

**2000 British Columbia Emissions Inventory of  
Criteria Air Contaminants:  
Methods and Calculations**

British Columbia Ministry of Water, Land and Air Protection  
Water, Air and Climate Change Branch  
Victoria, B.C.

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## ABSTRACT

An emission inventory is an accounting of all sources of air pollution within a defined geographic area. A comprehensive emission inventory is an essential air quality management tool. This report describes the methods and calculations used to compile the 2000 emission inventory for the Province of British Columbia. Inventory summaries are presented in the Appendices. The criteria air contaminants carbon monoxide, nitrogen oxides, sulphur oxides, volatile organic compounds and particulate matter (with PM<sub>10</sub> and PM<sub>2.5</sub> breakdowns) are included in this inventory.

Emission quantities were revised in June 2005 to reflect changes in the Residential Wood Burning Emissions in British Columbia report (WLAP 2004) and to correct a minor error in the prescribed burn emissions.

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## COMMENTS ?

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# TABLE OF CONTENTS

1 INTRODUCTION .....	1
1.1 Study Area .....	2
1.2 Contaminants Inventoried .....	3
1.3 Source Categories .....	4
2 POINT SOURCES .....	5
2.1 Permit Fee Database .....	5
2.1.1 Description .....	5
2.1.2 Limitations .....	6
2.1.3 Enhancements .....	6
2.2 FVRD .....	8
2.3 Industry Submissions .....	8
2.3.1 Pulp Mills .....	9
2.3.2 Canadian Forest Products Ltd. (Canfor) .....	9
2.3.3 Wood Residue Burning Sources .....	9
2.3.4 Teck Cominco .....	10
2.3.5 Duke Energy .....	11
2.3.6 Asphalt Plants .....	11
2.3.7 Questionnaire .....	11
2.3.8 Beehive Burners .....	12
2.4 Industry Sector Adjustments .....	14
2.4.1 Wood Products Industry (SIC 25) .....	14
2.4.2 Mining Industry (SIC 06) .....	15
2.4.3 Non-Metallic Mineral Production (SIC 35) .....	17
2.4.4 Primary Metal Production (SIC 29) .....	17
2.4.5 Oil and Gas Industry (Pipeline Transmission (SIC 46) and Crude Petroleum & Natural Gas Production (SIC 07)) .....	18
2.5 Reliability of Revised Estimates .....	18
3 AREA SOURCES .....	20
3.1 Prescribed Burns .....	21
3.1.1 Category 1 and 2 .....	21
3.1.2 Category 3 to 5 .....	21
3.1.3 Category 6 to 8 .....	22
3.1.4 BC Parks and Protected Areas .....	23
3.1.5 Crown Land .....	24
3.2 Wildfires .....	24
3.3 Residential Wood Use .....	24
3.4 Provincial Park Campfires .....	25
3.5 Other Area Sources .....	25
4 MOBILE SOURCES .....	26
4.1 Marine Vessels .....	26
4.2 Other Mobile Sources .....	26
5 RESULTS .....	26
5.1 Emissions Query Tools .....	28
5.1.1 Web Based Mapping Project .....	28

5.1.2 ACE.....	28
6 FUTURE DIRECTIONS .....	29
6.1 Airshed Specific Inventories.....	29
6.2 Interagency GIS .....	30
6.3 OWNERS.....	30
7 REFERENCES .....	31
Appendix A Emission Factors for Biomass Burning.....	33
A.1 Wildfires.....	34
A.2 Prescribed Burns .....	34
A.3 Logging Slash Debris.....	35
A.4 Open Burns .....	35
A.5 Crown Lands .....	36
A.6 Beehive Burners.....	36
Appendix B Open Burns.....	37
Appendix C Teck Cominco Statement .....	39
Appendix D Web Based Questionnaire .....	40
D.1 Cover Letter .....	40
D.2 Instructions.....	42
D.3 Questions and Answers.....	54
D.4 Web-based Questionnaire .....	57
Appendix E Emissions Summaries.....	62
E.1 GVRD Emissions for the Lower Fraser Valley (tonnes) .....	63
E.2 Environment Canada Emissions Outside the LFV (tonnes).....	65
E.3 WLAP Emissions Outside the LFV (Tonnes).....	67
E.4 BC Total Emissions (Tonnes) .....	69
Appendix F Point Source Emissions .....	71
F.1 Point Source Emissions Summarized by Industry Sector .....	71
F.2 Point Source Emissions Summarized by SCC.....	74
F.3 Point Source Emissions Details Sorted by Region.....	83

## Table of Tables

Table 1: Enhancements to the Permit Fee Dataset .....	8
Table 2: Beehive Burner Emission Factors .....	13
Table 3: Wood Product Facility Capacity/Production.....	15
Table 4: 2000 Mining Industry Production.....	16
Table 5: Coal Mining Storage Piles.....	17
Table 6: Fire Size Estimates .....	22
Table 7: Number of Fires by Region .....	22
Table 8: Prescribed Burns on Crown Land.....	24
Table 9: BC Residential Wood Burning Emissions.....	25
Table 10: Campfire Emission Factors.....	25
Table 11: WLAP Results for BC Outside the Fraser Valley (Tonnes).....	27

## List of Acronyms

ACE	Air Contaminant Emissions
AP	Air Protection
CAC	Criteria Air Contaminant
CCME	Canadian Council of Ministers of the Environment
COFI	Council of Forest Industries
EC	Environment Canada
EPA	Environmental Protection Agency
FRDA	Forest Resource Development Agreement
FVRD	Fraser Valley Regional District
GBEI	Georgia Basin Ecosystem Initiative
GHG	Greenhouse Gas
GIS	Geographic Information Systems
GOAT	GIS Oracle Access Tool
GVRD	Greater Vancouver Regional District
ISIS	Integrated Silviculture Information System
LFV	Lower Fraser Valley
NCASI	U.S. National Council for Air and Stream Improvement
NPRI	National Pollutant Release Inventory
OFTS	Open Fire Tracking System
OWNERS	One Window National Environmental Reporting System
SCC	Source Classification Code
SIC	Standard Industrial Classification
WACC	Water, Air and Climate Change
WLAP	British Columbia Ministry of Water, Land and Air Protection

# 1 INTRODUCTION

The 2004/05 – 2006/07 Service Plan for the Ministry of Water, Land and Air Protection (WLAP)\* sets four goals, the first one being:

**“Protect the environment and human health and safety by ensuring clean and safe water, land and air.”**

To ensure clean air, it is important to know the nature and quantity of substances being released into the atmosphere throughout the province. This emission inventory is an accounting of air contaminants released in the province over the calendar year 2000.

Data for the year 2000 emission inventory were compiled as a collaborative effort between the Ministry, the Greater Vancouver Regional District (GVRD), and Environment Canada. The Policy and Planning Department of the GVRD inventoried all sources within the Lower Fraser Valley (LFV). For the province outside the LFV, the Air Protection (AP) section of WLAP produced emission inventory estimates for sources that operate under ministry authorization (permit, approval or regulation), as well as sources that are large contributors or are best understood at a provincial level (such as prescribed burning, wildfires, and residential fuel wood combustion). The remaining estimates were prepared by the Criteria Air Contaminants Division of Environment Canada.

This report focuses on how year 2000 emission inventory estimates were prepared by Air Protection. Data from the GVRD and Environment Canada have been merged with these estimates to present a complete picture of provincial emission estimates within one document. However, details on the calculation methods used by either the GVRD or Environment Canada are not provided in this report as they are documented elsewhere (GVRD 2003; Cassaday and Van Heyst 1999). Previous emission inventory reports presented various summary data tables for the LFV, and the waste management regions of the province. A split for the LFV and the rest of BC is provided in this report. However, since the ministry is now moving toward airshed management planning, waste management region summaries are not provided in this report.

To utilize the emission inventory data on an airshed basis, Air Protection has developed two geographic information system (GIS) query tools for the B.C. emission inventory:

- a web based mapping application for point sources, prescribed burns and wildfires which was in the final stages of development when this report was released, and
- the Air Contaminant Emissions (ACE) system that resides on the government GIS Oracle Access Tool (GOAT).

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\* [http://www.bcbudget.gov.bc.ca/sp2004/wlap/wlap\\_goals.htm](http://www.bcbudget.gov.bc.ca/sp2004/wlap/wlap_goals.htm)

These emission inventory GIS capabilities position Air Protection for delivering on the following New Era commitment within the current WLAP service plan from an emission inventory perspective:

**“Implement an improvement plan for threatened airsheds.**

**The ministry is developing the science and a framework for working with communities to improve air quality.”**

The final chapter of this report discusses future directions for B.C. emission inventory work. Since there is a strong need for emission inventory data at all levels of government, this discussion covers airshed specific inventories, and various provincial and federal initiatives intended to improve the way data are collected.

To date, province-wide inventories have been performed for the years 1985, 1990 and 1995. With each inventory, improvements have been made to estimation methods. New source categories have also been added as more information became available. These progressive improvements make a direct comparison of estimates between the respective 1985, 1990, 1995 and 2000 reports misleading because it is not clear if a change in inventoried emissions is due to an actual change in emissions or an estimation methodology change. The reader is therefore strongly advised not to draw conclusions based on comparing the separate inventory reports.

To facilitate an appropriate comparison of past inventories and anticipated future emissions, backcasts and forecasts are required. These have been prepared for the LFV using 2000 data (GVRD 2004), and the rest of the province using 1995 data. However, to date this work has not been done for the entire province using the year 2000 dataset. At the time of this report release, Environment Canada was in the process of producing a National emission trends report for the years 1985 to 2020. The completed national trend report will offer the most accurate picture of B.C. emission trends.

## **1.1 Study Area**

To interpret the various tables provided in this report, it is useful to know the boundaries for the LFV used in the 2000 inventory, since some tables are presented with and without LFV inventory data. The LFV is defined in this report as bounded on the north by latitude 49° 30', on the east by longitude 121° 15', on the west by longitude 123° 20', and on the south by the Canada/United States border. Figure 1 shows the LFV area.

Throughout this report it is assumed that the information presented is for the study area of B.C. outside the LFV unless otherwise stated.

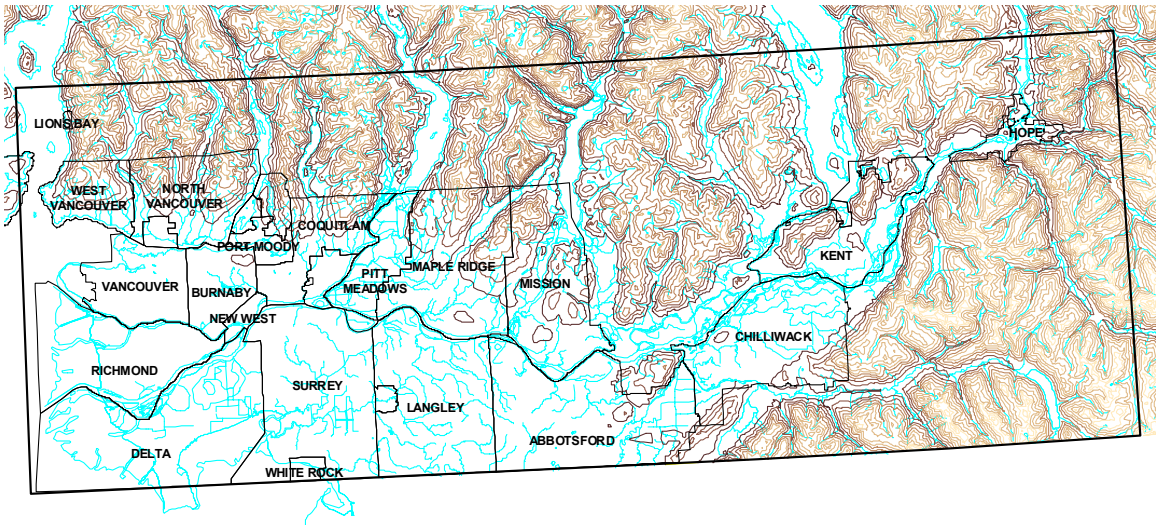


Figure 1: LFV Area Excluded from B.C. Study Area

## 1.2 Contaminants Inventoried

The criteria air contaminants (CACs) contained in this emission inventory are defined as follows:

- **carbon monoxide (CO);**
- **nitrogen oxides (NO<sub>x</sub>)** – includes nitric oxide (NO) and nitrogen dioxide (NO<sub>2</sub>), reported as NO<sub>2</sub> equivalent;
- **sulphur oxides (SO<sub>x</sub>)** – includes sulphur dioxide (SO<sub>2</sub>) and sulphur trioxide (SO<sub>3</sub>), reported as SO<sub>2</sub> equivalent;
- **volatile organic compounds (VOCs)** – any organic compound which participates in atmospheric photochemical reactions, but excluding methane, ethane, methyl chloroform, methylene chloride, CFC-113, CFC-114, CFC-115, CFC-11, CFC-12, CFC-22, FC-23, HCFC-123, HCRC-141b, HCFC-142b, and HFC-1341 (excluded because of their negligible photochemical reactivity); and
- **total particulate matter (Part):** or total suspended particulate matter of all sizes; includes emissions of PM<sub>10</sub> and PM<sub>2.5</sub>, described as follows:
  - **PM<sub>10</sub>** – particulate matter with aerodynamic diameters less than or equal to 10 micrometers. This group can be considered inhalable particulate;
  - **PM<sub>2.5</sub>** – particulate matter with aerodynamic diameters less than 2.5 micrometers. This group can be referred to as the fine fraction of PM<sub>10</sub>, or respirable particulate matter.

Total reduced sulphur (TRS) data were collected for the pulp mill sector only. An ideal data set for TRS would have included the oil and gas sector. However, since Environment Canada did not include TRS for sources they inventoried it was not possible to give adequate representation for this contaminant. TRS includes hydrogen sulphide (H<sub>2</sub>S), methyl mercaptan (MeSH), dimethyl sulphide (DMS) and dimethyl disulphide (DMDS).

It should also be noted that for this emission inventory, only primary emissions of PM<sub>10</sub> and PM<sub>2.5</sub> are quantified. Primary emissions are those which are emitted directly to the atmosphere from a source. Secondary fine particulate matter forms in the atmosphere from a complex series of interactions between primary emissions of particles and gases. While the emission inventory does not attempt to quantify secondary emissions, the primary emissions data are used as an input to current efforts to model secondary particulate formation.

An attempt was made to collect greenhouse gas (GHG) release data from large industrial sources. A few sources provided excellent data for this. However, a greater number did not provide any data. Therefore, GHG data are not presented in this report. Data on GHG releases within BC can be obtained from:

- Canada's Greenhouse Gas Inventory as produced by Environment Canada. Annual updates are available\*.
- Canada's Climate Change Voluntary Challenge & Registry Inc.†

Emission inventory reports produced by the GVRD also provide data on GHG releases within the LFV portion of the province.

### **1.3 Source Categories**

The year 2000 inventory is divided into the following source categories:

- **point sources** – industrial facilities that operate under Ministry authorization (permit, approval or regulation), or air discharge permit issued under GVRD Air Quality Management Bylaw No. 937.
- **area sources** – Stationary sources which are not normally required to obtain an air discharge permit such as:
  - prescribed burning, wildfires and residential fuel wood use as inventoried by WLAP, and
  - other sources such as light industrial, other residential, commercial and institutional sources as inventoried by Environment Canada.Emissions from most of these sources are small compared to the point sources but can be significant when considered collectively.
- **mobile sources**
  - on-road motor vehicles - this group consists primarily of mobile sources involved in the transportation of people and goods, including passenger cars, trucks and motorcycles.
  - marine transportation - inventoried by Levelton Associates as part of joint studies with GVRD, Environment Canada and WLAP, and
  - off-road sources - other mobile sources, including aircraft, marine vessels and railways, off-road vehicles and small off-road engines (such as agricultural, lawn and garden, construction, or recreational equipment).

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\* [http://www.ec.gc.ca/pdb/ghg/inventories\\_e.cfm](http://www.ec.gc.ca/pdb/ghg/inventories_e.cfm)

† <http://www.vcr-mvr.ca/>

- **natural sources** - occur in nature without the influence of human beings (nonanthropogenic). Includes categories such as wildfires, biogenics (plants), wildlife and marine aerosol.

## **2 POINT SOURCES**

Point source estimation began with the Ministry Permit Fee Database (WASTE). Since permit fees generally represent how much a given facility is entitled to release, emission releases are generally overestimated in this database. Therefore, a series of adjustments were made to the permit fee data set in order to reflect how much was actually released during the year 2000. The various steps taken in utilizing the permit fee dataset and estimating actual emission releases are described in the following sections.

### **2.1 Permit Fee Database**

#### **2.1.1 Description**

Under the Waste Management Permit Fees Regulation, sources that operate under Ministry permit, approval or regulation are assessed fees based on the type and quantity of contaminants they are entitled to discharge. Data for this are usually consistent with the relevant authorization documentation (permit, approval or regulation) and is entered into the Ministry WASTE database by regional office staff.

WASTE is an application that is accessed by multiple users throughout the Ministry. However, WASTE does not allow access to data files in a format that is conducive to preparing emission inventory estimates.

The annual emissions (in tonnes) are calculated for each authorized source by Regional Permit Fee Coordinators. Base data for fees are entered into WASTE and each permit (or source covered under regulation) is invoiced annually on the anniversary of its original issue (or registration). The regional Ministry offices are then responsible for a formal annual examination and verification of invoiced permit data and fees for facilities located in their region. Because this validation is customarily performed just before issuing the invoice, the data contained in WASTE are only reliable on the anniversary month of each permit. At other times, data may not accurately reflect current annual permit emissions and fee charges.

In order to ensure the best possible accuracy for the data extracted from the WASTE database, the results of audits conducted by staff from the Environmental Management Branch of the Ministry were used. These audits involved:

- Monthly downloads – after each month of invoicing, WASTE data were replicated for permits invoiced during the month and imported to the ‘WASTE Archived to FoxPro Fees and Loadings’ tracking system (WAFFL). Here the emissions were tallied into totals for each unique contaminant for each file, then re-linked to a table of fees-per-tonne.
- Individual fee adjustments – when necessary, the data in WASTE were updated and annual fees revised so that the permittee or registrant was sent a credit or debit, as calculated by the adjustment.

- Cancelled permit prorations – at the end of each year, the permits that were cancelled had their annual emissions prorated based on the original billing date and the cancellation date.
- Download of newly issued permits – at the end of each year, the newly issued permits were downloaded for import into WAFFL (since new issues are not included in the monthly downloads described above)

Completion of this process ensured that the permit fee dataset used as a starting point for the year 2000 emission inventory agreed with the year 2000 permit fee invoices for each source.

### **2.1.2 Limitations**

There are limits to using WASTE permit emission estimates for the year 2000 inventory. The main limitations are:

- WASTE does not include any estimates for PM<sub>10</sub> and PM<sub>2.5</sub>.
- Permit fee estimates may not reflect actual releases. In most cases, facilities opt to have permit limits and the associated fee levels above what is actually released, in order to avoid non-compliance.
- The WASTE database can be accessed and updated by various regional and headquarters staff. As described previously the results of audits conducted by Ministry staff were used to ensure the correct fee estimates were used in all cases.
- For the inventory it is assumed that permit fee estimates encompass all releases from point sources. However, some processes associated with point sources such as raw material storage piles are not charged fees for emissions and therefore do not appear in the WASTE database. These emissions are not handled consistently in this inventory. Estimates for coal storage piles are readily available and have been included (see Section 2.4.2.1). However, estimates for wood product industry storage piles have not been included because the data are not readily available.

The main task for emission inventory preparation is to determine the quantity of CAC's actually released from each source. There are 957 sources in British Columbia, which presents a large challenge. The remaining sections of this report explain how CAC quantities for the 957 sources were estimated for the year 2000 emission inventory.

### **2.1.3 Enhancements**

In order to divide particulate emissions into their PM<sub>10</sub> and PM<sub>2.5</sub> size fractions, additional enhancements were made to the WASTE dataset. This involved assigning source classification codes (SCC's) to each facility that is charged permit fees. In most cases each site (in a permit) can be assigned a unique SCC\*.

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\* In some cases, several SCC's can be assigned to each site. For these each site had to be divided into fractions to represent emission releases for each SCC.

To calculate fine particulate estimates, the U.S. EPA Particulate Emission Calculator version 2.02\* was used to obtain PM<sub>10</sub>/Part and PM<sub>2.5</sub>/Part size fractions. These were then imported into Oracle. In calculating the fine particulate amounts, it should be noted that the data regarding emission control technology applied to the source were incomplete. Therefore, to remain consistent, all the PM<sub>10</sub> and PM<sub>2.5</sub> emission estimates were calculated without controls. The values for emissions recorded in WASTE are estimates of actual emissions after control technology (if any) has been applied to the emissions. Since in theory, control technology generally reduces coarse particles more effectively than finer ones, the quantity of PM<sub>10</sub> and PM<sub>2.5</sub> emissions contained in the inventory will tend to under represent what was actually released.

For the 957 point sources operating in the province, either industry submissions or industry sector adjustments were used to determine emission release estimates for the year 2000. Table 1 describes the impact each set of estimations had on:

1. the number of sources accounted for (Sources column),
2. the accumulated total of sources in the inventory (Inventory Included Sources), and
3. the total quantity of particulate for which permits are charged fees (Fee Part) in relation to the amount of particulate included in the inventory (Inventory Part).

Particulate was selected as the contaminant for measuring overall progress in preparing the inventory since this contaminant is related to PM<sub>10</sub> and PM<sub>2.5</sub> releases, which are key to airshed management planning processes throughout the province.

Table 1 provides an indication as to how various adjustments to the permit fee data affected the total. The source adjustment flow chart (Figure 2: Source Adjustment Flowchart, page 19) is intended to serve as a useful adjunct to the following descriptions of the enhancements made to the dataset.

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\* <http://www.epa.gov/ttn/chief/software/pmcalc/>

**Table 1: Enhancements to the Permit Fee Dataset**

Category	Sources	Inventory Included Sources	Fee Part (tonnes)	Inventory Part (tonnes)
<b>FVRD</b>	85	85	3,263.7	2,783.5
<b>Industry Submissions</b>				
Pulp Mills	22	107	39,495.2	16,912.0
Canfor	11	118	14,386.3	5,779.1
Wood Residue Open Burning	163	281	5,601.7	2,702.6
Teck Cominco	3	284	2,851.2	307.3
Duke Energy	24	308	670.3	223.2
Asphalt Plants	72	380	0	75.2
Questionnaire	87	467	46,114.3	27,452.8
<b>Industry Sector Adjustments</b>				
Wood Products (SIC 25)	129	596	10,138.5	7,236.5
Mining (SIC 06)	17	613	1,985.9	1,299.8
Non-Metallic Mineral Products (SIC 35)	95	708	671.5	531.2
Primary Metal Manufacturing (SIC 29)	4	712	235.9	235.8
Pipeline Transport (SIC 46)	61	773	263.4	274.6
Crude Petroleum & Natural Gas Processing (SIC 07)	64	837	25.0	25.0
Other	120	957	2,363.4	2,198.7
<b>Total</b>	<b>957</b>	n/a	<b>128,066.5</b>	<b>68,037.3</b>

## 2.2 FVRD

Sources that operate within the Fraser Valley Regional District (FVRD) come under Ministry authorization. Under a cooperative agreement with both BC MWLAP and the FVRD, GVRD staff prepared the 2000 inventory of point sources for all permitted facilities in the LFV, regardless of which agency administers the permit. This agreement was made in order to ensure consistency of approach across the entire LFV airshed.

Each point source within the FVRD was requested by the GVRD to complete an emission inventory questionnaire. Out of the 87 permittees that were sent a questionnaire, 42 provided responses that were included in the inventory. Ministry permit fee estimates were used in the inventory for the remaining 45 sources that did not submit questionnaire responses.

The relatively low response rate for the FVRD permits is in contrast to the full response rate obtained for the 250 sources authorized by the GVRD. This can be attributed to the fact that permitted facilities under GVRD jurisdiction are required to report information specified by the GVRD District Director as a condition of permitting. A similar condition is not included in Ministry permits.

## 2.3 Industry Submissions

A number of industry sectors or large companies expressed a preference for a single integrated response to the Ministry request for inventory information. As well, a number of source types which made large collective contributions to the provincial emissions

were targeted for extra effort to ensure the best possible estimation of emissions. The results of these industry related submissions are described in the following sections.

### **2.3.1 Pulp Mills**

In order to ensure consistent and fair reporting for CAC emissions, the Council of Forest Industries and the BC Pulp and Paper Environmental Forum contracted the U.S. National Council for Air and Stream Improvement (NCASI) to prepare inventory of emissions from significant emission points of pulp mills operating in British Columbia (NCASI 2003). The results were limited to emissions from stacks and process vents, and wherever possible estimates were based on continuous monitoring data or periodic emission sampling results. The data were also checked for consistency by comparing emission rates to ranges observed for similar sources.

During the process of extracting the data from the report for entry into the database, a few errors in summing the table results were identified, and corrections were inserted after verification with a representative from the BC Pulp and Paper Environmental Forum.

### **2.3.2 Canadian Forest Products Ltd. (Canfor)**

For Canfor, data were prepared in Excel by the company and sent to the Ministry. This was Canfor's preferred method for preparing this data, as a number of the entries for emission factors etc. are common between facilities.

### **2.3.3 Wood Residue Burning Sources**

Permitted wood residue open burning sites are unique among the largest emitting source types identified in this report because they are found in several different industry sectors. Analysis of the permit fee data set for open burning sources (identified as sites with an SCC of 50300201) shows that setting a threshold of 100 tonnes or more of any one CAC accounted for 92% or more of the billed open burning emissions for each contaminant.

The majority of open burn permits are approved for logging companies and include spot, landing and pile burning of slash and debris in the wake of logging activity and land clearing. The open burn permits are tracked by the Ministry of Forests to ensure that they are not mistaken for wildfires. An opening number is assigned to each fire and recorded (in ISIS; see section 3.1.2). Burn quantity information is only recorded by WLAP (double counting does not occur between the two ministries).

Each open burn source is required to pay annual discharge fees under the Waste Management Act Permit Fees Regulation. There are 171 burn sites outside the LFV that were required to pay fees to the Ministry during 2000 (in Table 1, only 163 sources are noted because 8 of the burn sites are contained within other industry submissions and questionnaires). Of these sources, 93 were authorized to release 100 tonnes or more of any one CAC. These companies were surveyed by phone, e-mail or fax for information as to how much wood residue (by volume) they actually burned during 2000.

The process of collecting open burn information for the 93 surveyed sources included contacting either regional compliance officers, or the permitted company/facility itself. Revised data for 84 sources were obtained, making up a total of more than 81% of permitted emissions. Survey information was not available for 9 permits because either a contact was repeatedly not available (6 permits), or a company had ceased operation before the survey was conducted (3 permits). The revised data for fuel quantities are presented in Appendix B.

In order of decreasing confidence the estimates were based on:

- 1) Permit reports submitted to regional offices,
- 2) Calculations based on the amount of waste unit per production unit, or
- 3) Best-guess estimates on the percent of the permit limit burned.

For the 87 sources not surveyed, adjustment of permit emissions is based on the average amount burned per permit for the large surveyed sources. This assumes that because most of the open burn permits are for related industries, the average of the large sources is an indicator of the industry wide average activity. It is recognized that some accuracy is sacrificed by using this method of estimation, but the effort required to obtain better results was not justifiable when significant attempts had already been made to collect data for the nine large sources, and the remaining permits had total emissions which were less than 8% of the provincial permit fee total for this sector.

The quantities of wood residue burned are estimated in cubic metres per year. In order to obtain the units of tonnes per year required for emission calculations, an estimate of 0.8 cubic metres per tonne at 50% moisture for mixed species was used (Flegel and Kinrade 1995).

Emission factors used in WASTE as a basis for charging permit fees are different from those used for prescribed burning under the spot and pile burns categories. To maintain consistency the open burn emission factors were changed accordingly. Details concerning the open burn emission factor selection process are given in Appendix A.4.

### **2.3.4 Teck Cominco**

In 1999 and 2000, Teck Cominco implemented new industrial processes which were not reflected in the permit database. In order to obtain an accurate assessment of the emissions from the site, a site visit was conducted by WLAP staff. Sources of emissions were identified, and emissions data were supplied by the company.

Estimates for PM<sub>10</sub> and PM<sub>2.5</sub> were performed using the same methodology as most other sources (assignment of an SCC to the industrial process and use of the U.S. EPA PM Calculator). Teck Cominco is of the opinion that this calculation methodology may not accurately reflect actual contaminant loadings. Further information is available in Appendix C.

### **2.3.5 Duke Energy**

In 2000, Duke Energy had an annual greenhouse gas inventory prepared by Levelton Engineering Solutions, and audited by Clearstone Engineering Ltd. (Duke 2002). The data for this inventory also gave detailed and accurate data for the CAC emissions tracked in this report.

With the help of Duke Energy staff, the sources of emission in the report were associated with WASTE air emissions permit and site numbers. The relevant information was then entered into the database as Questionnaire responses. To verify that the data were entered correctly, summary reports were generated and the totals validated against the totals in the greenhouse gas inventory report.

### **2.3.6 Asphalt Plants**

Asphalt plants in British Columbia operate under the Waste Management Act Asphalt Plant Regulation\*. Under section 3(4) asphalt plant owners are required to pay emissions fees in arrears with respect to each calendar year of operation. Thus asphalt plant production numbers for 2000 were compiled by WLAP staff and entered into the database as questionnaire responses.

In addition, emissions monitoring was conducted for many of the asphalt plants by stack sampling consultants. Where emission factors resulting from emissions testing exist for a plant, they were used to calculate emissions. Where specific factors do not exist, it was assumed that all asphalt plants in British Columbia operate similar processes under similar conditions, and an average of all BC emission factors resulting from monitoring data was used.

Truck loading operations were not monitored for emissions, so an SCC code of 30500214 (Drum mix or batch mix plant load-out) was applied, and the related emission factors were used to calculate emissions based on production for each plant.

It is recognized that asphalt plants release relatively small amounts of air emissions relative to other industrial sources. A relatively detailed emission estimation technique was applied because the data were readily available.

### **2.3.7 Questionnaire**

When the year 2000 emission inventory was originally contemplated, permit fee totals for Ministry authorized sources were reviewed. By setting a threshold of 200 tonnes or more of any CAC, over 85% of emissions for each contaminant could be accounted for. Therefore, at the onset of the inventory it was decided that effort should be concentrated on these sources.

The industry submissions described above account for many of the sources that were identified by the 200 tonne threshold. The remaining 87 sources that were over the threshold were asked to complete a web based questionnaire that was pre-loaded with permit fee database information. The basic concept of the questionnaire was to invite

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\* [http://www.qp.gov.bc.ca/statreg/reg/W/WasteMgmt/217\\_97.htm](http://www.qp.gov.bc.ca/statreg/reg/W/WasteMgmt/217_97.htm)

permittees to overwrite their fee data and provide a more accurate indication of what was actually released in the year 2000.

A package containing the following information was mailed out to each facility:

- a cover letter,
- questions and answers,
- a year 2000 permit fee invoice for the facility, and
- instructions and background information.

A sample package is in Appendix D.

Follow up phone calls, faxes and e-mails were made to most facilities as appropriate in order to obtain the data. Responses were received for 74 questionnaires. Questionnaire responses also included data from an airshed emission inventory for Quesnel (Plain 2001) for: PA 3725 - Weldwood of Canada, PA 5737 - Cariboo Consultants, and PA 7841 - Quest/Tolko Wood Products.

For the 13 facilities that elected to not respond to the questionnaire, permit fee values were used as inventory results without further adjustment unless an alternate source of information was available (see Section 2.4 ). Included in the non-responses are coal mining facilities. For these, fugitive coal dust estimates from storage piles were added to the permit fee values (see Section 2.4.2.1 ).

### **2.3.8 Beehive Burners**

Releases from beehive burners account for 29% of the total fees charged for particulate emissions. Therefore, these sources were considered in some detail.

A number of beehive burners are part of facilities that were asked to complete a web-based questionnaire. Information received back for 31 burners indicate a 25% reduction in the amount of wood that was actually burned compared to permit fee estimates. The data obtained by questionnaire were used in the year 2000 emission inventory data set.

The reduction in the amount of wood burned is unexpected, as beehive burners are covered by the *Wood Residue Burner and Incinerator Regulation*. Section 3(1)(b) of which states that operators of burners and incinerators are required to submit an estimated annual amount of wood residue burned (in tonnes/year) at least 45 days before the authorized anniversary date. So in theory, the permit fee estimates should have been unchanged as a result of the questionnaire.

The quantity of wood burned for beehive burners that were not covered by the questionnaire were not adjusted. As a result, emissions associated with these burners are potentially overestimated (by as much as 25%).

The emission factors for beehive burners are an added complication. The U.S. EPA emission factors were developed based on literature published between 1952 and 1970.

Background documentation for these factors indicates:

"The information presented in this section has not been updated since it was originally prepared because no recent data were found. The use of conical burners is much less prevalent now than in the past and they are essentially obsolete."\*

The factors are as follows:

**Table 2: Beehive Burner Emission Factors**

Emission factors (kg/t)				
Part	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
0.5, 3.5 or 10	0.05	0.5	5.5	65

Ministry permit fee emission factors used for particulate are either 7 or 10 kg particulate/tonne of wood residue burned. This is difficult to justify for inventory purposes, as the factors used for forest pile burns in the inventory are 6 kg/tonne (the broadcast wildfire factor is 12 kg/tonne).

The U.S. EPA, documentation indicates the following for selecting particulate emission factors:

- **0.5 kg/tonne**  
Satisfactory operation: properly maintained burner with adjustable underfire air supply and adjustable, tangential overfire air inlets, approximately 500 percent excess air and 370°C exit gas temperature.
- **3.5 kg/tonne**  
Unsatisfactory operation: properly maintained burner with radial overfire air supply near bottom of shell, approximately 1200 percent excess air, 204°C exit gas temperature.
- **10 kg/tonne**  
Very unsatisfactory operation: improperly maintained burner with radial overfire air supply near bottom of shell and many gaping holes in shell. Approximately 1500 percent excess air and 204°C exit temperature.

In order to cross check the particulate emission factors for beehive burners it makes sense to review other U.S. EPA emission factors. The FIRE 6.23 database lists a particulate emission factor for wood/bark fired boilers at 3.6 kg/tonne burned (SCC 10200902 Wood/Bark fired boiler >50,000 Lb Steam). It seems highly unlikely that even a well operated beehive burner would release less particulate than a boiler. Therefore, emission factors used in the year 2000 emission inventory were either 3.5 or 10 kg/tonne for beehive burners.

In order to make the most appropriate emission factor selection, Ministry regional staff selected the factor to apply to each burner. This approach was chosen since regional staff are in the best position to assess the performance of burners in absolute and relative

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\* For more information on the U.S. EPA emission factors see:  
<http://www.epa.gov/ttn/chief/ap42/ch02/final/c02s07.pdf> and  
<http://www.epa.gov/ttn/chief/ap42/ch02/bgdocs/b02s07.pdf>

terms. Changes in the particulate emission factor lead to downward adjustment of permit fee estimates for these sources by 60%.

In the emission inventory update it is apparent that the beehive emission factors used for inventory purposes contrast the higher values used to calculate permit fees. As an incentive to phase out beehive burners, escalating fees are intended to be a key motivator for sawmill operators to phase out their burners. Therefore, the higher permit fee emission factors for beehive burners are unlikely to change.

## **2.4 Industry Sector Adjustments**

Small sources that are charged permit fees for being authorized to release under 200 tonnes of all Criteria Air Contaminants account for about 15% or less of the billed emissions for each contaminant\*. There are 490 permits in this group, which is 51% of the total number of permits in the province. Clearly, a large effort would be required to refine the emissions estimates on an individual permit basis. Therefore, these facilities were not asked to complete questionnaires, and a different approach was taken.

The data were grouped in Oracle and then sorted by total source emissions discharge. Organizing the data in a meaningful way allows for prioritizing efforts to determine adjustments to those sources.

By examining industry groupings and using available industry annual reports, it was possible to identify six major SIC groups for further refinement. These six groups account for about 10% of total emissions, but for 85% of small source emissions which have not yet been refined as described above. The revisions made for various industry sectors are described in the following sections.

### **2.4.1 Wood Products Industry (SIC 25)**

Wood products industry sources that have not been accounted for under the previous section of this report were adjusted based on the literature and data contained in WASTE. Permit fee estimates were multiplied by the actual production from the literature and the production capacity in WASTE. For this it is assumed that the WASTE emission estimates were a theoretical maximum that could be released from each facility in 2000, and that the maximum emission would result from the facility operating at its production capacity.

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\* This total increased to 20% when inventory estimates were used in place of permit fee estimates.

**Table 3: Wood Product Facility Capacity/Production**

Permit #	Company Facility	Reference	WASTE Capacity* (mfbm/year)	Published 2000 Production (mfbm/year)	% of Capacity
2061	Interfor - Squamish	(Interfor 2000)	165,000	89,000	53.9%
3877	Doman - Ladysmith	(Doman 2000)	100,000	88,000	88.0%
4166	Doman - Chemanius	(Doman 2000)	50,250	39,000	77.6%
4396	Doman - Cowichan Bay	(Doman 2000)	137,500	97,000	70.5%
6159	Houston Forest Products	(West Fraser 2000; Weldwood 2001)	225,000	259,000	115.1%
7206	Lignum - Williams Lake	(Lignum 2000)	466,250	229,000	49.1%
7605	Doman - Saltair	(Doman 2000)	125,000	119,000	95.2%
7685	Babine Forest Products	(West Fraser 2000; Weldwood 2001)	250,000	241,000	96.4%
8003	Doman - Nanaimo	(Doman 2000)	142,750	78,000	54.6%
8347	West Fraser - Quesnel	(West Fraser 2000)	23,750	19,000	80.0%
11401	Burnslake Specialty Wood Ltd.	(Weldwood 2001)	35,000	27,000	77.1%
<b>Totals</b>			<b>1,720,500</b>	<b>1,285,000</b>	
<b>Average production to capacity ratio:</b>					<b>74.7%</b>

\*Calculated as daily capacity times 250 days/year operating period for sawmill operations from WLAP "Waste Management Permit Fee System Procedure Manual"

The calculated average capacity ratio of 74.7% was applied to sources where published 2000 production data could not be found.

### 2.4.2 Mining Industry (SIC 06)

The mining industry commissions PriceWaterhouseCoopers to publish an annual report containing production figures for the province. Mine names were correlated to ministry permit numbers. Permit fee estimates were then adjusted using the technique described above. A summary of the data extracted from the PriceWaterhouseCoopers (PWC) 2000 *Report on Mining* (PWC 2000) is presented below.

Table 4 lists pertinent data that were used to adjust permit fee values.

**Table 4: 2000 Mining Industry Production**

PWC Mine Name	PWC Operator Name	PWC Location	Permit No.	Capacity (tonnes)	Actual Production (tonnes)	% of Capacity
<b>Metal &amp; Precious Metal Mines</b>						
Endako	Thompson Creek Mining Ltd.	Fraser Lake	2399	10,950,000	9,395,673	86%
Eskay Creek	Homestake Canada (acquired by Barrick in 2001)	Stewart		80,800	87,527	108%
Golden Bear	North American Minerals Corp.	Dease Lake	8620	1,281,000	518,849	41%
Highland Valley	Highland Valley Copper	Logan Lake	1557	49,776,000	49,693,800	100%
Huckleberry	Huckleberry Mines Limited	Smithers	14800	7,322,000	7,145,579	98%
Kemess	Northgate Exploration Limited	Mackenzie		17,520,000	14,138,000	81%
Mount Polley	Imperial Metals Corp.	Likely		7,300,000	6,950,000	95%
Myra Falls	Boliden Westmin Canada Ltd.	Campbell River	2408	1,460,000	1,166,624	80%
Sullivan	Cominco Ltd.	Kimberley		3,000,000	1,613,210	54%
<b>Provincial Totals</b>				<b>98,689,800</b>	<b>90,709,262</b>	<b>91.91%</b>
<b>Coal Mines</b>						
Bullmoose	Bullmoose Operating Corp.	Tumbler Ridge	6846	2,300,000	1,416,102	62%
Elkview	Elkview Coal Corporation	Sparwood	1807	6,000,000	4,061,074	68%
Fording Coal Mountain	Fording Coal Limited	Sparwood	4751	2,800,000	2,291,873	82%
Fording Greenhills	Fording Coal Limited	Elkford	6249	4,500,000	4,399,890	98%
Fording River	Fording Coal Limited	Elkford	1501	9,500,000	9,008,388	95%
Line Creek	Luscar Ltd.	Sparwood	5352	3,600,000	2,558,000	71%
Quintette	Quintette Operating Corp. (mine closed August 2000)	Tumbler Ridge	6683	5,000,000	1,760,000	35%
<b>Provincial Totals</b>				<b>28,700,000</b>	<b>23,735,327</b>	<b>82.70%</b>

The calculated average capacity ratio of 91.9% for metal and precious metal mines and 82.7% for coal mines was applied to sources where published year 2000 production data could not be found.

#### 2.4.2.1 Coal mining storage piles.

Emission factors from *Fugitive Coal Dust Emissions in Canada* (CCME 2001) prepared for the Canadian Council of Ministers of the Environment were used to estimate particulate emissions from coal mining, which does not appear in the permit fees database. For consistency with other BC estimates for those permits, the annual production figures from the PWC 2000 Report on Mining were used. The results are tabulated below. These results are entered into the database as part of the questionnaire responses.

**Table 5: Coal Mining Storage Piles**

Permit No.	Mine	Annual Production (10 <sup>6</sup> tonnes)	Description	SCC	EF (kg/tonne)	PART (tonnes)
6846	Bullmoose	1.42	Mining	30501022	0.013	18.5
		1.42	Loading	30501023	0.02	28.4
		1.42	Unloading	30501008	0.033	46.9
		1.42	Over Burden	30501021	0.006	8.5
4751	Coal Mountain	2.29	Mining	30501022	0.013	29.8
		2.29	Loading	30501023	0.02	45.8
		2.29	Unloading	30501008	0.033	75.6
		2.29	Over Burden	30501021	0.006	13.7
1807	Elkview (Balmer)	4.06	Mining	30501022	0.013	52.8
		4.06	Loading	30501023	0.02	81.2
		4.06	Unloading	30501008	0.033	134.0
		4.06	Over Burden	30501021	0.006	24.4
1501	Fording River	9.01	Mining	30501022	0.013	117.1
		9.01	Loading	30501023	0.02	180.2
		9.01	Unloading	30501008	0.033	297.3
		9.01	Over Burden	30501021	0.006	54.1
6249	Greenhills	4.4	Mining	30501022	0.013	57.2
		4.4	Loading	30501023	0.02	88
		4.4	Unloading	30501008	0.033	145.2
		4.4	Over Burden	30501021	0.006	26.4
5352	Line Creek	2.56	Mining	30501022	0.013	33.3
		2.56	Loading	30501023	0.02	51.2
		2.56	Unloading	30501008	0.033	84.5
		2.56	Over Burden	30501021	0.006	15.4
6683	Quintette	1.76	Mining	30501022	0.013	22.9
		1.76	Loading	30501023	0.02	35.2
		1.76	Unloading	30501008	0.033	58.1
		1.76	Over Burden	30501021	0.006	10.6

### 2.4.3 Non-Metallic Mineral Production (SIC 35)

Two companies contribute the bulk of this industry's emissions in British Columbia. Both provided data for the year 2000 emission inventory update. The details provided are not included in this report as one of the companies requested the information be kept confidential.

### 2.4.4 Primary Metal Production (SIC 29)

Alcan is responsible for 19 of the 24 permitted sites in this sector, contributing to roughly half of the original emissions estimate for this sector in 2000. The two greatest emissions sources for this sector include metal melting fuel use (SCC 39000605), and open burning (SCC 50300201). Wood residue open burning was adjusted as described in Section 2.3.3. For the remaining source, Alcan's reported 2000 production (Alcan 2000) was approximately 100.6% of capacity. Alcan's permit emission estimates were adjusted accordingly.

For the remaining permitted sources in this SIC group, production information was not readily available; therefore, their emissions were not adjusted.

## **2.4.5 Oil and Gas Industry (Pipeline Transmission (SIC 46) and Crude Petroleum & Natural Gas Production (SIC 07))**

Oil and Gas Industry sources are covered either by regulation or by individual permits. Specific source classification coding was used as a means of separation.

- Regulated site sources include natural gas compressor, oil pump, or electricity generation operations (SCC 202002) and natural gas stripping, or processing operations (SCC 31000202).

These sources are registered under the *Waste Management Act - Oil and Gas Waste Regulation*. Under the Regulation, facilities are responsible for providing an estimated annual amount of oxides of nitrogen and/or sulphur dioxide in tonnes per year (according to Schedule 1, section II, line (7)). These annual estimates are used to calculate a facility's fees for the upcoming year. For each regulated site, it is assumed that regulation requirements are met and that they provided an accurate estimate of 2000 releases. Registered oil and gas sites, therefore, were not adjusted and their original emissions (in tonnes/year) are included in the 2000 inventory.

- Permitted oil and gas sources include industrial natural gas fired compressors (SCC 20200201) and electric generation natural gas fired compressors (SCC 20100201).

Permitted industrial compressor sites ( SCC 20200201) were not adjusted from their original estimates, as fees for compressors are generally calculated assuming continuous operation, which is typical of actual operation. Remaining oil and gas source emissions (with other SCC's) were to be adjusted based on production to capacity information for 2000. However, because of the difficulty in securing quality 2000 performance information for this sector, further emission adjustments were not made. This can be justified due to the relatively insignificant contribution to releases from these remaining sources.

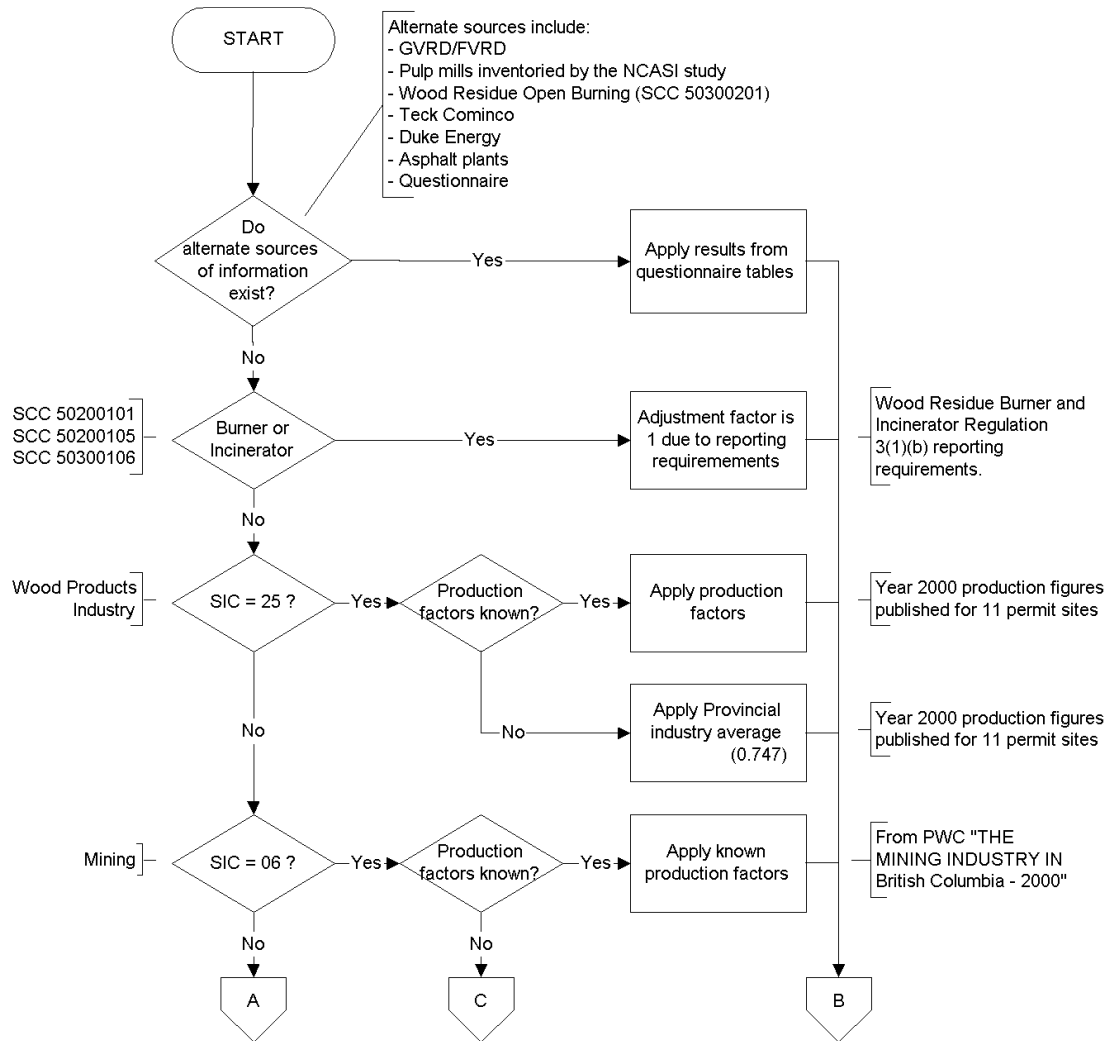
## **2.5 Reliability of Revised Estimates**

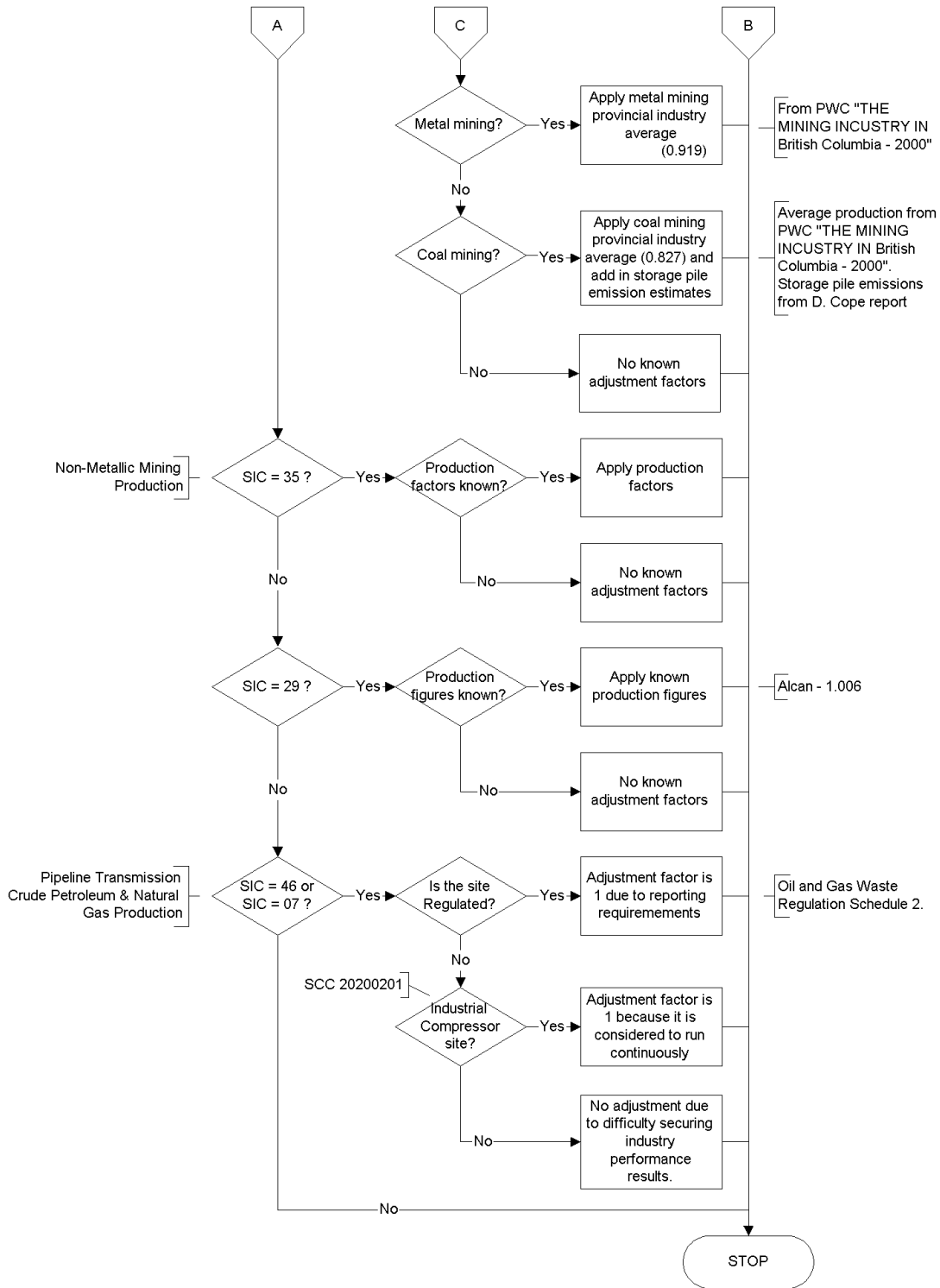
The revised emission estimates developed in this study reflect a more accurate estimation of 2000 releases than only using permit fee data. However, there are limitations to the adjustment process as noted below.

- The use of emission factors for estimating PM<sub>2.5</sub> and PM<sub>10</sub> are an average generalization of process releases and may not match exactly. The emission factors are dependent on a link to a SCC, and SCC designations are based on remote assumptions made by more than one person. There are, no doubt, errors for some SCC assignments within the data set.
- The use of industry information has certain assumptions associated with it. First, industry sector information used to adjust the original estimates was assumed to be correct. It must be noted, though, there is a small measure of uncertainty over industry statistics and their level of confidence. Furthermore, industry information was in most cases applied to all sources, but in reality, the information came from only a few sources. This does not provide an accurate revised estimate for some individual sites. It does, however, revise estimates based on a generalization of industry performance.

- For those sources not revised from the original estimates it is assumed the WASTE estimates reflect actual releases.
- Point sources are defined in this study as emission sources that require Ministry Authorization. Therefore, the inventory does not include fugitive emissions from sources such as log sort yards, chip handling and storage, and wastewater treatment systems. In fact, the only fugitive emission source accounted for is coal storage piles. This study also did not attempt to fill in point sources that are not included in WASTE.

**Figure 2: Source Adjustment Flowchart**





### 3 AREA SOURCES

Area sources for the province were estimated by Air Protection, and Environment Canada. Air Protection prepared estimates for prescribed burns, wildfires, and residential fuel wood use. These are best understood at a provincial level and account

for a significant proportion of emissions. Other source categories were estimated by Environment Canada.

### **3.1 Prescribed Burns**

Within the emission inventory context, the term “prescribed burns” usually applies to resource management activities. However, the Forest Fire Prevention and Suppression Regulation under the Forest Practices Code of British Columbia Act\* expands this definition to include the following categories of burns:

1. Small open fire for waste material (not to exceed 2 metres in height and 3 metres in diameter)
2. Small open fire for grass or stubble (burn area less than 0.2 hectares)
3. Large open fire more than 50 metres from combustible material
4. Large open fire for root raked windrows
5. Large open fire less than 50 metres from combustible material
6. Large open burn for grass or stubble (over 0.2 hectares)
7. Resource management open fire for waste material
8. Broadcast burn resource management open fire

In addition to these, prescribed burns are performed in BC parks, and on crown land.

#### **3.1.1 Category 1 and 2**

Category 1 and 2 burns, commonly referred to as backyard burns, are not required to have a reference number issued by the Ministry of Forests prior to ignition. This means there is no way of using Ministry of Forests data to track this emission source. Within the Environment Canada area source estimates there is a category for residential open burning. Therefore, the category 1 and 2 burns are incorporated in the overall year 2000 emission inventory update.

The remaining burn categories are tracked by the Ministry of Forests under the Open Fire Tracking System (OFTS). Under the OFTS, category 3-8 fires require a reference number which is used to provide a 14 day upcoming snapshot of planned burning for the Regional Protection Officers in case of wildfire outbreak.

#### **3.1.2 Category 3 to 5**

For category 3 to 5 burns a reference number is issued for each fire and recorded without accompanying size estimates. This creates an obvious problem if one wants to estimate emission releases. A further complication is that a person can apply to burn again using the same reference number. Since there is no basis for determining how many times this could occur it was assumed that each reference number is associated with one burn.

To determine the size of category 3 to 5 burns a survey of regional government staff that are responsible for monitoring open burning was conducted. Estimates received on the

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\* <http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcaregs/ffirepre/ffpasr.htm>

average volume of fuel burned per fire for each of the six Ministry of Forests Regions are as follows:

**Table 6: Fire Size Estimates**

MIN. OF FORESTS REGION	CONTACT	TITLE	OFFICE	FUEL VOLUME ESTIMATE (m <sup>3</sup> )
Coastal	Jim Kirby	Protection Officer	Parksville Fire Center	50
	Rick Kimmerly	Protection Officer	Abbotsford Fire Center	20
Kamloops	Bill Lamont	Protection Officer	Kamloops Fire Center	80
Kootenay	Alan Bond	Protection Officer	Kootenay Lake Zone Office	60 (Cat.3) 100 (Cat 5)
Cariboo	Earle Plain	Meteorologist	Williams Lake WLAP Office	80
Skeena	Nick Mortimer	Protection Officer	Smithers Fire Center	37.5
	Lauren Robertson	Protection Officer	Dease Lake Zone Office	60
Prince George	Dave Dunsdon	Protection Officer	Prince George Fire Center	35
	Rick Grayston	Protection Officer	Dawson Creek Zone Office	100

Note that there are large uncertainties in the estimates provided, as each estimate is based on limited field experience. However, it is the best information that could be obtained for compiling fuel volume estimates for these burns.

The number of fires for each region was combined with the fuel volume estimates to produce emission estimates. Wood waste volumes were converted to mass using the assumption that 1 m<sup>3</sup> of wood waste at 50% moisture weighs 0.8 tonnes (Flegel and Kinrade 1995). The emission factors used were the ones for logging slash debris (from Appendix A.3)

**Table 7: Number of Fires by Region**

Region	Fires	Volume (m <sup>3</sup> /fire)	Total Volume (m <sup>3</sup> )
Coast	500	35 (average of Coastal estimates)	17,500.0
Cariboo	389	80	31,120.0
Kamloops	528	80	42,240.0
Kootenay	191 (Cat. 3)	60	11,460.0
	2 (Cat. 4)	80 (average of Cat. 3 and Cat. 5 estimates)	160.0
	235 (Cat. 5)	100	23,500.0
Skeena	234	48.75 (average of Skeena estimates)	11,407.5
Omineca/Peace	580	67.5 (average of Prince George estimates)	39,150.0
<b>Total wood volume burned:</b>			<b>176,537.5</b>

### 3.1.3 Category 6 to 8

Category 6 to 8 burns outside of Provincial parks and private land are tracked by the Ministry of Forests in the Integrated Silviculture Information System (ISIS)\*. It should

\* <http://www.for.gov.bc.ca/his/isis/>

be noted that prescribed fires which occur on private land are not recorded by any Ministry and are therefore not part of this inventory. Omitting the private land burns should not have much of an impact since the allowable annual cut in 1998 for private land was 4.5% of the total (crown and private) (MOF 2000). A complete listing of the year 2000 prescribed burns contained in ISIS was obtained from the Ministry of Forests.

For each fire recorded in ISIS, the number of hectares burned, the 1:20,000 map sheet (embedded in the reference number), and the forest district is recorded. This information was entered in the inventory database for analysis. For the fires in Provincial parks, the data were derived from written records, and data for the number of hectares burned and the forest district were entered into the inventory database.

In order to estimate emissions, the quantity of fuel burned is typically expressed in kilograms. Therefore, conversion from hectares burned to kilograms of fuel consumed was required. The results of a Canada – British Columbia partnership agreement (FRDA II) study (Taylor 1996) presents a reasonable way of converting fuel loading in hectares to kilograms of fuel consumed. A key table of the study report lists the average area burned by wildfires from 1981 to 1990, categorized by biogeoclimatic zone. The areas are also separated into forest district. To determine year 2000 emissions it was assumed that the biogeoclimatic characteristics of the region did not change from 1981 to 2000. Therefore, by knowing the surface area burned and the forestry district, the amount of biomass for each fire within each biogeoclimatic zone could be calculated. The FRDA II report also lists mean fire biomass consumption (kg/ha) for each type of fire in each biogeoclimatic zone. This enabled calculation of kilograms of fuel for each fire listed in the ISIS dataset.

After fuel loadings were determined for each of the category 6 to 8 burns, they were multiplied by appropriate emission factors to determine emission estimates for each burn. Since there are a number of emission factors to choose from, a review of the current literature was conducted before deciding on the prescribed burn factors presented in Appendix A.2.

### **3.1.4 BC Parks and Protected Areas**

A few relatively large prescribed burns were performed in BC Parks in 2000. These burns are assigned an opening number within ISIS without burn quantity data. The following burn quantity data were obtained from the Parks and Protected Areas Branch of the Ministry:

- Junction Sheep Range 440 hectares (1100 hectares; 2 burns in 2000, 1 in 2001 and 2 in 2002. Therefore  $1100 \text{ hectares} \times \frac{2}{5}$  in 2000 or 440 hectares)
- Kalamalka Lake Provincial Park 30 hectares (grassland)
- Purcell Wilderness Conservatory 200 hectares
- Spatsizi Plateau Wilderness Provincial Park 9000 hectares

Emission estimates for these burns were determined using the same technique as described for the other prescribed burns.

### 3.1.5 Crown Land

Prescribed burning on crown land is for wildlife and range habitat management. Various contacts within WLAP and the Ministry of Forests reveal that the data for these burns is contained within and outside ISIS for 2000. The following table lists the burns that are known to be excluded from the ISIS dataset.

**Table 8: Prescribed Burns on Crown Land**

WLAP REGION	CONTACT	TITLE	OFFICE	AREA BURNED (Ha)	FUEL TYPE	COMMENTS
Okanagan	Tom Ethier	A/Manager of Legislation and Regulation	WLAP Victoria	20	Unknown.	Two burns of 10 Ha each at Vaseux Lake.
	Judy Millar	Ecosystem Officer	WLAP Okanagan	30	Under burn	Kalamalka Lake on Rattlesnake Hill.
Peace	Colene Wood	Standards & Guidelines Specialist	WLAP Victoria	3180	Grass, herbs, shrubs and perhaps some aspen seedlings.	In early May. Burns were short in duration.

To maintain consistency with other prescribed burn estimates, the same estimation technique (described in section 3.1.3) was used to convert fuel loading values from hectares to kilograms of fuel consumed where the fuel type is unknown, or classified as under burn. For the Peace region burn the biogeoclimatic zone was assumed to be entirely grassland when calculating fuel quantity. The emission factors used for these burns are described in Appendix A.2.

### 3.2 Wildfires

A dataset which includes the forest district, precise location and area burned (hectares) for each wildfire that occurred in the province is maintained by the Protection Branch of the Ministry of Forests. A copy of this dataset was obtained, and the emission calculation methods used for prescribed burns were also applied to the wildfire dataset. Emission factors for wildfires from Appendix A.1 were used.

### 3.3 Residential Wood Use

To date, provincial estimates for emissions associated with residential fuel use have been based on a number of questionable assumptions. Therefore, to better estimate the size of this source, WLAP commissioned a telephone survey in June 2003 to study wood burning habits of British Columbia residents (WLAP 2004). Using disproportionate sampling methodology, a total of 2100 wood burning appliance users were interviewed regarding their wood burning habits. The method used results in a margin of error for the survey results of less than 10% at the 95% confidence interval. Combining the results of this survey with results from previous surveys of the Okanagan regions gives emission quantities for chemical species of concern (contaminants) from residential wood burning in British Columbia (outside the Lower Fraser Valley).

There are no doubt differences between year 2000 and 2003 residential wood use emissions. However, since there is no means of adjusting (from 2003 to 2000) and the 2003 data were the best available, the 2003 data were used.

**Table 9: BC Residential Wood Burning Emissions**

Provincial Emissions (tonnes)						
Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
10,719.8	10,127.1	10,120.4	152.7	1,069.2	14,019.3	60,953.6

### 3.4 Provincial Park Campfires

Prior to 2001, BC Provincial campgrounds supplied firewood to campers. Now campers that want to have campfires can either purchase firewood in parks or bring their own. This encourages visitors to conserve wood and protect the environment by minimizing the use of fire and use camp stoves instead.

In 2001 the total cost of supplying wood within provincial campgrounds was \$1,400,000 (Block 2002). With an assumed cost of \$150 per cord the total number of cords burned was 9333. This was used to arrive at an overall provincial park campfire estimate in the year 2000 emission inventory.

In previous emission inventories, campfire emission estimates were not included since information related to the amount of fuel burned was not available.

The emission estimates for campfires were performed by Environment Canada. As part of the calculations it was assumed that one cord of wood weighed one tonne for mixed species with 22% moisture content. Emission factors used are as follows:

**Table 10: Campfire Emission Factors**

Emission factors (kg/t)						
Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
14.25	9.5	8.88	0.005	1.7	4.2712	85

These emission factors are the same as the ones used for logging slash debris except for SO<sub>x</sub> (for more information see Appendix A.3). A lower SO<sub>x</sub> number was used based on the assumption that campfires burn a low amount of bark relative to wood.

### 3.5 Other Area Sources

Remaining area source emission estimates were prepared by Environment Canada. Details on the calculation methodology are contained in the *1995 Criteria Contaminants Emission Inventory Guidebook* (Cassaday and Van Heyst 1999). The guidebook identifies relevant emission sectors with base quantities, emission factors and other information used to derive the emissions.

Using Environment Canada prepared estimates for these remaining categories makes sense as it conserves resources, while ensuring consistency between B.C. and other provinces. However, there is some potential for missing data for a few sources. An example of this is the fugitive dust released from material storage piles. As mentioned in the discussion on point source emissions, emission estimates in the year 2000 inventory only include coal storage piles. Wood storage piles can be anticipated to be an emission source as well. However, estimates for these releases and other releases associated with storage piles were not quantified as part of this inventory.

## **4 MOBILE SOURCES**

Mobile source estimates were prepared as a collaborative effort between the GVRD, Environment Canada and the Ministry.

### ***4.1 Marine Vessels***

Amongst anthropogenic emission sources in B.C., marine vessel emissions have been identified as significant sources of SO<sub>x</sub> and NO<sub>x</sub> within the LFV portion of the province. The 1994 GVRD Air Quality Management Plan also identified this source sector as requiring further study with respect to its impact on regional air quality. Therefore the GVRD in partnership with Environment Canada, contracted Levelton to perform marine vessel inventories in two areas; the LFV (Levelton 2002a), and B.C. and Washington State outside the LFV (Levelton 2002b).

One of the goals of the marine vessel emission inventory is to improve consistency of approach between the various jurisdictions, including airshed partners in neighbouring Washington State and to harmonize inventory data with airshed modelling efforts. Accordingly, the overall 2000 marine inventory addresses a larger area than the LFV, extending to all coastal areas in B.C. and Washington State.

The marine vessel estimates prepared by Levelton are considerably more detailed than what Environment Canada would have prepared on a national scale. Therefore, the Levelton estimates were used as part of the year 2000 emission inventory for the province.

### ***4.2 Other Mobile Sources***

Remaining mobile source emission estimates were prepared by Environment Canada. The motor vehicle emission factors were developed using the Mobile 6.2C model. This is the latest U.S. EPA model that has been modified for application in Canada.

## **5 RESULTS**

Year 2000 emission estimates as prepared by Air Protection are listed in Table 11. The rationale for concentrating on the wood industry, the pulp and paper industry, prescribed burning, forest fires, and residential wood heating are apparent when the emission totals for PM (including the PM<sub>10</sub> and PM<sub>2.5</sub> fractions) are considered. Further details of this data are presented where results are listed either by:

- standard industrial code (SIC) in Appendix F.1,
- source classification code (SCC) in Appendix F.2, or
- Ministry permit, approval or regulation registration number in Appendix F.3.

Estimates prepared by Environment Canada (area and mobile sources outside the LFV) and the GVRD (point, area, and mobile sources for the LFV) can be found in Appendix E.2 and Appendix E.1. Detailed estimates and background on the calculation methods used by either the GVRD or Environment Canada are not provided in this report as they are documented elsewhere (GVRD 2003; Cassaday and Van Heyst 1999).

Table 11: WLAP Results for BC Outside the Fraser Valley (Tonnes)

CATEGORY / SECTOR	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
<b>INDUSTRIAL SOURCES</b>							
Abrasives Manufacture	131	0	0	0	0	0	0
Aluminum Industry	1,778	1,149	546	5,450	11	1	75
Asbestos Industry	0	0	0	0	7	0	1
Asphalt Paving Industry	75	0	0	4	30	48	86
Cement and Concrete Industry	190	139	48	66	344	5	20
Chemicals Industry	91	72	49	290	3,019	30	123
Coal Mining Industry	4,460	3,317	1,227	1,884	1,319	806	42
Ferrous Foundries	127	108	38	0	45	1	43
Grain Industries	1	0	0	0	0	0	0
Mining and Rock Quarrying	1,514	1,013	366	683	1,093	80	265
Non-Ferrous Mining and Smelting Industry	247	186	122	3,086	0	0	0
Petroleum Refining	46	33	20	2,457	72	121	2,307
Plastics & Synthetic Resins Fabrication	1	0	0	4	13	1	14
Pulp and Paper Industry	17,424	9,327	7,032	16,069	18,767	6,023	69,596
Upstream Oil and Gas Industry	524	387	381	19,810	25,683	3,124	4,851
Wood Industry	36,239	19,299	12,016	433	5,962	22,214	257,400
Other Industries	1,603	1,024	597	338	1,100	328	839
<b>TOTAL INDUSTRIAL SOURCES</b>	<b>64,452</b>	<b>36,055</b>	<b>22,444</b>	<b>50,573</b>	<b>57,466</b>	<b>32,783</b>	<b>335,664</b>
<b>NON INDUSTRIAL FUEL COMBUSTION</b>							
Commercial Fuel Combustion	2	1	1	2	1	3	10
Electric Power Generation (Utilities)	261	242	237	110	2,469	542	2,429
Residential Fuel Wood Combustion	10,720	10,127	10,121	153	1,069	14,019	60,954
<b>TOTAL NON INDUSTRIAL FUEL COMBUSTION</b>	<b>10,983</b>	<b>10,370</b>	<b>10,358</b>	<b>264</b>	<b>3,539</b>	<b>14,564</b>	<b>63,393</b>
<b>INCINERATION</b>							
Municipal Incineration	375	250	234	2	46	142	2,641
Other Incineration & Utilities	105	84	53	61	128	36	406
<b>TOTAL INCINERATION</b>	<b>480</b>	<b>334</b>	<b>287</b>	<b>63</b>	<b>174</b>	<b>178</b>	<b>3,047</b>
<b>MISCELLANEOUS</b>							
Fuel Marketing	0	0	0	2	0	243	0
Marine Cargo Handling Industry	59	30	9	0	0	0	0
<b>TOTAL MISCELLANEOUS</b>	<b>59</b>	<b>30</b>	<b>9</b>	<b>2</b>	<b>0</b>	<b>243</b>	<b>0</b>
<b>OPEN SOURCES</b>							
Forest Fires	18,385	14,063	12,656	47	1,875	4,004	95,626
Prescribed Burning	28,732	20,789	18,773	100	3,413	8,556	189,280
<b>TOTAL OPEN SOURCES</b>	<b>47,117</b>	<b>34,852</b>	<b>31,429</b>	<b>147</b>	<b>5,288</b>	<b>12,560</b>	<b>284,906</b>
<b>GRAND TOTAL*</b>	<b>123,091</b>	<b>81,641</b>	<b>64,527</b>	<b>51,050</b>	<b>66,467</b>	<b>60,328</b>	<b>687,010</b>

\* Appendix F totals are the sum of “TOTAL INDUSTRIAL SOURCES”, “Commercial Fuel Combustion”, Electric Power Generation (Utilities)”, “TOTAL INCINERATION”, and “TOTAL MISCELLANEOUS.”

## **5.1 Emissions Query Tools**

The Air Protection section has developed two geographic information systems (GIS) query tools for the B.C. emission inventory that use:

- a web based mapping application for point sources, prescribed burns and wildfires which was in the final stages of development when this report was released, and
- the Air Contaminant Emissions (ACE) system that resides on the government GIS Oracle Access Tool (GOAT).

### **5.1.1 Web Based Mapping Project**

The web based mapping application was developed to provide information to the public on air pollution releases and ambient air monitoring sites throughout the province. Air pollution release data are available for point sources, prescribed burns, and wildfires. Two types of information are available for point sources: (i) maximum releases, and (ii) actual releases. Maximum releases are determined from annual permit fees, and actual releases are the inventory values.

The ambient air map layer provides a description of monitoring sites and parameters (ambient and meteorological) with the period during which monitoring was performed.

The web based map will be accessible through the WLAP Air Protection web site\* when it is completed.

### **5.1.2 ACE**

The creation of a GIS platform for point source data is relatively straightforward in terms of creating the data sets, and making the computer infrastructure work. Using GIS as a tool for utilizing area and mobile source data is more complex.

The Air Contaminant Emissions (ACE) project was undertaken by WLAP with funding from the Georgia Basin Ecosystem Initiative (GBEI) to add a spatial component to the provincial emission inventory for area and mobile sources. The project was tasked to provide a simple end-user interface to the emissions inventory that would offer the ability for both spatial and attribute exploration and reporting.

ACE is able to generate area and mobile emission estimates on any user defined area with spatial data sets gridded to resolutions of 1 km or 5 km. Obvious tradeoffs between speed and accuracy occur between these two resolutions.

Operation of ACE involves use of the provincial government's GIS Oracle Access Tool (GOAT)†. With the GOAT it is possible to take the overall provincial inventory for area and mobile sources and break it down into any user defined area of the province. From the end user perspective the basic operation of ACE involves:

- Display of gridded map themes,
- User selection of specific grid squares,

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\* <http://wlapwww.gov.bc.ca/air/>

† <http://srmwww.gov.bc.ca/gis/goat5/index.html>

- Creation of pre-defined Oracle Discoverer workbooks.

In order to prorate provincial total emissions by location, spatial information datasets were produced for 1 km and 5 km grid resolutions. Various map layers, and supporting information were used for this. The details for this work are described in development (Glen 2001a) and data dictionary documentation (Glen 2001b) for ACE.

ACE resides on the main government GIS platform. Therefore, end users can access and add virtually any government source of mapping information. This enables one to analyse emission inventory results within a wider conceptual context. When creating end use maps, coastal boundaries, road networks, and municipal boundaries have been found to be particularly useful.

## **6 FUTURE DIRECTIONS**

### ***6.1 Airshed Specific Inventories***

The Ministry is becoming increasingly involved in airshed management planning. Emission inventories provide technical information to assist with air quality management development and assessment. Provincial efforts to compile emission inventories offer a useful starting point for local airshed work. However, in order to continuously improve on the information available the following additional regional work has been performed:

- 1995 Sea-to-Sky Emissions Inventory of Common Air Contaminants
- Inventory of Common Air Contaminants Emitted in the Quesnel Airshed (Plain 2000)
- Golden Air Emission Inventory
- Bulkley Valley – Lakes District Inventory Improvement Strategy
- Prince George Emission Inventory Improvement Strategy

The first three studies are basically a refinement of emission inventory data available from existing provincial information. Better local estimates were used where data were available.

The BVLD and Prince George work reached further to look at uncertainties and bias within the provincial inventory that may be unacceptable at an airshed level. Both improvement strategies offer guidance for improvement. The main areas identified for improvement are:

- Permitted industrial sources (Prince George only)
- Beehive burners (particularly BVLD)
- On-road mobile sources (Prince George only)
- Backyard and prescribed burning
- Forestry resource waste burning
- Paved and unpaved road dust

Various options are being considered to improve local emission inventory estimates. It is anticipated that the techniques for local improvements will be applied to the rest of the province where it is practical to do so.

## **6.2 Interagency GIS**

Use of geographic information systems (GIS) for emission inventory work has also captured the attention of other government agencies. The Ottawa office of Environment Canada has used GIS to prepare national biogenic and road dust emission estimates. These are incorporated in the year 2000 data for B.C.

A key initiative that is being undertaken by the Pacific and Yukon office of Environment Canada with involvement from the GVRD and the province, is an interagency GIS. The intention is to expand the existing capabilities within ACE so that GIS can be used as a way of compiling complete emission inventory estimates. Considerable attention will also be placed on producing input files for dispersion modelling.

## **6.3 OWNERS**

The National Pollutant Release Inventory (NPRI) is a legislated, nation-wide, publicly accessible inventory of pollutant release information. Environment Canada is responsible for administering NPRI. The need for improved data collection harmonization and integration has been identified by Environment Canada. This has led to the development of OWNERS (One Window National Environmental Reporting System) – a web based database for reporting facilities and other stakeholders that enables simplified reporting of environmental information.

The Province of B.C., the GVRD and the provinces of Ontario and Alberta are working with Environment Canada to have CAC emission data collected via OWNERS. It is anticipated that future collection of point source CAC data will be handled using this system.

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## **Appendix A Emission Factors for Biomass Burning**

### **Wildfires, Prescribed Burning, Open Burn, and Beehive Burner – Emission Factors to be used in the BC Year 2000 Emission Inventory Update**

Emission factors from the following sources were reviewed to determine which ones should be used in the year 2000 B.C. Emission Inventory update:

*Biomass Consumption and Smoke Emissions from Contemporary and Prehistoric Wildland Fires in British Columbia*, Canadian Forest Service and Ministry of Forests, Victoria, BC, March 1996

*Stationary Point and Area Sources Emission Factors*, United States Environmental Protection Agency (AP-42)

*Development of Emissions Inventory Methods for Wildland Fire*, by EC/R Incorporated, for U.S. Environmental Protection Agency, February 2002

*PM<sub>10</sub> Emission Factor Listing Developed for Technology Transfer and AIRS Source Classification Codes with Documentation*, by E.H. Pechan & Associates Inc., for U.S. Environmental Protection Agency.

Note that FRDAII and AP-42 sets of emission factors appear to be based on the same research literature.

Fuel loading calculations were not considered as part of this comparison. It is reasonable to conclude that the FRDAII study conducted for B.C. would produce a more accurate estimate than AP-42. Although the First Order Fire Effects Model (FOFEM) - Version 4.0 and Consume - Version 2.1 could be anticipated to give superior fuel loading estimates, they were not used in the year 2000 emission inventory update. The effort required to obtain the input data would be relatively high. For specific airshed analysis, use of these models may be warranted.

## A.1 Wildfires

Contaminant	FRDA II or 1995 inventory		U.S. EPA			EPA 2002	
	(g/kg)	Comment	(g/kg)	Comment	Rating	(g/kg)	Comment
CO	101		70	Page 13.1-3	Not given	<b>102</b>	Average of emission factors used in FOFEM (103) and Consume (101) (Wood > 3 inches, Moderate (moisture), and Broadcast burned slash Mixed conifer) page 33
NO <sub>x</sub>	1.5		2	Page 13.1-3	Not given	<b>2.0</b>	Summary of NO <sub>x</sub> measurements – Average Wildfire page 42
SO <sub>x</sub>	0.005	Table 1.6-6 0.005 to 0.1 Low limit for wood and high limit for bark. Low limit assumed.	-	Page 13.1-3 – Negligible for sulphur oxides	Not given	<b>0.05</b>	California wind tunnel Douglas fir slash page 51 <b>Note:</b> SO <sub>x</sub> emissions are not included in the fire models or in AP-42. Emission factors vary considerably because of the variability in the fuel sulphur content.
VOC	<b>4.2712</b>	0.760 + emission factor for CH <sub>4</sub> * (0.616); CH <sub>4</sub> from FRDA study (5.7 g/kg) <sup>(a)</sup>	12.00	Page 13.1-3	Not given	4	Page 46 has same emission factor equation as for 1995 inventory – this is also confirmed on page 50 using the linear relationship of CO to VOC.
Part	17	Broadcast, wildfire, wildlife/range	8.5	Page 13.1-3	Not given	-	No factor
PM <sub>10</sub>	13	Broadcast, wildfire, wildlife/range	-	No factor	N/A	<b>15</b>	Consume Wildfires Average page 35
PM <sub>2.5</sub>	12	Broadcast, wildfire, wildlife/range	-	No factor	N/A	<b>13.5</b>	Consume Wildfires Average page 35

(a) From: Ward, Peterson and Hao, Air and Waste Management Association, *An Inventory of Particulate Matter and Air Toxic Emissions from Prescribed Fires in the USA for 1989*, 1993 Annual Meeting and Exhibition, Denver, Colorado, June 14 -18, 1993.

- Determining an emission factors for total particulate (part) is problematic because emission factors are not provided in the 2002 EPA study. Therefore, it makes sense to revert to the FRDAII ratios and back calculate. Therefore, the particulate emission factor to be used in the year 2000 update is  $15 * 17 / 13 = 19.61 \text{ g/kg}$

## A.2 Prescribed Burns

Contaminant	FRDA II or 1995 inventory		U.S. EPA			EPA 2002	
	(g/kg)	Comment	(g/kg)	Comment	Rating	(g/kg)	Comment
CO	101	Same as for wildfire	175	Table 13.1-3 (Conifer – Short Needle)	Not given	<b>102</b>	Average of emission factors used in FOFEM (103) and Consume (101) (Wood > 3 inches, Moderate (moisture), and Broadcast burned slash Mixed conifer) page 33
NO <sub>x</sub>	1.5	Same as for wildfire		No factor	N/A	<b>1.7</b>	Summary of NO <sub>x</sub> measurements – Average Prescribed forest facilities page 42
SO <sub>x</sub>	0.005	Table 1.6-6 0.005 to 0.1 Low limit for wood and high limit for bark. Low limit assumed.	-	Page 13.1-3 – Negligible for sulphur oxides		<b>0.05</b>	California wind tunnel Douglas fir slash page 51 <b>Note:</b> SO <sub>2</sub> emissions are not included in the fire models or in AP-42. Emission factors vary considerably because of the variability in the fuel sulphur content.
VOC	<b>4.2712</b>	Same as for wildfire	3.5	Table 13.1-3 (Conifer – Short Needle)	A	4	Page 46 has same emission factor equation as for 1995 inventory – this is also confirmed on page 50 using the linear relationship of CO to VOC.
Part	17	Broadcast, wildfire, wildlife/range	17	Table 13.1-3 (Conifer – Short Needle)	A	-	No factor
PM <sub>10</sub>	13	Broadcast, wildfire, wildlife/range	13	Table 13.1-3 (Conifer – Short Needle)	A	<b>10.95</b>	Consume (11.6 Broadcast burned slash – Douglas fir/hemlock, and 10.3 mixed conifer, a 50/50 split was assumed)
PM <sub>2.5</sub>	12	Broadcast, wildfire, wildlife/range	12	Table 13.1-3 (Conifer – Short Needle)	A	<b>9.65</b>	Average of Emission Factors used in FOFEM (9.15 Wood > 3 inches, Moderate (moisture) and Consume (10.9 Broadcast burned slash – Douglas fir/hemlock, and 9.4 mixed conifer, a 50/50 split was assumed). Avg. = $(9.15 + (10.9 + 9.4) / 2) / 2$

Part =  $10.95 * 17 / 13 = 14.31$

### A.3 Logging Slash Debris

Contaminant	FRDA II or 1995 inventory		U.S. EPA			EPA 2002	
	(g/kg)	Comment	(g/kg)	Comment	Rating	(g/kg)	Comment
CO	101	Same as for wildfire	37	Table 13.1-4 (Average for region - Pacific Northwest)	B	<b>85</b>	Consume pile-and-burn slash average piles page 33
NO <sub>x</sub>	1.5	Same as for wildfire		No factor provided	N/A	<b>1.7</b>	Summary of NO <sub>x</sub> measurements – Average Prescribed forest facilities page 42
SO <sub>x</sub>	0.005	Table 1.6-6 0.005 to 0.1 Low limit for wood and high limit for bark. Low limit assumed.	-	Page 13.1-3 – Negligible for sulphur oxides		<b>0.05</b>	California wind tunnel Douglas fir slash page 51 <b>Note:</b> SO <sub>2</sub> emissions are not included in the fire models or in AP-42. Emission factors vary considerably because of the variability in the fuel sulphur content.
VOC	<b>4.2712</b>	Same as for wildfire	No Data		N/A	4	Page 46 has same emission factor equation as for 1995 inventory – this is also confirmed on page 50 using the linear relationship of CO to VOC.
Part	6	Spot, landing	6	Logging slash debris	B		
PM <sub>10</sub>	4	Spot, landing	4	Logging slash debris	B	<b>9.5</b>	Consume broadcast burned slash average piles
PM <sub>2.5</sub>	4	Spot, landing	4	Logging slash debris	B	<b>8.88</b>	Average of Emission Factors used in FOFEM (9.15 Wood > 3 inches, Moderate (moisture) and Consume (8.6 pile-and-burn slash average piles)

Part = 9.5 \* 6/4 = 14.25

### A.4 Open Burns

The Ministry permit fee emission factors used for open burns are as follows:

Contaminant	Factor kg/tonne or g/kg
CO	65
SO <sub>x</sub>	0.05
NO <sub>x</sub>	0.5
VOC	5.5
Part	16

These factors are based on the beehive burner factors. For the year 2000 emission inventory update the above logging slash debris factors were used. This makes sense because the emissions from beehive factors can be anticipated to differ and are based on 1952 to 1970 data.

## A.5 Crown Lands

The following emission factors were used for habitat burns that occur on crown lands:

Contaminant	Factor kg/tonne or g/kg	Comments
CO	75	U.S. EPA AP-42 table 13.1-4 Rocky Mountain Grassland
SO <sub>x</sub>	0.05	Same as for wildfire
NO <sub>x</sub>	1.7	Same as for prescribed
VOC	4.271	Same as for wildfire
Part	10	U.S. EPA AP-42 table 13.1-4 Rocky Mountain Grassland
PM <sub>10</sub>	10	U.S. EPA AP-42 table 13.1-4 Rocky Mountain Grassland
PM <sub>2.5</sub>	9	Calculated using ratio for prescribed

## A.6 Beehive Burners

It is well recognized that the beehive burner data are outdated. However, since these factors are source specific, it makes sense to continue to use them in the year 2000 emission inventory update. It should also be noted that it is doubtful that superior data will be obtained for beehives since they are not configured to be tested according conventional stack sampling techniques. The factors from the U.S. EPA AP-42 publication are as follows:

Contaminant	Factor kg/tonne or g/kg
CO	65
SO <sub>x</sub>	0.05
NO <sub>x</sub>	0.5
VOC	5.5
Part	0.5, 3.5, or 10 depending on performance

The PM<sub>10</sub> and PM<sub>2.5</sub> size fraction for beehives used by U.S. EPA in the prevention of significant deterioration for PM<sub>10</sub> work is questionable. The basis for assignment is to “assume psd similar to refuse derived fuel in municipal waste combustion: AP-42, Table 2.1.2; 55% ≤ 10 microns.” The same size fractions are used in the U.S. EPA FIRE databases (versions 5 and 6.23) and the U.S. EPA PM Calculator. The above logging burning and slash debris emission factors appear to have more in common with beehive burners. Therefore, for the year 2000 emission inventory update the size fractions applied to beehive burners are PM<sub>10</sub>/Part = 4/6 = 0.66, and PM<sub>2.5</sub>/Part = 8.88/14.25 = 0.62.

## Appendix B Open Burns

Open Burns			
PERMIT	COMPANY	Permit Limit (m3/y)	Revised Quantity (m3/y)
1671	District of Sparwood	7800.0	2147.0
1768	Celgar Pulp Inc.	5000.0	4000.0
4005	Weyerhaeuser	16000.0	8400.0
4138	WYNDEL BOX & LUMBER COMPANY LIMITED	3000.0	2000.0
4321	DOMAN-WESTERN LUMBER LTD.	3000.0	900.0
4549	CHASM SAWMILLS - DIV. OF WEST FRASER MILLS (FORMERLY AINSWORTH, TAKEOVER APRIL 22, 2001)	3060.0	1800.0
4784	WEYERHAEUSER	3600.0	3600.0
4926	INTERNATIONAL FOREST PRODUCTS LIMITED	1000.0	0.0
4994	Cariboo Regional District	10000.0	2500.0
5093	International Forest Products Ltd.	4600.0	500.0
5261	District of Squamish	24000.0	240.0
5263	Canadian Forest Products	57500.0	20000.0
5280	HIGHWEST WASTE RECYCLER LIMITED	9000	9000
5411	PACIFIC FOREST PRODUCTS LIMITED	2800.0	0.0
5430	DOMAN-WESTERN LUMBER LTD.	840.0	0.0
5773	Weyerhaeuser	29200.0	1801.0
5821	WEYERHAEUSER	1000.0	500.0
5822	WEYERHAEUSER	2000.0	20.0
6016	INTERNATIONAL FOREST PRODUCTS LIMITED	3000.0	3000.0
6208	DOMAN-WESTERN LUMBER LTD.	2500.0	2250.0
6310	INTERNATIONAL FOREST PRODUCTS LIMITED	750.0	0.0
6419	WEYERHAEUSER COMPANY LIMITED	3500.0	1110.0
6426	WEYERHAEUSER COMPANY LIMITED	3000.0	5551.0
6857	INTERNATIONAL FOREST PRODUCTS LIMITED	1850.0	1850.0
6887	HUSBY FOREST PRODUCTS LTD.	750.0	200.0
6967	WESTERN FOREST PRODUCTS LIMITED	4000.0	4000.0
7064	WESTERN FOREST PRODUCTS LIMITED	2000.0	2000.0
7107	International Forest Products Ltd.	5000.0	5000.0
7184	INTERNATIONAL FOREST PRODUCTS LIMITED	1440.0	1440.0
7217	MILL & TIMBER PRODUCTS LTD.	600.0	0.0
7227	MEADOW CREEK CEDAR LTD.	3000.0	0.0
7492	DOMAN-WESTERN LUMBER LTD.	2500.0	450.0
7536	WEYERHAEUSER COMPANY LIMITED	1000.0	3470.0
7561	PACIFIC FOREST PRODUCTS LIMITED	2000.0	980.0
7600	INTERNATIONAL FOREST PRODUCTS LIMITED	600.0	0.0
7608	INTERNATIONAL FOREST PRODUCTS LIMITED	700.0	0.0
7683	Weyerhaeuser	4500.0	1362.0
7691	Western Forest Products Ltd.	11000.0	6000.0
7699	INTERNATIONAL FOREST PRODUCTS LIMITED	1800.0	1000.0
7739	PFP Forest Ltd.	4500.0	0.0
7745	Husby Forest Products Ltd.	6000.0	4000.0
7755	INTERNATIONAL FOREST PRODUCTS LIMITED	2400.0	1500.0
7800	INTERNATIONAL FOREST PRODUCTS LIMITED	1400.0	3000.0
7979	PACIFIC FOREST PRODUCTS LIMITED	3100.0	930.0
8150	PACIFIC FOREST PRODUCTS LIMITED	2800.0	672.0
8240	INTERNATIONAL FOREST PRODUCTS LIMITED	2000.0	300.0
8270	CANADIAN PACIFIC FOREST PRODUCTS LIMITED	3100.0	150.0
8392	TIMBERWEST FOREST LIMITED	1500.0	1500.0
8398	TIMBERWEST FOREST LIMITED	1500.0	0.0
8405	PACIFIC FOREST PRODUCTS LIMITED	2825.0	678.0
8492	INTERNATIONAL FOREST PRODUCTS LIMITED	3000.0	3000.0

Open Burns			
PERMIT	COMPANY	Permit Limit (m3/y)	Revised Quantity (m3/y)
8513	DOMAN-WESTERN LUMBER LTD.	1700.0	0.0
8663	PFP Forest Ltd.	5000.0	0.0
8867	TIMBERWEST FOREST LIMITED	1500.0	400.0
8875	MILL & TIMBER PRODUCTS LTD.	2900.0	0.0
8937	WEYERHAEUSER	5000.0	0.0
10669	Western Forest Products Ltd.	4000.0	2000.0
10859	TIMBERWEST FOREST LIMITED	1500.0	0.0
10981	WAPPLE- KENNETH ROBERT	4300.0	2150.0
11203	WEYERHAEUSER	1000.0	0.0
11205	INTERNATIONAL FOREST PRODUCTS LIMITED	1840.0	500.0
11395	INTERNATIONAL FOREST PRODUCTS LIMITED	3000.0	0.0
11493	INTERNATIONAL FOREST PRODUCTS LIMITED	1000.0	1000.0
11550	Timberwest Forest Ltd.	5250.0	1500.0
11614	INTERNATIONAL FOREST PRODUCTS LIMITED	1000.0	0.0
11669	Teal Cedar Products (formerly Timberwest)	8000.0	4750.0
11847	TIMBERWEST FOREST LIMITED	500.0	500.0
12013	WESTERN FOREST PRODUCTS LIMITED	2400.0	2400.0
12018	WESTERN FOREST PRODUCTS LIMITED	3000.0	1500.0
12154	INTERNATIONAL FOREST PRODUCTS LIMITED	1500.0	1500.0
12736	Fiedler Bros. Contracting Ltd.	18000.0	1296.0
12823	Coastal Mountain Excavations Ltd.	30000.0	30000.0
13501	International Forest Products Ltd.	6000.0	1980.0
13680	INTERNATIONAL FOREST PRODUCTS LIMITED	2400.0	300.0
14613	TIMBERWEST FOREST LIMITED	1500.0	0.0
14614	HECATE LOGGING LTD.	2600.0	2600.0
14752	TIMBERWEST FOREST LIMITED	1500.0	1000.0
15015	Western Forest Products Ltd.	5500.0	0.0
15255	HOUSTON FOREST PRODUCTS COMPANY	2500.0	0.0
15262	NORTHWOOD PULP AND TIMBER	2500.0	1875.0
15521	NORTHWOOD PULP AND TIMBER	500.0	375.0
15871	Western Forest Products Ltd.	5000.0	1250.0
16164	Western Forest Products Ltd.	4000.0	2000.0
16208	Columbia River Shake & Shingle	10000.0	6000.0

## Appendix C Teck Cominco Statement



### **Contaminants not reported**

Teck Cominco Metals Ltd. has recently completed start up of its new Lead Smelter at the Trail Operations at Trail B.C.. This Lead Smelter replaces the previous Sinter Plant and Blast furnace technology with Russian Kivcet technology. A significant difference between the old and new technology is that the Kivcet process allows for the capture and treatment of the bulk of the off gases from the Lead Smelting process.

No measured contaminant emission data for CO has been sampled from this process. Some preliminary NO<sub>x</sub> tests were done following the start-up of the new lead process, those results indicated very low emissions. Particle sizing (PM<sub>10</sub> and PM<sub>2.5</sub>) has not been differentiated from the off-gases nor have they been measured from this process source. It is believed that the calculated source emissions factor which is not based on the Kivcet technology may not accurately reflect actual contaminant loadings. A plan is being developed to measure the above noted contaminants.

### **The Emissions Trend or Prediction**

Trail operations is working towards an Environmental Management System (EMS) implementation based on ISO14001. The foundation of EMS is for continual improvement, therefore emissions for 2005 is expected to be less than today's emissions and will meet or exceed future Provincial and Federal requirements.

# Appendix D Web Based Questionnaire

## D.1 Cover Letter

January 14, 2002      File: 21540-20/BC 2000

To: Distribution

Re: **British Columbia Year 2000 Emission Inventory Update**

The Air Resources Branch (ARB) of the Ministry of Water, Land and Air Protection is preparing an emission inventory update for the year 2000. We are requesting that your company complete a web-based questionnaire concerning year 2000 emission releases.

A comprehensive emission inventory is one of the main tools used for deciding appropriate courses of action for managing air quality within the province. Each provincial inventory is also rolled up into an overall national inventory. The larger national inventory is used as the basis for developing national and international air quality agreements.

Provincial emission inventories are produced every five years. A copy of the 1995 inventory can be found at:

<http://wlapwww.gov.bc.ca/air/airquality/inventory/subindex.html>

A web-based questionnaire for collecting year 2000 release data is being used, in hopes of making data entry as convenient as possible. If questions arise concerning data entry, we also anticipate timesavings will be realized by allowing ARB staff and industry to review data as it is being entered. The web address for the questionnaire is:

<http://www.airemissions.org:8080/>

This is a secure web site that requires a user name and password, which is attached to the top of this page for your facility only.

The questionnaire for your facility has been pre-populated with company data that we have on file at the Ministry. The data for the facility name, location and the like should be changed if our records are not accurate. The more detailed information on emission releases has been extracted from the Ministry permit fee database.

To assist with data entry the following background information is enclosed:

Questions and answers concerning the year 2000 emission inventory,

A year 2000 permit fee invoice for your facility, and

Instructions for editing and completing the web-based 2000 Request of Air Emissions Information form.

Information sessions concerning the emission inventory will be held if there is sufficient interest.

We would appreciate your cooperation with filling out our questionnaire by March 15, 2002. For further information, please contact Tony Wakelin of my staff by telephone at (250) 356-0634, fax at (250) 356-7197, or via e-mail at [Tony.Wakelin@gems5.gov.bc.ca](mailto:Tony.Wakelin@gems5.gov.bc.ca)

Sincerely,

Lynn Bailey

Director

Attachments

cc: Regional Directors and Regional Managers, Ministry of Water, Land and Air Protection

John Newhook and Kelly Der, Greater Vancouver Regional District

Morris Mennell, Environment Canada

Marc Deslauriers, Environment Canada

## **D.2 Instructions**

### **2000 Request for Air Emissions Information**

#### **Instructions and Background Information**

As part of the year 2000 emission inventory update initiated by the Ministry of Water, Land and Air Protection, large industrial facilities are being requested to provide emission discharge information. To facilitate this, a web based reporting system has been developed. Each facility is able to access a questionnaire for their operation that has been pre-populated with data from the Ministry. Most of this data is from our permit fee database.

To access data for a particular facility a unique user name and password are required. These are sent out to each facility that is being requested to report to us.

This set of instructions and background information serves as a guide to using our web based reporting system. Questions concerning the year 2000 emission inventory update and the 2000 request for air emissions information can be directed to:

Tony Wakelin  
Air Emissions Engineer  
Air Resources Branch  
Ministry of Water, Land and Air Protection

Mailing:  
PO Box 9341, Stn Prov Govt, Victoria, B.C. V8W 9M1

Location:  
3rd Floor 2975 Jutland Rd., Victoria, B.C. V8T 5J9

Phone: (250) 356-0634      FAX: (250) 356-7197

e-mail: [Tony.Wakelin@gems5.gov.bc.ca](mailto:Tony.Wakelin@gems5.gov.bc.ca)

For the text that follows the term “questionnaire” means the “2000 Request for Air Emissions Information” form.

#### **General Access**

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Using Internet Explorer or a similar web access program access the web-site:

<http://www.airemissions.org:8080/>

Enter your user name and password as supplied.

When navigating through the questionnaire, use the <Tab> key to move from one field to the next. To move between sections use the <Previous> and <Next> tabs at the bottom of the screen. If for some reason the questionnaire displays an error message, exit the web page and re-enter. This should reset the problem.

Once inside the questionnaire for your facility, all data can be overwritten. Data entered in the questionnaire is saved when advancing from one screen to the next.

For security, the web connection will time out after approximately one hour during periods of inactivity. To get back in, go back to the web page and re-enter your username and password.

If a hand written questionnaire is preferable for you, copies of the questionnaire can be printed out. Enter the user name and password "template." Pages should be printed out one section at a time with the print properties set to landscape\*. Please do not write any data in the template via the web.

\* In Internet Explorer select File, Print, Properties, Orientation, Landscape.

## **Section 1: Facility Information**

### ➤ **Address physical and mailing**

Check the existing information. The completion of missing information for company web-site, e-mail would be appreciated. The website information may be used to as a link for someone who would like to find out more about your company. The e-mail address would allow Ministry staff to contact your facility quickly if we notice anomalies in the data.

### ➤ **NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODE(S) OR STANDARD INDUSTRIAL PROCESS (SIC) CODE(S)**

SIC codes provide a means of classifying facilities according to their primary activity. In the emission inventory these codes are used to tabulate and present data. SIC codes are divided into the following lettered divisions:

A.	Agricultural and Related Service Industries
B.	Fishing and Trapping Industries
C.	Logging and Forestry Industries
D.	Mining (including Milling), Quarrying and Oil Well Industries
E.	Manufacturing Industries
F.	Construction Industries
G.	Transportation and Storage Industries
H.	Communication and Other Utility Industries
I.	Wholesale Trade Industries
J.	Retail Trade Industries
K.	Finance and Insurance Industries
L.	Real Estate Operator and Insurance Agent Industries
M.	Business Service Industries
N.	Government Service Industries
O.	Educational Service Industries
P.	Health and Social Service Industries
Q.	Accommodation, Food and Beverage Service Industries
R.	Other Service Industries

This list will be useful when accessing the SIC code web site  
<http://www.statcan.ca/english/Subjects/Standard/sic/sic-e.htm>

SIC codes themselves are four digits in length. The first two digits classify the Major Group, and the following two digits get more specific. For example the SIC 2522 can be divided as follows:

25	Major Group – Wood Industries
252	Veneer and Plywood Industries
2522	Softwood Veneer and Plywood Industry

SIC coding has recently been replaced with the North American Industry Classification System (NAICS). The Ministry has yet to convert the SICs contained in our databases to

this new format. Considerable information on NAICS can be found on the web site:  
<http://www.statcan.ca/english/Subjects/Standard/>

For the year 2000 emission inventory update, we do not plan on changing all SICs to the new NAICS format. This will be done as part of the next update. We would appreciate the inclusion of the NAICS numbers in the questionnaire if it they are readily available.

### ➤ **Geographic Co-ordinates (Facility Front Door)**

Either UTM coordinates, or latitude and longitude can be used to identify the facility location. We are using these two coordinate systems in the questionnaire to save people from having to convert if they have one or the other.

For those who are unfamiliar, UTM stands for Universal Transverse Mercator. UTM offers advantages over angular coordinate systems like latitude and longitude by allowing the coordinate number to be tied directly to a distance measuring system. The zone for UTM is the map datum used to match the location of features on the ground to coordinates on the map.

The decision to use the facility front door was made because there are any number of individual emission release points within a facility, and providing locations for each could be very time consuming.

The mapblast site listed on the questionnaire can provide location information. However, the user is now required to register. After registering an e-mail is sent back with a userid and password.

The front door location is to be used for locating sources on a map of the province. Such maps are used as the basis for summarizing emissions for a particular area of the province.

## **Section 2 Greenhouse Gas (GHG) Releases**

We recognise that Greenhouse Gas (GHG) data is collected as part of the Voluntary Challenge Registry, and by Statistics Canada. However, this information lacks detail on individual facilities. We are requesting this data to assist us with greenhouse gas planning activities for the Province.

Division is made between fuel combustion and process. Industrial processes that produce GHG emissions are:

- Limestone Use (iron steel, glass, non-ferrous metal production)
- Soda Ash Use (glass manufacture)
- Cement Production (limestone calcination)
- Lime Production (limestone calcination)
- Ammonia Production (from natural gas)
- Primary Aluminium Production (electrolysis process)

Data on HFCs (hydrofluorocarbons) or PFCs (perfluorocarbons) should be included if the information is readily available. The major source of HFCs is air conditioning equipment. PFC emissions originate from primary aluminium production.

If multiple fuel types are used at your facility use the “Save and create new GHG” button and complete Section 2 for each fuel type.

### **Section 3 Operating Schedule**

Operating schedules are a key piece of information used in atmospheric dispersion modelling. The Ministry has limited information in the permit fee database. Much of the detail is missing or is unreliable.

The questionnaire can store multiple operating schedules. If this applies to your facility, use the “Save and create new Schedule” button. Please be sure to indicate which sites operate under each schedule (below the Monthly Profile table).

If the operating schedule for 2000 differed significantly from a normal year, we would like to know, so we don’t assume that the information provided is typical.

### **Section 4: Emission Point Information**

The exit characteristics of a stack can have a significant effect on how emissions are transported after they are released. We are therefore requesting this information on stacks that are 50 meters or more above grade and emit 10 tonnes or more of any one CAC. Please be sure to indicate the sites that discharge through stacks that meet the 50 meter, 10 tonne criteria.

The data supplied will assist in ensuring that atmospheric dispersion model runs produce reasonable results.

### **Section 5: Emissions from Specific Sources**

The emission estimates are the key part of the questionnaire. Pre-populated estimates indicate the data we have on file for permit fees. These estimates indicate how much your facility is authorized to release. For the year 2000 emission inventory update, we are seeking data on how much was actually released from your facility.

The data in our system is organized by:

- Permit number
- Site number
- Source Classification Code (SCC)

Note that if the permit number, site number, or SCC are missing, the Ministry data structure will not work. Therefore, the Ministry may fill in missing entries as required.

The user can cycle through the SCCs we have on file by using the buttons at the top of the page.

#### **➤ Site Description**

The site number relates to the permit issued by the Ministry. In all cases these should agree with the permit fee invoice included with the package that was mailed to you.

#### **➤ SCC Code**

The Source Classification Code (SCC) is a unique code that describes the particular emission source. The individual digits in a code go into further detail:

102	External Combustion Boilers Industrial
102006	Industrial Boiler Natural Gas
10200602	10 to100 MMBtu/Hr

SCC coding is useful for linking United States Environmental Protection Agency (U.S. EPA) emission factors to sources. It also provides a means of comparing emission source types to one another, an advantage for identifying anomalies.

SCCs have been assigned based on our understanding of your facility. We recognize that there will be incorrect SCC entries, as we do not have an in-depth understanding of each facility operating within the province. Therefore, we are requesting assistance to ensure that the correct codes are assigned.

The SCC web site <http://www.epa.gov/ttn/chief/codes/index.html#scc> has SCC listings in Adobe Acrobat (PDF) and Database (DBF) formats.

➤ **Control Equipment**

Control equipment details are contained in the various permits and technical reports on file at the Ministry. However, we do not have reliable database entries for this. The codes that should be used for control equipment are as follows:

Code	Description
1.	Cyclone
2.	Baghouse
3.	Electrostatic Precipitator
4.	Wet Collector (i.e. spray tower or venturi scrubber)
5.	Adsorber (i.e. carbon)
6.	Combustion (flare, thermal oxidation or catalytic)
7.	Condensation (contact or surface)
8.	Other (please describe)

If control equipment does not apply to certain parts of your operation leave this section blank.

➤ **Criteria Pollutant Emissions**

The criteria pollutant emissions table contains the parameters for estimating emissions. Note that the table is used to summarize and store data. It does not carry out emission calculations. Descriptions of the column headings are:

- Pollutant – the following are included:

Part	Total particulate matter.
PM <sub>10</sub>	Particulate matter with aerodynamic diameters of less than or equal to 10 micrometres. This group can be considered inhalable particulate.
PM <sub>2.5</sub>	Particulate matter with aerodynamic diameters of less than or equal to 2.5 micrometres. This group can be referred to as the fine fraction of PM <sub>10</sub> or respirable particulate matter.

SO <sub>x</sub>	Sulphur oxides, including sulphur dioxide and sulphur trioxide. Reported as sulphur dioxide equivalent.
NO <sub>x</sub>	Nitrogen oxides, including nitric oxide and nitrogen dioxide. Reported as nitrogen dioxide.
TRS	Total reduced sulphur
VOC	Volatile organic compounds, containing carbon, but excluding: carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonate, ammonium carbonate, methane, ethane, methylene chloride, methyl chloroform, many chlorofluorocarbons, and certain classes of perfluorocarbons.
CO	Carbon Monoxide
NH <sub>3</sub>	Ammonia

- Base quantity – typically amount of fuel burned, or amount of product produced. Please be sure to include the units.
- Emission factor – quantity of emissions produced per base quantity unit. Please include the units.
- Estimation code in order of decreasing confidence:

1.	Continuous emission monitor
2.	Manual stack test
3.	Material balance
4.	Ministry permit fee emission factor
5.	U.S. EPA emission factor
6.	Judgement or other Emission Factor

- Control equipment code (both primary and secondary) – take directly from the control equipment table.
- Control efficiency (%) – effectiveness of the control device for removing the contaminant.
- Annual emissions  

$$\text{Base Quantity} * \text{Emission Factor} * \text{Control Efficiency}$$

Pre-populated data in the tables only includes the pollutant and the annual emissions. PM<sub>10</sub> and PM<sub>2.5</sub> emission estimates have been added as described below. Information we have for the other columns (Base Quantity, Emission Factor, etc.) is included in the permit fee invoice enclosed for your facility. For the pollutants presented in the table a few merges and conversions were performed to ensure that all pollutants in the permit fee database have been accounted for with the CAC emissions.

- Part includes:  
TP-T, TPT3, TPT4 Particulate Total  
CP-T Particul.Combustible

- SO<sub>x</sub> includes:  
SOX- Sulfur Oxides  
SO<sub>2</sub>- Sulfur Dioxide  
S--T Sulfur Total \*1.998

For S--T most sulphur emissions are released as SO<sub>2</sub>. Therefore, the following correction, based on molecular weight was applied:

$$\begin{aligned} \text{SO}_2 \text{ equivalent} &= \text{S--T} * (32.064 + (15.9994 * 2) / 32.064) \\ &= \text{S--T} * 1.998 \end{aligned}$$

- NO<sub>x</sub> includes:  
NO<sub>2</sub>- Nitrogen Dioxide  
NOX- Nitrogen Oxides

- TRS includes:  
TRS Total Reduced Sulphur  
H<sub>2</sub>S Hydrogen Sulfide\*0.9408

The dominant source of TRS in the province is pulp mills. However, there are a few other sources in the province that are charged fees for the release of H<sub>2</sub>S, which is one of the main contaminants used in TRS analysis for emissions related to pulp mills. Therefore, it has been converted to TRS using the following formula:

$$\begin{aligned} \text{TRS equivalent} &= \text{H}_2\text{S} * (32.064 / (32.064 + 2 * 1.00797)) \\ &= 0.9408 \end{aligned}$$

- VOC includes:  
VOC Volatile Org Cmp  
HC-T Hydrocarbon-Total

When going through the table, there will be cases where specific sites are divided into a number of SCCs. This division is useful for assigning emission factors to processes such as veneer drying where there is a combustion component, and a wood drying component to the emissions released at the stack.

The SCC division is also used to determine PM<sub>10</sub> and PM<sub>2.5</sub> emission release quantities. Since these emissions are not typically measured, the assigned SCC is matched to a data set of PM<sub>10</sub>/Part and PM<sub>2.5</sub>/Part size fractions. Characteristics of the emission control equipment are also accounted for in the estimation of these emissions. Typical PM<sub>10</sub> estimation would be performed as follows:

$$\text{PM}_{10} = \text{Part} * (\text{Fraction PM}_{10}/\text{Part}) * \text{Control Efficiency}$$

For determining fine particulate emissions it is of course preferable to use actual monitoring data if it is available. It is also preferable to provide equipment control efficiencies as provided by the manufacturer since these are more reliable than typical removal efficiencies for different types of equipment (cyclone, ESP, etc.).

The list of CACs for the year 2000 emission inventory update has been expanded to include ammonia (NH<sub>3</sub>). This contaminant is a major source of secondary, PM<sub>2.5</sub> particulates that occur as a result of interactions with other atmospheric compounds. Agricultural sources account for the majority source of ammonia emissions. However, industrial point sources also contribute. Particularly those associated with combustion. For convenience, a list of emission factors for point sources that operated in British Columbia in 1995 is attached. These should be used for the year 2000 update, if better information is not available.

Keep in mind that the information we have on file is what we have been charging fees for. We recognize that there may be other emission sources that are not considered when assessing fees, particularly storage piles and vehicle road dust emissions (both paved and unpaved). We would appreciate being able to include these in the emission inventory. Note that the additional information will be used for airshed planning purposes and will not be used as a basis for adding additional discharge fees.

### **Section 6: Trends**

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Emission trends have been estimated according using socio-economic indicators such as gross domestic product (GDP). These can offer a reasonable indication of where industry sector emissions are anticipated to go. However, for airshed planning purposes, we would prefer to consider facility specific insights.

### **Section 7: Resources Incurred**

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We appreciate that your time is valuable and would like to account for the effort that industry puts into completing this questionnaire. This will be mentioned in the final report for the inventory.

Personnel costs are those incurred by the facility in number of person hours. External costs are to include the dollar cost of hiring consultants to do estimates, if this was done.

The questionnaire ends with inviting comments from those who have filled it out. We would appreciate receiving this feedback.

When printing out your questionnaire, set the print properties to landscape. This will ensure that Section 5 does not get truncated.

Thank you for your contribution to the year 2000 emission inventory update.

### Ammonia Point Source Emission Factors

SCC	Process Description	Emission Factor	Units	Material	Control Device
10100501	Other industries - distillate oil combustion	0.119827	kg/103L	distillate oil consumed	
10100601	Electric utilities - natural gas combustion	54.456667	kg/106m3	natural gas consumed	
10100903	Other industries - wood combustion	1.199999	kg/Mg	wood consumed	
10200101	Coal combustion	0.00028	kg/Mg	coal consumed	
10200104	Coal combustion	0.0028	kg/Mg	coal consumed	
10200501	Other industries - distillate oil combustion	0.119827	kg/103L	distillate oil consumed	
10200503	Other industries - distillate oil combustion	0.119827	kg/103L	distillate oil consumed	
10200601	Natural gas combustion - utility and industrial boilers	51	kg/106m3	gas consumed	
10200602	Natural gas combustion - utility and industrial boilers	51	kg/106m3	gas consumed	
10200603	Natural gas combustion - utility and industrial boilers	51	kg/106m3	gas consumed	
10200901	Other industries - wood combustion	1.199999	kg/Mg	wood consumed	
10200902	Other industries - wood combustion	1.199999	kg/Mg	wood consumed	
10200903	Other industries - wood combustion	1.199999	kg/Mg	wood consumed	
10200904	Other industries - wood combustion	1.199999	kg/Mg	wood consumed	
10200905	Other industries - wood combustion	1.199999	kg/Mg	wood consumed	
10200906	Other industries - wood combustion	1.199999	kg/Mg	wood consumed	
10201002	Other industries - liquefied petroleum gas combustion	0.035948	kg/103L	liquefied petroleum gas consumed	
10300404	Residential/commercial fuel burning - residual oil combustion	0.110241	kg/103L	residual oil consumed	
10300602	General fuel burning - commercial boilers - natural gas	7.848167	kg/106m3	natural gas consumed	
10500106	Other industries - natural gas combustion	52.855	kg/106m3	natural gas consumed	
10500206	Residential/commercial fuel burning - natural gas combustion	8.328667	kg/106m3	natural gas consumed	
10500209	Other industries - wood combustion	1.199999	kg/Mg	wood consumed	
20100101	Other industries - distillate oil combustion	0.119827	kg/103L	distillate oil consumed	
20100102	Other industries - distillate oil combustion	0.119827	kg/103L	distillate oil consumed	
20100105	Other industries - distillate oil combustion	0.119827	kg/103L	distillate oil consumed	
20100201	Electric utilities - natural gas combustion	54.456667	kg/106m3	natural gas consumed	
20100202	Electric utilities - natural gas combustion	54.456667	kg/106m3	natural gas consumed	
20200101	Other industries - distillate oil combustion	0.119827	kg/103L	distillate oil consumed	
20200102	Other industries - distillate oil combustion	0.119827	kg/103L	distillate oil consumed	
20200201	Other industries - natural gas combustion	52.855	kg/106m3	natural gas consumed	
20200203	Other industries - natural gas combustion	52.855	kg/106m3	natural gas consumed	
20200204	Other industries - natural gas combustion	52.855	kg/106m3	natural gas consumed	
20200253	Other industries - natural gas combustion	52.855	kg/106m3	natural gas consumed	
20200301	On-Road Mobile Sources - unleaded gas reciprocating	0.075491	kg/103L	unleaded gas consumed	
20200401	Other industries - distillate oil combustion	0.119827	kg/103L	distillate oil consumed	

SCC	Process Description	Emission Factor	Units	Material	Control Device
20300101	Residential/commercial fuel burning - distillate oil	0.119827	kg/103L	distillate oil consumed	
20300201	Residential/commercial fuel burning - natural gas combustion	8.328667	kg/106m3	natural gas consumed	
20300202	Residential/commercial fuel burning - natural gas combustion	8.328667	kg/106m3	natural gas consumed	
30100308	NH3 synthesis - carbon dioxide regeneration	1	kg/Mg	NH3 produced	
30100309	NH3 synthesis - condensate steam stripping	1.1	kg/Mg	NH3 produced	
30101030	Other industries - MSW incinerators - combustion	0.175	kg/Mg	MSW consumed	
30103001	Ammonium phosphate manufacture	0.07	kg/Mg	P2O5 produced	
30103002	Ammonium phosphate manufacture	0.07	kg/Mg	P2O5 produced	
30103003	Ammonium phosphate manufacture	0.07	kg/Mg	P2O5 produced	
30103024	Ammonium phosphate manufacture	0.07	kg/Mg	P2O5 produced	
30103025	Ammonium phosphate manufacture	0.07	kg/Mg	P2O5 produced	
30188501	Ammonia storage	0	kg/103L	capacity	
30300317	Other industries - coke oven gas combustion	8.328667	kg/106m3	coke oven gas consumed	
30301301	Gold processing, electrowinning	0.029	kg/Mg	gold	
30390002	Other industries - residual oil combustion	0.110241	kg/103L	residual oil consumed	
30500206	Other industries - natural gas combustion	52.855	kg/106m3	natural gas consumed	
30500207	Other industries - residual oil combustion	0.110241	kg/103L	residual oil consumed	
30500606	Clinker production	0.005	kg/Mg	clinker produced	fabric filter
30500706	Clinker production	0.005	kg/Mg	clinker produced	fabric filter
30501618	Coal combustion	0.00028	kg/Mg	coal consumed	
30600106	Other industries - natural gas combustion	52.855	kg/106m3	natural gas consumed	
30600201	Petroleum refineries - fluid catalytic cracking units	0.155	kg/103L		
30600904	Other industries - natural gas combustion	52.855	kg/106m3	natural gas consumed	
30790002	Paper mills - combustion - residual oil	0.08346	kg/103L	residual oil consumed	
30790003	Other industries - natural gas combustion	52.855	kg/106m3	natural gas consumed	
30790013	Other industries - natural gas combustion	52.855	kg/106m3	natural gas consumed	
31000205	Other industries - natural gas combustion	52.855	kg/106m3	natural gas consumed	
31000404	Other industries - natural gas combustion	52.855	kg/106m3	natural gas consumed	
31000405	Other industries - natural gas combustion	52.855	kg/106m3	natural gas consumed	
31000414	Other industries - natural gas combustion	52.855	kg/106m3	natural gas consumed	
31307001	Other industries - MSW incinerators - combustion	0.175	kg/Mg	MSW consumed	
49090013	Other industries - natural gas combustion	52.855	kg/106m3	natural gas consumed	
50100101	Other industries - MSW incinerators - combustion	0.175	kg/Mg	MSW consumed	
50100102	Other industries - MSW incinerators - combustion	0.175	kg/Mg	MSW consumed	
50100201	Other industries - MSW incinerators - combustion	0.175	kg/Mg	MSW consumed	
50100505	Other industries - MSW incinerators - combustion	0.175	kg/Mg	MSW consumed	
52000101	Other industries - MSW incinerators - combustion	0.175	kg/Mg	MSW consumed	

SCC	Process Description	Emission Factor	Units	Material	Control Device
50200102	Other industries - MSW incinerators - combustion	0.175	kg/Mg	MSW consumed	
50200105	Other industries - wood combustion	1.199999	kg/Mg	wood consumed	
50200201	Other industries - wood combustion	1.199999	kg/Mg	wood consumed	
50200202	Other industries - MSW incinerators - combustion	0.175	kg/Mg	MSW consumed	
50200505	Other industries - MSW incinerators - combustion	0.175	kg/Mg	MSW consumed	
50300102	Other industries - MSW incinerators - combustion	0.175	kg/Mg	MSW consumed	
50300103	Other industries - MSW incinerators - combustion	0.175	kg/Mg	MSW consumed	
50300104	Other industries - MSW incinerators - combustion	0.175	kg/Mg	MSW consumed	
50300105	Other industries - wood combustion	1.199999	kg/Mg	wood consumed	
50300106	Other industries - wood combustion	1.199999	kg/Mg	wood consumed	
50300111	Other industries - MSW incinerators - combustion	0.175	kg/Mg	MSW consumed	
50300115	Other industries - MSW incinerators - combustion	0.175	kg/Mg	MSW consumed	
50300201	Other industries - wood combustion	1.199999	kg/Mg	wood consumed	

## **D.3 Questions and Answers**

### **Year 2000 Emission Inventory - Questions and Answers**

#### **1. What is the purpose of an emission inventory update?**

An emission inventory update is an accounting of annual releases of air pollution within a defined geographic area. Data included in the inventory are types of emission sources, their location, and the quantity of air contaminants released.

A complete inventory is used by the ministry to determine appropriate courses of action for managing air quality within the province.

#### **2. What is the geographical coverage for the emission inventory update being conducted by ARB?**

The ARB emission inventory includes all Ministry authorized sources (covered under permit, approval or regulation) that operate within British Columbia and outside the Greater Vancouver Regional District (GVRD) and the Fraser Valley Regional District (FVRD).

The Air Quality Department of the GVRD inventories sources that operate within GVRD or FVRD.

#### **3. Are all sources accounted for in the year 2000 emission inventory update?**

Yes, in addition to Ministry and GVRD authorized sources, emissions associated with mobile (transportation) and area sources (such as commercial and residential heating) are to be accounted for.

The GVRD and Environment Canada, and the Ministry are working together to estimate emissions from mobile and area sources. Sources within the GVRD and FVRD are being estimated by the GVRD. Sources outside these areas are to be estimated by Environment Canada and the Ministry.

#### **4. Did the Ministry consult industrial facilities regarding the year 2000 emission inventory update?**

Yes, a letter of intent was sent out to large facilities on September 22, 2000, along with a set of questions and answers. Follow up consultation sessions were also held with industry groups with representation from:

- Alcan
- Canadian Petroleum Products Institute
- Canfor
- Clayburn Industries
- Cominco
- Consumers Packaging
- Council of Forest Industries
- Fording Coal
- Lafarge
- Levelton Engineering
- Mining Association of British Columbia

Petro-Canada  
Prince Rupert Grain  
TransCanada (Northwest Energy Ltd.)  
Westcoast Energy  
Western Brewers Association

## 5. What are the contaminants to be included in the year 2000 emission inventory?

The year 2000 emission inventory considers criteria air contaminants or CACs that include:

- **Total particulate matter (Part)** - or total suspended particulate matter of all sizes; includes emissions of PM<sub>10</sub> and PM<sub>2.5</sub>, described as follows:
  - PM<sub>10</sub> – particulate matter with aerodynamic diameters less than or equal to 10 micrometers. This group can be considered inhalable particulate;
  - PM<sub>2.5</sub> – particulate matter with aerodynamic diameters less than 2.5 micrometers. This group can be referred to as the fine fraction of PM<sub>10</sub>, or respirable particulate matter.
- **Sulphur oxides (SO<sub>x</sub>)** – includes sulphur dioxide (SO<sub>2</sub>) and sulphur trioxide (SO<sub>3</sub>), reported as SO<sub>2</sub> equivalent;
- **Nitrogen oxides (NO<sub>x</sub>)** – including nitric oxide (NO) and nitrogen dioxide (NO<sub>2</sub>), reported as NO<sub>2</sub> equivalent;
- **Total reduced sulphur (TRS)** - includes hydrogen sulphide (H<sub>2</sub>S), methyl mercaptan (MeSH), dimethyl sulphide (DMS) and dimethyl disulphide (DMDS);
- **Volatile organic compounds (VOCs)** – any organic compound which participates in atmospheric photochemical reactions, but excluding methane, ethane, methyl chloroform, methylene chloride, CFC-113, CFC-114, CFC-115, CFC-11, CFC-12, CFC-22, FC-23, HCFC-123, HCRC-141b, HCFC-142b, and HFC-134a (excluded because of their negligible photochemical reactivity); and
- **Carbon monoxide (CO)**;
- **Ammonia (NH<sub>3</sub>)**: this contaminant has been added in 2000 as it plays a role in the formation of fine particulate matter.

## 6. Is every Ministry of Water, Land and Air Protection (WLAP) authorized facility being asked to report?

No, analysis of the Ministry permit fee database shows that 812 sources release CACs within the province outside the LFV. If a size cut off of 200 tonnes is set for any one CAC, 222 facilities account for 85% or more of the billed emissions for each contaminant. Therefore, the Ministry is requesting that these 222 facilities provide data to the Ministry.

Emissions from the remaining 590 facilities are being estimated using permit fee data adjusted by ARB according to published industry information either for a facility or for a collective industry group.

**7. Our organization provides information to the National Pollution Release Inventory (NPRI). Why are we being asked to provide more information?**

The focus of NPRI is to gather toxic release and transfer data. NPRI does not require the reporting of all information required for estimating the common contaminants included in the year 2000 update. In addition to this, there are reporting thresholds for NPRI which preclude a number of facilities that can emit significant quantities of contaminants. More information on NPRI can be found at <<http://www.ec.gc.ca/pdb/npri/index.html>>.

Separate NPRI CAC reporting will change in 2002 NPRI reporting year, when NPRI is expanded to include criteria air contaminants currently collected in the B.C. emission inventory update. After the 2002 NPRI reporting year, facilities that report CACs to NPRI will not be required to submit the same data to the Ministry.

**8. Are other provinces also gathering emission inventory data?**

Yes, each province has (i) performed a 1995 emission inventory update, and (ii) is actively compiling a year 2000 emission inventory update. The efforts of the provinces are coordinated under the Emission and Projections Working Group (EPWG) of the National Air Issues Coordinating Committee (NAICC). For further information on the NAICC see <[http://www.mbnet.mb.ca/ccme/3e\\_priorities/3eb1.html](http://www.mbnet.mb.ca/ccme/3e_priorities/3eb1.html)>.

**9. What happens if our facility does not supply the data to the year 2000 emission inventory update?**

The Air Resources Branch is responsible for estimating year 2000 emissions from each permitted source that operates under a Ministry air discharge permit. If an authorized facility chooses not to provide data, the emission amounts estimated for permit fees will be used in the year 2000 emission inventory update. For large sources, some adjustments may be made based on capacity/production rates or the number of operating days.

## D.4 Web-based Questionnaire

### British Columbia Ministry of Water, Land and Air Protection 2000 Request for Air Emissions Information

Permit  
Number:

Facility  
Name:

## Section 1: Facility Information

Address physical and mailing	
Name:	
Address 1:	
Address 2:	
Address 3:	
Address 4:	
Company	

Technical contact	
Contact name:	
Contact Title:	
Phone:	
Fax:	

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODE(S) OR STANDARD INDUSTRIAL PROCESS (SIC) CODE(S)		
Type*	Code**	Industry Type

\* N = NAICS, S = SIC

\*\* SIC codes may be found at: <http://www.statcan.ca/english/Subjects/Standard/sic/sic-e.htm> Information on NAICS codes can be found at: <http://www.statcan.ca/english/Subjects/Standard/>

Geographic Coordinates (Facility Front Door)			
UTM Horizontal or easting (kk.kkk):		UTM Vertical or northing (kk.kkk):	
OR		Zone:	
Latitude (dd.mmmm) N:			

Locations can be obtained using mapblast <http://www.mapblast.com/myblast/index.mb> Enter street address and postal code, click on the "yellow pages" tab (not sure why) and the latitude and longitude will appear to four decimal places in the upper right corner of the map.

## Section 2: Greenhouse Gas (GHG) Releases

### Combustion

Fuel Type:									
Natural Gas	<input type="checkbox"/>	Propane	<input type="checkbox"/>	Oil	<input type="checkbox"/>	Wood Residue	<input type="checkbox"/>	Other	<input type="checkbox"/>
Quantity Used (Base Quantity):				Units:					

GHG	Emission Factor*	Units	Annual Emissions (TONNES)
CO2			
CH4			
N2O			
Other:			

\* For emission factors refer to [http://www.ec.gc.ca/pdb/ghg/ghg\\_docs\\_e.cfm](http://www.ec.gc.ca/pdb/ghg/ghg_docs_e.cfm)

### Process

#### Process Description:

Source Classification Code (SCC): \_\_\_\_\_ (See Section 4)

Annual Output (Base Quantity): \_\_\_\_\_ Units: \_\_\_\_\_

GHG	Emission Factor*	Units	Annual Emissions (TONNES)
CO2			
CH4			
N2O			
Other:			

\* For emission factors refer to [http://www.ec.gc.ca/pdb/ghg/ghg\\_docs\\_e.cfm](http://www.ec.gc.ca/pdb/ghg/ghg_docs_e.cfm)

\*\* HFCs or PFCs

## Section 3. Operating Schedule

Daily profile (check appropriate box)

	12-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12
am												
pm												

Weekly profile (check appropriate box)

Sun.	Mon.	Tue.	Wed.	Thurs.	Fri.	Sat.

Monthly Profile (check appropriate box)

January		May		September	
February		June		October	
March		July		November	

If there are multiple operating schedules please:

1. indicate the permit sites that operate under this schedule: \_\_\_\_\_, and
2. if more than one schedule is used repeat section 3 for each schedule.

If the operating schedule and/or production for 2000 differed significantly from normal year to year activity please indicate the downtime and reason: Used permit fee calculation schedules.

\_\_\_\_\_.

## Section 4: Emission Point Information:

This is only to be filled out for stacks that:

1. are 50 meters or more above grade, and
2. emit 10 tonnes or more of any one Common Air Contaminant (CAC) as listed in section 5.

<b>Geographic Parameters (Stack)</b>			
<b>Height above grade:</b>		<b>m</b>	
<b>Inside Diameter (at exit):</b>		<b>m</b>	
		<b>Flow Rate*:</b>	<b>m<sup>3</sup>/min*</b>
		<b>Exit Velocity:</b>	<b>m/min*</b>

\* Actual, not temperature or pressure corrected.

Fill out only if the stack is one kilometre or more from the facility front door:

Geographic Coordinates (Stack)			
UTM Horizontal or easting (kk.kkk):		UTM Vertical or northing (kk.kkk):	
OR		Zone:	

Please indicate the permit sites that discharge to this stack: \_\_\_\_\_

## Section 5: Emissions from Specific Sources

SITE: 1 SCC Code:

Description:

SCC's can be found at <http://www.epa.gov/ttn/chief/codes/index.html#scc>

CONTROL EQUIPMENT (For the above SCC)	
Code*	Description

Sulphur content of fuel if applicable: %

CRITERIA POLLUTANT EMISSIONS (Specify in tonnes per year)									
Pollutant	Base Quantity	Units	Emission Factor	Units	Est. Code	Ctrl Equip. Code Pri.	Ctrl Equip. Code Sec.	Ctrl Efficiency (%)	Annual Emissions Tonnes
Part									
PM10									
PM25									
SOx									
NOx									
VOC									
CO									

Comments: \_\_\_\_\_

\_\_\_\_\_

## Section 6: Trends

Indicate facility total emission trends for the common air contaminants listed under Section 4.

<b>Trends</b>			
<b>1990</b> ___ % of 2000	<b>1995</b> ___ % of 2000	<b>2000</b> 100%	<b>2005</b> ___ % of 2000

## Section 7: Resources Incurred

<b>Personnel costs</b>
------------------------

<b>External Costs (Consultants, Analysis)</b>
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<b>DO YOU HAVE ANY COMMENTS REGARDING THE INFORMATION REQUIRED BY THIS FORM OR HOW THIS FORM MAY BE IMPROVED?</b>

## Appendix E Emissions Summaries

Appendix E contains summaries of emissions categories and sectors defined by Environment Canada. For comparison to emissions estimated by WLAP, the categories were determined as follows:

<b>CATEGORY / SECTOR</b>	<b>SIC</b>
Abrasives Manufacture	3571
Aluminum Industry	2951
Asbestos Industry	0621
Asphalt Paving Industry	3699
Cement and Concrete Industry	3521,3541,3542,3549,3551
Chemicals Industry	37XX, but not 373X
Coal Mining Industry	063X
Ferrous Foundries	294X
Grain Industries	4711
Mining and Rock Quarrying	061X,081X
Non-Ferrous Mining and Smelting Industry	2959
Petroleum Refining	3611
Plastics & Synthetic Resins Fabrication	373X
Pulp and Paper Industry	27XX
Upstream Oil and Gas Industry	071X,091X,46XX,492X
Wood Industry	25XX,04XX
Commercial Fuel Combustion	85XX,91XX,99XX
Electric Power Generation (Utilities)	4911
Municipal Incineration	identified by inspection
Other Incineration & Utilities	identified by inspection
Fuel Marketing	5111
Marine Cargo Handling Industry	4551

X indicates any digit 0-9

Appendix E.1 contains the summary of emissions compiled by the GVRD, Appendix E.2 contains the summary of emissions compiled by Environment Canada, and Appendix E.3 contains the summary of emissions compiled by WLAP.

The total emissions presented in Appendix E.4 is the combination of all three contributions to the 2000 Air Emissions Inventory.

## E.1 GVRD Emissions for the Lower Fraser Valley (tonnes)

CATEGORY / SECTOR	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
<b>INDUSTRIAL SOURCES</b>							
Abrasives Manufacture	0	0	0	0	0	0	0
Aluminum Industry	0	0	0	0	1	0	0
Asbestos Industry	0	0	0	0	0	0	0
Asphalt Paving Industry	118	37	15	21	52	227	128
Bakeries	0	0	0	0	0	58	0
Cement and Concrete Industry	1,059	657	282	205	3,672	58	1,200
Chemicals Industry	5	4	4	9	135	11	42
Clay Products Industry	65	39	10	0	13	1	11
Coal Mining Industry	85	43	17	0	0	0	0
Ferrous Foundries	95	38	28	0	12	25	7
Grain Industries	600	204	25	0	0	0	0
Iron and Steel Industries	71	13	13	1	32	212	21
Iron Ore Mining Industry	0	0	0	0	0	0	0
Mining and Rock Quarrying	0	0	0	0	0	0	0
Non-Ferrous Mining and Smelting Industry	3	3	2	2	1	0	1
Oil Sands	0	0	0	0	0	0	0
Other Petroleum and Coal Products Industry	0	0	0	0	0	0	0
Paint & Varnish Manufacturing	3	2	1	0	0	203	0
Petrochemical Industry	0	0	0	0	0	0	0
Petroleum Refining	138	98	59	1,238	312	451	80
Plastics & Synthetic Resins Fabrication	1	1	1	1	5	3	4
Pulp and Paper Industry	371	65	56	9	159	50	183
Upstream Oil and Gas Industry	3	3	3	0	201	5	39
Wood Industry	2,103	869	443	15	236	1,349	1,857
Other Industries	755	207	109	28	317	1,888	213
<b>TOTAL INDUSTRIAL SOURCES</b>	<b>5,476</b>	<b>2,281</b>	<b>1,069</b>	<b>1,528</b>	<b>5,150</b>	<b>4,543</b>	<b>3,786</b>
<b>NON INDUSTRIAL FUEL COMBUSTION</b>							
Commercial Fuel Combustion	140	137	136	129	1,784	96	1,470
Electric Power Generation (Utilities)	99	99	99	26	235	72	123
Residential Fuel Combustion	177	176	174	46	2,178	127	923
Residential Fuel Wood Combustion	533	505	503	8	51	841	4,625
<b>TOTAL NON INDUSTRIAL FUEL COMBUSTION</b>	<b>949</b>	<b>917</b>	<b>912</b>	<b>209</b>	<b>4,249</b>	<b>1,136</b>	<b>7,142</b>
<b>TRANSPORTATION</b>							
Air Transportation	165	161	160	52	1,040	862	7,832
Heavy-duty diesel vehicles	279	279	258	259	12,253	423	2,556
Heavy-duty gasoline trucks	13	13	10	21	753	208	2,864
Light-duty diesel trucks	16	16	15	10	108	45	75
Light-duty diesel vehicles	27	27	25	5	100	29	62
Light-duty gasoline trucks	62	62	54	318	7,841	8,243	110,429
Light-duty gasoline vehicles	61	61	57	332	11,742	13,176	140,440
Marine Transportation	906	906	906	5,143	18,197	1,651	4,807
Motor cycles	1	1	1	1	101	265	1,054
Off-road use of diesel	1,113	1,113	1,024	616	13,464	1,838	7,025
Off-road use of gasoline	127	127	118	57	2,030	5,054	75,478
Rail Transportation	67	66	65	50	4,342	105	701
Tire wear & Brake lining	304	301	104	0	0	0	0
<b>TOTAL TRANSPORTATION</b>	<b>3,142</b>	<b>3,133</b>	<b>2,797</b>	<b>6,864</b>	<b>71,970</b>	<b>31,900</b>	<b>353,323</b>
<b>INCINERATION</b>							
Crematorium	0	0	0	0	0	0	0

CATEGORY / SECTOR	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
Industrial & Commercial Incineration	0	0	0	0	0	0	0
Municipal Incineration	4	2	1	95	451	4	27
Wood Waste Incineration	0	0	0	0	0	0	0
Other Incineration & Utilities	2	1	0	1	1	0	1
<b>TOTAL INCINERATION</b>	<b>6</b>	<b>3</b>	<b>1</b>	<b>96</b>	<b>453</b>	<b>4</b>	<b>28</b>
<b>MISCELLANEOUS</b>							
Cigarette Smoking	167	167	167	0	4	0	128
Dry Cleaning	0	0	0	0	0	137	0
Fuel Marketing	0	0	0	0	0	3,045	0
General Solvent Use	0	0	0	0	0	7,011	0
Marine Cargo Handling Industry	2,843	1,364	414	0	0	1	0
Meat Cooking	261	261	261	0	0	0	0
Pesticides and Fertilizer Application	118	58	17	0	0	0	0
Printing	9	2	2	0	11	799	8
Structural Fires	12	12	12	0	1	11	57
Surface Coatings	0	0	0	0	0	5,060	0
<b>TOTAL MISCELLANEOUS</b>	<b>3,411</b>	<b>1,865</b>	<b>872</b>	<b>0</b>	<b>16</b>	<b>16,064</b>	<b>193</b>
<b>OPEN SOURCES</b>							
Agriculture (Animals)	474	303	47	0	0	2,200	0
Agriculture Tilling and Wind Erosion	2,103	721	155	0	0	0	0
Construction Operations	172	36	7	0	0	0	0
Dust from Paved Roads	31,300	6,000	1,500	0	0	0	0
Dust from Unpaved Roads	0	0	0	0	0	0	0
Forest Fires	3	2	2	0	0	1	17
Landfills Sites	131	47	12	0	0	305	0
Mine Tailings	0	0	0	0	0	0	0
Prescribed Burning	525	523	523	11	129	615	2,791
<b>TOTAL OPEN SOURCES</b>	<b>34,707</b>	<b>7,633</b>	<b>2,246</b>	<b>11</b>	<b>129</b>	<b>3,121</b>	<b>2,808</b>
<b>LFV TOTAL</b>							
<b>TOTAL WITH OPEN SOURCES</b>	<b>47,691</b>	<b>15,833</b>	<b>7,897</b>	<b>8,708</b>	<b>81,967</b>	<b>56,766</b>	<b>367,279</b>
<b>TOTAL WITHOUT OPEN SOURCES</b>	<b>12,983</b>	<b>8,199</b>	<b>5,651</b>	<b>8,397</b>	<b>81,838</b>	<b>53,645</b>	<b>364,471</b>
<b>NATURAL SOURCES</b>							
Biogenics	0	0	0	0	534	14,141	0
Marine Aerosols	332	289	50	0	0	0	0
Wildlife	0	0	0	0	0	4	0
<b>TOTAL NATURAL SOURCES</b>	<b>332</b>	<b>289</b>	<b>50</b>	<b>0</b>	<b>534</b>	<b>14,146</b>	<b>0</b>
<b>GRAND TOTAL WITH NATURAL SOURCES</b>	<b>48,023</b>	<b>16,121</b>	<b>7,947</b>	<b>8,708</b>	<b>82,501</b>	<b>70,912</b>	<b>367,279</b>

## E.2 Environment Canada Emissions Outside the LFV (tonnes)

CATEGORY / SECTOR	PART	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
<b>INDUSTRIAL SOURCES</b>							
Abrasives Manufacture							
Aluminum Industry							
Asbestos Industry							
Asphalt Paving Industry	0	0	0	0	0	518	0
Bakeries	0	0	0	0	0	46	0
Cement and Concrete Industry							
Chemicals Industry							
Clay Products Industry							
Coal Mining Industry	1,334	667	267	0	0	0	0
Ferrous Foundries							
Grain Industries							
Iron and Steel Industries							
Iron Ore Mining Industry							
Mining and Rock Quarrying							
Non-Ferrous Mining and Smelting Industry							
Oil Sands							
Other Petroleum and Coal Products Industry							
Paint & Varnish Manufacturing							
Petrochemical Industry							
Petroleum Refining							
Plastics & Synthetic Resins Fabrication							
Pulp and Paper Industry							
Upstream Oil and Gas Industry	136	136	136	66,040	12,337	38,423	1,700
Wood Industry	523	283	210	3	36	300	3,381
Other Industries	3702	505	265	0	0	0	0
<b>TOTAL INDUSTRIAL SOURCES</b>	<b>5,695</b>	<b>1,590</b>	<b>878</b>	<b>66,043</b>	<b>12,373</b>	<b>39,287</b>	<b>5,081</b>
<b>NON INDUSTRIAL FUEL COMBUSTION</b>							
Commercial Fuel Combustion	112	95	79	508	1,131	49	708
Electric Power Generation (Utilities)							
Residential Fuel Combustion	123	112	101	114	1,517	80	578
Residential Fuel Wood Combustion							
<b>TOTAL NON INDUSTRIAL FUEL COMBUSTION</b>	<b>235</b>	<b>207</b>	<b>180</b>	<b>622</b>	<b>2,648</b>	<b>129</b>	<b>1,286</b>
<b>TRANSPORTATION</b>							
Air Transportation	139	137	134	24	234	443	5,889
Heavy-duty diesel vehicles	978	978	902	518	28,145	1,369	6,382
Heavy-duty gasoline trucks	9	9	7	14	599	247	3,491
Light-duty diesel trucks	122	122	113	68	1,000	454	815
Light-duty diesel vehicles	16	16	15	3	105	48	104
Light-duty gasoline trucks	77	75	61	263	7,515	10,229	154,746
Light-duty gasoline vehicles	34	33	31	212	8,235	11,160	144,044
Marine Transportation	1,591	1,591	1,591	9,486	38,333	1,331	4,139
Motor cycles	1	1	1	1	82	115	830
Off-road use of diesel	2,895	2,895	2,664	761	24,419	2,711	14,753
Off-road use of gasoline	664	664	611	40	4,634	23,722	222,582
Rail Transportation	499	496	455	256	20,845	1,045	3,972
Tire wear & Brake lining	264	261	91	0	0	0	0
<b>TOTAL TRANSPORTATION</b>	<b>7,291</b>	<b>7,279</b>	<b>6,676</b>	<b>11,645</b>	<b>134,146</b>	<b>52,874</b>	<b>561,746</b>
<b>INCINERATION</b>							
Crematorium							

CATEGORY / SECTOR	PART	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
Industrial & Commercial Incineration							
Municipal Incineration							
Wood Waste Incineration							
Other Incineration & Utilities	5	4	2	3	4	0	3
<b>TOTAL INCINERATION</b>	<b>5</b>	<b>4</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>0</b>	<b>3</b>
<b>MISCELLANEOUS</b>							
Cigarette Smoking	88	88	88	0	2	0	68
Dry Cleaning	0	0	0	0	0	104	0
Fuel Marketing	0	0	0	0	0	4,313	0
General Solvent Use	0	0	0	0	0	5,534	0
Marine Cargo Handling Industry							
Meat Cooking	203	203	203	0	0	0	0
Pesticides and Fertilizer Application	369	181	52	0	0	0	0
Printing	0	0	0	0	0	1,101	0
Structural Fires	5	5	5	0	0	4	20
Surface Coatings	0	0	0	0	0	3,865	0
<b>TOTAL MISCELLANEOUS</b>	<b>665</b>	<b>477</b>	<b>348</b>	<b>0</b>	<b>2</b>	<b>14,921</b>	<b>88</b>
<b>OPEN SOURCES</b>							
Agriculture (Animals)	7,220	4,595	718	0	0	5,951	0
Agriculture Tilling and Wind Erosion	12,949	4,369	378	0	0	0	0
Construction Operations	116	24	5	0	0	0	0
Dust from Paved Roads	419,786	80,459	19,240	0	0	0	0
Dust from Unpaved Roads	249,007	86,839	12,977	0	0	0	0
Forest Fires							
Landfill Sites	371	134	37	0	0	2,233	0
Mine Tailings	0	0	0	0	0	0	0
Prescribed Burning	1,108	1,063	1,057	33	296	1404	5,938
<b>TOTAL OPEN SOURCES</b>	<b>690,557</b>	<b>177,483</b>	<b>34,412</b>	<b>33</b>	<b>296</b>	<b>9,588</b>	<b>5,938</b>
<b>BCoLFV TOTAL</b>							
<b>TOTAL WITH OPEN SOURCES</b>	<b>704,448</b>	<b>187,040</b>	<b>42,496</b>	<b>78,346</b>	<b>149,469</b>	<b>116,799</b>	<b>574,142</b>
<b>TOTAL WITHOUT OPEN SOURCES</b>	<b>13,891</b>	<b>9,557</b>	<b>8,084</b>	<b>78,313</b>	<b>149,173</b>	<b>107,211</b>	<b>568,204</b>
<b>NATURAL SOURCES</b>							
Biogenics	0	0	0	0	40,195	4,113,366	0
Marine Aerosols	0	0	0	0	0	0	0
Wildlife	0	0	0	0	0	886	0
<b>TOTAL NATURAL SOURCES</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>40,195</b>	<b>4,114,253</b>	<b>0</b>
<b>GRAND TOTAL WITH NATURAL SOURCES</b>	<b>704,448</b>	<b>187,040</b>	<b>42,496</b>	<b>78,346</b>	<b>189,664</b>	<b>4,231,051</b>	<b>574,142</b>

### E.3 WLAP Emissions Outside the LFV (Tonnes)

CATEGORY / SECTOR	PART	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
<b>INDUSTRIAL SOURCES</b>							
Abrasives Manufacture	131	0	0	0	0	0	0
Aluminum Industry	1,778	1,149	546	5,450	11	1	75
Asbestos Industry	0	0	0	0	7	0	1
Asphalt Paving Industry	75	0	0	4	30	48	86
Bakeries							
Cement and Concrete Industry	190	139	48	66	344	5	20
Chemicals Industry	91	72	49	290	3,019	30	123
Clay Products Industry							
Coal Mining Industry	4,460	3,317	1,227	1,884	1,319	806	42
Ferrous Foundries	127	108	38	0	45	1	43
Grain Industries	1	0	0	0	0	0	0
Iron and Steel Industries							
Iron Ore Mining Industry							
Mining and Rock Quarrying	1,514	1,013	366	683	1,093	80	265
Non-Ferrous Mining and Smelting Industry	247	186	122	3,086	0	0	0
Oil Sands							
Other Petroleum and Coal Products Industry							
Paint & Varnish Manufacturing							
Petrochemical Industry							
Petroleum Refining	46	33	20	2,457	72	121	2,307
Plastics & Synthetic Resins Fabrication	1	0	0	4	13	1	14
Pulp and Paper Industry	17,424	9,327	7,032	16,069	18,767	6,023	69,596
Upstream Oil and Gas Industry	524	387	381	19,810	25,683	3,124	4,851
Wood Industry	36,239	19,299	12,016	433	5,962	22,214	257,400
Other Industries	1,603	1,024	597	338	1,100	328	839
<b>TOTAL INDUSTRIAL SOURCES</b>	<b>64,452</b>	<b>36,055</b>	<b>22,444</b>	<b>50,573</b>	<b>57,466</b>	<b>32,783</b>	<b>335,664</b>
<b>NON INDUSTRIAL FUEL COMBUSTION</b>							
Commercial Fuel Combustion	2	1	1	2	1	3	10
Electric Power Generation (Utilities)	261	242	237	110	2,469	542	2,429
Residential Fuel Combustion							
Residential Fuel Wood Combustion	10,720	10,127	10,121	153	1,069	14,019	60,954
<b>TOTAL NON INDUSTRIAL FUEL COMBUSTION</b>	<b>10,983</b>	<b>10,370</b>	<b>10,358</b>	<b>264</b>	<b>3,539</b>	<b>14,564</b>	<b>63,393</b>
<b>TRANSPORTATION</b>							
Air Transportation							
Heavy-duty diesel vehicles							
Heavy-duty gasoline trucks							
Light-duty diesel trucks							
Light-duty diesel vehicles							
Light-duty gasoline trucks							
Light-duty gasoline vehicles							
Marine Transportation							
Motor cycles							
Off-road use of diesel							
Off-road use of gasoline							
Rail Transportation							
Tire wear & Brake lining							
<b>TOTAL TRANSPORTATION</b>							
<b>INCINERATION</b>							
Crematorium							

CATEGORY / SECTOR	PART	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
<b>Industrial &amp; Commercial Incineration</b>							
Municipal Incineration	375	250	234	2	46	142	2,641
Wood Waste Incineration							
Other Incineration & Utilities	105	84	53	61	128	36	406
<b>TOTAL INCINERATION</b>	<b>480</b>	<b>334</b>	<b>287</b>	<b>63</b>	<b>174</b>	<b>178</b>	<b>3,047</b>
<b>MISCELLANEOUS</b>							
Cigarette Smoking							
Dry Cleaning							
Fuel Marketing	0	0	0	2	0	243	0
General Solvent Use							
Marine Cargo Handling Industry	59	30	9	0	0	0	0
Meat Cooking							
Pesticides and Fertilizer Application							
Printing							
Structural Fires							
Surface Coatings							
<b>TOTAL MISCELLANEOUS</b>	<b>59</b>	<b>30</b>	<b>9</b>	<b>2</b>	<b>0</b>	<b>243</b>	<b>0</b>
<b>OPEN SOURCES</b>							
Agriculture (Animals)							
Agriculture Tilling and Wind Erosion							
Construction Operations							
Dust from Paved Roads							
Dust from Unpaved Roads							
Forest Fires	18,384	14,063	12,656	47	1,875	4,004	95,626
Landfill Sites							
Mine Tailings							
Prescribed Burning	28,732	20,789	18,773	100	3,413	8,556	189,280
<b>TOTAL OPEN SOURCES</b>	<b>47,117</b>	<b>34,852</b>	<b>31,429</b>	<b>147</b>	<b>5,288</b>	<b>12,560</b>	<b>284,906</b>
<b>BCoLFV TOTAL</b>							
<b>TOTAL WITH OPEN SOURCES</b>	<b>123,091</b>	<b>81,640</b>	<b>64,527</b>	<b>51,050</b>	<b>66,467</b>	<b>60,328</b>	<b>687,010</b>
<b>TOTAL WITHOUT OPEN SOURCES</b>	<b>75,973</b>	<b>46,788</b>	<b>33,097</b>	<b>50,904</b>	<b>61,178</b>	<b>48,767</b>	<b>402,102</b>
<b>NATURAL SOURCES</b>							
Biogenics							
Marine Aerosols							
Wildlife							
<b>TOTAL NATURAL SOURCES</b>							
<b>GRAND TOTAL WITH NATURAL SOURCES</b>	<b>123,091</b>	<b>81,640</b>	<b>64,527</b>	<b>51,050</b>	<b>66,467</b>	<b>60,328</b>	<b>687,010</b>

## E.4 BC Total Emissions (Tonnes)

CATEGORY / SECTOR	PART	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
<b>INDUSTRIAL SOURCES</b>							
Abrasives Manufacture	131	0	0	0	0	0	0
Aluminum Industry	1,778	1,149	546	5,450	12	1	75
Asbestos Industry	0	0	0	0	7	0	1
Asphalt Paving Industry	193	37	15	25	82	793	214
Bakeries	0	0	0	0	0	104	0
Cement and Concrete Industry	1,249	797	331	271	4,016	63	1,220
Chemicals Industry	97	76	53	298	3,154	42	166
Clay Products Industry	65	39	10	0	13	1	11
Coal Mining Industry	5,879	4,027	1,511	1,884	1,319	806	42
Ferrous Foundries	222	145	66	1	57	26	50
Grain Industries	601	204	25	0	0	0	0
Iron and Steel Industries	71	13	13	1	32	212	21
Iron Ore Mining Industry	0	0	0	0	0	0	0
Mining and Rock Quarrying	1,514	1,013	366	683	1,093	80	265
Non-Ferrous Mining and Smelting Industry	250	189	125	3,088	1	0	1
Oil Sands	0	0	0	0	0	0	0
Other Petroleum and Coal Products Industry	0	0	0	0	0	0	0
Paint & Varnish Manufacturing	3	2	1	0	0	203	0
Petrochemical Industry	0	0	0	0	0	0	0
Petroleum Refining	184	131	79	3,695	383	572	2,387
Plastics & Synthetic Resins Fabrication	1	1	1	4	18	4	18
Pulp and Paper Industry	17,795	9,391	7,088	16,078	18,926	6,073	69,779
Upstream Oil and Gas Industry	664	526	520	85,851	38,222	41,553	6,590
Wood Industry	38,865	20,451	12,669	451	6,234	23,864	262,639
Other Industries	6,059	1,735	971	366	1,418	2,216	1,052
<b>TOTAL INDUSTRIAL SOURCES</b>	<b>75,622</b>	<b>39,927</b>	<b>24,389</b>	<b>118,146</b>	<b>74,988</b>	<b>76,612</b>	<b>344,531</b>
<b>NON INDUSTRIAL FUEL COMBUSTION</b>							
Commercial Fuel Combustion	254	234	216	639	2,916	149	2,187
Electric Power Generation (Utilities)	360	341	336	135	2,704	613	2,552
Residential Fuel Combustion	299	288	275	160	3,696	207	1,501
Residential Fuel Wood Combustion	11,253	10,632	10,623	161	1,120	14,860	65,579
<b>TOTAL NON INDUSTRIAL FUEL COMBUSTION</b>	<b>12,167</b>	<b>11,495</b>	<b>11,450</b>	<b>1,095</b>	<b>10,436</b>	<b>15,830</b>	<b>71,819</b>
<b>TRANSPORTATION</b>							
Air Transportation	304	298	293	76	1,274	1,305	13,721
Heavy-duty diesel vehicles	1,257	1,257	1,160	776	40,398	1,792	8,938
Heavy-duty gasoline trucks	22	22	18	35	1,352	455	6,355
Light-duty diesel trucks	139	139	128	78	1,107	500	890
Light-duty diesel vehicles	43	43	40	8	205	77	166
Light-duty gasoline trucks	139	137	115	581	15,356	18,472	265,176
Light-duty gasoline vehicles	96	95	88	544	19,977	24,335	284,484
Marine Transportation	2,497	2,497	2,497	14,629	56,530	2,982	8,946
Motor cycles	3	3	2	3	184	379	1,884
Off-road use of diesel	4,008	4,008	3,688	1,376	37,883	4,549	21,778
Off-road use of gasoline	791	791	729	96	6,664	28,776	298,060
Rail Transportation	566	562	520	306	25,187	1,151	4,673
Tire wear & Brake lining	568	561	195	0	0	0	0
<b>TOTAL TRANSPORTATION</b>	<b>10,433</b>	<b>10,412</b>	<b>9,473</b>	<b>18,509</b>	<b>206,116</b>	<b>84,773</b>	<b>915,069</b>
<b>INCINERATION</b>							
Crematorium	0	0	0	0	0	0	0

CATEGORY / SECTOR	PART	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
Industrial & Commercial Incineration	0	0	0	0	0	0	0
Municipal Incineration	379	252	235	97	497	145	2,668
Wood Waste Incineration	0	0	0	0	0	0	0
Other Incineration & Utilities	112	89	56	65	134	36	411
<b>TOTAL INCINERATION</b>	<b>492</b>	<b>341</b>	<b>291</b>	<b>161</b>	<b>631</b>	<b>181</b>	<b>3,079</b>
<b>MISCELLANEOUS</b>							
Cigarette Smoking	255	255	255	0	6	0	196
Dry Cleaning	0	0	0	0	0	241	0
Fuel Marketing	0	0	0	2	0	7,601	0
General Solvent Use	0	0	0	0	0	12,545	0
Marine Cargo Handling Industry	2,902	1,395	423	0	0	1	0
Meat Cooking	464	464	464	0	0	0	0
Pesticides and Fertilizer Application	487	239	68	0	0	0	0
Printing	9	2	2	0	11	1,900	8
Structural Fires	18	18	17	0	2	15	78
Surface Coatings	0	0	0	0	0	8,925	0
<b>TOTAL MISCELLANEOUS</b>	<b>4,135</b>	<b>2,372</b>	<b>1,229</b>	<b>2</b>	<b>18</b>	<b>31,227</b>	<b>281</b>
<b>OPEN SOURCES</b>							
Agriculture (Animals)	7,693	4,899	765	0	0	8,151	0
Agriculture Tilling and Wind Erosion	15,052	5,090	532	0	0	0	0
Construction Operations	288	60	12	0	0	0	0
Dust from Paved Roads	451,086	86,459	20,740	0	0	0	0
Dust from Unpaved Roads	249,007	86,839	12,977	0	0	0	0
Forest Fires	18,387	14,065	12,658	47	1,875	4,005	95,642
Landfill Sites	503	181	50	0	0	2,538	0
Mine Tailings	0	0	0	0	0	0	0
Prescribed Burning	30,366	22,376	20,353	144	3,838	10,575	198,009
<b>TOTAL OPEN SOURCES</b>	<b>772,381</b>	<b>219,968</b>	<b>68,087</b>	<b>191</b>	<b>5,714</b>	<b>25,269</b>	<b>293,651</b>
<b>PROVINCIAL TOTAL</b>							
<b>TOTAL WITH OPEN SOURCES</b>	<b>875,230</b>	<b>284,516</b>	<b>114,919</b>	<b>138,105</b>	<b>297,902</b>	<b>233,892</b>	<b>1,628,431</b>
<b>TOTAL WITHOUT OPEN SOURCES</b>	<b>102,849</b>	<b>64,547</b>	<b>46,832</b>	<b>137,914</b>	<b>292,189</b>	<b>208,623</b>	<b>1,334,780</b>
<b>NATURAL SOURCES</b>							
Biogenics	0	0	0	0	40,729	4,127,507	0
Marine Aerosols	332	289	50	0	0	0	0
Wildlife	0	0	0	0	0	891	0
<b>TOTAL NATURAL SOURCES</b>	<b>332</b>	<b>289</b>	<b>50</b>	<b>0</b>	<b>40,729</b>	<b>4,128,398</b>	<b>0</b>
<b>GRAND TOTAL WITH NATURAL SOURCES</b>	<b>875,562</b>	<b>284,804</b>	<b>114,969</b>	<b>138,105</b>	<b>338,631</b>	<b>4,362,290</b>	<b>1,628,431</b>

## Appendix F Point Source Emissions

Appendix F contains detailed point source emissions summarized by SIC and SCC, and by permit number (Grouped by WLAP administrative regions).

### F.1 Point Source Emissions Summarized by Industry Sector

Emissions by Industry Sector								
SIC	SIC DESCRIPTION	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
211	Veterinary Services	1.7	1.3	1.1	0.0	0.3	0.0	0.5
229	Other Services Incidental to Agricultural Crops	71.9	21.2	4.6	0.0	0.0	0.0	0.0
411	Logging Industry	2059.6	1360.4	1262.1	8.4	242.0	775.9	15431.7
611	Gold Mines	40.0	22.2	14.0	29.3	266.2	20.7	61.0
612	Copper and Copper-Zinc Mines	418.5	260.5	113.9	48.6	731.3	51.3	187.0
613	Nickel-Copper Mines	418.0	211.7	62.0	60.7	59.0	1.1	14.8
614	Silver-Lead-Zinc Mines	72.8	37.1	10.9	67.4	35.7	7.1	1.9
615	Molybdenum Mines	426.8	418.5	147.2	477.1	0.8	0.0	0.2
621	Asbestos Mines	0.5	0.5	0.4	0.5	6.8	0.5	1.5
631	Bituminous Coal Mines	4459.6	3317.4	1227.5	1884.2	1319.4	805.8	41.7
711	Conventional Crude Oil & Natural Gas	151.2	118.2	112.7	17415.3	12221.3	799.1	2200.9
712	Non-Conventional Crude Oil Industry	0.0			0.0	0.0	2.6	0.0
812	Limestone Quarries	138.0	62.8	17.9	0.0	0.0	0.0	0.0
821	Sand and Gravel Pits	70.8	30.0	9.5	1.2	20.5	1.3	4.4
1011	Meat & Meat Products Industry (Except Poultry)	0.2	0.2	0.2	0.0	4.7	0.2	1.2
1021	Fish Products Industry	17.0	5.3	2.1	0.0	1.1	0.1	0.2
1031	Canned & Preserved Fruit & Vegetable Ind.	0.3	0.3	0.3	0.0	7.1	0.3	1.7
1051	Cereal Grain Flour Industry	6.7	2.2	0.7	0.0	0.0	0.0	0.0
1053	Feed Industry	213.1	57.6	12.0	0.1	23.1	1.3	4.8
1091	Tea and Coffee Industry	0.1	0.0	0.0	0.0	0.0	0.0	0.0
1131	Brewery Products Industry	4.5	1.4	0.6	0.0	4.5	0.2	3.5
1699	Other Plastic Products Industries n.e.c.	375.2	308.7	153.5	0.0	0.0	0.0	0.0
2511	Shingle and Shake Industry	193.7	113.7	94.3	0.8	16.7	89.0	1330.6
2512	Sawmill & Planing Mill Products Industry	30220.5	15758.4	9525.7	364.5	5041.3	20481.9	225703.7
2522	Softwood Veneer and Plywood Industry	1630.5	922.8	648.2	9.9	185.8	650.4	7154.7
2541	Prefabricated Wooden Buildings Industry	43.9	23.5	17.8	0.3	2.6	18.2	210.2
2543	Wooden Door and Window Industry	26.2	11.5	5.8	0.2	8.4	3.6	32.6
2549	Other Millwork Industries	266.3	111.0	55.3	0.5	85.2	9.9	19.8
2591	Wood Preservation Industry	6.7	3.0	1.8	0.1	16.0	0.9	3.2
2592	Particle Board Industry	1189.8	655.5	254.2	9.4	143.5	91.6	1248.5
2593	Wafer Board Industry	481.7	276.5	112.7	37.3	193.2	72.6	5971.4
2599	Other Wood Industries n.e.c.	119.9	63.1	37.7	1.5	27.2	20.5	293.9

Emissions by Industry Sector								
SIC	SIC DESCRIPTION	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
2611	Wooden Household Furniture Industry	79.6	40.8	24.6	0.6	5.3	78.4	96.1
2711	PULP & NEWSPRINT INDUSTRY	17001.8	9010.2	6909.8	16068.5	18754.2	6018.7	69506.1
2712	Newsprint Industry	12.2	8.1	7.6	0.0	1.5	3.7	87.3
2732	Corrugated Box Industry	410.1	308.4	114.4	0.0	11.4	0.5	2.8
2941	Iron Foundries	126.9	107.8	38.3	0.2	44.9	0.9	43.0
2951	Primary Production of Aluminum Industry	1777.9	1149.1	545.9	5450.3	11.5	1.1	75.4
2959	Other Primary Smelting and Refining of Non-Ferrous Metal Industries	247.3	186.3	122.4	3086.0	0.0	0.0	0.0
3041	Custom Coating of Metal Products Ind.	25.9	10.4	5.2	0.0	0.0	0.0	0.0
3241	Truck and Bus Body Industry	205.2	146.6	117.5	34.0	510.8	114.3	111.1
3243	Non-commercial Trailer Industry	36.4	32.8	11.6	0.0	0.0	22.8	0.0
3255	Motor Vehicle Wheel and Brake Industry	0.1	0.1	0.1	0.0	0.0	0.0	0.0
3359	Other Communication & Electronic Equipment Ind.	0.5	0.5	0.4	1.7	2.5	0.2	0.0
3371	Electrical Transformer Industry	2.8	2.6	2.2	0.0	0.0	0.0	0.0
3521	Hydraulic Cement Industry	132.4	105.9	37.4	59.7	318.0	4.0	15.2
3542	Structural Concrete Products	0.3	0.1	0.0	0.0	1.4	0.1	0.3
3545	Structural Concrete Production	0.1	0.0	0.0	0.0	0.0	0.0	0.0
3549	Other Concrete Products	0.9	0.5	0.1	2.4	0.7	0.0	0.2
3551	Ready-Mix Concrete Industry	55.9	32.6	10.7	4.2	23.7	1.2	4.8
3561	Primary Glass & Glass Containers	71.5	65.8	58.6	298.6	372.6	46.6	0.0
3571	Abrasives Industry	130.8	0.0	0.0	0.0	0.0	0.0	0.0
3581	Lime Industry	104.3	14.2	2.0	0.7	109.8	5.8	21.9
3594	Other Non-Metallic Mineral Production	60.5	51.5	39.7	0.0	0.0	0.0	0.0
3599	Other Non-Metallic Mineral Production	107.0	84.0	66.8	0.2	33.5	1.8	6.7
3611	Refined Petroleum Products Industry (Except Lubricating Oil and Grease)	46.2	33.0	19.8	2457.0	71.7	121.0	2307.3
3699	Other Petroleum & Coal Products Industry	75.2	0.0	0.0	4.0	30.2	48.1	86.4
3711	Industrial Inorganic Chemical Industries	15.6	12.9	7.7	248.3	73.8	3.5	19.4
3712	Industrial Organic Chemical Industries	15.6	14.9	12.8	33.5	2940.7	26.6	100.5
3721	Chemical Fertilizer & Fertilizer Mtl's	60.0	44.0	28.2	0.0	0.0	0.0	0.0
3731	Plastic & Synthetic Resin Industry	0.6	0.5	0.4	3.7	12.7	0.9	14.4
3799	Other Chemical Products Industries n.e.c	0.1	0.1	0.0	7.9	4.4	0.0	3.5
4123	Hydroelectric Power Plant	0.4	0.0	0.0	0.0	0.0	0.0	0.0
4214	Excavating & Grading	144.0	144.0	82.0	0.5	4.5	49.5	585.0
4551	Marine Cargo Handling Industry	59.4	30.3	8.9	0.0	0.0	0.0	0.0
4611	Natural Gas Pipeline Transport Industry	373.3	268.6	268.4	2153.1	13351.8	2322.1	2650.5
4612	Crude Oil Pipeline Transport Industry	0.0			241.5	110.0	0.0	0.0
4711	Grain Elevator Industry	1.4	0.2	0.0	0.0	0.0	0.0	0.0
4911	Electric Power Systems Industry	261.3	242.2	237.2	109.6	2468.5	541.9	2429.1
4999	Other Utility Industries	377.4	252.0	235.1	12.4	67.9	142.2	2651.5
5111	Petroleum Products, Wholesale	0.0	0.0	0.0	1.6	0.2	243.0	0.1
5919	Other Waste Materials, Wholesale	2.2	2.1	2.1	0.0	0.8	0.2	0.4
8521	Post-Secondary Non-University Education	0.4	0.2	0.1	0.0	0.1	2.7	9.3
9149	OTHER RECREA. & VACATION CAMPS	1.4	0.7	0.5	1.3	0.4	0.4	0.9

Emissions by Industry Sector								
SIC	SIC DESCRIPTION	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
9941	Electric Motor Repair	0.2	0.2	0.1	0.4	0.6	0.2	0.0
NC02	WASTE DISPOSAL OPERATIONS	101.6	81.5	51.6	43.6	97.2	35.1	394.4
NC10	Other Recycling Operations	1.1	0.7	0.3	7.4	8.6	0.1	1.3
NC11	Unspecified Industry Group	0.0			0.0	0.0	5.1	0.0
	<b>Total:</b>	<b>65,253.7</b>	<b>36,662.7</b>	<b>22,977.7</b>	<b>50,750.3</b>	<b>60,109.6</b>	<b>33,748.6</b>	<b>341,150.0</b>

## F.2 Point Source Emissions Summarized by SCC

Emissions by SCC								
SCC	SCC Description	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
<b>External Combustion Boilers; Electric Generation</b>								
10100601	Natural Gas; Boilers > 100 Million Btu/hr except Tangential	0.1	0.1	0.1	0.0	3.1	0.2	0.7
10100902	Wood/Bark Waste; Wood/Bark Fired Boiler	3.2	2.9	2.4	0.0	0.0	0.0	0.0
<b>External Combustion Boilers; Industrial</b>								
10200101	Anthracite Coal; Pulverized Coal	10.0	2.3	0.6	0.1	14.0	0.6	3.2
10200104	Anthracite Coal; Traveling Grate (Overfeed) Stoker	5.1	2.6	1.4	0.0	0.0	0.0	0.0
10200401	Residual Oil; Grade 6 Oil	130.2	130.2	84.8	1594.5	775.4	11.4	181.1
10200501	Distillate Oil; Grades 1 and 2 Oil	2.6	1.3	0.3	32.3	52.0	1.4	21.4
10200601	Natural Gas; > 100 Million Btu/hr	14.5	14.5	14.5	11.4	418.4	7.7	83.4
10200602	Natural Gas; 10-100 Million Btu/hr	6.4	6.4	6.4	2.7	530.7	15.6	85.9
10200603	Natural Gas; < 10 Million Btu/hr	2.9	2.9	2.9	0.4	73.1	4.0	15.2
10200901	Wood/Bark Waste; Bark-fired Boiler	6260.3	2237.4	1332.2	2145.6	4260.2	533.0	12918.0
10200902	Wood/Bark Waste; Wood/Bark-fired Boiler	1401.2	1261.0	1064.5	76.2	384.0	698.6	10946.5
10200903	Wood/Bark Waste; Wood-fired Boiler - Wet Wood (>=20% moisture)	193.4	174.1	147.0	106.0	1007.5	470.9	1973.6
10200904	Wood/Bark Waste; Bark-fired Boiler (< 50,000 Lb Steam) **	17.3	6.2	3.7	0.5	2.2	5.6	78.8
10200905	Wood/Bark Waste; Wood/Bark-fired Boiler (< 50,000 Lb Steam) **	0.2	0.2	0.1	0.0	4.3	0.2	0.9
10200906	Wood/Bark Waste; Wood-fired Boiler (< 50,000 Lb Steam) **	15.0	13.5	11.4	1.2	5.6	13.8	195.8
10200908	Wood/Bark Waste; Wood-fired Boiler - Dry Wood (<20% moisture)	271.3	244.2	206.1	11.2	50.7	126.2	1787.3
10200910	Wood/Bark Waste; Fuel cell/Dutch oven boilers **	0.2	0.2	0.2	0.0	23.0	0.4	6.9
10200911	Wood/Bark Waste; Stoker boilers **	1067.6	960.8	811.1	276.3	689.9	35.3	1741.7
10200912	Wood/Bark Waste; Fluidized bed combustion boiler	38.2	34.4	29.0	95.4	579.1	18.7	927.3
10201002	Liquified Petroleum Gas (LPG); Propane	0.0	0.0	0.0	0.0	1.2	0.1	0.2
<b>External Combustion Boilers; Commercial/Institutional</b>								
10300404	Residual Oil; Grade 5 Oil	0.1	0.0	0.0	0.0	2.2	0.1	0.4
10300602	Natural Gas; 10-100 Million Btu/hr	27.2	27.2	27.2	0.1	43.5	1.2	6.7
10300603	Natural Gas; < 10 Million Btu/hr	0.2	0.2	0.2	0.0	6.7	0.5	1.6
<b>External Combustion Boilers; Space Heaters</b>								
10500106	Industrial; Natural Gas	469.8	469.8	469.8	20.4	2822.1	154.5	497.1
10500110	Industrial; Liquified Petroleum Gas (LPG)	0.6	0.6	0.6	0.1	20.6	1.1	4.1
10500206	Commercial/Institutional; Natural Gas	4.0	4.0	4.0	0.0	0.2	1.3	0.0
10500209	Commercial/Institutional; Wood	38.8	30.6	17.5	0.4	68.0	2.8	14.8
<b>Internal Combustion Engines; Electric Generation</b>								
20100101	Distillate Oil (Diesel); Turbine	31.1	28.1	28.1	28.9	434.9	29.4	94.6
20100102	Distillate Oil (Diesel); Reciprocating	13.3	12.8	12.0	13.7	205.5	14.1	44.7

Emissions by SCC								
SCC	SCC Description	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
20100105	Distillate Oil (Diesel); Reciprocating: Crankcase Blowby	0.0			0.0	0.0	1055.2	0.0
20100201	Natural Gas; Turbine	19.2	1.2	1.2	1.4	390.3	53.6	223.2
20100202	Natural Gas; Reciprocating	1.7	1.7	1.7	0.4	434.4	93.7	107.3
<b>Internal Combustion Engines; Industrial</b>								
20200101	Distillate Oil (Diesel); Turbine	52.2	50.1	47.0	48.6	730.9	50.0	159.0
20200102	Distillate Oil (Diesel); Reciprocating	36.5	35.0	32.8	34.0	510.8	35.0	111.1
20200201	Natural Gas; Turbine	244.4	244.4	244.4	331.0	5102.7	426.7	1648.3
20200202	Natural Gas; Reciprocating	7.6	7.6	7.6	1.0	826.7	73.4	334.5
20200203	Natural Gas; Turbine: Cogeneration	8.0	8.0	8.0	0.5	2465.7	74.0	350.4
20200253	Natural Gas; 4-cycle Rich Burn	1.4	1.4	1.3	0.1	48.4	11.8	61.3
20200401	Large Bore Engine; Diesel	22.9	21.1	17.9	39.6	486.0	13.4	128.5
20200902	Kerosene/Naphtha (Jet Fuel); Reciprocating	0.0			0.1	61.0	5.0	17.3
20201001	Liquified Petroleum Gas (LPG); Propane: Reciprocating	0.6	0.6	0.6	0.1	27.0	3.0	8.5
<b>Internal Combustion Engines; Commercial/Institutional</b>								
20300201	Natural Gas; Reciprocating	0.0	0.0	0.0	0.0	10.2	0.2	1.3
20300202	Natural Gas; Turbine	36.9	36.9	36.9	1.9	2614.8	111.8	331.3
<b>Industrial Processes; Chemical Manufacturing</b>								
30100508	Carbon Black Production; Bagging/Loading	0.1	0.1	0.0	0.0	0.0	0.0	0.0
30100605	Charcoal Manufacturing; Briquetting	8.3	3.6	1.4	0.0	10.2	0.0	13.6
30101030	Explosives (Trinitrotoluene); Open Burning: Waste	0.0			0.0	3.3	0.0	3.2
30101832	Plastics Production; Urea-Formaldehyde Resins	0.0			0.0	0.0	0.0	12.2
30102319	Sulfuric Acid (Contact Process); Concentrator	0.0			0.7	0.0	0.0	0.0
30102321	Sulfuric Acid (Contact Process); Storage Tank Vent	5.3	4.5	1.6	0.0	0.0	0.0	0.0
30103001	Ammonium Phosphates; Dryers and Coolers	1.5	1.3	0.5	0.0	0.0	0.0	0.0
30104501	Organic Fertilizer; General: Mixing/Handling	11.2	9.5	3.4	0.0	0.0	0.0	0.0
30107101	Hydrogen; Reformers	0.4	0.0	0.0	0.0	1.7	0.3	2.1
30113006	Ammonium Sulfate; Caprolactum By-product: Crystallizer (Evaporator)	1.3	0.0	0.0	0.0	0.0	0.0	0.0
30113007	Ammonium Sulfate; Caprolactum By-product: Screening	0.2	0.0	0.0	0.0	0.0	0.0	0.0
30121001	Caprolactum; General	23.2	21.8	18.1	0.0	0.0	0.0	0.0
30121009	Caprolactum; Ammonium Sulfate Drying	22.6	11.4	6.3	0.0	0.0	0.0	0.0
30125003	Methanol/Alcohol Production; Methanol: Distillation Vent	12.6	11.9	9.8	25.2	2459.8	22.1	83.6
30199999	Other Not Classified; Specify in Comments Field	6.5	6.5	6.1	0.0	0.0	0.0	0.0
<b>Industrial Processes; Food and Agriculture</b>								
30200201	Coffee Roasting; Direct Fired Roaster	0.1	0.0	0.0	0.0	0.0	0.0	0.0
30200502	Feed and Grain Terminal Elevators; Transfer/Convey	21.0	3.2	0.2	0.0	0.0	0.0	0.0
30200503	Feed and Grain Terminal Elevators; Cleaning	40.6	6.1	0.4	0.0	0.0	0.0	0.0

Emissions by SCC									
SCC	SCC Description	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO	
30200506	Feed and Grain Terminal Elevators; Loading (Shipping)	9.4	3.9	1.0	0.0	0.0	0.0	0.0	0.0
30200507	Feed and Grain Terminal Elevators; Removal from Bins (Tunnel Belt)	1.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0
30200508	Feed and Grain Terminal Elevators; Elevator Legs (Headhouse)	4.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0
30200512	Feed and Grain Terminal Elevators; Country Elevators: General	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30200604	Feed and Grain Country Elevators; Drying	16.5	2.5	0.2	0.1	9.7	0.5	1.9	
30200606	Feed and Grain Country Elevators; Loading (Shipping)	1.1	0.5	0.1	0.0	0.0	0.0	0.0	0.0
30200701	Grain Millings; General	32.9	4.9	0.3	0.0	0.0	0.0	0.0	0.0
30200714	Grain Millings; Durum Milling: Millhouse	23.3	11.4	3.3	0.0	0.0	0.0	0.0	0.0
30200742	Grain Millings; Dry Corn Milling: Grain Drying	1.1	0.7	0.3	0.0	0.0	0.0	0.0	0.0
30200802	Feed Manufacture; Grain Receiving	15.1	2.3	0.2	0.0	0.0	0.0	0.0	0.0
30200805	Feed Manufacture; Grinding	51.6	15.5	1.5	0.0	0.0	0.0	0.0	0.0
30200806	Feed Manufacture; Pellet Coolers	53.9	16.2	1.6	0.0	0.0	0.0	0.0	0.0
30200815	Feed Manufacture; Grinding	6.0	1.8	0.2	0.0	0.0	0.0	0.0	0.0
30200901	Beer Production; Grain Handling	3.2	0.5	0.0	0.0	0.0	0.0	0.0	0.0
30200905	Beer Production; Malt Kiln	1.0	0.6	0.2	0.0	0.0	0.0	0.0	0.0
30201201	Fish Processing; Cookers: Fresh Fish Scrap	4.7	2.9	1.1	0.0	0.0	0.0	0.0	0.0
30201299	Fish Processing; Other Not Classified	4.1	1.1	0.9	0.0	0.0	0.0	0.0	0.0
30204001	Cereal; Dryer	1.1	0.5	0.3	0.0	0.0	0.0	0.0	0.0
<b>Industrial Processes; Primary Metal Production</b>									
30300001	Aluminum Ore (Bauxite); Crushing/Handling	7.7	6.6	2.3	0.0	0.0	0.0	0.0	0.0
30300103	Aluminum Ore (Electro-reduction); Vertical Stud Soderberg Cell	25.0	25.0	22.3	2284.9	0.0	0.0	0.0	0.0
30300104	Aluminum Ore (Electro-reduction); Materials Handling	53.6	31.1	15.0	0.0	0.0	0.0	0.0	0.0
30300105	Aluminum Ore (Electro-reduction); Anode Baking Furnace	28.4	26.7	22.1	0.0	0.0	0.0	0.0	0.0
30300107	Aluminum Ore (Electro-reduction); Roof Vents	1362.0	789.9	381.3	372.3	0.0	0.0	0.0	0.0
30300108	Aluminum Ore (Electro-reduction); Prebake: Fugitive Emissions	44.6	25.9	12.5	0.0	0.0	0.0	0.0	0.0
30300201	Aluminum Hydroxide Calcining; Overall Process	5.8	0.7	0.1	0.0	0.0	0.0	0.0	0.0
30300312	By-product Coke Manufacturing; Coke: Crushing/Screening/Handling	14.7	7.2	5.7	0.0	0.0	0.0	0.0	0.0
30301008	Lead Production; Slag Fume Furnace	75.4	21.1	16.6	1181.0	0.0	0.0	0.0	0.0
30301010	Lead Production; Raw Material Crushing and Grinding	3.4	2.9	1.0	0.0	0.0	0.0	0.0	0.0
30301022	Lead Production; Lead Refining/Silver Retort	15.0	14.7	12.5	0.0	0.0	0.0	0.0	0.0
30301099	Lead Production; Other Not Classified	69.4	69.4	25.0	29.0	0.0	0.0	0.0	0.0
30301102	Molybdenum; Milling: General	409.8	409.8	144.6	477.1	0.0	0.0	0.0	0.0
30301301	Gold; General Processes	9.4	4.8	1.4	5.5	82.3	6.6	17.8	
30302401	Metal Mining (General Processes); Primary Crushing: Low Moisture Ore	108.3	55.2	16.2	0.0	0.0	0.0	0.0	0.0
30302402	Metal Mining (General Processes); Secondary Crushing: Low Moisture Ore	5.3	2.7	0.8	0.0	0.0	0.0	0.0	0.0
30302405	Metal Mining (General Processes); Primary Crushing: High Moisture Ore	196.2	100.0	29.4	0.0	0.0	0.0	0.0	0.0

Emissions by SCC								
SCC	SCC Description	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
30302406	Metal Mining (General Processes); Secondary Crushing: High Moisture Ore	32.0	16.3	4.8	0.0	0.0	0.0	0.0
30302408	Metal Mining (General Processes); Material Handling: High Moisture Ore	223.6	114.1	33.5	0.0	0.0	0.0	0.0
30302410	Metal Mining (General Processes); Dry Grinding without Air Conveying	67.4	57.3	20.2	0.0	0.0	0.0	0.0
30302411	Metal Mining (General Processes); Ore Drying	189.1	96.5	28.4	128.1	94.8	8.2	16.6
30303006	Zinc Production; Electrolytic Processor	0.5	0.5	0.4	0.0	0.0	0.0	0.0
30303007	Zinc Production; Flash Roaster	71.1	65.4	58.3	1876.0	0.0	0.0	0.0
30303015	Zinc Production; Zinc Melting	4.6	4.6	1.4	0.0	0.0	0.0	0.0
<b>Industrial Processes; Secondary Metal Production</b>								
30400104	Aluminum; Fluxing: Chlorination (Chlorine Demagging)	25.0	25.0	9.3	0.0	2.9	0.0	0.0
30400310	Grey Iron Foundries; Inoculation	0.5	0.4	0.3	0.1	21.0	0.4	5.2
30400410	Lead; Battery Breaking	0.4	0.4	0.3	0.0	0.0	0.0	0.0
30400418	Lead; Electric Furnace	0.1	0.0	0.0	0.0	0.0	0.0	0.0
30400601	Magnesium; Pot Furnace	0.6	0.5	0.5	0.3	0.0	0.0	0.0
30400899	Zinc; Other Not Classified	1.3	1.3	1.2	0.0	0.0	0.0	0.0
<b>Industrial Processes; Mineral Products</b>								
30500204	Asphalt Concrete; Cold Aggregate Handling	14.1	4.9	1.5	0.0	0.0	0.0	0.0
30500207	Asphalt Concrete; Asphalt Heater: Residual Oil	0.0	0.0	0.0	1.6	0.2	0.0	0.1
30500211	Asphalt Concrete; Rotary Dryer Conventional Plant with Cyclone	14.8	3.1	0.7	0.0	3.3	0.2	0.7
30500214	Asphalt Concrete; Truck Load-out	0.3	0.0	0.0	0.0	0.0	1.6	0.0
30500398	Brick Manufacture; Other Not Classified	49.0	25.9	8.8	0.0	0.0	0.0	0.0
30500606	Cement Manufacturing (Dry Process); Kilns	1.2	0.5	0.2	0.0	2.4	4.1	15.7
30500612	Cement Manufacturing (Dry Process); Raw Material Transfer	4.7	4.0	1.4	0.0	0.0	0.0	0.0
30500613	Cement Manufacturing (Dry Process); Raw Material Grinding and Drying	26.5	22.5	8.0	0.0	0.0	0.0	0.0
30500614	Cement Manufacturing (Dry Process); Clinker Cooler	10.3	8.7	3.1	59.7	318.0	0.0	0.0
30500617	Cement Manufacturing (Dry Process); Clinker Grinding	39.1	33.2	11.7	0.0	0.0	0.0	0.0
30500618	Cement Manufacturing (Dry Process); Cement Silos	24.2	20.6	7.3	0.0	0.0	0.0	0.0
30500619	Cement Manufacturing (Dry Process); Cement Load Out	19.8	16.9	5.9	0.0	0.0	0.0	0.0
30500706	Cement Manufacturing (Wet Process); Kilns	0.6	0.1	0.0	0.1	20.1	1.1	4.0
30500801	Ceramic Clay/Tile Manufacture; Drying	0.4	0.2	0.1	0.0	0.1	2.7	9.3
30501001	Coal Mining, Cleaning, and Material Handling; Fluidized Bed	1832.7	1759.4	769.8	1884.1	1305.1	805.2	38.4
30501008	Coal Mining, Cleaning, and Material Handling; Unloading	862.5	439.9	129.4	0.0	0.0	0.0	0.0
30501009	Coal Mining, Cleaning, and Material Handling; Raw Coal Storage	11.7	6.0	1.8	0.0	0.0	0.0	0.0
30501010	Coal Mining, Cleaning, and Material Handling; Crushing	223.9	114.2	33.6	0.0	0.0	0.0	0.0
30501016	Coal Mining, Cleaning, and Material Handling; Loading: Clean Coal	8.7	4.4	1.3	0.0	0.0	0.0	0.0
30501021	Coal Mining, Cleaning, and Material Handling; Overburden Removal	153.0	153.0	45.0	0.0	0.0	0.0	0.0
30501022	Coal Mining, Cleaning, and Material Handling; Drilling/Blasting	331.5	331.5	97.5	0.0	0.0	0.0	0.0

Emissions by SCC								
SCC	SCC Description	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
30501023	Coal Mining, Cleaning, and Material Handling; Loading	611.7	312.0	91.8	0.0	0.0	0.0	0.0
30501040	Coal Mining, Cleaning, and Material Handling; Truck Unloading: End Dump - Coal	20.0	3.0	0.1	0.0	0.0	0.0	0.0
30501043	Coal Mining, Cleaning, and Material Handling; Open Storage Pile: Coal	56.8	19.9	6.2	0.0	0.0	0.0	0.0
30501099	Coal Mining, Cleaning, and Material Handling; Other Not Classified	93.5	47.7	14.0	0.0	0.0	0.0	0.0
30501101	Concrete Batching; General (Non-fugitive)	118.5	60.4	17.8	0.0	0.0	0.0	0.0
30501106	Concrete Batching; Transfer: Sand/Aggregate to Elevated Bins	0.7	0.4	0.1	0.0	0.0	0.0	0.0
30501109	Concrete Batching; Mixer Loading of Cement/Sand/Aggregate	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30501113	Concrete Batching; Mixing: Dry	0.2	0.1	0.0	0.0	0.0	0.0	0.0
30501204	Fiberglass Manufacturing; Forming: Rotary Spun (Wool-type Fiber)	46.7	43.4	35.5	0.0	0.0	0.0	0.0
30501205	Fiberglass Manufacturing; Curing Oven: Rotary Spun (Wool-type Fiber)	0.1	0.1	0.1	0.0	0.0	0.0	0.0
30501209	Fiberglass Manufacturing; Curing: Flame Attenuation (Wool-type Fiber)	3.2	2.6	2.6	0.0	0.0	0.0	0.0
30501221	Fiberglass Manufacturing; Raw Material: Unloading/Conveying	8.0	4.1	1.2	0.0	0.0	0.0	0.0
30501222	Fiberglass Manufacturing; Raw Material: Storage Bins	2.5	1.3	0.4	0.0	0.0	0.0	0.0
30501401	Glass Manufacture; Furnace/General**	71.5	65.8	58.6	298.6	372.6	0.0	0.0
30501601	Lime Manufacture; Primary Crushing	1.1	0.5	0.2	0.0	0.0	0.0	0.0
30501607	Lime Manufacture; Raw Material Transfer and Conveying	6.7	1.5	0.2	0.0	0.0	0.0	0.0
30501613	Lime Manufacture; Lime Silos	0.9	0.7	0.3	0.0	0.0	0.0	0.0
30501618	Lime Manufacture; Calcining: Coal-fired Rotary Kiln	95.2	11.4	1.3	0.7	109.8	5.8	21.9
30501626	Lime Manufacture; Product Loading, Enclosed Truck	0.6	0.5	0.2	0.0	0.0	0.0	0.0
30502002	Stone Quarrying – Processing; Secondary Crushing/Screening	33.0	7.9	0.5	0.0	0.0	0.0	0.0
30502005	Stone Quarrying – Processing; Fines Mill	20.7	17.6	6.2	0.0	0.0	0.0	0.0
30502006	Stone Quarrying – Processing; Miscellaneous Operations: Screen/Convey/Handling	15.8	1.6	0.5	0.0	0.0	0.0	0.0
30502012	Stone Quarrying – Processing; Drying	1.7	0.2	0.0	0.0	0.0	0.0	0.0
30502510	Construction Sand and Gravel; Crushing	40.8	20.8	6.1	0.0	0.0	0.0	0.0
30503607	Bonded Abrasives Manufacturing; Final Machining	130.8	0.0	0.0	0.0	0.0	0.0	0.0
30510002	Bulk Materials Elevators; Loading	5.1	2.6	0.8	0.0	0.0	0.0	0.0
30510103	Bulk Materials Conveyors; Coal	124.3	63.4	18.6	0.0	0.0	0.0	0.0
30510105	Bulk Materials Conveyors; Limestone	1.9	1.0	0.3	0.0	0.0	0.0	0.0
30510198	Bulk Materials Conveyors; Mineral: Specify in Comments	10.1	5.1	1.5	0.0	0.0	0.0	0.0
30510203	Bulk Materials Storage Bins; Coal	178.2	90.9	26.7	0.0	0.0	0.0	0.0
30510205	Bulk Materials Storage Bins; Limestone	2.8	1.4	0.4	0.0	0.0	0.0	0.0
30510298	Bulk Materials Storage Bins; Mineral: Specify in Comments	41.0	20.9	6.1	0.0	0.0	0.0	0.0
30510299	Bulk Materials Storage Bins; Other Not Classified	0.0			0.0	0.0	20.9	0.0
30510403	Bulk Materials Unloading Operation; Coal	0.3	0.2	0.1	0.0	0.0	0.0	0.0
<b>Industrial Processes; Petroleum Industry</b>								
30600105	Process Heaters; Natural Gas-fired	0.8	0.8	0.8	218.0	35.3	0.7	8.8

Emissions by SCC								
SCC	SCC Description	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
30600106	Process Heaters; Process Gas-fired	0.7	0.7	0.7	0.0	24.5	1.3	4.9
30600201	Catalytic Cracking Units; Fluid Catalytic Cracking Unit	43.9	30.8	17.6	0.0	5.6	22.9	2292.7
30600402	Blowdown Systems; Blowdown System w/o Controls	0.0			0.0	0.0	359.8	0.0
30600701	Cooling Towers; Cooling Towers	0.0			0.0	0.0	17.4	0.0
30600904	Flares; Process Gas	0.1	0.1	0.1	0.0	4.7	0.1	1.2
30601401	Petroleum Coke Calcining; Coke Calciner	198.2	198.2	67.3	2792.3	0.0	0.0	0.0
<b>Industrial Processes; Pulp and Paper and Wood Products</b>								
30700101	Sulfate (Kraft) Pulping; Digester Relief and Blow Tank	0.0			0.0	0.0	9.5	0.0
30700102	Sulfate (Kraft) Pulping; Washer/Screens	0.0			0.0	0.0	305.4	0.0
30700103	Sulfate (Kraft) Pulping; Multi-effect Evaporator	0.0			0.0	0.0	25.7	0.0
30700104	Sulfate (Kraft) Pulping; Recovery Furnace/Direct Contact Evaporator	2111.4	1970.6	1759.4	1728.5	1398.1	280.4	8807.1
30700105	Sulfate (Kraft) Pulping; Smelt Dissolving Tank	806.4	714.2	599.1	67.6	144.9	48.3	0.0
30700106	Sulfate (Kraft) Pulping; Lime Kiln	479.4	80.5	49.7	719.9	1343.7	22.2	159.7
30700109	Sulfate (Kraft) Pulping; Liquor Oxidation Tower	0.0			0.0	0.0	71.9	0.0
30700110	Sulfate (Kraft) Pulping; Recovery Furnace/Indirect Contact Evaporator	2605.3	2605.3	2038.9	6459.5	4236.0	362.4	18775.0
30700222	Sulfite Pulping; Recovery System: NH3	239.4	225.0	186.7	316.6	1201.1	109.4	749.3
30700231	Sulfite Pulping; Acid Plant: NH3	0.0			14.4	0.0	0.0	0.0
30700234	Sulfite Pulping; Knotters/Washers/Screens/etc.	0.0			0.0	0.0	8.8	0.0
30700301	Neutral Sulfite Semichemical Pulping; Digester/Blow Pit/Dump Tank	5.5	5.1	4.3	0.0	0.0	0.0	0.0
30700304	Neutral Sulfite Semichemical Pulping; Sulfur Burner/Absorbers	0.0			0.2	0.0	0.0	0.0
30700702	Plywood Operations; Sanding Operations	35.1	17.9	5.3	0.0	0.0	0.0	0.0
30700703	Plywood Operations; Particleboard Drying	734.8	426.2	139.6	7.6	34.4	85.7	1213.4
30700704	Plywood Operations; Waferboard Dryer	296.8	172.2	56.4	31.3	141.8	0.0	4996.5
30700707	Plywood Operations; Hardboard: Pressing	209.8	121.7	39.9	0.0	0.0	0.0	0.0
30700710	Plywood Operations; Sawing	0.2	0.1	0.0	0.0	0.0	0.0	0.0
30700715	Plywood Operations; Southern Pine Plywood Veneer Dryer	5038.4	2922.3	957.3	0.1	9.0	1707.8	1.8
30700803	Sawmill Operations; Sawdust Pile Handling	17.9	6.3	2.0	0.0	0.0	0.0	0.0
30700804	Sawmill Operations; Sawing: Cyclone Exhaust	1945.1	778.0	389.0	0.0	2.9	0.2	0.6
30700805	Sawmill Operations; Planning/Trimming: Cyclone Exhaust	3990.1	1596.0	798.0	0.0	6.4	0.4	1.3
30700806	Sawmill Operations; Sanding: Cyclone Exhaust	23.7	11.9	6.2	0.0	0.0	0.0	0.0
30700807	Sawmill Operations; Sanderdust: Cyclone Exhaust	91.5	49.2	27.4	0.0	0.0	0.0	0.0
30700808	Sawmill Operations; Other Cyclones: Exhaust	6006.7	2402.7	1201.3	2.5	62.2	35.0	447.0
30700822	Sawmill Operations; Chip Transfer/Conveying	198.1	101.0	29.7	0.0	0.0	0.0	0.0
30701008	Oriented Strandboard (OSB) Manufacture; Direct Wood-fired Rotary Dryer, Aspen	76.2	44.2	14.5	0.0	0.0	0.0	0.0
30701057	Oriented Strandboard (OSB) Manufacture; Hot Press, PF Resin (surface layers) / MDI Resin (core layers)	9.9	2.9	0.0	0.0	0.0	0.0	0.0

Emissions by SCC								
SCC	SCC Description	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
30701399	Miscellaneous Paper Products; Other Not Classified	320.1	272.1	96.0	0.0	0.0	0.0	0.0
30703001	Miscellaneous Wood Working Operations; Wood Waste Storage Bin Vent	13.4	7.7	2.5	0.0	0.0	0.2	0.0
30703002	Miscellaneous Wood Working Operations; Wood Waste Storage Bin Loadout	65.1	37.8	12.4	0.0	0.0	0.0	0.0
30704004	Bulk Handling and Storage - Wood/Bark; Loading	6.7	4.1	3.3	0.0	0.0	0.0	0.0
30790002	Fuel Fired Equipment; Residual Oil: Process Heaters	102.2	86.9	30.7	5.4	39.6	26.9	387.0
30790003	Fuel Fired Equipment; Natural Gas: Process Heaters	2.1	2.1	1.9	0.2	29.8	7.2	46.3
30790014	Fuel Fired Equipment; Process Gas: Incinerators	0.0			1448.3	152.2	6.0	20.3
<b>Industrial Processes; Rubber and Miscellaneous Plastics Products</b>								
30800701	Fiberglass Resin Products; Plastics Machining: Drilling/Sanding/Sawing/etc.	81.4	69.2	24.4	0.0	0.0	0.0	0.0
30800703	Fiberglass Resin Products; Solvent Consumption	51.5	43.7	15.4	0.0	0.0	0.0	0.0
30800704	Fiberglass Resin Products; Adhesive Consumption	8.3	7.0	2.5	0.0	0.0	22.8	0.0
30800720	Fiberglass Resin Products; General	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30800722	Fiberglass Resin Products; Gel Coat: Spray On	134.2	114.1	40.3	0.0	0.0	0.0	0.0
30800901	Plastic Miscellaneous Products; Polystyrene: General	12.0	12.0	4.2	0.0	0.0	0.0	0.0
30801007	Plastic Products Manufacturing; Molding Machine	18.6	0.0	0.0	0.0	0.0	0.0	0.0
30890002	Fuel Fired Equipment; Residual Oil: Process Heaters	1.1	0.7	0.2	7.4	4.2	0.1	0.2
<b>Industrial Processes; Fabricated Metal Products</b>								
30903006	Machining Operations; Honing: Specify Material in Comments	0.1	0.1	0.0	0.4	0.5	0.0	0.0
<b>Industrial Processes; Oil and Gas Production</b>								
31000201	Natural Gas Production; Gas Sweetening: Amine Process	11.2	10.5	8.7	3563.5	281.5	8.1	127.1
31000202	Natural Gas Production; Gas Stripping Operations	12.6	11.8	9.8	6545.2	545.0	324.1	142.8
31000203	Natural Gas Production; Compressors	1.5	1.4	1.2	0.1	75.1	13.7	1.3
31000205	Natural Gas Production; Flares	2.3	2.2	1.8	1245.2	456.3	10.8	66.2
31000302	Natural Gas Processing Facilities; Glycol Dehydrators: Reboiler Burner Stack: Triethylene Glycol	0.0	0.0	0.0	0.0	0.8	0.0	0.2
31000303	Natural Gas Processing Facilities; Glycol Dehydrators: Phase Separator Vent: Triethylene Glycol	0.0			0.0	0.0	57.1	0.0
31000307	Natural Gas Processing Facilities; Relief Valves	5.9	3.4	2.4	5806.7	147.7	229.2	66.8
31000404	Process Heaters; Natural Gas	39.2	39.2	39.2	310.3	1479.1	49.6	448.0
31000405	Process Heaters; Process Gas	1.4	1.4	1.4	0.5	18.0	1.0	15.5
31000414	Process Heaters; Natural Gas: Steam Generators	161.5	161.5	161.5	7.1	422.9	144.8	1324.8
<b>Industrial Processes; Electrical Equipment</b>								
31307001	Electrical Windings Reclamation; Single Chamber Incinerator/Oven	0.6	0.5	0.5	1.8	2.5	0.3	0.0
<b>Industrial Processes; Transportation Equipment</b>								
31401001	Brake Shoe Debonding; Single Chamber Incinerator	0.1	0.1	0.1	0.0	0.0	0.0	0.0
<b>Industrial Processes; In-process Fuel Use</b>								
39000389	Lignite; General	0.1	0.1	0.0	0.0	4.4	0.1	1.1
39000605	Natural Gas; Metal Melting	125.9	107.0	37.8	0.0	0.0	0.0	31.7

Emissions by SCC								
SCC	SCC Description	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
<b>Industrial Processes; Miscellaneous Manufacturing Industries</b>								
39990011	Miscellaneous Manufacturing Industries; Distillate Oil (No. 2): Incinerators	0.3	0.2	0.1	0.3	0.3	0.0	0.0
<b>Petroleum and Solvent Evaporation; Surface Coating Operations</b>								
40200101	Surface Coating Application - General; Paint: Solvent-base	2.8	2.6	2.2	0.0	0.0	0.0	0.0
40200201	Surface Coating Application - General; Paint: Water-base	0.0			0.0	0.0	5.7	0.0
40200401	Surface Coating Application - General; Lacquer	98.5	92.6	76.8	0.0	0.0	70.2	0.0
40200501	Surface Coating Application - General; Enamel	0.0			0.0	0.0	0.1	0.0
40201601	Automobiles and Light Trucks; Prime Application/Electro-deposition/Dip/Spray	168.7	111.5	84.7	0.0	0.0	0.0	0.0
40201621	Automobiles and Light Trucks; Prime Coating: Solvent-borne - Automobiles	0.0			0.0	0.0	79.3	0.0
<b>Petroleum and Solvent Evaporation; Petroleum Liquids Storage (non-Refinery)</b>								
40400151	Bulk Terminals; Valves, Flanges, and Pumps	0.0			0.0	0.0	0.0	0.0
40400152	Bulk Terminals; Vapor Collection Losses	0.0			0.0	0.0	19.6	0.0
40400254	Bulk Plants; Tank Truck Vapor Losses	0.0	0.0	0.0	92.4	0.4	0.0	0.2
40400408	Petroleum Products - Underground Tanks; Crude Oil RVP 5: Working Loss	0.0			0.0	0.0	75.0	0.0
<b>Petroleum and Solvent Evaporation; Organic Solvent Evaporation</b>								
49090013	Fuel Fired Equipment; Natural Gas: Incinerators	0.2	0.2	0.2	0.0	3.8	0.1	1.7
<b>Waste Disposal; Solid Waste Disposal - Government</b>								
50100101	Municipal Incineration; Starved Air: Multiple Chamber	5.7	4.2	3.6	0.7	1.7	0.6	1.3
50100102	Municipal Incineration; Mass Burn: Single Chamber	0.8	0.4	0.3	0.0	0.1	0.0	0.0
50100201	Open Burning Dump; General Refuse	52.0	41.1	23.4	0.2	1.9	20.6	243.9
50100505	Other Incineration; Medical Waste Incinerator, unspecified type, Infectious wastes only	0.4	0.3	0.2	0.0	0.4	0.0	0.0
<b>Waste Disposal; Solid Waste Disposal - Commercial/Institutional</b>								
50200101	Incineration; Multiple Chamber	29.2	19.6	15.7	5.0	13.1	13.8	184.9
50200102	Incineration; Single Chamber	6.5	2.5	1.7	1.4	0.8	0.2	0.6
50200105	Incineration; Conical Design (Tee Pee) Wood Refuse	9136.0	5024.8	3654.4	112.8	1137.7	12513.4	147876.8
50200201	Open Burning; Wood	11.5	11.5	6.6	0.7	4.3	0.0	60.5
50200202	Open Burning; Refuse	0.6	0.5	0.3	0.0	0.2	1.6	3.2
50200505	Incineration: Special Purpose; Medical Waste Incinerator, unspecified type, Infectious wastes only	7.7	5.7	4.9	53.7	115.1	7.8	17.1
50200507	Incineration: Special Purpose; VOC Contaminated Soil	24.2	24.2	13.8	0.0	0.0	0.0	0.0
<b>Waste Disposal; Solid Waste Disposal - Industrial</b>								
50300102	Incineration; Single Chamber	4.7	1.7	1.1	0.7	1.5	2.6	9.1
50300103	Incineration; Controlled Air	0.1	0.1	0.1	0.0	0.0	0.0	0.0
50300105	Incineration; Conical Design (Tee Pee) Wood Refuse	3314.2	1822.8	1325.7	49.0	498.8	5458.5	64848.3
50300106	Incineration; Trench Burner: Wood	48.9	18.1	11.7	0.2	5.6	35.8	326.1
50300108	Incineration; Auto Body Components	0.0	0.0	0.0	0.0	0.0	0.0	0.0
50300109	Incineration; Trench Burner: Refuse	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Emissions by SCC								
SCC	SCC Description	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
50300111	Incineration; Mass Burn Refractory Wall Combustor	351.4	66.8	45.7	1.2	17.6	194.0	2292.4
50300201	Open Burning; Wood/Vegetation/Leaves	2716.0	1810.7	1692.5	9.5	316.6	922.5	19440.8
50300202	Open Burning; Refuse	144.0	144.0	82.0	0.5	4.5	49.6	585.1
50300701	Liquid Waste; General	24.8	19.6	11.2	222.2	77.7	0.0	0.0
50300830	Treatment, Storage, Disposal/TSDf; Containers: Fugitive Emissions	0.0			0.0	0.0	0.1	0.0
	Unclassified	3494.9			5397.9	14592.6	4864.8	29758.9
	<b>Provincial Total</b>	<b>65,253.7</b>	<b>36,662.7</b>	<b>22,977.7</b>	<b>50,750.3</b>	<b>60,109.6</b>	<b>33,748.6</b>	<b>341,150.1</b>

### F.3 Point Source Emissions Details Sorted by Region

Emissions by Region and Source											
Region	Permit	Facility	Lat.	Lon.	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
1	1863	PACIFICA PAPERS INC	49.25	-124.81	709.7			180.2	693.1	700.4	8493.5
1	1872	TIMBERWEST FOREST LIMITED	48.88	-124.23	29.8	12.0	6.1	0.0	4.3	0.3	0.9
1	1902	FLETCHER CHALLENGE CANADA LIMITED	48.85	-123.65	764.2	695.6	571.3	1958.0	1056.9	304.1	3716.6
1	2110	CXY CHEMICALS CANADA LTD.	49.15	-123.89	0.1	0.1	0.0	10.3	1.4	0.0	0.4
1	2245	PACIFIC FOREST PRODUCTS LIMITED	49.92	-126.66	154.1	61.7	30.8	0.0	0.0	0.0	0.0
1	2408	WESTMIN RESOURCES LIMITED	49.58	-125.60	202.4	126.7	69.5	48.6	730.9	50.0	158.9
1	2677	DUNCAN PAVING LTD.	48.81	-123.75	1.1	0.0	0.0	0.1	0.4	0.6	1.4
1	2696	MACMILLAN BLOEDEL LIMITED	49.24	-124.81	232.2	94.1	45.9	0.0	0.0	0.0	0.0
1	2708	HARMAC PACIFIC INC.	49.14	-123.86	511.5	443.8	346.8	2432.0	1184.1	255.2	3600.9
1	2768	ISLAND ASPHALT LTD.	48.43	-123.37	0.2	0.0	0.0	0.1	1.0	0.3	0.7
1	2786	IMPERIAL OIL	48.42	-123.40	0.0	0.0	0.0	1.6	0.2	0.0	0.1
1	2801	HUB CITY PAVING LTD.	49.07	-123.89	0.8	0.0	0.0	0.2	1.3	2.0	4.4
1	2853	MAYO FOREST PRODUCTS LTD.	49.16	-123.93	12.8	5.1	2.6	0.0	0.0	0.0	0.0
1	2960	LAFARGE CANADA INC.	49.65	-125.00	0.1	0.0	0.0	0.0	0.0	0.0	0.0
1	3011	EVANS REDI-MIX LTD.	48.75	-123.69	0.6	0.6	0.6	4.1	0.6	0.0	0.1
1	3051	MACMILLAN BLOEDEL LIMITED	49.23	-124.81	380.5	173.8	74.2	0.0	0.0	36.5	0.0
1	3076	ISLAND ASPHALT LTD.	48.41	-123.48	0.8	0.0	0.0	0.0	0.1	0.2	0.4
1	3086	OSBORNE CONTRACTING LIMITED	48.81	-123.74	0.0	0.0	0.0	2.4	0.3	0.0	0.1
1	3120	MACMILLAN BLOEDEL LIMITED	49.14	-123.84	67.5	27.5	13.3	0.0	0.0	0.0	0.0
1	3341	FLETCHER CHALLENGE CANADA LIMITED	50.07	-125.28	1266.5	578.3	425.0	568.1	1549.6	360.7	5091.2
1	3631	PET PALACE KENNELS INC.	48.46	-123.46	0.1	0.1	0.1	0.0	0.1	0.0	0.0
1	3760	WESTERN PULP INC.	50.38	-127.45	840.7	776.6	632.3	1865.4	1682.1	153.3	1279.1
1	3822	TOP SHELF FEEDS INC.	48.76	-123.69	24.7	7.4	0.7	0.0	0.6	0.0	0.1
1	3877	DOMAN-WESTERN LUMBER LTD.	49.00	-123.83	74.7	37.6	14.7	0.0	8.3	14.5	1.7
1	3956	TAYCO PAVING CO. LTD.	49.63	-125.01	0.2	0.0	0.0	0.1	0.5	0.2	0.6
1	3984	TAYCO PAVING CO. LTD.	50.11	-125.38	0.7	0.0	0.0	0.0	0.3	0.4	1.0
1	4005	WEYERHAEUSER COMPANY LIMITED	50.57	-127.12	50.3	33.5	31.3	0.2	6.0	19.4	359.9
1	4166	DOMAN FOREST PRODUCTS LIMITED	48.91	-123.74	25.1	10.1	5.0	0.0	0.0	0.0	0.0
1	4190	O.K. PAVING COMPANY	50.60	-127.16	0.2	0.0	0.0	0.0	0.2	0.1	0.1
1	4251	CONSTRUCTION AGGREGATES LTD.	48.41	-123.49	40.8	20.8	6.1	0.0	0.0	0.0	0.0
1	4396	DOMAN FOREST PRODUCTS LIMITED	48.76	-123.64	52.5	21.0	10.5	0.0	0.0	0.0	0.0
1	4581	BUTLER BROTHERS SUPPLIES LTD.	48.43	-123.37	8.1	4.2	1.2	0.0	0.0	0.0	0.0
1	4784	MACMILLAN BLOEDEL LIMITED	50.43	-126.26	41.0	27.4	25.6	0.1	4.9	12.3	293.8
1	4853	NANAIMO CONCRETE LTD.	49.16	-123.93	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	5263	CANADIAN FOREST PRODUCTS LIMITED	50.52	-126.88	286.8	191.2	178.7	1.0	34.2	110.7	2052.8

Emissions by Region and Source											
Region	Permit	Facility	Lat.	Lon.	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
1	5280	HIGHWEST WASTE RECYCLER LIMITED	48.48	-123.51	144.0	144.0	82.0	0.5	4.5	49.5	585.0
1	5601	TILBURY CEMENT LIMITED	48.59	-123.52	15.4	10.7	3.6	0.0	0.0	0.0	0.0
1	5701	ALBERNI FOUNDRY LTD.	49.26	-124.76	1.0	0.8	0.3	0.0	0.0	0.0	0.0
1	5821	MACMILLAN BLOEDEL LIMITED	49.01	-125.07	5.7	3.8	3.6	0.0	0.7	1.7	40.8
1	5822	MACMILLAN BLOEDEL LIMITED	49.02	-125.02	22.8	15.2	14.2	0.1	2.7	6.8	163.2
1	6016	INTERNATIONAL FOREST PRODUCTS LIMITED	50.36	-125.65	34.2	22.8	21.3	0.1	4.1	10.2	244.8
1	6081	CAPITAL CITY PAVING LTD.	48.48	-123.51	0.5	0.0	0.0	0.1	0.7	0.3	0.1
1	6187	G.L. HARPER SCRAP METAL AND DEMO. LIMITED	48.78	-123.70	0.5	0.5	0.5	0.0	0.0	0.2	0.2
1	6215	BHP MINERALS CANADA LTD.	50.61	-127.45	3.9	2.6	2.4	0.0	0.5	1.2	27.9
1	6471	HAYLOCK BROS. PAVING LTD.	49.31	-124.36	0.1	0.0	0.0	0.1	0.4	0.2	0.2
1	6857	INTERNATIONAL FOREST PRODUCTS LIMITED	50.46	-127.74	21.0	14.0	13.1	0.1	2.5	6.3	150.4
1	6967	WESTERN FOREST PRODUCTS LIMITED	50.48	-126.42	41.0	27.4	25.6	0.1	4.9	12.3	293.8
1	7149	MACMILLAN BLOEDEL LIMITED	48.92	-123.71	30.4	12.2	6.1	0.0	0.0	0.0	0.0
1	7393	ISLAND READY-MIX LTD.	50.01	-125.35	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	7395	TFL FOREST LTD	50.59	-126.10	14.6	9.8	9.1	0.1	1.7	4.4	104.8
1	7454	SHUSHARITE LOG SALES LTD.	50.72	-127.47	0.5	0.3	0.3	0.0	0.1	0.1	3.5
1	7492	DOMAN-WESTERN LUMBER LTD.	49.89	-126.67	5.1	3.4	3.2	0.0	0.6	1.5	36.7
1	7561	PACIFIC FOREST PRODUCTS LIMITED	49.72	-126.65	11.2	7.4	7.0	0.0	1.3	3.3	80.0
1	7605	DOMAN FOREST PRODUCTS LIMITED	49.00	-123.82	32.8	13.1	6.6	0.0	0.0	0.0	0.0
1	7691	WESTERN FOREST PRODUCTS LIMITED	50.59	-127.11	86.2	57.5	53.7	0.3	2.9	33.3	617.1
1	7699	INTERNATIONAL FOREST PRODUCTS LIMITED	51.09	-125.56	11.4	7.6	7.1	0.0	1.4	3.4	81.7
1	7755	INTERNATIONAL FOREST PRODUCTS LIMITED	50.28	-125.44	17.1	11.4	10.7	0.1	2.0	5.1	122.4
1	7759	PRIMEX FOREST PRODUCTS LTD.	49.69	-124.99	63.8	25.5	12.8	0.0	0.0	0.0	0.0
1	7800	INTERNATIONAL FOREST PRODUCTS LIMITED	49.64	-126.47	34.3	22.9	21.4	0.1	4.1	10.3	245.6
1	7935	HATHAWAY ENTERPRISES LTD.	48.42	-123.59	0.5	0.3	0.3	0.0	0.1	0.1	3.5
1	7937	PAULCAN ENTERPRISES LTD.	48.91	-123.75	38.3	15.7	7.7	0.0	1.8	0.7	0.4
1	7979	PACIFIC FOREST PRODUCTS LIMITED	49.64	-126.28	10.6	7.1	6.6	0.0	1.3	3.2	75.9
1	8003	DOMAN FOREST PRODUCTS LIMITED	49.15	-123.88	49.3	20.2	10.2	0.0	0.0	0.0	0.0
1	8125	THE HESQUIAHT INDIAN BAND	49.37	-126.27	0.8	0.4	0.3	0.0	0.1	0.0	0.0
1	8150	PACIFIC FOREST PRODUCTS LIMITED	49.69	-126.63	7.7	5.1	4.8	0.0	0.9	2.3	54.8
1	8155	COLUMBIA READY-MIX PROPERTIES LTD.	48.44	-123.50	0.9	0.5	0.2	0.0	0.0	0.0	0.0
1	8240	INTERNATIONAL FOREST PRODUCTS LIMITED	51.21	-127.39	3.4	2.3	2.1	0.0	0.4	1.0	24.5
1	8244	HOLLAND- H. A.	50.25	-125.40	0.2	0.2	0.2	0.0	0.0	0.1	1.7
1	8270	CANADIAN PACIFIC FOREST PRODUCTS LIMITED	49.87	-127.01	1.8	1.2	1.1	0.0	0.2	0.5	12.6
1	8278	MACMILLAN BLOEDEL LIMITED	50.39	-125.96	13.4	4.9	3.2	0.1	4.1	19.5	133.5
1	8392	TIMBERWEST FOREST LIMITED	50.41	-125.61	17.1	11.4	10.7	0.1	2.0	5.1	122.4

Emissions by Region and Source											
Region	Permit	Facility	Lat.	Lon.	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
1	8395	TIMBERWEST FOREST LIMITED	50.24	-125.36	0.5	0.3	0.3	0.0	0.1	0.1	3.5
1	8405	PACIFIC FOREST PRODUCTS LIMITED	49.79	-126.49	7.7	5.2	4.8	0.0	0.9	2.3	55.3
1	8492	INTERNATIONAL FOREST PRODUCTS LIMITED	50.04	-127.17	34.2	22.8	21.3	0.1	4.1	10.2	244.8
1	8534	C AND C LATH MILL LTD.	48.77	-123.71	35.9	14.3	7.2	0.0	0.0	0.0	0.0
1	8535	UPLAND READY MIX LTD.	50.04	-125.27	2.2	1.1	0.3	0.0	0.0	0.0	0.0
1	8596	DUNCAN ELECTRIC MOTOR LTD.	48.76	-123.61	0.1	0.1	0.1	0.0	0.1	0.2	0.0
1	8661	ADWOOD MANUFACTURING LTD.	48.91	-123.73	24.2	10.8	5.5	0.0	2.6	0.5	0.5
1	8830	NATIONAL SILICATES LIMITED	49.31	-124.26	0.1	0.1	0.1	0.0	1.6	0.1	0.3
1	8833	I & J LOGGING LTD.	50.08	-125.31	17.3	6.9	3.5	0.0	0.0	0.0	0.0
1	8839	R AND E PAVING LTD.	49.18	-124.74	0.5	0.0	0.0	0.0	0.1	0.1	0.2
1	8867	TIMBERWEST FOREST LIMITED	50.36	-124.47	4.6	3.0	2.8	0.0	0.5	1.4	32.7
1	9004	CANADIAN FOREST PRODUCTS LIMITED	50.52	-126.99	9.8	6.5	6.1	0.0	1.2	2.9	69.8
1	9082	CHEMAINUS FOREST PRODUCTS LTD.	48.91	-123.73	9.7	3.9	1.9	0.0	0.0	0.0	0.0
1	10699	DUBOIS ENTERPRISES	50.13	-125.24	0.5	0.3	0.3	0.0	0.1	0.1	3.5
1	10837	PLENK'S WOOD CENTRE LTD.	48.91	-123.74	13.4	8.2	4.8	0.2	0.7	3.5	25.4
1	11165	LAFARGE CONCRETE A DIVISION OF LAFARGE CANADA INC.	49.20	-124.00	0.1	0.0	0.0	0.0	0.0	0.0	0.0
1	11205	INTERNATIONAL FOREST PRODUCTS LIMITED	49.42	-126.31	5.7	3.8	3.5	0.0	0.7	1.7	40.5
1	11396	EDGE GRAIN FOREST PRODUCTS LTD.	50.20	-126.62	1.0	0.7	0.6	0.0	0.1	0.3	7.0
1	11493	INTERNATIONAL FOREST PRODUCTS LIMITED	50.41	-125.55	11.4	7.6	7.1	0.0	1.4	3.4	81.6
1	11550	TIMBERWEST FOREST LIMITED	50.52	-126.88	21.5	14.4	13.4	0.1	2.6	8.3	154.2
1	11587	MAYO FOREST PRODUCTS LTD.	49.16	-123.92	29.6	11.8	5.9	0.0	0.0	0.0	0.0
1	11803	REMAC FOREST PRODUCTS LIMITED	48.97	-124.90	4.9	3.3	3.0	0.0	0.6	1.5	34.9
1	11847	TIMBERWEST FOREST LIMITED	50.06	-127.05	5.7	3.8	3.6	0.0	0.7	1.7	40.8
1	12013	WESTERN FOREST PRODUCTS LIMITED	50.72	-125.48	27.4	18.3	17.1	0.1	3.3	8.2	196.0
1	12154	INTERNATIONAL FOREST PRODUCTS LIMITED	51.03	-126.44	17.1	11.4	10.7	0.1	2.0	5.1	122.4
1	12283	HIGHLAND MILLS LTD.	50.20	-126.46	3.4	2.3	2.1	0.0	0.4	1.0	24.4
1	12287	SHUSHARTIE LOGS SALES LTD.	51.02	-127.30	3.7	2.4	2.3	0.0	0.4	1.1	26.2
1	12394	HUB CITY PAVING LTD.	49.20	-124.07	0.5	0.0	0.0	0.0	0.2	0.3	0.6
1	12634	CUMBERLAND READY-MIX LTD.	49.63	-125.02	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	12661	REBCO WOOD PRODUCTS LTD.	49.26	-124.76	15.9	6.9	3.4	0.1	8.7	1.2	1.7
1	12672	TIMBERWEST FOREST LIMITED	50.42	-125.17	5.4	3.1	1.0	0.0	0.0	1.8	0.0
1	12740	OCEAN CONSTRUCTION SUPPLIES LIMITED	49.19	-123.95	0.3	0.1	0.0	0.0	0.0	0.0	0.0
1	12741	LAFARGE CANADA INC.	49.68	-124.97	0.7	0.6	0.2	0.0	0.0	0.0	0.0
1	12765	HYLAND PRECAST INC.	49.64	-125.01	0.1	0.0	0.0	0.0	0.0	0.0	0.0
1	12790	TOZAN CULTURAL SOCIETY	49.16	-123.97	0.4	0.2	0.1	0.0	0.1	2.7	9.3
1	12850	COURTENAY CONCRETE PRODUCTS LTD.	49.67	-125.01	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Emissions by Region and Source											
Region	Permit	Facility	Lat.	Lon.	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
1	12982	COMPTON- ELIZABETH KATHLEEN	48.87	-123.67	7.3	4.9	4.6	0.0	0.9	2.2	52.4
1	12989	ARC ASPHALT RECYCLING CORP.	48.46	-123.48	1.8	0.0	0.0	0.1	0.7	0.4	0.5
1	13036	ARROWSMITH CONCRETE LTD.	49.31	-124.52	0.1	0.0	0.0	0.0	0.0	0.0	0.0
1	13210	SALTAIR TIMBER PRODUCTS LTD.	48.91	-123.75	49.0	22.5	10.5	0.0	2.9	4.4	0.6
1	13257	DOMAN FOREST PRODUCTS LIMITED	48.91	-123.74	14.2	5.8	3.0	0.1	16.0	0.4	3.2
1	13287	INTERNATIONAL FOREST PRODUCTS LIMITED	50.97	-127.03	1.2	0.8	0.7	0.0	0.1	0.4	8.4
1	13312	DOLAN'S CONCRETE LTD.	49.24	-124.80	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	13316	WEE TREE LUMBER CO. LTD.	48.95	-123.78	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	13416	BEDROCK REDI-MIX LTD.	50.00	-123.83	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	13654	OCEAN CONSTRUCTION SUPPLIES LIMITED	48.27	-123.23	0.1	0.1	0.1	0.0	0.0	0.0	0.0
1	13742	BILL SMITH FOREST PRODUCTS LTD.	48.91	-123.74	4.6	2.0	0.9	0.0	0.9	0.3	0.2
1	13743	S.P.C.A. PARKSVILLE/QUALICUM BEACH BRANCH	49.31	-124.37	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	13748	COWICHAN LAKE CONCRETE LTD.	48.82	-124.02	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	13989	NAPRO BIOTHERAPEUTICS (CANADA) INC.	48.34	-123.26	0.0			0.0	0.0	0.1	0.0
1	14038	PRITAM HOLDINGS LTD.	48.91	-123.74	6.0	2.4	1.2	0.0	0.0	0.0	0.0
1	14416	JEMICO ENTERPRISES LTD.	48.91	-123.75	2.0	0.8	0.4	0.0	0.0	0.0	0.0
1	14422	DUKE POINT REMAN LTD.	49.15	-123.88	9.6	3.9	1.9	0.0	0.0	0.0	0.0
1	14425	MID-ISLAND REMAN INC.	49.14	-123.88	3.5	3.0	2.5	0.0	6.4	0.4	1.3
1	14452	COULSON MANUFACTURING LTD.	49.12	-124.48	13.7	5.5	2.7	0.0	0.0	0.0	0.0
1	14508	AQUILA CEDAR PRODUCTS LTD.	49.31	-124.32	8.1	3.2	1.6	0.0	0.0	0.0	0.0
1	14614	HECATE LOGGING LTD.	49.93	-127.07	29.6	19.8	18.5	0.1	3.5	8.9	212.2
1	14752	TIMBERWEST FOREST LIMITED	50.47	-128.98	11.4	7.6	7.1	0.0	1.4	3.4	81.6
1	14876	C MOKKO MANUFACTURING LTD.	49.96	-126.82	1.0	0.7	0.6	0.0	0.1	0.3	7.0
1	15003	FAMILY PET SERVICES LTD.	48.82	-123.67	0.1	0.1	0.1	0.0	0.1	0.0	0.0
1	15560	INTERNATIONAL FOREST PRODUCTS LIMITED	49.17	-125.72	5.7	3.8	3.6	0.0	0.7	2.2	40.8
1	15662	COMOX VALLEY ANIMAL HOSPITAL	49.69	-124.97	0.1	0.1	0.1	0.0	0.0	0.0	0.0
1	16377	HUB CITY PAVING LTD.	49.19	-124.76	0.9	0.0	0.0	0.0	0.3	0.5	1.2
1	16406	WEBB, KYLE	48.76	-123.72	0.4	0.0	0.0	0.0	0.2	0.3	0.6
2	1647	WESTERN PULP INC.	49.67	-123.25	777.8	708.1	552.7	415.3	710.4	160.9	2508.3
2	1835	CONTINENTAL POLE LTD.	50.32	-122.71	9.7	5.3	3.9	0.1	0.8	8.8	104.0
2	2061	INTERNATIONAL FOREST PRODUCTS LIMITED	49.70	-123.15	99.4	39.8	19.9	0.0	0.0	0.0	0.0
2	2328	JACK CEWE LIMITED	49.78	-124.21	1.2	1.2	1.1	1.1	17.1	1.2	3.7
2	2757	INTERNATIONAL FOREST PRODUCTS LIMITED	49.20	-122.65	52.2	23.7	11.5	1.3	5.9	18.1	208.2
2	3095	HOWE SOUND PULP AND PAPER LIMITED	49.52	-123.49	365.2	232.1	171.0	708.4	974.1	199.9	2886.1
2	3149	PACIFICA PAPERS INC.	49.87	-124.56	843.1	486.9	431.2	1116.1	2022.6	935.3	11340.2
2	3260	SWANSON'S READY-MIX LTD.	49.50	-123.74	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Emissions by Region and Source												
Region	Permit	Facility	Lat.	Lon.	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO	
2	3394	YOUNG LIFE OF CANADA	50.16	-123.85	0.4	0.3	0.2	0.1	0.2	0.2	0.6	
2	3969	B.A. BLACKTOP LIMITED	49.86	-124.50	0.2	0.0	0.0	0.0	0.1	0.2	0.4	
2	4397	CAMP ARTABAN SOCIETY	49.48	-123.35	0.8	0.3	0.2	0.0	0.1	0.0	0.0	
2	5030	ALPINE PAVING 1978 LTD.	49.73	-123.13	0.6	0.0	0.0	0.0	0.2	0.4	0.8	
2	5077	CARDINAL CONCRETE LTD.	49.73	-123.12	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
2	5789	BOYS AND GIRLS CLUB OF GREATER VANCOUVER	49.58	-123.32	0.1	0.0	0.0	0.0	0.0	0.1	0.1	
2	6068	CRANBERRY CONSTRUCTION SERVICES LTD.	49.83	-124.52	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	6431	CARDINAL CONCRETE LTD.	50.09	-123.03	0.1	0.1	0.0	0.0	0.0	0.0	0.0	
2	6733	COLUMBIA BITULITHIC LIMITED	49.19	-121.76	0.6	0.0	0.0	0.0	0.2	0.3	0.8	
2	6815	OSPREY MINING AND EXPLORATION	49.94	-123.41	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
2	6895	SWANSON'S READY-MIX LTD.	49.62	-123.98	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	7391	ACTION HOLDINGS LTD.	50.12	-122.97	1.3	0.0	0.0	0.1	0.5	0.8	1.7	
2	7720	SUN COAST PAVING LTD.			0.1	0.0	0.0	0.0	0.0	0.0	0.1	
2	8166	RAISIO CHEMICALS CANADA INC.	49.69	-123.16	0.4	0.4	0.4	0.1	9.4	0.5	2.0	
2	8428	TIMBER WEST FOREST COMPANY	49.74	-123.89	1.3	0.9	0.8	0.0	0.2	0.4	9.4	
2	8606	BAYSIDE SAWMILLS LTD.	49.50	-123.49	35.8	14.3	7.2	0.0	0.0	0.0	0.0	
2	8924	C.R.B. LOGGING CO. LTD.	50.52	-123.01	7.3	4.9	4.6	0.0	0.9	2.2	52.4	
2	8972	CAMP FIRCOM SOCIETY OF THE UNITED CHURCH OF CANADA	49.45	-123.34	0.2	0.1	0.0	1.1	0.2	0.1	0.2	
2	11210	MARTENS ASPHALT LTD.	49.20	-121.95	1.8	0.0	0.0	0.1	0.7	1.1	2.4	
2	11308	A. J. CARSTEN COMPANY LTD.	49.98	-124.71	2.8	2.6	2.2	0.0	0.0	0.0	0.0	
2	12736	FIEDLER BROS. CONTRACTING LTD.	49.42	-123.52	14.8	9.8	9.2	0.1	1.8	5.7	105.8	
2	12823	COASTAL MOUNTAIN EXCAVATIONS LTD.	50.17	-122.88	342.0	228.0	213.1	1.2	40.8	132.0	2448.0	
2	13397	INTERNATIONAL FOREST PRODUCTS LIMITED	51.02	-126.72	7.3	4.9	4.6	0.0	0.9	2.2	52.4	
2	13501	INTERNATIONAL FOREST PRODUCTS LIMITED	49.71	-123.54	22.6	15.0	14.1	0.1	2.7	8.7	161.6	
2	14243	IMPERIAL PAVING LIMITED	49.03	-122.41	2.7	0.0	0.0	0.3	2.2	3.4	7.5	
2	14309	ADAMS CONCRETE LTD.	49.84	-124.52	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	14450	GRANDVIEW BLACKTOP LTD.	49.02	-122.44	2.6	0.0	0.0	0.1	1.0	1.6	3.4	
2	14532	BRITISH COLUMBIA HYDRO AND POWER AUTHORITY	49.72	-123.53	9.4	6.2	5.8	0.0	1.1	2.8	67.1	
2	14835	HALRAY LOGGING LTD.	50.84	-123.00	3.9	2.6	2.4	0.0	0.5	1.2	27.9	
2	14987	CARDINAL CONCRETE LTD.	49.72	-123.15	2.2	1.2	0.3	0.0	1.8	0.1	0.4	
2	15644	ALBETH CONTRACTING LTD.	50.34	-122.81	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	15850	WESTCOAST ENERGY INC. (Centra Gas)	49.51	-123.50	11.2	11.2	11.2	0.5	35.6	13.6	95.3	
2	16115	P. & R. READY MIX LTD.	49.78	-124.45	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	16350	SHELL CANADA PRODUCTS LIMITED	49.40	-123.51	0.0			0.0	0.0	2.5	0.0	
3	1513	WEYERHAEUSER CANADA LTD.	51.58	-119.76	390.6	233.9	163.2	2.8	48.4	293.6	3810.2	
3	1517	WEYERHAEUSER CANADA LTD.	50.69	-120.42	1373.0	5.2	3.2	46.1	1350.2	213.5	4160.7	

Emissions by Region and Source											
Region	Permit	Facility	Lat.	Lon.	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
3	1541	SIMILCO MINES LTD	49.35	-120.55	144.5	96.6	31.8	0.0	0.0	0.0	0.0
3	1557	HIGHLAND VALLEY COPPER CORPORATION	50.46	-121.03	418.0	211.7	62.0	60.7	59.0	1.1	14.8
3	1775	CROWN PACKAGING LTD.	49.88	-119.44	410.1	308.4	114.4	0.0	11.4	0.5	2.8
3	1797	B.C. GAS INCORPORATED	50.75	-120.80	7.3	7.3	7.3	0.3	157.2	3.6	62.8
3	1798	BC GAS INC.	49.96	-120.92	7.3	0.5	0.5	0.3	157.4	3.6	62.9
3	1808	PACIFIC ABRASIVES AND SUPPLY INC.	49.01	-118.46	130.8	0.0	0.0	0.0	0.0	0.0	0.0
3	1846	WEYERHAEUSER CANADA LTD.	49.47	-120.49	82.6	40.4	16.9	0.2	30.2	14.2	6.0
3	1847	WEYERHAEUSER CANADA LTD.	49.33	-119.55	148.5	67.4	29.6	0.1	15.1	15.2	3.0
3	1894	LAFARGE CANADA INC.	50.66	-120.07	132.4	105.9	37.4	59.7	318.0	4.0	15.2
3	1907	ARMSTONG PELLET INC.	50.45	-119.20	31.8	12.7	6.4	0.0	0.1	0.0	0.0
3	1916	GREENWOOD FOREST PRODUCTS LTD.	49.48	-119.60	24.6	9.9	4.9	0.0	0.0	0.0	0.0
3	1937	FEDERATED CO-OPERATIVES LIMITED	50.76	-119.21	157.3	71.6	38.6	0.6	13.4	63.1	688.1
3	1945	TOLKO INDUSTRIES LTD.	50.23	-119.10	111.4	52.1	27.2	0.4	7.9	46.3	464.1
3	1951	POPE AND TALBOT LTD.	49.03	-118.44	121.4	62.0	27.3	0.4	72.7	13.2	14.5
3	1952	POPE AND TALBOT LTD.	49.01	-118.82	156.1	72.8	31.0	0.1	15.6	19.5	3.1
3	1973	AINSWORTH LUMBER CO.LTD	51.99	-121.12	157.0	85.6	61.2	2.1	23.2	234.8	2763.1
3	1996	WESTAR TIMBER LIMITED	50.97	-118.74	175.6	91.5	63.5	2.0	20.2	222.7	2632.3
3	2001	TOLKO INDUSTRIES LTD.	50.06	-120.47	235.9	122.2	72.3	1.8	18.4	211.5	2333.6
3	2011	RIVERSIDE FOREST PRODUCTS LIMITED	50.23	-119.03	482.8	247.8	165.0	1.7	21.5	194.7	2228.5
3	2019	INTERIOR SOFTWOOD RECOVERIES LTD. & 582912 B.C. LTD.	50.24	-118.97	64.9	29.3	13.0	0.0	7.1	6.4	1.4
3	2026	SCHMIDT- R.V.	50.23	-119.02	24.3	12.5	4.1	0.0	7.4	1.8	1.5
3	2082	RIVERSIDE FOREST PRODUCTS LTD	49.90	-119.50	396.8	213.5	114.9	29.7	267.3	68.7	729.0
3	2122	GORMAN BROS. LUMBER LTD.	49.82	-119.65	63.4	38.5	21.8	1.1	5.2	17.2	183.1
3	2258	WELCO MANAGEMENT SERVICES LTD.	49.03	-118.43	531.5	288.0	116.4	1.1	9.8	0.6	15.3
3	2280	CONTINENTAL LIME LTD.	50.82	-121.65	103.4	13.5	1.7	0.7	109.8	5.8	21.9
3	2340	WESTERN STAR TRUCK INC.	49.92	-119.39	205.2	146.6	117.5	34.0	510.8	114.3	111.1
3	2410	ASPEN PLANERS LTD.	50.11	-120.79	13.5	7.4	2.7	0.0	6.2	3.8	1.2
3	2412	ARDEW WOOD PRODUCTS LTD.	50.11	-120.79	14.1	7.1	2.8	0.0	3.6	2.8	0.7
3	2414	ASPEN PLANERS LTD.	50.10	-120.78	78.6	32.2	16.3	0.1	10.3	0.5	2.1
3	2455	OK BUILDERS SUPPLIES LIMITED	50.02	-119.42	0.1	0.0	0.0	0.0	0.0	0.0	0.0
3	2524	TOLKO INDUSTRIES LTD.	50.84	-120.28	300.8	241.2	220.8	0.2	33.3	1.1	6.7
3	2573	FEDERATED CO-OPERATIVES LIMITED	50.75	-119.22	147.7	60.7	29.5	0.5	2.3	9.9	78.8
3	2717	RIVERSIDE FOREST PRODUCTS (ARMSTRONG)	50.39	-119.22	188.2	95.5	37.8	6.1	27.9	56.2	984.1
3	2719	B.A. BLACKTOP LIMITED	50.67	-120.32	3.3	0.0	0.0	0.1	0.6	4.4	2.0
3	2743	PRINCETON- TOWN OF	49.47	-120.50	1.0	0.7	0.6	0.0	0.1	0.3	7.0
3	3013	KELOWNA ELECTROPLATING LTD.	49.86	-119.57	25.9	10.4	5.2	0.0	0.0	0.0	0.0

Emissions by Region and Source												
Region	Permit	Facility	Lat.	Lon.	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO	
3	3022	WEYERHAEUSER CANADA LTD.	50.69	-120.39	115.1	52.4	23.7	0.3	42.8	12.6	8.6	
3	3024	ROGERS FOODS LTD.	50.38	-119.24	6.7	2.2	0.7	0.0	0.0	0.0	0.0	
3	3066	MABEL LAKE SHINGLE LIMITED	50.56	-119.14	4.6	1.9	0.9	0.0	0.0	0.0	0.0	
3	3102	WESTLAKE PAVING AND AGGREGATES LTD.	49.87	-119.57	0.1	0.0	0.0	0.1	0.7	1.1	2.4	
3	3106	SURE CROP FEEDS (1986) LTD	50.63	-119.13	120.1	30.2	2.9	0.0	1.5	0.1	0.3	
3	3122	TOLKO INDUSTRIES LTD.	51.14	-120.12	316.8	169.4	111.3	3.4	36.5	387.5	4436.7	
3	3124	SLOCAN FOREST PRODUCTS LTD.	51.58	-119.74	231.4	129.3	80.4	2.5	23.0	218.2	2394.4	
3	3186	CONSUMERS PACKAGING INC.	50.23	-119.09	71.5	65.8	58.6	298.6	372.6	46.6	0.0	
3	3446	INTERNATIONAL FOREST PRODUCTS LIMITED	50.96	-119.69	193.5	99.6	60.8	1.6	20.7	185.3	2069.6	
3	3483	WESTLAKE PAVING AND AGGREGATES LTD.	50.41	-119.20	0.4	0.0	0.0	0.1	0.5	0.8	1.8	
3	3610	SUN-RYPE PRODUCTS LIMITED	49.89	-119.48	0.3	0.3	0.3	0.0	7.1	0.3	1.7	
3	3680	OK BUILDERS SUPPLIES LIMITED	50.27	-119.27	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
3	3682	OK BUILDERS SUPPLIES LIMITED	49.90	-119.49	0.1	0.1	0.0	0.0	0.0	0.0	0.0	
3	3683	OK BUILDERS SUPPLIES LIMITED	49.90	-119.40	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
3	3708	OK BUILDERS SUPPLIES LIMITED	49.48	-119.58	2.7	1.8	0.7	0.0	0.7	0.0	0.1	
3	3848	OKANAGAN AGGREGATES LTD.	50.41	-119.20	1.2	0.0	0.0	0.1	0.5	0.7	1.6	
3	3911	AINSWORTH LUMBER CO. LTD	50.76	-120.81	66.1	32.5	15.4	0.0	5.3	3.1	1.1	
3	4068	KELOWNA READY-MIX INC.	49.89	-119.49	0.1	0.1	0.0	0.0	0.2	0.0	0.0	
3	4086	PETERS BROS. PAVING 1981 LTD.	49.51	-119.64	2.4	0.0	0.0	0.1	0.7	1.1	1.5	
3	4215	AINSWORTH LUMBER CO.LTD	52.56	-121.06	362.7	209.8	145.6	5.5	48.5	500.6	5829.3	
3	4230	KEE-PEE LAMINATING LTD.	49.48	-119.56	9.2	3.7	1.8	0.0	0.0	0.0	0.0	
3	4517	OK BUILDERS SUPPLIES LIMITED	50.69	-120.33	0.1	0.1	0.0	0.0	0.0	0.0	0.0	
3	4545	MIGHTY WHITE DOLOMITE LIMITED	49.06	-119.00	72.2	36.8	10.8	0.0	0.0	0.0	0.0	
3	4549	AINSWORTH LUMBER CO.LTD			20.5	13.7	12.8	0.1	2.4	6.1	146.8	
3	4574	LYTTON LUMBER LTD.	50.20	-121.58	27.6	15.4	9.6	0.3	3.6	34.8	384.6	
3	4650	KELOWNA READY-MIX INC.	49.87	-119.58	0.1	0.1	0.0	0.0	0.3	0.0	0.1	
3	4659	BRITISH COLUMBIA HYDRO AND POWER AUTHORITY	50.24	-121.58	0.4	0.4	0.4	0.4	5.5	0.4	1.2	
3	4697	NORTH ENDERBY TIMBER LTD.	50.58	-119.15	22.2	9.8	5.6	0.1	0.9	9.4	111.2	
3	4719	ASHLAND CHEMICAL	50.02	-119.40	0.6	0.4	0.4	3.7	11.3	0.9	1.9	
3	4723	MIDVALLEY CONSTRUCTION LIMITED	49.87	-119.59	1.7	0.0	0.0	0.1	0.6	1.0	2.2	
3	4787	CANTEX ENGINEERING AND CONSTRUCTION CO. LTD.	49.02	-118.43	0.2	0.0	0.0	0.0	0.3	0.7	0.4	
3	5093	INTERNATIONAL FOREST PRODUCTS LIMITED	50.98	-119.72	7.2	4.8	4.5	0.0	0.9	2.8	51.6	
3	5190	KAMLOOPS SCRAP IRON LTD.	50.71	-120.37	1.3	1.3	1.3	0.0	0.7	0.0	0.1	
3	5225	NESTE CANADA INC.	50.71	-120.36	0.1	0.1	0.1	0.0	1.3	0.1	12.5	
3	5362	MALAKWA ENTERPRISES LTD.	51.00	-118.69	22.8	12.5	9.1	0.1	1.1	12.5	147.9	
3	5436	MARDAN ENTERPRISES LTD	50.55	-119.13	0.5	0.3	0.3	0.0	0.1	0.1	3.5	

Emissions by Region and Source												
Region	Permit	Facility	Lat.	Lon.	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO	
3	5499	DAWSON CONSTRUCTION LIMITED	50.62	-120.32	3.1	0.0	0.0	0.1	0.6	0.9	7.9	
3	5569	SIMILCO MINES LTD	49.20	-120.32	67.7	34.5	10.2	0.0	0.0	0.0	0.0	
3	5596	UNITED GRAIN GROWERS LTD.	50.40	-119.22	32.7	5.7	1.3	0.1	20.9	1.2	4.3	
3	5612	KOHLER LTD	50.40	-119.22	183.5	140.2	49.5	0.0	0.0	0.0	0.0	
3	5730	OLIVER READI-MIX LIMITED	49.16	-119.55	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	5909	OSOYOOS READY MIX LIMITED	49.02	-119.47	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	5932	PETERS BROS. PAVING 1981 LTD.			4.7	0.0	0.0	0.2	1.6	4.8	1.9	
3	6035	SUMMERLAND READI-MIX LTD.	49.59	-119.68	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
3	6089	EMIL ANDERSON CONSTRUCTION CO. LTD.			0.9	0.0	0.0	0.0	0.3	0.5	1.2	
3	6136	OK BUILDERS SUPPLIES LIMITED	50.26	-119.31	0.7	0.2	0.1	0.1	20.1	1.1	4.0	
3	6137	OK BUILDERS SUPPLIES LIMITED	49.59	-119.68	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
3	6319	M AND K READY MIX LTD.	50.25	-119.26	0.1	0.1	0.0	0.0	0.0	0.0	0.0	
3	6387	GRAND FORKS CONSTRUCTION SERVICES LTD.	49.03	-118.48	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	6484	CITC TIMBER CORP	50.89	-118.87	6.0	3.3	2.4	0.0	0.3	3.3	39.0	
3	6552	TILBURY CEMENT LIMITED	50.68	-120.29	3.0	1.5	0.4	0.0	0.0	0.0	0.0	
3	6578	MAAX WESTCO INC	50.36	-119.29	97.3	86.8	51.3	0.0	0.0	0.0	0.0	
3	6581	MCLEOD'S BY-PRODUCTS 1978 LTD.	50.38	-119.28	0.2	0.2	0.2	0.0	4.7	0.2	1.2	
3	6685	PETERS BROTHERS CONSTRUCTION LIMITED			0.3	0.0	0.0	0.0	0.1	0.2	0.4	
3	6785	CENTRAL ELECTRIC MOTOR REWIND	49.88	-119.45	0.5	0.5	0.4	1.7	2.5	0.2	0.0	
3	7041	PENTICTON FOUNDRY LIMITED	49.48	-119.57	124.9	106.2	37.5	0.0	0.0	0.0	31.7	
3	7193	SUMMERLAND FOREST PRODUCTS LTD.	49.59	-119.68	34.9	14.0	7.0	0.0	0.0	0.0	0.0	
3	7198	F.T. FIBERTECH LIMITED	50.35	-119.26	40.3	31.0	11.4	0.0	0.0	0.0	0.0	
3	7248	RIVERSIDE FOREST PRODUCTS (SODA CREEK) LIMITED	50.75	-121.20	6.5	2.9	1.6	0.1	11.7	0.6	2.4	
3	7425	HOLLCAN MILLWORKS LTD.	50.97	-118.74	10.0	4.0	2.0	0.0	0.0	0.0	0.0	
3	7428	MOLY-COP CANADA LTD	50.66	-120.32	1.0	0.8	0.5	0.2	44.9	0.9	11.2	
3	7472	SOUTH OKANAGAN CONCRETE PRODUCTS LTD.	49.04	-119.50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	7474	CANWOOD FURNITURE FACTORY INC.	49.49	-119.60	18.9	15.4	11.8	0.6	2.7	77.9	95.3	
3	7610	CAMPION MARINE INC.	49.92	-119.40	45.1	42.4	35.2	0.0	0.0	0.0	0.0	
3	7612	HOMESTAKE CANADA INC. - NICKEL PLATE MINE	49.22	-120.01	3.7	2.0	0.7	0.2	3.9	0.3	0.8	
3	7798	KON KAST PRODUCTS LTD.	49.92	-119.45	0.2	0.1	0.0	0.0	1.4	0.1	0.3	
3	7833	INLAND COASTAL CEDAR PRODUCTS (1991) LTD.	50.67	-119.24	9.0	3.6	1.8	0.0	0.0	0.0	0.0	
3	7839	SICAMOUS SAND AND GRAVEL	50.78	-119.00	7.5	3.8	1.1	0.0	0.0	0.0	0.0	
3	7899	348975 B.C. LTD.	50.45	-119.19	9.0	8.3	6.2	0.0	0.0	0.0	0.0	
3	7908	SEAWARD MECHANICAL	51.24	-118.95	14.6	9.8	9.1	0.1	1.7	4.4	104.8	
3	8141	LAKESIDE TIMBER LTD.	50.78	-119.33	73.4	39.7	28.5	1.0	9.9	108.7	1284.4	
3	8142	SALMON ARM READY MIX LTD.	50.69	-119.32	0.1	0.0	0.0	0.0	0.0	0.0	0.0	

Emissions by Region and Source												
Region	Permit	Facility	Lat.	Lon.	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO	
3	8529	NORGAARD READY-MIX LTD.	50.71	-120.33	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
3	8630	NORGAARD READY-MIX LTD.	50.71	-121.28	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
3	8631	WESTERN INDUSTRIAL CLAY PRODUCTS LTD.	50.68	-120.32	107.0	84.0	66.8	0.2	33.5	1.8	6.7	
3	8684	GABLE CONSTRUCTION LTD.			4.8	0.0	0.0	0.2	1.8	2.8	6.2	
3	8689	SICAMOUS CUSTOM SAWING	50.81	-119.00	7.3	4.9	4.6	0.0	0.9	2.2	52.4	
3	8890	DAVIS LAKE CEDAR LTD.	50.87	-119.60	5.1	2.8	2.0	0.1	0.7	8.0	95.1	
3	8892	SALMON ARM PAVING 1977 LTD.	50.88	-119.31	1.9	0.0	0.0	0.1	0.4	0.3	0.4	
3	9094	MILESTONE WOOD PRODUCTS INC.	50.41	-119.23	23.7	10.4	5.1	0.2	0.9	3.2	31.1	
3	10575	SICAMOUS SHAKE	50.96	-118.75	0.4	0.2	0.2	0.0	0.1	0.7	8.0	
3	10727	CAMBIE CEDAR PRODUCTS LTD.	50.88	-118.92	7.4	4.0	2.9	0.1	1.1	11.6	136.5	
3	10960	MAX VEOTS COFFEE ROASTING LTD	50.28	-119.22	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
3	10965	OKANAGAN AGGREGATES LTD.	51.00	-120.00	0.4	0.0	0.0	0.0	0.2	0.2	0.5	
3	11095	MOUNTAIN VIEW PET CREMATORIUM	49.48	-119.56	0.4	0.3	0.3	0.0	0.0	0.0	0.1	
3	11149	GOODE INDUSTRIES INC.	50.52	-119.83	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
3	11295	GAMBRINUS MALTING CORPORATION	50.40	-119.22	4.2	1.1	0.3	0.0	0.5	0.0	0.1	
3	11346	PAUL CREEK SLICING LTD.	50.71	-120.33	0.0	0.0	0.0	0.0	0.2	0.0	0.0	
3	12008	CANTEX ENGINEERING AND CONSTRUCTION CO. LTD.	49.28	-119.33	0.7	0.0	0.0	0.0	0.3	0.4	0.9	
3	12674	CON-ROCK REDI-MIX LTD.	49.29	-119.36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	12769	PARAGON VENTURES LTD.	50.63	-119.13	11.0	5.3	2.2	0.0	2.6	1.6	0.5	
3	12775	NORTHERN LITE MFG LTD.	49.91	-119.40	12.0	12.0	4.2	0.0	0.0	0.0	0.0	
3	12795	ABEDA WOOD PRODUCTS	50.02	-119.40	7.5	3.3	1.5	0.0	0.4	0.5	0.1	
3	13054	UNIQUE TIRE RECYCLING (CANADA) INC.	50.66	-120.06	1.1	0.7	0.3	7.4	8.6	0.1	1.3	
3	13075	ENVIROGREEN TECHNOLOGIES	49.35	-120.52	29.0	27.7	16.8	43.3	91.5	7.7	13.2	
3	13286	PRINCETON REDI-MIX (1993) LTD.	49.45	-120.51	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	13291	GIBBS HOLDINGS LTD	49.20	-119.82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	13592	WESTERN CONCRETE PRODUCTS LTD	50.41	-119.20	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
3	13596	PETER'S BROS CONSTRUCTION LTD.			0.7	0.0	0.0	0.0	0.4	0.6	0.5	
3	13693	BIGFOOT INDUSTRIES INC	50.40	-119.22	24.5	20.8	7.3	0.0	0.0	22.8	0.0	
3	13794	PENDOZI MACHINE SHOP LTD	49.86	-119.49	0.1	0.1	0.0	0.4	0.5	0.0	0.0	
3	14235	PETRO-CANADA	49.05	-119.50	0.0			0.0	0.0	2.6	0.0	
3	14256	CITY OF KAMLOOPS	50.68	-120.36	0.3	0.2	0.2	0.0	0.2	0.0	0.0	
3	14269	B LOUGHEED CONTRACTING LTD.			1.8	0.7	0.4	0.0	0.1	0.8	9.8	
3	14299	ORICA CANADA INC.	50.78	-119.35	0.0			0.0	3.3	0.0	3.2	
3	14441	ARMSTRONG READY MIX 1995 LIMITED	50.41	-119.21	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
3	14503	RW BLACKTOP LTD			1.3	0.0	0.0	0.1	0.5	0.8	1.7	
3	14518	SELKIRK PAVING LTD.	49.44	-117.55	2.1	0.0	0.0	0.1	0.8	1.2	2.7	

Emissions by Region and Source											
Region	Permit	Facility	Lat.	Lon.	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
3	14520	OKANAGAN ANIMAL CREMATIONS LIMITED	50.07	-119.38	0.7	0.5	0.4	0.0	0.0	0.0	0.2
3	14546	PETER'S BROS CONSTRUCTION LTD.	50.00	-120.00	1.3	0.0	0.0	0.1	0.5	0.8	1.7
3	14650	PAUL CREEK SLICING LTD	50.70	-120.34	2.5	1.1	0.7	0.0	7.3	0.4	1.5
3	14742	BZ ENTERPRISES LTD.	50.00	-120.00	1.8	0.7	0.4	0.0	0.1	0.8	9.8
3	14760	NORTH ENDERBY TIMBER LTD.	50.58	-119.15	4.7	1.7	1.1	0.7	1.5	0.1	9.1
3	15170	OKANAGAN AGGREGATES LTD.	50.00	-120.00	0.5	0.0	0.0	0.0	0.2	0.3	0.6
3	15575	PETRO-CANADA (PORT MOODY)	49.25	-119.75	0.0			0.0	0.0	1.8	0.0
3	15702	BRENDA PREVOST	50.70	-120.47	0.0	0.0	0.0	0.0	1.4	0.1	0.3
3	15832	ENERTEK PRODUCTS INTERNATIONAL INC.	49.03	-118.15	60.5	51.5	39.7	0.0	0.0	0.0	0.0
3	15945	PETER'S BROS. CONSTRUCTION LTD.	50.02	-119.35	3.9	0.0	0.0	0.2	1.5	2.3	5.1
3	16011	PETERS BROS. CONSTRUCTION LTD.	49.55	-115.76	1.4	0.0	0.0	0.1	0.5	0.1	0.1
3	16028	MEDI-TECK SERVICES	51.20	-120.00	1.2	0.9	0.7	10.4	22.0	0.0	3.2
3	16247	SHELL CANADA PRODUCTS LIMITED	49.46	-119.59	0.0			0.0	0.0	2.6	0.0
3	16435	Okanagan Aggregates Ltd.	50.00	-121.00	1.7	0.0	0.0	0.1	0.7	1.0	2.2
4	1480	DISTRICT OF ELKFORD	50.06	-114.93	2.9	1.9	1.8	0.0	0.3	0.9	20.6
4	1501	FORDING COAL LIMITED	50.19	-114.88	1503.5	1171.7	442.8	1011.2	544.5	388.9	0.0
4	1596	CRESTBROOK FOREST INDUSTRIES LTD.	49.53	-115.76	196.1	120.3	79.2	3.0	13.5	44.6	477.2
4	1671	DISTRICT OF SPARWOOD	49.70	-114.90	28.0	22.1	12.6	0.1	0.9	9.6	113.9
4	1750	J.H. HUSCROFT LIMITED	49.08	-116.47	12.2	6.5	2.4	0.0	2.5	3.1	0.5
4	1756	CRESTBROOK FOREST INDUSTRIES LTD.	49.91	-115.76	1.8	1.2	1.1	0.0	0.2	0.5	12.8
4	1768	STONE VENEPAL (CELGAR) PULP INC.	49.20	-117.45	45.6	30.4	28.4	0.2	5.4	17.6	326.4
4	1793	KALESNIKOFF LUMBER CO. LTD.	49.39	-117.55	6.4	2.5	1.3	0.0	0.0	0.0	0.0
4	1807	ELKVIEW COAL CORPORATION	49.75	-114.87	725.4	507.8	183.9	238.1	142.2	92.2	3.2
4	1842	SLOCAN GROUP	49.77	-117.47	735.5	364.1	239.9	4.5	64.2	281.6	3307.9
4	1854	NU-DAWN RESOURCES INC.	49.14	-117.20	11.1	5.7	1.7	0.0	0.0	0.0	0.0
4	1873	B.A. BLACKTOP LIMITED	49.53	-115.76	1.5	0.0	0.0	0.1	0.4	0.7	0.4
4	1899	ATCO LUMBER LTD.	49.12	-117.54	38.3	21.1	15.3	0.6	6.3	70.0	815.4
4	1935	GALLOWAY LUMBER COMPANY LTD.	49.38	-115.23	80.2	43.4	23.3	0.5	6.9	69.9	702.3
4	1954	SLOCAN GROUP	50.63	-116.09	306.6	166.6	107.0	3.3	34.1	380.3	4298.2
4	1987	ATCO LUMBER LTD.	49.17	-117.50	41.4	19.3	8.3	0.0	8.1	5.2	1.6
4	1997	DOWNIE TIMBER LTD.	50.99	-118.20	439.3	106.2	63.1	1.2	18.5	201.9	2292.6
4	2149	CRESTBROOK FOREST INDUSTRIES LTD.	49.92	-115.76	40.8	36.5	29.8	45.1	426.8	158.3	1810.3
4	2240	JOE KOZEK SAWMILLS LTD.	50.98	-118.17	34.6	19.0	13.8	0.2	1.7	19.0	224.6
4	2267	IMASCO MINERALS INC.	49.26	-116.64	65.8	26.0	7.1	0.0	0.0	0.0	0.0
4	2443	COMINCO LTD.	49.67	-115.96	61.6	31.4	9.2	67.4	35.7	7.1	1.9
4	2574	CRESTBROOK FOREST INDUSTRIES LTD.	49.27	-115.10	498.4	256.1	154.8	4.2	44.3	466.8	5190.5

Emissions by Region and Source											
Region	Permit	Facility	Lat.	Lon.	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
4	2661	EVANS FOREST PRODUCTS LIMITED	51.49	-117.19	43.5	17.4	8.7	0.0	0.0	0.0	0.0
4	2662	EVANS FOREST PRODUCTS LIMITED	51.31	-116.98	147.6	62.0	29.4	3.2	14.4	42.3	506.8
4	2667	KORPACK CEMENT PRODUCTS LIMITED	49.10	-117.73	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	2690	COMINCO LTD.	49.10	-117.73	60.0	44.0	28.2	0.0	0.0	0.0	0.0
4	2691	COMINCO LTD.	49.10	-117.71	169.8	114.6	61.1	1210.0	0.0	0.0	0.0
4	2692	COMINCO LTD.	49.10	-117.72	77.5	71.8	61.2	1876.0	0.0	0.0	0.0
4	2721	SUNSET SEED COMPANY LIMITED	49.09	-116.51	3.8	1.5	0.8	0.0	0.0	0.0	0.0
4	2760	BRISCO WOOD PRESERVERS LTD.	50.82	-116.28	2.2	1.3	0.6	0.0	7.0	1.0	1.4
4	2818	CANADA CEDAR POLE PRESERVERS LIMITED	49.38	-115.23	0.0	0.0	0.0	0.0	0.2	0.0	0.0
4	2825	COLUMBIA BREWING COMPANY	49.11	-116.52	0.3	0.3	0.3	0.0	4.0	0.2	3.4
4	3028	CRESTBROOK FOREST INDUSTRIES LTD.	50.16	-115.81	190.7	90.3	46.2	1.2	5.6	25.9	195.8
4	3039	WYNNDEL BOX & LUMBER COMPANY LIMITED	49.18	-116.56	46.7	33.0	22.9	0.7	3.0	11.4	105.7
4	3080	STONE VENEPAL (CELGAR) PULP INC.	49.34	-117.73	123.5	106.5	83.2	537.2	602.0	168.4	741.7
4	3281	SELKIRK PAVING LTD.	49.45	-117.55	1.7	0.0	0.0	0.1	0.6	1.0	2.2
4	3485	LOUIS SALVADOR AND SON LTD	49.51	-115.77	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	3963	KORPACK CEMENT PRODUCTS LIMITED	49.09	-117.67	0.1	0.0	0.0	0.0	0.0	0.0	0.0
4	3982	GARRETT READY MIX LIMITED	49.67	-114.90	0.1	0.0	0.0	0.0	0.0	0.0	0.0
4	4138	WYNNDEL BOX & LUMBER COMPANY LIMITED	49.17	-116.56	22.8	15.2	14.2	0.1	2.7	6.8	163.3
4	4272	INLAND NATURAL GAS CO. LTD.	49.12	-117.76	0.1	0.1	0.1	0.0	2.5	0.1	0.5
4	4308	REGIONAL DISTRICT OF CENTRAL KOOTENAY	50.27	-117.80	0.9	0.6	0.5	0.0	0.1	0.3	6.3
4	4328	ALBERTA NATURAL GAS CO. LTD.	49.65	-114.72	71.9	71.9	71.9	3.1	1030.7	554.9	392.8
4	4330	ALBERTA NATURAL GAS CO. LTD.	49.28	-115.17	39.5	39.5	39.5	1.7	878.1	694.5	85.2
4	4331	ALBERTA NATURAL GAS CO. LTD.	49.25	-115.85	37.1	37.1	37.1	1.6	160.2	431.1	133.3
4	4423	DOWNIE TIMBER LTD.	50.99	-118.21	1.5	1.0	0.9	0.0	0.2	0.4	10.5
4	4554	NELSON READY MIX CONCRETE LTD.	49.50	-117.27	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	4742	VALLEY BLACKTOP LTD.	51.00	-118.23	0.2	0.0	0.0	0.0	0.1	0.1	0.3
4	4751	FORDING COAL LIMITED	49.51	-114.67	397.8	299.2	110.9	1.2	192.0	10.1	38.4
4	5061	BXL BULK EXPLOSIVES LTD.	50.19	-114.88	0.1	0.1	0.0	7.9	1.1	0.0	0.3
4	5327	KOOTENAY RIVER CONCRETE PRODUCTS LTD.	49.12	-116.52	0.1	0.1	0.0	0.0	0.0	0.0	0.0
4	5352	MANALTA COAL LIMITED	49.88	-114.86	302.3	188.9	58.9	0.0	0.4	0.0	0.1
4	5490	POPE & TALBOT LTD.	49.34	-117.74	294.6	135.1	58.0	0.0	0.0	32.0	0.0
4	5907	MOUNTAIN MINERALS CO. LTD.	51.43	-117.06	28.8	8.0	2.3	0.0	3.3	0.2	0.7
4	6014	MAX HELMER CONSTRUCTION	50.52	-116.03	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	6139	BEAR LUMBER LTD.	49.45	-115.87	6.1	4.1	3.8	0.0	0.7	1.8	44.0
4	6140	BELL POLE COMPANY	50.98	-118.26	2.0	1.3	1.2	0.0	0.2	0.6	14.2
4	6167	BETHLEHEM RESOURCES (1996) CORPORATION	51.63	-118.42	0.0	0.0	0.0	0.0	0.0	0.1	0.1

Emissions by Region and Source											
Region	Permit	Facility	Lat.	Lon.	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
4	6249	FORDING COAL LIMITED	50.08	-114.87	983.2	769.2	296.6	542.8	292.3	208.8	0.0
4	6660	NELSON READY MIX CONCRETE LTD.	49.49	-117.30	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	6760	E.P. NELSON SAWMILLS LIMITED	50.90	-116.36	9.8	6.5	6.1	0.0	1.2	2.9	69.8
4	6906	GOLDEN CONCRETE LTD.	51.31	-116.97	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	7139	SEEL FOREST PRODUCTS LTD.	50.70	-116.12	0.8	0.4	0.1	0.0	0.0	0.3	0.0
4	7186	E.K. ECONOMY PAVING 1981 LTD.	49.51	-115.77	0.1	0.0	0.0	0.0	0.0	0.0	0.1
4	7224	GALLOWAY LUMBER COMPANY LTD.	49.38	-115.23	2.4	1.6	1.5	0.0	0.3	0.7	17.5
4	7340	WEST K CONCRETE LTD	49.23	-117.68	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	7545	SELKIRK PAVING LTD.	49.24	-117.67	1.0	0.0	0.0	0.0	0.4	0.6	1.3
4	7547	JONES TIES AND POLES 1973 LTD.	49.06	-117.85	1.0	0.7	0.6	0.0	0.1	0.3	7.0
4	7621	KORPACK CEMENT PRODUCTS LIMITED	49.26	-117.66	0.1	0.0	0.0	0.0	0.0	0.0	0.0
4	7626	SELKIRK CEDAR AND LUMBER	49.32	-117.62	2.1	0.9	0.4	0.0	0.0	0.0	0.0
4	7728	H. & J. READY MIX	51.00	-118.24	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	7823	MEADOW CREEK CEDAR LTD.	50.20	-116.96	190.7	82.8	46.2	0.3	9.1	63.8	741.7
4	7824	KOOTENAY PACIFIC INDUSTRIAL INC.	49.53	-115.77	0.1	0.1	0.1	0.0	0.0	0.0	0.0
4	8743	ERIE LAKE CEDAR	49.19	-117.33	2.0	1.3	1.2	0.0	0.2	0.6	14.2
4	8954	A.M. CEDAR LTD.	49.47	-117.45	4.0	2.6	2.5	0.0	0.5	1.2	28.4
4	8955	355567 B.C. LTD.	50.98	-118.33	23.8	15.9	14.8	0.1	2.8	9.2	170.3
4	9019	K-C RECYCLING LTD.	49.04	-117.61	0.4	0.4	0.3	0.0	0.0	0.0	0.0
4	10507	KARL BEATTIE CONTRACTING LTD.	51.03	-118.23	4.9	3.3	3.0	0.0	0.6	1.5	34.9
4	10724	HERRIDGE TRUCKING & SAWMILLING LTD.	50.22	-117.78	2.4	1.6	1.5	0.0	0.3	0.7	17.5
4	10836	ATCO LUMBER LTD.	50.22	-117.78	4.9	3.3	3.0	0.0	0.6	1.5	34.9
4	10981	WAPPLE- KENNETH ROBERT	50.20	-116.97	19.9	13.3	12.4	0.1	2.4	6.0	142.5
4	11672	BOARDS BY GEORGE LUMBER CO	50.25	-116.96	1.7	1.1	1.1	0.0	0.2	0.5	12.2
4	11688	REMPLE- HARVEY	50.25	-116.96	3.0	2.0	1.9	0.0	0.4	0.9	21.7
4	11784	KOOTENAY PAVING LTD.	50.47	-115.97	0.8	0.0	0.0	0.0	0.1	0.3	0.2
4	11817	EGGERS FOREST PRODUCTS	49.33	-117.24	4.9	3.3	3.0	0.0	0.6	1.5	34.9
4	11826	MEADOW CREEK CEDAR PRODUCTS	49.14	-116.41	4.0	2.6	2.5	0.0	0.5	1.2	28.4
4	11978	NELSON DISTRICT COMMUNITY RESOURCES SOCIETY	49.58	-117.23	0.7	0.5	0.5	0.0	0.1	0.2	5.2
4	12086	SAVARIE WOOD LTD.	49.49	-115.82	7.3	4.9	4.6	0.0	0.9	2.2	52.4
4	12282	GOOSE CREEK LUMBER LTD.	49.44	-117.55	13.9	5.8	3.2	0.0	0.1	0.3	7.0
4	12498	FINDELL- WALTER D.B.A. FIMAC CEDAR SALES	49.14	-117.26	0.8	0.5	0.5	0.0	0.1	0.2	5.7
4	12914	METRO ENGINEERING AND CONTRACTING LTD.	49.54	-115.75	0.1	0.0	0.0	0.0	0.3	0.2	1.2
4	12948	SELKIRK REMANUFACTURING LTD.	49.32	-117.64	0.1	0.1	0.1	0.0	0.0	0.0	1.0
4	12975	TOXCO WASTE MANAGEMENT LTD.	49.04	-117.61	5.4	4.3	2.4	5.4	0.0	0.0	0.0
4	13070	BC GAS UTILITY LTD.	49.16	-116.34	5.2	5.2	5.2	0.2	41.0	29.6	71.0

Emissions by Region and Source											
Region	Permit	Facility	Lat.	Lon.	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
4	13714	BC SPCA	49.55	-115.74	0.1	0.1	0.1	0.0	0.1	0.0	0.0
4	13730	KOOTENAY WOOD PRESERVERS LTD.	49.26	-115.31	1.5	1.0	0.9	0.0	0.2	0.4	10.5
4	13823	CAMERON'S CONCRETE REDI MIX	49.48	-115.07	4.5	2.3	0.7	0.0	0.0	0.0	0.0
4	14293	CRESCENT VALLEY CEDAR LTD.	49.45	-117.55	0.6	0.3	0.1	0.0	0.0	0.3	3.8
4	14741	WEST KOOTENAY BLACKTOP	49.23	-117.68	0.3	0.0	0.0	0.0	0.1	0.2	0.3
4	15056	POPE & TALBOT LTD.	50.44	-117.90	0.5	0.4	0.3	0.0	0.1	0.2	3.8
4	15649	SELKIRK PAVING LTD.	49.24	-117.67	1.9	0.0	0.0	0.1	0.7	1.1	2.4
4	15734	REVELSTOKE COMMUNITY FOREST CORPORATION	51.04	-118.21	0.4	0.3	0.3	0.0	0.1	0.1	3.1
4	15752	A.M. CEDAR LTD.	49.26	-117.21	7.9	5.3	4.9	0.0	0.9	2.4	56.8
4	15861	PETER KIEWIT SONS CO. LTD.	49.34	-117.76	0.4	0.0	0.0	0.0	0.0	0.0	0.0
4	16122	LAFARGE CANADA INC.	49.34	-117.77	0.7	0.6	0.2	0.0	0.0	0.0	0.0
4	16208	COLUMBIA RIVER SHAKE & SHINGLE LTD.	50.98	-118.30	55.6	37.1	34.6	0.2	6.6	21.5	397.8
5	1548	WEST FRASER MILLS LTD.	52.16	-122.18	186.2	86.4	37.2	0.0	6.0	21.7	1.2
5	1578	CARIBOO PULP AND PAPER COMPANY LIMITED	53.00	-122.49	703.5	528.4	398.6	342.0	696.5	195.4	1212.5
5	1615	WELDWOOD OF CANADA LIMITED	51.65	-121.33	554.7	312.5	180.1	8.2	77.8	549.6	6163.3
5	1764	WELDWOOD OF CANADA LIMITED	52.16	-121.17	389.1	236.2	140.7	4.8	32.0	97.3	756.7
5	2484	RIVERSIDE FOREST PRODUCTS(SODA CREEK) LTD.	52.16	-122.18	203.0	101.1	41.1	0.5	81.1	36.5	16.2
5	2576	QUESNEL WASTE DISPOSAL LTD.	53.00	-122.51	162.4	89.3	65.0	2.3	23.2	255.1	3014.8
5	3250	IMPERIAL OIL	51.65	-121.35	0.0			0.0	0.0	5.0	0.0
5	3283	LIGNUM LIMITED	52.12	-122.14	220.3	119.3	58.5	3.1	15.1	64.8	502.1
5	3339	LITTLE VALLEY FOREST PRODUCTS (1993) LTD.	52.40	-126.50	52.5	28.9	21.0	0.3	2.6	28.9	341.3
5	3679	RIVERSIDE FOREST PRODUCTS (WILLIAMS LAKE) LIMITED	52.12	-122.14	97.9	41.5	22.7	0.0	0.0	21.3	0.0
5	3725	WELDWOOD OF CANADA LIMITED	52.95	-122.49	380.4	205.2	121.7	5.7	212.2	74.1	206.0
5	3803	LINDE BROS. LUMBER LTD.	51.92	-122.12	14.1	7.8	5.7	0.1	0.7	7.8	91.9
5	3849	GENE'S PAVING W.E. BALL	52.16	-122.21	0.1	0.0	0.0	0.0	0.0	0.0	0.1
5	4263	AINSWORTH LUMBER CO.LTD	51.65	-121.37	260.8	154.4	97.4	3.3	26.1	256.1	2814.1
5	4321	DOMAN-WESTERN LUMBER LTD.	51.45	-126.38	10.3	6.8	6.4	0.0	1.2	3.1	73.4
5	4710	BRITISH COLUMBIA HYDRO AND POWER AUTHORITY	52.46	-125.31	9.8	8.9	8.9	9.1	137.4	9.0	29.9
5	4994	CARIBOO REGIONAL DISTRICT	51.39	-121.23	24.0	19.0	10.8	0.1	1.0	11.0	130.0
5	5350	C. & C. WOOD PRODUCTS LTD.	53.01	-122.51	17.4	9.1	4.5	0.3	43.0	4.7	8.6
5	5737	CARIBOO CONSULTANTS LTD.	53.04	-122.40	57.6	31.7	23.0	0.3	2.9	31.7	374.5
5	5804	QUESNEL RIVER PULP COMPANY	53.01	-122.50	0.2	0.2	0.2	0.0	39.9	84.5	33.6
5	5890	BRITISH COLUMBIA HYDRO AND POWER AUTHORITY	52.36	-126.72	16.2	14.8	13.3	38.3	182.1	7.7	44.4
5	6208	DOMAN-WESTERN LUMBER LTD.	51.66	-126.68	25.7	17.1	16.0	0.1	3.1	7.7	183.6
5	6920	H. WILLIAMSON BLACKTOP AND LANDSCAPING LTD	52.00	-122.00	2.3	0.0	0.0	0.1	0.9	1.4	3.0
5	6921	H. WILLIAMSON BLACKTOP AND LANDSCAPING LTD	52.00	-122.00	2.7	0.0	0.0	0.1	0.5	1.0	0.1

Emissions by Region and Source												
Region	Permit	Facility	Lat.	Lon.	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO	
5	7081	EVER-REDI CONCRETE PRODUCTS LTD.	52.99	-122.47	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	7206	LIGNUM LTD. AND RIVERSIDE FOREST PRODUCTS (WILLIAMS LAKE) LTD.	52.12	-122.22	0.7	0.4	0.4	0.0	0.1	0.2	4.8	
5	7512	WEST FRASER MILLS LTD.	53.00	-122.51	505.6	271.6	144.3	5.0	44.0	62.1	120.0	
5	7841	QUEST WOOD PRODUCTS	53.00	-122.50	335.6	207.2	144.7	3.8	632.3	88.0	126.4	
5	7842	EVER-REDI CONCRETE PRODUCTS LTD.	52.13	-122.13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	7844	SLOCAN FOREST PRODUCTS LTD.	53.00	-122.50	245.4	115.9	48.4	0.1	12.1	33.1	2.4	
5	8029	WEST CHILCOTIN FOREST PRODUCTS LTD.	52.41	-125.24	186.1	102.3	74.4	2.7	26.6	292.4	3455.7	
5	8261	B&L BLACKTOP LTD.			0.1	0.0	0.0	0.0	0.0	0.1	0.1	
5	8347	WEST FRASER MILLS LTD.	53.01	-122.51	48.5	19.4	9.7	0.0	0.0	0.0	0.0	
5	8792	CAMEL LAKE FORESTS PRODUCTS LTD.	51.67	-121.22	6.0	2.2	1.4	0.0	0.2	2.7	32.4	
5	8796	WESTECH WOOD PRODUCTS LTD.	52.11	-122.14	8.7	3.5	1.7	0.0	0.0	0.0	0.0	
5	8808	NW ENERGY (WILLIAMS LAKE) LIMITED	52.16	-122.17	9.9	8.9	7.5	30.0	566.0	337.4	589.0	
5	9026	TERRACE PAVING(385191 B.C. LTD.)	53.01	-122.51	2.1	0.0	0.0	0.0	0.3	0.6	0.5	
5	10669	WESTERN FOREST PRODUCTS LTD.	51.71	-127.57	22.8	15.2	14.2	0.1	2.7	8.8	163.2	
5	10984	JACKPINE FOREST PRODUCTS LTD.	52.15	-122.18	77.5	32.6	16.0	0.2	24.9	3.5	5.0	
5	11706	AINSWORTH LUMBER CO. LTD.	51.65	-121.32	320.6	181.7	61.1	31.3	141.8	0.0	4996.5	
5	11853	NAZKO RESOURCE MANAGEMENT LTD.	53.00	-122.52	1.8	0.7	0.4	0.0	0.0	0.0	0.0	
5	12255	BALL- FRED AND GEIER- JERRY	52.16	-122.20	0.0	0.0	0.0	0.0	0.4	0.0	0.1	
5	12259	PAL LUMBER CO. LTD.	52.15	-122.18	6.5	2.6	1.3	0.0	0.0	0.0	0.0	
5	12349	BOURDON- KEVIN	52.48	-122.42	0.7	0.3	0.1	0.0	0.0	0.0	0.3	
5	12474	HARMAN- WILLIAM	51.54	-121.01	0.4	0.3	0.2	0.0	0.0	0.1	2.8	
5	12592	PINNACLE WOOD PRODUCTS LTD.	53.01	-122.51	37.7	15.1	7.5	0.0	0.0	0.0	0.0	
5	12595	HILL & SONS CUSTOM PLANING LTD.	52.15	-122.18	6.7	2.7	1.3	0.0	0.0	0.0	0.0	
5	12869	CHIMNEY CREEK LUMBER CO. LTD.	52.06	-122.12	14.9	6.0	3.0	0.1	0.7	8.2	97.1	
5	12911	IMPERIAL OIL LIMITED			0.0			0.0	0.0	2.5	0.0	
5	12992	WILLIAMS LAKE CEDAR PRODUCTS LTD.	52.16	-122.19	4.9	2.3	1.4	0.1	16.8	1.1	3.4	
5	13296	M.W.Z. LOG PEOPLE LTD.	51.71	-121.33	6.7	2.5	1.6	0.0	0.3	3.1	36.4	
5	13444	WESTPINE FIBREBOARD LTD.	53.01	-122.52	138.4	84.1	38.8	37.7	137.4	0.0	114.5	
5	13680	INTERNATIONAL FOREST PRODUCTS LIMITED	52.04	-127.59	3.4	2.3	2.1	0.0	0.4	1.0	24.5	
5	13758	PINNACLE PELLET INC.	52.87	-122.43	27.3	13.4	5.3	0.0	0.0	0.0	0.0	
5	14271	WEST FRASER MILLS LTD.	52.50	-122.20	2.4	1.6	1.5	0.0	0.3	0.7	17.5	
5	14355	POTTER- JAMES	52.60	-121.50	0.2	0.2	0.2	0.0	0.0	0.1	1.7	
5	14430	IMPERIAL OIL LIMITED			0.0			0.0	0.0	2.6	0.0	
5	14592	MOHAWK OIL CO. LTD.			0.0			0.0	0.0	2.6	0.0	
5	14784	DURFELD LOG CONSTRUCTION LTD.	52.23	-122.09	5.9	3.9	3.6	0.0	0.7	1.8	41.9	
5	14839	SANDERS REDI-MIX LTD.	52.12	-122.13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Emissions by Region and Source											
Region	Permit	Facility	Lat.	Lon.	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
5	14952	WELDWOOD OF CANADA LIMITED	52.99	-122.49	62.1	35.7	13.8	0.1	24.9	17.4	6.2
5	15048	PACIFIC LOG HOMES LTD.	51.33	-121.11	19.2	7.1	4.6	0.1	0.8	8.8	104.0
5	15512	RIVERSIDE FOREST PRODUCTS (SODA CREEK) LIMITED	52.16	-122.18	3.8	1.5	0.8	0.0	0.0	0.0	0.0
5	15600	PETRO-CANADA	52.12	-122.13	0.0			0.0	0.0	2.6	0.0
5	15864	PONT- SHANE DBA CUSTOM WOOD FIBRE PRODUCTS	52.95	-122.45	7.1	2.8	1.4	0.0	0.0	0.0	0.0
5	15871	WESTERN FOREST PRODUCTS LIMITED	52.31	-128.17	14.3	9.5	8.9	0.1	1.7	5.5	102.0
5	16134	JACKPINE ENGINEERED WOOD PRODUCTS INC.	52.16	-122.19	45.6	18.3	9.1	0.0	0.0	0.0	0.0
5	16164	WESTERN FOREST PRODUCTS LIMITED	51.71	-127.57	25.7	17.1	16.0	0.1	3.1	9.9	183.6
6	1543	CANADIAN FOREST PRODUCTS LTD.	54.39	-126.72	841.5	510.5	325.4	11.8	90.0	510.5	5440.0
6	1691	WEST FRASER MILLS LTD.	54.45	-127.09	534.1	261.5	153.5	3.4	42.3	393.4	4376.2
6	1884	REPAP SMITHERS INC	54.75	-127.15	68.1	32.1	14.2	0.1	10.9	8.4	2.2
6	2198	BELL POLE COMPANY	54.52	-128.65	58.5	32.4	23.8	0.8	8.3	89.6	1066.1
6	2288	KENTRON CONSTRUCTION LTD.	54.05	-128.70	0.5	0.0	0.0	0.0	0.2	0.3	0.6
6	2399	THOMPSON CREEK MINING LTD	54.04	-125.10	409.9	409.9	144.7	477.1	0.8	0.0	0.2
6	2527	ALCAN SMELTERS AND CHEMICALS LIMITED	54.02	-128.40	11.5	11.5	6.6	0.7	4.3	0.0	60.5
6	2552	ALCAN SMELTERS AND CHEMICALS LIMITED	54.01	-128.42	1657.5	1066.1	494.3	5449.6	3.1	0.9	14.1
6	2567	CASSIAR MINING CORPORATION	59.29	-129.84	0.5	0.5	0.4	0.5	6.8	0.5	1.5
6	3008	SKEENA SAWMILLS- DIVISION OF WEST FRASER MILLS	54.51	-128.63	238.0	96.3	47.7	0.0	5.4	2.1	1.1
6	3010	SKEENA CELLULOSE INC.	54.51	-128.61	309.8	125.7	62.0	0.0	7.5	3.4	1.5
6	3019	DECKER LAKE FOREST PRODUCTS LIMITED	54.35	-125.92	301.1	165.0	112.1	1.3	18.2	152.4	1691.5
6	3083	EUROCAN PULP AND PAPER CO.	54.04	-128.70	1200.6	893.0	761.2	666.7	682.6	514.9	2227.6
6	3547	SKEENA CELLULOSE INC.	54.24	-130.29	3206.0	1078.3	692.1	1323.2	1435.6	252.3	3404.5
6	3732	L.B. PAVING LTD.	54.76	-127.14	0.6	0.0	0.0	0.0	0.2	0.4	0.8
6	4122	WELDWOOD OF CANADA LIMITED	54.18	-125.49	318.3	169.1	95.8	4.5	33.7	316.4	3479.5
6	4171	KITWANGA LUMBER CO. LTD.	55.11	-128.03	5.8	2.3	1.2	0.0	0.0	0.0	0.0
6	4470	J. S. MCMILLAN FISHERIES LTD.	54.29	-130.35	17.0	5.3	2.1	0.0	1.1	0.1	0.2
6	4625	BRITISH COLUMBIA HYDRO AND POWER AUTHORITY	58.45	-129.99	1.6	1.4	1.4	1.5	22.1	1.5	4.8
6	4626	BRITISH COLUMBIA HYDRO AND POWER AUTHORITY	59.57	-133.70	5.6	5.0	5.0	5.2	78.1	5.3	17.0
6	4628	BRITISH COLUMBIA HYDRO AND POWER AUTHORITY	57.90	-131.16	3.8	3.5	3.5	3.6	53.6	3.7	11.7
6	4629	BRITISH COLUMBIA HYDRO AND POWER AUTHORITY	54.19	-132.99	4.5	4.1	4.1	4.2	62.9	4.3	13.7
6	4641	BRITISH COLUMBIA HYDRO AND POWER AUTHORITY	54.02	-132.10	11.7	10.8	9.1	5.9	373.8	10.5	99.3
6	4721	BRITISH COLUMBIA HYDRO AND POWER AUTHORITY	54.26	-130.23	16.3	16.3	16.3	3.3	420.0	6.4	111.4
6	5339	HOUSTON FOREST PRODUCTS COMPANY	54.38	-126.72	917.3	451.1	284.9	18.1	167.5	844.1	9684.2
6	5543	COPPER MOUNTAIN CEDAR PRODUCTS LTD.	54.46	-128.48	23.7	13.0	9.5	0.1	1.2	13.0	153.8
6	5685	Q.C.I. SAWMILLS LTD.	53.98	-132.13	20.2	11.1	8.1	0.1	1.0	11.1	131.2
6	5710	TILBURY CEMENT LIMITED	54.00	-128.69	0.3	0.2	0.1	0.0	0.0	0.0	0.0

Emissions by Region and Source											
Region	Permit	Facility	Lat.	Lon.	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
6	5773	MACMILLAN BLOEDEL LIMITED	53.66	-132.32	20.6	13.8	12.9	0.1	2.5	8.0	147.7
6	6008	METHANEX CORPORATION	54.03	-128.69	15.6	14.9	12.8	33.5	2940.7	26.6	100.5
6	6046	PRINCE RUPERT PORT CORPORATION	54.32	-130.32	1.4	0.2	0.0	0.0	0.0	0.0	0.0
6	6055	ADVENTURE PAVING LIMITED	54.32	-130.29	0.2	0.0	0.0	0.0	0.1	0.1	0.3
6	6099	NORTHERN ENGINEERED WOOD PRODUCTS INC.	54.77	-127.15	227.5	117.6	56.0	0.6	99.3	5.2	19.8
6	6159	HOUSTON FOREST PRODUCTS COMPANY	54.45	-126.72	1.0	0.7	0.6	0.0	0.1	0.3	7.0
6	6262	INTERNATIONAL FOREST PRODUCTS LIMITED	54.17	-129.64	16.5	11.0	10.3	0.1	2.0	6.4	118.3
6	6419	WEYERHAEUSER COMPANY LIMITED	53.65	-132.58	12.6	8.4	7.9	0.0	1.5	3.8	90.5
6	6426	WEYERHAEUSER COMPANY LIMITED	53.69	-132.60	63.3	42.2	39.4	0.2	7.5	19.0	452.9
6	6686	WESTCOAST ENERGY INC. (PNG)	54.66	-127.12	8.7	8.7	8.7	0.4	185.6	37.6	74.1
6	6687	WESTCOAST ENERGY INC. (PNG)	54.30	-125.75	8.8	8.8	8.8	0.4	188.8	39.7	75.4
6	6699	RIDLEY TERMINALS INCORPORATED	54.23	-130.32	59.4	30.3	8.9	0.0	0.0	0.0	0.0
6	6741	PRINCE RUPERT GRAIN LIMITED	54.23	-130.33	71.9	21.2	4.6	0.0	0.0	0.0	0.0
6	6884	ALCAN SMELTERS AND CHEMICALS LIMITED	54.00	-128.71	109.0	71.5	45.0	0.0	4.1	0.2	0.8
6	6887	HUSBY FOREST PRODUCTS LTD.	53.99	-132.57	2.3	1.5	1.4	0.0	0.3	0.7	16.3
6	7064	WESTERN FOREST PRODUCTS LIMITED	52.88	-131.98	22.8	15.2	14.2	0.1	2.7	6.8	163.2
6	7156	PRINCE RUPERT HARBOUR DEBRIS SOCIETY			0.9	0.6	0.5	0.0	0.1	0.3	6.3
6	7184	INTERNATIONAL FOREST PRODUCTS LIMITED	53.88	-129.99	23.4	15.6	14.5	0.1	2.8	6.8	163.2
6	7189	CHEMICAL LIME COMPANY OF CANADA LTD	54.50	-126.30	0.4	0.3	0.1	0.0	0.0	0.0	0.0
6	7338	SILVERTIP MINING CORPORATION	60.00	-130.51	0.4	0.3	0.3	0.4	5.3	0.4	1.1
6	7536	WEYERHAEUSER COMPANY LIMITED	53.02	-131.90	473.9	316.0	295.3	1.7	56.5	142.0	3392.4
6	7683	MACMILLAN BLOEDEL LIMITED	53.21	-131.99	51.3	34.2	32.0	0.2	6.1	19.8	367.2
6	7685	BABINE FOREST PRODUCTS LIMITED	54.18	-125.48	22.0	14.7	13.7	0.1	2.6	6.6	157.3
6	7745	HUSBY FOREST PRODUCTS LTD.	53.98	-132.67	57.0	38.0	35.5	0.2	6.8	22.0	408.0
6	7748	SKEENA CELLULOSE INC	55.14	-127.77	504.7	273.6	193.6	2.4	23.4	257.5	3028.3
6	7864	SKEENA CELLULOSE INC	55.24	-127.61	6.9	3.5	1.0	0.0	0.0	0.0	0.0
6	7865	L B PAVING LTD.	54.77	-127.15	1.1	0.0	0.0	0.1	0.4	0.7	1.5
6	7923	YCS HOLDINGS LIMITED	54.54	-128.49	0.8	0.0	0.0	0.0	0.3	0.5	1.0
6	7927	INTERNATIONAL SKYLINE GOLD CORPORATION	56.07	-131.63	0.9	0.3	0.2	0.0	0.1	0.0	0.1
6	8041	ORENDA FOREST PRODUCTS LTD.			34.6	23.1	21.5	0.1	4.1	13.3	247.5
6	8116	NORTH AMERICAN METALS CORP			0.3	0.2	0.2	0.0	0.0	0.1	2.1
6	8224	ALCAN SMELTERS AND CHEMICALS LIMITED	53.51	-128.01	5.7	4.2	3.6	0.7	1.7	0.6	1.3
6	8226	EASTEND HOLDINGS	54.50	-128.53	0.8	0.4	0.1	0.0	0.0	0.0	0.0
6	8620	NORTH AMERICAN METALS CORP	58.79	-133.24	5.9	3.0	0.9	5.5	82.3	6.6	17.8
6	8854	ALCAN SMELTERS AND CHEMICALS LIMITED	53.53	-127.96	1.4	0.9	0.7	0.3	0.4	0.3	7.7
6	9073	ALL WEST TRADING CO	55.93	-129.97	4.9	3.3	3.0	0.0	0.6	1.5	34.9

Emissions by Region and Source											
Region	Permit	Facility	Lat.	Lon.	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
6	11055	TERRACE PRE-CUT MILL LTD.	54.51	-128.63	3.2	1.3	0.6	0.0	0.0	0.0	0.0
6	11401	BURNSLAKE SPECIALTY WOOD LTD.	54.21	-125.82	57.0	26.2	11.2	0.0	0.9	6.3	0.2
6	11422	TERRACE REDI-MIX LTD.	54.52	-128.65	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	11527	EAST END HOLDINGS	54.51	-128.58	0.1	0.0	0.0	0.0	0.0	0.0	0.0
6	11669	TIMBERWEST FOREST LIMITED	53.16	-132.06	54.2	36.1	33.8	0.2	6.5	20.9	387.8
6	12018	WESTERN FOREST PRODUCTS LIMITED	52.63	-128.37	17.1	11.4	10.7	0.1	2.0	5.1	122.4
6	12888	BOO FLAT LUMBER LIMITED	54.35	-125.93	1.1	0.7	0.7	0.0	0.1	0.3	7.7
6	12977	HOMESTAKE CANADA INC.	60.00	-120.00	0.5	0.3	0.3	0.0	0.1	0.2	3.7
6	13415	MERKLEY ENTERPRISES	54.42	-126.61	0.5	0.3	0.3	0.0	0.1	0.1	3.5
6	13757	CUSAC INDUSTRIES LTD	58.53	-130.01	14.5	11.5	9.0	8.5	128.0	8.8	27.8
6	13862	ADVENTURE PAVING LIMITED	54.02	-132.16	0.1	0.0	0.0	0.0	0.0	0.1	0.1
6	13943	HUCKLEBERRY MINES LTD.			0.5	0.3	0.3	0.0	0.1	0.2	3.7
6	14322	OOTSA LAKE SAWMILL LTD	54.01	-125.76	1.5	1.0	0.9	0.0	0.2	0.4	10.5
6	14733	SITKANA TIMBER LTD	53.47	-132.66	2.9	2.0	1.8	0.0	0.3	0.9	21.0
6	14800	HUCKLEBERRY MINES LTD.	53.67	-127.16	16.9	8.6	2.5	0.0	0.0	0.0	0.0
6	14845	RIVERSIDE CARBON PRODUCTS INC	55.13	-126.95	6.8	3.0	1.2	0.0	10.2	0.0	13.6
6	15094	PETRO-CANADA (PORT MOODY)	54.31	-128.35	0.0			0.0	0.0	2.6	0.0
6	15262	NORTHWOOD PULP AND TIMBER	54.50	-126.66	21.4	14.3	13.3	0.1	2.6	6.4	153.0
6	15350	FRANCOIS LAKE WOODWORKING LTD	54.08	-125.74	1.7	1.1	1.1	0.0	0.2	0.5	12.2
6	15521	NORTHWOOD PULP AND TIMBER	54.23	-125.76	4.3	2.9	2.7	0.0	0.5	1.3	30.6
6	15537	SILVA SERVICES LTD.	53.21	-131.99	7.3	4.9	4.6	0.0	0.9	2.2	52.5
6	15780	PACIFIC INLAND RESOURCES (WEST FRASER MILLS LTD.)	54.78	-127.17	2.4	1.6	1.5	0.0	0.3	0.7	17.5
7	1555	WESTCOAST ENERGY INC. (FNGP)	58.65	-122.69	32.9	32.2	30.4	3577.0	1217.4	338.7	373.1
7	1644	FLETCHER CHALLENGE CANADA LIMITED	55.29	-123.16	1119.2	642.0	458.7	304.0	743.1	151.2	2000.0
7	1675	THE PAS LUMBER COMPANY LIMITED	54.44	-122.64	512.0	281.4	203.7	6.3	72.5	797.4	9424.1
7	1676	SLOCAN FOREST PRODUCTS LTD.	55.30	-123.16	521.1	249.2	115.4	2.7	422.5	125.8	344.0
7	1699	NORTHWOOD INC.	54.00	-122.69	216.0	99.8	42.7	0.1	8.6	25.0	1.7
7	1707	FRASER-FORT GEORGE REGIONAL DISTRICT	53.74	-122.85	2.3	1.6	1.5	0.0	0.3	0.7	16.8
7	1722	DONOHUE FOREST PRODUCTS INC.	55.32	-123.17	315.6	141.3	65.5	0.3	17.5	45.7	253.7
7	1730	L AND M LUMBER LTD.	54.01	-124.05	38.6	31.6	26.0	4.1	36.3	9.2	180.7
7	1742	WESTCOAST ENERGY INC. (McMahon)	56.15	-120.67	15.0	14.3	12.3	1531.3	336.4	88.8	170.9
7	1772	STELLA-JONES INC.	53.86	-122.74	0.1	0.1	0.1	0.0	4.0	0.2	0.8
7	1778	CANADIAN FOREST PRODUCTS LTD.	53.85	-122.74	261.0	100.8	54.1	5.4	36.7	64.1	856.7
7	1787	RUSTAD BROS. AND CO. LTD.	53.85	-122.73	721.1	424.4	291.5	10.8	100.2	783.8	9016.4
7	1796	THE PAS LUMBER COMPANY LIMITED	53.92	-122.76	283.6	129.2	56.9	4.1	18.5	83.2	652.5
7	1832	WEST HILL LUMBER (1988) LTD.	53.95	-122.83	11.8	6.7	2.4	0.0	5.0	3.8	1.0

Emissions by Region and Source											
Region	Permit	Facility	Lat.	Lon.	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
7	1869	LAKELAND MILLS LTD.	53.92	-122.73	234.6	177.4	126.9	6.0	26.9	88.4	949.1
7	1888	FRASER-FORT GEORGE REGIONAL DISTRICT	54.29	-122.41	2.3	1.6	1.5	0.0	0.3	0.7	16.7
7	1955	CANADIAN FOREST PRODUCTS LIMITED	55.70	-121.63	118.5	60.1	23.5	0.2	29.5	23.1	5.9
7	2065	HUSKY OIL OPERATIONS LTD.	53.93	-122.70	46.2	33.0	19.8	2457.0	71.7	118.4	2307.3
7	2119	WESTCOAST ENERGY INC. (PG Sulphur Prod.)	53.85	-122.73	6.0	5.2	2.2	232.2	3.1	0.2	0.7
7	2190	CANADIAN FOREST PRODUCTS LIMITED	53.92	-123.25	787.8	387.1	238.0	8.0	68.1	684.6	7890.0
7	2268	CANADIAN FOREST PRODUCTS LIMITED	54.47	-124.17	655.7	361.8	243.8	8.2	94.5	916.4	10536.7
7	2376	WESTCOAST ENERGY INC. (FNGP Waste disposal-burn)	54.00	-123.00	0.1	0.1	0.1	0.0	0.0	0.0	0.8
7	2396	INLAND CONCRETE LIMITED	55.74	-120.26	0.1	0.0	0.0	0.0	0.0	0.0	0.0
7	2559	NORTHWOOD INC.	53.98	-122.70	1069.1	658.0	511.4	793.3	1500.3	270.4	4814.1
7	2650	B.C. CUSTOM TIMBER PRODUCTS LTD.	53.95	-123.77	7.0	3.8	2.8	0.0	0.3	3.8	45.0
7	2684	SLOCAN FOREST PRODUCTS LTD. - PLATEAU DIVISION	54.03	-124.33	864.4	471.0	299.4	9.3	106.3	1058.8	11867.9
7	2737	WESTCOAST ENERGY INC. (Taylor BS1/CS1)	56.14	-120.67	12.5	12.5	12.5	1.3	1737.9	134.4	105.8
7	2747	HAUER BROS. LUMBER LTD.	52.96	-119.46	60.0	33.0	24.0	0.3	3.0	33.0	390.0
7	2761	CANADIAN FOREST PRODUCTS LIMITED	53.92	-122.68	878.5	590.9	479.1	1105.2	609.0	169.0	1700.6
7	2762	INTERCONTINENTAL PULP COMPANY LTD.	52.92	-122.70	179.9	130.5	102.2	1390.3	231.5	229.6	2498.2
7	3016	B.C. CHEMICALS LTD.	53.92	-122.69	0.0	0.0	0.0	0.0	1.5	0.1	0.3
7	3027	NORTHWOOD INC.	54.12	-121.94	948.5	503.2	319.7	9.5	99.5	991.4	11230.1
7	3032	CANADIAN FOREST PRODUCTS LTD.	56.16	-120.71	108.3	54.4	28.3	3.3	80.0	337.4	3848.1
7	3034	CANADIAN FOREST PRODUCTS LTD. - POLAR DIVISION	54.50	-122.67	613.2	352.1	232.7	8.2	88.7	556.8	6298.7
7	3057	DONOHUE FOREST PRODUCTS INC.	55.34	-123.18	160.7	75.0	31.8	0.1	10.4	20.1	2.1
7	3104	SLOCAN FOREST PRODUCTS LTD. AND TACKAMA FOREST PRODUCTS LTD.	52.80	-119.24	267.9	139.0	83.1	2.1	27.3	245.7	2772.5
7	3133	NECHAKO LUMBER CO. LTD.	54.02	-124.02	353.1	242.1	170.9	9.7	45.2	160.2	1833.4
7	3335	APOLLO FOREST PRODUCTS LIMITED	54.49	-124.20	244.1	124.8	75.4	4.0	32.4	249.0	2787.3
7	3336	CANADIAN FOREST PRODUCTS LIMITED	53.68	-122.98	624.9	336.0	216.7	6.8	69.3	513.9	5884.5
7	3337	STUART LAKE LUMBER CO. LTD.	54.47	-124.18	247.8	131.8	85.2	2.6	27.3	293.3	3346.8
7	3403	CHETWYND FOREST INDUSTRIES	55.43	-121.33	632.5	345.1	210.0	7.6	69.5	667.4	7677.7
7	3406	ZEIDLER FOREST INDUSTRIES LTD.	53.33	-120.21	36.6	19.0	12.6	0.7	4.3	22.0	276.7
7	3448	WESTCOAST ENERGY INC. (Bluehills BS6)	56.66	-121.21	1.2			46.4	79.3	0.2	10.6
7	3449	WESTCOAST ENERGY INC. (Rigel BS11)	54.13	-121.95	26.9	0.2	0.2	0.1	8.1	0.3	2.3
7	3455	WESTCOAST ENERGY INC. (Laprise BS8)	57.36	-121.99	2.9	2.8	2.8	18.7	223.6	7.1	23.1
7	3457	WESTCOAST ENERGY INC. (Kobes BS3)	56.64	-121.65	6.8	6.6	6.6	63.2	570.1	16.7	55.3
7	3478	CANADIAN FOREST PRODUCTS LIMITED	56.24	-120.77	603.8	333.7	222.7	7.5	95.5	832.9	9514.5
7	3647	FINLAY FOREST INDUSTRIES INC.	55.34	-123.18	150.2	15.3	12.9	47.3	394.4	337.4	4418.3
7	3694	IMPERIAL OIL	55.31	-123.15	0.0			0.0	0.0	24.0	0.0
7	3845	COLUMBIA BITULITHIC LIMITED	53.96	-122.85	1.4	0.0	0.0	0.1	0.5	0.8	1.9

Emissions by Region and Source											
Region	Permit	Facility	Lat.	Lon.	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
7	3898	DUNKLEY LUMBER LIMITED	53.28	-122.47	546.0	268.7	175.5	4.8	47.5	533.1	6175.0
7	4081	REGIONAL DISTRICT OF BULKLEY-NECHAKO	54.43	-124.24	2.3	1.6	1.5	0.0	0.3	0.7	16.8
7	4206	TACKAMA FOREST PRODUCTS LTD.	58.74	-122.69	1278.4	727.0	484.3	17.9	380.3	767.3	8992.3
7	4346	FRASER-FORT GEORGE REGIONAL DISTRICT	54.19	-122.37	2.3	1.6	1.5	0.0	0.3	0.7	16.7
7	4489	BRITISH COLUMBIA HYDRO AND POWER AUTHORITY	58.80	-122.69	0.1	0.1	0.1	0.0	2.4	0.1	0.5
7	4530	NORTHWOOD PULP AND TIMBER LIMITED	53.86	-122.74	142.3	100.8	71.6	0.4	67.3	26.1	13.5
7	4680	CARRIER LUMBER LTD.	53.80	-122.72	172.8	80.6	34.1	0.1	8.0	21.5	0.2
7	5051	BRINK FOREST PRODUCTS LTD.	53.93	-122.75	4.0	1.6	0.8	0.0	0.0	0.0	0.0
7	5151	WESTCOAST ENERGY INC. (Hasler Flats-PRGP)	55.57	-121.94	25.6	23.1	22.1	5862.8	1162.2	43.7	242.3
7	5260	PETRO-CANADA	53.88	-122.74	0.0			0.0	0.0	191.6	0.0
7	5281	SLOCAN FOREST PRODUCTS LTD. - PLATEAU DIVISION			0.2	0.1	0.1	0.0	0.0	0.0	0.0
7	5375	RUSTAD BROS. & CO. LTD. (P.G. WOOD DIVISION)	53.82	-122.72	49.6	26.4	9.7	0.0	6.5	12.2	1.3
7	5625	WEST FRASER MILLS LTD.	54.07	-124.75	826.7	422.4	263.2	12.1	92.9	866.6	9879.6
7	5807	SABLE RESOURCES LTD.	57.33	-127.09	13.6	4.6	2.7	14.9	51.7	3.4	11.3
7	5808	SABLE RESOURCES LTD.			1.4	0.8	0.5	0.1	0.3	1.6	3.2
7	5942	DGS ASTRO PAVING LTD.			0.2	0.0	0.0	0.0	0.1	0.1	0.3
7	6118	REVELSTOKE CONCRETE INC.	56.22	-120.84	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	6297	OCEAN CONSTRUCTION SUPPLIES LIMITED	53.93	-122.77	0.6	0.3	0.1	0.0	0.0	0.0	0.0
7	6321	WESTCOAST ENERGY INC. (Hasler Flats-PRGP-Landfill)			0.4	0.2	0.1	0.0	0.0	0.0	0.0
7	6401	DGS ASTRO PAVING LTD.			0.1	0.0	0.0	0.1	0.4	0.3	0.3
7	6505	WOODLAND WINDOWS LTD.	53.89	-122.74	12.1	10.0	7.9	0.2	0.8	4.6	27.9
7	6556	ROLLING MIX CONCRETE B.C. LIMITED	53.94	-122.82	0.2	0.1	0.0	0.0	0.0	0.0	0.0
7	6557	PEACE RIVER REGIONAL DISTRICT			2.3	1.6	1.5	0.0	0.3	0.7	16.8
7	6683	QUINTETTE COAL LIMITED	55.03	-121.19	343.0	243.3	87.9	38.3	62.3	44.5	0.0
7	6690	PACIFIC NORTHERN GAS LTD.	54.13	-124.16	9.4	9.4	9.4	0.4	200.1	25.9	80.1
7	6695	PACIFIC NORTHERN GAS LTD.	54.29	-122.62	17.6	17.6	17.6	0.8	376.7	37.3	150.6
7	6754	LAFARGE CANADA INC.	53.84	-122.73	0.6	0.3	0.1	0.0	0.0	0.0	0.0
7	6846	BULLMOOSE OPERATING CORPORATION LTD.	55.14	-121.02	204.4	137.3	46.4	52.7	85.8	61.3	0.0
7	6956	FRASER-FORT GEORGE REGIONAL DISTRICT	54.96	-122.99	2.3	1.6	1.5	0.0	0.3	0.7	16.7
7	7258	SOLEX DEVELOPMENTS COMPANY INC.	56.16	-120.67	0.6	0.6	0.5	0.1	27.9	0.6	7.0
7	7528	CONTINENTAL LIME LTD.	53.87	-122.75	0.5	0.4	0.1	0.0	0.0	0.0	0.0
7	7596	LOUISIANA-PACIFIC CANADA LTD.	55.76	-120.28	161.2	94.9	51.6	5.9	51.4	72.6	974.9
7	7672	WESTCOAST ENERGY INC. (Sikanni Refuse Permit)			0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	7779	FIBRECO PULP INC.	56.16	-120.71	0.2	0.2	0.2	0.0	34.6	44.7	24.4
7	8074	DOLLAR SAVER LUMBER LTD.	53.84	-122.73	11.3	4.5	2.3	0.0	0.0	0.0	0.0
7	8076	SLOCAN FOREST PRODUCTS LTD.			1.0	0.4	0.3	0.0	0.1	0.0	0.1

Emissions by Region and Source											
Region	Permit	Facility	Lat.	Lon.	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
7	8212	AMOCO CANADA PETROLEUM COMPANY LTD.	56.82	-122.37	0.3	0.3	0.3	0.0	28.7	1.8	5.3
7	8280	BATER ELECTRIC 1983 LTD.	53.91	-122.79	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	8295	WEST FRASER ELECTRICAL SERVICES LIMITED	53.90	-122.80	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	8452	NORTHWOOD PULP AND TIMBER LIMITED	54.35	-121.35	1.1	0.4	0.3	0.0	0.1	0.0	0.1
7	8456	PITTMAN ASPHALT CO. LIMITED	53.91	-122.79	0.3	0.0	0.0	0.0	0.3	0.2	0.2
7	8462	UNOCAL CANADA LIMITED	56.53	-121.30	1.0	1.0	1.0	0.0	122.3	8.8	47.1
7	8721	DONOHUE FOREST PRODUCTS INC.	56.32	-125.19	0.2	0.1	0.1	0.0	0.0	0.0	1.1
7	8736	WISMER & RAWLINGS ELECTRIC LTD.	53.91	-122.79	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	8738	TALISMAN ENERGY INC.	55.13	-121.49	6.8	6.8	6.8	730.3	376.2	54.2	280.7
7	8998	LOUISIANA-PACIFIC CANADA LTD.	55.75	-121.29	788.6	355.1	208.5	224.4	129.2	141.2	1204.6
7	9034	FMC OF CANADA LIMITED	53.92	-122.70	2.8	2.4	2.4	0.3	56.7	2.6	15.8
7	9039	RAISO CHEMICALS CANADA INC.	53.86	-122.74	0.7	0.4	0.1	0.0	0.0	0.0	0.0
7	9040	SLOCAN GROUP	57.26	-125.48	1.0	0.4	0.3	0.0	0.1	0.0	0.1
7	9101	MOBIL OIL CANADA	59.36	-121.24	4.2	4.1	4.0	904.8	151.8	3.8	40.0
7	9103	LEE-VINE HOLDINGS LTD.	55.21	-123.05	1.1	0.7	0.7	0.0	0.1	0.3	7.6
7	10606	391605 B.C. LTD.	54.02	-124.08	49.2	29.7	19.9	0.7	3.4	10.2	118.5
7	10951	PETRO CANADA	56.32	-120.02	0.2	0.2	0.2	361.7	8.1	0.3	1.8
7	11116	DONOHUE FOREST PRODUCTS INC.	56.73	-125.13	0.2	0.1	0.1	0.0	0.0	0.0	1.1
7	11128	WESTCOAST ENERGY INC. (Taylor/Cogen)	56.14	-120.67	160.9	160.9	160.9	6.9	415.1	144.4	1318.1
7	11503	YCS HOLDINGS LTD.	52.00	-122.00	0.9	0.0	0.0	0.0	0.4	0.6	1.2
7	11638	DONOHUE FOREST PRODUCTS INC.	56.00	-124.00	0.2	0.1	0.1	0.0	0.0	0.0	1.1
7	12092	PRINCE GEORGE AND AREA PET MEMORIAL PARK	53.97	-122.60	0.3	0.2	0.2	0.0	0.0	0.0	0.1
7	12133	IMPERIAL OIL LIMITED	53.91	-122.71	0.0			0.0	0.0	7.9	0.0
7	12261	OMINECA REDI-MIX LTD.	54.27	-126.28	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	12414	NRT REDI-MIX LTD.	53.93	-122.76	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	12416	NECHAKO REDI-MIX LTD.	54.03	-124.01	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	12448	CANADIAN HUNTER EXPLORATION LTD.	55.75	-120.25	4.8	4.8	4.7	0.3	1571.3	38.5	199.2
7	12449	CANADIAN HUNTER EXPLORATION LTD.	55.59	-120.78	6.6	6.5	6.3	0.4	1718.7	52.7	273.4
7	12862	EXCEL ENERGY INC.	56.25	-120.85	0.5	0.5	0.5	371.5	101.0	2.5	13.7
7	13248	PETRO-CANADA	53.98	-122.77	0.0			0.0	0.0	2.6	0.0
7	13373	DGS ASTRO PAVING LTD.	54.55	-122.22	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	13405	P.F.I. PELLETT FLAME INC.	53.81	-122.73	45.5	25.9	18.1	1.3	15.5	14.9	205.4
7	13484	SLOCAN FOREST PRODUCTS LTD.	58.76	-122.68	430.8	249.9	81.9	7.6	34.4	85.7	1213.4
7	13538	NORTHWOOD INC.	53.99	-122.69	42.4	17.0	8.5	0.0	0.0	0.0	0.0
7	13770	R.D. MOYEN HOLDINGS LTD.	49.68	-124.97	0.1	0.0	0.0	0.0	0.0	0.0	0.1
7	14268	WESTCOAST ENERGY INC. (Cabin Lake)	59.20	-121.60	1.8	1.5	1.5	98.2	42.6	0.8	22.1

Emissions by Region and Source											
Region	Permit	Facility	Lat.	Lon.	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
7	14378	TLOH FOREST PRODUCTS INC.	54.50	-125.60	19.0	7.6	3.8	0.0	0.0	0.0	0.0
7	14444	WESTCOAST ENERGY INC. (Helmet A-71-G/94-P-10)	54.00	-125.00	10.8	10.8	10.8	0.7	370.5	27.4	87.9
7	14602	YCS HOLDINGS LTD.			0.9	0.0	0.0	0.0	0.3	0.5	1.1
7	14672	CANADIAN NATURAL RESOURCES	56.73	-121.09	1.6	1.5	1.3	0.1	63.3	12.4	0.8
7	14698	WESTCOAST ENERGY INC. (Jedney)	54.56	-122.46	0.6	0.6	0.6	202.3	479.0	42.0	161.4
7	14929	WESTCOAST ENERGY INC. (Highway)	56.20	-120.80	0.0			3.1	103.0	11.0	56.0
7	14980	NOVAGAS CLEARINGHOUSE LTD.	57.42	-122.72	29.1	28.6	28.6	0.2	192.2	158.8	77.5
7	15043	ANDERSON EXPLORATION LTD.	56.24	-120.86	0.0			0.0	106.4	0.0	0.0
7	15096	LITTLE RIVER EXCAVATING LTD.	54.50	-124.50	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	15368	FEDERATED PIPE LINES (WESTERN) LTD.	54.92	-122.94	0.0			0.0	11.1	0.0	0.0
7	15372	NEWCAL ENERGY INC	56.66	-121.70	0.0			160.6	19.6	0.0	0.0
7	15373	BERKLEY PETROLEUM CORP.	56.39	-121.06	0.0			52.5	179.9	0.0	0.0
7	15374	BERKLEY PETROLEUM CORP.	56.53	-120.53	0.0			15.0	73.9	0.0	0.0
7	15376	CANADIAN NATURAL RESOURCES LIMITED	57.12	-121.20	0.0			0.0	280.6	0.0	0.0
7	15377	CANADIAN NATURAL RESOURCES LIMITED	56.73	-121.02	0.0			0.0	83.7	0.0	0.0
7	15378	FEDERATED PIPE LINES (WESTERN) LTD.	55.62	-122.25	0.0			0.0	11.1	0.0	0.0
7	15379	NUMAC ENERGY INC.	57.47	-121.53	0.0			130.0	96.0	0.0	0.0
7	15380	BURLINGTON RESOURCES CANADA ENERGY LTD.	56.24	-120.84	0.0			0.0	136.3	0.0	0.0
7	15381	BURLINGTON RESOURCES CANADA ENERGY LTD.	55.14	-121.49	0.0			0.0	49.3	0.0	0.0
7	15382	SUMMIT RESOURCES LIMITED	58.95	-121.87	0.0			0.0	21.3	0.0	0.0
7	15383	SUNCOR INC.	56.75	-121.80	0.0			51.5	61.5	0.0	0.0
7	15384	SUNCOR INC.	56.48	-122.37	0.0			0.0	120.4	0.0	0.0
7	15385	SUNCOR INC.	56.48	-122.37	0.0			44.3	53.4	0.0	0.0
7	15386	ANDERSON EXPLORATION LTD.	57.12	-121.22	0.0			0.0	107.4	0.0	0.0
7	15387	SUNCOR INC.	56.73	-121.80	0.0			50.6	144.6	0.0	0.0
7	15389	BLUE RANGE RESOURCE CORPORATION	57.01	-122.16	0.0			0.0	20.9	0.0	0.0
7	15390	PIONEER NATURAL RESOURCES CANADA INC.	57.27	-121.42	0.0			0.0	21.0	0.0	0.0
7	15391	ANG GATHERING AND PROCESSING LTD.	54.40	-124.30	0.0			0.0	253.1	0.0	0.0
7	15392	ANDERSON EXPLORATION LTD.	56.58	-121.45	0.0			19.8	89.2	0.0	0.0
7	15393	CANADIAN NATURAL RESOURCES LIMITED	55.72	-121.22	0.0			178.6	29.1	0.0	0.0
7	15394	CANADIAN NATURAL RESOURCES LIMITED	54.37	-124.30	0.0			0.0	37.4	0.0	0.0
7	15395	NUMAC ENERGY INC.	57.28	-121.43	0.0			0.0	74.3	0.0	0.0
7	15396	REMINGTON ENERGY LTD.	56.76	-120.75	0.0			0.0	83.2	0.0	0.0
7	15397	PENN WEST PETROLEUM LTD.	56.72	-121.06	0.0			0.0	94.1	0.0	0.0
7	15398	ISH ENERGY LTD.	59.33	-120.80	0.0			0.0	60.1	0.0	0.0
7	15399	NOVAGAS CANADA LTD.	56.24	-120.85	0.0			0.0	81.4	0.0	0.0

Emissions by Region and Source											
Region	Permit	Facility	Lat.	Lon.	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
7	15400	NOVAGAS CANADA LTD.	57.23	-122.25	0.0			53.1	71.6	0.0	0.0
7	15402	REMINGTON ENERGY LTD.	54.13	-121.95	0.0			9.1	222.7	0.0	0.0
7	15403	PACIFIC NORTHERN GAS LTD.	55.07	-121.07	0.0			910.0	0.0	0.0	0.0
7	15404	ANDERSON EXPLORATION LTD.	56.23	-120.86	0.0			0.0	23.1	0.0	0.0
7	15405	ANDERSON EXPLORATION LTD.	59.23	-120.18	0.0			0.0	124.0	0.0	0.0
7	15406	ANDERSON EXPLORATION LTD.	56.23	-120.86	0.0			0.0	76.2	0.0	0.0
7	15407	TALISMAN ENERGY INC.	55.62	-121.58	0.0			300.0	149.3	0.0	0.0
7	15409	PETRO CANADA OIL AND GAS	57.30	-121.67	0.0			0.0	110.1	0.0	0.0
7	15410	PETRO CANADA OIL AND GAS	57.50	-121.50	0.0			345.0	36.7	0.0	0.0
7	15411	PETRO CANADA OIL AND GAS	57.32	-122.02	0.0			0.0	179.4	0.0	0.0
7	15412	PETRO CANADA OIL AND GAS	56.78	-128.48	0.0			10.6	0.0	0.0	0.0
7	15414	PETRO CANADA OIL AND GAS	56.20	-120.70	0.0			0.0	19.6	0.0	0.0
7	15416	PETRO CANADA OIL AND GAS	56.20	-120.75	0.0			67.0	21.4	0.0	0.0
7	15417	TALISMAN ENERGY INC.	54.13	-121.95	0.0			7.7	0.0	0.0	0.0
7	15418	TALISMAN ENERGY INC.	54.13	-121.95	0.0			7.8	0.0	0.0	0.0
7	15419	PETRO CANADA OIL AND GAS	56.78	-128.48	0.0			146.6	8.8	0.0	0.0
7	15420	PETRO CANADA OIL AND GAS	56.72	-121.06	0.0			13.3	7.3	0.0	0.0
7	15421	PETRO CANADA OIL AND GAS	58.69	-122.46	0.0			48.0	23.2	0.0	0.0
7	15422	PETRO CANADA OIL AND GAS	57.07	-121.91	0.0			0.0	68.8	0.0	0.0
7	15423	SEARCH ENERGY CORP.	56.39	-121.05	0.0			2.9	78.5	0.0	0.0
7	15424	SEARCH ENERGY CORP.	56.43	-120.71	0.0			0.0	104.2	0.0	0.0
7	15425	PETRO CANADA OIL AND GAS	56.32	-120.01	0.0			0.0	19.3	0.0	0.0
7	15426	PETRO CANADA OIL AND GAS	56.32	-120.01	0.0			0.0	20.5	0.0	0.0
7	15427	IMPERIAL OIL RESOURCES LIMITED	56.32	-120.01	0.2	0.2	0.2	957.0	55.9	0.1	1.6
7	15429	CANADIAN HUNTER EXPLORATION LTD.	55.77	-120.22	0.0			0.0	14.0	0.0	0.0
7	15430	CANADIAN HUNTER EXPLORATION LTD.	57.12	-121.50	0.0			0.0	13.5	0.0	0.0
7	15432	CANADIAN HUNTER EXPLORATION LTD.	55.35	-120.56	0.0			0.0	9.9	0.0	0.0
7	15433	REMINGTON ENERGY LTD.	57.12	-121.22	0.0			0.0	87.4	0.0	0.0
7	15434	CANADIAN NATURAL RESOURCES LIMITED	57.85	-120.77	0.0			0.0	96.6	0.0	0.0
7	15435	REMINGTON ENERGY LTD.	56.72	-121.07	0.0			0.0	103.8	0.0	0.0
7	15436	REMINGTON ENERGY LTD.	56.25	-120.86	0.0			3.9	27.0	0.0	0.0
7	15437	REMINGTON ENERGY LTD.	54.13	-121.95	0.0			0.5	148.0	0.0	0.0
7	15438	CANADIAN NATURAL RESOURCES LIMITED	56.78	-121.86	0.0			164.7	17.6	0.0	0.0
7	15439	CANADIAN NATURAL RESOURCES LIMITED	57.43	-122.79	0.0			0.0	160.6	0.0	0.0
7	15440	TALISMAN ENERGY INC.	54.00	-123.00	0.0			7.3	0.0	0.0	0.0
7	15441	CANADIAN NATURAL RESOURCES LIMITED	56.89	-120.62	0.0			0.0	157.7	0.0	0.0

Emissions by Region and Source											
Region	Permit	Facility	Lat.	Lon.	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO
7	15442	UNION PACIFIC RESOURCES INC.	54.00	-123.00	0.0			4.6	0.0	0.0	0.0
7	15443	UNION PACIFIC RESOURCES INC.	54.00	-123.00	0.0			3.4	0.0	0.0	0.0
7	15444	UNION PACIFIC RESOURCES INC.	54.00	-123.00	0.0			3.4	0.0	0.0	0.0
7	15449	BERKLEY PETROLEUM CORP.	56.20	-120.70	0.0			31.9	21.4	0.0	0.0
7	15455	CRESTAR ENERGY INC.	57.60	-120.92	0.0			0.0	114.9	0.0	0.0
7	15456	CANADIAN NATURAL RESOURCES LIMITED	56.88	-120.75	0.0			0.0	28.3	0.0	0.0
7	15457	CANADIAN NATURAL RESOURCES LIMITED	57.59	-120.90	0.0			0.0	66.5	0.0	0.0
7	15458	CANADIAN NATURAL RESOURCES LIMITED	56.88	-120.60	0.0			0.0	26.1	0.0	0.0
7	15504	TALISMAN ENERGY INC.	56.66	-121.70	0.0			29.5	0.0	0.0	0.0
7	15505	CANADIAN NATURAL RESOURCES LIMITED	56.78	-121.86	0.0			0.0	136.6	0.0	0.0
7	15506	WESTMINSTER RESOURCES LTD.	54.00	-123.00	0.0			0.0	41.6	0.0	0.0
7	15616	REMINGTON ENERGY LTD.	56.57	-121.29	1.6	1.6	1.6	92.5	23.2	18.9	81.1
7	15642	ASTRO ASPHALT RECYCLING LTD.	54.55	-122.22	1.1	0.0	0.0	0.1	0.4	0.7	1.5
7	15720	ANDERSON EXPLORATION LTD.	56.23	-120.85	0.0			0.5	19.4	0.0	0.0
7	15721	ENCAL ENERGY LTD.	57.13	-120.87	0.0			0.0	222.9	0.0	0.0
7	15722	CANADIAN NATURAL RESOURCES LIMITED	56.81	-121.88	0.0			0.0	148.1	0.0	0.0
7	15723	REMINGTON ENERGY LTD.	56.39	-121.08	0.0			0.0	19.1	0.0	0.0
7	15724	CANADIAN NATURAL RESOURCES LIMITED	56.77	-121.18	0.0			0.0	14.3	0.0	0.0
7	15725	CANADIAN NATURAL RESOURCES LIMITED	56.75	-121.19	0.0			0.0	14.3	0.0	0.0
7	15726	REMINGTON ENERGY LTD.	56.29	-121.26	0.0			42.0	38.1	0.0	0.0
7	15727	CANADIAN NATURAL RESOURCES LIMITED	56.76	-120.74	0.0			0.0	14.3	0.0	0.0
7	15736	PRIMEWEST ENERGY INC.	57.30	-121.68	1.3	1.3	1.3	0.1	350.0	10.7	55.9
7	15759	NOVAGAS CLEARINGHOUSE LTD.	59.01	-120.01	2.0	2.0	2.0	0.1	80.7	15.7	82.1
7	15776	PETRO CANADA	59.65	-122.16	4.1	4.1	4.1	277.4	203.7	2.1	35.3
7	15787	WESTMINSTER RESOURCES LTD.	57.65	-121.87	0.5	0.5	0.5	0.0	119.1	20.9	27.8
7	15810	CHUNZOLH FOREST PRODUCTS LTD.	54.00	-122.62	5.4	2.2	1.1	0.0	0.0	0.0	0.0
7	15854	TRANSALTA ENERGY INC.	58.65	-122.67	10.9	0.7	0.7	0.9	143.0	7.9	120.0
7	15860	PETRO CANADA OIL AND GAS	56.05	-120.31	0.0			1021.0	34.9	0.0	0.0
7	15879	CANADIAN NATURAL RESOURCES LIMITED	56.72	-121.78	0.0			51.9	190.4	0.0	0.0
7	15914	WESTCOAST ENERGY INC. (Sikanni Gas Plant)	57.95	-121.16	0.0			76.2	50.0	2.0	12.3
7	15915	WESTCOAST ENERGY INC. (Aitken Creek Gas Plant)	56.68	-121.23	0.0			56.6	173.0	6.0	27.6
7	15916	WESTCOAST ENERGY INC. (Buckinghorse Plant)	57.37	-122.84	0.0			0.0	2.0	0.0	0.4
7	15918	WESTCOAST ENERGY INC. (Stoddart BS10)	56.39	-121.05	2.0			4.5	63.6	5.0	16.7
7	15919	WESTCOAST ENERGY INC. (Beg Jedney BS18)	57.23	-122.23	0.0			3.6	5.3	1.0	3.4
7	15920	WESTCOAST ENERGY INC. (Nig Creek BS9)	57.13	-121.16	0.0			5.2	11.4	1.0	3.5
7	15928	WESTCOAST ENERGY INC. (Siphon Creek BS14)	56.55	-120.52	3.1			19.1	231.5	7.1	22.2

Emissions by Region and Source												
Region	Permit	Facility	Lat.	Lon.	Part	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	VOC	CO	
7	15933	ENCAL ENERGY LTD.	57.13	-120.87	0.0			241.5	27.7	0.0	0.0	
7	15967	CANADIAN NATURAL RESOURCES LIMITED	55.10	-120.90	0.0			0.0	162.6	0.0	0.0	
7	15995	LEHIGH PORTLAND CEMENT LIMITED	53.96	-122.85	2.2	1.1	0.3	0.0	0.0	0.0	0.0	
7	16010	Regional Blacktop Ltd.	54.55	-122.22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
7	16059	BERKLEY PETROLEUM CORP.	56.52	-122.24	0.0			52.3	18.8	0.0	0.0	
7	16061	BURLINGTON RESOURCES CANADA ENERGY LTD.	56.22	-126.77	0.0			103.5	17.9	0.0	0.0	
7	16151	BC RAIL LTD.	57.02	-121.47	12.2	8.1	7.6	0.0	1.5	3.7	87.3	
7	16168	SHININGBANK ENERGY LTD.	56.06	-121.25	0.0			0.0	256.6	0.0	0.0	
7	16217	RANGER OIL LTD	56.05	-121.23	0.0			30.1	2.1	0.0	0.0	
7	16232	HUSKY OIL OPERATIONS LTD.	57.97	-121.18	0.0			0.0	1.3	0.0	0.0	
7	16243	CANADIAN NATURAL RESOURCES LIMITED	56.63	-121.25	0.0			71.6	2.2	0.0	0.0	
7	16254	RANGER OIL LTD	59.62	-120.75	0.0			0.0	13.9	0.0	0.0	
7	16256	NUMAC ENERGY INC.	57.59	-120.90	0.0			0.0	8.4	0.0	0.0	
7	16257	JET ENERGY CORPORATION	53.87	-122.67	0.0			3.7	12.9	0.0	0.0	
7	16260	CANADIAN NATURAL RESOURCES LIMITED	56.58	-121.45	0.0			16.8	3.2	0.0	0.0	
7	16262	PETRO CANADA OIL AND GAS	57.31	-121.68	0.0			0.0	13.7	0.0	0.0	
7	16322	WESTCOAST ENERGY INC. (FN mainline CSN2 to CS9)	55.00	-122.00	81.0			24.4	3430.8	86.0	850.3	
7	16657	CANADIAN NATURAL RESOURCES	59.44	-120.80	8.2			0.5	279.9	20.7	66.4	
7	16658	CANADIAN NATURAL RESOURCES	59.49	-120.67	1.0			0.1	138.4	3.0	9.5	
7	16659	CANADIAN NATURAL RESOURCES	59.30	-120.48	2.0			0.1	65.8	4.0	13.6	
					<b>Total</b>	<b>65,259.7</b>	<b>36,663.0</b>	<b>22,976.6</b>	<b>50,748.8</b>	<b>60,113.3</b>	<b>33,753.8</b>	<b>341,162.7</b>

\* Inconsistencies in the totals between Table 11, and Appendices E.1, E.2, E.3 and E.4 are due to round-off errors.