2009 POST-ENUMERATION VOTERS LIST QUALITY MEASUREMENT

May 2009 - Report

ELECTIONS BC

EXECUTIVE SUMMARY

This report presents the findings of the 2009 Post-Enumeration Voters List Quality Measurement for Elections BC as of April 6, 2009. The purpose of the study was to assess the overall quality of the BC Voters List, including an analysis of both its coverage and currency. Comparisons with list quality estimates from the Pre-Enumeration Voters List Quality Measurement will also provide indicators of effectiveness for Elections BC's enumeration efforts. The list quality results in this report will also be used to support currency and coverage estimates for the April 28, 2009 revised voters list and the final May 12, 2009 General Voting Day voters list.

For the April, 2009 survey, Elections BC collaborated with Elections Canada to field a joint survey. As a result, adjustments to both the original questionnaire and sampling plan were implemented in order to obtain efficiencies in the survey methodology.

Coverage proportion was 92.6%

List coverage was determined to be 92.6%, based upon a April 6, 2009 demarcation date. This measure was calculated by comparing the number of registered voters to the estimated population of eligible voters.

Currency proportion, with imputation of non-responses, was 87.8% (±1.3%)

Using the multiple imputation statistical approach, responses were imputed for each of the non-responses, providing a higher level of certainty about their disposition. The findings from the imputation, taken together with the confirmed responses, provided a currency estimate of 87.8% (±1.3%, 19 times out of 20)[1] based on an April 6, 2009 extract of the voters list. This measure represents an increase in overall list currency, as compared to the estimates taken from the January 2009 Pre-Enumeration Voters List Quality Measure. However, as a number of changes to the survey methodology were introduced to the post-enumeration study, including the incorporation of a sample of electors from Elections Canada's National Register of Electors, some caution should be exercised when interpreting the pre-enumeration and post-enumeration results.

Overall list quality was 81.3% (±1.3%)

A measure of overall list quality was obtained by multiplying the coverage proportion by the currency proportion. The result of this calculation provided a list quality estimate of 81.3% (±1.3%, 19 times out of 20). This measure indicates that 81.3% of eligible voters are both listed on the Elections BC Voters List and their voter information is correct.

[1] Refers to a 95% confidence interval.

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INTRODUCTION

This report presents the findings of the 2009 Post-Enumeration Voters List Quality Measurement conducted by BC Stats on behalf of Elections BC. The purpose of the research is to assess the quality of the BC Voters List as of April 6, 2009, both in terms of its currency and its coverage. In an effort to better support shared objectives across organizations, Elections BC and Elections Canada collaborated together to field a joint survey. As a result, adjustments to both the original questionnaire and sampling plan were implemented in order to obtain efficiencies in the survey methodology.

By measuring list quality (and its constituent proportions of currency and coverage), it is possible to assess the overall status of the voters list at a given point in time. This provides insight as to the general comprehensiveness and accuracy of information found within Elections BC's database. Specific to this study, currency, coverage and quality estimates allow for a direct comparison to the January 2009 pre-enumeration survey results. This in turn provides a means of measuring the effectiveness of Elections BC's enumeration efforts.

For the currency estimate, three survey instruments were designed to solicit responses from a sample of 2,499[2] voters (drawn from the BC Voters List) and 4,900 electors (drawn from the BC portion of the National Register of Electors). The questionnaires included a phone, mail and web survey. Each survey asked respondents to verify three key details, specifically the voter's name, home address and mailing address. Several additional questions were asked in order to collect updated voter list information as well as providing indicators of over-coverage.

Survey administration took place over a five week period beginning April 17 and ending May 22, 2009.

Report Outline

The remainder of this report includes the following sections:

- RESULTS: findings from the coverage, currency and quality estimate calculations
- APPENDIX I: methodology used to create the coverage estimate
- APPENDIX II: details regarding the sourcing of phone numbers, survey design, sample selection and stratification, survey administration and the proxy decision rules and imputation of missing data

[2]The Elections BC portion of the sample was drawn using SPSS's Complex Samples procedure. Due to the rounding of strata sizes that occur during the sample allocation process, 2,499 voters were drawn from the population, rather than 2,500.

- APPENDIX III THROUGH V: a copy of the standard telephone survey script, mail survey form and introductory letter
- APPENDIX VI: a methodology on phone matching, provided by the vendor responsible for phone sourcing

JOINT ELECTIONS BC AND ELECTIONS CANADA METHODOLOGY

In order to better support the shared objectives of both Elections BC and Elections Canada, work was done to harmonize the survey questionnaires and sampling plans for each organizations' respective list quality measurements. Discussions commenced in the period following the fielding of the Elections BC January, 2009 Pre-Enumeration Voters List Quality Measurement.

The Elections BC sampling plan used in the January 2009 survey was based on an optimised Provincial Electoral District (PED) stratification scheme. To obtain comparable currency estimates with the April 2009 survey, Elections BC's original plan was to maintain the same stratification scheme for both the pre-enumeration and post-enumeration studies. Whereas Elections BC's sampling plan focused on the 85 PED's across British Columbia, Elections Canada's sampling plan used a geographic stratification based on the province's 36 Federal Electoral Districts (FED). Rather than optimising at the FED level, Elections Canada obtained optimal sampling by disproportionately stratifying each of the 36 FED's across five proposed list currency indicators. Elections Canada's five indicators were defined as follows:

- Linked to Canada Revenue Agency **AND** Diver License Files
- Linked to Canada Revenue Agency **OR** Diver License Files
- Not Linked - Elector Has Date of Birth
- Not Linked – Elector Does Not Have Date of Birth
- Unconfirmed – Elector's Registration Has Not Been Confirmed

Early in the collaboration process, efforts were made to achieve sampling efficiencies through the use of a single, unified sampling plan. As discussions progressed, it became clear that in order to obtain a single sampling plan, significant alterations would need to be made to either one or both of the organizations' original stratification schemes. For Elections BC, one of the primary goals of the post-enumeration, April 2009 survey was comparability with the pre-enumeration, January 2009 survey results. As such, each organization opted to utilise their original sampling plans, with only slight modifications to Elections BC's stratification scheme. This resulted in the sampling of 2499 Elections BC voters and 4900 (4788 determined to be in-scope) Elections Canada electors, based on each organization's sampling scheme.

While the sampling plans for each organization were largely unmodified, efficiencies were achieved through the development of a shared survey questionnaire. The questionnaire provided both organizations with an instrument that was able to collect data relevant to each organization's unique research goals. Additionally, discussions between Elections BC and Elections Canada methodologists allowed for further refinement of survey question wording and ordering.

While survey administration included a total of 7287 sample points from Elections BC's Voters List (2499) and Elections Canada's National Register of Electors (4788), the list quality estimates provided in this report only represent the results for the Elections BC portion of the sample.

With respect to over-coverage, the questionnaire used in the April, 2009 survey collected a sufficient range of respondent information (i.e. alternate names, addresses and birthdates) to generate provincial over-coverage estimates. For Elections Canada, the over-coverage information will be incorporated into a set of estimation procedures that will generate nationwide estimates of over-coverage. As Elections BC does not currently have an over-coverage estimation methodology, it is unclear at this time how the over-coverage data will be leveraged for a BC specific estimate. One option presently under consideration involves Elections Canada providing Elections BC with a BC level estimate of over-coverage, using Elections Canada's established estimation methodology.

RESULTS

COVERAGE ESTIMATE

The coverage estimate for Elections BC's voters list was generated using April 6, 2009 as the demarcation date. The population of registered voters in the Elections BC database as of this date was compared to the estimated population of eligible BC voters as determined by BC Stats Population Statistics section. The estimated population of eligible voters was also produced with a reference date of April 6, 2009. For a discussion of the methodology used to create the estimate, please refer to Appendix I.

It should be noted that the population used for the coverage calculation differs from that used in the currency estimate as it represents all registered voters. Specifically, the population for the currency estimate contains only those registered voters who had been allocated to a specific electoral district, lived at an address not identified as either "frozen" or "retired" in the BC Voters List, was not reported "moved", or had not been sampled to participate in the July 2008 or January 2009 survey. Additionally, the sample of linked BC voters drawn by Elections Canada on April 1, 2009 was removed from the BC Voters List population prior to sampling.

The population of registered voters was: 2,989,006

The estimated population of eligible voters was: 3,226,440

The calculation of coverage is:

$$\frac{\text{Registered Voters}}{\text{Estimated Eligible Voters}} = \text{Coverage (\%)}$$

$$\frac{2{,}989{,}006}{3{,}226{,}440} = \mathbf{92.6}\%$$

A summary of January 2009 and April 2009 coverage estimates are included in Table 9.

CURRENCY ESTIMATE

Estimates of currency for Elections BC's voters list were based on a population of 2,932,552 registered voters. This population represents only voters whose record was associated with one of the 85 Provincial Electoral Districts (PED)[3] or whose record was not identified as being "moved" through the Elections BC enumeration event. Additionally, voters who were selected to participate in the July 2008 or January 2009 survey, were drawn by Elections Canada, or were associated to an invalid residential address were also excluded from the April 2009 survey's sample population. In total 56,454 registered voters who were not allocated to the one of the 85 PED's, did not have a valid residential address, was reported "moved" or had been sampled previously, were excluded from the sampling plan for this study.

Responses & Non-Responses

The underlining goal for the quality study is to determine the level of currency of the home addresses in the voter registrations. The source for the currency is collected through responses or non-responses based on a survey using one of the following methods: phone survey, phone surveyor's call that provides enough information to make a currency determination, web survey, mail survey, return to sender (RTS) mail, call from participant, Canada Post's registered mail tracking information, or imputed calculation based on statistical analysis. For this survey, each response or non-response is categorized into:

- A **response** where information from the survey process is collected to determine currency. A response is further subcategorized into:
  - An **actual response**: this category includes responses where a reliable answer is determined through the completion of a phone survey, web survey, or mail survey;
  - A **proxy response**: this category includes responses where a reliable conclusion is made for the survey either by the phone surveyor's call, return to sender (RTS) mail, call from a participant, or Canada Post's registered mail tracking information;

  The currency results from these responses defines the number of "confirmed responses" and determines the "confirmed findings";

- A **non-response** where no or not enough information is collected to determine the currency. The currency for non-response voter registrations is estimated through

[3]At the time of sampling, some addresses were in the process of being assigned to a PED and as such couldn't be used in the study.

a statistical process known as imputation. The non-responses will define the number of "unconfirmed responses" and be the basis for the "imputed findings".

Confirmed Findings

From the overall sample of 7,827 in-scope records, confirmed records provided a response rate of 74.5%. Using the definitions above, responses for the overall sample consisted of 2,372 actual responses and 3,055 proxy responses, for a total of 5,427 confirmed responses. The composition of responses and non-responses for the January and April 2009 quality surveys are provided below in Table 1. As Table 1 is a summary of sample results, the data is un-weighted and therefore does not represent an extrapolation of the population.

Table 1: Pre and Post-Enumeration Response Rates

Response Category	Disposition Source		January, 2009		April, 2009	
			N	% of Total	N	% of Total
Response: YES, my record is correct	Actual Responses	Phone	1535	30.7%	1206	16.6%
		Mail	674	13.5%	787	10.8%
		Web	136	2.7%	146	2.0%
		Multiple Surveys*	18	0.4%	37	0.5%
		Other**	0	0.0%	0	0.0%
		Total	2363	47.3%	2176	29.9%
	Proxy Responses	Total	931	18.6%	2059	28.3%
	Total Current Responses		**3294**	**65.9%**	4235	**58.1%**
Response: NO, my record is not correct	Actual Responses	Phone	71	1.4%	89	1.2%
		Mail	55	1.1%	87	1.2%
		Web	16	0.3%	17	0.2%
		Multiple Surveys*	1	0.0%	2	0.0%
		Other**	2	0.0%	1	0.0%
		Total	145	2.9%	196	2.7%
	Proxy Responses	Total	463	9.3%	996	13.7%
	Total Not Current Responses		**608**	**12.2%**	1192	**16.4%**
Non-Responses	**Total**		**1098**	**22.0%**	1860	**25.5%**
TOTAL RESPONSES & NON-RESPONSES			**5000**	**100.0%**	**7287**	**100.0%**

* Some respondents completed more than one survey (i.e. a phone and mail survey)
** Instances where confirmation was not made by survey instrument (i.e. voter contacted EBC and confirmed their voter list information directly)

A further breakdown of April 2009 response rates by sample source is provided in Table 2. For the Elections BC portion of the sample, actual and proxy responses were obtained for 2,102 out of 2,499 records, giving a confirmed response rate of 84.1%. In the case of Elections Canada's sample, actual and proxy responses were obtained for 3,325 of 4,788 records, resulting in a confirmed response rate of 69.4%. It should be noted that the difference in response rates between Elections BC and Elections Canada may be a reflection of the differing sampling strategies employed by each organization. While the sampling plans for both organizations made use of disproportionate sampling, it is likely that Elections Canada's particular focus on low currency respondents (not-linked and unconfirmed electors) directly impacted the response rate for their sample. These findings, in addition to the rate of non-responses are summarised in the table below.

Table 2: EBC and EC Response Rates

Response Category	Disposition Source		EBC Sample - April, 2009		EC Sample - April, 2009	
			N	% of Total	N	% of Total
Response: YES, my record is correct	**Actual Responses**	Phone	563	22.5%	643	13.4%
		Mail	392	15.7%	395	8.2%
		Web	66	2.6%	80	1.7%
		Multiple Surveys*	2	0.1%	35	0.7%
		Other**	0	0.0%	0	0.0%
		Total	1023	40.9%	1153	24.1%
	Proxy Responses	Total	827	33.1%	1232	25.7%
	Total Current Responses		**1850**	**74.0%**	**2385**	**49.8%**
Response: NO, my record is not correct	**Actual Responses**	Phone	29	1.2%	60	1.3%
		Mail	37	1.5%	50	1.0%
		Web	11	0.4%	6	0.1%
		Multiple Surveys*	0	0.0%	2	0.0%
		Other**	0	0.0%	1	0.0%
		Total	77	3.1%	119	2.5%
	Proxy Responses	Total	175	7.0%	821	17.1%
	Total Not Current Responses		**252**	**10.1%**	**940**	**19.6%**
Non-Responses	**Total**		**397**	**15.9%**	**1463**	**30.6%**
TOTAL RESPONSES & NON-RESPONSES			**2499**	**100.0%**	**4788**	**100.0%**

Imputed Findings

The imputed findings represent the statistical analysis of confirmed and unconfirmed responses (responses and non-responses). In order to provide estimates of currency for non-responses, two distinct methods of analysis were used in this study. The first method assumed that all non-responses represent voter records that are not current. This can be thought of as a "worst-case" scenario as it produces a decidedly conservative estimate of currency. The second method of imputation uses multiple imputation and provides a less conservative, but likely more realistic estimate of currency. All results included in the Imputed Findings section have been weighted based on the stratification scheme, and as a result represent population estimates (i.e. for the entire Elections BC Voters List).

"Worst-Case" Scenario Imputed Findings

Using this "worst-case" scenario approach, it was possible to generate an estimate that was directly comparable to the January 2009 pre-enumeration results. The weighted proportion provides a measure of currency that focuses solely on the correctness of a voter's residential and/or mailing address on the Elections BC Voters List. For an address to be considered incorrect, the updated address information collected from the respondent had to be either entirely or substantially different than the residential address found within the voters list. This measure of currency, defined as *accuracy not included* in the January 2009 survey, was calculated to be 74.5% (±1.7%, 19 times out of 20) for the post-enumeration measurement. A comparison of January 2009 and April 2009 "worst-case" scenario estimates is provided in Table 3.

Table 3: "Worst-case" Scenario Currency Estimates

Audit	Weighted Currency	Standard Error	Margin of Error (±)	95% Confidence Interval	
				Lower Bound	Upper Bound
January, 2009	65.9%	0.007	1.3%	64.6%	67.2%
April, 2009	74.5%	0.009	1.7%	72.8%	76.2%

A comparison between January 2009 and April 2009 indicated an increase in currency of 8.6% percentage points, representing a statistically significant improvement. With this said, it is important to keep in mind how currency was defined for the "worst-case" scenario estimates. As the disposition of all unconfirmed records was assumed to be not current, the resulting "worst-case" scenario currency estimate became directly linked to response rate. Differences in survey methodology between January 2009 and April, 2009, including the usage of alternate priority mail services and survey instruments may have impacted the response rates of both surveys. Additionally, for the April survey, further administrative improvements were made for processing of return to sender (RTS) mail and Canada Post tracking information, which in turn may have increased the proportion of proxy confirmations in April 2009. A comparison of survey

methodologies and currency estimates between January 2009 and April 2009 is provided in

Table 4.

Table 4: Pre and Post-Enumeration Response Rate Comparison

Audit	Survey Questionnaire	Priority Mail Service	"Worst Case" Scenario		
			Yes	No	Unconfirmed
January N=5000	**2 page mail survey 3-5 minute phone survey**	**Xpresspost**	65.9%	12.2%	22.0%
April N=2499	**3 page mail survey 5-7 phone survey**	**Registered mail**	74.5%	10.1%	15.5%

Multiple Imputation Findings

An alternate method of estimation was made possible through the use of multiple imputation. Rather than assuming all non-responses represent an incorrect voter record, multiple imputation treats non-responses as missing at random. It should be noted however, that this does not mean data are missing completely at random (MCAR). Rather, the currency of non-responses can be predicted based on the analysis of relationships between other variables throughout the dataset. The resulting analysis produces a probability as to whether or not the disposition of a non-response is current. Similar to the "worst-case" scenario estimates, it was possible to obtain two additional measures of currency using the multiple imputation procedure. The multiple imputed currency measure provided a voter list currency proportion of 81.9% (±1.2%, 19 times out of 20). A summary of these values are included in Table 5, alongside the equivalent estimates from the January 2009 survey.

Table 5: Multiply Imputed Currency Estimates

Audit	Currency	Standard Error	Margin of Error (±)	95% Confidence Interval	
				Lower Bound	Upper Bound
January, 2009	81.9%	0.006	1.2%	80.6%	83.1%
April, 2009	87.8%	0.007	1.3%	86.5%	89.1%

Similar to the "worst-case" scenario estimates, the imputed January and April measures of currency can be directly compared. Applying a two sample Z-test[4] reveals a 99.9% probability that the difference in currency estimates between the pre-enumeration and post-enumeration measurements is statistically significant. In other words, the increase in currency of 5.9% percentage points from January to April is statistically significant using a 95% threshold. On a more practical level, the increase in currency estimates suggests that the voter list enumeration, rather than sampling error, resulted in the improvement of list currency.

[4] A Z-test provides a means of comparing proportions, revealing whether the difference between proportions is statistically significant or not.

Differences in survey methods between the January 2009 and April 2009 surveys may have obscured an even larger (or smaller) improvement to the voters list. As mentioned before, methodological changes made to the survey instrument and high-priority mail service may have served to alter the measured currency values for the April 2009 survey. Slight modifications to the imputation model in the form of the addition and removal of covariances between predictor variables may have affected the final imputed estimate of currency as well. Assuming that the April 2009 currency results remain constant over time, it is possible to determine what further improvement would be necessary to provide a statistically significant change for future audits. For example, to obtain a statistically significant improvement at a 95% threshold, an increase in list currency of 3.3 percentage points would be necessary. Using a 2,500 point sample size, a summary of this analysis is provided in Table 6.

Table 6: Significant Currency Improvements Estimates for Future Audits

Audit	Significance Level	Necessary Currency Proportion	Percentage point increase from April
Future Audits (N=2500)	**95.0%**	91.1%	3.3%
	97.5%	91.7%	3.9%
	99.0%	92.4%	4.6%

A further breakdown of currency measures can be generated across the 85 Provincial Electoral Districts (PED). However, due to the large number of PED's relative to the survey's total sample size, PED-level estimates provide only very general indicators of currency for each district. This generality is reflected in the large confidence intervals for each PED. In order to obtain confidence intervals that fall within standard thresholds of significance (±2.5%, 19 times out of 20), strata level sample sizes would need to increase by several orders of magnitude, resulting in a prohibitively large total sample size. However, for comparative purposes with the pre-enumeration results, a summary of January and April PED level currency is presented in Table 7 and Table 8.

Table 7: PED Level Currency Estimates

	PED	Pre-Enumeration (January)				Post-Enumeration (April)			
		Currency	95% CI	Lower	Upper	Currency	95% CI	Lower	Upper
1	ABM	81.1%	10.0%	71.1%	91.1%	87.6%	13.0%	74.6%	100.0%
2	ABS	74.9%	11.6%	63.3%	86.5%	85.1%	12.5%	72.6%	97.6%
3	ABW	80.3%	11.0%	69.2%	91.3%	90.6%	11.6%	79.0%	100.0%
4	APR	80.4%	12.3%	68.1%	92.7%	88.8%	13.2%	75.6%	100.0%
5	BDS	79.8%	13.0%	66.8%	92.7%	64.6%	18.7%	45.9%	83.4%
6	BND	73.7%	10.8%	63.0%	84.5%	94.8%	10.5%	84.4%	100.0%
7	BNE	89.8%	8.1%	81.7%	98.0%	87.5%	14.5%	73.1%	100.0%
8	BNL	81.3%	10.4%	70.9%	91.7%	86.2%	12.5%	73.7%	98.8%
9	BNN	89.9%	7.5%	82.3%	97.4%	86.9%	13.8%	73.0%	100.0%
10	CBC	80.6%	15.0%	65.5%	95.6%	75.5%	20.7%	54.8%	96.2%
11	CBN	80.0%	12.2%	67.8%	92.2%	75.6%	19.7%	56.0%	95.3%
12	CHC	81.2%	10.0%	71.2%	91.2%	92.8%	9.6%	83.1%	100.0%
13	CHH	81.0%	11.7%	69.3%	92.7%	87.4%	12.7%	74.7%	100.0%
14	CLR	77.0%	15.0%	62.1%	92.0%	76.8%	21.7%	55.1%	98.5%
15	CMX	85.0%	7.8%	77.2%	92.8%	92.1%	10.2%	81.9%	100.0%
16	CQB	87.9%	8.8%	79.1%	96.7%	89.7%	13.5%	76.2%	100.0%
17	CQM	86.4%	8.7%	77.7%	95.1%	88.3%	13.5%	74.8%	100.0%
18	CWV	86.7%	9.1%	77.6%	95.9%	98.1%	6.2%	91.9%	100.0%
19	DLN	88.6%	9.7%	78.9%	98.2%	88.9%	15.0%	73.9%	100.0%
20	DLS	88.3%	8.4%	79.9%	96.7%	95.7%	8.1%	87.6%	100.0%
21	ESR	83.5%	9.1%	74.4%	92.6%	91.5%	10.5%	81.0%	100.0%
22	FLA	89.5%	7.5%	82.0%	97.0%	88.0%	12.5%	75.5%	100.0%
23	FRN	78.1%	13.2%	64.9%	91.3%	80.0%	18.7%	61.4%	98.7%
24	JDF	85.5%	9.7%	75.8%	95.2%	74.0%	18.1%	55.9%	92.1%
25	KAN	84.8%	9.6%	75.2%	94.3%	82.0%	14.9%	67.1%	97.0%
26	KAS	78.0%	11.2%	66.7%	89.2%	90.3%	10.8%	79.5%	100.0%
27	KLA	83.6%	9.2%	74.4%	92.8%	74.5%	15.9%	58.6%	90.4%
28	KMI	77.5%	9.8%	67.6%	87.3%	84.3%	11.6%	72.7%	96.0%
29	KOE	79.6%	13.2%	66.4%	92.8%	86.2%	15.1%	71.0%	100.0%
30	KOW	71.2%	13.3%	57.9%	84.5%	84.1%	13.4%	70.7%	97.5%
31	LLY	80.6%	9.7%	70.9%	90.3%	88.8%	10.3%	78.5%	99.1%
32	MRM	84.4%	9.7%	74.8%	94.1%	91.1%	11.9%	79.3%	100.0%
33	MRP	90.6%	7.3%	83.3%	97.9%	87.1%	14.8%	72.3%	100.0%
34	NAN	86.8%	8.9%	77.9%	95.7%	91.9%	10.5%	81.4%	100.0%
35	NCW	78.4%	10.5%	67.9%	89.0%	83.3%	13.6%	69.7%	96.8%
36	NEC	79.3%	14.6%	64.6%	93.9%	84.2%	20.3%	63.9%	100.0%
37	NEL	81.4%	11.9%	69.5%	93.3%	81.1%	16.8%	64.3%	97.8%
38	NEW	78.5%	9.5%	69.0%	88.0%	88.8%	11.0%	77.8%	99.9%
39	NOC	73.4%	17.0%	56.4%	90.4%	85.5%	18.9%	66.6%	100.0%
40	NOI	74.5%	10.6%	63.9%	85.0%	90.7%	10.3%	80.4%	100.0%
41	NVL	90.9%	7.1%	83.8%	98.0%	91.1%	12.5%	78.6%	100.0%
42	NVS	85.6%	10.6%	75.0%	96.3%	92.9%	9.4%	83.5%	100.0%
43	OBG	79.9%	9.5%	70.4%	89.4%	87.8%	11.2%	76.7%	99.0%

Table 8: PED Level Currency Estimates Continued

PED		Accuracy Not Included				Accuracy Included			
		Currency	95% CI	Lower	Upper	Currency	95% CI	Lower	Upper
44	PAQ	85.8%	9.4%	76.4%	95.1%	95.6%	8.0%	87.6%	100.0%
45	PCN	57.5%	17.9%	39.6%	75.4%	90.3%	12.5%	77.8%	100.0%
46	PCS	78.7%	18.0%	60.7%	96.7%	88.7%	16.6%	72.1%	100.0%
47	PEN	88.9%	8.9%	80.0%	97.8%	87.9%	12.3%	75.6%	100.0%
48	POC	87.3%	8.2%	79.1%	95.5%	96.4%	6.9%	89.4%	100.0%
49	POM	85.5%	9.6%	75.8%	95.1%	95.7%	8.0%	87.7%	100.0%
50	POR	74.5%	12.3%	62.2%	86.8%	75.9%	14.6%	61.3%	90.4%
51	PRM	84.3%	9.9%	74.4%	94.2%	89.0%	12.3%	76.6%	100.0%
52	PRV	79.3%	9.6%	69.6%	88.9%	74.9%	16.2%	58.7%	91.1%
53	RCC	79.7%	9.6%	70.1%	89.3%	84.5%	15.0%	69.5%	99.5%
54	RCE	89.6%	7.5%	82.0%	97.1%	92.0%	10.6%	81.3%	100.0%
55	RCS	90.3%	7.2%	83.1%	97.4%	95.6%	8.3%	87.3%	100.0%
56	SAN	91.7%	9.8%	81.9%	100.0%	91.3%	11.3%	80.1%	100.0%
57	SAS	83.2%	10.0%	73.2%	93.2%	92.8%	9.6%	83.1%	100.0%
58	SHU	76.4%	10.7%	65.7%	87.0%	88.0%	12.6%	75.4%	100.0%
59	SKE	80.2%	13.8%	66.4%	94.0%	76.1%	21.6%	54.5%	97.8%
60	SKN	85.2%	15.6%	69.6%	100.0%	78.8%	26.7%	52.0%	100.0%
61	SRC	78.9%	11.1%	67.8%	90.0%	94.4%	9.6%	84.7%	100.0%
62	SRF	84.0%	11.5%	72.6%	95.5%	83.9%	14.2%	69.8%	98.1%
63	SRG	84.1%	11.9%	72.2%	95.9%	89.8%	14.6%	75.2%	100.0%
64	SRN	81.2%	10.6%	70.6%	91.9%	94.2%	9.9%	84.2%	100.0%
65	SRP	90.2%	8.4%	81.8%	98.6%	98.4%	9.3%	89.1%	100.0%
66	SRT	79.6%	10.6%	68.9%	90.2%	85.4%	13.4%	72.0%	98.9%
67	SWH	76.4%	12.1%	64.3%	88.5%	91.1%	10.3%	80.8%	100.0%
68	SWR	88.3%	9.5%	78.8%	97.9%	85.4%	13.1%	72.3%	98.5%
69	VFA	74.6%	10.3%	64.4%	84.9%	92.5%	9.3%	83.1%	100.0%
70	VFC	73.5%	11.9%	61.6%	85.4%	85.3%	13.2%	72.1%	98.6%
71	VFV	87.6%	8.1%	79.6%	95.7%	86.1%	14.0%	72.0%	100.0%
72	VHA	79.9%	10.1%	69.8%	90.0%	90.2%	10.4%	79.8%	100.0%
73	VKE	84.5%	9.0%	75.4%	93.5%	97.6%	7.3%	90.3%	100.0%
74	VKI	86.8%	8.6%	78.3%	95.4%	90.1%	12.1%	78.1%	100.0%
75	VLA	84.3%	8.9%	75.3%	93.2%	96.7%	10.6%	86.1%	100.0%
76	VMP	76.7%	10.1%	66.7%	86.8%	75.5%	16.0%	59.5%	91.5%
77	VNP	75.0%	10.6%	64.4%	85.6%	84.9%	12.3%	72.6%	97.2%
78	VNQ	82.0%	9.7%	72.3%	91.8%	93.2%	9.1%	84.2%	100.0%
79	VNW	74.1%	10.8%	63.3%	84.9%	85.2%	12.8%	72.4%	98.0%
80	VRM	87.8%	7.7%	80.1%	95.6%	94.1%	11.1%	83.0%	100.0%
81	VTB	76.4%	10.3%	66.1%	86.8%	83.1%	11.9%	71.2%	94.9%
82	VTS	84.9%	9.6%	75.3%	94.4%	94.0%	10.0%	84.0%	100.0%
83	WCA	86.9%	8.6%	78.4%	95.5%	88.1%	11.6%	76.5%	99.7%
84	WSS	73.2%	14.3%	58.9%	87.4%	84.5%	13.2%	71.3%	97.7%
85	WTK	71.3%	11.5%	59.8%	82.8%	83.3%	11.8%	71.5%	95.2%
TOTAL		**81.9%**	**1.2%**	**80.6%**	**83.1%**	**87.8%**	**1.3%**	**86.5%**	**89.1%**

* All values represent weighted estimates.

QUALITY ESTIMATE

An estimate of overall list quality was calculated by multiplying the estimated proportion of coverage by the estimated proportion of currency and its associated error term.

Estimated coverage was: 92.6%

Estimated currency was: 87.8% (±1.3%, 19 times out of 20)

The calculation of quality is:

Coverage X Currency = Quality (%)

92.6% X 87.8% (±1.3%) = **81.3 % (±1.3%, 19 times out of 20)**

Estimated Quality Findings

Compared to the estimate from the January 2009 survey, the quality measurement calculated for the April 2009 survey indicates a considerable improvement in list quality. An improvement of 8.6 percentage points was observed to occur between the January 2009 and April 2009 "worst case" scenario measurements. The probability that this increase represented an actual improvement in list quality was calculated to be nearly 100% and as such, determined to be statistically significant at a 95% threshold. As mentioned above though, the "worst case" scenario findings for both surveys are largely dependent on the overall response rate of the study. As a result, differences in survey methods between both surveys may have significantly impacted the "worst case" scenario currency estimates, which in turn altered the associated measures of list quality for both the January and April surveys.

Similar to the "worst case" scenario, list quality was observed to increase for the measures based on the multiply imputed currency estimates. The improvement was measured to be 6. 1 percentage points and determined to be statistically significant at a significance threshold approaching 100%. Provided the voters list's quality rate remains constant over time, an even more moderate increase of 3.2 percentage points would be sufficient to provide a statistically significant improvement for a future survey of similar sample size (2,500). Refer to Table 9 for a summary of coverage, currency and quality estimates for both the January 2009 and April 2009 surveys.

Table 9: Coverage, Currency and Quality Estimates

Audit	Coverage	Imputation Method	Currency	Quality
January, 2009	91.8%	"Worst case" scenario	65.9%	60.5%
		Multiple imputation	81.9%	75.2%
April, 2009	92.6%	"Worst case" scenario	74.5%	69.0%
		Multiple imputation	87.8%	81.3%

As with any statistical estimate, it was possible to generate a margin of error for each of the study's list quality measures. A margin of error, represents the uncertainty inherent in sampling and is defined by the lower and upper bounds of an estimates' confidence interval. For the purposes of this study, a 95% confidence interval was used, which indicates that 19 times out of 20, an estimated value will lie somewhere within the bounds of its confidence interval. For example, list quality using the multiply imputed currency definition, was measured to be 81.3% (±1.3%, 19 times out of 20). Based on the estimate's margin of error, 95% of the time the actual proportion of quality falls within of range of values, beginning at 80.0% and ending at 82.6%. A summary of each quality estimates' margin of error and accompanying confidence interval can be found in Table 10.

Table 10: Quality Estimates and Margins of Error

Audit	Imputation Method	Quality	Margin of Error (±)	95% Confidence Interval	
				Lower Bound	Upper Bound
January, 2009	"Worst case" scenario	60.5%	1.3%	59.2%	61.8%
	Multiple imputation	75.2%	1.2%	74.0%	76.4%
April, 2009	"Worst case" scenario	69.0%	1.7%	67.3%	70.7%
	Multiple imputation	81.3%	1.3%	80.0%	82.6%

Overall, list quality has improved from January 2009 to April 2009. While the improvement is statistically significant, adjustments in both survey methods and currency definitions reduce direct comparability across surveys. Practically, a relatively moderate increase of 6.1 percentage points in list quality actually represents a substantial improvement. When viewed within the context of a 2,932,552 record voters list, improvement in the list quality of nearly 179,000 records has a very practical relevance with respect to voters list improvement efforts. Furthermore, the results indicate that Election BC's enumeration efforts appear to have had a substantial impact on improving the overall quality of voters list, providing an effective means of preparing the voters list for general voting day.

APPENDIX I: ESTIMATING ELIGIBLE VOTER POPULATION

The eligible voter population must be estimated on a provincial and sub-provincial (PED) basis. The sub-provincial estimates are made such that they sum to the provincial estimate.

PROVINCIAL

There are four steps to estimating the number of eligible voters in British Columbia.

Step 1: Estimating Total Population

Statistics Canada produces estimates of the total population for Canada and the Provinces. The reference date for these estimates is the first day of each month and are produced using a component model with the 2006 Census adjusted for net census undercount forming the base. The population counts are released by Statistics Canada quarterly, approximately 3 months after the end of each quarter.

If available, the total population estimated by Statistics Canada is used. However, if the reference date for the eligible voter calculation is outside the published range of Statistics Canada, a forecast of the total provincial population is prepared by BC STATS using a standard component cohort-survival model. As the dates from the model will not match the voting dates, an interpolation between the closest estimated/forecasted quarterly data is performed to produce a total population count for the voting date.

Step 2: Removing the Population Aged 0 to 17

Age specific estimates of the provincial population are prepared by Statistics Canada each year with a reference date of July 1. The proportion of the British Columbia population aged 18 and over from the latest Statistics Canada estimate is applied to the total population in Step 1 to produce an estimate of the population 18 years of age and over.

Step 3: Removing Persons in BC Less Than 6 Months

An estimate of inter-provincial in-migrants aged 18 years and older for a six month period prior to the reference date is removed from the population estimated in Step 2. The estimate of inter-provincial in-migrants is taken either from Statistics Canada's most recent quarterly estimates, or if the reference period is outside the range published by Statistics Canada, the most recent estimate or forecast of quarterly inter-provincial in-migration prepared by BC STATS.

Step 4: Removing Non Canadian Citizens

To take in to account the resident British Columbia population who are not Canadian citizens the following three components are removed from the population estimated in Step 3.

a. The 18 and over immigrant population that were counted in the 2006 Census, had arrived in Canada prior to 1991 and are not citizens, is subtracted from the population estimated in Step 3. It is assumed that immigrants in Canada for more that 15 years who have not become a Canadian citizen will likely never become a citizen of Canada.

b. The immigrant population from the last five years who would be 18 or over as of the reference date are subtracted from the population estimated in Step 3.[5] Given that residency requirements and processing time for citizenship takes a minimum of approximately 4 ½ years, it was considered reasonable to reduce the eligible estimate by the immigrant population for at least that period of time.

c. Non-permanent Residents aged 18 years and over (i.e. persons in BC on a Student Visa, Work or Ministerial Permit, or are Refugee Claimants), are removed from the population estimated in Step 3. As the number of Non-permanent Residents in BC has been relatively stable for the past year, the most recent estimate published by Statistics Canada is used. The population derived in Step 4 is taken as the number of eligible voters as of the reference date.

SUB-PROVINCIAL BY AGE AND SEX

The sub-provincial PED age and sex estimates are derived from the provincial estimate. Data from the 2001 and 2006 Censuses obtained from Statistics Canada, as well as Client Registry data from the BC Ministry of Health are used to distribute provincial population growth among the PEDs by age and sex and to determine voter eligibility. For the purposes of this estimate, all data has been aggregated into 15 age groups: 0-17, 18-24, 25-29, 30-34,…, 80-84, and 85+.

Step 1: Estimating Base Population for Provincial Electoral Districts

Estimates of the population at the time of the 2006 Census for each PED by age group and sex are aggregated from small area estimates provided by Statistics Canada. The resulting estimates with a reference date of July 1, 2006 provide the base for our sub-provincial estimates.

[5] The immigrant population for the last five years is based on actual immigrant landings (not census). [Sources: Statistics Canada (quarterly components of population change) and Citizenship and Immigration Canada (personal communication)]

The distribution of growth in the Client Registry by age group and sex are used to allocate the estimated provincial population growth in each period among the PEDs. Then, BC STATS' population estimates for the second half of 2008 and the beginning of 2009 are used in conjunction with the Client Registry historical growth rate estimates to arrive at a PED population by age group and sex for the reference date.

Step 2: Removing the Population Aged 0 to 17

After ensuring the population estimates arrived at in Step 1 conform to BC STATS' provincial population estimates, the 0-17 age group is removed.

Step 3: Removing Persons in BC Less Than 6 Months

Mobility data from the 2001 and 2006 Censuses obtained from Statistics Canada are used to estimate the proportion of BC's interprovincial in-migrants arriving in each PED by age group and sex. These rates are used to distribute recent migrants among the PEDs as well as age and sex categories. The estimated in-migrant level by PED, age group, and sex are then removed from the 18+ population from Step 2.

Step 4: Removing Non-Canadian Citizens

2001 and 2006 Census data are also used to remove non-Canadian citizens over the age of 18 from the PED population estimated in Step 3. Provincial estimates of past immigrants who have never obtained citizenship, recent immigrants, and non-permanent residents are shared among the PEDs by age group and sex according to the distribution of non-citizens from the 2001 and 2006 Censuses. The resulting PED estimates are taken as the number of eligible voters as of the reference date.

APPENDIX II: CURRENCY AUDIT – METHODOLOGY

SURVEY DESIGN

Data were collected through one of three survey instruments: phone, mail and web questionnaires. Three slightly different versions of the survey instrument were created in order to accommodate the three survey modes (see Appendices III thru VI).

Each survey form asked respondents to confirm the correctness of their name, home address and mailing address. Confirmation of voter information was based on data from the BC Voters List (provided by Elections BC) whereas confirmation of elector information was based on data from the National Register of Electors (provided by Elections Canada). If a voter or elector indicated that any of the information was incorrect, they were asked to provide accurate and/or current information. Respondents were also asked additional questions regarding their date of birth, alternate names they have used and their residential history (see Appendices III thru VI).

SAMPLE DESIGN

For this study, a sample of 7,399 voters, electors and eligible electors were drawn from the National Register of Electors and the BC Voters List. One-hundred thirteen records were deemed "out of scope" prior to the beginning of the survey due to being a duplicate record (duplicates were found both between and within the Elections Canada and Elections BC samples) or an elector record identified as being inactive or deceased based on information in the BC Voters List.

The final sample size for the study was 7,287. The sample was comprised of 2,499 records from the Elections BC Voters List and 4,788 from the Elections Canada National Register of Electors. From the Elections Canada sample, a further 3,971 records were linked to the BC Voters List. Links were defined as any record that shared the same Elections BC card numbers or driver's license number across both the BC Voters List and the National Register of Electors.

The Elections BC portion was extracted on April 6, 2009 and the Elections Canada sample was obtained on April 1, 2009. For Elections BC, the target population included all eligible BC voters who: appeared on the Elections BC Voters List and were allocated to one of the 85 provincial electoral districts, lived at an address that was not identified as either being "frozen" or "retired", the record was not reported "moved" and the voter had not been sampled for a previous EBC or EC survey. Based on the April 6, 2009 extract, the target population consisted of 2,932,552 registered voters.

The sampling plan for Elections BC used in the January 2009 survey utilised an optimised stratification scheme, split across BC's 85 PED's. For the purposes of

obtaining comparable survey result over time, the same stratification scheme was also planned to be used for the April 2009 survey. For both the January 2009 and April 2009 surveys, the stratification scheme provided samples that accurately reflected the distribution of the target population based on BC's 85 PED's. Rather than creating strata level sample sizes that were simply proportional to the population of each electoral district, BC Stats opted to incorporate variance measures from the January 2009 quality audit into the April 2009 study. By doing so, it was possible to identify an optimal sample size for each strata that was dependent on the relative heterogeneity of its associated PED. The result was a smaller bound in the error of estimation as compared to other sampling strategies.

Similar to the Elections BC sampling plan, Elections Canada stratified their list of electors by BC's 36 FED's. Each FED was then further optimised by stratifying across four strata that Elections Canada identified to be indicators of list currency. Whereas Elections BC's strata level sample sizes were exclusively optimized at the PED level (and therefore disproportionate to the target population PED's), Elections Canada sampling plan utilized a blend of strata optimization and proportionate sampling. Elections Canada's five indicators of list currency are as follows:

- Linked to Canada Revenue Agency **AND** Diver License Files
- Linked to Canada Revenue Agency **OR** Diver License Files
- Not Linked - Elector Has Date of Birth
- Not Linked – Elector Does Not Have Date of Birth
- Unconfirmed – Elector's Registration Has Not Been Confirmed

As considerable overlap existed between EBC's and EC's target populations, efforts were made to harmonize the sampling plans between the two organizations. By aligning sampling methodologies, it was hoped that a large number of sample points could be shared between EBC and EC, increasing the confidence of each organizations respective currency estimates. Initial plans to share the results for linked records lead to the further stratification of the EBC population, by establishing proportional stratums across each PED for linked and non-linked voters.

After further review, the inclusion of linked EC data into the final EBC estimates was deemed to be unfeasible. One of the reasons for this is that, while linked records have the same card numbers in EBC's and EC's target populations, a small proportion of linked records have different address information in each list. As a result, the inclusion of any linked EC responses into the EBC sample could result in invalid estimates in the context of EBC's target population. Sharing linked records presented an additional concern for EBC's currency estimates, in that the geographic distribution of sample points across the EBC and EC list may have resulted in biased estimates without the use of EC's weighting parameters. While assuming EC's linked records were sampled with certainty (e.g. assigned a weight of 1 to each linked record) would alleviate this concern,

the contribution of EC's linked records to EBC's currency estimate would become negligible. As a result of these limitations, EC's linked records were not included in the currency and quality measures provided in this report.

The final calculation of sample size for each strata was achieved through the application of a Neymann Allocation (see Figure 1).

Figure 1: Neymann Allocation

$$n_i = n\left(\frac{N_i\sqrt{\hat{p}_i\hat{q}_i}}{\sum_{j=1}^{85} N_j\sqrt{\hat{p}_j\hat{q}_j}}\right), \quad i = 1,2,...,85$$

Usage of the Neymann Allocation is made possible by establishing a set sample size n. In greater detail, n_i represents the optimal sample size for the ith stratum; n is the overall sample size and N_i is the target population for the ith stratum. To provide an existing measure of variance, $\hat{p}_j$, PED level currency proportions were taken from the final quality measurement of the January 2009 Pre-Enumeration Voter List Quality Study. As with all proportional variance calculations, q represents a correction factor for p and is defined as (1-p).For a distribution of sample sizes, refer to Table 11 and Table 12

APPENDIX II

Table 11: Distribution of Stratified Sample Sizes

No.	Provincial Electoral District	PED	Estimated Population*	Measure of Variance**	Optimal Sample Size
1	Abbotsford-Mission	ABM	33,923	0.81	31
2	Abbotsford South	ABS	33,420	0.75	33
3	Abbotsford West	ABW	30,452	0.80	28
4	Alberni-Pacific Rim	APR	30,155	0.80	27
5	Boundary-Similkameen	BDS	27,621	0.80	25
6	Burnaby-Deer Lake	BND	33,950	0.74	34
7	Burnaby-Edmonds	BNE	33,706	0.90	23
8	Burnaby-Lougheed	BNL	35,060	0.81	31
9	Burnaby North	BNN	37,744	0.90	25
10	Cariboo-Chilcotin	CBC	19,543	0.81	18
11	Cariboo North	CBN	22,897	0.80	21
12	Chilliwack	CHC	35,744	0.81	31
13	Chilliwack-Hope	CHH	31,981	0.81	29
14	Columbia River-Revelstoke	CLR	23,272	0.77	22
15	Comox Valley	CMX	47,386	0.85	38
16	Coquitlam-Burke Mountain	CQB	30,863	0.88	22
17	Coquitlam-Maillardville	CQM	36,703	*0.86*	28
18	Cowichan Valley	CWV	40,623	0.87	31
19	Delta North	DLN	34,390	0.89	24
20	Delta South	DLS	33,707	0.88	24
21	Esquimalt-Royal Roads	ESR	36,842	0.84	31
22	Fort Langley-Aldergrove	FLA	42,449	0.89	29
23	Fraser-Nicola	FRN	20,114	0.78	19
24	Juan de Fuca	JDF	32,913	0.85	27
25	Kamloops-North Thompson	KAN	37,108	0.85	30
26	Kamloops-South Thompson	KAS	40,072	0.78	37
27	Kelowna-Lake Country	KLA	41,535	0.84	35
28	Kelowna-Mission	KMI	41,874	0.77	40
29	Kootenay East	KOE	28,756	0.80	26
30	Kootenay West	KOW	30,183	0.71	31
31	Langley	LLY	42,141	0.81	38
32	Maple Ridge-Mission	MRM	34,514	0.84	28
33	Maple Ridge-Pitt Meadows	MRP	36,235	0.91	24
34	Nanaimo	NAN	38,819	0.87	30
35	Nanaimo-North Cowichan	NCW	38,069	0.78	36
36	Nechako Lakes	NEC	14,968	0.79	14
37	Nelson-Creston	NEL	26,723	0.81	23
38	New Westminster	NEW	41,963	0.78	39
39	North Coast	NOC	14,822	0.73	15
40	North Island	NOI	38,899	0.74	39
41	North Vancouver-Lonsdale	NVL	37,439	0.91	24
42	North Vancouver-Seymour	NVS	36,549	0.86	30
43	Oak Bay-Gordon Head	OBG	37,977	0.80	35
44	Parksville-Qualicum	PAQ	40,119	0.86	32

Table 12: Distribution of Stratified Sample Sizes Continued

No.	Provincial Electoral District	PED	Estimated Population*	Measure of Variance**	Optimal Sample Size
45	Peace River North	PCN	22,354	0.58	25
46	Peace River South	PCS	16,800	0.79	16
47	Penticton	PEN	41,468	0.89	30
48	Port Coquitlam	POC	36,450	0.87	28
49	Port Moody-Coquitlam	POM	32,853	0.85	26
50	Powell River-Sunshine Coast	POR	35,258	0.75	35
51	Prince George-Mackenzie	PRM	32,411	0.84	27
52	Prince George-Valemount	PRV	34,029	0.79	31
53	Richmond Centre	RCC	41,608	0.80	38
54	Richmond East	RCE	40,675	0.90	28
55	Richmond-Steveston	RCS	41,816	0.90	28
56	Saanich North and the Islands	SAN	43,498	0.92	28
57	Saanich South	SAS	36,990	0.83	31
58	Shuswap	SHU	39,589	0.76	38
59	Skeena	SKE	20,527	0.80	19
60	Stikine	SKN	11,965	0.85	9
61	Surrey-Cloverdale	SRC	39,305	0.79	36
62	Surrey-Fleetwood	SRF	32,169	0.84	26
63	Surrey-Green Timbers	SRG	28,939	0.84	24
64	Surrey-Newton	SRN	29,774	0.81	26
65	Surrey-Panorama	SRP	37,689	0.90	25
66	Surrey-Tynehead	SRT	33,401	0.80	30
67	Surrey-Whalley	SWH	32,761	0.76	32
68	Surrey-White Rock	SWR	39,102	0.88	28
69	Vancouver-Fairview	VFA	40,622	0.75	40
70	Vancouver-False Creek	VFC	32,998	0.74	33
71	Vancouver-Fraserview	VFV	37,340	0.88	27
72	Vancouver-Hastings	VHA	38,331	0.80	35
73	Vancouver-Kensington	VKE	35,990	0.84	29
74	Vancouver-Kingsway	VKI	35,397	0.87	27
75	Vancouver-Langara	VLA	37,434	0.84	31
76	Vancouver-Mount Pleasant	VMP	37,200	0.77	36
77	Vancouver-Point Grey	VNP	40,488	0.75	40
78	Vancouver-Quilchena	VNQ	38,532	0.82	33
79	Vancouver-West End	VNW	34,958	0.74	35
80	Vernon-Monashee	VRM	44802	0.88	34
81	Victoria-Beacon Hill	VTB	41925	0.76	40
82	Victoria-Swan Lake	VTS	37563	0.85	31
83	West Vancouver-Capilano	WCA	38562	0.87	30
84	West Vancouver-Sea to Sky	WSS	34120	0.73	35
85	Westside-Kelowna	WTK	40636	0.71	42

* Estimated PED level count of registered voters within the study's target population

** Variance measures taken from January 2009 Pre-Enumeration Voters List Quality Survey

PHONE SOURCING

Information available in the voters list, including a voter's name, home address and mailing address, allowed records to be matched with a telephone number.

The matching process consisted of a single phase of automated phone sourcing, followed up with manual matching process for the Elections Canada portion of the sample. The automated sourcing procedure takes information for each record and runs it through a set of hierarchical matching algorithms. Typically, the automated matching process is supported by a quality assurance inspection of the sourced phone number following each successive algorithm. This quality assurance process was conducted on Elections Canada's records but not on Elections BC's records. Further details on the rules for automatic matching, in addition to manual matching routines can be found in Appendix VI.

From the complete sample of 2,499 Election BC voters and 4900 Elections Canada electors, 5,027 records were successfully matched to at least one phone number. A subset of 110 Elections BC records were matched to two or more phone numbers. Phone matching efforts were further supported by the inclusion of phone numbers taken from Elections BC administrative files. This supplemental set of phone numbers provided 413 records with a phone number, 158 of which had not been previously matched through the automated sourcing procedure. A summary of the sourcing results for the both the Elections BC and Elections Canada samples are provided in Table 13.

Table 13: Phone Sourcing Results Across Samples

Correctness of Sourced Number	Phone Result	EBC Sample (N=2499)	EC Sample (N=4788)	EBC & EC Combined Sample (N=7287)
Correct	Successfully Completed Survey	586	733	1319
	Unable to Complete Survey	389	507	896
	Respondent Deceased	4	24	28
	Total	979	1264	2243
Incorrect	Phone Number Not In Service	154	380	534
	Wrong Number	138	783	921
	Total	292	1163	1455
Unknown	Correctness of Number Uncertain	401	928	1329
TOTAL RECORDS MATCHED TO A NUMBER		**1672**	**3355**	**5027**
TOTAL RECORDS NOT MATCHED TO A NUMBER		**827**	**1445**	**2272**

*Unknown results for the Elections Canada sample include 69 records that were deemed out-of-scope prior to the fielding of the survey.

SURVEY ADMINISTRATION

Once phone sourcing was complete, the sample of 7,287 valid in-scope records was divided into two groups; voters and electors whose records were successfully matched to a phone number and those who weren't (see Table 13).

Telephone Administration

If there was a sourceable telephone number for the respondent's record, the voter and/or elector was sent an introductory letter by standard mail on April 17, 2009. The letter notified the voter that they would be contacted by telephone in the coming weeks and asked to participate in a short phone survey. The intro letter also provided a toll free number through which a voter could contact the phone vendor and complete the survey at a time of the respondent's choosing.

From April 21, 2009 to May 6, 2009, attempts were made to contact 5,027 individuals with by phone. If a respondent's telephone number was ultimately found to be incorrect or otherwise unreachable, they were then allocated to a sub-list and subsequently sent a letter survey through Canada Post registered mail.

In a handful of cases, a respondent or family member of a respondent contacted Elections BC directly and confirmed the currency of their voters list information over the phone. The details of the information was then transmitted to BC Stats for inclusion into the study's dataset. In the event a phone, mail or web survey completion was not received from one of these respondents, the information provided to Elections BC was treated as an actual survey completion.

Mail Administration

If no telephone number was easily attributed to a voter or elector's record, the voter was sent a survey through Canada Post registered mail[6]. In the initial mailing, letter surveys were distributed to sampled Elections BC voters and Elections Canada electors. Over the course of the survey, mail surveys were sent via registered mail to respondents who were unreachable by telephone or whose telephone number were found to be incorrect. A total of 5,983 pieces of registered mail were sent over the duration of the project, with a mail survey completion rate of 15.2%.

From this set of 5,983 mailings, 2,328 letter surveys were sent in the initial mailing date on April 20, 2009 (all 3,713 introductory letters were sent out on April 17, 2009). The remaining 3,655 registered letter surveys were sent out in one of four batches, as part of the sub-list mail outs. See Table 14 for a summary of all registered mail surveys. Responses, including undeliverable returns, were recorded until May 28, 2009.

[6] Due to a shortage of registered mail products, 1003 of the letter surveys were sent priority courier. The same tracking process was used for priority courier and registered mail.

Table 14: Summary of Registered Mailings

Mail Status as of May 28	EBC Sample	EC Sample	Total
Survey Completed	431	481	912
Mail Survey Returned	212	888	1100
Mail Survey Not Returned	1209	2762	3971
Total Mail Surveys	**1852**	**4131**	**5983**

Web Administration

The 5,983 respondents who received a letter survey were advised in the introduction that they could complete the on-line survey using a unique password provided in the letter. The web mode garnered 164 survey completions, averaging approximately 7 survey completions per day from April 22, 2009 to May 24, 2009.

DECISION RULES

A set of decision rules were developed in order to guide the data collection and analysis of records where a completed phone, mail or web survey could not be obtained. Listed below are the main proxy rules used throughout the course of the study. It should be noted that in instances where an inconsistency appeared between actual survey responses and a record's proxy information, the survey data would take precedence. For example, if a telephone response indicated that the voter's home address was correct, but their introductory letter was returned as moved, the record would be considered current.

Phone proxies: Due to time constraints, if information could be gathered from other sources (e.g. family member), then that information would be collected and recorded as a confirmed response. This also included instances where a family member contacted Elections BC directly by phone to confirm the currency of a voter's information.

Several call statuses provides phone proxy confirmations. If a respondent indicated to a phone surveyor that they wanted to complete a web survey, provided the respondent did not actually complete the web survey, their record was considered current. Similarly, if a phone surveyor coded a record's call status as a soft or firm appointment or confirmation of name on answering machine was considered a current proxy. Alternately, a wrong number with confirmation of that the respondent moved, was included as proxy confirmation of a record being not current.

Canada Post Registered mail proxies: In order to successfully deliver a piece of registered mail to a home address, Canada Post requires signature confirmation. This signature can be provided by anyone who is fourteen years of age or older at the

address. If a mail carrier is unable to deliver the registered mail to the home, then a notice is left on the door indicating to the addressee that there is a piece of mail available for pick up at a nearby post office. In order to successfully pick up the registered mail from a post office, the addressee must provide a piece of photo ID to the Canada Post customer service representative. Acceptable photo ID needs to contain both a name and address that matches the registered mail's delivery information.

In the majority of cases, a digital copy of the signature was uploaded for viewing to the Canada Post tracking website. Based on this information, it was possible to make two separate proxy decisions using signature data.

- If a survey was successfully delivered to an address, the presence of a signature match was considered to be a proxy confirmation that the record was correct. A signature match was defined as any instance where at least the surname or the first name of the respondent matched the tracking information.
- If a survey was successfully picked up from a post office, then due to Canada Post's delivery requirements, the record was also considered a proxy confirmation that the record was correct.

These proxies only applied to cases where no response was received from the addressee prior to the May 28, 2009 cut-off date.

Mail undeliverable proxies: if the mail was undeliverable as determined by Canada Post, the returns were considered either as an incorrect proxy or unconfirmed, depending on the reason that the letter was not successfully delivered:

The following tracking details were considered as an incorrect proxy: no such address; address incomplete; moved/unknown; no such post office; and item was redirected to receiver's new address.

Records were considered as unconfirmed, if the mail tracking details stated unclaimed; attempted delivery but no pick up; item was picked up but without a recorded signature; item not in Canada Post possession but without a recorded signature; and, item refused by addressee.

It should be noted that for nearly 300 records, Canada Post's tracking web page did not display any signature information, despite indicating that the registered mail was successfully delivered. As a result, the availability of proxy information for these records was greatly reduced. It is unclear at this time how this error may have affected the overall currency estimate. In all likelihood, this error would have increased the total proportion of unconfirmed records and therefore increased the number of records that required multiple imputation.

MISSING DATA

In order to estimate voters list currency for unconfirmed responses, BC Stats made use of multiple imputation (MI). Compared to other methods of imputation, the MI method offers several benefits, including the introduction of random variance to the estimate and a robustness to violations of normality.

With this in mind, there are two assumptions that need to be made if missing data are to be estimated through MI. First, the data both before and after imputation, are assumed to follow a multivariate normal distribution. The second assumption is that missing data are missing at random (MAR). As mentioned above, MAR does not mean data are missing completely at random. Rather, the rate at which data are missing can be predicted, based on the analysis of relationships between other variables throughout the dataset.

There are three distinct steps to multiple imputation. First, the imputation process is repeated *m* times to generate *m* complete datasets. Second, *m* datasets are analyzed using conventional statistical tools and third, results from the *m* datasets are combined into a summary set of findings. Typically, as few as three to five imputations are adequate and the end results offer the benefit of introducing uncertainty into the model. This in turn generates valid statistical inferences that correctly reflect this uncertainty due to missing data. Like the January study, five imputed datasets were generated and then combined to produce the final estimates of currency and quality for the April survey.

Much like the pre-enumeration survey, six variables were used to predict an unconfirmed record's currency. These variables included the following: a voter's age, whether a voter lived in a single unit or multi-unit dwelling, the absence or presence of a voter's driver's license number, whether a residential address was different from a record's mailing address, the most recent status update for a record and the most recent effective date for a record's residential address. Differences in the imputation model between the January and April were slight, and consisted only of adjustments to the covariances between predictor variables. Both the MI procedure and the predictive model were developed and analyzed with SPSS's AMOS 16.

APPENDIX III: TELEPHONE SURVEY SCRIPT

INTRODUCTION

Hello may I speak with <Given Name > <Surname >. My name is ___. I am calling on behalf of Elections BC. We are conducting a short 5 minute survey to improve the integrity of the voters list. This survey is important to ensure that voters receive necessary voting information. You were randomly selected from the list. The following questions are about you and will be used to confirm your registration or your eligibility to be registered as a provincial voter.

Additional Information:

Your participation in this survey is voluntary. Since only a limited number of people have been selected, your information is essential in order to produce meaningful results. Elections BC is conducting this survey in collaboration with BC Stats. Information collected from this survey may be shared with Elections Canada, but will not be shared or used for any purposes other than to improve voters list integrity.

Confidentiality Information:

We would like you to know that responses to this questionnaire will be kept confidential by BC Stats. Under Section 9 of the *Statistics Act*, BC Stats cannot disclose information that could be used to identify an individual response to any person, organization or government agency. Section 9 of the *Statistics Act* applies despite the provisions of the *Freedom of Information and Protection of Privacy Act* (*FOIPPA*), other than *Section 44*(1)(b)(2) (2.1) and (3) of *FOIPPA*.

If you choose to share any updated information with Elections BC, the data will be shared under Section 12 of the *BC Statistics Act*.

May I continue?

Continue - correct person	01	=> Q1
Correct name & number - call back anytime	20	=> /INT3
Correct name & number - specific call back	40	=> /INT3
Not at this number/ address	86	=> /INT2
Correct name & number - refused	85	=> /INT4
Refused - would not confirm if it was the correct person	21	=> /END
Call-back - no answer	31	=> /END
Line busy	30	=> /END
Not in service	10	=> /END
Deceased	55	=> /END
Language difficulties	44	=> /END
No phone number	09	=> /END

INT2

Proxy end

Thank you for your time, and have a good day/ afternoon/ evening.

Not at this number/ address	86	=> /END
Correct name & number - refused	85	=> /END

INT3

Call back end

Thank you. We will call back at <Date and Time >. Have a good day/ afternoon/ evening.

Correct name & number call back anytime	20	=> /END
Correct name & number specific call back	21	=> /CB

INT4

Web and proxy end

I understand you do not wish to complete the survey over the phone. Would you prefer to complete the survey online?

Yes	1	=> WEB1
No	85	=> INT2
Refused	85	=> INT2

WEB1

Web end

To access the survey online, go to http://www.survey.gov.bc.ca/logins/lqm.html Once there, type in your personal and confidential survey password: < USERID >.

Correct name & number - refused	85	=> INT2

Q1

Thank you for agreeing to participate in the survey. To confirm, is your name <Given Name><Middle Name><Surname>?

Note to Surveyor: Confirm both the correctness and spelling of the respondent's name

Yes	1	=> Q2
No	2	=> Q1a
Refused	3	=> Q2

Q1a

You indicated that your name is not <Given Name><Middle Name> <Surname>, what is your correct name?

Note to Surveyor: Confirm both the correctness and spelling of the respondent's name

Given Name: _____
Middle Name: _____
Surname: _____

Refused	3	=> Q2

Q2

Do you use or have you ever used any other **given names**?

Yes ..... 1 => Q2a
No ..... 2 => Q3
Refused ..... 3 => Q3

Q2a

You indicated that you use or have used a **given name** other than <Given Name>, what is this other **given name**?

Given Name: _____

Refused ..... 3 => Q3

Q3

Is there any other person, aged 18 and above, living at this address with any of the same **given names** as you?

Yes ..... 1 => Q4
No ..... 2 => Q4
Refused ..... 3 => Q4

Q4

Do you use or have you ever used any other **last names**?

Yes ..... 1 => Q4a
No ..... 2 => Q5
Refused ..... 3 => Q5

Q4a

You indicated that you use or have used a **last name** other than <Surname>, what is this other **last name**?

Last Name: _____
Refused ..... 3 => Q5

Q5

<u>The following information could serve to distinguish someone with the same name.</u>
What is your **date of birth**?

Year (YYYY): _____
Month (MM): _____
Day (DD): _____

Refused ..... 3 => Q6

Q6

Is there any other person living at this address with the same day, month, and year of birth?

Yes	1	=> Q7
No	2	=> Q7
Refused	3	=> Q7

Q7

We would like to verify your home address as of April 6th, 2009

IF ANY ARE WRONG THEN CHOOSE "NO"

Is your **home address**:

Unit Number
Building Number
Street Prefix (East, West, etc.)
Street Name
Street Type
Street Suffix (East, West, etc.)
City

Yes	1	=> Q8
No	2	=> Q7a
Refused	3	=> Q8

Q7a

Have you ever lived at this **home address**?

Yes	1	=> Q7b
No	2	=> Q7b
Refused	3	=> Q7b

Q7b

You indicated that the home address is incorrect, what is your correct **home address**?

Unit Number: _____
Building Number: _____ _____
Street Prefix (East, West, etc.):_____
Street Name: _____
Street Type: _____
Street Suffix (East, West, etc.): _____
City: _____

Refused	3	=> Q8

Q8

We would like to verify your mailing address as of April 6th, 2009

IF ANY ARE WRONG THEN CHOOSE "NO"
Is your current **mailing address**

Mail Line 1
Mail Line 2
Mail City
Postal Code?

Yes	1	=> Q9
No	2	=>Q8a
Refused	3	=> Q9

Q8a

You indicated that the mailing address is incorrect, what is your correct **mailing address**?

Mail Line 1: _____
Mail Line 2: _____
Mail City: _____
Postal Code: _____

Refused	3	=> Q9

Q9

To the best of your recollection, in which month and year did you move to your current **home address**?

Month (MM): _____
Year (YYYY): _____

Refused	3	=> Q10

Q10

At which address did you live before residing at your current **home address**?
(SKIP IF Q9 IS GREATER THAN 5 YEARS)

Street:_____
City:_____
Province:_____
Postal Code:_____

Refused	3	=> Q11

Q11

Do you have Canadian Citizenship?

Yes	1	=> Q12
No	2	=> Q12
Refused	3	=> Q12

Q12

What is your gender?

Gender:_____

Refused	3	=> INT 5

INT5

=> INT if NOT (Q1=2 OR Q7=2 OR Q8=2)

Completed with incorrect information end

If you are eligible to vote provincially, any updated information you provide through this survey will not be included in the voters list for the general election because registration will be closed from April 22nd until general voting day. You may register or update your registration information at the time you vote.

Information updates contained in your response will be used by Elections BC to improve voters list integrity. Would you like to pass along these updates to Elections BC?

Yes	1	=>INT
No	2	=> INT
Refused	3	=> INT

INT

End

On behalf of Elections BC, I would like to thank you very much for your time today. If you have any further questions about the survey, please contact Elections BC toll-free at 1-800-661-8683 or go online to www.elections.bc.ca
Again, thank you for your time, and have a good afternoon/ evening/ day.

Completed – information is correct (or refused)	-1	=> /END
Refused - would not confirm if it was the correct person	21	=> /END
Call-back no answer	31	=> /END
Line busy	30	=> /END
Not in service	10	=> /END
Deceased	55	=> /END
Language difficulties	44	=> /END
No phone number	9	=> /END

INT5

=> INT if	NOT (Q1=2 OR Q2=2 OR Q3=2 OR Q4=2)

Completed with incorrect information end

In preparation for the provincial election that will be on May 12th, 2009, Elections BC is also conducting a mail-out enumeration starting February 2nd, 2009. Any information that you provided through this survey unfortunately may not be included in the enumeration notice. Please respond to the enumeration notice when you receive it.

On behalf of Elections BC, I would like to thank you very much for your time today. The information you provided in this survey will be used both to assess the overall quality of the provincial voters list and to update your records within Elections BC's databases.

If you do not want this updated information to be shared with Elections BC, you must send a request to the Executive Director of BC Stats (Don McRae, PO Box 9410 Stn Prov Govt, Victoria, BC, V8W 9V1).

The request must be made in writing, signed and received by BC Stats no later than February 16, 2009, If you make this request, Elections BC will not be informed that your data were removed from the file.

If you have any further questions about the survey, please contact Elections BC toll-free at 1-800-661-8683 or go online to www.elections.bc.ca

Again, thank you for your time, and have a good afternoon/ evening/ day.

Completed – information incorrect ..... 24 => /END

INT

End

On behalf of Elections BC, I would like to thank you very much for your time today. If you have any further questions about the survey, please contact Elections BC toll-free at 1-800-661-8683 or go online to www.elections.bc.ca
Again, thank you for your time, and have a good afternoon/ evening/ day.

Completed – information is correct (or refused)..... 01 => /END
Refused - would not confirm if it was the correct person ..... 02 => /END
Call-back no answer..... 03 => /END
Line busy..... 04 => /END
Not in service ..... 05 => /END
Deceased ..... 06 => /END
Language difficulties ..... 07 => /END
No phone number ..... 15 => /END

APPENDIX IV: MAIL SURVEY FORM

ELECTIONS BC
Province of British Columbia

Mailing Address:
PO Box 9275 Stn Prov Govt
Victoria BC V8W 9J6

Phone: 250-387-5305
Toll-free: 1-800-661-8683/ TTY 1-888-456-5448
Fax: 250-387-3578
Toll-free Fax: 1-866-466-0665
Email: electionsbc@elections.bc.ca
Website: www.elections.bc.ca

«FIRST_NAME» «MIDDLE»«SURNAME»
«MAILLINE1»
«MAILLINE2»
«PROVINCE»«MAILLINE3»

April 17, 2009

Dear «FIRST_NAME»«MIDDLE» «SURNAME»:

Elections BC needs your help. As the independent, non-partisan Office of the Legislature responsible for administering provincial elections and referendums, we would like to confirm your registration or your eligibility to be registered as a provincial voter.

We are working with BC Stats, the Province's statistical agency, to conduct a survey that will determine the quality of the voters list. Your name has been randomly selected for this survey.

We need to ask you some questions. Please respond using one of the following options:

1. answer the questions in the enclosed survey and return it in the pre-paid envelope; or
2. complete the on-line survey at: http://www.survey.gov.bc.ca/logins/lqm.html, using your confidential survey password: [USERID]; or
3. call BC Stats to complete the survey over the telephone at 1-888-274-1700.

Your response to this survey before May 5, 2009 is important.

If you are eligible to vote provincially, any updated information you provide through this survey will **not** be included in the voters list for the general election because registration will be closed from April 22nd until general voting day. You may register or update your registration information at the time you vote.

We understand the importance of protecting your personal information. Please know that Elections BC and BC Stats take extreme care to ensure the information you give us in this survey is protected. This information may be shared with Elections Canada but will **not** be shared or used for any purpose other than to improve voters list integrity.

If you would like more information about this survey, please visit the Elections BC website at http://www.elections.bc.ca/index.php/resource-center/surveys/, or call Elections BC toll free at 1-800-661-8683.

Thank you for your help.

Sincerely,

Harry Neufeld
Chief Electoral Officer

Important – Please complete and return to BC Stats no later than May 5, 2009

ELECTIONS BC
Province of British Columbia

Mailing Address:
PO Box 9275 Stn Prov Govt
Victoria BC V8W 9J6

Phone: 250-387-5305
Toll-free: 1-800-661-8683/ TTY 1-888-456-5448
Fax: 250-387-3578
Toll-free Fax: 1-866-466-0665
Email: electionsbc@elections.bc.ca
Website: www.elections.bc.ca

Thank you!

Your information on the provincial voters list as of April 6, 2009:

Name: «FIRST_NAME» «MIDDLE »«SURNAME»

Home Address: «PHYSICAL_ADDRESS»
«CITY»

Mailing Address: «MAILLINE1»
«MAILLINE2» , «PROVINCE» , «MAILLINE3»

1. Is the **name** correct?

❍ Yes ❍ No →

What is your correct **name**?

First Name: _____

Middle Name:_____

Last Name: _____

2. Do you use or have you ever used any other **names**?

❍ No ❍ Yes →

What other **names** have you used?

First Name: _____

Middle Name:_____

Last Name: _____

SURVEY CONTINUES ON NEXT PAGE

1. Is there any other person, aged 18 and above, living at this address with any of the same given names?

❍ Yes ❍ No

2. What is your **date of birth**?

Day (DD): _____ Month (MM): _____

Year (YYYY): _____

3. Does anyone else in your household have the same **date of birth** as you?

❍ Yes ❍ No

4. Is the **home address** correct for where you live as of April 6, 2009?

❍ Yes ❍ No → 6.a: What is the correct **home address** for where you live?
(Please don't provide a postal address)
Example: *123-4567 West Broadway Avenue, Vancouver*

Apartment, Unit, Pad Number: _____ House or Building Number:_____
(Example *123*) (Example *4567*)

Street Name: _____ Street Type:_____
(Example *Broadway*) (Example *Avenue*)

Street Direction (if applicable) _____
(Example *West*)

City or Town: _____
(Example *Vancouver*)

6.b: Have you ever lived at the **home address** listed on **Page 1** of the survey?
❍ Yes ❍ No

SURVEY CONTINUES ON NEXT PAGE

1. When did you move to your current **home address**?

Month (MM):_____ Year (YYYY): _____

2. If you moved within the last **5 years**, at which address did you live before residing at your current **home address?**

Street Name: _____

City or Town: _____

Province:_____

Postal Code:_____

3. Is the **mailing address** correct as of April 6, 2009?

❍ Yes ❍ No → What is the correct **mailing address** for where you receive your mail?

Mailing Address: _____

_____

4. What is your gender?

❍ Female ❍ Male

5. Do you have Canadian citizenship?

❍ Yes ❍ No

Thank you for completing this survey.

If you have any questions or concerns regarding this survey, please contact Elections BC toll-free at 1-800-661-8683 or through Elections BC's website at www.elections.bc.ca.

Information updates contained in your response will be used by Elections BC to improve voters list integrity. If you **do not** want BC Stats to pass along your registration updates to Elections BC, please check the circle below.

❍ Please **do not** send my updated registration information to Elections BC.

END OF SURVEY **Page 3 of 3**

APPENDIX V: INTRODUCTORY LETTER

ELECTIONS BC
Province of British Columbia

Mailing Address:
PO Box 9275 Stn Prov Govt
Victoria BC V8W 9J6

Phone: 250-387-5305
Toll-free: 1-800-661-8683/ TTY 1-888-456-5448
Fax: 250-387-3578
Toll-free Fax: 1-866-466-0665
Email: electionsbc@elections.bc.ca
Website: www.elections.bc.ca

John/Jane Doe
#123 – 456 7th St.
Small Town, BC, V1X 1X1

Home Address:
#123 – 456 7th St.
Small Town, BC, V1X 1X1

Personal and Confidential

January 23, 2009

Dear John/Jane Doe

Elections BC needs your help. As the independent, non-partisan Office of the Legislature responsible for administering provincial elections and referendums, we need to ensure the provincial voters list is up-to-date and accurate.

We are working with BC Stats, the Province's statistical agency, who is conducting a survey to determine the quality of the voters list. Your record on the voters list has been randomly selected for inclusion in this survey.

Between January 27 and February 10, 2009, you will be contacted either by phone or Xpresspost mail. You will be asked to confirm your name, date of birth and home address as it appears on the voters list. If the information is incorrect, you will also be asked to provide the correct information. If you have not been contacted by February 10th, 2009, please call BC Stats, toll free, at 1-888-274-1700.

In preparation for the general election, Elections BC is also conducting a mail-out enumeration starting February 2nd, 2009. Any information that you provide through this survey unfortunately may not be included in the enumeration notice. Please respond to the enumeration notice when you receive it.

We understand the importance of protecting your personal information. Please know that both Elections BC and BC Stats take extreme care to ensure the information you give us in this survey is protected and not shared or used for any other purpose than to confirm your information on the voters list.

The information you provide is important and will help us to maintain an accurate voters list. If you would like more information about this survey, please visit the Elections BC website at http://www.elections.bc.ca/index.php/resource-center/surveys/, or call Elections BC toll free at 1-800-661-8683.

Thank you for your help.

Sincerely,

Harry Neufeld
Chief Electoral Officer

APPENDIX VI: PHONE SOURCING METHODOLOGY

The following methodology has been provided by the vendor responsible for phone sourcing – ASDE Survey Sampler.

Automated List Matching

1. Client list is received in any fixed format: Excel, Access, dbf, text, etc.
2. Fields are standardized to match the phone book database format used by ASDE.
3. List is run through the system to look for matches on 25 different combinations of fields and information: from full match of full name and address to match of surname to Postal code, therefore those 2 fields are the most important ones for any list matching success.
4. The system applies weights to various fields of a record and matches them uses those weights to determine if the record is considered acceptable or not.
5. A visual check is conducted to remove multiple numbers resulting from one record. This is included in the standard pricing.
6. The initial list is returned to the client as received with an extra column with the phone number as found in ASDE's database.
7. Match rates vary between 40%-60% depending on various attributes such as the quality and up-to-date status of the list. Due to spelling and other such variables, this can never be a complete process.

Manual List Matching

Following the process above, ASDE employees look up each record one by one using Canada 411 online. This human one on one judgment factor cannot be obtained in an automated way and means that client can expect up to 80% matches. It also allows for capturing spelling errors in street names or addresses

.

Each record goes through 4-5 passes before it is abandoned:

1. street # - address – city - province
2. address – city - province
3. address - postal code - province
4. surname -partial address- FSA
5. surname – city - province

ASDE normally considers it a match if the record is found to have:

- The same family name, regardless of the address, in the same city (as long as no other listings with the same family name appear in that city).

- The same family name, with a matching first name, regardless of the address, in the same city, unless there are multiple listings of that combination of first and last name.
- A different name, but the correct address (ASDE assume here that the 'name' on the client's list lives with the 'different name' of the telephone directory at the correct address.)