



# Seatterra – Projected Cost Allocation Scenarios

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Independent Analysis for the  
Canadian Taxpayers Federation

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## 1. Contents

2.	List of Tables .....	7
3.	Executive Summary .....	8
4.	Purpose of Analysis.....	9
5.	Limitations of analysis .....	9
6.	Assumptions / Inputs.....	9
7.	Quoted material from other sources.....	10
8.	Discussion – Present Value, Discount Rate, Nominal Dollars .....	10
9.	Capital Costs .....	11
a.	What is the total reported capital cost of the project? .....	11
b.	When are the reported capital costs incurred?.....	12
c.	Is the advertised capital cost realistic? .....	12
d.	Harmonized Sales Tax and Provincial Sales Tax.....	14
10.	Operating Costs .....	14
11.	Apportioning Costs .....	14
12.	Projected growth in dwellings .....	16
13.	Municipal Financing Authority Borrowing .....	19
a.	MFA Borrowing and timing of capital outlay.....	21
14.	Impact of incorporating Federal and Provincial contributions to the project’s true cost .....	21
15.	Cost allocation – Costs incurred collectively by the CRD area affected by Seaterra .....	23
a.	Selection of amortization period of capital cost loan .....	23
b.	A fictitious scenario: Pay-as-you-go, Zero-debt scenario .....	24
c.	20-year debt scenario .....	24
d.	25-year debt scenario .....	25
e.	30-year debt scenario (longest possible term) .....	26
f.	30-year debt scenario, no senior government funding .....	28
16.	Allocation of Operational Costs .....	30
a.	Estimated annual property tax for operational costs .....	30
b.	Capitalized operational costs.....	31
17.	Joint capital / operational costs.....	32
18.	Cost allocation to local municipalities .....	33
a.	Reconciliation to October 10, 2012 CRD Recommendation .....	35
19.	The impact of Seaterra municipalities opting out of the project.....	38
20.	Property taxation of business land owners .....	39
21.	Conclusions.....	41
22.	Appendix A – CRD Municipal Mill Rates, 2013.....	42
23.	Appendix B – BC Assessment Roll Values, 2013 .....	43
24.	Appendix C – Occurrences for property taxation purposes, 2013.....	44
25.	Appendix D – Collections from property taxes by municipalities, 2013 .....	45
26.	Appendix E – Average residential / business assessments, 2013 .....	46

27. References .....	47
28. Acknowledgements .....	48

## 2. List of Tables

Table 1 - Projected capital costs of Seaterra Program.....	12
Table 2 - Projected capital costs over time (CRD’s share) .....	12
Table 3 - Projected and Allocation of Design Capacities (August 3, 2012 recommendation) .....	16
Table 4 - Proposed Debt Servicing Allocation (August 3, 2012 recommendation).....	16
Table 5 - Population, Dwelling growth from 2001 to 2011 (Statistics Canada) .....	17
Table 6 - Sewered Equivalent Population Projections.....	18
Table 7 - Growth Rate Estimates, to 2030 .....	19
Table 8 - Assumed Growth from 2030 and the future.....	19
Table 9 - Committed Federal and Provincial Funding.....	21
Table 10 - Sample yearly levy for Seaterra capital costs (Pay-as-you-go, no debt) and tax burden for the average CRD SFD/Strata property owner .....	24
Table 11 - Sample yearly levy for Seaterra capital costs (20-year debt amortization scenario) and tax burden for the average CRD SFD/Strata property owner.....	25
Table 12 - Sample yearly levy for Seaterra capital costs (25-year debt amortization scenario) and tax burden for the average CRD SFD/Strata property owner.....	26
Table 13 - Sample yearly levy for Seaterra capital costs (30-year fully-extended debt amortization scenario) and tax burden for the average CRD SFD/Strata property owner .....	27
Table 14 - Sample yearly levy for Seaterra capital costs (30-year fully-extended debt amortization scenario) and tax burden for the average CRD SFD/Strata property owner, without senior government funding.....	29
Table 15 - Operational Cost impact on Seaterra average residential property taxes.....	30
Table 16 - Capitalized costs of operational expenses under different interest rates and time spans.....	31
Table 17 - Total costs to Seaterra residents, assuming 30 year capital amortization scenario .....	32
Table 18 - Apportionment between municipalities, as recommended October 10, 2012 .....	33
Table 19 - SFD tax bill per municipality, zero-growth assumption .....	34
Table 20 - Assumed growth rates .....	34
Table 21 - SFD tax bill per municipality, variable growth projection .....	35
Table 22 - CRD Allocation of Estimated Annual Charges (2017), from October 10, 2012 Supplementary to Item 6 report .....	37
Table 23 – CRD estimated cost per household in 2017, from October 10, 2012 Supplementary to Item 6 report.....	37
Table 24 - Impact of municipality withdrawing .....	38
Table 25 - Impact of business tax on residential rates (Capital Costs) .....	39
Table 26 - Capital and Operating Charges with business taxes .....	40

### 3. Executive Summary

The Seaterra Program encompasses seven municipalities. Collectively, the seven municipalities must pay for the project's capital and operational costs minus significant funding given by the federal and provincial government. The federal and provincial funding is not "free" from the taxpayer's perspective, but is "free" from the CRD's perspective. Costs would be prohibitive without federal and provincial funding.

As most of the costing was performed with the assumption of a project start in 2010, the project's advertised cost is likely to increase nearly \$50 million due to inflation alone. The federal and provincial funding is not increasing in proportion to capital costs, hence the CRD will be solely responsible for any cost overruns.

Capital costs incurred are funded by the CRD borrowing money from the Municipal Finance Authority (MFA). MFA rates are presently low on a historical basis and it is likely decision-makers will choose the lowest monthly cost option by taking the longest term loan of 30 years. There is risk that interest rates rising in 10 years will affect long-term costs of the project.

When all capital has been borrowed, the capital cost burden to pay interest and amortize the debt is \$221/year for an average single family dwelling (SFD) owner in the CRD. As positive growth is projected in the CRD, this burden will decrease slightly on a per-dwelling basis until the loan is paid off.

Operating costs are incurred when the project is built. These costs are estimated to slowly rise over time due to cost inflation and capacity utilization, partially offset by regional growth. The operational burden of an average SFD owner would be \$189/year after the project is finished.

The combined average burden would thus be \$410/year per average SFD owner in the CRD.

Seaterra capital and operating costs will have to be apportioned to member municipalities. There is a recommended formula in a October 10, 2012 CRD committee meeting that distributes capital and operating costs amongst member municipalities. Analysis of the committee recommendation results in Esquimalt and Victoria residents paying significantly more than other municipalities despite committee documentation indicating a flatter payout structure between municipalities. This paper could not reconcile CRD committee estimated costs per household or determine how such numbers were derived.

Finally, property taxation of businesses has not been considered elsewhere. This analysis concludes if Seaterra capital and operating costs were distributed at a 2:1 ratio between residents and businesses (which is presently done on a dollar basis), that upon Seaterra's completion, the average SFD owner would pay \$137/year less, while the average business property owner would pay \$2,134/year, assuming positive CRD growth.



## 4. Purpose

The purpose of this document is to analyze publicly available information concerning the Seaterra Program (formerly known as the Core Area Wastewater Treatment Program) and project potential financial impacts to residents and businesses within the affected areas of the Capital Regional District (CRD).

Geographical references to “member municipalities” or “CRD area” strictly refer to the municipal boundaries of Colwood, Esquimalt, Oak Bay, Saanich, Victoria and View Royal and not other areas of the whole CRD (e.g. Sooke, Port Renfrew, etc.).

## 5. Limitations of analysis

For clarity, this analysis does not consider the following:

- Costs concerning the centralized design of the project, as opposed to decentralized designs that were earlier considered by the CRD;
- Impacts or risks of Inflow and Infiltration (I&I);
- Modeling of extreme risks (e.g. earthquake, tsunami, etc.);
- Any expansions of the sewage system beyond the existing proposal;
- The impact of whether or not First Nation Band(s)<sup>1</sup> will join the Seaterra Program.

## 6. Assumptions and inputs

- The federal grant of \$253.4 million and provincial grant of \$248.0 million (1) is fully exercised and is “free money” in the perspective of the CRD (see section 14 for discussion), and this money is proportionately awarded as CRD capital expenditures are made;
- The design capacity of the sewage system is considered adequate for the life of the sewage system;
- The analysis utilizes the “traditional” option (rather than the Hybrid or P3 options in the 2010 E&Y business case document (2)) as summarized in Amendment 8 of the Core Area Liquid Waste Management Plan (3);
- The 2013 BC Assessment roll data uses net assessed value (equal to gross assessed value minus exemptions granted by member municipalities);
- Relative property values in member municipalities do not change<sup>2</sup>, but growth factors in the inclusion of extra assessment value;

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<sup>1</sup> Notably, Esquimalt First Nation was the only First Nation in British Columbia to not allow Statistics Canada census workers on the reservation.

- Property classes of Utilities, Supportive Housing, Major Industry, Light Industry, Managed Tree Farms, Recreational/Non-Profit and Farms are not allocated costs<sup>3</sup>.
- Revenues associated with the Resource Recovery Centre (RRC) at Hartland are not factored;
- An assumption First Nation(s)<sup>4</sup> do not join the Seaterra Program;
- Costs incurred to date for the Seaterra Program, beyond those as outlined in the various businesses cases and documentation, are not included in this analysis.

## 7. Quoted material from other sources

Material that has been directly quoted from other sources will be shaded in grey. Data obtained directly from CRD reports and presented without alteration will be indicated by the table caption shaded in grey. Tables with mixed data obtained from CRD reports and generated data will have the table captions underlined.

## 8. Discussion – Present Value, Discount Rate, Nominal Dollars

There is a magnitude of confusion between staff reports, business case studies and what is communicated to the public with regards to the actual cost of the project. This section will attempt to explain the concepts of present value, the discount rate, nominal and real dollars.

One dollar spent today equates to one dollar spent. If you were committed to spending \$100 a year from now, that liability would represent less than \$100 worth of value today, simply because you could obtain a risk-free return over that one year period. At current interest rates, you could invest \$100 in a 1-year treasury bill and earn a 1% return, so the \$100 liability due in 1 year is actually worth just over \$99.01<sup>5</sup> in the present.

If the \$100 were earmarked for something higher-yielding (e.g. pre-paying a debt), then the present value of that liability would reduce accordingly; for example, if your effective rate of interest was 5%, then your present value would be \$95.24 for a break-even transaction.

The present value of a liability that will occur in the future depends on when the liability is due and the *discount rate* used to calculate the liability. A liability that is to be paid later in the

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<sup>2</sup> Property taxation is a topic that confuses most people with no background in municipal finance; if an individual property assessment goes up, it does not necessarily imply that it will be taxed more.

<sup>3</sup> These seven property classes combine to be 0.446% of the total assessment roll. In contrast, Residential is 86.7% and Business is 12.9% of total CRD assessment roll.

<sup>4</sup> Their projected impact on capacity utilization was 0.68%.

<sup>5</sup> It is not 99 cents exactly because 99 cents invested at 1% will only yield 0.99 cents, which is 0.01 cents short of the dollar.

future is valued less today than a liability to be paid sooner. The present value of the liability also decreases with an increase in the discount rate.

While there can be reasonable cost estimations performed in nominal (money spent in the year such an expense occurs) terms, determining the appropriate discount rate to employ is a somewhat arbitrary decision and this is touched upon in some of the reports.

As explained in the Peer Review Team Report (4) (page 6-6), there are multiple methods for determining the discount rate, but the rate should not be that at which funds can be borrowed from the MFA; rather it should reflect the risks related to the project. The business case (2) uses a rate of 7.5%, which reflects a guideline by Partnerships BC (5). The reason for this is that the business case reports were attempting to make comparisons between traditional and private delivery of service and hence it would be inappropriate to use the cost of capital (debt) as a discount rate.

The financial treatment of discount rates has impact in many different fields; the most prominent of them is the discussion of defined-benefit pension systems, where lower discount rates create ever-increasing pension liabilities.

In addition, there is some degree of confusion between nominal costs (which is the actual dollar value of expenses in the year it is incurred) versus real costs (which is the inflation-adjusted cost). The translation between nominal cost and real cost depends on the assumption taken for inflation between the two dates.

As much as possible, this report tries to relate costs in an “apples-to-apples” manner and explicitly tries to delineate the difference between a present value cost and a nominal cost. To avoid confusion, any exceptions will be noted in this report. The aim of this report is to ensure that reported figures are translated into relevant 2013 dollars.

## **9. Capital Costs**

### **a. What is the total reported capital cost of the project?**

The current price tag advertised for the capital costs of the Seaterra Program is \$782,700,000 in nominal 2010 dollars. Net of federal (\$253.4 million) and provincial (\$248.0 million) contributions, the CRD’s share is \$281,300,000.

<b>Description</b>	<b>Core Area Program Costs</b>
Design/Engineering and Construction	\$ 631,250,000
Administration, Program Management and Miscellaneous	43,912,900
Preliminary Inflation Estimate	67,516,300
<b>Total Eligible Costs</b>	<b>742,679,200</b>
Land Purchase	13,000,000
Interim Financing Estimate	27,006,600
<b>Total Ineligible Costs</b>	<b>40,006,600</b>
<b>TOTAL COSTS (Eligible and Ineligible)</b>	<b>\$ 782,685,800</b>

**Table 1 - Projected capital costs of Seaterra Program**

This number was confirmed (the “McLoughlin Option”) in a document presented to the Core Area Liquid Waste Management Committee (CALWMC) on June 23, 2010.

The CRD intends to borrow the majority of this amount as expenses are incurred.

**b. When are the reported capital costs incurred?**

According to the business case, assuming a 2010 start to construction, CRD expenses are projected as follows, with percentage of total costs per year below:

<b>CRD Annual Contributions (\$ 000's)</b>								
<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>TOTALS</b>	
\$ 9,602	\$ 16,425	\$ 22,579	\$ 69,188	\$ 71,990	\$ 66,240	\$ 31,542	\$ 287,566	
3.3%	5.7%	7.9%	24.1%	25.0%	23.0%	11.0%	100.0%	

**Table 2 - Projected capital costs over time (CRD’s share)<sup>6</sup>**

As the project has been delayed, the figures will have to be translated into future dollars by at least three years; this is discussed in the subsequent section.

**c. Is the advertised capital cost realistic?**

The Peer Review (page 6-7) (4) makes reference to construction inflation. This figure was estimated to be 2%. It stated:

“In the Business Case, construction costs have been escalated on the basis of 2% per year to the mid-point of construction (2014). This estimate generally appears consistent with expectations for British Columbia for the near term, but may be on the low side for the out years.”

<sup>6</sup> The \$287.6 million figure does not reconcile with the advertised \$281.3 million because the federal and provincial funding assumptions in 2010 were different than what was subsequently announced. The total cost of the project, however, corresponds to the present situation.

As the amended business case (6) (September 2, 2010) cost estimates appear to have the project completion date on 2016, there appears to be an absence of an update of the relevant construction figures. Conservatively<sup>7</sup>, three years of inflation should be incorporated into the figures to adequately express costs in 2013 dollars. As the total project cost of \$782.7 million was derived from 2010 studies (and although never explicitly stated in the reports, likely implies nominal costs incurred would start from 2010), it would be prudent to factor in three years of inflation into the initial price tag, or a total of approximately \$830.6 million<sup>8</sup>.

Most of the significant bidding on the Seaterra Program has not occurred and these increased costs would not be confirmed until such bids were tendered.

Public announcements have clearly indicated the CRD is solely responsible for any cost overruns on the project. Although the federal and provincial agencies can allocate further funding to the project, there is no guarantee they will do so and hence this report does not speculate on any increase in senior government funding.

The \$782.7 million original estimate already included \$67.5 million in preliminary inflation estimates, but this is to account for inflation between the time construction starts to the completion of the project. This preliminary inflation estimate appears to be prudent.

Finally, the biosolids facility at the Hartland Landfill facility is expected to incur extra costs beyond the projected amount due to the initial assumption to deposit biosolids on land being rejected in a October 30, 2013 CRD meeting; options are being explored that will likely result in increased costs. Although this development is on-going, this analysis does not assume any higher costs for the Hartland facility's waste disposal. According to the staff memo (Review of Regional Biosolids Management Policy):

If the CRD is unable to find any users for an industrial feedstock, then a waste-to-energy facility, at an additional cost of \$38 million, would have to be constructed at Hartland.

As this additional cost has not been authorized, this analysis will not speculate further on whether it will or will not occur.

To conclude, this analysis assumes the total capital cost of the project will be \$830.6 million in 2013 nominal dollars, with the CRD's share being \$329.2 million. The difference from the advertised capital cost is strictly due to inflation since the project was last costed in 2010.

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<sup>7</sup> The Peer Review continues to explain how an analysis by BTY Group indicates that 2% may be a low projection of construction inflation in future years.

<sup>8</sup> Inflation indices use compounding annual rates, hence 2% inflation yields a 6.12% increase over three years.

#### **d. Harmonized Sales Tax and Provincial Sales Tax**

As the business case reports were finalized in 2010, British Columbia was prepared to transition to the Harmonized Sales Tax (HST) and the original costs excluded the 1.75% non-refundable portion of HST, representing approximately \$16 million extra. Subsequently, the HST has been repealed and therefore no longer a risk.

### **10. Operating Costs**

The yearly operating cost advertised for the Seatera Program is \$14,571,000 in 2010 dollars, based on an estimate by Stantec in June 2010 (3). This figure assumes full capacity of the sewage system is utilized and hence the actual operating costs will likely be less during the initial years after construction is completed. The system is initially expected to handle 82% of its design flow.

The Stantec report assumes 1.1% of capital costs will be withheld for a basic reserve for major capital repairs.

Applying the same inflation framework as discussed in the prior section would result in a \$15,463,000 annual cost in 2013 dollars.

There are concerns with certain variables that will negatively impact cost estimates. For example, the November 26, 2013 decision by BC Hydro to escalate electricity charges by 28% over the next five years will directly impact the sewage pumping cost. In addition, a significant portion of operational costs will be staffing and these costs will be subject to other pressures (collective bargaining agreements, labour market pressures, etc.).

It is beyond the scope of this analysis to quantify and determine whether these projected costs will materialize as reported, but the assumption will be that such costs will be subject to 2% inflation in the long run.

### **11. Apportioning Costs**

The Peer Review Report (4) (page 6-13) states the following:

A detailed affordability analysis needs to be completed to determine the extent of the final impact on the participating municipalities and on the taxpayers.

There does not appear to be a document with this detailed analysis. The Peer Review appears to make reference to "\$250 to \$450 per year per equivalent residential user". The May 2011 CRD Sewage Plan (3) (section 11.2) states, "the current estimate of annual cost per household,

assuming two-thirds senior government funding, varies among municipalities from \$210 to \$500.”

The capital and operation cost components will involve separate treatment. Based off of existing municipal tax structure, there is likely to be a separate municipal fee for sewage collection and one for CRD-related sewage expenses. For example, the City of Victoria currently has a sewer rate and a CRD sewer rate<sup>9</sup>, both of which have separate rate structures applied.

Municipalities are responsible for the upkeep of their local sewer systems and the analysis of local municipal sewage expenses is outside the scope of this paper. This point is made to not confuse the jurisdiction of the two sewage systems.

Adding complexity to this analysis is that certain municipalities have vastly different local sewage infrastructures. For example, Colwood has approximately a quarter of their population<sup>10</sup> on municipal sewage and the remainder on septic, while the majority of Oak Bay and Victoria are on municipal sewer. The internal situations of various CRD municipalities will have a material impact on negotiations of the rate structure that will be charged to end users. In addition, it remains to be negotiated between CRD participants what degree of capital costs will be paid by current users versus future ones.

While cost allocation formulas between municipalities are to be finalized, we will consider the scenario where capital and operational costs are apportioned to the property assessment base even though operational costs will be based on projected sewage usage.

A cost analysis of “per dwelling” or “per person” may not render an “apples-to-apples” comparison given the tools that municipalities have to charge land owners, which is directly through mill rates applied on assessed property values amongst different property classes. Using dwelling or population totals is sufficient for a first-pass estimate of costs, but cannot translate into mill rate impacts. In addition, per-capita amounts do not reflect what costs may be passed onto business or industrial land owners.

The last status of the allocation model between municipalities is the October 10, 2012 memorandum to the Core Area Liquid Waste Management Committee (7) which proposes charging member municipalities a percentage based off of the average dry weather flows and average annual flows. The table below contained a significant caveat that municipalities, in particular, Colwood and View Royal, needed to confirm their totals.

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<sup>9</sup> In the City of Victoria, the CRD sewage rate is currently \$0.798 per cubic metre, while the (local) sewage rate is \$0.678 per cubic metre.

<sup>10</sup> <http://www.colwood.ca/city-services/engineering/sewer-services>, January 2014.

Table 3 contains the CRD projections from the October 10, 2012 report, while Table 4 calculates the percentage allocation to capital and debt costs in accordance with the report, and makes an adjustment to exclude the impact of First Nations.

	Projected Capacity in 2030 ADWF (ML/day)	Allocation of Design Capacity ADWF (ML/day)	% of Total	Conversion Factor to AAF	AAF (ML/day)	% of Total
Colwood	4.12	4.70	4.35%	1.046	4.92	3.98%
Esquimalt	6.22	7.10	6.57%	1.161	8.24	6.67%
Langford	12.37	14.12	13.07%	1.013	14.30	11.58%
Oak Bay	5.80	6.62	6.13%	1.304	8.63	6.99%
Saanich	28.81	32.89	30.45%	1.13	37.17	30.09%
Victoria	33.55	38.30	35.46%	1.197	45.85	37.11%
View Royal	3.10	3.54	3.28%	1.028	3.64	2.95%
First Nations	0.64	0.73	0.68%	1.08	0.79	0.64%
Total	94.61	108.00	100.00%		123.53	

**Table 3 - Projected allocation of design capacities<sup>11</sup>**

	% Allocation of Debt Servicing Costs	% Allocation of Debt Servicing Costs (w/o FNs)	% Allocation of Operating Costs	% Allocation of Operating Costs (w/o FNs)
Colwood	4.24%	4.27%	4.28%	4.31%
Esquimalt	6.60%	6.65%	6.59%	6.64%
Langford	12.63%	12.71%	12.78%	12.86%
Oak Bay	6.39%	6.43%	6.30%	6.34%
Saanich	30.34%	30.55%	30.38%	30.58%
Victoria	35.95%	36.19%	35.79%	36.03%
View Royal	3.18%	3.20%	3.21%	3.23%
First Nations	0.67%	0.00%	0.67%	0.00%

**Table 4 - Proposed debt servicing and operating cost allocation**

Section 15 contains further analysis on how these apportion fractions are applied.

## 12. Projected growth in dwellings

One method the Seaterra Program can use to reduce costs on a per-capita or per-dwelling basis is to increase the growth (by population, or by residence, respectively) within the area it is servicing.

Statistics Canada census data taken over the past three census cycles (2001, 2006, 2011) shows a disparity of growth rates within the region. Specifically, while Colwood, Langford and View Royal have exhibited double-digit population growth rates over the past decade, the other

<sup>11</sup> ADWF – Average Dry Weather Flows / AAF – Average Annual Flows



municipalities have been relatively static. Notably these three municipalities also have significant populations that are not connected with sewers.

The dwelling count has increased at a higher rate than population, but this generally has been proportionate to population growth.

<b>2001 to 2011 Statistics Canada Census Data</b>									
	Colwood	Esquimalt	Langford	Oak Bay	Saanich	Victoria	View Royal	Total	CAGR
Population in 2011	16,093	16,209	29,228	18,015	109,752	80,017	9,381	<b>278,695</b>	
Population in 2006	14,687	16,840	22,459	17,908	108,265	78,057	8,768	<b>266,984</b>	
Population in 2001	13,745	16,127	18,840	17,798	103,654	74,125	7,271	<b>251,560</b>	
2006 to 2011 population change (%)	9.6%	-3.7%	30.1%	0.6%	1.4%	2.5%	7.0%	<b>4.4%</b>	0.86%
2001 to 2006 population change (%)	6.9%	4.4%	19.2%	0.6%	4.4%	5.3%	20.6%	<b>6.1%</b>	1.20%
<b>10-year population change</b>	<b>17.1%</b>	<b>0.5%</b>	<b>55.1%</b>	<b>1.2%</b>	<b>5.9%</b>	<b>7.9%</b>	<b>29.0%</b>	<b>10.8%</b>	<b>1.03%</b>
Total private dwellings (2011)	6,395	8,638	12,731	8,190	49,670	47,691	4,138	<b>137,453</b>	
Total private dwellings (2006)	5,770	8,340	9,125	8,280	48,105	44,783	3,512	<b>127,915</b>	
Total private dwellings (2001)	4,966	7,847	7,215	8,084	42,905	42,359	3,166	<b>116,542</b>	
2006 to 2011 Dwelling Growth	10.8%	3.6%	39.5%	-1.1%	3.3%	6.5%	17.8%	<b>7.5%</b>	1.45%
2001 to 2006 Dwelling Growth	16.2%	6.3%	26.5%	2.4%	12.1%	5.7%	10.9%	<b>9.8%</b>	1.88%
<b>10-year dwelling change</b>	<b>28.8%</b>	<b>10.1%</b>	<b>76.5%</b>	<b>1.3%</b>	<b>15.8%</b>	<b>12.6%</b>	<b>30.7%</b>	<b>17.9%</b>	<b>1.66%</b>

Table 5 - Population, dwelling growth from 2001 to 2011 (Statistics Canada)<sup>12</sup>

The Core Area Liquid Waste Management Plan (3) (Section 4) gives some scenario projections on the equivalent population and attempts to incorporate an estimate for non-residential usage:

The table below shows the existing and projected sewer residential population and equivalent population for the industrial, commercial; and institutional (ICI) sectors up to 2030 for each municipality for a low and a high rate of growth of 1.3% and 2.1% respectively (Stantec May 2010). As indicated in table 4.4 the projected total equivalent population for the year 2030 is 493,474 persons based on a high rate of growth. Using a low rate of growth, the projected sewer equivalent population in 2030 is 436,032 persons. The high rate of growth population projection includes a residential population of 342,266 persons, and an equivalent population of 151,208 persons for institutional, commercial and industrial sectors.

The projection for sewer equivalent population<sup>13</sup> is summarized in the table below:

<sup>12</sup> CAGR – Compound Annual Growth Rate

<sup>13</sup> Sewered equivalent population accounts for usage of industrial and business customers. The numbers on this table do not match with Census population data for this reason. In addition, the only sewer equivalent population estimates available were from 2008/2009 from the Core Area Liquid Waste Management Plan and not from 2011 or 2013.

<b>Municipality</b>	<b>2008/2009</b>	<b>2030 – Low Rate of Growth @ 1.3%</b>	<b>2030 – High Rate of Growth @ 2.1%</b>
Saanich	137,430	149,892	166,513
Victoria	114,539	122,669	141,734
View Royal	12,257	17,418	22,972
Oak Bay	21,674	22,173	26,304
Esquimalt	25,295	29,601	26,866
Colwood	8,933	35,526	34,548
Langford	20,964	58,753	74,737
<b>TOTALS</b>	<b>341,093</b>	<b>436,032</b>	<b>493,474</b>

Table 6 - Sewered equivalent population projections<sup>14</sup>

While extrapolation of growth trends is not a trivial activity, given the experience seen in prior 2001-2011 census data, the low growth projection appears to be the most likely outcome.

The various Official Community Plan documents give long-range population projections which may or may not be realized. In particular, population growth in the whole region has declined to 0.86% per year between the 2006 to 2011 census period. The estimate of 1.3% growth represents a higher rate of growth than the population due to Colwood, Langford, View Royal and, to a lesser degree, Saanich residents that are not currently on sewage will be put on sewage by 2030.

Hence, the estimates for the member municipalities of growth are as follows:

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<sup>14</sup> An explanation why Colwood's and Esquimalt's high growth projection (34,548 and 26,866, respectively) results in a lower population total than their low growth projection (35,526 and 29,601) eludes the author, but the table has been dutifully replicated from the CRD plan. This would suggest the population equivalent model has some breakage which would make one suspicious of the entire result, but these population equivalent figures are not otherwise used in the cost analysis portion of this document other than to extrapolate a growth rate per municipality between the present to 2030.

<b>Sewered Equivalent Population Projections</b>				
	<b>2009</b>	<b>2030</b>	<b>Growth</b>	<b>CAGR</b>
Colwood	8,933	35,526	298%	6.79%
Esquimalt	25,295	29,601	17%	0.75%
Langford	20,964	58,753	180%	5.03%
Oak Bay	21,674	22,173	2%	0.11%
Saanich	137,430	149,892	9%	0.41%
Victoria	114,539	122,669	7%	0.33%
View Royal	12,257	17,418	42%	1.69%
<b>Total</b>	<b>341,092</b>	<b>436,032</b>	<b>28%</b>	<b>1.18%</b>

**Table 7 - Growth rate estimates, to 2030**

This analysis does not attempt to estimate growth past 2030 beyond a cursory guess. The only reference that can be sought with such long-term projections is the management plan that gives the following growth rates for the 2045-2065:

	<b>CAGR</b>
Colwood	1.50%
Esquimalt	0.10%
Langford	1.50%
Oak Bay	0.10%
Saanich	0.10%
Victoria	0.10%
View Royal	1.00%

**Table 8 - Assumed growth from 2030 and later years**

### **13. Municipal Financing Authority Borrowing**

The CRD intends to borrow money from the Municipal Finance Authority of BC (the MFA). Substantially all of the capital costs for the Seaterra Program are anticipated to be paid through long-term borrowing.

Although the MFA does allow for bond issuances for terms greater than 10 years, the interest rate is fixed for 10 years and then resets at the then-prevailing five-year interest rate. Thus, a municipal entity wishing to borrow money for terms longer than 10 years will incur a component of interest rate risk after the initial 10 year period unless if they decide to engage in financial hedging<sup>15</sup>.

<sup>15</sup> The sort of financial hedging that could mitigate such interest rate risk is a sophisticated topic that is beyond the scope of this paper to analyze. There are methods to mitigate this future-dated interest rate risk, but they would come with costs and would result in a rise of the overall effective interest rate.

The MFA traditionally engages in 10-year bond issuances and less periodically, 20 years. The last 20-year issue floated was November 1, 2007 to mature on December 1, 2027 (coupon rate was 4.95% or about 0.75% above Government of Canada long-term yields at that time). The MFA transaction to the financial marketplace is an opaque process to the CRD and member municipalities – the CRD pays the MFA interest and principal, rather than the bond market.

As of the time of this report, the MFA estimates the 10-year interest rate to be 3.85%. The MFA also provides an indicative rate at 4.16% for a 30-year loan. The 30-year rate likely contains an embedded assumption<sup>16</sup> as to what the then-5 year rates will be for the duration of the loan.

Over the past decade, MFA 10-year rates have ranged from 2.90% to 5.15%. Since 1991<sup>17</sup>, 10-year rates have ranged from 2.90% to 10.07%.

Interest rates received by the MFA are a function of the prevailing 5-year and 10-year yields offered by Government of Canada securities. Currently the yield premium over the Government of Canada is 0.62% and 1.04%, respectively.

Interest rates over the past two years are at a historical low and while it is beyond the scope of this paper to speculate on what five-year interest rates will be in 10 years' time, the 2.31% that is currently available does appear to be very low by such historical standards.

Hence, for the purposes of analysis, the assumption will be that the CRD will be able to finance debt at 4.16% for 30 years. This will be higher than the actual experience of 3.85% for the first 10 years, but the extra 0.31% will be offset by interest rate risk after 10 years' time.

A municipality utilizing the MFA will receive 98.4% of funds from the loan. 1.6% is held back upon loan commencement; 0.6% is an expense charged to raise the funds, while 1.0% is a holdback and returned at debt maturity.

While the accounting treatment will amortize the 0.6% expense over the lifetime of the loan, the actual cash outlay to borrow the funds is incurred immediately. In addition, while the 1.0% holdback will be represented as an asset on the balance sheet, it is a cash flow that can only be accessed at loan maturity.

Hence, the amount required to be borrowed by the CRD will be the funds required, multiplied by the reciprocal of 0.984, or 1.0163, representing the cost of the holdback.

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<sup>16</sup> This is assuming the Expectation Hypothesis (of term structures) is correct. In practice there is sufficient volatility in interest rates that making a projection of rates in the future is exceedingly difficult. The spread between Government of Canada 10-year and long-term (20-30 year) yields is approximately 60 basis points which would suggest interest rates will rise at least between 10 to 30 years from present.

<sup>17</sup> The year is the earliest when data is readily available from MFA bond issues.

#### **a. MFA Borrowing and timing of capital outlay**

The Seaterra Program is not expected to borrow the entire capital cost of the project at once; it has indicated it will borrow money before the cash outlay is required. The percentage schedule on [Table 2](#) is used as the assumption of the timing of the capital outlay.

Interest rates incurred by Seaterra will be the then-10 year MFA rate. There can be no guarantee or certainty what the 10-year MFA rate will be, but for the purposes of this analysis, 4.16% shall be used.

### **14. Incorporating federal and provincial contributions to the project's true cost**

Federal	\$	253,400,000
Provincial	\$	248,000,000

**Table 9 - Committed federal and provincial funding**

Federal and provincial funding is contingent upon multiple factors, depending on the terms of the three programs applied for (the federal contributions are done under the Building Canada Fund – Major Infrastructure component for the McLoughlin Treatment Plant, the Green Infrastructure Fund for the wastewater conveyance systems, and the P3 Canada Fund for the Biosolids produced by the system).

Providing that the Seaterra Program is able to fulfill the conditions necessary for senior government funding, the senior government money is “free” from the CRD’s perspective, and hence most documentation provided by the CRD doing affordability analysis and cost projections only make reference to the CRD contribution toward the project as this is the direct cost borne by CRD sewage users.

However, from the perspective of the taxpayer, the CRD project is not free. The federal and provincial contributions represent an opportunity cost that could be applied elsewhere. For example, federal and provincial infrastructure money could be used to build roads or other municipal infrastructure (swimming pools, schools, etc.).

The method to measure the opportunity cost for taxpayers is arbitrarily defined by the number of taxpayers affected by the government decision.

The federal \$253.4 million grant is equivalent to \$7.57 per Canadian resident<sup>18</sup> across the country, or equivalent to \$909 per Canadian resident in the municipal areas affected by the Seaterra Program.

The provincial \$248.0 million grant is equivalent to \$56.40 per British Columbian resident<sup>19</sup>, or equivalent to \$890 per British Columbian resident in the municipal areas affected by the Seaterra Program.

These figures do not incorporate that such funding would be through borrowed money, which would incur extra interest charges.

If one wishes to equate the federal and provincial funding in terms of per-dwelling costs, the cost is approximately 2.3 times higher in the national and provincial area, and 2.0 times higher in the municipalities affected by Seaterra.

There is a cliché concerning funding received from multiple layers of governments that states, “There is only one taxpayer.” While every single Canadian incurs the cost of funded projects that are located well beyond where they can take personal benefit of such funding, every Canadian incurs the tax burden of having to participate in such funding. The same holds true for provincial projects.

It is a matter of philosophy of how to properly present these costs to the taxpayer (whether such projects as these are collective or local responsibilities), but to delve upon this topic requires going into the depths of discussing the devolution of federal and provincial responsibilities as outlined in Sections 91 and 92 of the *Constitution Act, 1867*.

As a result of the foregoing discussion, the analysis will include a “what-if” scenario with the assumption that the CRD has to fund the entire Seaterra Program on its own, separate from the “free” money that is being provided by senior governments. See Page 28 for this analysis.

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<sup>18</sup> This figure uses the 2011 census estimate, which enumerated 33,476,688 people. The projected population in October 2013 would result in a \$7.18/Canadian cost.

<sup>19</sup> This figure uses the 2011 census estimate, which enumerated 4,400,057 people. The projected population in October 2013 would result in a \$53.84/British Columbian cost.

## 15. Cost allocation – Costs incurred collectively by the CRD area affected by Seaterra

The following analysis makes extensive use of data on Appendix B, D and E.

This analysis relates costs as a function of assessed property values as provided by BC Assessment. While relying on “per-capita” or “per-dwelling” figures (from Census data) may yield some context, ultimately taxes to pay off capital are collected through mill rates. Operating costs will be proportionate to actual consumption, but as a whole, an “apples-to-apples” comparison will be expressed in mill rate changes and this can be directly translated into the impact on an average single family dwelling (SFD) or strata<sup>20</sup> dwelling.

The following tables make reference to the years assuming the start date of the project was the beginning of 2014 (year one). If the Seaterra Program is further delayed, inflation would result in additional costs.

Within the Seaterra Program’s municipal boundaries, the average single family dwelling was assessed at \$584,939 and the average strata dwelling was assessed at \$332,801. The average business assessment was \$1,358,989.

The average residential property tax bill, including all non-municipal<sup>21</sup> charges (CRD, Hospital District, School Tax, etc.) was \$3,655 (mean mill rate 6.2483 per \$1,000 assessed value). The average business property tax bill, including all non-municipal charges was \$28,897 (mean mill rate 21.2623 per \$1,000 assessed value).

The purpose of this section and subsequent sections is to distill costs into a projected change of mill rate, rather than computing a per-capita or per-dwelling amount.

### a. Selection of amortization period of capital cost loan

Similar to how a home mortgage is paid off, the selection of amortization rate is a critical variable on determining the yearly payments that will be incurred by property owners in the Seaterra Program area. A lower amortization rate results in higher yearly payments, but through the life of the debt, incurs less interest charges. This applies for every form of debt payment scheme. There are competing interests on selecting the amortization term.

People that are interested in moving into the Seaterra area in five years’ time would be thrilled if a lower amortization term was selected; they would pay less over time. Likewise if a resident was interested in moving out in five years, it is in their best interests to stretch out the amortization and save those future expenses for the next property owner.

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<sup>20</sup> This includes residential housing such as condominiums, townhouses and bare land stratas. Unfortunately there is no way to distinguish between these three from BC Assessment data.

<sup>21</sup> Non-municipal meaning not applying directly to the member municipality.

When examining the various business case documents and even the Peer Review document, there is very little mention of how long decision-makers intend to amortize the capital costs of the Seaterra Program. This paper will consider several options: Zero-debt, 20 years, 25 years and 30 years.

### b. A fictitious scenario: Pay-as-you-go, Zero-debt scenario

An extreme (and very unlikely to occur) decision would be the CRD to forego issuing debt and impose a special levy that results in costs being applied to landowners immediately as capital costs are incurred<sup>22</sup>. While such an approach would be prohibitive politically, it would result in the lowest total nominal cost due to the lack of interest expense and also the lack of the 1.6% holdback for MFA funding. We have the following schedule of payments, including those for the average-priced single family dwelling and strata dwelling:

Year	CRD Levy	Residential Mill Rate Addition (Zero-Growth)	SFD Tax (Zero-Growth)	Strata Tax (Zero-Growth)	Residential Mill Rate Addition (1.3% Growth)	SFD Tax (1.3% Growth)	Strata Tax (1.3% Growth)
1	\$ 10,992,000	0.2199	\$ 129	\$ 73	0.2199	\$ 129	\$ 73
2	\$ 18,803,000	0.3762	\$ 220	\$ 125	0.3713	\$ 217	\$ 124
3	\$ 25,847,000	0.5171	\$ 302	\$ 172	0.5039	\$ 295	\$ 168
4	\$ 79,203,000	1.5845	\$ 927	\$ 527	1.5242	\$ 892	\$ 507
5	\$ 82,411,000	1.6486	\$ 964	\$ 549	1.5656	\$ 916	\$ 521
6	\$ 75,829,000	1.5170	\$ 887	\$ 505	1.4221	\$ 832	\$ 473
7	\$ 36,108,000	0.7223	\$ 423	\$ 240	0.6685	\$ 391	\$ 222
<b>TOTALS</b>	<b>\$ 329,193,000</b>		<b>\$ 3,852</b>	<b>\$ 2,192</b>		<b>\$ 3,671</b>	<b>\$ 2,089</b>

Table 10 - Sample yearly levy for Seaterra capital costs (Pay-as-you-go, no debt) and tax burden for the average CRD SFD/Strata property owner

This could conceivably be advertised as a “short term pain for long term gain” proposal if elected officials are bold in their deliberations<sup>23</sup>. Years four to six, when most of the capital costs are incurred, would be financially unpalatable for most people.

Although the pay-as-you-go, zero-debt scenario is intriguing, given the political environment and public appetite, it will not be explored further.

### c. 20-year debt scenario

The following scenario considers the CRD borrowing the money as needed. The scenario assumes money is borrowed for the first year of the project for 20 years, the second year for 19 years, etc. The result of this amortization scheme is that the debt is fully paid off in 20 years’

<sup>22</sup> Anybody owning a strata unit that has incurred a special assessment charge will intuitively understand this concept.

<sup>23</sup> Especially the elected officials that are not running for re-election. Costs escalate in year 4, and the municipal term is 3 years.



time. Recall this assumes that interest rates remain constant at 4.16% after the 10 year period where rates will reset to the prevailing five-year rate.

Year	CRD Capital Cost	MFA Debt Service Payment	Residential Mill Rate Addition (Zero-Growth)	SFD Tax (Zero-Growth)	Strata Tax (Zero-Growth)	Residential Mill Rate Addition (1.3% Growth)	SFD Tax (1.3% Growth)	Strata Tax (1.3% Growth)
1	\$ 11,443,000	\$ 860,305	0.0172	\$ 10	\$ 6	0.0172	\$ 10	\$ 6
2	\$ 19,574,000	\$ 2,381,960	0.0477	\$ 28	\$ 16	0.0470	\$ 28	\$ 16
3	\$ 26,908,000	\$ 4,550,566	0.0910	\$ 53	\$ 30	0.0887	\$ 52	\$ 30
4	\$ 82,453,000	\$ 11,460,005	0.2293	\$ 134	\$ 76	0.2205	\$ 129	\$ 73
5	\$ 85,792,000	\$ 18,959,942	0.3793	\$ 222	\$ 126	0.3602	\$ 211	\$ 120
6	\$ 78,940,000	\$ 26,186,196	0.5239	\$ 306	\$ 174	0.4911	\$ 287	\$ 163
7	\$ 37,589,000	\$ 29,804,851	0.5963	\$ 349	\$ 198	0.5518	\$ 323	\$ 184
8	-	\$ 29,804,851	0.5963	\$ 349	\$ 198	0.5447	\$ 319	\$ 181
9	-	\$ 29,804,851	0.5963	\$ 349	\$ 198	0.5377	\$ 315	\$ 179
10	-	\$ 29,804,851	0.5963	\$ 349	\$ 198	0.5308	\$ 310	\$ 177
11	-	\$ 29,804,851	0.5963	\$ 349	\$ 198	0.5240	\$ 307	\$ 174
12	-	\$ 29,804,851	0.5963	\$ 349	\$ 198	0.5173	\$ 303	\$ 172
13	-	\$ 29,804,851	0.5963	\$ 349	\$ 198	0.5106	\$ 299	\$ 170
14	-	\$ 29,804,851	0.5963	\$ 349	\$ 198	0.5041	\$ 295	\$ 168
15	-	\$ 29,804,851	0.5963	\$ 349	\$ 198	0.4976	\$ 291	\$ 166
16	-	\$ 29,804,851	0.5963	\$ 349	\$ 198	0.4912	\$ 287	\$ 163
17	-	\$ 29,804,851	0.5963	\$ 349	\$ 198	0.4849	\$ 284	\$ 161
18	-	\$ 29,804,851	0.5963	\$ 349	\$ 198	0.4787	\$ 280	\$ 159
19	-	\$ 29,804,851	0.5963	\$ 349	\$ 198	0.4726	\$ 276	\$ 157
20	-	\$ 26,377,861	0.5277	\$ 309	\$ 176	0.4129	\$ 241	\$ 137
<b>TOTALS</b>		<b>\$ 478,239,895</b>		<b>\$ 5,596</b>	<b>\$ 3,184</b>		<b>\$ 4,845</b>	<b>\$ 2,757</b>

Table 11 - Sample yearly levy for Seaterra capital costs (20-year debt amortization scenario) and tax burden for the average CRD SFD/Strata property owner

#### d. 25-year debt scenario

This scenario is similar to the above scenario, except with a 25 year amortization period.

Year	CRD Capital Cost	MFA Debt Service Payment	Residential Mill Rate Addition	SFD Tax (Zero-Growth)	Strata Tax (Zero-Growth)	Residential Mill Rate Addition	SFD Tax (1.3% Growth)	Strata Tax (1.3% Growth)
1	\$11,443,000	\$ 750,798	0.0150	\$ 9	\$ 5	0.0150	\$ 9	\$ 5
2	19,574,000	\$ 2,065,913	0.0413	\$ 24	\$ 14	0.0408	\$ 24	\$ 14
3	26,908,000	\$ 3,920,118	0.0784	\$ 46	\$ 26	0.0764	\$ 45	\$ 25
4	82,453,000	\$ 9,757,692	0.1952	\$ 114	\$ 65	0.1878	\$ 110	\$ 62
5	85,792,000	\$ 16,010,222	0.3203	\$ 187	\$ 107	0.3042	\$ 178	\$ 101
6	78,940,000	\$ 21,945,069	0.4390	\$ 257	\$ 146	0.4116	\$ 241	\$ 137
7	37,589,000	\$ 24,867,186	0.4975	\$ 291	\$ 166	0.4604	\$ 269	\$ 153
8	-	\$ 24,867,186	0.4975	\$ 291	\$ 166	0.4545	\$ 266	\$ 151
9	-	\$ 24,867,186	0.4975	\$ 291	\$ 166	0.4486	\$ 262	\$ 149
10	-	\$ 24,867,186	0.4975	\$ 291	\$ 166	0.4429	\$ 259	\$ 147
11	-	\$ 24,867,186	0.4975	\$ 291	\$ 166	0.4372	\$ 256	\$ 145
12	-	\$ 24,867,186	0.4975	\$ 291	\$ 166	0.4316	\$ 252	\$ 144
13	-	\$ 24,867,186	0.4975	\$ 291	\$ 166	0.4260	\$ 249	\$ 142
14	-	\$ 24,867,186	0.4975	\$ 291	\$ 166	0.4206	\$ 246	\$ 140
15	-	\$ 24,867,186	0.4975	\$ 291	\$ 166	0.4152	\$ 243	\$ 138
16	-	\$ 24,867,186	0.4975	\$ 291	\$ 166	0.4099	\$ 240	\$ 136
17	-	\$ 24,867,186	0.4975	\$ 291	\$ 166	0.4046	\$ 237	\$ 135
18	-	\$ 24,867,186	0.4975	\$ 291	\$ 166	0.3994	\$ 234	\$ 133
19	-	\$ 24,867,186	0.4975	\$ 291	\$ 166	0.3943	\$ 231	\$ 131
20	-	\$ 24,867,186	0.4975	\$ 291	\$ 166	0.3892	\$ 228	\$ 130
21	-	\$ 24,867,186	0.4975	\$ 291	\$ 166	0.3842	\$ 225	\$ 128
22	-	\$ 24,867,186	0.4975	\$ 291	\$ 166	0.3793	\$ 222	\$ 126
23	-	\$ 24,867,186	0.4975	\$ 291	\$ 166	0.3744	\$ 219	\$ 125
24	-	\$ 24,867,186	0.4975	\$ 291	\$ 166	0.3696	\$ 216	\$ 123
25	-	\$ 21,440,196	0.4289	\$ 251	\$ 143	0.3146	\$ 184	\$ 105
<b>TOTALS</b>		<b>\$ 523,499,361</b>		<b>\$ 6,126</b>	<b>\$ 3,485</b>		<b>\$ 5,143</b>	<b>\$ 2,926</b>

Table 12 - Sample yearly levy for Seaterra capital costs (25-year debt amortization scenario) and tax burden for the average CRD SFD/Strata property owner

**e. 30-year debt scenario (longest possible term)**

This scenario contemplates borrowing money for the longest duration allowed by the MFA, 30 years. It also stretches out the amortization so that each tranche of debt issued has the full amortization, at 30 years:

Year	CRD Capital Cost	MFA Debt Service Payment	Residential Mill Rate Addition (Zero-Growth)	SFD Tax (Zero-Growth)	Strata Tax (Zero-Growth)	Residential Mill Rate Addition (1.3% Growth)	SFD Tax (1.3% Growth)	Strata Tax (1.3% Growth)
1	\$11,443,000	\$ 680,059	0.0136	\$ 8	\$ 5	0.0136	\$ 8	\$ 5
2	19,574,000	\$ 1,843,343	0.0369	\$ 22	\$ 12	0.0364	\$ 21	\$ 12
3	26,908,000	\$ 3,442,488	0.0689	\$ 40	\$ 23	0.0671	\$ 39	\$ 22
4	82,453,000	\$ 8,342,678	0.1669	\$ 98	\$ 56	0.1606	\$ 94	\$ 53
5	85,792,000	\$ 13,441,306	0.2689	\$ 157	\$ 89	0.2554	\$ 149	\$ 85
6	78,940,000	\$ 18,132,718	0.3627	\$ 212	\$ 121	0.3401	\$ 199	\$ 113
7	37,589,000	\$ 20,366,636	0.4074	\$ 238	\$ 136	0.3771	\$ 221	\$ 125
8	-	\$ 20,366,636	0.4074	\$ 238	\$ 136	0.3722	\$ 218	\$ 124
9	-	\$ 20,366,636	0.4074	\$ 238	\$ 136	0.3674	\$ 215	\$ 122
10	-	\$ 20,366,636	0.4074	\$ 238	\$ 136	0.3627	\$ 212	\$ 121
11	-	\$ 20,366,636	0.4074	\$ 238	\$ 136	0.3581	\$ 209	\$ 119
12	-	\$ 20,366,636	0.4074	\$ 238	\$ 136	0.3535	\$ 207	\$ 118
13	-	\$ 20,366,636	0.4074	\$ 238	\$ 136	0.3489	\$ 204	\$ 116
14	-	\$ 20,366,636	0.4074	\$ 238	\$ 136	0.3445	\$ 201	\$ 115
15	-	\$ 20,366,636	0.4074	\$ 238	\$ 136	0.3400	\$ 199	\$ 113
16	-	\$ 20,366,636	0.4074	\$ 238	\$ 136	0.3357	\$ 196	\$ 112
17	-	\$ 20,366,636	0.4074	\$ 238	\$ 136	0.3314	\$ 194	\$ 110
18	-	\$ 20,366,636	0.4074	\$ 238	\$ 136	0.3271	\$ 191	\$ 109
19	-	\$ 20,366,636	0.4074	\$ 238	\$ 136	0.3229	\$ 189	\$ 107
20	-	\$ 20,366,636	0.4074	\$ 238	\$ 136	0.3188	\$ 186	\$ 106
21	-	\$ 20,366,636	0.4074	\$ 238	\$ 136	0.3147	\$ 184	\$ 105
22	-	\$ 20,366,636	0.4074	\$ 238	\$ 136	0.3106	\$ 182	\$ 103
23	-	\$ 20,366,636	0.4074	\$ 238	\$ 136	0.3067	\$ 179	\$ 102
24	-	\$ 20,366,636	0.4074	\$ 238	\$ 136	0.3027	\$ 177	\$ 101
25	-	\$ 20,366,636	0.4074	\$ 238	\$ 136	0.2988	\$ 175	\$ 99
26	-	\$ 20,366,636	0.4074	\$ 238	\$ 136	0.2950	\$ 173	\$ 98
27	-	\$ 20,366,636	0.4074	\$ 238	\$ 136	0.2912	\$ 170	\$ 97
28	-	\$ 20,366,636	0.4074	\$ 238	\$ 136	0.2875	\$ 168	\$ 96
29	-	\$ 20,366,636	0.4074	\$ 238	\$ 136	0.2838	\$ 166	\$ 94
30	-	\$ 20,252,206	0.4051	\$ 237	\$ 135	0.2786	\$ 163	\$ 93
31	-	\$ 19,490,837	0.3899	\$ 228	\$ 130	0.2647	\$ 155	\$ 88
32	-	\$ 18,254,212	0.3652	\$ 214	\$ 122	0.2447	\$ 143	\$ 81
33	-	\$ 16,099,617	0.3221	\$ 188	\$ 107	0.2130	\$ 125	\$ 71
34	-	\$ 11,166,037	0.2234	\$ 131	\$ 74	0.1459	\$ 85	\$ 49
35	-	\$ 6,135,930	0.1228	\$ 72	\$ 41	0.0791	\$ 46	\$ 26
36	-	\$ 1,858,028	0.0372	\$ 22	\$ 12	0.0237	\$ 14	\$ 8
<b>TOTALS</b>		<b>\$ 607,572,076</b>		<b>\$ 7,110</b>	<b>\$ 4,045</b>		<b>\$ 5,659</b>	<b>\$ 3,220</b>

Table 13 - Sample yearly levy for Seaterra capital costs (30-year fully-extended debt amortization scenario) and tax burden for the average CRD SFD/Strata property owner

The consequence of extending the debt payments this far out in the future is the total debt service bite for the CRD is higher (\$608 million) and the total nominal costs for property owners is higher, but paid out at a slower rate.

It is likely that given the low interest rate environment and the optics of a lower amount of yearly payment that decision-makers would gravitate towards the 30-year option.

To repeat some caveats of the assumptions made previously, the 30-year scenario depends on interest rates remaining relatively constant over the term of debt; in addition, in later years the growth factor (assumed to be 1.3% across the Seaterra region) must remain at this pace. Given the general slow-down seen in growth this assumption is on shaky ground for approximately anything past year 15.

The consolidated operating cost and municipal allocation scenarios that will be discussed later in this paper assume the 30 year scenario.

#### **f. 30-year debt scenario, no senior government funding**

This scenario contemplates the “what-if” scenario where the Seaterra cost (\$844.1 million) is solely funded by CRD taxpayers (i.e. no federal or provincial funding). Also observe that this ignores questions whether such amounts can actually be raised by the CRD through the MFA at the assumed 4.16% rate.

Year	CRD Capital Cost	MFA Debt Service Payment	Residential Mill Rate Addition (Zero-Growth)	SFD Tax (Zero-Growth)	Strata Tax (Zero-Growth)	Residential Mill Rate Addition (1.3% Growth)	SFD Tax (1.3% Growth)	Strata Tax (1.3% Growth)
1	\$ 28,185,000	\$ 1,675,037	0.0335	\$ 20	\$ 11	0.0335	\$ 20	\$ 11
2	\$ 48,213,000	\$ 4,540,341	0.0908	\$ 53	\$ 30	0.0897	\$ 52	\$ 30
3	\$ 66,277,000	\$ 8,479,189	0.1696	\$ 99	\$ 56	0.1653	\$ 97	\$ 55
4	\$ 203,089,000	\$ 20,548,789	0.4111	\$ 240	\$ 137	0.3955	\$ 231	\$ 132
5	\$ 211,314,000	\$ 33,107,201	0.6623	\$ 387	\$ 220	0.6290	\$ 368	\$ 209
6	\$ 194,436,000	\$ 44,662,552	0.8935	\$ 523	\$ 297	0.8376	\$ 490	\$ 279
7	\$ 92,586,000	\$ 50,164,947	1.0036	\$ 587	\$ 334	0.9287	\$ 543	\$ 309
8	-	\$ 50,164,947	1.0036	\$ 587	\$ 334	0.9168	\$ 536	\$ 305
9	-	\$ 50,164,947	1.0036	\$ 587	\$ 334	0.9050	\$ 529	\$ 301
10	-	\$ 50,164,947	1.0036	\$ 587	\$ 334	0.8934	\$ 523	\$ 297
11	-	\$ 50,164,947	1.0036	\$ 587	\$ 334	0.8820	\$ 516	\$ 294
12	-	\$ 50,164,947	1.0036	\$ 587	\$ 334	0.8706	\$ 509	\$ 290
13	-	\$ 50,164,947	1.0036	\$ 587	\$ 334	0.8595	\$ 503	\$ 286
14	-	\$ 50,164,947	1.0036	\$ 587	\$ 334	0.8484	\$ 496	\$ 282
15	-	\$ 50,164,947	1.0036	\$ 587	\$ 334	0.8375	\$ 490	\$ 279
16	-	\$ 50,164,947	1.0036	\$ 587	\$ 334	0.8268	\$ 484	\$ 275
17	-	\$ 50,164,947	1.0036	\$ 587	\$ 334	0.8162	\$ 477	\$ 272
18	-	\$ 50,164,947	1.0036	\$ 587	\$ 334	0.8057	\$ 471	\$ 268
19	-	\$ 50,164,947	1.0036	\$ 587	\$ 334	0.7954	\$ 465	\$ 265
20	-	\$ 50,164,947	1.0036	\$ 587	\$ 334	0.7852	\$ 459	\$ 261
21	-	\$ 50,164,947	1.0036	\$ 587	\$ 334	0.7751	\$ 453	\$ 258
22	-	\$ 50,164,947	1.0036	\$ 587	\$ 334	0.7651	\$ 448	\$ 255
23	-	\$ 50,164,947	1.0036	\$ 587	\$ 334	0.7553	\$ 442	\$ 251
24	-	\$ 50,164,947	1.0036	\$ 587	\$ 334	0.7456	\$ 436	\$ 248
25	-	\$ 50,164,947	1.0036	\$ 587	\$ 334	0.7361	\$ 431	\$ 245
26	-	\$ 50,164,947	1.0036	\$ 587	\$ 334	0.7266	\$ 425	\$ 242
27	-	\$ 50,164,947	1.0036	\$ 587	\$ 334	0.7173	\$ 420	\$ 239
28	-	\$ 50,164,947	1.0036	\$ 587	\$ 334	0.7081	\$ 414	\$ 236
29	-	\$ 50,164,947	1.0036	\$ 587	\$ 334	0.6990	\$ 409	\$ 233
30	-	\$ 49,883,097	0.9979	\$ 584	\$ 332	0.6862	\$ 401	\$ 228
31	-	\$ 48,007,779	0.9604	\$ 562	\$ 320	0.6519	\$ 381	\$ 217
32	-	\$ 44,961,836	0.8995	\$ 526	\$ 299	0.6027	\$ 353	\$ 201
33	-	\$ 39,654,867	0.7933	\$ 464	\$ 264	0.5247	\$ 307	\$ 175
34	-	\$ 27,503,018	0.5502	\$ 322	\$ 183	0.3593	\$ 210	\$ 120
35	-	\$ 15,113,386	0.3023	\$ 177	\$ 101	0.1949	\$ 114	\$ 65
36	-	\$ 4,576,535	0.0916	\$ 54	\$ 30	0.0583	\$ 34	\$ 19
<b>TOTALS</b>		<b>\$ 1,496,507,400</b>		<b>\$ 17,512</b>	<b>\$ 9,963</b>		<b>\$ 13,938</b>	<b>\$ 7,930</b>

Table 14 - Sample yearly levy for Seaterra capital costs (30-year fully-extended debt amortization scenario) and tax burden for the average CRD SFD/Strata property owner, without senior government funding

## 16. Allocation of Operational Costs

### a. Estimated annual property tax for operational costs

Total yearly operational costs, expressed in 2013 dollars is \$15,500,000/year, which includes the assumption that the system will be operating at full capacity in its first full year past completion (studies project an initial capacity utilization of 84%). Another assumption is that in year one, operating costs will be one-quarter of baseline, year two will have one-half of baseline, year three at three-quarters and year four and beyond at full cost<sup>24</sup>.

With inflation at 2%, the following are the existing expectations for residential property taxes for operational costs:

Year	Operational Cost	Residential Mill Rate Addition (Zero-Growth)	Op. SFD Tax (Zero-Growth)	Op. Strata Tax (Zero-Growth)	Residential Mill Rate Addition (1.3% Growth)	Op. SFD Tax (1.3% Growth)	Op. Strata Tax (1.3% Growth)
1	3,875,000	0.0775	\$ 45	\$ 26	0.07752	\$ 45	\$ 26
2	7,905,000	0.1581	\$ 93	\$ 53	0.15611	\$ 91	\$ 52
3	12,094,650	0.2420	\$ 142	\$ 81	0.23579	\$ 138	\$ 78
4	16,448,724	0.3291	\$ 192	\$ 110	0.31655	\$ 185	\$ 105
5	16,777,698	0.3356	\$ 196	\$ 112	0.31874	\$ 186	\$ 106
6	17,113,252	0.3424	\$ 200	\$ 114	0.32094	\$ 188	\$ 107
7	17,455,517	0.3492	\$ 204	\$ 116	0.32316	\$ 189	\$ 108
8	17,804,628	0.3562	\$ 208	\$ 119	0.32539	\$ 190	\$ 108
9	18,160,720	0.3633	\$ 213	\$ 121	0.32764	\$ 192	\$ 109
10	18,523,935	0.3706	\$ 217	\$ 123	0.32991	\$ 193	\$ 110
11	18,894,414	0.3780	\$ 221	\$ 126	0.33219	\$ 194	\$ 111
12	19,272,302	0.3855	\$ 226	\$ 128	0.33448	\$ 196	\$ 111
13	19,657,748	0.3933	\$ 230	\$ 131	0.33679	\$ 197	\$ 112
14	20,050,903	0.4011	\$ 235	\$ 133	0.33912	\$ 198	\$ 113
15	20,451,921	0.4091	\$ 239	\$ 136	0.34146	\$ 200	\$ 114
16	20,860,959	0.4173	\$ 244	\$ 139	0.34382	\$ 201	\$ 114
17	21,278,178	0.4257	\$ 249	\$ 142	0.34620	\$ 203	\$ 115
18	21,703,742	0.4342	\$ 254	\$ 144	0.34859	\$ 204	\$ 116
19	22,137,817	0.4429	\$ 259	\$ 147	0.35100	\$ 205	\$ 117
20	22,580,573	0.4517	\$ 264	\$ 150	0.35343	\$ 207	\$ 118

Table 15 - Operational cost impact on Seaterra average residential property taxes

<sup>24</sup> From an accounting perspective, such costs are likely to be capitalized into the full cost of the project, but on a cash outlay basis, this assumption allows for a gradual scale-up of operating costs until the project is completed.

The table above cuts off at 20 years, but can be extended for the expected lifespan of the Seaterra Program.

Actual taxes incurred by residents will vary depending on water meter usage, but the sum of all taxes collected must equal the operational cost. A SFD utilizing less water than the average in the district will pay relatively less; a SFD utilizing more water will pay relatively more.

**b. Capitalized operational costs**

As the Seaterra Program, if fully executed, is not projected to have an end lifespan (although it has been reasonably estimated to last 50 years), the sum of future operational costs can be capitalized as a single present value. This calculation can be considered to be the equivalent of a “pre-payment” if such capital was provided up-front and solely dedicated toward the payment of operating costs.

With the assumptions of 2% inflation and 1.3% growth in the residential property tax base, the core assumption is the discount rate, or the ability to achieve a certain return of capital.

Using a variety of lifespan assumptions and discount rates, the following table provides the capitalized amount required to operating the Seaterra system with the 2% inflation and 1.3% growth assumption:

Rate	3%	4%	5%	6%	7%
PV (100 years)	\$ 971,584,000	\$ 667,431,000	\$ 489,802,000	\$ 379,309,000	\$ 306,396,000
PV (75 years)	\$ 805,349,000	\$ 595,181,000	\$ 458,000,000	\$ 365,136,000	\$ 300,004,000
PV (50 years)	\$ 593,197,000	\$ 477,782,000	\$ 392,356,000	\$ 328,060,000	\$ 278,857,000
PV (40 years)	\$ 492,746,000	\$ 412,359,000	\$ 349,539,000	\$ 299,904,000	\$ 260,255,000
PV (30 years)	\$ 382,001,000	\$ 332,915,000	\$ 292,323,000	\$ 258,539,000	\$ 230,237,000

Table 16 - Capitalized costs of operational expenses under different interest rates and time spans

To have an intuitive sense of these numbers, the following example is provided:

Question: You wish to fund (unreduced in years 1-4) 40 years of costs illustrated on Table 14. Your fund has the ability to earn a 4% return on investment. How much money are you required to start with today in order to pay the operating costs for 40 years?

Answer: \$435,312,000.

Financially, using the parameters shown, one is indifferent if they pay \$435.3 million today or pay the (unreduced) amounts on the rate schedule shown on table 14 over the next 40 years.

## 17. Joint capital / operational costs

The total cost burden on an average SFD property owner is obtained by adding the capital and operational levies as calculated above. The amortization period of the capital cost will determine the average residential tax paid as outlined in the prior section concerning capital costs.

Year	Total SFD Tax (Zero-Growth)	Total Strata Tax (Zero-Growth)	Total SFD Tax (1.3%-Growth)	Total Strata Tax (1.3%-Growth)
1	\$ 53	\$ 30	\$ 53	\$ 30
2	\$ 114	\$ 65	\$ 113	\$ 64
3	\$ 182	\$ 103	\$ 177	\$ 101
4	\$ 290	\$ 165	\$ 279	\$ 159
5	\$ 354	\$ 201	\$ 336	\$ 191
6	\$ 412	\$ 235	\$ 387	\$ 220
7	\$ 443	\$ 252	\$ 410	\$ 233
8	\$ 447	\$ 254	\$ 408	\$ 232
9	\$ 451	\$ 257	\$ 407	\$ 231
10	\$ 455	\$ 259	\$ 405	\$ 231
11	\$ 459	\$ 261	\$ 404	\$ 230
12	\$ 464	\$ 264	\$ 402	\$ 229
13	\$ 468	\$ 266	\$ 401	\$ 228
14	\$ 473	\$ 269	\$ 400	\$ 227
15	\$ 478	\$ 272	\$ 399	\$ 227
16	\$ 482	\$ 274	\$ 397	\$ 226
17	\$ 487	\$ 277	\$ 396	\$ 225
18	\$ 492	\$ 280	\$ 395	\$ 225
19	\$ 497	\$ 283	\$ 394	\$ 224
20	\$ 503	\$ 286	\$ 393	\$ 224
21	\$ 508	\$ 289	\$ 392	\$ 223
22	\$ 513	\$ 292	\$ 391	\$ 223
23	\$ 519	\$ 295	\$ 390	\$ 222
24	\$ 524	\$ 298	\$ 390	\$ 222
25	\$ 530	\$ 302	\$ 389	\$ 221
26	\$ 536	\$ 305	\$ 388	\$ 221
27	\$ 542	\$ 308	\$ 387	\$ 220
28	\$ 548	\$ 312	\$ 387	\$ 220
29	\$ 554	\$ 315	\$ 386	\$ 220
30	\$ 559	\$ 318	\$ 384	\$ 219
31	\$ 557	\$ 317	\$ 378	\$ 215
32	\$ 549	\$ 312	\$ 368	\$ 209
33	\$ 530	\$ 302	\$ 351	\$ 200
34	\$ 479	\$ 273	\$ 313	\$ 178
35	\$ 427	\$ 243	\$ 276	\$ 157
36	\$ 384	\$ 219	\$ 245	\$ 139
37	\$ 370	\$ 211	\$ 232	\$ 132
38	\$ 377	\$ 215	\$ 234	\$ 133
39	\$ 385	\$ 219	\$ 236	\$ 134
40	\$ 393	\$ 223	\$ 237	\$ 135

Table 17 - Total costs to Seaterra residents, assuming 30 year capital amortization scenario



### 18. Cost allocation to local municipalities

Please refer to Section 11 (Cost apportionment) for the assumptions of how member municipalities will be sharing costs. The strong variables in determining individual costs to member municipalities are their projected growth rates and their apportionment percentage. Although the October 10, 2012 recommendation (7) incorporates a sewer capacity trading scheme which will enable municipalities to purchase and sell sewer allocation to each other, the assumption is that this tool is not employed<sup>25</sup>.

For simplicity, the core assumption will be the 30-year capital funding scenario outlined in the prior section.

As a reminder, the following apportionment proposal was recommended on October 10, 2012:

	<b>% Allocation of Debt Servicing Costs</b>	<b>% Allocation of Debt Servicing Costs (w/o FNs)</b>	<b>% Allocation of Operating Costs</b>	<b>% Allocation of Operating Costs (w/o FNs)</b>
Colwood	4.24%	4.27%	4.28%	4.31%
Esquimalt	6.60%	6.65%	6.59%	6.64%
Langford	12.63%	12.71%	12.78%	12.86%
Oak Bay	6.39%	6.43%	6.30%	6.34%
Saanich	30.34%	30.55%	30.38%	30.58%
Victoria	35.95%	36.19%	35.79%	36.03%
View Royal	3.18%	3.20%	3.21%	3.23%
First Nations	0.67%	0.00%	0.67%	0.00%

Table 18 - Apportionment between municipalities, as recommended October 10, 2012

The zero-growth scenario below assumes no additional developments of property:

<sup>25</sup> There are punitive aspects to this scheme, mainly that an incorrect low guess of capacity would result in large charges if the municipality was not able to find a seller of “sewage credits”. This becomes much more of a burden for fast-growing municipalities. If they guess high, they will be paying for capacity they don’t use and capacity they might not be able to trade off to others.

<b>Zero-Growth Scenario</b>								
	Colwood	Esquimalt	Langford	Oak Bay	Saanich	Victoria	View Royal	CRD
Year	SFD Average	SFD Average	SFD Average	SFD Average	SFD Average	SFD Average	SFD Average	SFD Average
1	\$ 37	\$ 64	\$ 52	\$ 46	\$ 34	\$ 70	\$ 47	\$ 53
2	\$ 80	\$ 137	\$ 111	\$ 99	\$ 73	\$ 149	\$ 101	\$ 114
3	\$ 127	\$ 218	\$ 177	\$ 159	\$ 116	\$ 237	\$ 161	\$ 182
4	\$ 203	\$ 348	\$ 282	\$ 253	\$ 185	\$ 379	\$ 256	\$ 290
5	\$ 247	\$ 424	\$ 343	\$ 309	\$ 225	\$ 462	\$ 312	\$ 354
6	\$ 288	\$ 495	\$ 400	\$ 361	\$ 262	\$ 539	\$ 363	\$ 412
7	\$ 309	\$ 531	\$ 429	\$ 388	\$ 281	\$ 578	\$ 390	\$ 443
8	\$ 312	\$ 536	\$ 433	\$ 391	\$ 284	\$ 584	\$ 393	\$ 447
9	\$ 315	\$ 541	\$ 437	\$ 395	\$ 287	\$ 589	\$ 397	\$ 451
10	\$ 318	\$ 546	\$ 441	\$ 398	\$ 289	\$ 595	\$ 401	\$ 455
<b>10-Year Total</b>	<b>\$ 2,236</b>	<b>\$ 3,838</b>	<b>\$ 3,106</b>	<b>\$ 2,800</b>	<b>\$ 2,036</b>	<b>\$ 4,181</b>	<b>\$ 2,821</b>	<b>\$ 3,201</b>
<b>10-Year Average</b>	<b>\$ 224</b>	<b>\$ 384</b>	<b>\$ 311</b>	<b>\$ 280</b>	<b>\$ 204</b>	<b>\$ 418</b>	<b>\$ 282</b>	<b>\$ 320</b>

Table 19 - SFD tax bill per municipality, zero-growth assumption

The growth scenario involves the following percentage rates:

<b>Sewered Equivalent Population Projections</b>		
	<b>CAGR (to 2030)</b>	<b>CAGR (beyond 2030)</b>
Colwood	6.79%	1.50%
Esquimalt	0.75%	0.10%
Langford	5.03%	1.50%
Oak Bay	0.11%	0.10%
Saanich	0.41%	0.10%
Victoria	0.33%	0.10%
View Royal	1.69%	1.00%
CRD Total	1.30%	

Table 20 - Assumed growth rates<sup>26</sup>

<sup>26</sup> The 1.3% overall for the CRD is a “fudge factor” quotation; the actual rate is 1.18%, but does not materially affect the overall CRD calculations for the 10-year interval.

<b>Growth Scenario</b>									
	Colwood	Esquimalt	Langford	Oak Bay	Saanich	Victoria	View Royal	CRD	
Year	SFD Average	SFD Average	SFD Average	SFD Average	SFD Average	SFD Average	SFD Average	SFD Average	SFD Average
1	\$ 37	\$ 64	\$ 52	\$ 46	\$ 34	\$ 70	\$ 42	\$ 53	
2	\$ 75	\$ 136	\$ 106	\$ 99	\$ 72	\$ 148	\$ 88	\$ 113	
3	\$ 112	\$ 215	\$ 160	\$ 158	\$ 115	\$ 236	\$ 137	\$ 177	
4	\$ 167	\$ 340	\$ 243	\$ 253	\$ 182	\$ 375	\$ 215	\$ 279	
5	\$ 190	\$ 412	\$ 282	\$ 308	\$ 221	\$ 456	\$ 258	\$ 336	
6	\$ 207	\$ 477	\$ 313	\$ 359	\$ 257	\$ 530	\$ 295	\$ 387	
7	\$ 208	\$ 508	\$ 320	\$ 385	\$ 275	\$ 567	\$ 311	\$ 410	
8	\$ 197	\$ 508	\$ 307	\$ 388	\$ 276	\$ 570	\$ 309	\$ 408	
9	\$ 186	\$ 509	\$ 295	\$ 391	\$ 277	\$ 574	\$ 307	\$ 407	
10	\$ 176	\$ 510	\$ 284	\$ 395	\$ 279	\$ 577	\$ 305	\$ 405	
<b>10-Year Total</b>	<b>\$ 1,554</b>	<b>\$ 3,678</b>	<b>\$ 2,362</b>	<b>\$ 2,783</b>	<b>\$ 1,988</b>	<b>\$ 4,104</b>	<b>\$ 2,266</b>	<b>\$ 2,974</b>	
<b>10-Year Average</b>	<b>\$ 155</b>	<b>\$ 368</b>	<b>\$ 236</b>	<b>\$ 278</b>	<b>\$ 199</b>	<b>\$ 410</b>	<b>\$ 227</b>	<b>\$ 297</b>	

**Table 21 - SFD tax bill per municipality, variable growth projection**

The fast-growing municipalities (Colwood, Langford and View Royal) are able to reduce average SFD costs considerably with growth, while the rest of the municipalities do not have that luxury.

The reason why Esquimalt and Victoria residents will be paying more is due to their sewage requirements versus their residential property tax bases to support the costs. Saanich and Oak Bay have relatively larger tax bases to draw from, hence lower per-SFD costs for those municipalities.

#### **a. Reconciliation to October 10, 2012 CRD Recommendation**

There are some surprising conclusions out of this analysis – the model as proposed on October 10, 2012 appears to be skewed against Esquimalt and Victoria.

In particular, the disparity between this model and the model presented by the CRD was sufficiently high that it required a second look to see what the reconciliation was between the two methods.

The October 10, 2012 committee meeting contained the following chart:

**Estimated Costs Per Household in Core Area Sewer Municipalities**  
**Schedule showing gradual increase in annual cost implimented over 6 years**

	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
Colwood	52	103	155	207	258	310
Esquimalt	52	104	156	207	259	311
Langford	55	111	166	221	277	332
Oak Bay	65	130	196	261	326	391
Saanich	39	77	116	155	193	232
Victoria	59	118	177	235	294	353
View Royal	40	80	120	160	200	240

- Estimated Annual Household Cost in 2018 based on 2017 sewage flows, assumes 3 person households and costs allocated on 2017 population equivalent flows

- Annual estimated costs increase by an equal amount in each year but will vary based on actual billing/taxation method used by individual municipalities

**Figure 1 - CRD Projection of Annual Expenses, from October 10, 2012 meeting**

This model appears to be simplistic – for example, View Royal’s annual cost escalates by \$40/year over 6 years, but because View Royal is growing, there should be an adjustment factor to account for this growth. Other municipalities also exhibit linear increases (Colwood, Esquimalt at \$52/year, Langford at \$55/year, Oak Bay at \$66/year, Saanich at \$39/year and Victoria at \$58/year). Finally, the costing schedule as seen above does not appear to take into consideration the actual capital outlays as incurred by Seaterra.

Other document distributed in the October 10, 2012 committee meeting, “Supplementary to Item 6” contains three tables – the allocation of estimated annual charges in 2017, estimated cost per household in 2017 and estimated cost per household in 2030.

The first table is the raw cost for 2017, by municipality. The three columns on the right hand side were inserted for this report for comparison and the municipalities were put into alphabetical order:

<b>Allocation of Estimated Annual Charges in 2017 (\$ Million)</b>				
		<b>2017 Allocation (Calculated)</b>	<b>Allocation per recommendation (capital)</b>	<b>Allocation per recommendation (operating)</b>
Colwood	\$ 1.4	3.8%	4.3%	4.3%
Esquimalt	\$ 2.5	6.8%	6.6%	6.6%
Langford	\$ 4.1	11.1%	12.7%	12.9%
Oak Bay	\$ 2.5	6.8%	6.4%	6.3%
Saanich	\$ 11.5	31.1%	30.5%	30.6%
Victoria	\$ 13.8	37.3%	36.2%	36.0%
View Royal	\$ 1.2	3.2%	3.2%	3.2%
<b>Total</b>	<b>\$ 37.0</b>			

[Table 22 - CRD Allocation of Estimated Annual Charges \(2017\), from October 10, 2012 Supplementary to Item 6 report](#)

There is limited speculation why the 2017 allocation is different than the recommendation, unless if this was an estimate of the small municipalities (Colwood and Langford) trading capacity with the more established municipalities.

<b>Estimated Cost Per Household in 2017</b>					
		<b>Implied Households (calculated)</b>	<b>2011 Census Dwellings</b>	<b>2011 Census Population</b>	<b>2013 BCAA Occurrences</b>
Colwood	\$ 310	4,516	6,395	16,093	5,423
Esquimalt	\$ 311	8,039	8,638	16,209	4,872
Langford	\$ 332	12,349	12,731	29,228	12,221
Oak Bay	\$ 391	6,394	8,190	18,015	6,424
Saanich	\$ 232	49,569	49,670	109,752	38,615
Victoria	\$ 353	39,093	47,691	80,017	25,676
View Royal	\$ 240	5,000	4,138	9,381	3,403

[Table 23 – CRD estimated cost per household in 2017, from October 10, 2012 Supplementary to Item 6 report](#)

By taking the allocation of 2017 annual charges and dividing it by the estimated cost per household, one can derive the number of households that are being assumed per member municipality. For comparative purposes, this calculated figure is contrasted with the latest census data for dwellings and population, and also the number of residential occurrences in the BC Assessment data. Even when allowing for growth from the 2011 Census or 2013 BC Assessment figures, it is very difficult to reconcile what constitutes a “household” in this context.

Finally, the 2017 estimated cost per household does not reconcile with the 2017 estimated cost per household given in Figure 1 above – it is clear that the tables were generated with different cost models.

One of the reasons why the bulk of this analysis chose to use residential mill rate values and average single family dwellings as a baseline to measure costs is that it avoids the ambiguity of what constitutes a “household.”

The baseline measure should be the taxation impact to a single family dwelling owner.

The scheme proposed on the October 10, 2012 memorandum appears to be require amendment. In addition to the two separate cost projections provided by the CRD need to have further documentation outlining the various assumptions taken to arrive at those figures.

## 19. The impact of Seatterra municipalities opting out of the project

If there are municipalities that are able to successfully<sup>27</sup> exempt themselves from the Seatterra Program, the net impact to other municipalities would be the distribution of capital costs that would otherwise be allocated to all members.

It is not clear from documentation how Seatterra could scale in the event of a significant decline in required capacity.

If one of either Saanich or Victoria decided to opt out of the program, it would likely result in significant, if not terminal, changes in the project’s scope given the significance of both municipalities in the program.

Operational costs would likely decrease slightly due to less capacity utilization, but this amount would be immaterial compared to capital costs of construction.

<b>If the following municipality withdrew...</b>	<b>... the estimated cost increase on all others would be:</b>
Colwood	4.5%
Esquimalt	7.1%
Langford	14.7%
Oak Bay	6.8%
Saanich	44.0%
Victoria	56.5%
View Royal	3.3%

Table 24 - Impact of municipality withdrawing

<sup>27</sup> Although a council can opt out of the program, there are other procedural tools that can be employed to compel involvement in the project. Chapter 9 of the Peer Review document goes into some depth on the powers of the various government bodies.

## 20. Property taxation of business land owners

There has been little discussion as to the impact of Seaterra on business property owners.

For the 2013 taxation year, 33.1% of municipal and regional taxes levied have been paid by business property owners. 65.0% of taxes have been paid by residential owners. This is nearly a 2:1 ratio of residential to business taxes<sup>28</sup>.

If businesses were required to pay for capital costs at the same ratio, this would have the effect of subsidizing residential property owners – every dollar that business property taxes pay would be a dollar that residential owners would not have to pay. The following table depicts the effect of a 2:1 residential to business ratio on capital costs:

Year	CRD Capital Cost	MFA Debt Service Payment	Total Residential Charge	Total Business Charge	SFD Tax (Zero-Growth)	SFD Tax (1.3% Growth)	Business Tax (Zero-Growth)	Business Tax (1.3% Growth)
1	\$ 11,443,000	\$ 680,059	\$ 453,372	\$ 226,686	\$ 5	\$ 5	\$ 41	\$ 41
2	\$ 19,574,000	\$ 1,843,343	\$ 1,228,896	\$ 614,448	\$ 14	\$ 14	\$ 112	\$ 111
3	\$ 26,908,000	\$ 3,442,488	\$ 2,294,992	\$ 1,147,496	\$ 27	\$ 26	\$ 210	\$ 205
4	\$ 82,453,000	\$ 8,342,678	\$ 5,561,786	\$ 2,780,893	\$ 65	\$ 63	\$ 509	\$ 489
5	\$ 85,792,000	\$ 13,441,306	\$ 8,960,870	\$ 4,480,435	\$ 105	\$ 100	\$ 819	\$ 778
6	\$ 78,940,000	\$ 18,132,718	\$ 12,088,478	\$ 6,044,239	\$ 141	\$ 133	\$ 1,105	\$ 1,036
7	\$ 37,589,000	\$ 20,366,636	\$ 13,577,757	\$ 6,788,879	\$ 159	\$ 147	\$ 1,242	\$ 1,149
8	-	\$ 20,366,636	\$ 13,577,757	\$ 6,788,879	\$ 159	\$ 145	\$ 1,242	\$ 1,134
9	-	\$ 20,366,636	\$ 13,577,757	\$ 6,788,879	\$ 159	\$ 143	\$ 1,242	\$ 1,120
10	-	\$ 20,366,636	\$ 13,577,757	\$ 6,788,879	\$ 159	\$ 141	\$ 1,242	\$ 1,105

Table 25 - Impact of business tax on residential rates (Capital Costs)

In the zero-growth scenario, the average CRD business property<sup>29</sup> would pay \$1,242 in extra property taxes annually after all capital costs have been incurred. Accordingly, an average SFD owner would pay \$79/year less in that same year (year seven), thus reducing their total tax increase to \$159/year.

If one assumes operating costs are apportioned amongst residents and businesses at the 2:1 proportion<sup>30</sup>, the following are the total costs:

<sup>28</sup> This should not be confused with the mill rate multiplier; in terms of mill rates, residential is 6.248 and business is 21.2635, or about a 3.4:1 ratio.

<sup>29</sup> \$1.36 million in 2013.

<sup>30</sup> As operating costs will be billed on the basis of metering, this assumption is slightly punitive to business owners – the true ratio according to the Core Area Liquid Waste Management Plan is closer to 2.25:1.

Year	CRD Capital Cost	Total Residential Charge	Total Business Charge	SFD Tax (Zero-Growth)	SFD Tax (1.3% Growth)	Business Tax (Zero-Growth)	Business Tax (1.3% Growth)
1	\$ 11,443,000	\$ 3,036,706	\$ 1,518,353	\$ 36	\$ 36	\$ 278	\$ 278
2	\$ 19,574,000	\$ 6,498,896	\$ 3,249,448	\$ 76	\$ 75	\$ 594	\$ 587
3	\$ 26,908,000	\$ 10,358,092	\$ 5,179,046	\$ 121	\$ 118	\$ 947	\$ 923
4	\$ 82,453,000	\$ 16,527,602	\$ 8,263,801	\$ 193	\$ 186	\$ 1,511	\$ 1,454
5	\$ 85,792,000	\$ 20,146,003	\$ 10,073,001	\$ 236	\$ 224	\$ 1,842	\$ 1,749
6	\$ 78,940,000	\$ 23,497,313	\$ 11,748,657	\$ 275	\$ 258	\$ 2,149	\$ 2,014
7	\$ 37,589,000	\$ 25,214,769	\$ 12,607,384	\$ 295	\$ 273	\$ 2,306	\$ 2,134
8	-	\$ 25,447,509	\$ 12,723,754	\$ 298	\$ 272	\$ 2,327	\$ 2,126
9	-	\$ 25,684,904	\$ 12,842,452	\$ 301	\$ 271	\$ 2,349	\$ 2,118
10	-	\$ 25,927,047	\$ 12,963,523	\$ 303	\$ 270	\$ 2,371	\$ 2,111

**Table 26 - Capital and Operating Charges with business taxes**

In the zero-growth scenario, a SFD owner would pay \$148/year less, at the expense of the business property owner, whom would pay \$2,306/year. Still, SFD owners would see an overall tax increase of \$295.

This analysis does not apportion costs on a per-municipality basis due to the likeliness of the October 10, 2012 apportionment proposal not seeing the light of day.

On the matter of business taxation, this study concludes by stating that it appears probable that business property owners are going to face some burden of Seaterra capital costs to subsidize the effect on residential users.

However, businesses inevitably pass along tax increases to customers through the price of goods and services, so residents should expect that impact on their cost of living for goods and services that are purchased in the Seaterra municipalities.



## 21. Conclusions

Modeling costs is a complex activity. There are several variables that have significant consequences over 10-30 year intervals that will have dramatic effects over costs that will be borne by property owners. These modeling variables include:

- Projected dwelling growth rates within municipalities over time;
- Inflation estimates over time;
- Interest rates 10 years from now, and beyond;
- Whether the formula between CRD and member municipalities evolves over time.

All of these variables have a significant impact in modeling costs.

It is likely, given low interest rates, that capital costs of the project will be financed with 30 year debt. This will provide the lowest yearly costs to residents, but at the expense of having to pay debt servicing and interest for a longer duration. There is also considerable interest risk when rates reset 10 years from the initial bond issuance date.

It is highly recommended that the baseline cost be represented for a single family dwelling owner as this reduces ambiguity when representing costs per dwelling, or cost per person.

When the project is finished borrowing money, the average CRD SFD owner will pay about \$443 per year in capital and operational costs for the project, or about \$410 assuming 1.3% growth across the CRD.

The proposed apportionment of costs as presented on October 10, 2012 contains assumptions that will likely lead to Esquimalt and Victoria residents paying more for Seaterra than the rest of the CRD. It is likely that political pressures will require changes to the recommended apportionment formula.

Little discussion has occurred on the impact to business property owners. If a tax dollar is collected from business property taxes, this will have the effect of decreasing residential collections by a dollar. If the CRD municipalities continue to maintain a 2:1 ratio of residential to business tax collections, the impact of Seaterra to the average business property owner will be a combined capital and operating expense of approximately \$2,100/year. The corresponding impact for the average residential SFD owner would be a change from approximately \$410/year to \$273/year if business taxes are implemented in this manner. However, businesses inevitably pass along tax increases to customers through the price of goods and services, so residents should expect that impact on their cost of living for goods and services that are purchased in the Seaterra municipalities.

## 22. Appendix A – CRD Municipal Mill Rates, 2013

The following mill rates were obtained from the respective municipalities' bylaws establishing mill rates for the 2013 taxation year:

	1	2	4	5	6	8	9
	Residential	Utilities	Major Industry	Light Industry	Business	Rec/Non Profit	Farm
<b>Muni (General Rate, Including: General Debt; Excluding: School Tax, CRD, Hospital, BCAA/MFA, BC Transit)</b>							
Colwood	3.2006	40	0	32.9894	12.8211	11.8096	103.53
Esquimalt	4.8551	21.54743	31.45665	16.5234	12.4506	5.44052	0
Langford	2.5763	19.0645	8.27	8.27	7.7289	3.1044	2.5763
Oak Bay	3.1347	0	0	5.6152	5.6152	4.3795	1773.9581
Saanich (SD61)	3.5429	27.7146	10.7993	10.7993	12.335	6.8588	0.5
Saanich (SD63)	3.5429	27.7146	10.7993	10.7993	12.335	6.8588	0.5
Victoria	4.2271	32.5274	13.4535	14.4535	13.4535	8.2639	0
View Royal (SD61)	2.52342	31.70102	0	8.81447	8.81447	8.83896	20.23598
View Royal (SD62)	2.52342	31.70102	0	8.81447	8.81447	8.83896	20.23598

	1	2	4	5	6	8	9
	Residential	Utilities	Major Industry	Light Industry	Business	Rec/Non Profit	Farm
<b>Mill Rates (All-Inclusive)</b>							
Colwood	6.1674	58.1331	0	47.5134	22.0895	16.2074	111.4371
Esquimalt	5.81863	25.54191	36.77461	21.84136	14.88714	6.48401	0
Langford	5.6751	37.6597	18.983	23.2428	17.3206	7.6342	10.6061
Oak Bay	5.9554	16.7717	0	19.3389	14.7387	9.0187	2036.8055
Saanich (SD61)	6.1904	46.6627	20.5881	24.8479	21.6186	11.4062	8.0477
Saanich (SD63)	6.1473	46.6627	20.5881	24.8479	21.6186	11.4062	8.0477
Victoria	6.879	51.4691	23.294	27.5538	22.6671	12.8241	0
View Royal (SD61)	5.3836	50.1902	0	23.68427	18.332	13.3385	28.2355
View Royal (SD62)	5.5919	50.1902	0	23.68427	18.332	0	28.2355

## 23. Appendix B – BC Assessment Roll Values, 2013

The following data was compiled through data made available by BC Assessment. Category 3 (Supportive Housing) and Category 7 (Managed Forest Lands) were immaterial and hence excluded in the following:

	1	2	4	5	6	8	9	
	Residential	Utilities	Major Industry	Light Industry	Business	Rec/Non Profit	Farm	Totals
<b>Value, Non-Exempt (Land)</b>								
Colwood	\$ 1,561,082,502	\$ 515,900	\$ -	\$ 5,123,000	\$ 134,827,000	\$ 5,333,000	\$ 14,505	\$ 1,706,896,000
Esquimalt	1,427,985,402	587,000	11,959,000	6,464,000	102,799,952	10,413,000	-	1,560,208,000
Langford	2,864,520,005	3,397,100	-	9,629,300	457,308,124	14,150,000	133,583	3,349,236,000
Oak Bay	3,966,696,800	-	-	-	65,356,688	2,445,300	7,018	4,034,506,000
Saanich (SD61)	11,196,957,310	7,153,700	-	6,695,000	788,303,178	6,443,500	1,122,273	12,006,686,000
Saanich (SD63)	3,529,183,400	2,477,000	-	1,822,300	110,242,534	9,368,000	2,619,262	3,655,712,000
Victoria	8,853,228,131	5,967,360	7,274,000	40,651,200	2,027,135,024	18,428,500	-	10,952,684,000
View Royal (SD61)	1,069,207,602	188,000	-	284,000	80,968,100	6,526,000	45,875	1,157,220,000
View Royal (SD62)	8,651,000	-	-	-	-	-	25,343	8,676,000
<b>Totals</b>	<b>34,477,512,152</b>	<b>20,286,060</b>	<b>19,233,000</b>	<b>70,668,800</b>	<b>3,766,940,600</b>	<b>73,107,300</b>	<b>3,967,859</b>	<b>\$ 38,431,824,000</b>

	1	2	4	5	6	8	9	
	Residential	Utilities	Major Industry	Light Industry	Business	Rec/Non Profit	Farm	Totals
<b>Value, Non-Exempt (Improvements)</b>								
Colwood	\$ 945,822,687	\$ 1,033,300	\$ -	\$ 777,000	\$ 52,337,800	\$ -	\$ -	\$ 999,971,000
Esquimalt	839,430,202	560,600	6,191,000	7,379,400	76,023,600	44,000	-	929,629,000
Langford	2,097,825,403	4,120,400	-	9,069,400	520,838,026	364,900	-	2,632,218,000
Oak Bay	1,588,486,583	-	-	-	81,849,112	100,000	-	1,670,436,000
Saanich (SD61)	4,755,454,673	1,985,100	-	3,063,000	737,260,200	78,900	-	5,497,842,000
Saanich (SD63)	190,063,210	913,900	-	909,400	129,286,667	-	-	321,173,000
Victoria	4,479,353,423	10,136,800	2,808,000	15,872,800	1,989,717,177	2,678,600	-	6,500,567,000
View Royal (SD61)	610,564,401	188,200	-	1,790,000	76,697,100	-	-	689,240,000
View Royal (SD62)	2,620,400	-	-	-	-	-	-	2,620,000
<b>Totals</b>	<b>15,509,620,982</b>	<b>18,938,300</b>	<b>8,999,000</b>	<b>38,861,000</b>	<b>3,664,009,682</b>	<b>3,266,400</b>	<b>-</b>	<b>\$ 19,243,696,000</b>

	1	2	4	5	6	8	9	
	Residential	Utilities	Major Industry	Light Industry	Business	Rec/Non Profit	Farm	Totals
<b>Value, Non-Exempt (combined)</b>								
Colwood	\$ 2,506,905,189	\$ 1,549,200	\$ -	\$ 5,900,000	\$ 187,164,800	\$ 5,333,000	\$ 14,505	\$ 2,706,867,000
Esquimalt	2,267,415,604	1,147,600	18,150,000	13,843,400	178,823,552	10,457,000	-	2,489,837,000
Langford	4,962,345,408	7,517,500	-	18,698,700	978,146,150	14,514,900	133,583	5,981,454,000
Oak Bay	5,555,183,383	-	-	-	147,205,800	2,545,300	7,018	5,704,942,000
Saanich (SD61)	15,952,411,983	9,138,800	-	9,758,000	1,525,563,378	6,522,400	1,122,273	17,504,528,000
Saanich (SD63)	3,719,246,610	3,390,900	-	2,731,700	239,529,201	9,368,000	2,619,262	3,976,886,000
Victoria	13,332,581,554	16,104,160	10,082,000	56,524,000	4,016,852,201	21,107,100	-	17,453,251,000
View Royal (SD61)	1,679,772,003	376,200	-	2,074,000	157,665,200	6,526,000	45,875	1,846,459,000
View Royal (SD62)	11,271,400	-	-	-	-	-	25,343	11,297,000
<b>Totals</b>	<b>49,987,133,134</b>	<b>39,224,360</b>	<b>28,232,000</b>	<b>109,529,800</b>	<b>7,430,950,282</b>	<b>76,373,700</b>	<b>3,967,859</b>	<b>\$ 57,675,521,000</b>

## 24. Appendix C – Occurrences for property taxation purposes, 2013

For the following table, an “Occurrence” is not to be confused with a “dwelling”. The reconciliation is primarily due to apartment units being considered separate dwellings and cooperative housing while for property taxation purposes is considered to be a single occurrence.

For clarity, each unit within a strata property is considered to be an occurrence.

Some farm occurrences have an additional residential occurrence.

The table also includes properties that are both eligible and exempted from paying property taxes.

	1	2	4	5	6	8	9	
	Residential	Utilities	Major Industry	Light Industry	Business	Rec/Non Profit	Farm	Totals
<b>Occurrences (Exempt and non-exempt properties)</b>								
Colwood	5,423	11	-	7	200	41	2	5,684
Esquimalt	4,872	15	12	14	229	67	-	5,209
Langford	12,221	27	-	11	660	107	25	13,055
Oak Bay	6,424	4	-	-	182	131	1	6,742
Saanich (SD61)	30,068	51	-	7	1,066	450	152	31,802
Saanich (SD63)	8,547	22	-	4	208	154	254	9,189
Victoria	25,676	32	1	49	2,790	316	-	28,877
View Royal (SD61)	3,388	13	-	1	133	81	15	3,631
View Royal (SD62)	15	2	-	-	-	5	1	23
<b>Totals</b>	<b>96,634</b>	<b>177</b>	<b>13</b>	<b>93</b>	<b>5,468</b>	<b>1,352</b>	<b>450</b>	<b>104,212</b>

## 25. Appendix D – Collections from property taxes by municipalities, 2013

The following data was generated by multiplying the respective mill rate by the assessed value. Actual collections by municipalities vary slightly.

	1	2	4	5	6	8	9	
	Residential	Utilities	Major Industry	Light Industry	Business	Rec/Non Profit	Farm	Totals
<b>Collections (Including: General Debt; Excluding: School Tax, CRD, Hospital, BCAA/MFA, BC Transit)</b>								
Colwood	\$ 8,023,601	\$ 61,968	\$ -	\$ 194,637	\$ 2,399,659	\$ 62,981	\$ 1,502	\$ 10,744,000
Esquimalt	11,008,529	24,728	570,938	228,740	2,226,461	56,892	-	14,116,000
Langford	12,784,490	143,317	-	154,638	7,559,994	45,060	344	20,688,000
Oak Bay	17,413,833	-	-	-	826,590	11,147	12,450	18,264,000
Saanich (SD61)	56,517,800	253,278	-	105,380	18,817,824	44,736	561	75,740,000
Saanich (SD63)	13,176,919	93,977	-	29,500	2,954,593	64,253	1,310	16,321,000
Victoria	56,358,155	523,826	135,638	816,970	54,040,721	174,427	-	112,050,000
View Royal (SD61)	4,238,770	11,926	-	18,281	1,389,735	57,683	928	5,717,000
View Royal (SD62)	28,442	-	-	-	-	-	513	29,000
<b>Totals</b>	<b>\$ 179,550,542</b>	<b>\$ 1,113,021</b>	<b>\$ 706,576</b>	<b>\$ 1,548,147</b>	<b>\$ 90,215,576</b>	<b>\$ 517,178</b>	<b>\$ 17,607</b>	<b>\$ 273,669,000</b>

	1	2	4	5	6	8	9	
	Residential	Utilities	Major Industry	Light Industry	Business	Rec/Non Profit	Farm	Totals
<b>Collections (All-in)</b>								
Colwood	\$ 15,461,087	\$ 90,060	\$ -	\$ 280,329	\$ 4,134,377	\$ 86,434	\$ 1,616	\$ 20,054,000
Esquimalt	13,193,252	29,312	667,459	302,359	2,662,171	67,803	-	16,922,000
Langford	28,161,806	283,107	-	434,610	16,942,078	110,810	1,417	45,935,000
Oak Bay	33,083,339	-	-	-	2,169,622	22,955	14,294	35,290,000
Saanich (SD61)	98,751,811	426,441	-	242,466	32,980,544	74,396	9,032	132,485,000
Saanich (SD63)	22,863,325	158,229	-	67,877	5,178,286	106,853	21,079	28,396,000
Victoria	91,714,829	828,867	234,850	1,557,451	91,050,391	270,680	-	185,657,000
View Royal (SD61)	9,043,221	18,882	-	49,121	2,890,318	87,047	1,295	12,090,000
View Royal (SD62)	63,029	-	-	-	-	-	716	64,000
<b>Totals</b>	<b>\$ 312,335,698</b>	<b>\$ 1,834,896</b>	<b>\$ 902,309</b>	<b>\$ 2,934,213</b>	<b>\$ 158,007,788</b>	<b>\$ 826,978</b>	<b>\$ 49,449</b>	<b>\$ 476,893,000</b>

## 26. Appendix E – Average residential / business assessments, 2013

	<u>SFD Occurrences</u>	<u>SFD Land Value</u>	<u>SFD Improvements</u>	<u>SFD Average</u>
Colwood	4,322	\$ 1,237,178,300	\$ 826,762,800	\$ 477,543
Esquimalt	3,068	978,064,100	491,542,401	479,011
Langford	8,407	1,983,794,000	1,719,373,500	440,486
Oak Bay	5,484	3,580,124,300	1,304,652,183	890,732
Saanich	29,278	12,286,506,100	5,476,929,800	606,716
Victoria	10,500	4,335,213,200	1,591,295,187	564,429
View Royal	2,242	776,065,500	439,695,500	542,266
<b>Totals</b>	<b>63,301</b>	<b>\$ 25,176,945,500</b>	<b>\$ 11,850,251,371</b>	<b>\$ 584,939</b>

	<u>Strata Occurrences</u>	<u>Strata Land Value</u>	<u>Strata Improvements</u>	<u>Strata Average</u>
Colwood	764	\$ 151,694,100	\$ 95,577,686	\$ 323,654
Esquimalt	1,562	310,969,600	145,475,600	292,218
Langford	2,927	492,489,100	316,473,300	276,379
Oak Bay	725	228,990,000	85,435,700	433,691
Saanich	7,690	1,780,138,700	799,824,200	335,496
Victoria	12,784	3,063,009,501	1,332,798,501	343,852
View Royal	979	209,203,000	116,982,200	333,182
<b>Totals</b>	<b>27,431</b>	<b>\$ 6,236,494,001</b>	<b>\$ 2,892,567,187</b>	<b>\$ 332,801</b>

	<u>Business Occurrences</u>	<u>Business Land Value</u>	<u>Business Improvements</u>	<u>Business Average</u>
Colwood	200	\$ 134,827,000	\$ 52,337,800	\$ 935,824
Esquimalt	229	102,799,952	76,023,600	780,889
Langford	660	457,308,124	520,838,026	1,482,040
Oak Bay	182	65,356,688	81,849,112	808,823
Saanich	1,274	898,545,712	866,546,867	1,385,473
Victoria	2,790	2,027,135,024	1,989,717,177	1,439,732
View Royal	133	80,968,100	76,697,100	1,185,453
<b>Totals</b>	<b>5,468</b>	<b>\$ 3,766,940,600</b>	<b>\$ 3,664,009,682</b>	<b>\$ 1,358,989</b>

## 27. References

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## **28. Acknowledgements**

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