour Force Withdrawal (Average); Educ. Unempl. Rates; Educ. Part-Time Rates;
Labour Market Entry on July 1, 2016
Normal Life Expectancy for Mr.

Age	Year		Full-Time, Full-Year, Income	Labour Force Part'pn Rate	Unem-ployment Rate	Part-Time Factor	LMC Adjusted Income	Canadian Male Survival Rates	Discount Rate (2) 2.50%	Fully Adjusted & Discounted Income	Cumulative Adjusted & Discounted Income
18	2015		0	75.4%	18.7%	45.4%	0	0.9947	0.6862	0	0
19	2016		11,042	79.7%	17.8%	38.1%	4,479	0.9937	0.6695	2,980	2,980
20	2017		23,166	84.0%	16.8%	30.8%	11,193	0.9926	0.6531	7,257	10,236
21	2018		24,309	88.3%	15.9%	23.6%	13,797	0.9916	0.6372	8,717	18,954
22	2019		25,710	91.6%	15.0%	17.8%	16,460	0.9904	0.6217	10,135	29,088
23	2020		27,885	92.0%	14.1%	16.6%	18,380	0.9893	0.6065	11,029	40,117
24	2021		30,059	92.3%	13.2%	15.3%	20,393	0.9882	0.5917	11,924	52,041
25	2022		32,234	92.7%	12.3%	14.1%	22,501	0.9870	0.5773	12,821	64,862
26	2023		34,409	93.0%	11.5%	12.8%	24,705	0.9859	0.5632	13,718	78,580
27	2024		36,367	93.3%	10.7%	11.7%	26,747	0.9848	0.5495	14,473	93,053
28	2025		37,679	93.3%	10.4%	10.9%	28,058	0.9837	0.5361	14,795	107,847
29	2026		38,992	93.4%	10.1%	10.2%	29,395	0.9825	0.5230	15,104	122,952
30	2027		40,304	93.4%	9.8%	9.4%	30,758	0.9813	0.5102	15,401	138,352
31	2028		41,616	93.5%	9.5%	8.6%	32,148	0.9801	0.4978	15,685	154,037
32	2029		42,906	93.5%	9.2%	8.1%	33,462	0.9789	0.4856	15,907	169,944
33	2030		44,130	93.4%	9.1%	8.0%	34,483	0.9776	0.4738	15,972	185,915
34	2031		45,353	93.4%	8.9%	8.0%	35,508	0.9762	0.4622	16,023	201,938
35	2032		46,577	93.4%	8.7%	8.0%	36,536	0.9748	0.4510	16,062	218,000
36	2033		47,800	93.3%	8.5%	8.0%	37,568	0.9733	0.4400	16,088	234,088
37	2034		48,891	93.3%	8.3%	8.0%	38,479	0.9718	0.4292	16,051	250,139
38	2035		49,584	93.1%	8.1%	7.9%	39,020	0.9702	0.4188	15,853	265,992
39	2036		50,278	92.8%	8.0%	7.9%	39,559	0.9685	0.4086	15,653	281,646
40	2037		50,971	92.6%	7.8%	7.9%	40,099	0.9668	0.3986	15,452	297,098
41	2038		51,665	92.4%	7.6%	7.9%	40,638	0.9649	0.3889	15,249	312,346
42	2039		52,293	92.2%	7.5%	7.8%	41,134	0.9630	0.3794	15,029	327,375
43	2040		52,727	91.9%	7.4%	7.5%	41,503	0.9609	0.3701	14,762	342,137
44	2041		53,160	91.5%	7.3%	7.2%	41,873	0.9587	0.3611	14,496	356,633
45	2042		53,594	91.2%	7.1%	6.9%	42,241	0.9562	0.3523	14,230	370,863
46	2043		54,027	90.8%	7.0%	6.6%	42,609	0.9535	0.3437	13,964	384,827
47	2044		54,530	90.5%	6.9%	6.4%	42,957	0.9505	0.3353	13,692	398,518
48	2045		55,240	90.1%	6.9%	6.6%	43,245	0.9472	0.3271	13,401	411,919
49	2046		55,951	89.7%	6.9%	6.8%	43,526	0.9436	0.3192	13,109	425,028
50	2047		56,661	89.2%	6.9%	6.9%	43,801	0.9397	0.3114	12,816	437,844
51	2048		57,371	88.8%	6.9%	7.1%	44,069	0.9353	0.3038	12,522	450,366
52	2049		57,665	88.0%	7.0%	7.2%	43,798	0.9306	0.2964	12,079	462,445
53	2050		56,715	85.8%	7.4%	7.0%	41,955	0.9253	0.2891	11,225	473,670
54	2051		55,764	83.7%	7.7%	6.7%	40,152	0.9195	0.2821	10,415	484,085
55	2052		54,814	81.5%	8.1%	6.5%	38,389	0.9131	0.2752	9,647	493,732
56	2053		53,864	79.4%	8.4%	6.3%	36,666	0.9060	0.2685	8,920	502,652
57	2054		52,965	76.3%	8.7%	6.1%	34,655	0.8982	0.2620	8,154	510,806
58	2055		52,221	70.8%	8.8%	5.9%	31,717	0.8896	0.2556	7,211	518,017
59	2056		51,478	65.2%	8.9%	5.6%	28,841	0.8802	0.2493	6,329	524,346
60	2057		50,734	59.6%	9.0%	5.4%	26,028	0.8698	0.2432	5,507	529,853
61	2058		49,990	54.0%	9.1%	5.1%	23,278	0.8584	0.2373	4,742	534,595
62	2059		49,313	48.4%	9.1%	5.5%	20,508	0.8459	0.2315	4,017	538,611
63	2060		48,835	42.6%	8.5%	7.6%	17,591	0.8325	0.2259	3,308	541,919
64	2061		48,357	36.8%	8.0%	9.7%	14,800	0.8179	0.2204	2,668	544,587
65	2062	(1)	11,850	33.2%	7.6%	10.9%	3,235	0.8023	0.2170	563	545,150
Average (2000 $)			$43,324	87.2%	9.3%	9.6%	$30,996	X Actuarial Mult.		17.587	$545,150

	Future Period
Adjusted Earnings	$545,150
Net Employment Insurance	$3,115
Non-Wage Benefits	$32,709
Subtotal	$580,974

(1) Period To Age 65 (April 1, 2062)
(2) Impact of 1% Real Wage Growth Allowance: 29.6%

Table 16
Earnings Projection for the Average BC Male Working in Low Skill Occupations
Contingencies for the Average BC Male with a Grades 9-10 Education Level
Adjusted for: Labour Force Withdrawal (Average); Educ. Unempl. Rates; Educ. Part-Time Rates;
Labour Market Entry on July 1, 2018
Normal Life Expectancy for Mr.

Age	Year	Full-Time, Full-Year, Income	Labour Force Part'pn Rate	Unem-ployment Rate	Part-Time Factor	LMC Adjusted Income	Canadian Male Survival Rates	Discount Rate (2) 2.50%	Fully Adjusted & Discounted Income	Cumulative Adjusted & Discounted Income
18	2015	0	61.7%	29.7%	36.9%	0	0.9947	0.6862	0	0
19	2016	0	67.8%	30.4%	29.6%	0	0.9937	0.6695	0	0
20	2017	0	74.0%	31.0%	22.2%	0	0.9926	0.6531	0	0
21	2018	12,180	80.2%	31.6%	14.9%	5,682	0.9916	0.6372	3,590	3,590
22	2019	25,837	84.9%	31.7%	9.3%	13,576	0.9904	0.6217	8,359	11,949
23	2020	27,072	85.0%	30.2%	8.9%	14,645	0.9893	0.6065	8,787	20,736
24	2021	28,306	85.2%	28.6%	8.4%	15,757	0.9882	0.5917	9,213	29,950
25	2022	29,541	85.3%	27.1%	8.0%	16,912	0.9870	0.5773	9,637	39,586
26	2023	30,775	85.5%	25.5%	7.6%	18,112	0.9859	0.5632	10,057	49,643
27	2024	31,851	85.7%	24.2%	7.1%	19,235	0.9848	0.5495	10,408	60,051
28	2025	32,453	86.3%	23.6%	6.5%	20,021	0.9837	0.5361	10,557	70,608
29	2026	33,055	86.9%	23.0%	5.9%	20,829	0.9825	0.5230	10,703	81,311
30	2027	33,656	87.5%	22.4%	5.2%	21,660	0.9813	0.5102	10,845	92,157
31	2028	34,258	88.1%	21.8%	4.6%	22,513	0.9801	0.4978	10,984	103,140
32	2029	34,802	88.6%	21.1%	4.2%	23,282	0.9789	0.4856	11,068	114,208
33	2030	35,172	88.6%	20.3%	4.5%	23,740	0.9776	0.4738	10,996	125,204
34	2031	35,542	88.7%	19.4%	4.7%	24,202	0.9762	0.4622	10,921	136,125
35	2032	35,912	88.8%	18.5%	5.0%	24,667	0.9748	0.4510	10,844	146,968
36	2033	36,282	88.8%	17.7%	5.2%	25,135	0.9733	0.4400	10,764	157,732
37	2034	36,552	88.7%	17.0%	5.4%	25,439	0.9718	0.4292	10,611	168,344
38	2035	36,524	88.0%	17.0%	5.4%	25,241	0.9702	0.4188	10,255	178,599
39	2036	36,496	87.3%	17.0%	5.3%	25,044	0.9685	0.4086	9,910	188,508
40	2037	36,467	86.6%	16.9%	5.3%	24,846	0.9668	0.3986	9,574	198,083
41	2038	36,439	85.9%	16.9%	5.2%	24,648	0.9649	0.3889	9,249	207,332
42	2039	36,451	85.4%	16.8%	5.0%	24,603	0.9630	0.3794	8,989	216,321
43	2040	36,584	85.2%	16.4%	4.0%	25,014	0.9609	0.3701	8,897	225,218
44	2041	36,716	85.0%	16.0%	3.1%	25,429	0.9587	0.3611	8,803	234,021
45	2042	36,849	84.9%	15.6%	2.1%	25,847	0.9562	0.3523	8,707	242,728
46	2043	36,981	84.7%	15.2%	1.2%	26,268	0.9535	0.3437	8,609	251,337
47	2044	37,112	84.6%	14.7%	0.7%	26,594	0.9505	0.3353	8,476	259,813
48	2045	37,234	84.6%	14.2%	1.5%	26,620	0.9472	0.3271	8,249	268,062
49	2046	37,357	84.6%	13.7%	2.3%	26,643	0.9436	0.3192	8,024	276,086
50	2047	37,480	84.6%	13.2%	3.2%	26,663	0.9397	0.3114	7,801	283,888
51	2048	37,603	84.6%	12.6%	4.0%	26,679	0.9353	0.3038	7,581	291,468
52	2049	37,525	84.0%	12.3%	4.5%	26,421	0.9306	0.2964	7,287	298,755
53	2050	36,849	81.8%	12.3%	4.1%	25,359	0.9253	0.2891	6,785	305,540
54	2051	36,173	79.6%	12.3%	3.7%	24,314	0.9195	0.2821	6,306	311,846
55	2052	35,497	77.4%	12.3%	3.3%	23,285	0.9131	0.2752	5,851	317,698
56	2053	34,821	75.2%	12.4%	2.9%	22,273	0.9060	0.2685	5,418	323,116
57	2054	34,253	72.2%	12.4%	2.6%	21,070	0.8982	0.2620	4,958	328,074
58	2055	34,007	66.6%	12.6%	2.6%	19,272	0.8896	0.2556	4,382	332,455
59	2056	33,761	61.1%	12.8%	2.7%	17,504	0.8802	0.2493	3,841	336,296
60	2057	33,515	55.5%	12.9%	2.7%	15,766	0.8698	0.2432	3,336	339,632
61	2058	33,269	50.0%	13.1%	2.7%	14,058	0.8584	0.2373	2,864	342,496
62	2059	32,562	44.3%	13.1%	2.7%	12,215	0.8459	0.2315	2,392	344,888
63	2060	30,480	38.5%	12.5%	2.5%	9,998	0.8325	0.2259	1,880	346,768
64	2061	28,398	32.6%	11.9%	2.4%	7,955	0.8179	0.2204	1,434	348,202
65	2062 (1)	6,681	28.9%	11.6%	2.3%	1,669	0.8023	0.2170	291	348,492
Average (2000 $)		$33,759	82.5%	19.2%	4.9%	$21,392	X Actuarial Mult.		16.291	$348,492

	Future Period
Adjusted Earnings	$348,492
Net Employment Insurance	$27,235
Non-Wage Benefits	$20,910
Subtotal	$396,637

(1) Period To Age 65 (April 1, 2062)
(2) Impact of 1% Real Wage Growth Allowance: 29.4%

Table 17
Earnings Projection for the Average BC Male Working at Minimum Wage
Contingencies for the Average BC Male with a Grades 9-10 Education Level
Adjusted for: Labour Force Withdrawal (Average); Educ. Unempl. Rates; Educ. Part-Time Rates;
Labour Market Entry on July 1, 2018
Normal Life Expectancy for Mr.

Age	Year		Full-Time, Full-Year, Income	Labour Force Part'pn Rate	Unem-ployment Rate	Part-Time Factor	LMC Adjusted Income	Canadian Male Survival Rates	Discount Rate (2) 2.50%	Fully Adjusted & Discounted Income	Cumulative Adjusted & Discounted Income
18	2015		0	61.7%	29.7%	36.9%	0	0.9947	0.6862	0	0
19	2016		0	67.8%	30.4%	29.6%	0	0.9937	0.6695	0	0
20	2017		0	74.0%	31.0%	22.2%	0	0.9926	0.6531	0	0
21	2018		7,170	80.2%	31.6%	14.9%	3,344	0.9916	0.6372	2,113	2,113
22	2019		14,300	84.9%	31.7%	9.3%	7,514	0.9904	0.6217	4,626	6,740
23	2020		14,300	85.0%	30.2%	8.9%	7,736	0.9893	0.6065	4,642	11,381
24	2021		14,300	85.2%	28.6%	8.4%	7,960	0.9882	0.5917	4,654	16,036
25	2022		14,300	85.3%	27.1%	8.0%	8,187	0.9870	0.5773	4,665	20,701
26	2023		14,300	85.5%	25.5%	7.6%	8,416	0.9859	0.5632	4,673	25,374
27	2024		14,300	85.7%	24.2%	7.1%	8,636	0.9848	0.5495	4,673	30,047
28	2025		14,300	86.3%	23.6%	6.5%	8,822	0.9837	0.5361	4,652	34,699
29	2026		14,300	86.9%	23.0%	5.9%	9,011	0.9825	0.5230	4,630	39,329
30	2027		14,300	87.5%	22.4%	5.2%	9,203	0.9813	0.5102	4,608	43,937
31	2028		14,300	88.1%	21.8%	4.6%	9,397	0.9801	0.4978	4,585	48,522
32	2029		14,300	88.6%	21.1%	4.2%	9,566	0.9789	0.4856	4,548	53,069
33	2030		14,300	88.6%	20.3%	4.5%	9,652	0.9776	0.4738	4,471	57,540
34	2031		14,300	88.7%	19.4%	4.7%	9,737	0.9762	0.4622	4,394	61,934
35	2032		14,300	88.8%	18.5%	5.0%	9,822	0.9748	0.4510	4,318	66,252
36	2033		14,300	88.8%	17.7%	5.2%	9,907	0.9733	0.4400	4,242	70,494
37	2034		14,300	88.7%	17.0%	5.4%	9,952	0.9718	0.4292	4,151	74,646
38	2035		14,300	88.0%	17.0%	5.4%	9,883	0.9702	0.4188	4,015	78,661
39	2036		14,300	87.3%	17.0%	5.3%	9,813	0.9685	0.4086	3,883	82,543
40	2037		14,300	86.6%	16.9%	5.3%	9,743	0.9668	0.3986	3,754	86,298
41	2038		14,300	85.9%	16.9%	5.2%	9,673	0.9649	0.3889	3,630	89,928
42	2039		14,300	85.4%	16.8%	5.0%	9,652	0.9630	0.3794	3,526	93,454
43	2040		14,300	85.2%	16.4%	4.0%	9,778	0.9609	0.3701	3,478	96,932
44	2041		14,300	85.0%	16.0%	3.1%	9,904	0.9587	0.3611	3,429	100,360
45	2042		14,300	84.9%	15.6%	2.1%	10,031	0.9562	0.3523	3,379	103,739
46	2043		14,300	84.7%	15.2%	1.2%	10,158	0.9535	0.3437	3,329	107,068
47	2044		14,300	84.6%	14.7%	0.7%	10,247	0.9505	0.3353	3,266	110,334
48	2045		14,300	84.6%	14.2%	1.5%	10,223	0.9472	0.3271	3,168	113,502
49	2046		14,300	84.6%	13.7%	2.3%	10,199	0.9436	0.3192	3,072	116,574
50	2047		14,300	84.6%	13.2%	3.2%	10,173	0.9397	0.3114	2,977	119,550
51	2048		14,300	84.6%	12.6%	4.0%	10,146	0.9353	0.3038	2,883	122,433
52	2049		14,300	84.0%	12.3%	4.5%	10,068	0.9306	0.2964	2,777	125,210
53	2050		14,300	81.8%	12.3%	4.1%	9,841	0.9253	0.2891	2,633	127,843
54	2051		14,300	79.6%	12.3%	3.7%	9,612	0.9195	0.2821	2,493	130,336
55	2052		14,300	77.4%	12.3%	3.3%	9,380	0.9131	0.2752	2,357	132,693
56	2053		14,300	75.2%	12.4%	2.9%	9,147	0.9060	0.2685	2,225	134,918
57	2054		14,300	72.2%	12.4%	2.6%	8,797	0.8982	0.2620	2,070	136,988
58	2055		14,300	66.6%	12.6%	2.6%	8,104	0.8896	0.2556	1,842	138,831
59	2056		14,300	61.1%	12.8%	2.7%	7,414	0.8802	0.2493	1,627	140,458
60	2057		14,300	55.5%	12.9%	2.7%	6,727	0.8698	0.2432	1,423	141,881
61	2058		14,300	50.0%	13.1%	2.7%	6,042	0.8584	0.2373	1,231	143,112
62	2059		14,300	44.3%	13.1%	2.7%	5,364	0.8459	0.2315	1,051	144,162
63	2060		14,300	38.5%	12.5%	2.5%	4,691	0.8325	0.2259	882	145,044
64	2061		14,300	32.6%	11.9%	2.4%	4,006	0.8179	0.2204	722	145,766
65	2062	(1)	3,526	28.9%	11.6%	2.3%	881	0.8023	0.2170	153	145,920
Average (2000 $)			$14,300	82.2%	19.7%	5.1%	$8,957	X Actuarial Mult.		16.291	$145,920

	Future Period
Adjusted Earnings	$145,920
Net Employment Insurance	$12,017
Non-Wage Benefits	$8,755
Subtotal	$166,692

(1) Period To Age 65 (April 1, 2062)
(2) Impact of 1% Real Wage Growth Allowance: 28.9%

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Table 18
Earnings Projection for the Average BC Female with All Levels of Schooling
Adjusted for: Labour Force Withdrawal (Average); Educ. Unempl. Rates; Educ. Part-Time Rates;
Labour Market Entry on July 1, 2016
Normal Life Expectancy for Ms.

Age	Year	Full-Time, Full-Year, Income	Labour Force Part'pn Rate	Unem-ployment Rate	Part-Time Factor	LMC Adjusted Income	Canadian Female Survival Rates	Discount Rate (2) 2.50%	Fully Adjusted & Discounted Income	Cumulative Adjusted & Discounted Income
18	2015	0	69.7%	16.2%	44.8%	0	0.9971	0.6862	0	0
19	2016	8,811	72.7%	14.9%	38.4%	3,355	0.9967	0.6695	2,239	2,239
20	2017	18,643	75.6%	13.7%	32.0%	8,279	0.9964	0.6531	5,388	7,627
21	2018	19,711	78.6%	12.5%	25.5%	10,099	0.9960	0.6372	6,409	14,036
22	2019	20,913	80.8%	11.4%	20.5%	11,900	0.9956	0.6217	7,366	21,402
23	2020	22,514	80.7%	11.0%	19.5%	13,005	0.9953	0.6065	7,850	29,252
24	2021	24,116	80.5%	10.6%	18.6%	14,138	0.9949	0.5917	8,323	37,575
25	2022	25,717	80.4%	10.2%	17.7%	15,300	0.9945	0.5773	8,784	46,359
26	2023	27,318	80.3%	9.8%	16.7%	16,491	0.9941	0.5632	9,233	55,593
27	2024	28,718	80.1%	9.5%	16.2%	17,465	0.9937	0.5495	9,536	65,129
28	2025	29,517	79.6%	9.4%	16.9%	17,705	0.9933	0.5361	9,428	74,556
29	2026	30,316	79.2%	9.4%	17.5%	17,934	0.9929	0.5230	9,313	83,869
30	2027	31,115	78.7%	9.3%	18.2%	18,152	0.9924	0.5102	9,192	93,061
31	2028	31,914	78.2%	9.3%	18.9%	18,358	0.9920	0.4978	9,065	102,126
32	2029	32,618	77.8%	9.2%	19.4%	18,585	0.9915	0.4856	8,949	111,074
33	2030	33,036	78.0%	8.9%	19.4%	18,906	0.9909	0.4738	8,876	119,951
34	2031	33,455	78.1%	8.6%	19.5%	19,229	0.9903	0.4622	8,803	128,753
35	2032	33,873	78.3%	8.4%	19.5%	19,555	0.9897	0.4510	8,728	137,481
36	2033	34,291	78.4%	8.1%	19.6%	19,882	0.9890	0.4400	8,652	146,133
37	2034	34,655	78.6%	7.8%	19.5%	20,226	0.9883	0.4292	8,580	154,713
38	2035	34,857	79.0%	7.6%	19.0%	20,617	0.9875	0.4188	8,526	163,239
39	2036	35,058	79.4%	7.3%	18.6%	21,014	0.9866	0.4086	8,470	171,709
40	2037	35,260	79.8%	7.0%	18.1%	21,416	0.9857	0.3986	8,414	180,123
41	2038	35,461	80.1%	6.7%	17.6%	21,823	0.9847	0.3889	8,356	188,479
42	2039	35,673	80.4%	6.5%	17.2%	22,199	0.9836	0.3794	8,284	196,763
43	2040	35,912	80.2%	6.5%	16.6%	22,467	0.9824	0.3701	8,169	204,932
44	2041	36,152	80.0%	6.4%	16.0%	22,735	0.9810	0.3611	8,054	212,986
45	2042	36,392	79.8%	6.3%	15.5%	23,004	0.9795	0.3523	7,938	220,924
46	2043	36,632	79.7%	6.2%	14.9%	23,274	0.9779	0.3437	7,822	228,746
47	2044	36,796	79.1%	6.2%	14.6%	23,337	0.9760	0.3353	7,637	236,384
48	2045	36,736	77.6%	6.3%	14.7%	22,778	0.9739	0.3271	7,257	243,641
49	2046	36,676	76.1%	6.4%	14.9%	22,223	0.9717	0.3192	6,892	250,533
50	2047	36,616	74.5%	6.5%	15.1%	21,673	0.9692	0.3114	6,541	257,073
51	2048	36,556	73.0%	6.6%	15.3%	21,127	0.9665	0.3038	6,203	263,276
52	2049	36,392	71.0%	6.7%	15.3%	20,410	0.9635	0.2964	5,828	269,105
53	2050	35,921	67.4%	6.8%	15.0%	19,182	0.9603	0.2891	5,326	274,431
54	2051	35,450	63.9%	6.9%	14.7%	17,975	0.9567	0.2821	4,851	279,282
55	2052	34,979	60.3%	7.1%	14.4%	16,788	0.9529	0.2752	4,403	283,684
56	2053	34,508	56.8%	7.2%	14.1%	15,623	0.9486	0.2685	3,979	287,664
57	2054	34,002	52.9%	7.3%	13.8%	14,379	0.9440	0.2620	3,556	291,220
58	2055	33,391	48.2%	7.4%	13.6%	12,869	0.9390	0.2556	3,088	294,308
59	2056	32,781	43.5%	7.5%	13.5%	11,402	0.9335	0.2493	2,654	296,962
60	2057	32,171	38.7%	7.6%	13.3%	9,979	0.9276	0.2432	2,252	299,213
61	2058	31,560	34.0%	7.7%	13.1%	8,599	0.9211	0.2373	1,880	301,093
62	2059	30,872	29.4%	7.8%	12.8%	7,302	0.9141	0.2315	1,546	302,638
63	2060	29,951	25.4%	7.7%	12.1%	6,164	0.9065	0.2259	1,262	303,901
64	2061	29,030	21.3%	7.6%	11.3%	5,065	0.8983	0.2204	1,003	304,903
65	2062 (1)	7,016	18.8%	7.6%	10.9%	1,085	0.8893	0.2170	209	305,113
Average (2000 $)		$30,832	73.2%	8.4%	17.9%	$16,979	X Actuarial Mult.		17.970	$305,113

	Future Period
Adjusted Earnings	$305,113
Net Employment Insurance	$418
Non-Wage Benefits	$18,307
Subtotal	$323,837

(1) Period To Age 65 (April 1, 2062)
(2) Impact of 1% Real Wage Growth Allowance: 28.6%

Table 19
Earnings Projection for the Average BC Female Working in Low Skill Occupations
Contingencies for the Average BC Female with a Grades 9-10 Education Level
Adjusted for: Labour Force Withdrawal (Average); Educ. Unempl. Rates; Educ. Part-Time Rates;
Labour Market Entry on July 1, 2018
Normal Life Expectancy for Ms.

Age	Year		Full-Time, Full-Year, Income	Labour Force Part'pn Rate	Unem-ployment Rate	Part-Time Factor	LMC Adjusted Income	Canadian Female Survival Rates	Discount Rate (2) 2.50%	Fully Adjusted & Discounted Income	Cumulative Adjusted & Discounted Income
18	2015		0	49.2%	29.8%	57.6%	0	0.9971	0.6862	0	0
19	2016		0	50.9%	30.2%	47.7%	0	0.9967	0.6695	0	0
20	2017		0	52.7%	30.6%	37.8%	0	0.9964	0.6531	0	0
21	2018		8,102	54.5%	31.0%	27.9%	2,196	0.9960	0.6372	1,394	1,394
22	2019		17,202	55.9%	31.0%	20.3%	5,285	0.9956	0.6217	3,271	4,665
23	2020		18,132	56.1%	29.8%	19.6%	5,741	0.9953	0.6065	3,466	8,131
24	2021		19,063	56.3%	28.5%	18.9%	6,218	0.9949	0.5917	3,660	11,791
25	2022		19,993	56.5%	27.2%	18.2%	6,715	0.9945	0.5773	3,855	15,646
26	2023		20,924	56.6%	26.0%	17.5%	7,233	0.9941	0.5632	4,050	19,696
27	2024		21,676	56.9%	25.0%	17.1%	7,666	0.9937	0.5495	4,186	23,882
28	2025		21,896	57.4%	24.9%	17.5%	7,785	0.9933	0.5361	4,145	28,027
29	2026		22,117	57.9%	24.7%	18.0%	7,904	0.9929	0.5230	4,104	32,131
30	2027		22,337	58.3%	24.6%	18.4%	8,023	0.9924	0.5102	4,063	36,194
31	2028		22,558	58.8%	24.5%	18.8%	8,142	0.9920	0.4978	4,021	40,214
32	2029		22,762	59.4%	24.1%	18.9%	8,324	0.9915	0.4856	4,008	44,222
33	2030		22,918	60.2%	23.0%	18.1%	8,696	0.9909	0.4738	4,083	48,305
34	2031		23,074	61.1%	22.0%	17.4%	9,081	0.9903	0.4622	4,157	52,462
35	2032		23,229	61.9%	20.9%	16.6%	9,478	0.9897	0.4510	4,230	56,692
36	2033		23,385	62.7%	19.9%	15.9%	9,887	0.9890	0.4400	4,302	60,994
37	2034		23,538	63.4%	18.9%	15.1%	10,275	0.9883	0.4292	4,359	65,353
38	2035		23,684	63.8%	18.3%	14.4%	10,567	0.9875	0.4188	4,370	69,723
39	2036		23,830	64.2%	17.7%	13.7%	10,866	0.9866	0.4086	4,380	74,102
40	2037		23,976	64.6%	17.1%	13.0%	11,171	0.9857	0.3986	4,389	78,491
41	2038		24,122	65.0%	16.4%	12.3%	11,482	0.9847	0.3889	4,396	82,887
42	2039		24,225	65.2%	15.7%	11.9%	11,724	0.9836	0.3794	4,375	87,262
43	2040		24,200	64.8%	14.6%	12.3%	11,741	0.9824	0.3701	4,269	91,531
44	2041		24,174	64.3%	13.4%	12.7%	11,756	0.9810	0.3611	4,164	95,696
45	2042		24,148	63.9%	12.3%	13.1%	11,767	0.9795	0.3523	4,061	99,757
46	2043		24,122	63.5%	11.2%	13.5%	11,776	0.9779	0.3437	3,958	103,714
47	2044		24,106	62.8%	10.3%	13.7%	11,719	0.9760	0.3353	3,835	107,550
48	2045		24,116	61.2%	10.1%	13.6%	11,470	0.9739	0.3271	3,654	111,204
49	2046		24,127	59.7%	10.0%	13.4%	11,218	0.9717	0.3192	3,479	114,683
50	2047		24,138	58.1%	9.8%	13.3%	10,964	0.9692	0.3114	3,309	117,992
51	2048		24,148	56.5%	9.6%	13.2%	10,708	0.9665	0.3038	3,144	121,136
52	2049		24,172	54.7%	9.5%	12.9%	10,424	0.9635	0.2964	2,977	124,113
53	2050		24,235	52.3%	9.4%	12.4%	10,059	0.9603	0.2891	2,793	126,906
54	2051		24,298	49.9%	9.4%	11.8%	9,685	0.9567	0.2821	2,614	129,520
55	2052		24,362	47.5%	9.3%	11.3%	9,303	0.9529	0.2752	2,440	131,960
56	2053		24,425	45.1%	9.2%	10.8%	8,913	0.9486	0.2685	2,270	134,230
57	2054		24,381	42.2%	9.2%	10.1%	8,402	0.9440	0.2620	2,078	136,308
58	2055		24,019	38.0%	9.1%	9.0%	7,553	0.9390	0.2556	1,813	138,120
59	2056		23,656	33.9%	9.0%	8.0%	6,707	0.9335	0.2493	1,561	139,681
60	2057		23,294	29.7%	9.0%	6.9%	5,863	0.9276	0.2432	1,323	141,004
61	2058		22,931	25.5%	8.9%	5.8%	5,022	0.9211	0.2373	1,098	142,102
62	2059		22,449	21.6%	8.7%	5.3%	4,201	0.9141	0.2315	889	142,991
63	2060		21,609	18.6%	8.0%	6.3%	3,456	0.9065	0.2259	708	143,699
64	2061		20,769	15.5%	7.4%	7.3%	2,760	0.8983	0.2204	546	144,245
65	2062	(1)	4,992	13.6%	7.0%	8.0%	580	0.8893	0.2170	112	144,357
Average (2000 $)			$22,458	55.8%	18.7%	15.0%	$8,661	X Actuarial Mult.		16.668	$144,357

	Future Period
Adjusted Earnings	$144,357
Net Employment Insurance	$10,566
Non-Wage Benefits	$8,661
Subtotal	$163,585

(1) Period To Age 65 (April 1, 2062)
(2) Impact of 1% Real Wage Growth Allowance: 29.6%

Table 20
Earnings Projection for the Average BC Female Working in Low Skill Occupations
Contingencies for the Average BC Female with a Grades 9-10 Education Level
Adjusted for: Labour Force Withdrawal (Average); Educ. Unempl. Rates; Educ. Part-Time Rates;
Labour Market Entry on July 1, 2018
Normal Life Expectancy for Ms.

Age	Year		Full-Time, Full-Year, Income	Labour Force Part'pn Rate	Unem-ployment Rate	Part-Time Factor	LMC Adjusted Income	Canadian Female Survival Rates	Discount Rate (2) 2.50%	Fully Adjusted & Discounted Income	Cumulative Adjusted & Discounted Income
18	2015		0	49.2%	29.8%	57.6%	0	0.9971	0.6862	0	0
19	2016		0	50.9%	30.2%	47.7%	0	0.9967	0.6695	0	0
20	2017		0	52.7%	30.6%	37.8%	0	0.9964	0.6531	0	0
21	2018		8,102	54.5%	31.0%	27.9%	2,196	0.9960	0.6372	1,394	1,394
22	2019		17,202	55.9%	31.0%	20.3%	5,285	0.9956	0.6217	3,271	4,665
23	2020		18,132	56.1%	29.8%	19.6%	5,741	0.9953	0.6065	3,466	8,131
24	2021		19,063	56.3%	28.5%	18.9%	6,218	0.9949	0.5917	3,660	11,791
25	2022		19,993	56.5%	27.2%	18.2%	6,715	0.9945	0.5773	3,855	15,646
26	2023		20,924	56.6%	26.0%	17.5%	7,233	0.9941	0.5632	4,050	19,696
27	2024		21,676	56.9%	25.0%	17.1%	7,666	0.9937	0.5495	4,186	23,882
28	2025		21,896	57.4%	24.9%	17.5%	7,785	0.9933	0.5361	4,145	28,027
29	2026		22,117	57.9%	24.7%	18.0%	7,904	0.9929	0.5230	4,104	32,131
30	2027		22,337	58.3%	24.6%	18.4%	8,023	0.9924	0.5102	4,063	36,194
31	2028		22,558	58.8%	24.5%	18.8%	8,142	0.9920	0.4978	4,021	40,214
32	2029		22,762	59.4%	24.1%	18.9%	8,324	0.9915	0.4856	4,008	44,222
33	2030		22,918	60.2%	23.0%	18.1%	8,696	0.9909	0.4738	4,083	48,305
34	2031		23,074	61.1%	22.0%	17.4%	9,081	0.9903	0.4622	4,157	52,462
35	2032		23,229	61.9%	20.9%	16.6%	9,478	0.9897	0.4510	4,230	56,692
36	2033		23,385	62.7%	19.9%	15.9%	9,887	0.9890	0.4400	4,302	60,994
37	2034		23,538	63.4%	18.9%	15.1%	10,275	0.9883	0.4292	4,359	65,353
38	2035		23,684	63.8%	18.3%	14.4%	10,567	0.9875	0.4188	4,370	69,723
39	2036		23,830	64.2%	17.7%	13.7%	10,866	0.9866	0.4086	4,380	74,102
40	2037		23,976	64.6%	17.1%	13.0%	11,171	0.9857	0.3986	4,389	78,491
41	2038		24,122	65.0%	16.4%	12.3%	11,482	0.9847	0.3889	4,396	82,887
42	2039		24,225	65.2%	15.7%	11.9%	11,724	0.9836	0.3794	4,375	87,262
43	2040		24,200	64.8%	14.6%	12.3%	11,741	0.9824	0.3701	4,269	91,531
44	2041		24,174	64.3%	13.4%	12.7%	11,756	0.9810	0.3611	4,164	95,696
45	2042		24,148	63.9%	12.3%	13.1%	11,767	0.9795	0.3523	4,061	99,757
46	2043		24,122	63.5%	11.2%	13.5%	11,776	0.9779	0.3437	3,958	103,714
47	2044		24,106	62.8%	10.3%	13.7%	11,719	0.9760	0.3353	3,835	107,550
48	2045		24,116	61.2%	10.1%	13.6%	11,470	0.9739	0.3271	3,654	111,204
49	2046		24,127	59.7%	10.0%	13.4%	11,218	0.9717	0.3192	3,479	114,683
50	2047		24,138	58.1%	9.8%	13.3%	10,964	0.9692	0.3114	3,309	117,992
51	2048		24,148	56.5%	9.6%	13.2%	10,708	0.9665	0.3038	3,144	121,136
52	2049		24,172	54.7%	9.5%	12.9%	10,424	0.9635	0.2964	2,977	124,113
53	2050		24,235	52.3%	9.4%	12.4%	10,059	0.9603	0.2891	2,793	126,906
54	2051		24,298	49.9%	9.4%	11.8%	9,685	0.9567	0.2821	2,614	129,520
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(2) Impact of 1% Real Wage Growth Allowance: 29.6%

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By hand

March 17, 2000
Our file: 215199
Your file 8777-96618

This is Exhibit "C" referred to in the affidavit of Douglas G. Hildebrand sworn before me, at Vancouver, BC this 23rd day of March 20 00
A COMMISSIONER FOR TAKING AFFIDAVITS FOR BRITISH COLUMBIA

Harper Grey Easton
Barristers and Solicitors
3100 - 650 West Georgia St.
P.O. Box 11504
Vancouver , B.C.
V6B 4P7

Attention of Ms. Birgitta von Krosigk

Dear Sirs/Mesdames:

Re: Cost Benefit Analysis of Lovaas Treatment

Further to our preliminary report of December 7, 1999, "Cost-Benefit Analysis of Lovaas Treatment for Autism and Autism Spectrum Disorder (ASD)", we respond to the critique of our report attached to the Affidavit of Ms. Carolyn Green (February 2000).

The critique is entitled "Critical Appraisal of Submitted Cost-Benefit Models of 'Lovaas' Early Intensive Behavioural Intervention for Autism" (February, 2000) and is co-authored by Ms. Carolyn Green, Dr. Ken Bassett and Dr. Arminée Kazanjian, all of the B.C. Office of Health Technology Assessment (BCOHTA), University of British Columbia. Hereinafter we refer to the critique as Green et al for identification purposes.

We commence our reply with general comments, followed by specific comments on each section of the critique in chronological order (i.e., starting at page 1 through to page 18).

I. General Comments in Reply

1. As economists, we are in no position to comment on the medical/health effectiveness of Lovaas Treatment per se – we leave that issue to the medical specialists. Our cost-benefit analysis (CBA) does, however, explore a wide

range in effectiveness outcomes through sensitivity analysis. Our sensitivity testing was deliberately skewed towards the "downside" (i.e., scenarios which reduced net benefits relative to "most likely" or base case assumptions) in order to address the "robustness" of results.

2. Green et al maintain that our range in effectiveness assumptions should have been extended even further in the less favourable direction. For example, Green et al suggest that some proportion of children with autism should be assumed normal "without Lovaas", and that greater-than-10% of children "with Lovaas" should be assumed very dependent.[1] Our computer-based CBA model can be easily applied to explore even less favourable effectiveness assumptions. The suggestion by Green et al of zero difference in effectiveness between the "with Lovaas" and "without Lovaas" is, however, extreme. The result of such a scenario is self-evident, but the effectiveness assumption is contrary to the Jacobsen et al and Lovaas research which we were directed to assume within a British Columbia context.

3. Our cost assumptions were developed largely from review of material provided by the provincial government and by counsel. Variation in cost assumptions was also explored in sensitivity testing and we welcome any suggestions regarding alternate cost assumptions. We note that Green et al did not provide any comments on specific cost levels to assume.

4. To assist reviewers of our preliminary CBA, we will provide under separate letter two items: (1) a description of cost information from various sources which can be compared to our cost assumptions and which therefore provides context; and (2) CBA results for alternate effectiveness scenarios which reflect Green et al's comments.

5. We agree with Green et al that Drummond et al provide an excellent framework for economic evaluation techniques. As indicated below, we basically find Drummond et al to be supportive of our analysis, as distinct from the misinterpretations provided by Green et al.

II. Executive Summary Section (pages 1-2)

1. Green et al suggest the effectiveness assumptions are skewed in favour of Lovaas treatment. As Green et al appear to substantially dispute the

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[1]/ Green et al indicate at page 1 that our CBA assumed an effectiveness range of 40% to 80% for the "very dependent" state without Lovaas treatment. This is incorrect. The 40% to 80% range pertained to the "semi-dependent" state without Lovaas treatment. The range for the "very dependent" state without Lovaas treatment was 20% to 60%.

effectiveness of Lovaas treatment, this comment is to be expected. Effectiveness of treatment is a matter for medical/health specialists.

2. Green et al are critical of the cost assumptions and suggest costs should be based on actual measurements of functioning autism treatment programs. We note, however, that there already exists extensive cost information related to special needs individuals (including autistic persons) in British Columbia (moderately dependent, heavily dependent) in terms of their health, education and residential care requirements.

III. Section One-Introduction (Pages 3-5)

1.0 Economic Modelling Bias

1.1 We agree with the comments about models, potential for bias and the excerpt from Sheldon. Clinical trials are required, for example, prior to approval and commercialisation of a new drug treatment. The purpose of the Lovaas CBA (preliminary report) is to explore the treatment's potential economic merit vis à vis the existing approach to the disorder. The preliminary CBA report strikes us as appropriate within such a context.

2.0 Appropriateness of CBA Model

2.1 It is true that a cost-benefit study attempts to quantify in monetary terms the costs and benefits associated with each alternative. As Drummond et al outline in Chapter 7, the benefits of a health treatment option typically include the following:

(a) future health care costs avoided (or saved);
(b) increased productive output due to improved health status;
(c) intangible benefits which are the value of improved health per se to the individual consumer of the health care option.

2.2 Our CBA study quantified in monetary terms both cost saving (a) and wage income (b) benefits. This approach is consistent with Drummond et al's description of the Human Capital Approach (Section 7.2.1). Our method is also conservative in that no attempt was made to monetize intangible benefits of improved health (c), which, of course, would have increased the net benefits of Lovaas treatment in each scenario examined. Our decision not to monetize intangible benefits of improved health relates to the potential for double counting with (a) and (b), which Drummond et al discusses in Section 7.3. Hence our CBA restricts the monetary measure of willingness-to-pay (WTP) benefits to avoided costs and increased income productivity. Given

the double counting issue just noted and the very contentious issue of WTP approaches to monetizing intangible benefits of improved health (contingent valuation approach), our approach strikes us as appropriate in the context.[2]

2.3 Drummond et al also distinguish the typical assessment in which the costs and health benefits of the proposed option both increase, versus the atypical assessment (dominant case) in which costs of the proposed option are lower and health benefits increase (win-win). At page 142, Drummond et al say it is unnecessary to quantify health benefits in the dominant (win-win) case, for obvious reasons. Our CBA of Lovaas treatment was a dominant case – i.e., costs were lower and health benefits greater than the "no Lovaas" approach.

3.0 B.C. Government's Benefit-Cost Analysis Guidelines

3.1 Geen et al's comments on the B.C. Government's CBA guidelines are misplaced. The B.C. guidelines on CBA are consistent with Drummond et al's discussion on CBA. The B.C. Government's guidelines are reflective of guidelines published by the federal government and international lending institutions. Whilst the guidelines are not specifically targeted to health care, the concepts are generally accepted by economists.

IV. Sections Two-Three: Appraisal Methodology and Results (pages 6-11)

1.0 Appraisal Checklist

1.1 We have no difficulty with this 10-point checklist.

2.0 Well-Defined Question Posed? (#1)

2.1 We were asked to address a very specific question in our CBA: the costs and benefits of Lovaas treatment versus no Lovaas treatment. The no Lovaas treatment case was, of course, intended to reflect the *status quo* (or existing) approach to the disorder. We were not asked to address a range of other alternatives. The fact that other alternatives were not addressed does not invalidate the CBA methodology or results.

2.2 Green et al suggest alternatives should be compared to the "do nothing" option. This is appropriate when the "do nothing" option is viable (e.g., in a case evaluating alternate drug treatments where the consumer can choose the

---

[2] / *Another conservative feature of our CBA relates to benefit (b) increased productive output. We restricted our monetized benefit to wage earnings. As Drummond et al point out at page 210, a monetized benefit could be added to reflect increased productivity of household services. We frequently monetize the value of household services activity in serious personal injury cases along the lines suggested by Drummond et al (e.g., hourly replacement cost x number of hours of productive household work). In our CBA, however, we have not included the value of increased productive household work.*

"do nothing" option, i.e., it is feasible). In the case of autism, statutory or institutional mitigation comes into play. The "do nothing" case assumes that our society is prepared to "do nothing" for significantly handicapped individuals. Our comparative case for Lovaas treatment is the status quo scenario (without Lovaas) which involves the social costs of dealing with handicapped individuals. This approach appears to satisfy the intent of Drummond et al's references to "do nothing" and status quo in their Chapter 2.

3.0 Competing Alternatives (#2)

3.1 Green et al are critical of the lack of detail underlying the service requirements and costs of the two options addressed. Further detail will be provided under separate letter.

3.2 Green et al repeat the "textbook" need for the "do nothing" case as a benchmark. See response at 2.2.

4.0 Effectiveness Established? (#3)

4.1 Our CBA addressed a broad range of possible effectiveness outcomes for the "with Lovaas" and status quo cases. We also indicated that our base case (most likely) assumptions were drawn from Jacobsen et al and Lovaas research. Beyond that, we leave it to the medical/health specialists to address effectiveness issues.

5.0 All Costs/Consequences Identified (#4)

5.1 Further detail is requested and will be provided.

6.0 Costs/Consequences Measured Accurately in Physical Units (#5)

6.1 Issues raised concerning cost reliability, cost detail and range of effectiveness assumptions have been dealt with above.

6.2 Green et al suggest costs and consequences should be integrated into the measure of cost per quality-adjusted life years (QUALs). In essence, they suggest an alternate methodology to CBA be applied, namely cost-utility analysis (CUA) which is a variant of cost-effectiveness analysis (CEA). Under CUA/CEA methods, the consequences (health benefits) of a treatment option are not expressed in monetary terms, but are dealt with in physical units such as QUALs. The cost per QUALs are computed for each option and compared to establish the cost per QUALs gained.

6.3 We agree with Drummond et al and Green et al that CUA and CEA analyses can be useful and complementary to CBA in evaluating project options.

However, in the context of our evaluation, calculating the cost per QUAL has the following limitations:

- As Drummond et al say (see page 142), there is no need to bother calculating QUALs if it is a dominant assessment (i.e., lower cost and more effective – win/win case) such as our assessment. Calculation of QUALs in this context simply makes the dominant option even more attractive.
- Calculation of QUALs is obviously much more relevant to evaluating treatment options involving differences in life expectancy; in our assessment, life expectancy is assumed to be the same for both options.

6.4 As an exercise and for purposes of illustration only, we have calculated the cost per QUALs following the method set out by Drummond et al in Chapter 6. We re-express the discounted cost of "without" and "with" Lovaas treatment (excluding wage income) on a cost per QUALs basis. The assumptions are as follows:

- Weights for normal, semi-dependent and very dependent states are set at 1.0, 0.85 and 0.65 respectively; these are arbitrary weights, but generally reflect the data in Table 6.7 of Drummond et al;
- The expected weight for the "with" and "without" Lovaas treatment cases are calculated at 0.89 and 0.75 respectively assuming our Base Case effectiveness outcomes;
- From Tables 13 and 14 of our report, the discounted value of life-years (unadjusted for quality) is about 26.3 at 3.5% real assuming an 80/20 incidence rate for males/females;
- discounted QUALs are calculated, therefore, at about 23.4 and 19.7 for the "with" and "without" Lovaas treatment cases respectively;
- on this basis the cost per QUALs gained is estimated as follows (per child):

Scenario	Discounted Cost	Discounted Cost per QUALs
(a) Without Lovaas	$2.4 million	$121,800
(b) With Lovaas	$1.4 million	$ 59,800
(c) Cost Saving	$1.0 million	$ 62,000 gained
(d) Ratio (a) to (b)	1.714	2.037

The above illustration indicates that inclusion of health benefits as measured by QUALs increases the relative merit of Lovaas treatment. This is evident from the benefit/cost ratio (ratio of avoided cost to cost) which increases from about 1.7 (unadjusted for life quality) to 2.0 (adjusted for life quality). In conclusion on this point, we note that there is contention amongst economists as to quantification of

QUALs (i.e., just as there is in valuing an individual's health benefits in monetary terms) as noted by Drummond et al in Chapter 6.

7.0 Costs/Consequences Valued Credibly (#6)

7.1 Issues already addressed.

8.0 Costs/Consequences Adjusted for Differential Timing (#7)

8.1 No apparent disagreement on discounting.

9.0 Incremental Analysis Done? (#8)

9.1 Issues already addressed.

10.0 Allowance Made for Uncertainty (#9)

10.1 Issues already addressed.

11.0 Include All Issues of Concern (#10)

11.1 Our CBA was a focussed assessment. Clearly there are issues of concern for many stakeholders that go beyond this narrowly focussed analysis. This does not, however, invalidate the study's findings.

V. Summary and Conclusions (pages 17-18)

The points made in summary and conclusion have already been addressed. As stated above, alternate effectiveness assumptions can be made and CBA results efficiently calculated with our computerised model. Further detail on costs can be provided, and CBA results can be generated with alternate cost assumptions as well. Other criticisms advanced by Green et al stem from their literal, textbook interpretations of Drummond et al, which, we have pointed out, have frequently been misinterpretations.

This concludes our reply.

Yours very truly,

Douglas G. Hildebrand
Director

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Delivered by Hand

March 20, 2000

This is Exhibit" D "referred to in the affidavit of Douglas G. Hildebrand sworn before me, at Vancouver BC this 23rd day of March 2000
A COMMISSIONER FOR TAKING AFFIDAVITS FOR BRITISH COLUMBIA

Our File: 215199
Your File: 8777-96618

Harper Grey Easton
Barristers and Solicitors
3100 – 650 West Georgia St.
P. O. Box 11504
Vancouver BC V6B 4P7

Attention of Ms. Birgitta von Krosigk

Dear Sirs/Mesdames:

Re: Cost Benefit Analysis of Lovaas Treatment

Further to our letter to you dated March 17, 2000, we respond to issues in Green et al's (February 2000) critique which we did not address in the earlier letter, namely, (1) cost information and (2) CBA results for alternative effectiveness scenarios which reflect Green et al's comment.

1.0 Description of Cost Information

In Sections 2.2 and 2.3 of our preliminary report, we briefly introduced the broad cost categories and mentioned principal sources of data used in the CBA. In the attached Data Appendix, we provide some further information with regard to cost derivation and data sources.

As indicated on Page 6 of our preliminary report, except for Lovaas early intervention and costs for Outcome 1 in the "with" treatment scenario, service costs for Outcome 2 are assumed to be 70% of those for Outcome 3. Hence, our descriptions in the Data Appendix focus on the costs for Outcome 3 unless otherwise noted.

2.0 CBA Results for Alternative Effectiveness Scenarios Based on Green et al's Comments

Green et al maintain that our range in effectiveness assumptions should have been extended further in the less favourable direction. For example, Green et al suggest that greater-than-10% of children "with Lovaas" should be assumed very dependent and that some proportion of children with autism should be assumed normal "without Lovaas". As indicated in our letter of March 17, 2000, as economists, we are not in a position to comment on the effectiveness of Lovaas treatment. In our preliminary analysis, we applied a computer model to explore the most likely scenarios based on Jacobson (1996)[1]. Our model can certainly be used to investigate any other possible scenarios, such as those suggested by Green et al. Examining these alternative scenarios, however, does not reflect our opinion with regard to the likelihood of their occurrence, an issue which can only be addressed by medical and health specialists.

In this section, we explore the impact on net benefits from Lovaas treatment by considering various alternative effectiveness scenarios. To achieve this, we take a three-step approach:

> Step 1: All else equal (to what we assumed in the preliminary report), we increase the proportion of children "with" Lovaas treatment but remain very dependent;
>
> Step 2: All else equal, we increase the proportion of children "without" Lovaas treatment but achieve normal functioning;
>
> Step 3: We simultaneously increase both the proportion of children "with" treatment but remain very dependent and the proportion of children "without" Lovaas treatment but achieve normal functioning.

Before we conduct step 1, we need to make some supplementary cost assumptions to facilitate our analysis.

➢ Cost Assumptions for Children "Without" Lovass Achieving Normal Functioning

On Page 9 of Green et al's critique, it was pointed out that "as many as 20% of children labelled 'autistic' achieved education and employment without the significant public expenditures that this model [our CBA model] attributes to all children not receiving Lovaas treatment". Our supplementary cost assumptions for the "without" treatment

[1] John W. Jacobson et al, *Financial Cost and Benefits of Intensive Early Intervention for Young Children with Autism – Pennsylvania Model Achieving Cost Savings.*

scenario are provided in Table 2A, attached. The difference between Table 2A and Table 2 of our preliminary report is that cost assumptions for Outcome 1 (Normal) have been added in Table 2A.

As no substantial expenditures in education and adult care are expected for children "without" treatment who achieve normal functioning, we assume costs incurred by children achieving normal functioning are the same "with" or "without" Lovaas treatment beyond age 6. From age 3 to age 6, costs incurred by children achieving normal functioning "without" treatment are assumed to be the same as costs incurred by children "without" treatment who belong to the semi-dependent category.

Table 3A, attached, provides a revised comparison of annual costs for "with" and "without" Lovaas treatment by age range and outcome. Although weights for each outcome in Table 3A are the same as in the Base Case of our preliminary report, expected annual cost savings can be estimated by assuming any specific weight for each outcome (as illustrated in Tables 3B and 3C, which will be discussed later in Section 2.2).

➢ Effectiveness Assumptions

In Section 3.2 of our preliminary report, we carried out a series of sensitivity analyses, the first of which was "Cost Savings of Lovaas Treatment by Outcome Distributions" (Table 7 of preliminary report). Table 7 calculated the cost savings (benefits) of Lovaas treatment by changes in the outcome distribution for the "with" Lovaas treatment scenario, the "without" Lovaas treatment scenarios and both scenarios simultaneously.

Variations in the "with" treatment outcomes were assumed as follows in our previous report:

(i) 10% of children "with" treatment will remain very dependent;

(ii) 20% - 60% achieve normal functioning;

(iii) (i) and (ii) imply that 30% - 70% of children are assumed to be semi-dependent.

Variations in the "without" treatment outcomes were assumed as follows in Table 7 of the preliminary report:

(a) 0% of children "without" treatment will achieve normal functioning;

(b) 40% - 80% achieve semi-dependent;

(c) (a) and (b) imply that 20% - 60% of children are assumed to remain very dependent.

In the following, we vary these assumptions step by step to explore the impact on our CBA results. Our sensitivity testing in the downward (less favourable) direction extends to the point of zero difference in effectiveness between the "with" and "without" scenarios.

2.1 Increasing the proportion of "Very Dependent" under "With" Lovaas

Green et al suggest that our assumption that only 10% of children "with" treatment remain very dependent (assumption (i) above) is overly optimistic. In Tables 7A and 7B, attached, we re-run the model allowing a higher proportion of children "with" treatment in the very dependent category.

Table 7A: Cost Savings of Lovaas Treatment By Outcome Distribution where **20%** of children "with" treatment are assumed to remain very dependent; detailed assumptions are listed in the table below:

Outcome	"With" Lovaas	"Without" Lovaas
Normal	20% - 60%	0%
Semi-dependent	20% - 60%	40% - 80%
Very Dependent	**20%**	20% - 60%

Table 7 of our preliminary CBA report indicated a net benefit of Lovaas treatment of about $1.01 million (excluding wages) per child, with an associated internal-rate-of-return of 42% for the Base Case. The Target Sensitivity Case[2] (shaded cell) in Table 7A shows that increasing the percentage of children "with" Lovaas who remain very dependent to 20% yields a net benefit from Lovaas treatment of $0.83 million (excluding wages), with an associated internal-rate-of-return of 35%. Sensitivity test results for various cases other than the Target Sensitivity Case are provided in cells surrounding the shaded cell in Table 7A.

[2] Target Sensitivity Case is defined as the case when the median "with" Lovaas outcome distribution and the median "without" Lovaas outcome distribution occur simultaneously. For example in Table 7A, when the "with" Lovaas outcome distribution varies from 20/60/**20** (normal/semi-dependent/very dependent, with the very dependent set at a constant 20% in Table 7A) to 60/20/**20**, the median "with" Lovaas distribution will be 40/40/**20**. Similarly, when the "without" Lovaas outcome distribution varies between 0/40/60 to 0/80/20, the median "without" Lovaas distribution will be 0/60/40. Similar concept is followed in Tables 7 (B–E). Results for Target Sensitivity Case are shaded and the corresponding internal-rate-of-return (excluding wages) is calculated in each table.

Table 7B: Cost Savings of Lovaas Treatment By Outcome Distribution where **30%** of children "with" treatment are assumed to remain very dependent; detailed assumptions are listed in the table below:

Outcome	"With" Lovaas	"Without" Lovaas
Normal	20% - 60%	0%
Semi-dependent	10% - 50%	40% - 70%
Very Dependent	**30%**	30% - 60%

The Target Sensitivity Case in Table 7B shows that increasing the percentage of children "with" Lovaas who remain very dependent to 30% yields a net benefit from Lovaas treatment of $0.75 million (excluding wages), with an associated internal-rate-of-return of 32%. Sensitivity test results for various cases other than the Target Sensitivity Case are provided in cells surrounding the shaded cell in Table 7B.

2.2 Increasing the proportion of "Normal" under "Without" Lovaas

Green et al suggest that the assumption that 0% of children "without" treatment appear in the normal functioning category (our assumption (a) above) seems to be biased in favour of Lovaas treatment. They indicate that about 10-20% of a population of children with autism achieve employment independent of specific treatment program. In Tables 7C and 7D, attached, we re-run the model allowing a higher proportion of children "without" treatment in the normal functioning category.

Table 7C: Cost Savings of Lovaas Treatment By Outcome Distribution where **10%** of children "without" treatment are assumed to achieve normal functioning; detailed assumptions are listed in the table below:

Outcome	"With" Lovaas	"Without" Lovaas
Normal	20% - 60%	**10%**
Semi-dependent	30% - 70%	40% - 80%
Very Dependent	10%	10% - 50%

The Target Sensitivity Case in Table 7C shows that increasing the percentage of children "without" Lovaas who obtain normal functioning to 10% yields a net benefit from Lovaas treatment of $0.65 million (excluding wages), with an associated internal-rate-of-return of 28%. Sensitivity test results for various cases other than the Target Sensitivity Case are provided in cells surrounding the shaded cell in Table 7C.

Table 7D: Cost Savings of Lovaas Treatment By Outcome Distribution where **20%** of children "without" treatment are assumed to achieve normal functioning; detailed assumptions are listed in the table below:

Outcome	"With" Lovaas	"Without" Lovaas
Normal	20% - 60%	**20%**
Semi-dependent	30% - 70%	40% - 70%
Very Dependent	10%	10% - 40%

The Target Sensitivity Case in Table 7D shows that increasing the percentage of children "without" Lovaas who obtain normal functioning to 20% yields a net benefit from Lovaas treatment of $0.38 million (excluding wages), with an associated internal-rate-of-return of 22%. For cases surrounding the Target Sensitivity Case in Table 7D, net benefits from Lovaas treatment remain positive except in one case, when the "with" and "without" Lovaas outcome distributions are exactly the same (i.e., there is zero difference in effectiveness between the "with" and "without" treatment scenarios).

This can be explained by the attached Table 3B, where this specific case is explored in terms of annual cost comparison. The net loss is simply the present value of the incremental cost of "with" Lovaas vs "without" Lovaas over the three-year intervention period.

2.3 Increasing the proportion of "Very Dependent" under "With" Lovaas and the proportion of "Normal" under "Without" Lovaas

Table 7E: Cost Savings of Lovaas Treatment By Outcome Distribution where **30%** of children "with" treatment are assumed to remain very dependent and **20%** of children "without" treatment are assumed to achieve normal functioning; detailed assumptions are listed in the table below:

Outcome	"With" Lovaas	"Without" Lovaas
Normal	20% - 60%	**20%**
Semi-dependent	10% - 50%	40% - 50%
Very Dependent	**30%**	30% - 40%

The Target Sensitivity Case in Table 7E shows that increasing the percentage of children "without" Lovaas who obtain normal functioning to 20% and simultaneously increasing the percentage of children "with" Lovaas but remain very dependent to 30% yields a net benefit from Lovaas treatment of $0.30 million (excluding wages), with an associated internal-rate-of-return of 16%. For cases surrounding the Target Sensitivity Case in Table 7E, net benefits from Lovaas treatment remain positive except in one case, when the

"with" and "without" Lovaas outcome distributions are exactly the same (i.e., there is zero difference in effectiveness between the "with" and "without" treatment scenarios).

This can be explained by the attached Table 3C, where this specific case is explored in terms of annual cost comparison. The net loss is simply the present value of the incremental cost of "with" Lovaas vs "without" Lovaas over the three-year intervention period.

2.4 CBA Results of Additional (Downward) Sensitivity Tests

To facilitate the comparison of the Base Case result of our preliminary report with the Target Sensitivity Case results under the alternative scenarios examined in Sections 2.1 – 2.3, Table I below provides a summary of the related results contained in the associated tables.

Table I Net Benefits From Lovaas - Base Case vs Target Sensitivity Cases

Table	Net Benefits (Millions)*	IRR
7	$1.01	42.28%
7A	$0.83	34.97%
7B	$0.75	32.38%
7C	$0.65	27.81%
7D	$0.38	22.19%
7E	$0.30	16.19%

*: *Excluding Wages*

From Tables 7 (A-E) and Table I, we observe the following:

(a) Extending the sensitivity analysis further in the less favourable direction results in reduced net benefits from Lovaas treatment, however, in all of the Target Sensitivity Cases of Tables 7(A-E), net benefits remain substantially positive;

(b) When the surrounding cases in all five tables (Tables 7 (A-E)) are considered, only two yield negative benefits, which occur under the extreme assumption that there is zero difference in effectiveness between the "with" and "without" treatment scenarios;

(c) Of all these alternative scenarios, the internal-rate-of-return for the Target Sensitivity Case remains significantly higher than any of the hurdle rates[3] used in our preliminary CBA study.

Hence, skewing the sensitivity analysis even further towards the "downside" scenarios consolidates the "robustness" of our preliminary CBA results. This conclusion holds before considering the positive effect of increased quality-of-life discussed in Section 6 of our earlier reply to Green et al.

This concludes our supplementary reply.

Yours truly,

Douglas G. Hildebrand
Director

Att.

[3] Discussed in detail in Section 2.8.2 of our preliminary report.

Data Appendix: Description of Cost Derivation and Data Sources for Costs Used in CBA Study of Lovaas Treatment

Cost Item	Cost Used in CBA (Bolded Figures)	Detailed Cost Derivation	Data Source
Child Care			
Early Intensive Intervention (Lovaas Treatment Cost)	**$65,000**	Sum of the four major categories, rounded to the nearest $1,000 (For all 3 "with" treatment" Outcomes).	Therapists and consultant's service charges are based on information from B.C. families currently running programs in B.C. (as provided through counsel); Traveling expenses include airline ticket, hotel accommodations, car rentals and food/meals; Teaching materials include arrangement cost for professional workshops and seminars, etc.
	$28,080	- Junior Therapists @ $15/hour for 36 hours/week, 52 weeks/year	
	$7,800	- Senior Therapists @ $25/hour for 6 hours/week, 52 weeks/year	
	$16,500	- Consultant @1,500/day for minimum of 9 days/year, plus a minimum of $3,000 travel expenses/year	
	$13,095	- Teaching Materials @25% of the total of Therapists and Consultant service charges	
Respite Services	$3,700	Mid-point of cost range $3,200 and $4,100, rounded to the nearest $100.	Cost ranges are based on information from B.C. families currently running programs in B.C. (as provided through counsel)
Behaviour Support	$8,300	Directly based on cost amount provided, rounded to the nearest $100.	Based on information from B.C. families currently running programs in B.C. (as provided through counsel)
Supported Childcare	$9,600	Directly based on cost amount provided, rounded to the nearest $100.	Based on information from B.C. families currently running programs in B.C. (as provided through counsel)
Placement	$32,400	Based on the lower range of $2,700 - $7,500 monthly costs, for 12 months	Cost ranges are monthly residential costs per child based on Gateway Task Force Report, October 1997
Education			
Normal	$4,000	Based on cost amount provided. (For Outcome 1 only)	Ministry of Attorney General, Legal Service Branch, October 15, 1999 (Page 2)
Low incidence/high cost	$27,650	@ 70% of the cost quoted for 'Intensive Special' (For Outcome 2 only)	
Intensive Special	$39,500	$16,500 + A top-up amount, Top-up Amount = ($18,000 +$28,000)/2	$16,500 is the grant per child with autism or ASD provided by government, based on inofrmation provided by Ministry of Attorney General, Legal Service Branch, October 15, 1999 (Page 3); top-up amount is based on information provided by counsel
Adult Care			
Day Program	$26,400	@ $2,200/month for12 months	Based on information contained in the survey conducted by the Ministry of Children and Families Tab 4, Graph 3: Residential Services 1998/99, Types of Services and Associated Cost per day; Gateway Contracts - Residential
Residential (Family Home)	$71,820	@ 70% of the cost quoted for 'Residential (Group Home)' (For Outcome 2 only)	
Residential (Group Home)	$102,600	Sum of two kinds of residential placement for adults, namely, family homes ($22,630) and group home ($80,003), rounded to the nearest $100.	Both figures are based on information contained in the survey conducted by the Ministry of Children and Families Tab 4, Graph 4: Residential Services, Staffed Group Homes vs. Family Care

Table 2A Estimated Costs For The "Without" Lovaas Treatment Scenario

Cost Item	Outcome 1: Normal			Outcome 2: Semi-dependent			Outcome 3: Very Dependent		
	Annual Amount	Starting Age	Ending Age	Annual Amount	Starting Age	Ending Age	Annual Amount	Starting Age	Ending Age
Child Care									
Respite Services	$2,590	3	6	$2,590	3	19	$3,700	3	19
Behaviour Support	$5,810	3	6	$5,810	3	19	$8,300	3	19
Supported Childcare	$6,720	3	6	$6,720	3	12	$9,600	3	18
Placement	$22,680	3	6	$22,680	3	19	$32,400	3	19
Education									
Normal	$4,000	6	19	$0	N/A	N/A	$0	N/A	N/A
Low incidence/high cost	$0	N/A	N/A	$27,650	6	19	$0	N/A	N/A
Intensive Special	$0	N/A	N/A	$0	N/A	N/A	$39,500	6	19
Adult Care									
Day Program	$0	N/A	N/A	$18,480	19	LFT	$26,400	19	LFT
Residential (Family Home)	$0	N/A	N/A	$71,820	19	LFT	$0	N/A	N/A
Residential (Group Home)				$0	N/A	N/A	$102,600	19	LFT

LFT: lifetime

Table 3A Expected Annual Costs and Cost Savings - Base Case

	Costs for With Lovaas Treatment				Costs for Without Lovaas Treatment				Annual Cost Savings
	Annual Amount				Annual Amount				
Age Range	Normal	Semi-Dependent	Very Dependent	Expected Annual Cost	Normal	Semi-Dependent	Very Dependent	Expected Annual Cost	
Weight	40%	50%	10%	100%	0%	50%	50%	100%	
3 - 6	65,000	65,000	65,000	**65,000**	37,800	37,800	54,000	**45,900**	**-19,100**
6 - 12	4,000	65,450	93,500	**43,675**	4,000	65,450	93,500	**79,475**	**35,800**
12 - 18	4,000	58,730	93,500	**40,315**	4,000	58,730	93,500	**76,115**	**35,800**
18 - 19	4,000	58,730	83,900	**39,355**	4,000	58,730	83,900	**71,315**	**31,960**
19 +	0	90,300	129,000	**58,050**	0	90,300	129,000	**109,650**	**51,600**

Table 3B Expected Annual Costs and Cost Savings

- Outcome Distribution as 20/70/10 for both "with" and "without" Lovaas Treatment

	Costs for With Lovaas Treatment				Costs for Without Lovaas Treatment				Annual Cost Savings	PV Cost Savings
	Annual Amount				Annual Amount					
Age Range	Normal	Semi-Dependent	Very Dependent	Expected Annual Cost	Normal	Semi-Dependent	Very Dependent	Expected Annual Cost		
Weight	20%	70%	10%	100%	20%	70%	10%	100%		
3 - 6	65,000	65,000	65,000	**65,000**	37,800	37,800	54,000	**39,420**	-25,580	-72,879
6 - 12	4,000	65,450	93,500	**55,965**	4,000	65,450	93,500	**55,965**	**0**	**0**
12 - 18	4,000	58,730	93,500	**51,261**	4,000	58,730	93,500	**51,261**	**0**	**0**
18 - 19	4,000	58,730	83,900	**50,301**	4,000	58,730	83,900	**50,301**	**0**	**0**
19 +	0	90,300	129,000	**76,110**	0	90,300	129,000	**76,110**	**0**	**0**

Table 3C Expected Annual Costs and Cost Savings

- Outcome Distribution as 20/50/30 for both "with" and "without" Lovaas Treatment

	Costs for With Lovaas Treatment				Costs for Without Lovaas Treatment				Annual Cost Savings	PV Cost Savings
	Annual Amount				Annual Amount					
Age Range	Normal	Semi-Dependent	Very Dependent	Expected Annual Cost	Normal	Semi-Dependent	Very Dependent	Expected Annual Cost		
Weight	20%	50%	30%	100%	20%	50%	30%	100%		
3 - 6	65,000	65,000	65,000	**65,000**	37,800	37,800	54,000	**42,660**	-22,340	-63,648
6 - 12	4,000	65,450	93,500	**61,575**	4,000	65,450	93,500	**61,575**	0	0
12 - 18	4,000	58,730	93,500	**58,215**	4,000	58,730	93,500	**58,215**	0	0
18 - 19	4,000	58,730	83,900	**55,335**	4,000	58,730	83,900	**55,335**	0	0
19 +	0	90,300	129,000	**83,850**	0	90,300	129,000	**83,850**	0	0

Table 7A Cost Savings of Lovaas Treatment By Outcome Distributions

Target Sensitivity Case (Shaded)			
"With" Lovaas		"Without" Lovaas	
40%	Normal	0%	Normal
40%	Semi-dependent	60%	Semi-dependent
20%	Very Dependent	40%	Very Dependent

Excluding Wages

"With" Lovaas Outcome Distribution	"Without" Lovaas Outcome Distribution				
	0/40/60	0/50/50	0/60/40	0/70/30	0/80/20
20/60/20	646,773	558,862	470,951	383,040	295,129
30/50/20	828,470	740,559	652,648	564,737	476,826
40/40/20	1,010,166	922,255	834,344	746,434	658,523
50/30/20	1,191,863	1,103,952	1,016,041	928,130	840,219
60/20/20	1,373,559	1,285,649	1,197,738	1,109,827	1,021,916

Including Wages

"With" Lovaas Outcome Distribution	"Without" Lovaas Outcome Distribution				
	0/40/60	0/50/50	0/60/40	0/70/30	0/80/20
20/60/20	765,892	654,530	543,167	431,805	320,442
30/50/20	960,245	848,883	737,520	626,158	514,796
40/40/20	1,154,598	1,043,236	931,873	820,511	709,149
50/30/20	1,348,951	1,237,589	1,126,226	1,014,864	903,502
60/20/20	1,543,304	1,431,942	1,320,580	1,209,217	1,097,855

Note: IRR for the Target Sensitivity Case = 34.97%

Table 7B Cost Savings of Lovaas Treatment By Outcome Distributions

Target Sensitivity Case (Shaded)			
"With" Lovaas		"Without" Lovaas	
40%	Normal	0%	Normal
30%	Semi-dependent	60%	Semi-dependent
30%	Very Dependent	40%	Very Dependent

Excluding Wages

"With" Lovaas Outcome Distribution	"Without" Lovaas Outcome Distribution			
	0/40/60	0/50/50	0/60/40	0/70/30
20/50/30	563,478	475,567	387,656	299,745
30/40/30	745,174	657,263	569,352	481,442
40/30/30	926,871	838,960	751,049	663,138
50/20/30	1,108,567	1,020,657	932,746	844,835
60/10/30	1,290,264	1,202,353	1,114,442	1,026,531

Including Wages

"With" Lovaas Outcome Distribution	"Without" Lovaas Outcome Distribution			
	0/40/60	0/50/50	0/60/40	0/70/30
20/50/30	659,145	547,783	436,420	325,058
30/40/30	853,498	742,136	630,773	519,411
40/30/30	1,047,851	936,489	825,127	713,764
50/20/30	1,242,204	1,130,842	1,019,480	908,117
60/10/30	1,436,557	1,325,195	1,213,833	1,102,470

Note: IRR for the Target Sensitivity Case = 32.38%

Table 7C Cost Savings of Lovaas Treatment By Outcome Distributions

Target Sensitivity Case (Shaded)			
"With" Lovaas		"Without" Lovaas	
40%	Normal	10%	Normal
50%	Semi-dependent	60%	Semi-dependent
10%	Very Dependent	30%	Very Dependent

Excluding Wages

"With" Lovaas Outcome Distribution	"Without" Lovaas Outcome Distribution				
	10/40/50	10/50/40	10/60/30	10/70/20	10/80/10
20/70/10	460,461	372,550	284,639	196,728	108,817
30/60/10	642,158	554,247	466,336	378,425	290,514
40/50/10	823,854	735,943	648,032	560,121	472,211
50/40/10	1,005,551	917,640	829,729	741,818	653,907
60/30/10	1,187,247	1,099,336	1,011,426	923,515	835,604

Including Wages

"With" Lovaas Outcome Distribution	"Without" Lovaas Outcome Distribution				
	10/40/50	10/50/40	10/60/30	10/70/20	10/80/10
20/70/10	566,923	455,561	344,199	232,836	121,474
30/60/10	761,277	649,914	538,552	427,189	315,827
40/50/10	955,630	844,267	732,905	621,542	510,180
50/40/10	1,149,983	1,038,620	927,258	815,896	704,533
60/30/10	1,344,336	1,232,973	1,121,611	1,010,249	898,886

Note: IRR for the Target Sensitivity Case = 27.81%

Table 7D Cost Savings of Lovaas Treatment By Outcome Distributions

Target Sensitivity Case (Shaded)			
"With" Lovaas		"Without" Lovaas	
40%	Normal	20%	Normal
50%	Semi-dependent	50%	Semi-dependent
10%	Very Dependent	30%	Very Dependent

Excluding Wages

"With" Lovaas Outcome Distribution	"Without" Lovaas Outcome Distribution			
	20/40/40	20/50/30	20/60/20	20/70/10
20/70/10	190,854	102,943	15,032	-72,879
30/60/10	372,550	284,639	196,728	108,817
40/50/10	554,247	466,336	378,425	290,514
50/40/10	735,943	648,032	560,121	472,211
60/30/10	917,640	829,729	741,818	653,907

Including Wages

"With" Lovaas Outcome Distribution	"Without" Lovaas Outcome Distribution			
	20/40/40	20/50/30	20/60/20	20/70/10
20/70/10	261,208	149,846	38,483	-72,879
30/60/10	455,561	344,199	232,836	121,474
40/50/10	649,914	538,552	427,189	315,827
50/40/10	844,267	732,905	621,542	510,180
60/30/10	1,038,620	927,258	815,896	704,533

Note: IRR for the Target Sensitivity Case = 22.19%

Table 7E Cost Savings of Lovaas Treatment By Outcome Distributions

Target Sensitivity Case (Shaded)			
"With" Lovaas		"Without" Lovaas	
40%	Normal	20%	Normal
30%	Semi-dependent	50%	Semi-dependent
30%	Very Dependent	30%	Very Dependent

	Excluding Wages	
"With" Lovaas	"Without" Lovaas Outcome Distribution	
Outcome Distribution	20/40/40	20/50/30
20/50/30	24,263	-63,648
30/40/30	205,959	118,048
40/30/30	387,656	299,745
50/20/30	569,352	481,442
60/10/30	751,049	663,138

	Including Wages	
"With" Lovaas	"Without" Lovaas Outcome Distribution	
Outcome Distribution	20/40/40	20/50/30
20/50/30	47,714	-63,648
30/40/30	242,067	130,705
40/30/30	436,420	325,058
50/20/30	630,773	519,411
60/10/30	825,127	713,764

Note: IRR for the Target Sensitivity Case = 16.19%

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DOUGLAS G. HILDEBRAND, B.A. (Economics), M.B.A.

A. Overview Résumé – Litigation Economics

Mr. Hildebrand holds a B.A. Economics (with Distinction) from the University of Saskatchewan (1969) and a Master of Business Administration (M.B.A.) from the University of British Columbia (1971).

During the 1968 to 1972 period, Mr. Hildebrand held economic research positions with the federal government and the University of British Columbia. Since 1972, Mr. Hildebrand has been practising as a Senior Economic Consultant based in Vancouver, and has been practising at the Partner level since 1975. He has been Director of Columbia Pacific Group, a management and economic consulting firm, since 1980.

A primary area of practice includes economic and financial assessments for litigation, regulatory and project approval purposes (courts, administrative and regulatory tribunals, arbitration hearings, government review agencies). Mr. Hildebrand's consulting activities include assessment of damages in personal injury and fatality cases; and economic assessments of major projects and policies (e.g., cost-benefit analysis), including major project facility applications before Canadian regulatory authorities and review agencies.

Mr. Hildebrand has undertaken over 1,000 assignments since the mid-1980s involving economic and financial assessments of damage claims for personal injury and fatality cases. Assessments have included earnings projections for educational referent groups and a broad range of occupations inclusive of statistical labour market contingencies; income allocations in fatality cases for the purpose of determining loss of financial support; assessment of household services; income and cost of care multipliers; present value of care costs; management fee and tax gross-up simulations; critique of expert reports; and expert testimony in B.C. Supreme Court on numerous occasions.

Mr. Hildebrand is a member of professional economist associations including member and Past President of the Association of Professional Economists of British Columbia.

Mr. Hildebrand is also trained as a commercial arbitrator/mediator, practises as a mediator of personal injury cases and is a member of the BC Arbitration and Mediation Institute and the Commercial Mediation Association.

This is Exhibit A *"referred to in the affidavit of* Douglas G. Hildebrand *sworn before me, at* Vancouver, BC *this* 23rd *day of* March *20* 00

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DOUGLAS G. HILDEBRAND – Résumé (Cont'd.)

B. Cost-Benefit Analysis Experience

Mr. Hildebrand is experienced in undertaking cost-benefit analysis (CBA) and/or discounted-cash-flow (DCF) analysis of proposed capital projects and policies covering most key sectors of the economy.

CBA assessments have been undertaken by Mr. Hildebrand in accordance with provincial (British Columbia) and/or federal government guidelines on cost-benefit analysis. Net benefits have been determined and tested under a range of assumptions including costs, discount rates, markets (volume, prices) and environmental externalities (e.g., air pollution). Adjustments have been applied to labour and non-market resources, where appropriate, ("shadow prices") in the valuation of costs and benefits. Examples of CBA and related economic/financial assessments undertaken by Mr. Hildebrand include the following:

Representative Projects – Economic/Financial Analysis

- Cost-Benefit Analysis of the Vancouver Island Natural Gas Pipeline	Inland Natural Gas Co. Ltd.
- Cost-Benefit Analysis of Oil Transportation Projects	TransMountain Oil Pipeline Co.
- Cost-Benefit Analysis of Aluminum Smelter and Hydro Power Complex	Aluminum Company of Canada, Ltd
- Cost-Benefit Analysis of Railway Bridge Options (with Crippen)	Public Works Canada
- Cost-Benefit Analysis of Relocating Rail Lines in Vancouver's Urban Core	City of Vancouver
- Cost-Benefit Analysis of Natural Gas Vehicle Use	BC Hydro
- Cost-Benefit Analysis of Natural Gas Exports	Pan Alberta Gas

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Representative Projects – Economic/Financial Analysis

- Cost-Benefit Analysis of Natural Gas Processing Facilities in Northeast B.C.	Westcoast Energy Inc.
- Cost-Benefit analysis of a Hydroelectric Project	B.C. Hydro
- Cost-Benefit Analysis of Airport Road/Ferry Improvements	City of Prince Rupert
- Financial (DCF) Valuation of the Line Creek Coal Mine	Shell Canada Resources
- Financial (DCF) Valuation of the Quintette Coal Mine	Denison Mines Ltd.
- Financial (DCF) Valuation of the Balmer and Greenhills Coal Mines	Westar Mining Ltd.
- Financial (DCF) Valuation of Ridley Terminals	Ridley Terminals Inc.
- Cost-Benefit Valuation of the UBC Co-generation Project	University of British Columbia
- Cost-Benefit Valuation of Electricity Exports from B.C.	B.C. Utilities Commission
- Cost-Benefit Valuation of Private Hydro Projects in B.C.	Iskut Pulpower; Canadian/French Consortium
- Cost-Benefit Valuation of Gold-Copper Mine in B.C.	Private Mining Company
- Financial (DCF) Valuation of Independent Power Producer	Private Arbitration
- Cost-Benefit Valuation of Non-Power Uses of Hydroelectric Reservoir	BC Hydro
- Financial Impact of Container Port Expansion at Roberts Bank	Vancouver Port Corp; Corporation of Delta
- Cost-Benefit Analysis of Strategies to Enhance Pacific Rim Traffic Links through Vancouver International Airport	Transport Canada

C. *Expert Witness Appearances – Economic/Financial Analysis*

- B.C. Supreme Court (numerous appearances)
- Federal Court of Canada
- Superior Court, State of Washington
- Assessment Appeal Board of B.C.
- Expropriation Compensation Board of B.C.
- B.C. Utilities Commission
- Manitoba Public Utilities Board
- National Energy Board
- National Farm Products Marketing Council
- Private Commercial Arbitrations
- Environmental Assessment Hearing