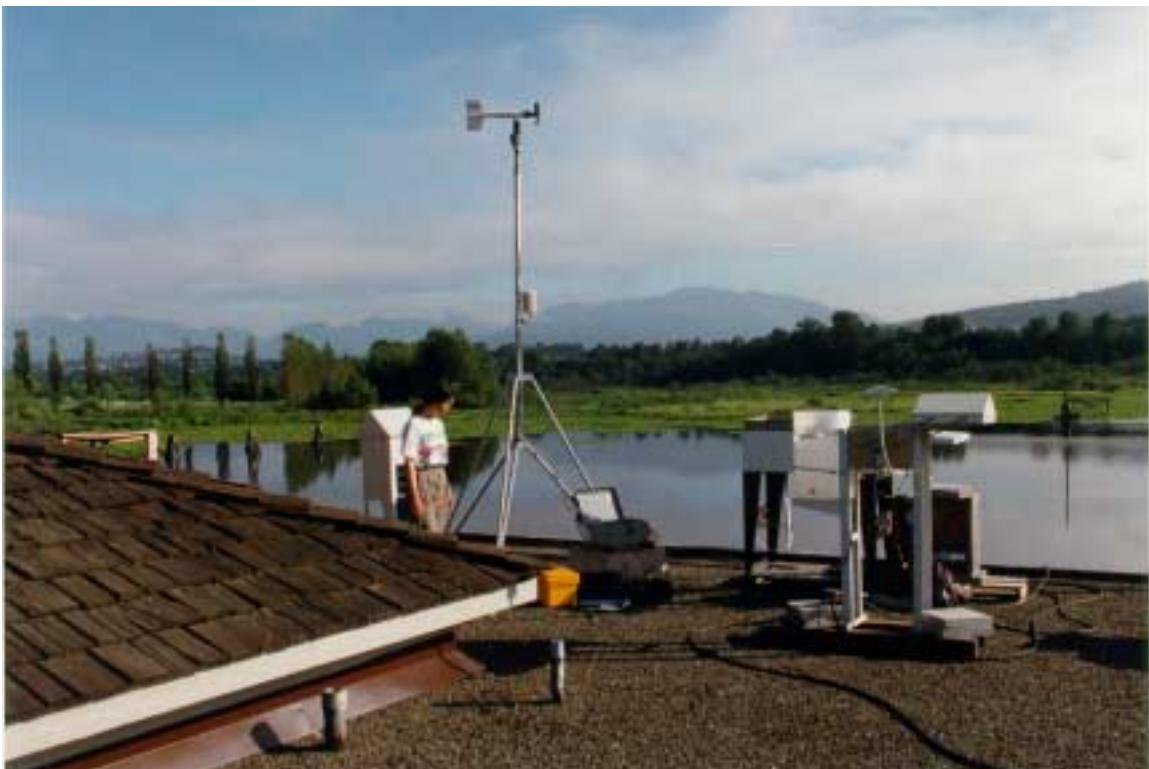


# ***Assessment of PAH Levels in Atmospheric Particulates from Burnaby Lake B.C. (1995)***



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## **ABSTRACT**

*PAHs were assessed in dry air at Burnaby Lake, located in the greater Vancouver area of British Columbia, with the aim of characterizing concentrations, particle size distributions and deposition rates to an urban watershed. Weekly samples were collected using a high volume polyurethane foam sampler (HV/PUF) for gaseous and particulate PAHs and a 13 stage low pressure impactor (LPI) for particle size fractionation. Mean total PAH concentrations were 40 and 4.1 ng/m<sup>3</sup> for HV/PUF and LPI samples, respectively, reflecting differences in gaseous and particulate fractions. Benzo[a]pyrene exceeded the Ontario Ministry of Environment ambient air quality criterion in five of the 29 HV/PUF samples and two LPI samples. Toxic equivalent values were similar for both sets of samples (0.29-0.30 ng BaP TEQ/m<sup>3</sup>). High molecular weight PAHs exhibited a tri-modal distribution at <0.08, 0.11 and 0.9 µm. Generally, lower molecular weight PAHs were associated with the summer months, while higher molecular weight PAHs were associated with the winter months, indicating different sources. Deposition velocities for LPI samples ranged between 0.24-15 cm/s and mean total PAH deposition rates were approximately 6,900 ng/m<sup>2</sup>/day. Deposition rates generally mirrored concentration patterns for different seasons. Approximately 150 kg per year of total PAHs is expected to enter the Brunette River watershed in the form of dry atmospheric deposition. Although the present study represents a limited snapshot in time, the exceedence of the ambient air quality criterion for benzo[a]pyrene in several HV/PUF and LPI winter samples suggests that PAH concentrations during the colder season may pose a risk to human health, especially to individuals most sensitive to air pollution. The relatively high PAH deposition rates to the area suggests that the PAH contribution from atmospheric sources may represent a significant portion of the total PAH load to the Brunette River watershed. Atmospheric deposition of PAHs may consequently play an important role in the reported exceedence of water quality guidelines and criteria for benzo[a]pyrene in local rivers and may possibly affect the health of aquatic life residing within the watershed.*

## RÉSUMÉ

On a étudié les hydrocarbures polycycliques aromatiques (HAP) dans des échantillons d'air sec prélevés au lac Burnaby, dans la région du Grand Vancouver (Colombie-Britannique) pour déterminer les concentrations de HAP, la granulométrie des particules et les taux de dépôt dans un bassin hydrographique de région urbaine. Toutes les semaines, on a prélevé des échantillons avec un échantillonneur de volume élevé à mousse de polyuréthane pour les HAP gazeux et particulaires, et avec un impacteur basse pression à 13 étages pour la séparation granulométrique. En moyenne, la concentration de HAP totaux mesurée à l'échantillonneur était de  $40 \text{ ng/m}^3$  et celle mesurée à l'impacteur, de  $4,1 \text{ ng/m}^3$ , ce qui dénote des différences entre les fractions gazeuses et les fractions particulières. Par ailleurs, dans 5 des 29 échantillons prélevés à l'échantillonneur et dans 2 des échantillons prélevés à l'impacteur la concentration de benzo[a]pyrène (BaP) dépassait la limite recommandée dans les critères sur la qualité de l'air ambiant du ministère de l'Environnement de l'Ontario. Les valeurs d'équivalent toxique (TEQ) étaient les mêmes pour les deux groupes d'échantillons ( $0,29 - 0,30 \text{ ng TEQ BaP/m}^3$ ). La distribution des HAP de poids moléculaire élevé présentait trois pics ( $< 0,08, 0,11$  et  $0,9 \mu\text{m}$ ). En général, les HAP de faible poids moléculaire étaient associés aux mois d'été et ceux de poids élevé aux mois d'hiver, ce qui dénoterait des sources différentes. Les vitesses de dépôt déterminées pour les échantillons prélevés à l'impacteur étaient comprises entre  $0,24$  et  $15 \text{ cm/s}$ , et le taux de dépôt moyen des HAP totaux était d'environ  $6\,900 \text{ ng/m}^2/\text{jour}$ . En général, les taux de dépôt concordaient avec les concentrations mesurées aux différentes saisons. Le bassin de la rivière Brunette recevrait environ  $150 \text{ kg par an}$  de HAP totaux sous forme de dépôts atmosphériques secs. L'étude présentée ici ne donne qu'un instantané de la situation, mais comme la concentration de benzo[a]pyrène de plusieurs des échantillons prélevés en hiver à l'échantillonneur et à l'impacteur dépasse la valeur recommandée dans les critères relatifs à la qualité de l'air ambiant, on peut penser que durant la saison froide les HAP peuvent atteindre des concentrations posant un risque pour la santé humaine, surtout pour celle des personnes sensibles à la pollution de l'air. Par ailleurs, vu les taux de dépôt de HAP relativement élevés dans la région, les apports de HAP d'origine atmosphérique représenteraient une partie importante de la charge totale de HAP dans le bassin hydrographique de la rivière Brunette. Par conséquent, les dépôts atmosphériques de HAP pourraient expliquer dans une mesure significative les concentrations de benzo[a]pyrène supérieures aux valeurs recommandées dans les critères et les lignes directrices sur la qualité de l'eau qui ont été mesurées dans les cours d'eau locaux et pourraient avoir des effets sur la santé des organismes aquatiques du bassin hydrographique.

## 1. INTRODUCTION

The atmosphere is an important pathway for the transport and global distribution of many toxic substances. Polycyclic aromatic hydrocarbons (PAHs) are ubiquitous in the urban atmosphere and are one of the first atmospheric pollutants to be identified as suspected carcinogens. They are produced through incomplete combustion of organic materials and result from both natural and anthropogenic processes. Anthropogenic sources include aluminum smelters (CEPA, 1994), incineration, wood burning and automobile exhaust (BCMELP, 1993). Natural sources include forest fires, diagenesis and biosynthesis (NRCC, 1983). PAHs are found in both vapor and particle phases. Most particle-phase PAHs are associated with aerosols in the accumulation mode (1-2  $\mu\text{m}$ ) (Pistikopoulos *et al.*, 1990; Aceves and Grimalt, 1993; Venkataraman and Friedlander, 1994). As a result, they are readily inhaled into lung alveoli, posing a potentially significant health risk to humans. Of special concern are benzo[a]pyrene, benzo[b]fluoranthene, benzo[j]fluoranthene, benzo[k]fluoranthene and indeno[1,2,3-cd]pyrene which have all been classified as 'probably carcinogenic to humans' and defined as toxic under the Priority List 1 assessment by Environment Canada/Health and Welfare Canada (CEPA, 1994).

In the present study, PAHs were measured in ambient air at Burnaby Lake located in the Brunette River watershed, a highly urbanized and industrialized area within the municipalities of Burnaby, Vancouver and New Westminster, B.C. (Figure 1). The watershed drains 6,060 hectares of land divided into four predominant land uses, namely, 42% residential, 31% open space and forested, 15% commercial and institutional and 5.5% industrial (Hall and Anderson, 1988). Approximately 15% of the total land area is taken up by highways, streets and alleys. This includes two major highways (Highways 1 and 7) which follow the lower elevation contours around both sides of Burnaby Lake and form the major east-west corridor between Vancouver and the Fraser Valley. Anthropogenic sources of PAHs and trace metals to the watershed are numerous and are dominated by vehicular and industrial emissions.

The objectives of the study were: 1) to characterize the concentration and particle size distribution of PAHs in ambient air; 2) to quantify atmospheric deposition of PAHs to the Burnaby Lake area; and 3) to examine the seasonal variation in PAH concentration and deposition rates and their relationships to environmental factors.

## **2. SITE DESCRIPTION**

Burnaby Lake is positioned between two ridges that run laterally for several kilometers in an approximately east-west direction on the north and south sides of the lake. Because of the topography, the natural flow of winds through the lake basin is generally from the east or the west. The commercial and institutional land use areas are scattered throughout the basin, while the industrial areas (mechanical, shipping, transportation and manufacturing) are concentrated along Still Creek to the west and the Brunette River to the east side of Burnaby Lake (Hall and Anderson, 1988). The north, south and south west sides are surrounded by residential areas. Highway 7 runs along the north side of the lake and Highway 1 along the south side. A major intersection connects these two highways to the east (Figure 1).

Atmospheric sampling equipment was installed on the roof of the Rowing Club Pavilion Building on the south side of Burnaby Lake at a height of 4.9 meters above the water. The building was situated over the lake on pilings and was away from any local sources of pollution. The site was chosen for its proximity to traffic corridors, as well as its distance from any particular point source. Because the site was free of any physical obstructions to wind flow, samples were expected to be representative of the area.

## **3. METHODS**

### **1.1 Field Sampling**

#### **1.1.1 *Meteorological Instruments***

A meteorological tower was used for recording physical variables such as wind direction, wind speed, temperature, barometric pressure and relative humidity. Wind speed and direction were measured using an RM Young anemometer mounted at a height of 7.9 meters above the lake and 3 meters above sampling height. Temperature was measured using an RM Young thermistor. Barometric pressure was measured with a Setra Systems aneroid barometer. Relative humidity was measured with an RM Young hygrometer. Rainfall amount was measured using an Environment Canada standard rain gauge. All meteorological data were captured by a CR-10 data logger from Campbell Scientific and downloaded to a computer for processing.

### ***1.1.2 High Volume/Poly-Urethane Foam Sampler***

A High Volume/Poly-Urethane Foam sampler (HV/PUF), Model PS-1, from Graseby-General Metal Works (Cleves, Ohio) was used to obtain particulate and gaseous air samples. Air was drawn through a 102 mm diameter glass microfiber filter of pore size 1.5  $\mu\text{m}$  (Whatman Type 934-AH) to collect particulate matter and a polyurethane (PUF) foam plug to collect gas-phase semi-volatile compounds. Sampling procedures were in accordance to those established by the manufacturer. Weekly samples were collected for 30 weeks between January 31 to December 5, 1995 (Table 1). Sampling times ranged from 73.7-169.5 hours with an average flow rate of 0.23  $\text{m}^3/\text{min}$ . Flow rates were determined at the beginning and end of each sampling period by measuring the pressure drop across the sampling train, which is proportional to the flow rate. Prior to sampling, the PUF plugs and filters were extracted with dichloromethane. The sampling head was loaded and unloaded at the laboratory to prevent sample contamination.

### ***1.1.3 Low Pressure Impactor***

Atmospheric particulate matter was collected with a 13 stage low pressure cascade impactor (LPI) Model # 20-930 (Graseby Andersen, Smyrna, Georgia) capable of separating atmospheric particles into 13 unique size fractions corresponding to the following cutoff diameters ( $\mu\text{m}$ ): >35, 21.7, 15.7, 10.5, 6.6, 3.3, 2.0, 1.4, 0.9, 0.52, 0.23, 0.11 and 0.08. Sampling procedures were those established by the manufacturer. Glass fiber filters were used as impaction surfaces and for the backup filter. Filters used as impaction surfaces were sprayed with silicone spray (Dow Corning 316) to improve particle capture. Weekly samples were collected for 13 weeks between February 7 and August 15, 1995 (Table 2). The sampling volume ranged from 29.9-30.4  $\text{m}^3$ . The flow rate (3.0 L/min) was calculated from the pressure drop across the critical orifice using a calibration graph provided by the manufacturer. In order to sample continuously through various weather conditions, the LPI was positioned beside a MIC rainfall sampler equipped with an automatic cover that automatically slid over the LPI during periods of precipitation.

## **1.2 Field Quality Assurance/Quality Control**

### ***1.2.1 Meteorological Data***

Meteorological instruments were evaluated yearly using manufacturer's procedures to ensure that they performed accurately and within manufacturer's specifications. The standard Environment Canada rain gauge had an accuracy

of +/- 0.1 mm. The accuracy of the RM Young anemometers was +/-0.05 m/s over the threshold limit of 0.5 m/s over a range of 0-30 m/s. The wind direction accuracy was within 5 degrees of true north after being sited with a compass setup. The RM Young thermistors had an accuracy of +/-0.4 °C. The RM Young hygrometers had an accuracy of +/-3% over a range of 0-100%. The RM Young barometers had an accuracy of +/- 0.2 mb over a range of 800-1,100 mb.

### **1.2.2 *Chemical Data***

Field blanks were used to confirm the quality and accuracy of the methods involved in the transportation, collection and handling of samples. Field blanks were obtained by performing normal installation procedures and removing the sampling media (filters, PUF or substrates) without sampling. The blank samples were taken to the laboratory for analysis.

### **1.2.3 *Sample Handling***

Documented sample handling protocols were established prior to sampling to ensure data quality and to prevent contamination by the personnel or other outside sources. Only non-smoking personnel were employed in the sampling program. Personnel were required to wear polyethylene gloves during sample handling.

## **1.3 Laboratory Methods**

Samples were analyzed for selected PAHs at ZENON Analytical Services, Burnaby, B.C., using low resolution GC-MS (modified method SW846-8270B, revision 2) (EPA, 1994). Refer to Table 3 for a list of target analytes, their molecular weights and boiling points. PAHs with molecular weights >200 amu (having four or more rings) were classified as "high molecular weight" while those with <200 amu were classified as "low molecular weight". For HV/PUF samples, extracts from the glass fiber filter and PUF were combined and analyzed together.

The QA/QC component of the analytical analysis included laboratory blanks, standards, spikes and replicates. Blanks were used to assess reagents and methods. Lab spikes were used as a measure of accuracy against known standards. Replicates were used as a measure of the precision of the analytical procedures.

## **1.4 Data Processing and Analysis**

Data were blank corrected based on averaged field blank values. The blank-corrected values were then evaluated with respect to recoveries of specifically spiked compounds (laboratory spikes). Laboratory spikes were deemed acceptable if they were in the range of 60-140% of the target analyte. Naphthalene was removed from the data set due to consistently low surrogate recoveries, as were data for the week of February 21-28. Values below the minimum detection limit were set to zero for calculations and reporting purposes.

Four outliers were identified by Principal Components Analysis (PCA) and graphical display and removed from the data set. For PCA analysis, data was log normalized and standardized (using standard deviations) prior to component extraction from a correlation matrix. All PCA models discussed had eigenvalues >1.0 at least to PC 4, indicating that the range of real (as opposed to random) variation in the data sets extended to the fourth PC. Canonical Correlation Analysis (CCA) was used to determine whether environmental physical variables can predict contaminant related variables. Data were log normalized prior to inclusion in CCA analysis. Statistical analysis was performed using SYSTAT version 7.0. Benzo[a]pyrene (BaP) TEQs were calculated according to toxic equivalence factors values from Schedule 1.1 of the B.C. Waste Management Act (1998).

### **1.4.1 Deposition Calculations**

#### *Deposition Velocities*

Deposition calculations were performed on the particulate PAH data collected by LPI. Deposition velocities ( $V_d$ ) for particles  $<5\text{ }\mu\text{m}$  were calculated after Slinn and Slinn (1980), while those for particles  $>5\text{ }\mu\text{m}$  were calculated after Noll and Fang (1989). For particles  $<5\text{ }\mu\text{m}$ , the deposition velocity was calculated using the following formula:

$$V_{d(<5\mu\text{m})} = C_D u_{avg(h)} \quad (\text{m/s})$$

where:

$C_D$  = the drag coefficient ( $1.3 \times 10^{-3}$ )

$u_{avg(h)}$  = the mean wind velocity at height  $h$  (m/s)

Deposition velocities for particles  $>5\text{ }\mu\text{m}$  were calculated assuming negligible gravitational effects using the following formula:

$$V_{d(>5\mu\text{m})} = E_A u_{avg}^* \quad (\text{m/s})$$

where:

$E_A =$  the particle effective inertial coefficient =  $1.12e^{-30.36/da}$   
 where:  $d_a$  is the aerodynamic particle diameter  
 $u^*_{avg} =$  the mean friction velocity =  $k u_{avg} \ln [Z_0/(Z-d)]$  (m/s)  
 where:  $k$  = Von Karman's constant (0.4)  
 $Z_0$  = surface roughness (0.25 m)  
 $Z$  = height of the wind speed measurement (m)  
 $d$  = height of the sampler above ground (m)

### *Deposition Rates*

Deposition rates were calculated from the product of the deposition velocity and contaminant concentration. Total deposition was calculated as the sum of deposition rates for each particle size interval. The equation consisted of a combination of the Slinn and Slinn (1980) and Noll and Fang (1989) equations, for particles of diameter <5 µm and >5 µm, respectively:

$$D_t = \sum_{(da<5\mu m)} [(1.3 \times 10^{-3}) u_{avg} C_{da}] + \sum_{(da>5\mu m)} [(1.12 e^{-30.36/da} u^*_{avg}) C_{da}] \text{ (ng/m}^2/\text{sec)}$$

where:

$d_a$  = the aerodynamic particle diameter

$C_{da}$  = the contaminant concentration for particles of diameter "a" (ng/m<sup>3</sup>)

$u_{avg}$  = mean wind speed (m/s)

$u^*_{avg}$  = mean friction velocity (m/s)

## 4. RESULTS AND DISCUSSION

### 1.5 Meteorological Data

Meteorological data collected during the study period are presented in Table 4 and Figure 2. Results represent average weekly values calculated over each seven day sampling period.

Some meteorological data were lost or suspect for several reasons: data logger overload, violent storms that flooded equipment or knocked it over and freezing conditions. The mean temperature ranged from a low of 2.7°C during the week of February 28 to a high of 21.2 °C during the week of June 27. The mean relative humidity ranged from 64.6-98.8% with lower values typical of the summer months. Precipitation varied throughout the study period, ranging from 0-131.4 mm with considerably greater amounts of precipitation falling during the

fall months. Mean atmospheric pressure values ranged from 1,002-1,023 mb with more pronounced fluctuations during the fall and winter period. Wind speeds ranged from 1.0-2.7 m/s with higher values during the fall and winter seasons. Winds were predominantly from the east to south-east during the study period. Some seasonal trends were observed where northerly winds were generally present only during the fall-winter period and westerly winds only during the spring-summer period. Because the wind direction was evaluated from frequency patterns, there was often difficulty in determining a “prevailing” wind direction, especially when daily wind direction predominated in two or more different octants in the same week.

## 1.6 HV/PUF DATA

### 1.6.1 *PAH Concentrations and TEQs*

Table 5 presents the PAH concentrations measured in HV/PUF samples throughout the sampling period, and Table 6 presents a statistical summary of the data. Seventeen of the 22 parent PAHs and six of the seven non-standard PAHs were detected in the samples. Mean individual PAHs values ranged from 0.015 to 17 ng/m<sup>3</sup>. Phenanthrene, acenaphthene, fluorene, fluoranthene and pyrene were the most abundant PAHs, in the order listed. These are the typical PAHs associated with incineration, gasoline and wood combustion (Duval and Friedlander, 1981). The more volatile low molecular weight (MW) PAHs predominated over high MW PAHs with mean values approximately four times higher for the former. 7-12 Dimethylb[a]anthrene, 3-methylcholanthrene, dibenzo[a,l]pyrene, dibenzo[a,l]pyrene and dibenzo[a,h]pyrene were not detected in any samples, likely due to their relative rarity but also possibly due to their detection limits being 3x higher than that of the rest of the PAHs. Alkylated phenanthrene concentrations were considerably lower than their unsubstituted counterparts, indicating a predominance of combustion (as opposed to petrogenic) sources (Yunker *et al.*, 1999). Total PAH concentrations ranged between 17-92 ng/m<sup>3</sup> with a mean of 40 ng/m<sup>3</sup>. The mean BaP TEQ concentration was 0.29 ng TEQ/m<sup>3</sup>.

In comparison to other studies using similar methods, individual PAHs were generally similar or lower than those measured by Belzer (1995, unpublished data) and Faulkner (1985) in Vancouver and Delta, B.C. and by Dann (1998) at numerous urban sites across Canada. In contrast, concentrations were generally over an order of magnitude greater than those measured at a rural site in Chesapeake Bay (Leister and Baker, 1994).

PAH concentration time series are shown in Figure 3. Acenaphthylene, acenaphthene, fluorene and phenanthrene concentrations peaked in late summer, fluoranthene and pyrene peaked in late spring-early summer, while

most of the PAHs with MW >228 amu peaked in the winter. Benzo[a]pyrene exceeded the Ontario Ministry of Environment ambient air quality criterion annual value of 0.3 ng/m<sup>3</sup> (OME, 1999) in five of the 29 HV/PUF samples. All exceedences occurred in the cooler months, November to April, with the highest exceedences occurring in January and February.

BaP TEQ concentrations (Figure 3) were highest in the winter, reflecting relatively high MW PAH levels. This trend of elevated high MW PAH concentrations in the winter season was also reported in a nine year seasonal study of the San Francisco Bay Area (Fiessel *et al.*, 1991). Although the mean concentrations for benzo[a]pyrene and benzo[ghi]perylene were between 2-4 times greater than those measured in the present study, the San Francisco study identified an important link between mutagenicity, an indicator of carcinogenic potential, and elevated levels of high MW PAHs associated with the winter period. This indicates that the winter season may be the most important, in terms of possible health effects for residents in the Burnaby Lake area.

PCA was applied to normalized PAH concentration data to better identify groups of PAHs showing similar temporal patterns. Figure 4 shows the first two PCs of the loadings plot accounting for 45 and 29% of the variability, respectively. The analysis generated three clusters separated by differences in molecular weight. Cluster #1 was composed of PAHs of molecular weight <178 amu, cluster #2 of PAHs of molecular weight between 178-228 amu and cluster #3 of PAHs of molecular weight >228 amu. PCA scores (Figure 5) indicated that these clusters were generally associated with the following seasons: late summer-fall period (cluster #1), late spring-early summer (cluster #2) and winter (cluster #3). When wind direction was added to the analysis (Figure 6), two main wind patterns emerged, with cluster A (corresponding to PAHs of molecular weight <178 amu) associated with winds from the N, NE, E and SE, and cluster B (corresponding to PAHs of molecular weight between 178-228 amu) associated with winds from the W, SW, E and SE. As winds from the E and SE are present in both clusters, the main difference between the two is that cluster A includes winds from the northerly direction and cluster B from the westerly direction. Although Burnaby Mountain is located directly to the north of the lake and may create a wind barrier in this direction, it is possible that the two oil refineries and tank storage facilities, located to the north of the site, may be a source of the lower MW PAHs whose volatility is greatly enhanced during the warmer period of late summer-early fall. Fluoranthene, pyrene and phenanthrene, which were associated with westerly winds of late spring-early summer, may be primarily generated by automobile emissions from the downtown core and nearby highways. These specific PAHs have been linked with gasoline powered cars, incineration and wood combustion (Duval and Friedlander, 1981).

## 1.7 LPI DATA

### 1.7.1 PAH Concentrations and TEQs

Tables 7-17 present the concentrations of PAHs analyzed in weekly LPI samples and Table 18 presents the mean PAH concentrations in each particle size fraction for the 11 samples. Mean size fractionated PAH concentrations are shown in Figure 7. Low MW PAH concentrations did not show a clear size distribution, however total high MW PAHs indicated a tri-modal distribution for the <0.08, 0.11 and 0.9  $\mu\text{m}$  size fractions. The <0.08  $\mu\text{m}$  fraction is that most frequently associated with boiler-like emissions and the 0.11  $\mu\text{m}$  fraction with automobile emissions and wood combustion (Hildemann *et al.*, 1991). The 0.9  $\mu\text{m}$  fraction may be associated with secondary reaction products on primary aerosols.

The highest BaP TEQ concentration (Figure 8) was associated with the 0.11  $\mu\text{m}$  fraction, which has the potential to penetrate deep within lung alveoli, the site of blood gas exchange. The backup filter (<0.08  $\mu\text{m}$ ) had the second highest BaP TEQ concentration, indicating that primary particles may also present a high potential for toxicity. BaP TEQs and the majority of PAHs were generally associated with particulate matter of <2.0  $\mu\text{m}$  (Figure 9). This is consistent with results of other similar studies conducted in urban areas (Baek *et al.*, 1991; Hildemann *et al.*, 1991).

Although there was a general tendency for PAHs to associate with particle sizes <2  $\mu\text{m}$ , PCA analysis of mean PAH concentrations among the different particle size fractions revealed a subtle size preference based on molecular weight. Figure 10 presents the factor loadings plot for normalized PAH concentrations measured in the 13 different particle size fractions. Factors 1 and 2 accounted for 39 and 15% of the total variance, respectively. High positive loadings on Factor 1 characterized the high MW PAHs in cluster A, while high negative loadings on Factor 1 characterized the lower MW PAHs in cluster B. The PCA scores plot (Figure 11) indicated that most PAHs in cluster A were generally associated with smaller particle sizes, while most PAHs in cluster B were generally associated with larger particle sizes. Other investigators report similar distributions, with relatively non-volatile PAHs found in association with particles <1  $\mu\text{m}$  and more volatile PAHs found in association with particles >1  $\mu\text{m}$  (Pistikopoulos *et al.*, 1990; Van Vaeck and Van Cauwenberghe, 1985).

A seasonal effect was also seen for size fractionated PAHs in LPI samples. For PAHs of MW >228 amu, levels were generally higher in the colder months than in the warmer months (Figure 12). PAHs of molecular weight >228 amu exhibited a clear winter peak in the 0.11  $\mu\text{m}$  size fraction. This may be due to a greater extent of gas-particle condensation at lower temperatures giving rise to a higher production of sub-micron particulate material (Aceves and Grimalt, 1993), or to

increased emissions in the 0.11  $\mu\text{m}$  fraction during the colder season, possibly from wood combustion in residential dwellings. Low MW PAH concentrations were higher in the warmer season than in the colder season for most size fractions  $>1.0 \mu\text{m}$ .

For individual PAHs summed across all LPI stages (Tables 19 and 20), phenanthrene, fluoranthene, pyrene, chrysene and benzo[*b*]fluoranthene had the highest mean concentrations (0.44-0.53 ng/m<sup>3</sup>). Levels of total high MW PAHs were over three times higher than those of low MW, which is the opposite of that found for HV/PUF samples which more effectively capture the gaseous phase PAHs (Figure 13). The mean total PAH concentration was 4.1 ng/m<sup>3</sup>, which is almost an order of magnitude lower than for the HV/PUF samples. In contrast, the mean BaP TEQ concentration in LPI samples (0.30 ng TEQ/m<sup>3</sup>) was nearly identical to that in HV/PUF samples (0.29 ng TEQ/m<sup>3</sup>), due to the similar concentrations of PAHs with molecular weights  $>202 \text{ amu}$  which are used in the TEQ calculations. Benzo[*a*]pyrene accounted for most of the toxicity of both HV/PUF and LPI samples (Table 21).

### 1.7.2 **PAH Deposition Rates**

Deposition velocities for PAHs in LPI samples were calculated according to a combination of the Slinn and Slinn (1980) and Noll and Fang (1989) equations (as described in section 3.4.1) for particles  $>5 \mu\text{m}$  and  $<5 \mu\text{m}$ , respectively. Values ranged from 0.24-15 cm/sec, with deposition velocities increasing sharply for particles with diameters  $>10.5 \mu\text{m}$  (Table 22). This range was similar to that obtained experimentally by Gardner *et al.* (1992), for similar particle size fractions, but higher than the commonly employed average deposition velocity of 0.1-0.2 cm/s. The working theory was that by combining the Slinn and Slinn and Noll and Fang models we can obtain a closer approximation of true deposition velocities than by using either of the two models alone. The Slinn and Slinn equation, applicable to particles  $<5 \mu\text{m}$ , is independent of particle diameter and equal to the limiting value set by atmospheric turbulence. The Noll and Fang equation, applicable for particles  $>5 \mu\text{m}$ , contains the inertial settling velocity which increases exponentially with particle diameter. It should be noted that for particles  $>20 \mu\text{m}$  the deposition velocity may be overestimated using this approach. This is because the Stokes velocity becomes important as very large particles tend to ignore air eddies and simply deposit to the ground under the influence of gravity (Noll and Fang, 1989). Nevertheless, the combination of these two models should yield relatively accurate field deposition rates for ambient PAHs.

Size fractionated PAH deposition rates calculated from weekly LPI concentrations and deposition velocities are shown in Tables 25-33. Mean size fractionated deposition rates for the entire sampling period are shown in Table 34 and Figure 14. Generally PAH deposition rates increased with increasing

particle diameter for particles  $>10.5\text{ }\mu\text{m}$  with the highest rates corresponding to the  $>35\text{ }\mu\text{m}$  fraction. Some of the higher molecular weight PAHs also showed a smaller deposition peak in the  $0.11\text{ }\mu\text{m}$  fraction. The association between high deposition rates with particle sizes  $>10.5\text{ }\mu\text{m}$  is not a function of high PAH concentrations associated with this size fraction, but rather a consequence of the fact that for particles  $>5\text{ }\mu\text{m}$ , the deposition velocity becomes heavily dependent on the particle size diameter.

A comparison of deposition rates between the winter - early spring and late spring - summer samples (Figure 15) indicated that, generally, for high MW PAHs, deposition rates tended to be higher in the colder season, while low MW PAHs tended to be higher in the warmer season. This pattern appears to parallel concentration peaks observed in the LPI samples. The relatively high BaP TEQ deposition rates measured during the cooler period suggests that aquatic life may be most at risk from impacts of atmospheric deposition at this time of the year.

Table 35 presents the deposition rates for the sum of all particulate fractions for weekly LPI samples and Table 36 presents a statistical summary of this data. In decreasing order, phenanthrene, fluoranthene and pyrene had the highest mean deposition rates, ranging from  $1,000$ - $1,300\text{ ng/m}^2/\text{day}$ . Total high MW PAH deposition rates were more than two times higher than total low MW deposition rates (Figure 16), reflecting concentration patterns. The mean deposition rate for the sum of PAHs ( $6,900\text{ ng/m}^2/\text{day}$ ) was approximately an order of magnitude higher than that obtained experimentally over water in rural England (Gardner *et al.*, 1992) and over Chesapeake Bay, using an average deposition velocity of  $0.49\text{ cm/s}$  (Leister and Baker, 1994). This is largely a reflection of the higher PAH concentrations at Burnaby Lake compared to those measured in the other studies.

PAH concentration and deposition time series graphs for LPI samples are shown in Figure 17. Deposition rates followed concentration maxima for acenaphthene, fluorene, benzo[*j*]fluoranthene, benzo[a]pyrene, indeno[1,2,3-*cd*]pyrene, benz[*a,h*]anthracene and total low MW PAHs. Peak deposition rates occurred in May for total low MW PAHs and in February for total high MW PAHs. Both these peaks correspond to concentration maxima and in the case of February 7 to high wind speed. Benzo[a]pyrene exceeded the Ontario Ministry of Environment Ambient Air Quality Criterion of  $0.3\text{ ng/m}^3$  (OME, 1999) during the weeks of February 7 and April 18. Canonical Correlation Analysis (not shown) did not reveal any significant correlations between deposition rates and the environmental variables wind speed, temperature, pressure and relative humidity.

Yearly estimates of PAH deposition rates are shown in Table 37. A total  $830$  and  $1,700\text{ }\mu\text{g/m}^2$  of total low and high MW PAHs, respectively, are expected to be deposited in the Burnaby Lake area over the period of one year. When projected

over the total area of the Brunette River watershed, approximately 150 kg of total PAHs are expected to be entering the system in the form of dry atmospheric deposition. This relatively high PAH deposition rate to the area, suggests that the PAH contribution from atmospheric sources may represent a significant portion of the total PAH load to the Brunette River watershed.

When converted to BaP TEQ equivalents, approximately 81  $\mu\text{g}/\text{m}^2$  is estimated to be deposited to the area over the period of one year with approximately 5.0 kg BaP TEQs being deposited to the entire watershed as dry atmospheric deposition. As a relatively large proportion of the land within the Brunette River watershed contains impervious surfaces, most of the atmospheric deposition is expected to be carried off by surface runoff directly into the environmentally sensitive urban creeks and rivers. Water and sediment quality studies in rivers within the Brunette River watershed (Sekela *et al.*, 1998) have indicated that aquatic life may be at risk in the more urbanized reaches as a result of exceedences of federal and provincial water quality guidelines and criteria for benzo[a]pyrene. This coupled with winter exceedences of the benzo[a]pyrene OME human health criterion for ambient air, indicates that PAHs from atmospheric deposition may represent a significant health threat to this urban ecosystem.

## 5. CONCLUSION

The majority of PAHs measured in this study were detected in both HV/PUF and LPI samples, a reflection of their ubiquitous nature in urban air sheds. Phenanthrene, acenaphthene, fluoranthene and pyrene, PAHs typically associated with combustion sources, were measured in the highest concentrations in both types of samples. The more volatile low MW PAHs predominated over the high MW PAHs in HV/PUF samples indicating that most of the low MW PAHs were found in vapour form, while the reverse was true for LPI samples representing the particulate PAH fraction. The mean total PAH concentration was considerably higher in HV/PUF samples ( $40 \text{ ng}/\text{m}^3$ ) versus LPI samples ( $4.1 \text{ ng}/\text{m}^3$ ) however the BaP TEQ concentration was relatively similar, 0.29 and  $0.30 \text{ ng}/\text{m}^3$ , for the former and latter, respectively. Benzo[a]pyrene contributed to the majority of the total toxicity for both types of samples.

Benzo[a]pyrene exceeded the Ontario Ministry of Environment ambient air quality criterion in five of the 29 HV/PUF samples and two of the 11 LPI samples. All exceedences occurred in the cooler months (November to April), indicating that the winter season may be most important in terms of adverse health effects. Although vehicular emissions are a source of PAHs during the entire year, the occurrence of the more toxic higher MW PAHs during the winter season may be due to a number of factors including residential fire wood combustion, wind

direction and inversions that could concentrate emissions. Individual PAH concentrations measured in HV/PUF samples were generally similar or lower relative to those reported in other studies conducted in Vancouver and other urban locations across Canada but considerably higher than those reported in rural locations.

PAHs measured in HV/PUF samples indicated a seasonal trend with PAHs of low molecular weight (<178 amu) associated with the late summer-fall period and north-easterly winds, those of medium molecular weight (178-228 amu) associated with late spring-early summer period and westerly winds, and those of high molecular weight (>228 amu) associated with the winter period.

High MW PAH concentrations measured by LPI indicated a tri-modal distribution for the following cutoff diameters: <0.08, 0.11 and 0.9  $\mu\text{m}$ . Low MW PAH concentrations were higher in the warmer season than in the colder season, and during this time they were generally associated with size fractions >1.0  $\mu\text{m}$ . The more volatile lower MW PAHs were associated with larger particle sizes, while the more toxic higher MW PAHs were associated with sub-micron sized particles. PAHs of MW >228 amu and BaP TEQs exhibited a clear winter peak in the 0.11  $\mu\text{m}$  size fraction.

Deposition velocities for LPI samples ranged between 0.24-15 cm/s. Deposition rates increased with increasing particle diameter for particles >10.5  $\mu\text{m}$ , with the highest rates generally corresponding to the >35  $\mu\text{m}$  fraction. Deposition rates were within the range of experimentally determined values reported in similar studies.

The mean total PAH deposition rate for LPI samples was approximately 6,900 ng/m<sup>2</sup>/day. For high MW PAHs, deposition rates tended to be higher in the colder season, while for low MW PAHs they were higher in the warmer season, reflecting concentration patterns. Deposition rates were not found to be correlated with environmental variables measured at the site.

A total of 830 and 1,700  $\mu\text{g}/\text{m}^2$  of total low and high MW PAHs, respectively, are expected to be deposited to the Burnaby Lake area over the period of one year with approximately 150 kg of total PAHs entering the Brunette River watershed in the form of dry atmospheric deposition. When converted to BaP TEQ equivalents, approximately 81  $\mu\text{g}$  TEQ/m<sup>2</sup> is estimated to be deposited to the Burnaby Lake area over the period of one year with approximately 5.0 kg TEQ being deposited to the entire watershed as dry atmospheric deposition.

In conclusion, the air pathway appears to be an important source of PAHs to the Burnaby Lake area. The relatively high PAH concentrations measured at the site are a reflection of the highly urbanized location of the lake, receiving inputs from a multitude of sources. The exceedence of the OME ambient air quality criterion for benzo[a]pyrene in several HV/PUF and LPI winter samples suggests that

PAH concentrations during the colder season may pose a risk to human health. The relatively high PAH deposition rates to the area suggests that the PAH contribution from atmospheric sources may represent a significant portion of the total PAH load to the Brunette River watershed, while the reported exceedence of water quality guidelines and criteria for benzo[a]pyrene in local rivers, suggests that aquatic life may be at risk in the more urbanized reaches. The magnitude of atmospheric contribution of PAHs to the watershed is at present unknown, as there is insufficient data characterizing the PAH load from surface runoff.

## 6. ACKNOWLEDGMENTS

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**Table 1. HV/PUF Sample Collection Information**

Week	Date on	Date off	Average Atmospheric Pressure (mb)	Average Atmospheric Pressure (mm Hg) (Pa)	Average Temperature (°C)	Average Temperature (K) (Ta)	Average Magnehelic Pressure ("H2O) (l)	Total elapsed time (hours)	Total elapsed time (min) (t)	Flow* (m³/min) (Qa) Qa=I[sqrt(Ta/Pa)-b]/m'	Volume (m³) V=Qa*t
1	31-Jan	07-Feb	1021	765.8	8	281.2	50.0	166.9	10013.4	0.23	2292.3
2	07-Feb	14-Feb	1019	764.3	4.7	277.9	41.0	166.1	9963.0	0.21	2098.5
3	14-Feb	17-Feb	1008	756.1	2.4	275.6	70.5	73.7	4420.8	0.27	1189.9
4	17-Feb	21-Feb	1016	762.1	8.2	281.4	62.0	94.3	5657.4	0.25	1432.0
5	21-Feb	28-Feb	1023	767.3	5.1	278.3	45.0	167.3	10039.2	0.22	2192.9
6	28-Feb	03-Mar	1020	765.1	2.7	275.9	57.5	74.0	4442.4	0.24	1078.6
7	03-Mar	07-Mar	1015	761.3	2.6	275.8	63.0	94.9	5691.0	0.25	1445.1
8	25-Apr	02-May	1011	758.3	12.9	286.1	61.5	167.5	10050.0	0.25	2547.2
9	02-May	09-May	1011	758.3	13.8	287.0	68.0	166.8	10008.0	0.27	2669.8
10	09-May	16-May	1010	757.6	13.8	287.0	70.0	165.3	9918.0	0.27	2686.5
11	16-May	23-May	1016	762.1	14.4	287.6	70.5	167.7	10062.0	0.27	2732.9
12	23-May	30-May	1015	761.3	18.5	291.7	69.5	167.3	10038.0	0.27	2716.8
13	13-Jun	20-Jun	1010	757.6	14.9	288.1	68.0	164.1	9843.6	0.27	2629.2
14	20-Jun	27-Jun	1019	764.3	17.7	290.9	56.0	168.2	10092.0	0.24	2451.0
15	27-Jun	04-Jul	1013	759.8	21.2	294.4	53.0	167.9	10074.0	0.24	2395.2
16	04-Jul	11-Jul	1014	760.6	17.9	291.1	69.5	167.3	10038.0	0.27	2716.1
17	11-Jul	18-Jul	1018	763.6	19.8	293.0	68.0	118.9	7134.0	0.27	1909.9
18	18-Jul	25-Jul	1013	759.8	20.8	294.0	69.0	169.0	10140.0	0.27	2741.2
19	25-Jul	01-Aug	1015	761.3	17.4	290.6	60.0	167.0	10017.6	0.25	2515.8
20	01-Aug	08-Aug	1011	758.3	17.5	290.7	61.0	168.1	10086.0	0.25	2556.1
21	12-Sep	19-Sep	1015	761.3	18.2	291.4	28.0	164.6	9877.8	0.19	1840.8
22	19-Sep	26-Sep	1015	761.3	15.7	288.9	37.5	167.8	10066.8	0.21	2066.8
23	26-Sep	03-Oct	1012	759.1	13.2	286.4	37.0	169.5	10168.2	0.20	2075.2
24	03-Oct	10-Oct	1015	761.3	11.5	284.7	33.5	166.6	9993.6	0.20	1966.1
25	10-Oct	17-Oct	1016	762.1	11.3	284.5	35.0	166.6	9996.6	0.20	1996.2
26	17-Oct	24-Oct	1022	766.6	8.9	282.1	32.0	168.6	10117.2	0.19	1954.8
27	07-Nov	14-Nov	1012	759.1	8.4	281.6	32.0	166.6	9994.8	0.19	1933.7
28	14-Nov	21-Nov	1016	762.1	9.4	282.6	31.5	167.5	10051.2	0.19	1934.4
29	21-Nov	28-Nov	1013	759.8	9.1	282.3	33.0	167.9	10076.4	0.20	1970.1
30	28-Nov	05-Dec	1006	754.6	6.5	279.7	38.0	168.1	10086.6	0.21	2072.1

\*From Field Calibration:

slope (m') = 304.8445347

Y intercept (b')= -39.48768322

**Table 2. LPI Sample Collection Information**

Week	Analysis	Date On	Time on	Date off	Time off	Time elapsed (min)	Ambient Pressure (mb)	Ambient Pressure ("Hg) Pa	Initial Pressure at Critical Orifice (mm Hg)	Final Pressure at Critical Orifice (mm Hg)	Average Pressure at Critical Orifice (mm Hg)	Average Pressure at Critical Orifice ("Hg) (Pco)
1	PAHs	07-Feb	10:30	14-Feb	09:00	9990	1019	30.13	114	125	119.5	4.71
2	PAHs	21-Feb	10:50	28-Feb	08:40	9950	1023	30.25	114	113	113.5	4.47
3	PAHs	07-Mar	10:15	14-Mar	08:30	9975	1002	29.63	114	116	115	4.53
4	PAHs	21-Mar	08:35	28-Mar	08:30	10075	1021	30.19	114	96	105	4.14
5	PAHs	04-Apr	08:30	11-Apr	08:40	10090	1011	29.90	114	114	114	4.49
6	PAHs	18-Apr	09:10	25-Apr	08:30	10040	1018	30.10	114	114	114	4.49
7	PAHs	02-May	09:30	09-May	08:15	10035	1011	29.90	114	114	114	4.49
8	PAHs	23-May	08:00	30-May	07:30	10050	1015	30.01	116	114	115	4.53
9	PAHs	20-Jun	09:00	27-Jun	07:45	10005	1019	30.13	120	112	116	4.57
10	PAHs	18-Jul	07:50	25-Jul	08:43	10133	1013	29.95	114	116	115	4.53
11	PAHs	01-Aug	08:30	08-Aug	08:30	10080	1011	29.90	114	114	114	4.49
12	PAHs	08-Aug	08:30	15-Aug	08:30	10080	1014	29.98	114	114	114	4.49

**Notes:**

July 18, Aug. 1 and Aug. 8 dates did not have complete records for elapsed time - assumed a flow of 3.0 L/min and a total sample volume of 30.0 m<sup>3</sup>.

\* From pressure drop across the critical orifice (flow calibration graph provided by Graseby Andersen)

**Table 3. List of Target Analytes, Molecular Weights and Boiling Points**

Analyte	Molecular Weight (amu)	Boiling Point (°C)
<b>Low MW PAHs</b>		
Acenaphthylene	152.20	270
Acenaphthene	154.21	279
Fluorene	166.22	294
Phenanthrene	178.24	339
Anthracene	178.24	339.9
<b>High MW PAHs</b>		
Fluoranthene	202.26	367
Pyrene	202.24	404
Benzo(c)phenanthrene	228.29	-
Benz(a)anthracene	228.30	400
Chrysene	228.30	448
Benzo(b)fluoranthene	252.32	-
Benzo(k)fluoranthene	252.32	480
Benzo(j)fluoranthene	252.32	-
7,12-Dimethyl(a)anthrene	256.36	-
Benzo(a)pyrene	252.32	312
3-Methylcholanthrene	268.37	280
Indeno(1,2,3-c,d)pyrene	276.34	-
Dibenz(a,h)anthracene	278.36	-
Benzo(g,h,i)perylene	276.34	sublimes at 350
Dibenzo(a,l)pyrene	302.38	-
Dibenzo(a,i)pyrene	302.38	-
Dibenzo(a,h)pyrene	302.38	-
<b>Non Standard PAHs</b>		
Methylnaphthalenes	142.19	-
Dimethylnaphthalenes	156.22	-
Methylphenanthrenes/anthracenes	192.27	-
Dimethylphenanthrenes/anthracenes	206.30	-
Benzo(a)fluorene	216.30	-
Benzo(b)fluorene	216.30	-
Dibenz(a,j)acridine	279.33	-

- indicates data not found

**Table 4. Meteorological Data Collected at Burnaby Lake During the Sampling Period**

Week	Start	Stop	Wind Direction	Wind Speed (m/s)	Temp. (°C)	Pressure (mb)	RH (%)	Precipitation (mm)
1	Jan-31-95	Feb-06-95	E	1.7	8.0	1021	86.8	n/a
2	Feb-07-95	Feb-13-95	NE	2.7	4.7	1019	70.4	n/a
3	Feb-14-95	Feb-20-95	SE	1.9	5.5	1012	98.8	24.2
4	Feb-21-95	Feb-27-95	S	1.0	5.1	1023	91.4	2.7
5	Feb-28-95	Mar-06-95	SE	1.4	2.7	1017	75.4	2.3
6	Mar-07-95	Mar-13-95	SE	2.3	7.9	1002	90.3	11.5
7	Mar-14-95	Mar-20-95	SE	2.7	9.2	1012	82.8	8.3
8	Mar-21-95	Mar-27-95	E	1.8	5.6	1021	80.5	0.2
9	Mar-28-95	Apr-03-95	E	1.4	10.7	1018	74.9	9.6
10	Apr-04-95	Apr-10-95	E	2.1	8.4	1011	84.2	37.8
11	Apr-11-95	Apr-17-95	SW	1.7	7.9	1013	78.1	24.0
12	Apr-18-95	Apr-24-95	W	1.4	10.4	1018	77.4	0.0
13	Apr-25-95	Apr-28-95	W	1.5	15.1	1009	64.6	0.0
14	May-02-95	May-08-95	S	1.4	13.8	1011	81.0	9.2
15	May-09-95	May-15-95	E	1.8	13.8	1010	83.2	28.0
16	May-16-95	May-22-95	SW	1.6	14.4	1016	69.3	0.4
17	May-23-95	May-29-95	SE	1.5	18.5	1015	66.9	0.0
18	May-30-95	Jun-05-95	SE and S	1.6	16.8	1013	73.9	8.8
19	Jun-06-95	Jun-12-95	E	1.6	15.9	1014	81.5	30.4
20	Jun-13-95	Jun-19-95	SE and E	1.7	14.9	1010	83.3	9.2
21	Jun-20-95	Jun-26-95	SE, S and E	1.5	17.7	1019	76.9	0.0
22	Jun-27-95	Jul-03-95	E and SW	1.9	21.2	1013	67.0	3.2
23	Jul-04-95	Jul-10-95	E	1.5	17.9	1014	78.9	19.6
24	Jul-11-95	Jul-17-95	W	1.9	19.8	1018	73.1	0.0
25	Jul-18-95	Jul-24-95	E	2.0	20.8	1013	76.2	0.2
26	Jul-25-95	Jul-31-95	SW, S and SE	1.9	17.4	1015	75.9	51.0
27	Aug-01-95	Aug-07-95	E	1.7	17.5	1011	86.0	51.6
28	Aug-08-95	Aug-13-95	E	1.9	15.6	1014	85.6	11.2
29	Aug-14-95	Aug-21-95	E	1.5	15.2	1013	85.9	45.4
30	Aug-22-95	Aug-28-95	S	1.4	15.8	1014	80.1	7.2
31	Aug-29-95	Sep-04-95	E	n/a	17.0	1014	80.5	9.4
32	Sep-05-95	Sep-11-95	E	n/a	16.8	1016	85.7	3.8
33	Sep-12-95	Sep-18-95	NE	n/a	18.2	1015	82.6	1.6
34	Sep-19-95	Sep-25-95	NE	n/a	15.7	1015	76.0	4.4
35	Sep-26-95	Oct-02-95	E and NE	n/a	13.2	1012	90.0	33.6
36	Oct-03-95	Oct-09-95	E	1.7	11.5	1015	90.9	89.8
37	Oct-10-95	Oct-16-95	SE	1.3	11.3	1016	92.5	76.6
38	Oct-17-95	Oct-23-95	N	1.3	8.9	1022	90.5	9.2
39	Oct-24-95	Oct-30-95	N	2.3	5.8	1017	86.0	30.2
40	Oct-31-95	Nov-06-95	n/a	n/a	n/a	n/a	n/a	n/a
41	Nov-07-95	Nov-13-95	n/a	n/a	n/a	n/a	n/a	n/a
42	Nov-14-95	Nov-20-95	SE	1.7	9.4	1016	78.6	36.4
43	Nov-21-95	Nov-27-95	SE	1.7	9.1	1013	81.8	131.4
44	Nov-28-95	Dec-05-95	SE and S	2.3	6.5	1006	77.6	71.0

Values represent means for each sampling period.  
n/a denotes data not available due to equipment failure.

**Table 5. PAH Concentrations (ng/m<sup>3</sup>) in HV/PUF Samples from Burnaby Lake (1995)**

Parameter	MDC	Jan 31-Feb 7	Feb 7-14	Feb 14-17	Feb 17-21	Feb 28-Mar 3	Mar 3-7	Apr.25-May2	May2-May9	May9-May16	May16-May23	May23-May30
<b>Standard PAHs</b>												
Acenaphthylene	0.01000	0.9445	1.6294	0.5715	0.8223	2.8727	2.0002	0.0982	0.1112	0.1069	0.2770	0.1810
Acenaphthene	0.01000	1.0070	1.1684	1.7137	1.4083	2.1063	2.8479	0.4486	0.8630	0.5751	1.5523	1.7486
Fluorene	0.01000	3.6855	4.4489	4.1218	2.5077	4.2526	5.2124	1.3778	2.5033	1.9929	4.1130	5.6486
Phenanthrene	0.01000	21.7834	15.2398	6.7330	10.8774	6.9512	8.6961	10.4411	14.3673	16.9847	22.2197	30.9445
Anthracene	0.01000	2.6175	1.5268	0.6326	1.0906	0.7852	0.6980	0.7111	0.6675	1.0164	1.2520	1.3742
<b>Total low MW PAHs</b>	n/a	<b>30.0379</b>	<b>24.0133</b>	<b>13.7725</b>	<b>16.7063</b>	<b>16.9680</b>	<b>19.4546</b>	<b>13.0767</b>	<b>18.5123</b>	<b>20.6761</b>	<b>29.4140</b>	<b>39.8969</b>
Fluoranthene	0.01000	3.4870	3.0508	1.1968	1.7857	1.1749	1.6548	3.9407	3.3431	4.7958	4.7958	16.1381
Pyrene	0.01000	2.8341	2.8341	1.0237	1.2636	1.1328	1.3073	2.3019	1.8875	2.4851	2.6902	8.2872
Benzo(c)phenanthrene	0.01000	0.1963	0.0000	0.0000	0.0000	0.0000	0.0698	0.0611	0.0567	0.0262	0.0698	0.0960
Benz(a)anthracene	0.01000	0.7111	0.7198	0.1527	0.1265	0.2923	0.1963	0.1221	0.1221	0.1352	0.1745	0.2181
Chrysene	0.01000	0.5453	0.9161	0.2508	0.2181	0.4275	0.2574	0.2356	0.2748	0.3315	0.4362	0.3577
Benz(b)fluoranthene	0.01000	1.1982	1.1982	0.3148	0.3126	0.5220	0.3432	0.2908	0.2647	0.2821	0.3214	0.3737
Benz(k)fluoranthene	0.01000	0.2312	0.3599	0.1047	0.0785	0.1570	0.1003	0.1091	0.0611	0.2661	0.3054	0.0654
Benzo(j)fluoranthene	0.01000	0.1919	0.0000	0.0000	0.0000	0.0000	0.0523	0.0218	0.0174	0.0131	0.0218	0.0131
7,12-Dimethyl(a)anthrene	0.03000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Benz(a)pyrene	0.01000	0.6762	0.4908	0.1745	0.1440	0.3490	0.1570	0.3621	0.0960	0.1091	0.2225	0.1309
3-Methylcholanthrene	0.03000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Indeno(1,2,3-c,d)pyrene	0.01000	1.0164	0.5780	0.1636	0.2007	0.2705	0.1440	0.2094	0.1440	0.1919	0.1876	0.1221
Dibenz(a,h)anthracene	0.01000	0.0654	0.0545	0.0109	0.0170	0.0275	0.0201	0.0218	0.0131	0.0000	0.0218	0.0218
Benzo(g,h,i)perylene	0.01000	0.9510	0.9379	0.2617	0.3228	0.4362	0.2225	0.3926	0.2487	0.3141	0.3228	0.2792
Dibenzo(a,l)pyrene	0.03000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Dibenzo(a,i)pyrene	0.03000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Dibenzo(a,h)pyrene	0.03000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total high MW PAHs	n/a	12.1043	11.1402	3.6543	4.4696	4.7898	4.5250	8.0690	6.5291	8.9502	9.5697	26.1033
<b>Total PAHs</b>	n/a	<b>42.1421</b>	<b>35.1535</b>	<b>17.4268</b>	<b>21.1759</b>	<b>21.7578</b>	<b>23.9796</b>	<b>21.1458</b>	<b>25.0414</b>	<b>29.6263</b>	<b>38.9837</b>	<b>66.0003</b>
<b>TEQs</b>	n/a	<b>1.1655</b>	<b>0.8942</b>	<b>0.2764</b>	<b>0.2546</b>	<b>0.5305</b>	<b>0.2719</b>	<b>0.4802</b>	<b>0.1839</b>	<b>0.2158</b>	<b>0.3641</b>	<b>0.2450</b>
<b>Non-standard PAHs</b>												
Methylnaphthalenes	0.05000		3.62082	4.79867		9.16110						
Dimethylnaphthalenes	0.05000		2.74833	5.67116		13.95977						
Methylphenanthrenes/anthracenes	0.05000		8.28861	2.96645		3.66444						
Dimethylphenanthrenes/anthracenes	0.05000		4.79867	1.83222		1.74497						
Benz(a)fluorene	0.05000		0.18322	0.09597		0.12651						
Benz(b)fluorene	0.05000		0.37081	0.10470		0.14396						
Dibenzo(a,j)acridine	0.05000		0.00000	0.00000		0.00000						

**Notes:**

Non detectable values shown as zeroes.

MDC = Method Detection Concentration

n/a = not applicable

**Table 6. Statistical Summary of PAH Concentrations (ng/m<sup>3</sup>) in HV/PUF Samples from Burnaby Lake (1995)**

Parameter	mean	minimum	maximum	standard error
<b>Standard PAHs (n=25)</b>				
Acenaphthylene	1.3	0.00	5.7	0.28
Acenaphthene	6.0	0.36	24	1.4
Fluorene	5.9	1.1	19	0.89
Phenanthrene	17	6.7	40	1.5
Anthracene	1.0	0.34	2.6	0.089
<b>Total low MW PAHs</b>	<b>31</b>	<b>13</b>	<b>83</b>	<b>3.4</b>
Fluoranthene	4.2	1.2	16	0.59
Pyrene	2.5	1.0	8.3	0.27
Benzo(c)phenanthrene	0.058	0.00	0.20	0.0080
Benz(a)anthracene	0.18	0.057	0.72	0.030
Chrysene	0.31	0.13	0.92	0.029
Benzo(b)fluoranthene	0.34	0.10	1.2	0.049
Benzo(k)fluoranthene	0.11	0.026	0.36	0.016
Benzo(j)fluoranthene	0.021	0.00	0.19	0.0069
7,12-Dimethyl(a)anthrene	0.00	0.00	0.00	0.00
Benzo(a)pyrene	0.17	0.039	0.68	0.028
3-Methylcholanthrene	0.00	0.00	0.00	0.00
Indeno(1,2,3-c,d)pyrene	0.19	0.026	1.0	0.035
Dibenz(a,h)anthracene	0.015	0.00	0.065	0.00
Benzo(g,h,i)perylene	0.33	0.057	0.95	0.040
Dibenzo(a,l)pyrene	0.00	0.00	0.00	0.00
Dibenzo(a,i)pyrene	0.00	0.00	0.00	0.00
Dibenzo(a,h)pyrene	0.00	0.00	0.00	0.00
<b>Total high MW PAHs</b>	<b>8.4</b>	<b>3.7</b>	<b>26</b>	<b>0.87</b>
<b>Total PAHs</b>	<b>40</b>	<b>17</b>	<b>92</b>	<b>3.6</b>
<b>TEQs</b>	<b>0.29</b>	<b>0.069</b>	<b>1.2</b>	<b>0.045</b>
<b>Non-standard PAHs (n=3)</b>				
Methylnaphthalenes	5.9	3.6	9.2	0.54
Dimethylnaphthalenes	7.5	2.7	14	1.1
Methylphenanthrenes/anthracenes	5.0	3.0	8.3	0.54
Dimethylphenanthrenes/anthracenes	2.8	1.7	4.8	0.32
Benzo(a)fluorene	0.14	0.10	0.18	0.0082
Benzo(b)fluorene	0.21	0.10	0.37	0.027
Dibenz(a,j)acridine	0.00	0.00	0.00	0.00

**Table 7. PAH Concentrations (ng/m<sup>3</sup>) Measured by LPI at Burnaby Lake (February 7-14, 1995)**

Sample: Particle Cutoff Diameter (μm)	MDC	Stage 1 >35	Stage 2 21.7	Stage 3 15.7	Stage 4 10.5	Stage 5 6.6	Stage 6 3.3	Stage 7 2.0	Stage CO 1.40	Stage L2 0.90	Stage L3 0.52	Stage L4 0.23	Stage L5 0.11	Stage LF 0.08	Stage BU backup filter
<b>PAHs</b>															
Acenaphthylene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acenaphthene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.02135	0.00000
Fluorene	0.01000	0.01635	0.00968	0.02035	0.02736	0.02870	0.03136	0.02236	0.02636	0.00000	0.47014	0.00000	0.00634	0.00634	0.03270
Phenanthrene	0.01000	0.00667	0.02002	0.00000	0.03003	0.00000	0.03670	0.00667	0.00334	0.00000	0.08675	0.04004	0.04671	0.02336	0.07007
Anthracene	0.01000	0.00000	0.00000	0.02269	0.02035	0.00000	0.03337	0.03203	0.02369	0.02336	0.00000	0.00000	0.02135	0.00000	0.00000
<b>Total low MW PAHs</b>	<b>n/a</b>	<b>0.02302</b>	<b>0.02970</b>	<b>0.04304</b>	<b>0.07774</b>	<b>0.02870</b>	<b>0.10143</b>	<b>0.06106</b>	<b>0.05339</b>	<b>0.02336</b>	<b>0.55689</b>	<b>0.04004</b>	<b>0.07441</b>	<b>0.05105</b>	<b>0.10277</b>
Fluoranthene	0.01000	0.02669	0.03003	0.01668	0.03670	0.01001	0.05339	0.03337	0.01001	0.01335	0.06006	0.01001	0.05339	0.00667	0.14348
Pyrene	0.01000	0.03003	0.03337	0.01001	0.02669	0.00334	0.06006	0.04004	0.00667	0.03003	0.05005	0.03003	0.07007	0.02002	0.14681
Benz(c)phenanthrene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.03337
Benz(a)anthracene	0.01000	0.02336	0.00000	0.08008	0.08008	0.09676	0.08675	0.08675	0.11678	0.00000	0.05339	0.00000	0.11345	0.02336	0.18018
Chrysene	0.01000	0.04738	0.01101	0.01602	0.01802	0.00000	0.02402	0.00000	0.04004	0.00234	0.07407	0.00000	0.15749	0.03737	0.16350
Benzo(b)fluoranthene	0.01000	0.09209	0.02536	0.01735	0.02469	0.00000	0.02870	0.01869	0.06340	0.01301	0.12212	0.28228	0.42242	0.10878	0.21688
Benzo(k)fluoranthene	0.01000	0.00000	0.01635	0.00000	0.00000	0.00000	0.00000	0.00000	0.02135	0.00000	0.05339	0.00000	0.14014	0.04004	0.07341
Benzo(j)fluoranthene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.05339	0.00000	0.00000	0.00000
7,12-Dimethyl(a)anthrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Benzo(a)pyrene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.20354	0.07007	0.10677
3-Methylcholanthrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Indeno(1,2,3-c,d)pyrene	0.01000	0.15682	0.00000	0.01635	0.01602	0.00000	0.03003	0.00000	0.04004	0.02169	0.07007	0.15015	0.28028	0.07674	0.16016
Dibenz(a,h)anthracene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.03337	0.00000	0.02769
Benzo(g,h,i)perylene	0.01000	0.10511	0.02836	0.02202	0.02302	0.00000	0.02503	0.00000	0.06006	0.01168	0.07841	0.17184	0.42209	0.11845	0.36703
Dibenzo(a,l)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Dibenzo(a,i)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Dibenzo(a,h)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
<b>Total high MW PAHs</b>	<b>n/a</b>	<b>0.48148</b>	<b>0.14448</b>	<b>0.17851</b>	<b>0.22523</b>	<b>0.11011</b>	<b>0.30797</b>	<b>0.17885</b>	<b>0.35836</b>	<b>0.09209</b>	<b>0.56156</b>	<b>0.64431</b>	<b>1.94962</b>	<b>0.50150</b>	<b>1.61929</b>
<b>Total PAHs</b>	<b>n/a</b>	<b>0.50450</b>	<b>0.17417</b>	<b>0.22155</b>	<b>0.30297</b>	<b>0.13881</b>	<b>0.40941</b>	<b>0.23991</b>	<b>0.41175</b>	<b>0.11545</b>	<b>1.11845</b>	<b>0.68435</b>	<b>2.02402</b>	<b>0.55255</b>	<b>1.72206</b>
<b>TEQs</b>	<b>n/a</b>	<b>0.04291</b>	<b>0.00417</b>	<b>0.01301</b>	<b>0.01368</b>	<b>0.00968</b>	<b>0.01755</b>	<b>0.01054</b>	<b>0.02816</b>	<b>0.00564</b>	<b>0.03690</b>	<b>0.05826</b>	<b>0.36390</b>	<b>0.10264</b>	<b>0.21632</b>

**Notes:**

Non detectable values shown as zeroes.

MDC = Method Detection Concentration

n/a = not applicable

**Table 8. PAH Concentrations (ng/m<sup>3</sup>) Measured by LPI at Burnaby Lake (March 7-14, 1995)**

Sample: Particle Cutoff Diameter (μm)	MDC	Stage 1 >35	Stage 2 21.7	Stage 3 15.7	Stage 4 10.5	Stage 5 6.6	Stage 6 3.3	Stage 7 2.0	Stage CO 1.40	Stage L2 0.90	Stage L3 0.52	Stage L4 0.23	Stage L5 0.11	Stage LF 0.08	Stage BU backup filter
<b>PAHs</b>															
Acenaphthylene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acenaphthene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Fluorene	0.01000	0.01169	0.00234	0.00100	0.00000	0.00000	0.00668	0.00635	0.00100	0.00000	0.00000	0.00368	0.00835	0.00000	0.01403
Phenanthrene	0.01000	0.08019	0.01002	0.00000	0.00000	0.00000	0.05012	0.04343	0.00668	0.02673	0.01002	0.02339	0.03675	0.00334	0.08353
Anthracene	n/a	0.00434	0.00000	0.00000	0.00000	0.00000	0.01737	0.01136	0.00000	0.00000	0.00000	0.00067	0.00368	0.00334	0.01036
<b>Total low MW PAHs</b>	<b>0.01000</b>	<b>0.09622</b>	<b>0.01236</b>	<b>0.00100</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.07417</b>	<b>0.06114</b>	<b>0.00768</b>	<b>0.02673</b>	<b>0.01002</b>	<b>0.02773</b>	<b>0.04878</b>	<b>0.00668</b>	<b>0.10792</b>
Fluoranthene	0.01000	0.08152	0.00000	0.01804	0.01136	0.01136	0.03809	0.03141	0.00802	0.02807	0.02472	0.02472	0.03141	0.01470	0.05145
Pyrene	0.01000	0.07751	0.02406	0.02339	0.01336	0.01671	0.04009	0.03007	0.01002	0.03408	0.02406	0.02406	0.03074	0.01069	0.06348
Benz(c)phenanthrene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.01002	0.00000	0.01002
Benz(a)anthracene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.03675	0.00000	0.00000
Chrysene	0.01000	0.03007	0.01604	0.02038	0.01804	0.01169	0.02673	0.01637	0.00000	0.01236	0.01570	0.02339	0.04343	0.01537	0.05680
Benzo(b)fluoranthene	0.01000	0.02172	0.01570	0.01838	0.01570	0.01570	0.02673	0.01504	0.01002	0.01169	0.01704	0.05346	0.08353	0.02673	0.08019
Benzo(k)fluoranthene	0.01000	0.00000	0.00000	0.01002	0.00000	0.01002	0.00000	0.01002	0.00000	0.00000	0.00000	0.01637	0.02940	0.01002	0.02138
Benzo(j)fluoranthene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7,12-Dimethyl(a)anthrene A47	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Benzo(a)pyrene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.04678	0.00000	0.03040
3-Methylcholanthrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Indeno(1,2,3-c,d)pyrene	0.01000	0.01169	0.01303	0.01002	0.00000	0.02974	0.01804	0.01604	0.00000	0.00000	0.01136	0.03675	0.08019	0.02239	0.07685
Dibenz(a,h)anthracene	0.01000	0.00000	0.00000	0.00000	0.00000	0.02138	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Benzo(g,h,i)perylene	0.01000	0.01470	0.01236	0.01236	0.01002	0.03675	0.02072	0.00000	0.01437	0.00000	0.01303	0.02773	0.06348	0.02072	0.09021
Dibenzo(a,l)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Dibenzo(a,i)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Dibenzo(a,h)pyrene	n/a	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
<b>Total high MW PAHs</b>	<b>n/a</b>	<b>0.23722</b>	<b>0.08119</b>	<b>0.11260</b>	<b>0.06849</b>	<b>0.15336</b>	<b>0.17040</b>	<b>0.11894</b>	<b>0.04243</b>	<b>0.08620</b>	<b>0.10591</b>	<b>0.20648</b>	<b>0.45573</b>	<b>0.12061</b>	<b>0.48079</b>
<b>Total PAHs</b>	<b>n/a</b>	<b>0.33344</b>	<b>0.09355</b>	<b>0.11360</b>	<b>0.06849</b>	<b>0.15336</b>	<b>0.24457</b>	<b>0.18009</b>	<b>0.05012</b>	<b>0.11293</b>	<b>0.11594</b>	<b>0.23421</b>	<b>0.50451</b>	<b>0.12730</b>	<b>0.58871</b>
<b>TEQs</b>	<b>n/a</b>	<b>0.00451</b>	<b>0.00418</b>	<b>0.00484</b>	<b>0.00157</b>	<b>0.03204</b>	<b>0.00628</b>	<b>0.00571</b>	<b>0.00100</b>	<b>0.00117</b>	<b>0.00398</b>	<b>0.01433</b>	<b>0.07778</b>	<b>0.00815</b>	<b>0.05593</b>

**Notes:**

Non detectable values shown as zeroes.

MDC = Method Detection Concentration

n/a = not applicable

**Table 9. PAH Concentrations (ng/m<sup>3</sup>) Measured by LPI at Burnaby Lake (March 21-28, 1995)**

Sample: Particle Cutoff Diameter (μm)	MDC	Stage 1 >35	Stage 2 21.7	Stage 3 15.7	Stage 4 10.5	Stage 5 6.6	Stage 6 3.3	Stage 7 2.0	Stage CO 1.40	Stage L2 0.90	Stage L3 0.52	Stage L4 0.23	Stage L5 0.11	Stage LF 0.08	Stage BU backup filter
<b>PAHs</b>															
Acenaphthylene	0.01000	0.00000	0.10916	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acenaphthene	0.01000	0.00000	0.09593	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Fluorene	0.01000	0.01786	0.01621	0.00033	0.00728	0.00000	0.00496	0.00992	0.00000	0.02481	0.00000	0.03639	0.03242	0.00000	0.00662
Phenanthrene	0.01000	0.02316	0.02646	0.01985	0.02316	0.01654	0.02977	0.03639	0.00662	0.09593	0.00000	0.08270	0.10255	0.01654	0.05293
Anthracene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
<b>Total low MW PAHs</b>	<b>n/a</b>	<b>0.04102</b>	<b>0.24777</b>	<b>0.02018</b>	<b>0.03043</b>	<b>0.01654</b>	<b>0.03473</b>	<b>0.04631</b>	<b>0.00662</b>	<b>0.12074</b>	<b>0.00000</b>	<b>0.11909</b>	<b>0.13497</b>	<b>0.01654</b>	<b>0.05954</b>
Fluoranthene	0.01000	0.02415	0.02415	0.02382	0.02051	0.01059	0.01059	0.01059	0.01059	0.04069	0.01753	0.04730	0.04730	0.03076	0.04697
Pyrene	0.01000	0.03573	0.02580	0.02117	0.02117	0.00794	0.01456	0.01125	0.01125	0.03903	0.02249	0.05557	0.05557	0.02911	0.06417
Benzo(c)phenanthrene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Benz(a)anthracene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.14555
Chrysene	0.01000	0.02084	0.02249	0.00000	0.00000	0.00000	0.00000	0.00000	0.00033	0.02845	0.03076	0.04300	0.06285	0.02613	0.03837
Benzo(b)fluoranthene	0.01000	0.01621	0.02448	0.02283	0.00000	0.00000	0.02249	0.00000	0.02977	0.03308	0.02316	0.11578	0.19848	0.06947	0.13232
Benzo(k)fluoranthene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.05624	0.00000	0.00000
Benzo(j)fluoranthene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7,12-Dimethyl(a)anthrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Benzo(a)pyrene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.10255	0.03639	0.04300
3-Methylcholanthrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Indeno(1,2,3-c,d)pyrene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.06285	0.00000	0.00000
Dibenz(a,h)anthracene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Benzo(g,h,i)perylene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.05293	0.13232	0.00000
Dibenzo(a,l)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.10586
Dibenzo(a,i)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Dibenzo(a,h)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
<b>Total high MW PAHs</b>	<b>n/a</b>	<b>0.09692</b>	<b>0.09692</b>	<b>0.06781</b>	<b>0.04168</b>	<b>0.01852</b>	<b>0.04763</b>	<b>0.02183</b>	<b>0.05194</b>	<b>0.14125</b>	<b>0.09395</b>	<b>0.31459</b>	<b>0.71816</b>	<b>0.19186</b>	<b>0.57625</b>
<b>Total PAHs</b>	<b>n/a</b>	<b>0.13794</b>	<b>0.34469</b>	<b>0.08799</b>	<b>0.07211</b>	<b>0.03506</b>	<b>0.08237</b>	<b>0.06814</b>	<b>0.05855</b>	<b>0.26199</b>	<b>0.09395</b>	<b>0.43368</b>	<b>0.85313</b>	<b>0.20840</b>	<b>0.63579</b>
<b>TEQs</b>	<b>n/a</b>	<b>0.00162</b>	<b>0.00245</b>	<b>0.00228</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.00225</b>	<b>0.00000</b>	<b>0.00298</b>	<b>0.00331</b>	<b>0.00232</b>	<b>0.01158</b>	<b>0.14059</b>	<b>0.04333</b>	<b>0.07079</b>

**Notes:**

Non detectable values shown as zeroes.

MDC = Method Detection Concentration

n/a = not applicable

**Table 10. PAH Concentrations (ng/m<sup>3</sup>) Measured by LPI at Burnaby Lake (April 4-11, 1995)**

Sample: Particle Cutoff Diameter (μm)	MDC	Stage 1 >35	Stage 2 21.7	Stage 3 15.7	Stage 4 10.5	Stage 5 6.6	Stage 6 3.3	Stage 7 2.0	Stage CO 1.40	Stage L2 0.90	Stage L3 0.52	Stage L4 0.23	Stage L5 0.11	Stage LF 0.08	Stage BU backup filter
<b>PAHs</b>															
Acenaphthylene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.04361	0.00000	0.00000	0.00000	0.00000	0.00000
Acenaphthene	0.01000	0.00000	0.03105	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Fluorene	0.01000	0.00000	0.02279	0.01057	0.01189	0.00826	0.00925	0.00760	0.00859	0.01255	0.01090	0.00000	0.00000	0.00000	0.00826
Phenanthrene	0.01000	0.00000	0.02081	0.03105	0.03138	0.01982	0.01189	0.06706	0.01619	0.00000	0.00000	0.00000	0.00000	0.00000	0.04361
Anthracene	0.01000	0.00000	0.01123	0.00000	0.00000	0.00000	0.00000	0.00000	0.02907	0.03568	0.00000	0.03733	0.00000	0.00000	0.02511
<b>Total low MW PAHs</b>	<b>n/a</b>	<b>0.00000</b>	<b>0.06508</b>	<b>0.03138</b>	<b>0.04295</b>	<b>0.03964</b>	<b>0.02907</b>	<b>0.01949</b>	<b>0.10472</b>	<b>0.10803</b>	<b>0.01090</b>	<b>0.03733</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.07697</b>
Fluoranthene	0.01000	0.00000	0.01586	0.03469	0.03039	0.02775	0.02643	0.02213	0.15064	0.33499	0.01090	0.00958	0.00859	0.00000	0.04295
Pyrene	0.01000	0.00000	0.00231	0.03039	0.03105	0.02313	0.02874	0.02081	0.14437	0.35150	0.00000	0.00000	0.00429	0.00000	0.03733
Benzo(c)phenanthrene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.01817	0.05781	0.00000	0.00000	0.00000	0.00000	0.00958
Benz(a)anthracene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.15791	0.21936	0.00000	0.00000	0.00000	0.00000	0.00000
Chrysene	0.01000	0.02048	0.02577	0.02213	0.03304	0.03700	0.03898	0.00000	0.10472	0.21705	0.02048	0.02445	0.02709	0.02279	0.03799
Benzo(b)fluoranthene	0.01000	0.01652	0.01982	0.00363	0.02081	0.00066	0.01850	0.00000	0.05946	0.12983	0.01883	0.03964	0.05484	0.02246	0.02973
Benzo(k)fluoranthene	0.01000	0.00496	0.00925	0.00000	0.01024	0.00000	0.01123	0.00000	0.03105	0.05187	0.00000	0.01288	0.01850	0.00793	0.01354
Benzo(j)fluoranthrene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7,12-Dimethyl(a)anthrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Benzo(a)pyrene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.03370	0.02808	0.00000	0.00000	0.00000	0.00000	0.00000
3-Methylcholanthrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Indeno(1,2,3-c,d)pyrene	0.01000	0.00000	0.02015	0.01421	0.01321	0.00000	0.01982	0.00000	0.02279	0.03304	0.01421	0.02081	0.03238	0.00000	0.01949
Dibenz(a,h)anthracene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Benzo(g,h,i)perylene	0.01000	0.00000	0.01388	0.00000	0.01321	0.01057	0.00000	0.00000	0.01652	0.02808	0.00000	0.02412	0.04130	0.00991	0.04889
Dibenzo(a,l)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Dibenzo(a,i)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Dibenzo(a,h)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
<b>Total high MW PAHs</b>	<b>n/a</b>	<b>0.04196</b>	<b>0.10704</b>	<b>0.10505</b>	<b>0.15197</b>	<b>0.09911</b>	<b>0.14371</b>	<b>0.04295</b>	<b>0.73935</b>	<b>1.45160</b>	<b>0.06442</b>	<b>0.13148</b>	<b>0.18698</b>	<b>0.06310</b>	<b>0.23951</b>
<b>Total PAHs</b>	<b>n/a</b>	<b>0.04196</b>	<b>0.17212</b>	<b>0.13644</b>	<b>0.19491</b>	<b>0.13875</b>	<b>0.17278</b>	<b>0.06244</b>	<b>0.84407</b>	<b>1.55963</b>	<b>0.07532</b>	<b>0.16881</b>	<b>0.18698</b>	<b>0.06310</b>	<b>0.31648</b>
<b>TEQs</b>	<b>n/a</b>	<b>0.00215</b>	<b>0.00694</b>	<b>0.00320</b>	<b>0.00575</b>	<b>0.00007</b>	<b>0.00694</b>	<b>0.00000</b>	<b>0.06310</b>	<b>0.07479</b>	<b>0.00472</b>	<b>0.00942</b>	<b>0.01381</b>	<b>0.00304</b>	<b>0.00823</b>

**Notes:**

Non detectable values shown as zeroes.

MDC = Method Detection Concentration

n/a = not applicable

**Table 11. PAH Concentrations (ng/m<sup>3</sup>) Measured by LPI at Burnaby Lake (April 18-25, 1995)**

Sample: Particle Cutoff Diameter (μm)	MDC	Stage 1 >35	Stage 2 21.7	Stage 3 15.7	Stage 4 10.5	Stage 5 6.6	Stage 6 3.3	Stage 7 2.0	Stage CO 1.40	Stage L2 0.90	Stage L3 0.52	Stage L4 0.23	Stage L5 0.11	Stage LF 0.08	Stage BU backup filter
<b>PAHs</b>															
Acenaphthylene	0.01000	0.00000	0.00000	0.00000	0.00000	0.12417	0.21248	0.05578	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acenaphthene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.03254
Fluorene	0.01000	0.00498	0.00996	0.00000	0.00000	0.00232	0.05943	0.01062	0.00000	0.00365	0.00166	0.00299	0.00764	0.00000	0.00564
Phenanthrene	0.01000	0.02390	0.02722	0.00000	0.00000	0.00000	0.15007	0.00000	0.00000	0.01760	0.00564	0.01328	0.03586	0.01627	0.00000
Anthracene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.14774	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.04714
<b>Total low MW PAHs</b>	<b>n/a</b>	<b>0.02888</b>	<b>0.03718</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.12649</b>	<b>0.56972</b>	<b>0.06640</b>	<b>0.00000</b>	<b>0.02125</b>	<b>0.00730</b>	<b>0.01627</b>	<b>0.04349</b>	<b>0.01627</b>	<b>0.08533</b>
Fluoranthene	0.01000	0.02224	0.01992	0.00000	0.00000	0.00564	0.16899	0.00199	0.00000	0.01361	0.01693	0.01726	0.04250	0.01594	0.13081
Pyrene	0.01000	0.02722	0.02457	0.00000	0.00000	0.00797	0.15538	0.01494	0.00000	0.02058	0.01793	0.02357	0.05445	0.02291	0.13313
Benz(a)phenanthrene	0.01000	0.00000	0.00000	0.00000	0.00000	0.01660	0.03851	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.02988
Benz(a)anthracene	0.01000	0.00000	0.00000	0.00000	0.00000	0.16932	0.29017	0.11886	0.00000	0.00000	0.00000	0.00000	0.12450	0.00000	0.26527
Chrysene	0.01000	0.02656	0.02390	0.00000	0.00000	0.13147	0.33665	0.02888	0.00000	0.00000	0.02490	0.02490	0.04714	0.02092	0.22178
Benzo(b)fluoranthene	0.01000	0.01726	0.01627	0.00000	0.00000	0.27324	0.27689	0.01760	0.00000	0.01726	0.03054	0.05378	0.14309	0.05412	0.21149
Benzo(k)fluoranthene	0.01000	0.01029	0.00930	0.00000	0.00000	0.10359	0.12052	0.00531	0.00000	0.00000	0.00000	0.01959	0.03984	0.01394	0.04880
Benzo(j)fluoranthene	0.01000	0.00000	0.00000	0.00000	0.00000	0.04847	0.06308	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7,12-Dimethyl(a)anthrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Benzo(a)pyrene	0.01000	0.00000	0.00000	0.00000	0.00000	0.09628	0.11919	0.00000	0.00000	0.00000	0.00000	0.00000	0.08035	0.00000	0.07636
3-Methylcholanthrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Indeno(1,2,3-c,d)pyrene	0.01000	0.00000	0.00000	0.00000	0.00000	0.15239	0.09927	0.00000	0.00000	0.00000	0.00000	0.02490	0.07437	0.02855	0.06142
Dibenz(a,h)anthracene	0.01000	0.00000	0.00000	0.00000	0.00000	0.01262	0.00664	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Benzo(g,h,i)perylene	0.01000	0.00000	0.00000	0.00000	0.00000	0.13679	0.07537	0.00000	0.00000	0.00000	0.00000	0.03353	0.11255	0.05113	0.11521
Dibenzo(a,l)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Dibenzo(a,i)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Dibenzo(a,h)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
<b>Total high MW PAHs</b>	<b>n/a</b>	<b>0.10359</b>	<b>0.09396</b>	<b>0.00000</b>	<b>0.00000</b>	<b>1.15438</b>	<b>1.75066</b>	<b>0.18758</b>	<b>0.00000</b>	<b>0.05146</b>	<b>0.09031</b>	<b>0.19754</b>	<b>0.71879</b>	<b>0.20750</b>	<b>1.29416</b>
<b>Total PAHs</b>	<b>n/a</b>	<b>0.13247</b>	<b>0.13114</b>	<b>0.00000</b>	<b>0.00000</b>	<b>1.28088</b>	<b>2.32039</b>	<b>0.25398</b>	<b>0.00000</b>	<b>0.07271</b>	<b>0.09761</b>	<b>0.21381</b>	<b>0.76228</b>	<b>0.22377</b>	<b>1.37948</b>
<b>TEQs</b>	<b>n/a</b>	<b>0.00276</b>	<b>0.00256</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.19525</b>	<b>0.21511</b>	<b>0.01418</b>	<b>0.00000</b>	<b>0.00173</b>	<b>0.00305</b>	<b>0.01232</b>	<b>0.12596</b>	<b>0.01252</b>	<b>0.14120</b>

**Notes:**

Non detectable values shown as zeroes.

MDC = Method Detection Concentration

n/a = not applicable

**Table 12. PAH Concentrations (ng/m<sup>3</sup>) Measured by LPI at Burnaby Lake (May 2-9, 1995)**

Sample: Particle Cutoff Diameter (μm)	MDC	Stage 1 >35	Stage 2 21.7	Stage 3 15.7	Stage 4 10.5	Stage 5 6.6	Stage 6 3.3	Stage 7 2.0	Stage CO 1.40	Stage L2 0.90	Stage L3 0.52	Stage L4 0.23	Stage L5 0.11	Stage LF 0.08	Stage BU backup filter
<b>PAHs</b>															
Acenaphthylene	0.01000	0.05470	0.04075	0.05347	0.07373	0.16008	0.04185	0.03188	0.07572	0.04540	0.06035	0.04141	0.05271	0.03012	0.00000
Acenaphthene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Fluorene	0.01000	0.01860	0.02225	0.05513	0.03819	0.08070	0.02491	0.01461	0.09465	0.00033	0.02956	0.01561	0.01295	0.02126	0.02690
Phenanthrene	0.01000	0.15942	0.01959	0.07738	0.11757	0.16340	0.08668	0.03686	0.31916	0.02591	0.05513	0.04683	0.05480	0.10661	0.18266
Anthracene	0.01000	0.00000	0.00000	0.00000	0.07174	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
<b>Total low MW PAHs</b>	<b>n/a</b>	<b>0.23271</b>	<b>0.08260</b>	<b>0.18598</b>	<b>0.30123</b>	<b>0.40418</b>	<b>0.15344</b>	<b>0.08336</b>	<b>0.48954</b>	<b>0.07164</b>	<b>0.14503</b>	<b>0.10385</b>	<b>0.12046</b>	<b>0.15799</b>	<b>0.20956</b>
Fluoranthene	0.01000	0.17403	0.01694	0.06742	0.07340	0.09698	0.05247	0.03288	0.11392	0.03853	0.03653	0.02391	0.04052	0.00598	0.08735
Pyrene	0.01000	0.11325	0.02126	0.05812	0.06676	0.09133	0.03886	0.01993	0.08436	0.04417	0.04716	0.02790	0.03853	0.00565	0.09864
Benz(c)phenanthrene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Benz(a)anthracene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.10794	0.14082	0.00000	0.00000	0.13882	0.12321	0.15443
Chrysene	0.01000	0.03786	0.00000	0.00000	0.03089	0.04019	0.00000	0.18432	0.91000	0.00000	0.00000	0.04849	0.02823	0.04816	
Benzo(b)fluoranthene	0.01000	0.03487	0.00000	0.00000	0.01893	0.02557	0.02690	0.01827	0.00000	0.08436	0.00000	0.03952	0.09233	0.04151	0.08137
Benzo(k)fluoranthene	0.01000	0.00000	0.00000	0.00000	0.00000	0.01262	0.00000	0.00000	0.02889	0.00000	0.00000	0.02126	0.00000	0.00000	
Benzo(j)fluoranthene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	
7,12-Dimethyl(a)anthrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	
Benzo(a)pyrene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.05480	0.00000	0.00000	0.03421	0.00000	0.00000
3-Methylcholanthrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	
Indeno(1,2,3-c,d)pyrene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.02889	0.00000	0.00000	0.03089	0.00000	
Dibenzo(a,h)anthracene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	
Benzo(g,h,i)perylene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.03886	0.00000	0.00000	0.06974	0.03105	0.08934
Dibenzo(a,l)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	
Dibenzo(a,i)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	
Dibenzo(a,h)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	
<b>Total high MW PAHs</b>	<b>n/a</b>	<b>0.36001</b>	<b>0.03819</b>	<b>0.12554</b>	<b>0.15908</b>	<b>0.24477</b>	<b>0.17104</b>	<b>0.07107</b>	<b>0.49053</b>	<b>1.36931</b>	<b>0.08369</b>	<b>0.09133</b>	<b>0.51478</b>	<b>0.23564</b>	<b>0.55928</b>
<b>Total PAHs</b>	<b>n/a</b>	<b>0.59273</b>	<b>0.12079</b>	<b>0.31152</b>	<b>0.46031</b>	<b>0.64895</b>	<b>0.32448</b>	<b>0.15443</b>	<b>0.98007</b>	<b>1.44095</b>	<b>0.22873</b>	<b>0.19518</b>	<b>0.63524</b>	<b>0.39362</b>	<b>0.76885</b>
<b>TEQs</b>	<b>n/a</b>	<b>0.00349</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.00189</b>	<b>0.00256</b>	<b>0.00395</b>	<b>0.00183</b>	<b>0.01079</b>	<b>0.08598</b>	<b>0.00000</b>	<b>0.00395</b>	<b>0.06563</b>	<b>0.01647</b>	<b>0.02358</b>

**Notes:**

Non detectable values shown as zeroes.

Excluding naphthalene.

MDC = Method Detection Concentration

n/a = not applicable

**Table 13. PAH Concentrations (ng/m<sup>3</sup>) Measured by LPI at Burnaby Lake (May 23-30, 1995)**

Sample: Particle Cutoff Diameter (μm)	MDC	Stage 1 >35	Stage 2 21.7	Stage 3 15.7	Stage 4 10.5	Stage 5 6.6	Stage 6 3.3	Stage 7 2.0	Stage CO 1.40	Stage L2 0.90	Stage L3 0.52	Stage L4 0.23	Stage L5 0.11	Stage LF 0.08	Stage BU backup filter
<b>PAHs</b>															
Acenaphthylene	0.01000	0.05463	0.04070	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.04534	0.06027	0.04136	0.05264	0.03008	0.00000
Acenaphthene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Fluorene	0.01000	0.01857	0.02222	0.07065	0.05373	0.09619	0.04046	0.03018	0.11012	0.00033	0.02952	0.01559	0.01294	0.02123	0.04245
Phenanthrene	0.01000	0.15920	0.01957	0.00000	0.00000	0.00000	0.00000	0.00000	0.09884	0.02587	0.05506	0.04677	0.05473	0.10647	0.00000
Anthracene	0.01000	0.00000	0.00000	0.00000	0.07164	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
<b>Total low MW PAHs</b>	<b>n/a</b>	<b>0.23240</b>	<b>0.08249</b>	<b>0.07065</b>	<b>0.12537</b>	<b>0.09619</b>	<b>0.04046</b>	<b>0.03018</b>	<b>0.20896</b>	<b>0.07154</b>	<b>0.14484</b>	<b>0.10371</b>	<b>0.12030</b>	<b>0.15778</b>	<b>0.04245</b>
Fluoranthene	0.01000	0.17380	0.01692	0.00000	0.00000	0.00000	0.00000	0.00000	0.01061	0.03847	0.03648	0.02388	0.04046	0.00597	0.00000
Pyrene	0.01000	0.11310	0.02123	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.04411	0.04710	0.02786	0.03847	0.00564	0.00000
Benzo(c)phenanthrene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Benz(a)anthracene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.10779	0.14063	0.00000	0.00000	0.13864	0.12305	0.15423
Chrysene	0.01000	0.03781	0.00000	0.00000	0.00000	0.00000	0.00531	0.00000	0.14925	0.90879	0.00000	0.00000	0.04842	0.02819	0.01327
Benzo(b)fluoranthene	0.01000	0.03483	0.00000	0.00000	0.01891	0.02554	0.02687	0.01824	0.00000	0.08425	0.00000	0.03947	0.09221	0.04146	0.08126
Benzo(k)fluoranthene	0.01000	0.00000	0.00000	0.00000	0.00000	0.01260	0.00000	0.00000	0.02886	0.00000	0.00000	0.02123	0.00000	0.00000	0.00000
Benzo(j)fluoranthene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7,12-Dimethyl(a)anthrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Benzo(a)pyrene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.05473	0.00000	0.00000	0.03416	0.00000	0.00000
3-Methylcholanthrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Indeno(1,2,3-c,d)pyrene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.02886	0.00000	0.00000	0.03085	0.00000	0.00000
Dibenz(a,h)anthracene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Benzo(g,h,i)perylene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.03881	0.00000	0.00000	0.06965	0.03101	0.03781
Dibenzo(a,l)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Dibenzo(a,i)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Dibenzo(a,h)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
<b>Total high MW PAHs</b>	<b>n/a</b>	<b>0.35954</b>	<b>0.03814</b>	<b>0.00000</b>	<b>0.01891</b>	<b>0.02554</b>	<b>0.04478</b>	<b>0.01824</b>	<b>0.26766</b>	<b>1.36750</b>	<b>0.08358</b>	<b>0.09121</b>	<b>0.51410</b>	<b>0.23532</b>	<b>0.28657</b>
<b>Total PAHs</b>	<b>n/a</b>	<b>0.59194</b>	<b>0.12063</b>	<b>0.07065</b>	<b>0.14428</b>	<b>0.12172</b>	<b>0.08524</b>	<b>0.04842</b>	<b>0.47662</b>	<b>1.43904</b>	<b>0.22842</b>	<b>0.19493</b>	<b>0.63439</b>	<b>0.39310</b>	<b>0.32902</b>
<b>TEQs</b>	<b>n/a</b>	<b>0.00348</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.00189</b>	<b>0.00255</b>	<b>0.00395</b>	<b>0.00182</b>	<b>0.01078</b>	<b>0.08587</b>	<b>0.00000</b>	<b>0.00395</b>	<b>0.06554</b>	<b>0.01645</b>	<b>0.02355</b>

**Notes:**

Non detectable values shown as zeroes.

MDC = Method Detection Concentration

n/a = not applicable

**Table 14. PAH Concentrations (ng/m<sup>3</sup>) Measured by LPI at Burnaby Lake (June 20-27, 1995)**

Sample: Particle Cutoff Diameter (μm)	MDC	Stage 1 >35	Stage 2 21.7	Stage 3 15.7	Stage 4 10.5	Stage 5 6.6	Stage 6 3.3	Stage 7 2.0	Stage CO 1.40	Stage L2 0.90	Stage L3 0.52	Stage L4 0.23	Stage L5 0.11	Stage LF 0.08	Stage BU backup filter
<b>PAHs</b>															
Acenaphthylene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acenaphthene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.01999	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Fluorene	0.01000	0.01965	0.00000	0.00866	0.02298	0.00000	0.00000	0.00000	0.00000	0.03198	0.00000	0.00000	0.00000	0.00000	0.00000
Phenanthrene	0.01000	0.01965	0.00866	0.00000	0.07095	0.00000	0.00000	0.00000	0.00000	0.05663	0.00067	0.00167	0.01499	0.00600	0.02265
Anthracene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
<b>Total low MW PAHs</b>	n/a	<b>0.03931</b>	<b>0.00866</b>	<b>0.00866</b>	<b>0.09394</b>	<b>0.00000</b>	<b>0.01999</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.08861</b>	<b>0.00067</b>	<b>0.00167</b>	<b>0.01499</b>	<b>0.00600</b>	<b>0.02265</b>
Fluoranthene	0.01000	0.03631	0.02365	0.02765	0.03598	0.00000	0.01865	0.01732	0.01732	0.02332	0.01799	0.01865	0.02898	0.02099	0.03864
Pyrene	0.01000	0.03931	0.02465	0.01166	0.02465	0.00700	0.00566	0.00833	0.01233	0.01999	0.01832	0.02199	0.02632	0.02132	0.04397
Benzo(c)phenanthrene	0.01000	0.02265	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Benz(a)anthracene	0.01000	0.04564	0.03098	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Chrysene	0.01000	0.05396	0.03165	0.00000	0.01599	0.00000	0.00000	0.00000	0.01366	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Benzo(b)fluoranthene	0.01000	0.06163	0.03731	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.03131	0.04963	0.07595
Benzo(k)fluoranthene	0.01000	0.06962	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Benzo(j)fluoranthene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7,12-Dimethyl(a)anthrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Benzo(a)pyrene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
3-Methylcholanthrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Indeno(1,2,3-c,d)pyrene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Dibenz(a,h)anthracene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Benzo(g,h,i)perylene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.06129
Dibenzo(a,l)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Dibenzo(a,i)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Dibenzo(a,h)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
<b>Total high MW PAHs</b>	n/a	<b>0.32911</b>	<b>0.14823</b>	<b>0.03931</b>	<b>0.07662</b>	<b>0.00700</b>	<b>0.02432</b>	<b>0.02565</b>	<b>0.04330</b>	<b>0.04330</b>	<b>0.03631</b>	<b>0.04064</b>	<b>0.08661</b>	<b>0.09194</b>	<b>0.21985</b>
<b>Total PAHs</b>	n/a	<b>0.36842</b>	<b>0.15690</b>	<b>0.04797</b>	<b>0.17055</b>	<b>0.00700</b>	<b>0.04430</b>	<b>0.02565</b>	<b>0.04330</b>	<b>0.13191</b>	<b>0.03698</b>	<b>0.04231</b>	<b>0.10160</b>	<b>0.09793</b>	<b>0.24250</b>
<b>TEQs</b>	n/a	<b>0.01769</b>	<b>0.00683</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.00313</b>	<b>0.00496</b>	<b>0.00759</b>

**Notes:**

Non detectable values shown as zeroes.

MDC = Method Detection Concentration

n/a = not applicable

**Table 15. PAH Concentrations (ng/m<sup>3</sup>) Measured by LPI at Burnaby Lake (July 18-25, 1995)**

Sample: Particle Cutoff Diameter (μm)	MDC	Stage 1 >35	Stage 2 21.7	Stage 3 15.7	Stage 4 10.5	Stage 5 6.6	Stage 6 3.3	Stage 7 2.0	Stage CO 1.40	Stage L2 0.90	Stage L3 0.52	Stage L4 0.23	Stage L5 0.11	Stage LF 0.08	Stage BU backup filter
<b>PAHs</b>															
Acenaphthylene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acenaphthene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Fluorene	0.01000	0.00000	0.02100	0.04733	0.00767	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.01333	0.02133
Phenanthrene	0.01000	0.01800	0.08600	0.19400	0.00033	0.00000	0.00000	0.00133	0.00000	0.00100	0.00000	0.00000	0.01867	0.00267	0.07367
Anthracene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
<b>Total low MW PAHs</b>	<b>n/a</b>	<b>0.01800</b>	<b>0.10700</b>	<b>0.24133</b>	<b>0.00800</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.00133</b>	<b>0.00000</b>	<b>0.00100</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.03200</b>	<b>0.02400</b>	<b>0.09247</b>
Fluoranthene	0.01000	0.03333	0.05033	0.08100	0.00733	0.00233	0.00000	0.01300	0.00000	0.22500	0.01700	0.00933	0.02833	0.01433	0.04667
Pyrene	0.01000	0.03500	0.03333	0.06533	0.01633	0.00900	0.00600	0.01433	0.00300	0.00567	0.01200	0.00500	0.03300	0.00933	0.05433
Benz(c)phenanthrene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Benz(a)anthracene	0.01000	0.00000	0.00000	0.00000	0.01933	0.00000	0.00000	0.00000	0.00000	0.00000	0.01500	0.00000	0.02667	0.01133	0.00000
Chrysene	0.01000	0.02000	0.02100	0.00000	0.01233	0.00000	0.00000	0.00000	0.00967	0.00000	0.00967	0.00000	0.02567	0.01000	0.02393
Benzo(b)fluoranthene	0.01000	0.01567	0.00000	0.00000	0.00833	0.00000	0.00000	0.00000	0.00000	0.00000	0.00733	0.01633	0.03667	0.01400	0.04467
Benzo(k)fluoranthene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.01113	0.00000
Benzo(j)fluoranthene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7,12-Dimethyl(a)anthrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Benzo(a)pyrene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.01900	0.00000	0.00000
3-Methylcholanthrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Indeno(1,2,3-c,d)pyrene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.01837
Dibenz(a,h)anthracene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Benzo(g,h,i)perylene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.03833	0.00000	0.04467
Dibenzo(a,l)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Dibenzo(a,i)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Dibenzo(a,h)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
<b>Total high MW PAHs</b>	<b>n/a</b>	<b>0.10400</b>	<b>0.10467</b>	<b>0.14633</b>	<b>0.06367</b>	<b>0.01133</b>	<b>0.00600</b>	<b>0.02733</b>	<b>0.01267</b>	<b>0.23067</b>	<b>0.06100</b>	<b>0.03067</b>	<b>0.20767</b>	<b>0.05900</b>	<b>0.24377</b>
<b>Total PAHs</b>	<b>n/a</b>	<b>0.12200</b>	<b>0.21167</b>	<b>0.38767</b>	<b>0.07167</b>	<b>0.01133</b>	<b>0.00600</b>	<b>0.02867</b>	<b>0.01267</b>	<b>0.23167</b>	<b>0.06100</b>	<b>0.03067</b>	<b>0.23967</b>	<b>0.08300</b>	<b>0.33623</b>
<b>TEQs</b>	<b>n/a</b>	<b>0.00157</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.00277</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.00223</b>	<b>0.00163</b>	<b>0.02533</b>	<b>0.00253</b>	<b>0.00925</b>

**Notes:**

Non detectable values shown as zeroes.

MDC = Method Detection Concentration

n/a = not applicable

**Table 16. PAH Concentrations (ng/m<sup>3</sup>) Measured by LPI at Burnaby Lake (August 1-8, 1995)**

Sample: Particle Cutoff Diameter (μm)	MDC	Stage 1 >35	Stage 2 21.7	Stage 3 15.7	Stage 4 10.5	Stage 5 6.6	Stage 6 3.3	Stage 7 2.0	Stage CO 1.40	Stage L2 0.90	Stage L3 0.52	Stage L4 0.23	Stage L5 0.11	Stage LF 0.08
<b>PAHs</b>														
Acenaphthylene	0.01000	0.00000	0.00000	0.00000	0.01200	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acenaphthene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Fluorene	0.01000	0.01067	0.00000	0.00000	0.01533	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Phenanthrene	0.01000	0.11000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.02300	0.20967	0.00000
Anthracene	0.01000	0.01267	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
<b>Total low MW PAHs</b>	<b>n/a</b>	<b>0.13333</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.02733</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.02300</b>	<b>0.20967</b>	<b>0.00000</b>
Fluoranthene	0.01000	0.02467	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00167	0.00333	0.01167	0.07533	0.00233
Pyrene	0.01000	0.01533	0.00000	0.00000	0.01967	0.00000	0.00000	0.00000	0.00633	0.00267	0.00367	0.01533	0.05167	0.00367
Benzo(c)phenanthrene	0.01000	0.00000	0.00000	0.00000	0.00700	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Benz(a)anthracene	0.01000	0.00000	0.00000	0.00000	0.09933	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Chrysene	0.01000	0.00200	0.00000	0.00000	0.13000	0.00000	0.00000	0.01867	0.00767	0.02067	0.00000	0.00200	0.00400	0.00133
Benzo(b)fluoranthene	0.01000	0.00000	0.00000	0.00000	0.13000	0.00000	0.00000	0.01133	0.00833	0.02967	0.00800	0.01333	0.02933	0.01767
Benzo(k)fluoranthene	0.01000	0.00000	0.00000	0.00000	0.04667	0.00000	0.00000	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00667
Benzo(j)fluoranthene	0.01000	0.00000	0.00000	0.00000	0.02833	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7,12-Dimethyl(a)anthrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Benzo(a)pyrene	0.01000	0.00000	0.00000	0.00000	0.04833	0.00000	0.00000	0.00600	0.00000	0.02067	0.00000	0.00000	0.01933	0.00800
3-Methylcholanthrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Indeno(1,2,3-c,d)pyrene	0.01000	0.00000	0.00000	0.00000	0.03833	0.00000	0.00000	0.01333	0.00567	0.02100	0.00000	0.00000	0.02667	0.01267
Dibenz(a,h)anthracene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00700	0.00000	0.01567	0.00000	0.00000	0.01100	0.00000
Benzo(g,h,i)perylene	0.01000	0.00000	0.00000	0.00000	0.03033	0.00000	0.00000	0.01200	0.00667	0.02033	0.00000	0.01667	0.03000	0.02800
Dibenzo(a,l)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Dibenzo(a,i)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Dibenzo(a,h)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
<b>Total high MW PAHs</b>	<b>n/a</b>	<b>0.04200</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.57800</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.06833</b>	<b>0.04467</b>	<b>0.13233</b>	<b>0.01500</b>	<b>0.05900</b>	<b>0.24733</b>	<b>0.08033</b>
<b>Total PAHs</b>	<b>n/a</b>	<b>0.17533</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.60533</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.06833</b>	<b>0.04467</b>	<b>0.13233</b>	<b>0.01500</b>	<b>0.08200</b>	<b>0.45700</b>	<b>0.08033</b>
<b>TEQs</b>	<b>n/a</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.08360</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.01750</b>	<b>0.00297</b>	<b>0.04507</b>	<b>0.00080</b>	<b>0.00133</b>	<b>0.03970</b>	<b>0.01297</b>

**Notes:**

Non detectable values shown as zeroes.

MDC = Method Detection Concentration

n/a = not applicable

**Table 17. PAH Concentrations (ng/m<sup>3</sup>) Measured by LPI at Burnaby Lake (August 8-15, 1995)**

Sample: Particle Cutoff Diameter (μm)	MDC	Stage 1 >35	Stage 2 21.7	Stage 3 15.7	Stage 4 10.5	Stage 5 6.6	Stage 6 3.3	Stage 7 2.0	Stage CO 1.40	Stage L2 0.90	Stage L3 0.52	Stage L4 0.23	Stage L5 0.11
<b>PAHs</b>													
Acenaphthylene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acenaphthene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Fluorene	0.01000	0.01567	0.00000	0.02233	0.01267	0.01667	0.00000	0.02133	0.00000	0.01533	0.00933	0.00000	0.04533
Phenanthrene	0.01000	0.00800	0.05067	0.06900	0.04067	0.03067	0.00400	0.17933	0.00233	0.08167	0.02300	0.01200	0.27600
Anthracene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
<b>Total low MW PAHs</b>	<b>n/a</b>	<b>0.02367</b>	<b>0.05067</b>	<b>0.09133</b>	<b>0.05333</b>	<b>0.04733</b>	<b>0.00400</b>	<b>0.20067</b>	<b>0.00233</b>	<b>0.09700</b>	<b>0.03233</b>	<b>0.01200</b>	<b>0.32133</b>
Fluoranthene	0.01000	0.01067	0.03467	0.02233	0.01200	0.02267	0.00533	0.06367	0.00567	0.02533	0.01133	0.01400	0.08733
Pyrene	0.01000	0.01433	0.03000	0.02133	0.01200	0.02067	0.01033	0.04867	0.01167	0.02000	0.01100	0.01433	0.07367
Benz(c)phenanthrene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Benz(a)anthracene	0.01000	0.00000	0.00000	0.00000	0.00000	0.01467	0.01567	0.00000	0.01933	0.01267	0.00000	0.01667	0.00000
Chrysene	0.01000	0.00000	0.00000	0.00000	0.00000	0.01133	0.00667	0.00000	0.01500	0.00000	0.00000	0.00700	0.00000
Benzo(b)fluoranthene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00867	0.00000	0.00000	0.01100	0.00000	0.00000	0.00800	0.00000
Benzo(k)fluoranthene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.01000	0.00000	0.00000	0.00000	0.00000
Benzo(j)fluoranthene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7,12-Dimethyl(a)anthrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Benzo(a)pyrene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
3-Methylcholanthrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Indeno(1,2,3-c,d)pyrene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00767	0.00000	0.00000	0.00000	0.00000
Dibenz(a,h)anthracene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Benzo(g,h,i)perylene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00867	0.00000	0.00000	0.00000	0.00000
Dibenzo(a,l)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Dibenzo(a,i)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Dibenzo(a,h)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
<b>Total high MW PAHs</b>	<b>n/a</b>	<b>0.02500</b>	<b>0.06467</b>	<b>0.04367</b>	<b>0.02400</b>	<b>0.07800</b>	<b>0.03800</b>	<b>0.11233</b>	<b>0.08900</b>	<b>0.05800</b>	<b>0.02233</b>	<b>0.06000</b>	<b>0.16100</b>
<b>Total PAHs</b>	<b>n/a</b>	<b>0.04867</b>	<b>0.11533</b>	<b>0.13500</b>	<b>0.07733</b>	<b>0.12533</b>	<b>0.04200</b>	<b>0.31300</b>	<b>0.09133</b>	<b>0.15500</b>	<b>0.05467</b>	<b>0.07200</b>	<b>0.48233</b>
<b>TEQs</b>	<b>n/a</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.00000</b>	<b>0.00233</b>	<b>0.00157</b>	<b>0.00000</b>	<b>0.00557</b>	<b>0.00127</b>	<b>0.00000</b>	<b>0.00247</b>	<b>0.00000</b>

**Notes:**

Non detectable values shown as zeroes.

MDC = Method Detection Concentration

n/a = not applicable

**Table 18. Mean PAH Concentrations (ng/m<sup>3</sup>) Measured by LPI at Burnaby Lake (February-August, 1995) (n=11)**

Sample: Particle Cutoff Diameter (μm)	MDC	Stage 1 >35	Stage 2 21.7	Stage 3 15.7	Stage 4 10.5	Stage 5 6.6	Stage 6 3.3	Stage 7 2.0	Stage CO 1.40	Stage L2 0.90	Stage L3 0.52	Stage L4 0.23
<b>PAHs</b>												
Acenaphthylene	0.01000	0.00994	0.01733	0.00486	0.00779	0.02584	0.02312	0.00797	0.00688	0.01221	0.01096	0.00752
Acenaphthene	0.01000	0.00000	0.01154	0.00000	0.00000	0.00000	0.00182	0.00000	0.00000	0.00000	0.00000	0.00000
Fluorene	0.01000	0.01219	0.01150	0.02149	0.01792	0.02117	0.01610	0.01118	0.02188	0.00809	0.05010	0.00675
Phenanthrene	0.01000	0.05529	0.02438	0.03464	0.02852	0.02200	0.03429	0.02872	0.04582	0.03159	0.02148	0.02633
Anthracene	0.01000	0.00155	0.00102	0.00206	0.01488	0.00000	0.01804	0.00394	0.00480	0.00537	0.00000	0.00345
<b>Total low MW PAHs</b>	<b>n/a</b>	<b>0.07896</b>	<b>0.06577</b>	<b>0.06305</b>	<b>0.06912</b>	<b>0.06901</b>	<b>0.09337</b>	<b>0.05181</b>	<b>0.07939</b>	<b>0.05726</b>	<b>0.08255</b>	<b>0.04406</b>
Fluoranthene	0.01000	0.05522	0.02113	0.02651	0.02070	0.01703	0.03399	0.02058	0.02971	0.07118	0.02298	0.01912
Pyrene	0.01000	0.04553	0.02187	0.02195	0.02106	0.01701	0.03270	0.01894	0.02636	0.05562	0.02307	0.02233
Benzo(c)phenanthrene	0.01000	0.00206	0.00000	0.00000	0.00064	0.00151	0.00350	0.00000	0.00165	0.00526	0.00000	0.00000
Benz(a)anthracene	0.01000	0.00627	0.00282	0.00728	0.01807	0.02552	0.03569	0.01869	0.04634	0.04668	0.00622	0.00152
Chrysene	0.01000	0.02700	0.01381	0.00532	0.02067	0.02022	0.04350	0.00581	0.04770	0.19088	0.01596	0.01134
Benzo(b)fluoranthene	0.01000	0.02825	0.01263	0.00565	0.02158	0.03176	0.03883	0.00901	0.01654	0.03665	0.02064	0.06015
Benzo(k)fluoranthene	0.01000	0.00772	0.00317	0.00091	0.00517	0.01033	0.01427	0.00139	0.00658	0.00997	0.00485	0.00444
Benzo(j)fluoranthene	0.01000	0.00000	0.00000	0.00000	0.00258	0.00441	0.00573	0.00000	0.00000	0.00000	0.00000	0.00000
7,12-Dimethyl(a)anthrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Benzo(a)pyrene	0.01000	0.00000	0.00000	0.00000	0.00439	0.00875	0.01084	0.00055	0.00306	0.01439	0.00000	0.00000
3-Methylcholanthrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Indeno(1,2,3-c,d)pyrene	0.01000	0.01532	0.00302	0.00369	0.00614	0.01656	0.01520	0.00267	0.00692	0.01213	0.00869	0.02115
Dibenz(a,h)anthracene	0.01000	0.00000	0.00000	0.00000	0.00000	0.00309	0.00060	0.00064	0.00000	0.00142	0.00000	0.00000
Benzo(g,h,i)perylene	0.01000	0.01089	0.00496	0.00313	0.00696	0.01674	0.01101	0.00109	0.00966	0.01252	0.00831	0.02971
Dibenzo(a,l)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Dibenzo(a,l)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Dibenzo(a,h)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
<b>Total high MW PAHs</b>	<b>n/a</b>	<b>0.19826</b>	<b>0.08341</b>	<b>0.07444</b>	<b>0.12797</b>	<b>0.17292</b>	<b>0.24586</b>	<b>0.07937</b>	<b>0.19454</b>	<b>0.45670</b>	<b>0.11073</b>	<b>0.16975</b>
<b>Total PAHs</b>	<b>n/a</b>	<b>0.27722</b>	<b>0.14918</b>	<b>0.13749</b>	<b>0.19709</b>	<b>0.24193</b>	<b>0.33923</b>	<b>0.13119</b>	<b>0.27392</b>	<b>0.51396</b>	<b>0.19328</b>	<b>0.21381</b>
<b>TEQs</b>	<b>n/a</b>	<b>0.00729</b>	<b>0.00247</b>	<b>0.00212</b>	<b>0.01010</b>	<b>0.02223</b>	<b>0.02342</b>	<b>0.00469</b>	<b>0.01140</b>	<b>0.02771</b>	<b>0.00491</b>	<b>0.01084</b>

**Notes:**

Non detectable values shown as zeroes

MDC = Method Detection Concentration

n/a = not applicable

**Table 19. PAH Concentrations (ng/m<sup>3</sup>) for the Sum of all Particulate Fractions in LPI Samples from Burnaby Lake**

Sampling Date:	MDC	95/02/07	95/03/07	95/03/21	95/04/04	95/04/18	95/05/02	95/05/23	95/06/20	95/07/18	95/08/01	95/08/08
<b>PAHs</b>												
Acenaphthylene	0.01000	0.00000	0.00000	0.10916	0.00000	0.39243	0.76217	0.32501	0.00000	0.00000	0.01200	0.00000
Acenaphthene	0.01000	0.02135	0.00000	0.09593	0.04361	0.03254	0.00000	0.00000	0.01999	0.00000	0.00000	0.00000
Fluorene	0.01000	0.69803	0.05513	0.15680	0.03105	0.10890	0.45566	0.56418	0.08328	0.12947	0.08467	0.15867
Phenanthrene	0.01000	0.37037	0.37421	0.53258	0.11067	0.28984	1.45201	0.56650	0.20187	0.39567	0.74667	0.78533
Anthracene	0.01000	0.17684	0.05112	0.00000	0.24182	0.19489	0.07174	0.07164	0.00000	0.00000	0.01267	0.00000
<b>Total low MW PAHs</b>	<b>n/a</b>	<b>1.26660</b>	<b>0.48045</b>	<b>0.89448</b>	<b>0.13842</b>	<b>1.01859</b>	<b>2.74158</b>	<b>1.52733</b>	<b>0.30513</b>	<b>0.52513</b>	<b>0.85600</b>	<b>0.94400</b>
Fluoranthene	0.01000	0.50384	0.37487	0.36553	0.56558	0.45584	0.86084	0.34660	0.32545	0.52800	0.16767	0.33300
Pyrene	0.01000	0.55722	0.42232	0.41482	0.71490	0.50266	0.75590	0.29751	0.28548	0.30167	0.24600	0.30500
Benzo(c)phenanthrene	0.01000	0.03337	0.02005	0.00000	0.67393	0.08499	0.00000	0.00000	0.02265	0.00000	0.00700	0.00000
Benz(a)anthracene	0.01000	0.94094	0.03675	0.14555	0.08556	0.96813	0.66523	0.66434	0.07662	0.07233	0.09933	0.07900
Chrysene	0.01000	0.59126	0.30638	0.27324	0.37727	0.88712	1.32813	1.19104	0.11526	0.13227	0.18633	0.04000
Benzo(b)fluoranthene	0.01000	1.43577	0.41163	0.68806	0.63198	1.11155	0.46363	0.46302	0.25583	0.14300	0.24767	0.02767
Benzo(k)fluoranthene	0.01000	0.34468	0.10725	0.05624	0.43475	0.37118	0.06277	0.06269	0.06962	0.01113	0.06333	0.01000
Benzo(j)fluoranthene	0.01000	0.05339	0.00000	0.00000	0.17146	0.11155	0.00000	0.00000	0.00000	0.00000	0.02833	0.00000
7,12-Dimethyl(a)anthrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Benzo(a)pyrene	0.01000	0.38038	0.07718	0.18194	0.00000	0.37218	0.08901	0.08889	0.00000	0.01900	0.10233	0.02267
3-Methylcholanthrene	0.03333	0.00000	0.00000	0.00000	0.06178	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Indeno(1,2,3-c,d)pyrene	0.01000	1.01835	0.32609	0.06285	0.00000	0.44090	0.05978	0.05970	0.00000	0.01837	0.11767	0.00767
Dibenz(a,h)anthracene	0.01000	0.06106	0.02138	0.00000	0.21011	0.01926	0.00000	0.00000	0.00000	0.00000	0.03367	0.00000
Benzo(g,h,i)perylene	0.01000	1.43310	0.33645	0.29110	0.00000	0.52457	0.22899	0.17728	0.06129	0.08300	0.20300	0.00867
Dibenzo(a,l)pyrene	0.03333	0.00000	0.00000	0.00000	0.20648	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Dibenzo(a,i)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Dibenzo(a,h)pyrene	0.03333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
<b>Total high MW PAHs</b>	<b>n/a</b>	<b>7.35335</b>	<b>2.44036</b>	<b>2.47933</b>	<b>0.00000</b>	<b>5.84993</b>	<b>4.51428</b>	<b>3.35108</b>	<b>1.21219</b>	<b>1.30877</b>	<b>1.50233</b>	<b>0.83367</b>
<b>Total PAHs</b>	<b>n/a</b>	<b>8.61995</b>	<b>2.92082</b>	<b>3.37380</b>	<b>3.56822</b>	<b>6.86853</b>	<b>7.25586</b>	<b>4.87841</b>	<b>1.51732</b>	<b>1.83390</b>	<b>2.35833</b>	<b>1.77767</b>
<b>TEQs</b>	<b>n/a</b>	<b>0.92336</b>	<b>0.22148</b>	<b>0.28349</b>	<b>0.34635</b>	<b>0.72663</b>	<b>0.22013</b>	<b>0.21983</b>	<b>0.04021</b>	<b>0.04532</b>	<b>0.20393</b>	<b>0.03587</b>

**Notes:**

MDC = Minimum Detectable Concentration

n/a denotes not applicable

**Table 20. Statistical Summary of PAH Concentrations (ng/m<sup>3</sup>) for the Sum of All Particulate Fractions in LPI Samples from Burnaby Lake (n=11)**

Parameter	mean	minimum	maximum	standard error
Acenaphthylene	0.15	0.00	0.76	0.075
Acenaphthene	0.019	0.00	0.10	0.0090
Fluorene	0.23	0.031	0.70	0.069
Phenanthrene	0.53	0.11	1.5	0.11
Anthracene	0.075	0.00	0.24	0.027
<b>Total low MW PAHs</b>	<b>0.97</b>	<b>0.14</b>	<b>2.7</b>	<b>0.22</b>
Fluoranthene	0.44	0.17	0.86	0.054
Pyrene	0.44	0.25	0.76	0.053
Benzo(c)phenanthrene	0.077	0.00	0.67	0.060
Benz(a)anthracene	0.35	0.037	0.97	0.11
Chrysene	0.49	0.040	1.3	0.14
Benzo(b)fluoranthene	0.53	0.028	1.4	0.13
Benzo(k)fluoranthene	0.14	0.010	0.43	0.047
Benzo(j)fluoranthrene	0.033	0.00	0.17	0.017
7,12-Dimethylb(a)anthrene	0.00	0.00	0.00	0.00
Benzo(a)pyrene	0.12	0.00	0.38	0.041
3-Methylcholanthrene	0.0056	0.00	0.062	0.0056
Indeno(1,2,3-c,d)pyrene	0.19	0.00	1.0	0.093
Dibenz(a,h)anthracene	0.031	0.00	0.21	0.019
Benzo(g,h,i)perylene	0.30	0.00	1.4	0.12
Dibenzo(a,l)pyrene	0.019	0.00	0.21	0.019
Dibenzo(a,i)pyrene	0.00	0.00	0.00	0.00
Dibenzo(a,h)pyrene	0.00	0.00	0.00	0.00
<b>Total high MW PAHs</b>	<b>2.8</b>	<b>0.00</b>	<b>7.4</b>	<b>0.69</b>
<b>Total PAHs</b>	<b>4.1</b>	<b>1.5</b>	<b>8.6</b>	<b>0.75</b>
<b>TEQs</b>	<b>0.30</b>	<b>0.036</b>	<b>0.92</b>	<b>0.085</b>

**Table 21. Comparison of Mean PAH TEQs (ng TEQ/m<sup>3</sup>) in HV/PUF and LPI Samples from Burnaby Lake (1995)**

Parameter	TEFs*	HV/PUF concs.	HV/PUF TEQs	LPI concs.	LPI TEQs
<b>PAHs</b>					
Acenaphthylene	0	1.3	0.00	0.15	0.00
Acenaphthene	0	6.0	0.00	0.019	0.00
Fluorene	0	5.9	0.00	0.23	0.00
Phenanthrene	0	17	0.00	0.53	0.00
Anthracene	0	1.0	0.00	0.075	0.00
<b>Total low MW PAHs</b>	-	<b>31</b>	-	<b>0.97</b>	-
Fluoranthene	0	4.2	0.00	0.44	0.00
Pyrene	0	2.5	0.00	0.44	0.00
Benzo(c)phenanthrene	0	0.058	0.00	0.077	0.00
Benz(a)anthracene	0.1	0.18	0.018	0.35	0.035
Chrysene	0	0.31	0.00	0.49	0.00
Benzo(b)fluoranthene	0.1	0.34	0.034	0.53	0.053
Benzo(k)fluoranthene	0.1	0.11	0.011	0.14	0.014
Benzo(j)fluoranthene	0	0.021	0.00	0.033	0.00
7,12-Dimethyl(a)anthrene	0	0.00	0.00	0.00	0.00
Benzo(a)pyrene	1	0.17	<b>0.17</b>	0.12	<b>0.12</b>
3-Methylcholanthrene	0	0.00	0.00	0.0056	0.00
Indeno(1,2,3-c,d)pyrene	0.2	0.19	0.039	0.19	0.038
Dibenz(a,h)anthracene	1.1	0.015	0.017	0.031	0.035
Benzo(g,h,i)perylene	0	0.33	0.00	0.30	0.00
Dibenzo(a,l)pyrene	0	0.00	0.00	0.019	0.00
Dibenzo(a,i)pyrene	0	0.00	0.00	0.00	0.00
Dibenzo(a,h)pyrene	0	0.00	0.00	0.00	0.00
<b>Total high MW PAHs</b>	-	<b>8.4</b>	-	<b>2.8</b>	-
<b>Total PAHs</b>	-	<b>40</b>	-	<b>4.1</b>	-
<b>Total TEQs</b>			<b>0.29</b>		<b>0.30</b>

\* from Schedule 1.1 of the BC Waste Management Act (1998)

**Table 22. Mean Deposition Velocities (cm/sec) for PAHs Measured by LPI at Burnaby Lake (February to August 1995) (n=11)**

Particle Cutoff Diameter ( $\mu\text{m}$ )	>35	21.7	15.7	10.5	6.6	<6.6
Mean deposition velocity (+/- SE)	15 (1.1)	9.1 (0.63)	5.3 (0.37)	2.1 (0.14)	0.37 (0.030)	0.24 (0.020)

**Table 23. PAH Deposition Rates (ng/m<sup>2</sup>/day) from LPI Concentrations at Burnaby Lake (February 7-14, 1995)**

Sample: Particle Cutoff Diameter (μm)	Stage 1 >35	Stage 2 21.7	Stage 3 15.7	Stage 4 10.5	Stage 5 6.6	Stage 6 3.3	Stage 7 2.0	Stage CO 1.40	Stage L2 0.90	Stage L3 0.52	Stage L4 0.23	Stage L5 0.11	Stage LF 0.08	Stage BU backup filter	Total Deposition all fractions
<b>PAHs</b>															
Acenaphthylene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acenaphthene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.43	0.00	6.43	
Fluorene	300.70	104.58	128.88	66.49	12.63	9.44	6.73	7.93	0.00	141.52	0.00	1.91	1.91	9.84	792.56
Phenanthrene	122.74	216.37	0.00	72.98	0.00	11.05	2.01	1.00	0.00	26.11	12.05	14.06	7.03	21.09	506.50
Anthracene	0.00	0.00	143.67	49.46	0.00	10.04	9.64	7.13	7.03	0.00	0.00	6.43	0.00	0.00	233.40
<b>Total low MW PAHs</b>	<b>423.44</b>	<b>320.95</b>	<b>272.54</b>	<b>188.92</b>	<b>12.63</b>	<b>30.53</b>	<b>18.38</b>	<b>16.07</b>	<b>7.03</b>	<b>167.63</b>	<b>12.05</b>	<b>22.40</b>	<b>15.37</b>	<b>30.94</b>	<b>1538.89</b>
Fluoranthene	490.95	324.56	105.64	89.19	4.41	16.07	10.04	3.01	4.02	18.08	3.01	16.07	2.01	43.19	1130.25
Pyrene	552.31	360.62	63.38	64.87	1.47	18.08	12.05	2.01	9.04	15.07	9.04	21.09	6.03	44.19	1179.25
Benzo(c)phenanthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.04	10.04
Benz(a)anthracene	429.58	0.00	507.05	194.60	42.59	26.11	26.11	35.15	0.00	16.07	0.00	34.15	7.03	54.24	1372.69
Chrysene	871.43	119.01	101.41	43.79	0.00	7.23	0.00	12.05	0.70	22.30	0.00	47.41	11.25	49.22	1285.79
Benzo(b)fluoranthene	1693.77	274.07	109.86	60.00	0.00	8.64	5.62	19.08	3.92	36.76	84.97	127.16	32.74	65.29	2521.88
Benzo(k)fluoranthene	0.00	176.70	0.00	0.00	0.00	0.00	0.00	6.43	0.00	16.07	0.00	42.18	12.05	22.10	275.54
Benzo(j)fluoranthene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.07	0.00	0.00	16.07
7,12-Dimethyl(a)anthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Benzo(a)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	61.27	21.09	32.14	114.50
3-Methylcholanthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Indeno(1,2,3-c,d)pyrene	2884.31	0.00	103.52	38.92	0.00	9.04	0.00	12.05	6.53	21.09	45.20	84.37	23.10	48.21	3276.35
Dibenz(a,h)anthracene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.04	0.00	8.34	18.38
Benzo(g,h,i)perylene	1933.10	306.53	139.44	55.95	0.00	7.53	0.00	18.08	3.52	23.60	51.73	127.06	35.66	110.48	2812.67
Dibenzo(a,l)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dibenzo(a,i)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dibenzo(a,h)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total high MW PAHs</b>	<b>8855.45</b>	<b>1561.49</b>	<b>1130.31</b>	<b>547.31</b>	<b>48.46</b>	<b>92.71</b>	<b>53.84</b>	<b>107.87</b>	<b>27.72</b>	<b>169.04</b>	<b>193.95</b>	<b>586.87</b>	<b>150.96</b>	<b>487.43</b>	<b>14013.41</b>
<b>Total PAHs</b>	<b>9278.89</b>	<b>1882.44</b>	<b>1402.85</b>	<b>736.24</b>	<b>61.09</b>	<b>123.24</b>	<b>72.22</b>	<b>123.94</b>	<b>34.75</b>	<b>336.67</b>	<b>206.00</b>	<b>609.27</b>	<b>166.33</b>	<b>518.37</b>	<b>15552.30</b>

**Table 24. PAH Deposition Rates (ng/m<sup>2</sup>/day) from LPI Concentrations at Burnaby Lake (March 7-14, 1995)**

Sample: Particle Cutoff Diameter (μm)	Stage 1 >35	Stage 2 21.7	Stage 3 15.7	Stage 4 10.5	Stage 5 6.6	Stage 6 3.3	Stage 7 2.0	Stage CO 1.40	Stage L2 0.90	Stage L3 0.52	Stage L4 0.23	Stage L5 0.11	Stage LF 0.08	Stage BU backup filter	Total Deposition all fractions
<b>PAHs</b>															
Acenaphthylene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acenaphthene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fluorene	181.47	21.33	5.36	0.00	0.00	1.70	1.61	0.25	0.00	0.00	0.93	2.12	0.00	3.56	218.33
Phenanthrene	1244.38	91.41	0.00	0.00	0.00	12.72	11.03	1.70	6.78	2.54	5.94	9.33	0.85	21.20	1407.87
Anthracene	67.40	0.00	0.00	0.00	0.00	4.41	2.88	0.00	0.00	0.17	0.93	0.85	2.63	79.28	
<b>Total low MW PAHs</b>	<b>1493.26</b>	<b>112.73</b>	<b>5.36</b>	<b>0.00</b>	<b>0.00</b>	<b>18.83</b>	<b>15.52</b>	<b>1.95</b>	<b>6.78</b>	<b>2.54</b>	<b>7.04</b>	<b>12.38</b>	<b>1.70</b>	<b>27.39</b>	<b>1705.48</b>
Fluoranthene	1265.12	0.00	96.39	23.29	4.22	9.67	7.97	2.04	7.12	6.28	6.28	7.97	3.73	13.06	1453.14
Pyrene	1202.90	219.37	124.95	27.40	6.20	10.18	7.63	2.54	8.65	6.11	6.11	7.80	2.71	16.11	1648.68
Benz(c)phenanthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.54	0.00	2.54	5.09	
Benz(a)anthracene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.33	0.00	0.00	9.33	
Chrysene	466.64	146.25	108.89	36.99	4.34	6.78	4.16	0.00	3.14	3.99	5.94	11.03	3.90	14.42	816.46
Benzo(b)fluoranthene	337.02	143.20	98.18	32.20	5.83	6.78	3.82	2.54	2.97	4.33	13.57	21.20	6.78	20.35	698.78
Benzo(k)fluoranthene	0.00	0.00	53.55	0.00	3.72	0.00	2.54	0.00	0.00	4.16	7.46	2.54	5.43	79.41	
Benzo(j)fluoranthene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7,12-Dimethyl(a)anthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Benzo(a)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.87	0.00	7.72	19.59	
3-Methylcholanthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Indeno(1,2,3-c,d)pyrene	181.47	118.83	53.55	0.00	11.04	4.58	4.07	0.00	0.00	2.88	9.33	20.35	5.68	19.51	431.30
Dibenz(a,h)anthracene	0.00	0.00	0.00	0.00	7.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.94
Benzo(g,h,i)perylene	228.14	112.73	66.05	20.55	13.65	5.26	0.00	3.65	0.00	3.31	7.04	16.11	5.26	22.90	504.64
Dibenzo(a,i)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dibenzo(a,i)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dibenzo(a,h)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total high MW PAHs</b>	<b>3681.29</b>	<b>740.38</b>	<b>601.55</b>	<b>140.44</b>	<b>56.95</b>	<b>43.25</b>	<b>30.19</b>	<b>10.77</b>	<b>21.88</b>	<b>26.89</b>	<b>52.41</b>	<b>115.68</b>	<b>30.62</b>	<b>122.04</b>	<b>5674.35</b>
<b>Total PAHs</b>	<b>5174.54</b>	<b>853.11</b>	<b>606.90</b>	<b>140.44</b>	<b>56.95</b>	<b>62.08</b>	<b>45.71</b>	<b>12.72</b>	<b>28.67</b>	<b>29.43</b>	<b>59.45</b>	<b>128.07</b>	<b>32.31</b>	<b>149.44</b>	<b>7379.84</b>

**Table 25. PAH Deposition Rates (ng/m<sup>2</sup>/day) from LPI Concentrations at Burnaby Lake (March 21-28, 1995)**

Sample: Particle Cutoff Diameter (μm)	Stage 1 >35	Stage 2 21.7	Stage 3 15.7	Stage 4 10.5	Stage 5 6.6	Stage 6 3.3	Stage 7 2.0	Stage CO 1.40	Stage L2 0.90	Stage L3 0.52	Stage L4 0.23	Stage L5 0.11	Stage LF 0.08	Stage BU backup filter	Total deposition all fractions
<b>PAHs</b>															
Acenaphthylene	0.00	813.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	813.75
Acenaphthene	0.00	715.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	715.11
Fluorene	226.60	120.83	1.44	12.20	0.00	1.03	2.06	0.00	5.16	0.00	7.56	6.74	0.00	1.37	384.99
Phenanthrene	293.74	197.27	86.68	38.81	5.02	6.19	7.56	1.37	19.93	0.00	17.18	21.31	3.44	11.00	709.51
Anthracene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total low MW PAHs</b>	<b>520.34</b>	<b>1846.96</b>	<b>88.12</b>	<b>51.01</b>	<b>5.02</b>	<b>7.22</b>	<b>9.62</b>	<b>1.37</b>	<b>25.09</b>	<b>0.00</b>	<b>24.75</b>	<b>28.04</b>	<b>3.44</b>	<b>12.37</b>	<b>2623.36</b>
Fluoranthene	306.33	180.01	104.02	34.38	3.21	2.20	2.20	2.20	8.45	3.64	9.83	9.83	6.39	9.76	682.45
Pyrene	453.20	192.34	92.46	35.48	2.41	3.02	2.34	2.34	8.11	4.67	11.55	11.55	6.05	13.33	838.86
Benzo(c)phenanthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Benz(a)anthracene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.24	30.24
Chrysene	264.37	167.68	0.00	0.00	0.00	0.00	0.00	0.07	5.91	6.39	8.94	13.06	5.43	7.97	479.82
Benzo(b)fluoranthene	205.62	182.48	99.68	0.00	0.00	4.67	0.00	6.19	6.87	4.81	24.06	41.24	14.43	27.49	617.55
Benzo(k)fluoranthene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.69	0.00	0.00	11.69
Benzo(j)fluoranthene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7,12-Dimethyl(a)anthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Benzo(a)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.31	7.56	8.94	37.81
3-Methylcholanthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Indeno(1,2,3-c,d)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.06	0.00	0.00	13.06
Dibenz(a,h)anthracene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Benzo(g,h,i)perylene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.00	27.49	0.00	22.00
Dibenzo(a,l)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dibenzo(a,i)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dibenzo(a,h)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total high MW PAHs</b>	<b>1229.52</b>	<b>722.51</b>	<b>296.16</b>	<b>69.86</b>	<b>5.62</b>	<b>9.90</b>	<b>4.54</b>	<b>10.79</b>	<b>29.35</b>	<b>19.52</b>	<b>65.37</b>	<b>149.23</b>	<b>39.87</b>	<b>119.74</b>	<b>2771.97</b>
<b>Total PAHs</b>	<b>1749.86</b>	<b>2569.47</b>	<b>384.28</b>	<b>120.87</b>	<b>10.64</b>	<b>17.12</b>	<b>14.16</b>	<b>12.17</b>	<b>54.44</b>	<b>19.52</b>	<b>90.11</b>	<b>177.27</b>	<b>43.30</b>	<b>132.11</b>	<b>5395.33</b>

**Table 26. PAH Deposition Rates (ng/m<sup>2</sup>/day) from LPI Concentrations at Burnaby Lake (April 4-11, 1995)**

Sample: Particle Cutoff Diameter (μm)	Stage 1 >35	Stage 2 21.7	Stage 3 15.7	Stage 4 10.5	Stage 5 6.6	Stage 6 3.3	Stage 7 2.0	Stage CO 1.40	Stage L2 0.90	Stage L3 0.52	Stage L4 0.23	Stage L5 0.11	Stage LF 0.08	Stage BU backup filter
<b>PAHs</b>														
Acenaphthylene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.19	0.00	0.00	0.00	0.00	0.00
Acenaphthene	0.00	261.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fluorene	0.00	191.59	52.06	22.48	2.83	2.16	1.78	2.01	2.93	2.55	0.00	0.00	0.00	1.93
Phenanthrene	0.00	0.00	102.48	58.69	10.74	4.63	2.78	15.67	3.78	0.00	0.00	0.00	0.00	10.19
Anthracene	0.00	94.41	0.00	0.00	0.00	0.00	0.00	6.79	8.34	0.00	8.72	0.00	0.00	5.87
<b>Total low MW PAHs</b>	<b>0.00</b>	<b>547.01</b>	<b>154.54</b>	<b>81.16</b>	<b>13.57</b>	<b>6.79</b>	<b>4.55</b>	<b>24.47</b>	<b>25.24</b>	<b>2.55</b>	<b>8.72</b>	<b>0.00</b>	<b>0.00</b>	<b>17.98</b>
Fluoranthene	0.00	133.28	170.81	57.44	9.50	6.17	5.17	35.19	78.26	2.55	2.24	2.01	0.00	10.03
Pyrene	0.00	19.44	149.66	58.69	7.92	6.71	4.86	33.73	82.12	0.00	0.00	1.00	0.00	8.72
Benzo(c)phenanthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.24	13.51	0.00	0.00	0.00	0.00	2.24
Benz(a)anthracene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36.89	51.25	0.00	0.00	0.00	0.00	0.00
Chrysene	292.96	216.58	108.99	62.43	12.66	9.11	0.00	24.47	50.71	4.79	5.71	6.33	5.33	8.88
Benzo(b)fluoranthene	236.26	166.60	17.89	39.33	0.23	4.32	0.00	13.89	30.33	4.40	9.26	12.81	5.25	6.95
Benzo(k)fluoranthene	70.88	77.75	0.00	19.35	0.00	2.62	0.00	7.25	12.12	0.00	3.01	4.32	1.85	3.16
Benzo(j)fluoranthene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7,12-Dimethyl(a)anthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Benzo(a)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.87	6.56	0.00	0.00	0.00	0.00	0.00
3-Methylcholanthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Indeno(1,2,3-c,d)pyrene	0.00	169.38	69.95	24.97	0.00	4.63	0.00	5.33	7.72	3.32	4.86	7.56	0.00	4.55
Dibenz(a,h)anthracene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Benzo(g,h,i)perylene	0.00	116.62	0.00	24.97	3.62	0.00	0.00	3.86	6.56	0.00	5.63	9.65	2.32	11.42
Dibenzo(a,l)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dibenzo(a,i)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dibenzo(a,h)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total high MW PAHs</b>	<b>600.10</b>	<b>899.65</b>	<b>517.30</b>	<b>287.19</b>	<b>33.92</b>	<b>33.57</b>	<b>10.03</b>	<b>172.73</b>	<b>339.13</b>	<b>15.05</b>	<b>30.72</b>	<b>43.68</b>	<b>14.74</b>	<b>55.96</b>
<b>Total PAHs</b>	<b>600.10</b>	<b>1446.65</b>	<b>671.84</b>	<b>368.35</b>	<b>47.49</b>	<b>40.37</b>	<b>14.59</b>	<b>197.20</b>	<b>364.37</b>	<b>17.60</b>	<b>39.44</b>	<b>43.68</b>	<b>14.74</b>	<b>73.94</b>

**Table 27. PAH Deposition Rates (ng/m<sup>2</sup>/day) from LPI Concentrations at Burnaby Lake (April 18-25, 1995)**

Sample: Particle Cutoff Diameter (μm)	Stage 1 >35	Stage 2 21.7	Stage 3 15.7	Stage 4 10.5	Stage 5 6.6	Stage 6 3.3	Stage 7 2.0	Stage CO 1.40	Stage L2 0.90	Stage L3 0.52	Stage L4 0.23	Stage L5 0.11	Stage LF 0.08	Stage BU backup filter	Total Deposition all fractions
<b>PAHs</b>															
Acenaphthylene	0.00	0.00	0.00	0.00	28.03	32.94	8.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	69.61
Acenaphthene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.04	5.04
Fluorene	46.98	55.22	0.00	0.00	0.52	9.21	1.65	0.00	0.57	0.26	0.46	1.18	0.00	0.87	116.92
Phenanthrene	225.51	150.92	0.00	0.00	0.00	23.26	0.00	0.00	2.73	0.87	2.06	5.56	2.52	0.00	413.43
Anthracene	0.00	0.00	0.00	0.00	0.00	22.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.31	30.21
<b>Total low MW PAHs</b>	<b>272.49</b>	<b>206.14</b>	<b>0.00</b>	<b>0.00</b>	<b>28.56</b>	<b>88.31</b>	<b>10.29</b>	<b>0.00</b>	<b>3.29</b>	<b>1.13</b>	<b>2.52</b>	<b>6.74</b>	<b>2.52</b>	<b>13.23</b>	<b>635.22</b>
Fluoranthene	209.85	110.43	0.00	0.00	1.27	26.19	0.31	0.00	2.11	2.62	2.68	6.59	2.47	20.28	384.80
Pyrene	256.83	136.20	0.00	0.00	1.80	24.08	2.32	0.00	3.19	2.78	3.65	8.44	3.55	20.64	463.48
Benzo(c)phenanthrene	0.00	0.00	0.00	0.00	3.75	5.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.63	14.35
Benz(a)anthracene	0.00	0.00	0.00	0.00	38.23	44.98	18.42	0.00	0.00	0.00	0.00	19.30	0.00	41.12	162.04
Chrysene	250.57	132.52	0.00	0.00	29.68	52.18	4.48	0.00	0.00	3.86	3.86	7.31	3.24	34.38	522.07
Benzo(b)fluoranthene	162.87	90.19	0.00	0.00	61.69	42.92	2.73	0.00	2.68	4.73	8.34	22.18	8.39	32.78	439.48
Benzo(k)fluoranthene	97.09	51.53	0.00	0.00	23.39	18.68	0.82	0.00	0.00	0.00	3.04	6.18	2.16	7.56	210.46
Benzo(j)fluoranthene	0.00	0.00	0.00	0.00	10.94	9.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.72
7,12-Dimethyl(a)anthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Benzo(a)pyrene	0.00	0.00	0.00	0.00	21.74	18.47	0.00	0.00	0.00	0.00	0.00	12.45	0.00	11.84	64.50
3-Methylcholanthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Indeno(1,2,3-c,d)pyrene	0.00	0.00	0.00	0.00	34.40	15.39	0.00	0.00	0.00	0.00	3.86	11.53	4.43	9.52	79.12
Dibenz(a,h)anthracene	0.00	0.00	0.00	0.00	2.85	1.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.88
Benzo(g,h,i)perylene	0.00	0.00	0.00	0.00	30.88	11.68	0.00	0.00	0.00	0.00	5.20	17.45	7.93	17.86	90.99
Dibenzo(a,l)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dibenzo(a,i)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dibenzo(a,h)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total high MW PAHs</b>	<b>977.21</b>	<b>520.87</b>	<b>0.00</b>	<b>0.00</b>	<b>260.62</b>	<b>271.36</b>	<b>29.08</b>	<b>0.00</b>	<b>7.98</b>	<b>14.00</b>	<b>30.62</b>	<b>111.41</b>	<b>32.16</b>	<b>200.60</b>	<b>2455.89</b>
<b>Total PAHs</b>	<b>1249.70</b>	<b>727.00</b>	<b>0.00</b>	<b>0.00</b>	<b>289.17</b>	<b>359.66</b>	<b>39.37</b>	<b>0.00</b>	<b>11.27</b>	<b>15.13</b>	<b>33.14</b>	<b>118.16</b>	<b>34.68</b>	<b>213.82</b>	<b>3091.11</b>

**Table 28. PAH Deposition Rates (ng/m<sup>2</sup>/day) from LPI Concentrations at Burnaby Lake (May 2-9, 1995)**

Sample: Particle Cutoff Diameter (μm)	Stage 1 >35	Stage 2 21.7	Stage 3 15.7	Stage 4 10.5	Stage 5 6.6	Stage 6 3.3	Stage 7 2.0	Stage CO 1.40	Stage L2 0.90	Stage L3 0.52	Stage L4 0.23	Stage L5 0.11	Stage LF 0.08	Stage BU backup filter	Total Deposition all fractions
<b>PAHs</b>															
Acenaphthylene	540.26	236.52	181.82	96.22	37.84	6.77	5.16	12.25	7.34	9.76	6.70	8.52	4.87	0.00	1154.02
Acenaphthene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fluorene	183.69	129.15	187.46	49.84	19.08	4.03	2.36	15.31	0.05	4.78	2.52	2.09	3.44	4.35	608.17
Phenanthrene	1574.52	113.73	263.13	153.43	38.62	14.02	5.96	51.62	4.19	8.92	7.57	8.86	17.24	29.54	2291.36
Anthracene	0.00	0.00	0.00	93.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	93.62
<b>Total low MW PAHs</b>	<b>2298.48</b>	<b>479.39</b>	<b>632.40</b>	<b>393.10</b>	<b>95.54</b>	<b>24.82</b>	<b>13.48</b>	<b>79.18</b>	<b>11.59</b>	<b>23.46</b>	<b>16.80</b>	<b>19.48</b>	<b>25.55</b>	<b>33.90</b>	<b>4147.16</b>
Fluoranthene	1718.85	98.31	229.25	95.78	22.92	8.49	5.32	18.42	6.23	5.91	3.87	6.55	0.97	14.13	2235.00
Pyrene	1118.57	123.37	197.63	87.11	21.59	6.28	3.22	13.64	7.14	7.63	4.51	6.23	0.91	15.95	1613.80
Benzo(c)phenanthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Benzo(a)anthracene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.46	22.78	0.00	0.00	22.45	19.93	24.98	107.59
Chrysene	373.95	0.00	0.00	0.00	7.30	6.50	0.00	29.81	147.18	0.00	0.00	7.84	4.57	7.79	584.94
Benzo(b)fluoranthene	344.43	0.00	0.00	24.70	6.04	4.35	2.95	0.00	13.64	0.00	6.39	14.93	6.71	13.16	437.33
Benzo(k)fluoranthene	0.00	0.00	0.00	0.00	0.00	2.04	0.00	0.00	4.67	0.00	0.00	3.44	0.00	0.00	10.15
Benzo(j)fluoranthene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7,12-Dimethyl(a)anthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Benzo(a)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.86	0.00	0.00	5.53	0.00	0.00	14.40
3-Methylcholanthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Indeno(1,2,3-c,d)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.67	0.00	0.00	5.00	0.00	0.00	9.67
Dibenz(a,h)anthracene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Benzo(g,h,i)perylene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.28	0.00	0.00	11.28	5.02	14.45	37.04
Dibenzo(a,l)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dibenzo(a,i)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dibenzo(a,h)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total high MW PAHs</b>	<b>3555.80</b>	<b>221.67</b>	<b>426.87</b>	<b>207.60</b>	<b>57.85</b>	<b>27.66</b>	<b>11.50</b>	<b>79.34</b>	<b>221.47</b>	<b>13.54</b>	<b>14.77</b>	<b>83.26</b>	<b>38.11</b>	<b>90.46</b>	<b>5049.91</b>
<b>Total PAHs</b>	<b>5854.27</b>	<b>701.07</b>	<b>1059.28</b>	<b>600.70</b>	<b>153.39</b>	<b>52.48</b>	<b>24.98</b>	<b>158.52</b>	<b>233.06</b>	<b>36.99</b>	<b>31.57</b>	<b>102.74</b>	<b>63.66</b>	<b>124.35</b>	<b>9197.07</b>

**Table 29. PAH Deposition Rates (ng/m<sup>2</sup>/day) from LPI Concentrations at Burnaby Lake (May 23-30, 1995)**

Sample: Particle Cutoff Diameter (μm)	Stage 1 >35	Stage 2 21.7	Stage 3 15.7	Stage 4 10.5	Stage 5 6.6	Stage 6 3.3	Stage 7 2.0	Stage CO 1.40	Stage L2 0.90	Stage L3 0.52	Stage L4 0.23	Stage L5 0.11	Stage LF 0.08	Stage BU backup filter	Total Deposition all fractions
<b>PAHs</b>															
Acenaphthylene	1004.70	439.84	0.00	0.00	0.00	0.00	0.00	0.00	7.79	10.36	7.11	9.05	5.17	0.00	1484.01
Acenaphthene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fluorene	341.61	240.17	447.32	130.57	42.34	6.95	5.19	18.92	0.06	5.07	2.68	2.22	3.65	7.30	1254.05
Phenanthrene	2928.09	211.50	0.00	0.00	0.00	0.00	0.00	16.99	4.45	9.46	8.04	9.40	18.30	0.00	3206.22
Anthracene	0.00	0.00	0.00	174.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	174.09
<b>Total low MW PAHs</b>	<b>4274.41</b>	<b>891.51</b>	<b>447.32</b>	<b>304.67</b>	<b>42.34</b>	<b>6.95</b>	<b>5.19</b>	<b>35.91</b>	<b>12.29</b>	<b>24.89</b>	<b>17.82</b>	<b>20.67</b>	<b>27.11</b>	<b>7.30</b>	<b>6118.38</b>
Fluoranthene	3196.50	182.82	0.00	0.00	0.00	0.00	0.00	1.82	6.61	6.27	4.10	6.95	1.03	0.00	3406.11
Pyrene	2080.17	229.42	0.00	0.00	0.00	0.00	0.00	0.00	7.58	8.09	4.79	6.61	0.97	0.00	2337.63
Benz(a,c)phenanthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Benz(a)anthracene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.52	24.17	0.00	0.00	23.83	21.15	26.50	114.17
Chrysene	695.42	0.00	0.00	0.00	0.00	0.91	0.00	25.65	156.18	0.00	0.00	8.32	4.84	2.28	893.60
Benzo(b)fluoranthene	640.52	0.00	0.00	45.94	11.24	4.62	3.13	0.00	14.48	0.00	6.78	15.85	7.12	13.96	763.65
Benzo(k)fluoranthene	0.00	0.00	0.00	0.00	0.00	2.17	0.00	0.00	4.96	0.00	0.00	3.65	0.00	0.00	10.77
Benzo(j)fluoranthene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7,12-Dimethyl(a)anthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Benzo(a)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.40	0.00	0.00	5.87	0.00	0.00	15.28
3-Methylcholanthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Indeno(1,2,3-c,d)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.96	0.00	0.00	5.30	0.00	0.00	10.26
Dibenz(a,h)anthracene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Benzo(g,h,i)perylene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.67	0.00	0.00	11.97	5.33	6.50	30.47
Dibenzo(a,l)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dibenzo(a,i)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dibenzo(a,h)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total high MW PAHs</b>	<b>6612.61</b>	<b>412.24</b>	<b>0.00</b>	<b>45.94</b>	<b>11.24</b>	<b>7.69</b>	<b>3.13</b>	<b>46.00</b>	<b>235.00</b>	<b>14.36</b>	<b>15.67</b>	<b>88.35</b>	<b>40.44</b>	<b>49.25</b>	<b>7581.93</b>
<b>Total PAHs</b>	<b>10887.01</b>	<b>1303.75</b>	<b>447.32</b>	<b>350.61</b>	<b>53.58</b>	<b>14.65</b>	<b>8.32</b>	<b>81.91</b>	<b>247.30</b>	<b>39.25</b>	<b>33.50</b>	<b>109.02</b>	<b>67.55</b>	<b>56.54</b>	<b>13700.32</b>

**Table 30. PAH Deposition Rates (ng/m<sup>2</sup>/day) from LPI Concentrations at Burnaby Lake (June 20-27, 1995)**

Sample: Particle Cutoff Diameter (μm)	Stage 1 >35	Stage 2 21.7	Stage 3 15.7	Stage 4 10.5	Stage 5 6.6	Stage 6 3.3	Stage 7 2.0	Stage CO 1.40	Stage L2 0.90	Stage L3 0.52	Stage L4 0.23	Stage L5 0.11	Stage LF 0.08	Stage BU backup filter	Total Deposition all fractions
<b>PAHs</b>															
Acenaphthylene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Acenaphthene	0.00	0.00	0.00	0.00	0.00	3.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.46	
Fluorene	208.01	0.00	31.56	32.14	0.00	0.00	0.00	0.00	5.53	0.00	0.00	0.00	0.00	277.25	
Phenanthrene	208.01	53.87	0.00	99.22	0.00	0.00	0.00	0.00	9.80	0.12	0.29	2.59	1.04	3.92	
Anthracene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
<b>Total low MW PAHs</b>	<b>416.03</b>	<b>53.87</b>	<b>31.56</b>	<b>131.37</b>	<b>0.00</b>	<b>3.46</b>	<b>0.00</b>	<b>0.00</b>	<b>15.33</b>	<b>0.12</b>	<b>0.29</b>	<b>2.59</b>	<b>1.04</b>	<b>3.92</b>	
Fluoranthene	384.30	147.10	100.74	50.31	0.00	3.23	3.00	3.00	4.03	3.11	3.23	5.01	3.63	6.68	
Pyrene	416.03	153.31	42.48	34.47	1.77	0.98	1.44	2.13	3.46	3.17	3.80	4.55	3.69	7.61	
Benz(a)c phenanthrene	239.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	239.75	
Benz(a)anthracene	483.02	192.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	675.70	
Chrysene	571.16	196.82	0.00	22.36	0.00	0.00	0.00	2.36	0.00	0.00	0.00	0.00	0.00	792.70	
Benz(b)fluoranthene	652.25	232.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.42	8.59	13.14	
Benz(k)fluoranthene	736.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	736.87	
Benz(j)fluoranthene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,12-Dimethyl(a)anthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Benz(a)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3-Methylcholanthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Indeno(1,2,3-c,d)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Dibenz(a,h)anthracene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Benz(g,h,i)perylene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.60	10.60	
Dibenzo(a,l)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Dibenzo(a,i)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Dibenzo(a,h)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
<b>Total high MW PAHs</b>	<b>3483.37</b>	<b>921.96</b>	<b>143.23</b>	<b>107.14</b>	<b>1.77</b>	<b>4.21</b>	<b>4.44</b>	<b>7.49</b>	<b>7.49</b>	<b>6.28</b>	<b>7.03</b>	<b>14.98</b>	<b>15.90</b>	<b>38.03</b>	
<b>Total PAHs</b>	<b>3899.40</b>	<b>975.82</b>	<b>174.78</b>	<b>238.51</b>	<b>1.77</b>	<b>7.66</b>	<b>4.44</b>	<b>7.49</b>	<b>22.82</b>	<b>6.40</b>	<b>7.32</b>	<b>17.57</b>	<b>16.94</b>	<b>41.95</b>	
														<b>4763.31</b>	
														<b>5422.87</b>	

**Table 31. PAH Deposition Rates (ng/m<sup>2</sup>/day) from LPI Concentrations at Burnaby Lake (July 18-25, 1995)**

Sample: Particle Cutoff Diameter (μm)	Stage 1 >35	Stage 2 21.7	Stage 3 15.7	Stage 4 10.5	Stage 5 6.6	Stage 6 3.3	Stage 7 2.0	Stage CO 1.40	Stage L2 0.90	Stage L3 0.52	Stage L4 0.23	Stage L5 0.11	Stage LF 0.08	Stage BU backup filter	Total Deposition all fractions
<b>PAHs</b>															
Acenaphthylene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Acenaphthene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Fluorene	282.95	374.77	35.56	0.00	0.00	0.00	0.00	0.00	0.00	2.95	4.72	4.16	28.65	733.77	
Phenanthrene	1158.76	1536.05	1.55	0.00	0.00	0.30	0.00	0.22	0.00	0.00	4.13	0.59	16.30	87.55	2805.44
Anthracene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
<b>Total low MW PAHs</b>	<b>1441.72</b>	<b>1910.82</b>	<b>37.11</b>	<b>0.00</b>	<b>0.30</b>	<b>0.00</b>	<b>0.22</b>	<b>0.00</b>	<b>0.00</b>	<b>7.08</b>	<b>5.31</b>	<b>20.46</b>	<b>116.20</b>	<b>3539.21</b>	
Fluoranthene	678.19	641.34	34.02	4.15	0.00	2.88	0.00	49.79	3.76	2.07	6.27	3.17	10.33	116.83	1552.79
Pyrene	449.13	517.29	75.77	16.02	1.93	3.17	0.66	1.25	2.66	1.11	7.30	2.07	12.02	66.75	1157.14
Benzo(c)phenanthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Benz(a)anthracene	0.00	0.00	89.68	0.00	0.00	0.00	0.00	0.00	3.32	0.00	5.90	2.51	0.00	16.01	117.41
Chrysene	282.95	0.00	57.21	0.00	0.00	0.00	2.14	0.00	2.14	0.00	5.68	2.21	5.30	29.27	386.90
Benzo(b)fluoranthene	0.00	0.00	38.66	0.00	0.00	0.00	0.00	0.00	1.62	3.61	8.11	3.10	9.88	31.64	96.63
Benzo(k)fluoranthene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.46	2.46	4.93
Benzo(j)fluoranthene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,12-Dimethyl(a)anthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Benzo(a)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.20	0.00	0.00	4.20	8.41
3-Methylcholanthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Indeno(1,2,3-c,d)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.06	4.06	8.13
Dibenz(a,h)anthracene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Benzo(g,h,i)perylene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.48	0.00	9.88	18.37	36.73
Dibenzo(a,l)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Dibenzo(a,i)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Dibenzo(a,h)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
<b>Total high MW PAHs</b>	<b>1410.28</b>	<b>1158.63</b>	<b>295.33</b>	<b>20.18</b>	<b>1.93</b>	<b>6.05</b>	<b>2.80</b>	<b>51.04</b>	<b>13.50</b>	<b>6.79</b>	<b>45.95</b>	<b>13.05</b>	<b>53.94</b>	<b>289.59</b>	<b>3369.06</b>
<b>Total PAHs</b>	<b>2851.99</b>	<b>3069.46</b>	<b>332.44</b>	<b>20.18</b>	<b>1.93</b>	<b>6.34</b>	<b>2.80</b>	<b>51.26</b>	<b>13.50</b>	<b>6.79</b>	<b>53.03</b>	<b>18.37</b>	<b>74.40</b>	<b>405.79</b>	<b>6908.27</b>

**Table 32. PAH Deposition Rates (ng/m<sup>2</sup>/day) from LPI Concentrations at Burnaby Lake (August 1-8, 1995)**

Sample: Particle Cutoff Diameter (µm)	Stage 1 >35	Stage 2 21.7	Stage 3 15.7	Stage 4 10.5	Stage 5 6.6	Stage 6 3.3	Stage 7 2.0	Stage CO 1.40	Stage L2 0.90	Stage L3 0.52	Stage L4 0.23	Stage L5 0.11	Stage LF 0.08	Stage BU backup filter	Total Deposition all fractions
<b>PAHs</b>															
Acenaphthylene	0.00	0.00	0.00	18.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.62	
Acenaphthene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Fluorene	125.30	0.00	0.00	23.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.27	160.36	
Phenanthren	1292.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.42	40.27	0.00	77.60	1414.40	
Anthracene	148.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	148.79	
<b>Total low MW PAHs</b>	<b>1566.21</b>	<b>0.00</b>	<b>0.00</b>	<b>42.42</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>4.42</b>	<b>40.27</b>	<b>0.00</b>	<b>88.86</b>	<b>1742.18</b>
Fluoranthene	289.75	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.64	2.24	14.47	0.45	9.35	317.21	
Pyrene	180.11	0.00	0.00	30.52	0.00	0.00	0.00	1.22	0.51	0.70	2.95	9.92	0.70	24.52	251.16
Benzo(c)phenanthrene	0.00	0.00	0.00	10.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.86
Benz(a)anthracene	0.00	0.00	0.00	154.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	154.17
Chrysene	23.49	0.00	0.00	201.76	0.00	0.00	3.59	1.47	3.97	0.00	0.38	0.77	0.26	0.00	235.69
Benzo(b)fluoranthene	0.00	0.00	0.00	201.76	0.00	0.00	2.18	1.60	5.70	1.54	2.56	5.63	3.39	0.00	224.36
Benzo(k)fluoranthene	0.00	0.00	0.00	72.43	0.00	0.00	0.00	1.92	0.00	0.00	0.00	0.00	1.28	0.00	75.63
Benzo(j)fluoranthene	0.00	0.00	0.00	43.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	43.97
7,12-Dimethyl(a)anthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Benzo(a)pyrene	0.00	0.00	0.00	75.01	0.00	0.00	1.15	0.00	3.97	0.00	0.00	3.71	1.54	0.00	85.39
3-Methylcholanthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Indeno(1,2,3-c,d)pyrene	0.00	0.00	0.00	59.49	0.00	0.00	2.56	1.09	4.03	0.00	0.00	5.12	2.43	0.00	74.73
Dibenz(a,h)anthracene	0.00	0.00	0.00	0.00	0.00	0.00	1.34	0.00	3.01	0.00	0.00	2.11	0.00	0.00	6.47
Benzo(g,h,i)perylene	0.00	0.00	0.00	47.08	0.00	0.00	2.30	1.28	3.91	0.00	3.20	5.76	5.38	11.33	80.24
Dibenzo(a,l)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dibenzo(a,i)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dibenzo(a,h)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total high MW PAHs</b>	<b>493.35</b>	<b>0.00</b>	<b>0.00</b>	<b>897.07</b>	<b>0.00</b>	<b>0.00</b>	<b>13.12</b>	<b>8.58</b>	<b>25.42</b>	<b>2.88</b>	<b>11.33</b>	<b>47.50</b>	<b>15.43</b>	<b>45.20</b>	<b>1559.89</b>
<b>Total PAHs</b>	<b>2059.56</b>	<b>0.00</b>	<b>0.00</b>	<b>939.49</b>	<b>0.00</b>	<b>0.00</b>	<b>13.12</b>	<b>8.58</b>	<b>25.42</b>	<b>2.88</b>	<b>15.75</b>	<b>87.77</b>	<b>15.43</b>	<b>134.06</b>	<b>3302.07</b>

**Table 33. PAH Deposition Rates (ng/m<sup>2</sup>/day) from LPI Concentrations at Burnaby Lake (August 8-15, 1995)**

Sample: Particle Cutoff Diameter (μm)	Stage 1 >35	Stage 2 21.7	Stage 3 15.7	Stage 4 10.5	Stage 5 6.6	Stage 6 3.3	Stage 7 2.0	Stage CO 1.40	Stage L2 0.90	Stage L3 0.52	Stage L4 0.23	Stage L5 0.11	Stage LF 0.08	Stage BU backup filter	Total Deposition all fractions
<b>PAHs</b>															
Acenaphthylene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Acenaphthene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Fluorene	201.22	0.00	98.75	21.50	4.69	0.00	4.48	0.00	3.22	1.96	0.00	9.52	0.00	0.00	
Phenanthrene	102.75	382.41	305.10	69.01	8.62	0.84	37.67	0.49	17.15	4.83	2.52	57.97	0.70	0.98	
Anthracene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
<b>Total low MW PAHs</b>	<b>303.97</b>	<b>382.41</b>	<b>403.86</b>	<b>90.51</b>	<b>13.31</b>	<b>0.84</b>	<b>42.15</b>	<b>0.49</b>	<b>20.37</b>	<b>6.79</b>	<b>2.52</b>	<b>67.49</b>	<b>0.70</b>	<b>0.98</b>	<b>1336.39</b>
Fluoranthene	137.00	261.65	98.75	20.36	6.37	1.12	13.37	1.19	5.32	2.38	2.94	18.34	1.19	2.59	572.59
Pyrene	184.10	226.43	94.33	20.36	5.81	2.17	10.22	2.45	4.20	2.31	3.01	15.47	0.56	3.01	574.44
Benzo(c)phenanthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Benz(a)anthracene	0.00	0.00	0.00	0.00	4.12	3.29	0.00	4.06	2.66	0.00	3.50	0.00	0.00	0.00	17.64
Chrysene	0.00	0.00	0.00	0.00	3.19	1.40	0.00	3.15	0.00	0.00	1.47	0.00	0.00	0.00	9.21
Benzo(b)fluoranthene	0.00	0.00	0.00	0.00	2.44	0.00	0.00	2.31	0.00	0.00	1.68	0.00	0.00	0.00	6.43
Benzo(k)fluoranthene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.10	0.00	0.00	0.00	0.00	0.00	0.00	2.10
Benzo(j)fluoranthene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7,12-Dimethyl(a)anthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Benzo(a)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.76	4.76
3-Methylcholanthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Indeno(1,2,3-c,d)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.61	0.00	0.00	0.00	0.00	0.00	0.00	1.61
Dibenz(a,h)anthracene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Benzo(g,h,i)perylene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.82	0.00	0.00	0.00	0.00	0.00	0.00	1.82
Dibenzo(a,l)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dibenzo(a,i)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dibenzo(a,h)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total high MW PAHs</b>	<b>321.10</b>	<b>488.08</b>	<b>193.08</b>	<b>40.73</b>	<b>21.93</b>	<b>7.98</b>	<b>23.59</b>	<b>18.69</b>	<b>12.18</b>	<b>4.69</b>	<b>12.60</b>	<b>33.82</b>	<b>1.75</b>	<b>10.36</b>	<b>1190.59</b>
<b>Total PAHs</b>	<b>625.07</b>	<b>870.49</b>	<b>596.94</b>	<b>131.24</b>	<b>35.23</b>	<b>8.82</b>	<b>65.74</b>	<b>19.18</b>	<b>32.56</b>	<b>11.48</b>	<b>15.12</b>	<b>101.31</b>	<b>2.45</b>	<b>11.34</b>	<b>2526.98</b>

**Table 34. Mean Size Fractionated Deposition Rates (ng/m<sup>2</sup>/day) for PAHs measured by LPI at Burnaby Lake (February - August 1995) (n=11)**

Sample: Particle Cutoff Diameter (μm)	Stage 1 >35	Stage 2 21.7	Stage 3 15.7	Stage 4 10.5	Stage 5 6.6	Stage 6 3.3	Stage 7 2.0	Stage CO 1.40	Stage L2 0.90	Stage L3 0.52	Stage L4 0.23	Stage L5 0.11	Stage LF 0.08	Stage BU backup filter
<b>PAHs</b>														
Acenaphthylene	140.45	61.49	16.53	10.44	8.54	6.60	2.04	1.11	2.30	1.83	1.26	1.60	0.91	0.00
Acenaphthene	0.00	23.73	0.00	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.92
Fluorene	174.45	106.55	89.72	31.53	7.51	3.88	2.31	4.04	1.18	14.22	0.91	2.27	1.20	6.24
Phenanthrene	825.67	264.29	61.11	41.21	5.27	8.19	5.40	7.97	4.69	4.88	4.46	14.02	6.05	22.92
Anthracene	19.65	8.58	13.06	28.83	0.00	5.48	1.14	1.27	1.40	0.00	0.81	0.67	0.08	2.10
<b>Total low MW PAHs</b>	<b>1160.23</b>	<b>464.63</b>	<b>180.43</b>	<b>112.01</b>	<b>21.32</b>	<b>24.47</b>	<b>10.90</b>	<b>14.39</b>	<b>9.57</b>	<b>20.93</b>	<b>7.43</b>	<b>18.55</b>	<b>8.82</b>	<b>32.17</b>
Fluoranthene	780.03	182.72	75.96	30.96	4.54	9.09	4.14	10.41	10.90	4.78	3.59	8.52	2.57	23.31
Pyrene	608.82	192.88	68.02	30.86	4.57	8.70	4.07	5.36	11.98	4.52	4.44	8.33	3.15	20.74
Benz(c)phenanthrene	21.80	0.00	0.00	0.99	0.68	1.09	0.00	0.39	1.23	0.00	0.00	0.23	0.00	2.19
Benz(a)anthracene	82.96	17.52	54.25	31.71	11.20	10.85	5.72	10.19	9.47	1.46	0.85	11.90	4.37	18.54
Chrysene	370.83	85.79	34.23	33.39	7.90	12.39	1.71	9.00	33.09	3.53	2.45	8.96	3.81	16.42
Benzo(b)fluoranthene	384.54	90.57	24.05	36.72	13.56	10.41	2.11	3.58	7.09	5.46	13.64	22.77	8.84	20.91
Benzo(k)fluoranthene	91.08	32.50	4.87	8.34	4.59	4.02	0.38	1.61	1.98	1.46	1.20	6.67	2.23	4.39
Benzo(j)fluoranthene	0.00	0.00	0.00	4.00	1.99	1.78	0.00	0.00	0.00	0.00	0.00	1.46	0.00	0.00
7,12-Dimethyl(a)anthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Benzo(a)pyrene	0.00	0.00	0.00	6.82	3.95	3.36	0.10	0.72	2.62	0.00	0.38	10.29	2.06	6.59
3-Methylcholanthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Indeno(1,2,3-c,d)pyrene	278.71	26.20	20.64	11.22	7.26	4.46	0.60	1.83	2.54	2.48	6.10	13.71	4.01	8.67
Dibenz(a,h)anthracene	0.00	0.00	0.00	0.00	1.24	0.19	0.12	0.00	0.27	0.00	0.00	1.11	0.00	0.76
Benzo(g,h,i)perylene	196.48	48.72	18.68	13.50	7.18	3.29	0.21	2.61	2.45	2.45	7.86	19.70	7.70	21.98
Dibenzo(a,l)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dibenzo(a,i)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dibenzo(a,h)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total high MW PAHs</b>	<b>2815.25</b>	<b>676.89</b>	<b>300.70</b>	<b>208.51</b>	<b>68.66</b>	<b>69.62</b>	<b>19.16</b>	<b>45.68</b>	<b>83.61</b>	<b>26.14</b>	<b>40.52</b>	<b>113.64</b>	<b>38.75</b>	<b>144.50</b>
<b>Total PAHs</b>	<b>3975.48</b>	<b>1141.53</b>	<b>481.12</b>	<b>320.52</b>	<b>89.98</b>	<b>94.09</b>	<b>30.06</b>	<b>60.07</b>	<b>93.18</b>	<b>47.07</b>	<b>47.95</b>	<b>132.19</b>	<b>47.56</b>	<b>176.68</b>

**Table 35. PAH Deposition Rates (ng/m<sup>2</sup>/day) for the Sum of all LPI Particulate Fractions - Burnaby Lake (February-August 1995)**

PAHs	95/02/07	95/03/07	95/03/21	95/04/04	95/04/18	95/05/02	95/05/23	95/06/20	95/07/18	95/08/01	95/08/08
Acenaphthylene	0.00	0.00	813.75	10.19	69.61	1154.02	1484.01	0.00	0.00	18.62	0.00
Acenaphthene	6.43	0.00	715.11	261.01	5.04	0.00	0.00	3.46	0.00	0.00	0.00
Fluorene	792.56	218.33	384.99	282.30	116.92	608.17	1254.05	277.25	733.77	160.36	345.34
Phenanthrene	506.50	1407.87	709.51	208.96	413.43	2291.36	3206.22	378.85	2805.44	1414.40	991.05
Anthracene	233.40	79.28	0.00	124.12	30.21	93.62	174.09	0.00	0.00	148.79	0.00
<b>Total low MW PAHs</b>	<b>1538.89</b>	<b>1705.48</b>	<b>2623.36</b>	<b>886.58</b>	<b>635.22</b>	<b>4147.16</b>	<b>6118.38</b>	<b>659.56</b>	<b>3539.21</b>	<b>1742.18</b>	<b>1336.39</b>
Fluoranthene	1130.25	1453.14	682.45	512.65	384.80	2235.00	3406.11	717.37	1552.79	317.21	572.59
Pyrene	1179.25	1648.68	838.86	372.85	463.48	1613.80	2337.63	678.90	1157.14	251.16	574.44
Benzo(c)phenanthrene	10.04	5.09	0.00	19.99	14.35	0.00	0.00	239.75	0.00	10.86	0.00
Benz(a)anthracene	1372.69	9.33	30.24	88.14	162.04	107.59	114.17	675.70	117.41	154.17	17.64
Chrysene	1285.79	816.46	479.82	808.94	522.07	584.94	893.60	792.70	386.90	235.69	9.21
Benzo(b)fluoranthene	2521.88	698.78	617.55	547.53	439.48	437.33	763.65	911.43	96.63	224.36	6.43
Benzo(k)fluoranthene	275.54	79.41	11.69	202.32	210.46	10.15	10.77	736.87	4.93	75.63	2.10
Benzo(j)fluoranthene	16.07	0.00	0.00	0.00	20.72	0.00	0.00	0.00	0.00	43.97	0.00
7,12-Dimethyl(a)anthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Benzo(a)pyrene	114.50	19.59	37.81	14.43	64.50	14.40	15.28	0.00	8.41	85.39	4.76
3-Methylcholanthrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Indeno(1,2,3-c,d)pyrene	3276.35	431.30	13.06	302.27	79.12	9.67	10.26	0.00	8.13	74.73	1.61
Dibenz(a,h)anthracene	18.38	7.94	0.00	0.00	3.88	0.00	0.00	0.00	0.00	6.47	0.00
Benzo(g,h,i)perylene	2812.67	504.64	60.49	184.65	90.99	37.04	30.47	10.60	36.73	80.24	1.82
Dibenzo(a,l)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dibenzo(a,i)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dibenzo(a,h)pyrene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total high MW PAHs</b>	<b>14013.41</b>	<b>5674.35</b>	<b>2771.97</b>	<b>3053.78</b>	<b>2455.89</b>	<b>5049.91</b>	<b>7581.93</b>	<b>4763.31</b>	<b>3369.06</b>	<b>1559.89</b>	<b>1190.59</b>
<b>Total PAHs</b>	<b>15552.30</b>	<b>7379.84</b>	<b>5395.33</b>	<b>3940.36</b>	<b>3091.11</b>	<b>9197.07</b>	<b>13700.32</b>	<b>5422.87</b>	<b>6908.27</b>	<b>3302.07</b>	<b>2526.98</b>
<b>TEQs</b>	<b>1207.00</b>	<b>193.34</b>	<b>106.37</b>	<b>158.69</b>	<b>165.79</b>	<b>71.84</b>	<b>106.19</b>	<b>232.40</b>	<b>31.93</b>	<b>152.86</b>	<b>7.70</b>

**Table 36. Statistical Summary of PAH Deposition Rates (ng/m<sup>2</sup>/day) for the Sum of all LPI Particulate Size Fractions (n=11)**

Parameter	mean	minimum	maximum	standard error
Acenaphthylene	320	0.00	1500	170
Acenaphthene	90	0.00	720	67
Fluorene	470	120	1300	100
Phenanthrene	1300	210	3200	310
Anthracene	80	0.00	230	25
<b>Total low MW PAHs</b>	<b>2300</b>	<b>640</b>	<b>6100</b>	<b>520</b>
Fluoranthene	1200	320	3400	290
Pyrene	1000	250	2300	200
Benzo(c)phenanthrene	27	0.00	240	21
Benz(a)anthracene	260	9.3	1400	120
Chrysene	620	9.2	1300	110
Benzo(b)fluoranthene	660	6.4	2500	200
Benzo(k)fluoranthene	150	2.1	700	66
Benzo(j)fluoranthene	7.3	0.00	44	4.3
7,12-Dimethyl(a)anthrene	0.00	0.00	0.00	0.00
Benzo(a)pyrene	34	0.00	110	11
3-Methylcholanthrene	0.00	0.00	0.00	0.00
Indeno(1,2,3-c,d)pyrene	380	0.00	3300	290
Dibenz(a,h)anthracene	3.3	0.00	18	1.7
Benzo(g,h,i)perylene	350	1.8	2800	250
Dibenzo(a,l)pyrene	0.00	0.00	0.00	0.00
Dibenzo(a,i)pyrene	0.00	0.00	0.00	0.00
Dibenzo(a,h)pyrene	0.00	0.00	0.00	0.00
<b>Total high MW PAHs</b>	<b>4700</b>	<b>1200</b>	<b>14000</b>	<b>1100</b>
<b>Total PAHs</b>	<b>6900</b>	<b>2500</b>	<b>16000</b>	<b>1300</b>
<b>TEQs</b>	<b>220</b>	<b>7.7</b>	<b>1200</b>	<b>100</b>

**Table 37. Mean Yearly PAH Deposition Rates Calculated from LPI concentrations from Burnaby Lake (February to August 1995) (n=11).**

Parameter	Mean deposition rate/day (ng/m <sup>2</sup> /day)	Estimated deposition rate/yr (ug/m <sup>2</sup> /yr)	Estimated deposition rate to total watershed (g/yr)	Estimated deposition rate to total watershed (kg/yr)
Acenaphthylene	320	120	7100	7.1
Acenaphthene	90	33	2000	2.0
Fluorene	470	170	10000	10
Phenanthrene	1300	480	29000	29
Anthracene	80	29	1800	1.8
<b>Total low MW PAHs</b>	<b>2300</b>	<b>830</b>	<b>50000</b>	<b>50</b>
Fluoranthene	1200	430	26000	26
Pyrene	1000	370	22000	22
Benzo(c)phenanthrene	27	10	600	0.60
Benz(a)anthracene	260	95	5800	5.7
Chrysene	620	230	14000	14
Benzo(b)fluoranthene	660	240	15000	15
Benzo(k)fluoranthene	150	54	3300	3.3
Benzo(j)fluoranthene	7.3	2.7	160	0.16
7,12-Dimethyl(a)anthrene	0.00	0.00	0	0.00
Benzo(a)pyrene	34	13	760	0.76
3-Methylcholanthrene	0.00	0.00	0	0.00
Indeno(1,2,3-c,d)pyrene	380	140	8500	8.5
Dibenz(a,h)anthracene	3.3	1.2	74	0.07
Benzo(g,h,i)perylene	350	130	7700	7.7
Dibenzo(a,l)pyrene	0.00	0.00	0	0.00
Dibenzo(a,i)pyrene	0.00	0.00	0	0.00
Dibenzo(a,h)pyrene	0.00	0.00	0	0.00
<b>Total high MW PAHs</b>	<b>4700</b>	<b>1700</b>	<b>100000</b>	<b>100</b>
<b>Total PAHs</b>	<b>6900</b>	<b>2500</b>	<b>150000</b>	<b>150</b>
<b>TEQs</b>	<b>220</b>	<b>81</b>	<b>4900</b>	<b>5.0</b>

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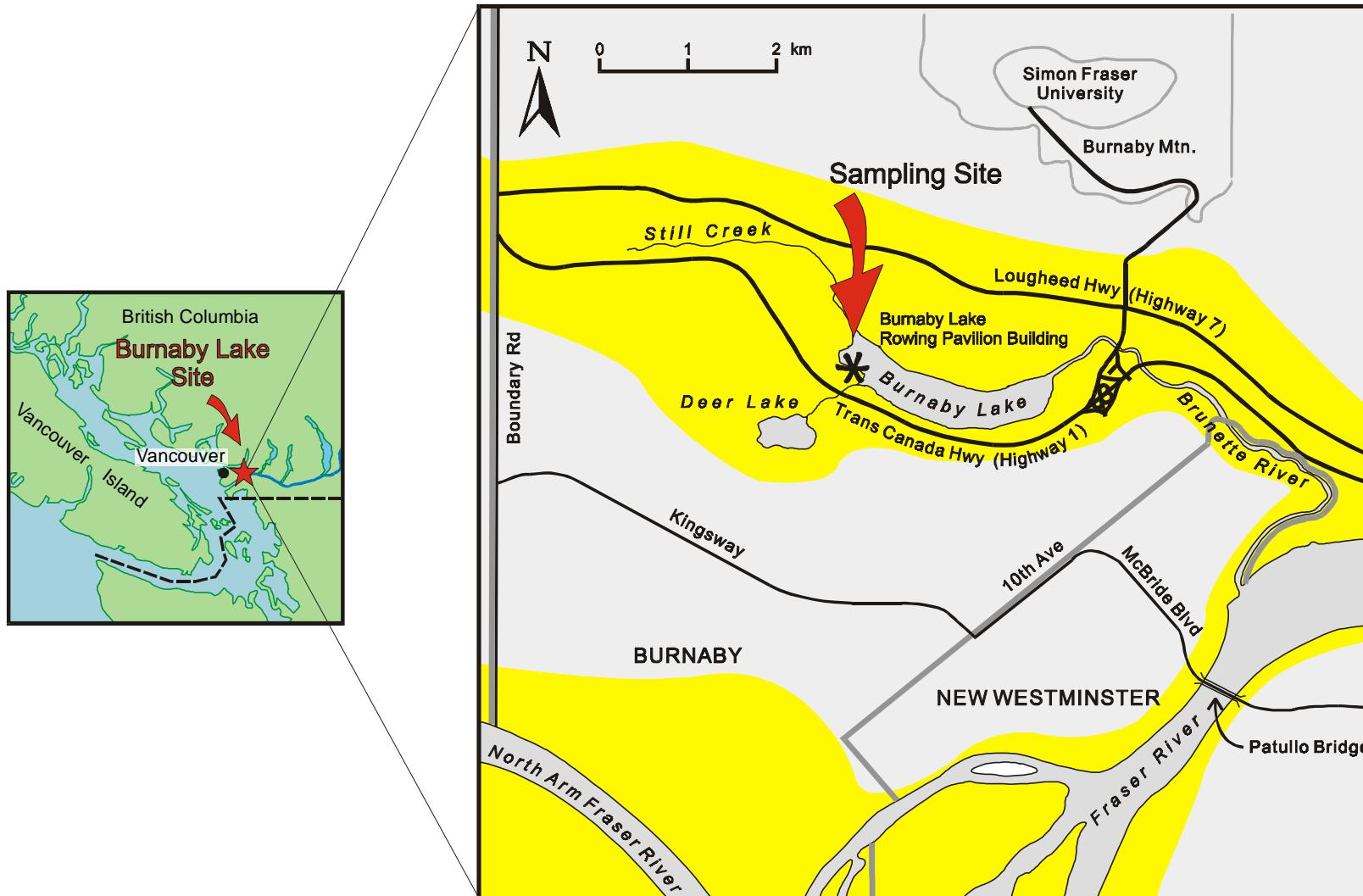


Figure 1. Map of Burnaby Lake and surrounding area.

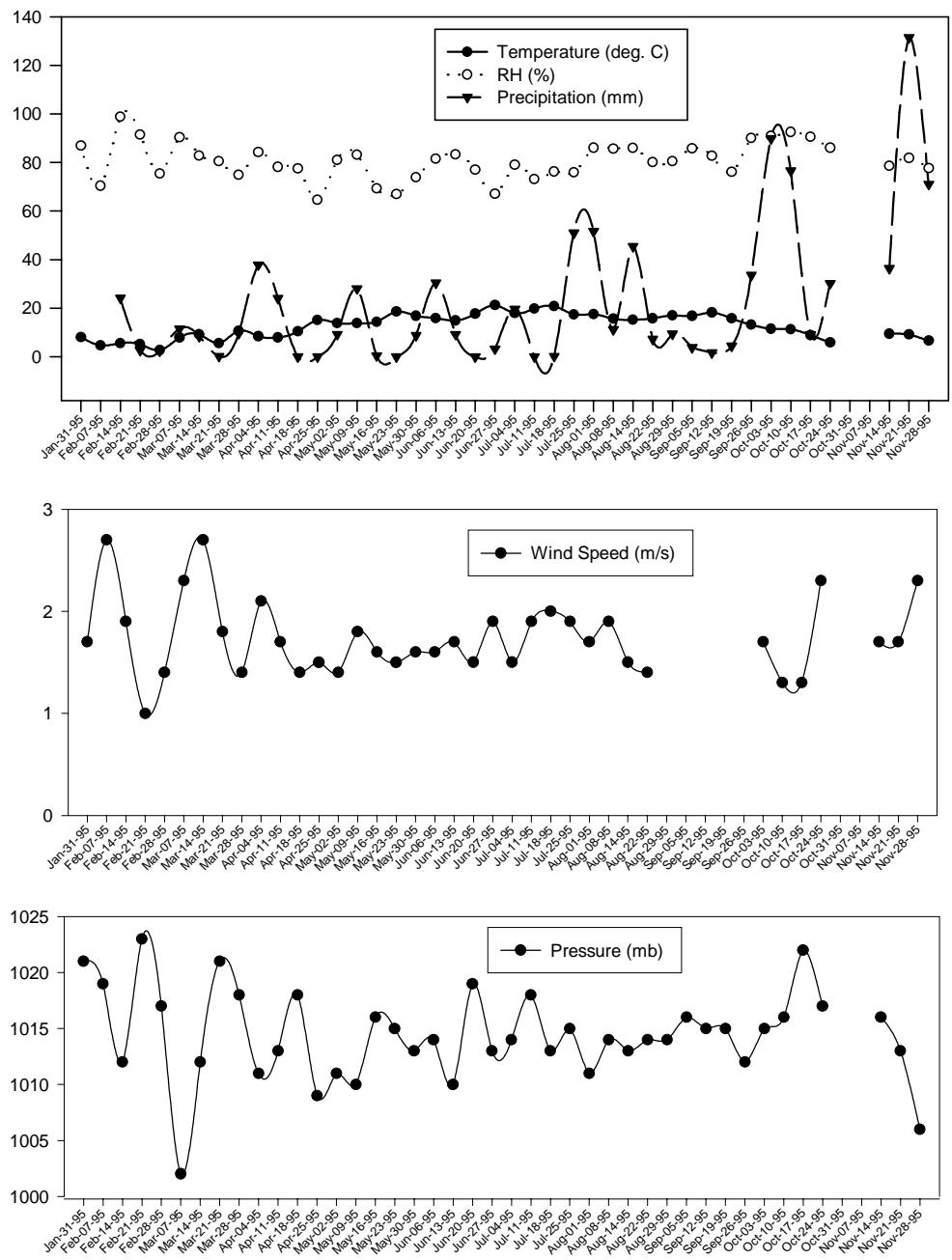


Figure 2. Temperature, relative humidity (RH), precipitation, wind speed and pressure measured during the sampling period at Burnaby Lake in 1995.

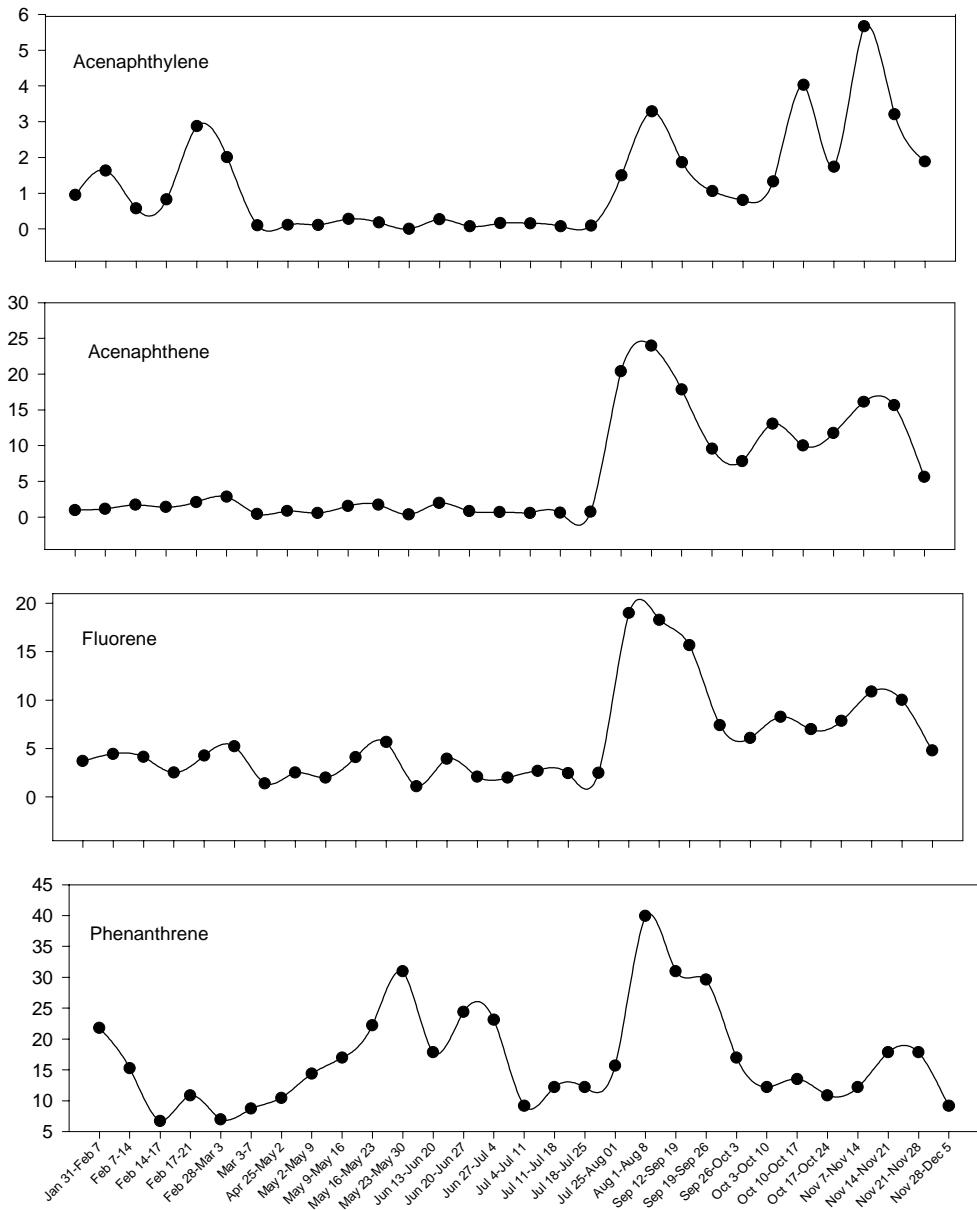


Figure 3. PAH concentrations ( $\text{ng}/\text{m}^3$ ) measured in HV/PUF samples from Burnaby Lake in 1995.

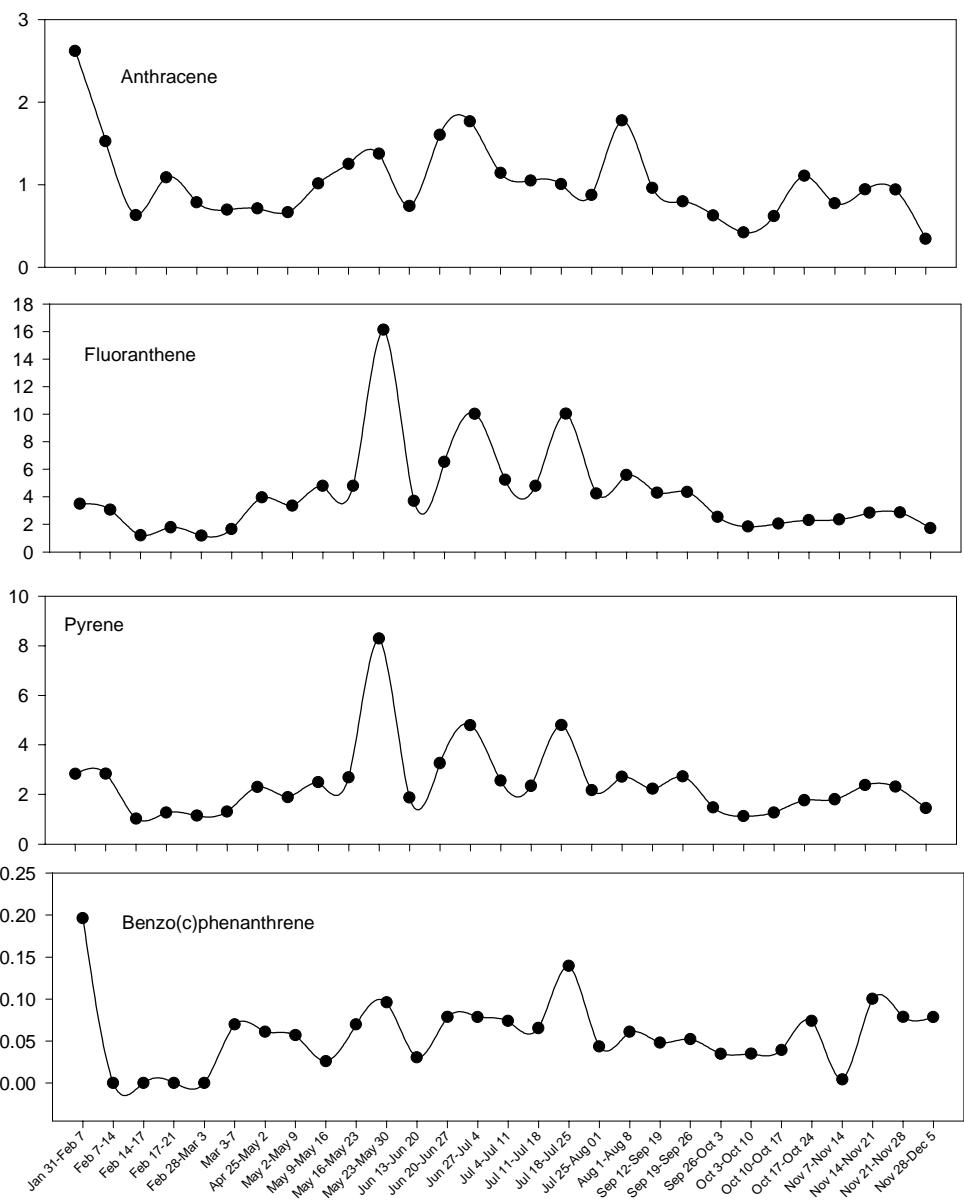


Figure 3 (continued). PAH concentrations ( $\text{ng}/\text{m}^3$ ) measured in HV/PUF samples from Burnaby Lake 1995.

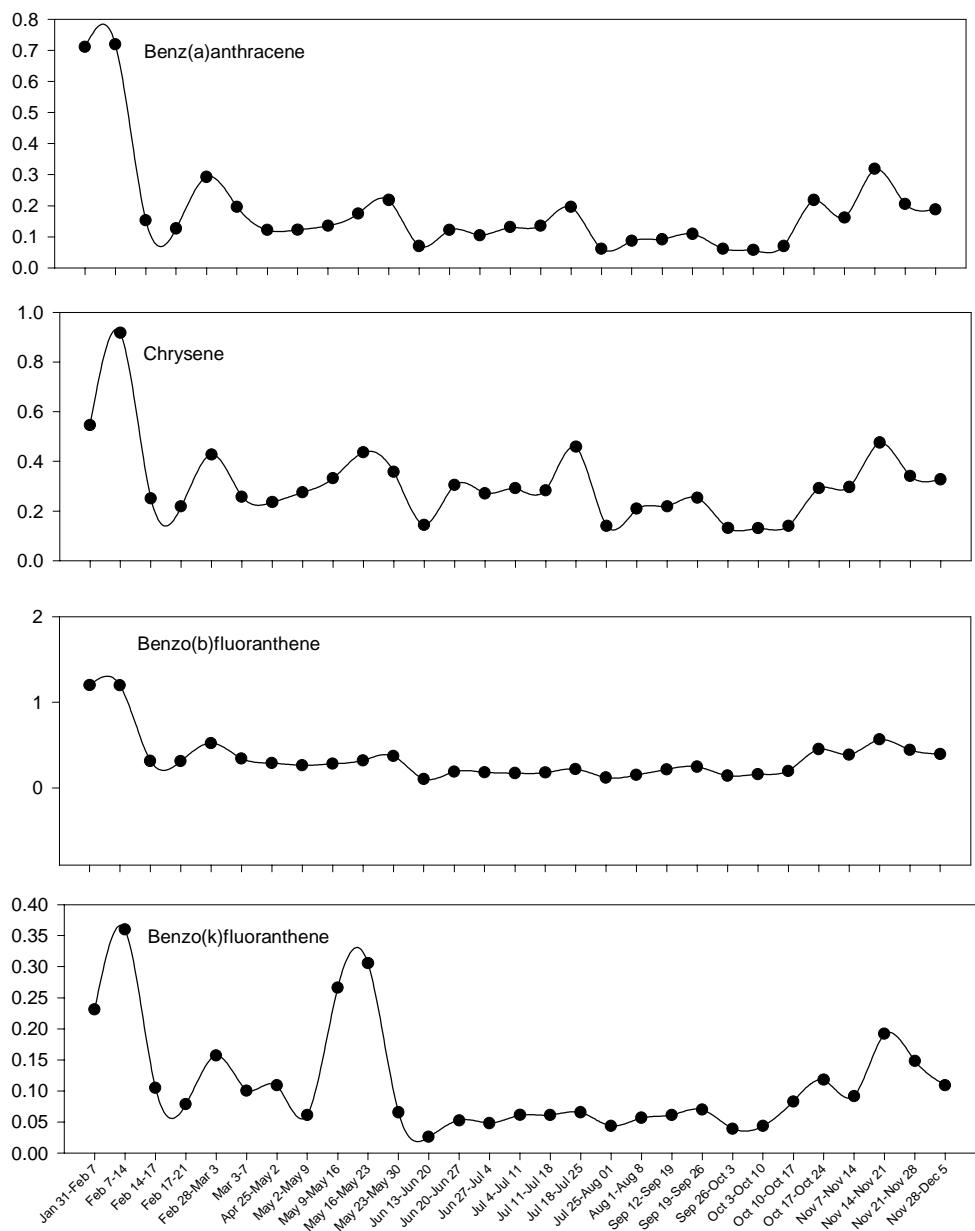


Figure 3 (continued). PAH concentrations ( $\text{ng}/\text{m}^3$ ) measured in HV/PUF samples from Burnaby Lake 1995.

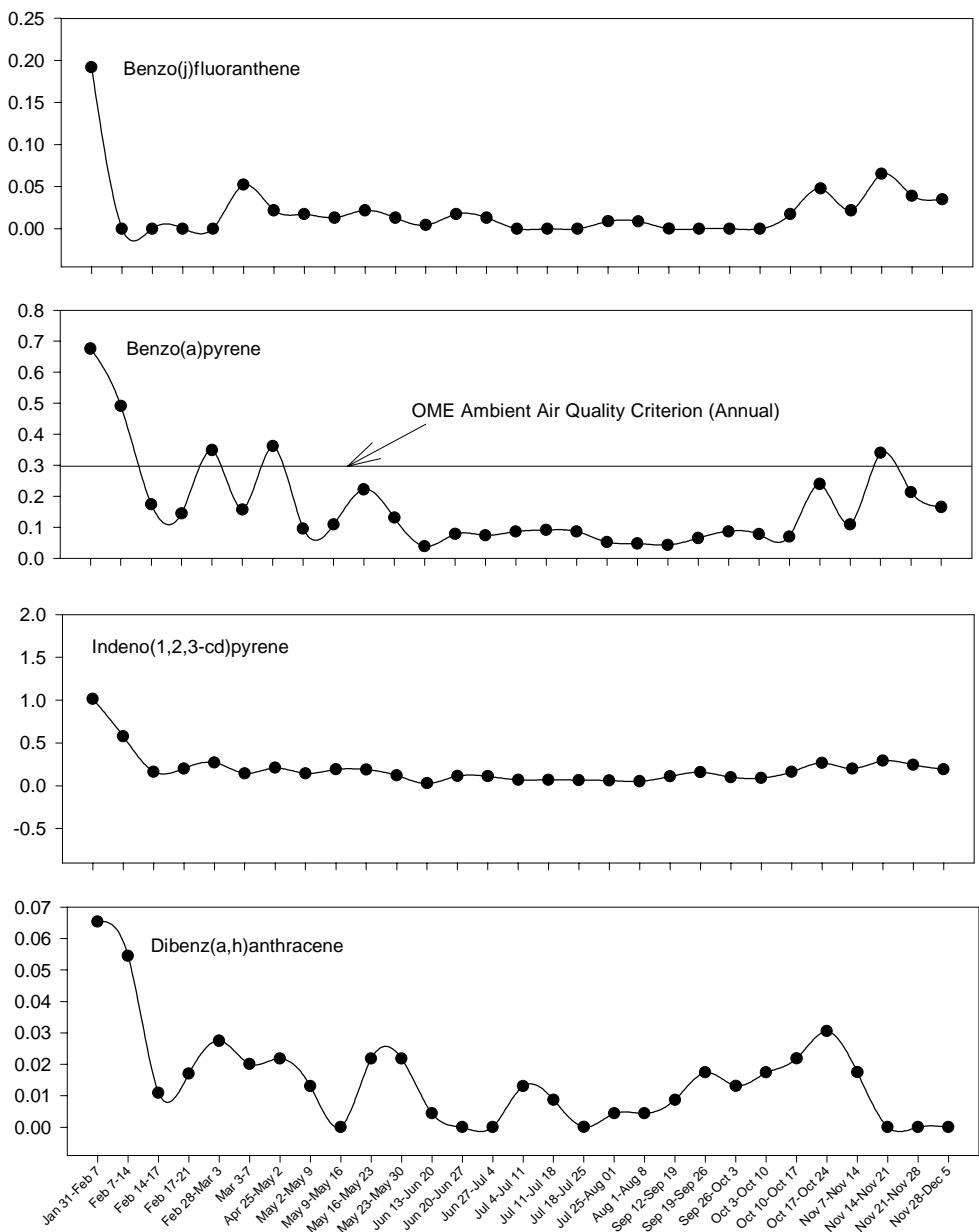


Figure 3 (continued). PAH concentrations ( $\text{ng}/\text{m}^3$ ) measured in HV/PUF samples from Burnaby Lake 1995.

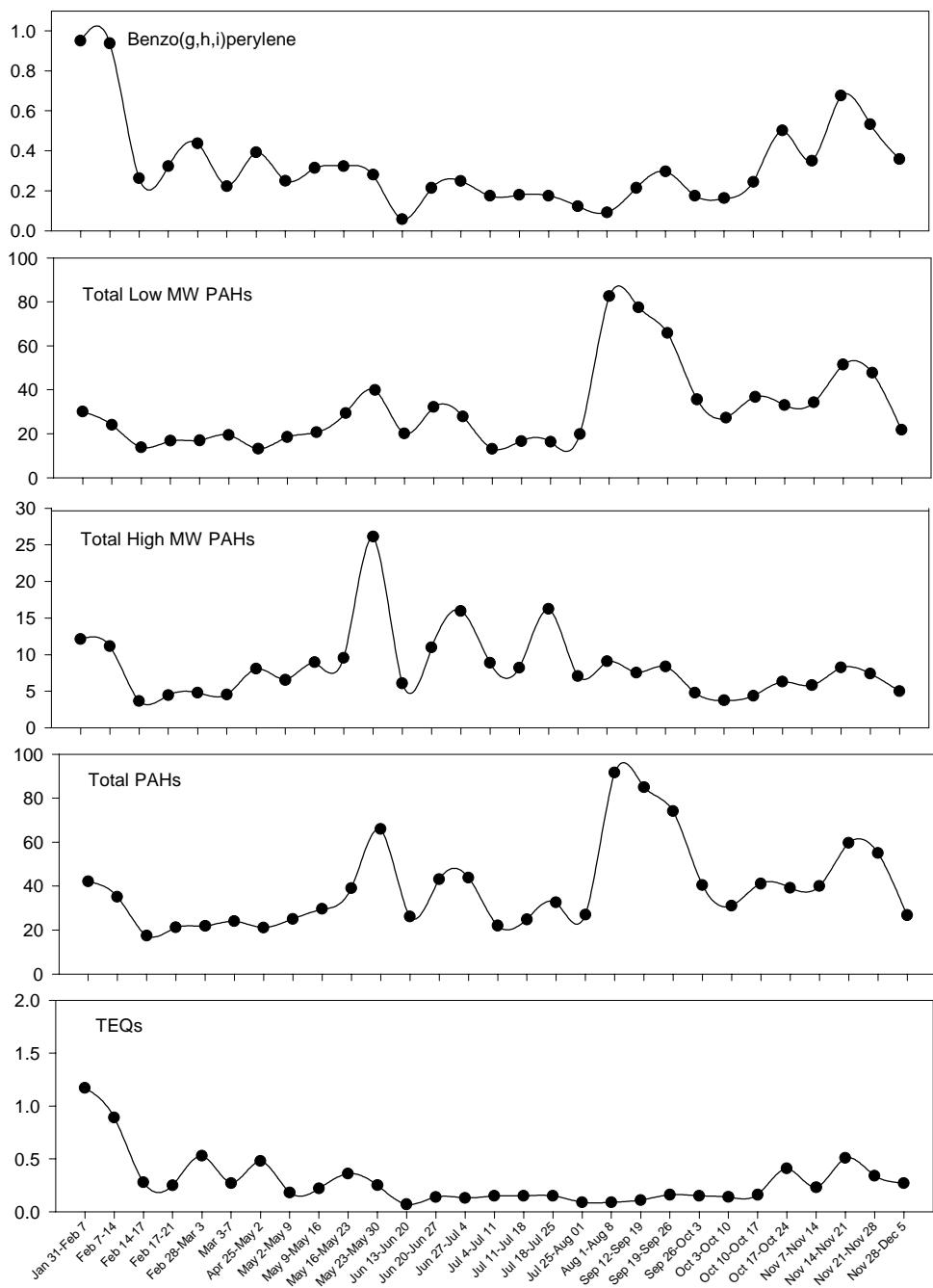


Figure 3 (continued). PAH concentrations ( $\text{ng}/\text{m}^3$ ) measured in HV/PUF samples from Burnaby Lake 1995.

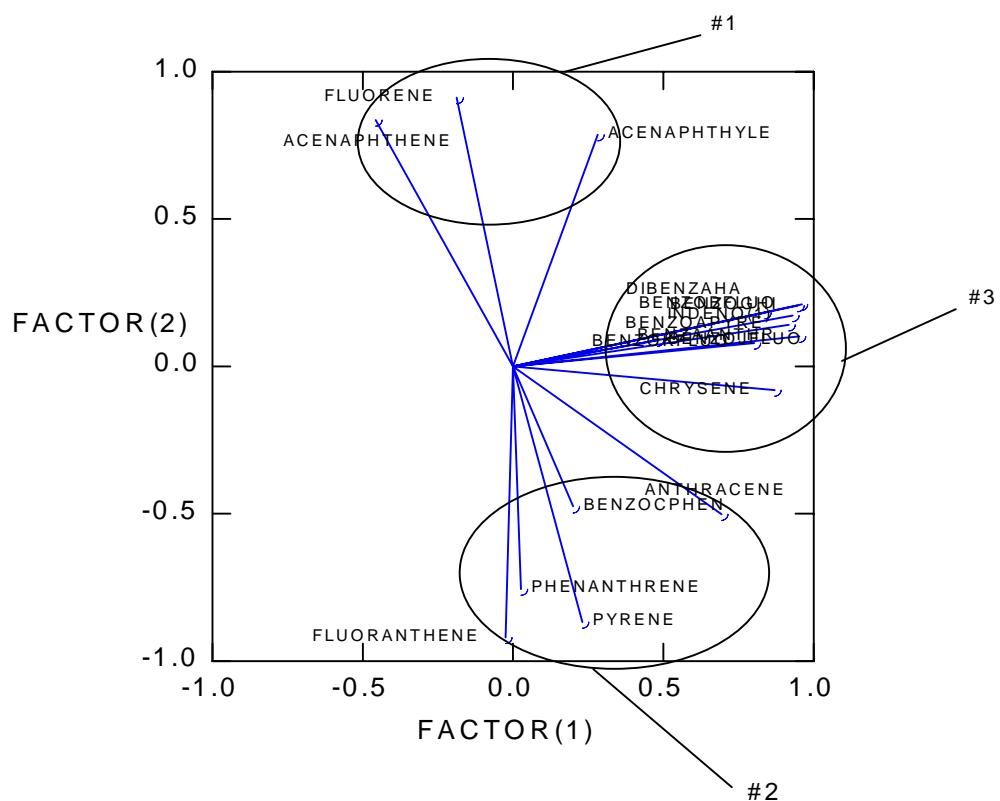


Figure 4. PCA factor loadings plot of PAH concentrations In HPUF samples.

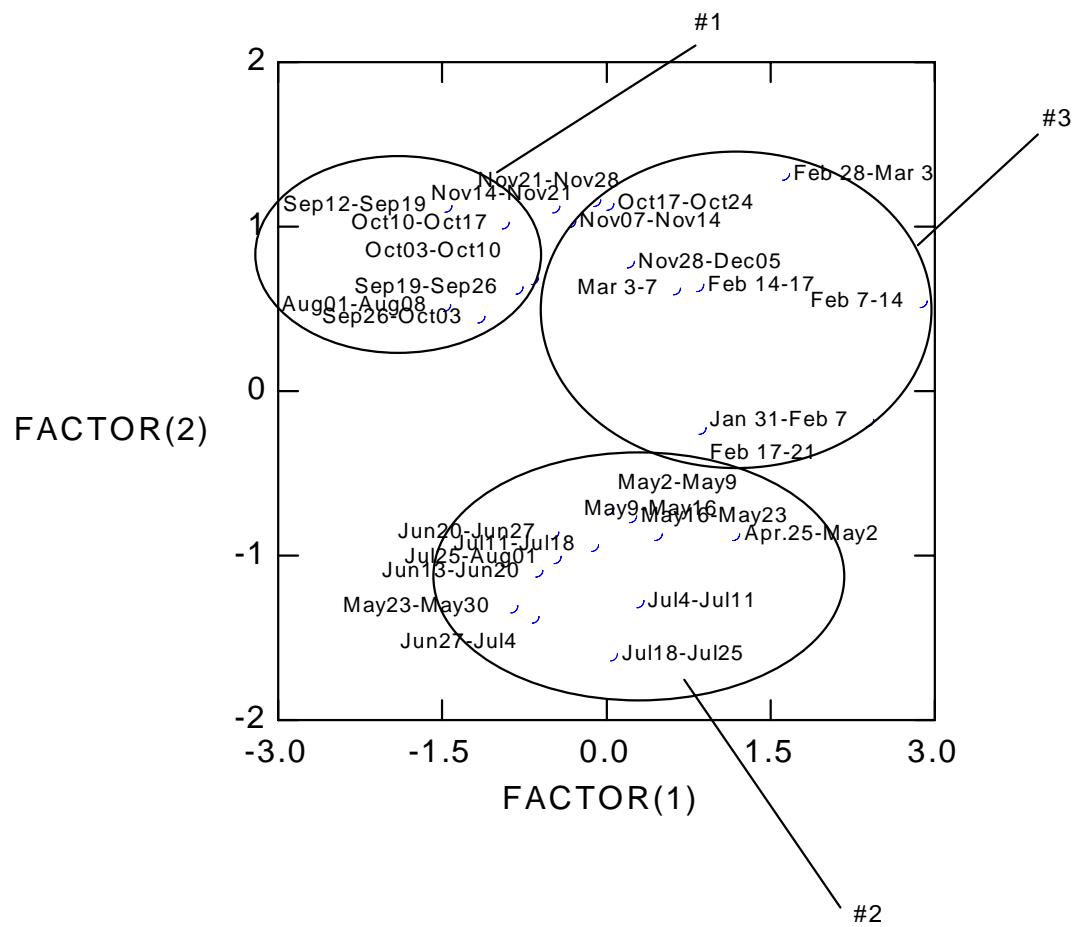


Figure 5. PCA scores plot of sampling dates from analysis of PAH concentrations in HV/PUF samples.

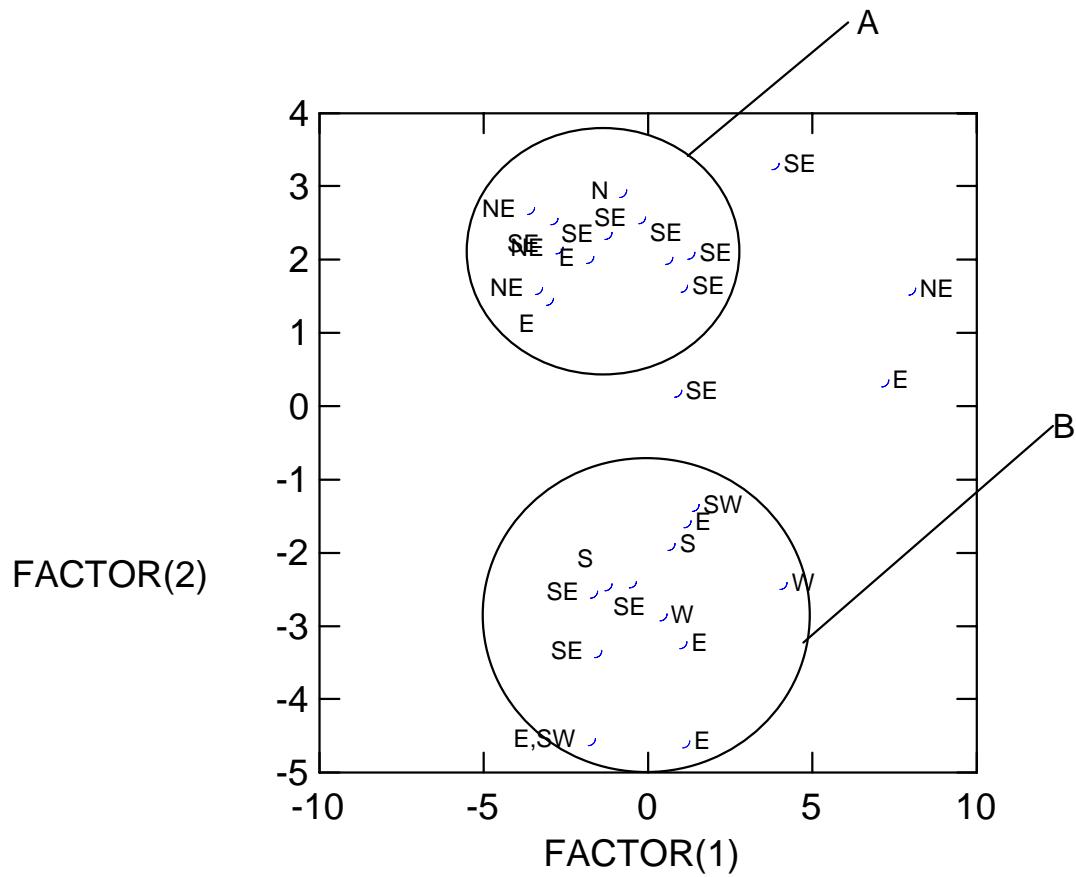


Figure 6. PCA scores plot of wind direction from analysis of PAH concentrations in HV/PUF samples.

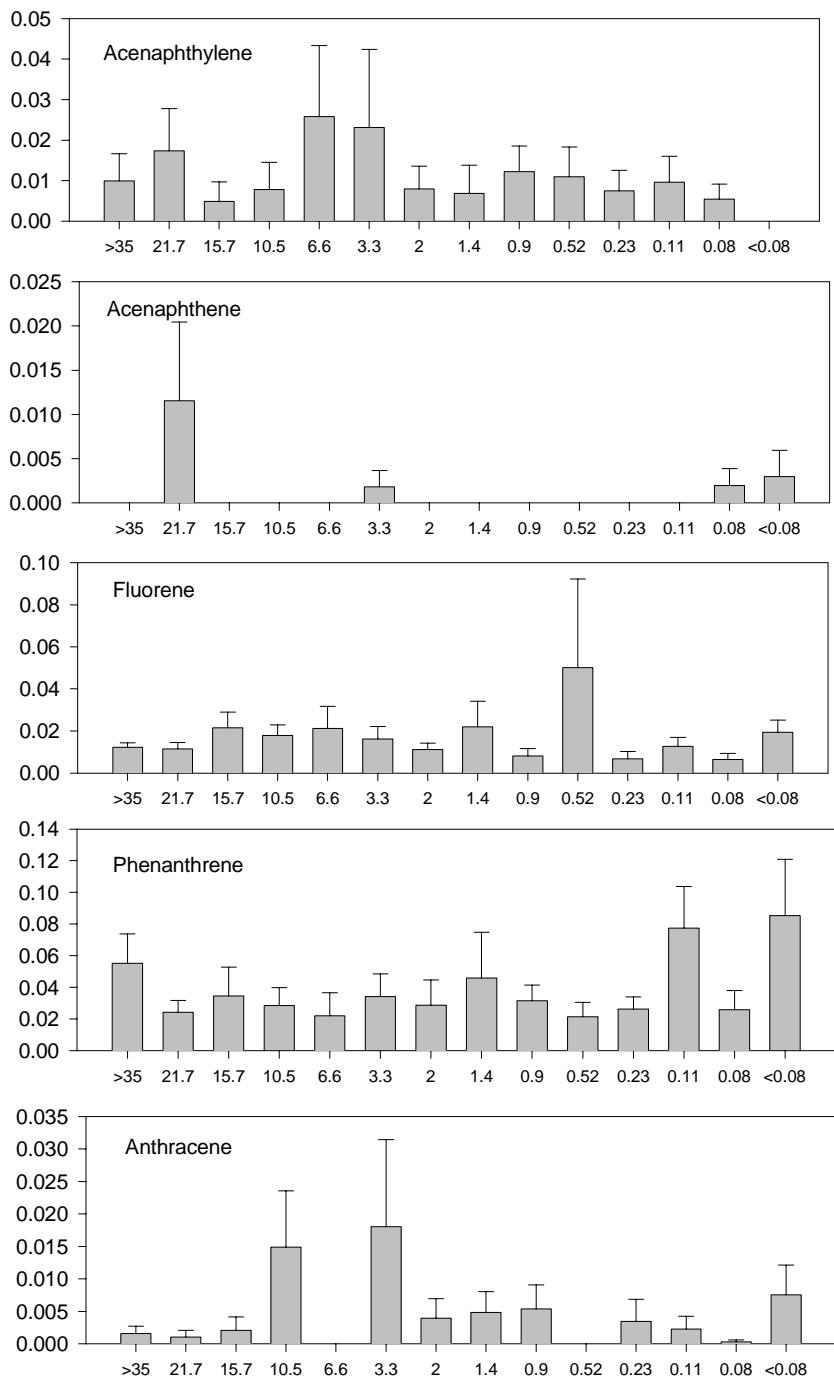


Figure 7. PAH concentrations (means +/- SE, ng/m<sup>3</sup>) for the various particle size diameter ( $\mu\text{m}$ ) fractions measured with the LPI at Burnaby Lake (February - August 1995) (n=11).

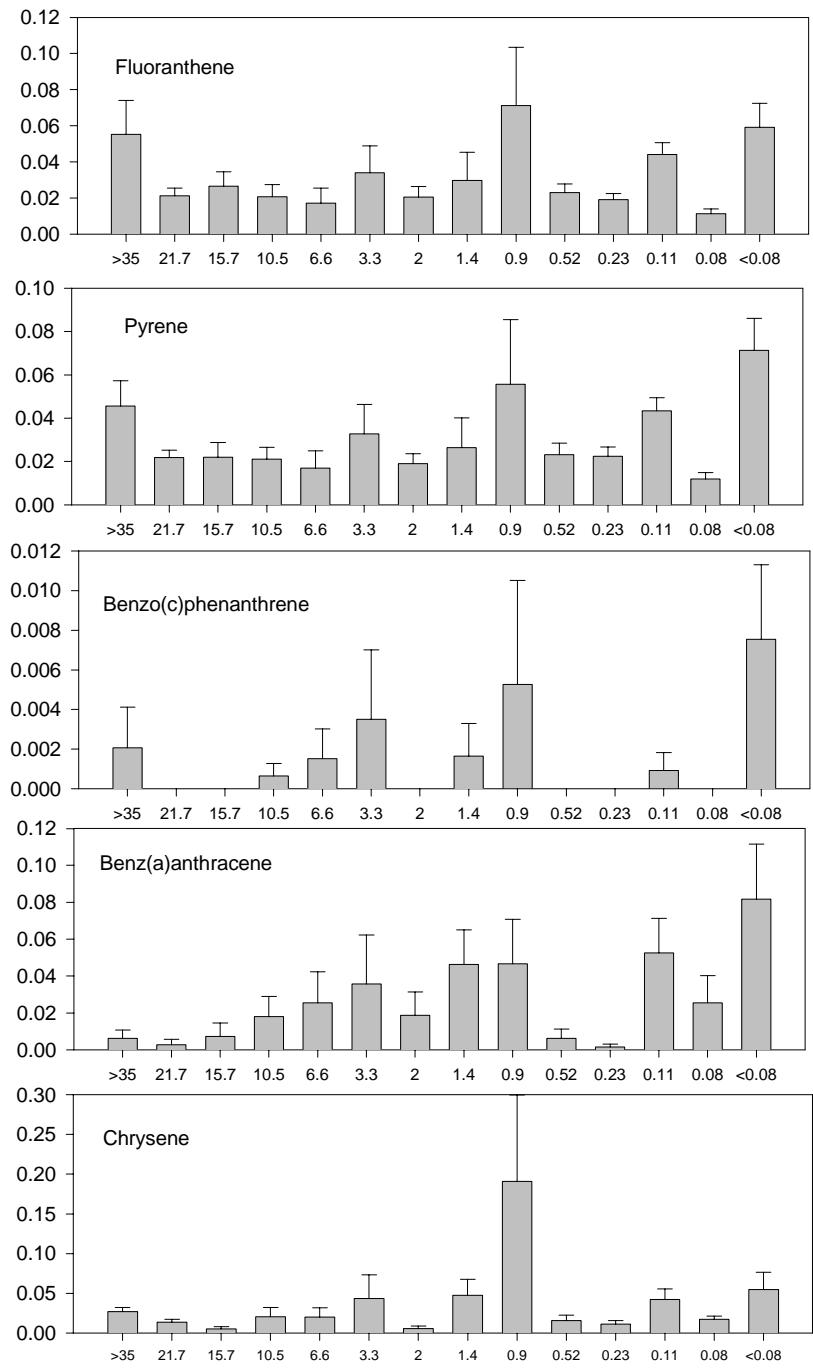


Figure 7 (continued). PAH concentrations (means +/- SE, ng/m<sup>3</sup>) for the various particle size diameter ( $\mu\text{m}$ ) fractions measured with the LPI at Burnaby Lake (February - August 1995) (n=11).

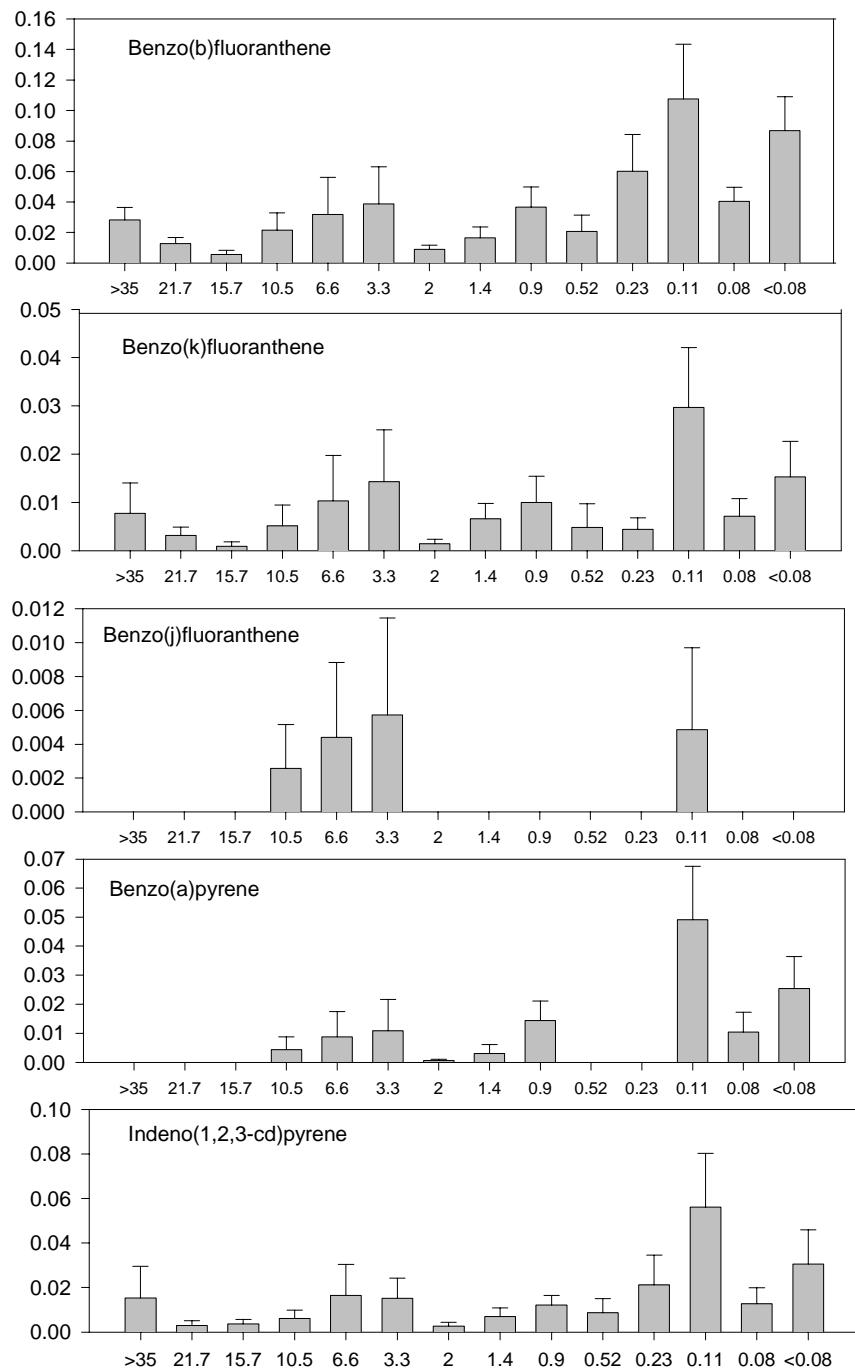


Figure 7 (continued). PAH concentrations (means +/- SE, ng/m<sup>3</sup>) for the various particle size diameter ( $\mu\text{m}$ ) fractions measured with the LPI at Burnaby Lake (February - August 1995) (n=11).

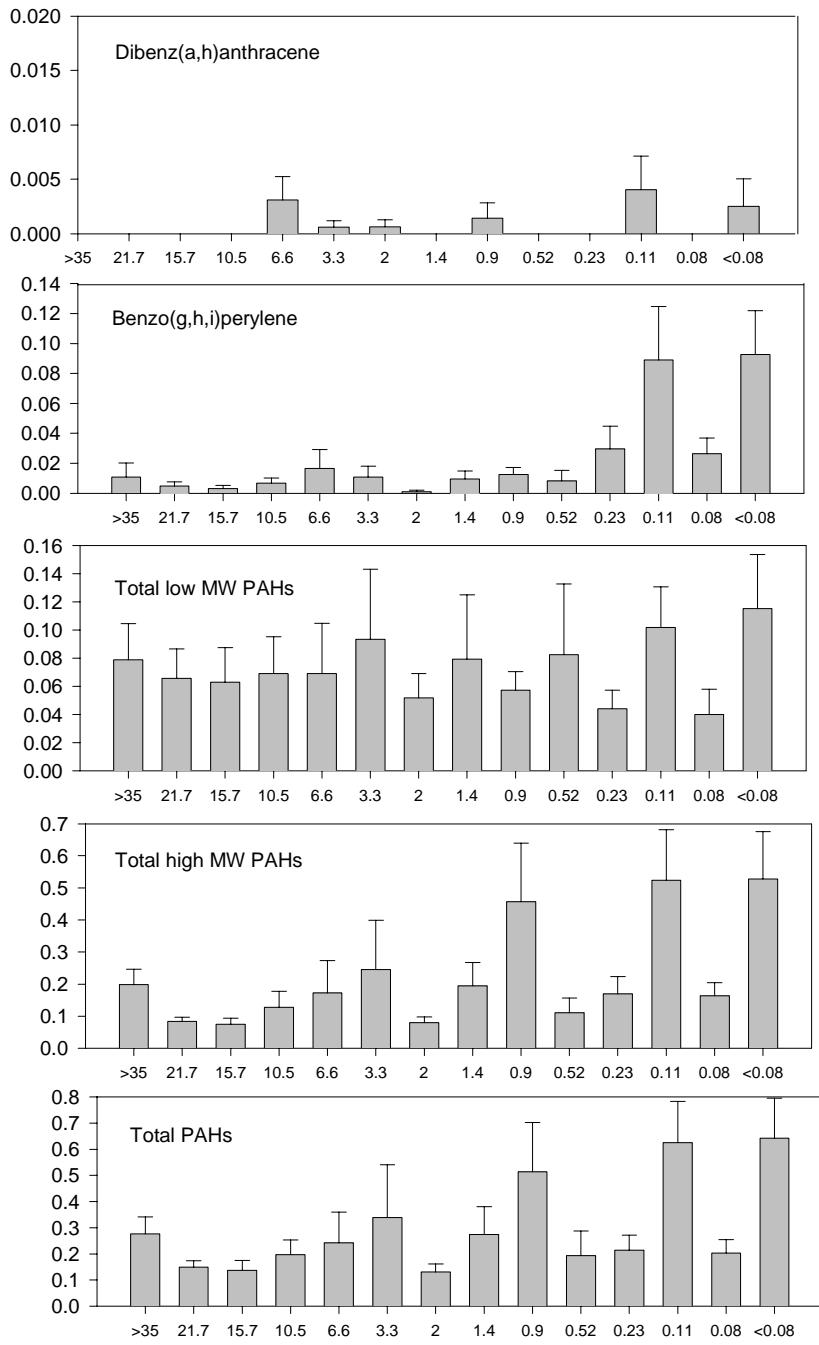


Figure 7 (continued). PAH concentrations (means +/- SE, ng/m<sup>3</sup>) for the various particle size diameter ( $\mu\text{m}$ ) fractions measured with the LPI at Burnaby Lake (February - August 1995) (n=11).

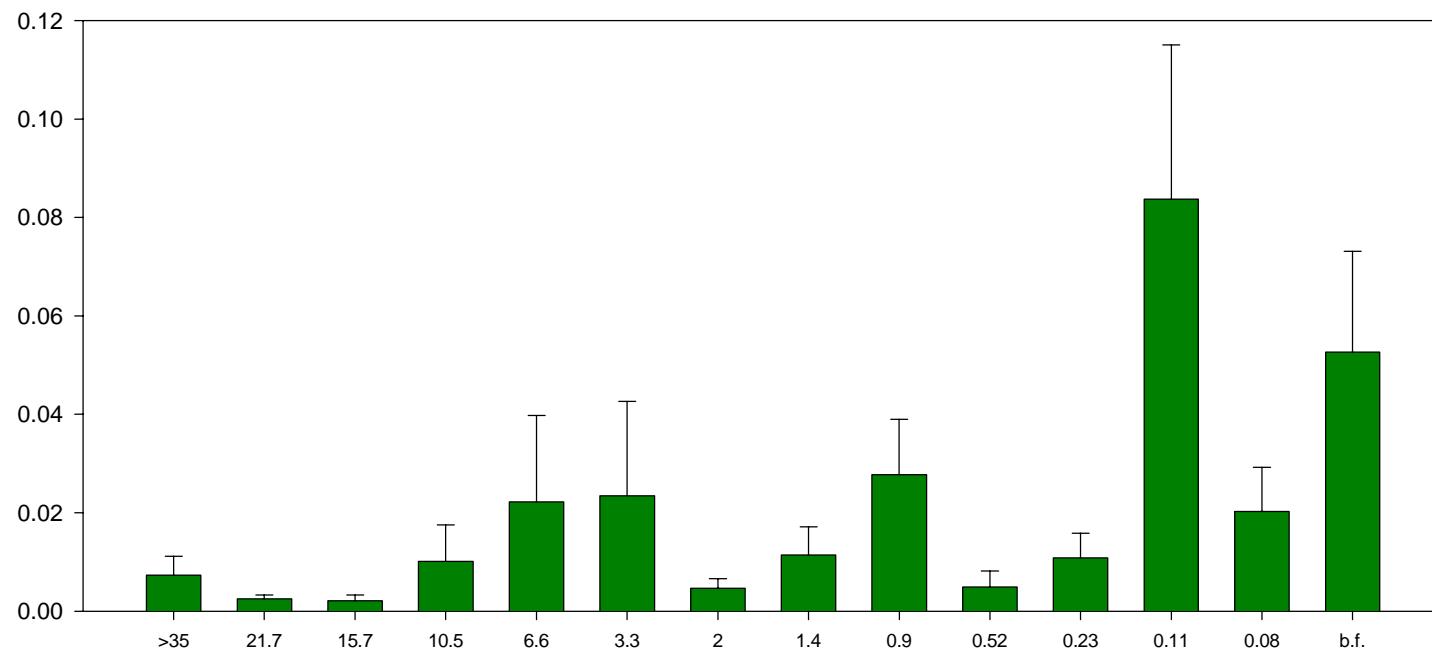


Figure 8. PAH concentrations (means +/- SE, ng/m<sup>3</sup>) for the various particle size diameter fractions (µm) measured with the LPI at Burnaby Lake (February - August 1995) (n=11).

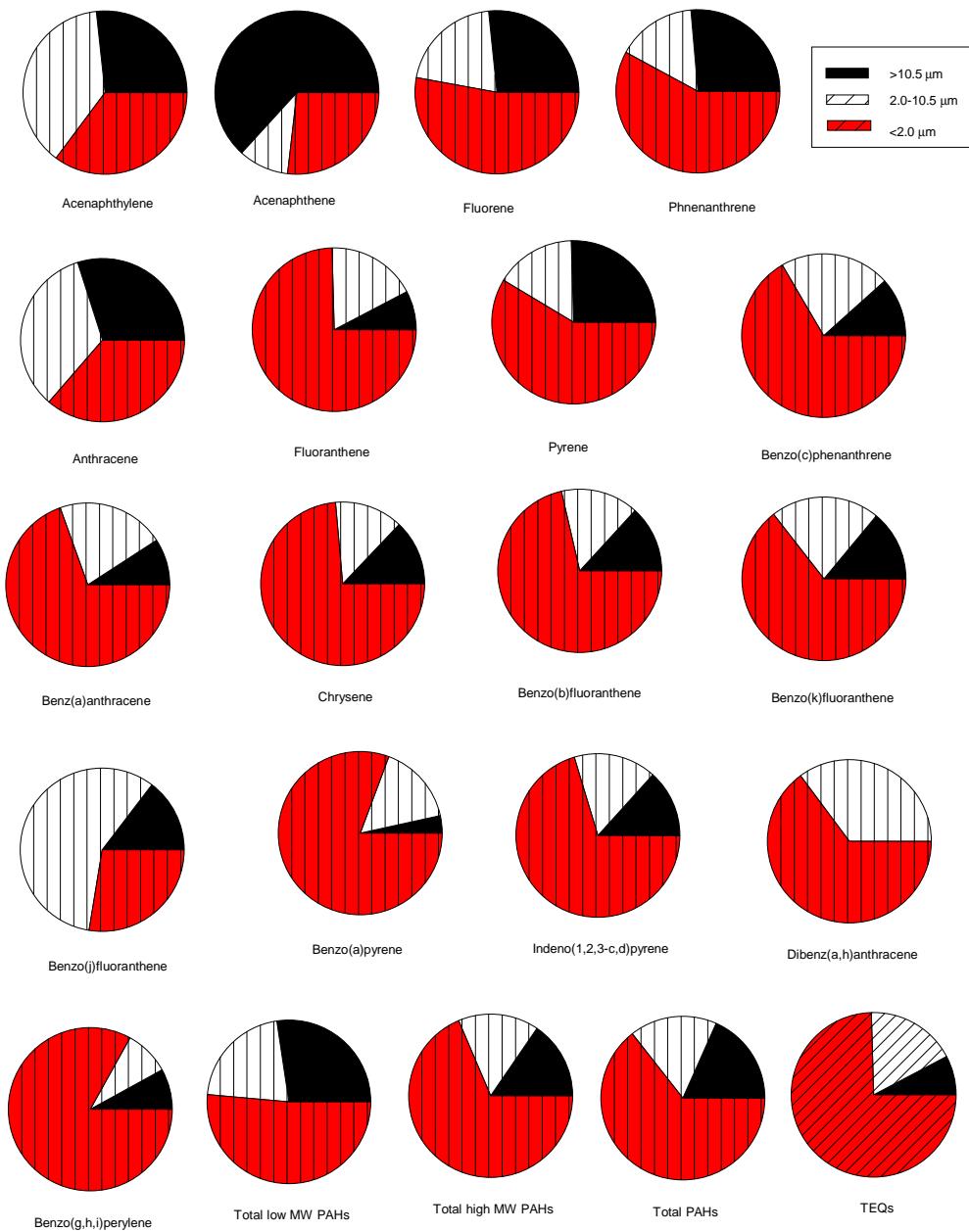


Figure 9. Mean PAH distributions (% of total concentration) among three particulate size fractions measured by LPI at Burnaby Lake in 1995 (n=11).

## Factor Loadings Plot

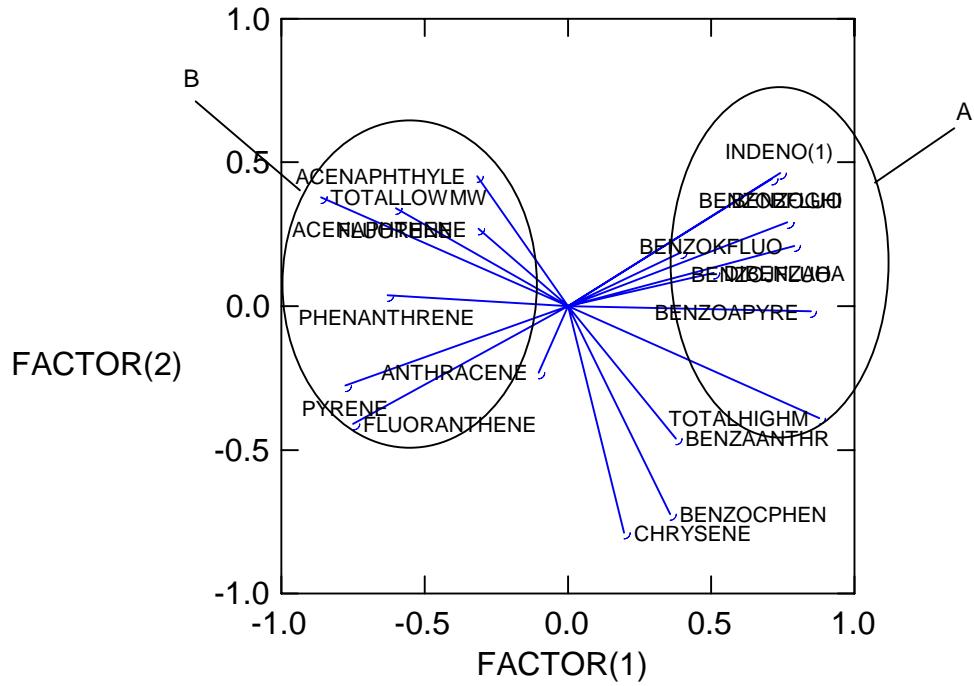


Figure 10. PCA Loadings plot of mean PAH concentrations measured by LPI.

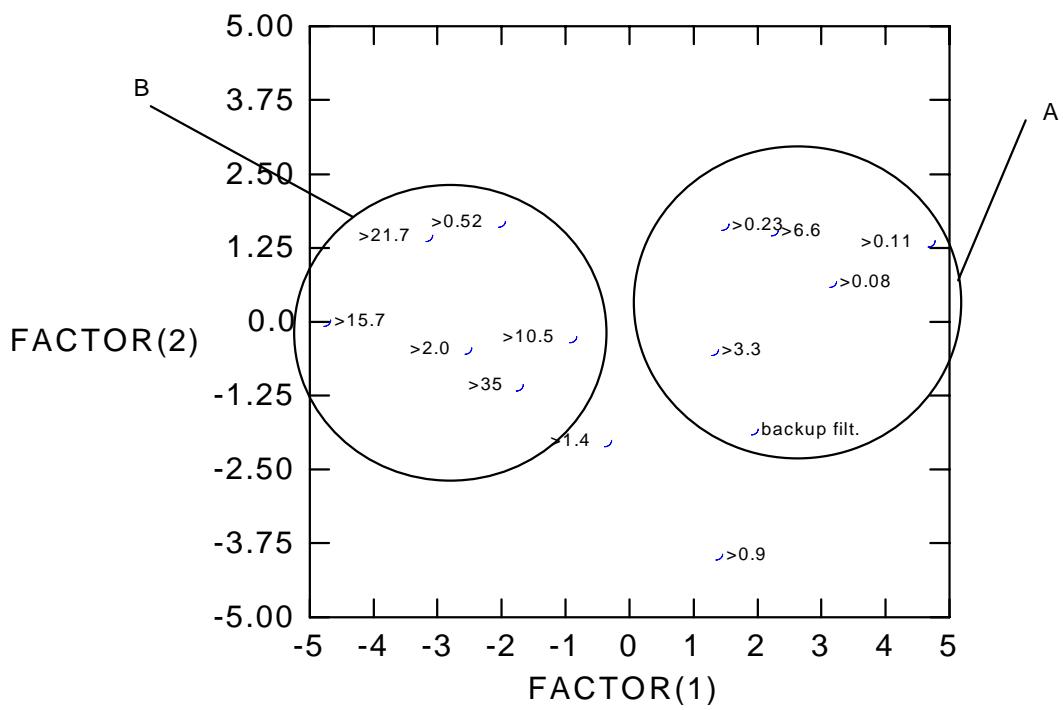


Figure 11. PCA scores plot of particle size distributions from analysis of PAH concentrations in LPI samples.

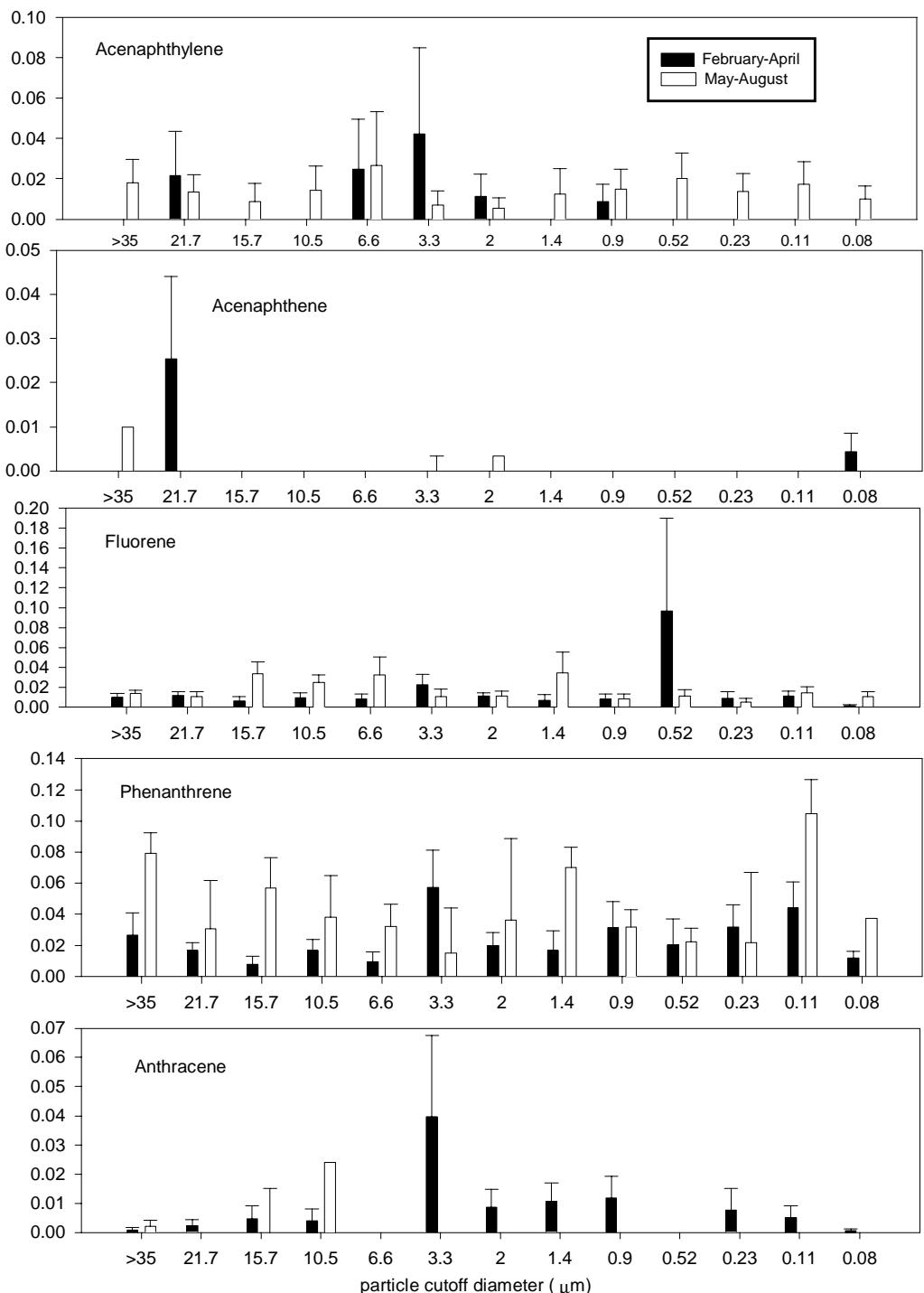


Figure 12. Comparison of mean size fractionated PAH concentrations ( $\text{ng}/\text{m}^3$ , +/- SE) in LPI samples from February-April (n=5) and May-August (n=6) from Burnaby Lake in 1995.

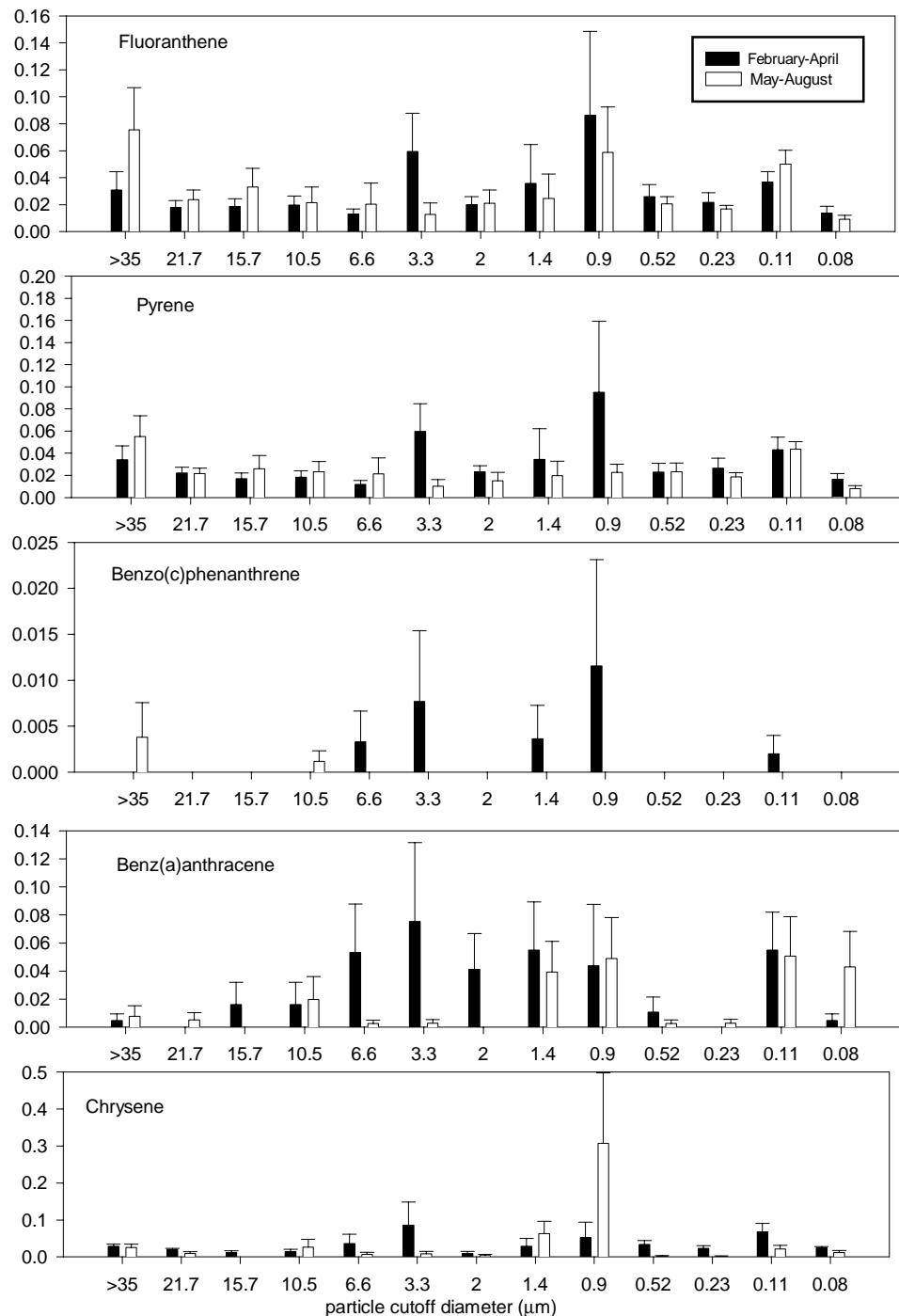


Figure 12 (continued). Comparison of mean size fractionated PAH concentrations (ng/m<sup>3</sup> +/- SE) in LPI samples from February-April (n=5) and May-August (n=6) from Burnaby Lake in 1995.

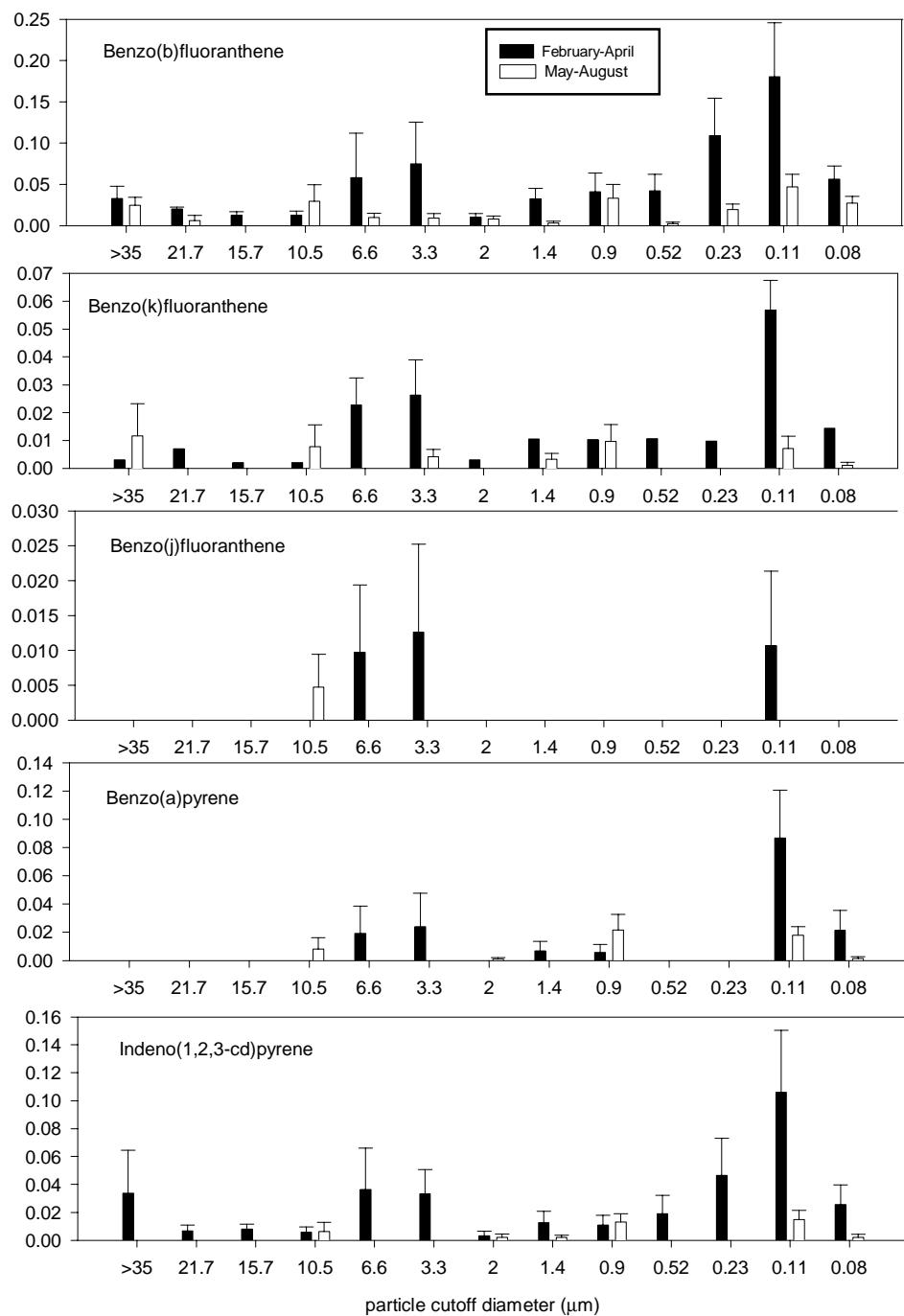


Figure 12 (continued). Comparison of mean size fractionated PAH concentrations (ng/m<sup>3</sup> +/- SE) in LPI samples from February-April (n=5) and May-August (n=6) from Burnaby Lake in 1995.

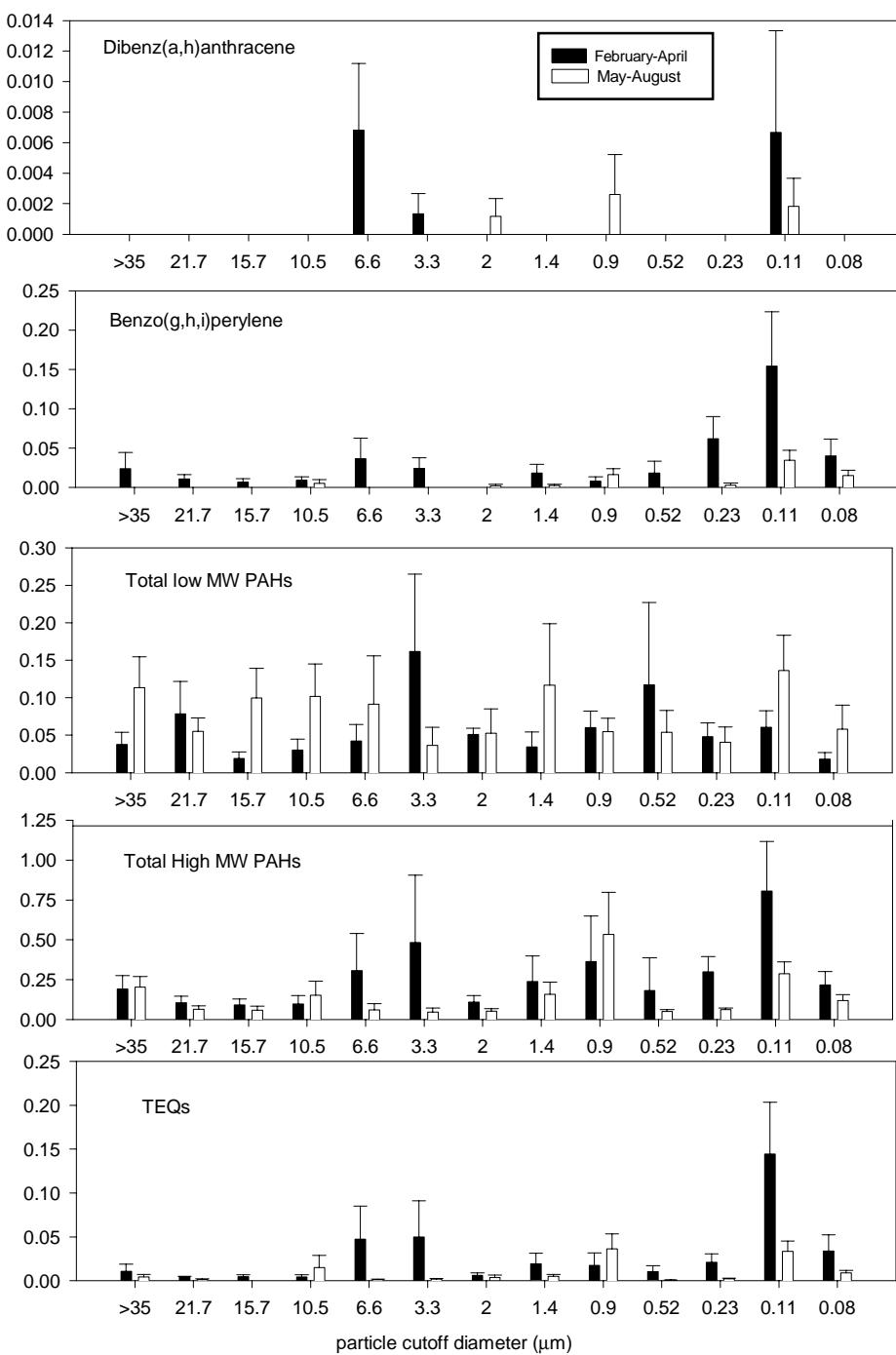


Figure 12 (continued). Comparison of mean size fractionated PAH concentrations ( $\text{ng}/\text{m}^3 \pm \text{SE}$ ) in LPI samples from February-April ( $n=5$ ) and May-August ( $n=6$ ) from Burnaby Lake in 1995.

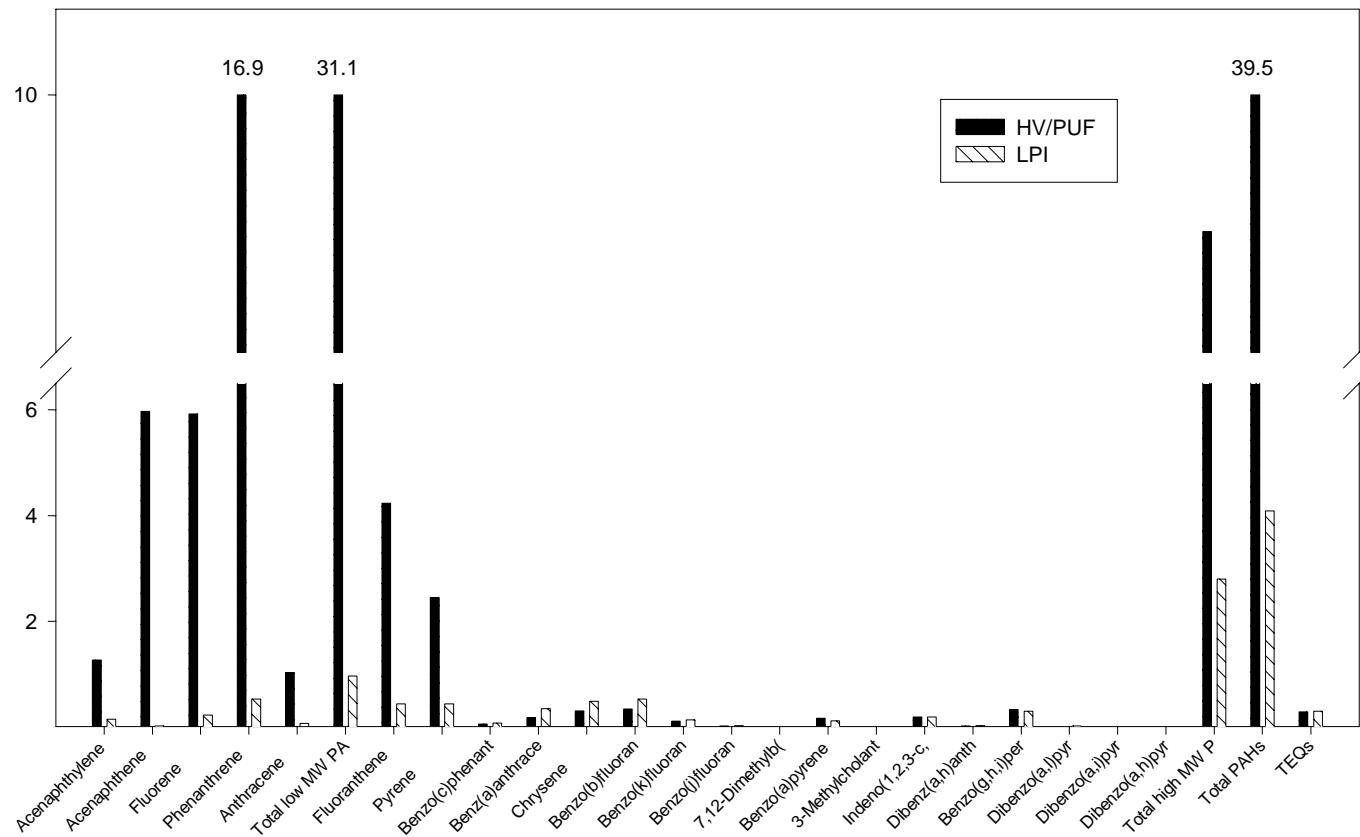


Figure 13. Mean PAH concentrations ( $\text{ng}/\text{m}^3$ ) measured by HV/PUF (n=25) and LPI (n=11) at Burnaby Lake in 1995. LPI concentrations represent sum totals of all stages.

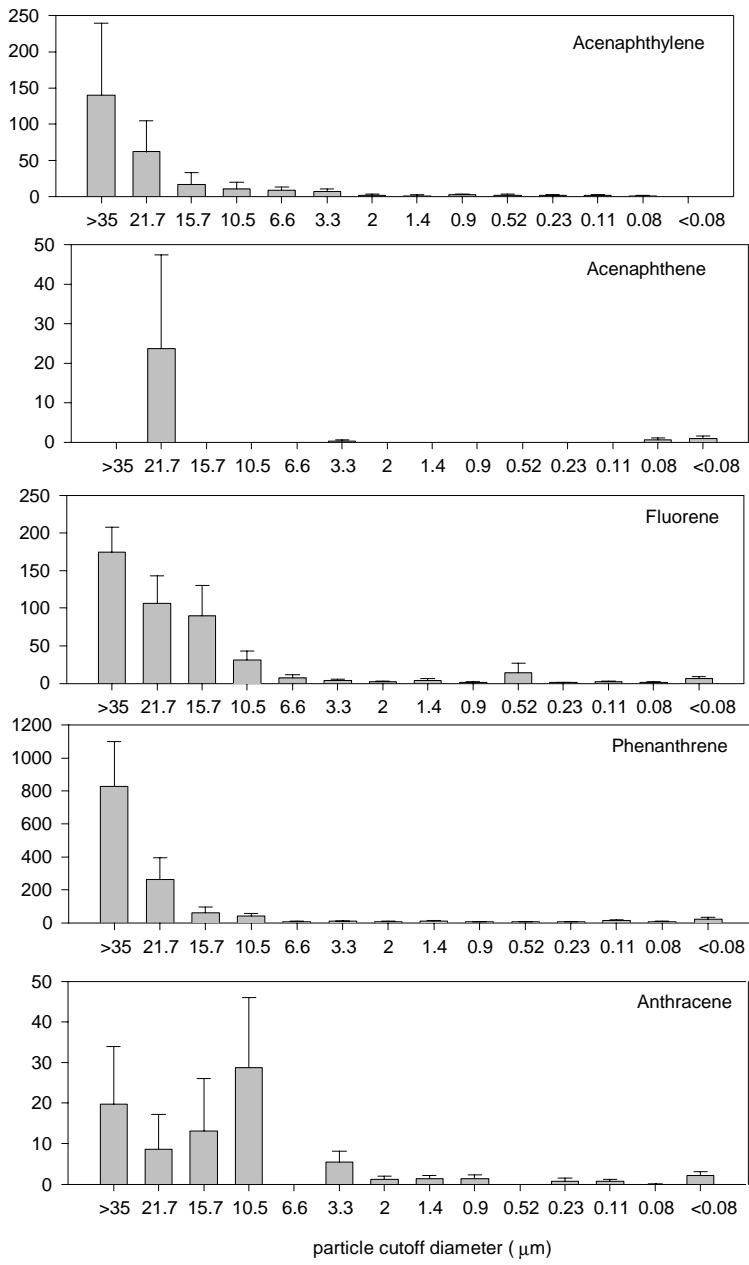


Figure 14. PAH deposition rates (means +/- SE, ng/m<sup>2</sup>/day) for the various particle size diameter fractions measured with the LPI at Burnaby Lake (February - August 1995)

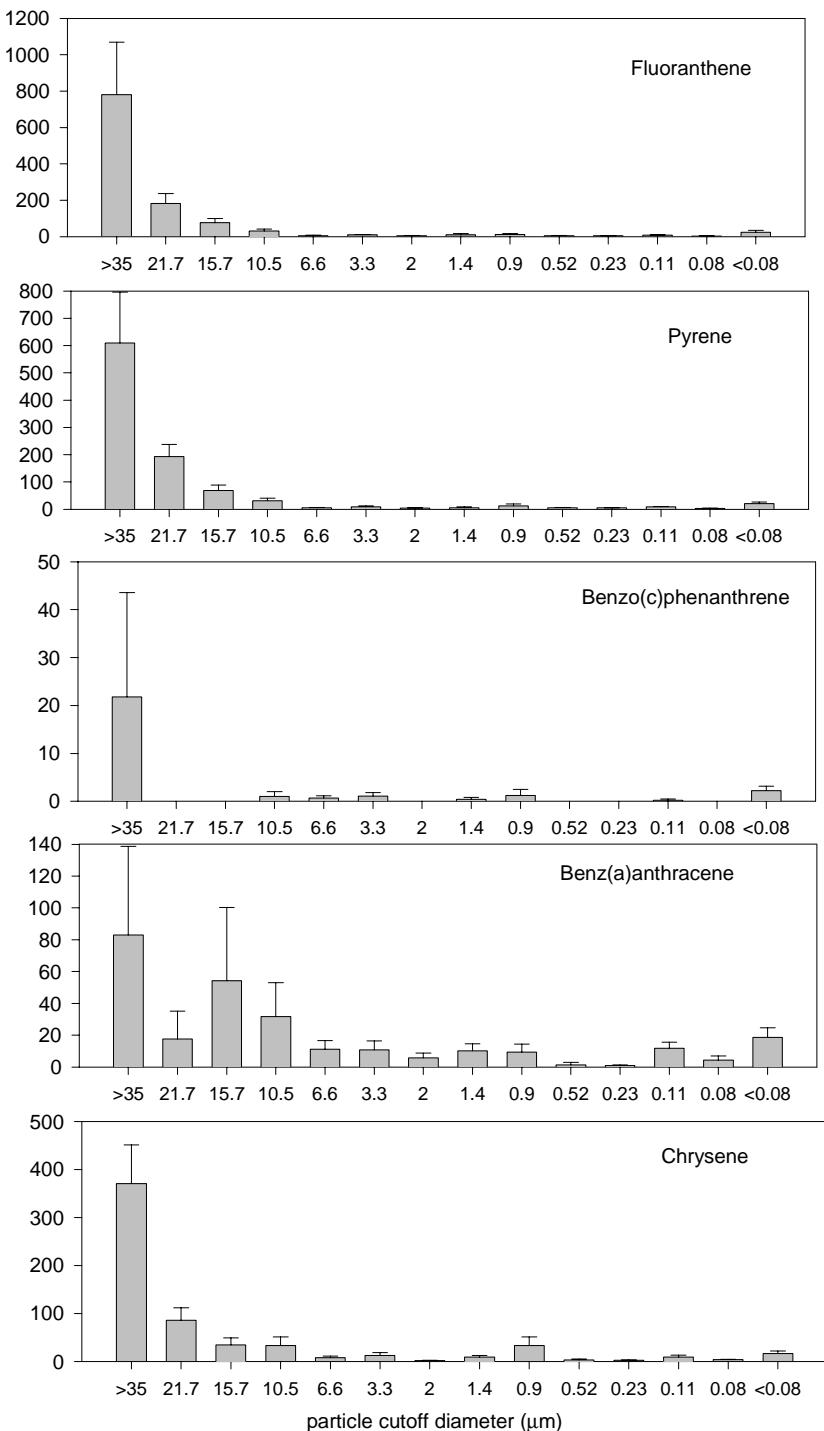


Figure 14 (continued). PAH deposition rates (means +/- SE,  $\text{ng}/\text{m}^2/\text{day}$ ) for the various particle size diameter fractions measured with the LPI at Burnaby Lake (February - August 1995) (n=11).

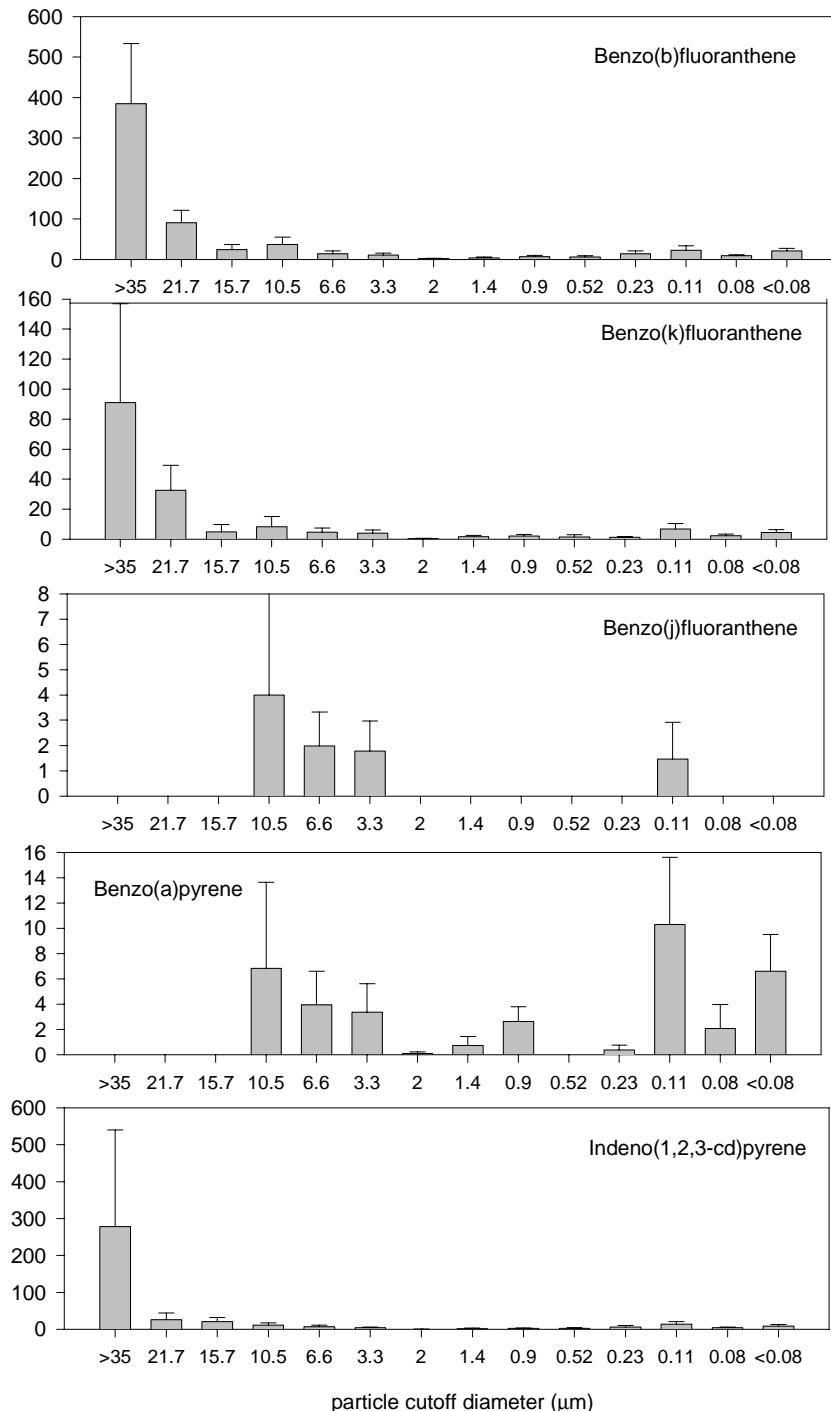


Figure 14 (continued). PAH deposition rates (means +/- SE, ng/m<sup>2</sup>/day) for the various particle size diameter fractions measured with the LPI at Burnaby Lake (February - August 1995) (n=11).

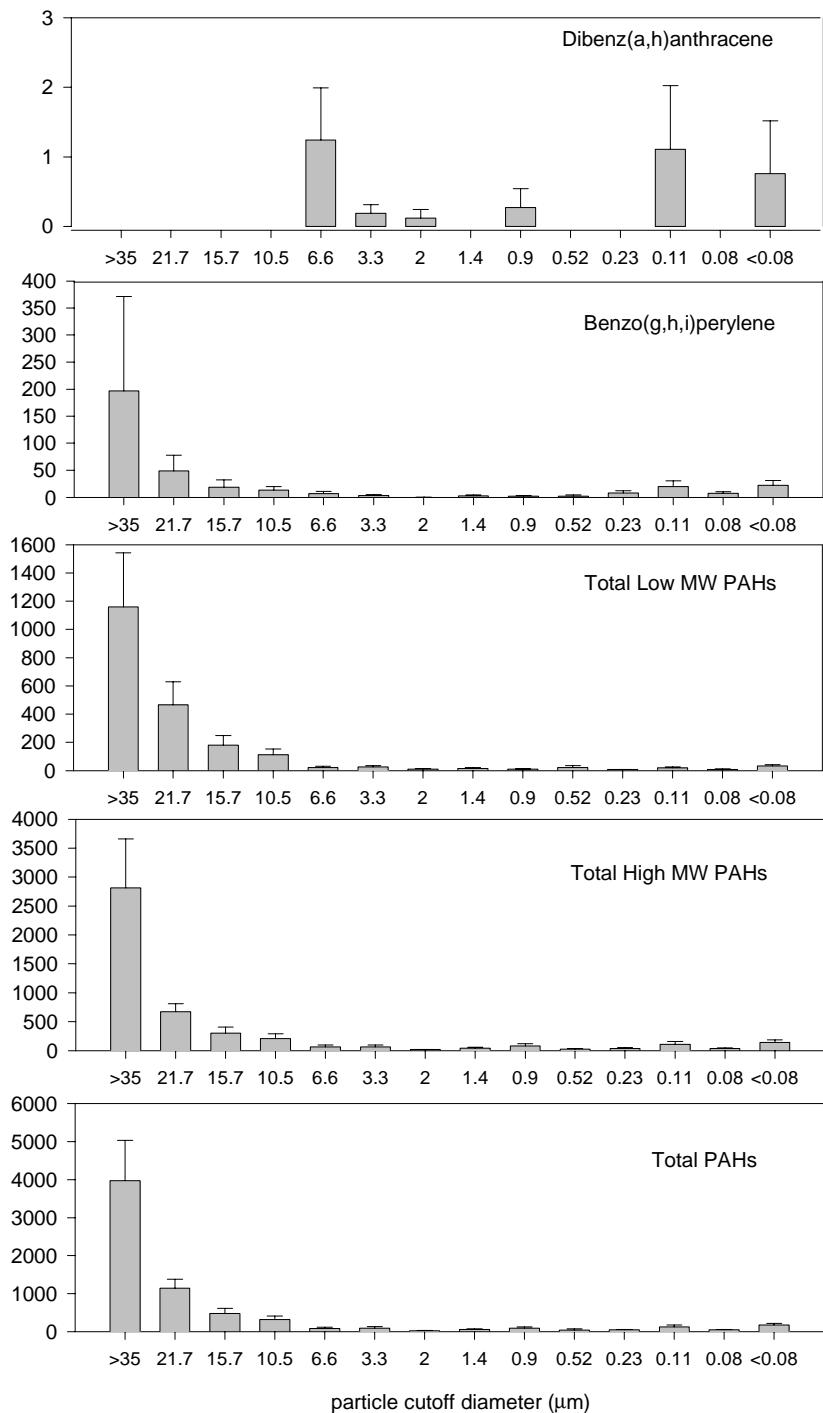


Figure 14 (continued). PAH deposition rates (means  $\pm$  SE, ng/m<sup>2</sup>/day) for the various particle size diameter fractions measured with the LPI at Burnaby Lake (February - August 1995) (n=11).

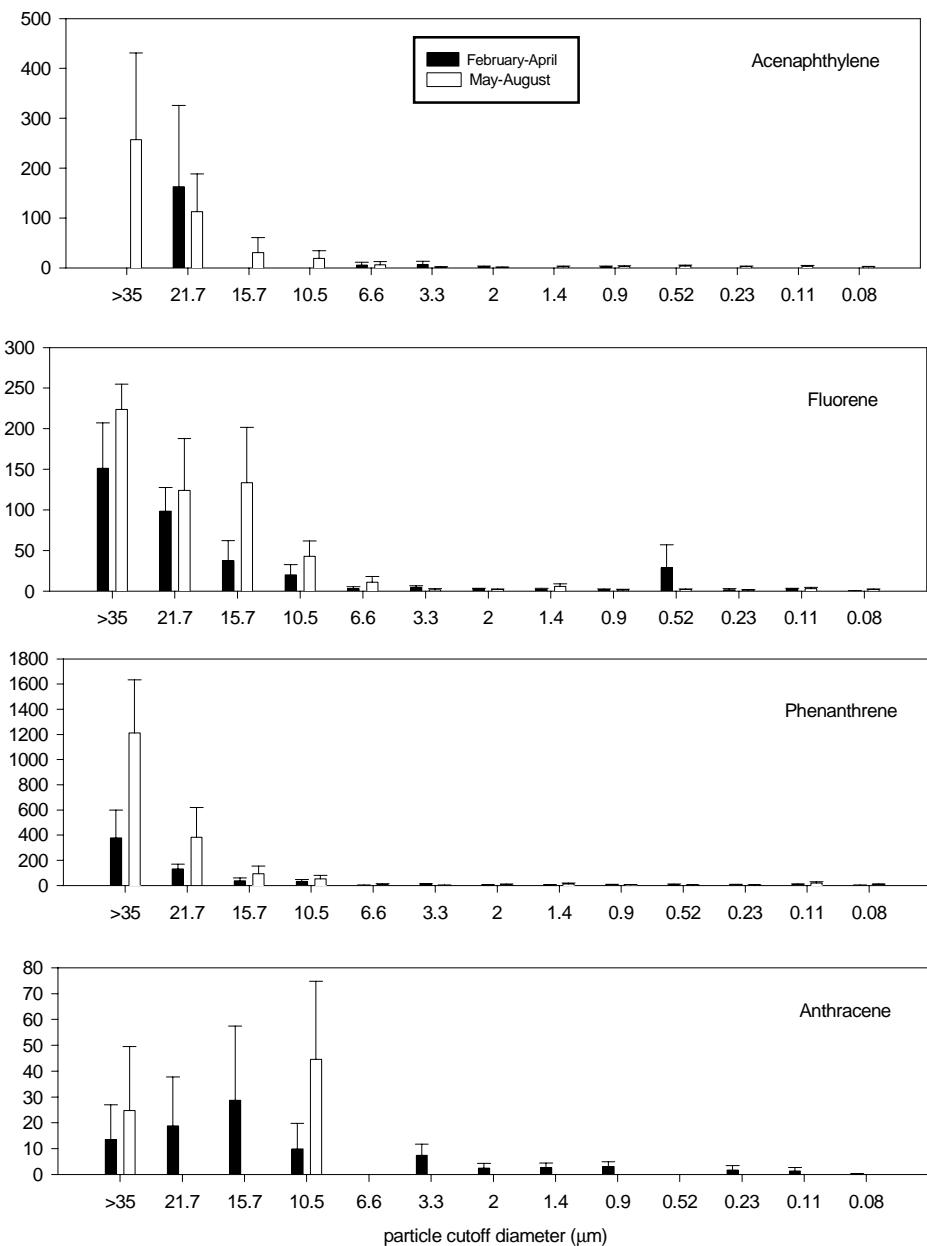


Figure 15. Comparison of mean size fractionated PAH deposition rates ( $\text{ng}/\text{m}^2/\text{day}$ , +/- SE) in LPI samples from February-April (n=5) and May-August (n=6) at Burnaby Lake in 1995.

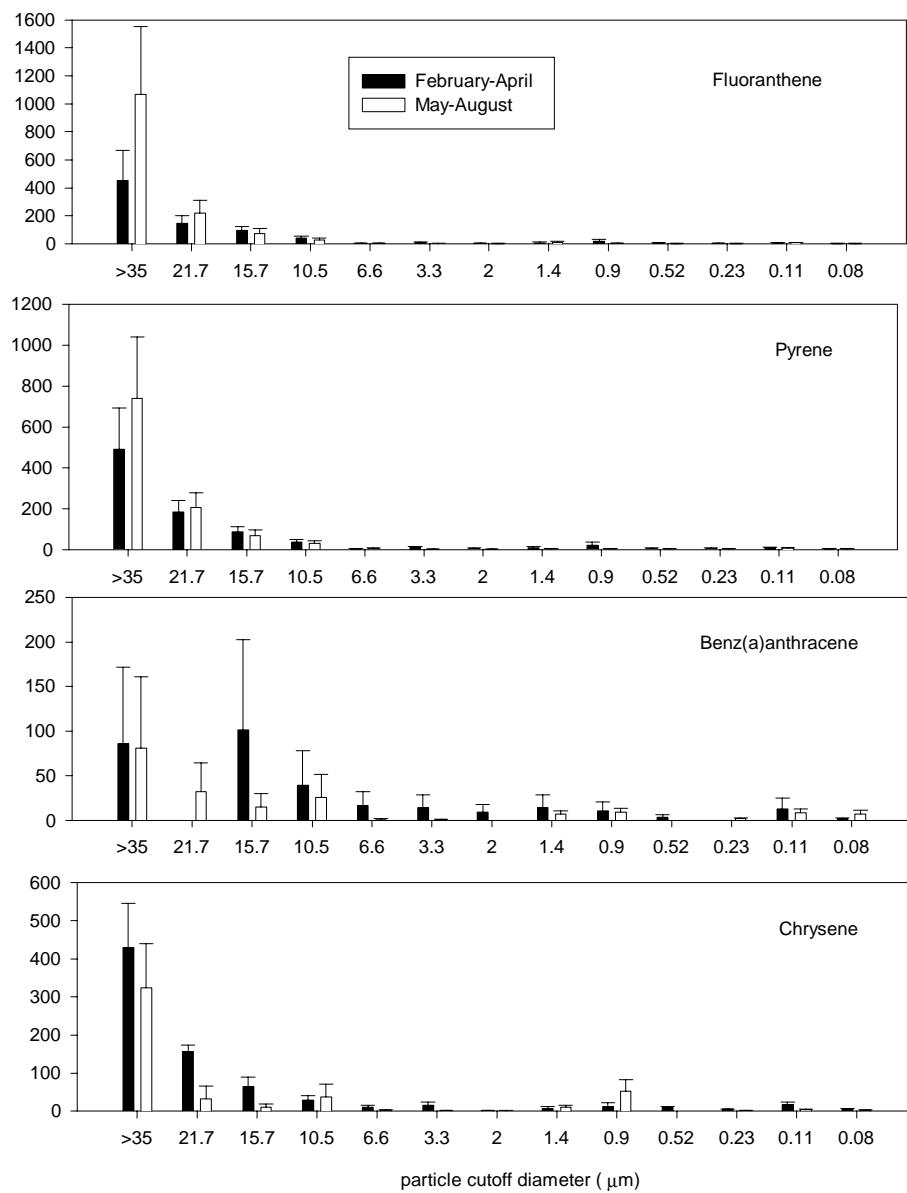


Figure 15 (continued). Comparison of mean size fractionated PAH deposition rates (ng/m<sup>2</sup>/day +/- SE) in LPI samples from February-April (n=5) and May-August (n=6) at Burnaby Lake in 1995.

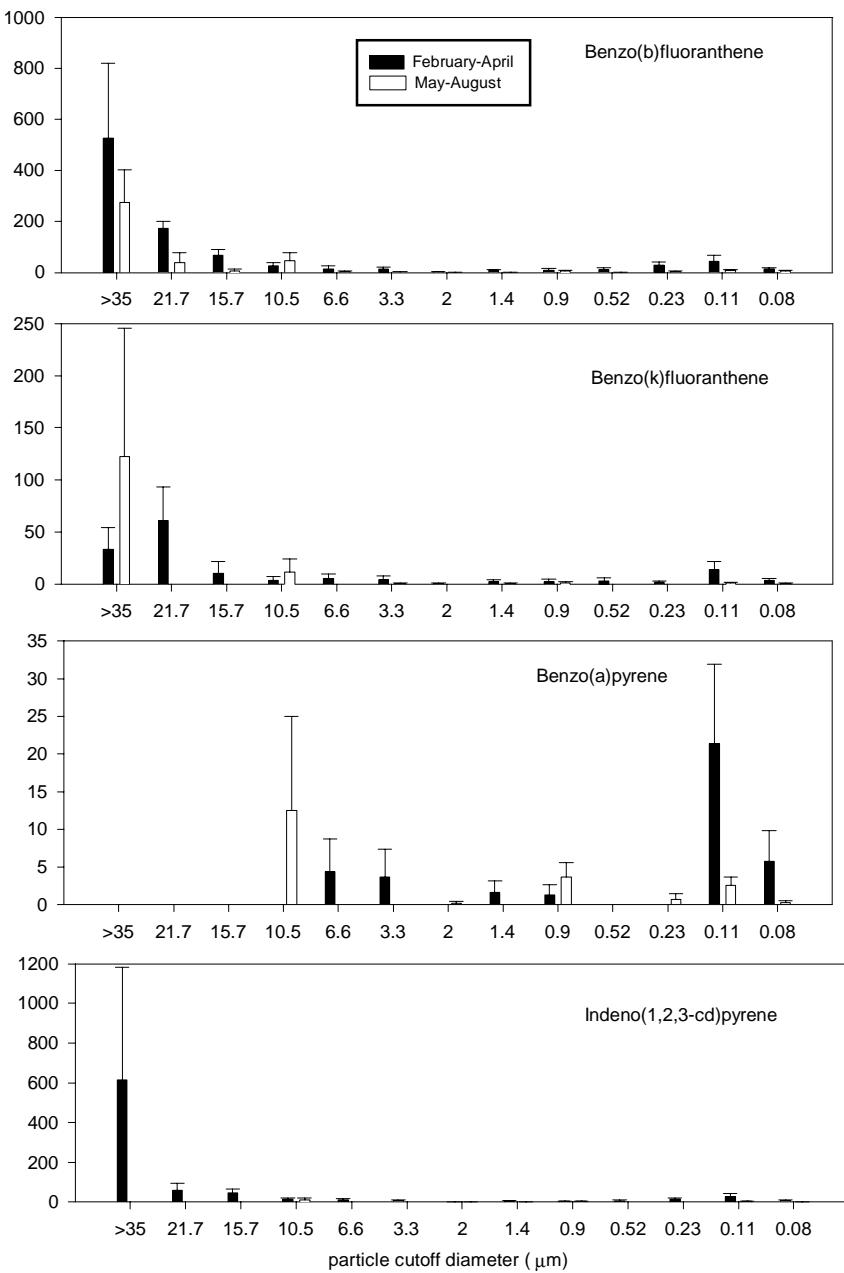


Figure 15 (continued). Comparison of mean size fractionated PAH deposition rates (ng/m<sup>2</sup>/day +/- SE) in LPI samples from February-April (n=5) and May-August (n=6) at Burnaby Lake in 1995.

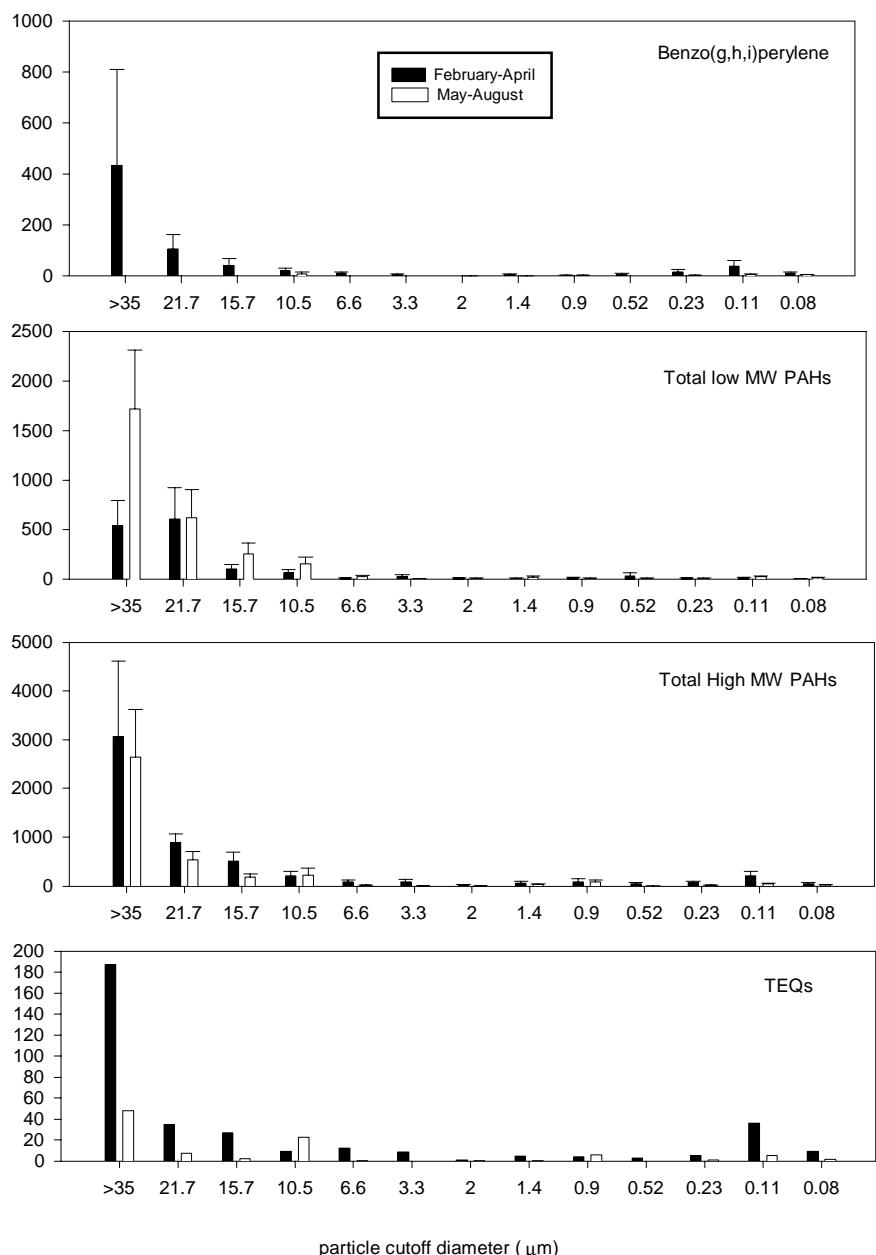


Figure 15 (continued). Comparison of mean size fractionated PAH deposition rates (ng/m<sup>2</sup>/day +/- SE) in LPI samples from February-April (n=5) and May-August (n=6) at Burnaby Lake in 1995.

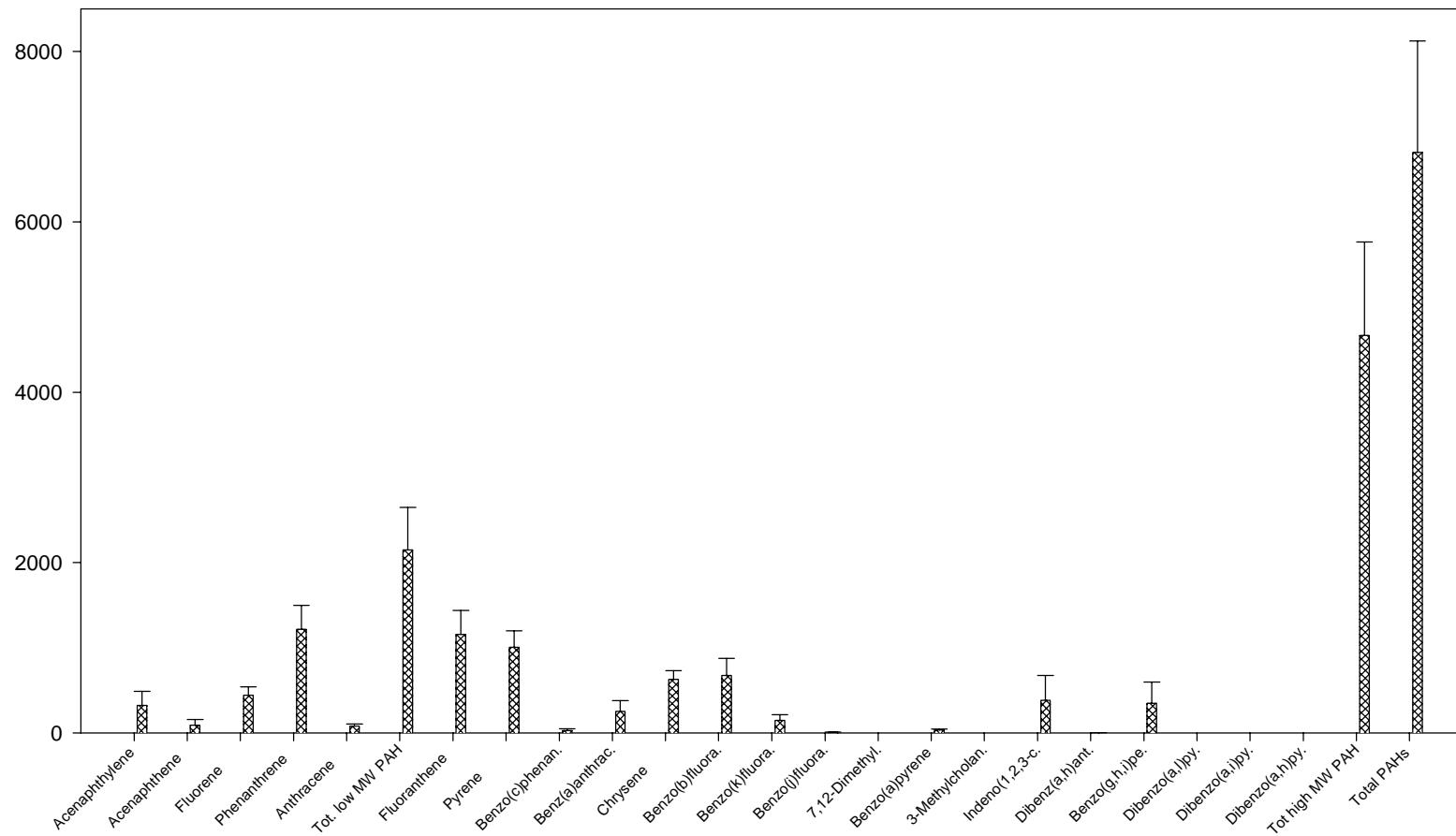


Figure 16. Mean daily deposition rates ( $\text{ng}/\text{m}^2/\text{day} +/\text{-SE}$ ) for PAHs measured by LPI at Burnaby Lake in 1995.

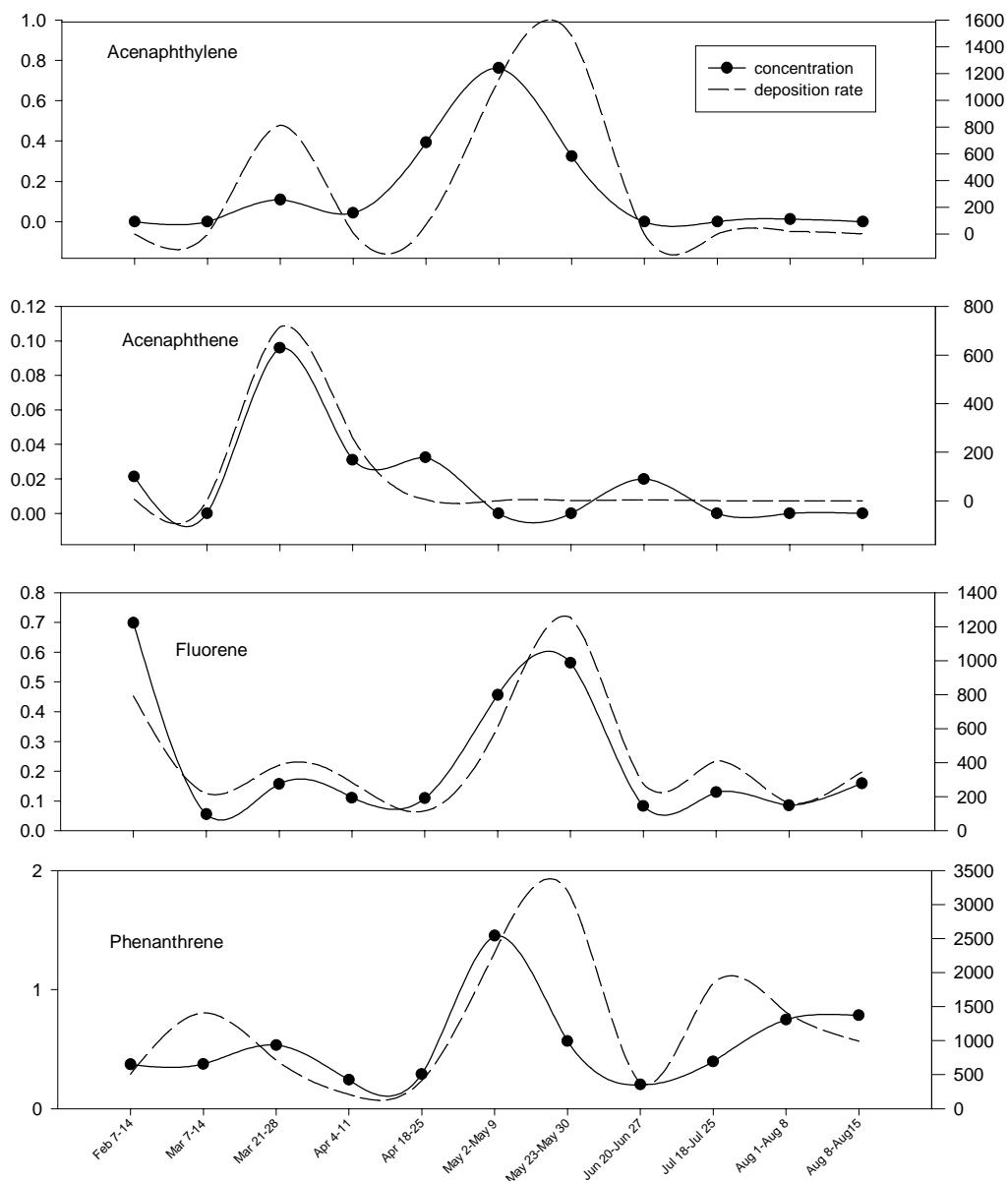


Figure 17. PAH concentrations (ng/m<sup>3</sup>, left axis) and deposition rates (ng/m<sup>2</sup>/day, right axis) measured in LPI samples from Burnaby Lake in 1995.

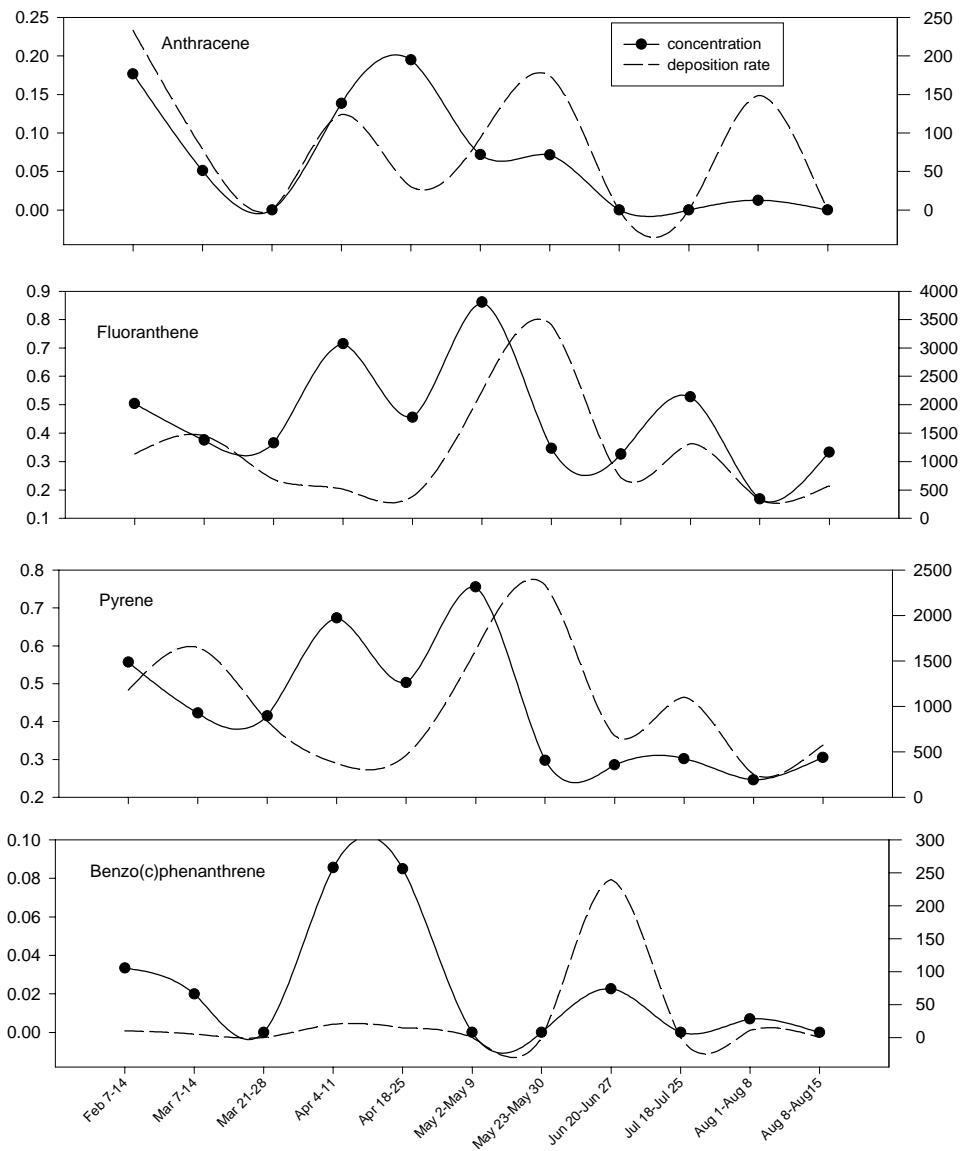


Figure 17 (continued). PAH concentrations (ng/m<sup>3</sup>, left axis) and deposition rates (ng/m<sup>2</sup>/day, right axis) measured in LPI samples from Burnaby Lake in 1995.

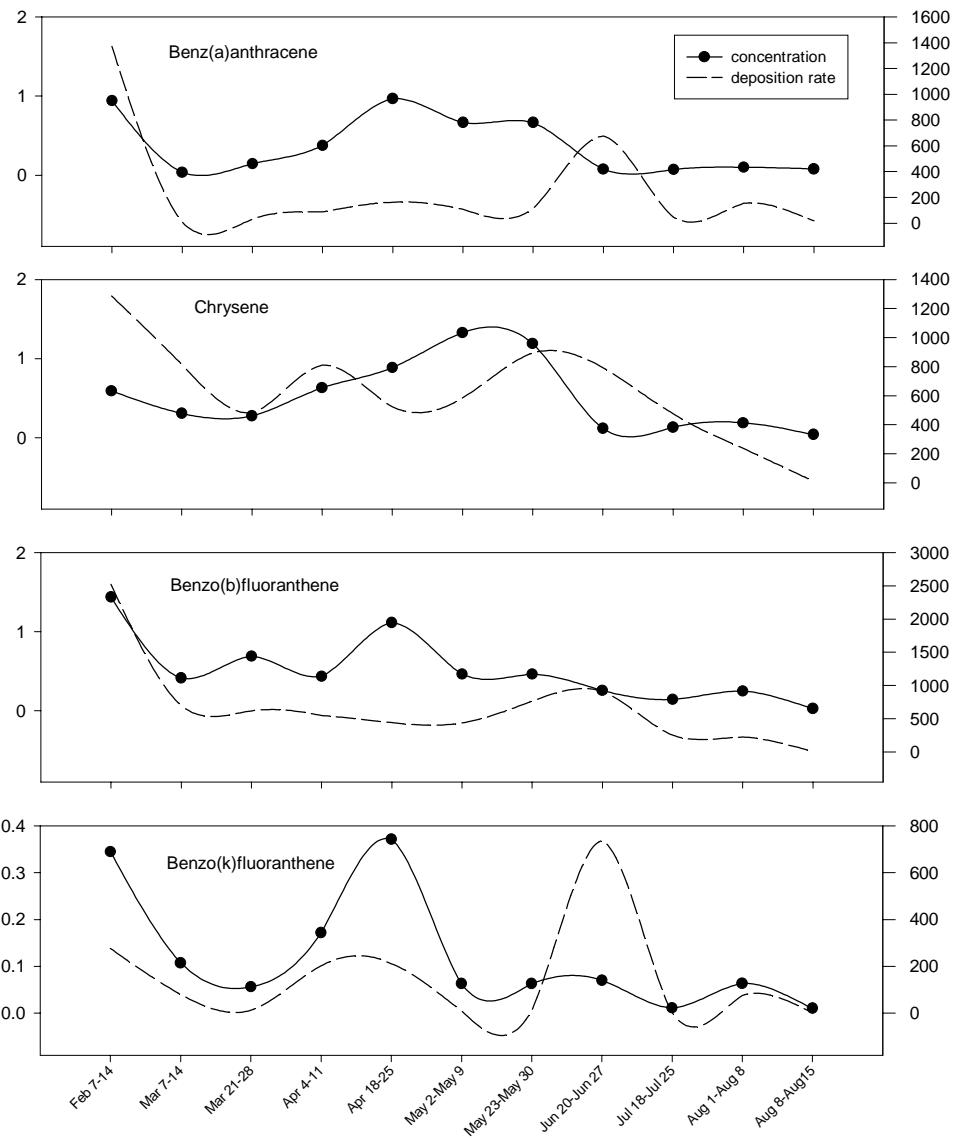


Figure 17 (continued). PAH concentrations (ng/m<sup>3</sup>, left axis) and deposition rates (ng/m<sup>2</sup>/day, right axis) measured in LPI samples from Burnaby Lake in 1995.

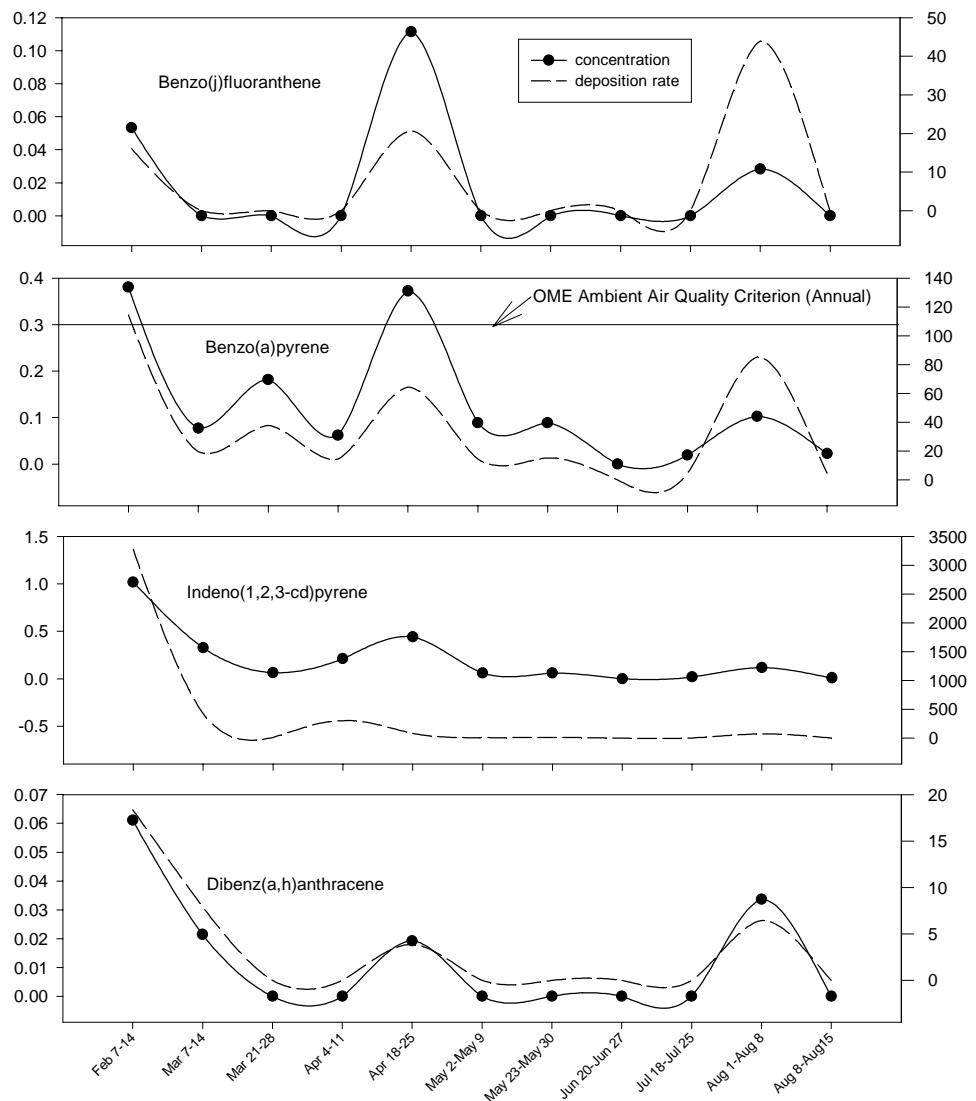


Figure 17 (continued). PAH concentrations (ng/m<sup>3</sup>, left axis) and deposition rates (ng/m<sup>2</sup>/day, right axis) measured in LPI samples from Burnaby Lake in 1995.

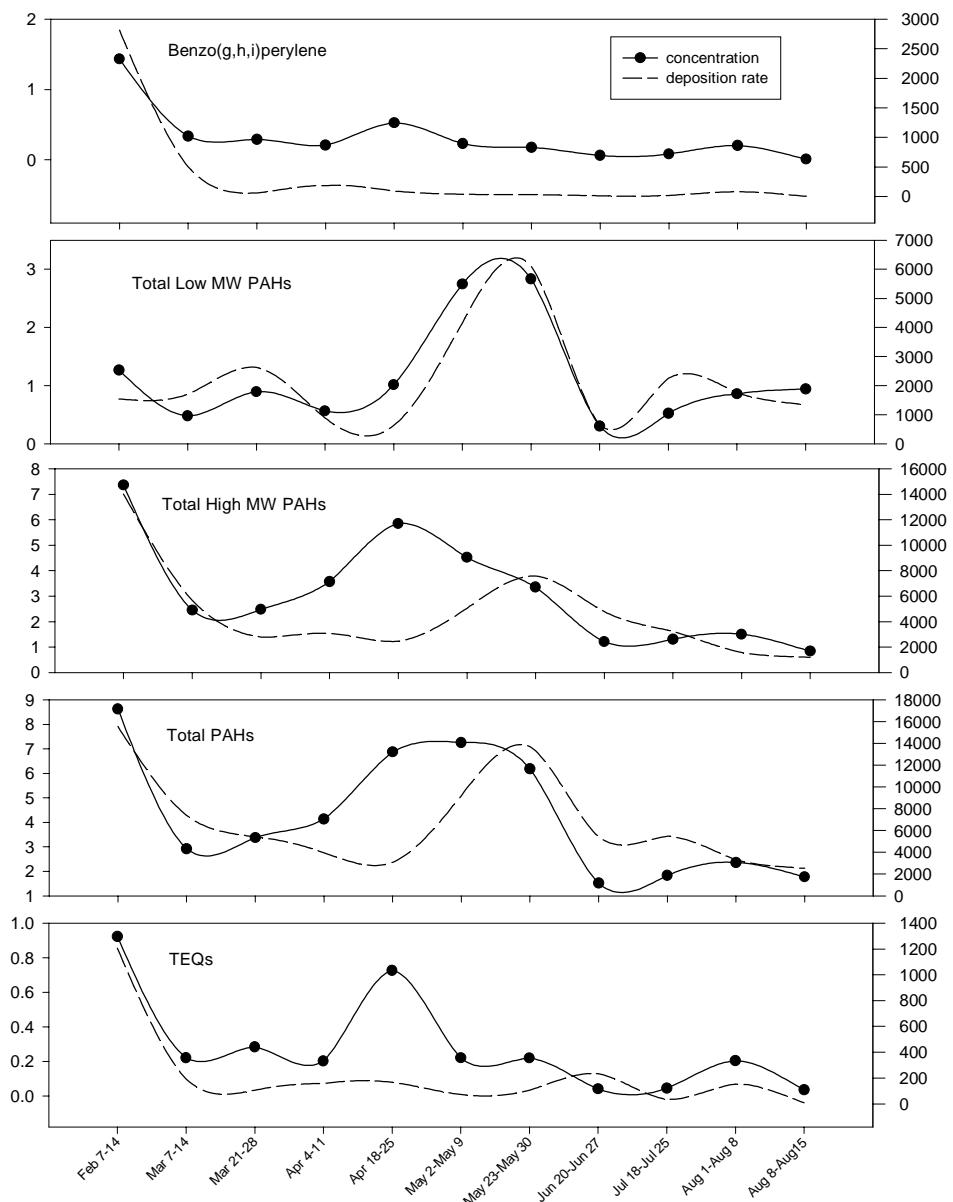


Figure 17 (continued). PAH concentrations (ng/m<sup>3</sup>, left axis) and deposition rates (ng/m<sup>2</sup>/day, right axis) measured in LPI samples from Burnaby Lake in 1995.