California Environmental Protection Agency

Air Resources Board

Ambient Air Monitoring for Hexavalent Chromium and Metals in Barrio Logan: May 2001 through May 2002

Operations Planning and Assessment Section
Quality Management Branch
Monitoring and Laboratory Division

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In addition to this report, the companion paper Neighborhood Scale Monitoring in Barrio Logan, authored by Linda C. Murchison, Carolyn B. Suer, and Jeffrey P. Cook of the California Air Resources Board, was prepared and presented at the Air and Waste Management Association's 96th Annual Conference and Exhibition, June 22-26, 2003, in San Diego, CA.

I. Report Identification and Approval

Title: Ambient Air Monitoring for Hexavalent Chromium and Metals in Barrio Logan: May 2001 through May 2002

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Approval: The following monitoring report has been reviewed and approved by the Monitoring and Laboratory Division

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II. Introduction

In May 2001, the Air Resources Board (ARB) began monitoring around two chrome plating facilities in the San Diego community known as Barrio Logan (Figure 1). The location of the chrome-plating facilities close to multiple residences and a community youth center, coupled with local concern over hexavalent chromium emissions from these facilities, provided a strong basis for designing a receptor-oriented sampling scheme focusing on airborne hexavalent chromium concentrations. The monitoring conducted for this study was also consistent with ARB's policy of incorporating environmental justice concerns into all ARB programs.

A second, equally important reason for monitoring in Barrio Logan was to provide monitoring data pursuant to the Children's Environmental Health Protection Act (SB25, Escutia, 1999). SB25 requires that air monitoring be conducted at multiple locations within each of six communities to evaluate the levels of air pollution, including toxic air contaminants, affecting children. Monitoring at the Memorial Academy Charter School, the primary SB25 site in the San Diego area, was conducted from October 1999 through February 2001, and generated data on the ambient concentrations of over fifty pollutants. The full report may be accessed on the internet at www.arb.ca.gov/ch/aq_result/barriologan/tech_support_doc_07-02_final.pdf.

In response to the concerns of the community members, and to meet the requirements of SB25, staff of the Monitoring and Laboratory Division (MLD) collected ambient air samples for hexavalent chromium and other metals in Barrio Logan between May 2001 and May 2002. Samples were collected near two chrome plating facilities on Newton Avenue, a residential-commercial thoroughfare located between San Diego Bay and Interstate Highway 5 (Figure 2).

The monitoring at Barrio Logan also addressed the need for data to verify that the existing chrome plating Air Toxic Control Measure (ATCM) is effectively providing public health protection, especially in community settings where residences and sensitive receptors are in close proximity to possible emission sources.[1] Barrio Logan was well-suited for assessing the effectiveness of the hexavalent chromium ATCM since it is a residential-commercial area with single-family homes and apartments located in close proximity to light industrial facilities, including decorative and hard chrome plating shops. Many of the families living near the chrome plating shops include children and the elderly. In addition to the plating shops, there are approximately twelve single-family residences, a cabinet shop, a neighborhood youth center, and a community swimming pool on Newton Avenue between South Evans Street and Sampson Street.

As a result of this monitoring, the current ATCM is being reevaluated with respect to emission controls required for decorative chrome plating facilities.

[1] 17CCR §93102, Hexavalent Chromium Airborne Toxic Control Measure for Chrome Plating and Chromic Acid Anodizing Operations. Adopted: February 18, 1988. Amended: May 21, 1998.

Figure 1: San Diego Bay Region

Master Plating
(Decorative Chrome)

Carlson & Beauloye
(Hard Chrome)

Figure 2: Newton Avenue Chrome Plating Shops

This report includes a description of the sampling approach used during each phase, a summary of the analytical methods used, quality control information, data quality objectives, and a summary of results. All sampling protocols as well as field and laboratory operating procedures are included in a separate appendix.

III. Sampling Design

A. Site Selection

The selection of sampling sites was based on the requirement to measure hexavalent chromium emissions from the nearby chrome plating facilities. Of primary importance was placement of the samplers as close as possible to residences and sites with greater resident activity or at a community center. In most cases, residents were receptive to placing samplers in their front yards.

In a subsequent phase of the project, samplers were placed where the highest ambient concentrations were likely to be measured. Several key factors were considered in determining the placement of the samplers. First, any possible sources of hexavalent chromium other than the plating facilities were identified and evaluated in terms of the likelihood that emissions from those sources would impact the samplers.

Second, the influence of wind speed and direction on sampling locations near the plating facilities was considered. Wind roses were created using meteorological data from San Diego Airport/Lindbergh Field and measurements made from a meteorological station placed on Newton Avenue during the earlier phase of the project. The wind roses, coupled with input from the San Diego County Air Pollution Control District (SDAPCD), assisted in placement of the samplers at residences and other locations in the neighborhood to better explain impacts from the plating operations on residents.

During the latter phases of sampling, staff of the ARB and the SDCAPCD used air dispersion models to place additional samplers and ensure complete coverage in all areas of expected high concentrations. Meteorological data and facility emission rates from source tests collected early in the project were used as model input.

All sampling locations were chosen with reference to Appendix E of Title 40 Part 58 of the Code of Federal Regulations (CFR), and other monitoring guidance documents. The criteria account for the influence of nearby buildings, trees, roadways and other topographical features that may impact the samplers. Some compromises to specifications on allowable distances between obstacles and the samplers were necessary given their location near houses. (Refer to photographs in Appendix E (page 589).

Sampling was done in six phases with the last four phases conducted consecutively. Each sampling phase involved differences in site locations, sampling duration, or additional sampling for selected metals, depending on the specific objective. The initial phases of sampling were intended to understand exposure of residents to hexavalent

chromium, and to determine general ambient concentrations in the area. When elevated ambient concentrations at nearby residences immediately around the platers were observed, the study focus changed to identify the specific cause of the high concentrations.

B. Sampling Times

1. Period

The study period for hexavalent chromium in Barrio Logan was 133 days between May 22, 2001, and May 24, 2002. The sampling period was made up of six phases: I, II, III, III-A, III-B, III-C, and III-D (see Table 1). The last four phases, during which the source and pattern of hexavalent chromium emissions from the chrome shops were determined, occurred from February 5, 2002, through May 24, 2002.

2. Duration

The sampling duration varied depending on the site objective and the parameter measured (hexavalent chromium or other metals). Each sampling phase provided information for the next phase, allowing for more focused sampling near the potential source during the time of maximum expected emissions.

Ambient sampling was 24-hours and 12-hours in duration. Indoor sampling at each plating facility was initially conducted for 8-hours and included hours of business and/or plating operation. This was later expanded at one plater to include 12-hour and 24-hour duration indoor samples to coincide with the ambient sampling.

Twelve-hour indoor sampling was added at one plater to obtain information on re-entrainment of hexavalent chromium dust during the early morning hours of setup and cleaning prior to the start of plating operations.

3. Frequency

At the outset, ambient sampling was conducted each weekday, from May 22, 2001 through June 8, 2001. During two weeks of sampling in December 2001, the frequency increased to include weekdays and Saturdays. From February 5 through the end of the project on May 24, 2002, sampling occurred daily.

The frequency of indoor sampling was linked to the operation of the plating facilities and, in the case of one of the two plating facilities, coincided with days on which source emissions tests were performed (see Phase III (February/March 2002) page 16 for more information).

Table 1 summarizes the sampling period, duration, and frequency during each phase of the study.

Table 1: Hexavalent Chromium Sampling Times

Phase	*Dates*	*Period*	*Duration*	*Frequency*
I*	May 22 – June 8, 2001	13 days	24 hours	Each weekday except for May 28
II	December 3 – December 17, 2001	13 days	24 hours	Daily, Monday - Saturday
III	February 5 – March 8, 2002	32 days	24-, 12-, and 8-hour samples	Daily
III-A	March 11 – March 24, 2002	14 days	23- and 12-hour samples	Daily
III-B	March 25 – March 28, 2002	4 days	23- and 12-hour samples	Daily
III-C	March 29 – April 19, 2002	22 days	23- and 12-hour samples	Daily
III-D	April 20 – May 24, 2002	35 days	23- and 12-hour samples	Daily

*Data from Phase I were later invalidated and were not used in evaluations.

IV. Sampling Method

ARB and SDCAPCD staffs conducted the air sampling in Barrio Logan. The sampling techniques, including field quality control procedures, were developed by the ARB.

A. Air Samplers

The ambient air samplers used for the project were portable BGI, Inc. PQ-100 PM10 Reference Samplers (BGI). A XonTech 920 air sampler operated by the SDCAPCD was used indoors at the exhaust port at Master Plating. Both samplers collected total suspended particulate.

The BGI air sampler is a single-filter, battery-powered, mass-flow controlled unit capable of 24-hours of continuous operation. Each unit is microprocessor-controlled and can store hourly and 24-hour average flow rate information.

The XonTech 920 air sampler is a multi-channel unit capable of collecting hexavalent chromium and metals samples simultaneously. The 920 unit, used in ARB's regular toxics air monitoring network, is less portable than the BGI sampler and requires 110v AC current. The 920 sampler is also mass-flow controlled and may be programmed to start and stop without the presence of a field operator.

Throughout the project, all sampling was conducted at a nominal flow rate of 10 standard liters per minute (slpm) during each sampling run. The flow rate was pre-set and maintained by each sampler with a mass flow controller. Sampling duration varied among sites from eight hours to twenty-four hours, but all sampling was conducted at a constant flow rate. All samplers were configured to collect total suspended particulate only and were not equipped with any size selective inlet, impactor, or cyclone. Operational details for the BGI sampler and XonTech 920 can be found in Appendix B.2 (page 171).

B. Hexavalent Chromium Sample Filters

Whatman 37 millimeter cellulose fiber filters (20-25 micron pore size prior to preparation) were used for sampling hexavalent chromium. The filters have low ash residue and metal content. Prior to use, the filters were soaked in a sodium bicarbonate solution then dried in a fume hood. The sodium bicarbonate is used as to prevent chemical reduction of the hexavalent chromium in the sample. Filters were inspected for contamination or damage, then mounted in plastic filter cassettes and stored in petri dishes for transport to the field. Filters were prepared in batches and released to the field on an as-needed basis. All filters were prepared, handled, and transported under identical conditions.

C. Total Metals Sample Filters

Whatman 37 millimeter Teflon membrane filters (0.5 micron pore size) were used for sampling seven metals (total chromium, lead, copper, manganese, zinc, nickel, and iron). Unlike the filters for hexavalent chromium, no pre-treatment is required. All total metals filters were inspected for contamination or damage, mounted in plastic filter cassettes and stored in petri dishes for transport to the field. Sample and field blank filters were prepared, handled and transported under identical conditions. All filters were prepared and analyzed at ARB's northern laboratory in Sacramento.

D. Meteorological Station

A Met One meteorological (met) station was operated at the "Vacant Lot " site on Newton Avenue during all phases of the project. The Met One station is a battery-powered unit capable of collecting and storing hourly average data on wind speed, wind direction, ambient temperature, and relative humidity. The Met One data logging system calculates and records meteorological parameters. The standard deviation of the horizontal wind direction, known as sigma-theta, was collected by the Met One data logger and recorded in hourly averages. Sigma theta values, wind speed and direction, along with emissions information may be used in point source dispersion modeling.

The met station was positioned according to standard siting criteria used by the ARB. Priority was given to locating the met station coincident with a sampler. This resulted in placing the met station closer to a nearby one story house and 15-foot tall tree than the specified distance of one and one-half times the obstruction height. Another known compromise was the six-foot height of the station instead of the recommended ten-foot minimum.

Hourly averaged measurements of ambient temperature, wind speed, wind direction, and relative humidity were collected. Meteorological data were used during several phases (-III, -III-A, -III-B, and -III-C) of monitoring, along with associated hexavalent chromium emission related data for modeling runs to site monitors at the south end of Newton Avenue and along Main Street.

Daily wind speed and predominant wind direction data are provided in Appendix C. The predominant wind direction was calculated using the hours between 0700 and 1800 each day to coincide with hours of chrome plating at Master Plating.

V. Sampling Locations and Events

Several phases of monitoring were conducted to evaluate emissions of hexavalent chromium and metals near the plating facilities. The sampling dates, duration, locations and sampling design of each phase are described below as Phase I through Phase III-D. The selection of ambient sampling sites was based primarily on the location of receptors and their proximity to the chrome plating facilities. With the exception of Phase I, State and Federal siting criteria were used (40CFR, Part 58, Appendix E, and ARB's Quality Assurance Manual, Volume II, Section 2.0.4 (February 2000)) as guidance.

The monitoring sites consisted of the following locations, as shown in Figure 3:

- *2121 Newton Avenue*
  A residence located on the south side of Newton Avenue between the chrome plating shops. It consists of a single-family residence facing Newton Avenue, and a second, smaller residence directly behind the first. Both residences are occupied.

- *Alley*
  A rooftop located on the south side of Newton Avenue. The alley monitoring site is in the predominant downwind location of one of the two plating facilities (Master Plating) and is located directly south of the residences at 2121 Newton Avenue. The alley runs parallel to Newton Avenue.

- *Master Plating*
  Master Plating is one of the two neighborhood chrome plating facilities around which most of the monitoring was conducted. It is a decorative chrome plating facility applying a relatively thin layer of chrome over nickel plated parts such as bathroom fixtures, automotive parts, and other small machined parts. Plating occurs during the shop's regular business hours of approximately 7:00 a.m. to 4:00 p.m. but was generally confined to Thursdays and Fridays in the afternoon. Mater plating is located at 2109 Newton Avenue.

  Monitoring inside Master Plating occurred at the exhaust fan outlet, referenced in data tables as "MPIEXT," and at the opposite end of the building, referenced as "2109 Newton."

- *Carlson & Beauloye (C&B)*
  C&B is a hard chrome plater specializing in applying wear and corrosion resistant chrome surfaces to industrial and military parts. It is the second

plating facility on the 2100 block of Newton Avenue and is located at 2141 Newton Avenue. Chrome plating at C&B occurs for longer periods, often over 24 hours or more, since the thickness of chrome plating on industrial parts is typically tens times or more that applied to decorative chrome parts. C&B also has an extensive machine shop with grinding, fabricating, and metal spraying capabilities. Monitoring at C&B was conducted within the facility in conjunction with a series of stationary source tests to determine compliance with applicable State and District regulations as specified on the facility's permit to operate.

- *2144 Newton Avenue*
  A single-family residence located on north side of Newton Avenue across the street from C&B.

- *2152 Newton Avenue*
  A single-family residence located on north side of Newton Avenue and to the east of 2144 Newton Avenue, also across the street from C&B.

- *Mercado Apartments*
  A multi-unit apartment complex located on the 2000 block of Newton Avenue to the north of the plating facilities. Monitoring at the Mercado Apartments occurred in the parking area along South Evans Street.

- *Vacant Lot*
  A fenced site located on the east side of Newton Avenue, directly across the street from Master Plating. Local residents occasionally use the area for outdoor cooking and ceremonial gatherings. Samplers and a meteorological station were placed in the vacant lot.

- *2168 Newton Avenue*
  A residence located on north side of Newton Avenue, in the predominant downwind direction from Master Plating and C&B. Monitoring at 2168 Newton Avenue was based on air dispersion modeling results from ARB and SDCAPCD staff.

- *2196 Newton Avenue*
  The site of a community swimming pool operated and maintained by the Barrio Station, a youth activity center. Referenced in data tables simply as "Pool," this monitoring site is located near 2168 and is predominantly downwind of the plating facilities.

- *2191 Main Street*
  The address of a half-block-long warehouse on south side of Main Street; an impact area for possible emissions from C&B, as predicted by dispersion models.

- *2141 Main Street*
  The address of an empty building adjacent to the warehouse at 2191 Main Street. Owned by San Diego Gas & Electric, the location of the monitoring site on this building was also based on modeling results.

A. Phase I (May / June 2001)

Hexavalent chromium sampling in Barrio Logan occurred daily from May 22 through June 8, 2001. Seven samplers were used during Phase I, five single units and one collocated pair. Samplers were located in the front yards of 2121, 2144, and 2152 Newton Avenue. The remaining samplers were placed in the Alley, the parking area of the Mercado Apartments, and a collocated pair of samplers in the Vacant Lot. The sampling duration was 24 hours. A meteorological station was placed in the Vacant Lot to collect data on wind speed and direction.

One purpose of this sampling was to collect data needed for evaluating the emissions from the two chrome platers on the neighborhood. Samplers were placed in a semi-circular pattern around the facilities on residential property. The objective was to gather information on exposure of nearby local residents. Daily activity information, in the form of ampere-hours, was recorded from each plating operation.

An in-depth review of sampler placement after Phase I determined that the sites did not meet siting criteria and hexavalent chromium results may have been adversely affected at 2121, 2144, and 2152 Newton Avenue, and the Vacant Lot. Airflow to the samplers at the Vacant Lot may also have been obstructed due to fine-mesh screens placed around the lot fence by the property owners. Consequently, data from this phase of monitoring was deemed invalid for use in further assessments.

In the winter of 2001, samplers were re-deployed to the same locations as Phase I monitoring.

B. Phase II (December 2001)

The repeat sampling effort, identified as Phase II, occurred from December 3 through December 17, 2001. Greater consideration was given to placement of sampler inlets with respect to the ground and possible airflow obstructions. Tripods were used to elevate the sampling inlets of samplers at 2121, 2144, and 2152 Newton Avenue and at the Vacant Lot to a minimum of two meters above the ground.

The sampling approach remained the same as for Phase I. The sampling duration at all sites was 24 hours and, as with Phase I, the hours of plating at each facility were recorded as ampere-hours. The purpose for recording ampere-hours was to confirm that any hexavalent chromium readings from air sampling coincided with actual plating from one or both of the facilities. Sampling on Saturday was added.

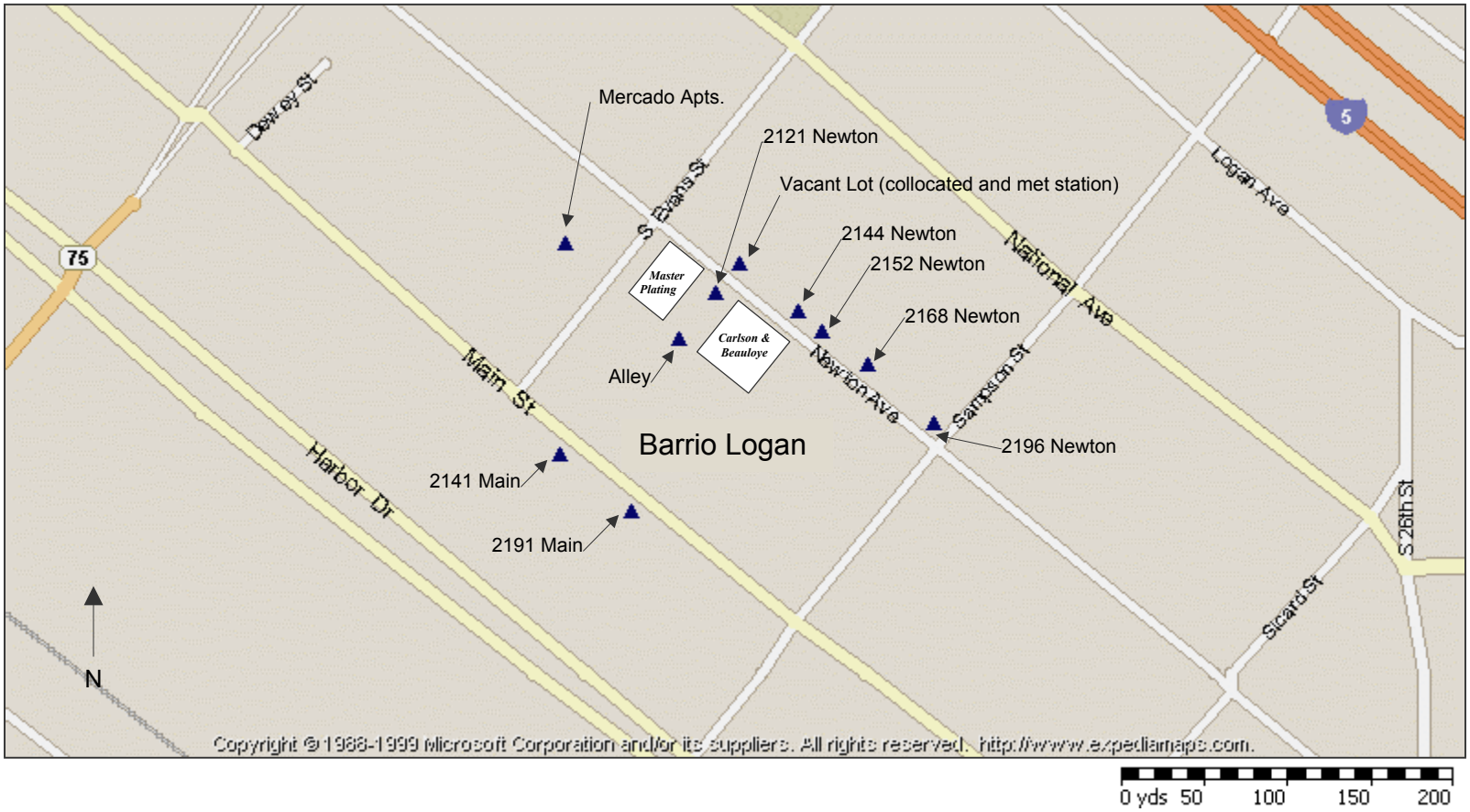
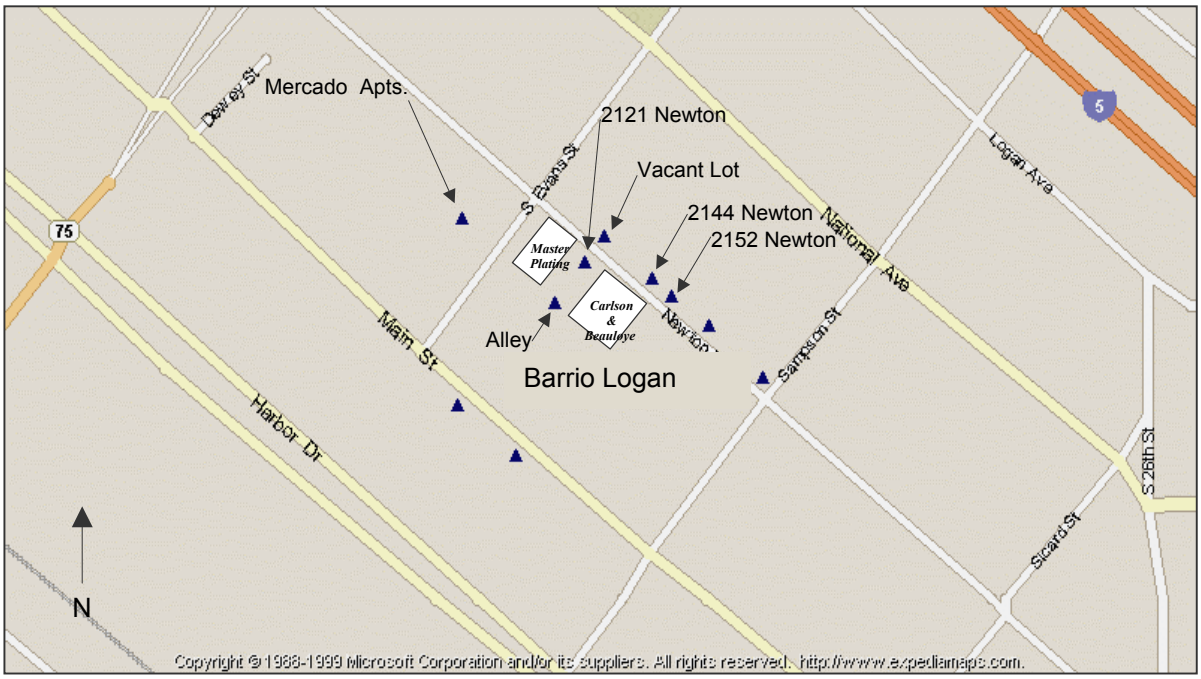


Figure 3: Barrio Logan Outdoor Sampling Locations

The results of the December monitoring showed some unusually high hexavalent chromium levels (nine samples had results greater than 3.0 ng/m^3) along Newton Avenue and in the immediate vicinity. The single highest 24-hour ambient hexavalent chromium value recorded in ARB's statewide toxics network was 22 ng/m^3 measured on February 20, 1995, in Burbank in the South Coast Air Basin. The next highest values statewide were 9.9 ng/m^3 and 3.0 ng/m^3. The statewide annual average is 0.12 ng/m^3. Levels of hexavalent chromium in Phase II ranged from less than the LoD (0.2 ng/m^3) to 22 ng/m^3. Among the 25 measurements in Phase II that were above the LoD, the average value was 3.1 ng/m^3 and the median was 1.3 ng/m^3. Seven of the 25 values above the LoD were observed at the monitoring site in the Alley. Results of the December sampling are shown in Table 2.

Figure 4: Phase II Monitoring Sites



Unlabelled sites were not used in this phase.

Table 2: Phase II - December 3-17, 2001- Hexavalent Chromium Results

Date	Day	Wind Direction	MP Amp Hours	2121 Newton (24hr)	Vacant Lot (24hr)	Vacant Lot (C) (24hr)	2144 Newton (24hr)	2152 Newton (24hr)	Alley (24hr)	Mercado Apts (24hr)
12/03/01	Monday	WNW	NA	<0.2	<0.2	NA	<0.2	<0.2	<0.2	<0.2
12/04/01	Tuesday	WNW	0	0.2	<0.2	<0.2	<0.2	<0.2	0.5	<0.2
12/05/01	Wednesday	WNW	421	1.9	<0.2	<0.2	<0.2	0.3	0.6	NA
12/06/01	Thursday	WNW	NA	3.8	<0.2	<0.2	0.2	0.2	0.3	<0.2
12/07/01	Friday	W	NA	9.3	3.6	3.2	7.9	4.8	1.3	0.3
12/08/01	Saturday	WNW	closed	<0.2	<0.2	NA	<0.2	<0.2	<0.2	<0.2
12/09/01	Sunday	(various)	closed							
12/10/01	Monday	WNW	0	<0.2	<0.2	<0.2	0.8	1.5	<0.2	<0.2
12/11/01	Tuesday	S	0	<0.2	<0.2	<0.2	NA	<0.2	4.0	0.3
12/12/01	Wednesday	WNW	0	0.2	<0.2	<0.2	<0.2	<0.2	6.9	1.0
12/13/01	Thursday	S	416	2.4	<0.2	<0.2	<0.2	<0.2	22	0.5
12/14/01	Friday	WNW	NA	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
12/15/01	Saturday	WNW	closed	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
12/17/01	Sunday	WNW	closed	0.3	<0.2	<0.2	0.4	0.5	<0.2	<0.2

All result concentrations are in nanograms per cubic meters (ng/m^3).
Hour in parentheses is sampling duration.
(C) = collocated sampler

Limit of Detection for 24 hour sample = 0.2 ng/m^3.
NA = invalid sample
Shaded areas indicate no sample collected.

C. Phase III (February / March 2002)

Further sampling was conducted to identify the source or sources of the emissions and the specific activities leading to the high concentrations found in December. Follow-on sampling began on February 5 and ran daily through March 8, 2002. As with the December sampling, ARB staff recorded ampere-hours from C&B and Master Plating at the beginning and at the end of each sampling day. The SDCAPCD conducted sampling inside the building near the facility's exhaust fan at Master Plating. This began on February 7 and continued each weekday, except for February 18, until March 8, 2002.

A comprehensive approach was taken to investigate the chrome plating facilities on Newton Avenue. The goal was to identify the source of the emissions, including the pathway by which the hexavalent chromium became airborne, and to address the public health concern associated with the ambient hexavalent chromium levels.

The following is a summary of additional investigation and sampling conducted within the neighborhood to fully evaluate the nature and extent of the high hexavalent chromium concentrations first observed in December:

1) Staff of SDCAPCD and ARB collected activity data from each facility, including ampere-hours, operational status of plating tanks, type and number of parts being plated, and other operating processes, such as the use of air agitation to mix the plating solution ("sparging").

2) The SDCAPCD, in coordination with ARB, performed unannounced, detailed compliance inspections and reviewed operational records at Master Plating and C&B. Despite the high hexavalent chromium levels in the community, both facilities were found to be operating in compliance with the existing rules and were operating in accordance with their permits at the time.

3) On March 5 and 6, SSD and SDCAPCD staff collected a total of 35 soil, dust, and wipe samples (including blanks) at various locations near the platers including yards of nearby residences, the vacant lot and other neighborhood sites. Dust samples were also collected within Master Plating and C&B. Each sampling site represented likely areas for the accumulation of hexavalent chromium-laden dust and other areas where the presence of hexavalent chromium was suspected. In addition to hexavalent chromium, samples were analyzed for total chromium, lead, and nickel using U.S. EPA methods. EnviroMatrix Analytical of San Diego, a private, accredited environmental laboratory, performed all analyses for SDCAPCD.

   Results from dust and soil samples were used as a preliminary screening tool primarily to help guide the investigation. Details regarding the analytical results from soil and dust samples may be obtained from the Program Review Section within SSD.

4) ARB conducted source tests of C&B along the exhaust ducting of the facility's two chrome tanks on February 11, 12, 19, 20, 27, and 28, 2002. The purpose of the source tests was to determine if the mist elimination system for the chrome plating tanks was functioning as designed and whether the facility was in compliance with the District rules and regulations. The test results showed that the source met the existing rules and regulations of the SDCAPCD.

5) Indoor air sampling was conducted at Master Plating and at C&B. At Master Plating, indoor sampling was conducted at the facility's exhaust fan. This represented air being emitted into the community and included emissions from all phases of the plater's operation, including housekeeping. Placing the sampler at the facility's exhaust fan was done in lieu of traditional source testing since Master Plating is a decorative chrome plater and does not have a chromic acid mist collection and elimination system. It was required to suppress hexavalent chromium emissions on the surface of the plating tanks. Indoor hexavalent chromium concentrations at Master Plating ranged from 2.4 to 904 ng/m^3 (8 to 24-hour averages). See Figure 10 for a graph of these results.

   Indoor sampling at C&B was conducted only in conjunction with source tests of the facility to verify that the chromic acid mist collection system was functioning correctly and that source test results reflected the controlled emissions from properly operating collection, transport, and control systems. Eight hour indoor samples at C&B were collected on February 11, 12, 19, 20, 27, and 28, 2002. Indoor hexavalent chromium concentrations ranged from 12 to 43 ng/m^3.

6) An air dispersion model was run to estimate locations of high concentrations using emission data from Master Plating and C&B and meteorological data collected from the Vacant Lot. This assisted in siting additional monitors.

7) ARB and SDCAPCD staff conducted extensive area-walks and unannounced inspections of nearby businesses in Barrio Logan looking for possible sources of hexavalent chromium that might have led to the elevated levels observed in December. None were found.

8) Beginning with Phase III, a workgroup consisting of staff and management from the Planning and Technical Support Division (PTSD), SSD, MLD, and the SDCAPCD began evaluating hexavalent chromium data with respect to wind direction and plating activity data.

Although Phase III ambient sampling occurred at the same locations as Phase II sampling, significant differences were made to the sampling design to diagnose the causes of the hexavalent chromium emissions. Ambient sampling was expanded to include Saturdays and Sundays. Multiple samplers were placed at three of the six ambient sites to obtain greater temporal resolution in sampling and/or to collect ambient concentration data on airborne metals. The metals information was collected at the source and in the community in order to establish emission fingerprints.

An increase in temporal resolution was needed to better align the facilities operating hours with the sampling hours. It was achieved by operating two samplers at 2121 Newton and 2152 Newton. One of the two samplers at each site was operated for a 24-hour duration, the other, for a 12-hour duration. Both samplers were set with internal timers to begin at approximately 8:00 a.m. each day. Since the flow rate through each sampler was kept the same, the LoD was increased by a factor of two for the 12-hour samples from 0.2 ng/m^3 to 0.4 ng/m^3. Nevertheless, because the ambient concentrations present in the neighborhood frequently were at or above 0.4 ng/m^3, the addition of 12-hour samples provided useful information.

The residence at 2121 Newton was chosen for 12-hour sampling because it is bounded by the two chrome plating facilities. 2152 Newton was chosen because it is located directly across Newton Avenue from C&B, the larger (higher amp-hour production rate) chrome plating facility.

Two ambient samplers and one indoor air sampler, at Master Plating, collected seven different airborne metals: total chromium, copper, iron, lead, manganese, nickel, and zinc. One of the two ambient multiple metals samplers was placed at 2121 Newton Avenue. The second metals sampler was placed at the Alley monitoring location, the location of the 22 ng/m^3 hexavalent chromium result in December 2001. Both ambient multiple metals samplers were operated for 24 hours per sample.

The metals readings would help identify the source of the emissions using a variety of ratios and comparisons. One compared the hexavalent chromium to total chromium ratio and another compared indoor concentrations of one of the six other metals analyzed with outdoor concentrations. The seven metals chosen for analysis were associated with chrome plating and activities, such as grinding, welding, and nickel plating.

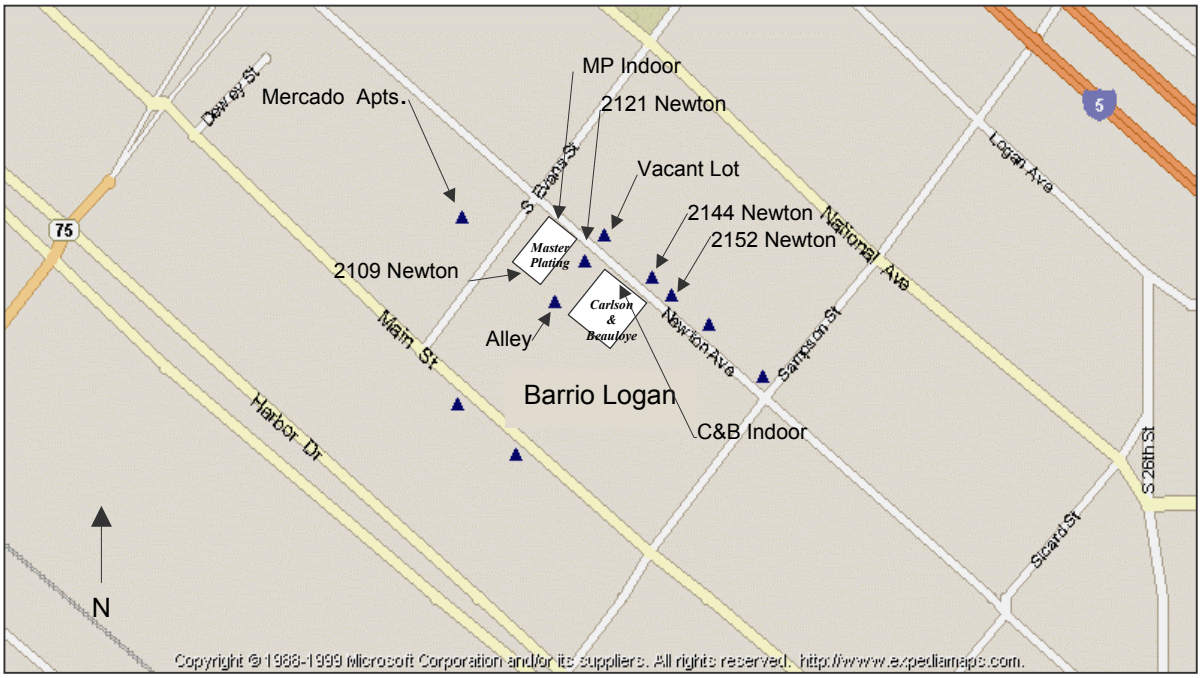
Indoor sampling at Master Plating continued for the duration of the project. At Master Plating, the sampling duration indoors was primarily aimed at profiling emissions during hours of facility operation. Exhaust fan samples were collected for eight continuous hours during normal business hours (approximately 8:00 a.m. through 4:00 p.m. on weekdays), and included hexavalent chromium measurements as well as metals measurements. An additional 13 indoor hexavalent chromium samples were collected just inside the roll-top door located on the southwest side of Master Plating adjacent to the alley. The back door samples (identified as 2109 Newton on data tables) were collected over 24-hours and were intended to establish whether the higher values seen at the Alley sampling location were caused by activities within Master Plating. Indoor sampling at C&B was conducted for 8 hours on those days that source testing occurred at the facility.

Results from Phase III air monitoring confirmed the continued presence of high ambient levels of hexavalent chromium first observed in December 2001. Twenty-four hour levels at 2121 Newton were as high as 3.6 ng/m^3. Twelve-hour samples collected at 2121 Newton ranged from less than the LoD (0.4 ng/m^3) to 4.7 ng/m^3. The highest

ambient concentration recorded at a site other than 2121 Newton during Phase III was 0.9 ng/m^3 at 2152 Newton (12-hour sample collected on February 22).

Sampling results for hexavalent chromium are shown in Table 3. For comparison purposes, the closest routine toxics sampling site to Newton Avenue is located in Chula Vista, approximately 10 miles to the south. In 2001, the highest 24-hour hexavalent chromium measurement was 0.3 ng/m^3 at Chula Vista, one-twelfth of what was detected at 2121 Newton during Phase III.

Figure 5: Phase III Monitoring Sites



Unlabelled sites were not used in this phase.

Table 3: Phase III - February 5 - March 8, 2002 - Hexavalent Chromium Results

Date	Day	Wind Direction	MP Amp Hours	C&B Amp Hours		2121 Newton (24hr)	2121 Newton (12hr)	Vacant Lot (24hr)	Vacant Lot Co-Loc (24hr)	2144 Newton (24hr)	2152 Newton (24hr)	2152 Newton (12 hr)	Alley (24hr)	Mercado Apts (24hr)	MPIEXT Indoor (8hr)	C&B 2141 Newton (24hr)	2109 Newton (24hr)
				Tank 1	Tank 2												
2/5/02	Tuesday	SSW	0	13593	11698	<0.2	<0.4	0.3	0.3	<0.2	<0.2	<0.4	0.3	NA			
2/6/02	Wednesday	SSE/W	193	14153	0	0.3	<0.4	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2			
2/7/02	Thursday	W	280	0	0	0.4	NA	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	149.0		
2/8/02	Friday	W/WSW	370	1975	0	0.8	0.9	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	265.0		
2/9/02	Saturday	W/SW	closed	4383	2650	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2			
2/10/02	Sunday	(various)	closed	4383	2650	1.4	<0.4	0.2	<0.2	0.3	0.4	<0.4	0.8	<0.2			
2/11/02	Monday	W	0	8659	5917	0.6	0.8	0.3	0.3	<0.2	0.4	0.5	0.2	0.2	17.0	30.0	
2/12/02	Tuesday	SSE	0	8798	5237	0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.4	0.2	<0.2	3.9	27.0	
2/13/02	Wednesday	SSE	141	2690	1	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	NA	220.0		
2/14/02	Thursday	S	363	5279	0	<0.2	0.4	0.3	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	451.0		
2/15/02	Friday	W	203	3779	0	0.5	1.7	<0.2	<0.2	<0.2	<0.2	0.5	<0.2	<0.2	368.0		
2/16/02	Saturday	W	closed	1992	0	<0.2	0.4	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2			
2/17/02	Sunday	SE/SW	closed	59	0	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.4	0.2	<0.2			
2/18/02	Monday	W	0	59	0	0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.4	0.2	<0.2			
2/19/02	Tuesday	W	0	1	2630	0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	5.9	12.0	
2/20/02	Wednesday	W	0	6258	3744	0.3	0.4	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	0.2	6.0	18.0	
2/21/02	Thursday	W	423	323	2257	3.6	4.7	0.4	0.4	0.6	0.3	0.7	0.4	0.4	521.0		544.00
2/22/02	Friday	WNW	377	2219	1911	1.7	4.3	0.2	<0.2	0.3	0.3	0.9	<0.2	0.2	442.0		302.00
2/23/02	Saturday	W/SW	closed	1885	1267	0.3	<0.4	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2			
2/24/02	Sunday	W	closed	0	3	<0.2	<0.4	<0.2	<0.2	0.2	<0.2	<0.4	<0.2	<0.2			

All result concentrations are in nanograms per cubic meters (ng/m^3). Limit of Detection for 24 hour sample = 0.2 ng/m^3.
Hour in parentheses is sampling duration. Limit of Detection for 12 hour sample = 0.4 ng/m^3. (C) = collocated sampler
MP = Master Plater (decorative chrome plating) Limit of Detection for 8 hour sample = 0.6 ng/m^3. NA = invalid sample
C&B = Carlson & Beauloye (hard chrome plating) Shaded areas indicate no sample collected

Table 3 (cont.): Phase III - February 5 - March 8, 2002 - Hexavalent Chromium Results

Date	Day	Wind Direction	MP Amp Hours	C&B Amp Hours		2121 Newton (24hr)	2121 Newton (12hr)	Vacant Lot (24hr)	Vacant Lot Co-Loc (24hr)	2144 Newton (24hr)	2152 Newton (24hr)	2152 Newton (12 hr)	Alley (24hr)	Mercado Apts (24hr)	MPIEXT Indoor (8hr)	C&B 2141 Newton (24hr)	2109 Newton (24hr)
				Tank 1	Tank 2												
2/25/02	Monday	W	0	6253	0	0.4	0.4	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	6.0		
2/26/02	Tuesday	W	0	13053	764	0.6	0.6	<0.2	<0.2	<0.2	NA	<0.4	<0.2	<0.2	2.4		4.40
2/27/02	Wednesday	SSE	149	9616	632	0.2	0.7	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	851.0	42.0	NA
2/28/02	Thursday	SSE	225	9942	2853	1.3	0.8	0.7	0.4	<0.2	0.2	<0.4	<0.2	<0.2	904.0	43.0	107.00
3/1/02	Friday	W	209	875.5	1721	1.9	3.4	<0.2	<0.2	0.5	<0.2	<0.4	<0.2	<0.2	614.0		216.00
3/2/02	Saturday	NNE	closed	38.5	1101	0.4	0.4	<0.2	<0.2	<0.2	<0.2	<0.4	NA	<0.2			
3/3/02	Sunday	W	closed	0	0	1.3	<0.4	<0.2	<0.2	<0.2	<0.2	<0.4	0.3	<0.2			
3/4/02	Monday	W	0	2334	1039	0.3	0.6	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	96.0		16.00
3/5/02	Tuesday	SSW	0	8780	2386	0.5	<0.4	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	48.0		26.00
3/6/02	Wednesday	W	94	3752	2982	1.0	3.1	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	652.0		215.00
3/7/02	Thursday	SSE	115	0	1562	0.2	<0.4	0.3	0.5	<0.2	<0.2	<0.4	<0.2	<0.2	367.0		
3/8/02	Friday	S	0	828	543	<0.2	<0.4	<0.2	0.2	<0.2	NA	<0.4	<0.2	<0.2	87.0		

All result concentrations are in nanograms per cubic meters (ng/m^3). Limit of Detection for 24 hour sample = 0.2 ng/m^3. NA = invalid sample
Hour in parentheses is sampling duration. Limit of Detection for 12 hour sample = 0.4 ng/m^3. (C) = collocated sampler
MP = Master Plater (decorative chrome plating) Limit of Detection for 8 hour sample = 0.6 ng/m^3.
C&B = Carlson & Beauloye (hard chrome plating) Shaded areas indicate no sample collected.

Table 4: Phase III - February 5 - March 8, 2002 - Metals Results

Date	Day	Wind Direction	MP Amp Hours	C&B Amp Hours		Total Chromium 2121 Newton (24hr)	Total Chromium Alley (24hr)	Total Chromium MPIEXT Indoor (24hr)	Copper 2121 Newton (24hr)	Copper MPIEXT Indoor (8hr)	Iron 2121 Newton (24hr)	Iron MPIEXT Indoor (8hr)	Lead 2121 Newton (24hr)	Lead MPIEXT Indoor (8hr)
				Tank 1	Tank 2									
2/5/02	Tuesday	SSW	0	13593	11698	9.1	7.8		65		1621		31	
2/6/02	Wednesday	SSE/W	193	14153	0	5.8	3.6		84		783		24	
2/7/02	Thursday	W	280	0	0	3.7	4	158	52	6327	633	5699	12	25
2/8/02	Friday	W/WSW	370	1975	0	2.8	2	281	41	5066	661	7958	12	67
2/9/02	Saturday	W/SW	closed	4383	2650	3.2	3.4		26		1886		18	
2/10/02	Sunday	(various)	closed	4383	2650	NA	5.8		NA		NA		NA	
2/11/02	Monday	W	0	8659	5917	5.4	3.7	101	48	2202	1129	11886	19	127
2/12/02	Tuesday	SSE	0	8798	5237	5.1	3.6	40	47	895	1026	10092	18	47
2/13/02	Wednesday	SSE	141	2690	1	NA	4	NA	NA	NA	NA	NA	NA	NA
2/14/02	Thursday	S	363	5279	0	4.1	3.3	497	40	8764	796	12823	12	74
2/15/02	Friday	W	203	3779	0	5.3	3.6	403	47	6062	647	8122	11	129
2/16/02	Saturday	W	closed	1992	0	3.6	NA		14		418		7.3	
2/17/02	Sunday	SE/SW	closed	59	0	2.6	2.2		11		256		4	
2/18/02	Monday	W	0	59	0	3	2.7		24		529		6.8	
2/19/02	Tuesday	W	0	1	2630	3.6	NA	NA	31	NA	732	NA	11	NA
2/20/02	Wednesday	W	0	6258	3744	4.4	4.6	43	76	1633	995	7799	14	156
2/21/02	Thursday	W	423	323	2257	7.9	5.6	488	136	7162	1882	17228	21	66
2/22/02	Friday	WNW	377	2219	1911	7	5.2	501	62	5543	1716	14028	41	47
2/23/02	Saturday	W/SW	closed	1885	1267	4.3	3.3		17		333		19	
2/24/02	Sunday	W	closed	0	3	4.8	4.2		39		706		20	

All result concentrations are in nanograms per cubic meters (ng/m^3).
Hour in parentheses is sampling duration.
MP = Master Plater (decorative chrome plating)
C&B = Carlson & Beauloye (hard chrome plating)

NA = invalid sample
(C) = collocated sampler
Shaded areas indicate no sample collected.

Table 4 (cont.): Phase III - February 5 - March 8, 2002 - Metals Results

Date	Day	Wind Direction	MP Amp Hours	C&B Amp Hours		Total Chromium 2121 Newton (24hr)	Total Chromium Alley (24hr)	Total Chromium (MPIEXT Indoor (24hr)	Copper 2121 Newton (24hr)	Copper MPIEXT Indoor (8hr)	Iron 2121 Newton (24hr)	Iron MPIEXT Indoor (8hr)	Lead 2121 Newton (24hr)	Lead MPIEXT Indoor (8hr)
				Tank 1	Tank 2									
2/25/02	Monday	W	0	6253	0	6.2	5.4	79	137	8417	1257	8371	40	1349
2/26/02	Tuesday	W	0	13053	764	8.2	10	34	80	17206	997	14723	38	3451
2/27/02	Wednesday	SSE	149	9616	632	4	3.4	797	25	5539	350	25155	14	214
2/28/02	Thursday	SSE	225	9942	2853	5.2	2.2	942	38	8742	289	12271	7.3	73
3/1/02	Friday	W	209	875.5	1721	5.2	3.7	930	34	6626	804	10340	9.8	47
3/2/02	Saturday	NNE	closed	38.5	1101	3.1	2.8		26		671		14	
3/3/02	Sunday	W	closed	0	0	7.7	4		90		1228		24	
3/4/02	Monday	W	0	2334	1039	5.6	3.9	436	52	7011	1348	30432	28	255
3/5/02	Tuesday	SSW	0	8780	2386	3.6	2.9	146	45	2365	760	10128	16	477
3/6/02	Wednesday	W	94	3752	2982	5	4	NA	46	NA	414	NA	9.9	NA
3/7/02	Thursday	SSE	115	0	1562	3.2	2.6	416	90	13947	157	15357	3.4	253
3/8/02	Friday	S	0	828	543	3.7	3.6	404	23	12045	669	12597	13	270

All result concentrations are in nanograms per cubic meters (ng/m^3).
Hour in parentheses is sampling duration.
MP = Master Plater (decorative chrome plating)
C&B = Carlson & Beauloye (hard chrome plating)

NA = invalid sample
(C) = collocated sampler
Shaded areas indicate no sample collected.

Table 4 (cont.): Phase III - February 5 - March 8, 2002 - Metals Results

Date	Day	Wind Direction	MP Amp Hours	C&B Amp Hours		Manganese 2121 Newton (24hr)	Manganese MPIEXT Indoor (8hr)	Nickel 2121 Newton (24hr)	Nickel MPIEXT Indoor (8hr)	Zinc 2121 Newton (24hr)	Zinc MPIEXT Indoor (8hr)
				Tank 1	Tank 2						
2/5/02	Tuesday	SSW	0	13593	11698	77		20		190	
2/6/02	Wednesday	SSE/W	193	14153	0	17		20		96	
2/7/02	Thursday	W	280	0	0	12	23	12	508	65	1448
2/8/02	Friday	W/WSW	370	1975	0	15	53	11	1006	83	1909
2/9/02	Saturday	W/SW	closed	4383	2650	60		17		76	
2/10/02	Sunday	(various)	closed	4383	2650	NA		NA		NA	
2/11/02	Monday	W	0	8659	5917	24	95	15	717	119	2849
2/12/02	Tuesday	SSE	0	8798	5237	30	53	19	253	116	5114
2/13/02	Wednesday	SSE	141	2690	1	NA	NA	NA	NA	NA	NA
2/14/02	Thursday	S	363	5279	0	16	35	13	672	77	1085
2/15/02	Friday	W	203	3779	0	13	28	13	846	67	1504
2/16/02	Saturday	W	closed	1992	0	7.9		8.2		50	
2/17/02	Sunday	SE/SW	closed	59	0	4.9		3.7		25	
2/18/02	Monday	W	0	59	0	10		7.3		78	
2/19/02	Tuesday	W	0	1	2630	16	NA	11	NA	86	NA
2/20/02	Wednesday	W	0	6258	3744	21	55	15	375	104	3918
2/21/02	Thursday	W	423	323	2257	54	70	32	760	215	1623
2/22/02	Friday	WNW	377	2219	1911	38	66	19	517	141	1237
2/23/02	Saturday	W/SW	closed	1885	1267	10		7.3		89	
2/24/02	Sunday	W	closed	0	3	18		10		79	

All result concentrations are in nanograms per cubic meters (ng/m^3).
Hour in parentheses is sampling duration.
MP = Master Plater (decorative chrome plating)
C&B = Carlson & Beauloye (hard chrome plating)

NA = invalid sample
(C) = collocated sampler
Shaded areas indicate no sample collected.

Table 4 (cont.): Phase III - February 5 - March 8, 2002 - Metals Results

Date	Day	Wind Direction	MP Amp Hours	C&B Amp Hours		Manganese 2121 Newton (24hr)	Manganese MPIEXT Indoor (8hr)	Nickel 2121 Newton (24hr)	Nickel MPIEXT Indoor (8hr)	Zinc 2121 Newton (24hr)	Zinc MPIEXT Indoor (8hr)
				Tank 1	Tank 2						
2/25/02	Monday	W	0	6253	0	39	63	21	461	165	3100
2/26/02	Tuesday	W	0	13053	764	44	182	23	464	142	9513
2/27/02	Wednesday	SSE	149	9616	632	9.6	186	13	1422	56	1354
2/28/02	Thursday	SSE	225	9942	2853	11	103	9.9	2323	55	3446
3/1/02	Friday	W	209	875.5	1721	30	58	11	1023	57	3289
3/2/02	Saturday	NNE	closed	38.5	1101	23		7.6		114	
3/3/02	Sunday	W	closed	0	0	33		23		143	
3/4/02	Monday	W	0	2334	1039	37	178	16	1648	140	7310
3/5/02	Tuesday	SSW	0	8780	2386	20	72	11	297	68	2687
3/6/02	Wednesday	W	94	3752	2982	9.8	NA	7.8	NA	52	NA
3/7/02	Thursday	SSE	115	0	1562	4	65	5.1	879	32	2158
3/8/02	Friday	S	0	828	543	15	68	7.6	876	55	3073

All result concentrations are in nanograms per cubic meters (ng/m^3).
Hour in parentheses is sampling duration.
MP = Master Plater (decorative chrome plating)
C&B = Carlson & Beauloye (hard chrome plating)

NA = invalid sample
(C) = collocated sampler
Shaded areas indicate no sample collected.

D. Phase III-A (March 2002)

In early March, several important modifications were made to the Phase III sampling design to coordinate the duration of each sample and to focus on those monitoring sites where most of the high values were recorded in February. Phase III-A sampling is the period from March 11 through March 24, 2002. On March 9 and 10 all samplers were shut down for quality control (QC) checks and maintenance; therefore no sampling occurred.

One modification was to reset the 24-hour sample to 23 hours to give the site operator time to service each sit and keep the sample period synchronized. A 23-hour run allowed field technicians to collect all samples, download information from each sampler's microprocessor, and still maintain the same start time for all samplers. Twenty-three hours is consistent with MLD's QC criteria for manual 24-hour samples and with the data quality objective (DQO) for coincident samples as outlined in the December 7, 2001, Barrio Logan sampling protocol. The start time for all samplers (12- and 24-hour) was approximately 8:00 a.m. each morning.

The extent of sampling was reduced to sites that consistently had the highest readings in December and February. This provided more efficient use of resources and focused our efforts where additional information was needed. The remaining sites were 2121 Newton, the Alley, and indoors at Master Plating. Sampling during this phase consisted of 12- and 24-hour hexavalent chromium measurements at 2121 and the Alley each day, and inside Master Plating each weekday. Twenty-four hour metals measurements were collected at 2121 and the Alley each day.

Beginning on March 24, ARB and SDCAPCD samplers were used to collect 12-hour hexavalent chromium samples inside Master Plating over the weekends, specifically from Sunday evening through Monday morning. The Sunday night-Monday morning time periods experienced high readings when active plating was not occurring. Sampling was reoriented to isolate this time period more distinctly and understand the emission source. All sampler start times were pre-set on Fridays prior to 4:00 p.m., as there was no access to Master Plating after 4:00 p.m. The Friday-Monday weekend sampling schedule inside Master Plating during Phase III-A was conducted as shown in Figure 6.

From March 11 through March 24, 9 of 14 24-hour ambient hexavalent chromium measurements at 2121 Newton were equal to or greater than the LoD. Five 23-hour readings were greater than 1 ng/m^3. Hexavalent chromium results from Phase III-A are shown in Table 5.

Figure 6: Weekend Sampling Scheme Inside Master Plating (starting March 23, 2002)

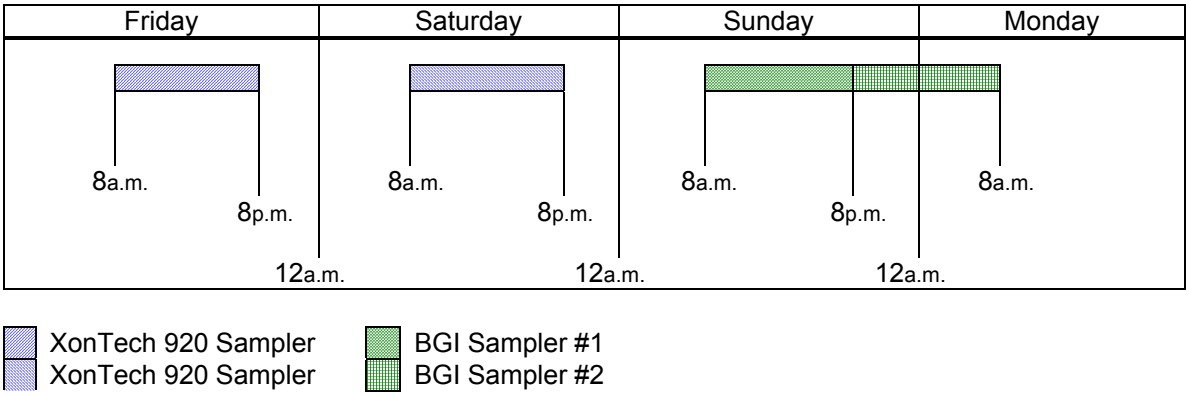
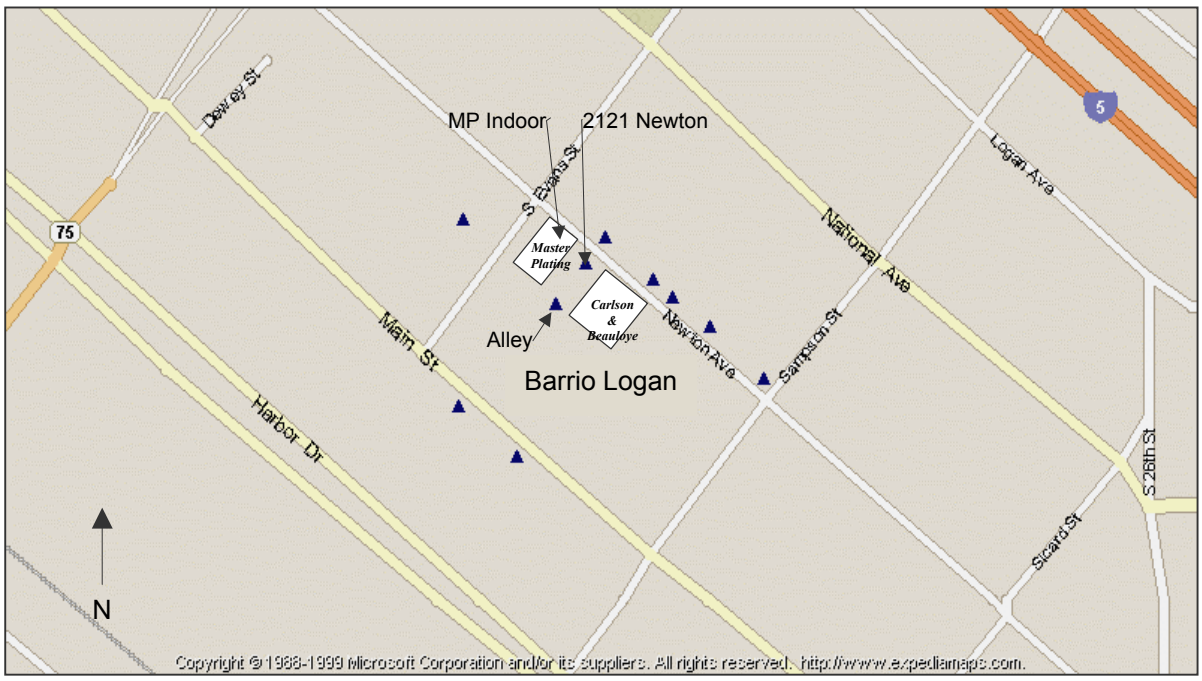


Figure 7: Phases III-A and III-B Monitors



Unlabelled sites were not used in these phases.

Table 5: Phase III-A - March 11-24, 2002 - Hexavalent Chromium Results

Date	Day	Wind Direction	MP Amp Hours	C&B Amp Hours		2121 Newton (24hr)	2121 Newton (12hr)	Alley (24hr)	Alley (12hr)	MPIEXT Indoor (12hr)	MPIEXT Indoor (24hr)	MPIEXT Indoor (12hr night)
				Tank 1	Tank 2							
3/9/02	Saturday	W	closed	0	40.5							
3/10/02	Sunday	W	closed	0	40.5							
3/11/02	Monday	W	0	3665	0	0.3	<0.4	<0.2	<0.4	5.1	4.6	
3/12/02	Tuesday	S	0	4310	2354	<0.2	<0.4	<0.2	<0.4	3.5	3.1	
3/13/02	Wednesday	SSE/WNW	0	6309	1928	0.2	<0.4	<0.2	<0.4	7.8	5.3	
3/14/02	Thursday	W	179	1482	0	1.3	1.5	<0.2	NA	308.0	142.0	
3/15/02	Friday	W	316	423	666	1.9	2.9	<0.2	<0.4	845.0	383.0	
3/16/02	Saturday	W	closed	201	0	<0.2	0.4	<0.2	<0.4			
3/17/02	Sunday	W	closed	201	0	<0.2	<0.4	<0.2	<0.4			
3/18/02	Monday	WNW	0	4676	2086	0.2	<0.4	<0.2	<0.4	36.0	17.0	
3/19/02	Tuesday	W	0	5802	31	0.3	0.5	<0.2	<0.4	6.5	12.0	
3/20/02	Wednesday	W	0	5884	2297	1.0	1.5	0.2	<0.4	60.0	22.0	
3/21/02	Thursday	W	119	7566	0	1.0	1.9	<0.2	0.4	153.0	83.0	
3/22/02	Friday	W	344	3627	0	3.1	4.8	0.3	<0.4	600.0		
3/23/02	Saturday	S/W	closed	0	0	<0.2	<0.4	<0.2	<0.4	46.0		
3/24/02	Sunday	W	closed	0	0	<0.2	<0.4	<0.2	<0.4	25.0		49.0

All result concentrations are in nanograms per cubic meters (ng/m^3).
Hour in parentheses is sampling duration.
MP = Master Plater (decorative chrome plating)
C&B = Carlson & Beauloye (hard chrome plating)
NA = invalid sample

Limit of Detection for 24 hour sample = 0.2 ng/m^3.
Limit of Detection for 12 hour sample = 0.4 ng/m^3.
Limit of Detection for 8 hour sample = 0.6 ng/m^3.
Shaded areas indicate no sample collected.
(C) = collocated sampler

Table 6: Phase III-A - March 11-24, 2002 - Metals Results

Date	Day	Wind Direction	MP Amp Hours	C&B Amp Hours		Total Chromium 2121 Newton (24hr)	Total Chromium Alley (24hr)	Copper 2121 Newton (24hr)	Copper Alley (24hr)	Iron 2121 Newton (24hr)	Iron Alley (24hr	Lead 2121 Newton (24hr)	Lead Alley (24hr
				Tank 1	Tank 2								
3/9/02	Saturday	W	closed	0	40.5								
3/10/02	Sunday	W	closed	0	40.5								
3/11/02	Monday	W	0	3665	0	NA	3.2	NA	41	NA	518	NA	13
3/12/02	Tuesday	S	0	4310	2354	3.1	2.8	16	18	238	331	16	19
3/13/02	Wednesday	SSE/WNW	0	6309	1928	5.2	3.6	66	33	941	782	13	9.5
3/14/02	Thursday	W	179	1482	0	5.4	3.8	75	42	774	768	15	13
3/15/02	Friday	W	316	423	666	5.6	3.4	43	17	483	345	11	6.7
3/16/02	Saturday	W	closed	201	0	2.3	2.1	7.4	5	141	96	2.3	1.4
3/17/02	Sunday	W	closed	201	0	2.3	1.9	6	4.8	104	95	2.7	2.8
3/18/02	Monday	WNW	0	4676	2086	NA	4.9	NA	28	NA	440	NA	10
3/19/02	Tuesday	W	0	5802	31	NA	4.9	NA	78	NA	715	NA	25
3/20/02	Wednesday	W	0	5884	2297	NA	5.7	NA	60	NA	877	NA	20
3/21/02	Thursday	W	119	7566	0	4.8	4.2	66	42	608	640	14	13
3/22/02	Friday	W	344	3627	0	NA	NA	NA	NA	NA	NA	NA	NA
3/23/02	Saturday	S/W	closed	0	0	2	1.6	7.7	3.9	96	69	3.8	1
3/24/02	Sunday	W	closed	0	0	2.1	2	7.5	7.1	153	150	10	7.9

All result concentrations are in nanograms per cubic meters (ng/m^3).
Hour in parentheses is sampling duration.
MP = Master Plater (decorative chrome plating)
C&B = Carlson & Beauloye (hard chrome plating)

NA = invalid sample
(C) = collocated sampler
Shaded areas indicate no sample collected.

Table 6 (cont.): Phase III-A - March 11-24, 2002 - Metals Results

Date	Day	Wind Direction	MP Amp Hours	C&B Amp Hours		Manganese 2121 Newton (24hr)	Manganese Alley (24hr	Nickel 2121 Newton (24hr)	Nickel Alley (24hr	Zinc 2121 Newton (24hr)	Zinc Alley (24hr)
				Tank 1	Tank 2						
3/9/02	Saturday	W	closed	0	40.5						
3/10/02	Sunday	W	closed	0	40.5						
3/11/02	Monday	W	0	3665	0	NA	17	NA	9.7	NA	62
3/12/02	Tuesday	S	0	4310	2354	14	19	5.3	7.3	37	54
3/13/02	Wednesday	SSE/WNW	0	6309	1928	25	24	15	11	92	67
3/14/02	Thursday	W	179	1482	0	18	18	15	13	102	81
3/15/02	Friday	W	316	423	666	12	10	17	9	72	45
3/16/02	Saturday	W	closed	201	0	3	2.1	2.6	2.4	21	14
3/17/02	Sunday	W	closed	201	0	3	2.2	1.7	2	15	14
3/18/02	Monday	WNW	0	4676	2086	NA	11	NA	7.1	NA	66
3/19/02	Tuesday	W	0	5802	31	NA	25	NA	15	NA	103
3/20/02	Wednesday	W	0	5884	2297	NA	26	NA	18	NA	138
3/21/02	Thursday	W	119	7566	0	21	22	15	15	95	100
3/22/02	Friday	W	344	3627	0	NA	NA	NA	NA	NA	NA
3/23/02	Saturday	S/W	closed	0	0	2.3	1.5	4.3	1.6	17	15
3/24/02	Sunday	W	closed	0	0	4.2	3.1	2	2.2	23	22

All result concentrations are in nanograms per cubic meters (ng/m^3).
Hour in parentheses is sampling duration.
MP = Master Plater (decorative chrome plating)
C&B = Carlson & Beauloye (hard chrome plating)

NA = invalid sample
(C) = collocated sampler
Shaded areas indicate no sample collected.

E. Phase III-B (Late March 2002)

Another modification, referred to as Phase III-B, ran from March 25 through March 28, 2002. It differed from Phase III-A sampling in two ways. First, 12-hour metals samples were taken within Master Plating, rather than 8-hour samples, to better index activities within the facility to 12-hour metals results at ambient sites. Second, all chrome plating activity at Master Plating stopped as of March 25 due to a court order to discontinue plating while additional air data was collected and evaluated. Therefore, all ambient readings after March 25 represented either sources of hexavalent chromium other than Master Plating, or activities by Master Plating other than plating that produced elevated ambient levels.

Table 7 contains hexavalent chromium monitoring results for Phase III-B and shows that on three of the four days of this phase of monitoring, high ambient levels were noted at 2121 Newton with 12- and 24-hour samples. The high levels seen at the ambient sites were consistent with high indoor levels at Master Plating and with westerly winds which would have caused emissions from Master Plating to impact the samplers at 2121 Newton. Although all chrome plating at Master Plating was stopped by March 25, field observations confirmed that sweeping, clean-up activities, and construction were taking place. Amidst routinely low inside and outside readings (post closure), we recorded periodic significant spikes in hexavalent chromium concentration that coincided with the activities inside the plater that re-entrained floor residue. The hexavalent chromium-laden dust within the facility was carried westerly by winds and impacted samplers at 2121 Newton.

Table 7: Phase III-B - March 25-28, 2002 - Hexavalent Chromium Results

Date	Day	Wind Direction	MP Amp Hours	C&B Amp Hours		2121 Newton (24hr)	2121 Newton (12hr)	Alley (24hr)	Alley (12hr)	MPIEXT Indoor (12hr)	MPIEXT Indoor (24hr)
				Tank 1	Tank 2						
3/25/02	Monday	W	0	0	0	0.6	0.7	<0.2	<0.4	41.0	28.0
3/26/02	Tuesday	W	0	0	0	<0.2	<0.4	<0.2	<0.4	19.0	12.0
3/27/02	Wednesday	W	0	15715	1843	0.7	1.1	<0.2	<0.4	34.0	12.0
3/28/02	Thursday	S	0	20432	5377	1.0	0.4	<0.2	<0.4	21.0	20.0

All result concentrations are in nanograms per cubic meters (ng/m^3).
NA = invalid sample
(C) = collocated sampler
Hour in parentheses is sampling duration.
MP = Master Plater (decorative chrome plating)
C&B = Carlson & Beauloye (hard chrome plating)

Limit of Detection for 24 hour sample = 0.2 ng/m^3.
Limit of Detection for 12 hour sample = 0.4 ng/m^3
Limit of Detection for 8 hour sample = 0.6 ng/m^3.

Table 8: Phase III-B - March 25-28, 2002 - Metals Results

Date	Total Chromium 2121 Newton (12hr)	Total Chromium Alley (12hr)	Total Chromium MPIEXT Indoor (12hr)	Copper 2121 Newton (12hr)	Copper Alley (12hr)	Copper MPIEXT Indoor (12hr)	Iron 2121 Newton (12hr)	Iron Alley (12hr)	Iron MPIEXT Indoor (12hr)	Lead 2121 Newton (12hr)	Lead Alley (12hr)
3/25/02	9.3	7.1	433	84	21	7318	478	167	12688	15	4.3
3/26/02	7.5	7.7	111	50	58	1716	461	529	8359	9	9.6
3/27/02	14	7.8	321	569	121	28118	1735	641	104706	36	12.0
3/28/02	7.7	7.7	50	46	35	1318	456	432	3094	13	6.2

Table 8 (cont.): Phase III-B - March 25-28, 2002 - Metals Results

Date	Lead MPIEXT Indoor (12hr)	Manganese 2121 Newton (12hr)	Manganese Alley (12hr)	Manganese MPIEXT Indoor (12hr)	Nickel 2121 Newton (12hr)	Nickel Alley (12hr)	Nickel MPIEXT Indoor (12hr)	Zinc 2121 Newton (12hr)	Zinc Alley (12hr)	Zinc MPIEXT Indoor (12hr)
3/25/02	577	14	5.4	85	18	5.1	1599	137	49	5906
3/26/02	117	11	12	53	13	26	533	82	93	2299
3/27/02	1530	23	16	445	146	30	8505	747	209	34821
3/28/02	69	15	12	23	15	8.3	436	195	178	1122

All result concentrations are in nanograms per cubic meters (ng/m^3).
Hour in parentheses is sampling duration.
MP = Master Plater (decorative chrome plating)
C&B = Carlson & Beauloye (hard chrome plating)
NA = invalid sample
(C) = collocated sampler
Shaded areas indicate no sample collected.

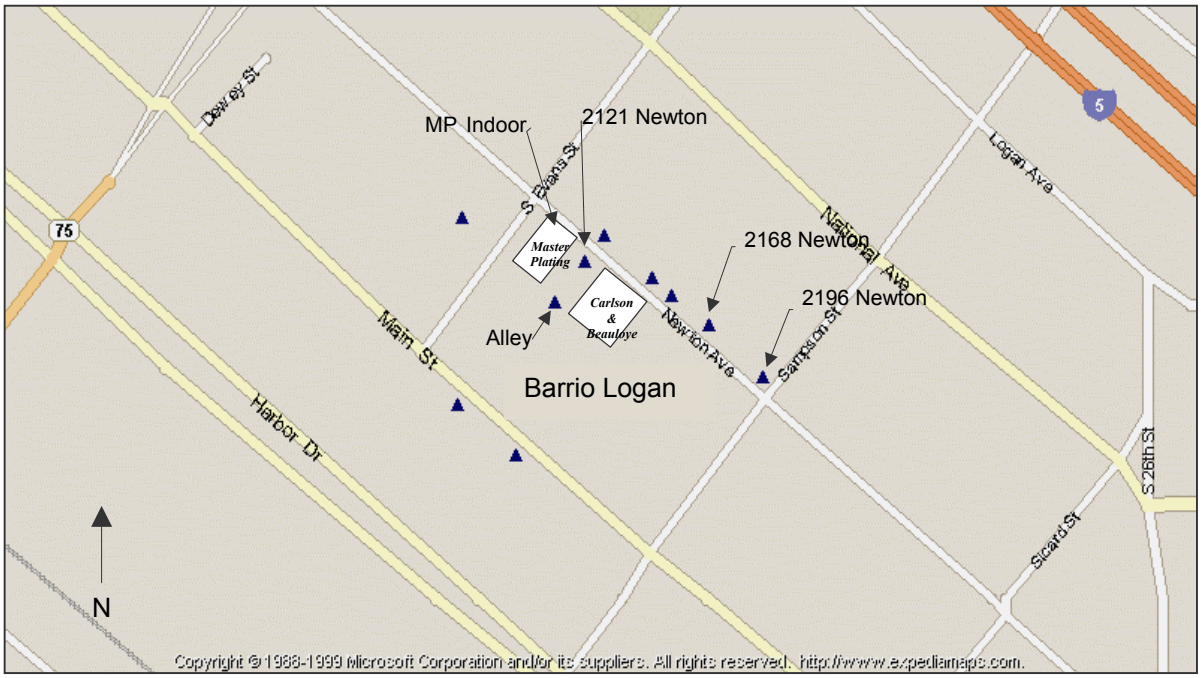
F. Phase III-C (March / April 2002)

Sampling for this phase is identified as the period from March 29 through April 19, 2002 and included the same monitoring locations as Phase III-B. In addition, however, ARB and PTSD staff ran dispersion models using input from C&B source testing results, ampere-hour readings, and meteorological measurements to select areas the C&B plume would strike the ground. The purpose was to aid in the placement of two additional samplers. Samplers were placed downwind of C&B to confirm their contribution to the neighborhood exposure to hexavalent chromium as shown in Figure 8.

The models supported placing samplers at 2168 Newton Avenue, a private residence, and at 2196 Newton Avenue, a community swimming pool operated by the Barrio Station, a local youth center. Sampling at 2168 Newton began on March 29. Sampling at 2196 Newton, referred to as the Pool, began on April 12. At each of these new sites, 12-hour hexavalent chromium samples were collected each day. Samples from 2168 Newton and the Pool were collected from 9:00 a.m. to 9:00 p.m. The timing of these 12-hour duration samples was based on the diurnal wind patterns in this part of San

Diego this time of year. During the daytime hours, breezes typically are onshore while in the evening hours the prevailing wind is from inland areas toward the ocean (offshore). See Figures 1 and 2.

Figure 8: Phase III-C Monitors



Unlabelled sites were not used in this phase.

The samplers at 2168 Newton and the Pool were intended to capture potential emissions from C&B to ensure that conclusions being formulated thoroughly addressed the causes of high concentrations in the neighborhood. On several days early in Phase III-C, relatively high ambient levels were detected at 2168 Newton. For example, on April 1 a reading of 0.7 ng/m^3 was recorded at 2168 Newton. Relatively little plating activity occurred at C&B on April 1. However, the resultant wind direction for at least one-third of the day was from the northwest to the southeast with an average speed of approximately 2.7 knots. Activity from within Master Plating (e.g., cleaning, painting, etc.) may have resulted in high ambient levels recorded at 2168 Newton, southeast of the facility. Most other ambient readings taken during Phase III-C at 2168 Newton were at or below the LoD.

High readings at 2121 Newton during Phase III-C ranged from below the LoD to 21 ng/m^3 for a 24-hour sample collected on April 6. While some weekend plating occurred at C&B (8900 amp hours at Tank 1 and 5200 amp hours at Tank 2) on Saturday, April 6, the facility was closed and no other activities occurred. A value of 21 ng/m^3, however, can be explained through activity and sampling data from Master Plating. Documentation from field personnel confirms that during the weekend of April 6, clean up and construction took place within Master Plating. Indoor air samples collected on April 6 revealed a hexavalent chromium level of 2315 ng/m^3, the highest level recorded

during the entire study. Fugitive dust generated within Master Plating by clean up and construction activities, which was later shown to contain high levels of hexavalent chromium (1200 mg/kg or higher), exited the building either through the exhaust fan or through the front door and resulted in elevated readings at 2121 Newton. Light, southwesterly winds early in the day, followed by northwesterly winds during the late afternoon and early evening support the conclusion that hexavalent chromium-laden dust, generated by activities at Master Plater not directly related to plating, resulted in high ambient levels near a source.

Throughout the study, the high readings at 2121 Newton occurred on days that the residence was downwind of Master Plating. On these days C&B would have been downwind of 2121 Newton.

Hexavalent chromium analyses of samples collected prior to and during Phase III-C implicated Master Plating as the source of the high ambient hexavalent chromium measurements. Data up through and including Phase III-C suggest that Master Plating's routine cleaning activities, leading to fugitive dust outside the building, as well as its daily plating process, were the cause of the high ambient hexavalent chromium readings.

All results from Phase III-C are shown in Table 9 (hexavalent chromium) and Table 10 (metals).

Table 9: Phase III-C - March 29-April 19, 2002 - Hexavalent Chromium Results

Date	Day	Wind Direction	MP Amp Hours	C&B Amp Hours		2121 Newton (24hr)	2121 Newton (12hr)	Alley (24hr)	Alley (12hr)	MPIEXT Indoor (12hr)	MPIEXT Indoor (12hr night)	MPIEXT Indoor (24hr)	2168 Newton (12hr)	2196 Newton Pool (12hr)
				Tank 1	Tank 2									
3/29/02	Friday	W	0	3347	1144	<0.2	<0.4	<0.2	0.5	11.0			0.6	
3/30/02	Saturday	W	closed	0	3486	2.1	2.9	<0.2	<0.4	127.0			<0.4	
3/31/02	Sunday	W	closed	0	3486	0.7	1.5	<0.2	<0.4				<0.4	
4/1/02	Monday	W	0	3684	3364	<0.2	<0.4	0.4	<0.4	10.0		4.9	0.7	
4/2/02	Tuesday	SW	0	7552	5271	0.2	<0.4	<0.2	<0.4	10.0		6.5	<0.4	
4/3/02	Wednesday	W	0	11553	5303	0.2	<0.4	<0.2	<0.4	4.5		3.4	<0.4	
4/4/02	Thursday	W	0	8647	1928	<0.2	<0.4	<0.2	<0.4	8.1		4.9	<0.4	
4/5/02	Friday	W	0	245	810	<0.2	<0.4	<0.2	<0.4	5.3			<0.4	
4/6/02	Saturday	WSW	closed	8932	5161	21.0	16.0	<0.2	<0.4	2315.0			0.4	
4/7/02	Sunday	SSE	closed	8932	5161	0.2	<0.4	<0.2	<0.4	10.0	401.0		<0.4	
4/8/02	Monday	SW	0	262	5053	0.4	0.5	0.3	0.5	200.0		76.0	<0.4	
4/9/02	Tuesday	WNW	0	1883	12542	NA	0.9	<0.2	<0.4	25.0		9.4	<0.4	
4/10/02	Wednesday	WSW	0	5210	7471	<0.2	<0.4	<0.2	<0.4	25.0		10.0	<0.4	
4/11/02	Thursday	SSE	0	0	1908	<0.2	<0.4	<0.2	<0.4	9.1		4.6	<0.4	
4/12/02	Friday	SSE	0	0	1856	<0.2	0.5	<0.2	<0.4	6.4			<0.4	<0.4
4/13/02	Saturday	W	closed	11925	10845	<0.2	<0.4	<0.2	<0.4	<0.4			<0.4	<0.4
4/14/02	Sunday	SSE	closed	11925	10845	<0.2	<0.4	<0.2	<0.4	<0.4	<0.4		<0.4	<0.4
4/15/02	Monday	SSE	0	6140	5904	0.3	0.7	<0.2	<0.4	6.2		2.9	<0.4	<0.4
4/16/02	Tuesday	S	0	13033	7129	0.4	0.9	<0.2	<0.4	91.0		49.0	<0.4	<0.4
4/17/02	Wednesday	SW	0	2043	10314	0.2	<0.4	<0.2	<0.4	NA		NA	0.4	<0.4
4/18/02	Thursday	W	0	789	13320	<0.2	<0.4	<0.2	<0.4	5.4		3.1	<0.4	<0.4
4/19/02	Friday	SSE	0	3436	529	0.3	<0.4	0.2	<0.4	20.0			<0.4	<0.4

All result concentrations are in nanograms per cubic meters (ng/m^3).
NA = invalid sample
Hour in parentheses is sampling duration.
(C) = collocated sampler
MP = Master Plater (decorative chrome plating)
C&B = Carlson & Beauloye (hard chrome plating)

Limit of Detection for 24 hour sample = 0.2 ng/m^3.
Limit of Detection for 12 hour sample = 0.4 ng/m^3.
Limit of Detection for 8 hour sample = 0.6 ng/m^3.

Shaded areas indicate no sample collected.

Table 10: Phase III-C - March 29-April 19, 2002 - Metals Results

Date	Day	Wind Direction	MP Amp Hours	C&B Amp Hours		Total Chromium 2121 Newton (12hr)	Total Chromium Alley (24hr)	Total Chromium Alley (12hr)	Total Chromium MPIEXT (12hr)	Total Chromium MPIEXT (12hr night)	Copper 2121 Newton (12hr)	Copper Alley (24hr)	Copper Alley (12hr)
				Tank 1	Tank 2								
3/29/02	Friday	W	0	3347	1144	9.5	4.2				62	19	
3/30/02	Saturday	W	closed	0	3486	14		7.7			91		39
3/31/02	Sunday	W	closed	0	3486	12		6.9	652	49	104		33
4/1/02	Monday	W	0	3684	3364	6.7		6.7	64		47		24
4/2/02	Tuesday	SW	0	7552	5271	6.7		6.7	87		84		47
4/3/02	Wednesday	W	0	11553	5303	6.7		4.4	53		96		51
4/4/02	Thursday	W	0	8647	1928	NA		6.7	67		NA		72
4/5/02	Friday	W	0	245	810	6.4		5.4			81		60
4/6/02	Saturday	WSW	closed	8932	5161	35		5.9			30		13
4/7/02	Sunday	SSE	closed	8932	5161	4.6		4.7			10		11
4/8/02	Monday	SW	0	262	5053	8.4		7.3	1426		46		23
4/9/02	Tuesday	WNW	0	1883	12542	8.3		NA	178		45		NA
4/10/02	Wednesday	WSW	0	5210	7471	6.3		7	220		54		56
4/11/02	Thursday	SSE	0	0	1908	6.6		6	80		18		24
4/12/02	Friday	SSE	0	0	1856	10		5.6			40		29
4/13/02	Saturday	W	closed	11925	10845	5.7		5			30		14
4/14/02	Sunday	SSE	closed	11925	10845	4.5		4.2			17		8.2
4/15/02	Monday	SSE	0	6140	5904	6.5		5.7	NA		22		19
4/16/02	Tuesday	S	0	13033	7129	7.9		4.7	371		35		21
4/17/02	Wednesday	SW	0	2043	10314	6.3		5.4	137		77		45
4/18/02	Thursday	W	0	789	13320	1.7		NA	49		9.7		NA
4/19/02	Friday	SSE	0	3436	529	7.5		4.8			31		26

All result concentrations are in nanograms per cubic meters (ng/m^3).
Hour in parentheses is sampling duration.
MP = Master Plater (decorative chrome plating)
C&B = Carlson & Beauloye (hard chrome plating)

NA = invalid sample
(C) = collocated sampler
Shaded areas indicate no sample collected.

Table 10 (cont.): Phase III-C - March 29-April 19, 2002 - Metals Results

Date	Copper MPIEXT (12hr)	Copper MPIEXT (12hr night)	Iron 2121 Newton (12hr)	Iron Alley (24hr)	Iron Alley (12hr)	Iron MPIEXT Indoor (12hr)	Iron MPIEXT Indoor (12hr night)	Lead 2121 Newton (12hr)	Lead Alley (24hr)	Lead Alley (12hr)	Lead MPIEXT Indoor (12hr)	Lead MPIEXT Indoor (12hr night)
3/29/02			701	281				16	5.6			
3/30/02			447		304			10		6.9		
3/31/02	8312	407	470		325	21105	1006	16		7	625	49
4/1/02	1002		699		560	13169		8.9		6.7	53	
4/2/02	3806		688		609	13750		8.9		6.7	178	
4/3/02	6583		683		613	4880		11		6.7	254	
4/4/02	3506		NA		677	4725		NA		12	96	
4/5/02			538		522			10		11		
4/6/02			318		217			7.4		3.5		
4/7/02			181		197			2.3		1.9		
4/8/02	6489		362		324	9814		9.4		5.7	614	
4/9/02	1597		861		NA	17168		16		NA	104	
4/10/02	5012		516		674	9692		9.8		10	413	
4/11/02	5381		199		362	10265		4.6		7.6	120	
4/12/02			388		323			9.8		5.6		
4/13/02			519		475			11		6.6		
4/14/02			281		210			6.3		3.4		
4/15/02	NA		172		185	NA		1.9		1.6	NA	
4/16/02	6647		425		336	7017		11		2.1	228	
4/17/02	9443		831		869	6762		9.3		8.5	163	
4/18/02	3647		116		NA	6048		1.7		NA	63	
4/19/02			597		527			10		6.8		

All result concentrations are in nanograms per cubic meters (ng/m^3).
Hour in parentheses is sampling duration.
MP = Master Plater (decorative chrome plating)
C&B = Carlson & Beauloye (hard chrome plating)

NA = invalid sample
(C) = collocated sampler
Shaded areas indicate no sample collected.

Table 10 (cont.): Phase III-C - March 29-April 19, 2002 - Metals Results

Date	Nickel 2121 Newton (12hr)	Nickel Alley (24hr)	Nickel Alley (12hr)	Nickel MPIEXT Indoor (12hr)	Nickel MPIEXT Indoor (12hr night)	Zinc 2121 Newton (12hr)	Zinc Alley (24hr)	Zinc Alley (12hr)	Zinc MPIEXT Indoor (12hr)	Zinc MPIEXT Indoor (12hr night)
3/29/02	27	7.1				144	56			
3/30/02	33		9.5			105		45		
3/31/02	34		13	2734	121	168		47	11481	483
4/1/02	13		11	479		98		69	2306	
4/2/02	20		13	1501		73		69	1700	
4/3/02	22		11	1461		82		71	3126	
4/4/02	NA		19	670		NA		98	1764	
4/5/02	17		14			68		72		
4/6/02	11		5			44		27		
4/7/02	2.7		2.9			21		22		
4/8/02	13		8.3	1584		95		70	6023	
4/9/02	26		NA	1123		109		NA	2028	
4/10/02	14		16	1052		85		108	5077	
4/11/02	5.2		9.4	1386		41		68	2166	
4/12/02	11		9.9			55		49		
4/13/02	8.1		9.7			54		42		
4/14/02	5.3		4.8			35		26		
4/15/02	15		6.8	NA		29		31	NA	
4/16/02	11		6.5	1220		63		47	3522	
4/17/02	19		14	1064		123		106	5026	
4/18/02	2.7		NA	528		17		NA	2723	
4/19/02	11		9			58		63		

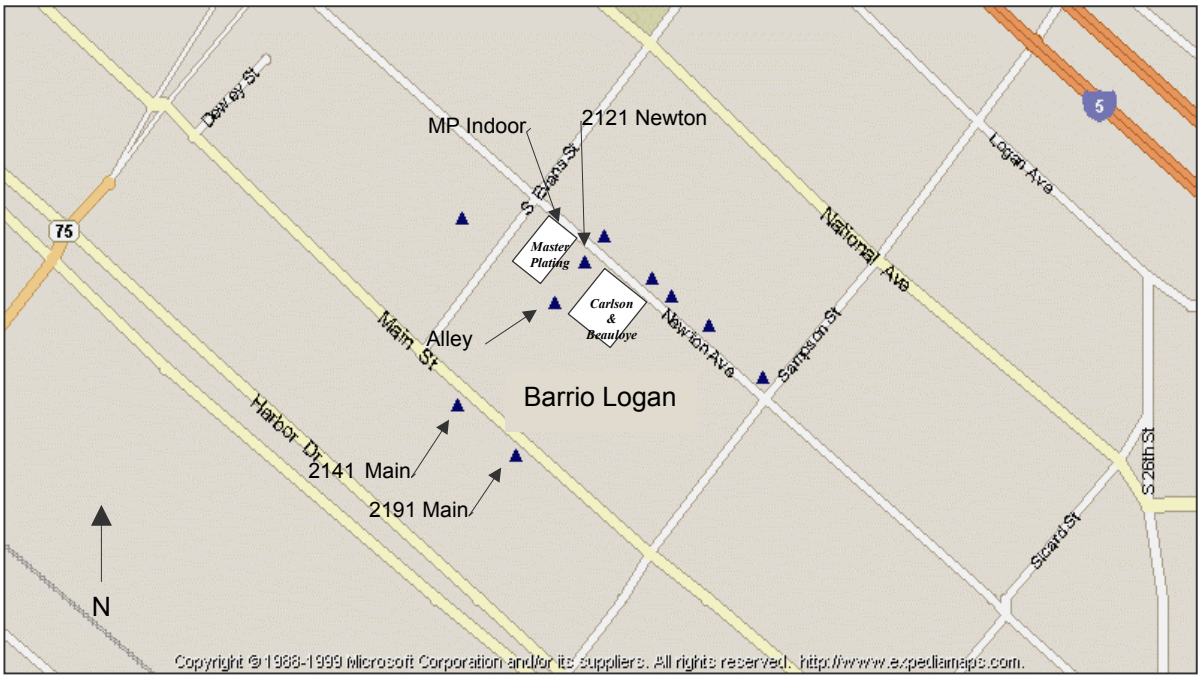
All result concentrations are in nanograms per cubic meters (ng/m^3).
Hour in parentheses is sampling duration.
MP = Master Plater (decorative chrome plating)
C&B = Carlson & Beauloye (hard chrome plating)

NA = invalid sample
(C) = collocated sampler
Shaded areas indicate no sample collected.

G. Phase III-D (April / May 2002)

By late April a significant amount of data had been gathered and preliminary conclusions drawn as to the source of the high hexavalent chromium emissions. A final supplement to the study, Phase III-D, focused on acquiring additional information from Master Plating. Particular emphasis was on emissions from C&B, and whether the emissions vented through two exhaust stacks on the roof could be detected at the Pool, 2168 Newton Avenue, or on two new sites on Main Street.[2] Beginning on April 20, sampling was reduced to 24-hour samples at 2121 Newton Avenue and the Alley site. On May 3, all 12-hour indoor hexavalent chromium sampling at Master Plating was discontinued; but 24-hour indoor sampling continued.

Figure 9: Phase III-D Monitors



Unlabelled sites were not used in this phase.

Twelve-hour sampling for hexavalent chromium continued at 2168 Newton and the Pool (downwind of C&B) and on May 3, 12-hour sampling began at the two new sites on Main Street. Main Street runs parallel to and south of Newton Avenue (see Figure 9). The new sites were intended to detect emissions from C&B, whose operation overnight made it important to be downwind of C&B during offshore conditions. The two samplers on Main Street were operated overnight (from 9:00 p.m. to 9:00 a.m.) and were operated sequentially with samplers at 2168 Newton and the Pool, which operated from 9:00 a.m. to 9:00 p.m. One sampler was placed at 2191 Main, on the roof of a large warehouse. Two collocated samplers were placed on the roof of an adjoining building

[2] Results from stationary source tests of C&B conducted by the ARB in February showed that all emissions were within controlled limits specified on the facility's Permit to Operate and would not result in the high ambient concentrations detected during the study.

located at 2141 Main. As with samplers at 2168 Newton and the Pool, the samplers at 2191 and 2141 Main Street were intended to capture potential emissions from C&B.

Ambient hexavalent chromium concentrations during Phase III-D ranged from below detection to 1.2 ng/m^3 at 2168 Newton on April 24. Winds on that day were almost exclusively northwesterly. While neither Master Plating nor C&B were plating on that day, records indicate that activity within Master Plating may have disturbed hexavalent chromium-laden dust.

On April 29, 2002 additional dust samples were collected by SDCAPCD at eight locations within Master Plating. The purpose was to determine if high ambient readings observed outside of Master Plating at 2121 Newton Avenue were attributable to dust from cleaning activities within the facility. EnviroMatrix Analytical analyzed the samples under contract to SDCAPCD. Duplicate samples from six of the eight locations were also screened at MLD for comparison with results from EnviroMatrix Analytical.

The dust sampling locations within Master Plating were:

(1) shelf under the SDCAPCD sampler head,
(2) forward containment area near the west side of the building,
(3) on the top steps of the staircase along the west side of the building,
(4) within the dust/debris can located near the grinding room,
(5) inside the facility at the front door near the east wall of the building,
(6) inside the facility at the rear door,
(7) at the bottom of the staircase along the west wall of the building behind the buffing wheel, and
(8) rear area of the building near the treatment unit. Duplicate samples collected from locations (1), (2), and (3) above.

Results ranged from <1 mg/kg (LOD) to 1200 mg/kg. Details regarding the analytical results from soil and dust samples may be obtained from the Program Review Section within SSD or from SDCAPCD.

Throughout the study, ARB staff performed the daily operation, maintenance, and field quality control (QC) for the BGI samplers and the meteorological station. All QC for the XonTech 920 sampler used to collect samples within Master Plating was conducted by SDCAPCD staff.

Commencing May 4th, the SDCAPCD staff assumed all field operations in Barrio Logan from the ARB. ARB continued to provide all sampling equipment, consumables and, by filter analysis. The transfer of field responsibilities was based on the general reduction in sample collection and planned cessation of all sampling on May 24. Sampling for Phase III-D began on April 20 and concluded on May 24, 2002 at which time all air monitoring ended in Barrio Logan. Results for Phase III-D are shown in Table 11.

VI. Analytical Methodology

All filter samples received from the field were logged into MLD's Laboratory Information Management System for tracking and reporting purposes. Filters were inspected for contamination, tears, holes, etc. Filters were not analyzed if they did not meet validation criteria specified in MLD 039, Part 11, or Volume II, Appendix R, Section R.1.2.9, of MLD's Quality Assurance Manual.

The following sections summarize and reference the laboratory methodologies used to analyze air sample filters for hexavalent chromium and metals.

A. Hexavalent Chromium

Exposed filters were extracted with deionized water and analyzed by ion chromatography method MLD 039 (SOP in Appendix B.3, page 235). The analytical concentration was converted to air concentration using the extract volume and the total volume of air sampled.

The LoD of the sample depended on the sample duration. The LoD is inversely proportional to the mass on the filter, as determined by flow rate and sample duration. Typically, hexavalent chromium samples are collected using a flow rate of 10 standard liters per minute (slpm) for 24 hours (see Attachment 2 for calculations).

For this study, 12-hour and 8-hour samples were collected and have a LoD of approximately 0.4 ng/m^3 and 0.6 ng/m^3 of sampled air, respectively.

B. Metals

The analytical method for metals analysis was ARB's "Standard Operating Procedure for the Trace Elemental Analysis of Low-Volume Samples Using Inductively Coupled Plasma-Mass Spectrometry (ICP-MS)" (MLD 061). The SOP for MLD 061 is included in Appendix B.4, page 244. Each filter was extracted with nitric acid followed by heat and sonication. Extracts were diluted and analyzed by ICP-MS. The metals of interest were total chromium, copper, iron, lead, manganese, nickel and zinc. LoDs vary among the metals, but all were in the low parts per billion (ppb) range per MLD 061.

Table 11: Phase III-D - April 20-May 24, 2002 - Hexavalent Chromium Results

Date	Day	Wind Direction	MP Amp Hours	C&B Amp Hours		2121 Newton (24hr)	Alley (24hr)	MPIEXT Indoor (24hr)	MPIEXT Indoor (12hr)	MPIEXT Indoor (12hr night)	2168 Newton (12hr)	2196 Newton Pool (12hr)	2141 Main (12hr)	2141 Main Coll (12hr)	2191 Main (12hr)
				Tank 1	Tank 2										
4/20/02	Saturday	SSW	0	9918	471	<0.2	<0.2		<0.4		<0.4	<0.4			
4/21/02	Sunday	W	0	9918	471	<0.2	<0.2		1.9	266	<0.4	<0.4			
4/22/02	Monday	W	0	16934	5361	0.3	<0.2	1.7	7.8		<0.4	<0.4			
4/23/02	Tuesday	W	0	23105	10698	0.2	<0.2	1.7	4.6		<0.4	<0.4			
4/24/02	Wednesday	WNW	0	28613	7272	<0.2	0.2	2	4.5		1.2	NA			
4/25/02	Thursday	W	0	17175	8108	<0.2	<0.2	2	4.2		<0.4	<0.4			
4/26/02	Friday	S	0	3436	2372	0.4	0.3		7.5		0.7	<0.4			
4/27/02	Saturday	W	0	9918	6.5	<0.2	<0.2		NA		<0.4	<0.4			
4/28/02	Sunday	W	0	648.5	6.5	<0.2	<0.2	2.7			<0.4	<0.4			
4/29/02	Monday	W	0	5177	4829	0.3	0.2	7.2	17		0.5	0.4			
4/30/02	Tuesday	W	0	13766	3813	0.3	0.3	NA	NA		0.7	0.5			
5/1/02	Wednesday	SW	0	9270	4202	0.8	0.5	330	724		0.5	<0.4			
5/2/02	Thursday	S	0	6096	7920	0.2	<0.2	8.6	13		<0.4	<0.4			
5/3/02	Friday	W	0	0	50	<0.2	<0.2				<0.4	<0.4	<0.4	<0.4	<0.4
5/4/02	Saturday	W	0	302	144	<0.2	<0.2				<0.4	<0.4	<0.4	<0.4	<0.4
5/5/02	Sunday	SW	0	0	144	0.2	<0.2	1.7			<0.4	<0.4	<0.4	<0.4	<0.4
5/6/02	Monday	S	0	0	0	0.2	<0.2	3.8			<0.4	<0.4	<0.4	<0.4	<0.4
5/7/02	Tuesday	SE	0	0	0	<0.2	<0.2	4.3			<0.4	<0.4	<0.4	<0.4	<0.4
5/8/02	Wednesday	S	0	6540	0	<0.2	<0.2	5.7			<0.4	<0.4	<0.4	<0.4	<0.4
5/9/02	Thursday	W	0	0	0	<0.2	0.2	3.9			<0.4	<0.4	<0.4	<0.4	<0.4
5/10/02	Friday	S	0	0	0	<0.2	<0.2	6.7			<0.4	<0.4	<0.4	0.4	<0.4
5/11/02	Saturday	S/W	0	1331	225	<0.2	<0.2	<0.2			<0.4	<0.4	<0.4	<0.4	<0.4
5/12/02	Sunday	W	0	1331	225	<0.2	<0.2	0.6			<0.4	0.4	<0.4	<0.4	<0.4
5/13/02	Monday	W	0	197	0	<0.2	<0.2	7.3			<0.4	<0.4	<0.4	<0.4	<0.4
5/14/02	Tuesday	S	0	0	0	<0.2	<0.2	1.0			<0.4	<0.4	<0.4	<0.4	<0.4

All result concentrations are in nanograms per cubic meters (ng/m^3).
NA = invalid sample
Hour in parentheses is sampling duration.
(C) = collocated sampler
MP = Master Plater (decorative chrome plating)
C&B = Carlson & Beauloye (hard chrome plating)

Limit of Detection for 24 hour sample = 0.2 ng/m^3.
Limit of Detection for 12 hour sample = 0.4 ng/m^3.
Limit of Detection for 8 hour sample = 0.6 ng/m^3.

Shaded areas indicate no sample collected.

Table 11 (cont): Phase III-D - April 20-May 24, 2002 - Hexavalent Chromium Results

Date	Day	Wind Direction	MP Amp Hours	C&B Amp Hours		2121 Newton (24hr)	Alley (24hr)	MPIEXT Indoor (24hr)	MPIEXT Indoor (12hr)	MPIEXT Indoor (12hr night)	2168 Newton (12hr)	2196 Newton Pool (12hr)	2141 Main (12hr)	2141 Main Coll (12hr)	2191 Main (12hr)
				Tank 1	Tank 2										
5/15/02	Wednesday	SSE	0			0.6	1.3	3.9			0.4	<0.4	<0.4	<0.4	NA
5/16/02	Thursday	SSE	0			0.2	<0.2	2.0			<0.4	<0.4	<0.4	<0.4	<0.4
5/17/02	Friday	WSW	0			0.3	NA	11			<0.4	0.7	<0.4	<0.4	<0.4
5/18/02	Saturday	S	0			<0.2	<0.2	2.3			<0.4	1.4	<0.4	<0.4	<0.4
5/19/02	Sunday	SW	0			<0.2	<0.2	0.7			<0.4	<0.4	<0.4	<0.4	<0.4
5/20/02	Monday	W	0			0.5	0.4	8			<0.4	0.9	<0.4	<0.4	<0.4
5/21/02	Tuesday	W	0			<0.2	<0.2	11			<0.4	0.4	<0.4	<0.4	<0.4
5/22/02	Wednesday	W	0			<0.2	<0.2	0.8			<0.4	0.7	<0.4	<0.4	<0.4
5/23/02	Thursday	SSE	0			<0.2	<0.2	1.6			0.8	<0.4	<0.4	<0.4	<0.4
5/24/02	Friday		0			0.2	<0.2	2.5			<0.4	<0.4	<0.4	<0.4	<0.4

All result concentrations are in nanograms per cubic meters (ng/m^3).
NA = invalid sample
Hour in parentheses is sampling duration.
(C) = collocated sampler
MP = Master Plater (decorative chrome plating)
C&B = Carlson & Beauloye (hard chrome plating)

Limit of Detection for 24 hour sample = 0.2 ng/m^3.
Limit of Detection for 12 hour sample = 0.4 ng/m^3.
Limit of Detection for 8 hour sample = 0.6 ng/m^3.

Shaded areas indicate no sample collected.

VII. Quality Control

Field and laboratory QC procedures are critical to ensuring that data collected are consistent, relevant, and defensible. The ARB's standard field and laboratory QC procedures were used for each phase of the project and are detailed in the SOPs contained in Appendix B.

A. Field Sampling

Field QC procedures are those activities performed on a routine basis in the field to ensure that samples are representative, accurate, and precise. During all phases of the Barrio Logan project, the following field QC procedures were performed unless otherwise noted in Section IX of this report.

1. Sampler Calibrations and Flow Checks

Calibrations and flow checks were conducted on air samplers using flow meters either certified or calibrated against a primary standard. Certification of a field flow standard involves a multi-point comparison in the laboratory against a primary flow standard traceable to the National Institute of Standards Technology (NIST), followed by least square regression analysis. Calibrations are similar to certifications except that a single comparison is made, rather than a multi-point, and the acceptable coefficient of determination is less strict. Details on flow standard certification and calibration procedures are available from the ARB's Quality Assurance Section. All meteorological equipment was calibrated prior to field deployment using NIST-traceable standards.

The ambient samplers were calibrated in the field using an NIST-traceable standard at least once during each phase of the study to verify the flow rate was 10 slpm. Calibration and certification information is contained in Appendix C.1, page 278.

2. Collocated Samples

Measurement precision is an important quality assessment attribute and was determined using side-by-side identical samplers (collocated) operated each day during Phases II and III at the Vacant Lot, and Phase III-D at 2141 Main Street. Each sampler was operated identically to the other following criteria set forth in 40CFR, Part 58 (i.e., within 4 meters of each other, but at least 1 meter apart to prevent airflow interference). Valid collocated results are shown in each Table of data from Phases II, III, and III-D and are summarized in Section XI of this report.

3. Trip Blanks

A trip blank is an unexposed filter that is used to indicate whether contamination occurred during transport and handling of the filters from the laboratory to the field and back. One trip blank per day was submitted for analysis along with the daily batch of field samples. All trip blanks were prepared and handled as regular sample filters and were found to be free of contamination (less than the limit of detection).

B. Hexavalent Chromium Analysis

Analysis of hexavalent chromium by ion chromatography (MLD 039) includes laboratory QC procedures such as the use of filter blanks, water blanks, spiked filters, and replicate analyses.

1. Calibration Curve

Four known standards were used to establish the linear regression calibration curve before samples were analyzed. The results of the analysis of the calibration curve must have a correlation coefficient of 0.950 or greater or else the standards are re-analyzed. If a sample was analyzed under an 'out-of –control' condition, the ion chromatographer was recalibrated and samples were re-analyzed. The calibration curve is run prior to field samples as well as after each 10 samples in the analysis run.

2. Filter Blanks

Filter blanks are unexposed filters that are extracted and analyzed along with each batch of field samples to monitor any contamination that may have been introduced. All filter blanks for this project were free of contamination (results below the LoD).

3. Water Blanks

Water blanks are samples of the nanopure water used to extract the sample set. They were analyzed with each set of extracted filters to test for contamination. All water blanks analyzed for this project were free of contamination (results below the LoD).

4. Laboratory Spikes

Laboratory spikes are samples prepared and analyzed to assess the analytical process, independent of any matrix effects (such as interferences that may be found in field samples). Measuring the recovery of a known sample in a controlled matrix or from a matrix-free sample is used to assess laboratory performance and the accuracy of the analytical process. For hexavalent chromium analyses, unexposed filters are prepared using standard techniques, then spiked with a known quantity of hexavalent chromium. Spiked samples are extracted and analyzed in the same manner as all field samples. Spikes were run with each sample batch extracted.

The measured concentration of laboratory spikes for the project were within the control limits of $\pm$20% of the known concentration.

5. Replicate Analysis

Analytical precision is the agreement between replicate measurements of the same sample extract. Replicates were done at a rate of one per ten field samples. Relative percent difference (RPD) between results was calculated and all were within 20% of one another, which meets the <30% method criteria.

C. Metals Analysis

Metals were analyzed by ICP-MS. Laboratory QC procedures included analyzing calibration (reagent) blanks, rinse blanks, extraction (filter) blanks, and the use of calibration verification standards, internal standards, and post-digestion spikes. As with hexavalent chromium analysis, replicate analyses were run on ten percent of each sample batch.

1. Calibration (Reagent) Blanks

The calibration blank (reagent blank) is used to check for contamination during analysis. The solution is analyzed before and after analyzing each sample batch. The sample batch must be re-analyzed if either the pre-analysis or post-analysis blank results are greater than the LoD.

2. Rinse Blanks

Rinse blanks are used to flush the system between all samples and standards to prevent cross contamination.

3. Extraction Blank

The extraction blank (filter blank) is an extract created using an unexposed Teflon filter and the same reagents, solutions, and preparation procedures as the sample batch. This blank is used to monitor any contamination that may have been introduced during extraction procedures. An extraction blank is created and analyzed with each sample batch. Results must be less than the LoD for each element reported.

4. Calibration Verification (Standard Check)

A check of a mid-range standard is made every ten samples and after completion of the last sample in each batch. If the standard check is greater than $\pm$10% of the expected value, re-calibration and sample reanalysis must be performed.

5. Internal Standards

Internal standards are compounds that analytically behave similarly to the target analytes. Internal standards are compounds not found in the sample but are added in equal amounts to the reagent blank, to the calibration standards, and to the samples. They are used to quantitate results and are used to correct for injection variability in mass spectrometer methods. The intensities of all internal standards must be monitored for every analysis. The internal standard intensities must register between 60 - 140% of the intensity of that internal standard in the initial calibration standard. Dilutions and/or corrective actions, as described in the SOP (Appendix B), must be made if outside the limits.

6. Post-Digestion Spikes

Post-digestion spikes are added to an aliquot of a prepared extract or its dilution. The spike amount recovered upon analysis must be within 80 - 120% of the known value, based on the original concentration of each element of interest in the sample. Every batch of 40 or fewer samples includes a low and high spike for analysis.

Details on analytical procedures for hexavalent chromium (MLD 039) and total metals analyses (MLD 061) may be found in Appendix B.

VIII. Laboratory Results

MLD's Inorganic Laboratory Section (ILS) staff performed analyses for all hexavalent chromium and metals using ion chromatography and ICP-MS, respectively. All concentration data were reported in units of nanograms per cubic meter (ng/m^3). ILS staff performed corrective actions as needed prior to submitting data to OPAS staff per the method procedure. Data were peer reviewed by ILS staff and also reviewed by OPAS staff.

Sampling locations and durations are noted in the column headers of each table of results. Shaded areas of the tables represent instances where no sample was collected on that day. "NA" indicates invalid data that have not been reported.

IX. Data Quality Objectives

Data quality objectives (DQOs), as in any ambient air sampling work, were identified prior to the study to ensure the data from this study are of sufficient quantity and quality to meet the quality objectives and users needs.

DQOs for the Barrio Logan project originally focused on meeting the data needs for reassessment of the hexavalent chromium Air Toxic Control Measure (ATCM) for chrome plating facilities. However, the DQOs evolved from the initial Phase I work and later focused on providing SSD and other ARB client Divisions the data necessary to evaluate the neighborhood residents' exposure to the high ambient levels of hexavalent chromium observed in December 2001 (Phase II).

The DQOs required best practices and rigid quality goals. Strict adherence to those goals enabled the data to be used for other purposes as well, including modeling and inventory evaluation.

Table 12: Data Quality Objectives

Parameter Measured	Goal	Achieved
Accuracy (% difference in flow)	10%	8.3% or less
Precision (average RPD)	20%	7.5%
Completeness – Hexavalent Chromium	75%	98% (see Table 15)
Completeness - Metals	75%	94% (see Table 15)

The following is a description of key field and laboratory measurement objectives used throughout the Barrio Logan project to generate the quantity and quality of data needed by the clients.

A. Sampler Precision and Accuracy

Accuracy is defined as the extent of agreement between an observed value and an accepted reference standard. For this project, the accuracy of field samplers is described as the percent difference between the flow transfer standard (reference) and each sampler's indicated flow.

Results of field flow checks using a certified or calibrated transfer standard are shown in Appendix C. All samplers differed by 8.3 percent or less which met the goal of ±10%.

Precision is the degree of mutual agreement among individual measurements made under prescribed conditions. Precision for manual sampling methods is obtained by operating collocated samplers at selected sites. For each pair of collocated samplers, one is designated as the primary sampler and is used to report air quality for the site. The other is designated as the collocated sampler. The differences in the measured concentration between the two collocated samplers are used to calculate and assess the precision of the monitoring data.

For the Barrio Logan project, collocated samplers were placed at the Vacant Lot during Phases I, II, III and III-D. Considering only valid hexavalent chromium sample pairs, there were 11 collocated pairs collected during Phase II, 32 during Phase III, and 22 for Phase III-D. For all phases in which collocated samples were collected, the RPD between the primary and collocated results varied. Fifty-eight of 66 valid sample pairs (88 percent) had a RPD of zero. Among those samples with RPDs greater than zero, the average was 52. The average RPD for all collocated pairs collected was 6.3. This met the project requirements for precision.

Table 13: Collocated Sampler Results – Hexavalent Chromium at 2141 Main

Date	Primary Result	Collocated Result	RPD	Date	Primary Result	Collocated Result	RPD
5/3/02	<0.4	<0.4	0	5/14/02	<0.4	<0.4	0
5/4/02	<0.4	<0.4	0	5/15/02	<0.4	<0.4	0
5/5/02	<0.4	<0.4	0	5/16/02	<0.4	<0.4	0
5/6/02	<0.4	<0.4	0	5/17/02	<0.4	<0.4	0
5/7/02	<0.4	<0.4	0	5/18/02	<0.4	<0.4	0
5/8/02	<0.4	<0.4	0	5/19/02	<0.4	<0.4	0
5/9/02	<0.4	0.4	67	5/20/02	<0.4	<0.4	0
5/10/02	<0.4	<0.4	0	5/21/02	<0.4	<0.4	0
5/11/02	<0.4	<0.4	0	5/22/02	<0.4	<0.4	0
5/12/02	<0.4	<0.4	0	5/23/02	<0.4	<0.4	0
5/13/02	<0.4	<0.4	0	5/24/02	<0.4	<0.4	0

Table 14: Collocated Sampler Results – Hexavalent Chromium at Vacant Lot

Date	Primary Result	Collocated Result	RPD	Date	Primary Result	Collocated Result	RPD
12/03/01	<0.2	NA	NA	2/15/02	<0.2	<0.2	0
12/04/01	<0.2	<0.2	0	2/16/02	<0.2	<0.2	0
12/05/01	<0.2	<0.2	0	2/16/02	<0.2	<0.2	0
12/06/01	<0.2	<0.2	0	2/17/02	<0.2	<0.2	0
12/07/01	3.6	3.2	12%	2/18/02	<0.2	<0.2	0
12/08/01	<0.2	NA	NA	2/19/02	<0.2	<0.2	0
12/10/01	<0.2	<0.2	0	2/20/02	<0.2	<0.2	0
12/11/01	<0.2	<0.2	0	2/21/02	0.4	0.4	0
12/12/01	<0.2	<0.2	0	2/22/02	0.2	<0.2	67%
12/13/01	<0.2	<0.2	0	2/23/02	<0.2	<0.2	0
12/14/01	<0.2	<0.2	0	2/24/02	<0.2	<0.2	0
12/15/01	<0.2	<0.2	0	2/25/02	<0.2	<0.2	0
12/17/01	<0.2	<0.2	0	2/26/02	<0.2	<0.2	0
2/5/02	0.3	0.3	0	2/27/02	<0.2	<0.2	0
2/6/02	<0.2	<0.2	0	2/28/02	0.7	0.4	55%
2/7/02	<0.2	<0.2	0	3/1/02	<0.2	<0.2	0
2/8/02	<0.2	<0.2	0	3/2/02	<0.2	<0.2	0
2/9/02	<0.2	<0.2	0	3/3/02	<0.2	<0.2	0
2/10/02	0.2	<0.2	67%	3/4/02	<0.2	<0.2	0
2/11/02	0.3	0.3	0	3/5/02	<0.2	<0.2	0
2/12/02	<0.2	<0.2	0	3/6/02	<0.2	<0.2	0
2/13/02	<0.2	<0.2	0	3/7/02	0.3	0.5	50%
2/14/02	0.3	<0.2	100%	3/8/02	<0.2	0.2	67%

B. Representativeness

Representativeness for this project refers to how well the sampling design captures the hexavalent chromium concentrations in the monitoring area, and therefore represents the exposure of residents in the community. All sampling sites were near the chrome plating facilities or at residences in order to meet the definition of representativeness.

Samplers located at 2121, 2144, 2152, and 2168 Newton Avenue and the Vacant Lot were positioned on tripods with the sampler inlet approximately 2 meters above ground level. Limited space and security considerations required placing those samplers at the Mercado Apartments, the Pool, the Alley, and those samplers on Main Street atop buildings or other structures. All samplers were within the 2-7 meter range above the ground as required for particulate matter samplers. Air mixing within that range is considered thorough enough to ensure that sampled air is representative of the exposure experienced by receptors.

C. Completeness

Data are complete if a stated percentage of the intended measurements were obtained. The target number of valid samples (including collocated samples) is prescribed in the

monitoring protocol for each event. They ensure the measurements span a comparable period of time and thus can be compared directly, or that an adequate number of samples were collected at a site to generate meaningful statistics. A minimum of 75 percent of the intended number of valid samples was required to satisfy the data completeness objective. If less than 75% valid samples were obtained during any monitoring event for this project, make-up runs were to be conducted until a sufficient number of samples were obtained to meet a satisfactory level of data completeness. For purposes of this project, valid samples were defined as samples that met criteria for sampler calibration, filter preparation, sample collection and review, DQOs, and laboratory analysis.

All individual events had completeness greater than the required 75% as shown in Table 15. The overall completeness for hexavalent chromium was 98% and 94% for metals.

Table 15: Sampling Completeness

Monitoring Event	Expected Number of Hexavalent Chromium Samples	Number of Valid Hexavalent Chromium Samples	Percent Completeness (Hexavalent Chromium)	Expected Number of Metals Samples[1]	Number of Valid Metals Samples	Percent Completeness (Metals)
Phase II	91	87	96	0	0	NA[2]
Phase III	324	317	98	106	102	96
Phase III-A	78	77	99	28	22	79
Phase III-B	24	24	100	12	12	100
Phase III-C	153	150	98	58	55	95
Phase III-D	248	242	98	0	0	NA
TOTAL	918	897	98	204	191	94

[1]Airborne metals samples consisted of a single filter analyzed for seven different metals. [2]Not applicable.

D. Comparability

Data are comparable if they are collected using the same sampling protocols and analytical methods. Comparability among sample sets for this project required that the same sampling methods and procedures, analytical techniques, and reporting units be used during each phase of sampling.

All samples were assessed qualitatively to determine if data collected during each event were comparable with one another. All events were deemed comparable in that they employed the same sampling procedures, analytical techniques, and reporting units. Slight modifications in the LoD were made based on sampling duration and subsequent volume of air collected.

E. Coincident Sampling

A sample is defined as coincident if it is collected on the same day with start and end times within two hours of the coincident sample. Coincident sampling is intended to ensure comparability with other samples collected during the project.

Samplers were run coincident during Phases I and II. As the number of samplers deployed increased with Phase III, start-times for the 24-hour samplers were increasingly delayed on each successive sampling day due to the time required to change filters and download sampler data for each sampler. The lag time resulted in the start-time of some 24-hour samplers delayed with respect to other 24-hour samplers. To correct the delay and ensure all samplers had the same start-time, 24-hour samplers were run for 23 hours. The extra hour of non-operation enabled field staff to perform filter change-outs and download data and maintain a consistent start time at all 24-hour sampling sites.

X. Field Observations

Activities other than plating at each of the chrome plating facilities were suspected of having a major impact on the ambient hexavalent chromium and metals concentrations in the neighborhood. To enhance data usability and assess these activities with respect to ambient readings of hexavalent chromium and metals, field personnel from ARB and SDCAPCD recorded cleaning, painting, and construction activities, particularly after the March 24 chrome plating shutdown at Master Plating. Other activities in the neighborhood that may have resulted in high ambient readings through a known or unknown cause were also recorded.

Activity information is contained in Appendix C.4, page 507.

XI. Modifications to Sampling Protocols

Summarized below are operational departures from the sampling protocols written for Phase II, III, and III-A through III-D. Modifications to the Phase I sampling protocol are not described since those data were invalidated. In addition to the changes described below, several additional sites and sampling intervals were added during the course of the project. These additions are described in Section IV of this report.

Sampling protocols used for the project are contained in Appendix A.1 through A.3, pages 1-87.

A. Phase II

Phase II was intended to repeat Phase I in terms of sampling sites, duration, etc. During Phase I sampling several modifications were made after the project began and those changes were implemented in Phase II.

One primary and one collocated sampler were placed at the Vacant Lot rather than at the Barrio Station Youth Center as initially proposed.

Field calibrations of samplers were not performed as originally specified. Flow checks were performed instead using a calibrated field flow meter.

B. Phase III

Sampling was extended to March 8 from the original end date of February 26, 2002. Sampling was later extended from March 8 through the end of March, April, and through May 24, resulting in Phases III-A, -B, -C, and -D.

C. Phase III-A

A modified sampling schedule on Fridays, Saturdays and Sundays was employed to assist in identifying the source of elevated hexavalent chromium levels on days and at times when chrome plating was not occurring. The schedule is detailed in Section IV.

D. Phase III-B

No significant modifications were made from the planned sampling during Phase III-B.

E. Phase III-C

On March 31, filters designed for metals sampling were inadvertently used with ARB samplers located within Master Plating to collect hexavalent chromium samples. Therefore, there are no indoor hexavalent chromium data for March 31. Metals results have been reported for that day although sampling for metals within Master Plating was not originally scheduled for March 31.

F. Phase III-D

No met data was recorded from April 27 through May 6 due to equipment malfunction. Daily wind direction information for those days was provided by SDCAPCD from 24-hour vector readings obtained from nearby network monitoring sites.

XII. Summary of Results and Findings

The approach taken called for sample results to be assessed as they were received. This resulted in a dynamic network evolution. The goal of determining neighborhood ambient concentrations of hexavalent chromium grew to include determining the specific cause of high readings. By changing the duration and location of samplers we were able to identify the predominant source of the hexavalent chromium emissions. Monitoring on a neighborhood scale provided a wealth of information that the statewide monitoring network could not.

The most significant results and findings from monitoring in Barrio Logan that helped pinpoint the hexavalent chromium source are indicated below.

- Master Plating was usually closed on Saturdays and Sundays and chrome plating was rarely performed on Mondays and Tuesdays. Indoor concentrations at Master Plating increased throughout the week relative to plating operations. Likewise,

Master Plating indoor hexavalent chromium to total chromium ratio (%Cr6) was elevated on Mondays. There were also elevated hexavalent chromium levels on Mondays at 2121 Newton Avenue with similar %Cr6 patterns as at Master Plating. This apparent inconsistency, referred to as the Sunday-night-Monday-morning phenomenon, was attributed to cleaning and other activities performed inside Master Plating on Monday mornings that entrained hexavalent chromium inside that impacted the neighbors.

- With the exception of the point above, high ampere hours at Master Plating, indicative of active plating, coincided with high indoor concentrations at Master Plating. See Figure 11.

- Meteorological data confirmed that 70 percent of the time the winds were from the west. High ampere hours at Master Plating corresponded to high hexavalent chromium concentrations at 2121 Newton when winds were from the west. When there were high indoor concentrations at Master Plating and predominantly west winds, there were high ambient concentrations at the 2121 and 2152 Newton Avenue sites. Concentrations at 2121 Newton Avenue were less than 1 ng/m^3 when winds were from the south, even with high amp-hours and/or high indoor concentrations at Master Plating. See Figures 12 and 13.

- Results of source testing showed that C&B had appropriate controls in place and was not contributing to the high levels of hexavalent chromium exposure in the neighborhood, as did Master Plating.

- There was no clear statistical relationship between ampere hour readings at C&B and hexavalent chromium concentrations at 2121 Newton. See Figures 14, 15 and 16.

- High %Cr6 ratios indoors at Master Plating corresponded to days with high amp-hours (chrome plating activity). On west wind days the %Cr6 at 2121 Newton Avenue was similarly elevated. Alternately, the %Cr6 was low at 2121 Newton Avenue when winds were from the south, even though amp-hours and Master Plating indoor %Cr6 was high. See Figures 17 and 18.

- There was a positive correlation between the metals concentrations at Master Plating and 2121 Newton Avenue for both iron and nickel on west wind days beyond statewide background levels. (Figures 19 and 20) This comparison associates Master Plating with impacts at 2121 Newton Avenue using measures other than hexavalent chromium. Nickel is used in the decorative plating process at Master Plating but not with the hard plating process at Carlson and Beauloye.

- On 95 percent of the sampling days (between February 5th and May 24th), the hexavalent chromium concentration at 2121 Newton Avenue was higher than at any of the five other ambient sites in the neighborhood. The variation in concentrations at the ambient sites (high at 2121 Newton Avenue and significantly lower at the

other sites) suggested a local source of hexavalent chromium in proximity to 2121 Newton Avenue.

- Chrome plating stopped on March 25th at Master Plating and indoor and outdoor concentrations dropped. Occasionally there were elevated hexavalent chromium concentrations at 2121 Newton Avenue after closure of the plating operation, but they were specifically on days when cleaning and construction activities were being conducted at Master Plating.

- Hexavalent chromium concentrations were reduced indoors at Master Plating from an average of 83.6 ng/m^3 (33 sample results) during active plating to 5.9 ng/m^3 (34 sample results) after the chrome plating shutdown. This represents a 93 percent reduction. Ambient hexavalent chromium concentrations were reduced from an average of 0.78 ng/m^3 at 2121 Newton Avenue during active plating at Master Plating to 0.2 ng/m^3 (LOD = 0.2 ng/m^3) after the chrome plating activity at Master Plating stopped. This represents a 74% reduction or 85% of the maximum possible reduction (maximum possible reduction is 87% due to analytical instrument sensitivity). See Figures 21 and 22.

XIII. Future Studies

Valuable information regarding planning for neighborhood scale monitoring studies was obtained from this project. This project started as a neighborhood exposure study and evolved into a diagnostic study due to the real-time data analysis and the results found. The information resulted in an ever-changing sampling scheme that was made possible by the flexibility of staff and equipment. These changes enhanced the data collection and provided information that led to significant changes in the neighborhood and its exposure to hexavalent chromium.

Suggestions for planning future studies based on lessons learned at Barrio Logan include aspects of network planning, community involvement, data analysis and data release as follows:

- Involve the local air district early.
- Identify the purpose or hypothesis early and with as much agreement as possible from agencies and stakeholders.
- Identify secondary objectives.
- Design the sampling network with defined sample duration and frequency using approximately 3-5 monitoring sites at exposure locations, 2-4 monitoring sites at source-oriented locations, and 1-2 background sites. Review inventories and models to support the network design.
- Develop appropriate, detailed protocols to address monitoring, data analysis and data transmittal, but plan to be flexible and issue protocol updates as needed.
- Use rigid chain-of-custody procedures and assume litigation potential.
- Review literature for similar work and refer to statewide network data for background information.

- Develop internal and external data analysis groups.
- Determine compliance of source/facility(s) with all relevant permits.
- Track all relevant source activity information to explain data.
- Establish a community/interagency working group early.
- Interact with residents as well as community representatives.
- Involve residents in gathering information (provide cameras, notebooks, etc.).
- Provide timely and easily understood summaries of results.
- Update web-based reference materials including community pages, protocols, fact sheets, data summaries, and SOPs.

Attachment 1
Data Evaluation Graphs
Figures 10 - 22

Figure 10: Hexavalent Chromium Concentrations at Master Plating

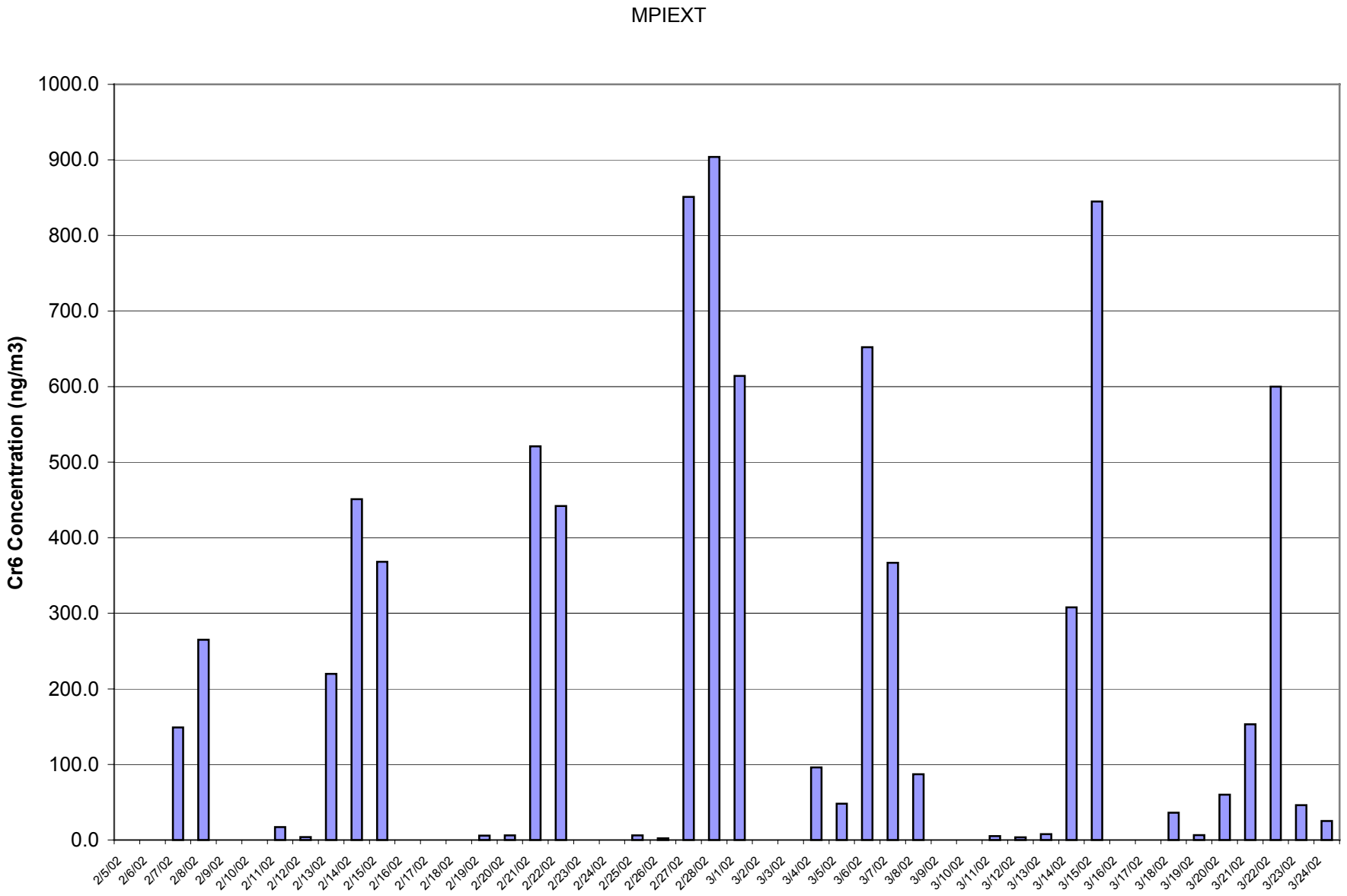


Figure 11: Indoor Hexavalent Chromium Concentration vs. Amp Hours

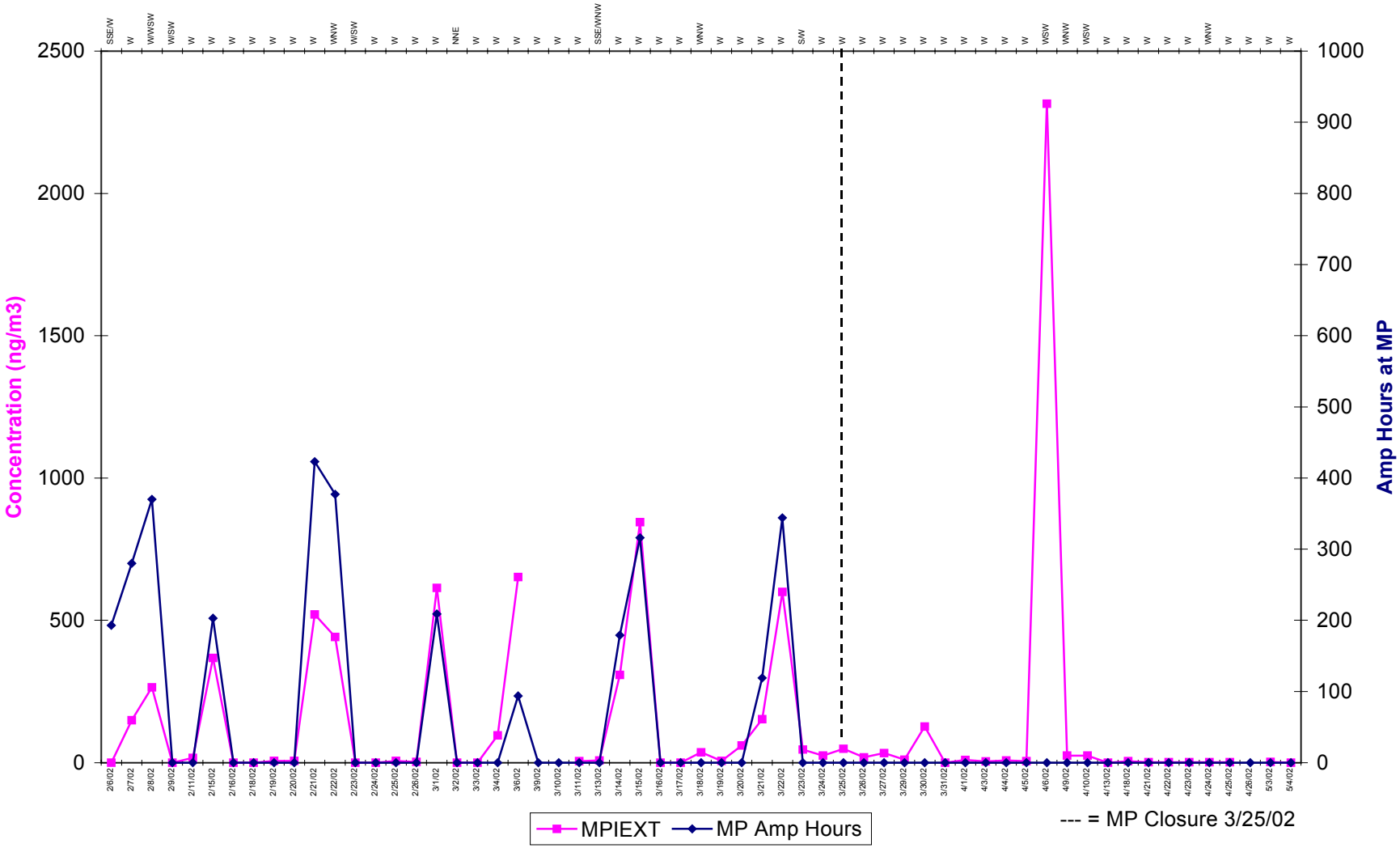


Figure 12: 2121 vs Indoor Hexavalent Chromium Concentrations

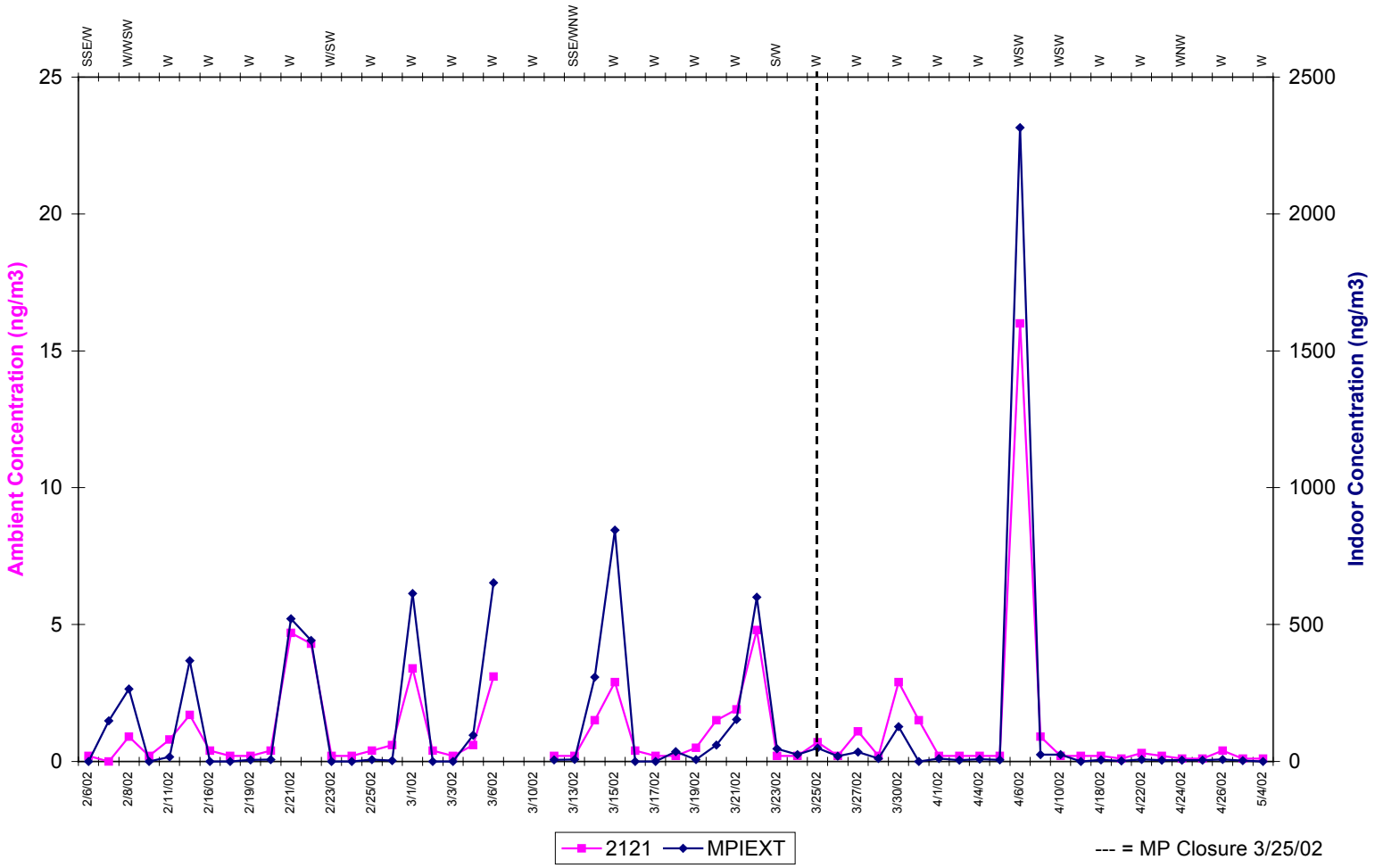


Figure 13: Indoor and Ambient Hexavalent Chromium Concentrations vs Amp Hours

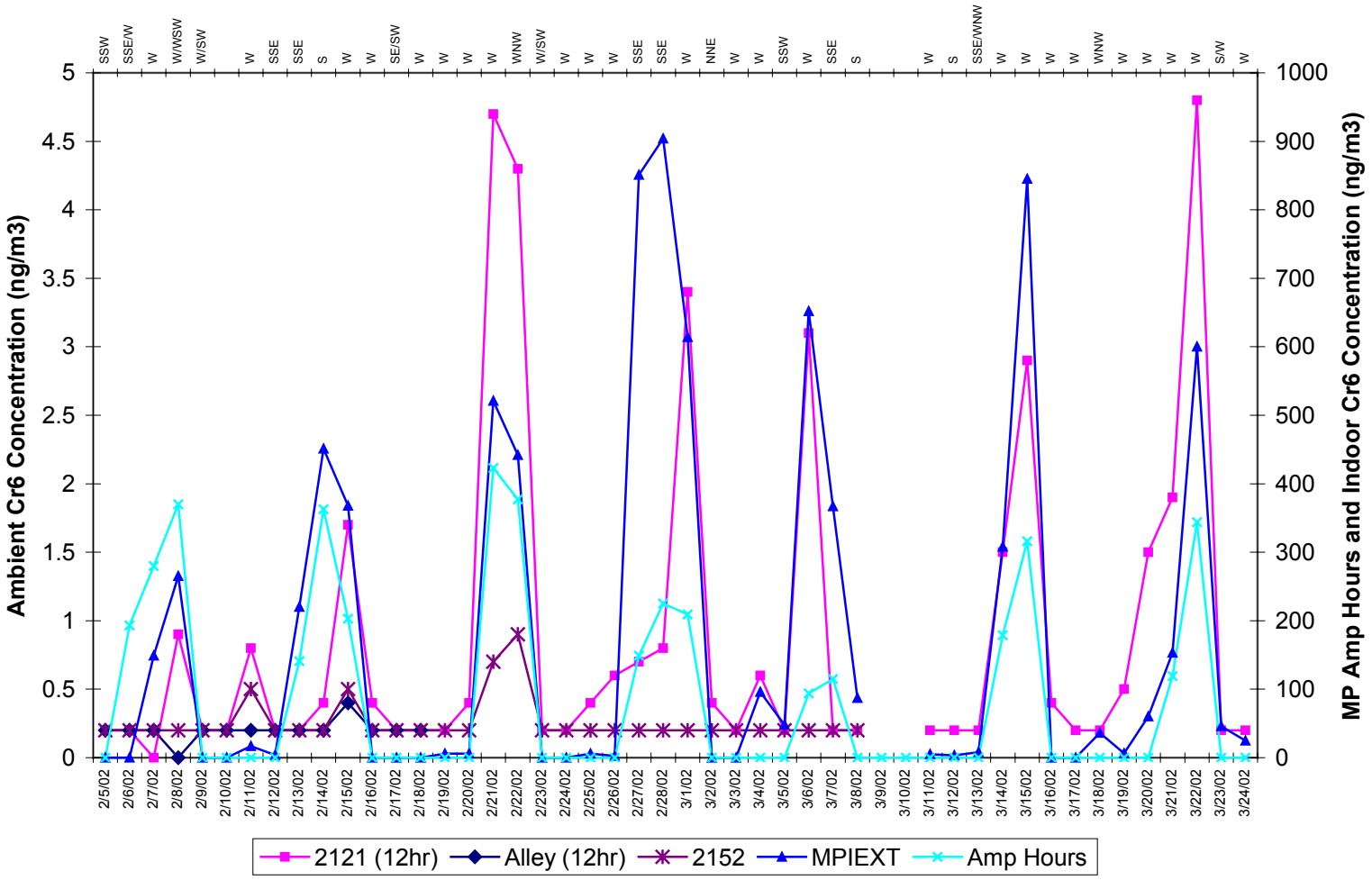


Figure 14: Amp Hours at Carlson & Beauloye

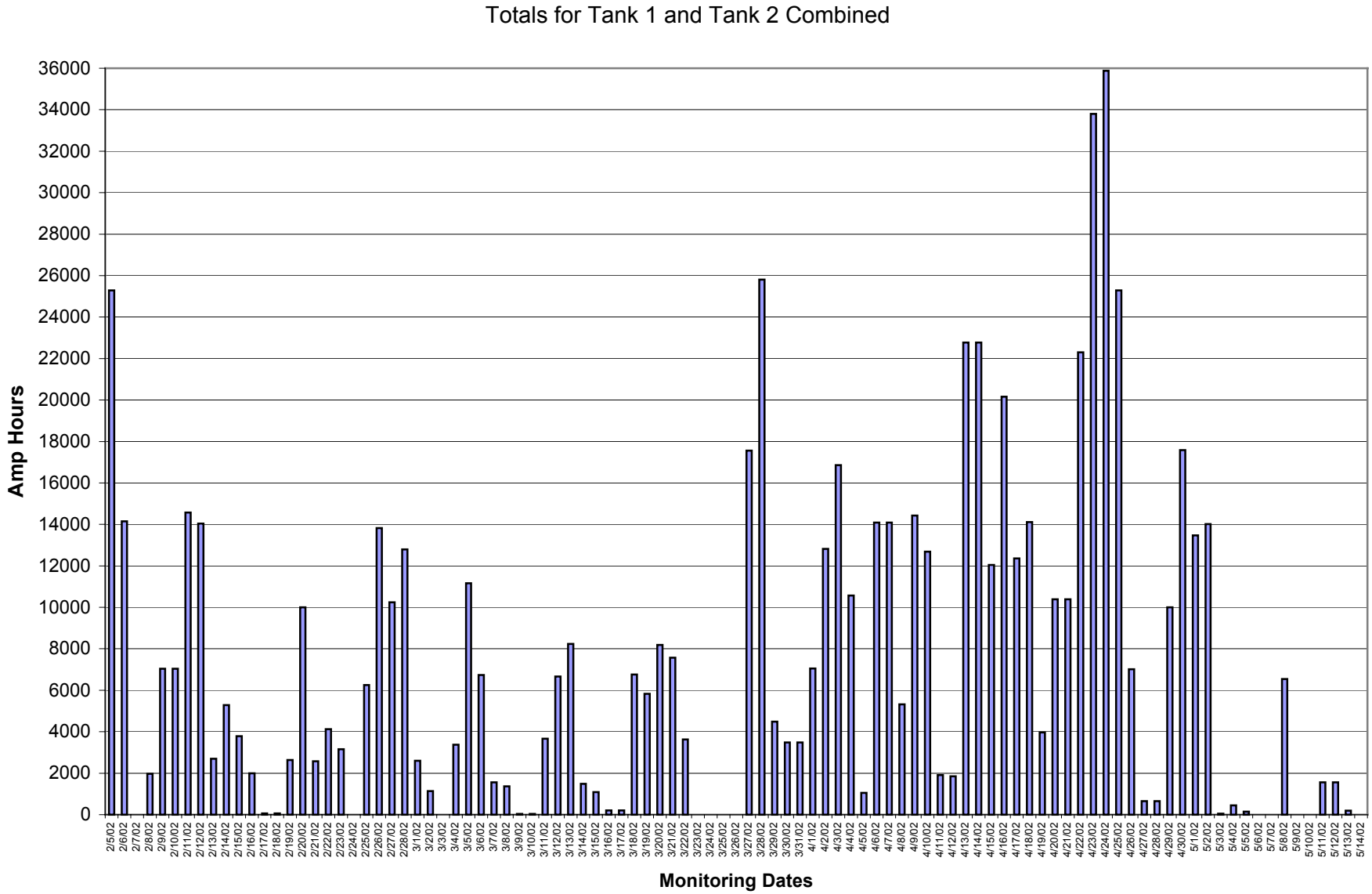


Figure 15: C&B Amp Hours vs. Hexavalent Chromium Concentrations at 2121 Newton (1)

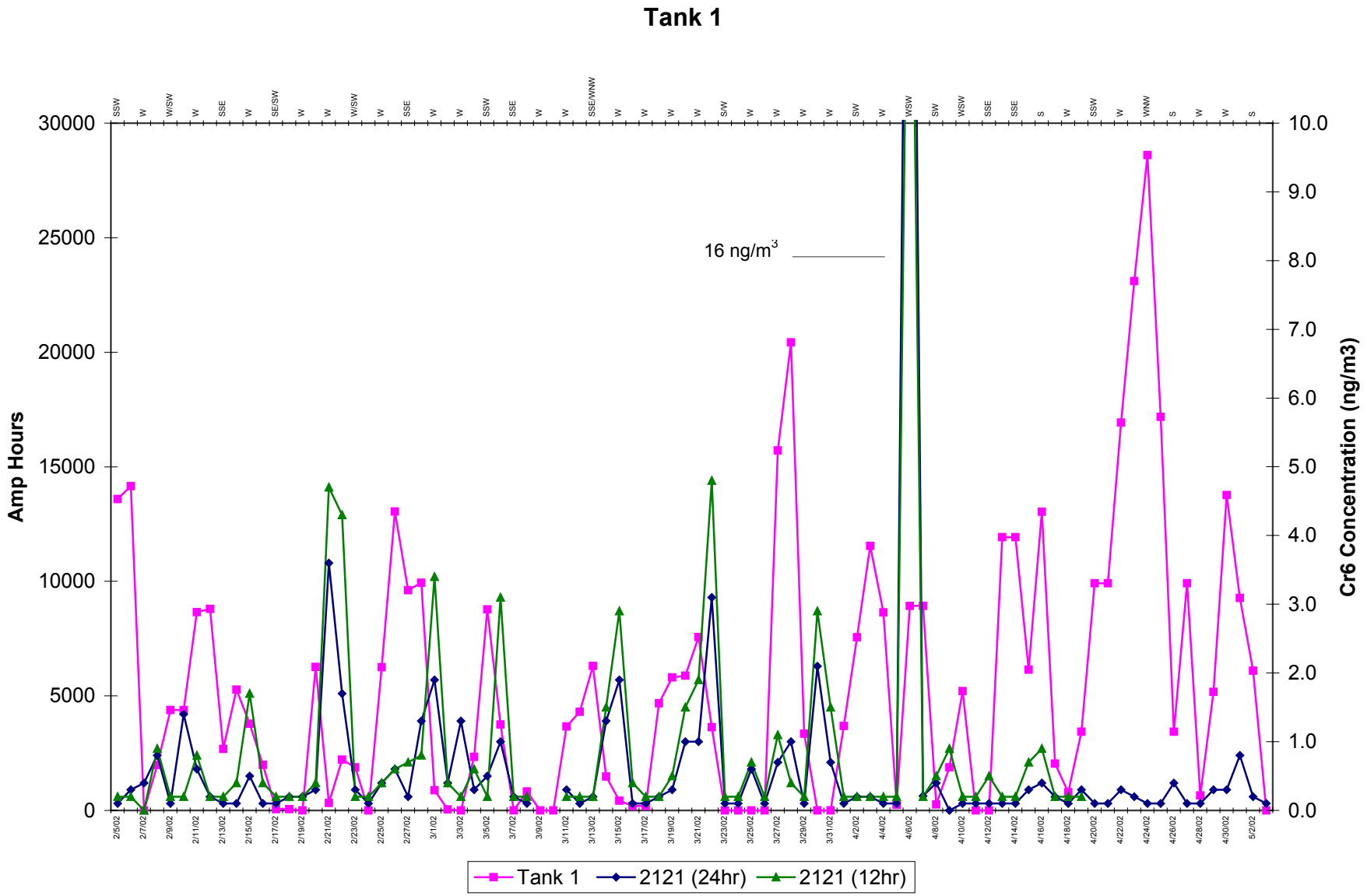


Figure 16: C&B Amp Hours vs. Hexavalent Chromium Concentrations at 2121 Newton (2)

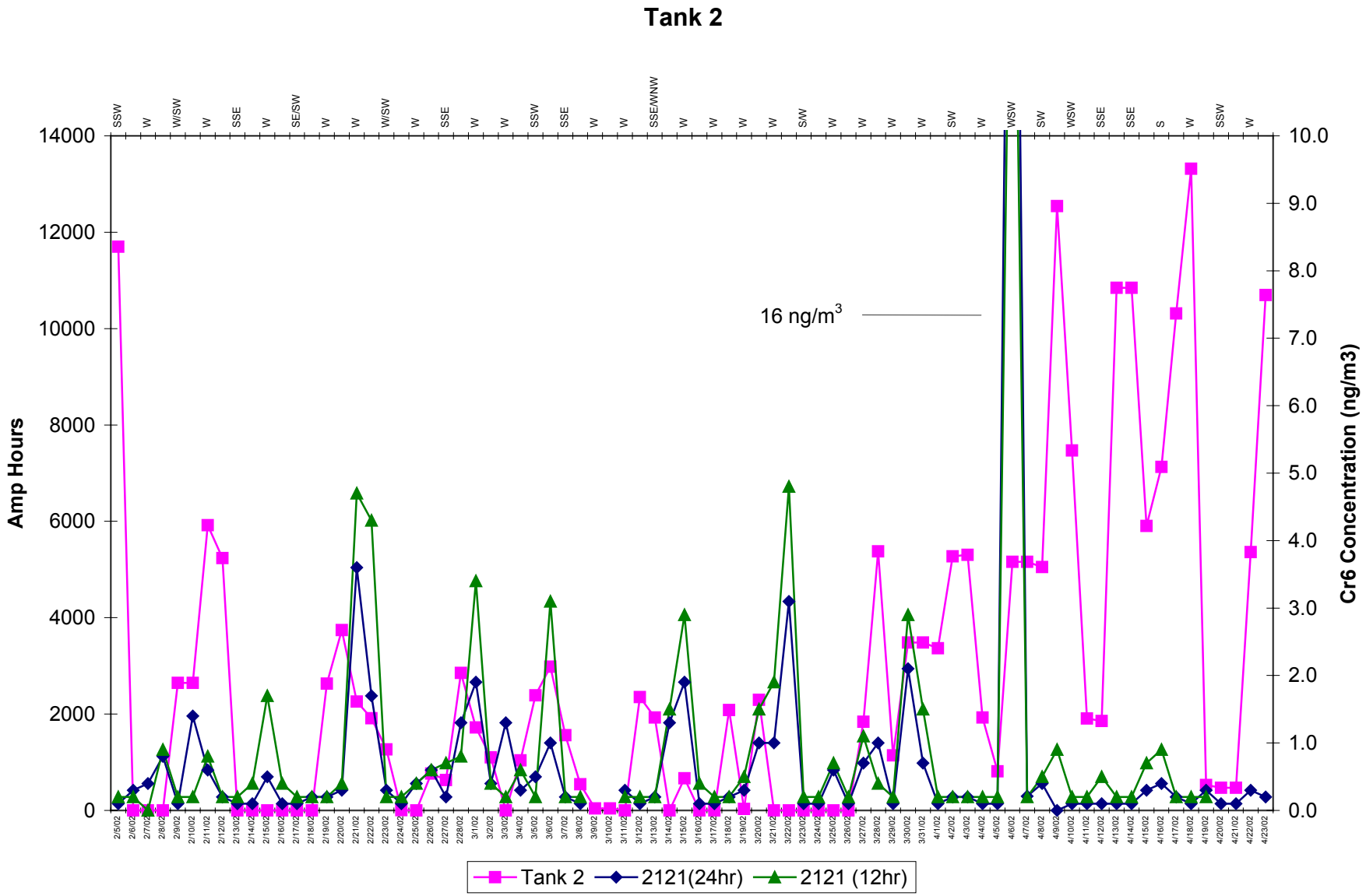


Figure 17: Ratio vs. Amp Hours at Master Plating

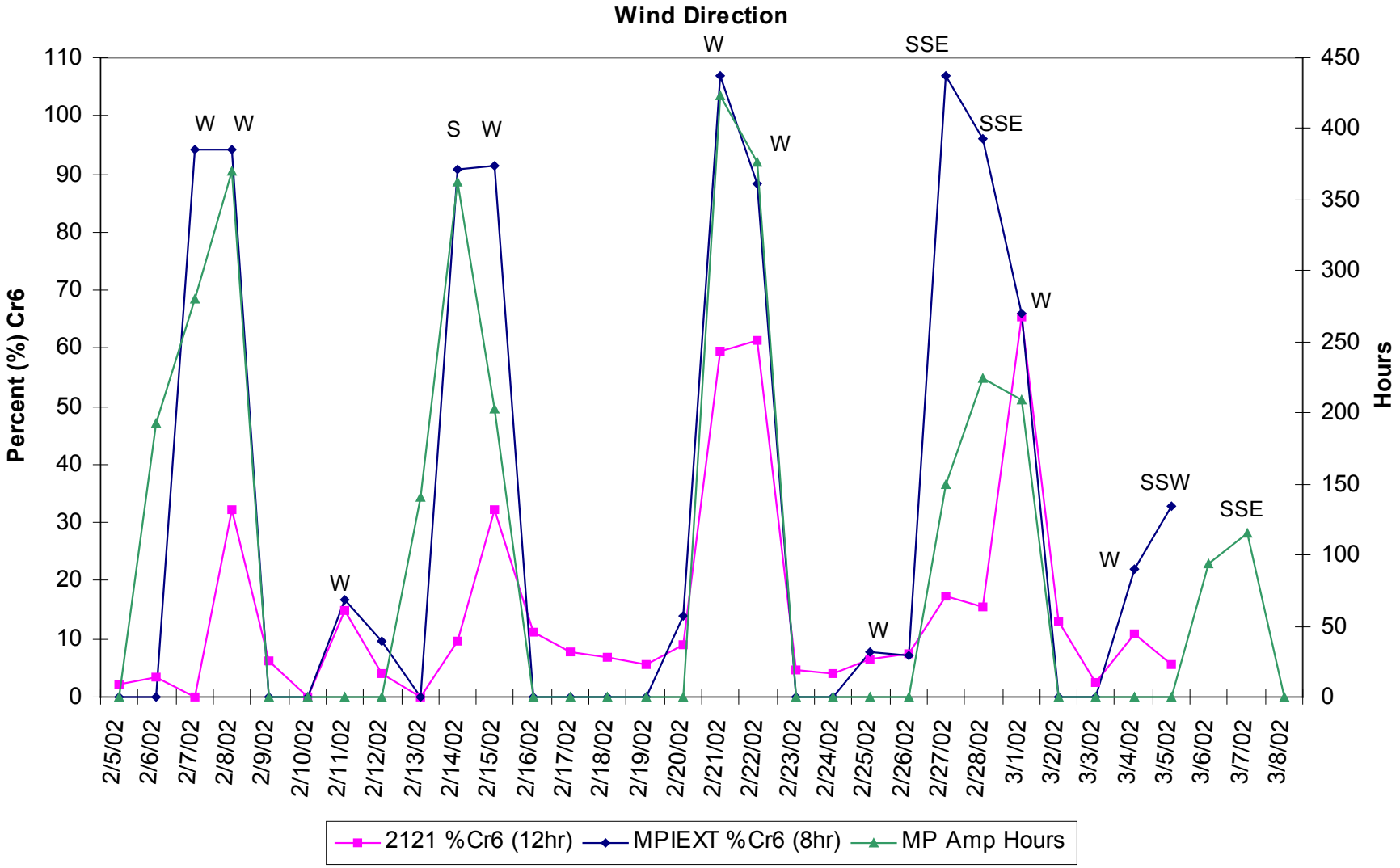


Figure 18: Hexavalent Chromium Ratio Comparisons on West Wind Days

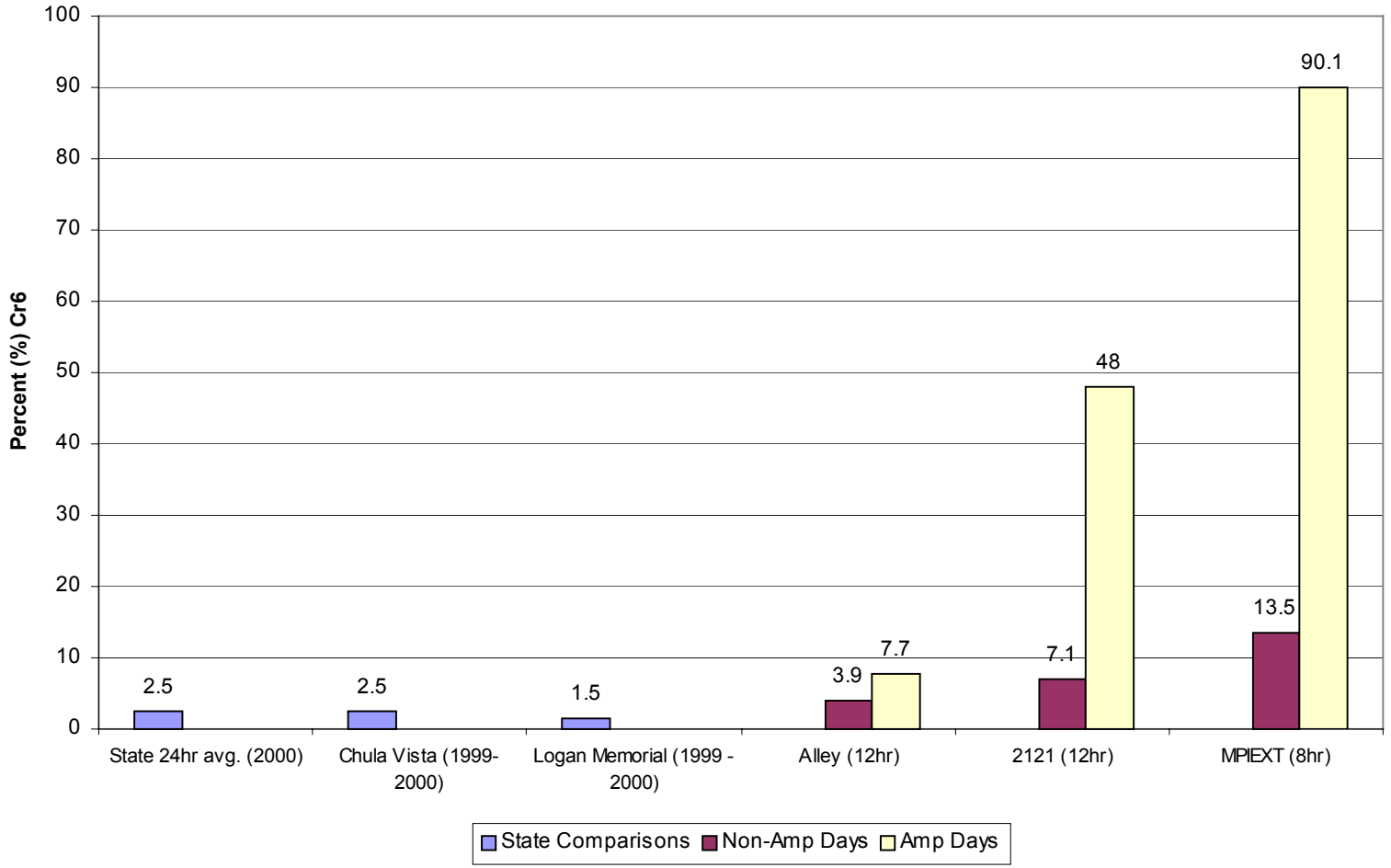


Figure 19: Iron Concentrations on West Wind Days

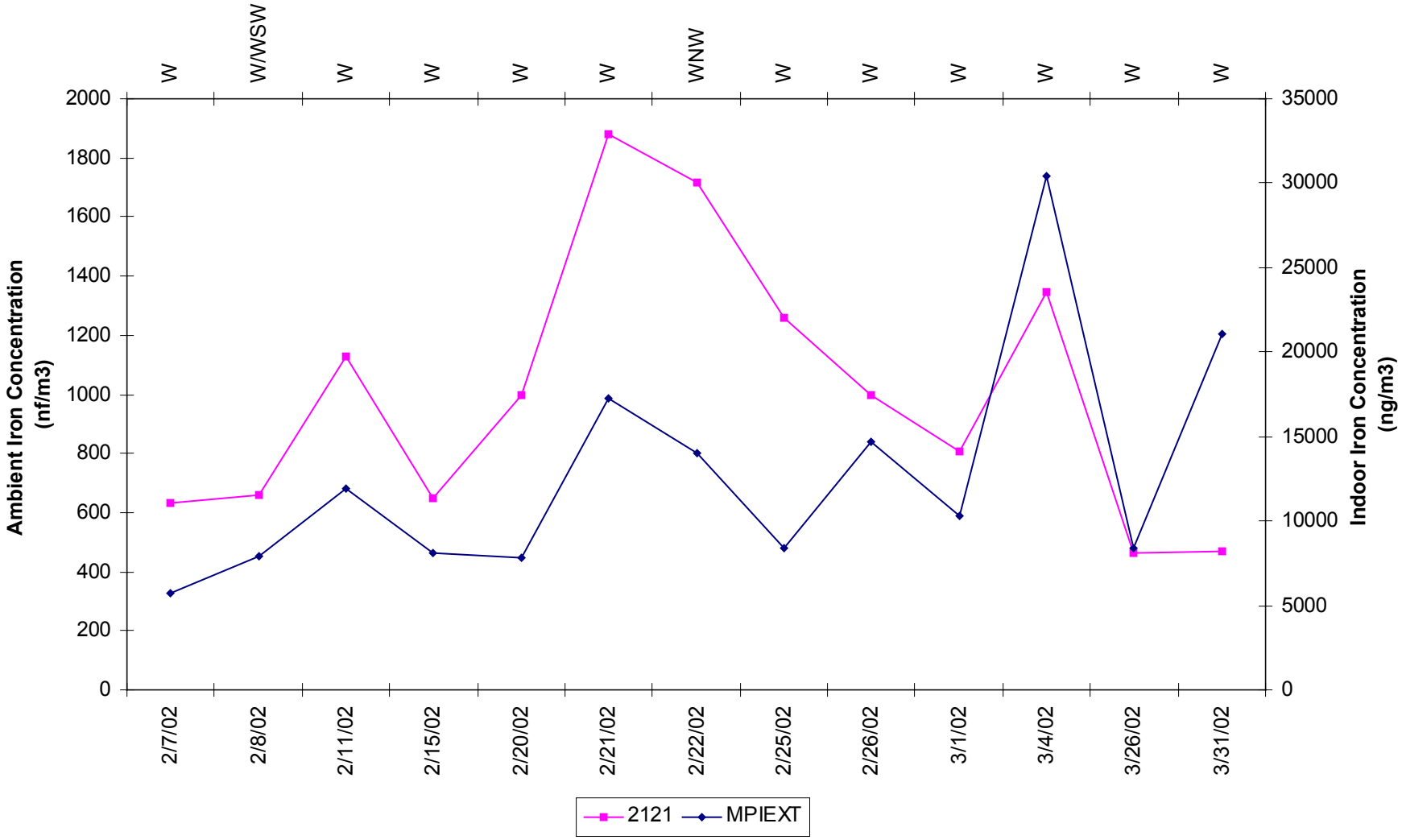
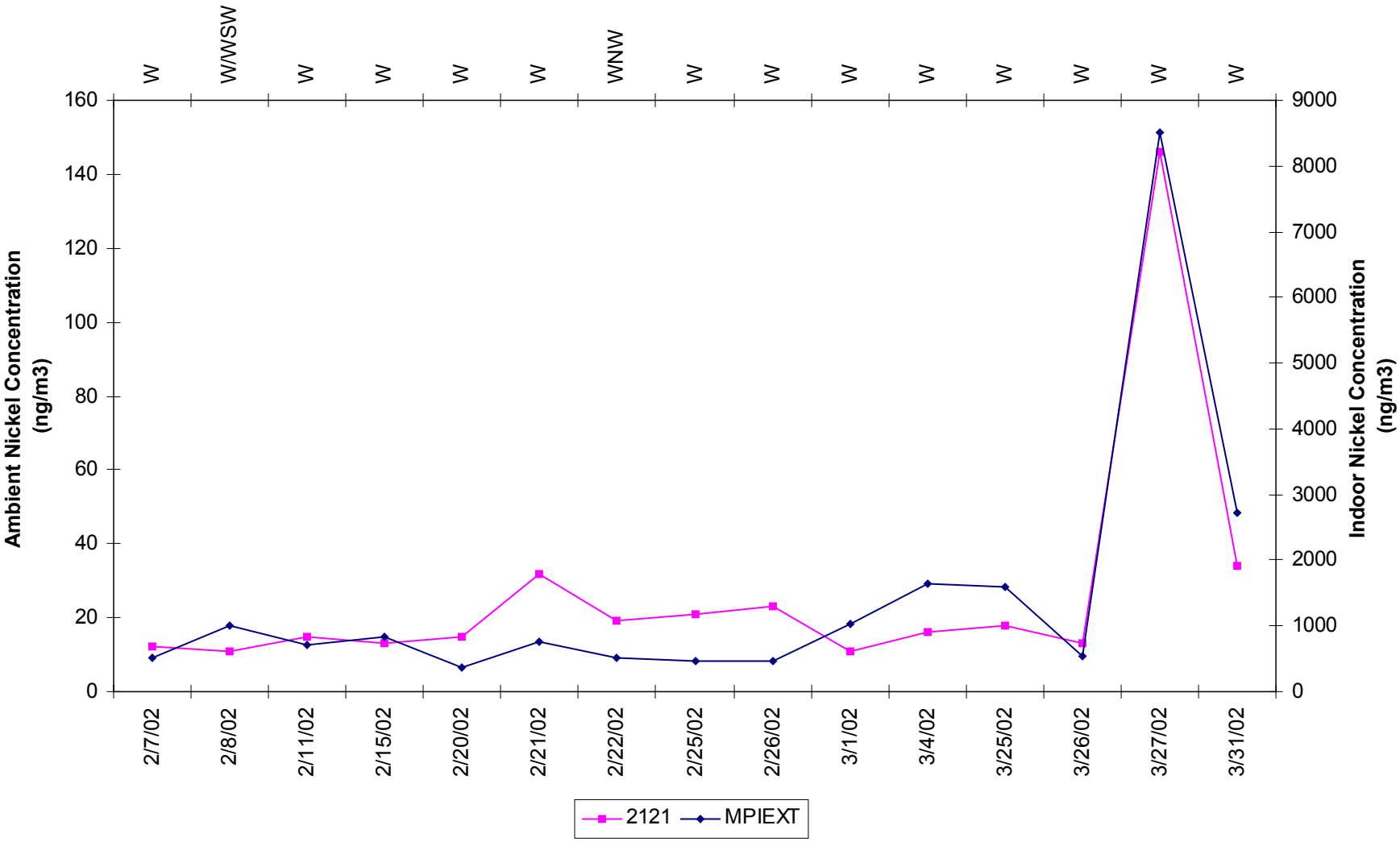


Figure 20: Nickel Concentrations on West Wind Days



Average Hexavalent Chromium Concentrations
Before and After Master Plating Closure
on West Wind Days

Figure 21: Hexavalent Chromium Reduction at Master Plating

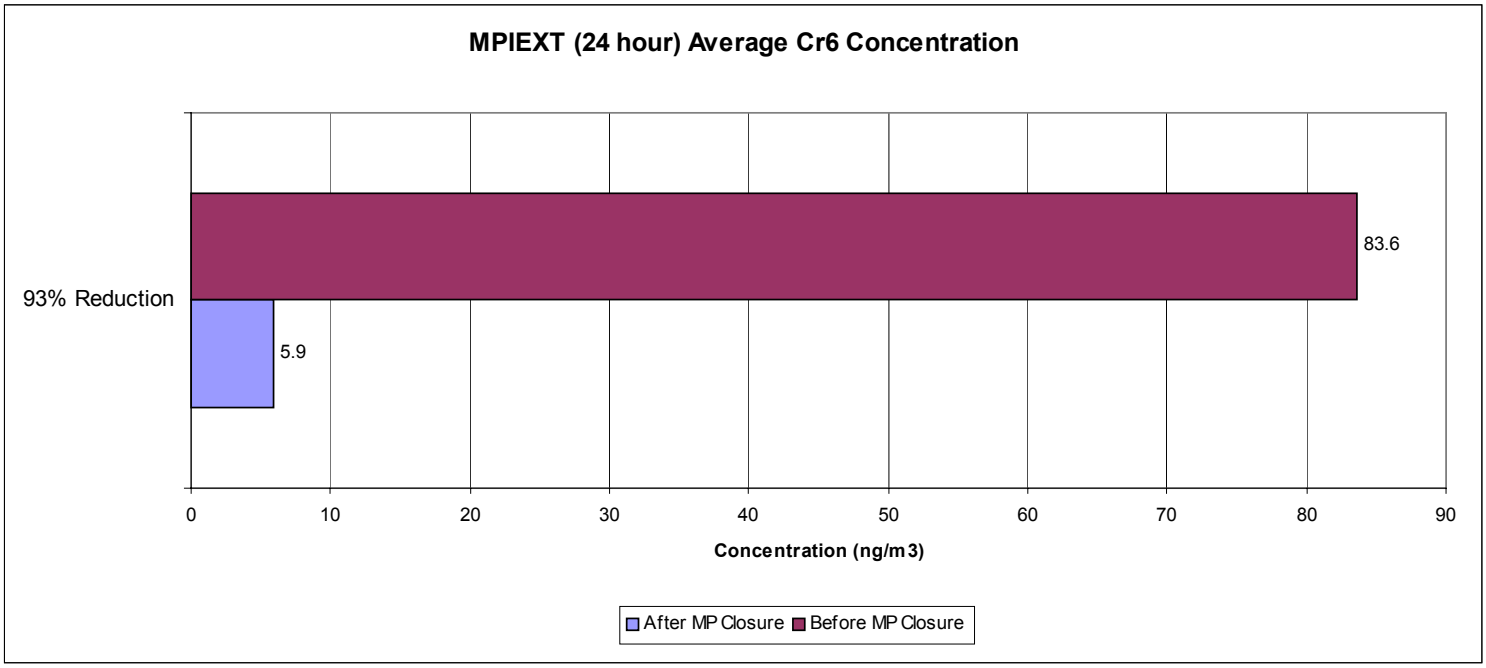
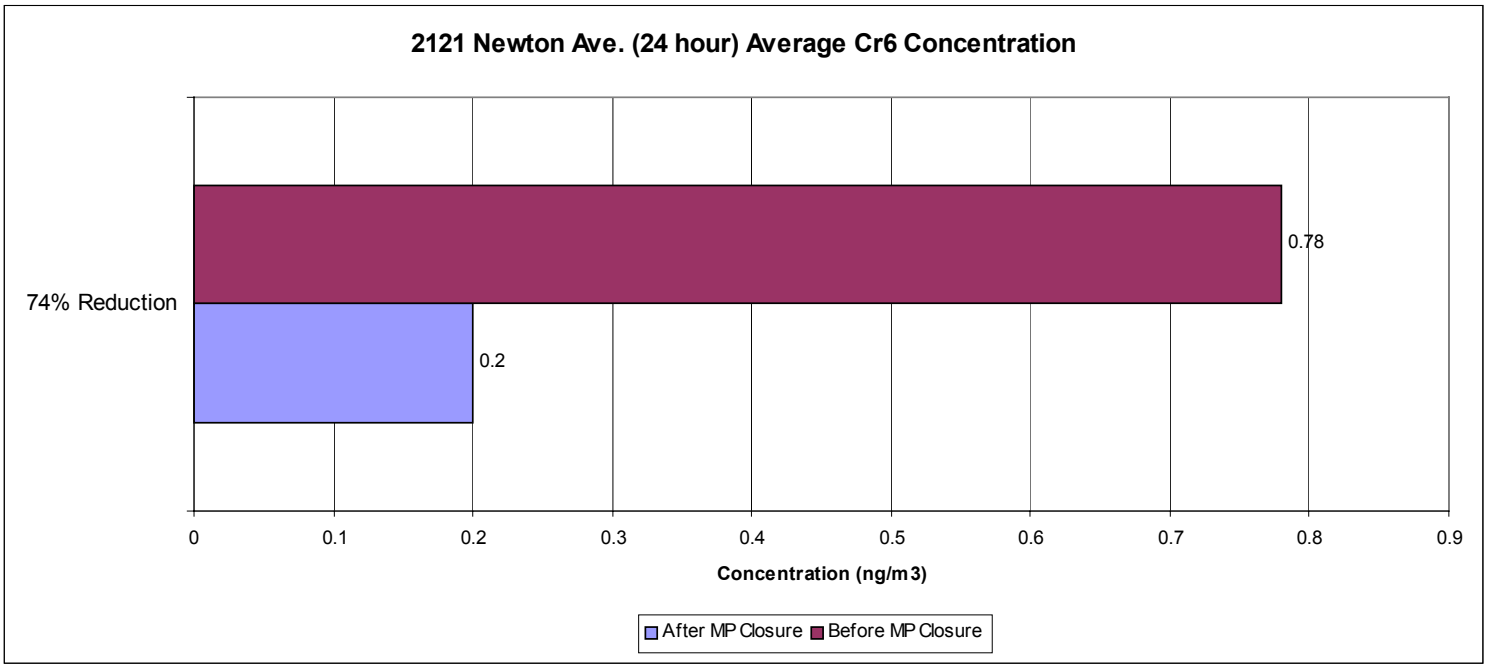


Figure 22: Hexavalent Chromium Reduction at 2121 Newton Avenue



Maximum reduction possible at 2121 Newton is 87% based on 1/2 LoD (LoD = 0.2 ng/m3). Therefore, actual reduction at 2121 Newton was 85% of maximum possible reduction.

Attachment 2
Calculations

1) Hexavalent Chromium Ratio

The hexavalent chromium ratios were calculated as follows:

$$\%Cr6 = (\text{Hexavalent} / \text{Total}) \times 100$$

Where:

%Cr6 = percent hexavalent chromium ratio,
Hexavalent = hexavalent chromium concentration in ng/m^3, and
Total = total chromium concentration in ng/m^3

2) Concentration Conversion

The analytical concentration was converted to air concentration using the extract volume and the total volume of air sampled as follows:

$$\text{Conc.}\ (ng/m^3) = \frac{[\text{Extract Volume (mL)}]\ [\text{Extract Conc. (ng/mL)}]}{[\text{Total Air Volume Sampled } (m^3)]}$$

3) Hexavalent Chromium Level of Detection (LoD)

The relationship between the LoD in ng/mL and the LoD in air concentration units of ng/m^3 is expressed as follows:

$$\text{LoD}\ (ng/m^3) = \frac{[\text{Extract Volume (mL)}]\ [\text{LoD (ng/mL)}]}{[\text{Flow Rate (L/min)}]\ [\text{Duration (hr)}]\ [60\ \text{min/hr}]\ [0.001 m^3/L]}$$

Where:

Extract Volume = The volume of deionized water used for filter extraction. Per MLD 039, the extract volume is a constant 15mL.

LoD = The published limit of detection, 0.2 ng/mL of extract.

Flow Rate = Sampler flow rate.

Duration = Total hours of sampling.

4) Data Quality Objectives

a) ***Accuracy*** - Accuracy is defined as the extent of agreement between an observed value and an accepted reference standard. For this project, the accuracy of field samplers is described as the percent difference between the

flow transfer standard (reference) and each sampler's indicated flow as shown below:

$$\%\text{Difference} = [(\text{Indicated} - \text{Reference}) / (\text{Reference})] \times 100$$

b) ***Precision*** - Precision is the degree of mutual agreement among individual measurements made under prescribed conditions. Precision for manual sampling methods is obtained by operating collocated samplers at selected sites. For each pair of collocated samplers, one is designated as the primary sampler and is used to report air quality for the site. The other is designated as the collocated sampler. The differences in the measured concentration between the two collocated samplers are used to calculate and assess the precision of the monitoring data.

Precision is estimated as the relative percent difference (RPD) between a sample and collocated sample pair. RPD for collocated samplers is calculated as the absolute difference between two sample results divided by the mean of the two sample results:

$$RPD = (|x - y|) / ((x + y)/2)$$

Where x = measured concentration from primary sampler, and
y = measured concentration from collocated sampler

As x and y approach the detection limit (e.g., 0.2 ng/m^3 for 24-hour hexavalent chromium) the RPD becomes less significant.

Appendices for the report on Ambient Air Monitoring for Hexavalent Chromium and Metals in Barrio Logan: May 2001 through May 2002

Operations Planning and Assessment Section
Quality Management Branch
Monitoring and Laboratory Division

October 14, 2003

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Appendix A Sampling Protocols

Appendix A.1

Air Sampling for Hexavalent Chromium in Barrio Logan,
May 7, 2001

State of California
California Environmental Protection Agency
Air Resources Board

AIR SAMPLING FOR HEXAVALENT CHROMIUM IN BARRIO LOGAN

Monitoring and Laboratory Division

May 7, 2001

The following protocol has been reviewed and approved by the Air Resources Board (ARB) staff. Approval of this protocol does not necessarily reflect the views and policies of the ARB, nor does the mention of trade names or commercial products constitute endorsement or recommendation for use.

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1.0 Sampling Plan Identification and Approval

Title: Air Sampling for Hexavalent Chromium in Barrio Logan.

Approval: The following sampling plan is recommended for approval by the Monitoring and Laboratory Division.

Signatures:

5/15/01
Kenneth R. Stroud, Chief — Date
Air Quality Surveillance Branch
Air Resources Board

5.09.01
Jeffrey P. Cook, Chief — Date
Quality Management Branch
Air Resources Board

5/9/01
Michael Poore, Chief — Date
Northern Laboratory Branch
Air Resources Board

5.16.01
William V. Loscutoff, Chief — Date
Monitoring and Laboratory Division
Air Resources Board

The attached sampling plan has been reviewed and meets all expectations regarding the request by the Stationary Source Division for hexavalent chromium sampling in Barrio Logan.

5/18/01
Donald Ames, Assistant Chief — Date
Stationary Source Division
Air Resources Board

2.0 Background and Scope of Project

In 1986 the Air Resources Board (ARB) formally identified hexavalent chromium as a toxic air contaminant (TAC). The identification was made as part of the Toxic Air Contaminant Identification and Control Act, also known as AB 1807. During the identification process, chrome plating operations were recognized as a major source of hexavalent chromium emissions in the State. In 1988, pursuant to AB 1807, the ARB adopted an air toxic control measure (ATCM) aimed at reducing hexavalent chromium emissions from chrome plating facilities.

Chrome plating facilities are categorized by the thickness of the chrome layer applied to parts and referred to as hard chrome shops or decorative chrome shops. Hard chrome shops typically electroplate industrial components, including pistons and crankshafts, with a relatively thick layer of chrome. Decorative chrome shops specialize in electroplating parts primarily for decorative purposes, such as automobile bumpers and bathroom fixtures, with a thin layer of chrome. Both types of chrome plating, as well as chromic acid anodizing, use chemical solutions containing hexavalent chromium that may be released to the atmosphere during the plating process.

The ATCM, and its required modifications to the techniques and equipment used by chrome platers, have resulted in a reduction of hexavalent chromium emissions from plating shops by an estimated 97 percent. Individuals living near plating operations, however, may still be subject to increased exposure, and therefore increased health risk, during chrome plating operations. To evaluate the exposure of individuals living near chrome plating shops, the Stationary Source Division (SSD) requested that monitoring be conducted around several chrome plating operations in and around the San Diego community known as Barrio Logan. Barrio Logan is located within the Logan Heights area of San Diego (Figure 1) (1).

In response to the request, the Monitoring and Laboratory Division (MLD) will conduct hexavalent chromium monitoring in and around Barrio Logan in two phases. The first phase consists of monitoring around two chrome shops (one decorative and one hard chrome) located in a mixed residential-commercial area. The second phase consists of monitoring farther north near a decorative chrome shop in Logan Heights. Monitoring will take place primarily on residential property. Agreements with residents and other parties to allow monitoring will be arranged prior to the placement of any samplers. The sampling approach during each phase will be a circular or semi-circular pattern of samplers around one or more chrome platers with each sampler placed at or near a residence or other location that will provide information on emission patterns. The objective of the project is to collect samples representative of the possible exposure experienced by residents living close to chrome plating shops.

To place the data in perspective, hexavalent chromium values obtained in Barrio Logan will be compared with values obtained at other TAC monitoring sites around the State and with values recorded during the Barrio Logan Toxics Monitoring Project. All results from the current monitoring project will be compiled in a sampling report and submitted to SSD. The final report will also be made available to community groups and other interested parties.

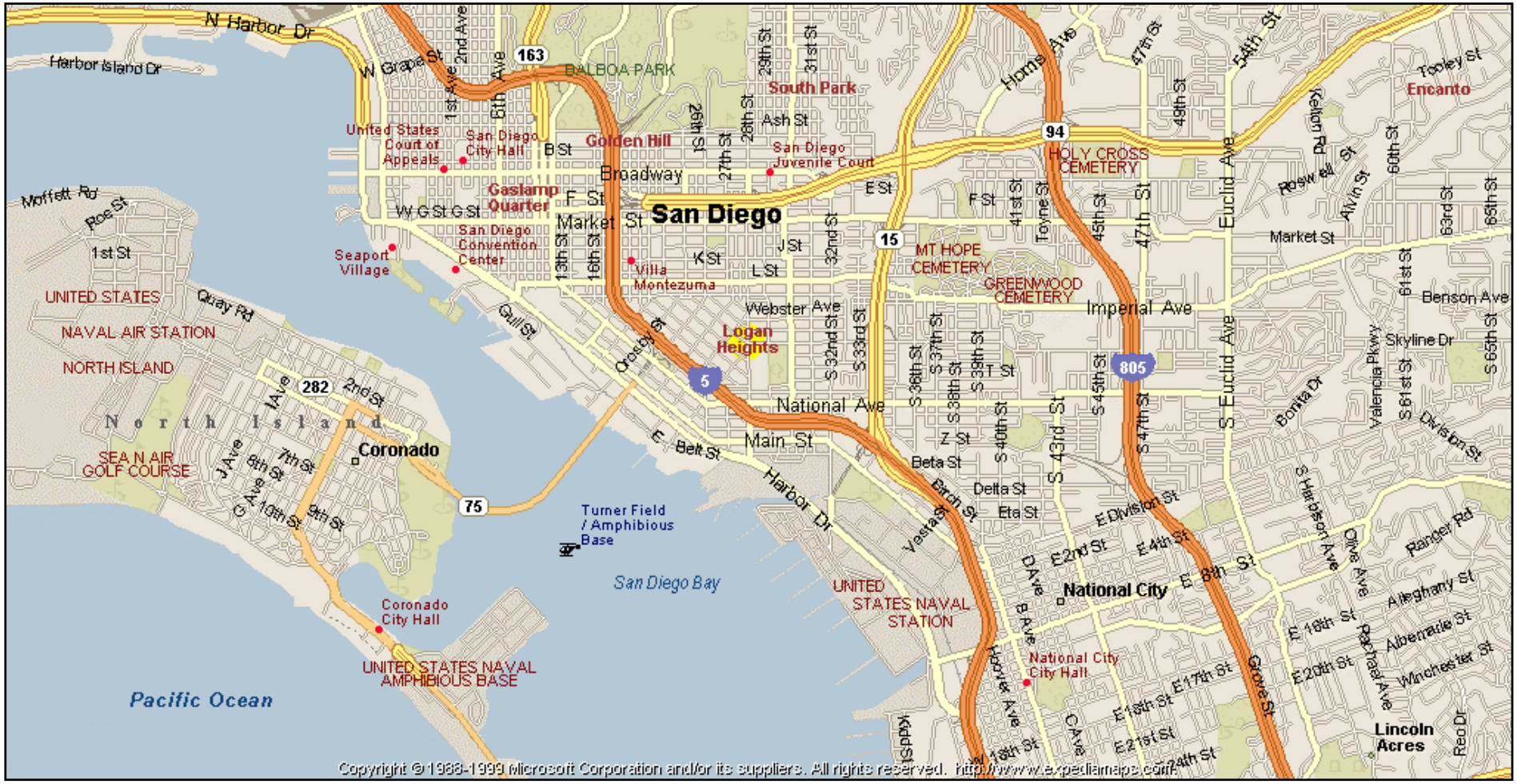


Figure 1: San Diego Area

3.0 Roles and Responsibilities

MLD and SSD are the divisions in ARB with overall responsibility for the Barrio Logan hexavalent chromium monitoring project. MLD will plan and conduct the monitoring, perform all analyses, and address all associated quality control and quality assessment activities. MLD and SSD will work cooperatively with community organizations to secure appropriate monitoring sites. SSD will use the acquired monitoring data, in conjunction with data obtained from other sources, to evaluate the effectiveness of the current ATCM for controlling hexavalent chromium emissions from chrome plating shops at the neighborhood level.

ARB management contacts for the project are listed below with an explanation of the functions their respective sections will be performing.

- Todd Wong, Manager
  Technology Assessment Section
  Project Assessment Branch

  The Technology Assessment Section (TAS) will be the primary contact group for communication between SSD and MLD and will coordinate all meetings between ARB staff and local community groups. The TAS will notify the San Diego County Air Pollution Control District regarding all monitoring work and will verify chrome plating operations for the duration of the project. Verification may include obtaining District inspection records (i.e., ampere-hour logs) for each plating operation and contacting individual platers for specific process information to ensure that operations will be continuous throughout the sampling period. The TAS will assist MLD staff in selecting sampling sites and operating samplers and will review and comment on the sampling plan and sampling report as generated by MLD.

- Jeffrey P. Cook, Chief
  Quality Management Branch
  Monitoring and Laboratory Division

  The Operations Planning and Assessment Section (OPAS) has overall project responsibility for MLD. In conjunction with the Special Purpose Monitoring Section (SPMS), OPAS will assist in selecting sampling sites and coordinating sampling activities with appropriate community representatives. OPAS staff will prepare the sampling plan and will assist in the preparation the sampling report issued to SSD. OPAS will also track samples, validate preliminary results, and conduct the primary analysis of data generated during the project.

- Kenneth R. Stroud, Chief
  Air Quality Surveillance Branch
  Monitoring and Laboratory Division

- Dennis Goodenow, Manager
  Special Purpose Monitoring Section
  Air Quality Surveillance Branch

  Within the Air Quality Surveillance Branch, SPMS will have overall responsibility for installing, operating, and removing all samplers and other instruments as necessary. The SPMS will be responsible for arranging for the transport of all sampling media to and from the sampling sites. The SPMS staff will conduct all field quality control (QC) activities for the duration of the project and will provide TAS and OPAS staff with sampler QC data and confirmation that the sampling plan was followed.

- Michael Poore, Chief
  Northern Laboratory Branch
  Monitoring and Laboratory Division

- Russell Grace, Manager
  Inorganics Laboratory Section
  Northern Laboratory Branch

  The Inorganics Laboratory Section (ILS) will have responsibility for preparing and supplying all sampling media to SPMS staff and will perform all laboratory analyses. ILS staff will provide appropriate laboratory information to OPAS, including the date and number of filters released and returned from the field, sampling dates and locations, sample hold time, date of analysis, analysis results (including units), and any notable inconsistencies (e.g., samples returned without validating flow rate information, etc.). ILS staff will conduct the initial check of the filter and sampling data as it is received from the field to establish the validity of the sample. ILS staff will enter information from samples received from the field in the Laboratory Information Management System (LIMS).

General questions regarding the scope of responsibilities associated with each of the sections involved in the project may be referred to the respective staff contacts listed below:

- Glen Villa
  Technology Assessment
  Stationary Source Division
  (916) 322-6456
  gvilla@arb.ca.gov

- Harlan Quan
  Special Purpose Monitoring
  Monitoring and Laboratory Division
  (916) 327-0951
  hquan@arb.ca.gov

- Webster Tasat
  Operations Planning and Assessment
  Monitoring and Laboratory Division
  (916) 322-7055
  wtasat@arb.ca.gov

- Donald Taylor
  Inorganics Laboratory
  Monitoring and Laboratory Division
  (916) 322-8972
  dtaylor@arb.ca.gov

4.0 Sampling Design and Method

4.1 Sampling Sites

The selection of sampling sites will be based primarily on the location of receptors and their proximity to chrome plating facilities. Siting criteria in 40 CFR Part 58, Appendix E, will be referenced. However, where CFR siting criteria are overly general and not specific to assessing local exposure, alternative criteria will be used.

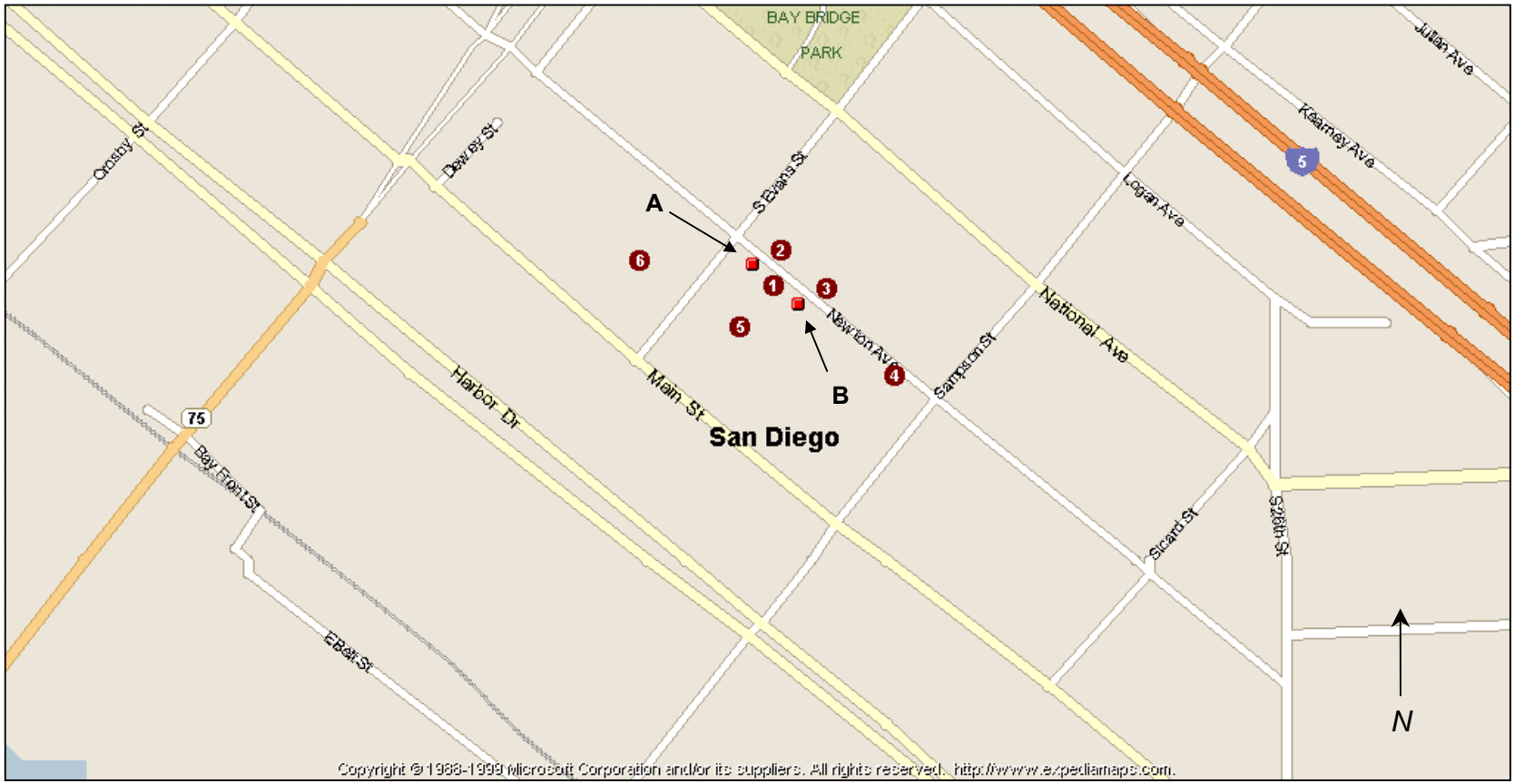
The first phase of hexavalent chromium sampling in Barrio Logan will be conducted along Newton Avenue and South Evans Street using a total of seven samplers (Figure 2). Six of the seven samplers will be primary; one will be collocated. The proposed sites are as follows. One sampler will be placed at a residence directly between two chrome plating facilities, Master Plating and Carlson & Bealoye, on Newton Avenue. Two samplers will be placed at residences on the north side of Newton Avenue, downwind of the plating facilities. Primary and collocated samplers will be placed at the Barrio Youth Center, located on Newton Avenue near Sampson Street. Samplers will be placed at the Mercado Apartment complex at the corner of Newton Avenue and South Evans Street and on residential property mid-block between Newton Avenue and Main Street.

Phase two of the project will be conducted in the vicinity of California Plating, a decorative chrome shop in the Logan Heights area approximately one and one-half miles northeast of the plating shops in Barrio Logan (Figure 3). Three sampling sites are planned in the immediate vicinity of California Plating. The proposed sites will be on residential property, on property owned by the City of San Diego, or on property owned by other organizations. For all sites, samplers will be receptor-oriented and, therefore, will be placed as close to residences or areas of human activity as possible.

Meteorological sensors will be placed at the Barrio Youth Center during phase one of the project and at one of the three selected sampling locations during phase two. At each location, measured parameters will consist of ambient temperature, wind speed, wind direction, and relative humidity. A wind rose plot from data collected during the Barrio Logan Toxics Monitoring Project shows the wind pattern expected during sampling (Figure 4).

4.2 Duration and Interval

Sampling during the first phase is scheduled over a two-week period beginning May 22 and ending June 6. The second phase of sampling will be conducted from June 11 through June 15. The sampling duration at all sites will be 24-hours. The results will be used to develop a profile of ambient concentrations of hexavalent chromium for



	Sampling Sites					
	1	**2**	**3**	**4**	**5**	**6**
Proposed Location	Residential Property	Residential Property	Residential Property	Barrio Youth Center	Residential Property	Mercado Apartments
Address	2121 Newton Ave.	Newton Ave.	Newton Ave.	2175 Newton Ave.	Alley (Newton/Main)	2001 Newton Ave.
Samplers / Sensors	BGI	BGI	BGI	2 BGIs / Met One	BGI	BGI
Sampling Days	11	11	11	11	11	11
Samples per Site	8	8	8	16	8	8
Pollutant / Parameter	Cr6+	Cr6+	Cr6+	Cr6+ / T, WS, WD, RH	Cr6+	Cr6+
Start Date	May 22nd					
End Date	June 6th					
Sampling Duration	24 hours ± 1 hour					
Sampling Interval	Daily					

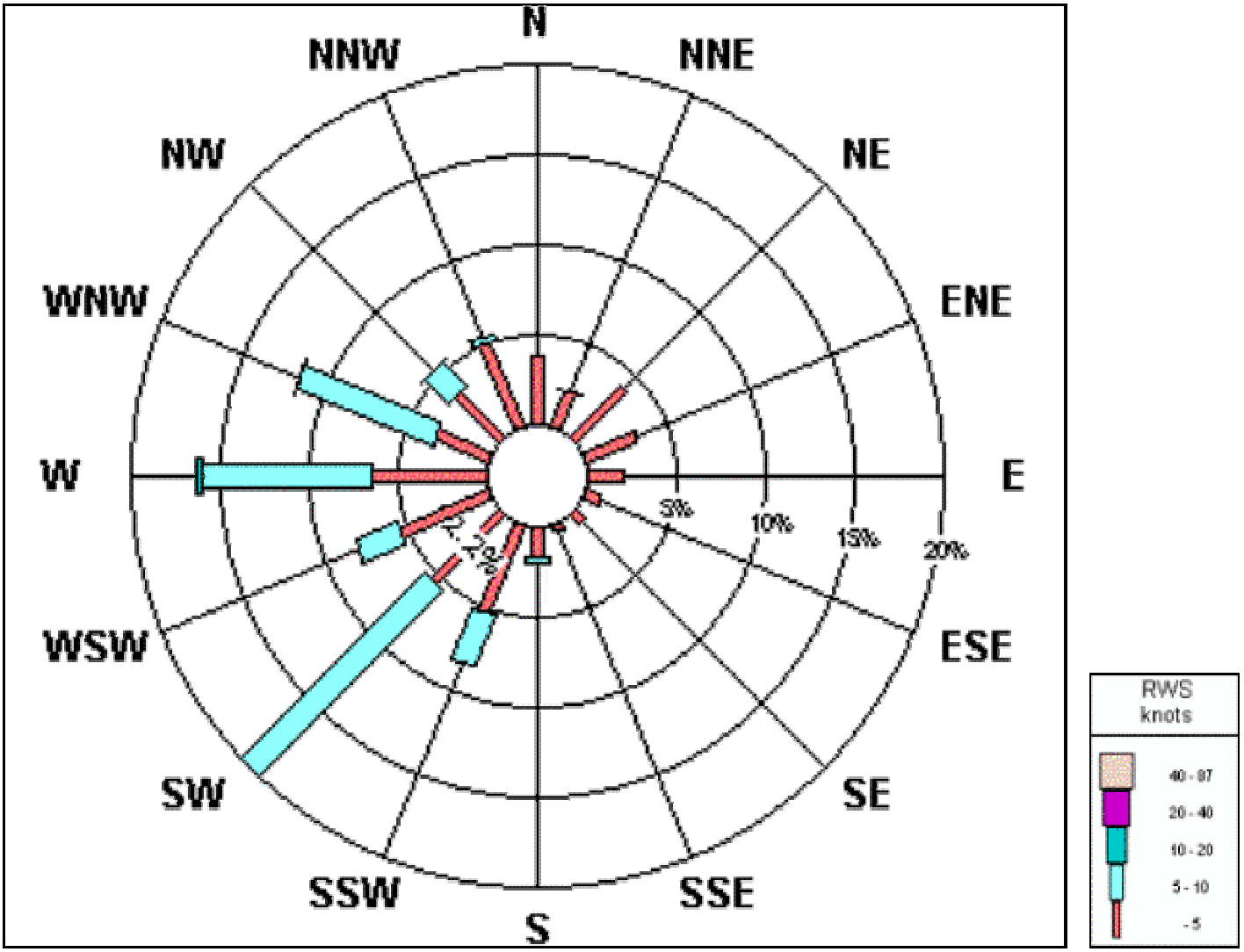
A = *Master Plating* (decorative chrome), 2109 Newton Ave.
B = *Carlson & Bealoye* (hard chrome), 2141 Newton Ave.

Figure 2: Phase I Sampling

	Sampling Sites		
	1	**2**	**3**
Proposed Location	Greater Apostolic Faith Center	28th Street-Mini Street Park	Residential / Commercial Property
Address	138 28th Street	28th Street & Imperial Ave.	Imperial Ave.
Samplers / Sensors	BGI / Met One	BGI	BGI
Sampling Days	5	5	5
Samples per Site	4	4	4
Pollutant / Parameter	Cr6+ / T, WS, WD, RH	Cr6+	Cr6+
Start Date	June 11th		
End Date	June 15th		
Sampling Duration	24 hours ± 1 hour		
Sampling Interval	Daily		

C = *California Plating* (decorative chrome), 2802 Imperial Ave.

Figure 3: Phase II Sampling



Meteorological data from Barrio Logan Toxics Monitoring Project
Wind rose based on data from May 1st - July 1st 2000

Figure 4: Wind Rose for Barrio Logan

individuals living near chrome plating facilities; therefore, a daily sampling interval will be used during each phase of the project. Sampling will be conducted Monday through Friday. During phase one, sampling will be suspended on Monday, May 28, and will resume on Tuesday, May 29. No loss of data is expected during this pause in sampling since is not expected that chrome plating facilities will operate over a holiday weekend. Actual hours of plating operation for both phases of the project will be verified through facility ampere-hour logs and physical inspections of the plating shops.

During each phase of the project, the sample run at each site will be coincident with all other sample runs in the same area. For example, the date, start-time and end-time of a sampler at a residence on Newton Avenue will be the same as all other sampling sites along Newton Avenue and South Evens Street. The purpose of coincident sampling is to obtain a 24-hour "snapshot" of potential hexavalent chromium exposure at selected sites around chrome plating facilities and to determine what differences may be present between upwind and downwind sites.

4.3 Sampling Equipment and Operation

Sampling equipment used for the project will consist of seven BGI PQ-100 samplers and one Met One meteorological station. Each BGI sampler is a single-filter, battery-powered unit capable of 24 hours of continuous operation. The Met One station is battery-powered and in standard operation is equipped with a solar panel for recharging. Line power may be used, if available, for the BGI samplers or the Met One station.

Each sampler is operated at a nominal flow rate of 10 standard liters per minute (slpm) during each sampling run. The flow rate is pre-set and is maintained by each sampler with a mass flow controller. A 10 slpm flow rate ensures that enough air is drawn through the sampler during each 24-hour period (14.4 m3) that hexavalent chromium will be detected, if present, at the detection limit of 0.2 nanograms per cubic meter (ng/m3). All samplers are configured to collect total suspended particulate only and are not equipped with any size selective inlet, impactor, or cyclone.

Details on sampler operation and maintenance are found in the BGI PQ-100 Air Sampler Instruction Manual (Appendix A-1).

Whatman #41 37-millimeter cellulose fiber filters are used for sampling hexavalent chromium. The filters have low ash residue and metal content (2). After laboratory preparation, filters are mounted in plastic filter cassettes and stored in petri dishes for transport to the field. Filter-loaded cassettes are placed in filter holders and attached to the inlet of each sampler. Filters used for sampling and those used as field blanks will be prepared, handled and transported under the same conditions. Sections 5.0 and 8.0 of this sampling plan describe the preparation and use of sampling filters and trip blanks for the project.

4.4 Collocated Sampling

Collocated sampling is conducted to establish or verify the precision of a sampling method. Each sampler of a collocated pair is operationally identical and is run under the same conditions. The concentration values are then compared. Precision measurements

are an important quality assessment technique and will help to validate the sampling method used for the project. To verify the precision of the BGI sampler, a collocated pair will be operated at the Barrio Youth Center each day during phase one of the project. Each sampler will have the same start and end times, total run time, and will be situated with general reference to criteria set forth in 40 CFR, Part 58, Appendix A (i.e., within 4 meters of each other, but at least 2 meters apart to prevent airflow interferences); however, these criteria will be referenced as guidelines only and practical considerations including space availability will be of primary concern (3).

5.0 Sample Collection and Analysis

5.1 Filter Preparation

Prior to shipment to the field, filters will be prepared by NLB for hexavalent chromium sampling. Preparation involves soaking filters in a sodium bicarbonate solution, and then drying and storing the filters until they are shipped to the field. Filters are prepared in batches and released to the field on an as needed basis. Filters are briefly inspected prior to release for contamination or damage. Contaminated or damaged filters are rejected for sampling.

A minimum of 80 filters will be used for the project, 64 during the first phase (56 sampling filters and 8 trip blanks) and 16 during the second phase (12 sampling filters and 4 trip blanks). Trip blanks will be analyzed along with the sample filters to ensure that no contamination occurred during transport of the filters to and from the sampling locations.

5.2 Sampling Procedure

Once permission is granted from the appropriate representatives of the chosen sampling sites, samplers will be set up using tripods or custom platforms. Each sampler will be calibrated on-site with a currently certified flow standard traceable to the National Institute of Standards and Technology (NIST). At least one additional flow check will be performed on each sampler at the end of each phase of sampling.

Following calibration, filters are loaded into each sampler. The start date and time and the site identification number are entered into each sampler's microprocessor. After approximately 24 hours, sampling filters are retrieved and elapsed time, average flow rate, and other information are collected from each sampler. Any necessary on-site maintenance is performed.

Sampled filters are stored in a cool, dry location in separate petri dishes labeled with the sampling date, location, operator, and flow rate information. At the conclusion of each phase of sampling, filters will be transported to the ARB's laboratory in Sacramento.

5.3 Laboratory Analysis

After the laboratory receives exposed filters, they will be logged into MLD's Laboratory Information Management System (LIMS) and assigned a bar code number for tracking through the analysis, validation, and verification process. Information on sampling date, location, interval, and flow rate are entered into LIMS and the filter is inspected for

contamination, tears, holes, etc. Valid filters undergo extraction with deionized water and the extract run through an ion chromatograph.

The published LOD for hexavalent chromium analysis is 0.2 ng/m3 and has been verified through multiple runs of hexavalent chromium standard through an ion chromatograph.

Additional information on the analytical method, including method sensitivity and precision, is described in the laboratory Standard Operating Procedure (SOP) (Appendix A-2).

6.0 Data Quality Objectives

The primary purpose of DQOs in any ambient air sampling work is to produce data that is of sufficient quantity and quality to meet the needs of the end user. DQOs for the Barrio Logan project are based on providing SSD the data necessary to evaluate the current hexavalent chromium ATCM for chrome plating facilities. The data may, however, be used for other purposes, including modeling, inventory evaluation, and risk assessment and therefore must be comprehensive enough to meet the needs of multiple end users (4).

6.1 Precision and Accuracy

Precision is the agreement between replicate measurements of the same property under the same conditions. Accuracy is a measure of how close an individual measurement is to the actual value.

For this project, sampler precision will be assessed through the use of collocated BGI samplers at the Barrio Youth Center. The relative percent difference (RPD) between the results will provide variability information of the sampling method. Analytical precision will be expressed as the RPD between two replicate analyses made on a sample extract. A minimum of 10 percent of extracts from all valid samples at either sampling location will undergo two replicate analyses and the RPD will be calculated. Extracts from trip blanks will be analyzed using the same procedure as sample filters. Trip blank analysis will provide baseline values, if present, that may be used to correct analytical results.

The accuracy of MLD Method 039 will be assessed through the percent recovery of samples spiked with a NIST-traceable stock solution of hexavalent chromium. Standard ILS practice requires that all hexavalent chromium analyses of spiked samples must demonstrate recovery of the spiked value ± 20 percent.

6.2 Representativeness

Representativeness for this project refers to how accurately the sampling design represents the potential exposure of residents in the community. During each phase, the number of sites, their location at sites encircling chrome plating facilities, and the sampling duration and interval, help to address the spatial and temporal representativeness necessary for exposure-oriented sampling. The sampling configuration, coupled with meteorological measurements, will help identify the source-receptor connection.

Emissions from each plating facility may originate from wall-mounted extraction fans or from short stacks on the sides or atop the buildings. However, air mixing at ground level is thorough enough to ensure that sampling on residential rooftops, or within 2-15 meters from the sampler intake, will be representative of the exposure experienced by receptors (3).

6.3 Completeness

Data are complete if a prescribed percentage of the intended measurements are obtained. The target number of valid samples (including collocated samples) is 68 (56 during phase one and 12 during phase two). A minimum of 75 percent of the intended number of valid samples will be required to satisfy the data completeness objective. The 75 percent minimum corresponds to 42 valid samples (6 days) from sampling near Master Plating and Carlson & Bealoye (phase one) and 9 valid samples (3 days) from sampling near California Platers (phase two). This number of samples is important to capture potentially varying meteorological regimes in the neighborhood. If less than 42 valid samples are obtained during phase one and less than 9 valid samples are obtained from phase two, make-up runs will be conducted until a sufficient number of samples are obtained to meet a satisfactory level of data completeness.

For purposes of this project, valid samples are defined as samples that meet criteria for sampler calibration, filter preparation, sample collection and review, DQOs, and laboratory analysis.

6.4 Comparability

Data are comparable if they are collected using the same sampling protocols and analytical methods. Comparability among sample sets for this project requires that the same sampling methods and procedures, analytical techniques, and reporting units are used during each phase of sampling.

Samples will be assessed qualitatively to determine if data collected during phase one are comparable with that collected during phase two.

6.5 Coincident Sampling

A sample is defined as coincident if it is collected on the same day with start or end times within two hours of the coincident sample. All samplers during each phase of the project will be run coincident with one another. Any sample run that is not coincident with all other sampling runs during each phase of the project, or which generates data that is invalid, voids that sample day for purposes of data completeness and will require a make-up run.

7.0 Data Tracking, Validation, and Verification

Data tracking involves frequent review of sample collection, transfer, log in, and analysis to ensure that any problems that may develop are identified quickly and corrective action is taken. Validation is the process by which specific criteria (e.g., sampler calibration requirements, etc.) are applied to samples or laboratory measurements by site operators,

laboratory personnel, or data analysts to determine if the data is usable. Verification refers to a review of the data at all stages of transfer and recording to ensure that errors are not made and all data meets a qualitative standard of reasonableness.

Samples from the project will be tracked primarily by OPAS staff and will be validated and verified by AQSB, ILS, and OPAS staff. A diagram of the flow of data from pre-collection through final reporting is illustrated in Figure 5.

8.0 Quality Control / Quality Assessment

Field and laboratory quality control (QC) procedures are critical to ensuring that data collected are consistent, relevant, and defensible. The ARB's standard field and laboratory QC procedures will be used for the project and are contained in field and laboratory SOPs. All QC data, with appropriate explanation, will be included in the final sampling report.

8.1 Equipment Calibration

Field calibration of all samplers will be conducted using a flow transfer standard traceable to a primary flow standard. The procedure through which the transfer standard is certified is a multi-point comparison against a primary flow standard followed by least squares regression analysis. The certification procedure is detailed on the ARB's website at www.arb.ca.gov/aaqm/qmosprog/stdslab.html. Meteorological equipment is calibrated prior to field deployment.

8.2 Flow Checks

Flow checks using a NIST-traceable transfer standard will be conducted at least once following calibration on each sampler during each phase of the project. The purpose is to verify that the sampler flow rate is nominally 10 slpm. A 10 slpm flow rate is critical in achieving an analytical LOD of 0.2 ng/m3.

8.3 Analytical Quality Control

For the analysis of hexavalent chromium by ion chromatography, laboratory QC procedures include the use of filter blanks, extract (water) blanks, and spiked filters. Replicate analyses are routinely run on 10 percent of each sample batch for QC purposes.

One trip blank per sampling location per day will be analyzed along with samples as a check of possible contamination associated with the transport of the filters from the laboratory to the field and back.

Details on laboratory QC procedures, instrument calibration procedures, analysis sensitivity, and precision are included in the laboratory SOP and quarterly QC reports generated by the ILS and reviewed by the MLD's Program Evaluation and Standards Section (PE&S).

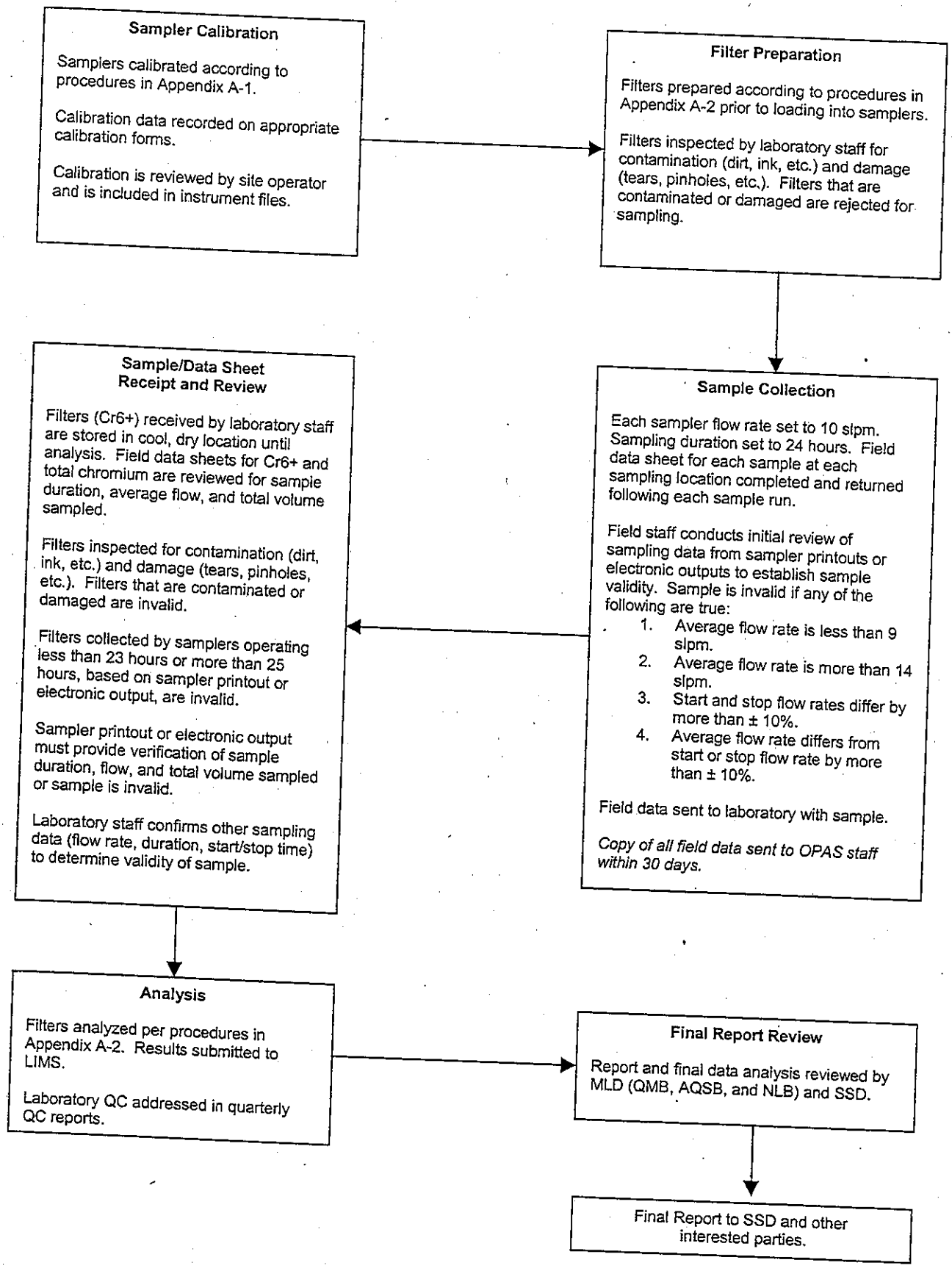


Figure 5: Data Flow

8.4 Corrective Action

Samples that do not meet validation criteria for sampler calibration, flow rate, sampling interval, filter integrity, or any DQO outlined in Section 6.0 will be considered invalid and will require make-up samples.

All make-up runs will be conducted according to the same methods, procedures, DQOs, and laboratory QC standards required during the original sampling.

9.0 Reporting

At the completion of the project, all data will be compiled and MLD will provide a final report to SSD. The final report will include a review and explanation of the project's goals, the sampling design and method, the types and results of analyses conducted, and the means of data validation. A summary will also be given of all associated sampling and laboratory quality control. The draft final report will undergo internal MLD review, then be presented to SSD and all other interested parties.

10.0 References

1. Information regarding the Barrio Logan area and the Barrio Logan Youth Center obtained from Barrio Station website: http://www.barrio-station.org.

2. U.S. EPA, *Compendium of Methods for the Determination of Inorganic Compounds in Ambient Air*, EPA/625/R-96/010a, June, 1999.

3. 40 CFR, Part 58, Appendices A and E.

4. U.S. EPA, Quality Assurance Guidance Document, *Draft Quality Assurance Project Plan for the Air Toxics Pilot Monitoring Program*, August, 2000.

Appendix A.2

Air Sampling for Hexavalent Chromium in the Barrio Logan Community of San Diego, December 7, 2001

(Appendices A-2 and A-3 of Protocol can be found in Appendix B of this document)

State of California
California Environmental Protection Agency
Air Resources Board

AIR SAMPLING FOR HEXAVALENT CHROMIUM IN THE BARRIO LOGAN COMMUNITY OF SAN DIEGO

A DETERMINATION OF AMBIENT HEXAVALENT CHROMIUM CONCENTRATIONS NEAR TWO CHROME PLATING FACILITIES

Monitoring and Laboratory Division

December 7, 2001
Revised from November 21, 2001

The following protocol has been reviewed and approved by the Air Resources Board (ARB) staff. Approval of this protocol does not necessarily reflect the views and policies of the ARB, nor does the mention of trade names or commercial products constitute endorsement or recommendation for use.

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1.0 Sampling Plan Identification and Approval

Title: Air Sampling for Hexavalent Chromium in Barrio Logan.

Approval: The following sampling plan is recommended for approval by the Monitoring and Laboratory Division.

Signatures:

Kenneth R. Stroud, Chief
Air Quality Surveillance Branch
Air Resources Board
Date

Jeffrey P. Cook, Chief
Quality Management Branch
Air Resources Board
Date

Michael Poore, Chief
Northern Laboratory Branch
Air Resources Board
Date

William V. Loscutoff, Chief
Monitoring and Laboratory Division
Air Resources Board
Date

The attached sampling plan has been reviewed and meets all expectations regarding the request by the Stationary Source Division for hexavalent chromium sampling in Barrio Logan.

Donald Ames, Assistant Chief
Stationary Source Division
Air Resources Board
Date

2.0 Project Background

2.1 Hexavalent Chromium Air Toxics Control Measure

The Air Resources Board (ARB) formally identified hexavalent chromium as a toxic air contaminant (TAC) in 1986 under the Toxic Air Contaminant Identification and Control Act, commonly known as Assembly Bill (AB) 1807. As part of the identification process, chrome plating facilities were recognized as a major source of hexavalent chromium emissions. In 1988 the ARB adopted an air toxic control measure (ATCM) for chrome plating and chromic acid anodizing operations. As required by AB 1807, the ATCM is designed to reduce hexavalent chromium emissions from plating and anodizing facilities.

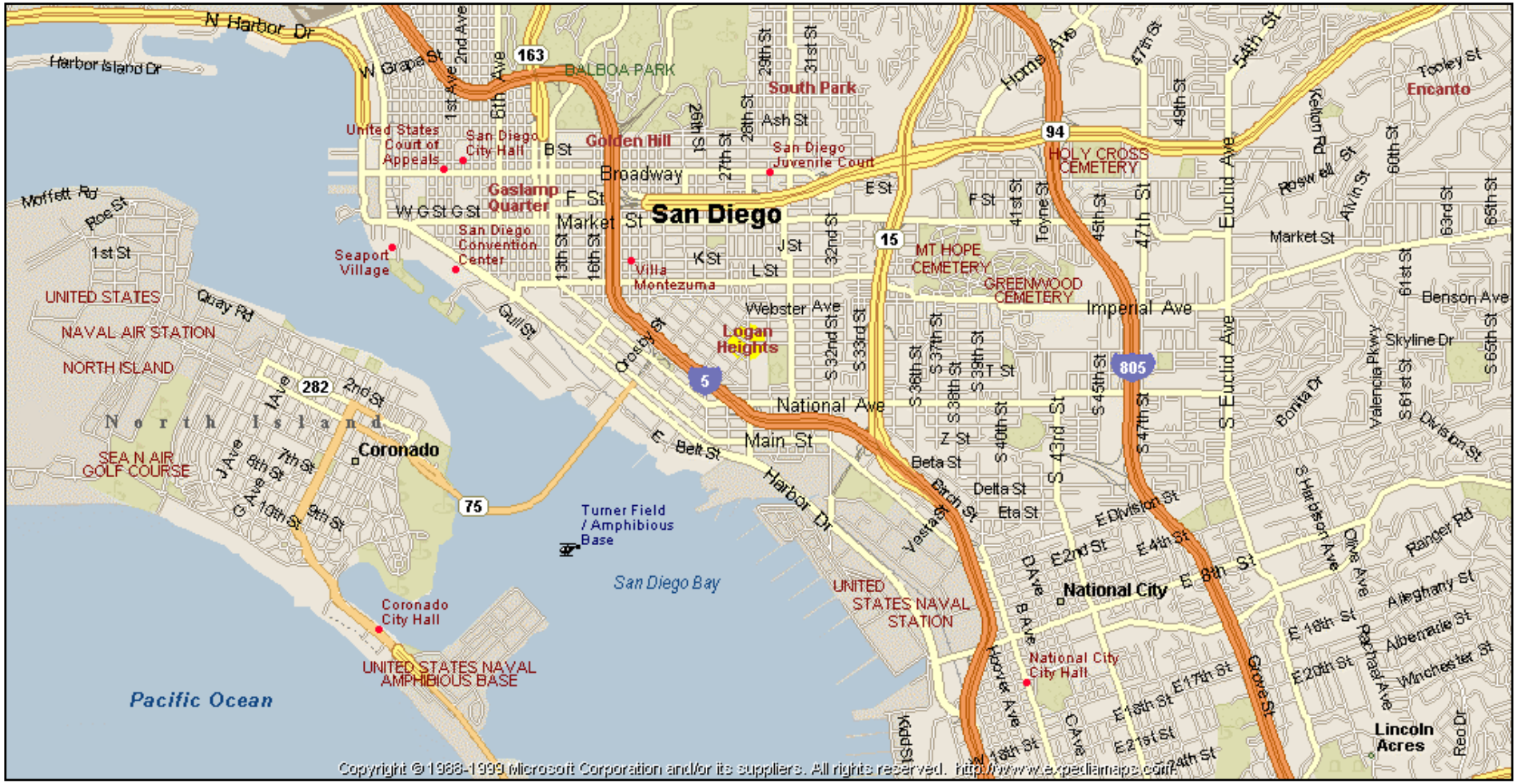
Electroplating facilities that specialize in applying chrome to parts are categorized by the thickness of the applied chrome layer and are referred to as hard chrome shops or decorative chrome shops. Hard and decorative chrome shops are responsible for much of the 61 percent of Statewide stationary source hexavalent chromium emissions (1). Hard chrome shops electroplate industrial equipment with a layer of chrome measured in thousandths of an inch. Chrome is applied at these shops primarily for the mechanical and chemical wear resistance it imparts on equipment such as industrial rollers and cylinder rods. Decorative chrome shops specialize in electroplating objects primarily for decorative purposes, including automobile bumpers and bathroom fixtures. The thickness of chrome applied in decorative plating is typically measured in millionths of an inch (2). Both types of chrome plating, as well as chromic acid anodizing, use chemical solutions containing hexavalent chromium that may be released to the atmosphere during plating and related processes.

The ATCM, and its required modifications to the techniques and equipment used by hard and decorative chrome platers, has resulted in significant reductions Statewide reductions of hexavalent chromium emissions from plating shops. However, residents living in proximity to plating operations may be subject to increased exposure, and therefore increased health risk, from chrome plating shops. To evaluate the possible exposure experienced by nearby residents and to gather information for revisions to the ATCM that may be required, the Stationary Source Division (SSD) requested that ambient air sampling for hexavalent chromium be conducted around two chrome plating operations in Barrio Logan, a community located within the Logan Heights area of San Diego (Figure 1).

2.2 Air Sampling in May/June of 2001

In response to the request by SSD, the ARB's Monitoring and Laboratory Division (MLD) conducted ambient air sampling for hexavalent chromium in Barrio Logan between May 22 and June 8, 2001. Following sample collection and analysis, MLD staff reviewed the arrangement of samplers and determined that the air flow to four of the seven samplers may have been obstructed due to their proximity to walls, trees, and ground vegetation. The hexavalent chromium values obtained are therefore suspect in terms of accuracy, precision, and representativeness and may be considered questionable for addressing the possible exposure experienced by residents near the chrome plating operations.

The decision was made, therefore, to conduct additional sampling at the same locations as the first sampling effort, but with greater consideration given to positioning the sampler



Approximate scale: 1"=1 mile

Figure 1
Logan Heights Area of San Diego

inlets with respect to the ground and possible air flow obstructions. Details of the May/June sampling are included in the original sampling plan, *Air Sampling for Hexavalent Chromium in Barrio Logan*, dated May 7, 2001. The analytical results and daily wind roses from the May/June sampling events are given in Appendix A-1.

3.0 Roles and Responsibilities

MLD and SSD are the divisions in ARB with overall responsibility for the Barrio Logan hexavalent chromium air sampling project. MLD will plan and conduct the monitoring, perform all analyses, and address all associated quality control and quality assessment activities. SSD will use monitoring data, in conjunction with data obtained from other sources, to evaluate the effectiveness of the current ATCM for controlling hexavalent chromium emissions from chrome plating shops in areas with nearby residences.

ARB management contacts for the project are listed below with an explanation of the primary functions their respective sections will be performing.

- Todd Wong, Manager
  Technology Assessment Section
  Project Assessment Branch

  Staff of the Technology Assessment Section (TAS) will be the primary contact group for communication between SSD and MLD and will coordinate meetings between ARB staff and the San Diego County Air Pollution Control District. TAS staff will collect historical plating data from chrome plating operations (*Carlson & Beauloye* and *Master Plating*) and will provide the information to staff of the Operations Planning and Assessment Section to be included in the final project report.

- Jeffrey P. Cook, Chief
  Quality Management Branch
  Monitoring and Laboratory Division

- Webster Tasat, Manager
  Operations Planning and Assessment Section
  Quality Management Branch

  The Operations Planning and Assessment Section (OPAS) will have overall project responsibility for MLD. In conjunction with the Special Purpose Monitoring Section (SPMS), OPAS will assist in selecting sampling sites and coordinating sampling activities with appropriate community representatives. OPAS will coordinate activities between SPMS, NLB, and any outside laboratory involved in comparative analytical work. OPAS staff will prepare the sampling plan and will prepare the sampling report issued to SSD. OPAS will also track samples, validate preliminary results, and conduct the primary analysis of data generated during the project.

- Kenneth R. Stroud, Chief
  Air Quality Surveillance Branch
  Monitoring and Laboratory Division

- Dennis Goodenow, Manager
  Special Purpose Monitoring Section
  Air Quality Surveillance Branch

  SPMS will have responsibility for installing, operating, and removing all samplers and other instruments from the sampling locations. The SPMS will be responsible for arranging for the transport of all sampling media to and from the sampling sites and will collect plating and other operational data from the plating facilities on each sampling day. Plating data will be in the form of elapsed amp-hours from all chrome electroplating tanks used at each plating facility. SPMS staff will conduct all field quality control (QC) activities and will provide OPAS staff with sampler QC data and confirmation that the sampling plan was followed. SPMS staff will provide OPAS staff with all data sheets and data collection information (including meteorological data) after all sampling is complete.

- Michael Poore, Chief
  Northern Laboratory Branch
  Monitoring and Laboratory Division

- Peter Samra, Acting Manager
  Inorganics Laboratory Section
  Northern Laboratory Branch

  The Inorganics Laboratory Section (ILS) will have responsibility for preparing and supplying all sampling media to SPMS staff and will perform all laboratory analyses. ILS staff will provide appropriate laboratory information to OPAS, including the date and number of filters released and returned from the field, sampling dates and locations, sample hold time, date of analysis, analysis results (including units), and any notable inconsistencies (e.g., samples returned without validating flow rate information, etc.). ILS staff will conduct the initial check of the filter and sampling data as it is received from the field to establish the validity of the sample. ILS staff will enter information from samples received from the field in the Laboratory Information Management System (LIMS).

General questions regarding the scope of responsibilities associated with each of the sections involved in the project may be referred to the respective staff contacts listed below:

- Glen Villa
  Technology Assessment Section
  Stationary Source Division
  (916) 322-6456
  gvilla@arb.ca.gov

- Harlan Quan
  Operations Support Section
  Monitoring and Laboratory Division
  (916) 327-0951
  hquan@arb.ca.gov

- Donald Taylor
  Inorganics Laboratory Section
  Monitoring and Laboratory Division
  (916) 322-8972
  dtaylor@arb.ca.gov

- Steve Aston
  Special Purpose Monitoring Section
  Monitoring and Laboratory Division
  (916) 327-4724
  saston@arb.ca.gov

4.0 Sampling Design and Method

4.1 Sampling Sites

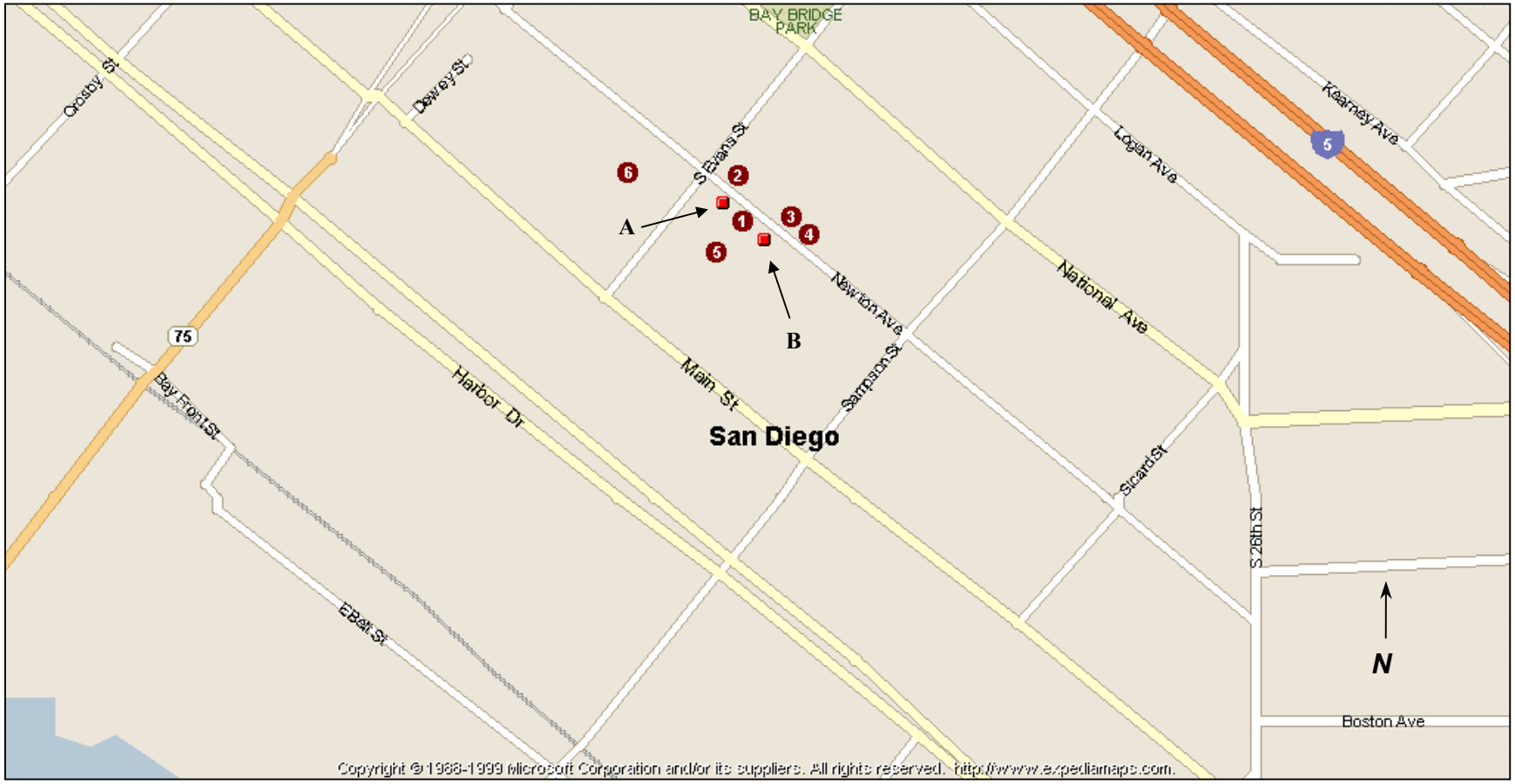
The selection of sampling sites is based primarily on the location of receptors and their proximity to the chrome plating facilities. To the extent possible, all samplers will be positioned with reference to microscale monitoring siting criteria in 40 CFR Part 58, Appendix E, and Volume II of ARB's Quality Assurance Manual (Table 1)(3). Siting criteria will apply to single sampler locations, collocated, and parallel sites. If it is not physically possible to meet a particular siting requirement, every effort will be made to ensure that the sampler inlet is placed so as to minimized airflow obstructions.

Item / Influence	Requirement*
Height of Inlet	2 to 7 meters above ground level.
Spacing Between Inlets (Collocated Samplers)	Within 4 meters, but at least 1 meter apart.
Obstacles	Distance between sampler and obstacle must be at least 2 times the height the obstacle protrudes above the sampler.
Tree Dripline	Inlet must be 10 meters from dripline if tree represents an obstruction.
Walls, Parapets, etc.	Inlet must be 2 meters from walls, parapets, etc.
Air Flow Arc	Unrestricted 270° arc which must include predominant wind direction for seasonal high pollutant; samplers located on the side of a building require 180° clearance.
Traffic	5 to 15 meters from roadway.

** From 40 CFR Part 58, Appendix E, and ARB Quality Assurance Manual, Volume II, Section 2.0.4 (February 2000).*

Table 1
Microscale Monitoring Requirements for Low-Volume PM Samplers

The pattern of samplers will be in an upwind-downwind circular arrangement around the chrome platers on Newton Avenue near South Evans Street (Figure 2). The most significant design differences between the earlier sampling plan (May 7, 2001) and the current plan involve: 1) Sampler inlet placement relative to the ground and other airflow obstructions at each of the sampling locations. 2) Comparison of the analytical method used for hexavalent chromium analysis by two different laboratories—ARB's Sacramento laboratory and a separate laboratory used for analyzing filters for a concurrent study designed to evaluate toxic emissions inventory information and dispersion modeling in Barrio Logan. The sampling portion of inventory and modeling study, conducted under contract to the ARB's Planning and Technical Support Division (PTSD), is expected to occur during the same sampling period as the current project.



Approximate map scale: 1" = 1/12 mile. All sampling locations are approximate.

Chrome Platers

A = Master Plating (Decorative Chrome), 2109 Newton
B = Carlson & Beauloye (Hard Chrome), 2141 Newton

Sampling Locations

1 = 2121 Newton Avenue
2 = Vacant Lot (collocated + met station)
3 = 2144 Newton Avenue
4 = 2152 Newton Avenue
5 = Alley
6 = Mercado Apartments (1 + 1 parallel sampler)
Total Number of Samplers = 8

Figure 2
Sampling Locations and Chrome Platers on Newton Avenue

3) Use of background hexavalent chromium concentration data from the inventory and modeling study.

Sampling for the current project will be conducted at six sites along Newton Avenue: One sampler will be placed in the front yard at each of two residences on the north side of Newton Avenue (2144 and 2152 Newton Avenue). Two collocated samplers will be placed a vacant lot also on the north side of Newton Avenue. One sampler will be placed at the residence on the south side of Newton directly between the plating facilities (2121 Newton Avenue). One sampler will be placed along the north side of the alley behind the plating facilities, south of the residence located at 2121 Newton Avenue. Two samplers will be placed at the Mercado Apartments north of the plating facilities (one sampler will be run daily for the full sampling period; the second sampler will be run every other sampling day for the full sampling period).

A portable meteorological station will be placed at the vacant lot on the north side of Newton Avenue near the collocated samplers. Ambient temperature, wind speed, wind direction, and relative humidity will be measured continuously and reported in hourly averages. The standard deviation of the horizontal wind direction (i.e., the sigma value of horizontal wind direction measurements in degrees, or sigma-theta) will be calculated and reported in hourly averages. A wind rose plot of wind data collected from Logan Memorial Academy during the Barrio Logan Toxics Monitoring Project in December 2000 shows the wind pattern expected during the current project (Figure 3).

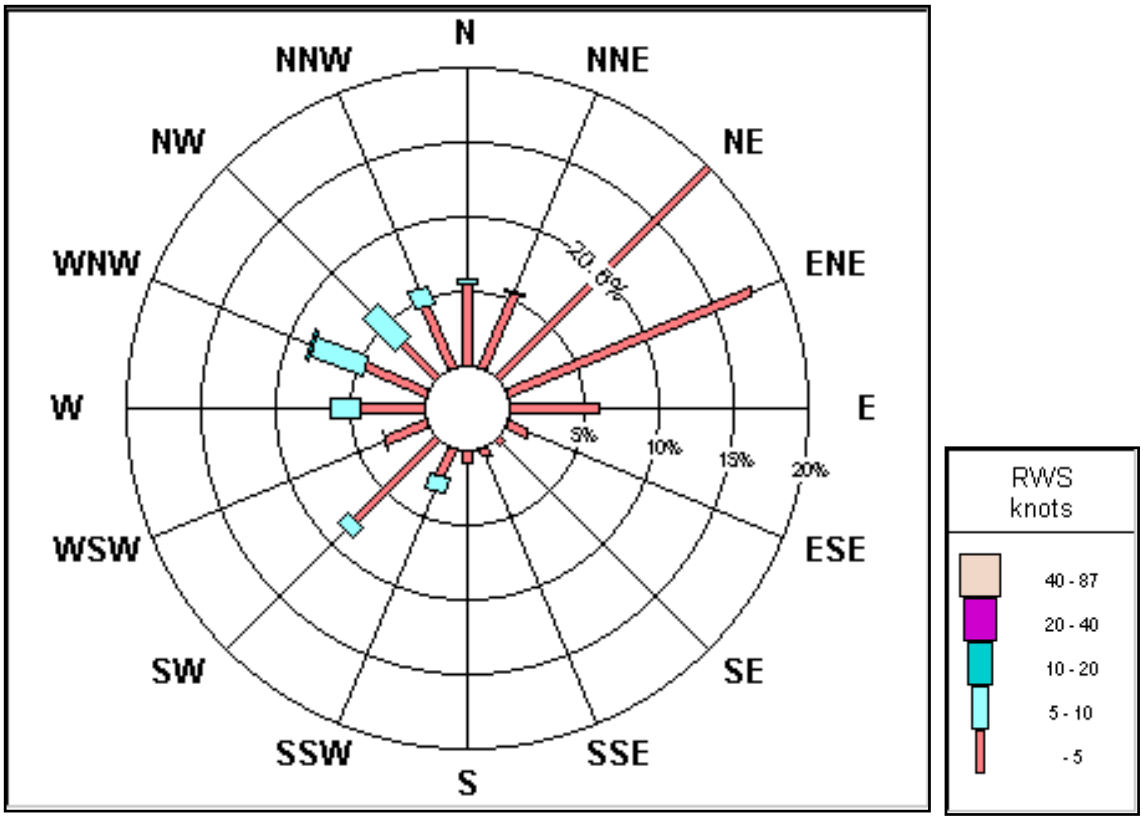
4.2 Duration and Interval

Sampling is scheduled for 13 days beginning December 3rd and ending December 17th and will include two weekend (Saturday) sampling events. The sampling duration at each site will be 24-hours.

All samples collected for this project will be coincident with one another (i.e., sampling will be conducted on the same day at each site; start-times and end-times of samplers will be within two hours of each other). The purpose of coincident sampling is to obtain a 24-hour profile of hexavalent chromium exposure at selected sites around the chrome plating facilities.

Hexavalent chromium sampling for the inventory/modeling study will be conducted at the Mercado Apartments, Memorial Academy, Point Loma, a location on Boston Avenue, and at the National Steel and Shipbuilding Company (NASSCO), a major shipyard near Barrio Logan, from approximately December 3rd through December 21st. Sampling at these sites will be conducted for 12 hours each weekday and will provide area background data for the current project.

Within the same sampling period as the current project (December 3rd – 17th), hexavalent chromium measurements will be made at the regular toxic monitoring sites in El Cajon, 16 miles to the northeast of Barrio Logan, and in Chula Vista, eight miles to the south of Barrio Logan. One hexavalent chromium sample will be collected from each of these



Average 24-Hour Wind Pattern for December 2000 as measured at Memorial Academy during the Barrio Logan Toxics Air Monitoring Project from October 1999 - March 2001

Figure 3
Wind Rose for Barrio Logan

sites on Sunday, December 9th. In addition to measurements made in and around Barrio Logan at toxic sites for the inventory/modeling study, measurements made at El Cajon and Chula Vista will provide additional information on background hexavalent chromium concentrations in the San Diego area.

4.3 Equipment

Sampling equipment used for the project will consist of eight BGI PQ-100 samplers, custom tripods, battery cases, and one Auto Met meteorological station. Each BGI sampler is a single-filter, battery-powered unit capable of 24 hours of continuous operation. Tripods will be used to elevate the inlet of selected samplers to a minimum of two meters above the ground (Figure 4). The meteorological station is battery-powered and may be equipped with a solar panel for recharging. Line power may be used, if available, for the BGI samplers or the Auto Met station.

Each sampler is operated at a nominal flow rate of 10 standard liters per minute (slpm). The flow rate is pre-set and is maintained with a mass flow controller. A 10 slpm flow rate ensures that enough air is drawn through the sampler during each 24-hour period (14.4 m3) that hexavalent chromium will be detected, if present, at the detection limit of 0.2 nanograms per cubic meter of air (ng/m3). All samplers are configured to collect total suspended particulate only and are not equipped with any size selective inlet, impactor, or cyclone. Details on sampler operation and maintenance are found in the BGI PQ-100 Air Sampler Instruction Manual (Appendix A-2).

Whatman #41 37-millimeter cellulose fiber filters (20-25 μm pore size) are used for sampling hexavalent chromium. The filters have low ash residue and metal content (4). After laboratory preparation, filters are mounted in plastic filter cassettes and stored in petri dishes for transport to the field. Filter-loaded cassettes are placed in filter holders and attached to the inlet of each sampler. Filters used for sampling and those used as trip blanks will be prepared, handled and transported under the same conditions. Sections 5.0 and 8.0 of this sampling plan describe the preparation and use of sampling filters and trip blanks for the project. A summary of key operating parameters and requirements for the project are given in Table 2.

4.4 Collocated Sampling

Collocated sampling is conducted to establish or verify the total system precision. Each sampler of a collocated pair is operationally identical and is run under the same conditions. The concentration values are then compared. Precision measurements are an important quality assessment technique and are used to validate the sampling design. To verify the precision of the PQ-100 sampler, a collocated pair will be operated at the vacant lot on the north side of Newton Avenue on each sampling day. Each sampler will have the same start and end times, total run time, and will be situated with reference to collocated sampling criteria set forth in 40 CFR, Part 58, Appendix A, and Volume II of ARB's Quality Assurance Manual (5).

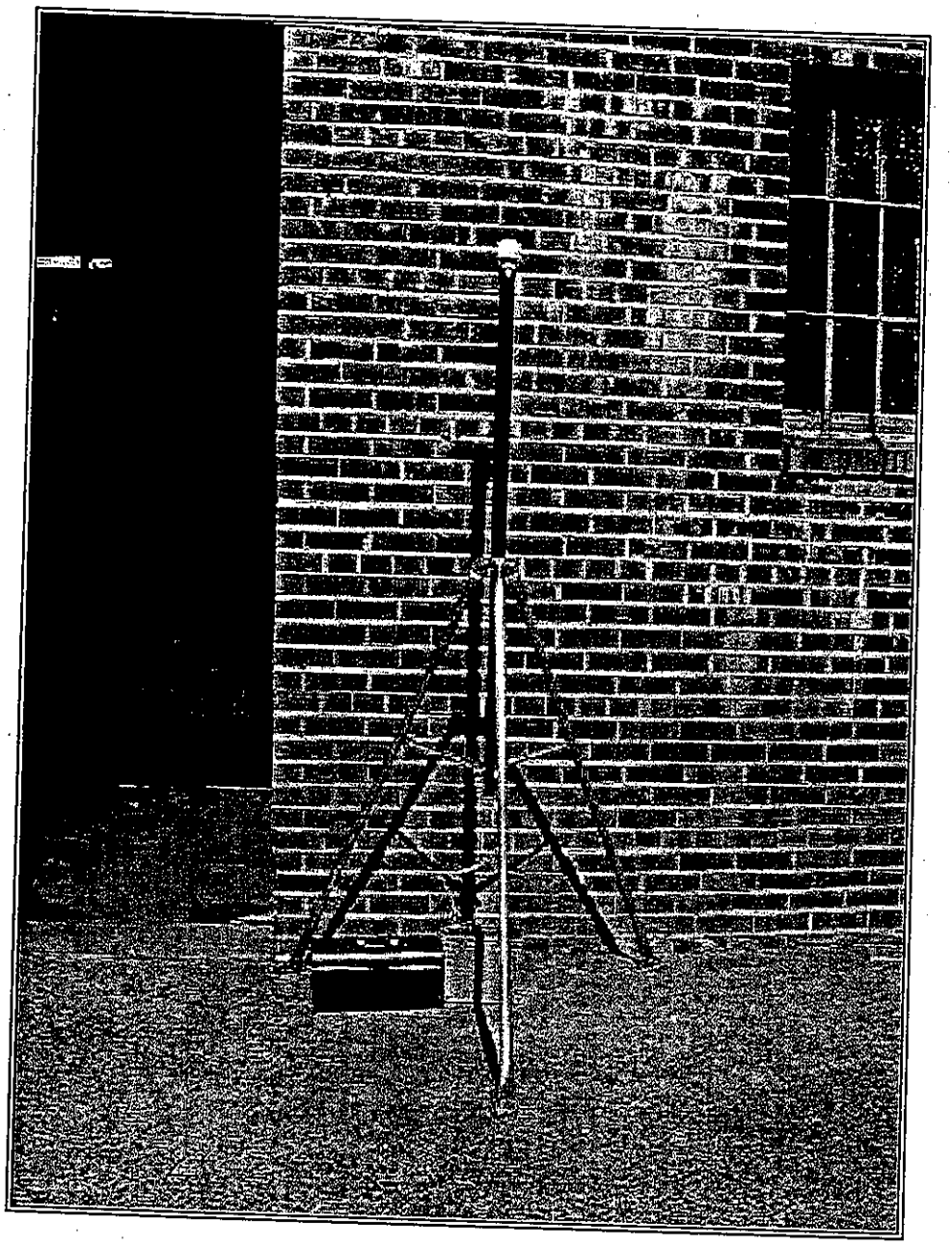


Figure 4
BGI PQ-100 Sampler with Tripod Mounted Inlet

Sample Collection Criteria	Sampling Sites / Standards						
Proposed Sampling Location	2121 Newton	2144 Newton	2152 Newton	Alley (behind 2121 Newton)	Vacant Lot (north side of Newton)[1]	Mercado Apartments	Mercado Apartments[2]
Sampler Placement[3]	Front Yard	Front Yard	Front Yard	Roof of Shed	Within Fenced Lot	Within SW parking area	(Near toxics sampler)[4]
Expected Number of Valid Samples[5]	**13**	**13**	**13**	**13**	**26**	**13**	7[6]
Minimum Number of Valid Samples	10	10	10	10	20[7]	10	6
Minimum Number of Flow Checks[8]	2	2	2	2	2	2	2
Sampler Target Flow Rate (slpm)	10	10	10	10	10	10	10
Sampling Duration (hours)	24	24	24	24	24	24	24
Sampling Interval	Daily[9]	Daily	Daily	Daily	Daily	Daily	Dec. 3rd, 5th, 7th, 10th, 12th, 14th, and 17th

[1]Collocated samplers.
[2]Second sampler operated at Mercado Apartments in parallel with inventory/modeling study toxics sampler.
[3]To the extent possible, all samplers will be placed in accordance with siting criteria listed in Table 1.
[4]Placed next to first BGI PQ-100 sampler; placement next to inventory/modeling study sampler to be determined based on consistency with siting criteria; otherwise, both samplers placed atop awning in the Mercado Apartments parking lot.
[5]Total number of NLB-supplied filters for project: **91 + 13 trip blanks = 104.**
[6]Filters for parallel sampler supplied by inventory/modeling study laboratory: 7 + 1 trip blank = 8.
[7]Minimum of 10 days with valid samples for both collocated samplers needed.
[8]Sampler flow checks will be conducted before and after project.
[9]Monday through Saturday.

Table 2
Sample Collection Criteria

5.0 Sample Collection and Analysis

5.1 Filter Preparation

Prior to shipment to the field, ILS staff will prepare filters for hexavalent chromium sampling. Preparation involves soaking filters in a sodium bicarbonate solution. Filters are then dried and stored in a cool, dry location prior to shipment to the field. Filters are prepared in batches and released to the field on an as needed basis. Each filter is briefly inspected prior to release from the lab for contamination or damage. Contaminated or damaged filters are rejected for sampling.

As with the May/June sampling, one trip blank per sampling day will be included in the filters returned to ARB's Sacramento laboratory for analysis.

5.2 Sampling Procedure

Once permission is granted from the appropriate representatives of the chosen sampling sites, samplers will be set up and visually checked to ensure that air flow interferences are minimized. The target flow rate of each sampler (10 slpm) will be checked before any sampling with a calibrated flow standard. At least one additional flow check will be performed on each sampler at the completion of the project. Pre- and post-sampling flow check information is recorded on a sampler flow check log (Figure 5).

Following pre-sampling flow checks, a filter is loaded into each sampler. The start date and time are entered into each sampler's microprocessor. After approximately 24 hours, each sampler will automatically stop. Elapsed time, target flow rate, and other sampling information are noted on a daily 24-Hour Sample Report (Figure 6). Complete operating information stored in the sampler's microprocessor will be downloaded each day on a laptop computer. For each valid sampling day, SPMS staff will collect amp-hour information from *Carlson & Beauloye* and *Master Plating* (Figure 7).

Prior to loading a new filter into a sampler, the sampler is checked and any necessary on-site maintenance is performed. Unexposed filters are stored in a protected, dry location in individual petri dishes until loaded into a sampler. All data from each sampler's data logger are downloaded after each sample run into a laptop computer. The data are later printed out for review by ILS staff to review and validate each sample run. After each sample run, exposed filters are placed in individual petri dishes labeled with the sampling date and location and are placed in a plastic bag protected from contamination. The filters are stored under ambient conditions in the transport van until transported to laboratory. The 24-Hour Sample Report, including sample transfer documentation, will accompany samples when they are returned from the field.

In the event of severe storm conditions at any of the sites, sampling will be stopped. Make-up samples will be taken as necessary during clear (non-storm) conditions in order to meet the data completeness objective in Section 6.3.

5.3 Laboratory Analysis

After the laboratory receives exposed filters, they will be logged into MLD's Laboratory Information Management System (LIMS) for tracking through the analysis, validation, and verification process. Information on sampling date, location, interval, and flow rate are entered into LIMS and the filter is inspected for contamination, tears, holes, etc. Valid filters undergo extraction with deionized water and the extract run through an ion chromatograph. The ARB's published limit of detection (LOD) for hexavalent chromium analysis is 0.2 ng/m3 and has been verified through multiple runs of hexavalent chromium standard through an ion chromatograph.

Additional information on the analytical method, including method sensitivity and precision, is described in the laboratory Standard Operating Procedure (SOP) (Appendix A-3). QC information is contained within a QC report produced quarterly by the

Sampler Flow Check Log

Transfer Standard Information:

*MFM Make & Model:*_____ *Flow Range:*_____

*I.D.(Bar Code):*_____ *Calibration Date:*_____

Flow Check Data:

		Pre-Sampling Flow Check		Post-Sampling Flow Check		
Date	Sampler I.D.	Transfer Standard Flow Rate (slpm)	Sampler Flow Rate (slpm)	Transfer Standard Flow Rate (slpm)	Sampler Flow Rate (slpm)	Comments

Figure 5
Flow Check Form

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24-Hour Sample Report

Site Name: _____ *Filter I.D. or Code:* _____

Sampler I.D.: _____ *Start Date / Time:* _____

Field Operator: _____ *End Date / Time:* _____

Sample Summary:

Elapsed Time (min)	Target Flow Rate (slpm)	Total Volume Sampled (liters)	Observed Conditions

Observed Conditions
A. No Unusual Conditions
B. Rain / Snow
C. Fog
D. Nearby Smoke / Fire
E. Construction
F. Sampler Malfunction
G. Other (state)

Operator Comments:

_____

_____

_____

Filter / Sample Transfer:

Action	Date	Time	Initials		Comments
			Released	Taken	
Filter transferred from lab to site operator					
(Filter transfer)					
(Filter transfer)					
(Filter transfer)					
Filter transferred from site operator to lab					

Figure 6
Sample Report Form

Chrome Plater Ampere-Hours

Carlson & Beauloye

Date	Time	Plating in Progress?	Amp-Hour Meter (Tank #1)	Amp-Hour Meter (Tank #2)

Comments (Note any air agitation of chrome tank solution ('sparging')):_____

_____

Master Plating

Date	Time	Plating in Progress?	Amp-Hour Meter (Tank #1)

Comments (Note any air agitation of chrome tank solution ('sparging')):_____

_____

Figure 7
Daily Ampere-Hour Usage Form

laboratory and reviewed by management and an independent group within MLD to ensure that analyses are performed within pre-established limits.

5.4 Interlaboratory Analytical Comparison

To determine variability between the laboratory used to analyze hexavalent chromium samples collected for the current project (MLD's Sacramento Laboratory) and the laboratory used for the inventory/modeling study, two PQ-100 samplers will be operated at the Mercado Apartments. One sampler will be operated coincident with all other samplers for the current project and the filters forwarded to MLD for analysis. The second sampler will be operated every other sampling day using filters supplied by the laboratory performing hexavalent chromium analysis for the inventory/modeling study (see Table 2). Exposed filters will be forwarded to the inventory/modeling study laboratory for analysis according to that laboratory's standard operating procedures. All filter preparation by the inventory/modeling study laboratory will also be according to that laboratory's standard operating procedure. Results will be forwarded to OPAS and compiled with results obtained from all other sampling locations.

Field samples used for the interlaboratory analytical comparison will be limited to those collected at the Mercado Apartments primarily due to space considerations at the other sampling locations along Newton Avenue. An additional interlaboratory comparison check between MLD's laboratory and the inventory/modeling laboratory using spiked filters may be conducted at a later date.

6.0 Data Quality Objectives

The primary purpose of DQOs in any ambient air sampling work is to produce data that is of sufficient quantity and quality to meet the needs of the end user. DQOs for the Barrio Logan project are based on providing SSD the data necessary to evaluate the current hexavalent chromium ATCM for chrome plating facilities. The data may, however, be used for other purposes, including modeling, inventory evaluation, and risk assessment and therefore must be comprehensive enough to meet the needs of multiple end users (5).

6.1 Precision and Accuracy

Precision is the agreement between replicate measurements of the same property under the same conditions. Accuracy is a measure of how close an individual measurement is to the actual value.

For this project, sampler precision will be assessed through the use of collocated samplers at the vacant lot. The relative percent difference (RPD) between the results will provide variability information of the sampling method. Analytical precision will be expressed as the RPD between two replicate analyses made on a sample extract. A minimum of 10 percent of extracts from all valid samples at either sampling location will undergo two replicate analyses and the RPD will be calculated. Extracts from trip blanks will be analyzed using the same procedure as sample filters. Trip blank analysis will provide baseline values, if present, that may be used to correct analytical results.

The accuracy of MLD Method 039 will be assessed through the percent recovery of samples spiked with a National Institute of Standards Technology (NIST)-traceable stock solution of hexavalent chromium. Standard ILS practice requires that all hexavalent chromium analyses of laboratory spiked samples must demonstrate recovery of the spiked value ± 20 percent.

6.2 Representativeness

Representativeness for this project refers to how accurately the sampling design represents the potential exposure of residents in the community. The number of sites, their location at sites encircling chrome plating facilities, and the sampling duration and interval, address the spatial and temporal representativeness requirements of assessing the possible exposure of residents living near chrome plating facilities. The sampling configuration, coupled with meteorological measurements and verification of chrome plating operations during sampling, will help identify the source-receptor connection. Plating verification may include obtaining local air district inspection records (i.e., ampere-hour logs) for each plating operation and contacting individual platers for specific process information.

6.3 Completeness

Data are complete if a prescribed percentage of the intended measurements are obtained. The total intended number of valid MLD-collected samples (including collocated samples) is 91. The overall data completeness objective is to obtain a minimum of approximately 75 percent of the total intended valid samples. If less than 70 valid samples are obtained, make-up runs will be conducted until a sufficient number of samples are obtained to meet a satisfactory level of data completeness. Additionally, make-up samples will be collected if more than three samples are invalidated for any one sampling site or, for collocated samplers, more than three invalid samples per sampler.

For purposes of this project, valid samples are defined as samples that meet criteria for sampler calibration, filter preparation, sample collection and review, DQOs, and laboratory analysis.

6.4 Comparability

Data are comparable if they are collected using the same sampling protocols and analytical methods. Comparability among sample sets for this project requires that the same sampling methods and procedures, analytical techniques, and reporting units be used during each phase of sampling.

Data collected for the inventory/modeling study will be used to provide information on background hexavalent chromium concentrations and will not be used for direct comparison to samples collected at the six sites around the chrome platers.

6.5 Coincident Sampling

A sample is defined as coincident if it is collected on the same day with start or end times within two hours of the coincident sample. All samplers during the project will be run coincident with one another, with the exception of one sampler at the Mercado

Apartments that will be operated every other day. Any sample run that is not coincident with all other sampling runs in terms of the start/stop time will be invalid for purposes of evaluating data completeness.

7.0 Data Tracking, Validation, and Verification

Data tracking involves frequent review of sample collection, transfer, log in, and analysis to ensure that any problems that may develop are identified quickly and corrective action is taken. Validation is the process by which specific criteria (e.g., sampler calibration requirements, etc.) are applied to samples or laboratory measurements by site operators, laboratory personnel, or data analysts to determine if the data is usable. Verification refers to a review of the data at all stages of transfer and recording to ensure that errors are not made and all data meets a qualitative standard of reasonableness.

Samples will be tracked by OPAS staff from collection through analysis. AQSB and ILS staff will apply standard validation and verification criteria to all samples as required by field and laboratory SOPs. A diagram of the flow of data from pre-collection through final reporting is illustrated in Figure 8.

8.0 Quality Assessment / Quality Control

Field and laboratory quality control (QC) procedures are critical to ensuring that data collected are consistent, relevant, and defensible. The ARB's standard field and laboratory QC procedures will be used for the project and are contained in field and laboratory SOPs. All QC data, with appropriate explanation, will be included in the final sampling report.

8.1 Equipment Calibration

Calibration of all sampling equipment is conducted on a prescribed schedule as recommended by the manufacturer using a calibrated flow transfer standard traceable to a primary flow standard. The procedure through which the transfer standard is calibrated is detailed on the ARB's website at www.arb.ca.gov/aaqm/qmosprog/stdslab.html and through documentation from MLD's Program Evaluation and Standards Section (PE&S). Meteorological equipment is calibrated using NIST-traceable standards, where appropriate.

8.2 Flow Checks

Flow checks using a calibrated transfer standard will be conducted at least twice on each sampler during the project. The purpose is to verify that the sampler flow rate is nominally 10 slpm.

8.3 Analytical Quality Control

For the analysis of hexavalent chromium by ion chromatography, laboratory QC procedures include the use of filter blanks, extract (water) blanks, and spiked filters. Replicate analyses are routinely run on 10 percent of each sample batch for QC purposes.

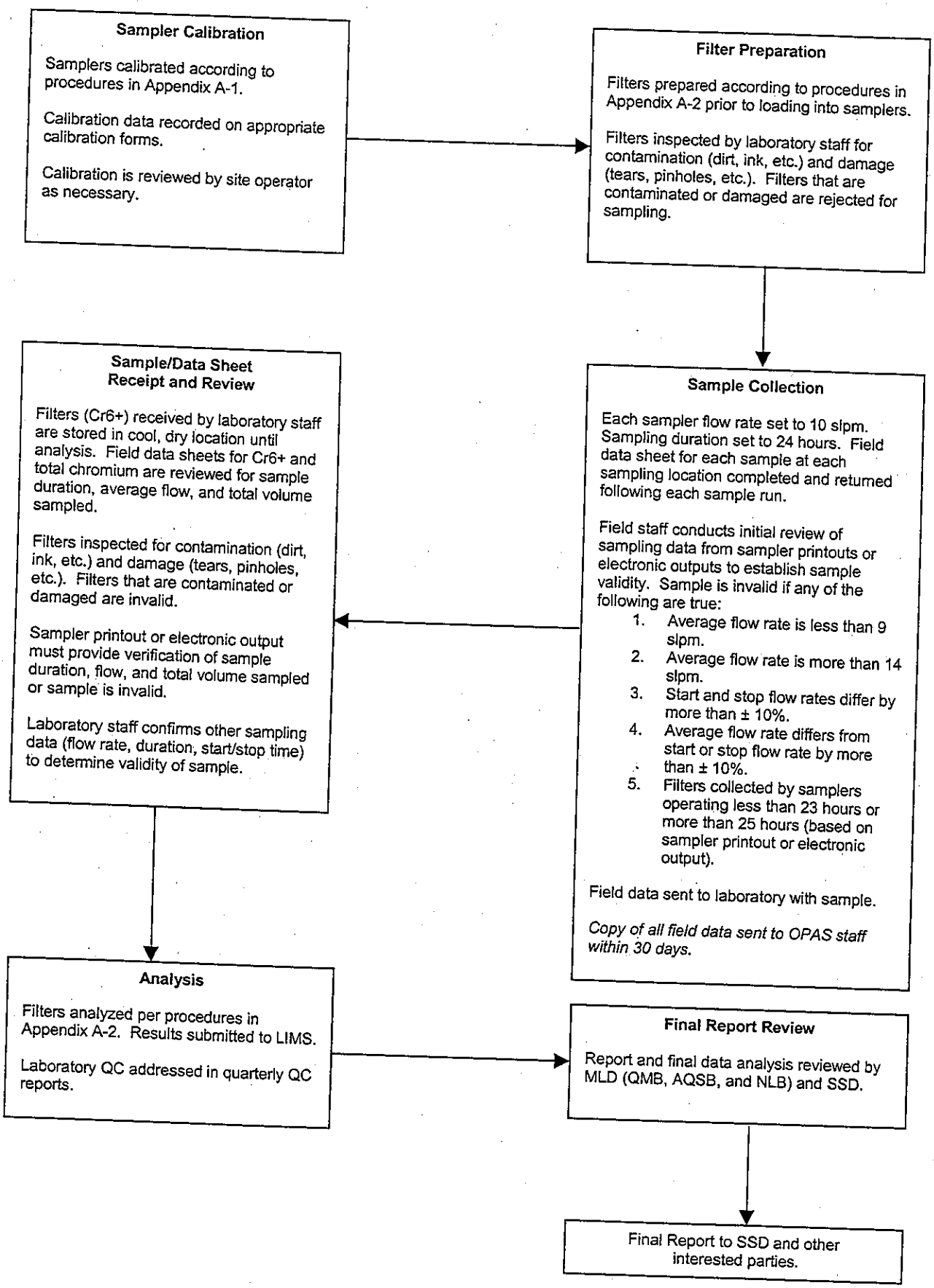

Figure 8
Major Data Validation Steps

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One trip blank per day will be analyzed along with samples as a check of possible contamination associated with the transport of the filters from the laboratory to the field and back.

Details on laboratory QC procedures, instrument calibration procedures, analysis sensitivity, and precision are included in the laboratory SOP and quarterly QC reports generated by the ILS and reviewed by PE&S.

8.4 Corrective Action

Samples that do not meet validation criteria for sampler calibration, flow rate, sampling interval, filter integrity, or any DQO outlined in Section 6.0 will be considered invalid and will require make-up samples. All make-up runs will be conducted according to the same methods, procedures, DQOs, and laboratory QC standards required during the original sampling.

9.0 Reporting

At the completion of the project, all data will be compiled and MLD will provide a final report to SSD. The final report will include a review and explanation of the project's goals, the sampling design and method, the types and results of analyses conducted, and the means of data validation. A summary will also be given of all associated sampling and laboratory quality control. The draft final report will undergo internal MLD review, then be presented to SSD and all other interested parties.

10.0 References

1. California Air Resources Board, *The 2001 California Almanac of Emissions & Air Quality*, 2001

2. Information regarding chrome finishing processing obtained from the following website: http://www.finishing.com/index.html.

3. 40 CFR, Part 58, Appendices A and E.

4. U.S. EPA, *Compendium of Methods for the Determination of Inorganic Compounds in Ambient Air*, EPA/625/R-96/010a, June, 1999.

5. U.S. EPA, Quality Assurance Guidance Document, *Draft Quality Assurance Project Plan for the Air Toxics Pilot Monitoring Program*, August, 2000.

Appendix A-1

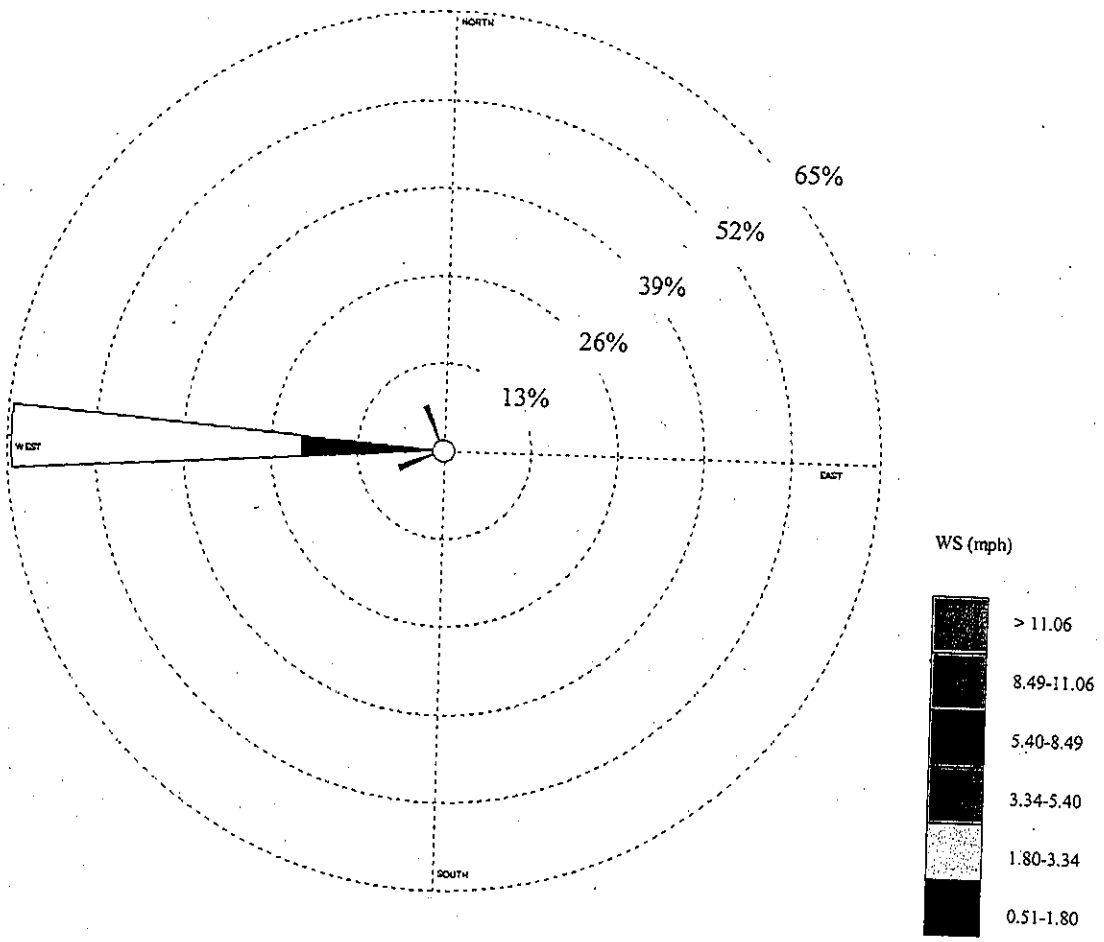
Analytical Results and Wind Rose Plots for May/June Sampling

Barrio Logan II Cr(VI) Air Sampling Results[1]

Date	2121 Newton	2144 Newton	2152 Newton	Alley	Mercado Apts.	Vacant Lot (primary)	Vacant Lot (collocated)
May 22	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	--	--
May 23	0.3	0.3	0.2	< 0.2	< 0.2	< 0.2	< 0.2
May 24	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.2	0.3
May 25	0.3	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	Inv.
May 29	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
May 30	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
May 31	< 0.2	< 0.2	0.3	< 0.2	< 0.2	0.2	< 0.2
June 1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.3
June 4	< 0.2	< 0.2	0.3	< 0.2	< 0.2	0.4	< 0.2
June 5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
June 6	< 0.2	0.9	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
June 7	0.3	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.2
June 8	0.4	0.2	< 0.2	< 0.2	< 0.2	0.3	< 0.2

[1] All values in ng/m3. Cr (VI) LOD = 0.2 ng/m3

The Barrio Logan II air quality data are presented below with a strong caveat that they may have been adversely affected by physical factors such as turbulence, deposition, and/or reintrainment. The position and location of the samplers in the confined sampling sites with respect to obstacles, the ground, or vegetation may have inadvertently introduced a bias in the accuracy, precision, or representativeness of the sample results. The effect on the data is unknown and unquantifiable at this time. Consequently, the data should not be used to draw conclusions, inferences or make statements of cause and effect until further sampling can be done to help confirm the effect of these factors. For further information, please contact Jeff Cook at 916.322.3726.



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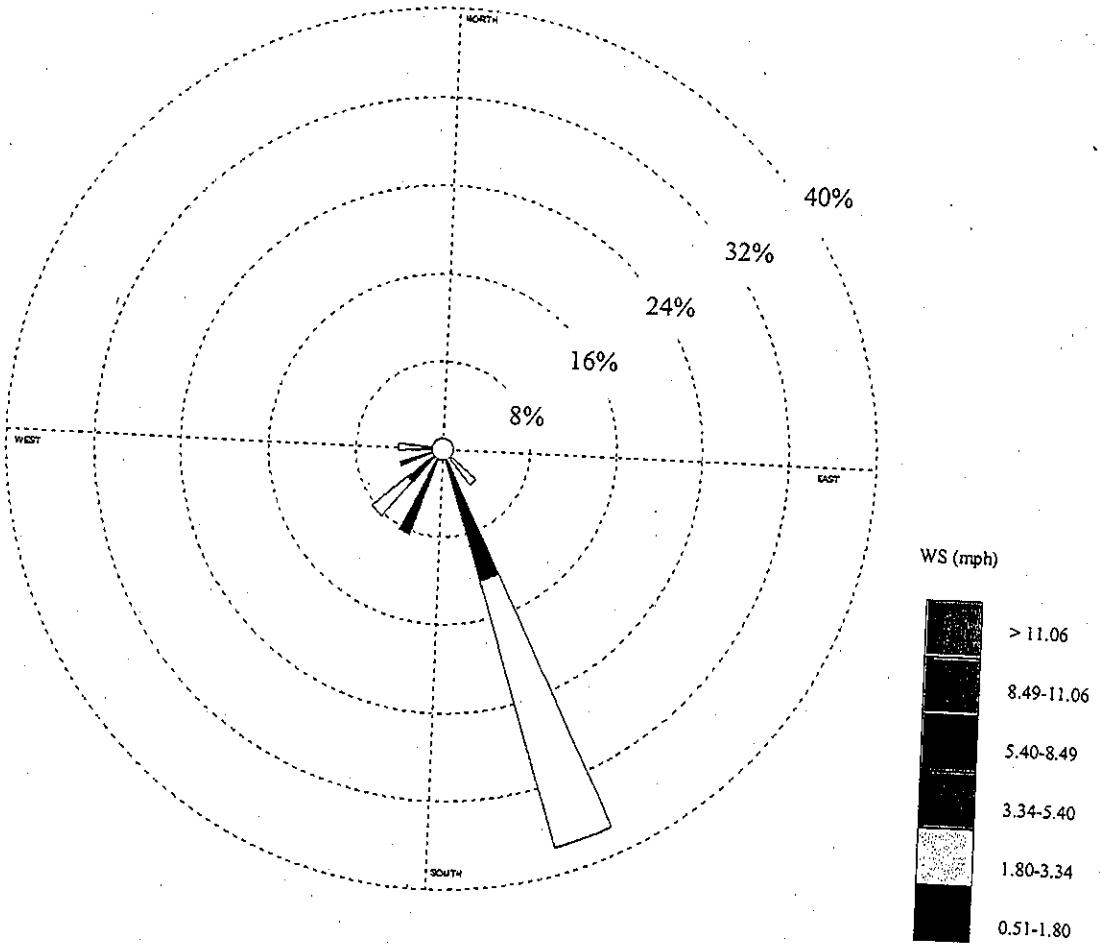

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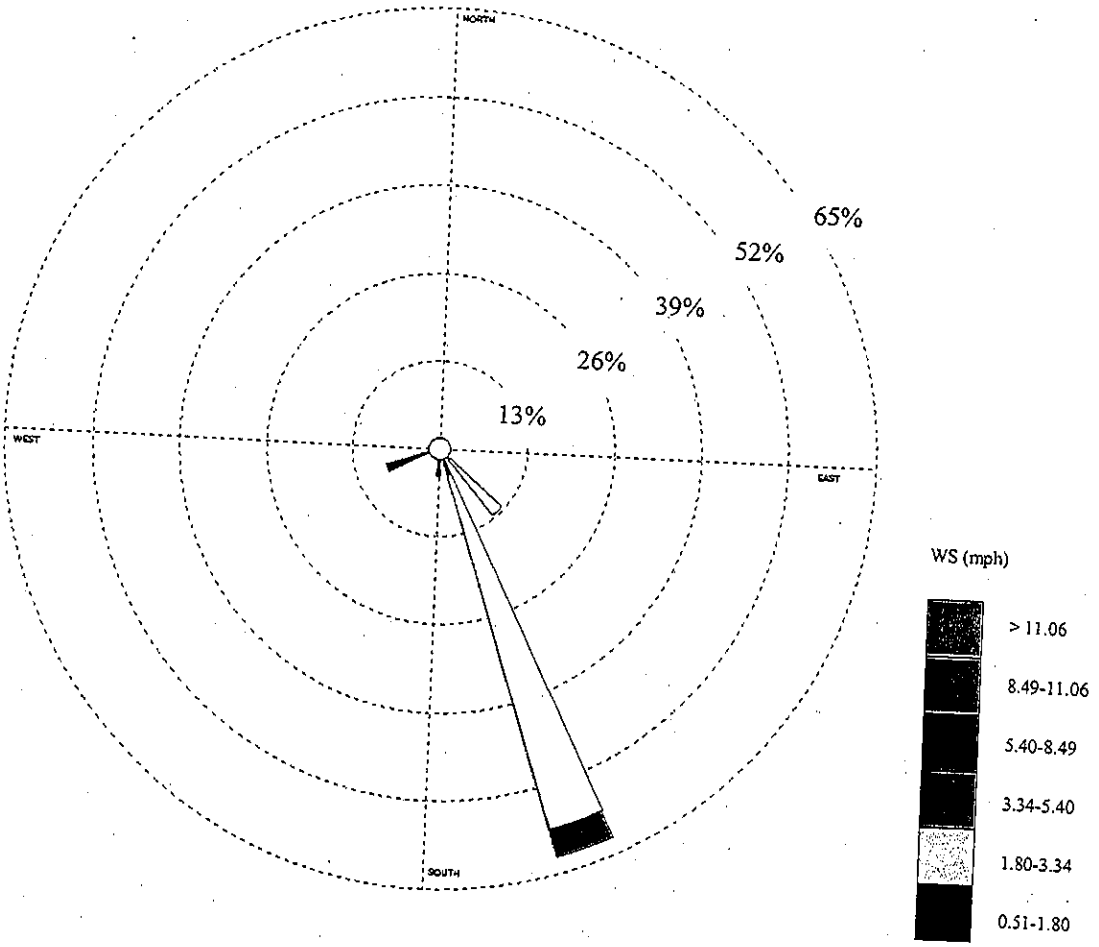

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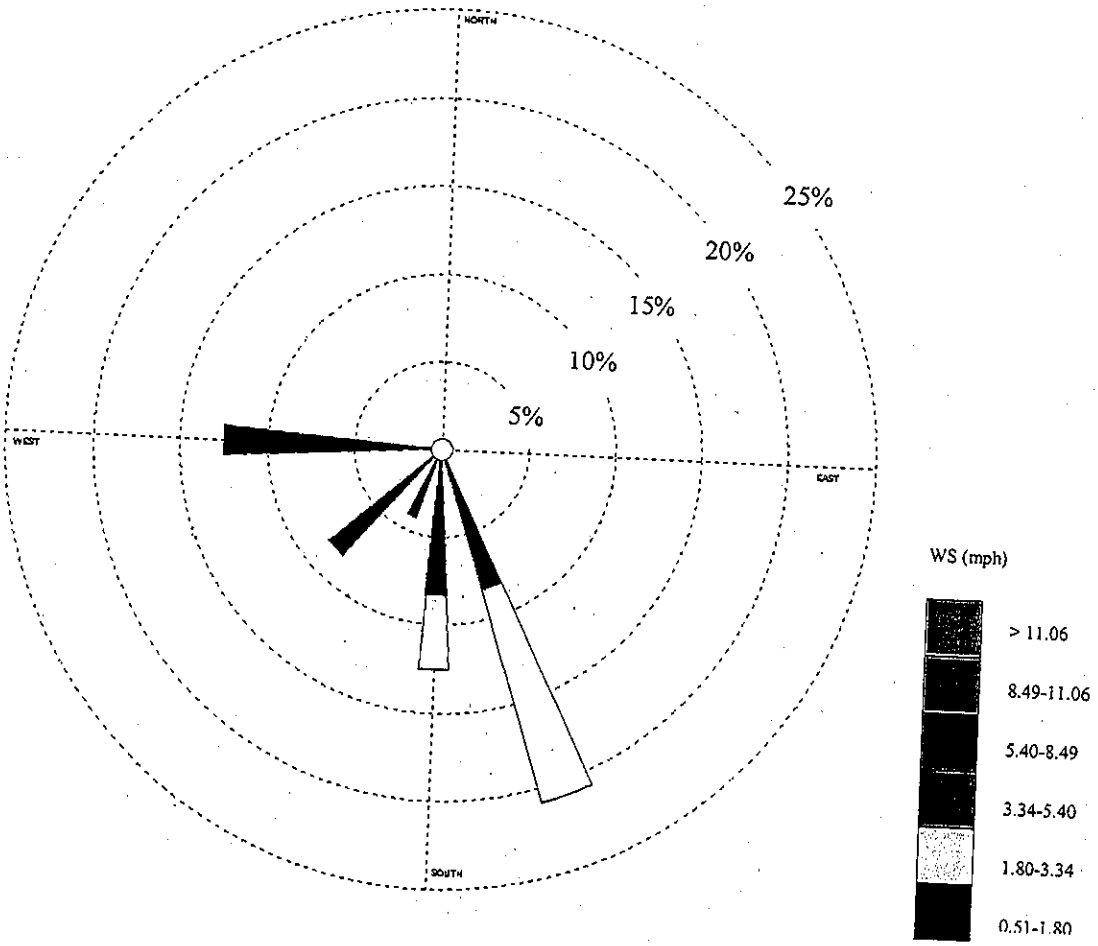

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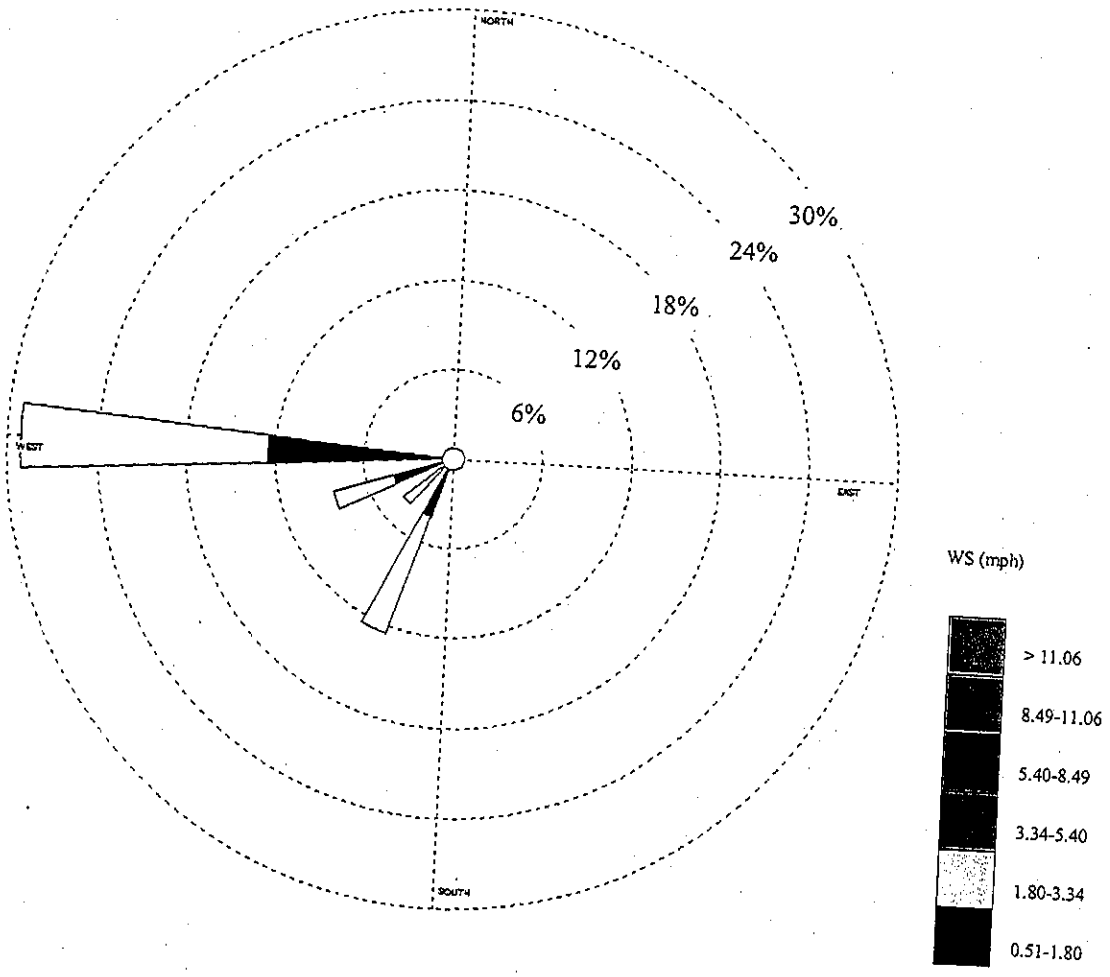

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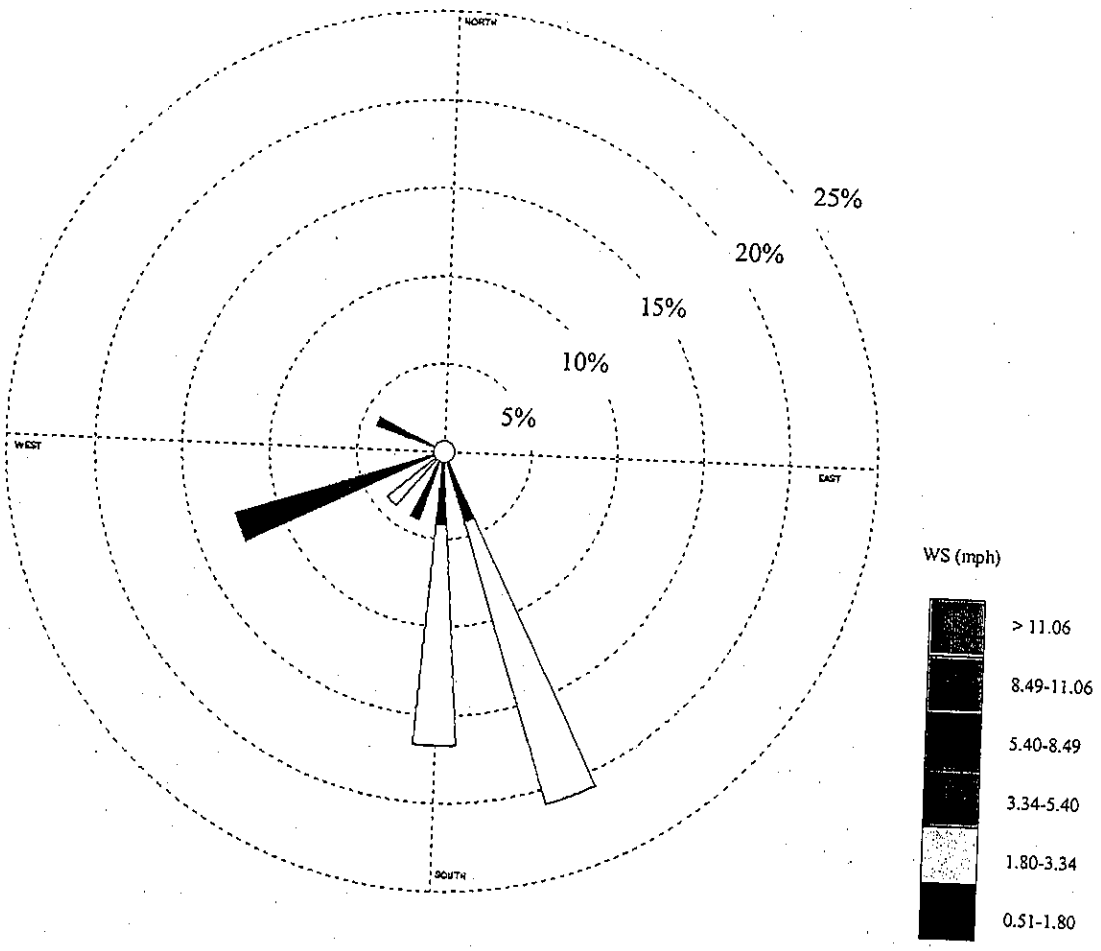

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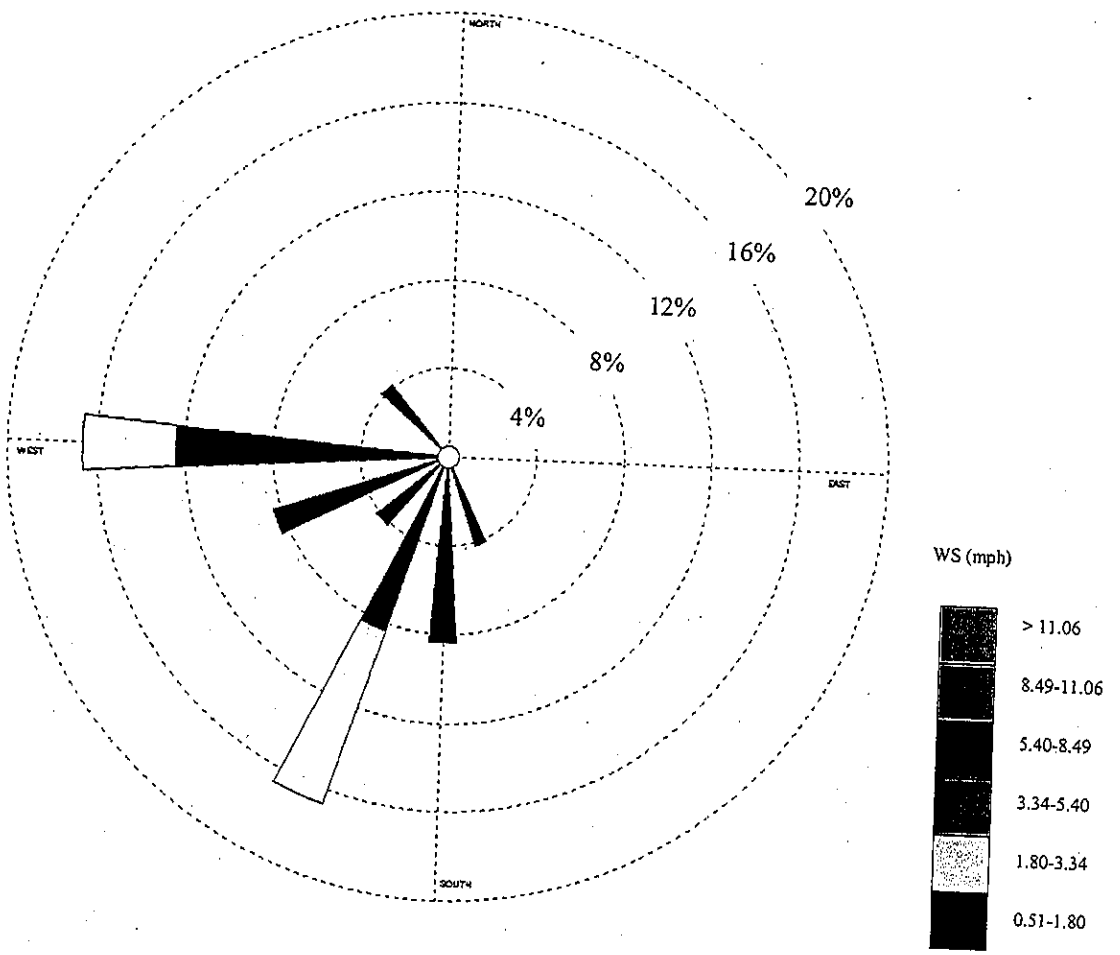

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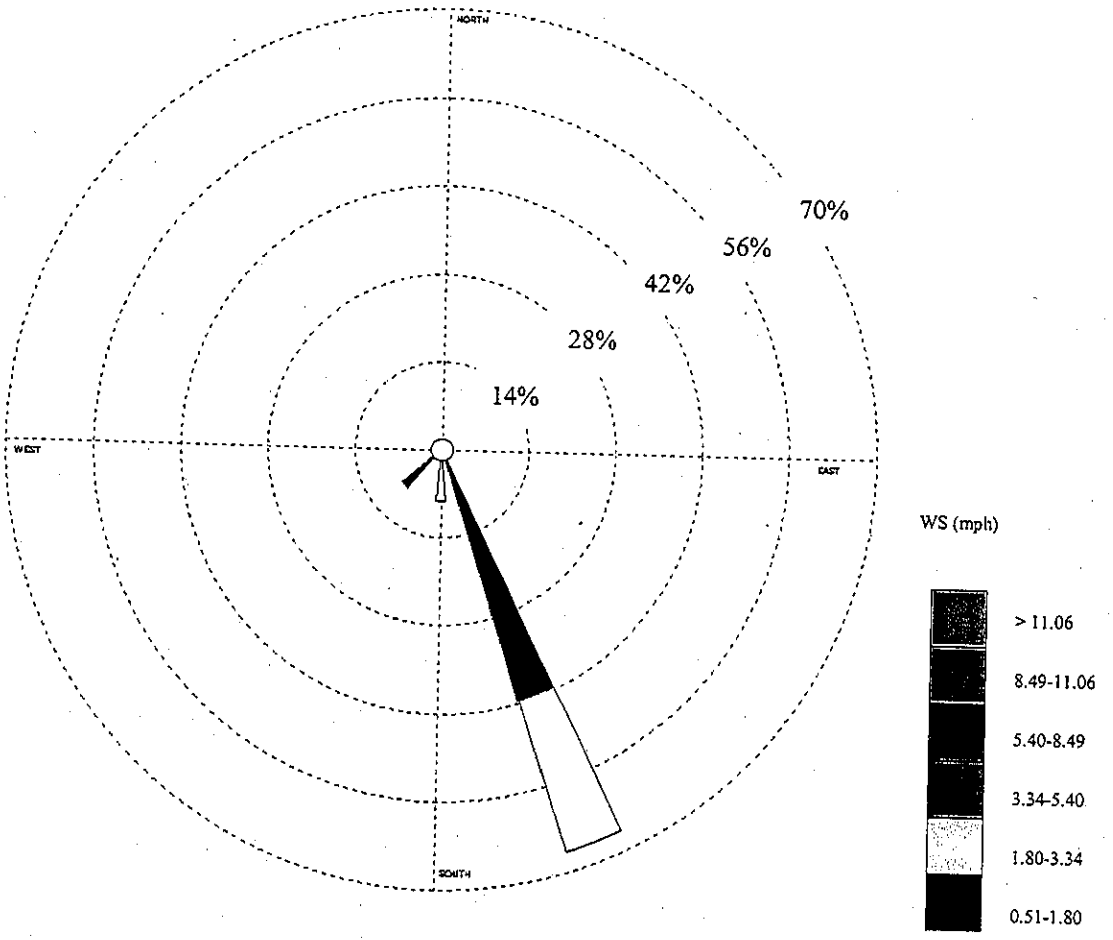

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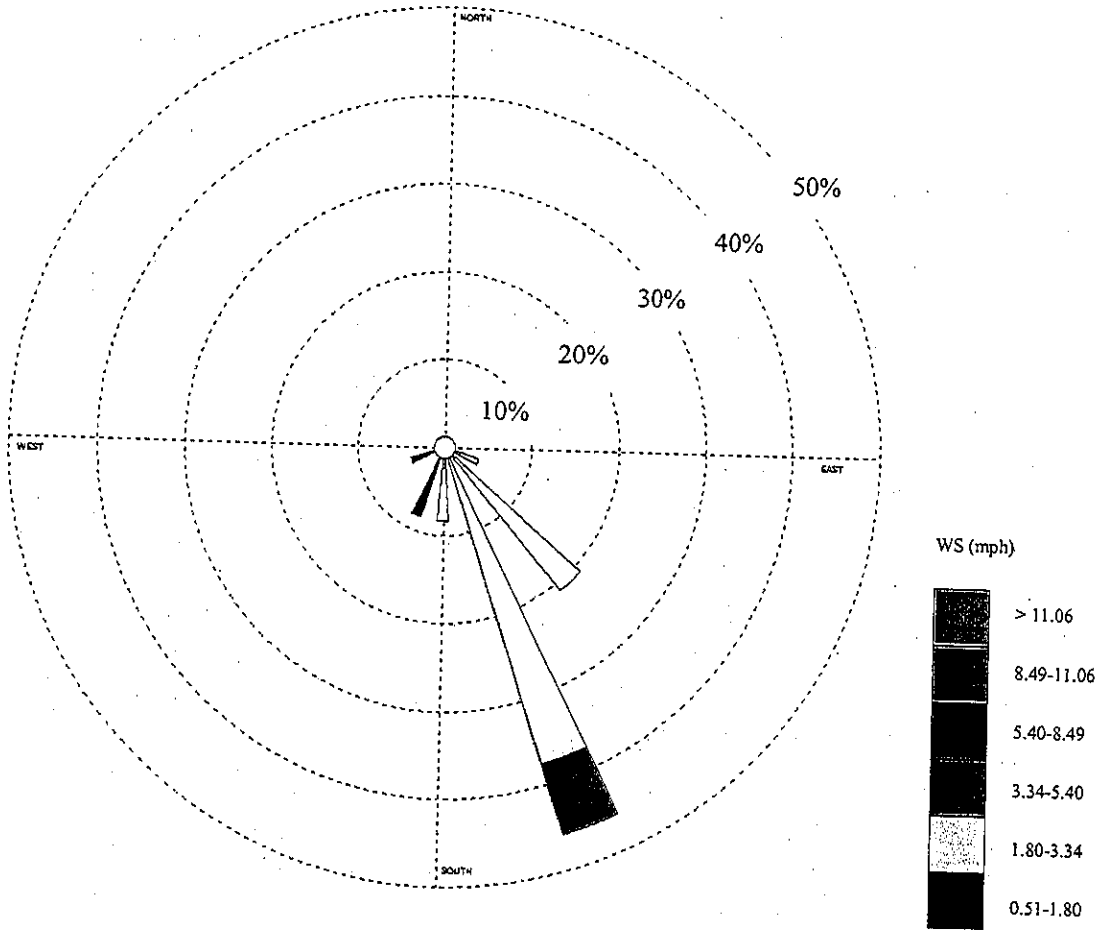

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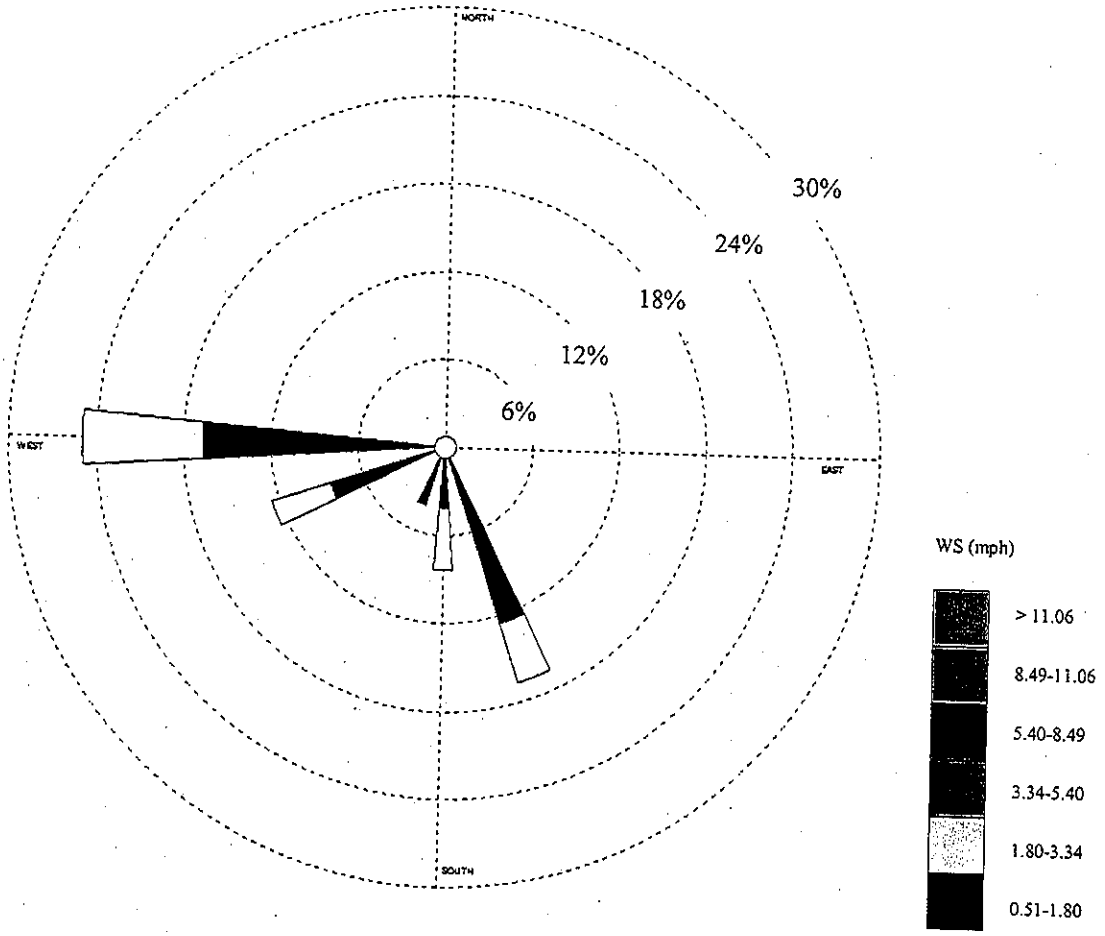

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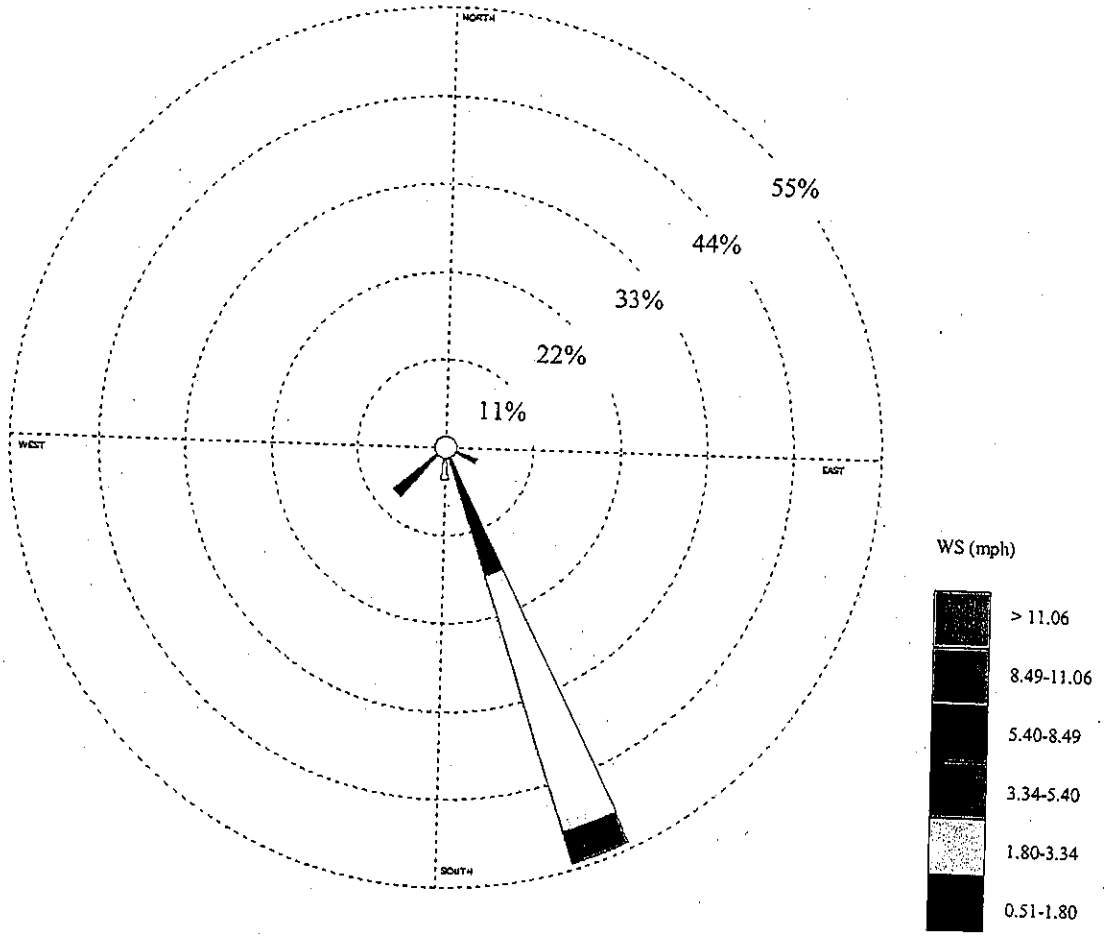

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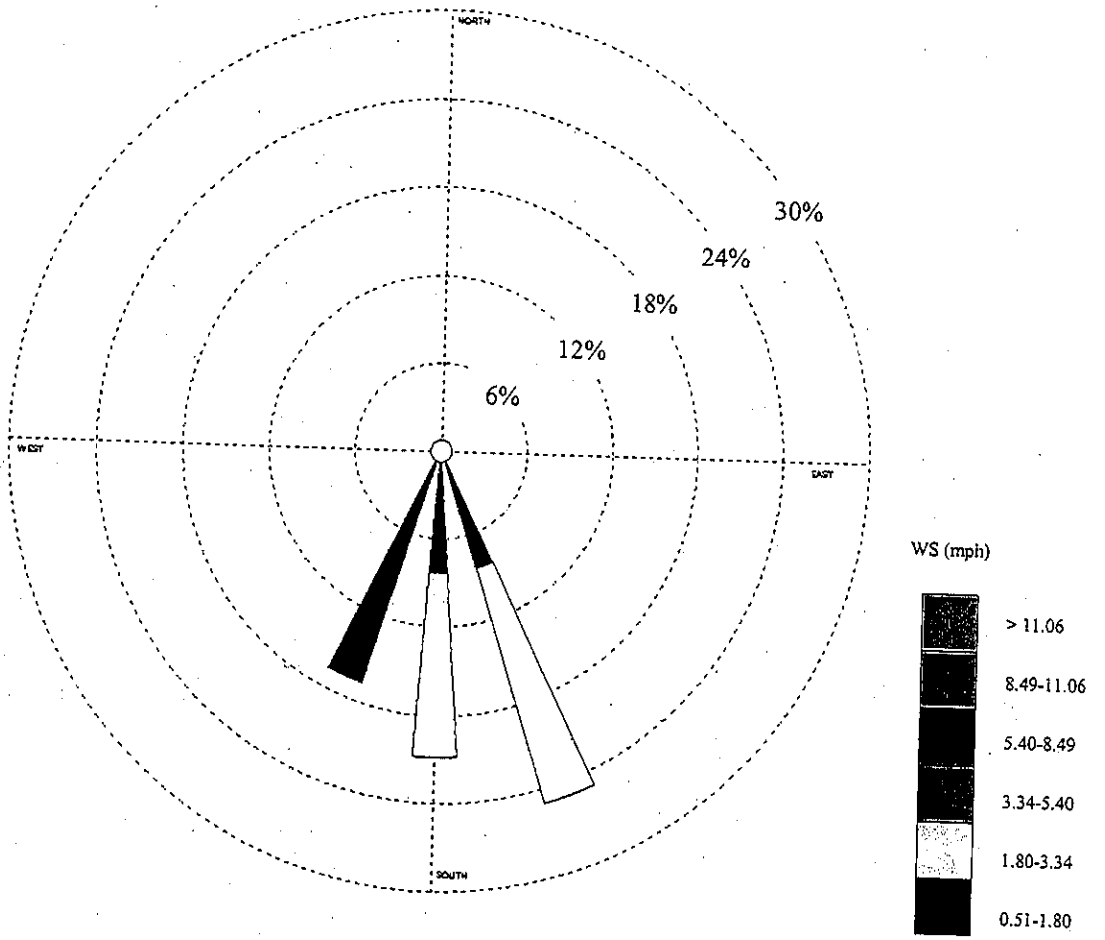

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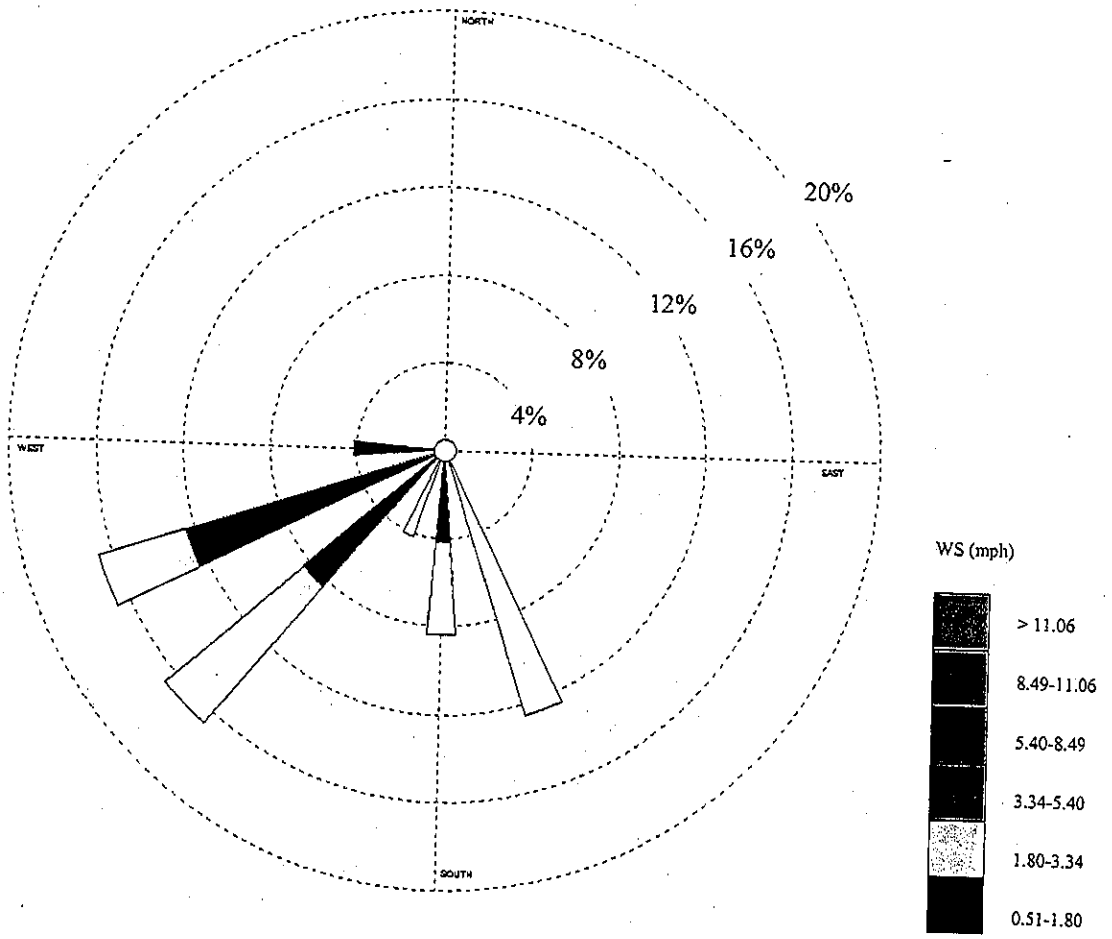

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Appendix A-2

Instruction Manual for BGI PQ-100 Sampler

Appendix A-3

Standard Operating Procedure for the Analysis of Hexavalent Chromium at Ambient Atmospheric Levels by Ion Chromatography (Method MLD 039)

Note: The following appendix represents the standard operating procedure at the time of publication.

Appendix A.3

Air Sampling for Hexavalent Chromium and Metals in Barrio Logan, February 7, 2002

State of California
California Environmental Protection Agency
Air Resources Board

AIR SAMPLING FOR HEXAVALENT CHROMIUM AND METALS IN BARRIO LOGAN

AIR SAMPLING PROTOCOL FOR MEASURING THE AIR CONCENTRATION OF HEXAVALENT CHROMIUM AND METALS NEAR TWO CHROME PLATING FACILITIES

Monitoring and Laboratory Division

February 7, 2002

The following protocol has been reviewed and approved by the Air Resources Board (ARB) staff. Approval of this protocol does not necessarily reflect the views and policies of the ARB, nor does the mention of trade names or commercial products constitute endorsement or recommendation for use.

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Analytical Results from December 2001 Sampling	A-1

1.0 Sampling Plan Identification and Approval

Title: Air Sampling for Hexavalent Chromium and Metals in Barrio Logan.

Approval: The following sampling plan is recommended for approval by the Monitoring and Laboratory Division.

Signatures:

Kenneth R. Stroud, Chief — Date 2-13-02
Air Quality Surveillance Branch
Air Resources Board

Jeffrey P. Cook, Chief — Date 02.13.02
Quality Management Branch
Air Resources Board

Michael W. Poore, Chief — Date 2/13/02
Northern Laboratory Branch
Air Resources Board

William V. Loscutoff, Chief — Date 2.13.02
Monitoring and Laboratory Division
Air Resources Board

2.0 Project Background

2.1 Previous Near-Source Air Sampling in Barrio Logan

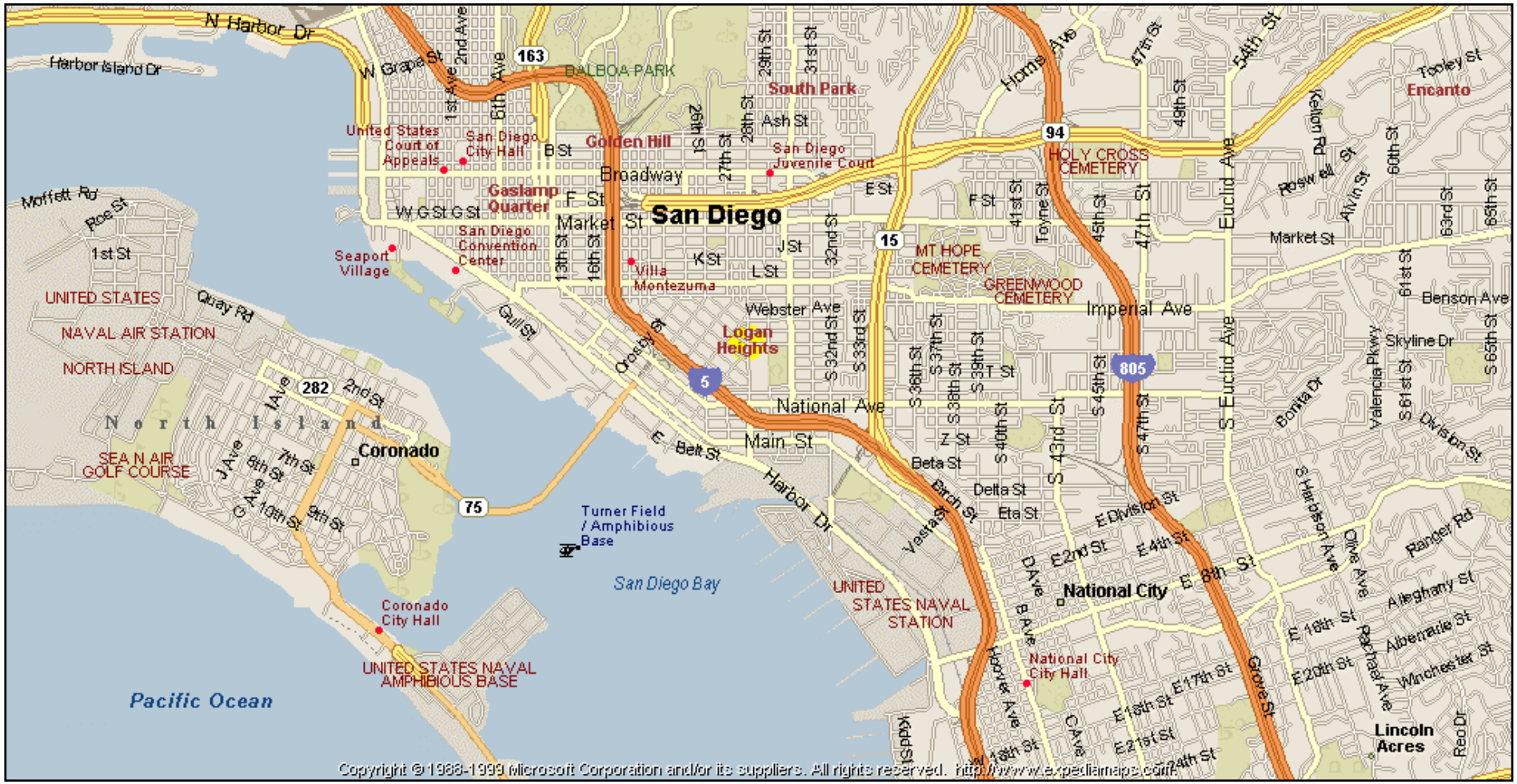
In March 2001, the Stationary Sources Division (SSD) of the Air Resources Board (ARB) requested that the Monitoring and Laboratory Division (MLD) conduct ambient air sampling for hexavalent chromium in Barrio Logan, a community within the Logan Heights area of San Diego (Figure 1). Sampling occurred between May 22 and June 8, 2001, at six sampling sites situated around two chrome platers along a residential-commercial section of Newton Avenue. The purpose was to gather data necessary to evaluate the possible exposure to hexavalent chromium experienced by nearby residents and to collect information needed for revising the ARB's chrome plating Air Toxic Control Measure (ATCM).

Following sample collection and analysis, MLD staff reviewed the arrangement of samplers and determined that optimal air flow to the samplers at four of the six sites may have been obstructed due to walls, trees, and ground vegetation. The hexavalent chromium values obtained during the sampling were therefore suspect in terms of accuracy, precision, and representativeness and were considered questionable for addressing impacts experienced by residents living near the chrome plating operations. In the fall of 2001, the decision was made to conduct additional sampling at the same locations as the May/June sampling, but with greater consideration given to positioning the sampler inlets. A second protocol was drafted, and sampling was conducted between December 3 and December 17, 2001.

Measurements obtained during the December sampling effort were significantly higher than those obtained in May/June. Ambient concentrations measured during December ranged from below the limit of detection (LoD) to 22 nanograms per cubic meter (ng/m3) of sampled air, with an average concentration from all 87 samples collected of 0.98 ng/m3. Because of the high values recorded during December, additional sampling at the same locations was proposed to gain more information on the contribution of the plating operations to the observed values and to determine other possible sources of the emissions. A third sampling effort in Barrio Logan was planned in late January 2002 to occur in early February. The purpose of this protocol is to address the design, schedule, collection methods, and analytical procedures that will be used for the current sampling project. The protocol also describes the data quality objectives, data management, field and laboratory quality control, and reporting procedures.

The current sampling project is more comprehensive than previous near-source sampling in Barrio Logan. Significant differences between earlier sampling (May/June and December) and the current project include:

- Increased number of sampling days (from 13 to 22)
- Increased ambient sampling on weekends (Saturdays and Sundays)
- Addition of source sampling at the hard and decorative plating shops
- Greater temporal resolution in ambient samples (24-hour/12-hour)
- Addition of metals sampling
- Collection of more detailed facility process rate information



Approximate scale: 1"=1 mile

Figure 1
Logan Heights and Surrounding San Diego Area

Details of the May/June sampling are included in the original sampling plan, *Air Sampling for Hexavalent Chromium in Barrio Logan*, dated May 7, 2001. The December sampling is described in *Air Sampling for Hexavalent Chromium in the Barrio Logan Community of San Diego*, dated December 7, 2001 (revision). The analytical results and from the December sampling are given in Appendix A-1.

2.2 Goals and Objectives for Current Project

The goals of the current sampling project are: 1) to obtain more information on the possible connection between the values recorded in December and the chrome plating operations on Newton Avenue in Barrio Logan and, 2) to determine what other sources may be contributing to the high values measured in December.

The overall sampling objectives of the project are to sample for 22 days at 6 ambient and 2 in-facility sites to obtain 211 valid hexavalent chromium samples and 51 valid airborne metals samples. In-facility sampling at 1 of the facilities (Carlson & Beauloye) will be conducted as a component of source sampling scheduled for 6 days in February (1). Since the control technology used at the second plating shop (Master Plating) precludes the use of traditional source sampling methods, a minimum of 7 days of 8-hour, in-facility samples for hexavalent chromium and airborne metals will be obtained within the second plater in lieu of source sampling. Specific data quality objectives for the project are described in Section 6.0 of this protocol.

3.0 Roles and Responsibilities

3.1 Air Resources Board

MLD and SSD are the divisions in ARB with overall responsibility for the Barrio Logan hexavalent chromium air sampling project. MLD will plan and conduct the monitoring, perform all analyses, and address all associated quality control and quality assessment activities. SSD will use monitoring data, in conjunction with data obtained from other sources, to evaluate the effectiveness of the current ATCM for controlling hexavalent chromium emissions from chrome plating shops in areas with nearby residences.

Primary ARB management contacts for the project are listed below with an explanation of the primary functions their respective sections will be performing.

- Dan Donohue, Chief
  Emissions Assessment Branch
  Stationary Source Division

- Todd Wong, Manager
  Technology Assessment Section
  Project Assessment Branch

Staff of the Technology Assessment Section (TAS) will be the primary contact group for communication between SSD and MLD and will coordinate meetings between ARB staff and the San Diego County Air Pollution Control District. TAS staff will collect historical plating data and compliance information from chrome plating operations (Carlson & Beauloye and Master Plating) and will provide the information to staff of the Operations Planning and Assessment Section (OPAS) to be included in the final project report. TAS staff will also coordinate any ancillary sampling and analysis of material that may impact air results during the course of the project (e.g., soil sampling near the chrome plating facilities) and will provide any analysis data to OPAS following appropriate analysis.

- Jeffrey P. Cook, Chief
  Quality Management Branch
  Monitoring and Laboratory Division

- Webster Tasat, Manager
  Operations Planning and Assessment Section
  Quality Management Branch

OPAS will have overall project responsibility for MLD. In conjunction with the Special Purpose Monitoring Section (SPMS), OPAS will assist in selecting sampling sites and coordinating sampling activities with appropriate community representatives. OPAS will coordinate activities between SPMS, NLB, and any outside laboratory involved in comparative analytical work. OPAS staff will prepare the sampling plan and will prepare the sampling report issued to SSD. OPAS will also track samples, validate preliminary results, and conduct the primary analysis of data generated during the project.

- Kenneth R. Stroud, Chief
  Air Quality Surveillance Branch
  Monitoring and Laboratory Division

- Dennis Goodenow, Manager
  Special Purpose Monitoring Section
  Air Quality Surveillance Branch

SPMS will have responsibility for installing, operating, and removing all samplers and other instruments from the sampling locations. The SPMS will be responsible for arranging for the transport of all sampling media to and from the sampling sites and will collect plating and other operational data from the plating facilities on each sampling day. Plating data will be in the form of elapsed amp-hours from all chrome electroplating tanks used at each plating facility. SPMS staff will conduct all field quality control (QC) activities and will provide OPAS staff with sampler QC data and confirmation that the sampling plan was followed. SPMS staff will provide OPAS staff with all data sheets and data collection information (including meteorological data) after all sampling is complete.

- Michael Poore, Chief
  Northern Laboratory Branch
  Monitoring and Laboratory Division

- Russell Grace, Acting Manager
  Inorganics Laboratory Section
  Northern Laboratory Branch

The Inorganics Laboratory Section (ILS) will have responsibility for preparing and supplying all sampling media to SPMS staff and will perform all laboratory analyses. ILS staff will provide appropriate laboratory information to OPAS, including the date and number of filters released and returned from the field, sampling dates and locations, sample hold time, date of analysis, analysis results (including units), and any notable inconsistencies (e.g., samples returned without validating flow rate information, etc.). ILS staff will conduct the initial check of the filter and sampling data as it is received from the field to establish the validity of the sample. ILS staff will enter information from samples received from the field in the Laboratory Information Management System (LIMS).

3.2 San Diego County Air Pollution Control District

The San Diego County Air Pollution Control District (SDCAPCD) will assist in the sampling project by operating one additional sampler (XonTech 920 multi-channel) to be used to sample air concentrations of hexavalant chromium and metals within Master Plating. In cooperation with the facility operator, SDCAPCD personnel will determine the placement of the 920 within the facility. ARB (SPMS) staff will provide hexavalent chromium and metals filters for the 920 to SDCAPCD personnel on or before each day of sampling. SDCAPCD personnel will sample within Master Plating over seven days from February 7th through February 15th. SDCAPCD personnel will perform all calibrations, flow checks, and maintenance procedures for the 920 used in the project. All filter analyses (hexavalent chromium and metals) will be performed by ARB's laboratory in Sacramento. ARB (SPMS) staff will coordinate transport of the exposed filters to Sacramento via overnight delivery. SDCAPCD personnel may also collect hourly ampere-hour readings from each facility to document plating activity. The primary SDCAPCD contact for the project is listed below:

- Mahmood Hossain, Senior Air Pollution Chemist
  San Diego County Air Pollution Control District

4.0 Sampling Design and Method

4.1 Sampling Sites

As with the May/June and December sampling, the selection of sampling sites for this project is based primarily on the location of receptors and their proximity to the chrome plating facilities and expected meteorological conditions at the time of sampling. To the extent possible, all samplers will be positioned with reference to microscale monitoring siting criteria in 40 CFR

Part 58, Appendix E, and Volume II of ARB's Quality Assurance Manual (Table 1)(2). Siting criteria will apply to ambient single sampler, collocated, and parallel sites. If it is not physically possible to meet a particular siting requirement, every effort will be made to ensure that the sampler inlet is placed so as to minimize airflow obstructions. The pattern of samplers will be in an upwind-downwind circular arrangement around the chrome platers on Newton Avenue near South Evans Street in the same locations as the May/June and December sampling (Figure 2).

Proposed locations for samplers are as follows: three samplers will be placed in the front yard at 2121 Newton to collect hexavalent chromium (12-hour and 24-hour samples) and metals (24-hour samples). One sampler (24-hour hexavalent chromium) will be placed in

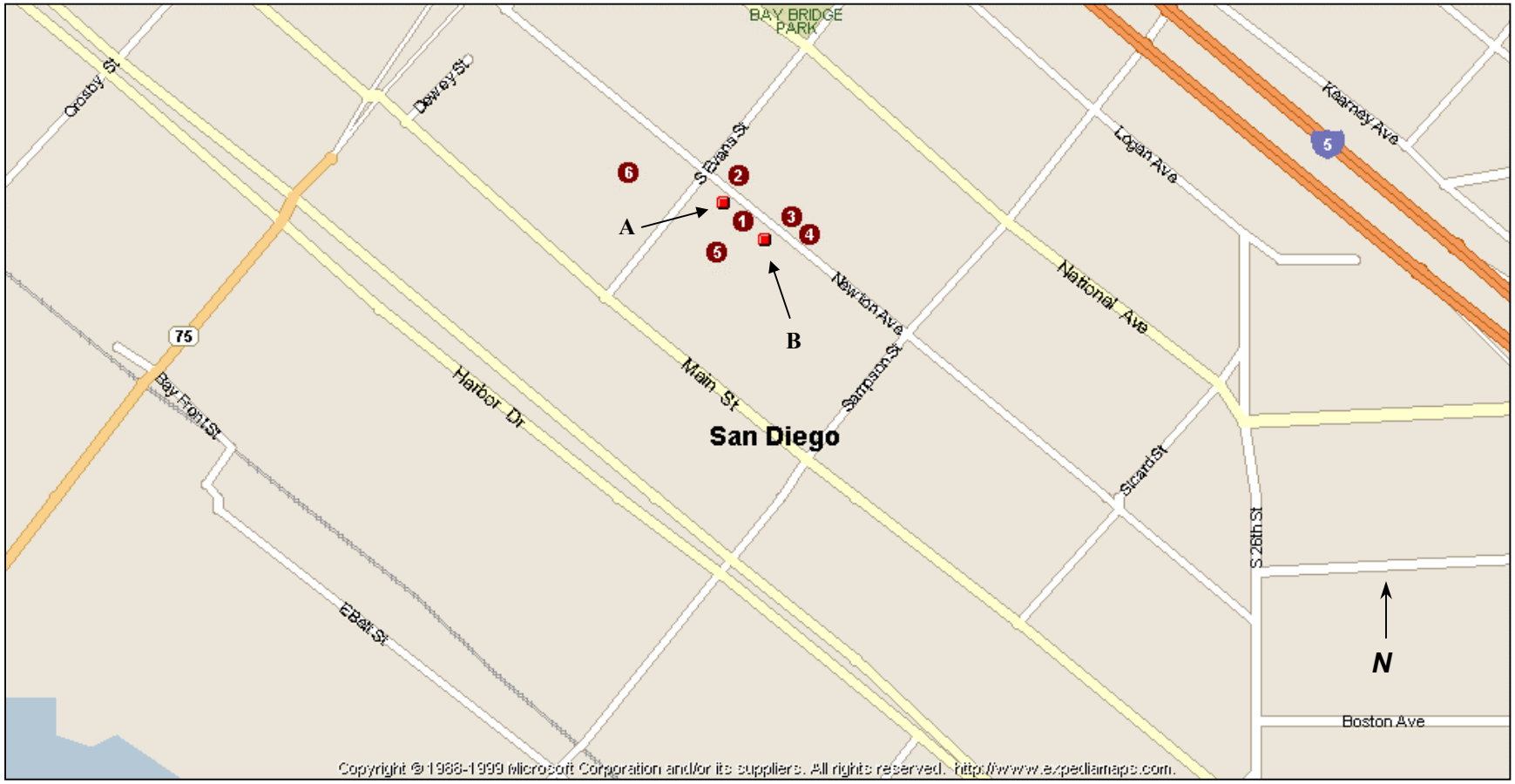
Table 1
Microscale Monitoring Requirements for Low-Volume PM Samplers

Item / Influence	Requirement*
Height of Inlet	2 to 7 meters above ground level.
Spacing Between Inlets (Collocated Samplers)	Within 4 meters, but at least 1 meter apart.
Obstacles	Distance between sampler and obstacle must be at least 2 times the height the obstacle protrudes above the sampler.
Tree Dripline	Inlet must be 10 meters from dripline if tree represents an obstruction.
Walls, Parapets, etc.	Inlet must be 2 meters from walls, parapets, etc.
Air Flow Arc	Unrestricted 270° arc that must include predominant wind direction for seasonal high pollutant; samplers located on the side of a building require 180° clearance.
Traffic	5 to 15 meters from roadway.

** From 40 CFR Part 58, Appendix E, and ARB Quality Assurance Manual, Volume II, Section 2.0.4 (February 2000).*

the front yard of 2144. Two samplers (12-hour and 24-hour hexavalent chromium) will be placed at 2152 Newton. Two collocated samplers (24-hour hexavalent chromium) will be placed within a vacant lot on the north side of Newton Avenue to the west of 2144 Newton. Two samplers (24-hour hexavalent chromium and 24-hour metals) will be placed along the north side of the alley behind the plating facilities, due south of the residence located at 2121 Newton Avenue. One sampler (24-hour hexavalent chromium) will be placed at the Mercado Apartments northwest of the plating facilities. One sampler (8-hour hexavalent chromium) will be operated within Carlson & Beauloye on each of six days during the source sampling. Table 2 summarizes the placement of samplers.

A portable meteorological station will be placed at the vacant lot on the north side of Newton Avenue near the collocated samplers. Ambient temperature, wind speed, wind direction, and relative humidity will be measured continuously and reported in hourly averages. The standard deviation of the horizontal wind direction (sigma-theta) will be calculated and reported in hourly averages. A wind rose plot of wind data collected from Logan Memorial Academy during the Barrio Logan Toxics Monitoring Project in February 2000 shows the expected wind pattern expected during the current ambient sampling (Figure 3).



Approximate map scale: 1" = 1/12 mile. All sampling locations are approximate.

Chrome Platers

A = Master Plating (Decorative Chrome), 2109 Newton
B = Carlson & Beauloye (Hard Chrome), 2141 Newton

Proposed Ambient Sampling Sites

1 = 2121 Newton Avenue
2 = Vacant Lot (collocated + met station)
3 = 2144 Newton Avenue
4 = 2152 Newton Avenue
5 = Alley
6 = Mercado Apartments

Figure 2
Proposed Sampling Locations and Chrome Platers on Newton Avenue

Table 2
Sampler Placement Chart

Proposed Sites	Sampler Interval / Type				
	24-hour Cr^{6+}	*12-hour[1] Cr^{6+}*	*8-hour[2] Cr^{6+}*	*Collocated[3]*	*Metals*
2121 Newton	x	x			
2144 Newton	x				x
2152 Newton	x	x			
Vacant Lot	x				
Alley	x			x	
Mercado Apts.	x				x
C&B[4] / MP[5]			x		

[1]12-hour samples should be operated during daylight hours (e.g., 6 am – 6 pm). Collection of plating tank amp-hours will occur at the beginning and end of each sampling day the facilities are in operation. LoD for 12-hour sample = 0.4 ng/m3.
[2]XonTech 920 operated by SDCAPCD for in-facility air sampling of Cr^{6+} and metals at Master Plating on weekdays February 7th-15th. ARB sampling for Cr^{6+} at Carlson & Beauloye will be coincident with source sampling February 11th, 12th, 19th, 20th, 25th, and 26th. LoD for 8-hour sample = 0.6 ng/m3.
[3]Cr^{6+} collocated sampler operated on a 24-hour interval.
[4]Carlson & Beauloye.
[5]Master Plating.

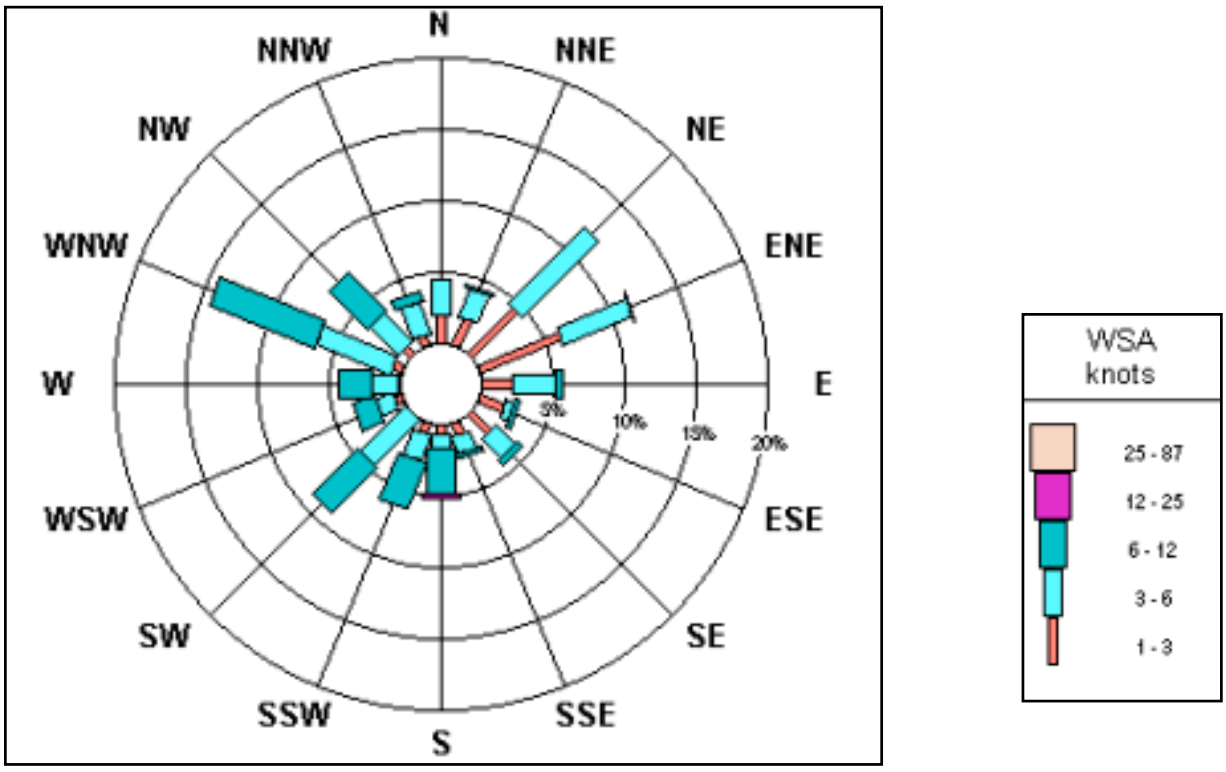
4.2 Duration and Interval

Ambient sampling is scheduled each day for approximately 22 days beginning February 5th through February 26th and will include three weekends (Saturdays/Sundays). The sampling duration will vary among the sites according to Table 2. The sampling schedule is designed to ensure that ambient sampling occurs on at least two days when no plating is taking place at either facility. Non-plating days may coincide with the February 18th holiday and on Saturdays and/or Sundays. The ambient sampling schedule is summarized in Figure 4.

All 24-hour samples collected for this project will be coincident with one another (i.e., sampling will be conducted on the same day with the same start-times and end-times within two hours of each other). The purpose of coincident sampling is to obtain a 24-hour profile of hexavalent chromium/airborne metals impact at selected sites around the chrome plating facilities.

4.3 Equipment

Sampling equipment used for the project will consist of a total of 12 BGI PQ-100 samplers, custom tripods, battery cases, and one Auto Met meteorological station. Each BGI sampler is a single-filter, battery-powered unit capable of 24 hours of continuous operation. Tripods will be used to elevate the inlet of selected samplers to a minimum of two meters above the ground. The meteorological station is battery-powered. Line power may be used, if available, for the BGI samplers and/or the Auto Met station. Each sampler is operated at a nominal flow rate of



Average 24-Hour Wind Pattern for February 2000 as measured at Memorial Academy during the Barrio Logan Toxics Air Monitoring Project from October 1999 - March 2001

Figure 3
Average Wind Rose for Barrio Logan (February 2000)

February 2002

Su	M	Tu	W	Th	F	Sa
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28		

Note: Source sampling and in-facility emissions sampling at Carlson & Beauloye will occur on the 11th, 12th, 19th, 20th, 25th, and 26th. In-facility emissions sampling at Master Plating will occur on the 7th, 8th, 11th, 12th, 13th, 14th, and 15th.

Figure 4
Ambient Sampling Schedule

10 standard liters per minute (slpm). The flow rate is pre-set and is maintained with a mass flow controller. A 10 slpm flow rate ensures that enough air is drawn through the sampler during each 12- or 24-hour period (7.2 m3 or 14.4 m3) that hexavalent chromium or metals will be detected, if present.

Details on sampler operation and maintenance for the BGI PQ-100 Air Sampler are available at the manufacturer's web address: http://www.bgiusa.com/aam/pq100v61.pdf. Operational details regarding the XonTech 920 sampler to be used by SDCAPCD for in-facility sampling are available in Appendix R, Volume II, of the ARB's Quality Assurance Manual at http://www.arb.ca.gov/aaqm/qmosqual/qamanual/vol2/v2apxr.pdf.

Whatman #41 37-millimeter cellulose fiber filters (20-25 µm pore size) are used for sampling hexavalent chromium. For sampling metals, Whatman 37-millimeter PTFE (or equivalent) filters (0.5 µm pore size) will be used. After laboratory preparation, all filters are mounted in plastic filter cassettes/snap rings and stored in petri dishes for transport to the field. Filter-loaded rings are placed in filter holders and attached to the inlet of each sampler. Filters used for sampling and those used as trip blanks will be prepared, handled, and transported under the same conditions. Sections 5.0 and 8.0 of this sampling plan describe the preparation and use of sampling filters and trip blanks for the project.

4.4 Collocated Sampling

Collocated sampling is conducted to establish or verify the total system precision. Each sampler of a collocated pair is operationally identical and is run under the same conditions. The concentration values are then compared. Precision measurements are an important quality assessment technique and are used to validate the sampling design. To verify the precision of the BGI sampler, a collocated pair will be operated at the vacant lot on the north side of Newton Avenue on each sampling day. Each sampler will have the approximately the same start and end times, total run time, and will be situated with reference to collocated sampling criteria set forth in 40 CFR, Part 58, Appendix A, and Volume II of ARB's Quality Assurance Manual.

4.5 In-Facility Emission Sampling

In-facility emission sampling will occur on each source sampling day at Carlson & Beauloye and each weekday from February 7th through February 15th at Master Plating. The in-facility sampling is part of the emissions test at Carlson & Beauloye and will supplement emission information collected at the stack. Sampling within Master Plating will be used to estimate mass emission rates from the facility.

In-facility sampling at Carlson & Beauloye will be conducted using the same type of sampler used for ambient sampling (BGI PQ-100) and will consist of collecting hexavalent chromium samples only. In-facility sampling at Master Plating will be conducted by SDCAPCD using a XonTech 920 sampler that is configured to collect both hexavalent chromium and metals samples simultaneously. The 920 collects total suspended particulate at a nominal flow rate of 10 slpm.

5.0 Sample Collection and Analysis

5.1 Filter Preparation

Prior to shipment to the field, ILS staff will prepare filters for hexavalent chromium and metals sampling. Each filter is briefly inspected prior to release from the lab for contamination or damage. Contaminated or damaged filters are rejected for sampling.

As with the May/June and December sampling, trip blanks will be included in the filters returned to ARB's laboratory for analysis (one trip blank per filter type per day).

5.2 Sampling Procedure

The target flow rate of each sampler (10 slpm) will be checked before any sampling with a certified flow transfer standard. A flow-verification will also be performed on each sampler at the completion of the project. Pre- and post-sampling flow check information is recorded on a sampler flow check log (Figure 5).

Following pre-sampling flow checks, a filter will be loaded into each sampler. The start date and time are entered into each sampler's microprocessor. After approximately 12 or 24 hours, each sampler will automatically stop. Elapsed time, target flow rate, and other sampling information are noted on a daily Sample Report (Figure 6). Complete operating information stored in the sampler's microprocessor will be downloaded each day on a laptop computer. For each valid sampling day, staff of SPMS, TAS, and SDCAPCD will collect amp-hour and activity information from Carlson & Beauloye and Master Plating (Figure 7).

Prior to loading a new filter into a sampler, the sampler is checked and any necessary on-site maintenance is performed. Unexposed filters are stored in a protected, dry location in individual petri dishes until loaded into a sampler. All data from each sampler's data logger are downloaded after each sample run into a laptop computer. The data are later printed out for review by ILS staff to review and validate each sample run. After each sample run, exposed filters are placed in individual petri dishes labeled with the sampling date and location and are placed in a plastic bag protected from contamination. The filters are stored under ambient conditions until returned to the laboratory. For this project, each day's filters will be transported via overnight express delivery to Sacramento for analysis. Each set of filters sent to Sacramento for analysis will include a hexavalent chromium filter blank and a metals filter blank. The Sample Reports, including sample transfer documentation, will accompany samples when they are returned from the field.

In the event of rain at the time of daily filter retrieval and replacement, sampling will be suspended until clear conditions resume. Make-up samples will be taken as necessary during clear (non-rain) conditions in order to meet the overall data completeness objective in Section 6.3.

Sampler Flow Check Log

Transfer Standard Information:

MFM Make & Model: _____ *Flow Range:* _____

I.D.(Bar Code): _____ *Calibration Date:* _____

Flow Check Data:

Date	Sampler I.D.	Pre-Sampling Flow Check		Post-Sampling Flow Check		Comments
		Transfer Standard Flow Rate (slpm)	Sampler Flow Rate (slpm)	Transfer Standard Flow Rate (slpm)	Sampler Flow Rate (slpm)	

Figure 5
Flow Check Form

Sample Report

Site Name: _____

Sampler I.D.: _____

Field Operator: _____

Filter I.D. or Code: _____

Start Date / Time: _____

End Date / Time: _____

Sample Summary:

Elapsed Time (min)	Target Flow Rate (slpm)	Total Volume Sampled (liters)	Observed Conditions

Observed Conditions
A. No Unusual Conditions
B. Rain / Snow
C. Fog
D. Nearby Smoke / Fire
E. Construction
F. Sampler Malfunction
G. Other (state)

Operator Comments:

_____

_____

_____

Filter / Sample Transfer:

Action	Date	Time	Initials		Comments
			Released	Taken	
Filter transferred from lab to site operator					
(Filter transfer)					
(Filter transfer)					
(Filter transfer)					
Filter transferred from site operator to lab					

Figure 6
Sample Report Form

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Chrome Plater Ampere-Hours

Carlson & Beauloye

Date	Time	Plating in Progress?	Amp-Hour Meter (Tank #1)	Amp-Hour Meter (Tank #2)

Comments (Note any air agitation of chrome tank solution ('sparging')):_____

_____

Master Plating

Date	Time	Plating in Progress?	Amp-Hour Meter (Tank #1)

Comments (Note any air agitation of chrome tank solution ('sparging')):_____

_____

Figure 7
Ampere-Hour Usage Form

081

5.3 Laboratory Analysis

Upon receipt of exposed filters, ILS staff will log filters into MLD's Laboratory Information Management System (LIMS) for tracking through the analysis, validation, and verification process. Information on sampling date, location, interval, and flow rate are entered into LIMS, and the filter is inspected for contamination, tears, holes, etc.

Valid hexavalent chromium filters undergo extraction with deionized water and the extract is run through an ion chromatograph. The ARB's published limit of detection (LoD) for hexavalent chromium analysis (based on a 24-hour sample collected at 10 slpm) is 0.2 ng/m3 and has been verified through multiple runs of hexavalent chromium standard through an ion chromatograph. Additional information on the analytical method for hexavalent chromium, including method sensitivity and precision, is described in the laboratory Standard Operating Procedure (SOP) for MLD Method 039. A summary of Method 039 is available online at http://www.arb.ca.gov/aaqm/sop/summary/sop039.htm. Detailed information may be obtained from the ILS acting manager, Mr. Russell Grace, at (916) 322-8959.

Metals filters will be analyzed using Inductively Coupled Plasma Mass Spectrometry (ICP-MS). ICP-MS typically allows for the detection of very low levels (i.e., sub-ppb) of multiple elements, including chromium, nickel, and lead. The SOP for ICP-MS, MLD Method 061, is currently under review. General information regarding Method 061, including LoDs and laboratory quality control, may be obtained from ILS.

6.0 Data Quality Objectives

6.1 Precision and Accuracy

Precision is the agreement between replicate measurements of the same property under the same conditions. Accuracy is a measure of how close an individual measurement is to the actual value. For the current project, 24-hour sampler precision will be assessed through the use of collocated samplers at the vacant lot. For hexavalent chromium analysis, analytical precision will be expressed as the relative percent difference (RPD) between two replicate analyses made on a sample extract. A minimum of 10 percent of extracts from all valid samples will undergo two replicate analyses, and the RPD will be calculated. Extracts from trip blanks will be analyzed using the same procedure as sample filters. Trip blank analysis will provide baseline values, if present, that may be used to correct analytical results.

The accuracy of Method 039 will be assessed through the percent recovery of samples spiked with a National Institute of Standards Technology (NIST)-traceable stock solution of hexavalent chromium. ILS practice requires all hexavalent chromium analyses of laboratory-spiked samples demonstrate recovery of the spiked value ± 20 percent.

Details on the accuracy and precision of Method 061 (ICP-MS) may be obtained from the ILS acting manager.

6.2 Representativeness

Representativeness for this project refers to how accurately the sampling design represents the impact of hexavalent chromium on residents surrounding the chrome plating facilities. The number of sites, their location encircling the plating facilities, and the sampling duration and interval address the spatial and temporal representativeness. The sampling configuration, coupled with meteorological measurements and verification of chrome plating operations during sampling, will help identify the source-receptor connection. Plating verification may include obtaining SDCAPCD inspection records (i.e., ampere-hour logs) for each plating operation and contacting individual platers for specific process information.

6.3 Completeness

Data are complete if a prescribed percentage of the intended measurements are obtained. The total intended number of valid samples (including collocated and in-facility samples) is 211 (assumes 22 days of sampling with six days of in-facility samples collected from Carlson & Beauloye and 7 days from Master Plating). The overall data completeness objective is to obtain a minimum of approximately 90 percent of the total intended valid samples. If less than 190 valid hexavalent chromium samples and 46 valid metals samples are obtained, make-up runs will be conducted until a sufficient number of samples are obtained to meet a satisfactory level of data completeness.

For purposes of this project, valid samples are defined as samples that meet criteria for sampler-flow verifications, filter preparation, sample collection and review, DQOs, and laboratory analysis.

6.4 Comparability

Data are comparable if they are collected using the same sampling protocols and analytical methods. Comparability among sample sets for this project requires that the same sampling methods and procedures, analytical techniques, and reporting units used for sampling hexavalent chromium and metals be used for the duration of the project. For this project, all samplers used will be the same make and model and will be operated at the same flow rate, with the exception of the sampler used for in-facility sampling at Master Plating. MLD has operated the BGI and 920 in parallel in other special monitoring projects and has comparability data.

6.5 Coincident Sampling

A sample is defined as coincident if it is collected on the same day with start or end times within approximately two hours of the coincident sample. All 24-hour samplers during the project will be run coincident with one another; 12-hour samplers will be operated coincident other 12-hour samplers. Any sample run that is not coincident with other comparable sampling runs in terms of the start/stop time will be invalid for purposes of evaluating data completeness.

7.0 Data Tracking, Validation, and Verification

Data tracking involves frequent review of sample collection, transfer, log in, and analysis to ensure that any problems that may develop are identified quickly and corrective action is taken. Validation is the process by which specific criteria (e.g., sampler calibration requirements, etc.) are applied to samples or laboratory measurements by site operators, laboratory personnel, or data analysts to determine if the data is usable. Verification refers to a review of the data at all stages of transfer and recording to ensure that errors are not made and all data meets a qualitative standard of reasonableness.

MLD staff will track samples from collection through analysis. In particular, SPMS and ILS staff will apply standard validation and verification criteria to all samples as required by field and laboratory SOPs. Data identified as invalid will not be reported or used for any other purpose.

8.0 Quality Assessment / Quality Control

Field and laboratory QC procedures are critical to ensuring that data collected are consistent, relevant, and defensible. The ARB's standard field and laboratory QC procedures will be used for the project and are contained in field and laboratory SOPs. All QC data, with appropriate explanation, will be included in any final report.

8.1 Flow Verification and Equipment Calibration

The flow rate of each sampler will be checked and adjusted, if necessary, at the beginning of the project using a National Institute of Standards Technology (NIST)-traceable transfer standard. Additional flow verifications using a NIST transfer standard will also be conducted on each sampler at the end of the project. The purpose of flow checks is to verify that the sampler flow rate is a nominal 10 slpm. Meteorological equipment (Auto Met) will be calibrated using NIST-traceable standards, where appropriate, prior to deployment.

A description of transfer standard calibration is detailed on the ARB's website at http://www.arb.ca.gov/aaqm/qmosprog/stdslab/stdslab.htm and through documentation from MLD's Program Evaluation and Standards Section (PE&S).

8.2 Analytical Quality Control

For the analysis of hexavalent chromium by ion chromatography, laboratory QC procedures include the use of filter blanks, extract (water) blanks, and spiked filters. Replicate analyses are routinely run on 10 percent of each sample batch for QC purposes.

A description of laboratory QC procedures for ICP-MS is available from the ILS acting manager.

Details on laboratory QC procedures, instrument calibration procedures, analysis sensitivity, and precision are included in the laboratory SOP and quarterly QC reports generated by the ILS and

reviewed by management and an independent group within MLD (PE&S) to ensure that analyses are performed within pre-established limits.

8.3 Corrective Action

Samples that do not meet validation criteria for sampler calibration, sampling interval, filter integrity, or any DQO outlined in Section 6.0 will be considered invalid and will require make-up samples. All make-up runs will be conducted according to the same methods, procedures, DQOs, and laboratory QC standards required during the original sampling.

9.0 Reporting

Every effort will be made to provide ambient data to SSD, the Planning and Technical Support Division (PTSD), and SDCAPCD two weeks after receipt of the filters by ILS. At the completion of the project, all data will be compiled and MLD will provide a final monitoring report to SSD. The final report will include a review and explanation of the project's goals, the sampling design and method, the types and results of analyses conducted, and the means of data validation. A summary will also be given of all associated sampling and laboratory quality control. The draft final report will undergo internal MLD review, then be presented to SSD and all other interested parties.

10.0 References

1. Details on the applicable source sampling method, including quality assurance elements, may be found in the source test protocol, *Carlson & Beauloye Chromium Source Test, Project Number T-02-003*, February, 2002, and at the following ARB web site: http://www.arb.ca.gov/testmeth/vol3/M_425.pdf.

2. 40 CFR, Part 58, Appendices A and E.

Appendix A-1

Analytical Results from December 2001 Sampling

Barrio Logan Hexavalent Chromium Air Sampling Results[1]
December 2001

Date	2121 Newton	2144 Newton	2152 Newton	Alley	Mercado Apts.	Vacant Lot (primary)	Vacant Lot (collocated)
12/03/01	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	Inv.
12/04/01	0.2	<0.2	<0.2	0.5	<0.2	<0.2	<0.2
12/05/01	1.9	<0.2	0.3	0.6	Inv.	<0.2	<0.2
12/06/01	3.8	0.2	0.2	0.3	<0.2	<0.2	<0.2
12/07/01	9.3	7.9	4.8	1.3	0.3	3.6	3.2
12/08/01	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	Inv.
12/10/01	<0.2	0.8	1.5	<0.2	<0.2	<0.2	<0.2
12/11/01	<0.2	Inv.	<0.2	4.0	0.3	<0.2	<0.2
12/12/01	0.2	<0.2	<0.2	6.9	1.0	<0.2	<0.2
12/13/01	2.4	<0.2	<0.2	22.0	0.5	<0.2	<0.2
12/14/01	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
12/15/01	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
12/17/01	0.3	0.4	0.5	<0.2	<0.2	<0.2	<0.2

[1] All values in ng/m3. LoD = 0.2 ng/m3

Appendix B Standard Operating Procedures

Appendix B.1

PQ100 Air Sampler Instruction Manual,
PM_{10} Reference Sampler,
BGI, Inc.

PQ100
Air Sampler

INSTRUCTION MANUAL

PM_{10} REFERENCE SAMPLER

DESIGNATION NO. RFPS-1298-124

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Manual Version: 6.1

January 2000

PREFACE

The purpose of this manual is to provide complete operational, calibration and maintenance details for the BGI PQ100 air sampler. This instrument has been specifically designed to meet or exceed the operational requirements of a Reference Method sampling device under 40 CFR Part 50, Appendix J ("Reference Method For The Determination of Particulate Matter as PM-10 in the Atmosphere") and was designated a Federal Reference Method Sampler Number RFPS-1298-124 in December 1998.

SAFETY

The PQ100 should only be operated as described and for its intended use. Because the PQ100 runs primarily from battery power, all of the typical hazards associated with high voltages and internal A.C. wiring have been reduced or eliminated. Personal injury, damage to the instrument, or fire can occur if the following electrical precautions are not observed:

- Caution should always be given when attaching the A.C. mains power connection. Do not attempt to connect main power if the plug or wire are cracked or frayed.
- Do not attempt to connect main power if the power cord, leads, or outlet are wet. Do not immerse power cords in water or other liquids.
- Place power cords away from traffic and do not allow anything to rest on them during operation.
- Do not overload AC outlets.
- Do not attach improperly wired external batteries, solar panels or power sources.
- Do not open the control panel or handle any other of the electrical parts while power is applied to the PQ100. Always disconnect the power supply first.

In addition, personal injury or damage to the instrument could occur if the following precautions are not observed:

- Always operate the PQ100 in a normal, upright position. The legs should be bolted down to prevent tipping in conditions of high winds.
- Do not operate the PQ100 if any of the parts are defective, damaged, or missing.

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1.0 INTRODUCTION

The BGI PQ100 is an "Intelligent Air Pump" that can monitor it's own airflow rate and thereby adjust the pump speed to compensate for changes in load pressure and/or other forces which would otherwise hamper the flow of air through a filter (or sample collector). The PQ100 can be programmed to begin it's sampling job at a specific date and time and stop sampling after the user defined run time is depleted. A 24 character by 2 line Liquid Crystal Display provides the operator with a readout of flow rate, and other useful information.

Events such as the flow being restricted by blocking the inlet, batteries depleted (power failure), pump unable to regulate flow (excess resistance), etc. all force the pump into a shutdown mode which consumes no battery power until the problem causing the shutdown is corrected.

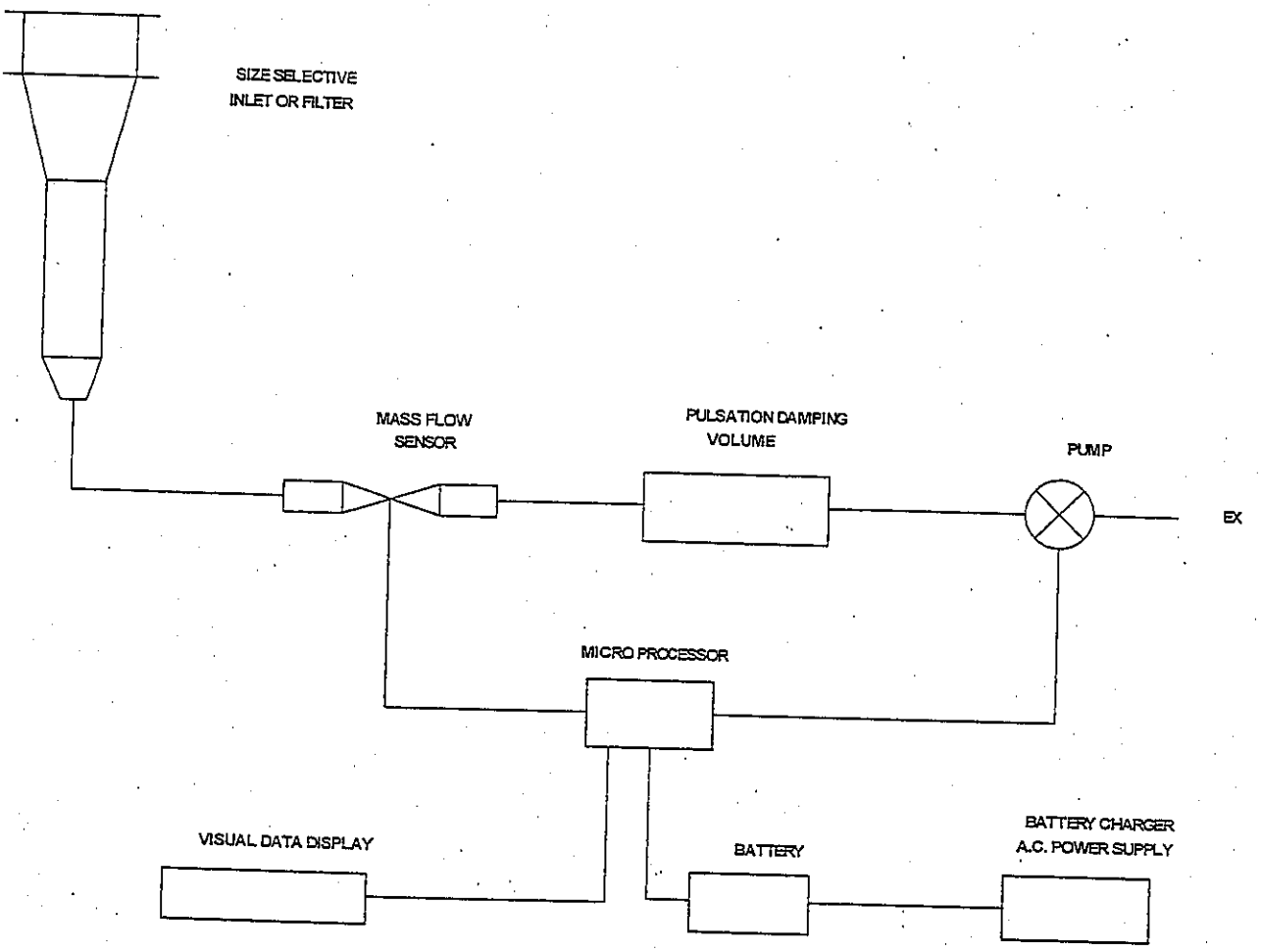
The PQ100 was designed to operate from 1 standard liter per minute (1000 cc per minute) to 25.0 standard liters per minute and is unaffected by changes in ambient temperature and barometric pressure. The flow rate precision is guaranteed 2% of the calibration set point. Standard conditions, for some forms of air sampling, being 20°C, 760 mm of Mercury barometric pressure.

Certain default values in this instrument have been selected to reflect EPA style air sampling procedures. The default "Run Time" is 24 hours. The default "Start Date and Time" is midnight tomorrow.

Principle of Operation

The operating principle of the PQ100 can be appreciated by referring to the block diagram below. Air is drawn by the pump through a size selective inlet device and/or filter. It then passes inside the instrument housing to a Mass Flow Sensor. The signal generated by the sensor is then routed to a microprocessor which determines if the flow is at the set value and adjusts the pump speed to maintain the correct flow rate. Because the flow sensor is extremely sensitive and all pumps produce pulsation to some degree, a pulsation damping volume has been introduced to control this effect. The microprocessor not only controls the flow rate accurately and precisely to the set point but also performs several other functions. These include turning the instrument on at a preselected time and running it for a selected interval. The flow is maintained by the processor to a designated pressure and temperature value. A pulse width modulated signal is configured and sent to the pump motor in a constantly updated manner based on signal information received from the Mass Flow Sensor. The microprocessor also stores all parametric information generated during the run period and configures it for presentation on the visual display and downloading to the software provided with the instrument.

The system is completed by it's 12 volt battery and external battery charger/A.C. power supply. The power supply function permits operation if desired with no battery whatsoever.



Schematic Diagram of PQ100 System

2.0 GETTING STARTED CHECKLIST

2.1 Included with the PQ100

1. PQ100 Main Unit
2. PQ101 Battery Charger
3. CQ1 Charger/Battery Cable
4. CQ2 PC Communication Adapter Cable
5. PC Software Diskettes - 3 ½",720K
6. PQMAN Manual
7. PQ102 Hose Adapter

2.2 Optional Accessories Available (See Section 5)

1. PQ103 External Battery
2. CQ3 External Battery Adapter Cable
3. BGI16.7 Size Selective Inlet (SSI) Kit
4. TP100 Dicot Inlet Tripod Assembly
5. F20 47mm Filter Holder for BGI16.7
6. F21 Filter Cassette (for use with F20 above)
7. CQ5 Auto Lighter Plug Adapter Cable
8. TSP CAP Total Suspended Particulate Inlet

2.3 User Supplied Items

1. A Bubble Meter/Calibrator.
   Note: Dry Calibrators and Rotameters are not recommended!
2. A length of rubber hose (about a half meter).
3. A Pinch Clamp or Valve (helpful but not required).
4. Ambient Temperature and Local Barometric Pressure Readings.
5. A Magnehelic Pressure Gauge (helpful but not required).
6. Filter Holder (F20) with Filter Cassettes (F21) to collect sample (also protects the PQ100 from damage).

Note: Permanent damage can occur if the PQ100 is operated without a filter in series with the Inlet. If the unit is operated without a SSI head with filter and holder, a suitable filter must be used to prevent damage to the pump and sensors.

3.0 HOW TO USE THE PQ100 IMMEDIATELY

3.1 What the Buttons do

"ON/OFF"	Turns the PQ100 On or Off.
"RESET"	Press after a sampling job to clear all the counters in preparation for the next sampling job.
"RUN/STOP"	Use when the PQ100 has been reset and programmed for another run and you now wish to start the pump.
"+"	Increase
"-"	Decrease
"SETUP"	Traveling from screen to screen and entering the information set on the screen.
"ENTER"	Accepts new setting within the screen.

3.2 Running the PQ100 at 16.7 Liters per Minute

1. Turn the PQ-100 on (Push the "ON/OFF" button). If a message is blinking on the display, press "ENTER" to proceed to the "MAIN IDLE DISPLAY".

2. Before you change any setups and to delete the last run push the "RESET" button. Screen display should be:

   ET0000Min TS00.00M (Date)
   Q(Flow)Lpm T(Time) Bty(Capacity)%

   (Date) - today's date in military type notation; e.g., 01JAN= January 1st
   (Flow) - the current flow rate selected to be regulated.
   (Time) - military time; e.g., 13:08= 13 Hours 8 Minutes or 1:08 PM
   (Capacity) - remaining charge in the internal battery.

3. Press "SETUP"
Screen reads; "Select FLOW RATE"

To change TARGET FLOW RATE;

* Press ENTER (Whole number value will remain on constant while the tenths still blink); use "+" or "-" to increase or decrease until 16 is displayed.
* Press ENTER (Tenths value will now remain constant while whole number blinks); use "+" or "-" to increase or decrease until .7 is displayed.

Note: If the flow rate displayed is followed by Lpm then the selected flow rate is calibrated and recalibration is not required. If CAL is displayed then calibration should be performed as described in section 7.0.

4. Press "SETUP"
Screen reads; "Set DATE and TIME"

To change the Date and Time;

a. DAY: Press ENTER and change by pressing the + or - key. When the day is correct, press ENTER.
b. MONTH: To change, press + or - key. When correct, press ENTER.
c. YEAR: To change, press + or - key. When correct, press ENTER.
d. TIME (hrs): To change, press + or - key. When correct, press ENTER.
e. TIME (min): To change, press + or - key. When correct, press ENTER.

5. Press "SETUP"
Screen reads; "Set START DATE and TIME"

This determines when you wish to start a sample job. It always defaults to midnight the next day. Should you wish to change it;

a. DAY: Press ENTER and change by pressing the + or - key.

6. Press "SETUP"
Screen reads; "Set RUN TIME"

This is for when you wish to set the length of time that the pump will run for. (Other than for 24 hrs). It always defaults to 24 hrs 0 min. To change;

a. HOURS: Press ENTER and change by pressing the + or - key. When the hours are correct, press ENTER.

b. MINUTES: To change, press + or - key. When correct, press ENTER.

c. (enable): This is to turn this function On or Off. If "On" then the pump will run for the amount of time specified and then power itself off. SET THIS FUNCTION TO "OFF" IF YOU WISH TO RUN UNTIL THE BATTERIES RUN DOWN. Change by pressing + or - key. When correct, press ENTER. FOR THE PURPOSE OF THIS TUTORIAL, SET TO "OFF".

7. Press "SETUP"
Screen returns to the "MAIN IDLE DISPLAY"

DO NOT PRESS THE RESET BUTTON AT THIS TIME AS THE START TIME AND RUN TIME WILL DEFAULT.

8. Press "RUN/STOP"
If the START TIME ENABLE is set to "OFF" then the pump will begin to run immediately and will run until one of the shutdown causes (explained in APPENDIX E) force the unit to terminate the sample job. During the initial time that the PQ100 requires to stabilize its flow rate, flow will be displayed as --.-Lpm. If the START TIME ENABLE is set to "ON" then the message "Alarm Triggered Run..." followed by "PQ100 Powering Down.." will appear briefly. The PQ100 is now waiting for the internal real time clock to achieve the designated start time and will then power itself on and begin the Air Sample Job.

3.3 Downloading (A Quick Start Overview)

1. Insert the "PQ" software diskette in the "A:" drive of your PC or notebook and type INSTALLC at the A:\> prompt. This will create a subdirectory on your hard drive called PQ and will copy all files from the floppy disk to this subdirectory. After the installation is complete, type PQ at the A:\> prompt to run the program (see section 8.0).

2. From the PQ MAIN MENU, select "b" to begin a job and answer the questions provided or simply press enter for each of the entries.

3. From the PQ MAIN MENU, select "I" to import (download) the data from the PQ100.

4. Connect the cable provided from your computer to the UTILITY ADAPTER port on the front of the PQ100. NOTE: THE PQ100 MUST BE AT THE "MAIN IDLE DISPLAY" FOR THE DOWNLOAD TO WORK.

5. When the download is complete you may then select "s" from the "PQ MAIN MENU" to view the file data.

4.0 SPECIFICATIONS

4.1 Flow Rate Precision, Accuracy and Pulsation

Flow Rate Selections: 1.0 to 25.0 Lpm in .1 Lpm increments

Flow Rate Accuracy: .5%
(When calibrated with an electronic Bubblemeter)

Flow Rate Precision: 2%

Pulsation for various applications as measured downstream from the filter:

Flow Rate	Media Type	Pulsation
16.7 Lpm	47mm Quartz	4.56%
10.0 Lpm	47mm Quartz	3.84%
10.0 Lpm	47mm Teflo	7.38%
7.0 Lpm	47mm Quartz	5.06%
5.0 Lpm	47mm Quartz	6.13%
4.0 Lpm	47mm Quartz	7.94%
2.2 Lpm	37mm MCE w/BGI-4 Cyclone	4.70%

4.2 Run Times for Various Applications

Flow Rate	Media Type	Pressure Drop	Run Time
25.0 Lpm	47mm Teflo	28.0cm H2O	11.6 Hours
25.0 Lpm	47mm Fiberglass	37.0cm H2O	7.4 Hours
16.7 Lpm	47mm Teflo	10.8cm H2O	33.6 Hours
16.7 Lpm	47mm Fiberglass	25.4cm H2O	32.4 Hours
16.7 Lpm	47mm Quartz	33.0cm H2O	28.4 Hours
14.0 Lpm	37mm MCE .8112.0cm H2O		13.0 Hours
12.0 Lpm	37mm MCE .894.0cm H2O		13.5 Hours
12.0 Lpm	25mm MCE .8170.0cm H2O		11.6 Hours
10.0 Lpm	37mm MCE .866.0cm H2O		19.8 Hours
2.2 Lpm	37mm w/BGI-4 Cyclone	5.0cm H20	67.0 Hours

4.3 Dimensions and Weights (PQ100 Main Unit Only)

Dimensions:

Height: 5.3" (13.46cm)
Width: 9.9" (25.15cm)
Depth: 9.7" (24.64cm)

Weight: 19 Lbs. (8.63Kg)

4.4 Electrical Specifications

Main Battery-	12V 12Ah Short Circuit Protected
Clock Battery-	3.6V Lithium Cell
Clock Battery Life-	2 Years
Motor Drive-	High Efficiency Pulse Width Modulator
Flow Rate Measurement-	Mass Flow Sensor
Serial Data Signals:	
	Outputs- 9V Nom.
	Inputs- 30V Max.

Charging System;

Mains-	120VAC or 240VAC Switch Selected
	50 or 60 Hz
Max Load-	4 Batteries or equivalents

Note: As the PQ100 can run from the Charger, a running, discharged PQ100 counts as 2 battery loads. This charger can charge 3 units and simultaneously, run one of the units (which totals 4 battery loads).

4.5 Hardware Requirements for PQ Software

IBM XT, AT or 100% Compatible Clone
MS-DOS Operating System version 2.1 or greater
Minimum one 3.5, 5.25, Low or High Density Floppy Drive
COM1 or COM2 RS232 Serial Port for Downloading
(Not required for Correction Calculator)
Any Video Adapter Configuration
Hard Disk is preferred but not required

For Printouts: All printouts are directed to LPT1 as generic ASCII text with no special printer functions. This means that redirection can be accomplished using the MS-DOS function "MODE" and that any printer will work.

4.6 Dimensions, Weights and Flow Specifications for SSI

BGI16.7 Inlet Kit (Including Tripod Assembly)

Flow Rate:	16.7 Lpm 5%
Weight:	16 Lbs. (7.3Kg)
Inlet Overall Diameter:	11" (27.94cm)
Inlet Height:	16" (40.64cm)
Tripod Diameter Footprint:	68" (1.73M)
Tripod/Inlet Overall Height:	76" (1.93M)

5.0 ACCESSORIES

5.1 Cables

CQ1 Charger/ Battery Cable	Connects the PQ100 to the charger or an external battery
CQ2 PC Communication Adapter Cable	Connects the PQ100 to a computer for downloading
CQ3 External Battery Adapter Cable	Connects an external battery to the charger
CQ5 Auto Lighter Plug Adapter Cable	Use to partial charge the PQ100 or to run from an automobile electrical system
CQ6 External High Capacity Battery Cable	Use to connect the PQ100 to a large external battery, typically 80 Amp Hour for greater than 48 hour run time

5.2 Inlets, Adapters and Filter Holders

PQ102 Hose Adapter	For attachment of a rubber hose to the PQ100.
BGI16.7 Inlet Kit	PM10 Size Selective Inlet for separation and collection of particles with an aerodynamic equivalent of 10 micrometers or less.
F20 47mm Filter Holder for BGI16.7	Inserts into Dicot Inlet and holds Filter Media, also used as TSP Inlet when used with TSP CAP.
F21 Filter Cassette (for use with F20 above)	Plastic Cassette containing a screen and filter media
TSP CAP 100 Micrometer Inlet	(for use with F20 above)

5.3 Batteries and Chargers

PQ101 Battery Charger Auxiliary Power Supply	Used to Recharge system batteries and to power the PQ100 for long run times when AC Power is available.
PQ103 External Battery	Used for doubling run times.

5.4 Miscellaneous

TP100 Inlet Tripod Assembly	Supports Dicot Inlet at EPA recommended height

6.0 OPERATION DETAILS

6.1 Basic Operation

To operate the PQ100 Air Sampler, press the Power "On/Off" pushbutton keyswitch. The unit will beep a few times and display;

BGI PQ100 Air Sampler

and briefly, the unit serial number and firmware revision;

SN:1234 Version 3.51

and then;

Initializing!

During the power-up sequence if it has been determined that the unit had previously shutdown due to one of the shutdown conditions, i.e. "Flow Rate Error", "Low Batteries", "Sample Run Completed" etc. the unit will then flash one of these messages at the display and requires that the user press the "Enter" key to continue on to the MAIN IDLE DISPLAY (See APPENDIX E for a description of all shutdown codes). If the unit was powered down normally, i.e. the power "On/Off" key was previously pressed while at the MAIN IDLE DISPLAY, then it will jump from the above initialization messages directly to the MAIN IDLE DISPLAY and will not display a flashing error message.

6.2 Main Idle Display

ET0000Min TS00.00M 28oct (or similar)
Q10.0 Lpm T01:00 Bty99%

Where;

ET	is the Elapsed Time of the previous run in minutes.
TS	is the Total Sample of the previous run in cubic meters.
Q	is the selected TARGET flow rate in liters per minute.
Bty	is the percentage of charge stored in the battery.
T	is Time (24:00 hour system)
28oct	is Day Month (year is displayed only on Setup and download).

For power conservation purposes, the PQ100 is equipped with an algorithm which detects inactivity. If the front panel pushbutton switches or the RS232 port are not used within 3 minutes the unit will power itself off.

6.3 What to Do Next

Pressing the "Setup" key steps through the various Menu Selections. Each of the selections are explained in detail, in the order they will be encountered, on the following pages.

6.4 Setting a New Target Flow Rate

From the "MAIN IDLE DISPLAY" press the "Setup" key once until the message below appears;

Select FLOW RATE
Target Q... xx.yLpm

where;

xx = Liters per minute
y = tenths of a Liter per minute

The target flow rate is that which the PQ100 will draw air through the inlet at when a run is initiated.

If the displayed flow rate is acceptable and you do not wish to change it, press the "Setup" key. This action will change nothing and will step the menu to the next selection. If a change is required, press the "Enter" key. You will notice that the whole number value (the value preceding the decimal point) will then remain on while the tenths value continues to flash. The value that remains on is the one that will change when the "+/-" keys are pressed. When the proper value has been reached, pressing the "Enter" key will then select the tenths value (the digit after the decimal point) for editing. After the values have been entered, pressing the "Setup" key will then store the new values in memory and step to the next menu selection.

6.5 Setting the Date and Time

From the "MAIN IDLE DISPLAY" press the "Setup" key twice until the message below appears;

Set DATE and TIME
dd mmm yyyy hh:mm

where;

dd = day of the month
mmm = month
yyyy = year
hh = hour (0-24, 24 hour system) mm = minutes (0-59)

The date and time are read from the real time clock just prior to entering this screen. This action copies the precise date and time data at that instant to temporary memory locations. Once the values have been established in these temporary locations they are then modifiable by the user and will then be flashing on the display.

If all is correct pressing the "Setup" key will change nothing and will step the menu to the next selection. If a change is required, press the "Enter" key. You will notice that the day will then remain on while the rest of the values continue flashing. The value that remains on is the one that will change when the "+/-" keys are pressed. When the proper value has been reached, pressing the "Enter" key will then select the next value for editing. After all the values have been entered, pressing the "Setup" key will then write the new values to the real time clock and step to the next menu selection.

Notes:

1. Seconds will always default to zero. Therefore, if you wish to synchronize the clock exactly, press the "Setup" key at zero seconds.
2. Once the Set Time menu selection is entered, the clock is not read again during this screen. Don't expect the date or time to change while this menu selection is engaged. However, the clock is not halted, and is still keeping time. If the "Enter" key is never pressed while this menu selection is being displayed no changes are made to the date or time even though the time does not appear to change.
3. Century will only change on 12/31/1999 at midnight. Century will then become 2000.

6.6 Setting the Start Date and Time

From the "MAIN IDLE DISPLAY" press the "Setup" key three times until the message below appears;

Set START DATE and TIME
dd mmm hh:mm eee

Where;

dd = day of the month
mmm = month
hh = hour (0-24, 24 hour system) mm = minutes (0-59)
eee = enable "On" or "Off"

Note: If "On" is enabled see the next section for further description of run procedure.

This sets the date and time that the sampler will begin running the pump. If all is acceptable pressing the "Setup" key will change nothing and will step the menu to the next selection. If a change is required, press the "Enter" key. You will notice that the day will then remain on while the rest of the values continue flashing. The value that remains on is the one that will change when the "+/-" keys are pressed. When the proper value has been reached, pressing the "Enter" key will then select the next value for editing. After all the values have been entered, pressing the "Setup" key will then write the new values to the real time clock alarm registers and step to the next menu selection. This function can be disabled. This means that if the Enable (eee) is set to "Off", the PQ100 will begin to run the pump immediately when the "Run/Stop" key is pressed from the "MAIN IDLE DISPLAY" regardless of the start time and date.

IF YOU SIMPLY WANT THE PUMP TO START RUNNING WHEN YOU PRESS THE "RUN/STOP" KEY, THE LOWER RIGHT OF THE DISPLAY SHOULD INDICATE OFF.

Note: When the reset key is pressed to clear the counters this setup will automatically default to Midnight (00:00) of the next day. If some other Date and Time are required you must reset the run first before using this menu selection (See Resetting the Counters).

RESET DOES NOT AFFECT THE ENABLE AND WILL REMAIN UNCHANGED!

6.7 Setting the Run Time

From the "MAIN IDLE DISPLAY" press the "Setup" key four times until the message below appears;

Set RUN TIME
Hours:hh Min:mm eee

Where;

hh = hour (0-99 hours)
mm = minutes (0-59)
eee = enable "On" or "Off"

This sets the length of time that the sampler will run the pump for. If the setting is acceptable, pressing the "Setup" key will change nothing and will step the menu to the next selection. If a change is required, press the "Enter" key. You will notice that the hours will then remain on while the other values continue flashing. The NON-FLASHING value will now change when the "+/-" keys are pressed. When the proper value has been achieved, pressing the "Enter" key will then select the next value for editing. After all the values have been entered, pressing the "Setup" key will then store the new values and step to the "MAIN IDLE DISPLAY".

This function can be disabled thereby allowing the pump to run until some other shutdown such as Low Batteries etc. if the Enable (eee) is off.

IF YOU SIMPLY WANT THE PUMP TO RUN UNTIL SOME OTHER CONDITION SUCH AS BATTERIES TOO LOW CAUSES A SHUTDOWN, THE LOWER RIGHT OF THE DISPLAY SHOULD INDICATE OFF.

Note: When the reset key is pressed to clear the counters this setup will automatically default to 24 Hours. If some other Run Time is required you must reset the run first before using this Mode (See Resetting the Counters).

RESET DOES NOT AFFECT THE ENABLE AND WILL REMAIN UNCHANGED!

Note: If START TIME was enabled, after RUN TIME screen, the unit will not step the screen to the "MAIN IDLE DISPLAY". Instead, the next screen that appears will state;

To initiate a run,
Press Run/Stop

At this time pressing "Run/Stop" will power the unit off and sampling will commence at the programmed run time. If you simply wish to go to the main idle screen (bypass this function) press "Setup". This will return you to the "MAIN IDLE DISPLAY". At this point you can also press "Run/Stop" to initiate the run.

6.8 Running the Pump

6.8.1 Start Time Disabled

To initiate a run, from the "MAIN IDLE DISPLAY", press the "Run/Stop" key. If the START ALARM is disabled (See setting the Start Time and Date) the pump will immediately begin running and the "Q" in the display window will start to flash. This indicates normal operation and the pump will run at the specified Flow Rate until a stop condition is encountered (i.e. Batteries depleted, excess Flow Restriction etc.). If "CAL" is displayed after the Flow Rate in the lower left corner of the display, this target is not calibrated and therefore the Flow Rate indicated is a coarse approximation and is somewhere 10% of that displayed. Use the Calibration Mode to set this to 2%.

During the initial time that the PQ100 requires to stabilize its flow rate, flow will be displayed as --.-Lpm.

6.8.2 Start Time Enabled

To initiate a run, from the "MAIN IDLE DISPLAY", press the "Run/Stop" key. If the Alarm values are correctly set and Enabled, the PQ100 will power itself off (or GO TO SLEEP) until the start date and time have been reached. When the Alarm triggers the PQ100 to "Wake-Up", after the Initialization and diagnostics, the pump will begin to run until a shutdown condition occurs.

6.8.3 Run Time

If the RUN TIME is Enabled ("On"), the pump will run until this shutdown condition occurs. Successful completion is indicated by the following message flashing on the screen when the unit is powered on;

SAMPLE RUN COMPLETED!
Key "Enter" to Continue!

6.8.4 Acoustic Phenomena at High Negative Pressure

When running the PQ100 at very high load pressures (i.e. 150 centimeters of water or better), a metal popping sound may be heard by the user. This is merely the internal pulsation dampner (Plenum) adjusting its chamber area. The PQ100 will alert you as to the nature of any problems via the shutdown messages as described in APPENDIX E.

6.9 Verifying the Flow Rate

To verify the Flow Rate while the Pump is running, a Bubble Meter is highly recommended for Calibration and Verification of the true Actual Flow Rate. Use section 8.7; Appendix A, Equation 2; or the "CORRECT" utility provided on floppy diskette to calculate the corrected flow rate as shown on the Calibration/Verification Standard.

THERMODYNAMIC EQUILIBRIUM MUST BE CONSIDERED WHEN TAKING SAMPLE READINGS. IN THE CASE OF THE BUBBLE METER IN THE 10-20 Lpm RANGE, TAKE 15 READINGS AND IGNORE THEM. THEN, TAKE 10 READINGS AND AVERAGE.

If the flow rate is not within 2% of the "Corrected Flow Rate" a leak in the system is the probable cause and should be inspected.

6.10 Resetting the Run

When a Run has been completed, and all the information from it either recorded or downloaded via the Communications Software, the "Reset" key can be pressed to clear all of the "Run-Time Variables". This action causes the "Elapsed Time" (ET) and the "Total Sample" (TS) to Clear (all zero's) and also causes the Start Time Alarm Clock to default to the next occurrence of Midnight (00:00) and the Run Time to 24 Hours. The Reset Function does not affect the Enables for the Start Time or Run Time. Also, all "Flow Calibrations" remain in memory.

NOTE: IF YOU SIMPLY WISH TO START A NEW RUN WITH NO CHANGES (DEFAULT START TIME, RUN TIME, AND CALIBRATION VALUES ARE ALL ACCEPTABLE) THEN THE ONLY ACTIONS NECESSARY AFTER RECORDING OR DOWNLOADING THE PREVIOUS RUN DATA IS TO PRESS THE "RESET" KEY (CLEARS ALL COUNTERS AND DEFAULTS THE RUN TIME AND START TIME) AND PRESS "RUN/STOP" FROM THE "MAIN IDLE DISPLAY". THIS WILL CAUSE THE PQ100 TO BEGIN A SAMPLING JOB IDENTICAL TO THE PREVIOUS JOB.

7.0 CALIBRATION

7.1 Entering and Using Calibration Mode

From the "MAIN IDLE DISPLAY" press the "Setup" key once until the message below appears;

Select FLOW RATE
Target Q... xx.yLpm

(See Section 6.4 to select a new target Flow Rate.)

From the "Select FLOW RATE" message screen you must press both the "Reset" key and the "Run/Stop" key simultaneously to enter the calibration mode and the message below will appear;

CALIBRATE Target=qq.qLpm

where;

qq.q = Target Flow Rate to be Calibrated

CAUTION: BE CAREFUL WHEN USING CALIBRATION MODE. IT IS NOT USED TO CHECK CALIBRATION FLOW RATE. INCORRECT USE CAN ERASE A PREVIOUSLY STORED CALIBRATION. IF YOU SIMPLY WISH TO CHECK THE FLOW RATE ACCURACY FOR THE SELECTED TARGET, GO TO THE MAIN IDLE DISPLAY AND PRESS "RUN/STOP". BE CERTAIN THAT THE START DATE ENABLE IS SET TO "OFF" (SECTION 6.9).

This mode is used to Calibrate the PQ100 at a target flow rate. It should be noted here that each individual target has it's own independent calibration storage area and is non-volatile. That means that each and every flow rate from 1.0 LPM to 25.0 LPM can have its own discrete tolerances without approximation and will remain programmed in the instrument even in the event of total battery discharge. Pump speed values are also stored with the calibration data.

Assuming that a typical filter for a target was in place at the time of the calibration, the filter load is compensated for causing the pump to initialize to the proper speed. Once a target has been calibrated it should never have to be re-calibrated unless extreme conditions are expected.

To use this mode, Press the "Run/Stop" key to turn on the pump (pump will start to draw at somewhere in the range of the target flowrate depending on the resistance presented by the filter and calibrating device) and the following message will appear;

Reference Q.. rr.r

Where;

rr.r is an approximate flow rate used only as a visual aid in finding the corrected flow on the calibration device. This value may indicate 5 to 15% error. Don't be concerned! This is for reference only!

Use the "+/-" keys to move the pump speed up or down until the calibration device indicates the "Corrected Flow Rate" value as determined by the Calibration Equations given on the following pages.

HOLDING DOWN THE "RESET" KEY WHILE PRESSING THE "+" OR "-" KEY WILL ALLOW FOR COARSE ADJUSTMENT OF THE PUMP SPEED. WHEN THE PUMP SPEED WILL SEEM TO GO NO HIGHER OR LOWER, THE UPPER AND LOWER LIMITS HAVE BEEN REACHED.

When a good stable reading has been achieved, pressing the "Enter" key will store both the "Actual Sensed Flow Rate" and the pump speed data into the table of non- volatile calibrations where they will remain as "Constants" until a change is required (Only under "Extreme Ambient Conditions" as it should be impervious to moderate changes) and will then exit the Setup menu and return to the "MAIN IDLE DISPLAY".

CALIBRATIONS ARE NOT AFFECTED UNTIL THE ENTER KEY IS PRESSED AND THE PUMP IS RUNNING.

7.2 Using a Bubble Meter

When using the Bubble Meter to read the Flow Rate of the PQ100, thermodynamic equilibrium must be considered before accepting the indicated Flow Rate. If the Bubble meter is left standing for a long period of time, a cooling effect caused by evaporation will cause the meter to read incorrectly for the first 10-15 samples.

AT LEAST 15 READINGS ON THE BUBBLE METER SHOULD BE TAKEN AND IGNORED BEFORE TAKING 10 READINGS AND AVERAGING THEM FOR THE CALIBRATION.

7.3 Using a Rotameter

Calibrating the PQ100 Air Sampler with a Rotameter is to be avoided for two reasons. The PQ100 is more accurate (.5% of the expected flow rate) than the typical rotameter (within 3% of Full Scale). Secondly, the rotameter, unlike the bubble meter, has a reference condition calibration and requires a correction for ambient conditions.

The procedure for using a rotameter is best illustrated by example.

Example 4:
Referring to the conditions cited in example 1 (Appendix A), the required set point is 9.74 Lpm. If a rotameter is used, they are typically calibrated at 760 millimeters of Mercury and 70 degrees Fahrenheit (21.11 degrees Celsius or 294.29 degrees Kelvin). The room conditions in Example 1 were 19 degrees Celsius and 765 millimeters of Mercury. The equation for the rotameter correction is;

$$QI = QT \left(\frac{PT}{PI} \times \frac{TI}{TT} \right)^{1/2} \quad \text{Equation \#4}$$

$$QI = 9.74 \left(\frac{760}{765} \times \frac{292.18}{294.93} \right)^{1/2} = 9.66 \text{ Lpm}$$

where;

QT is the Rotameter Calibration Condition flow rate in Liters per minute (Lpm)

QI is the calibrator reading (Lpm) at a given Time, Temperature and Barometric Pressure

PT is the Rotameter Calibration Condition Barometric Pressure (760) in millimeters of mercury (mm of Hg)

PI is the Indicated Barometric Pressure reading (mm of Hg.) at the time of the calibrator flow reading

TT is the Rotameter Calibration Condition Temperature (21.11) in degrees Celsius.

TI is the Indicated Temperature reading (degrees Celsius) at the time of the calibrator flow reading.

However, a 3% accurate rotameter, suitable for reading 10 Lpm, usually reads 2 to 20 Lpm. That means 9.66 Lpm could actually vary from 9.06 to 10.26 Lpm! Therefore, if a rotameter must be used with the PQ100, the corrections are pointless and a straight 10 Lpm read from the rotameter should be utilized. The accuracy of the PQ100 is now degraded to 5%.

7.4 Calibration Notes

1. After a Calibration has been entered, it should be "Run" 15 minutes or so for verification. If the measured flow appears to be offset, determine the amount of offset and jot this number down. Next, Re-enter the Calibration mode and this time, set the calibration high or low depending on the observed offset.

2. If the "Run/Stop" key is pressed to stop the pump for any reason during calibration, the Target location becomes Un-Calibrated. If the "Setup" key is then pressed to exit, the location remains Un-Calibrated.

   THE ONLY WAY TO "ACCEPT" THE VALUE IS TO PRESS THE "ENTER" KEY WHILE THE PUMP IS RUNNING.

3. EACH TARGET FLOW RATE THAT IS TO BE USED SHOULD BE CALIBRATED WITH A FILTER WHOSE PRESSURE DROP IS SIMILAR TO THE TYPE ACTUALLY INTENDED FOR USE.

Failure to follow this procedure will result in an extended time period for the Flow Control System to Equilibrate (1-3 min.)

8.0 INSTALLATION AND USE OF THE PC SOFTWARE

8.1 Supported Hardware

Any IBM PC or compatible running MS-DOS 2.1 or higher with 1 floppy drive and at least 512K of memory. Any video adapter, Color or Monochrome, may be used. A hard drive is useful but not required. One serial communication port must also be available if you intend to use the communication software but is not required for the correction calculator program. For printouts, any printer attached to or redirected from LPT1 will work. All data sent to print are ASCII characters with no special printer functions called out.

8.2 Installation on a Hard Disk System

To install the software onto your C drive (typical installation), insert the supplied floppy disk into drive A of your PC, select drive A and run the "INSTALLC.bat" batch program. The installation utility will then create a subdirectory called "PQ" on the C drive and copy all files to it. Those wishing to install to another Drive such as D, E or F can use the "INSTALL.bat" batch program and specify the drive you want to install on as an argument, e.g., "INSTALL D:".

8.3 Advanced Installation

For those users who wish to install to other directories from any other floppy drive, the only file supplied on the disk of real importance is "PQ.EXE". You may create any directory you wish and copy this file to it. All files managed by PQ.EXE are, by default, placed in the directory where PQ.EXE resides unless full path names are specified.

8.4 Floppy Based Systems (No Hard Drive)

The Executable program supplied "PQ.EXE" can be run directly from either floppy drive by simply invoking the program from the drive prompt.

A:\>PQ

8.5 Program Overview

PQ.exe is a menu driven program that utilizes the serial communication port of the PC to download sample data from the PQ Series of Air Sampling Systems and to provide Data logging, Concentration Equations, export to Database, and Chain of Custody applications. PQ allows the user to communicate with the PQ100 Air Sampler and downloads Run Data from the PQ100 to your PC. The data may then at a later time be appended with the

measured final filter weight, printed and stored for later use.

The Correction Calculator is also available from the PQ Main Menu and allows the user to determine corrections for calibration and verification of flow rate.

8.6 Running the Program

From the MS-DOS prompt (typically "C:\PQ>") type;

PQ [ENTER]

if COM1 is to be used or,

PQ -2 [ENTER]

if COM2.

where;

[ENTER] is the enter key on the PC Keyboard

The "PQ" Main Menu will then be displayed.

Note: "Ctrl-C" refers to the simultaneous depression of two keys at once on the computer console. To produce a "Ctrl-C", press and hold down the "Ctrl" key on the keyboard. While this key is held down press the "C" key. This action will most always halt the program and return you to the MS-DOS prompt.

8.7 Correct Utility

CORRECT is a utility that will perform the calculations outlined in the CALIBRATION EQUATIONS. From the PQ Main Menu press "c". The resulting screen will present a message that describes this utilities function. You must have the present local barometric pressure reading and the ambient temperature reading of the calibration area. To correct to Engineering Standards answer "y" to the first two questions presented by the utility (See Appendix A for other than Engineering Standard Conditions). Then enter the "Target Flow Rate" in liters per minute. The target flow rate is that which the PQ100 is set to operate at. Then enter your barometric pressure and temperature readings. The results from the correction equations will then be displayed. The Corrected Flow Rate value is that which must be observed on the calibration standard (Bubble Meter) for the given target flow rate. A Printout can then be obtained for reference.

8.8 Beginning a Sample Job

To initiate a run and manage the data generated by the PQ100, a file must be opened at the

beginning of a job to store site and other background data along with "Initial Filter Weight". Initial weight is used when the job is complete to determine delta weight (final weight, minus initial weight) and when combined with sample time is used to compute concentration.

From the PQ Main Menu press "b" to Begin a Job File for a Run. The resulting screen requires that you adopt a Job File naming convention.

a. Default method — By pressing enter at the prompt, a unique name will be given to the file based on today's date and run number.

b. Custom method — Type in anything you wish.

Once a file name has been entered, a number of other fields are presented such as Site Name, Station Code, Job Code, Operator, Filter Number, and Initial Filter Weight. You may press enter for each field which will leave it blank. The job file editor provides the means to enter the data later if you wish, however, it is recommended that the fields be filled when beginning the job to avoid confusion and to maintain chain of custody.

8.9 Downloading

When a sample job has been completed, the data pertaining to the run is stored in the PQ100 until it is reset by the user. Prior to resetting the PQ100 for its next run, the data should be downloaded using the PQ software to provide information such as run time, total sample accumulated, cause of the shutdown etc. All of this data is important in determining the particulate concentration and conditions during the prior run.

From the PQ Main Menu press "I" to import data from the PQ100. The resulting screen will prompt you for a file to append the download to. This should be the file that was begun in the previous step to insure file integrity. If you do not remember the name of the file, go back to the MAIN MENU and select "d" to view a directory of current files. If you try to select a file that was already appended with a download, the system will let you know. When the proper file has been selected you are ready to download.

THE RS-232 INTERFACE CABLE SHOULD NOW BE ATTACHED TO THE PQ100 AND TO THE PC "COM1" or "COM2" PORT. THE PQ100 MUST BE POWERED ON AND AT THE MAIN IDLE DISPLAY FOR THE DOWNLOAD TO WORK!

8.10 Adding the Final Filter Weight

Upon completion of the sample job, the final filter weight must be determined and this final weight entered in order to compute concentration. From the PQ Main Menu press "a" to Add the final filter weight. Again you are asked for the appropriate file name and again you must be careful to select the proper file. When the file is selected the resulting screen will show the initial weight, final weight, delta weight (difference) and standard concentration. All except for initial weight should display zero. When a final weight is entered, concentration is dynamically computed and displayed. This is to allow for re-entry of the final weight in case concentration computes unbelievable results indicating an error during entry. When the results are as expected press "n" for no new filter weight and the program will exit normally.

8.11 Data Displays

Showing the data on the screen is accomplished by pressing "s" at the MAIN MENU. You can alternately obtain a printout if a printer is attached to your computer. Simply press 'Y' when prompted with "Would you like a printout (y) or (n)?". If a printer is not attached pressing 'Y' will result in the DOS message;

"Write fault error writing device PRN" "Abort, Retry, Ignore, Fail?"

You must then press 'a' to abort and you will be sent back to the DOS prompt.

8.12 Managing Data Files

Job files can be easily erased when no longer required using the "e"rase function or can be "r"enamed to allow reuse of a particular Job File name while retaining the old data if required. All Job files from the PQ software have the extension ".run" and can be copied to floppy disk using standard MS-DOS functions for archive purposes.

8.13 Spreadsheet Support

Job Files can be exported to a coma delimited file called database.txt. This format is readable by most database programs allowing reports and graphs to be generated for presentation. This function is provided as a tool for users of database programs that are experienced enough with their database program to import from this type of file format.

From the PQ Main Menu press "x" to export the run data to a file. You will be prompted to enter a file name. After entering the file name you will be asked if this is a new database you are generating or appending an old one. If this is a new report that you are

generating based on a particular site etc. select "n"ew. If you want to add records to build a database, press "a"ppend.

This is used to combine a number of run files into a multi record database with each job file as a record. For a more detailed description of the use of this type of file refer to the users manual of your database program. If you do not already have a database program, Borland Paradox is recommended as it is the most user friendly and simplest to use.

9.0 A.C. POWER SUPPLY/CHARGER

The PQ100 should be Recharged before use to allow for the greatest available Run Time. Use the Charger/Battery cable to connect the PQ100 Utility adapter connector to any of the three receptacles on the front of the Power Supply/Charger and plug the unit into a source of 110-120 V.A.C. or set the selector switch on the rear of the unit to 220-240 V.A.C. if that is the type of power available. The Power Supply/Charger was designed to provide enough energy for up to four battery loads.

The PQ100, when powered on and is pumping air, counts as two battery loads as power is being provided to run the pump and charge the internal battery. Charging is activated only when AC power is actually applied to the charger. This allows the system to be used in a long run time application where the batteries are to be used for power loss protection. While the Charger is engaged the PQ100 will display [DCin] in the lower right corner of the display.

When the batteries have reached full charge (16 hours typically), the PQ100 will then display "Charged" in the lower right display.

THE PQ100 SHOULD ALWAYS BE CONNECTED TO THE CHARGER WHEN NOT IN USE! THIS WILL PROVIDE MAXIMUM RUN TIME WHENEVER NEEDED AND WILL NOT HARM THE INTERNAL BATTERIES.

10.0 MAINTENANCE AND SERVICE

10.1 Replacement Component List

The following is a list of components for replacement and/or servicing the PQ100 and may be ordered from the factory (Refer to drawing figures 1 thru 7 for identification by Item#);

Item#	Fig.	PN	Description
1	5	BGI16.7	Dicot Inlet
3	5	CT16.7	Coupler Tube - Old Model
4	5,4,7	B1424	Filter Holder Top
5	4,7	BUNA135	O-Rings
6	4,7	A1657	Cassette Top - New Model
7	4,7	F1/U	Screen
8	4,7	A1658	Cassette Bottom - New Model
9	5,4,7	B1425	Filter Holder Bottom
10	5	A1446	Holder Hose Adapter - Old Model
11	5,6	TP100	Tripod Assembly
11a	5,6	B1453	Leg Extensions - Old Model
69	5	P1001	Pull Pin
12	5	HS4	1 Meter of Rubber Hose - Old Model
13	5,6	CRPQ1	Cradle Assembly - Old Model
14	5,6,7	PQ100 Main Unit	
15	7	B1475	TSP Inlet
16	7	A1474	TSP Cover
17	7	SC0100	#10-32x3/8" Flat Head Screw
18	1	PQ103 Main Battery	
19a	1	SC0101	#6-32x1/4" Screw w/ washer
19b	1	WS0100	#6x.372 Flat Washer
20	1	B1412	Pulsation Dampner/Plenum
21	1	HS3	Hose
22	1	PQ101 Pump Assembly	
23	1	B1413	Chassis
24	3	SC0107	#4-40 x 1/4" Phillips Pan Head Screws
25a	1	SC0103	#4-40x1 ½" Pan Head Screws
25b	1	WS0101	#4x.372 Flat Washer
26	1	HS2	Hose
27	1	A1416	Sensor tube adapters

Item#	Fig.	PN	Description
28	1	Buna 113	O Rings
29	1	CB1	Clock Battery
30	1	MFS1	Mass Flow Sensor
31	1	HS1	Hose
32	1	PQFP	Front Panel Assembly
33	1	SC0104	#8-32x1/4" Flat Head Screws
71	1	BP001	Rubber Bumper
72	1	BATT.PCA	P.C. Ass'y, Battery
34	5	PQ102 Hose Adapter	
35	2	B1292	Valve Upper Plate
36	2	B1293	Valve Lower Plate
37	2	A1288	Diaphragm Retainer
38	2	A1281	Diaphragm
39	2	A1289	Diaphragm Retainer Bushing
40	2	B1283	Pump Housing
41	2	A1287	Follower Yoke
42	2	DDRI-6632	Bearing \ as assembly only
43	2	A1294	Eccentric /
44	2	SC0105	Set Screw
45	2	SC0106	#2.5x8mm CheeseHead Screw
46	2	A1290	Motor Mount
47	2	PQMOTOR	Motor
48	2	BUNA010	O-Rings
49	2	A1402	Locating Pins
50	2	B1408	Valves
51	3	SC4014	#4-40x1/2" Phillips Pan Head
52	3	Nt3006#4-40	Hex Nut w/ Captive Washer
53	3	SC2001	#4-40x3/8" Screw w/ Washer
54a	3	SC3014	#8-32 Phillips Pan Head
54b	3	LW4001	#8 Internal Tooth Lock Washer
55	3	SC3028	#10-32x1/2" Slotted
56	3	NT3027	7/16" Panel Nut
57	3	ICA001	Utility Connector/Cable Assembly
58	3	DSP001	Display Assembly
59	3	PQ100PC	P.C. Assembly
60	3	B1417	Front Panel
61	3	B1409	Graphic Faceplate
62	3	H9111B	Handle
63	3	A1419,A1420	Exhaust Port
64	3	A1418	Inlet Receptacle
65	3	CCC001	Cap and Chain

Item#	Fig.	PN	Description
66	3	A1483	Connector Gasket
67	3,5	BUNA116	O-Ring
86	2	SC1014	#8x1" Sheet Metal Screws
87	2	A1403	Inlet/Outlet Tube
88	2	SC1013	#8x1/2" Sheet Metal Screws
146	7	SC3030	#6-32 x 3/8" Philips pan head screw
147	7	DI 1010	10 micron inlet top
148	7	1709-L9	Spacer
149	7	1709-L8	Screen
150	7	DI1011	10 micron inlet sub top
151	7	DI1012	10 micron inlet body
152	7	Buna-036	O-ring
153	7	DI1013	10 micron inlet tube
154	7	SC3031	1/4 x 3/8 NPT adapter
155	7	SC3032	1/4 NPT nipple
156	7	JC3033	Jar top
157	7	SC3034	1/4 NPT plug
158	7	JR3035	Glass jar
159	7	Buna-026	O-ring
--	-	ICA002	Internal Battery Cable Assembly
--	-	ICA003	Flow Sensor Cable Assembly

10.2 Rebuilding the Pump after 5000 Hours

To determine "Pump Cumulative Time" you must use the PQ software to obtain a download from the PQ100 (See Section 8.9). Pump Cumulative time is the number of actual service hours of the dual diaphragm pump and is shown when either printing or screen viewing a download. When this time exceeds 5000 hours the pump should be rebuilt. The rebuild is a relatively easy task and requires the replacement of the diaphragms, valves, and bearing. A kit of parts is available from the factory (Order #PQ110) and includes instructions. Service can also be performed by the factory.

10.3 Replacement of the Mass Flow Sensor

As each mass flow sensor is unique and will present variations in operation, all stored calibrations are obsolete when the sensor is replaced. Each flow sensor replacement kit contains an 8 pin DIP Integrated Circuit (I.C.) that must be replaced (socketed) on the main printed circuit board. This will clear all calibrations and will require that a new set of calibrations must be entered for the new sensor.

11.0 OPERATIONAL THEORY

When first powered on, the micro controller runs through some initialization and diagnostic routines. When completed, data stored as "Run-Time information" is then read from the non-volatile (EEPROM) memory device. Amongst this data is a single byte flag called the "shutdown code". If this code indicates that the system was shutdown normally (i.e. power-off button was pressed) it will proceed to the "IDLE MODE" display screen which contains all the pertinent run-time information such as Elapsed Time, Total Sample, Battery condition, last known Flow Rate when halted etc. If the shutdown code indicates that some other event has caused the system to power down such as Flow Restricted, Excess Flow Resistance, Batteries Too Low, Sample run time Completed, an appropriate message will be displayed to the operator indicating the cause of the stoppage and requires operator intervention to proceed to the "IDLE MODE" display. From the "IDLE MODE" display the active keys are "Reset" (all run parameters to their default conditions), "Run/Stop"- runs the pump at the last selected flow rate and continues the previously setup run (if a start time was programmed then the pump will not begin to run until the start time has been achieved), and "Setup" allows for programming the user definable run parameters such as target Flow Rate, Start time, Run time, Date & Time, and also provides a calibration mode. If Run/Stop is pressed at this time the pump will begin to run and attempt to match the target, pre-programmed Flow Rate.

12.0 WARRANTY INFORMATION

BGI Incorporated warrants equipment of its manufacture and bearing its nameplate to be free from defects in workmanship and material. We make no warranty, express or implied, except as set forth herein. BGI's liability under this warranty extends for a period of one (1) year from the date of BGI's shipment. It is expressly limited to repairing or replacing at the factory during this period and at BGI's option, any device or part which shall within one year of delivery to the original purchaser, be returned to the factory, transportation prepaid and which on examination shall in fact be proved defective.

BGI assumes no liability for consequential damages of any kind. The purchaser, by acceptance of this equipment, shall assume all liability for consequences of its misuse by the purchaser, his employees or others. This warranty will be void if the equipment is not handled, installed, or operated in accordance with our instructions. If damage occurs during transportation to the purchaser, BGI must be notified immediately upon arrival of the equipment. Return transportation charges are collect.

A defective part in the meaning of this warranty shall not, when such part is capable of being repaired or replaced, constitute a reason for considering the complete equipment defective. Acknowledgment and approval must be received from BGI prior to returning parts or equipment for credit. BGI Incorporated makes engineering changes and improvements from time to time on instruments of its manufacture. We are under no obligation to retrofit these improvements and/or changes into instruments which have already been purchased.

No representative of ours has the authority to change or modify this warranty in any respect.

APPENDIX A. CALIBRATION EQUATIONS

Because the PQ100 uses a "Through Stream" mass flow sensor, the mass flow is not affected by pressure and temperature. However, the velocity (flow rate) through a fixed area nozzle will vary with atmospheric conditions. When work is carried out in an area with conditions other than Engineering Standard Conditions the "Corrected Flow Rate" is that which is measured on the calibration device for these new conditions.

The following equations are used to determine the "Corrected Flow Rate" that should be set on the PQ100 for atmospheric conditions other than "Engineering Standard Conditions" of 20 degrees Celsius (293.18 degrees Kelvin) and 760 millimeters of Mercury. They are provided for users who do not have access to an IBM PC or Compatible and can not use the "CORRECT" utility provided on the floppy disk.

These equations and recommendations have been prepared for Investigators with an advanced understanding of atmospheric sampling procedures. It is not our intention to justify every equation and procedure set down below to the uninitiated. For this reason, the "Correct" program supplied with the instrument is highly recommended.

To set up a calibration on the PQ100 to "Engineering Standard Conditions" the following applies;

$$QI = QS \left(\frac{PS}{PI} \times \frac{TI}{TS} \right) \quad \text{Equation \#1}$$

where;

QS is the Standard Condition (PQ100 Target) flow rate in Liters per minute (Lpm)

QI is the calibrator reading (Lpm) at a given Time, Temperature and Barometric Pressure

PS is the Standard Condition Barometric Pressure (760) in millimeters of mercury (mm of Hg) (Equal to 1013.25 HectoPascals)

PI is the Indicated Barometric Pressure reading (mm of Hg.) at the time of the calibrator flow reading

TS is the Standard Condition Temperature (20) in degrees Celsius

TI is the Indicated Temperature reading (degrees Celsius) at the time of the calibrator flow reading

Therefore, for Standard Conditions;

$$QI = QS \left(\frac{760}{PI} \times \frac{TI}{293.18} \right)$$

$$QI = 2.592 \; QS \left(\frac{TI}{PI} \right) \text{ Equation \#2}$$

Example 1:
The instrument is being set up to run at 10 Lpm at Standard Conditions with a bubble meter. The ambient conditions in the set up location are 19 degrees Celsius (292.18 degrees Kelvin) and 765 millimeters of Mercury.

Then;

$$QI = 2.592 \; 10.0 \left(\frac{292.18}{765} \right) = 9.899 \text{ Liters per minute}$$

Therefore, if you set a Target Flow of 10.0 Lpm on the PQ100 and 9.90 Lpm on the bubble meter, you will always be sampling at 10.0 Lpm to Standard Conditions regardless of changes in the weather (i.e. regardless of changes in air density). At a later date when you wish to check the calibration, Equation #2 still applies as in Example 2.

Example 2:
The instrument was set as detailed in Example 1. You are now out of doors at a sampling site. The conditions are TI = 27 degrees Celsius (300.18 degrees Kelvin) and PI = 750 millimeters of Mercury.

From Equation #2;

$$QI = 2.549 \; 10.0 \left(\frac{300.18}{750} \right) = 10.37 \text{ Liters per minute}$$

Therefore, if the PQ100 reads 10.00 Lpm and the bubble meter reads 10.37 Lpm the PQ100 is still in calibration and is sampling 10.0 Lpm at Standard Conditions.

On July 18, 1997, U.S. EPA changed the regulations for the operation of mass flow controlled instruments (e.g., the PQ100). Previously, EPA specified a set of "EPA Standard Conditions", which were 25 degrees C and 760 mm of Hg.

Now, mass flow controlled instruments are to be run in "volumetric mode". The details of EPA's recommended calibration procedure may be found in general form 40 CFR Part 50, Appendix M, 8.2.4 July 18, 1997. When applying these instructions to the PQ100, the following steps are suggested:

1. Place a clean filter of the type to be used for the sampling in the PQ100 filter holder.

2. Remove the PM10 inlet and connect a bubble meter to the filter holder. BGI adaptor (P/N L-30) is convenient for this purpose.

3. Enter the calibration mode and adjust the flow up or down until the bubble meter reads 16.67 LPM and lock the flow rate.

4. Record the barometric pressure and temperature at the time of calibration.

5. This procedure provides volumetric flow rate control as long as there are no shifts in temperature. EPA recommends the use of seasonal average values. In the case of the PQ100, this requires calibration for each season of intended use. Since it is not practical to be out of doors to perform the calibration, a facility has been provided in the calculation section of our software supplied with the PQ100.

6. In software, selection the correction calculator. Then select (C) "EPA volumetric or user defined conditions".

   For T insert average seasonal local temperature
   For P insert average seasonal local barometric pressure
   For sample target flow rate enter 16.67 lpm
   Enter Pstd at calibration location (local)
   Enter Tstd at calibration location (local)

   The program will return the flow rate which is to be observed on the bubble meter in order to be running in the field at 16.67 lpm.

EPA regulations require that you calibrate at 3 flow rates. The other two flow rates selected are generally in the range of 15 lpm and 18.4 lpm (± 10%). This procedure serves no particular purpose with the PQ100 which is microprocessor controlled. However, it is a statutory requirement and must be performed for concentration measurements to be compliant. An example of the calibration procedure is illustrative:

Tstd = 10°C, outdoor location, seasonal average
Pstd = 720 mm of Hg

Target flow rate = 16.67 lpm (desired volumetric flow at above conditions)
Tlab = 22°C (conditions in calibration location)
Plab = 760 mm of Hg

Corrected flow rate = 16.95 lpm (flow in calibration location)

In the event that a computer is unavailable, the above example may be calculated manually:

$$\text{Corrected Q} = \text{Qtarget} \left(\frac{\text{Plab}}{\text{Pstd}} \times \frac{\text{Tstd}}{\text{Tlab}} \right)$$

APPENDIX B. TROUBLESHOOTING

Problem: Pressing the "Run/Stop" key causes the unit to shutdown.
Answer: This indicates that the PQ100 is now powered off and ready to begin a sample run at the designated Start Date and Time. It means that the enable for the Start Date and Time is set to "On" (See Section 6.1). Be sure that the Start Date and Time are set correctly.

Problem: The Actual Flow Rate is not what is indicated in the Display.
Answer: Variations in Atmospheric Conditions (B.P. and Temp.) will cause slight variations in flow as displayed on the Calibration Device however the PQ100 will be displaying "True Flow Rate". If large variations exist, or if the variation is different from that of the calculated "Corrected Flow Rate" as described in the Calibration Equations Section of this manual then, the unit requires service.

Problem: I hear a popping metal sound as the PQ100 load pressure increases.
Answer: When running the PQ100 at very high load pressures (i.e. 150 centimeters of water or better), a strange metal popping sound may be heard by the user. Do not be concerned! This is merely the internal pulsation dampner (Plenum) adjusting its chamber area. The PQ100 will alert you as to the nature of any problems via the shutdown messages as described in APPENDIX E.

Problem: The flow rate does not seem to hold when additional pressure is added to the load (usually tested using a pinch clamp).
Answer: This is usually caused by a leak somewhere between the PQ100 Inlet and the calibration measuring device. Make sure that the hose adapter is firmly tightened in the PQ100 inlet, check the inlet mechanism and filter holder. You can usually isolate the suspect device by starting at the PQ100 inlet and working your way out.

APPENDIX C. SYSTEM BATTERIES

MAIN INTERNAL BATTERY

If the Internal Battery should ever require replacement, use ONLY the proper BGI Battery (PQ103).

EXTERNAL BATTERY PACK

The External Battery Pack is used to provide double the Run Time Capacity of the PQ100.

CAUTION: REVERSAL OF THE BATTERY LEADS CAN CAUSE IRREPARABLE DAMAGE TO THE PQ100.

CLOCK BATTERY

The Real Time Clock/Calender is backed-up by a Lithium Cell that will require changing once every 2 years. It also provides power to the Alarm Clock wake-up circuit. The PQ100 will let you know when this battery requires changing by providing a warning just prior to shutdown or when powered on and must be acknowledged by the user. You can temporarily ignore the warnings but a replacement should be acquired from the factory immediately. If the battery is allowed to get too low (ignoring the warnings) you may not be able to power off the PQ100 (It will keep waking up after a shutdown).

IF "REPLACE CLOCK BATTERY" MESSAGE IS ENCOUNTERED YOU MUST REPLACE THE CLOCK BATTERY IMMEDIATELY FOR CONTINUED OPERATION. IGNORING THIS MESSAGE MAY PRODUCE ERRATIC OPERATION.

APPENDIX D. MILITARY TIME CHART

The following chart is supplied for users who are unfamiliar with a 24 hour Military type time system.

00:00	12:00 Midnight
01:00	1:00 AM
02:00	2:00 AM
03:00	3:00 AM
04:00	4:00 AM
05:00	5:00 AM
06:00	6:00 AM
07:00	7:00 AM
08:00	8:00 AM
09:00	9:00 AM
10:00	10:00 AM
11:00	11:00 AM
12:00	12:00 Noon
13:00	1:00 PM
14:00	2:00 PM
15:00	3:00 PM
16:00	4:00 PM
17:00	5:00 PM
18:00	6:00 PM
19:00	7:00 PM
20:00	8:00 PM
21:00	9:00 PM
22:00	10:00 PM
23:00	11:00 PM

APPENDIX E. SHUTDOWN MESSAGES

The following is a description of the various messages that can be displayed by the PQ100 or the PQ Software to indicate the reason for sample job termination or current status of the PQ100;

00 Download not yet Appended! PQ Software

* Indicates that a previously created job file has yet to receive a download from a PQ100 Sampler.

01 LOW BATTERY SHUTDOWN! PQ100
Low Batteries! PQ Software

* Indicates that the sample job was terminated when the battery power had been depleted and should now be recharged.

02 SAMPLE RUN COMPLETED! PQ100
Run Completed! PQ Software

* Indicates that the sample job was terminated when the RUN TIME had been depleted (See Section 6.7 or Section 6.8.3).

03,04 FLOW RESTRICTED! PQ100
Flow Restricted! PQ Software

* Indicates that the sample job was terminated due to a flow rate transient of 50% of the target flow rate and is usually caused by a kinked or broken hose, filter load removal etc.

During the initial time that the PQ100 requires to stabilize its flow rate, flow will be displayed as --.-Lpm. During this stabilization period, flow rate is allowed to vary more than 50% for a maximum of one minute. After one minute the flow is considered restricted causing the above shutdown. Once the flow rate has stabilized, the flow rate will appear and response to transients greater than 50% is instantaneous.

05 Counters Reset, Awaiting new Run! PQ Software

* Indicates that the PQ100 has been "Reset" and is now ready for a new sample job.

06 Powered Off Normally! PQ Software

* Indicates that the PQ100 had last been powered off by pressing the "ON/OFF" button. If you simply allow the PQ100 to power itself off (automatic after approximately 3 minutes of no user activity such as key presses or downloads) then the last Shutdown code is retained.

07 Waiting for Alarm Event! PQ Software

* Indicates that the PQ100 has been programmed to start a sampling job at some future time and is waiting for this occurrence.

08 MAXIMUM LOAD EXCEEDED! PQ100
Maximum Load Exceeded! PQ Software

* Indicates that the sample job was terminated because the PQ100 could not force the pump to run any faster to regulate flow rate. This can happen when a large load pressure is developed and the battery voltage drops. To eliminate this problem you can run from the charger, recharge the batteries or try a different filter media.

09 Run Terminated by Operator! PQ Software

* Indicates that the sample job was terminated when an operator has pressed the "RUN/STOP" button while a sample job was in progress.

10 RUN TIME EXCEEDED! PQ100

* Indicates that the PQ100 can not initiate a run as the RUN TIME (See Section 6.7) has not been reset.

11 REPLACE CLOCK BATTERY! PQ100

* Indicates that the internal clock battery now requires replacement (See Appendix C).

APPENDIX F. ASSEMBLING THE PQ167 PM10 AIR SAMPLING SYSTEM

Included with your PQ167 PM10 Air Sampler System are the following items (Item#'s are indicated on the appended drawings);

Item#	Qty..	PN	Description
14	1	PQ100	Air Sampler Main Unit
*	1	PQ101	Battery Charger/Auxiliary Power Supply
34	1	PQ102	Hose Adapter
*	1	CQ1	Charger/External Battery Cable
*	1	CQ2	PC Communication Adapter Cable
*	1	PQMAN	Manual
12	1	HS4	1 Meter of Rubber Hose
11	1	TP100	Tripod Frame
*	3	B1453	Leg Extensions
13	1	CRPQ1	PQ Series Sampler Cradle
01	1	BGI16.7	Inlet
2,3	1	WJ16.7	Water Jar w/ 2.5" Coupler
4,5,9,10	1	F20	Filter Holder (Requires F21 Cassette)
6,7,8	2	F21	47mm Filter Adapter Cassette w/Screen

For U.S., Canada and Mexico;

*	1	QD3	3.5" PQ Software Diskette

FOR COMPLETE SYSTEM ASSEMBLY PLEASE REFER TO FIGURES 4, 5 AND 6.

APPENDIX G. ASSEMBLING THE BGITSP AIR SAMPLING SYSTEM

Included with your PQTSP Air Sampler System are the following items (Item#'s are indicated on the appended drawings);

Item#	Qty.	PN	Description
14	1	PQ100	Air Sampler Main Unit
*	1	PQ101	Battery Charger/Auxiliary Power Supply
34	1	PQ102	Hose Adapter
*	1	CQ1	Charger/External Battery Cable
*	1	CQ2	PC Communication Adapter Cable
*	1	PQMAN	Manual
4,5,9,10	1	F20	Filter Holder (Requires F21 Cassette)
6,7,8	2	F21	47mm Filter Adapter Cassette w/Screen
15,16,17	1	TSP CAP	TSP Inlet Adapter Cap

For U.S., Canada and Mexico;

*	1	QD3	3.5" PQ Software Diskette

FOR COMPLETE SYSTEM ASSEMBLY PLEASE REFER TO FIGURES 4, AND 7.

APPENDIX H. INSTALLING FILTER MEDIA

Referring to Figure 4, the filter media is placed on screen (7) and placed on the inner lip of cassette base (8). Cassette top (6) is then inserted into cassette base when pin of base is aligned with locating hole on cassette top. Holder base (9) and holder top (4) are supplied with O-Rings (5) already installed. Loaded cassette is then inserted into base (9) with the screen side down and holder top (4) is then screwed into base (9) firmly as to insure against leaks.

APPENDIX I. CONCENTRATION EQUATION

For reference, the following is the formula for Concentration used by the PQ Software;

$$\frac{\text{CONTAMINANT WEIGHT (mg)} \times 1000}{\text{TOTAL SAMPLE VOLUME } (m^3)} = \text{CONCENTRATION } \left(\frac{\text{micrograms}}{m^3}\right)$$

Where;

(CONTAMINANT WEIGHT) is the difference between initial filter weight and final filter weight

(TOTAL SAMPLE VOLUME) is the Volume of air passed through the filter in cubic meters

(CONCENTRATION) is the quantity of particulate matter in micrograms per cubic meter

APPENDIX J. FLOW RATE STABILITY

EPA Regulations 40 CFR part 53.43 (July 1987) require measurement of flow rate stability during the testing of an instrument for reference or equivalency. This test is permanently incorporated into the PQ100 firmware. The flow rate through the instrument is measured and stored automatically while the run is in progress. The initial flow rate is measured one minute after the instrument has stabilized the flow rate (The flow rate is stable when the PQ100 visual display shows the actual flow rate instead of "Q--.-"). The flow rate is then sampled once every hour thereafter until the completion of the run with a maximum capability of 30 readings after the initial.

NOTE: THE RUN MUST BE CONTINUOUS IN ORDER FOR THE READINGS TO BE TRUE. IN OTHER WORDS, IF A RUN IS HALTED FOR ANY REASON THE PQ100 MUST BE RESET TO INSURE THAT THE READINGS ARE STORED IN THE PROPER SEQUENCE.

The Flow Rate Stability Report is generated after a run is completed and the data has been downloaded as previously described by the PQ Software. The report is shown as a second page after a run has been "Screened". The option of obtaining a printout is given for each screen after viewing the data.

The following is a description of the equations used to calculate flow rate stability as shown in the report;

$$\bar{F} = \frac{F(1) + F(2) + F(3) + ... F(n)}{n}$$

where;

$\bar{F}$ = Average Flow Rate in Liters per Minute
n = Total number of readings taken
F(1) = Initial Flow Rate reading 1 minute after flow has stabilized
F(2) = Flow Rate 1 Hour after Initial Flow Rate reading
F(n) = Flow Rate (n-1) Hours after Initial reading

The first EPA indicator of flow rate stability is the percent of difference between average flow rate and initial flow rate.

$$= \frac{\bar{F} - F(1)}{F(1)} \times 100$$

where;

% difference between average and initial flow rate.
This may be a plus or minus value and may not exceed 5% (EPA).

The second EPA indicator of flow rate stability is the percent of difference between each hourly flow rate reading and the initial flow rate.

$$(t) = \frac{F(t) - F(1)}{F(1)}$$

where;

F(t) = hourly flow rate readings F(2), F(3), F(4) etc.
(t) = % difference between individual hourly readings and initial flow rate. This may be a plus or minus value and no value may exceed 10%.

In reality all displayed values should be expected to be typically less than 1% and should not exceed 2%. Values more than 2% should be investigated. A blocked or restricted inlet, hose, etc. at precisely the time the PQ100 takes a reading internally should be suspected.

APPENDIX K. FIGURES

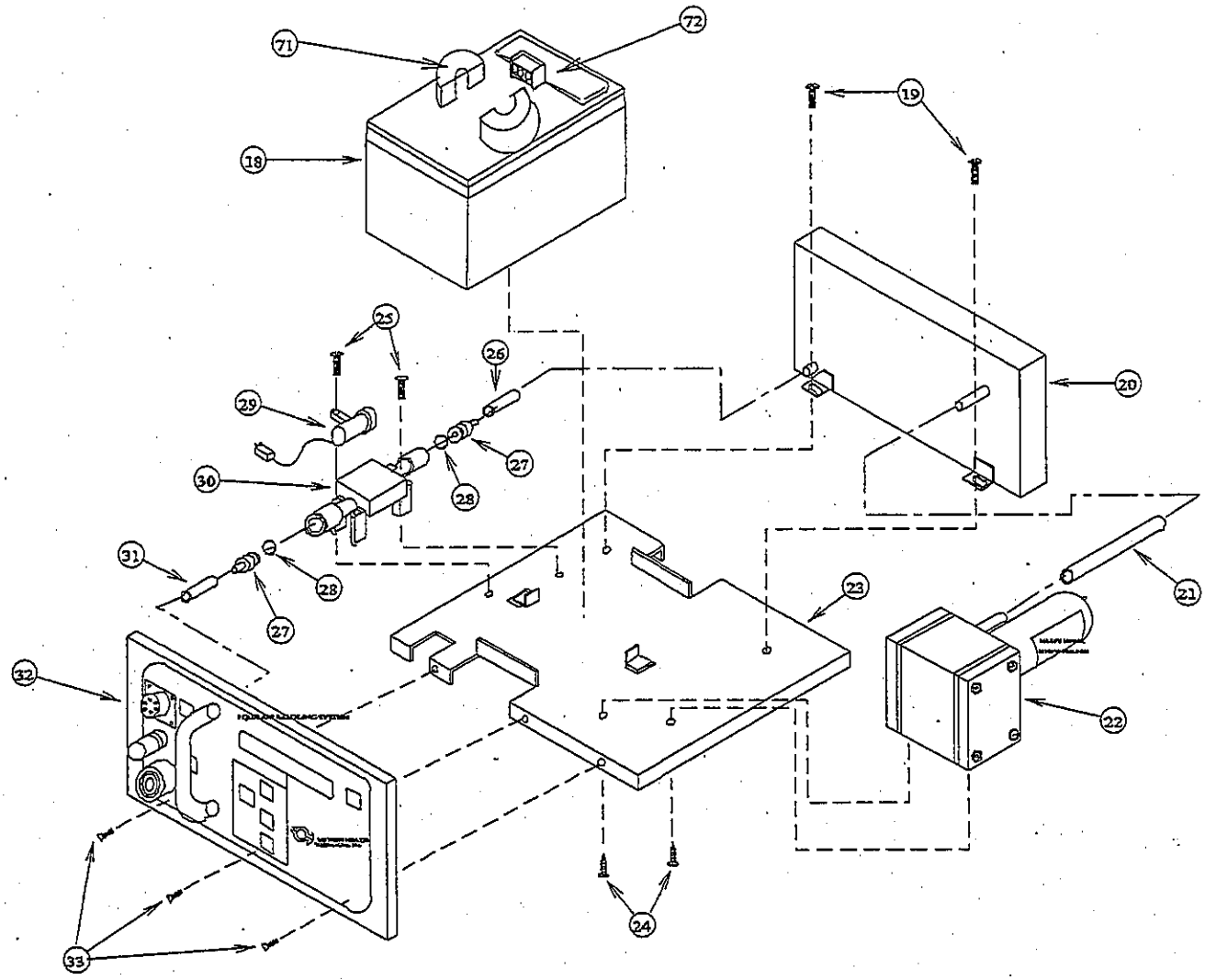


Figure 1. Exploded assembly view.

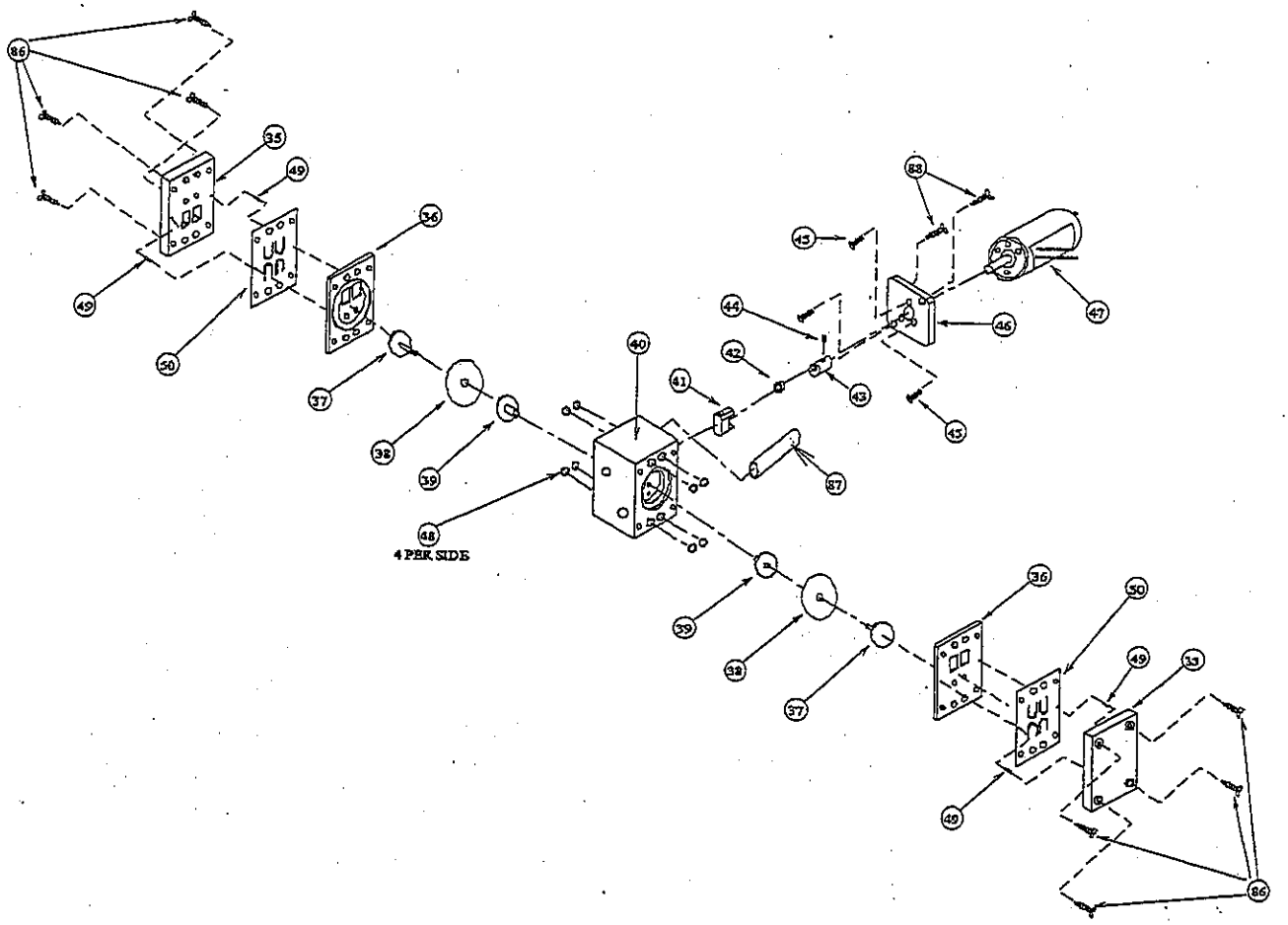


Figure 2. Exploded view of pump.

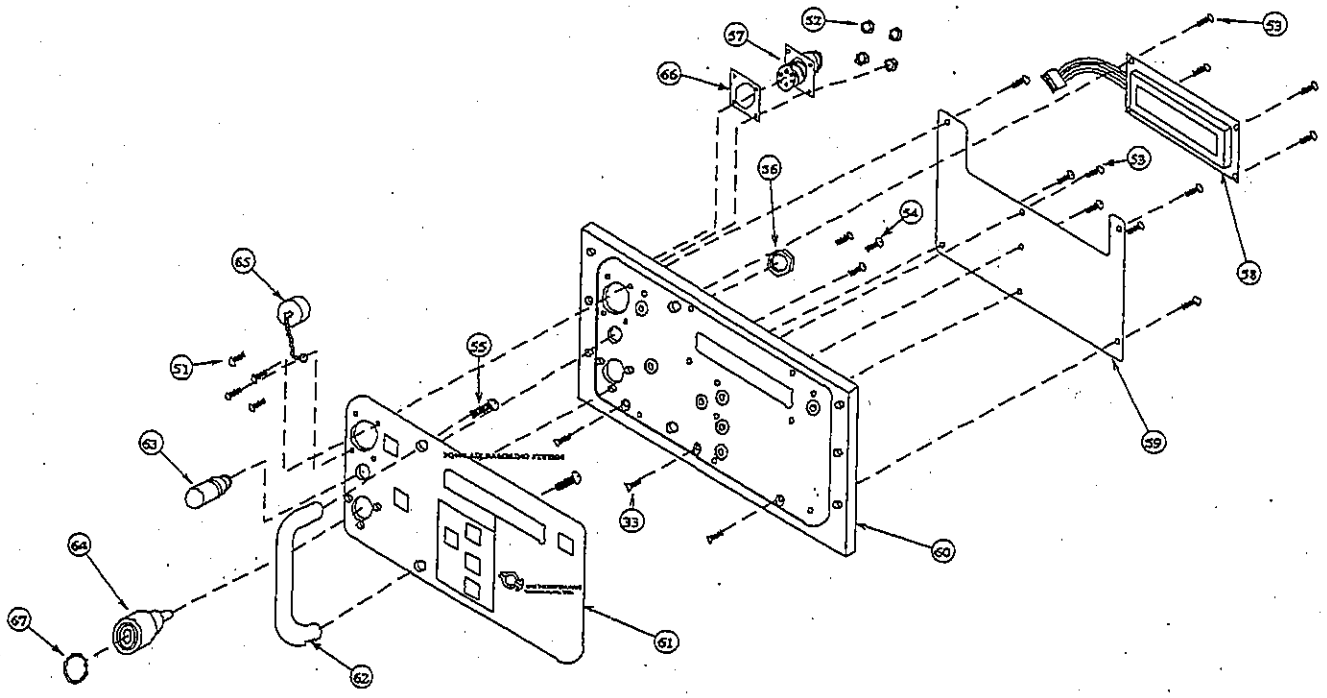


Figure 3. Exploded view of front of PQ100.

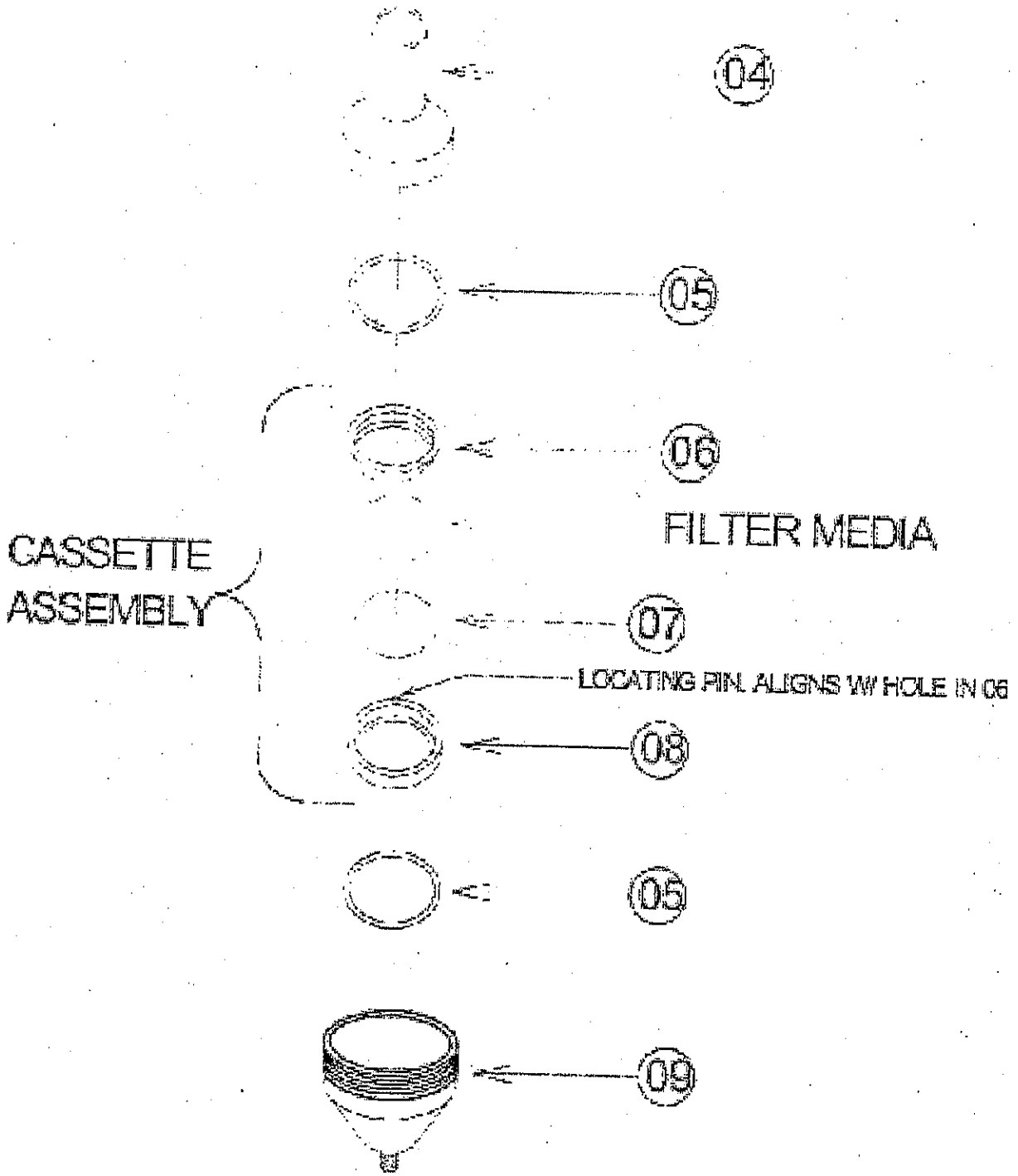


Figure 4. Exploded view of filter cassette and holder assembly

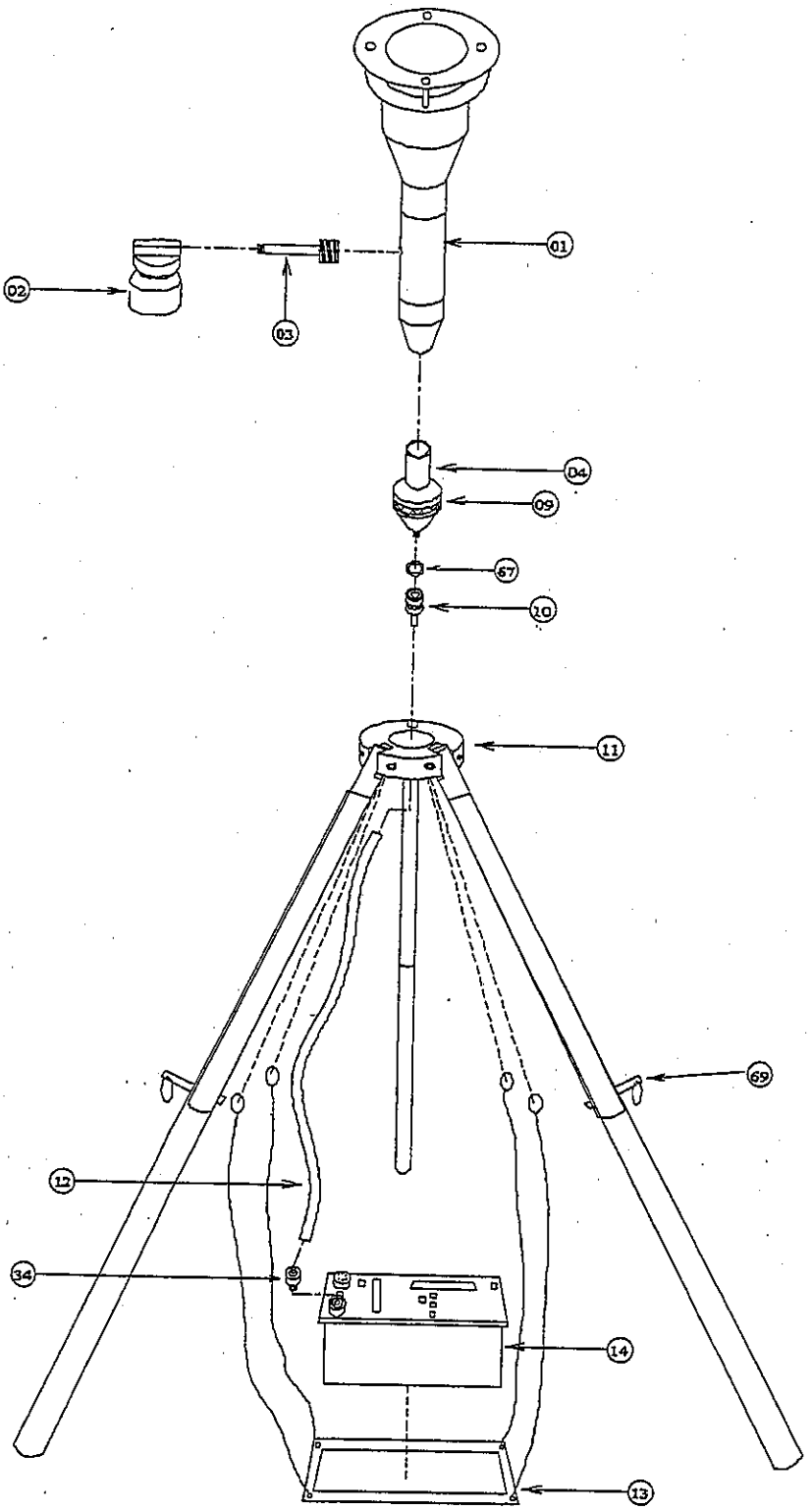


Figure 5. Exploded assembly with inlet and tripod.

(January 2000: OBSOLETE. Parts subject to stock on hand. See Appendix O.)

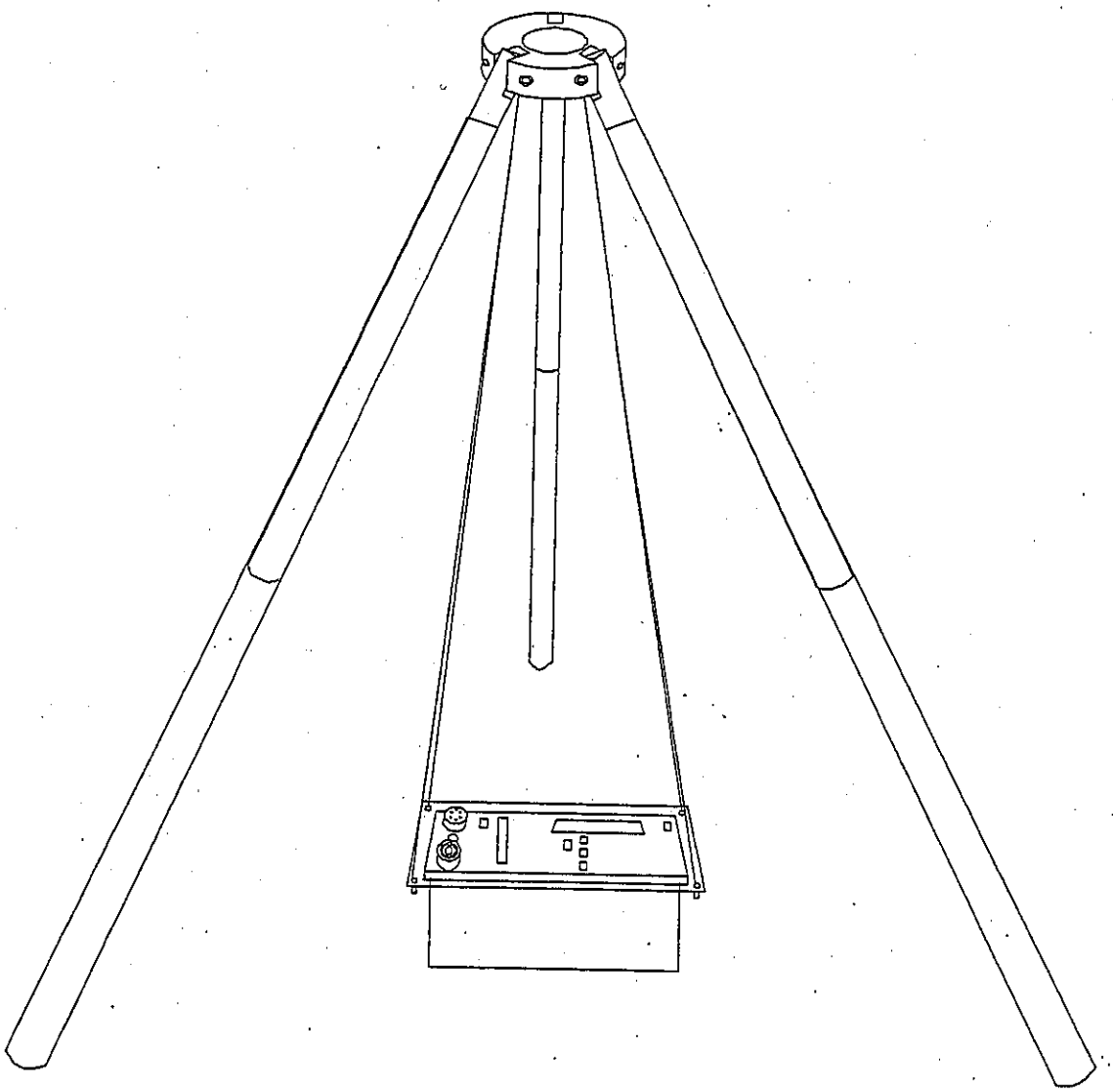


Figure 6. Assembled PQ100 tripod.

(January 2000: OBSOLETE. Parts subject to stock on hand. See Appendix O.)

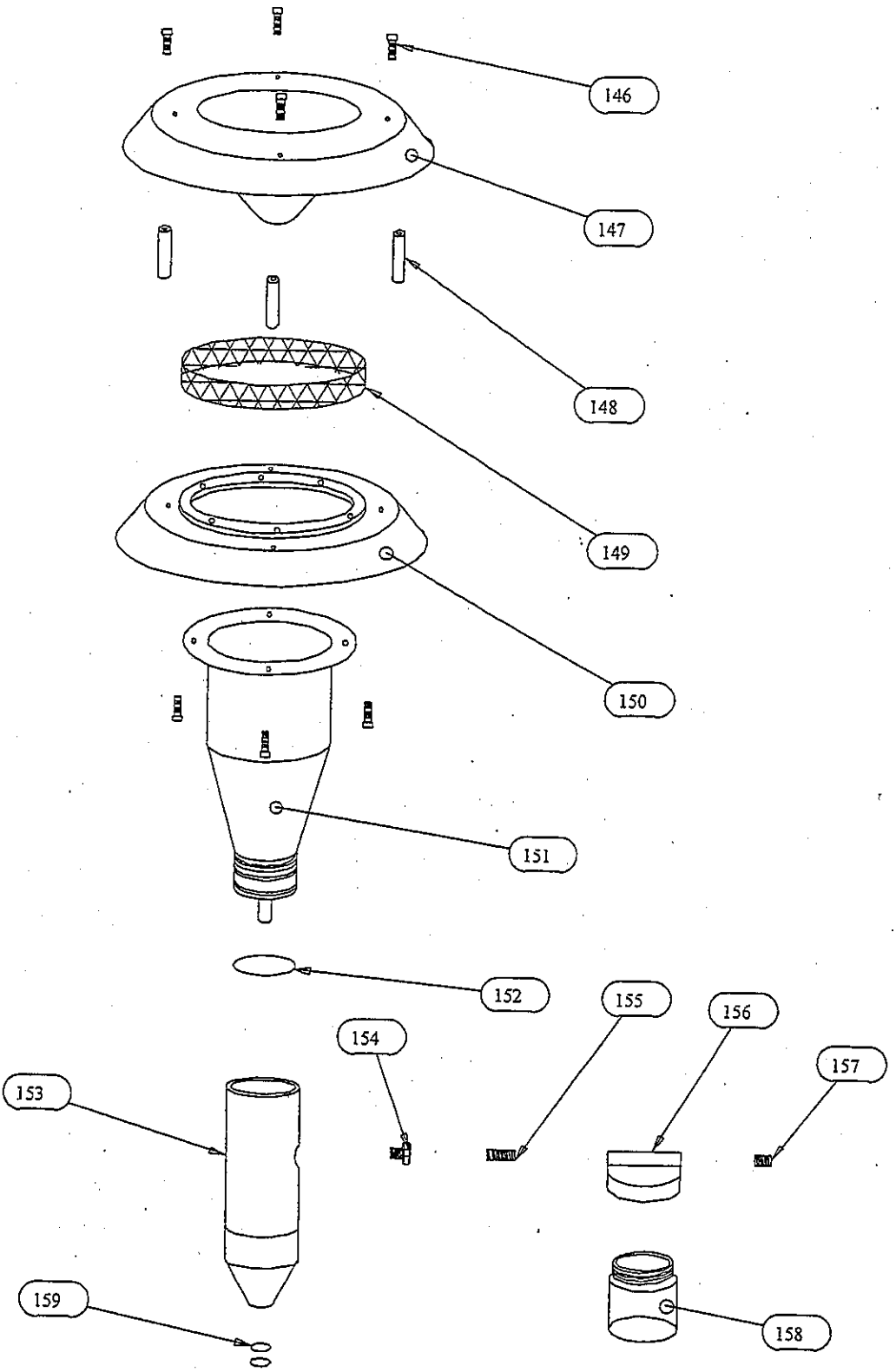


Figure 7. Exploded view of PM10 inlet

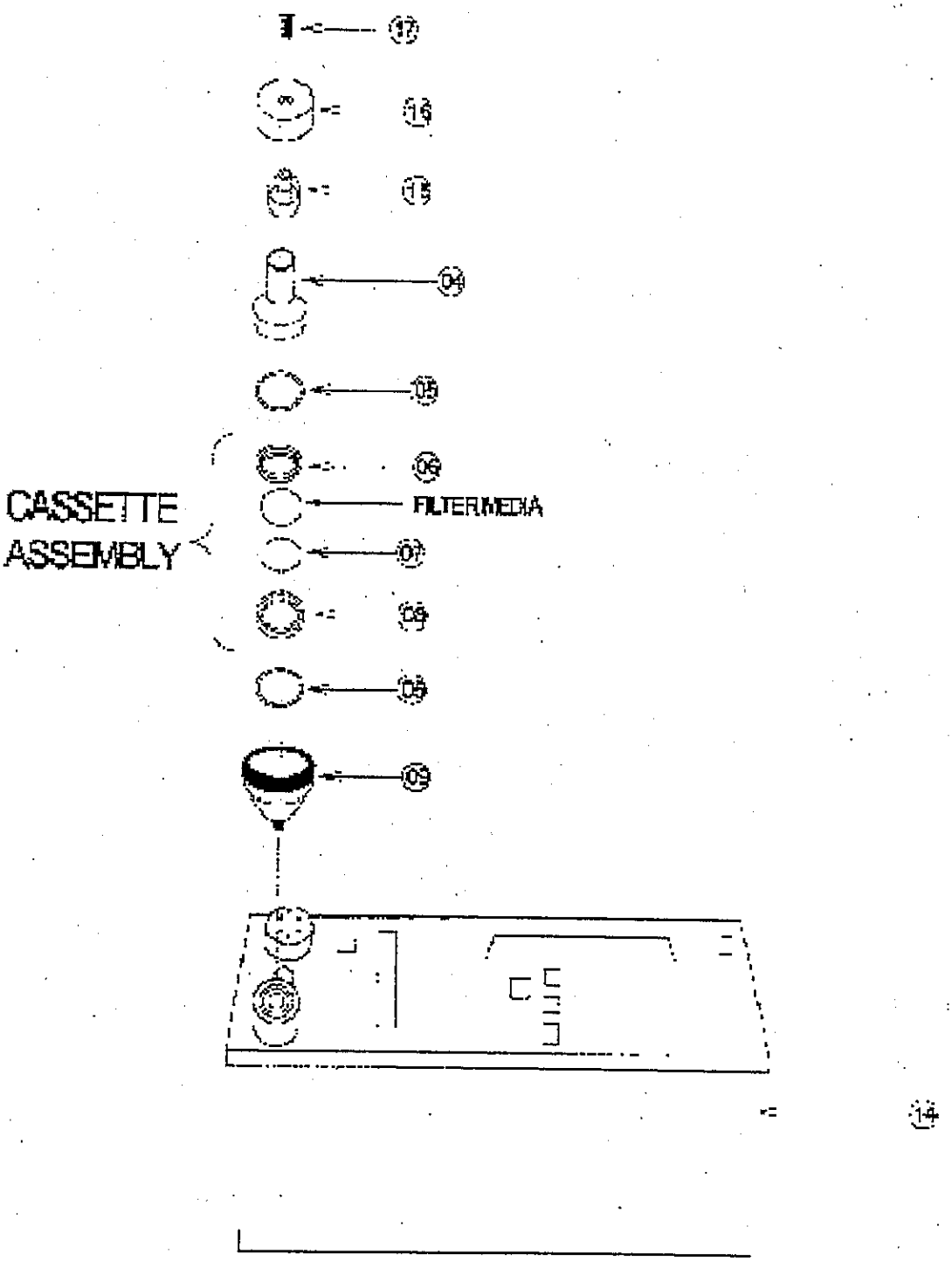


Figure 8. PQ100 Front with Filter Assembly.

APPENDIX L. FILTER HANDLING AND WEIGHING

Note: The following guidelines are based on the regulations developed for sampling PM2.5. It is recommended that these guidelines be followed for PM_{10} sampling using the PQ100.

Filter Specifications

For exact compliance with EPA procedures for PM2.5, refer to 40 CFR Part 50, Appendix L, and Section 2.12 of EPA's Quality Assurance Handbook.

In brief, the filter should have the following characteristics:

Size: Circular, 46.2 mm diameter ± 0.25 mm. Medium. Polytetrafluoroethylene (PTFE Teflon), with integral support ring.

Support ring: Polymethylpentene (PMP) or equivalent inert material, 0.38 ± 0.04 mm thick, outer diameter 46.2 mm ± 0.25 mm, and a width of 3.68 mm (+0.00 mm, -0.51mm).

Pore size: 2μm as measured by ASTM F316.94.

Filter thickness: 30 to 50 μm.

Maximum pressure drop (clean filter): 30 cm H_2O column @ 16.67 Lpm clean air flow.

Maximum moisture pickup: Not more than 10 μg weight increase after 24-hour exposure to air of 40 percent relative humidity, relative to weight after 24-hour exposure to air of 35 percent relative humidity.

Collection efficiency: Greater than 99.7 percent, as measured by the DOP test (ASTM D 2986-91) with 0.3 μm particles at the sampler's operating face velocity.

Alkalinity: Less than 25 microequivalents/gram of filter, as measured by the guidance given in reference 2 in section 13.0 of this appendix.

One current source of these filters is Pallflex Products Corp. Of Putnam, CT, USA; Type TK15-S3M.

Filter Handling

Filters should be handled delicately using non-serrated forceps, never using fingers (even in laboratory gloves) to touch any part of the filter. When not in use, filters should be stored in protective cartons in conditions of moderated temperature and relative humidity. Filters should from the always be transported from the laboratory to the sampling location in the filter cassette, which should be protected within a metal canister. These canisters may be ordered directly from BGI.

Filter Cassette Handling

The filter cassettes provided for use with the PQ100 have been designed with an interference fit to prevent the cassette from coming apart easily, therefore some care must be exercised when opening and closing the cassette, especially when a filter is inside. Always maintain the cassette in an upright position, especially if the filter has already been used to collect particles. To open, place a clean, flat blade device (knife edge, screwdriver blade) against the outside edge of the cassette between the upper and lower halves and gently wedge them apart. DO NOT TWIST THEM APART, this could tear the filter. Set the upper half of the cassette aside.

To close the cassette, place it the upper and lower halves together and gently press them together, being careful not to twist them. When closed, the two halves should seat snugly together with the backing screen securely held in place between the two halves.

Filter Weighing

Because of the small amounts of material collected, an extremely high quality microbalance and carefully, temperature and humidity controlled filter weighing room are recommended. For complete EPA recommended details, consult 40 CFR 50 Appendix L8.0, Federal Register, July 18, 1997, and Section 2.12 of EPA's Quality Assurance Handbook.

The analytical balance used to weigh filters must be suitable for weighing the type and size of filters specified and have a readability of $\pm 1 \mu g$. The balance should be calibrated as specified by the manufacturer at installation and should be recalibrated immediately prior to each weighing session.

APPENDIX M. EXTERNAL DATALOGGER

The BGI Datatrans is a "Download Data Collector" designed to extract the "Data Download" from a PQ100 at the end of its sample period and store it until it can be uploaded to a personal computer running BGI PQ software, for more permanent storage. This device facilitates rapid "Filter and Data" collection in the field while providing trouble free data collection at extended temperature range (-30° to +60°C). The Datatrans was designed specifically to address the problem of field data collection at these extended temperatures where notebook, laptop or palmtop computers are not designed to operate below 0°C.

To use the Datatrans

1. Turn the unit on with the power switch on the front panel (See Figure M1).
2. The following light sequence should be observed: red, yellow then green.
3. The green light will remain on (This indicates a ready condition). If the yellow light is also illuminated, one or more runs are currently stored in the Datatrans and it should either be downloaded or erased as described below.

NOTE: The Datatrans should be fitted with a fresh, new 9-Volt battery prior to each field use.

Downloading the PQ100

1. Place the connection switch, located on the front panel of the Datatrans, in the "Samp" (sampler) position.
2. Insure the PQ100 Sampler is powered on and at the Main Idle Screen.
3. Attach the PQ100 Adapter to the Datatrans (See Figure M2) and plug the other end of the adapter into the Utility Port on the front panel of the PQ100.
4. Press and hold the pushbutton on the front of the Datatrans.
5. The red light will turn on, the green light will turn off and if communication is successful the yellow light will flash for each line of data received. When the download is complete, the yellow light will remain on, the red light will stop flashing and turn off and the green light will turn on.

Note that the PQ100 takes less than 5 seconds to download.

6. Repeat the above steps for each sample run that is to be collected (multiple samplers) realizing that the "Runs" are stacked up using **First In, Last Out methodology.**

NOTE: You must remember how many runs that you've stored in the Datatrans. 20 is the maximum. If you try to store 21 runs, the Datatrans will not accept the 21st run. You will notice that the yellow light flashes while data is transferring. When memory becomes full, the red light will not flash indicating that the run was not accepted.

7. It is now safe to turn the unit off.

NOTE: The data will be retained in the Datatrans, even if the 9-Volt battery fails, until it has been uploaded into a computer and the unit is erased using the data deletion procedure described below.

To upload to the Computer

1. Plug the Datatrans into the RS232 serial port of the computer.
2. Turn on the power switch and observe the following light sequence: red, yellow then green. (Green light indicates unit is ready and yellow on indicates Runs are stored). Red light turns off.
3. Place the connection switch, located on the front panel, in the **(Comp)** computer position.
4. Insure the computer is running BGI PQ Software for DOS. (B)egin a new job, then (I)mport data from the sampler should be selected and should be ready to receive data as if it were attached directly to the sampler.
5. Press any key on the computer keyboard to initiate the transfer.
6. Green light will turn off, Red Light will turn on and "Run Data" will be stored in the Datatrans.
7. When the transfer is complete, the software will step to the next screen indicating that the "Run" has been transferred.
8. If multiple runs have been stored in the Datatrans, the last run captured is the current resident run. While a run is resident, the Datatrans retains the characteristics of the sampler type it was captured from. To step the Datatrans to the next run, you must first download the current run and then press the pushbutton. Repeat for multiple runs pushing the Datatrans button after each sample is uploaded. You must "Begin" a new run for each sample run to be uploaded to the computer. When all runs have been uploaded, the yellow light will remain off.
9. To use the device again for new runs from the field, you must erase it as described below:

NOTE: TO RECYCLE SAMPLE RUNS:

If after all runs have been downloaded, a lost file, mistake or a problem is discovered and you must download a run again, the Datatrans allows the runs to be recycled as long as it has not yet been erased as described in the Erasure Procedure below.

AFTER GREEN LIGHT GOES OFF, INDICATING ALL RUNS HAVE BEEN DOWNLOADED, PRESSING BUTTON WILL RETRIEVE THE SERIES OF RUNS AND REMAIN UNTIL DELETED.

THIS IS HELPFUL IF YOU ARE UNSURE OF AN UPLOADED RUN.

DATA DELETION PROCEDURE
(TO ERASE THE DATATRANS AFTER ALL RUNS HAVE BEEN TRANSFERRED)

1. Turn the power switch off.
2. Hold down the pushbutton.
3. While holding the pushbutton down, turn the power switch On.
4. The Red light will turn on, now release the button.
5. When erased, all three lights will flash 2 times in unison and 1 time in series.
6. Unit is now cleared and ready for new downloads.

Maintenance

The Datatrans requires no maintenance except for replacement of the 9-volt battery. A spare, fresh battery should always be taken to the field.

Troubleshooting

Most of the problems that occur with the device can be traced to a bad 9-Volt battery. It is recommended that the user purchase Duracell Alkaline Batteries which come packaged with a cell tester. Follow the instructions given on the box or cell and determine if the cell requires replacement or not. It is highly recommended that the user install a brand new, fresh cell before each field use (If you forget to turn the unit off for some reason, you will have about 18 full hours of battery use).

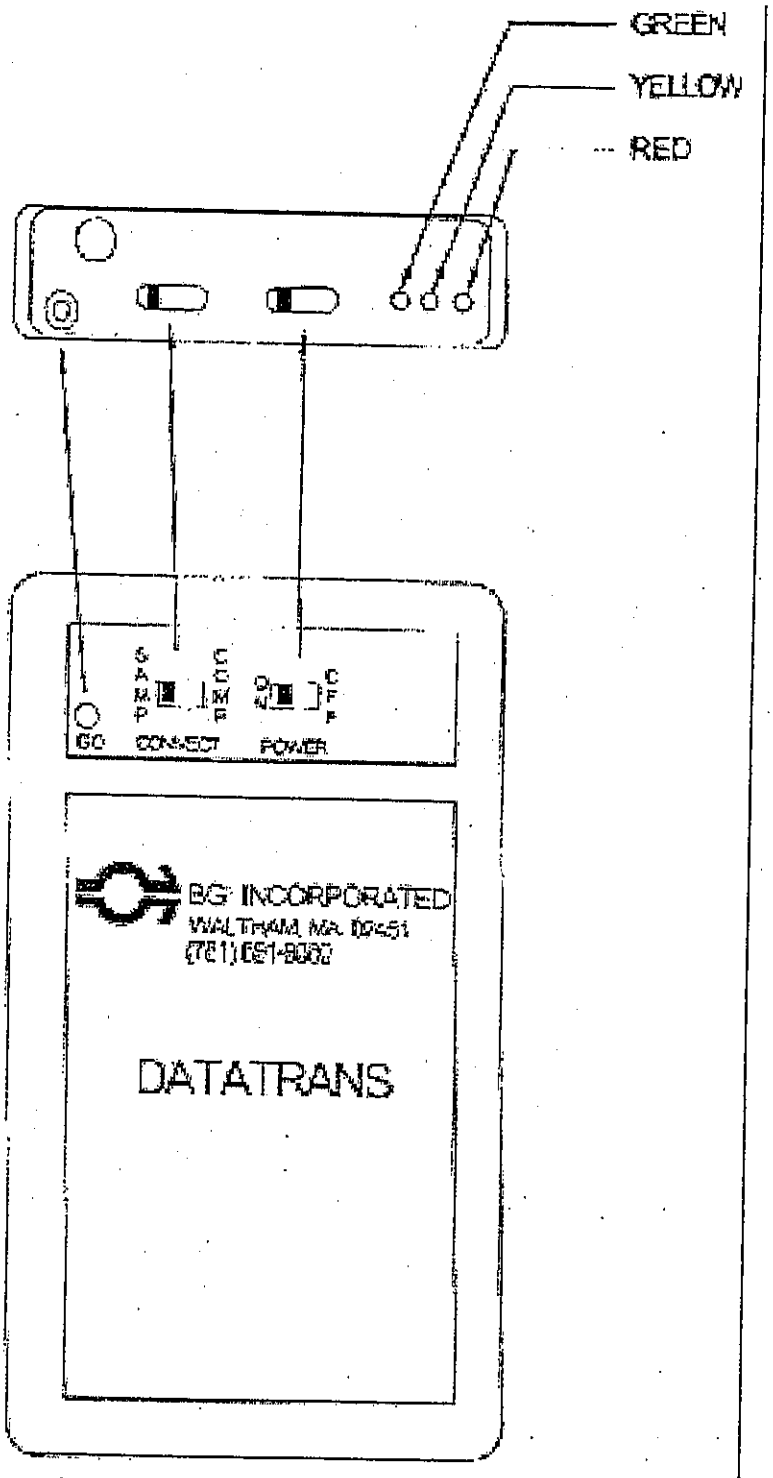


Figure M1. Schematic Diagram of Datatrans

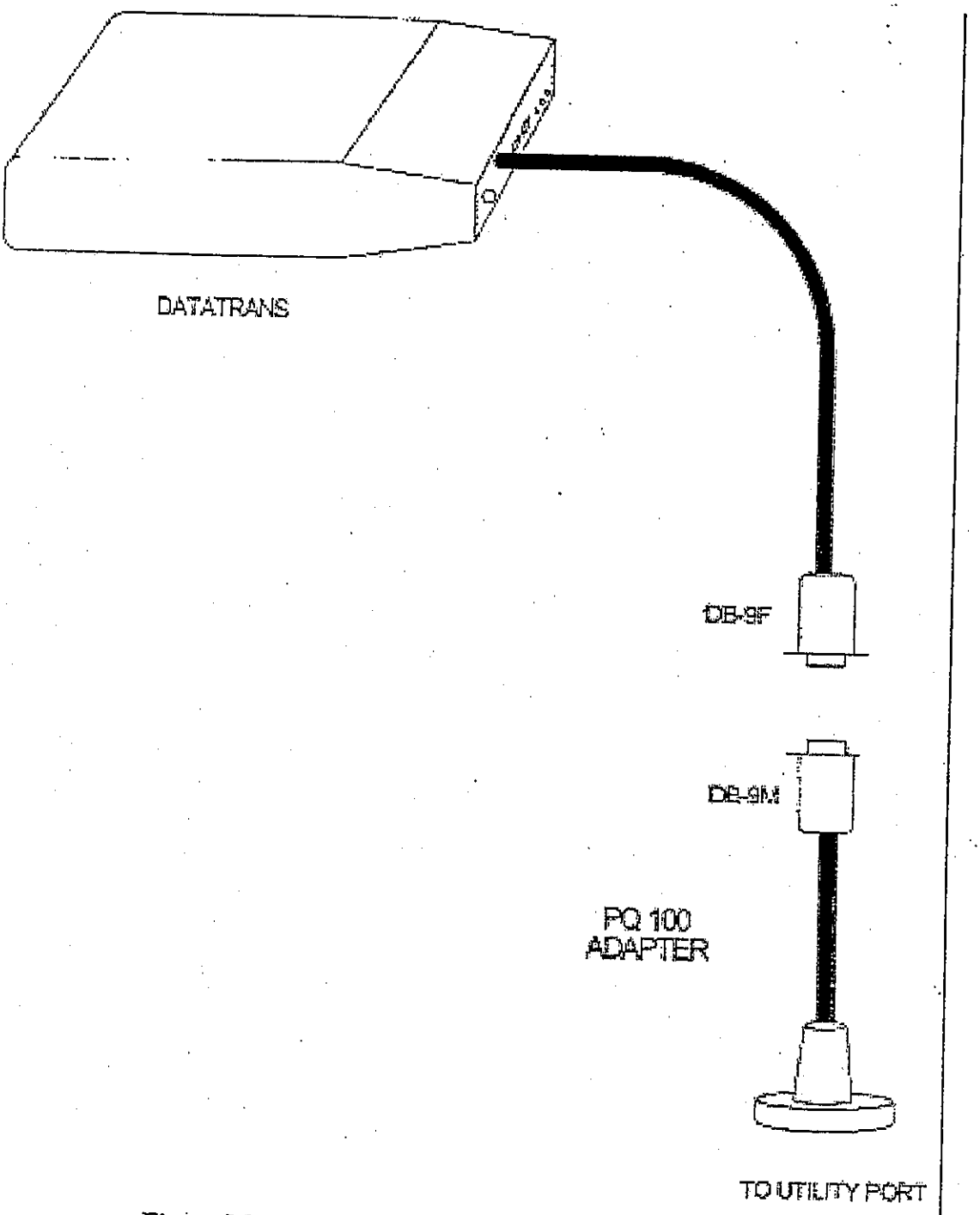


Figure M2. Datatrans with adapter for use with PQ100

APPENDIX N. SOLAR PANEL POWER SUPPLY

Introduction

The SP32, solar panel kit is intended to permit the PQ100 to run for extended or, indefinite periods of time depending on the available sunlight (solar radiation) at a given location. The solar panel may only be used as the sole source of power for a U.S. EPA-designated instrument if sampling is not being performed every day (i.e., continuously).

Because of the low current draw of the instruments they are highly amenable to this technique. Given sufficient sunlight, they may be deployed in locations where no line power is available. The basic components of the solar kit are:

1. 32-watt solar panel with mounting brackets.
2. Built in voltage regulator.
3. 100+ amp hour (approx.) ballast battery. (User supplied).

The purpose of the external high capacity battery is to provide back up power on days when there is little or no sunlight. The recommended battery capacity will provide 7-8 days run time with little or no sunlight. It will recharge, almost completely, after one days' use during a day of full sunlight while the instrument is non-operational. Complete recharging of a fully depleted system would require 10 days.

This type of system should not be considered for latitudes higher than 45-50° N or S, or particularly overcast regions.

Operational Considerations

While the use of solar power is highly desirable from the standard of utilizing a renewable energy source and being freed from the need to locate a source of power in difficult situations, there are some preliminary considerations. Clearly, the PQ100 is not operating directly from the received energy of the sun but rather from a battery, which has been charged by that energy. If a PQ100 were to be run continuously from the internal and (recommended) external battery, 7 to 8 days run time could be achieved. However, considering only EPA designated sampling conditions, i.e. sampling from midnight to midnight, then it would be possible to run on alternate days yielding one day to replenish the energy used. Given that this is accomplished in full sunlight while the instrument is running, the extra day recovery reduces the need for full sunlight by 50%. If the popular, one in 3 days, or one is 6 days schedule is utilized, the probability of complete replenishment is greatly increased.

Experience has shown that on cloudless days in the Boston area, 5 Kwh/M^2 insolation will replenish the energy used by a PQ100. In order to determine the suitability of the PQ100 solar system for a given location, Appendix A of the cited reference gives the insolation index for 54 locations in the US and other places throughout the world. Given a one in 6 day sampling schedule; only Fairbanks Alaska is unsuitable for solar application in the months of November, December and January. These are clear sky tables and seasonal overcast must be

considered in individual locals. Table N1 comprises locations at various US latitudes and indicates operational months vs. sampling schedules.

There are other factors which will reduce the energy replenishment of the system and make accurate performance predictions difficult. Amongst these are:

1. Dirt on the solar panel.
2. Extreme cold weather affecting battery performance.
3. Extremely high particulate loadings causing high filter resistance and consequent high current drain.
4. Old "used up" batteries -- more than two years old.

While all the preceding factors are to be considered in the deployment of a solar powered PQ100. They are not easy to quantitate. The effect of too little sunlight will be noticed on the "percent charge remaining" on the PQ100's main screen. Given perfect replenishment, it will always read 99%. If at any time it falls below 50% it is well to consider replacing the large battery with a fully charged one. At a minimum, given winter gloom, a fully charged battery and an every other day sampling schedule, a one month operating period is achievable at any location below 45° latitude.

Setting up

Subsequent to unpacking a new unit, it is attached to the rear leg of the PQ100 as shown in Figure N1. It is important that the board provided be located as shown in the figure with the battery placed on top of it. This serves to anchor the lower end of the panel to prevent its lifting during high winds. Failure to do so could result in damage to the solar panel and the PQ100. **NOTE:** In due consideration of weight, shipping expense and ready, local availability, a battery is not furnished with the solar panel kit.

However, the recommended battery is known as a "trolling motor" battery. This is a marine type battery used for low speed, electric outboard motors. They are equipped with handles and 5/16 inch binding posts with wing nuts. Because of their marine specifications, they are a "deep discharge" battery, which is also the type recommended for solar panel applications[1].

Direction

The direction of the solar panel will be with its long axis from the north to south, with the foot (low) end of the panel to the south. Inasmuch as the cell will be attached to the rear leg of the PQ100, this means that the back of the PQ100 is pointing due south and the front of the instrument is due North as illustrated in Figure N2.

Tilt Angle

The tilt angle is defined as the angle of inclination of a solar collector measured from the horizontal. The reason for tilt angle is because of the suns' elevation will vary over a range of 47° from winter solstice to summer solstice [1].

For the greatest annual energy production, the tilt angle should equal the latitude at the location of deployment. For best energy production, the wintertime the angle should be the latitude plus 15°. The maximum summertime production is obtained at latitude minus 15°. The tilt angle and one method of setting is shown in Figure N3.

It may also be set with a user supplied protractor/bubble level.

Wiring Connections

On the back of the solar panel is a rectangular box from which two cables exit as shown if Figure N4. The cable with 5/16 inch ring terminals is intended to connect to the external battery described in section N 2. The white wire is positive (+). The black wire is negative (-) and the green wire, with the tinned end is ground. A 12-inch ground spike and terminal is provided.

The other wire emanating from the box is equipped with a CPC connector. This wire is installed on the PQ100 panel normally used for the power supply cable. This wire is installed in place of the power supply cable when running on solar power.

Overall Operation and Troubleshooting

Prior to deploying a PQ100 with solar panel, it is prudent to ensure that the internal battery is fully charged. This is accomplished by plugging the PQ100's power supply into a source of line current for 16 hours. Full internal battery charge will be indicated on the main menu display as 99% or charged when the battery is full charged and the power supply is disconnected.

The external solar panel battery may be initially charged from any automotive battery charger. Alternatively, the PQ100 may simply set in a sunny location or the actual field sampling site and not run for 10 days. The solar panel will fully charge both batteries.

Troubleshooting

Battery is not maintaining at least 50% charge – caused by inclement weather or excessive current drain. Excessive current drain is caused by an excessively dirty filter or a worn out pump. After installing a new filter, if problem persists, check for worn pump valves or diaphragms.

If either battery is in excess of two years old – replace.

Reference

(1) Stand-Alone Photovoltaic Systems, A Handbook of Recommended Design Practice. Available from National Technical Information Service
US Department of Commerce
5285 Port Royal Road
Springfield, VA 22161
Document No. SAND87-7023

Solar Panel Parts List

Quantity	Figure	Part Number	Description
1	N 1	5PI	Solar panel assembly
1	N 4	A1920	PQ100 adapter cable

TABLE N1. Clear Sky Insolation Data from Northernmost to Southernmost U.S. cities[1].

Months wherein full charge can be maintained.

City	N. Latitude	Continuous Sampling	Every other day Sampling	Third day Sampling	Sixth day Sampling
Caribou, ME	46° 52'	Mar-Aug	Jan-Oct	Jan-Dec	Jan-Dec
Boston, MA	41° 40'	May-Sept	Jan-Nov	Jan-Dec	Jan-Dec
Raleigh-Durham, NC	35° 52'	Apr-Aug	Jan-Dec	Jan-Dec	Jan-Dec
Miami, FL	25° 48'	Feb-Sep	Jan-Dec	Jan-Dec	Jan-Dec

NOTE: This approximation is based upon 5 Kwh/M^2 received, as being necessary to fully restore the PQ100 system whilst drawing 500 MA (typical).

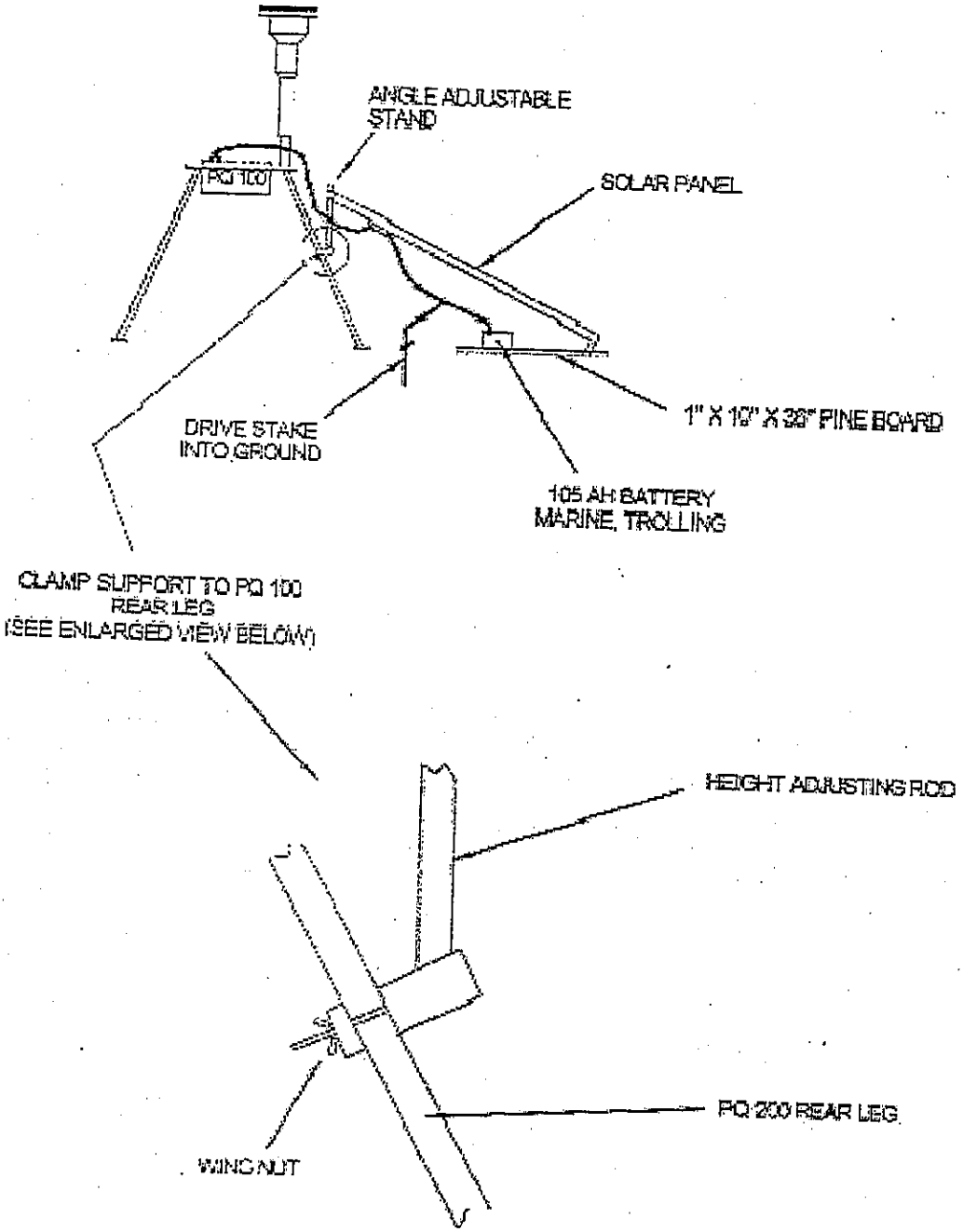


Figure N1. Setup of Solar Panel

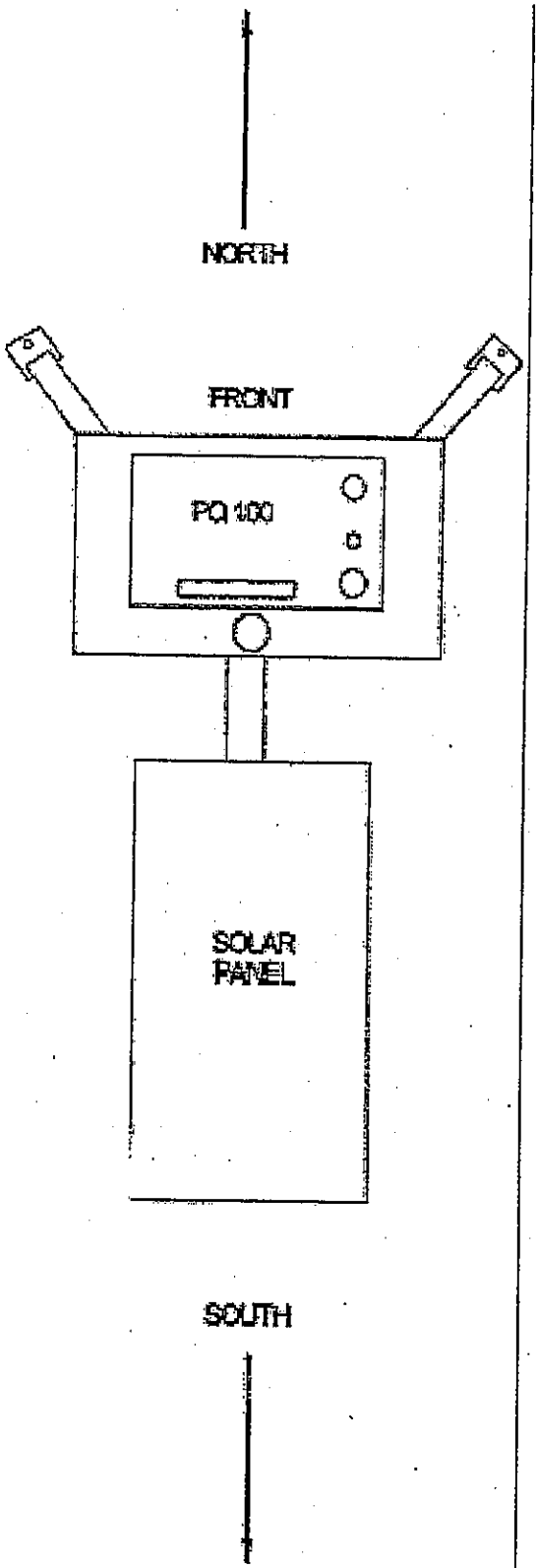
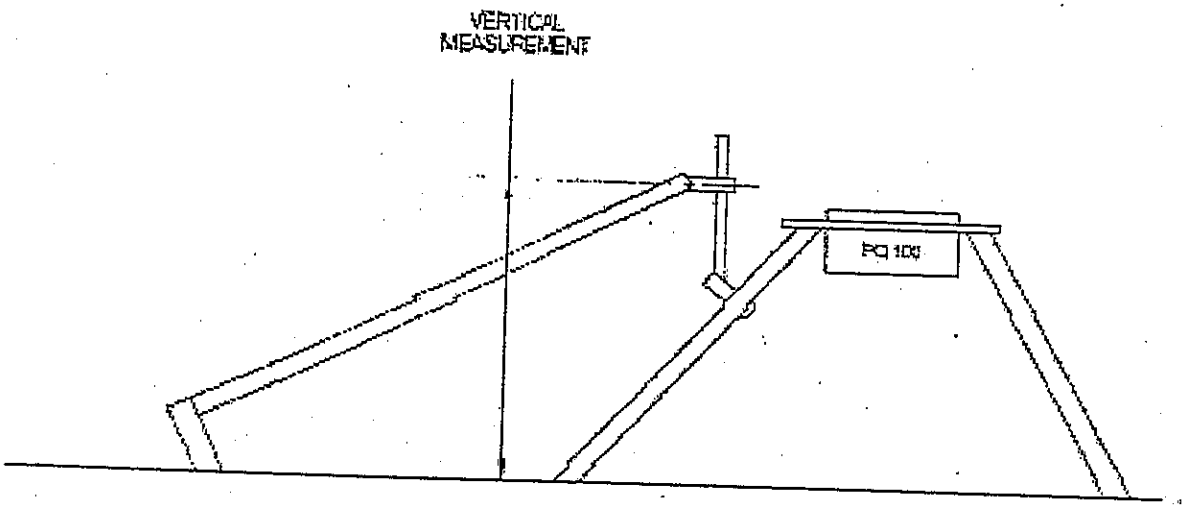


Figure N2. Orientation



VERTICAL MEASUREMENT		TILT ANGLE
INCHES	CM	DEGREES
18.7	47.5	15
27.5	69.8	25
35.2	89.4	35
42.2	107.2	45
48.0	121.9	55
51.8	131.6	65

Figure N3. Setting Tilt Angle

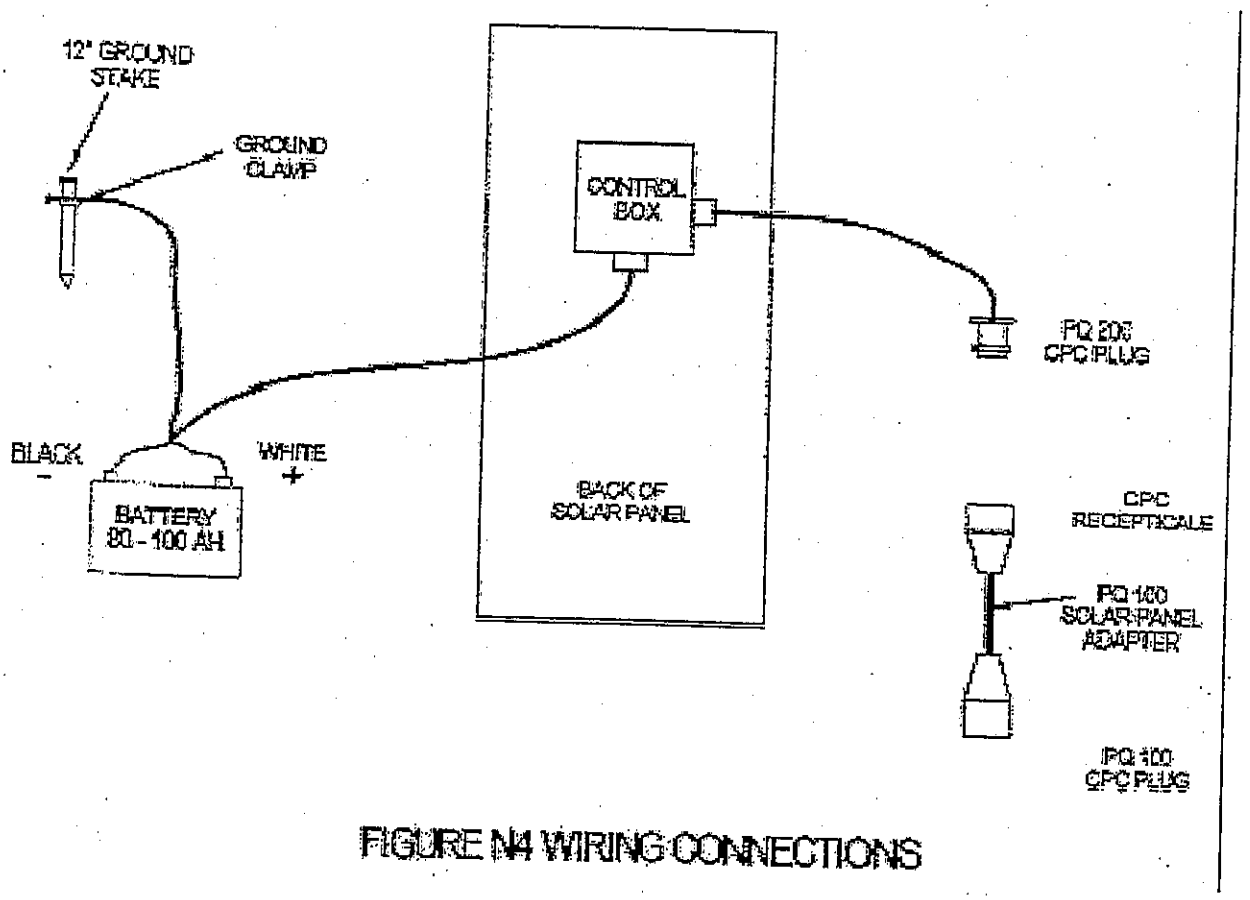


FIGURE N4 WIRING CONNECTIONS

APPENDIX O. RIGID MOUNTING ASSEMBLY

Introduction

The original PQ167 utilized a tripod assembly, which held the PQ100 pump in a swinging cradle. This assembly, now designated PQ167S, is detailed in Figures 4, 5, and 6. A new, improved rigid assembly is available designated PQ167R. Details of this new assembly are shown in Figures O.1 and O.2. *(January 2000: Only PQ167R is now in production.)*

Description

The inlet is still maintained at a height of two meters above the ground, with the filter holder plugged directly into the bottom of the PM10 inlet, as previously done.

An outlet cap for the bottom of the filter holder has been designed which is similar to the EPA L30 component with the addition of an "O" ring. This allows the filter holder to be placed onto a down tube which is a longer version of the EPA designed L19 component. Inasmuch as particulate matter is removed from the air stream prior to passage through the tube its increased length is not a consideration.

The downtube slips over a support member welded into a plate, which serves multiple functions. The support member serves as a water trap and is fitted with the same drain valve as is used in the PQ200 water trap. The support plate has a rectangular slot into which the PQ100 pump module can be placed, this supports the PQ100 at waist height for ease of use. Three stub legs are welded to the bottom of the support plate, which permits the attachment of 3 legs, which are interchangeable with the legs on the PQ200.

ASSEMBLING THE PQ167R PM10 AIR SAMPLING SYSTEM

Included with your PQ167R PM10 Air Sampler System are the following items. Item #'s are indicated on the appended drawings.

Item #	Quantity	Part Number	Description
14	1	PQ100	Air Sampler Main Unit
*	1	PQ101	Battery Charger/Auxiliary Power Supply
34	1	PQ102	Hose Adapter
*	1	CQ1	Charger/External Battery Cable
*	1	CQ2	PC Communication Adapter Cable
*	1	PQMAN	Manual
-	1	HS5	1 foot; Rubber Hose
-	1	TP100R	Tripod Frame
*	3	A1634	Legs
01	1	SSI-2.5	Inlet
3	1	JR3035	Water Jar w/2.5" Coupler
4,5,9,10	1	F20	Filter Holder (Requires F21 Cassette)
6,7,8	2	F21	47mm Filter Adapter Cassette w/Screen
-	1	A1741	Long Down Tube
-	1	A1904	Filter Adapter
*	1	QD3	3.5" PQ Software Diskette

For complete system assembly refer to Figures 4, 5, 6, O.1 and O.2.

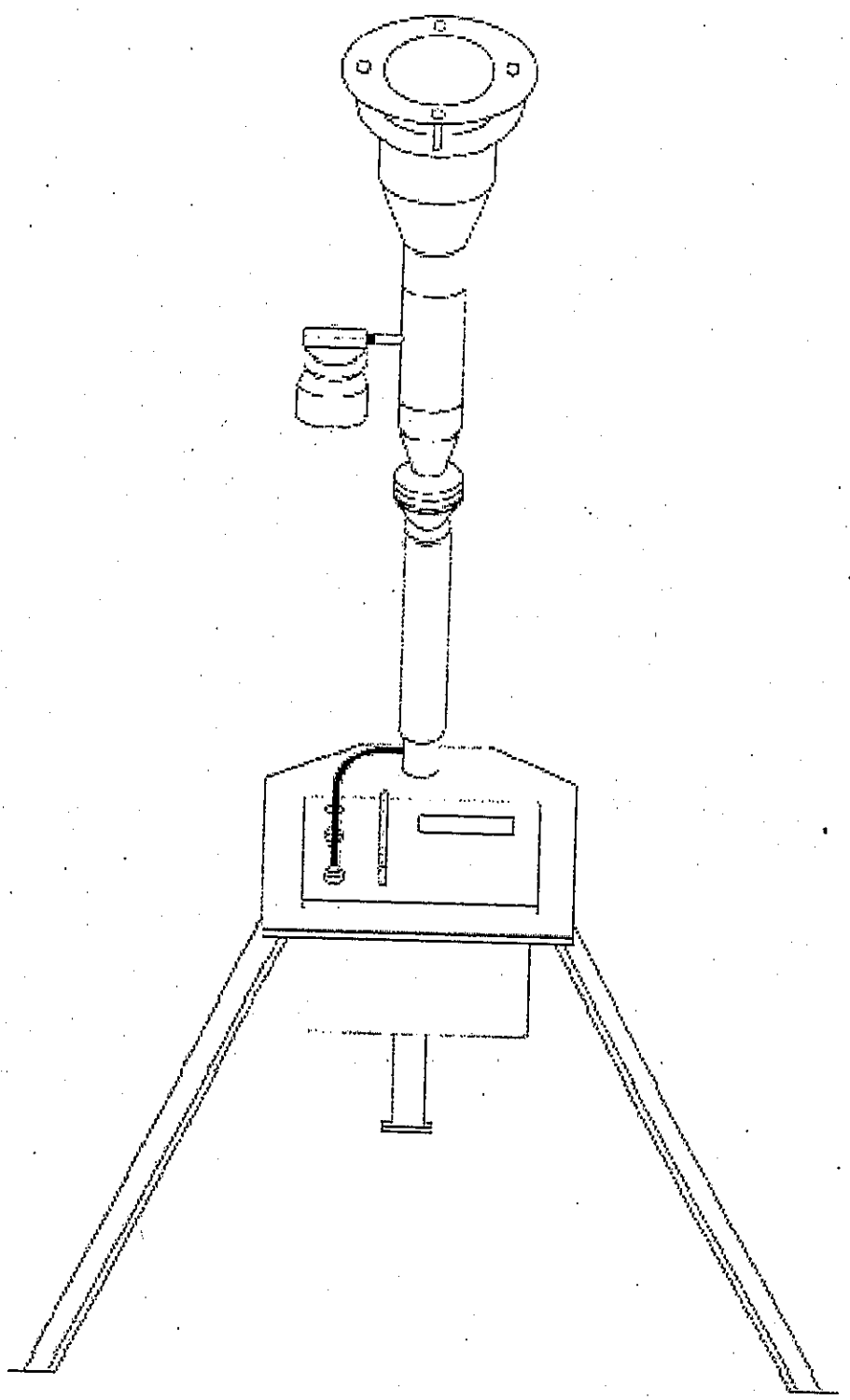


Figure O1. PQ167R Rigid Mounting Stand

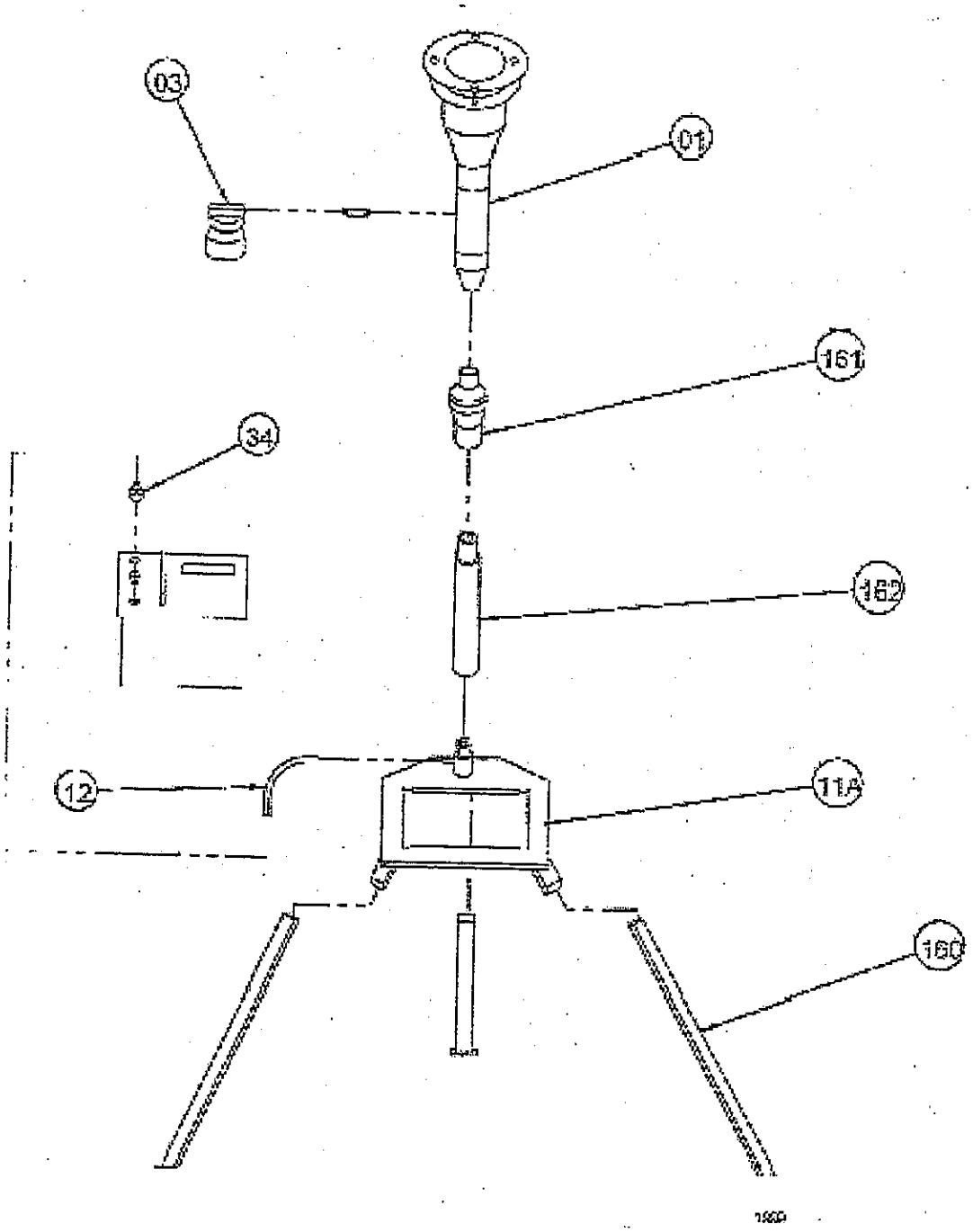


FIGURE 0.2 EXPLODED VIEW OF PQ167R STAND

PQ100 Instruction Manual Revision History

Version 5.0	Updated to WP6.0 format	March 1998
Version 6.0	Added Preface, Safety, Appendix L, M, N, and O Added Designation Information	December 1998
Version 6.01	Corrections to Replacement Component List	February 1999
Version 6.02	Corrections to Appendix M	April 1999
Version 6.03	Corrections to Appendix N	January 2000
Version 6.1	Miscellaneous corrections	January 2000

Appendix B.2

ARB Quality Assurance Manual, Volume II, Standard Operating Procedure for Air Quality Monitoring, Appendix R, XonTech 920

STATE OF CALIFORNIA

AIR RESOURCES BOARD

QUALITY ASSURANCE

VOLUME II

STANDARD OPERATING PROCEDURE FOR AIR QUALITY MONITORING

APPENDIX R

XONTECH 920

MONITORING AND LABORATORY DIVISION

JUNE 1991

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APPENDIX R

XONTECH 920

			Pages	Revision	Date
R.1.0-GENERAL INFORMATION					
R.1.0	GENERAL INFORMATION		4	0	06/10/91
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STATE OF CALIFORNIA

AIR RESOURCES BOARD

QUALITY ASSURANCE

VOLUME II

STANDARD OPERATING PROCEDURE FOR AIR QUALITY MONITORING

APPENDIX R.1.0

XONTECH 920

MONITORING AND LABORATORY DIVISION

JUNE 1991

R.1.0 GENERAL INFORMATION

R.1.0.1 THEORY OF OPERATION

The Model 920 Toxic Air Sampler is designed for the unattended collection of ambient air samples on a variety of filter materials (37 or 47 millimeter) and solid sorbent tubes for laboratory analysis of toxic compounds. The sampler is modular in design such that eight individually controlled sampling channels can be readily installed. The sampler precisely controls the sampling time and the flow rate through each sampling head using a microprocessor and mass flow controller.

The Model 920 sampler is comprised of three assemblies: the Pump Assembly, the Control Assembly, and the Sampling Assembly. The three assemblies are illustrated in the system block diagram, Figure R.1.0.1, and the sample flow through the system is illustrated in Figure R.1.0.2.

The Pump Assembly contains the Gast Model 1022-V103 rotary vane vacuum pump and a solid state relay, which allows the pump to be switched by the microprocessor. The pump assembly has control circuitry, plumbing, and space to add a second low-volume vacuum pump. The Control Assembly contains the microprocessor, flow control modules, control panel (keyboard, printer, and display), and measurement electronics. The Sampling Assembly can accommodate up to eight sampling modules, each containing a slider valve, driver motor, and sampling media holder. Two types of sampling media can be utilized: one that uses solid sorbent sampling tubes and one that uses 37 or 47 millimeter filters. Because of the flow capacity, a maximum of four 47-millimeter filters and four sampling tubes may be operated simultaneously.

The sampler must be leak checked and calibrated before operation. To operate the sampler, the operator changes the sample number and sets the start and stop time through the control panel. When the microprocessor clock reaches the indicated start time, the software sends a signal to start the pump. The microprocessor actuates the motor to open the slider valve in the sampling module, and then it opens the solenoid valve of the flow control module. The mass flow controller regulates the flow according to the set point, which is selected via the thumbwheel switch on the flow module. The 0 to 5VDC flow signal from the MFC is proportional to the flow and is monitored by the microprocessor. The processor monitors the flow four times per minute for the duration of the sampling period.

At the end of the sampling period, a report is printed which indicates the total volume of air which passed through the sampling device.

NOTE: For clarity, the three major components of the sampler are termed assemblies. Removable sub-assemblies for each sampling channel are termed modules. This terminology differs from that used in the manufacturer's manual.

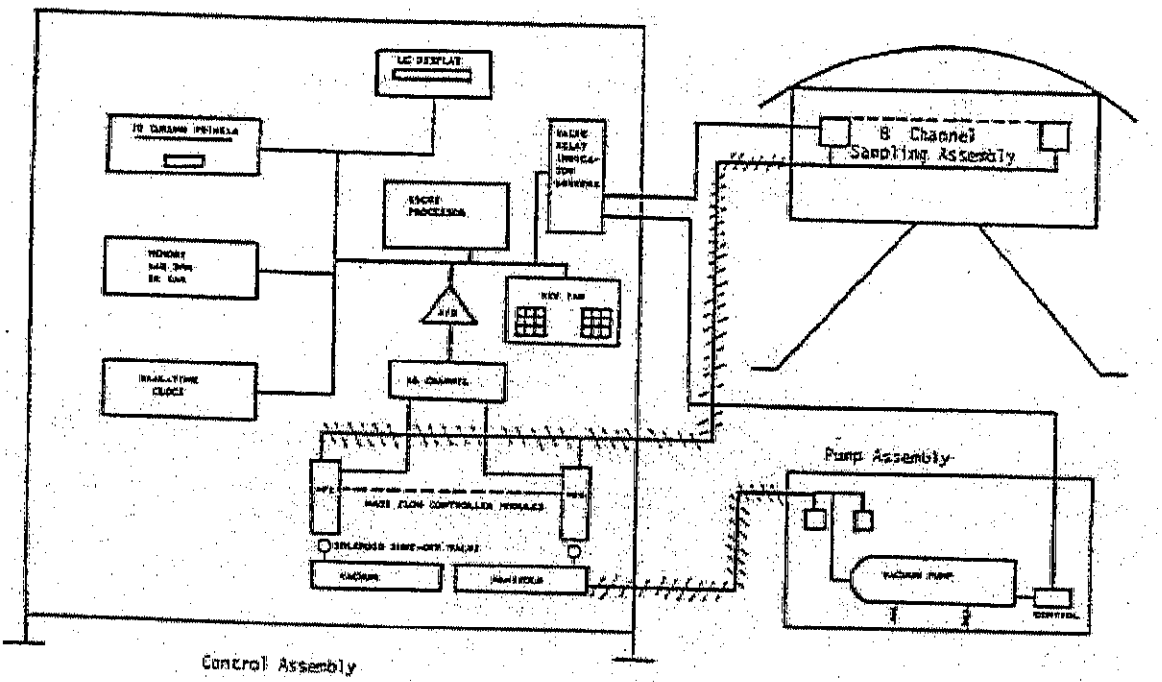


Figure R.1.0.1
System Block Diagram

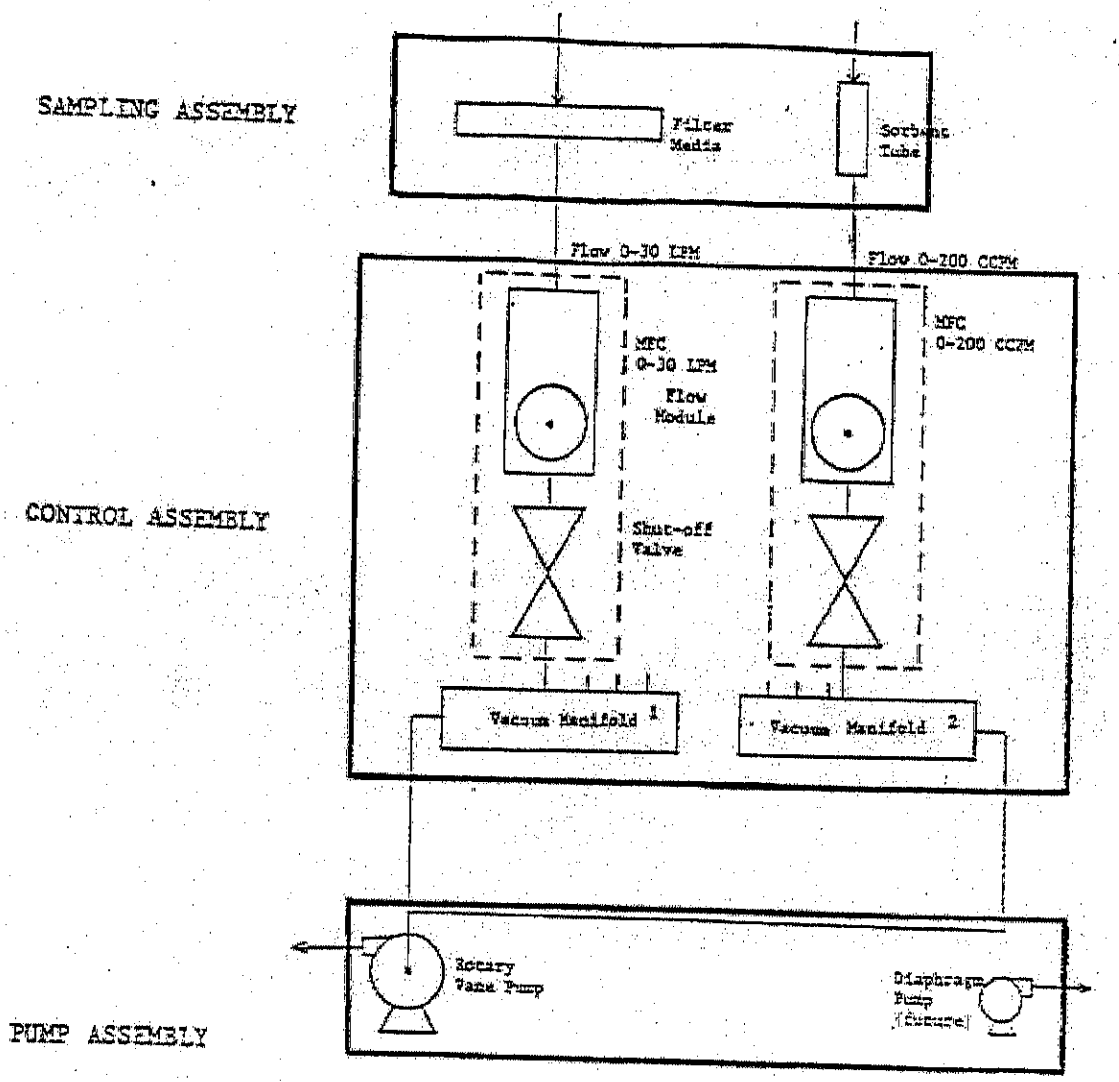


Figure R.1.0.2
Flow Diagram-920 Air Sampler System

R.1.1 INSTALLATTON PROCEDURE

R.1.1.1 PHYSICAL INSPECTION

Unpack the sampler components from each carton and examine them carefully for evidence of shipping damage or rough handling. Verify that the sampler is complete upon receipt and check for loose or damaged components. If components are found damaged, notify your supervisor for appropriate action.

R.1.1.2 INITIAL START UP

1. Assemble the Sampling Assembly by installing the three legs in the leg sockets. Install the legs with the feet facing outward and tighten the retaining screws with a large slot type screwdriver.

2. Install the sample modules as follows:

   a. Select the channels on which to install the sample modules. Filter modules must be installed on channels 1 to 4, while absorption tube modules can be installed on any channel. The channels are numbered on the sample support and corresponding numbers may be found on labels attached to tubing and the flow module mounts.

   b. Place the top of the sample module into the slot on top of the sample support.

   c. Start both knurled knobs of the holder into the support by hand and then tighten with a screwdriver.

   d. Remove the plastic cap from the Swagelok fitting.

   e. Connect the short (approximately 8 in. long) tube to the Swagelok fitting so that the metal tab on the quick disconnect fitting is pointing down. Tighten the fitting finger tight and then tighten it 1/4 turn with a wrench.

   f. Install a filter holder or absorption tube holder in the sample module as applicable.

g. Slide the quick connect onto the filter holder or absorption tube holder until it snaps into place.

h. Loop the electrical connector through the back of the sample support and connect it to the connector directly below and closest to the sampling holder for that channel.

3. Install the weather shield, used to protect the sampling modules, as follows:

a. Remove the weather shield from the shipping container.

b. Slide the weather shield down over the sample support with the slotted stanchions going between the two tabs.

c. Screw the bolts in with the large black knobs through the slots of the weather shield into the support. Place a black spacer on either side of the stanchion.

d. Tighten the weather shield in place.

4. Install the legs on the Control Assembly as follows:

a. Remove the Control Assembly and legs from the shipping container.

b. Open the assembly and make sure that all components are secure. Remove any loose components.

c. Attach the two legs to the assembly using the supplied screws. Be careful to avoid scratching the painted surfaces.

d. Place the unit upright and within eight feet of the Sampling Assembly. Make sure the cables and tubing will reach.

e. Secure the unit so the wind will not blow it over.

5. Install any additional sampling channels required as per Section R.1.1.3.

6. Locate the Pump Assembly within eight feet of the Control Assembly and within eight feet of a 110 VAC power source. This assembly has two cables which are captive to the box. One is the power cable to the entire assembly and one is the power cable to the Control Assembly.

   a. Remove the pump box from the shipping container.

   b. Remove the connecting tubing from inside the pump box.

   c. Close the pump box lid and secure the latches.

7. Complete the installation of the sampler by interconnecting the three assemblies as follows:

   a. Remove the plastic caps from the rear of the Control Assembly.

   b. Connect the eight tubes from the Sampling Assembly to the rear of the Control Assembly. Be sure that each channel tube is connected to the appropriate channel. Each tube is labeled from the right showing channels 1-8. Finger-tighten the Swagelok connection and tighten each fitting 1/4 turn with a wrench.

   c. Remove the plastic caps from the pump box.

   d. Connect two tubes to the pump box. One is 1/4 inch O.D. and the other is 3/8 inch O.D.

   e. Connect the other end of the tube to the lower fittings on the Control Assembly. Hand-tighten each fitting and then tighten it 1/4 turn with a wrench.

   f. Unscrew the protective covers from both electrical connectors on the Control Assembly.

   g. Open the Control Assembly and make sure the power is off. Power button down; push on the bottom of the button.

h. Connect the yellow cable from the pump box to the right rear of the Control Assembly (looking from the back).

i. Connect the power cable from the Sampling Assembly to the large connector on the left rear of the Control Assembly.

j. Check all tubes and electrical connections for proper connection, and that the power is off at the Control Assembly.

k. Connect the power cable to 110 Volt, 15 amp dedicated circuit.

R.1.1.3 ADDING ADDITONAL CHANNELS

When an additional flow channel is installed, it will be necessary to install the sample holder, the flow module and the AC solid state relay. Follow these steps:

1. Install the Sample Holder as described in Section R.1.1.4.

2. Install the Flow Module as described in Section R.1.1.5.

3. Install the Solid State Relay as described in Section R.1.1.6.

R.1.1.4 INSTALLING AN ADDITIONAL SAMPLE HOLDER

The following steps are necessary when an additional sample holder is installed:

1. Remove the plastic cap from the bulkhead tubing connection for the channel of interest on the Control Assembly.

2. Connect the 3/8"or 1/4" tubing with the quick disconnect. Tighten the nut finger tight, and then tighten it 1/4 turn with a wrench, making sure the quick connect is easily depressed. (It should face you when held in a vertical position.)

3. Place the sample holder tab into the slot on top of the support. Start both captive screws before tightening them.

4. Install the filter or tube holder.

5. Attach the quick connect to the filter holder or to the tube holder.

R.1.1.5 INSTALLING AN ADDITIONAL FLOW MODULE

The following steps are necessary when an additional flow module is installed.

1. Turn off the power.

2. Depress the metal tab on the quick connect and remove the plug from the channel of interest.

3. When installing additional modules for the first time, it is necessary to remove the metal retaining clip from the quick connect female coupler located on the manifold in the Control Assembly. If the retaining clip is engaged with the flow module in place, it will be very difficult to remove the flow module.

   To remove the retaining clip, do the following:

   a. Depress the tab slightly to allow movement of the spring-loaded pin.

   b. Using a stiff wire or tool, e.g., a straightened wire paper clip, depress the spring-loaded pin so that it will slide under the metal retaining ring.

   c. Carefully release the pressure on the tab and hold a thumb over the pin so that it is not ejected with spring.

   d. Remove the metal pin and its spring and remove the metal retainer and its spring.

      NOTE: These metal retainers were left on the quick connects to keep the plugs from falling out during shipment. The system will run without them because the vacuum will hold them in place.

4. Remove the plastic cap from the bulkhead fitting, which extends through the Control Assembly.

5. Attach the seven-inch tube to the bulkhead fitting. Tighten fitting finger tight and tighten it 1/4 turn with a wrench.

6. Remove the plastic cap from the flow module and inspect to ensure the screen is present.

7. Connect the flow module to the seven-inch tube. Tighten the fitting finger tight and tighten it 1/4 turn with a wrench.

8. Push the control module in so that it mates with the quick connect and tighten the 4 screws with a screwdriver.

9. Connect the electrical connections to the appropriate channel positions: the 9-pin connector to J1 to J8 and 2-pin connector to A2J1-A2J8.

10. Turn on the power.

R.1.1.6 INSTALLING ADDITIONAL CHANNEL SOLID STATE RELAYS

1. The solid state relay circuit board (PB8) is located above the vacuum manifold in the Control Assembly. Installation or replacement of the OAC5 solid state relays may require removal of flow modules one to four in order to gain access to the circuit board.

2. Open the control panel and lock in horizontal position.

3. Remove flow modules one to four if necessary to gain access to PB8.

4. Install the OAC5 solid state relay in the PB8 in the appropriate channel. Push the relay into the socket and tighten the Phillips screw.

5. Replace any flow modules that were removed, return control panel to vertical, and lock panel in place with knurled screws.

R.1.2 OPERATION

R.1.2.1 START UP

Start up is divided into two sections: **Cold Start and Warm Start.** A cold start is needed when there is a memory battery change with power off or a desire to zero all values in memory.

The cold start does not affect the clock or its time. The clock has its own battery and will keep accurate time when the power is off.

A warm start will occur each time there is a power failure or the power is turned off. The memory has its own battery and retains the program when the power is off.

R.1.2.2 COLD START

System initiation takes place each time the system is restarted. This allows the computer to know the position of each valve. This initiation will open all slider valves, close all slider valves, and then set up the system as programmed.

A cold start is performed as follows:

CAUTION: When a cold start is performed, up to four slider valves can be open. The cold start will cause all open valves to close and the power supply can drive only f our valves at a time. If more than four valves are open, it is necessary to disconnect those in excess of four valves temporarily. To do this, pull the plug that connects the sample holder to the sample support until the initiation cycle is complete (time is displayed). Plug these channels in and then use SLIDER TEST to close the valves.

1. With the power OFF, hold down the **ENTER** key and turn the power ON. Hold the key down and watch the display carefully until you see the display quickly flash "PRINTER READY".

2. Release the **ENTER** key.

3. Wait 90 seconds while the system is initiated, then the time should be displayed as:

   TIME HH:MM DDD

   (where HH is hour, MM is minute, and DDD is the Julian day). If the time is not displayed as described, repeat Steps 1-3.

4. Push **STEP** to examine the station number. **There should not be a** station number. If there is a station number, turn off the power and repeat Steps 1-4.

5. Enter the STATION NUMBER.

6. Enter the TIME.

7. Select Channel 11 by pushing **CHANNEL MENU**, then **11**.

8. Push **ENTER** to enter Channel 11 menu.

9. Push **BACKSTEP** four times to display:

   11 SLOPE 0.00

10. Enter 100 as the slope by pushing **SET 100** followed by **ENTER**.

11. Examine the value; it should read:

    11 SLOPE 100.00

    If not, repeat Step 10.

12. Push **SYSTEM MENU** until the TIME appears on the display.

13. Push **STEP** two times to show:

    CONTROL BOX XX.X C

The value XX.X should read approximately 25.0° C. This will vary depending on the ambient temperature.

NOTE: There must be a mass flow meter plugged into one of the channels in order to display temperature or voltages properly.

14. Install samples and operate the system as described in Section R.1.2.5.

R.1.2.3 WARM START

A warm start is performed automatically each time the system is turned on without the ENTER key depressed. The following may be expected:

1. The system initiation will be performed.

2. The system will flag any busy channels with a power failure time.

3. Any channels, which have a stop time less than the power fail time will begin to print their reports.

NOTE: If the display does not display the time and the printer runs but does not print, perform a cold start.

4. Sample times will not be changed.

5. Channels in use will turn **"ON"**.

6. After 10 seconds, the printer will print "READY".

Operator actions are not required with a warm start. The system will usually run automatically when power comes on after a power outage.

R.1.2.4 SAMPLING FREQUENCY

The present 12-day sampling schedule is exhibited as Figure R.1.2.1.

R.1.2.5 PRE-RUN PROCEDURE

All filters and sorption tubes are prepared in the laboratory and must be given a unique sample number. The operator at the field site collects the sample and returns it to the lab for analysis.

1. The sample program must be modified before a sample can be run. Open the Control Assembly door, which exposes the front panel. The indicator light for each channel will indicate if any channel is currently in operation. A label for each flow module shows the corresponding channel number.

2. Determine the correct channel to be programmed. Enter that channel number to begin the channel programming sequence. See Figure R.1.2.2 for Channel Control Guide or pages 25-41 of the Operations Manual for programming details.

3. Enter the SAMPLE NUMBER.

4. **STEP** to the START TIME and, if necessary, set the start hour, minute, and Julian day.

5. **STEP** to the STOP TIME and, if necessary, set the stop hour, minute, and Julian day.

6. If necessary, set the sample flow rate using the digital switches on the flow control module to the appropriate setting based on the MFC calibration (see Section R.3).

7. Ensure that the Channel is ON LINE. (See page 58 of the Operations Manual for help). Confirm that the data has been entered correctly. To PRINT a copy of the channel program, push **PRINT OPTIONS MENU** and **STEP** to the desired channel, then press **PRINT**.

8. If you observed any irregularities in channel operation, examine the channel program for the following:

START time, STOP time, SLOPE, INTERCEPT DAYS/CYCLE and ONLINE. SCANS, SMPL TIME, STFLOW and VOLUME should be zero. Fix any errors by re-entering data.

R.1.2.6 CHANGING FILTER SAMPLES

1. If necessary, swing the weather shield of the Sampling Assembly out of the way by loosening the two large knobs on either side of the shield. Lift the shield up and swing it to the side away from where you want to work.

   CAUTION: Do not get your fingers in the slider valves. If one should close on your finger, you can push it open.

   NOTE: The slider valve of the channel which is being changed should be closed. On operating channels, the sliders will be open.

2. Push in on the metal tab of the quick disconnect on the channel of interest and pull down. The plastic quick connect will be removed from the filter holder.

3. Unscrew the bottom of the filter holder, being careful not to drop the filter. See Figure R.1.2.3 for an Exploded View of the Filter Holder.

4. If present, remove the used filter cassette and place it in its numbered container for return to the laboratory for analysis.

5. Wipe all dirt from the support screen, O-ring, face plate, and rubber gasket.

6. Be sure O-ring and support screen (fine grid side up) are in place and undamaged.

7. Remove the new filter cassette from its numbered container and place it on the O-ring, making sure that it is seated properly and that the cassette is placed so that the filter is next to the support screen.

8. Ensure that the rubber gasket is in place on top of the cassette, and screw this assembly with cassette in place, up into the holder. Do not over tighten or a torn filter may result.

9. Push in the metal tab on the quick connect and slide it on to the filter holder.

10. Record the filter number on the filter box or shipment envelope and toxics log sheet.

11. Swing the weather shield back to its horizontal position and slide it down to its stop.

12. Tighten the two large knobs.

13. The Model 920 is now ready for automatic operation.

R.1.2.7 CHANGING SORPTION TUBES

NOTE: The SEP-PAK cassette contains a skin irritant. Handle with care.

1. Install the sorbent tube cassette assembly in the XonTech 920 sampling head (See Figure R.1.2.4) as follows:

   a. Position the weather shield to one side of the Sampling Assembly to provide access to the sampling heads.

   b. Remove the metal cassette holder from the sampling head by disconnecting the quick disconnect tubing fitting and turning the cassette holder counterclockwise (CCW) to "unscrew" it from the sampling heads.

   c. Remove the used SEP-PAK cassettes if applicable, cap the ends with the yellow caps provided, seal the SEP-PAK cassettes in the glass culture tube, place the culture tube in the aluminum cylinder, seal, and then place it in the cardboard shipping container and cap container.

      NOTE: If the rubber gasket comes out with the SEP-PAK, re-insert gasket in sampling module.

d. Remove the new SEP-PAK cassettes from the shipping containers (cardboard tube, aluminum tube, and glass culture tube), remove the yellow caps, and return the yellow caps to the glass culture tube.

e. Check the sorbent tube cassette assembly to ensure all the connections are intact.

f. Insert the short end of the sorbent tube into the red rubber gasket inserted in the sampling head. (The SEP-PAK with the smallest identification number should be on top).

NOTE: The gasket must be in place to properly seal the sample flow stream. Install a new gasket if none is in the sampling head.

g. Reinstall the metal cassette holder on the sampling head by turning it clockwise (CW) to screw it into the sampling head, finger tight only.

h. Reinstall the tubing quick disconnect onto the cassette holder.

R.1.2.8 POST-RUN PROCEDURE

1. Open the Control Assembly door, which allows access to the front panel. A light for each channel will indicate which channels, if any, are operating.

2. Remove the sample media as described in Sections R.1.2.6 and R.1.2.7.

3. From the Control Assembly, advance the paper with paper feed switch. Remove the automatic printout for the specific sample. Check the sample number on the display. If they do not match, resolve differences before proceeding. Also, check the printout for start and stop times, start, stop, and average flow rates, volume, and power failures.

4. Send the printout with the filter in the proper mailer. Include site name, operator name, type of sample, type of analysis, air sampler ID, and date shipped.

5. Table R.1.2.1 contains a list of pollutants, filter media, flow rates, run times, start times, and stop times. If the flow rates are not within ±10% and the run time ±1 hour, then the run should be repeated later on the sixth day particulate sampling schedule, if practical.

6. Next, log in the appropriate data onto the Sampling Log for Toxics (see Figure R.1.2.5). This logsheet is to be returned to the Air Monitoring Manager in your area on a monthly basis.

R.1.2.9 QUALITY CONTROL CRITERIA FOR FILTER SAMPLES

Quality control invalidation criteria for filter samples collected by the XonTech, Model 920 low-volume samplers are listed below. All samples collected in the field are to be checked using these criteria. If a sample does not meet these criteria, the sample is invalid. The sample filter and XonTech printout should still be sent to the laboratory with a clear, concise explanation of the reason for the invalidation. A make-up sample should be collected on the next scheduled PM10/SSI sampling date, if possible, but at least prior to the next scheduled Model 920 sampling date.

1. Filter Contamination - Filters, which are dropped or become contaminated with any foreign matter (i.e., dirt, finger marks, ink, liquids, etc.) are invalid.

2. Damaged or Torn Filters - Filters with tears or pinholes which occurred before or during sampling are invalid.

3. Sample Flow Rate

   a. If the average flow rate, as printed on the XonTech 920 printout is not within 10 percent of 10.0 LPM, the sample is invalid.

   b. If the average flow rate, as printed on the XonTech 920 printout exceeds 14.0 LPM, the sample is invalid.

   c. If the start and stop flow rates, as printed on the XonTech 920 printout differ by more than ±10 percent, the sample is invalid.

d. If the average flow rate, as printed on the XonTech 920 printout differs from the start or stop flow rates by more than 10 percent, the sample is invalid.

4. Start/Stop Time - Filter samples collected by samplers starting before 2300 hours and after 0100 hours, as indicated by the XonTech 920 printout, are invalid.

5. Sample Run Duration - Filter samples collected by samplers which operate less than 23 hours or more than 25 hours, as documented by the XonTech 920 printout, are invalid.

6. Power Failure - If a power failure during a sample run causes the stop time or sample duration requirements (#4 and #5 above) to be violated, the sample collected during that run is invalid.

7. Sampler Printout - If the sampler printout is not complete or is missing and cannot be retrieved from the sampler, the sample is invalid.

1998 SAMPLING SCHEDULE

North of Tehachapis: 910, 920 (Cr6, TM, HCHO), TSP

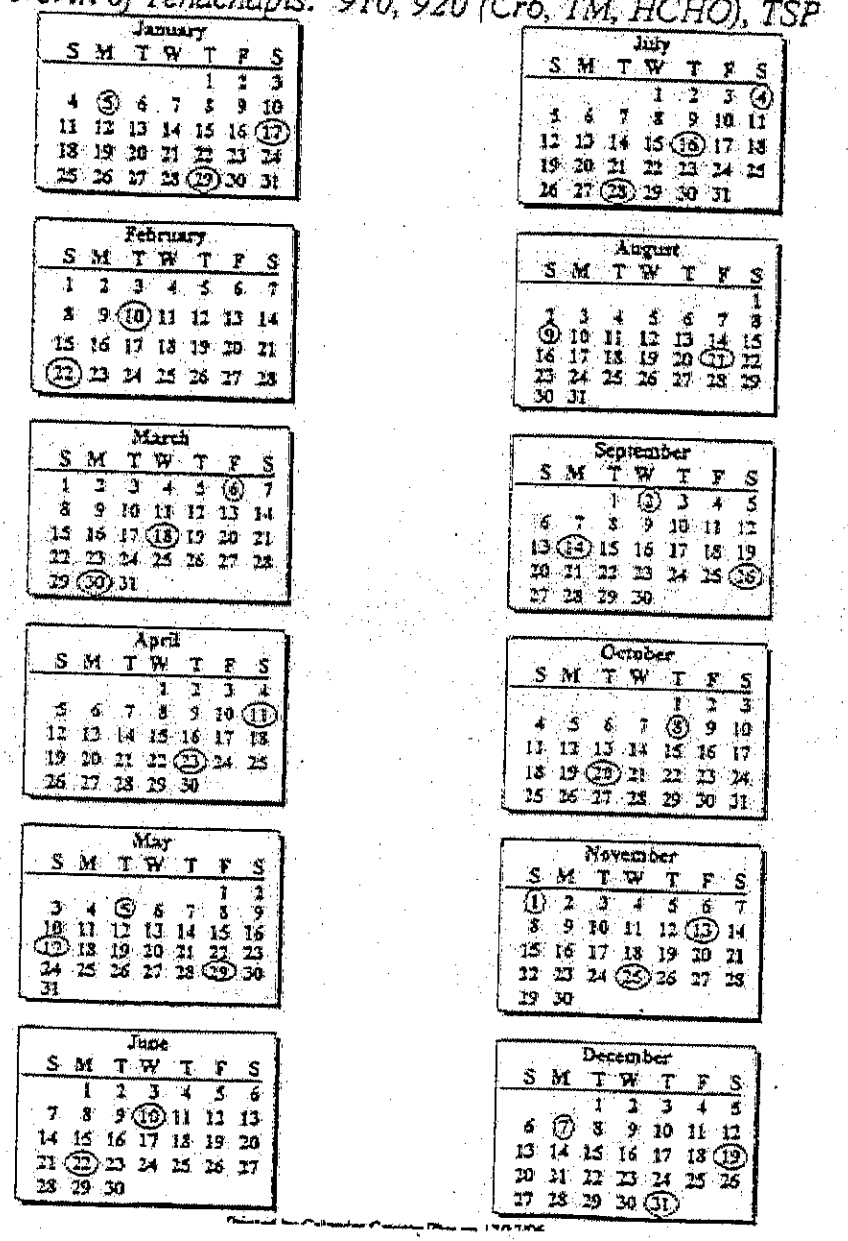


Figure R.1.2.1
XonTech 920 Sampling Schedule

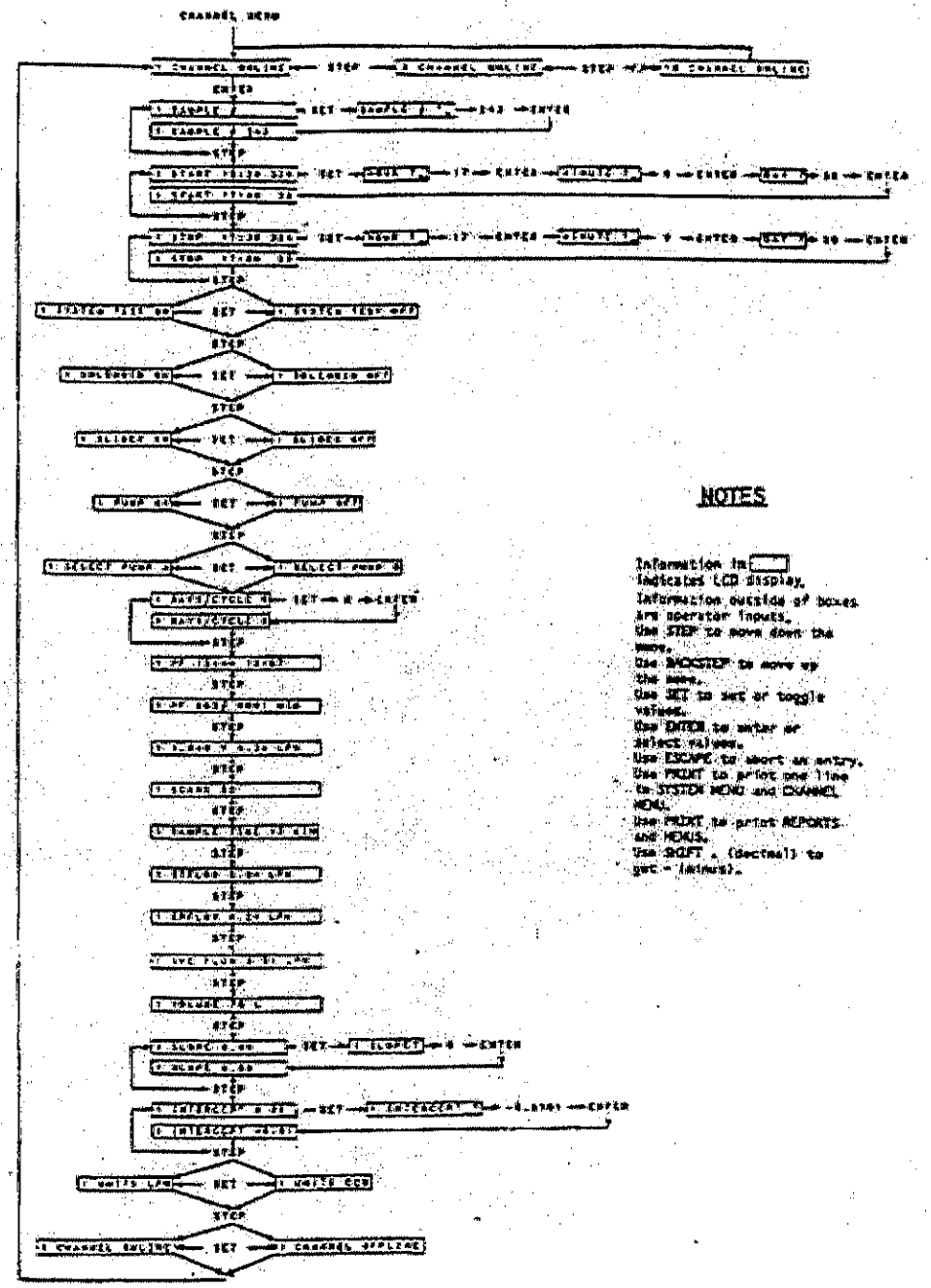


Figure R.1.2.2
Channel Control Guide

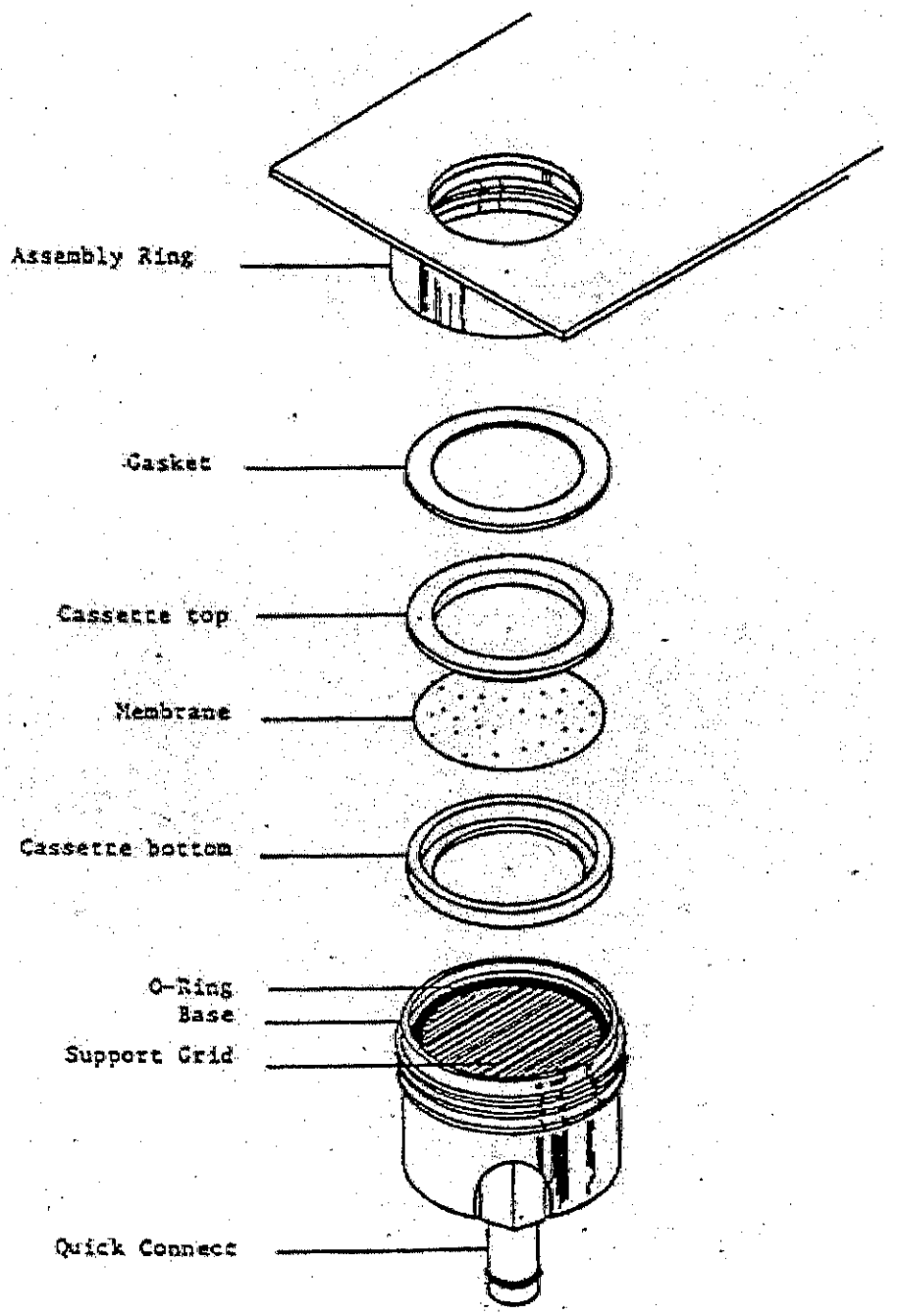


Figure R.1.2.3
Exploded View of the Filter Holder

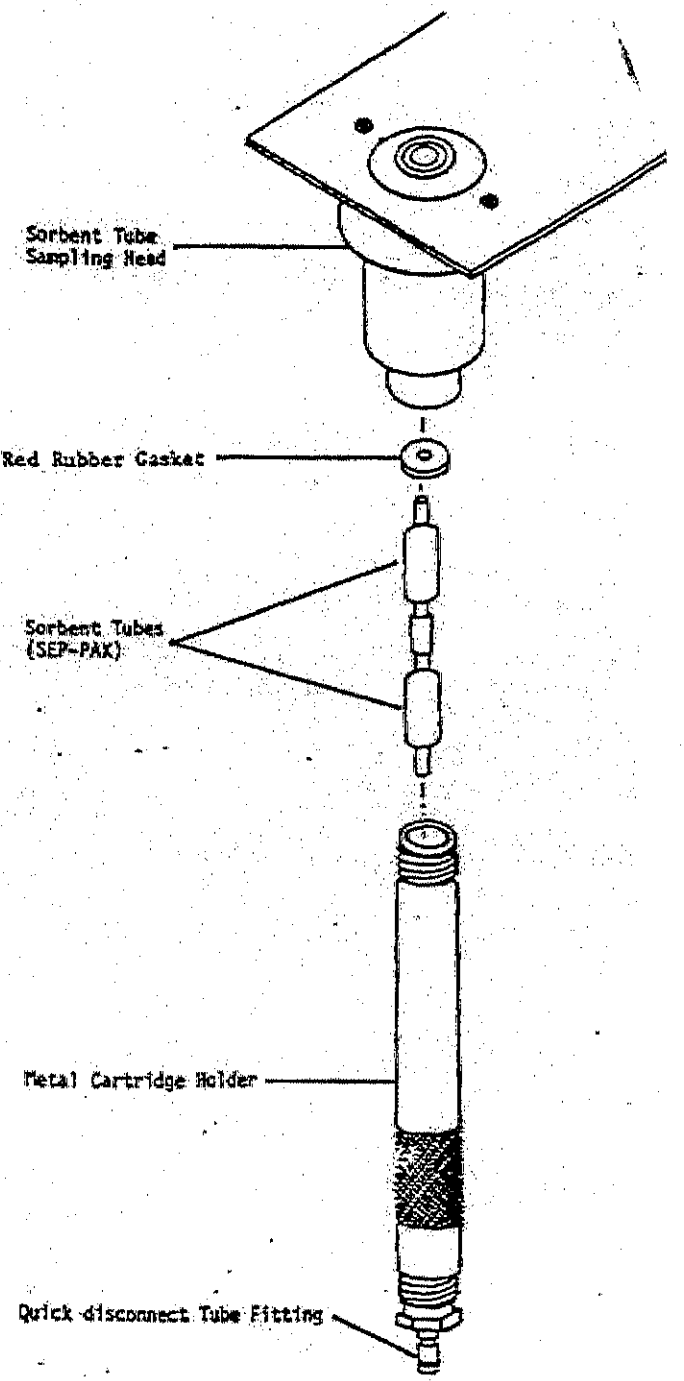


Figure R.1.2.4
Exploded View of the Sorbent Tube Sampling Assembly

CARB - MLD
Monthly Toxics Sampling Log

Location:_____ Month/Year:_____

Station #:_____ Operator/Agency:_____

DATE			Ch.		Sample	920 Samp	Elap	End Press		910A			
SCHED	RUN	SHIP	#	Type	#	Volume	Time	Can	910A	Flow	Dial	Comments

Date 910A Leak Checked:_____

Collection Method

Type:	Sampler
B = Bag	910A
C = Canister	910A
F = Filter	920, Dichot, Hi-Vol, PM10
T = Tube	920

Dichot ARB Number _____
Hi-Vol/PM10 ARB # _____
910A ARB Number _____
920 ARB Number _____

NOTE: Elapsed time and canister and sample pressure columns apply only to canister samples.
[_] Comments on Reverse.

MLD-101 (5/91)

Figure R.1.2.5
Sampling Log For Toxics

Table R.1.2.1
Air Toxics Sampling Information Table

Pollutant	Media	Flow Rate*	Run Time	Start Time	Stop Time
CR^{+6}	37mm PVC Filter**	10-14 LPM	24 ± 1 Hour	00:01:XXX	23:59:XXX
Total Metals	37mm Teflon Filter	10-14 LPM	24 ± 1 Hour	00:01:XXX	23:59:XXX
Formaldehyde	Sorbent Tubes	0.7 LPM	24 ± 1 Hour	00:01:XXX	23:59:XXX
ABC	Glass Fiber	18-20 LPM	24 ± 1 Hour	00:01:XXX	23:59:XXX

* These values are currant as of 6/91.

** Considering cellulose fiber.

NOTE: For stations, which experience severe fog in the winter, it is advisable that the Cr^{+6} and the Total Metals channels be set at flows of 10 LPM.

R.1.3 ROUTINE SERVICE CHECKS

R.1.3.1 GENERAL INFORMATION

Perform the following routine service checks using the attached schedule (Table R.1.3.1) and the procedures documented below and in Section R.1.4. Checks may be performed more frequently but should be performed at least at the prescribed intervals. The Model 920 Quality Control Checksheet (Figure R.1.3.1) should be filled out when the samples are changed and forwarded monthly to the appropriate Air Monitoring Section.

R.1.3.2 EACH RUN

1. Inspect the printer paper. Ensure that enough paper is on the roll for the report(s) to be printed out.
2. Check O-rings or gaskets for placement, resiliency, and cracks.
3. Inspect printer type. Replace the printer ribbon if the type is not clear and distinct.

R.1.3.3 MONTHLY SERVICE

1. Check System Time; the system clock will be set to Pacific Standard Time (PST) $\pm$2 minutes.
2. Check pressure on vacuum manifolds. The vacuum should be greater than 25 in/Hg.
3. Inspect tubing and power cords for loose connection, kinks, cracks, or other defects. Repair and replace parts as necessary.
4. Ensure that the Control Assembly internal fan operates when the ambient temperature is above 30°C.

R.1.3.4 QUARTERLY SERVICE

1. Clean Control Assembly fan filter.

2. Clean inside Pump Assembly.

3. Clean exteriors.

4. Clean inside Control Assembly.

5. Perform leak test on each sampling channel (see Section R.1.4.1).

R.1.3.5 SEMI-ANNUAL SERVICE

1. Perform calibration of the operating channels.

2. Change pump intake and exhaust filters.

3. Clean MFC screens.

4. Check battery voltage.

R.1.3.6 ANNUAL SERVICE

1. Change memory battery and check voltage.

2. Change clock battery.

3. Note the date when the pump vanes were last changed. Replace them if the last change was more than 30 months or check for wear if the last change is not known. Then label the sampler (on top of the pump) with the new change date.

Perform Leak Test	3 Months					
Calibrate Mass Flow Controllers	6 Months					
Change Pump Intake/Exhaust Filter	6 Months					
Check MFC Screens	6 Months					
Change Memory Batteries	1 Year					
Change Clock Batteries	1 Year					
Replace Pump Vanes	30 Months					

COMMENTS: _____

_____

_____

_____

REVIEWED BY: _____ DATE: _____

Figure R.1.3.1
Model 920 Quality Control Checksheet

Table R.1.3.1
920 Sampler Service Schedule

	EACH RUN	MONTHLY	QUATERLY	SEMI-ANNUAL	ANNUAL	30MONTHS
Inspect Paper	X					
Inspect O-Rings or Gasket	X					
Check System Time	X					
Inspect Print Type Quality	X					
Inspect Vacuum Gauge	X					
Inspect Tubing	X					
Inspect Power Cables		X				
Check Control Assembly Fan		X				
Clean Control Assembly Filter			X			
Clean Inside Pump Assembly				X		
Clean Assembly Exteriors				X		
Clean Control Assembly Interior				X		
Perform Leak Test				X		
Change Pump Intake and Exhaust Filters					X	
Clean MFC Screens					X	
Perform Calibration					X	
Change Memory Battery						X
Change Clock Battery						X
Replace Pump Vanes						X

R.1.4 DETAILED MAINTENANCE PROCEDURES

R.1.4.1 CHANGING THE PAPER ROLL

1. Remove the paper roll clear plastic cover by pulling the cover out toward you.

2. Remove the old roll by cutting the paper and then pulling the remaining paper through the printer in a forward direction.

   CAUTION: Pulling the paper out in a reverse direction will damage the print mechanism.

3. Press the **POWER** switch on the printer to the OFF position. Push on the left side of the switch.

4. Push down on both sides of the print mechanism cover and remove the cover.

5. Unroll several inches of the paper from the new roll.

6. Cut a straight edge on the paper roll if it is jagged. This will facilitate the entry of the paper into the printer.

7. Slide the paper through the slot connecting the paper compartment and the printer compartment. You can slide the paper in about one-quarter inch before it stops.

8. Press the **POWER** switch to the ON position and wait a few seconds.

9. While holding the paper in place, press the power switch to the PAPER FEED position (push switch to the right). The printer will activate, and a rubber roller will pull the paper into the printer compartment. Hold the switch in the PAPER FEED position until the paper emerges from the top of the printer mechanism. When an inch of paper has emerged from the top of the printer, release the PAPER FEED

button. Now pull the paper through the printer until several inches are exposed.

10. Replace the paper roll cover by sliding it into the slot provided until the cover is against the front panel of the printer.

11. Replace the printer cover by sliding the paper through the slot in the printer cover and reinstalling.

R.1.4.2 CHANGING THE PRINTER RIBBON

1. Press the **POWER** switch on the printer to the OFF position. Push the left side of the switch.

2. Remove the printer cover. It is not necessary to remove the paper.

3. Push down on the right side of ribbon cartridge.

4. Install the new cartridge (slide the ribbon over paper). Be sure paper goes between the ribbon cartridge and the ribbon. Be sure the ink cartridge is inserted firmly to prevent weak or irregular printing. The cartridge must be properly seated and aligned for best printing.

   Turn the cartridge "knob" (marked by an arrow) clockwise to stretch the ribbon.

5. Replace the cover.

   NOTE: If the ribbon ink gets on the printer plastic case, wipe it off before it dries.

R.1.4.3 CLEANING THE CONTROL ASSEMBLY FAN FILTER

1. Grasp the Fan Filter Cover on the edge that says: PRY OFF TO REMOVE and pull down. The cover and filter cassette will come off.

2. Remove the three screens from the cassette.

3. Wash the screens and the cassette and cover with water and detergent.

4. Rinse all the parts and dry them. Replace screens if seriously damaged.

5. Insert the screens so that the corrugations alternate in direction as they are inserted into the cassette.

6. Wipe out the inside of inlet (bottom) of the fan.

7. Install the filter as follows:

   a. Place the cassette between the two springs on the cover.

   b. The springs on the cover slide up between two tabs on the metal fan support. Start one spring and compress the other spring and slide the cassette and cover into place.

R.1.4.4 CHANGING MEMORY BATTERIES (B2)

The memory batteries may be changed with the power ON or OFF. There is an advantage to changing the batteries with the power ON; the **memory is not lost.**

1. Open the front panel of the computer.

2. Locate batteries, B2. Depress the battery springs and remove one battery and then the other.

3. Replace with: M Alkaline batteries 1.5 V. Be sure to install the batteries as indicated in the battery holder.

4. If the power is OFF, it will be necessary to go through a cold start.

5. If the sampler fails to return to normal operation (i.e., pump comes on, sliders continue to open and close, unusual display), the problem can usually be corrected by removing all batteries and turning power OFF to clear the memory. A cold start will be necessary if this method is used.

R.1.4.5 CHANGING CLOCK BATTERIES (B1)

The clock batteries may be changed with the power ON or OFF. There is an advantage to changing the batteries with the power ON; the **clock time is not lost.**

1. Open the front panel of the computer.

2. Locate batteries, B1. Depress the battery springs and remove one battery and then the other.

3. Replace with: AA Alkaline batteries 1.5 V. Be sure to install the batteries as indicated in the battery holder.

4. If the power is OFF, it will be necessary to set the clock

R.1.4.6 CHANGING PUMP INTAKE AND EXHAUST FILTERS

1. Turn off the power in the Control Assembly.

2. Disconnect power from the 110 VAC source.

3. Open the pump box.

4. Unscrew the jar from the inlet side (this is usually the cleaner side). Note condition of the cover gasket.

5. Unscrew the end cap and remove the filter cassette. Discard the filter cassette.

6. Clean the jar and end cap with water and detergent. Rinse and thoroughly dry.

7. Wipe the exposed surface with a dry cloth or Kim Wipe to remove excess dirt.

8. Insert a new filter cassette and tighten it into place with the end cap.

9. Install a new cover gasket.

10. Replace the jar and tighten it.

11. Repeat Steps 4-10 for outlet side.

12. Connect the 110 V power and turn on power to resume operation.

R.1.4.7 REPLACING PUMP VANES

1. Turn off the power in the Control Assembly.

2. Disconnect power from the 110 VAC source.

3. Open the pump box.

4. Disconnect the tubing from the tee at the inlet of the pump.

5. Remove both filter jars so they will not be broken.

6. Using a socket wrench, remove the bolts from the end plate on the filter end of the pump.

7. Remove the end plate. (Note the contour and angle of the vanes so the new vanes can be inserted properly).

8. Remove the worn or broken vanes.

9. Blow out or vacuum out the pump chamber (if available, use a small compressed air can). Rotate the motor shaft to be sure that all pieces of the vanes are removed.

NOTE: Sometimes a piece will wedge between the top of the rotor and body. If this is the case, remove the piece by rotating the motor in reverse. Note this information in a logbook. Sometimes this can cause a change in the clearance between the rotor and body. If the pump shows a low vacuum after the vanes are replaced, then the pump will need to be realigned in the shop.

10. Insert four new vanes, making sure that vanes are inserted so they fit the contour of rotor. (Pointed edge out and toward the direction of rotation.)

11. Replace the end cap. Tighten all screws finger tight before cinching down on any of them. Tighten them with a socket wrench.

12. Reinstall the filter jars.

13. Connect the inlet tubing.

14. Connect the 110 V power and resume operation.

15. Check final vacuum/pressure reading.

R.1.4.8 CLEANING EXTERIOR OF SYSTEM

Using soap and water with a sponge, wash the exterior of the pump box, control box, and Sampling Assembly. Do not get water into sample holder assembly. Use a damp rag or sponge. You must keep the slider valve clean and dry. There is nothing to lubricate in any of the assemblies.

R.1.4.9 CLEANING INTERIOR OF THE PUMP ASSEMBLY

1. **AVOID EXTREME DANGER:** Disconnect power.

2. Wipe out the interior of the pump box with a damp rag. Wipe all surfaces, including the pump.

3. Reconnect the power.

R.1.4.10 CLEANING THE INTERIOR OF THE CONTROL ASSEMBLY

1. **AVOID EXTREME DANGER**: Disconnect power.

2. Wipe out the interior of the control box with a damp rag.

3. Reconnect power.

R.1.4.11 LEAK TEST

1. Remove exposed filter or tube from sampling module, if appropriate.

2. Turn on the pump using the sequence of steps given below. The pump motor should be run for at least 10 minutes before leak testing begins. The high and low flow manifold vacuum gauges should have >25 in. Hg vacuum.

   a. Press **CHANNEL MENU.**

   b. Press **STEP** to the appropriate channel.

   c. Press **ENTER.**

   d. Press **STEP** until the display reads "SYSTEM TEST OFF".

   e. Press **SET**. The display will read "SYSTEM TEST ON", and the pump will turn on.

   f. Unplug power cable to slider valve.

3. Change Filter or tube. Install the appropriate pollutant sampling media (see Table R.1.2.1). Use a new filter or tube for this test.

4. Observe normal flow operation.

   a. Press **STEP** until the display reads "VOLTS/LPM".

   b. Check Table R.1.2.1 for normal flow rate.

   c. Troubleshoot if irregularities arise.

5. Leak Test Solenoid Valve.

   a. Press **BACKSTEP** until the display reads "SOLENOID ON".

   b. Press **SET** to turn off the solenoid. The display will read "SOLENOID OFF". (Retain same thumbwheel setting).

c. Press **STEP** until the display reads "VOLTS/LPM".

d. Observe the voltage. It updates every 15 seconds.

e. The voltage should be <2 percent of the full-scale reading of 5 volts (0.10 volts).

6. Determine "rest voltage" of the Mass Flow Controller. Rest voltage is defined as the voltage of the MFC when the pump is off and there is not any air passing through the MFC.

a. Press **BACKSTEP** until the display reads "SOLENOID OFF".

b. Press **SET**. The display will read "SOLENOID ON".

c. Press **STEP** until the display reads "PUMP ON".

d. Press **SET**. The display will read "PUMP OFF".

e. Press **STEP** until the display reads "VOLTS/LPM".

f. Note the voltage. It should be <0.10 volts.

g. If voltage is >0.10 volts call shop personnel.

7. Perform Leak Test from Sampling Module to MFC.

a. Press **BACKSTEP** until the display reads "PUMP OFF".

b. Press **SET**. The display will read "PUMP ON".

c. Press **STEP** until the display reads "VOLTS/LPM".

d. Observe the voltage and LPM. The normal operating flow rate should be on the display at this time.

e. Slide the calibration adapter (plugged to prevent flow) on top of the exposed filter or tube orifice and tighten. It may be necessary

to remove the slider, on the slider valve, to get a good seal for the tube sampling subassembly. The slider can be easily removed using an Allen wrench.

CAUTION: Do not over-tighten the calibration adapter. Over-tightening of the adapter can warp the surface plate of the sampling module.

f. The voltage reading on the display should be <2 percent of full scale (<0.10 volts) with the rest voltage subtracted.

g. If the voltage is >0.10 volts, then check all connections (particularly the calibration adapter) and seals for the source of the leak and correct.

8. If calibration is to be performed, go to Section R.3.0, otherwise, loosen the calibration adapter plug (slowly, because the resulting pressure surge may destroy the filter) and remove the calibration adapter from the sampling module.

9. Post Leak Test.

   a. Press **BACKSTEP** until the display reads "SYSTEM TEST ON".

   b. Press **SET**. The pump will stop and the display will read "RESET VALUES".

   c. Press **ESCAPE**. The display will read "SYSTEM TEST OFF".

   d. Enter the outcome on the Model 920 Quality Control Check Sheet Figure R.1.3.1

   e. Connect power cable to sampling module.

10. Inspect O-rings. Clean the O-rings if they are dirty. Replace the O-rings if they are cracked or damaged, after the leak check.

R.1.4.12 CLEANING MASS FLOW CONTROLLER (MFC) INLET SCREENS

1. Disconnect tubing to inlet of MFC on channel being serviced.

2. Unscrew inlet fitting to MFC.

3. Inspect screen on end of fitting for cleanliness and proper attachment.

4. If dirty, rinse with deionized water from squirt bottle. If dirt is persistent, it may be necessary to soak fitting in acetone.

5. If solvent is used, then you must rinse screen with deionized water and dry.

6. Install fitting in MFC and reconnect inlet tubing.

R.1.5 TROUBLE SHOOTING

The following information is a set of precautionary measures to be aware of while servicing the Model 920 Air Sampler. Table S-1 on page 91 of the Operations Manual contains further troubleshooting hints.

R.1.5.1 PUMP SERVICE

CAUTION: NEVER LUBRICATE THIS DRY "OIL-LESS" AIR PUMP. The carbon vanes and grease packed motor bearings require no oil.

Construction: The outer end plate, body, rotor, and mounting bracket are all cast iron. Consequently, any moisture that accumulates in the pump will tend to corrode the interior when the pump stands idle. The vanes are made of hard carbon and are precision ground. They should last 5,000 to 10,000 hours (on a 12-day sampling schedule this translates to 6 to 12 years) depending upon the amount of vacuum at which the pump is operated.

NOTE: The motor is thermally protected and can automatically restart when the protector resets. Always DISCONNECT power source before servicing. Personal injury and/or property damage could result.

Filters: Dirty filters restrict airflow and, if not corrected, could lead to possible motor overloading and early pump failure. Check filters periodically and replace when necessary.

Flushing: Should excessive dirt, foreign particles, moisture, or oil be permitted to enter the pump, the vanes will act sluggish or even break. Flushing of the pump should take care of these situations. In order to flush a pump, remove the filter and muffler assemblies, and introduce several teaspoons full of solvent* into the pump through the intake WHILE THE PUMP IS RUNNING. Flush unit in a well-ventilated area. Eye protection is recommended. Keep face away from exhaust port and do not flush unit with flammable solvent. Repeat the flushing procedure, and if it does not remedy the situation, remove the end plate for further examination.

*Recommended Solvent: Gast Flushing Solvent Part AH255.

CAUTION: DO NOT USE KEROSENE, GASOLINE, OR ANY FLAMMABLE LIQUID.

Disassembly: If flushing does not eliminate the problem, remove the six bolts holding the end plate to the body. Now remove the end plate and the four vanes (DO NOT REMOVE THE ROTOR OR LOOSEN ANY ELECTRIC MOTOR "THRU-BOLTS".) If the pump fails to produce the proper vacuum or pressure, the vanes could be worn. A metallic clanging could mean the rotor and body are touching. The top clearance may be adjusted by "lightly" tapping on the pump body (either top or bottom depending upon whether clearance is too large or small). The rotor should be turned while setting clearance to assure that all points on the rotor clear the body. End clearance for the drive end is .0015 and .003 inches for the dead end.

R.1.5.2 PRINTER SELF TEST

The print head and ribbon can be tested only after inserting paper. Do not print without paper. To perform the test, follow these steps:

1. Assure ON-OFF switch is in the OFF position.

2. Plug in power source to printer.

3. Depress ON-OFF switch until the printer reaches paper feed position.

4. Hold switch in paper feed position until LED light goes on and printer starts to operate. Release switch.

5. There are two ways to stop the printer:

   a. Turn ON-OFF switch to OFF position during printing operation. Wait about three seconds and depress ON-OFF switch to ON. Printer is now ready.

   b. Allow printing to continue until it stops automatically.

R.1.5.3 SLIDER VALVE

The slider valve mechanism consists of a motor driven gear mechanism, which turns a cam. The cam actuates two micro switches as it drives the slider valve open and closed. A nylon set screw is used to connect the camshaft to the motor drive.

CAUTION: Do not replace the nylon screw with a metal screw. The drive is very strong and something needs to give in the event that a finger is caught in the slider valve when it is moving.

If the nylon set screw becomes loose, it will become necessary to tighten or replace it.

1. Remove the Sample Holder Assembly from the Sampling Assembly.
2. Remove the slider cover plate and note the orientation of the slot for reassembly (it is off center).
3. Rotate the motor shaft counter clockwise until the screw is exposed.
4. Tighten or replace screw.
5. Replace the cover plate with the slot in the same orientation as above.
6. Install the Sample Holder Assembly.

STATE OF CALIFORNIA

AIR RESOURCES BOARD

QUALITY ASSURANCE

VOLUME II

STANDARD OPERATING PROCEDURE FOR AIR QUALITY MONITORING

APPENDIX R.2.0

ACCEPTANCE TEST PROCEDURE FOR THE XONTECH 920 AIR SAMPLER

MONITORING AND LABORATORY DIVISION

JUNE 1991

R.2.0 ACCEPTANCE TEST PROCEDURE

R.2.0.1 GENERAL INFORMATION

Before beginning acceptance testing of the XonTech Model 920 multichannel sampler, read the manual thoroughly. Then, initiate an acceptance test log and an acceptance test report. Record the dates of the individual tests, problems, contacts with the manufacturer, and any other pertinent information on the acceptance test log.

R.2.0.2 PHYSICAL INSPECTION

Unpack the XonTech 920 and check for physical damage and that the sampler is complete, if this has not already been done. Record the MFC serial numbers on the Acceptance Test Datasheet, Figure R.2.0.1.

1. Verify that the sampler comes with two copies of the operating and service manual.

2. Visually verify that the cabinet and all connections, which may be exposed to the elements, are weatherproof. Assemble the legs to the sampling head and connect any external parts necessary to complete the acceptance test procedure.

3. Open cabinet door and loosen captive panel mounting screws when necessary to perform the following checks:

   a. Check for correct power cord phasing; standard wiring configuration has the black wire connected to the brass terminal of the plug, white to the copper terminal, and green to earth ground. Check internal wiring to assure that all other wiring is secure.

   b. Check to see that all integrated circuits, plugs, and other connectors are properly seated in their mating receptacles.

   c. Complete assembly of any internal and accessory parts required to perform the acceptance test. (Install the inlet sampling head and leave installed for chamber testing.)

d. Verify four each AA size Alkaline batteries are installed in the memory and clock circuits labeled B1 and B2.

R.2.0.3 OPERATIONAL CHECKS

Refer to the XonTech 920 manual for proper operation of the required acceptance test steps, and to check performance of the operational results. During chamber tests, connect a strip chart recorder to the reference mass flow meters external of the chamber to assure proper Operation of the Model 920 mass flow controllers. Recorder charts should be cut into 24-hour segments and labeled at the bottom with the following:

Test performed (across bottom of chart)
Date
Make, model number, and serial number of 920 sampler under test
Range on which test is performed
Recorder trace color identification, if appropriate
Recorder identification

Clear, precise notations should be entered on the chart indicating when the tests were started and ended, pertinent information regarding sample flow, voltages, temperatures, etc., and any unusual conditions observed. Charts and 920 sampler print outs should be attached to the final acceptance reports.

Perform the following operational checks and record the results on the test report.

1. When satisfied that the 920 sampler is completely assembled and meets all physical specifications, turn on the main power switch. Follow the manufacturer's manual procedures for a Cold Start.

   a. Use the self-test procedures to verify the battery voltages.

2. Use the manufacturer's manual to perform the following performance checks and check them off as they pass or fail on the Acceptance Test Datasheet.

   a. Power Failure: Kill power to the unit and leave off for at least five minutes. Reconnect the power and verify that the 920 sampler restarts correctly following the Warm Start procedure.

b. Channel Programming Performance: Program channels 1 through 8 and verify that the program is entered and functions properly.

c. Display Unit: Verify that all segments of display operate properly during self-test.

d. Printer Unit: Verify proper operation of printer by performing printer self test.

e. Slider and Solenoid Function: Manually operate each channel and verify **ON and OFF** function of solenoids and for smooth and complete opening and closing of sliders.

f. Leak Check: Check Channels for plumbing leaks following Quality Assurance Manual Procedures (see Section R.1.4.12).

g. Memory Backup: Verify that when the unit power is interrupted for seven days or more, that the battery maintains memory.

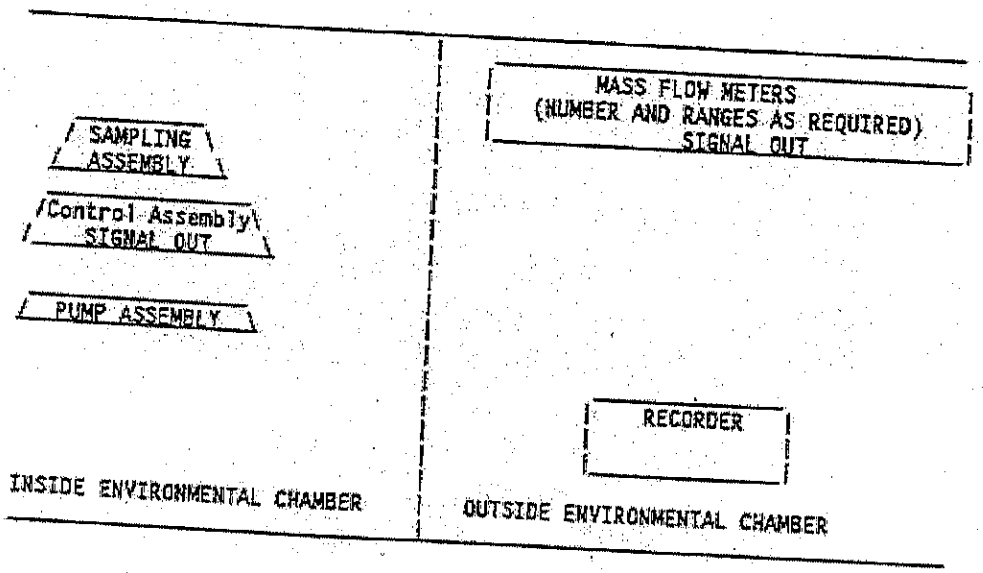
h. MFC Attitude Check: Verify that when the MFC's are rotated 45 degrees in any direction from their normal position that their readings remain stable.

i. MFC Linearity Test: Check each mass flow controller at 100, 75, 5O, 25, and 10 percent of full scale against a certified mass flow meter of the proper range. Each point should be within 1 percent for acceptable linearity. Record all linearity check results on standard calibration forms and attach the completed forms to the final report.

j. Perform the power supply self test to verify ±5 VDC and 12 VDC. Record the voltages on the Acceptance Test Datasheet.

R.2.0.4 ENVIRONMENTAL CHAMBER OPERATIONAL TESTS

1. Temperature and Voltage Stability - Set up the 920 sampler in the environmental chamber. Connect certified MFM's placed outside of the chamber to the channels under test as shown in the diagram on the next page. Keep the tube length from the Model 920 to the MFM's as short as possible.



2. With the 920 sampler operating, run a temperature/voltage test using Thermotron controller program ranging from 1 to 55 degrees C.

   a. Record the airflow into each channel during the test with a MFM and recorder which are outside of the chamber. The sample flow rate shall not change by more than $\pm$.1 percent per degree Centigrade.

   b. Reliability Testing: Verify that the Model 920 operates properly with no malfunctions of any component part during the chamber testing, such as microprocessor, printer, and displays.

R.2.0.5 POST ACCEPTANCE TEST

1. Confirm that all recorder charts are properly labeled, the test report is complete, and the 920 sampler meets or exceeds all specifications. Give the test package (test report, recorder charts, log) to the project coordinator for review.

2. After the test results have been reviewed and accepted, contact the Administrative Services Division's property clerk to have a property number assigned and attached to the sampler, complete a move tag, and turn the completed unit over to the stock clerk.

ACCEPTANCE TEST DATASHEETS
XONTECH MODEL 920 MULTICHANNEL SAMPLER

Serial No. _____ Date Testing Initiated _____

ARB Property # _____ Date of Acceptance of Unit _____

Acceptance test performed by _____

Results and data reviewed by _____ Date _____

1. **Physical/Visual Inspection**

	Passed	Failed	Final OK
Checked for shipping damage			
Two operator's manuals			
Unit weatherproof			
Checked power cord phasing			
Checked internal wiring			
Checked switches and lamps			
Checked/seated IC's, etc.			
Accessory parts complete			
Physically assemble legs			
Physically connect tubing			

2. **Operational Checks Performed**

	Passed	Failed	Final OK
Battery voltages self test			
Power failure/auto restart			
Channel programming			
Display performance			
Printer performance			
Slider/solenoid function			
Leak test			
Memory backup performance			
MFC altitude sensitivity			
MFC linearity			
Power supply self test voltages			
Actual measured voltage	+15 VDC	-15 VDC	+12 VDC

* Enter MFC S/N in Section 3.

Figure R.2.0.1
Acceptance Test Datasheet

3. Environmental Chamber Test

XonTech MFC Information			Certified MFM Information		
Manufacturer	Range	S/N	ARB #	Range	Expiration Date

Temperature and Voltage Stability

	% Dev	Pass	Fail	Final
35°C, 115V				
35°C, 125V				
35°C, 105V				
15°C, 115V				
15°C, 125V				
15°C, 105V				

Attach run results and calculations to final report.

4. Comments/Maintenance and Repairs Performed:

Attach additional sheets if necessary.

Figure R.2.0.1
Acceptance Test Datasheet (cont.)

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APPENDIX R.3.0

CALIBRATION PROCEDURE FOR THE XONTECH 920 AIR SAMPLER

MONITORING AND LABORATORY DIVISION

JUNE 1991

R.3.0 CALIBRATION PROCEDURE

R.3.0.1 OVERVIEW

The mass flow controllers (MFCs) inside the XonTech 920 Control Assembly are calibrated using flow transfer standards that have been certified against a primary flow standard. The certification of the transfer standard is referenced to 25 • C and 760mm Hg. Since the flow transfer standard is a mass flow meter (MFM) the calibration does not have to be corrected for altitude or temperature.

One to three calibrations of the MFC are performed against the flow transfer standard. The initial calibration is as is to verify previously collected data. The second calibration, final, is performed if leaks were corrected or other maintenance performed. The third calibration, confirmation, is performed after new slope and intercept data are input into the 920 microprocessor.

R.3.0.2 APPARATUS

1. Transfer standard mass flow meters:
   Ranges: 0-3 SLPM and 0-30 SLPM
2. 1/4 inch + 3/8 inch Teflon tubing
3. Calibration adapter
4. 2 adjustable wrenches (6 inch)
5. 1/4 inch + 5/16 inch brass plugs
6. Spare O-rings
7. New filters, cassettes and tubes
8. Calibration report forms
9. 1/8 inch Allen wrench
10. Calculator capable of performing linear regression curve fitting.

STATE OF CALIFORNIA

AIR RESOURCES BOARD

QUALITY ASSURANCE

VOLUME II

STANDARD OPERATING PROCEDURE FOR AIR QUALITY MONITORING

APPENDIX R.3.1

CALIBRATION PROCEDURE FOR THE XONTECH 920 AIR SAMPLER

MONITORING AND LABORATORY DIVISION

JUNE 1991

R.3.1 CALIBRATION

R.3.1.1 AS IS CALIBRATION

Other than routine daily checks, sampler repairs or adjustments should not be made prior to the as is calibration. The sampler should be calibrated after six months of operation, if the sampler is moved to a different site, or if the initial falls outside of the specified tolerance limits (see Table R.1.2.1).

1. Lift the sampling assembly hood and tilt it in the direction that allows access to the sampling module in need of calibration. Remove the existing filter or tube (if one is currently installed) and replace with an unexposed filter or tube.

2. Turn on the pump using the sequence given below. The pump motor should run for at least 10 minutes before the calibration beings. The high- and low-flow manifold gauges should have >25 in. Hg vacuum.

a. Press **Channel Menu**.

b. Press **Step** to the appropriate channel.

c. Press **Enter**.

d. Press **Step** until the display reads "System Test Off".

e. Press **Set**. The display will read "System Test On", and the pump will turn on.

f. Unplug the power cord to slider valve motor.

NOTE: The slider valve for the absorbent tube must be removed to properly seal calibration adapter.

g. Install calibration adapter. Try to ensure a leak free seal in the adapter set up. Do not correct other leaks at this time. A complete leak check with repairs will be done after the as is calibration.

3. Connect the certified MFM to the sampling module, if XonTech style adapter is used. The large O-ring on the calibration adapter will seal the filter sampling ports, and the small Oring will seal the tube inlet when the slider valve involved. If the ARB adapter is used, it is placed in the filter holder in place of the plastic cassette. Install the appropriately sized Teflon tubing between the MFM and the calibration adapter. Tighten all compression fittings (i.e., Swagelok) 1/4 turn past finger tight. Plug in and turn on the MFM.

4. Fill out the XonTech 920 Calibration Form (Figure R.3.1.0) as completely as possible. Enter date, pollutant, sample property number, site name, site number, transfer standard certification information, as is information, etc.

5. After the sampler has warmed up:

   a. Press **Step** until the display reads "Voltage/LPM".

   b. With the thumbwheel set to the as is set point, record the transfer standard display, thumbwheel setting, volts display, and flow rate display after the readout has stabilized.

   c. Advance the thumbwheel setting by 5-101 of full scale and record the average volts and flow rate on the XonTech 920 Calibration Form after the 920 display has stabilized.

   d. Repeat Step 3 until 2 points are collected above the as is thumbwheel set point and 2 points are collected below the as is set point.

6. Return system to standby.

   a. Press **Backstep** until the display reads "System Test On".

   b. Press **Set**. The pump will stop and the display will read "Reset Values".

   c. Press **Escape**. The display will read "System Test Off".

R.3.1.2 LEAK TEST

1. Perform leak test as stated in Section R.1.4.11.

2. Repair leaks as needed.

R.3.1.3 FINAL CALIBRATION

NOTE: For stations which experience severe fog in the winter, it is advisable that the Cr^{+6} and the Total Metals channels be set at flows of 10 LPM.

A final calibration is required after maintenance is performed that would affect the flow path of the sample air, after installation of the sampler or replacement of the control assembly or flow module. Perform the final calibration, if required, using the same procedures as used in the "as is" calibration. Using the data obtained (voltage displayed vs. standard flow), calculate the new slope and intercept and program the new values into the channel menu.

R.3.1.4 CONFIRMING CALIBRATION

A confirming calibration is required if the new slope and/or the intercept values are entered into the 920 microprocessor. The confirming calibration compares the standard flow rate calculated from the flow transfer standard with the flow rate display of the 920. The confirming calibration must have a slope of 1.00 ± 0.01 and intercept of less than 0.5 percent of the MFC full scale flow rate.

At the conclusion of all calibrations, remove the calibration adapter and plug in the power cord to the slider valve motor.

XONTECH 920 CALIBRATION FORM

Site _____
Site No. _____
Sampler Property No. _____
MFC Serial No. _____
Pollutant _____ Channel _____

Date _____ Log # _____
Transfer Standard Prop. No.: _____
Transfer Standard Channel: _____
Certification Expires: _____
Airflow= _____ X Display ± _____

Vacuum Hi/Lo _____ / _____
Leak Check Voltage _____
Previous Cal. Log # _____
Previous Cal. Slope _____
% Dev. from Previous Cal. _____

	As Is	Final	Conf.
	----- Flow Versus -----		
	Volts	Volts	Disp.
Slope			
Intercept			
Corr. Coef.			
Set Point			

	XONTECH 920			TRANSFER STANDARD	
	Set Point	Volt Display	Flow Rate Display	Display	Std. Flow Rate
As Is					
Final					
Conf.					

Comments: _____

Calibrated by _____ Checked by _____

MLD-82 (5/91)

Figure R.3.1.0
XonTech 920 Calibration Form

R.3.2 CALCULATIONS

The final calibration or the as is calibration (if a final calibration is not required) must have a correlation coefficient greater than 0.999. The comparison between the standard flow rate and the 920 flow rate display (confirming calibration) must have a slope of 1.00 $\pm$ 0.01 and an intercept of +0.5 percent of full scale ($\pm$0.15 LPM for a 30 LPM full-scale flow rate). If the confirming calibration data do not meet these specifications, maintenance, and/or another final calibration must be performed, a new slope and intercept entered into the 920 microprocessor, and another confirming calibration performed.

R.3.2.1 DETERMINATION OF STANDARD FLOW RATES

Multiply the transfer standard display values by the transfer standard certification slope and add the intercept to obtain the standard flow rate values for the as is, final, and confirming calibrations. Record values on the XonTech 920 Calibration Form (Figure R.3.1.0).

R.3.2.2 AS IS LINEAR REGRESSION

Perform a linear regression calculation on the as is voltage display and the as is standard flow rates. Record the slope, intercept and correlation coefficient.

R.3.2.3 FINAL LINEAR REGRESSION

Calculate the linear regression for the final voltage displays and the standard flow rates. Record the slope, intercept and correlation coefficient. Enter the slope and intercept values into the proper channel.

R.3.2.4 THUMBWHEEL SET POINT

Determine the correct thumbwheel set point by either performing a linear regression of standard flow rate versus set point or adjusting the thumbwheel with channel in normal operation to get the desired display flow rate.

R.3.2.5 CONFIRMING CALIBRATION

For the confirming calibration, perform a linear regression analysis of standard flow rate versus 920 flow rate display. The slope and intercept must meet the requirements of Section R.3.2.

R.3.2.6 PERCENT DEVIATION FROM PREVIOUS CALIBRATION

Determine the percent deviation from the previous calibration using the following calculation:

$$\frac{S1 - S2}{S2} \times 100 = \% \text{ Deviation}$$

where,

S1 = the previous flow rate determined by using the as is thumbwheel setting with the final slope and intercept values from Section R.3.1.2.

S2 = the final flow rate determined by using final thumbwheel setting with the final slope and intercept values from Section R.3.1.2.

Enter the value on the XonTech 920 Calibration Form.

R.3.2.7 CALIBRATION REPORTING INSTRUCTIONS

Complete the XonTech 920 Calibration Form (see Figure R.3.1.0). Send in to the instrument files. Return a copy to the sampling site for inclusion in the station file.

R.3.2.8 BLANK FORMS AND ASSISTANCE

A supply of blank XonTech 920 Calibration Forms, as well as assistance in calibration procedures, can be obtained by contacting:

STATE OF CALIFORNIA
Air Resources Board
Monitoring and Laboratory Division
Air Quality Surveillance Branch
P.O. Box 2815
Sacramento, CA 95812

Appendix B.3

Standard Operating Procedure for the Analysis of Hexavalent Chromium at Ambient Atmospheric Levels by Ion Chromatography, Method MLD039

Engineering and Laboratory Branch
Monitoring and Laboratory Division

METHOD MLD 039

STANDARD OPERATING PROCEDURE FOR THE ANALYSIS OF HEXAVALENT CHROMIUM AT AMBIENT ATMOSPHERIC LEVELS BY ION CHROMATOGRAPHY

Effective Date: August 1, 1993
Revision Number: 3

DISCLAIMER: Mention of any trade name or commercial product in this Standard Operating Procedure does not constitute endorsement or recommendation of this product by the Air Resources Board. Specific brand names and instrument descriptions listed in the Standard Operating Procedure are equipment used by the ARB laboratory. Any functionally equivalent instrumentation can be used.

1 INTRODUCTION

The California Air Resources Board identified hexavalent chromium (Cr+6) as a toxic air contaminant in January 1986. Chromium is a natural constituent of the earth's crust and present is several oxidation states. Trivalent chromium (Cr+3) is naturally occurring, environmentally pervasive and a trace element in man and animals. Hexavalent chromium is anthropogenic from a number of commercial and industrial sources. Chromium +6 readily penetrates biological membranes and has been identified as an industrial toxic and cancer causing substance. Hexavalent chromium is a known inhalation irritant and associated with respiratory cancer. Chromium +6 exposure is primarily associated with the chrome plating and anodizing process and emissions from chromate treated cooling towers.

Hexavalent chromium has been measured in the air at sites in many populated areas of California. Twenty monitoring stations (plus two colocated sites) have been set up to assess public exposure to hexavalent chromium. Cellulose filters are exposed to ambient air using a Xontech 920 Toxic Air Sampler. Samples are taken every 12 days, year round. The analytical procedure for the analysis of chromium +6 from exposed filters is described in this document ELB-SOP Method MLD 039.

2 SUMMARY OF METHOD

MLD Method 039 covers the determination of chromium +6 from bicarbonate impregnated ashless cellulose filters exposed to ambient air and submitted to the laboratory by the site operators. The filters are extracted in deionized water via sonication for 3 hours. The extract is analyzed by ion chromatography using a system comprised of a guard column, an analytical column, a post-column derivatization module, and a UV-VIS detector. In the analysis procedure, chromium +6 exists as chromate due to the near neutral pH of the eluant. After separation through the column, the Cr+6 forms a complex with the diphenylcarbohydrazide (DPC) which can be detected at 540 nm. The peak analysis is completed using the P.E. Nelson 2600 chromatography software version 5.2.

3 INTERFERENCES AND LIMITATIONS

Sodium carbonate used as the stabilizing media in the Cr+6 filters was observed to cause interferences with the analysis. Higher concentrations of the sodium bicarbonate impregnating solution may cause flow restrictions during ambient air sampling. The use of a smaller pore size impregnated filter has been shown to cause definite flow restrictions during sampling.

4 INSTRUMENTATION AND EQUIPMENT

This SOP assumes familiarity with the installation and operation of the Dionex ion chromatographic system. For more detailed instructions in the operation of the Dionex IC, please refer to the Dionex operations manual.

4.1 Dionex Ion Chromatographic System

The ion chromatographic system is comprised of modular units from the Dionex Corporation:

- a Dionex gradient pump
- Automation Interface- to control the injection valve
- Reagent Delivery Module (RDM) (P/N 35354)
- Variable Wavelength Detector
- Automated Sampler

4.2 Operating Conditions

Sample Loop Volume	400 ☞L
Analytical Column	Ion Pac CS5 (P/N 037028)and an Ion Pac CG5 guard column (P/N 037029)
Eluant	2 mM Pyridinedicarboxylic Acid (PDCA) 2 mM Na_2HPO_4 10 mM NaI 2.8 mM LiOH
Flow Rate	1.0 mL/min
Post-Column Reagent	2 mM Diphenylcarbohydrazide (DPC) 10% CH_3OH 0.9% N H_2SO_4
Reagent Flow Rate	0.5 mL/min
Mixing Device	Reaction coil
Detector Wavelength	540 nm

P.E. Nelson 2600 chromatography data system (revision 5.2) is used to analyze all the data.

5 REAGENTS AND MATERIALS

5.1 Materials

- Nanopure ASTM Type I deionized water (> 16 MΩ-cm) for preparing eluant and standards.
- volumetric flasks 1L, 2L
- wide-mouth polyethylene storage bottles (250 mL and 1000 mL)
- Sartorius analytical balance
- Rainin EDP-2 digital pipettor with disposable pipets (100μL)
- all chemicals are spectrophotometric grade
- Teflon centrifuge tubes 30 mL with caps
- Ultrasonicator
- combination hot plate/stir plate
- gases are high-purity nitrogen at 110 psi for valve switching and high-purity helium at 20 psi for degassing the eluant and pressurizing the reservoirs

5.2 Reagents

5.2.1 Eluant Stock

An eluant stock solution of the following reagents is prepared in deionized water:

- 20 mM (3.34 gm/L) Pyridine 2,6-Dicarboxylic Acid (PDCA)
- 20 mM (5.36 gm/L) Disodium hydrogen phosphate heptahydrate (Na_2HPO_4-$7H_2O$)
- 100 mM (15.0 gm/L) Sodium iodide (NaI)
- 500 mM (38.5 gm/L) Ammonium acetate ($CH_3CO_2NH_4$)
- 28.0 mM (1.10 gm/L) Lithium hydroxide monohydrate (LiOH)

The PDCA is slow to dissolve. Heat approximately 700 mL deionized water in a 1 L beaker on a hot plate/stirrer. Add the PDCA and let it dissolve before adding the remaining reagents. Turn off the heat, and let cool. Pour into a 1L volumetric flask and bring to volume with deionized water. Transfer the stock eluant to a 1 L wide-mouth polyethylene storage bottle.

5.2.2 Working Eluant

The working eluant is prepared by diluting 100 mL of the eluant stock to volume in a 1L volumetric flask. Transfer the eluant to the eluant reservoir on the IC. (2 L of the working eluant maybe easier to prepare.) The pH of the diluted eluant should be between 6.70 and 6.80.

5.2.3 Post-column Reagent

Dissolve 0.5 gm of 1,5-diphenylcarbohydrazide in 100 mL HPLC grade methanol in a 1 L volumetric flask. Add about 500 mL deionized water and 25 mL of 96% spectrophotometric grade sulfuric acid. Bring to volume with deionized water. Transfer to the reservoir for the reagent delivery module.

5.3 Sodium bicarbonate impregnating solution

The filters are soaked in a 0.12 mM sodium bicarbonate ($NaHCO_3$) solution. Dissolve 5.0 gm of sodium bicarbonate in deionized water in a 500 mL volumetric flask. Bring to volume and transfer to a wide-mouth polyethylene storage bottle.

5.4 Calibration standards

The calibration stock solution for Cr+6 is obtained from the National Institute of Science and Technology-Standard Reference Material (Gaithersburg, Md.). The solution is 1.0 mgm/mL in deionized H_2O.

5.4.1 Intermediate standard

A 100 µgm/mL intermediate standard is prepared from the stock. Dilute 10.0 mL of the stock to volume in 100 mL volumetric flask with deionized water. Transfer the solution to 250 mL wide-mouth polyethylene storage bottle.

5.4.2 Working standards

Prepare the working standard from the intermediate solution. The working standard is 1.0 µgm/mL. Dilute 1.0 mL of intermediate standard with deionized water in 100 mL volumetric flask. Transfer to a 250 mL wide-mouth storage container. The dilutions of the 1.0 µgm/mL working standard for the 100 mL calibration standards is as follows:

0.5 ngm/mL	50 ☞L
1.0 ngm/mL	100 ☞L
1.5 ngm/mL	150 ☞L
2.5 ngm/mL	250 ☞L

5.5 Control standard

As part of the quality assurance program in the evaluation of the data a control or secondary source of the intermediate range calibration standard (1.0 ngm/mL) is run as a check of the precision of the instrument and calibration. A stock solution of 1.0 mgm/mL Cr+6 is obtained from Inorganic Ventures (Lakewood, N.J.). An intermediate standard of 100 µgm/mL is prepared as in 5.4.1 above. The working control standard of 1.0 µgm/mL is prepared as 5.4.2 above.

A control of 1.0 ngm/mL is prepared from the working solution by diluting 100 µL of 1.0 µgm/mL to 100 mL with deionized water. The solution is run once for every calibration completed.

5.6 All the solution are stored in the refrigerator until ready for use. The solutions are brought to room temperature before analysis.

6 PROCEDURE

Whenever the filter is handled use clean teflon coated or plastic tweezers or handle with disposable PVC gloves.

6.1 Preparation and handling of filters

In a large clean petri dish pour in some of the sodium bicarbonate impregnating solution. Place in the dish one at a time, so that there is no overlap a Whatmen #41 37 mm cellulose filter. Allow the filters to soak for a few minutes. After soaking, remove the filters from the solution and place them on a plastic net or rack. Let the filters dry in the hood, approximately 2 hours. Store the dried filters in a zip-loc bar and keep in the freezer until needed to send to the field or used as spikes or blanks in the analysis. The freezing is done to reduce the sodium bicarbonate from reacting with possible interfering substances present in the air.

When preparing the filters for mailing out to the field, place the filter in a clean, black filter holder ring, and place this in a clean plastic petri dish and place a label on the lid for identification of the site.

Presently filters/dishes are sent out to the field approximately every 3-4 months. If possible these filters should be kept in a cool, dry place.

6.2 Filter log-in

The filters are logged into the laboratory information management system (LIMS) and assigned an identification number. Data is entered the system regarding date run, site, average flow rate, duration, and air flow through the Xontech.

6.2.1 The quality control criteria for the filters is given below. All samples being logged in from the field are checked for these criteria. If a sample does not meet these criteria, the sample is invalid.

1. filter contamination: filters which are dropped or become contaminated with any foreign matter (i.e. dirt, finger marks, ink, liquids, etc.) are invalid.

2. damaged or torn filters: filters with tears or pinholes which occurred before or during sampling are invalid.

3. sample flowrate:

   - if the average flowrate, as printed on the Xontech 920 printout, is less than 9.0 LPM, the sample is invalid.

   - if the average flowrate, as printed on the Xontech 920 printout, exceeds 14 LPM, the sample is invalid.

   - if the start and stop flowrates, as printed on the Xontech 920 printout, differ by more than $\pm$ 10%, the sample is invalid.

   - if the average flowrate, as printed on the Xontech 920 printout, differs from the start or stop flowrates by more than $\pm$ 10%, the sample is invalid.

4. start/stop time: filter samples collected by samplers starting before 2300 hours and after 0100 hours, as indicated on the Xontech 920 printout, are invalid.

5. sample run duration: filter samples collected by the samplers which operate less than 23 hours or more than 25 hours, as documented by the Xontech 920 printout, are invalid.

6. power failure: if a power failure during a sample run causes the stop time or sample duration requirements (#4 and #5 above) to be violated, the sample collected during that run is invalid.

7. sample printout: if the sampler printout is not complete or is missing and can not be retreived from the sampler, the sample is invalid.

6.2.2 Upon arrival of the filter to the laboratory, the sample should be placed int e freezer until ready for use.

6.3 Filter extraction

Due to oxidation/reduction and conversion problems of Cr+3 and Cr +6, the extraction should be immediately prior to analysis. Cr+6 concentrations in the extracts have been shown to increase significantly with time. Therefore, it is important that the ion chromatograph be equilibrated and ready for analysis.

6.3.1 Remove the exposed filter from the petri dish and sample ring using disposable PVC gloves:

Place the filter in a 30 mL teflon tube and add 15 mL of deionized water and cap the tube tightly.

6.3.2 Place the teflon tubes in an test tube rack and place in a sonicator for 3 hours.

6.3.3 After 3 hours of sonication, remove the tubes and transfer the sample to a 5 mL Dionex IC autosampler vial. and analyze. Extracts should be stored in a refrigerator until all analysis of samples are complete.

6.4 Quality Control

6.4.1 Blanks: Blanks are run for each sample set extracted and analyzed, both a water blank and a filter blank. These are run after the calibration, standard check, and controls are analyzed.

6.4.2 Spikes: A clean, unexposed filter is spiked with 15 ☞L of the 1.0 ☞gm/mL solution and allowed to dry. These filters are kept in a storage bag and kept in the freezer until ready for use. A spike is run with each sample set extracted. The calculated value should be 1.0 ngm/mL with a recover of ± 20%.

6.5 Instrument calibration procedure

The first four runs should be the working standards, this calibration is run initially and then every **10** samples in the analysis run. This is to compensate for any change in the Cr+6 concentrations that occurs naturally. This is followed by a standardcheck using the intermediate standard (1.0 ngm/mL) and a control (1.0 ngm/mL).

7 METHOD SENSITIVITY AND PRECISION

7.1 Linearity: The calibration curve is linear from 0.2 to 10.0 ngm/mL Cr+6. The detection limit is 0.2 ngm/mL.

7.3 Limit of detection (LOD)

The following is the calculated results for the Cr+6 detection limit:

The standard deviation of 8 runs of 0.5 ngm/mL = 0.031 x intercept of calibration = 0.072 correlation coefficient of calibration = 0.997 calculated LOD = 3 (standard deviation) + absolute value of b= 0.165 ngm/mL or **0.2 ngm/mL**

8 REFERENCES

1. California Air Resources Board Method 105: Procedure for the Analysis of Hexavalent Chromium at Ambient Atmospheric Levels by Ion Chromatography.
2. Dionex Technical Note TN24: Determination of Chromium by Ion Chromatography Dionex Corporation, July 1991.

Appendix B.4

Standard Operating Procedure for the Trace Elemental Analysis of Low-Volume Samples Using Inductively Coupled Plasma-Mass Spectrometry (ICP-MS), SOP MLD061

California Environmental Protection Agency

Air Resources Board

SOP MLD061

STANDARD OPERATING PROCEDURE (SOP) FOR THE TRACE ELEMENTAL ANALYSIS OF LOW-VOLUME SAMPLES USING INDUCTIVELY COUPLED PLASMA - MASS SPECTROMETRY (ICP-MS)

Northern Laboratory Branch (NLB)
Monitoring and Laboratory Division (MLD)

Date SOP for MLD061 First Approved: May 1, 2002
Revision Number: 0.0

DISCLAIMER: Mention of trade names or commercial products in this document does not constitute endorsement or recommendation for use. Specific brand names for instruments and materials listed herein are only for descriptive purposes by the Air Resources Board laboratory.

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SOP MLD061

STANDARD OPERATING PROCEDURE (SOP) FOR THE TRACE ELEMENTAL ANALYSIS OF LOW-VOLUME AMBIENT AIR SAMPLES USING INDUCTIVELY COUPLED PLASMA - MASS SPECTROMETRY (ICP-MS)

1. SCOPE

This document details the acid extraction and trace elemental analysis of ambient air samples using an inductively coupled plasma-mass spectrometer (ICP-MS). The extraction procedures herein are suitable for low-volume ambient air samples collected on exposed Teflon membranes, sized up to 47 millimeters in diameter. Also, this document outlines the basic steps necessary to develop an analysis method for other types of air samples requiring trace metal analysis by ICP-MS.

1.1 Northern Laboratory Branch (NLB) uses the acronym ICP-MS as designated by the instrument manufacturer(s) and patent holder(s) of this technology. The United States Environmental Protection Agency (U.S. EPA) alternately uses the acronyms ICP-MS and ICP/MS. Literature searches should include both acronyms.

1.2 ICP-MS offers improved detection limits over previous elemental analysis techniques, which is essential given the decreasing levels of toxic metals found in ambient air. Also, ICP-MS allows for the rapid determination of a multitude of isotopic analytes previously uncharacterized by the Air Resources Board (ARB).

1.3 This method gives the basic procedures for preparing sample extracts, analyzing the extracts, and determining the reliability of the data acquired. Since sample matrices and analytes of interest both fluctuate, the analyst is responsible for demonstrating the accuracy and precision of the method by monitoring potential sources of interferences and taking appropriate action to ensure data of known quality. The analyst using this method should be knowledgeable in the recognition and correction of spectral, chemical and physical interferences in ICP-MS.

2. DEFINITIONS

2.1 **Inductively Coupled Plasma-Mass Spectrometer.** An analytical instrument that uses a radio-frequency inductively coupled plasma (ICP), which nebulizes (aerosolizes) a liquid sample into a state of ionization, configured in series with a quadropole mass spectrometer (MS), which separates the resulting ions by their mass-to-charge ratios, and then quantifies the number of ions detected using an electron multiplier detector. Interferences, mass-to-charge ratio overlaps, and background ions must be assessed and valid corrections applied. (Figure 18.1)

2.2 **Limit of Detection (LOD).** A calculated value that represents the minimum concentration of an analyte that can be reported with 99% confidence. (Section 17)

2.3 **Ultrasonic Nebulizer / Desolvator.** A two-fold device that: 1) uses transducer-based sonication to convert liquid samples into aerosols prior to being introduced into the plasma for ionization; and, 2) heats, then cools the nebulized sample to remove much of the primary solvent, which for this method is water. The desolvator lessens the interference effects of hydrogen and oxygen. (Figure 18.2)

3. SUMMARY OF METHOD

3.1 Ambient air particulates, collected on Teflon membranes, are extracted into a dilute nitric acid solution by sonication with heating. The extraction solution is stored at room temperature until elemental analysis by ICP-MS.

3.2 This method uses an ultrasonic nebulizer serially configured with a desolvator unit. If a pneumatic nebulizer is used, additional correction equations for hydrides, oxides, and dioxides must be added.

3.3 This method is known to be suitable for $PM_{2.5}$, Dichotomous PM_{10} (Dichot), and Total Metal samples, provided the particulates are collected on Teflon membranes. Depending on the analytes of interest, this method may not be suitable for analysis of air samples collected on quartz or glass micro-fiber filters.

3.4 For special projects, the analyst should request that air volumes be high enough that the liquid volumes necessary for extraction allow for analysis using the ultrasonic nebulizer. If the sampling air volume cannot be increased, the analyst can reduce the instrument sweeping parameters or use a less effective nebulizer, such as the crosscut pneumatic, which will require the need for additional correction equations for oxides and hydrides.

4. LABORATORY INTERFERENCES

4.1 Contamination of samples will be less likely if the analyst does:

4.1.1 Wear talc-free gloves when handling unexposed or exposed filters.

4.1.2 Clean all equipment used in the sample preparation and analysis in a manner consistent with good laboratory practices for metals analysis.

4.1.3 Use American Society for Testing and Materials (ASTM) Type I de-ionized (DI) water, with a resistivity of greater than 17.8 megaohms, for sample extraction and standard preparation. Record the resistivity prior to use. Back rinse the end of the delivery tube before filling containment vessels.

5. CHEMICAL INTERFERENCES

5.1 Pay close attention to the nature of solutions introduced to the ICP-MS.

5.1.1 Nitric acid at less than 2% (v/v) is required for ICP-MS analysis to minimize the damage to the interface and to minimize isobaric molecular interferences (Section 6.1).

5.1.2 In general, when developing an analysis method, try to use a final nitric acid concentration of 1% for all analysis solutions. If higher acid extractions are required, dilute to 1% to minimize formation of nitrates.

5.1.3 The final dilutions of sample extracts must match the acid content of the calibration standards in order to match potential interferences.

5.1.4 The concentration of dissolved solids in analysis solutions should be less than 2% because of the sample interface on the instrument. Higher concentrations may plug the sample cone orifice.

5.1.5 Precautions must be taken to protect the channel electron multiplier from high chemical concentrations (high ion currents). The channel electron multiplier suffers from fatigue after being exposed to high ion currents. This fatigue can last from several seconds to hours depending on the extent of exposure. During this period, response factors are constantly changing, which causes instrument instability that invalidates the calibration curve, and, thereby, invalidates all associated sample results. A sodium bicarbonate ($NaHCO_3$) sample matrix is known to cause this problem.

6. INSTRUMENT INTERFERENCES

6.1 Isobaric Molecular and Doubly-Charged Ion Interferences

Proper correction of isobaric molecular and doubly-charged ion interferences is fundamental to successful analysis using ICP-MS. Therefore, it is recommended that the analyst consult sources beyond this SOP for further details on correcting for these interferences. The Perkin-Elmer ICP-MS instrument manual goes over how to develop correction equations for molecular interferences, and how to insert the equations into the electronic method. When troubleshooting interferences, it is safe to assume that all isobaric and doubly-charged interferences that could affect ICP-MS determinations have already been identified in the literature.

6.1.1 Isobaric molecular interferences are caused by ions consisting of more than one atom. For example, the contribution of ArCl on the ^{75}As signal.

6.1.2 Doubly-charged ion interferences are caused by ions consisting of more than one charge. For example, the contribution of MoO^+ ions on the Cd isotopes.

6.2 Spectral Interferences

A spectral interference results from the presence of other isotopes or ions that have the same atomic weight or mass number as the analyte.

6.2.1 For single isotope interferences, such as the effect of ^{54}Fe on ^{54}Cr, the Perkin-Elmer software (version 2.3.2) automatically gives starting point suggestions for correction equations. For the numerous multi-element interferences (compounds), the analyst will need to determine the correction equations.

6.2.2 Very high ion currents at adjacent masses can contribute to ion signals at the mass of interest. Although this type of interference is uncommon when analyzing samples solutions from Teflon membranes, it can be a problem for other types of samples, such as those collected on quartz or glass micro-fiber filters. Correction of these types of problems could require resolution improvement, matrix separation, analysis using another isotope, or a different method.

6.2.3 Isotopes of different elements forming atomic ions with the same nominal mass-to-charge ratio (m/z) cause isobaric elemental interferences. Correction of these interferences involves calculating the signal of the interference element, by using its natural abundance ratio with another of its isotope(s), and then subtracting the calculated signal of the interference from the total signal of the analyte isotope.

6.3 Transport Interferences

Transport interferences are a specific physical interference associated with the sample nebulization and transport process through the instrument. These usually result from sample matrix components that influence the aerosol formation or cause a change in the surface tension or viscosity. Changes in the matrix composition can cause observed signal suppression or enhancement.

6.4 Matrix Interferences

Matrix interferences are caused by the elemental properties of the samples in solution. To identify matrix interferences, determine if the response is linear by diluting the sample, and then perform analyses at varying low and high nebulizer argon flow rates.

6.4.1 For matrices of known composition, match the composition of the standards to that of the samples.

6.4.2 For matrices of unknown composition, use an internal standard (Section 9.3) that has been matched to the analyte so that the two elements are similarly affected by matrix changes.

6.5 Memory Interferences

Memory interferences can occur when there are large concentration differences between samples or standards that are analyzed sequentially. Sample deposition on the sampler and skimmer cones, spray chamber design, and the type of nebulizer all affect the extent of the memory interferences that are observed. The rinse period between samples must be long enough to eliminate significant memory interference.

7. APPARATUS AND MATERIALS

7.1 Inductively coupled plasma-mass spectrometer

7.2 Peristaltic pumping system capable of circulating at least four solutions

7.3 Ultrasonic Nebulizer configured with a desolvator

7.4 Sample vials, polypropylene, equipped with screw-top caps

7.5 Sonication bath with heating capability to 69 degrees Celsius (°C)

7.6 Quartz heating rod, used if needed to supplement the heating capability of the sonication bath

7.7 Micro-pipettes with metal-free disposable tips, 100-microliter (µl) to 10-milliliter (ml) capacity

7.8 Miscellaneous: talc-free gloves; disposable laboratory wipes/towels; self-adhesive labels; waterproof ink pen; timer

8. REAGENTS

8.1 Nitric Acid, concentrated, spectrometric grade

8.2 De-ionized water, ASTM Type I, filtered, with a resistivity of greater than 17.8 megaohms

8.3 Argon gas, high purity grade (99.99%); tanks allow for longer runs, and are recommended over cylinders

8.4 ICP-MS Grade Reference Standards, National Institute of Standards and Technology (NIST) traceable material, 10 µg/ml stock, in two percent nitric acid; diluted to make necessary analysis solutions

8.5 Secondary source of Reference Standards

8.6 Ethanol, spectrometric grade, for use with the alternative extraction procedure

9. ANALYSIS SOLUTIONS

9.1 Calibration Standards

9.1.1 Concentrations of the calibration standards chosen should be within the linear range for each element. To avoid precipitation problems and short storage-life, be sure that the elements used in the calibration standard dilutions are compatible. Use a chemical reference to verify compatibility; failure to do so may result in unwanted precipitates.

9.1.2 Calibration standards must be verified using a quality control standard (Section 9.2) and monitored closely for stability.

9.2 Control Standard

The control standard is the initial calibration verification solution that must be prepared in the same acid matrix as the calibration standards. This solution must be an independent standard near the midpoint of the linear range at a concentration other than that used for the instrument calibration. An independent standard is defined as a standard composed of the analytes from a source different from those used in the standards for instrument calibration.

9.3 Internal Standard

Selecting the proper internal standard, at an ideal concentration, can eliminate the need for some correction equations.

9.3.1 The internal standard should be no more than 50 atomic mass units (amu) removed from the analyte.

9.3.2 Recommended internal standards for this method are ^{45}Sc, ^{69}Ga, ^{89}Y, ^{115}In, and ^{209}Bi for analytes beginning with Mass 23 and ending with Mass 238.

9.3.3 To cover a lower mass range, use ^{6}Li.

9.3.4 Depending on the behavior of the analyte(s) of interest for a given matrix, the analyst should alternately try ^{103}Rh, ^{159}Tb, and ^{169}Ho.

9.3.5 For sample types not specifically listed in this method, the analyst should test alternative internal standards.

9.3.6 Concentration(s) of the internal standard(s) for this method should be 5 to 50 nanogram per milliliter (ng/ml).

9.3.7 The concentrations should be selected based on interference correction needs. Select a high enough concentration that normal shift(s) in the sample matrices are made inconsequential.

9.3.8 Unnecessarily high internal standard concentrations will contribute to detector fatigue (Section 5.1.5).

9.3.9 For method development, the concentration may need to exceed 50 ng/ml. A concentration of 200 ng/ml is not unreasonable, especially for the crosscut nebulizer.

9.3.10 Internal standards may be added in-line at the time of analysis using a channel of the peristaltic pump and an appropriate mixing manifold, or may be added manually to the calibration standards and samples.

9.3.11 Before preparing the mixed internal standard, each stock solution must be analyzed separately to determine possible spectral interferences (Section 6.2) or the presence of impurities. Mixed internal standards must be prepared as needed with the realization that concentrations can change on aging.

9.3.12 The concentration of internal standard must be added equally to the reagent blank, to the calibration standards, and to the samples.

9.4 Tuning Solution

The tuning solution usually contains elements representing all of the mass regions of interest, thereby verifying that the resolution and mass calibration of the instrument are within the required specifications (Section 15.7). The solution is also used to verify that the instrument has reached thermal stability.

9.4.1 The tuning solution used for this method is 5 ng/ml Li, Co, Ce, In, Bi in 1% nitric acid.

9.4.2 Only include analytes in this solution that are actually in the tuning method.

9.4.3 When analyzing for a single analyte at a low concentration, narrow the tuning mass range significantly. Include the isotope of interest as well as the internal standard. For example, when analyzing for ^{52}Cr, include its

internal standard, ^{69}Ga, in the tuning solution. When testing for a specific analyte isotope, it may be suitable to include a second isotope of the same analyte.

9.4.4 In general and for method development, always extend the tuning range beyond the range of interest.

9.5 Pulse Detector Solution

The pulse detector solution is used when performing a pulse stage detector optimization.

9.5.1 The solution should contain 5 ng/ml In or other suitable element, such as Rh, depending on the analytes of interest. Prepare using a 1% nitric acid matrix.

9.5.2 To reduce the time needed to optimize, the method should have a single analyte.

9.6 Analog Detector Solution

The analog solution is used when performing an analog stage detector optimization. Use a high calibration standard solution when possible.

9.6.1 The solution should contain 50 ng/ml Mg or other suitable element, depending on the analytes of interest. Prepare using a 1% nitric acid matrix.

9.6.2 To reduce the time needed to optimize, the method used for this should have only a single analyte.

9.7 Optimization Solution

The optimization solution is used when performing the daily optimization procedures (Table 1).

9.7.1 Ideally, the solution should contain the analytes needed to do a lens calibration and a pulse detector calibration.

9.7.2 At a minimum, all analytes in the optimization solution should be needed in the lens calibration and pulse detector calibration.

9.7.3 For this method, use the analytes of interest at a concentration of 5 ng/ml in 1% nitric acid.

9.8 Performance Check Solution

The performance check solution is used when checking the instrument performance as part of the daily optimization procedures (Table 1). The solution used is 5 ng/ml Li, Co, Ce, In, Bi in 1% nitric acid.

9.9 Dual Detector Calibration Solution

The solution should contain the same elements as in the calibration standard solutions at a concentration of 50 ng/ml in 1% nitric acid.

9.10 Interference Check Solution (ICS)

The ICS is intended to evaluate corrections for known interferences on analytes. An ICS should be prepared containing known concentrations of interfering elements to demonstrate the magnitude of the interferences and provide an adequate test of any corrections. The ICS is used to verify that the interference levels are corrected within quality control limits (Section 17.4) by the data system. Use either a commercially prepared mixture or prepare limited mixtures to target possible problems for a given matrix. Some examples:

9.10.1 Chloride in the ICS provides a means to evaluate software corrections for chloride-related interferences such as $^{35}Cl^{16}O^{+}$ on $^{51}V^{+}$ and $^{40}Ar^{35}Cl^{+}$ on ^{75}As.

9.10.2 Iron is used to demonstrate adequate resolution of the spectrometer for the determination of manganese.

9.10.3 Molybdenum serves to indicate oxide effects on cadmium isotopes.

9.10.4 Add other components to the ICS to evaluate the ability of the measurement system to correct for various molecular-ion interferences.

10. BLANKS

There are at least three types of blanks required for the analysis: the calibration blank, the rinse blank, and the extraction (method) blank. Below is a discussion about each.

10.1 Calibration Blank (Reagent Blank)

The calibration blank is used in establishing the calibration curve before analysis of samples. It should be a solution of 1% nitric acid and include the exact internal standard that will be a part of the standard calibration and sample analysis. If additional components (such as hydrochloric acid) are needed for stability of some analytes, then the additional components must be included in the calibration blank. The same solution is used to verify contamination during analysis. Analyze the

solution prior to analyzing a sample batch (pre-analysis) and after analyzing the same sample batch (post-analysis). The batch should be re-analyzed if either result is found to be greater than the LOD for any reported analyte.

10.2 Rinse Blank

The rinse blank is used to flush the system between all samples and standards. Plain de-ionized water may be suitable, based on the Reagent Blank results. The rinse blank should consist of no more than 1% nitric acid for the rinse cycle between samples. Increase to no more than 2% acid for cleaning purposes, and do not run for prolonged periods.

10.3 Extraction Blank (Unexposed Filter Blank)

The extraction blank is carried through the complete sample preparation procedure. The extraction blank contains a Teflon filter (unexposed) and the same volumes of reagents as the sample solutions.

11. SAMPLE PREPARATION OF LOW-VOLUME AIR SAMPLES COLLECTED ON TEFLON FILTERS (37-MILLIMETERS IN DIAMETER)

11.1 Prepare sample labels using a waterproof pen. On each label, write at a minimum the sample identification number and the date of the extraction. Method blanks using unexposed filters kept in the laboratory should be labeled to distinguish them from other types of blanks, e.g. Trip Blanks, brought in from the field.

11.2 For each sample to be extracted, use a clean, metal-free extraction vial. For best results, affix each label to the cap of the extraction vial. The labels should adhere confidently. Loose labels will come off in the sonicator.

11.3 Wash and rinse a two-liter amber glass bottle fitted with an adjustable dispensing unit. Fill this bottle with 4% nitric acid. Adjust the dispenser to deliver 16-ml aliquots; verify dispensed volume by weight (consider the dilute acid solution to be the same density as pure water).

11.4 Repeat the following steps (Sections 11.4.1 through 11.4.5) for each sample listed on the extraction worklist:

11.4.1 Place each 37-mm Teflon filter into a separate, labeled extraction vial, being sure that the filter is as far down in the vial as possible (Figure 11.4.1).

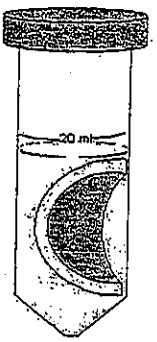


Figure 11.4.1, Extraction Vial Set-Up

11.4.2 If the filter is properly positioned in a 50-ml centrifuge tube, a volume of 16 ml should cover the exposed portion of the filter. In some cases, a slender portion of the filter may be left above the solution level.

11.4.3 Failure to position the filter as indicated may cause the filter to float and yield incomplete sample extraction.

11.4.4 The position of the filter(s) should be checked periodically during sonication. On occasion, be prepared to use a clean glass rod to push a floating filter back into the solution.

11.4.5 Dispense a 16-ml aliquot of 4% nitric acid into the vial with the filter. Seal the vial with a cap and place in a rack.

11.4.6 For special projects, adjust the amount of acid added based on the analytes of interests. A lower volume, such as 16 ml is good to target low concentration elements, such as Cr. Increase volume to keep high concentration elements, such as Fe, within the linear range of the instrument. Whatever volume is used, be certain the acid covers the entire filter.

11.4.7 Make sure to adjust the final calculation to reflect the actual volume used.

11.4.8 The same procedure should be followed for the preparation of a method blank, using a clean, unused Teflon filter.

11.5 Place the filled racks, two to three centimeters apart in the sonication bath. Plug in the heating rod first, then insert it into the sonication bath, taking care not to allow the rod to touch the extraction vial racks or the sides of the sonication unit. The heated portion of the heating rod, which operates at 900 degrees Celsius (°C), will melt most anything solid that touches it.

11.6 The samples should be sonicated for three full hours with the sonicator set to a temperature of 69 °C. Follow the manufacturer's suggestions for effective operation of the sonication bath.

11.7 After the samples and blanks have finished sonicating, allow the solutions to cool to room temperature. The extraction solutions are then ready for dilution to 1% nitric acid and subsequent analysis by ICP-MS.

12. SAMPLE PREPARATION OF LOW-VOLUME AIR SAMPLES COLLECTED ON TEFLON FILTERS (47-MILLIMETERS IN DIAMETER)

12.1 Follow all procedures listed in Section 11, except increase the volume of 4% nitric acid used (Section 11.4.5) from 16 ml to 32 ml or greater. Adjust the final nitric acid concentration to 1% prior to analysis by ICP-MS.

12.1.1 $PM_{2.5}$ samples are collected on 47-mm Teflon filters

13. ALTERNATE PROCEDURE FOR SAMPLE PREPARATION

This alternate procedure may provide better recoveries for some analytes, and also eliminates the manual dilutions required of 4% nitric acid samples.

Keep in mind that the addition of even small amounts of ethanol will significantly alter the intensities. Carbon bonding can greatly increase spectral interferences, and, in doing so, greatly decrease the intensities of particular analytes involved in C-X bonding. This alternate procedure is known to significantly dampen the intensities detected for As and Cu, and to entirely hamper the detection of all of the K isotopes.

13.1 After positioning the filter in the extraction file, moisten the membrane with ethanol. Use 50- to 150-µl, depending on the size of the membrane. Take care to cover the entire exposed area of the membrane with the aliquot of ethanol. Use the smallest aliquot volume possible to consistently wet the membrane, and use the same aliquot volume for every sample in a given project.

13.1.1 Teflon is a hydrophobic material. The extraction solution will not penetrate the membrane unless the hydrophobic nature of Teflon is eliminated using a solvent, such as ethanol (spectrometric grade).

13.2 Repeat the steps in Section 11 for each sample.

13.3 Adjust the calibration standards to include the same amount (v/v) of ethanol as the samples.

14. DAILY OPTIMIZATION

The following optimization procedures should be performed daily, even if the previous analysis was for samples of similar matrices. The instrument must run for at least fifteen minutes with the plasma on before optimization. The information provided below is not intended to replace the operator's manual.

14.1 Perform X-Y Adjustment

14.1.1 The X-Y adjustment needs to be performed whenever the sample or skimmer cones are changed, or whenever the plasma torch has been removed or its configuration altered.

14.1.2 Using the optimization solution rotate the X and Y adjustment knobs to obtain the positions resulting in the maximum signal intensities. It seems to work best if the Y adjustment is done first. Repeat the adjustment of each knob three times or until the best signal intensity is achieved.

14.2 Perform nebulizer gas flow optimization

14.2.1 Perform this optimization while observing a signal from one of the optimization solution analytes.

14.2.2 The curve should increase, attain a maximum point, and then decrease (appearing like a mountain). If the curve is not satisfactory, adjust the Start and End values in the Parameter Range fields and repeat optimization.

14.2.3 To reduce analyte oxide levels, follow the operator's manual instructions for reducing the nebulizer gas flow.

14.3 Perform lens optimization

14.3.1 Use the optimization solution. The software will perform the optimization and then automatically set the lens voltage to the optimum value when the procedure is complete.

14.3.2 Flush the sample introductory system with reagent water when the optimization is complete.

14.4 Check instrument performance

14.4.1 Use the Performance Check Solution.

14.4.2 The performance specifications when using the ultrasonic nebulizer are:

Background:	<80 cps at Mass 220
CeO / Ce:	≤ 0.0004
Ce^{++} / Ce:	≤ 0.01
In Sensitivity:	>150,000 cps

14.4.3 When troubleshooting performance problems, it may be necessary to use the crosscut pneumatic nebulizer. Typical performance specifications using the crosscut are:

Background:	<30 cps at Mass 220
CeO / Ce:	≤ 0.03
Ce^{++} / Ce:	≤ 0.05
In Sensitivity:	>75,000 cps

14.4.4 If the performance check is satisfactory, flush the system with DI water and begin the analysis.

14.4.5 If the performance check is not satisfactory, check the conditions of the peristaltic pump tubing, the cones, and check the position and cleanliness of the torch and injector. Once this inspection is complete, repeat each of the daily optimization procedures.

15. COMPLETE OPTIMIZATION

The following optimization procedures should be performed every 2 weeks, or whenever the sample background matrix changes significantly. Perform the detector optimization (Sections 15.1 and 15.2) in the following order: Pulse, Analog, repeat Pulse, repeat Analog, then perform a Daily Optimization (Section 14) in addition to these procedures.

15.1 Pulse Stage Detector Optimization

15.1.1 Use the pulse detector solution.

15.1.2 The software performs the optimization. A plot of intensity versus pulse stage voltage will be displayed. A diamond indicates the optimum point.

15.2 Analog Stage Detector Optimization

15.2.1 Use the analog detector solution.

15.3 Dead Time Correction

15.3.1 Dead time (τ) is the amount of time required for the detector and its

an ion strikes the detector it will not be able to record another ion strike until a time, τ, has elapsed. The detector is "dead" for τ seconds (typically 50- to 60-nanoseconds).

15.3.2 This procedure need only be done as part of the complete optimization procedure.

15.3.3 Use the dead time correction value that results in the highest correlation coefficient (typically 0.9999).

15.4 Dual Detector Calibration

15.4.1 Use the dual detector calibration solution.

15.4.2 Prior to performing this procedure, the analog and pulse stages of the detector must first be calibrated.

15.4.3 Dual detector calibration is used to extend the dynamic range of the detector by normalizing the analog stage of the detector to the pulse stage.

15.5 Lens Calibration

15.5.1 Use the optimization solution for this procedure.

15.5.2 This procedure is done only after all prior optimization procedures have been performed.

15.6 Check Oxides, Doubly-Charged Ions, Background and Sensitivity

15.6.1 Use the tuning solution to perform this procedure.

15.6.2 All prior optimization procedures must be complete before performing this procedure. Compare values obtained with those listed in Section 14.4.3.

15.7 Perform Mass Calibration and Resolution Check

The mass calibration step should only be performed after attaining satisfactory results from the instrument performance check (Section 14.4).

15.7.1 Use the tuning solution to verify the resolution and mass calibration of the instrument.

15.7.2 Conduct the mass calibration and resolution checks in the mass regions of interest.

15.7.3 The mass calibration and resolution parameters are required criteria that must be met prior to analysis of samples. If the mass calibration differs more than 0.05 amu from the true value, then the mass calibration must be adjusted to the correct value.

15.7.4 The resolution must also be verified to be within 0.1 amu of the target value. The DAC value should be 0.65 at 10% peak height, as suggested by Perkin-Elmer service. The Perkin-Elmer manual gives a DAC target of 0.7 at 10% peak height. Be consistent with whatever target value is chosen.

16. SAMPLE ANALYSIS

16.1 Refer to Section 17 and Table 2 for a description of quality control measures required for this method. The analyst should follow the manufacturer's instructions for safe operation of the instrument. Allow at least 30 minutes for the instrument to equilibrate before analyzing any samples.

16.2 Verify instrument performance by analyzing the tuning solution at least four times with relative standard deviations of less than or equal to five percent for the analytes contained in the tuning solution.

16.2.1 If the standard deviations exceed five percent, check the X-Y adjustment, the argon flow on the nebulizer, the ICP-MS plasma flow, and the condition and position of the torch, the skimmer and sampling cones prior to trying a re-make of the tuning solution.

16.2.2 If the tactics listed above do not improve performance, then run a complete optimization.

16.3 Verify the magnitude of elemental and molecular-ion isobaric interferences and the adequacy of any corrections at the beginning of an analytical run or once every twelve hours, whichever is more frequent. This is done by either analyzing the interference check solution or by analyzing the control solution.

16.3.1 The analyst should be aware that precipitation might occur with some elements, specifically silver. Refer to Section 6 for a discussion on the interferences and the literature for potential solutions to those interferences if additional guidance is needed.

16.4 Calibrate the Instrument

16.4.1 Calibrate for the analytes of interest using a calibration blank and at least three calibration standards.

16.4.2 The results of the calibration blank must be less than three times the limit of detection (LOD) for each element. If this is not the case, the reason for the out-of-control condition must be identified and corrected, and affected samples re-analyzed. If the concentration of the blank is consistently greater than three times the LOD, the LOD may be indicative of an estimated LOD and should be re-evaluated.

16.4.3 Flush the system with the rinse blank between standard solutions.

16.4.4 Use the average of at least 3 integrations for both calibration and sample analysis, unless the available sample volume is limited.

16.5 Verify Calibration with the Control Standard

16.5.1 Immediately after the calibration has been established, the calibration must be verified for every analyte by the analysis of the control solution.

16.5.2 The results should be within established limits of the expected target value. If the control value is out of range, the analysis must be terminated, the problem corrected, the instrument recalibrated and the new calibration verified. The instrument may need adjusting prior to recalibration, or the solutions may be invalid, requiring that a new set of standards and a new control be prepared.

16.5.3 Any samples analyzed under an out-of-control calibration are considered invalid and must be re-analyzed.

16.5.4 During the course of an analytical run, the instrument may be resloped or recalibrated to correct for instrument drift. A recalibration must then be followed, immediately, by a new analysis of the control before any further samples may be analyzed.

16.6 Standard Check

A check of a mid-range standard should be made every ten samples and after completion of the last sample. Should a standard check be greater than ± 10% of the expected value, recalibrate and re-analyze the samples back to the point where the calibration was known to be in control.

16.7 Analyze Samples

16.7.1 The extraction blanks should be treated as samples and should be analyzed along with the ambient filter samples.

16.7.2 The system should be flushed with the rinse blank for about thirty seconds (or until the signal levels return to the method's level of quantification) before the analysis of each sample.

16.7.3 Each sample should be nebulized until a steady-state signal is achieved (usually about thirty seconds) before collecting data.

16.7.4 Samples with values greater than the linear range for an analyte must be diluted and re-analyzed, or an alternate less-abundant isotope can be measured. The linearity at the alternate mass must be confirmed by an appropriate calibration.

17. PERFORMANCE CRITERIA / QUALITY CONTROL

All quality control data should be maintained in an organized manner and be available for easy reference or inspection. Refer to Table 2 for a quick summary.

17.1 Method Limit of Detection

17.1.1 The limit of detection for each isotope is calculated according to the MLD061 reference method, EPA600/R-94-111 Method 200.8,

as follows:

$$LOD = (t)_{(n-1 = 0.99)} \times SD = 3.14 \times SD$$

where SD is the standard deviation of n repetitions of the lowest standard expressed in instrument units of ng/ml, and the $(t)_{(n-1 = 0.99)}$ is the Student's t value for a 99% confidence level and a SD estimate with a degree of freedom equal to n-1. For 7 replicates, the t value equals 3.14.

17.1.2 The y-intercept for each linear calibration must be set to zero.

17.1.3 For a method LOD, use the internal standards and the exact instrument settings (sweeps and dwell) used to analyze the ambient samples.

17.1.4 Repeat the LOD determination a minimum of 5 times, each time on a different day. Use this added information, specifically the fluctuation of results, to assist in setting the final LOD value reported for each analyte.

17.1.5 The published method LOD in aerometric units of nanogram per cubic meter (ng/m^3) must be set after the calculated values in ng/ml are evaluated by the analyst based on the analytical tendencies of actual ambient samples. Judgment as to the conversion of the calculated LOD (ng/ml) into the published LOD (ng/m^3) may be necessary, especially if the air volumes are vastly different within a sample set or project.

17.1.6 For sample types analyzed on a limited or one-time basis, it may not be possible to establish a method LOD over several days. At a minimum, run 7 replicates of the lowest standard, and use the cumulative standard deviations of the actual samples analyzed as guides to setting an LOD for the special study method.

17.2 Verifying the Method LOD

The published method LOD should be verified no less than once per year.

17.2.1 Verification of the method LOD should yield a value less than the reported LOD value.

17.2.2 If the verified value is higher than the reported value, the cause should be investigated. It may be necessary to evaluate sample data obtained after the last valid LOD verification.

17.3 Instrument Detection Limit (IDL)

The IDL is used to compare instrument to instrument functioning, or to verify manufacturer's reported values. Although NLB does not use IDL in data QC evaluations, the IDL can be useful in testing literature methods.

17.3.1 To determine an IDL, use settings for sweeps and dwell time that are unrealistic for normal analysis, but will yield the most outstanding results.

17.3.2 All consumables, in particular cones and tubing, should be new.

17.3.3 Run 7 replicates of a blank solution and a low standard. Insert the standard deviation value into the LOD equation above (Section 17.1.1).

17.4 Control Standard

The control standard is prepared using a stock source secondary to the stock source used to prepare the calibration standards.

17.4.1 Without a history of ICP-MS analysis, the control and warning limits for a quantitative method have been initially set at ±10% and ±5% of the target value for each analyte, respectively. In time, these limits will be set based on the standard deviations of the recorded mean.

17.4.2 Document each control value as a percent ratio of the actual value over the target value.

17.5 Standard Checks

At pre-set intervals during a batch analysis, the calibration must be verified using a mid-range standard or the control standard. Results must be ±10% of the target value for each analyte to verify that the calibration in use is valid. If a standard check exceeds the limit, the analysis must be stopped and the instrument must either be recalibrated or have the existing calibration(s) resloped by re-analysis of one or more of the standards. All reportable results must be re-analyzed or reprocessed with a valid calibration.

17.5.1 Document each standard check value as a percent ratio of the actual value over the target value.

17.5.2 Reprocessed data must include reprocessing of all QC samples associated with the reprocessed sample results.

17.6 Internal Standards

The intensities of all internal standards must be monitored for every analysis. When the intensity of any internal standard fails to register between 60 to 140% of the intensity of that internal standard in the initial calibration standard, the following procedure is followed:

17.6.1 The sample must be diluted fivefold and re-analyzed with the addition of appropriate amounts of internal standards.

17.6.2 Repeat dilution until the internal standard intensities fall within the prescribed window.

17.6.3 Check that the intensity levels of the internal standards for the calibration blank and interference check standard agree within ±20% of the intensity level of the internal standard of the original calibration solution. If they do not agree, stop the analysis, find and correct the problem, recalibrate, verify the new calibration, and re-analyze the affected samples.

17.7 Interferences

If the concentrations of interference sources (such as C, Cl, etc.) are such that the analyte is less than the limit of quantification and the concentration of the interferences are insignificant, then the data may go uncorrected.

17.7.1 To obtain analyte data of known quality, it is necessary to measure more than the analytes of interest to apply corrections or to determine whether interference corrections are necessary.

17.7.2 Monitoring interference sources does not necessarily require monitoring the interference itself, but that a molecular species may be monitored to indicate the presence of the interference.

17.7.3 When correction equations are used, all QC criteria must also be met. Extensive QC for interference corrections are required at all times.

17.7.4 The monitored masses must include those elements whose hydrogen, oxygen, hydroxyl, chlorine, nitrogen, carbon and sulfur molecular ions could affect the analytes of interest.

17.7.5 Unsuspected interferences may be detected by adding pure major matrix components to a sample to observe any impact on the analyte signals. When an interference source is present, the sample elements impacted must be flagged to indicate the percentage interference correction applied to the data or an uncorrected interference by virtue of the elemental equation used for quantitation.

17.7.6 The isotope proportions for an element or molecular ion cluster provides information useful for quality assurance.

17.7.7 Only isobaric elemental, molecular, and doubly-charged interference corrections which use the observed isotopic-response ratios, or parent-to-oxide ratios, are acceptable corrections for use in MLD061.

17.8 Dilution Test

If the analyte concentration is within the linear dynamic range of the instrument and sufficiently high (minimally, a factor of at least 100 times greater than the concentration in the reagent blank), analysis of a fivefold dilution must agree within ± 10% of the original determination. If it does not agree within these limitations, an interference effect must be suspected.

17.9 Duplicates

If there is enough sample solution available, every tenth sample should be analyzed in duplicate as a record of the method precision.

The percent relative difference (%RD) between duplicate determinations is calculated as follows:

$$\%RD = \frac{|D_1 - D_2|}{(D_1 + D_2)/2} \times 100$$

where D_1 and D2 equal the concentrations determined for the first and second aliquots, respectively. A value of 30% RD should not be exceeded for analyte

values greater than 5 times the LOD. If this limit is exceeded, the reason must be investigated, the cause corrected if possible, and any samples analyzed during the out-of-limit conditions must be re-analyzed.

17.10 Blanks

Results for the blanks must be less than the LOD for each analyte reported. If blank value(s) exceed the LOD, the sample preparation and analysis procedures should be reviewed to determine the extent and source of contamination.

17.11 Spikes (Post-Digestion)

Post-digestion spikes are added to an aliquot of a prepared sample or its dilution. Spikes are fundamental in assuring the reliability of the method parameters and, subsequently, the data generated. The spike should be recovered within 80–120% of the known value, based on the original concentration of each element of interest in the sample.

The percent recovery (%R) is calculated as follows:

$$\%\,R = \frac{|\,C_s - C\,|}{s} \times 100$$

where C_s equals the determined concentration (ng/ml) of the spiked aliquot, C equals the determined concentration (ng/ml), and s equals the concentration (ng/ml) of the spike added.

17.11.1 Every batch of 40 or less samples must include a low and a high spike.

17.11.2 A low spike should be at a concentration greater than the limit of quantitation (LOQ) and less than 10 times the LOD for each analyte to be reported.

17.11.3 A high spike should be at a concentration greater than 10 times the LOD for each analyte to be reported.

17.11.4 For method development, run test spikes of varying concentrations, from low to high, using in the ambient sample matrix.

17.11.5 For special project method testing, or where there is limited ambient sample available, sacrifice an ambient sample for testing and subsequent spiking (method confirmation) to provide a record of the reliability of the analysis method.

17.11.6 If the spike is not recovered within the specified limits, consider that the sample may be out of the linear range after spiking. If the out-of-limits

spike concentration remains in the linear range, this may indicate an under or over correction of an interference.

17.11.7 When checking for a matrix effect correction using a dilution, the results must agree within 10% of the original determination.

18. INSTRUMENTATION SCHEMATICS

18.1 ICP-MS

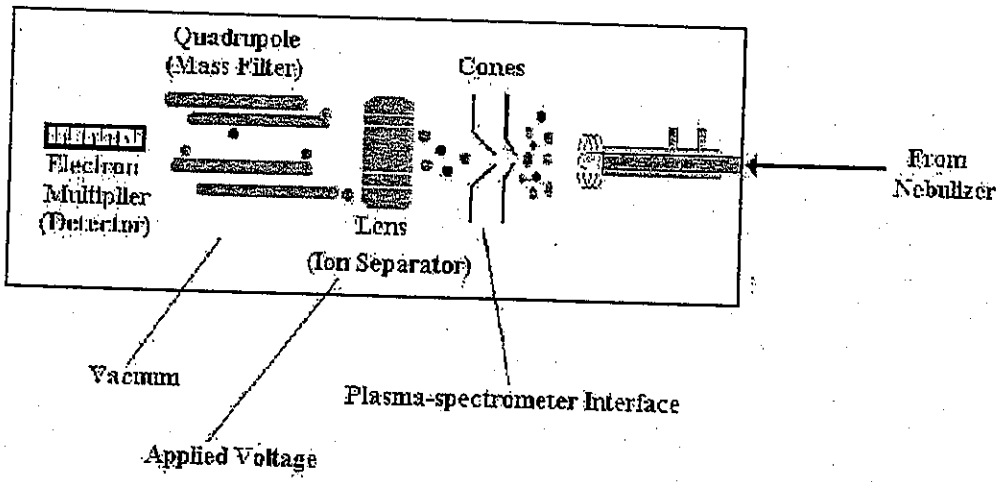


Figure 18.1, Perkin-Elmer ELAN 6100

18.2 ULTRASONIC NEBULIZER

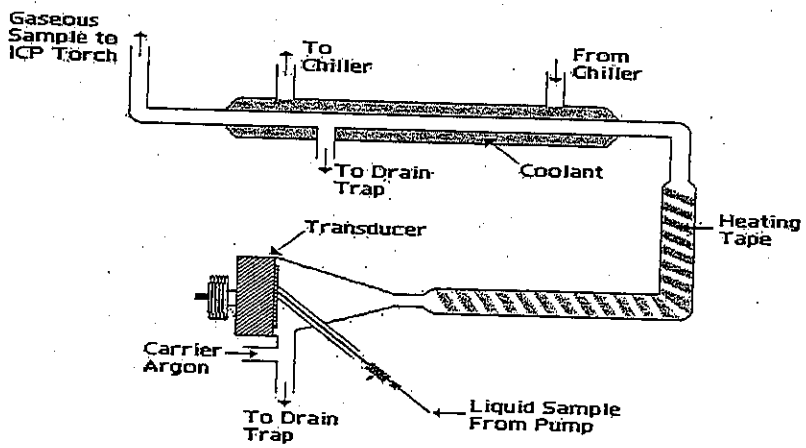


Figure 18.2, Ultrasonic Nebulizer

19. DAILY INSTRUMENT MAINTENANCE

-Check sample waste container level.
-Inspect argon tank supply.
-Check argon pressure to the instrument.
-Inspect chiller connections for possible leaks.
-Check vent system for blocks.
-Inspect torch and aerosol injector tubes.
-Inspect nebulizer for clogs.
-Inspect sample capillary tubing to be sure it is clean and good condition.
-Check peristaltic pump tubing before operation and every 3 hours of use (replace after 8 hours).
-At end of day, flush system for 5 minutes with the plasma on with a maximum of 2% nitric acid, followed by deionized water.

20. PERIODIC INSTRUMENT CHECKS

-Clean torch components and replace any worn O-rings on the torch assembly.
-Inspect and clean RF coil.
-Check nebulizer spray pattern; clean and replace tip as necessary.
-Clean nebulizer components and replace worn O-ring on the transducer face.
-Check drain fitting for leaks.
-Check that pump rollers are clean; remove and clean pump head as necessary.

21. HANDLING AND DISPOSAL OF ICP-MS CHEMICALS

The ICP-MS analyst is responsible for ensuring the safe storage and disposal of all chemical standards and reagents associated with this method.

21.1 Ordering Chemicals

21.1.1 Storage of excess chemicals takes up valuable lab space. Prior to ordering chemicals, assess needs carefully. Order only amounts that will be utilized within the following year.

21.1.2 Purchase smaller volumes whenever possible to minimize disposal costs of unused portions.

21.2 Disposing of Chemicals

21.2.1 The ICP-MS analyst is responsible for notifying the Division's Hazardous Waste Coordinator of disposal needs.

21.2.2 For disposal of the ICP-MS chemicals, the Hazardous Waste Coordinator should have the waste removal vendor do an inventoried lab-pack in favor of a drum. Drums of mixed chemicals are more difficult to profile

and create more problems to dispose of than lab-packs. Also, the chemicals can be stored as "usable materials" rather than "laboratory waste."

21.2.3 The autosampler rinse solution is less than 1% acidified DI water and can be disposed of in the laboratory sink, followed by a minute of flushing with tap water.

21.2.4 Standard dilutions in the parts-per-billion (ppb) range, which is the typical operating range of the ICP-MS, can be disposed of in the laboratory sink, followed by a minute of flushing with tap water. The exception is mercury (Hg) dilutions, which must be collected by the analyst and disposed of by the waste vendor.

21.2.5 The ICP-MS analyst is responsible for keeping chemicals and reagents separate and in their original containers.

22. REVISION HISTORY OF METHOD 061

REVISION	EFFECTIVE DATE	PRIMARY CHANGE(S) FROM PREVIOUS REVISION
MLD061, Draft	08/01/00	Startup of NLB trace metal analysis of low-volume ambient filter samples using ICP-MS; developed from U.S. EPA Method 6020 (9/94)
MLD061, Revision 0.0	01/01/02	Extraction procedure changed to eliminate use of ethanol, a contributor to numerous carbon-bonded interferences. Changed optimization and tuning procedures and solutions to accommodate instrument malfunctions and failures.

23. REFERENCES

1. Perkin-Elmer / SCIEX, "Elan 6100 Software Guide," November 1999.

2. EPA 600/R-94-111 Method 200.8, Trace Elements in Water and Wastes – ICP/MS, May 1994.

3. EPA SW-846 Ch 3.3 Method 6020, Metals by Inductively Couple Plasma/Mass Spectrometry, August 1994.

Table 1. OPTIMIZATION PROCEDURES

Procedure	When to Perform
X-Y Adjustment	Daily; whenever the cones are cleaned or replaced; or after any maintenance procedures in the torch chamber.
Nebulizer Gas Flow	Daily
Lens Voltage Optimization	Daily
Instrument Performance Check	Daily
Detector Optimization: Analog Stage Voltage Pulse Stage Voltage	Perform a Dual Detector Calibration when you require extended dynamic range (above two million counts per second) in a quantitative analysis. A detector calibration is always necessary if the Dual Mode in the method is selected.
Dead Time Correction	This procedure is only required when the detector is replaced, in which case, it should be performed after the detector optimization.
Dual Detector Calibration	Perform a Dual Detector Calibration when you require extended dynamic range (above two million counts per second) in a quantitative analysis. A detector calibration is always necessary if the Dual Mode in the method is selected. You must calibrate for each analyte. A minimum of two masses is required for a Dual Detector calibration.
Auto Lens Calibration	This is required when Auto Lens is used in the method. Also perform an Auto Lens calibration when sample matrices are significantly different to achieve the best performance with Auto Lens.

Table 2. QUALITY CONTROL PROCEDURES

Quality Control Procedure	Typical Frequency	Acceptance Criteria
Initial calibration (Section 9.1)	At the beginning of the analysis; must be done after tuning and optimization	Correlation coefficient, r2, must be > 0.9995, using a minimum of 3 standards and a reagent blank
Initial calibration verification Using the middle calibration standard (Section 17.5)	Analyzed immediately after the initial calibration	90%-110% of the actual concentration for all analytes to be determined
Initial calibration verification using the control standard (Section 9.2)	Analyzed immediately after running the calibration verification standards	90%-110% of the actual concentration for all analytes to be determined
Interference check standard (Section 9.10)	Analyzed as part of the method development process, whenever samples from a new site are added, or as a troubleshooting mechanism as findings warrant	90%-110% of the actual concentration for all analytes to be determined
Reagent Blank (Section 10.1)	Analyzed after calibration verifications, as a sample solution (pre-analysis); analyzed again, as a sample solution, at the end of each batch (post-analysis)	< LOD for all analytes to be reported; indicates contamination acquired during analysis
Continuing calibration Verification (Section 17.5)	Analyzed before the first Sample, after every 10 samples, and at the end of the run	90%-110% of the actual concentration for all analytes to be determined
Filter blanks (Section 10.3)	Random checks at intervals determined by analyst; analyzed as a sample	Document results of analytes reported to create historical record
Spike, low; at a concentration < 10 times the LOD (Section 17.11)	1 per sample set of 40 samples prepared using an aliquot of ambient sample; analyzed as a sample	80%-120% recovery for all analytes to be reported
Spike, high; at a concentration > 10 times the LOD (Section 17.11)	1 per sample set of 40 samples prepared using an aliquot of ambient sample; analyzed as a sample	80%-120% recovery for all analytes to be reported
Duplicate aliquot of sample solution (Section 17.9)	1 duplicate analyzed for every ten samples; analyzed as a sample	< 30% relative difference (%RD) for all analytes > LOQ

Table 3. OPERATING CONDITIONS FOR ICP-MS (WITH ULTRASONIC NEBULIZER)

Parameter	Operating Condition	Normal Range
Detector	Dual; Pulse/Analog	Dual; Pulse / Analog
Mode	Peak Hopping	Scanning / Peak Hopping
ICP RF Plasma	860 – 1250 W	800-1500 W
Nebulizer argon flow	0.6 – 0.7 L/min	0.5 – 0.95 L/min

Table 4. OPERATING CONDITIONS FOR ULTRASONIC NEBULIZER

Parameter	Operating Condition	Normal Range
Injector gas flow	0.6 L/min	0.3 – 1.5 L/min
Sample uptake	2.5 ml/min	0.1 – 3.0 ml/min
Heating temperature, nebulizer	140 °C	140 – 160 °C
Cooling temperature, nebulizer	3 °C	-5 – 10 °C
Heating temperature, desolvator	160 °C	120 – 160 °C
Sweep gas flow	2.0 L/min	1.4 –2.4 L/min

Table 5. INTERFERENCE CRITERIA (BY ORDER)

Order	Possible Interference(s)	Check
1	Argides	Check at –40 mass for carrier, (Cl, C, N, etc.)
2	Oxides	Check at –16 mass for carrier (Mo, Ti, Ca, Zn, etc.)
3	Dioxides	Check at –32 mass for carrier
4	Doubly Charged Ions	Show at ½ original mass, i.e., shows at 69 for Ba-138.
5	Dimers	Show at double the original mass; typical dimers include N, Ar, S.
6	Hydrides	Check at –1 mass and at –17 mass for possible problems.
7	Nitrogen	Check at –14 mass for carrier

Table 6. SOME INTERFERENCE CONSIDERATIONS FOR AIR SAMPLES

Element	Interference(s)
Background	Background will contain numerous Argides (ArX); Ar-40, ArH, ArO, ArN, Ar_2O_2, N_2, CO, CO_2
Addition of organic solvents, e.g. C_2H_2OH	Increases overall Oxides, Dioxides, and Hydrides, especially CO, CO_2.
^{52}Cr	$^{40}Ar\ ^{12}C$
^{54}Cr	^{54}Fe
B	Contaminates glassware.
^{69}Ga	Do not use as Internal Standard if ^{138}Ba is present because of dimer interference. Use ^{71}Ga instead.
^{56}Fe	$^{40}Ar^{16}O$
^{45}Sc	Interferences: SiO, CO_2. Do not use ^{45}Sc as an Internal Standard for samples with high Si, or samples collected on quartz/glass fiber filters, or samples with high C.
^{28}Si	Difficult when using a nitric acid extraction because of N_2. Also, ICP torch is made of quartz. Si is not recommended by ICP-MS.
^{75}As	Interference: $^{40}Ar\ ^{35}Cl$ Do not add correction unless actually interferes; check low spike results.
^{58}Ni	ArO, NaCl
^{120}Sn	Preferred isotope.
^{64}Zn	S_2, $^{48}Ca^{16}O$

Appendix C Field Data

Appendix C.1

Flow Certification Reports and Flow Check Logs

CALIFORNIA AIR RESOURCES BOARD

FLOW CERTIFICATION REPORT

TO : *PHIL B POWERS*
AIR MONITORING - CENTRAL

LOG NUMBER : *2002 050*

FROM: BRIAN SPREADBOROUGH
Program Evaluation & Standards

CALIBRATION DATE: *02/26/2002*
REPORT DATE : *02/28/2002*

IDENTFICATION

Instrument : *TYLAN 4 in 1 MFM*
Property No. : 9632
Serial No. :
Previous Log No.: *2001 292*
Bar Code No. : *20001444*
Elevation : *25.00'*
Instr. Prop. Of : *AIR MONITORING - CENTRAL*

Site Name : *MLD Standards Lab*
Site Number : *34-299*
Location : *1309 T-Street*
Sacramento, CA 95814

CALIBRATION STANDARDS	ID NUMBER
BROOKS FLOW STANDARD	2856
SIERRA FLOW STANDARD	20000560

CALIBRATION RESULTS

MFM / MFC Position		Pos 1	Pos 2	Pos 3	Pos 4
Instr. Range		30 L	10 L	3 L	~~100 cc~~
Maximum Display		30	10	3	~~100~~
Linear Regression	Slope	0.9708	0.9890	0.9944	~~1.0345~~
	Intercept	-.3276	0.0358	-.1157	~~1.2462~~
Change From Prev.Slope%		-0.64	0.07	-0.11	~~1.86~~
Prev. Calibration Date		11/13/2001	11/07/2001	11/21/2001	~~11/19/2001~~

Certification Equation:

Certification Expires: *05/28/2002*

Position 1 , Range 30 L Std. Air Flow = 1.0307 * (Display) + 0.4138
Position 2 , Range 10 L Std. Air Flow = 1.0117 * (Display) - 0.0344
Position 3 , Range 3 L Std. Air Flow = 1.0073 * (Display) + 0.1160
~~**Position 4 , Range 100 cc Std. Air Flow = 1.0014 * (Display) 1.1882**~~

Comments: 100 cc is damaged-unable to certify

Calibrated By *STAFF*

Checked By *BTS*

CALIFORNIA AIR RESOURCES BOARD

FLOW CERTIFICATION REPORT

TO : *STEVE ASTON*
SPECIAL PURPOSE MONITORING

LOG NUMBER : *2002 072*

FROM: BRIAN SPREADBOROUGH
Program Evaluation & Standards

CALIBRATION DATE: *03/27/2002*
REPORT DATE : *03/27/2002*

IDENTFICATION

Instrument : *TYLAN 4 in 1 MFM*
Property No. : 20003865
Serial No. : *BE0160*
Previous Log No.: *2000 342*
Bar Code No. : *20003865*
Elevation : *25.00'*
Instr. Prop. Of : *SPECIAL PURPOSE MONITORING AND SUPPORT*

Site Name : *MLD Standards Lab*
Site Number : *34-299*
Location : *1309 T-Street*
Sacramento, CA 95814

CALIBRATION STANDARDS	ID NUMBER
BROOKS FLOW STANDARD	2856
SIERRA FLOW STANDARD	20000560

CALIBRATION RESULTS

MFM / MFC Position		Pos 1	Pos 2	Pos 3	Pos 4
Instr. Range		100 cc	3 L	10 L	20 L
Maximum Display		100	3	10	20
Linear Regression	Slope	1.0134	1.0350	1.0100	1.0179
	Intercept	0.7074	0.0286	0.0865	0.1489
Change From Prev.Slope%		1.76	-0.78	-0.09	1.64
Prev. Calibration Date		12/04/2000	12/05/2000	11/14/2000	12/19/2000

Certification Equation:

Certification Expires: *06/26/2002*

Position 1 , Range 100 cc Std. Air Flow = 0.9993 * (Display)- 0.4934
Position 2 , Range 3 L Std. Air Flow = 0.9636 * (Display)- 0.0289
Position 3 , Range 10 L Std. Air Flow = 0.9915 * (Display)- 0.1642
Position 4 , Range 20 L Std. Air Flow = 0.9879 * (Display)- 0.2797

Comments:

Calibrated By [signature]

Checked By BJS

CALIFORNIA AIR RESOURCES BOARD

FLOW CERTIFICATION REPORT

TO : *JOHN D LAWSON*
AIR MONITORING - NORTH

LOG NUMBER : *2001 300*

FROM: BRIAN SPREADBOROUGH
Program Evaluation & Standards

CALIBRATION DATE: *11/26/2001*
REPORT DATE : *12/01/2001*

IDENTFICATION

Instrument : *TYLAN 4 in 1 MFM*
Property No. : 9412
Serial No. :
Previous Log No.: *2001 182*
Bar Code No. : *20001183*
Elevation : *25.00'*
Instr. Prop. Of : *AIR MONITORING - NORTH*

Site Name : *MLD Standards Lab*
Site Number : *34-299*
Location : *1309 T-Street*
Sacramento, CA 95814

CALIBRATION STANDARDS	ID NUMBER
BROOKS FLOW STANDARD	2856
SIERRA FLOW STANDARD	20000560

CALIBRATION RESULTS

MFM / MFC Position		Pos 1	Pos 2	Pos 3	Pos 4
Instr. Range		20 cc	3 L	10 L	30 L
Maximum Display		100	3	10	30
Linear Regression	Slope	4.1583	0.9092	0.9165	0.9940
	Intercept	-6.496	-.0105	0.2008	0.1019
Change From Prev.Slope%		0.76	-0.19	0.36	-0.14
Prev. Calibration Date		07/25/2001	07/26/2001	08/03/2001	08/03/2001

Certification Equation:

Certification Expires: *02/25/2002*

Position 1 , Range 20 cc **Std. Air Flow =** **0.2423 * (Display)+ 1.5612**
Position 2 , Range 3 L **Std. Air Flow =** **1.0991 * (Display)+ 0.0184**
Position 3 , Range 10 L **Std. Air Flow =** **1.0918 * (Display)- 0.2114**
Position 4 , Range 30 L **Std. Air Flow =** **1.0051 * (Display)- 0.0790**

Comments:

Calibrated By Taylor Lusk

Checked By BJS

Transfer Standard Information:

Sampler Flow Check Log

MFM Make & Model: AALBORG GFM37

Flow Range: 0-20 lpm

I.D.(Bar Code): 20005004

Calibration Date: 1/23/01

Flow Check Data:

		Pre-Sampling Flow Check		Post-Sampling Flow Check		
Date	Sampler I.D.	Transfer Standard Flow Rate (slpm)	Sampler Flow Rate (slpm)	Transfer Standard Flow Rate (slpm)	Sampler Flow Rate (slpm)	Comments
11/30/01	315	9.35	*10.0*			
11/30/01	312	9.50	*10.1*			
11/30/01	257	9.50	*10.1*			
11/30/01	314	9.40	*10.0*			
11/30/01	316	9.50	*10.1*			
11/30/01	311	9.50	*10.1*			
11/30/01	245	9.50	*10.1*			
11/30/01	258	9.50	*10.1*			
12/5/01	310 spare	9.60	*10.2*			
12/5/01	243 spare	9.50	*10.1*			
12/5/01	259 spare	9.60	*10.2*			
12/18/01	315			*9.50*	*10.0*	
12/18/01	312			*7.70*	*8.4*	
12/18/01	257			*9.55*	*10.2*	
12/18/01	314			*9.60*	*10.2*	
12/18/01	316			*9.65*	*10.3*	
12/18/01	311			*9.65*	*10.3*	
12/18/01	245			*9.65*	*10.3*	
12/18/01	258			*9.65*	*10.3*	
12/18/01	310 spare			*9.65*	*10.3*	
12/18/01	243 spare			*9.60*	*10.2*	
12/18/01	259 spare			*9.65*	*10.3*	

Sampler Flow Check Log

Transfer Standard Information:

MFM Make & Model: Tylan RO-28

I.D.(Bar Code): 20001183

Flow Range: 0-30 slpm

Calibration Date: 11/26/2001

Tylan RO-28 0-30 slpm
ID (Bar Code): 20001440
Cal. Date: 2/26/2002
Cert. Transfer Std. For final flows

Flow Check Data:

		Pre-Sampling Flow Check		Post-Sampling Flow Check		
Date	Sampler I.D.	Transfer Standard Flow Rate (slpm)	Sampler Flow Rate (slpm)	Transfer Standard Flow Rate (slpm)	Sampler Flow Rate (slpm)	Comments
2/4/2002	311	10.15	10.12			*Flow = 1.0051 x display - .0790*
2/4/2002	245	10.20	10.17			*Tylan 4 and 1*
2/4/2002	258	10.20	10.17			*Property # 9412*
2/4/2002	243	10.20	10.17			*Bar code # 20001183*
2/4/2002	38	10.25	10.22			
2/4/2002	312	10.15	10.12			
2/4/2002	314	10.15	10.12			
2/4/2002	315	10.25	10.22			
2/4/2002	259	10.25	10.22			
2/4/2002	310	10.20	10.17			
2/4/2002	257	10.20	10.17			
2/5/2002	244	10.15	10.12			
2/5/2002	39	10.20	10.17			
2/5/2002	41	10.20	10.17			
2/5/2002	316	10.20	10.17			
3/10/2002	259			9.50	10.20	*Flow = 1.03072 x display + .41384*
3/10/2002	38			9.45	10.15	*Tylan 4 and 1*
3/10/2002	310			9.45	10.15	*Property # 9632*
3/10/2002	257			9.50	10.20	Bar code # 20001444
3/10/2002	244			9.50	10.20	
3/10/2002	312			9.45	10.15	
3/10/2002	315			9.55	10.25	
3/10/2002	41			9.60	10.30	
3/10/2002	314			9.50	10.20	
3/10/2002	243			9.50	10.20	
3/10/2002	245			9.50	10.20	
3/10/2002	311			9.35	10.00	
3/10/2002	258			9.50	10.20	
3/10/2002	39			9.50	10.20	
3/14/2002	316			9.50	10.20	

Transfer St[illegible]rd Information:

Sampler Flow Check Log

MFM Make & Model: Tylan 4 in 1 MFM

Flow Range: 0-30 slpm

I.D.(Bar Code): 20003865 log # 2002072

Calibration Date: 3/27/02

Flow Check Data:

		Pre-Sampling Flow Check		Post-Sampling Flow Check		
Date	Sampler I.D.	Transfer Standard Flow Rate (slpm)	Sampler Flow Rate (slpm)	Transfer Standard Flow Rate (slpm)	Sampler Flow Rate (slpm)	Comments
4/4/02	315	10.59	10.18			*Air flow = .9879 x (display) - .2797*
4/4/02	244	10.47	10.06			
4/4/02	258	10.57	10.16			
4/4/02	259	10.55	10.14			
4/4/02	310	10.47	10.06			
4/4/02	312	10.56	10.15			
4/4/02	311	10.48	10.07			
4/4/02	243	10.52	10.11			
4/4/02	257	10.59	10.18			
5/2/02	41			10.62	10.21	
5/2/02	244			10.56	10.15	
5/2/02	38			10.45	10.04	
5/2/02	245			10.53	10.12	
5/2/02	315			10.75	10.34	
5/2/02	311			10.54	10.13	
5/2/02	314			10.71	10.30	
5/2/02	243			10.60	10.19	
5/2/02	310			10.55	10.14	
5/2/02	258			10.66	10.25	
5/2/02	316			10.45	10.04	
5/2/02	259			10.59	10.18	
5/2/02	312			10.65	10.24	
5/2/02	257			10.70	10.29	

Appendix C.2

ARB Meteorological Station Calibration Report

ARB Calibration Report - Resultant Wind Speed

Calibration Summary:

ID Information:

				Calibration Info.:	
Station Name:	Automet 5304	Manufacturer:	Met One	AS-FOUND:	
Site #:	Barrio Logan	Model #:	010	AS-LEFT:	X
Station Address:	Newton Ave. Lot	Serial #:	X1462	Calibration Date:	01/07/02
Agency:	ARB	Translator #:	466A	Report Date:	01/08/02
		Serial #:	X1042	Previous Cal. Date:	11/19/01

Calibration Results:

Component:		Wind Speed
Instrument Range (knots per hour):		0 to 86.84
AS-LEFT Starting Torque (gm-cm):		0.38
AS-LEFT Absolute Avg Speed Difference (knots):		0.02
Wind Speed Best Fit Line	Slope:	1.001
	Intercept:	0.002
	Correlation:	1.00000
AS-LEFT Meets Both PSD Requirements:		YES

Meteorology:

Temperature (°C):	22.0
Elevation (Feet.):	60
Pressure (mmHg):	759.0

Sensor Height:

Feet Above Ground:	
Roof height in feet.:	0.0
Calculated data to meet EPA height:	32.8
To meet EPA height:	0.0
	32.8

Calibration Standards:

Standard:	I.D. #:	Cert. Date:	Cert. Factor:
R.M. Young 18310 Torque Disc (0 to 15 gm-cm):	N.A.	Factory	N.A.
R.M. Young 18810 Selectable Drive (10-1,000 rpm):	20003897	10/02/01	RPM=(Meter*10)+0

==========

Calibration Data:

Translator:

Zero Scale:		Full Scale:	
DMM Voltage:	Knots:	DMM Voltage:	Knots:
N.A.	N.A.	N.A.	N.A.

Starting Torque:

In gm-cms:	0.2	Starting speed in meters/sec:	0.38
K Factor:	1.4	Meets PSD torque standard:	YES

Speed Accuracy (@ 0 <0.54 & Difference DAS - True <±5% of True)

RPM:	True (y): Knots per Hour	DAS (x): Knots	Difference DAS - True	PSD Difference Data	Meets PSD Difference Standard:
0	0.52	0.50	-0.02	1	YES
50	3.11	3.10	-0.01	0.3%	
110	6.22	6.22	0.00	0.0%	Absolute Avg. Diff.:
220	11.92	11.92	0.00	0.0%	0.02
450	23.83	23.81	-0.02	0.1%	
920	48.17	48.12	-0.05	0.1%	

Wind Speed Regression Data

Regression Results:

x Coefficient (Slope):	1.0008
y Constant (Intercept):	0.0024
Number of Observations:	6
Correlation:	1.000000

Corrected RWS:

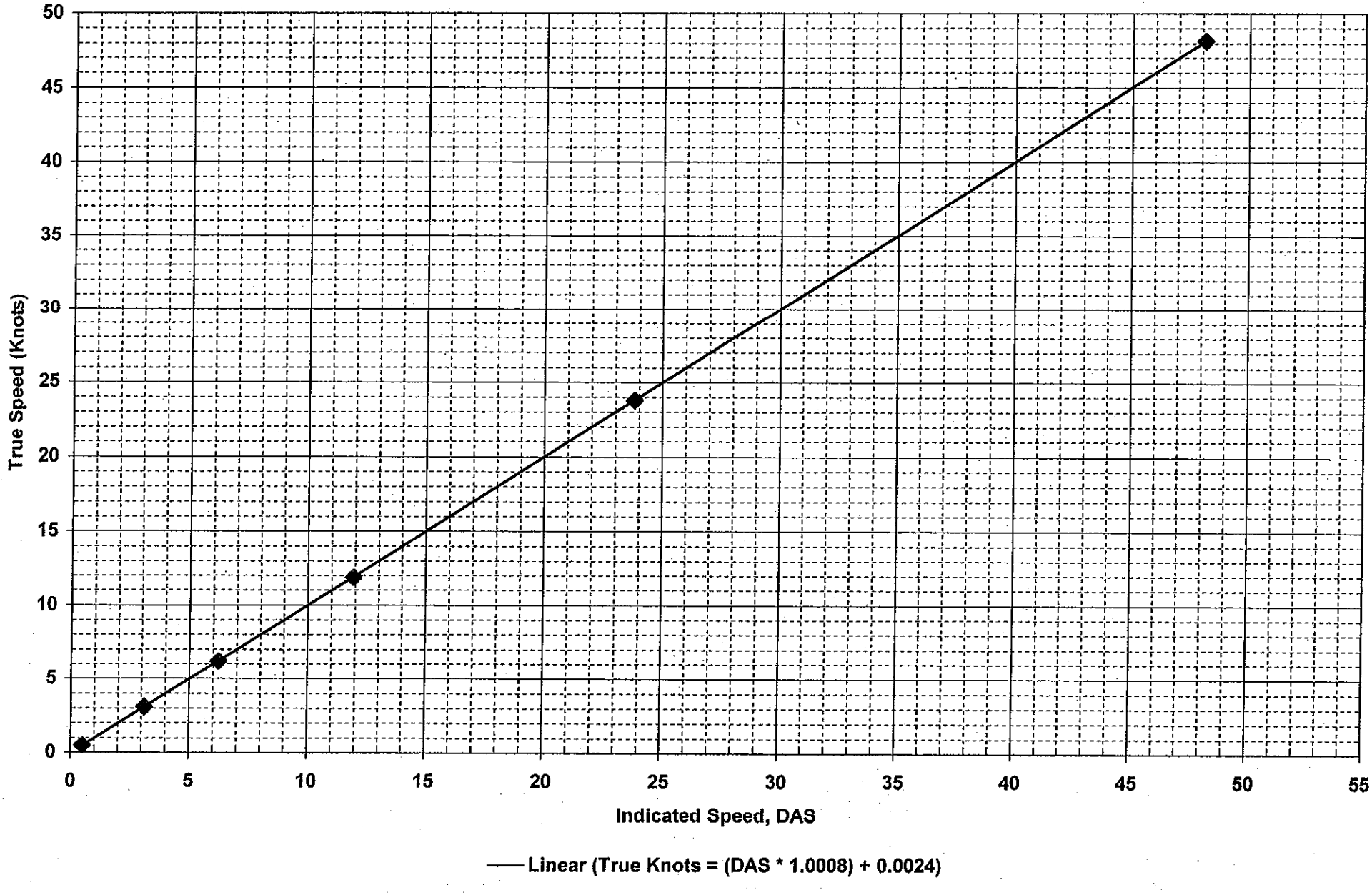
(DAS * x) + y
0.50
3.10
6.23
11.93
23.83
48.16

Comments:	Post Cal. Performed in Sacto.		
Calibrated by:	Andy Cowell	Checked by:	

Rev. 07/00 (SUR)

CALIBRATION GRAPH (AS-LEFT)

Barrio Logan AutoMet Resultant Wind Speed
Station Number: ??-??? Sensor Number: X1462 Cal. Date: 1/7/02



Created by: Andy Cowell

ARB Calibration Report - Resultant Wind Direction

Calibration Summary:

ID Information:

				Calibration Info.:	
Station Name:	Automet 5304	Manufacturer:	Met One	AS-FOUND:	
Site #:	Barrio Logan	Model #:	020C	AS-LEFT:	X
Station Address:	Newton Dr. Lot	Serial #:	W5517	Calibration Date:	01/08/02
Agency:	ARB	Translator #:	466A	Report Date:	01/09/02
		Serial #:	X1042	Installation Date:	11/19/01

Calibration Results:

Component:		Wind Direction
Instrument Range (degrees):		0 to 360
AS-LEFT Azimuth in relation to True North (deg):		359.0
AS-LEFT Starting Torque (gm-cms):		3.5
AS-LEFT Absolute Average Difference (degrees):		1.2
Wind Direction Best Fit Line	Slope:	0.990
	Intercept:	1.524
	Correlation:	1.00000
AS-LEFT Meets Both PSD Requirements:		YES

Meteorology:

Temperature (°C):	22.0
Elevation (Feet.):	60
Pressure (mmHg):	759.0

Sensor Height:

Feet Above Ground:	10.5
Roof height in feet.:	0.0
Calculated data to meet EPA height:	22.3
To meet EPA height:	-10.5
	22.3

Calibration Standards:

Standard:	I.D. #:	Cert. Date:	Cert. Factor:
Brunton 5008 Pocket Transit	5081192140	Factory	WYSIWYG
R.M. Young 18310 Torque Disk	N.A.	Factory	N.A.
Met One 040 Degree Fixture	N.A.	Factory	WYSIWYG

Calibration Data:

Direction Accuracy:

True Degrees (y):	DAS Degrees (x):	Difference DAS - True	Calculated Data to Meet PSD Direction
10	8.8	-1.3	
90	88.8	-1.3	1
180	180.7	0.7	1
270	271.3	1.3	1
350	351.7	1.7	1
	Absolute Avg. Diff.:	1.2	

Translator:	DMM Voltage:	Degrees:
Zero Scale:	N.A.	N.A.
Half Scale:	N.A.	N.A.
Starting Torque:	gram-centimeters:	3.5
	K Factor:	38
	Speed in m/sec.:	0.30
	Meets torque std.:	YES
	PSD Correction:	-1.0

Wind Direction Regression Data

Regression Results:

x Coefficient (Slope):	0.9903
y Constant (Intercept):	1.5238
Number of Observations:	5
Correlation:	0.999996

Corrected RWD:

(DAS * x) + y
10.2
89.4
180.5
270.1
349.8

AS-LEFT Condition (0 to 360° only):

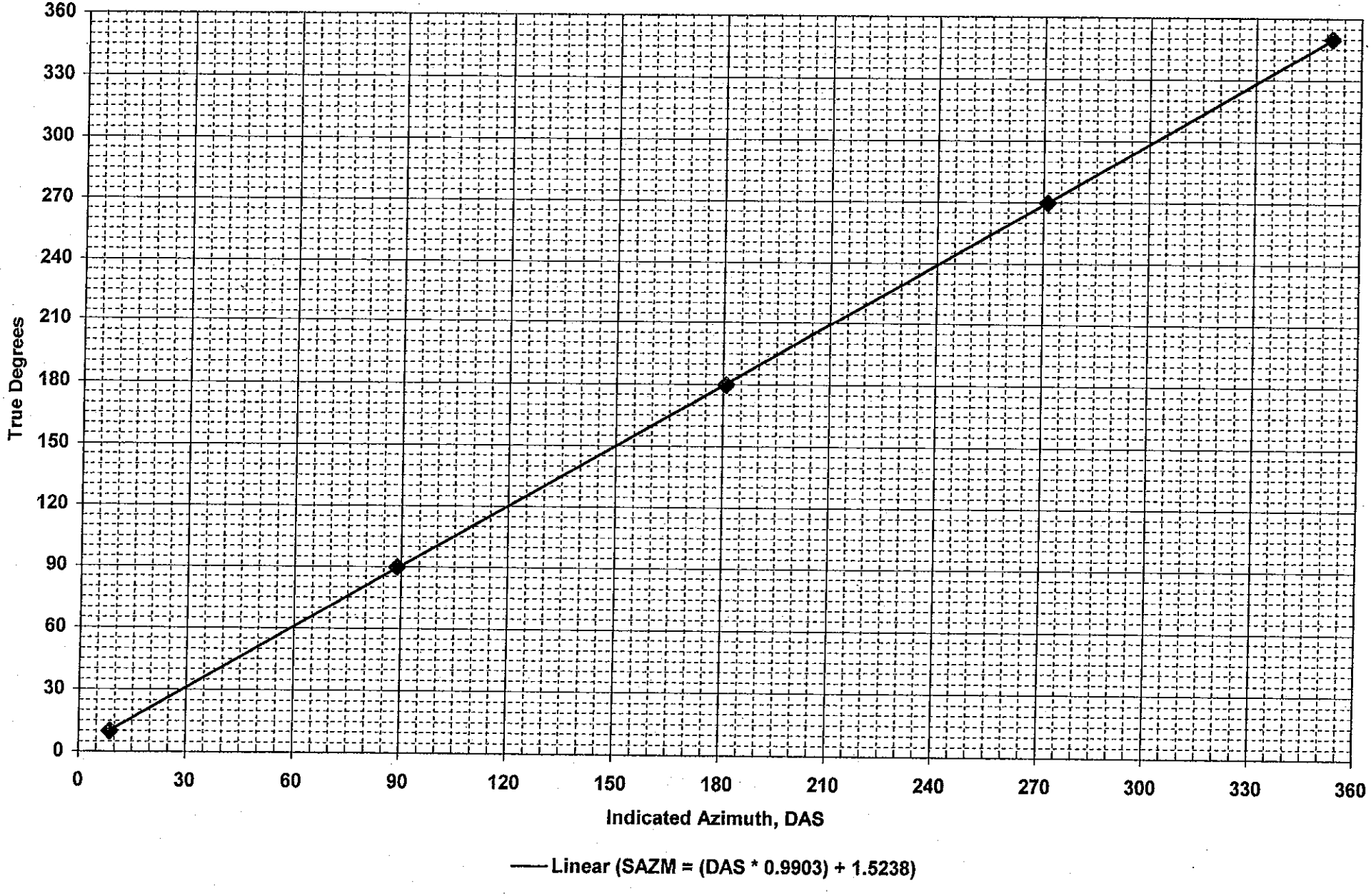
			Calculated Data to Meet PSD Direction
Declination of Site (Degrees East):	16.0		
Calculated True North Heading:	344.0		
Crossarm Orientation Uncorrected Transit Reading:	344.0		
Crossarm Degrees in Relation to True North:	0.0	Meets Direction Standard	1
DAS Output with Vane Parallel to Crossarm:	359.0		1
DAS Output Degrees off from True North:	-1.0		1
Azimuth computed from above measurements:	359.0	YES	1

Comments:	Post Cal. Ran in Sacto.		
Calibrated by:	Andy Cowell		Checked by:

Rev. 07/00 (SUR)

CALIBRATION GRAPH (AS-LEFT)

Barrio Logan Resultant Wind Direction
Station Number: ??-??? Sensor Number: W5517 Cal. Date: 1/7/02



Created by: Andy Cowell

ARB Calibration Report - Outside Temperature

Calibration Summary:

ID Information:

				Calibration Info.:	
Station Name:	Automet 5304	Manufacturer:	Met One	AS-FOUND:	
Site #:	Barrio Logan	Model #:	060A-2	AS-LEFT:	X
Station Address:	Newton Ave. Lot	Serial #:	X6353	Calibration Date:	01/08/02
Agency:	ARB	Translator #:	466A	Report Date:	01/09/02
		Serial #:	X1042	Previous Cal. Date:	11/19/01

Calibration Results:

Component:		Outside Temp.
Instrument Range (degrees centigrade):		-50 to 50
AS-LEFT Average Ice Bath Difference (°C):		0.21
AS-LEFT Average Ambient Bath Difference (°C):		0.16
AS-LEFT Average Hot Bath Difference (°C):		0.03
Outside Temperature Best Fit Line	Slope:	1.004
	Intercept:	-0.222
	Correlation:	1.00000
AS-LEFT Meets PSD °C Difference Requirement:		YES

Meteorology:

Temperature (°C):	22.0
Elevation (Feet.):	60
Pressure (mmHg):	759.0

Sensor Height:

Feet Above Ground:	13.0
Feet Above Roof:	0.0

Calibration Standards:

Standard:	I.D. #:	Cert. Date:	Slope:	Intercept:
Omega HH-64 Digital Thermometer	753038	10/02/01	0.9950	0.1407
Omega KHSS-316U-RSC-12 Thermister Probe	920274	10/02/01	N.A.	N.A.

Calibration Data:

If Average Difference of any bath is >0.50°C, correct.

Reference Bath	DAS Degree C (x)	Digital Degree C	True Degree C (y)	Difference DAS - True
ICE	0.20	-0.15	-0.01	0.21
	0.20	-0.15	-0.01	0.21
	0.20	-0.15	-0.01	0.21
Average	0.20		-0.01	0.21
AMBIENT	24.33	24.10	24.12	0.21
	24.13	23.95	23.97	0.16
	23.93	23.80	23.82	0.11
Average	24.13		23.97	0.16
HOT	48.35	48.45	48.35	0.00
	48.29	48.35	48.25	0.04
	48.46	48.50	48.40	0.06
Average	48.37		48.33	0.03

Transalator:

Zero Scale:	
N.A.	N.A.
DMM Volts	Degrees C
N.A.	N.A.
Full Scale:	

Regression & Graph Data:

x	y
0.20	-0.01
24.13	23.97
48.37	48.33

PSD Data:
0.21
0.16
0.03

Outside Temperature Regression Data

Regression Results:

x Coefficient (Slope):	1.0036
y Constant (Intercept):	-0.2216
Number of Observations:	3
Correlation:	1.000000

Corrected OTEMP:

(DAS * x) + y
-0.02
24.00
48.32

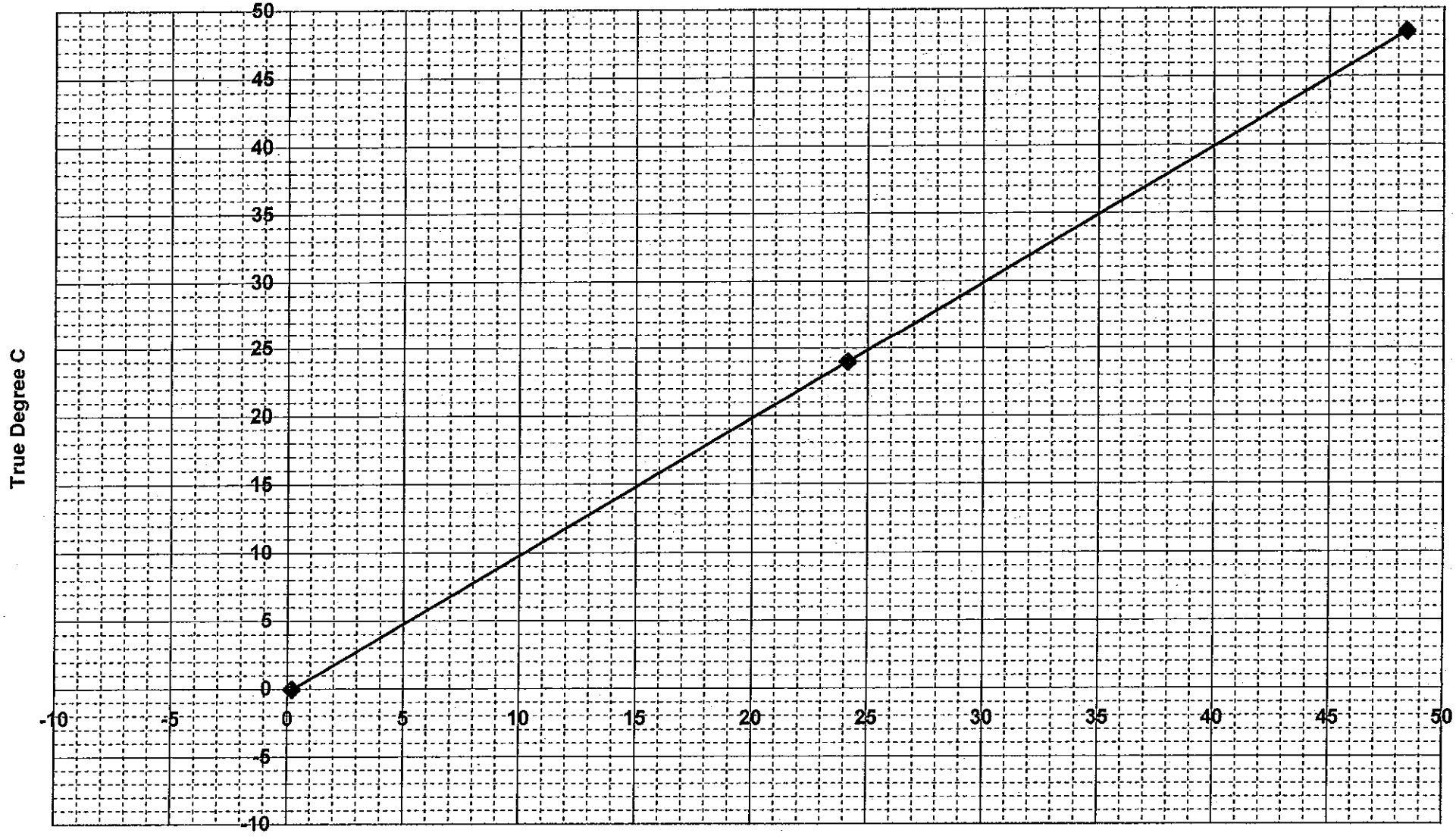
Comments:	Post cal. Performed in Sacto.		
Calibrated by:	Andy Cowell	Checked by:	

Rev. 07/00 (SUR)

CALIBRATION GRAPH (AS-LEFT)

Barrio Logan AutoMet Outside Temperature

Station Number: ??-??? Sensor Number: X6353 Cal. Date: 1/8/02



Created by: An[illegible] Cowell

ARB Calibration Report - Relative Humidity

Calibration Summary:

ID Information:

Station Name:	Automrt 5304	Manufacturer:	Met One	**Calibration Info.:** AS-FOUND:	
Site #:	Barrio Logan	Model #:	083D-0-6	AS-LEFT:	X
Station Address:	Newton Ave. Lot	Serial #:	M6303	Calibration Date:	01/08/02
Agency:	ARB	Translator #:	466A	Report Date:	01/09/02
		Serial #:	X1042	Previous Cal. Date:	11/19/01

Calibration Results:

Component:		Relative Humidity
Instrument Range (Percent Relative Humidity):		0 to 100
Relative Humidity Best Fit Line	Slope:	1.015
	Intercept:	-0.274
	Correlation:	0.99836
Absolute Average Percent Difference (%RH):		1.4
AS-LEFT Meets PSD Requirements:		YES

Meteorology:

Temperature (°C):	16.0
Elevation (Ft.):	60
Pressure (mmHg):	759.0

Sensor Height:

Feet Above Ground:	13.0
Feet Above Roof:	0.0

Calibration Standards:

Standard:	I.D. #:	Cert. Date:	Cert. Factor:
Rotronic ER25 Calibration Device:	None	Factory	N.A.
Rotronic EA10 Salt Standard:	109802	08/11/98	(10 x 1)+0
Rotronic EA35 Salt Standard:	359901	02/16/99	(35 x 1)+0
Rotronic EA50 Salt Standard:	509901	02/18/99	(50 x 1)+0
Rotronic EA80 Salt Standard:	809906	10/12/99	(80 x 1)+0

Calibration Data:

Translator:

Zero Scale:		Full Scale:	
DMM Voltage:	%RH:	DMM Voltage:	%RH:
N.A.	N.A.	N.A.	N.A.

% Relative Humidity Accuracy (If Any Difference > 5.0%RH, adjust so Avg. Diff. Is <2.0%RH Difference)

TRUE %RH (y)	DAS %RH (x)	DAS Voltage	Difference DAS - True	Meets PSD Criteria
0	0.3	N.A.	N.A.	YES
9.8	8.6	N/A	-1.2	1
34.4	35.2	N/A	0.8	1
49.4	50.7	N/A	1.3	1
79.8	77.4	N/A	-2.4	1
		ABS Avg. Diff.:	1.4	

Relative Humidity Regression Data

Regression Results:

X Coefficient (Slope):	1.0151
Y Constant (Intercept):	-0.2739
Number of Observations:	4
Correlation:	0.998365

Corrected %RH:

(DAS * x) + y
0.0
8.5
35.5
51.2
78.3
100.0

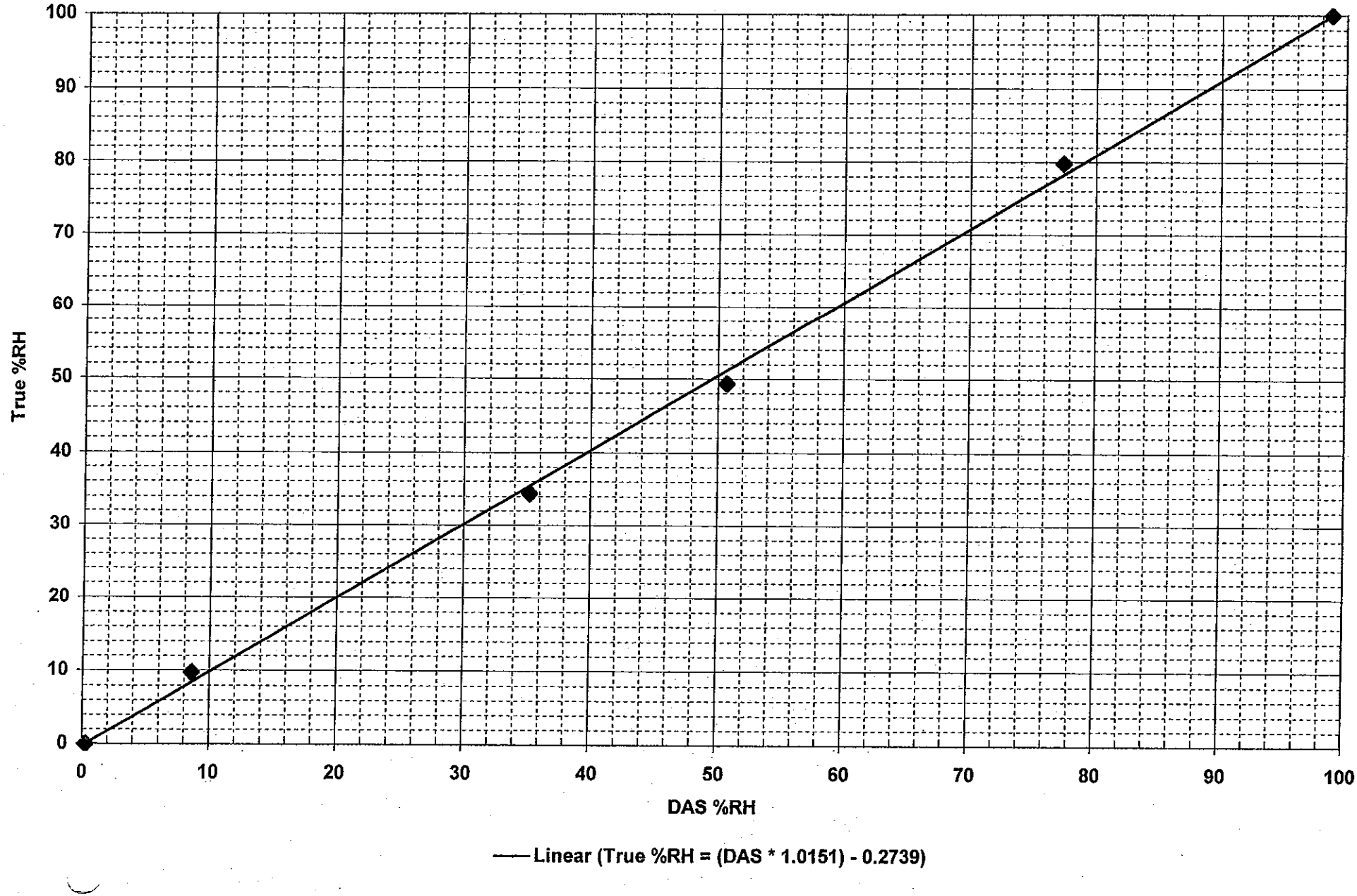
Comments:	Post cal. Perfomed in Sacto.		
Calibrated by:	Andy Cowell		Checked by:

Rev. 07/00 (SUR)

CALIBRATION GRAPH (AS-LEFT)

Barrio Logan AutoMet % Relative Humidity

Station Number: ??-??? Sensor Number: M6303 Cal. Date: 1/8/02



Created by: Andy Cowell

Appendix C.3

Barrio Logan Meteorological Data with Wind Roses

Wind Speed and Direction **0700 - 1800 hours**

Date	High Wind Speed (knots)	Average Wind Speed (knots)	Predominant Wind Direction	Percent Calm Wind	
12/3/01	3.8	2.5	WNW	17	
12/4/01	4.4	2.7	WNW / NW	17	
12/5/01	4.4	2.6	WNW / NW	33	
12/6/01	4.0	2.5	WNW	33	
12/7/01	3.2	1.8	W	38	
12/8/01	3.3	2.1	WNW	13	
12/9/01	5.4	3.4	WNW	4	
12/10/01	5.5	3.3	S	25	
12/11/01	4.8	2.9	WNW	54	
12/12/01	4.5	2.7	S	46	
12/13/01	3.6	2.4	WNW	25	
12/14/01	7.3	3.9	S	38	
12/15/01	4.3	2.6	WNW	42	
12/16/01	3.4	2.5	WNW / NW	25	
12/17/01	4.3	2.4	WNW	42	
2/5/02	4.3	2.4	SSW	41.7	
2/6/02	4.1	2.7	SSE & W	45.8	
2/7/02	4.5	3.0	W	25.0	
2/8/02	4.8	2.9	W & WSW	20.8	
2/9/02	3.7	2.4	W & SW	41.7	
2/10/02	3.9	2.9	am-NtoNNE and pm-WtoSSW	12.5	
2/11/02	4.7	3.3	W	16.7	
2/12/02	4.5	3.2	SSE	41.7	
2/13/02	4.8	2.8	SSE	41.7	
2/14/02	5.0	3.2	S	41.7	
2/15/02	4.7	3.1	W	45.8	
2/16/02	4.4	2.6	W	12.5	
2/17/02	7.7	4.2	SE & SW	4.2	
2/18/02	4.3	3.1	W	4.2	
2/19/02	4.6	3.1	W	4.2	
2/20/02	5.0	3.4	W	16.7	
2/21/02	3.9	2.5	W	29.2	
2/22/02	4.6	2.6	WNW	45.8	POWER FAILURE - NO DATA FOR 6 HOURS
2/23/02	4.8	3.2	W & SW	4.2	
2/24/02	4.8	3.3	W	25.0	
2/25/02	4.2	2.9	W	41.7	
2/26/02	5.0	2.8	W	37.5	
2/27/02	5.1	3.1	SSE	16.7	
2/28/02	5.0	3.9	SSE	0.0	
3/1/02	5.1	4.2	W	8.3	
3/2/02	3.6	2.1	NNE	33.3	NO DATA FOR 6 HOURS-AM ONLY
3/3/02	3.9	3.1	W	11.1	ONLY 3 HOURS OF DATA
3/4/02	5.3	3.5	W	17.4	POWER FAILURE - NO DATA FOR 1 HOUR
3/5/02	4.2	2.7	SSW	15.4	NO DATA FOR 5 HOURS-AM ONLY

Wind Speed and Direction **0700 - 1800 hours**

Date	High Wind Speed (knots)	Average Wind Speed (knots)	Predominant Wind Direction	Percent Calm Wind
3/6/02	4.1	2.8	W	20.8
3/7/02	5.2	3.8	SSE	20.8
3/8/02	5.4	3.9	S	8.3
3/9/02	4.9	3.0	W	25.0
3/10/02	5.1	3.6	W	
3/11/02	4.5	3.3	W	
3/12/02	5.4	4.1	S	
3/13/02	5.8	4.3	SSE/WNW	
3/14/02	6.7	5.4	W	
3/15/02	6.5	4.2	W	
3/16/02	6.0	5.0	W	
3/17/02	4.7	3.8	W	
3/18/02	5.4	3.8	WNW	
3/19/02	4.6	3.3	W	
3/20/02	4.9	3.3	W	
3/21/02	4.2	2.9	W	
3/22/02	4.7	3.5	W	
3/23/02	5.7	3.8	S/W	
3/24/02	4.9	4.0	W	
3/25/02	4.8	3.6	W	
3/26/02	4.8	3.3	W	
3/27/02	4.3	2.8	W	
3/28/02	4.0	3.1	S	
3/29/02	5.1	3.1	W	
3/30/02	5.2	3.4	W	
3/31/02	5.1	3.7	W	
4/1/02	4.2	3.3	W	
4/2/02	5.4	3.5	SW	
4/3/02	4.3	3.7	W	
4/4/02	5.0	3.7	W	
4/5/02	4.8	2.9	W	
4/6/02	4.8	3.2	WSW	
4/7/02	6.1	4.6	SSE	
4/8/02	5.8	3.8	SW	
4/9/02	5.4	4.0	WNW	
4/10/02	5.3	3.5	WSW	
4/11/02	5.7	4.0	SSE	
4/12/02	4.5	3.7	SSE	
4/13/02	5.9	3.5	W	
4/14/02	4.2	3.3	SSE	
4/15/02	8.4	5.4	SSE	
4/16/02	6.6	5.6	S	
4/17/02	5.1	4.1	SW	
4/18/02	5.4	4.3	W	
4/19/02	6.4	4.6	SSE	
4/20/02	5.6	4.5	SSW	
4/21/02	5.2	4.0	W	

Wind Speed and Direction **0700 - 1800 hours**

Date	High Wind Speed (knots)	Average Wind Speed (knots)	Predominant Wind Direction	Percent Calm Wind
4/22/02	5.3	3.9	W	
4/23/02	5.0	3.6	W	
4/24/02	4.2	2.8	WNW	
4/25/02	4.8	4.0	W	
4/26/02	7.4	4.3	W	
4/27/02	NA	NA	NA	
4/28/02	NA	NA	NA	
4/29/02	NA	NA	NA	
4/30/02	NA	NA	NA	
5/1/02	NA	NA	NA	
5/2/02	NA	NA	NA	
5/3/02	5.1	3.6	W	
5/4/02	5.0	3.5	W	
5/5/02	4.8	3.4	SW	
5/6/02				
5/7/02	5.5	3.7	S	
5/8/02	5.7	4.0	S	
5/9/02	5.1	3.8	W	
5/10/02	6.3	5.3	S	
5/11/02	5.0	4.1	S/W	
5/12/02	5.0	3.6	W	
5/13/02	4.6	3.4	W	
5/14/02	5.8	4.7	S	
5/15/02	6.2	5.0	SSE	
5/16/02	5.7	4.5	SSE	
5/17/02	6.2	3.9	WSW	
5/18/02	5.6	3.8	S	
5/19/02	5.3	3.9	SW	
5/20/02	4.6	3.9	W	
5/21/02	5.2	4.3	W	
5/22/02	4.6	3.8	W	
5/23/02	6.9	5.1	SSE	

Barrio Logan Cr6

Barrio Logan Cr6 Meteorological Data

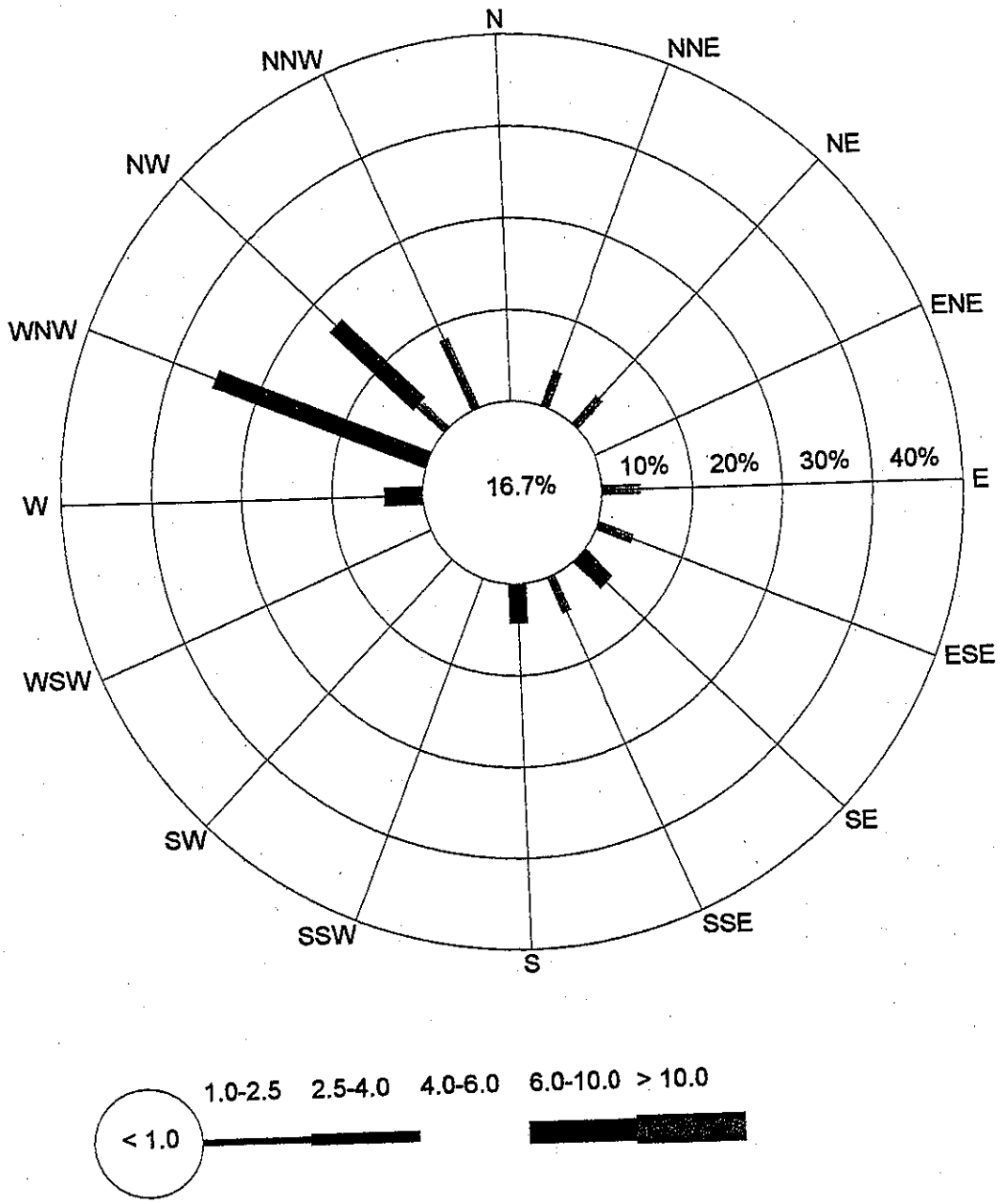
Log Date: 2001/12/03

Printing: 2002/01/09

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%RH)	SIGMA (Deg)
01:00	1.3	108	13.6	81	31
02:00	2.6	138	13.1	84	31
03:00	0.6	52	12.3	91	31
04:00	0.9	87	11.9	95	31
05:00	1.2	28	11.9	96	31
06:00	1.1	347	12.1	95	31
07:00	0.8	3	12.2	95	31
08:00	1.1	92	12.6	93	31
09:00	0.7	58	13.4	91	31
10:00	1.7	148	14.0	89	31
11:00	2.8	173	14.6	85	31
12:00	2.5	265	15.7	78	31
13:00	3.2	286	17.0	67	31
14:00	3.1	291	16.7	66	31
15:00	3.2	285	16.2	73	31
16:00	3.5	305	15.8	70	31
17:00	3.8	307	15.1	68	31
18:00	3.3	302	14.6	66	31
19:00	2.3	311	14.2	64	31
20:00	2.6	307	14.1	66	31
21:00	3.1	303	14.1	68	31
22:00	3.0	292	13.3	73	31
23:00	1.7	348	12.2	80	31
24:00	1.1	45	11.3	88	31
Sum			332.1	1922	746
Average	2.1	338	13.8	80	31
Maximum Time			17.0 13:00	96 05:00	31 01:00
Minimum Time			11.3 24:00	64 19:00	31 18:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

WIND ROSE PLOT

2001 12/03 Time: 01:00 ----- 2001 12/03 Time: 24:00



Barrio Logan Cr6

Barrio Logan Cr6 Meteorological Data

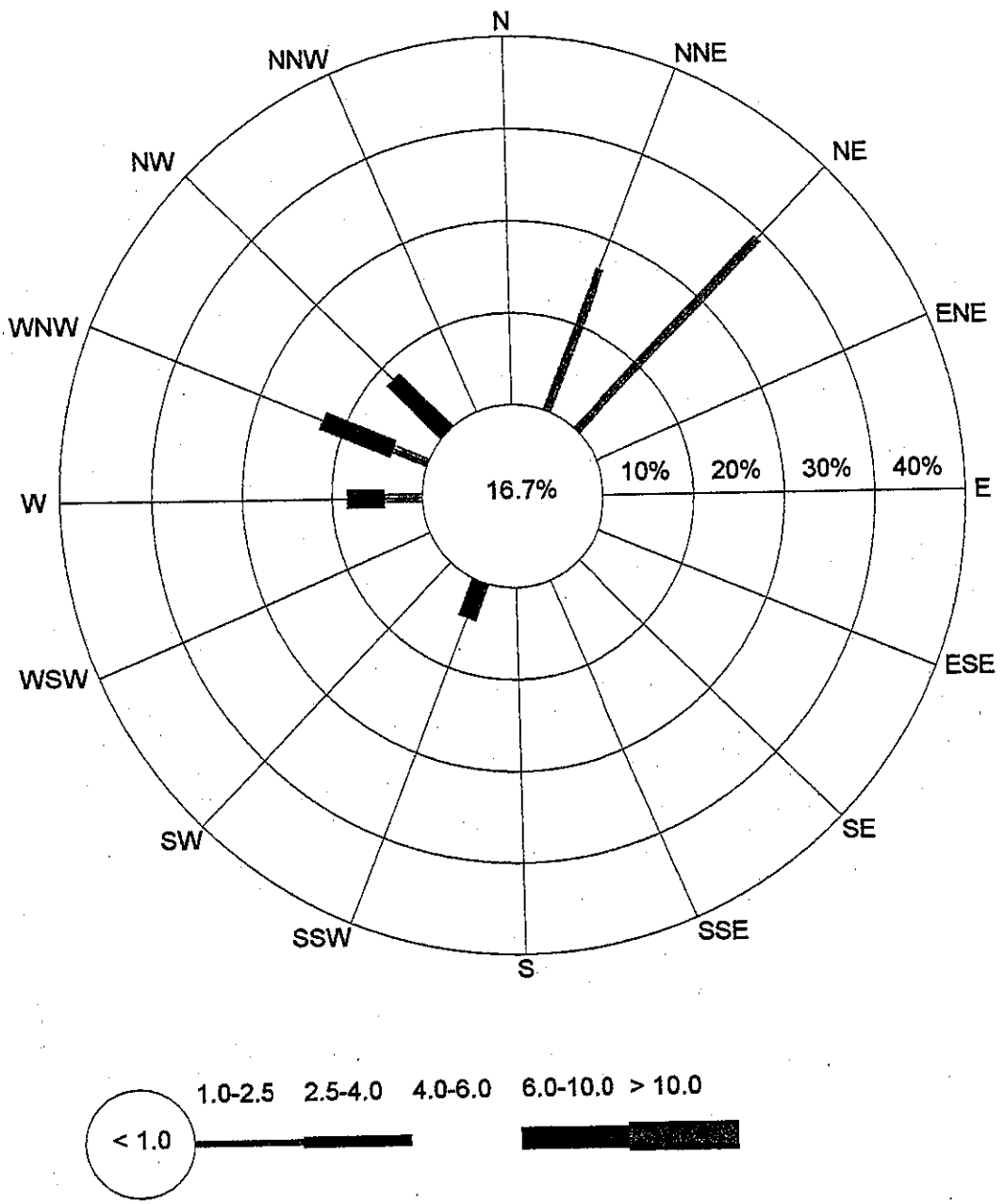
Date: 2001/12/04

Printing: 2002/01/09

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%RH)	SIGMA (Deg)
01:00	1.0	28	11.0	88	31
02:00	0.8	28	10.8	91	31
03:00	1.2	41	10.6	92	31
04:00	0.8	44	10.0	92	31
05:00	1.4	38	9.8	90	31
06:00	0.8	53	9.2	92	31
07:00	1.1	47 NE	9.0	91	31
08:00	1.4	33 NNE	9.6	89	31
09:00	1.0	29 NNE	11.6	82	31
10:00	3.3	213 SW	14.4	69	31
11:00	3.5	293 WNW	15.2	63	32
12:00	4.4	306 NW	15.7	58	32
13:00	4.0	305 NW	16.2	52	32
14:00	3.9	306 NW	16.1	52	32
15:00	2.9	288 WNW	16.2	50	32
16:00	3.0	262 W	15.6	54	32
17:00	2.1	277 W	14.5	60	32
18:00	1.3	296 WNW	13.9	63	32
19:00	0.9	326	13.1	68	32
20:00	1.1	49	11.6	74	32
21:00	1.5	41	10.6	76	32
22:00	1.3	53	10.1	75	32
23:00	1.1	51	9.3	75	32
24:00	1.5	33	8.6	77	33
Sum			292.7	1774	757
Average	1.9	3	12.2	74	32
Maximum Time			16.2 13:00	92 04:00	33 24:00
Minimum Time			8.6 24:00	50 15:00	31 05:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

WIND ROSE PLOT

2001 12/04 Time: 01:00 ----- 2001 12/04 Time: 24:00



Barrio Logan Cr6

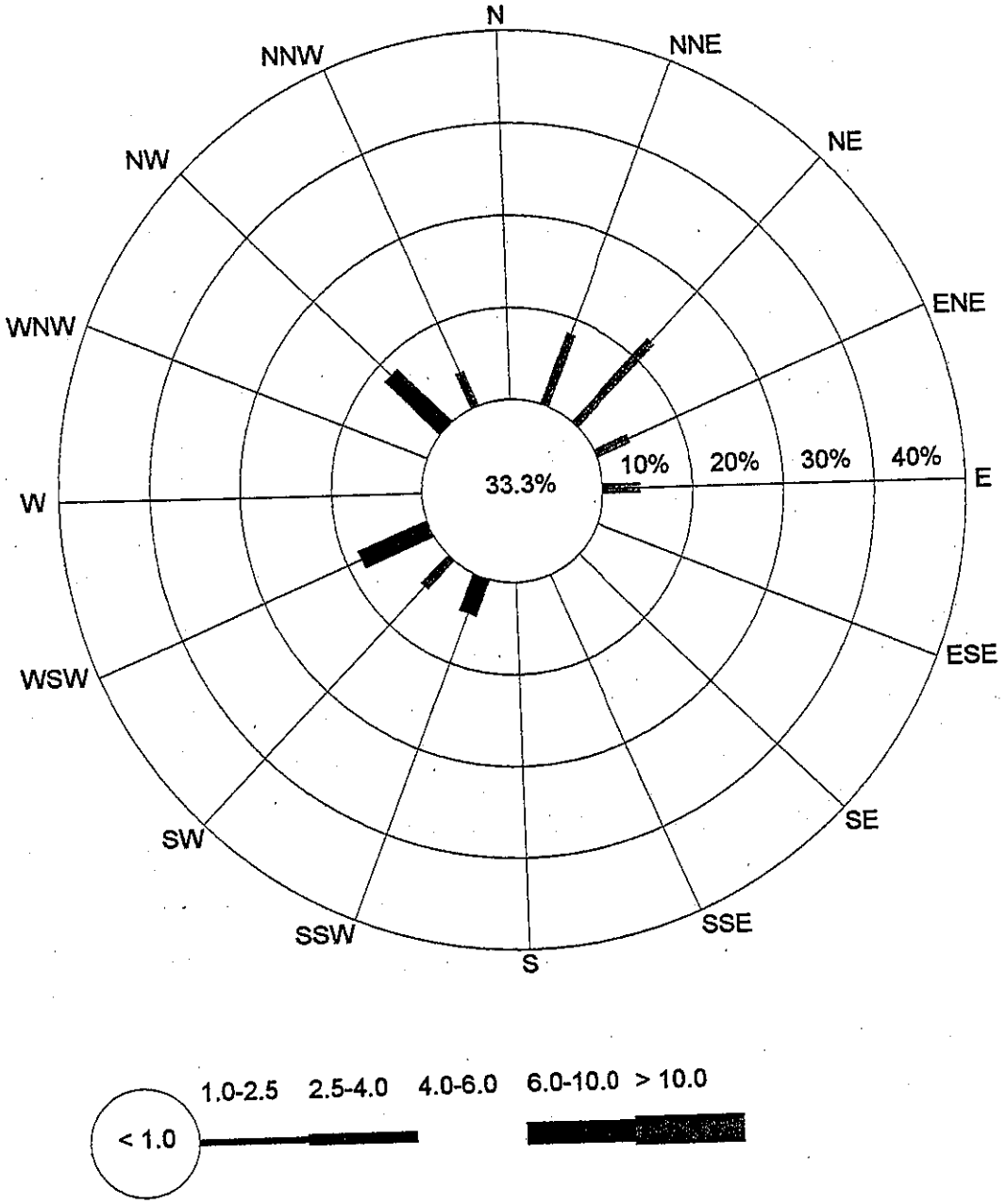
Barrio Logan Cr6 Meteorological Data

Log Date: 2001/12/05 Printing: 2002/01/09

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%RH)	SIGMA (Deg)
01:00	1.5	40	8.1	77	33
02:00	1.0	56	7.7	77	33
03:00	0.9	58	7.2	79	32
04:00	1.5	39	6.7	78	32
05:00	1.1	49	6.1	80	32
06:00	1.1	60	6.2	77	33
07:00	0.7	52 NE	6.3	76	33
08:00	0.9	21 N	7.6	72	33
09:00	1.3	100 E	9.6	63	33
10:00	1.7	230 SW	13.0	56	33
11:00	2.7	203 SSW	14.4	54	34
12:00	2.6	257 WSW	16.4	47	33
13:00	3.4	256 WSW	16.7	50	33
14:00	4.3	298 WNW	17.3	46	33
15:00	4.4	297 WNW	17.0	52	33
16:00	3.3	317 NW	16.5	53	33
17:00	3.1	311 NW	15.0	63	33
18:00	2.2	332 NNW	14.0	69	33
19:00	1.7	21	13.4	72	33
20:00	1.0	68	12.4	76	33
21:00	0.6	70	11.8	79	33
22:00	0.8	41	10.9	81	33
23:00	0.9	58	10.4	82	33
24:00	1.9	32	10.1	78	33
Sum			274.7	1637	791
Average	1.9	23	11.4	68	33
Maximum Time			17.3 14:00	82 23:00	34 11:00
Minimum Time			6.1 05:00	46 14:00	32 05:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

WIND ROSE PLOT

2001 12/05 Time: 01:00 ----- 2001 12/05 Time: 24:00



Barrio Logan Cr6

Barrio Logan Cr6 Meteorological Data

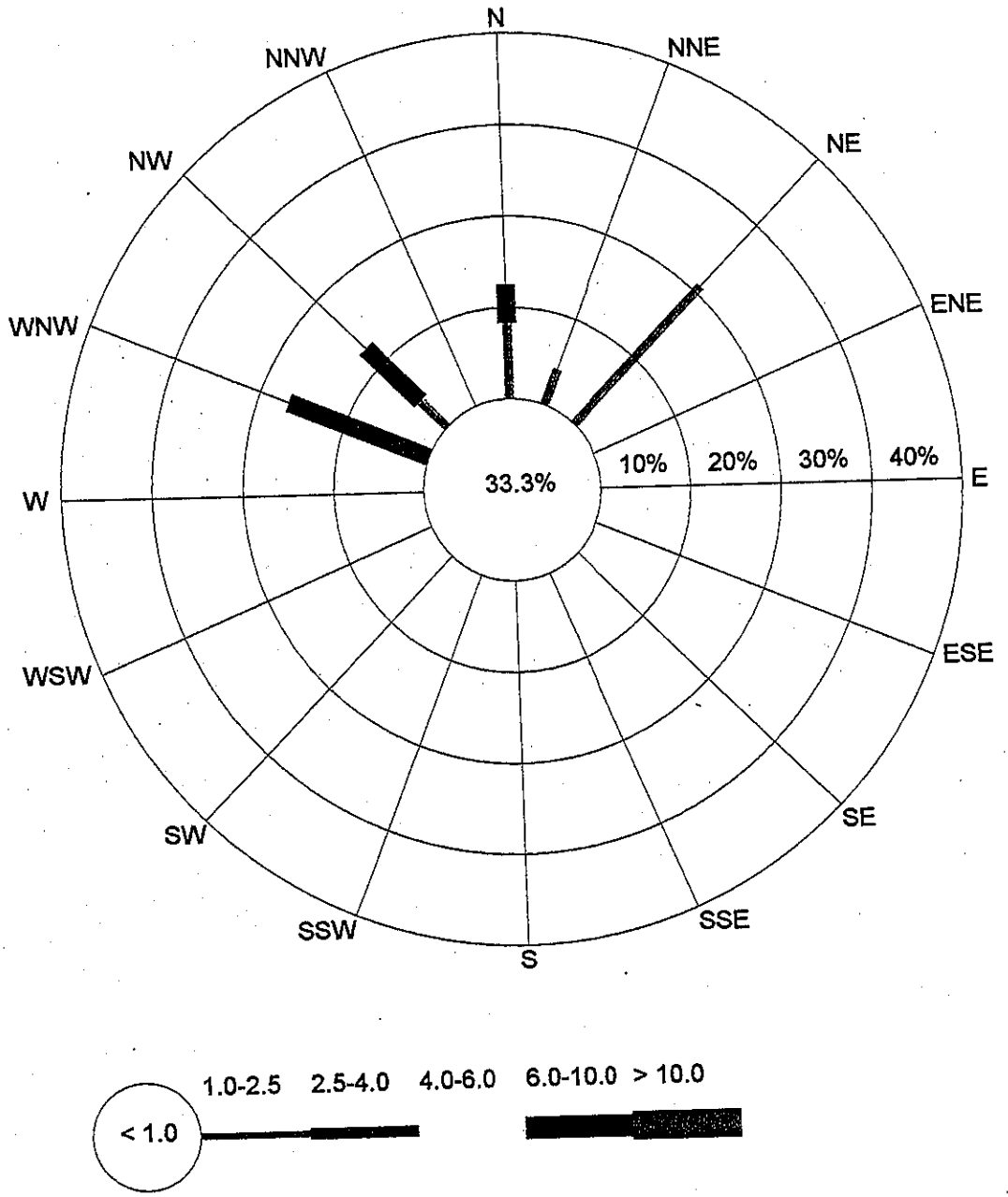
Log Date: 2001/12/06

Printing: 2002/01/09

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%RH)	SIGMA (Deg)
01:00	1.9	31	9.7	74	33
02:00	1.5	39	9.2	73	33
03:00	1.2	50	8.7	76	33
04:00	0.7	88	8.0	77	32
05:00	0.9	33	8.1	75	32
06:00	0.8	65	8.4	75	32
07:00	0.9	35 NE	7.9	74	32
08:00	1.0	25 NNE	9.7	68	33
09:00	1.9	311 NW	12.1	60	33
10:00	2.6	325 NW	14.9	59	33
11:00	2.0	1 N	17.6	44	33
12:00	2.7	296 WNW	19.8	37	33
13:00	3.3	292 WNW	19.4	48	33
14:00	3.3	299 WNW	20.8	38	32
15:00	4.0	299 WNW	19.7	49	32
16:00	3.7	310 NW	18.3	58	32
17:00	2.8	356 N	17.3	54	32
18:00	1.6	11 N	16.5	47	32
19:00	1.5	39	15.7	49	32
20:00	0.8	73	14.3	55	32
21:00	0.9	47	13.4	58	32
22:00	0.9	51	12.2	64	32
23:00	1.1	47	11.8	70	32
24:00	1.2	50	10.8	72	32
Sum			324.5	1456	777
Average	1.8	15	13.5	61	32
Maximum Time			20.8 14:00	77 04:00	33 10:00
Minimum Time			7.9 07:00	37 12:00	32 24:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

WIND ROSE PLOT

2001 12/06 Time: 01:00 ----- 2001 12/06 Time: 24:00



Barrio Logan Cr6

Barrio Logan Cr6 Meteorological Data

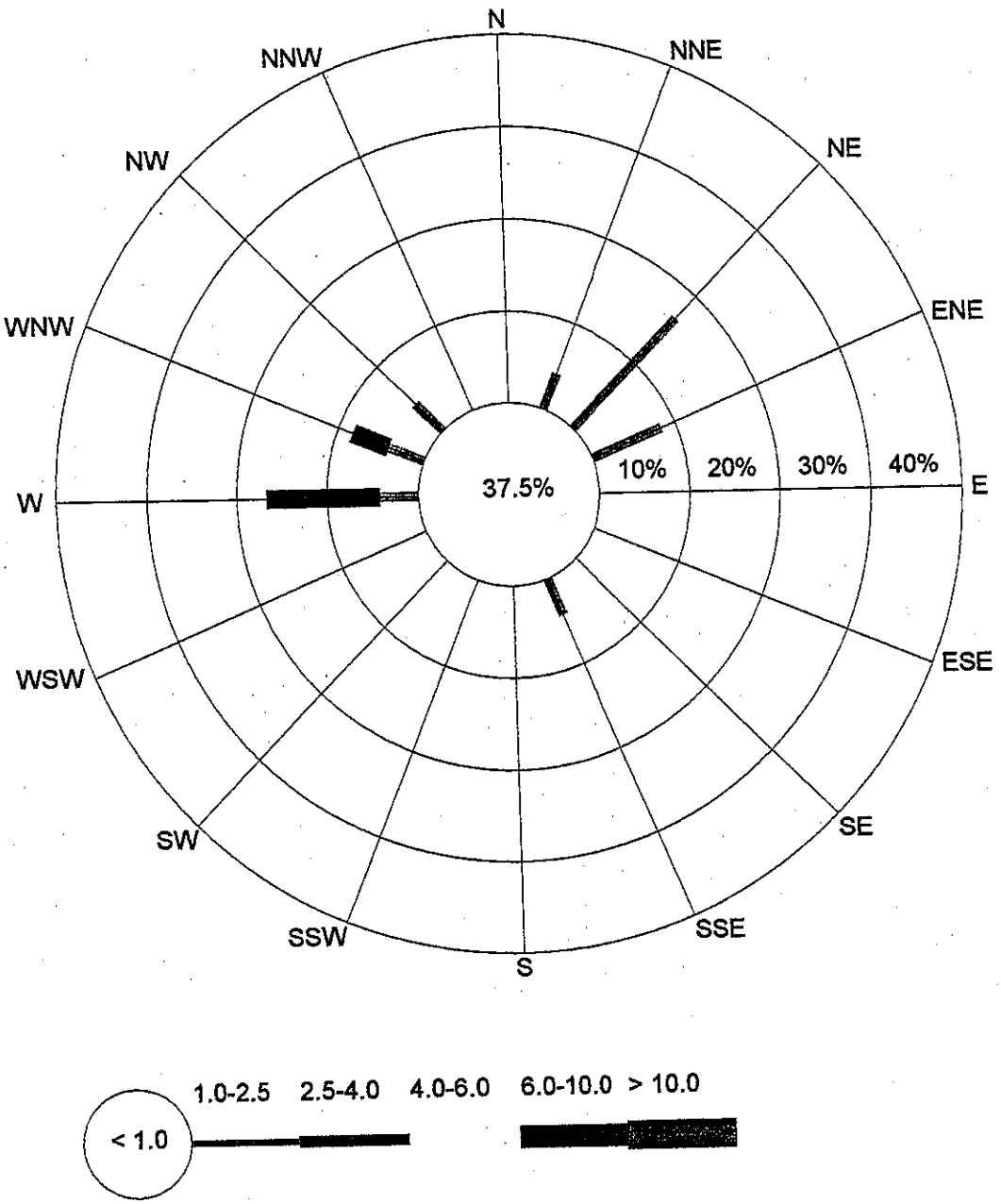
Log Date: 2001/12/07

Printing: 2002/01/09

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%RH)	SIGMA (Deg)
01:00	1.3	43	11.4	63	32
02:00	1.0	356	11.2	59	32
03:00	0.6	87	9.9	65	32
04:00	1.2	34	10.2	58	31
05:00	1.0	30	10.1	55	31
06:00	0.5	79	9.0	60	31
07:00	0.6	69 ENE	9.2	58	31
08:00	0.8	43 NE	11.5	51	32
09:00	0.9	91 E	16.1	38	32
10:00	1.6	319 NW	19.3	35	32
11:00	1.7	293 WNW	22.9	23	32
12:00	2.5	270 W	24.5	17	32
13:00	3.2	287 WNW	25.0	17	32
14:00	2.7	263 W	25.2	19	32
15:00	2.6	280 W	24.0	31	32
16:00	1.8	265 W	23.3	38	32
17:00	1.3	167 SSE	21.0	47	32
18:00	1.5	57 ENE	18.8	56	32
19:00	1.0	49	17.0	64	32
20:00	1.2	53	15.7	66	32
21:00	1.3	65	14.6	63	32
22:00	1.5	43	13.8	57	32
23:00	1.3	31	13.3	49	32
24:00	1.0	67	12.1	54	32
Sum			389.2	1143	765
Average	1.4	30	16.2	48	32
Maximum Time			25.2 14:00	66 20:00	32 11:00
Minimum Time			9.0 06:00	17 12:00	31 05:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

WIND ROSE PLOT

2001 12/07 Time: 01:00 ----- 2001 12/07 Time: 24:00



Barrio Logan Cr6

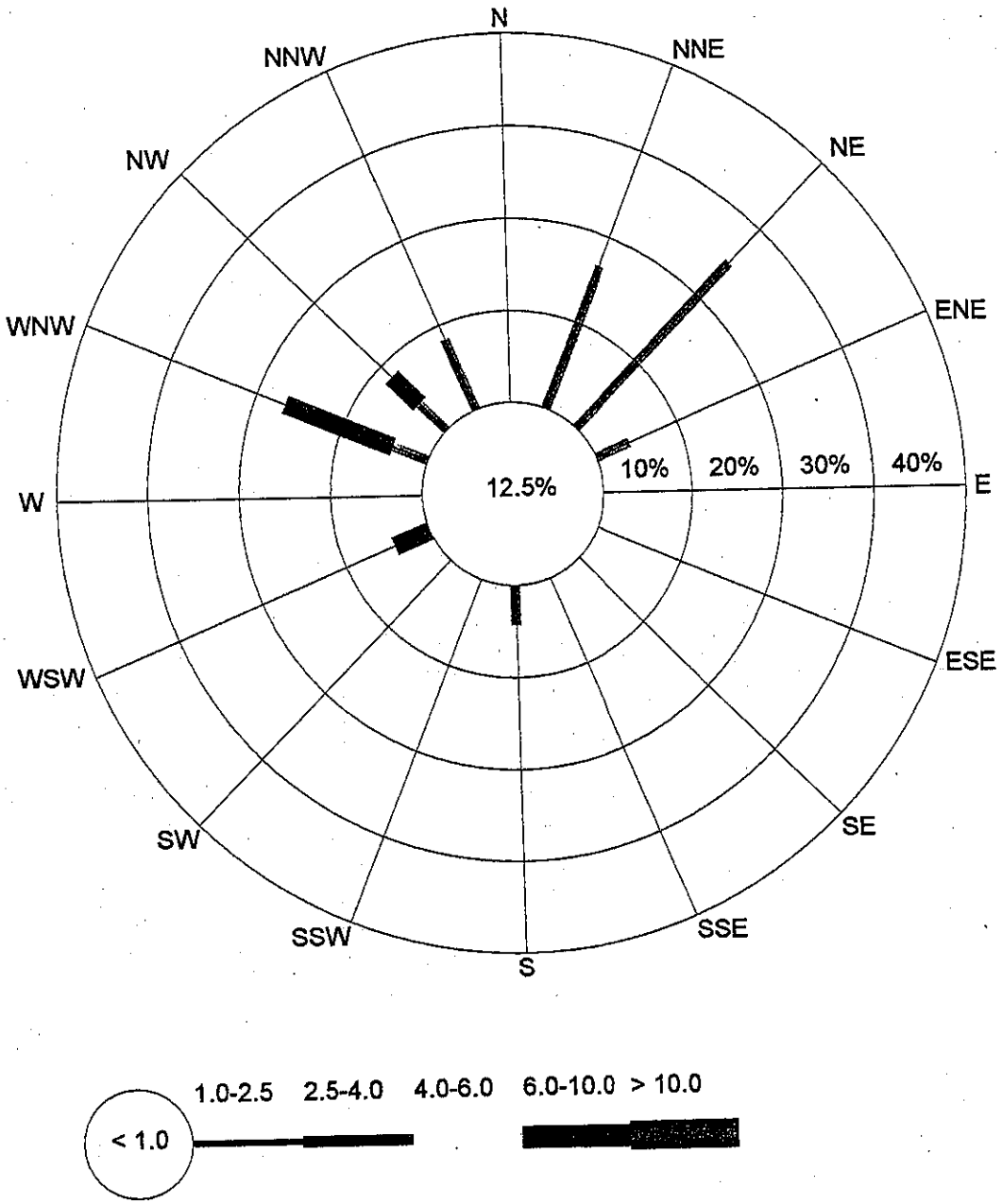
Barrio Logan Cr6 Meteorological Data

.og Date: 2001/12/08 Printing: 2002/01/09

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%RH)	SIGMA (Deg)
01:00	1.6	48	11.7	55	32
02:00	1.3	36	11.5	52	32
03:00	1.6	41	11.9	46	32
04:00	1.3	30	10.8	47	32
05:00	1.2	64	10.0	49	32
06:00	1.1	31	9.9	47	32
07:00	1.4	31 NNE	10.3	43	32
08:00	1.2	176 S	13.8	36	32
09:00	1.2	328 NNW	14.9	42	32
10:00	1.4	348 NNW	19.7	26	32
11:00	2.5	292 WNW	22.5	19	32
12:00	2.8	294 WNW	24.0	15	32
13:00	3.3	249 W	24.0	16	32
14:00	3.0	305 NW	24.7	13	32
15:00	3.3	297 WNW	23.6	14	32
16:00	2.5	298 WNW	22.9	16	32
17:00	1.3	305 NW	20.3	26	32
18:00	0.8	67 ENE	17.6	36	31
19:00	0.9	62	16.0	40	31
20:00	1.0	61	14.5	44	31
21:00	1.4	43	13.9	37	31
22:00	1.5	54	13.9	26	31
23:00	1.2	47	13.6	23	31
24:00	1.8	32	13.0	23	31
Sum			388.9	792	763
Average	1.7	13	16.2	33	32
Maximum Time			24.7 14:00	55 01:00	32 11:00
Minimum Time			9.9 06:00	13 14:00	31 24:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

WIND ROSE PLOT

2001 12/08 Time: 01:00 ----- 2001 12/08 Time: 24:00



Barrio Logan Cr6

Barrio Logan Cr6 Meteorological Data

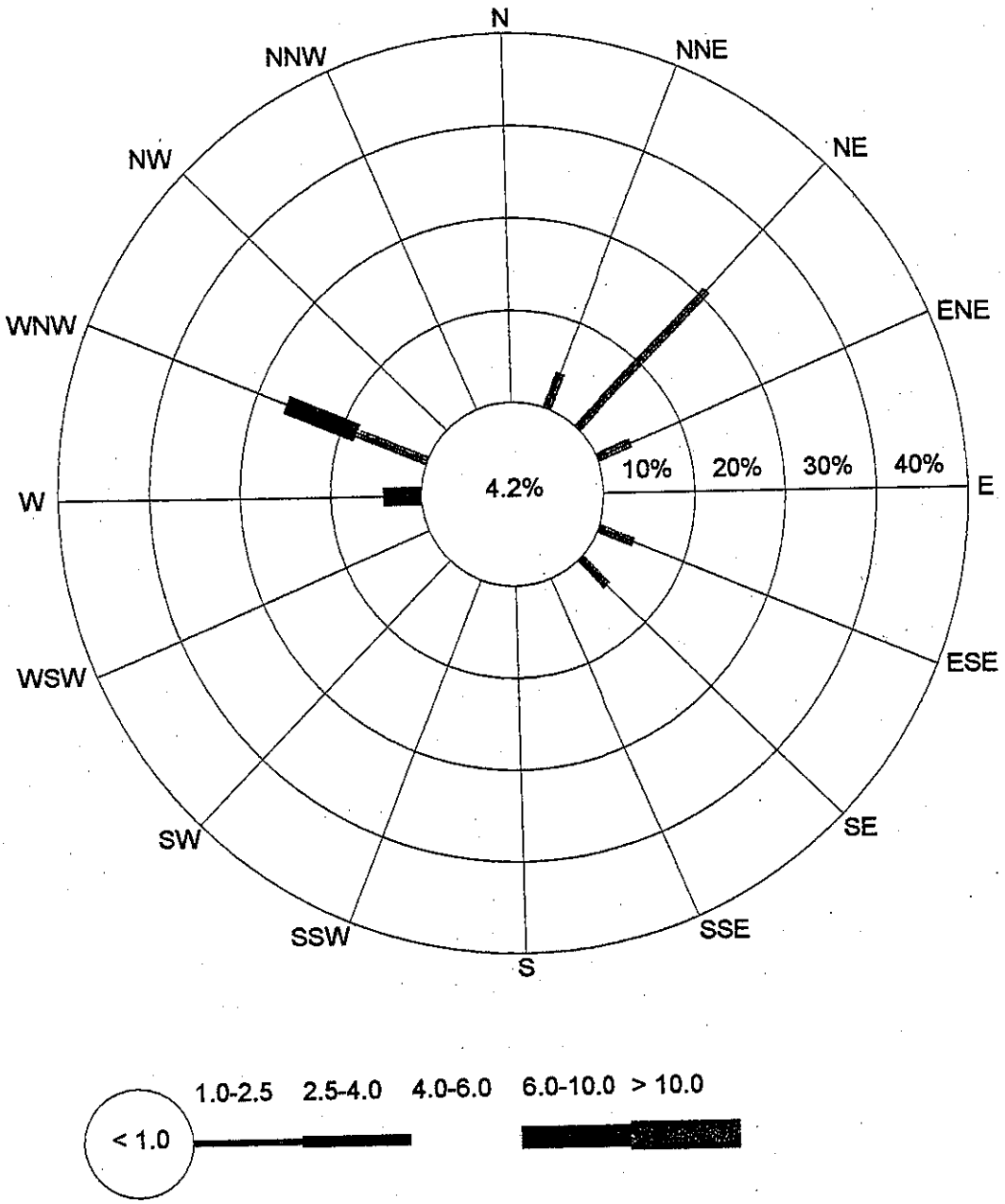
Log Date: 2001/12/09

Printing: 2002/01/09

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%RH)	SIGMA (Deg)
01:00	1.7	27	12.1	23	31
02:00	1.1	57	12.0	23	31
03:00	1.0	38	10.6	27	31
04:00	1.4	49	9.9	29	31
05:00	1.8	46	9.9	28	30
06:00	1.6	40	9.9	28	30
07:00	0.8	56 NE	9.5	30	30
08:00	1.0	41 NE	10.8	29	30
09:00	1.6	127 SE	14.3	22	30
10:00	1.9	124 SE	17.0	20	31
11:00	4.2	185 S	17.2	44	31
12:00	4.1	199 SSW	16.9	67	31
13:00	4.3	295 WNW	17.2	65	30
14:00	5.4	301 WNW	16.0	65	30
15:00	5.0	303 WNW	15.8	59	30
16:00	4.8	303 WNW	15.1	59	30
17:00	4.1	305 WNW	13.9	61	30
18:00	3.1	303 WNW	13.6	63	30
19:00	3.4	301	13.3	64	30
20:00	4.0	299	13.3	66	30
21:00	4.0	298	13.1	67	30
22:00	3.2	280	12.8	67	30
23:00	2.1	295	11.4	77	30
24:00	1.9	285	11.5	76	30
Sum			317.1	1159	728
Average	2.8	334	13.2	48	30
Maximum Time			17.2 11:00	77 23:00	31 11:00
Minimum Time			9.5 07:00	20 10:00	30 24:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

WIND ROSE PLOT

2001 12/09 Time: 01:00 ----- 2001 12/09 Time: 24:00



Barrio Logan Cr6

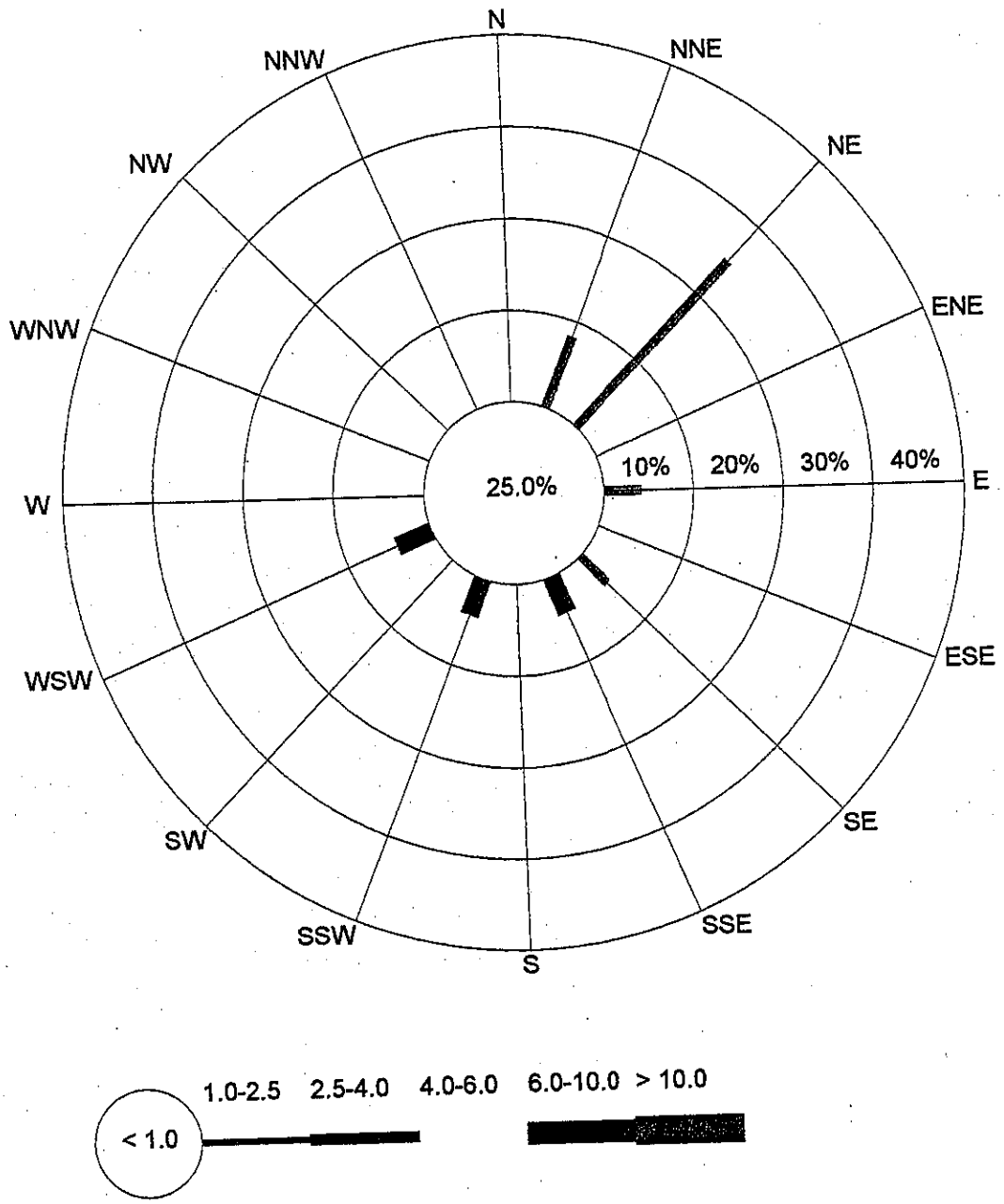
Barrio Logan Cr6 Meteorological Data

.og Date: 2001/12/10 Printing: 2002/01/09

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%RH)	SIGMA (Deg)
01:00	1.6	35	10.1	82	29
02:00	1.6	36	9.2	85	29
03:00	1.7	37	8.9	85	29
04:00	1.6	36	8.9	84	29
05:00	1.2	22	8.5	85	29
06:00	1.3	34	8.5	85	29
07:00	1.4	41 NE	8.0	86	29
08:00	1.2	29 NNE	8.5	84	30
09:00	1.2	86 E	11.2	76	30
10:00	2.5	144 SE	13.3	67	30
11:00	4.0	164 SSE	13.9	64	30
12:00	4.7	176 S	14.5	60	30
13:00	5.1	186 S	14.6	61	30
14:00	5.5	191 S	14.6	61	30
15:00	5.1	211 SSW	14.0	64	29
16:00	3.3	256 WSW	13.7	64	29
17:00	3.0	192 SSW	11.7	76	29
18:00	2.6	158 SSE	11.5	83	29
19:00	0.9	71	10.9	87	29
20:00	0.7	83	10.4	89	29
21:00	0.7	54	9.9	86	29
22:00	1.0	67	9.4	87	29
23:00	0.8	64	8.9	88	29
24:00	0.6	61	8.5	88	29
Sum			261.7	1879	706
Average	2.2	83	10.9	78	29
Maximum Time			14.6 13:00	89 20:00	30 11:00
Minimum Time			8.0 07:00	60 12:00	29 19:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

WIND ROSE PLOT

2001 12/10 Time: 01:00 ----- 2001 12/10 Time: 24:00



Barrio Logan Cr6

Barrio Logan Cr6 Meteorological Data

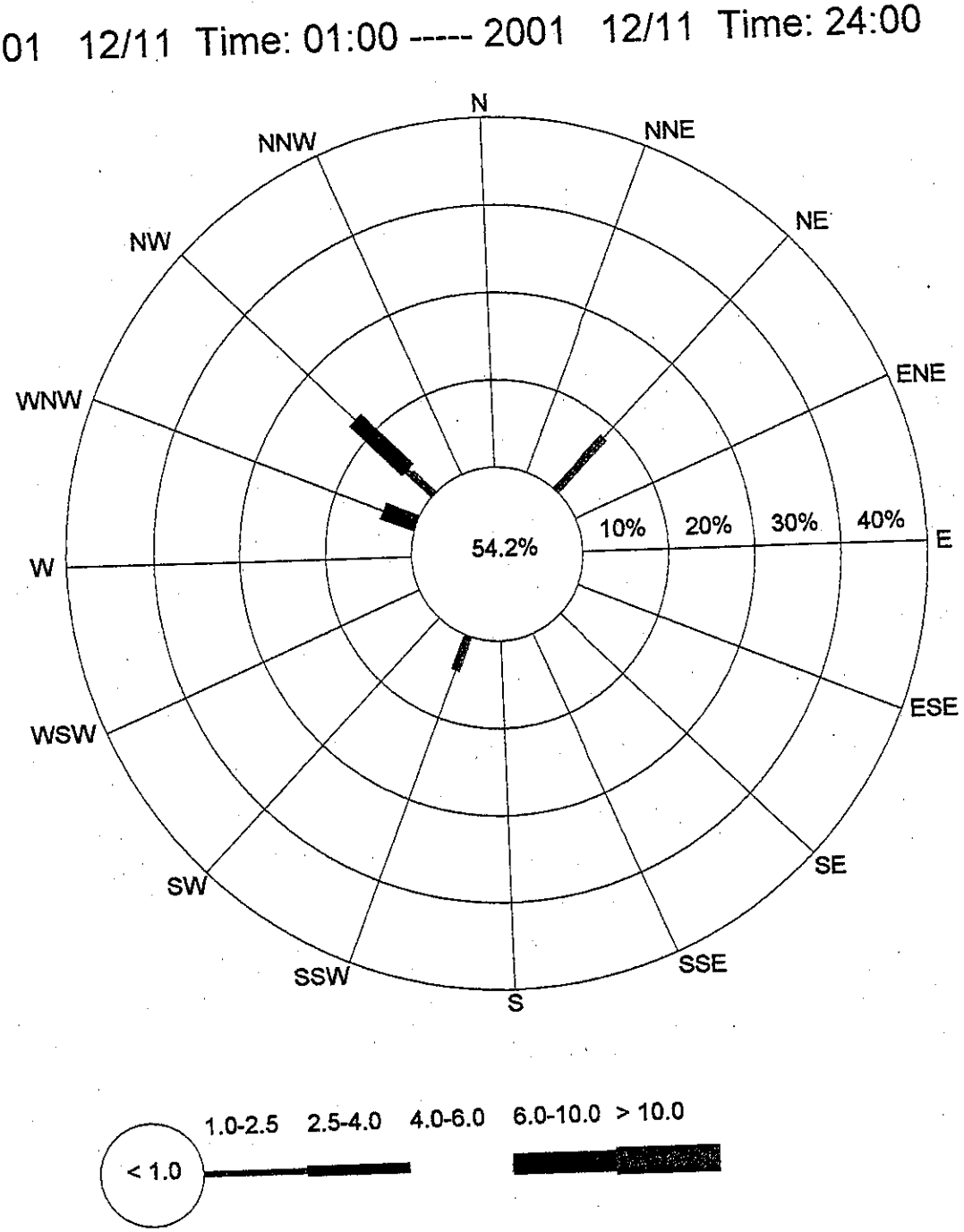
Log Date: 2001/12/11

Printing: 2002/01/09

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%RH)	SIGMA (Deg)
01:00	0.7	48	8.1	89	29
02:00	0.7	62	7.9	89	29
03:00	0.8	54	7.4	90	29
04:00	0.7	66	7.3	88	29
05:00	0.6	43	6.8	89	29
06:00	0.7	38	7.1	88	29
07:00	0.7	47 NE	7.3	87	29
08:00	0.8	27 NNE	8.2	85	29
09:00	0.9	84 E	10.2	80	30
10:00	2.2	196 SSW	12.7	67	30
11:00	3.3	313 NW	14.1	56	30
12:00	4.0	296 WNW	14.9	57	30
13:00	4.8	295 WNW	15.3	56	30
14:00	4.2	298 WNW	15.5	52	30
15:00	4.4	299 WNW	15.2	49	30
16:00	4.3	302 WNW	14.6	53	31
17:00	3.4	305 NW	14.1	50	31
18:00	1.4	309 NW	13.4	56	31
19:00	0.8	15	12.5	65	31
20:00	0.7	46	11.3	67	31
21:00	0.8	31	9.8	69	31
22:00	1.1	46	9.2	71	31
23:00	1.2	47	9.0	71	31
24:00	1.0	47	8.4	73	31
Sum			260.4	1696	722
Average	1.8	15	10.9	71	30
Maximum Time			15.5 14:00	90 03:00	31 23:00
Minimum Time			6.8 05:00	49 15:00	29 01:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

WIND ROSE PLOT

2001 12/11 Time: 01:00 ----- 2001 12/11 Time: 24:00



Barrio Logan Cr6

Barrio Logan Cr6 Meteorological Data

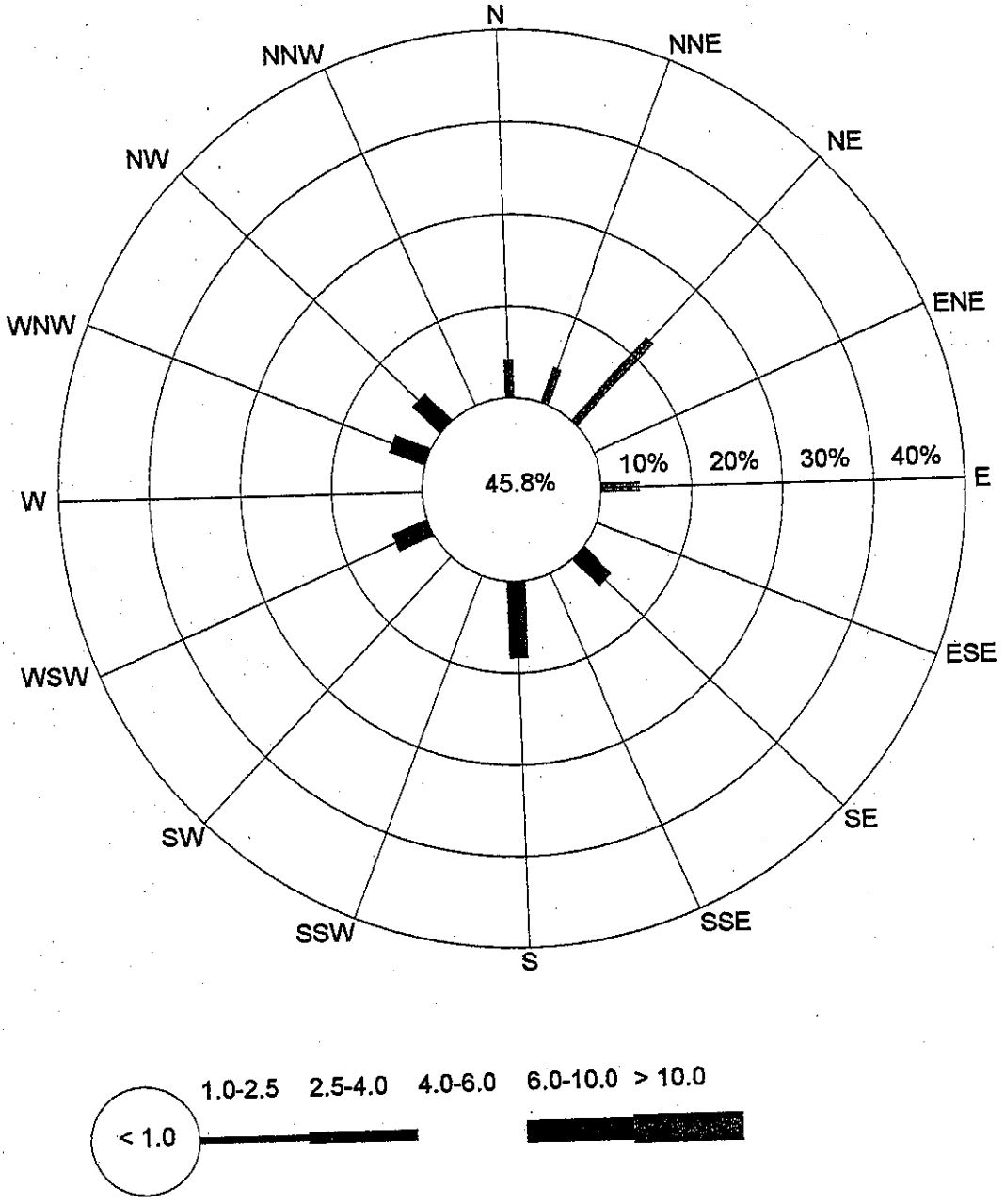
Log Date: 2001/12/12

Printing: 2002/01/09

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%RH)	SIGMA (Deg)
01:00	1.0	56	7.8	74	31
02:00	0.8	54	7.4	75	31
03:00	0.8	33	7.2	77	31
04:00	0.6	36	7.7	77	31
05:00	0.7	55	8.6	76	31
06:00	0.8	68	9.3	75	31
07:00	0.8	53 NE	9.7	75	31
08:00	0.8	26 NNE	10.6	74	32
09:00	1.2	93 E	12.1	69	32
10:00	2.6	132 SE	14.3	61	32
11:00	4.5	177 S	14.7	58	32
12:00	3.8	188 S	15.2	57	32
13:00	3.7	183 S	15.6	55	32
14:00	3.8	241 WSW	16.1	50	32
15:00	3.9	300 WNW	16.3	52	32
16:00	3.2	313 NW	15.8	55	33
17:00	2.2	354 N	15.0	57	32
18:00	1.3	21 NNE	13.9	60	32
19:00	1.2	35	13.0	66	32
20:00	0.9	20	12.4	72	33
21:00	0.8	45	11.4	76	33
22:00	0.9	49	10.3	79	33
23:00	1.5	43	9.6	80	33
24:00	1.9	36	9.6	77	33
Sum			283.6	1625	770
Average	1.8	45	11.8	68	32
Maximum Time			16.3 15:00	80 23:00	33 23:00
Minimum Time			7.2 03:00	50 14:00	31 01:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

WIND ROSE PLOT

2001 12/12 Time: 01:00 ----- 2001 12/12 Time: 24:00



Barrio Logan Cr6

Barrio Logan Cr6 Meteorological Data

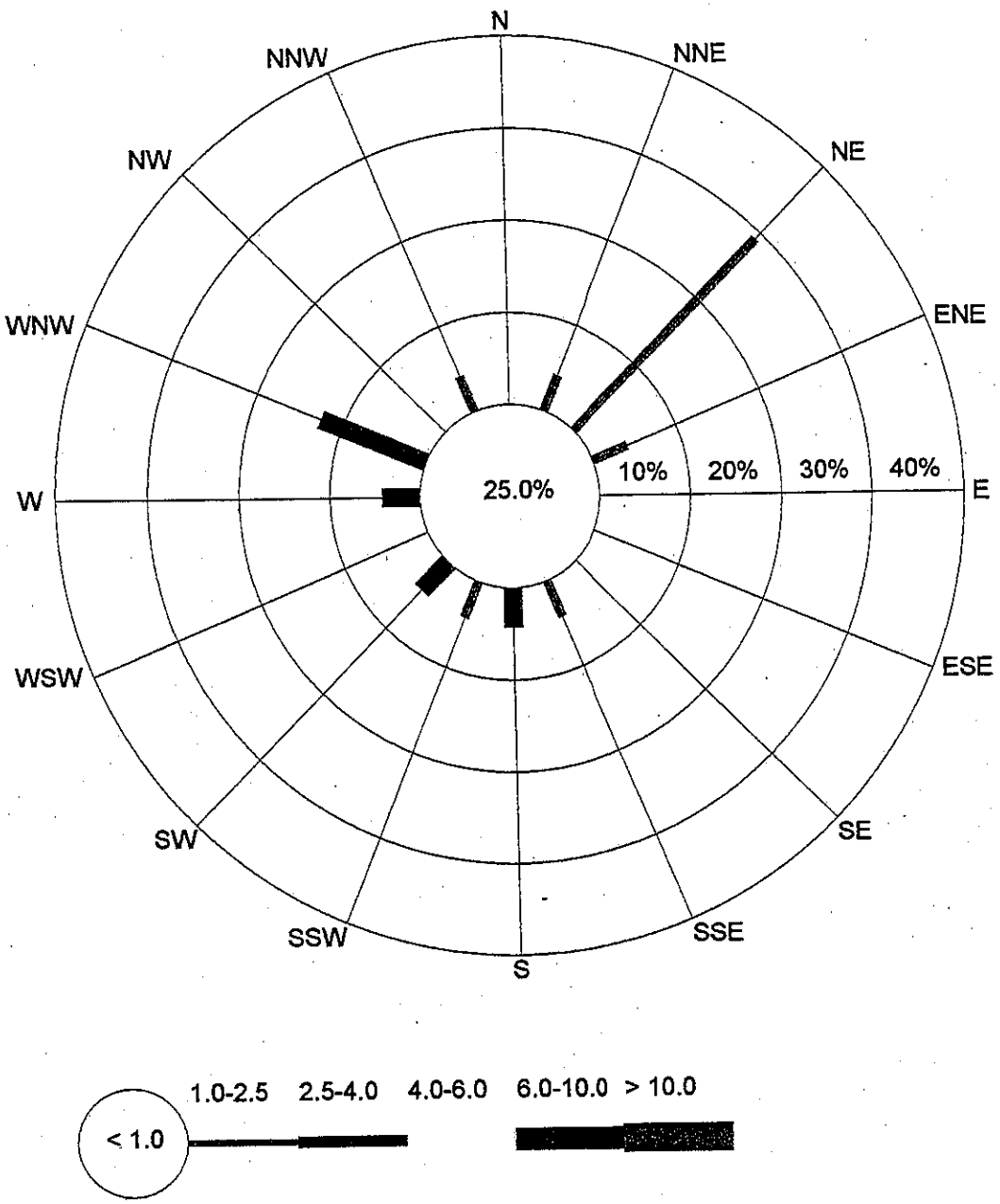
Printing: 2002/01/09

Log Date: 2001/12/13

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%RH)	SIGMA (Deg)
01:00	0.7	33	9.0	78	33
02:00	0.6	53	7.9	81	33
03:00	1.6	39	7.7	78	33
04:00	1.8	40	7.7	73	33
05:00	1.0	72	7.1	74	33
06:00	1.0	49	6.3	78	33
07:00	1.2	52 NE	6.7	70	33
08:00	1.1	40 NE	7.4	67	33
09:00	1.1	18 N	9.7	60	33
10:00	1.8	166 SSE	12.9	53	33
11:00	2.2	195 SSW	14.3	49	34
12:00-plating	3.6	179 S	15.7	34	33
13:00 Another	3.5	215 SW	16.3	39	33
14:00 read	3.4	264 W	16.7	45	33
15:00	3.5	292 WNW	16.6	52	33
16:00	3.2	293 WNW	16.0	53	33
17:00	2.6	297 WNW	14.7	56	33
18:00	1.6	336 NNW	13.4	60	32
19:00	1.2	43	12.2	65	32
20:00	0.7	60	11.2	68	32
21:00	0.8	17	10.3	72	32
22:00	0.6	70	9.7	73	32
23:00	1.5	38	8.7	72	32
24:00	0.8	41	8.3	71	32
Sum			266.4	1521	786
Average	1.7	32	11.1	63	33
Maximum Time			16.7 14:00	81 02:00	34 11:00
Minimum Time			6.3 06:00	34 12:00	32 24:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

WIND ROSE PLOT

2001 12/13 Time: 01:00 ----- 2001 12/13 Time: 24:00



Barrio Logan Cr6

Barrio Logan Cr6 Meteorological Data

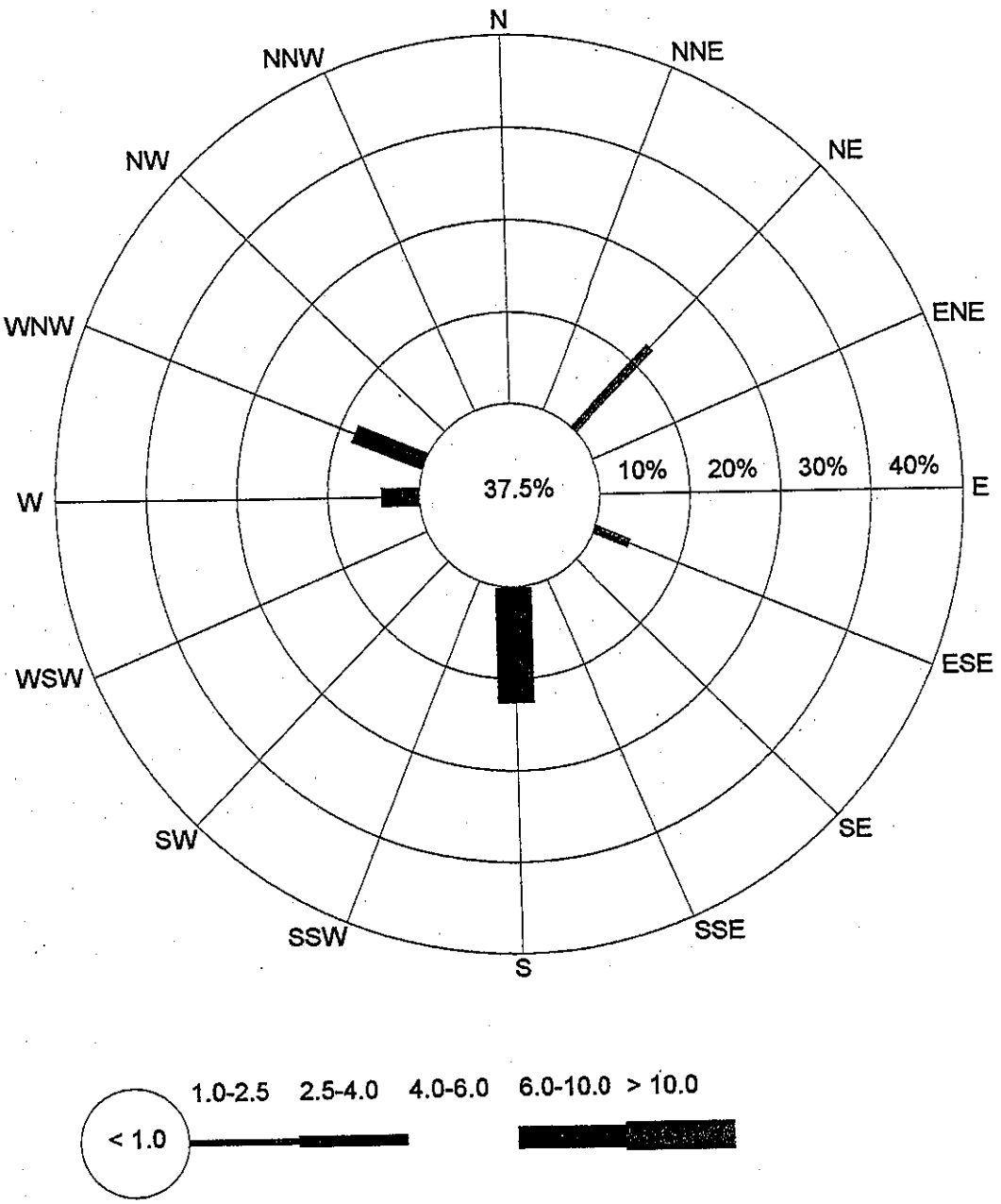
Log Date: 2001/12/14

Printing: 2002/01/09

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%RH)	SIGMA (Deg)
01:00	0.7	59	7.6	72	32
02:00	1.1	35	7.4	71	31
03:00	0.8	59	6.9	73	31
04:00	1.5	37	6.9	71	31
05:00	0.9	6	6.9	70	31
06:00	0.8	31	7.2	68	30
07:00	0.6	30 NNE	7.6	66	31
08:00	1.0	38 NE	8.5	66	31
09:00	1.0	48 NE	10.1	62	31
10:00	1.7	110 ESE	12.7	59	31
11:00	4.5	159 SSE	13.9	65	31
12:00	5.2	200 SW	13.8	70	30
13:00	6.2	190 S	13.6	71	30
14:00	6.1	184 S	13.3	73	30
15:00	7.3	184 S	12.5	82	29
16:00	5.1	262 W	12.1	84	29
17:00	4.6	291 WNW	12.6	68	29
18:00	3.6	288 WNW	12.5	69	29
19:00	4.5	298	12.2	65	29
20:00	3.4	296	11.9	67	29
21:00	2.8	279	11.6	69	29
22:00	1.0	336	11.0	73	29
23:00	1.0	46	10.1	77	29
24:00	0.9	17	8.7	82	29
Sum			251.5	1690	723
Average	2.8	9	10.5	70	30
Maximum Time			13.9 11:00	84 16:00	32 01:00
Minimum Time			6.9 03:00	59 10:00	29 17:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

WIND ROSE PLOT

2001 12/14 Time: 01:00 ----- 2001 12/14 Time: 24:00



Barrio Logan Cr6

Barrio Logan Cr6 Meteorological Data

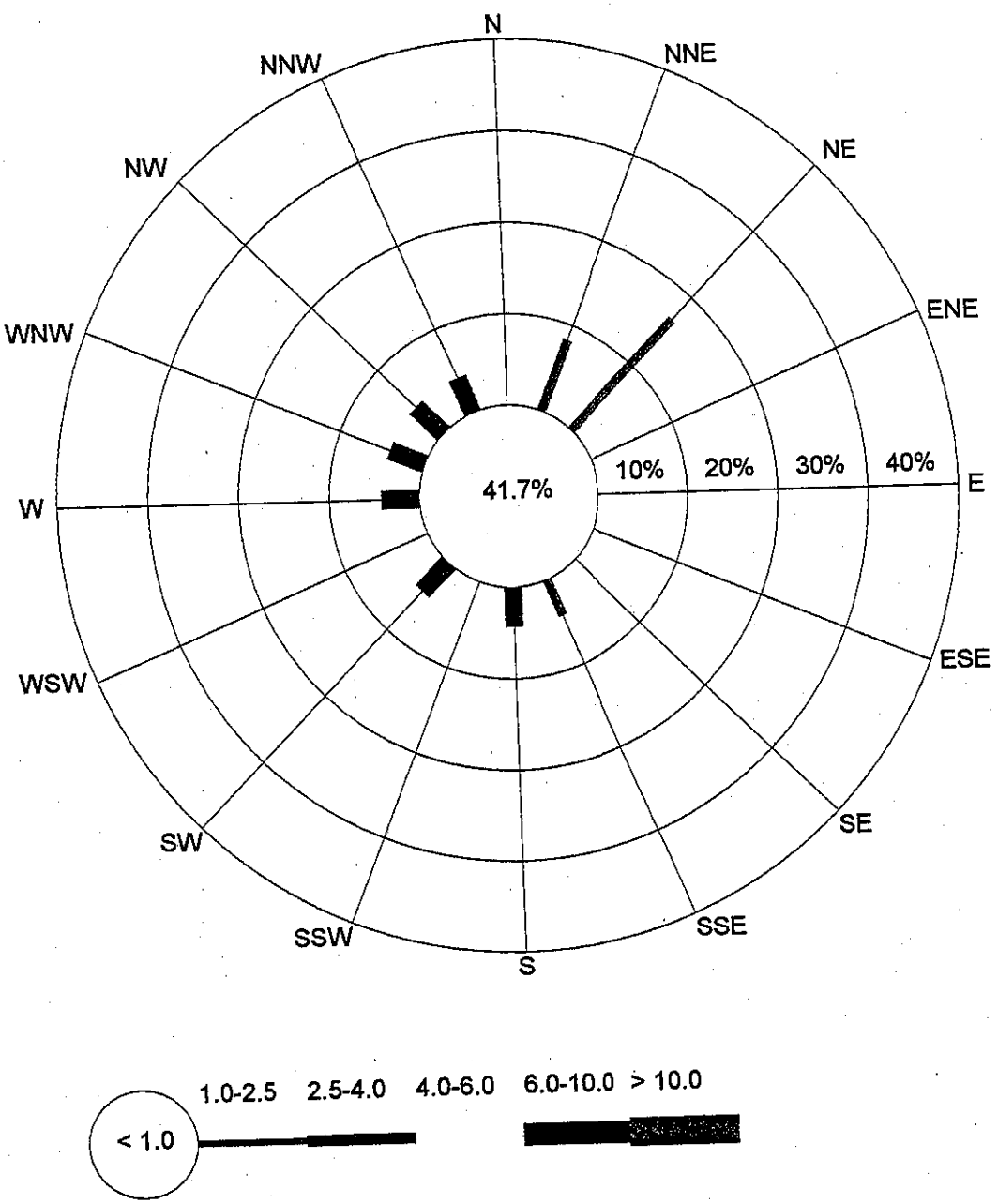
Log Date: 2001/12/15

Printing: 2002/01/09

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%RH)	SIGMA (Deg)
01:00	0.6	32	8.5	81	29
02:00	0.9	34	8.0	82	29
03:00	1.6	40	7.8	82	30
04:00	1.2	48	7.4	83	30
05:00	0.6	76	6.7	86	30
06:00	0.6	61	6.3	87	30
07:00	0.6	71 ENE	6.2	86	30
08:00	0.6	56 NE	6.9	84	30
09:00	0.9	31 NNE	8.9	77	31
10:00	1.9	163 SSE	11.8	68	31
11:00	3.1	176 S	12.9	65	31
12:00	3.1	223 SW	13.9	59	31
13:00	3.4	262 W	14.8	57	31
14:00	3.7	301 WNW	15.1	57	31
15:00	4.3	300 WNW	15.1	49	31
16:00	3.9	312 NW	14.8	51	31
17:00	3.3	337 NNW	13.7	55	31
18:00	2.1	12 NNE	12.6	63	32
19:00	0.6	78	11.5	67	32
20:00	0.8	48	10.7	68	32
21:00	1.1	55	9.6	73	32
22:00	0.9	24	8.7	74	32
23:00	1.5	46	8.1	72	32
24:00	1.6	31	8.1	61	32
Sum			248.1	1683	741
Average	1.8	34	10.3	70	31
Maximum Time			15.1 15:00	87 06:00	32 24:00
Minimum Time			6.2 07:00	49 15:00	29 01:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

WIND ROSE PLOT

2001 12/15 Time: 01:00 ----- 2001 12/15 Time: 24:00



Barrio Logan Cr6

Barrio Logan Cr6 Meteorological Data

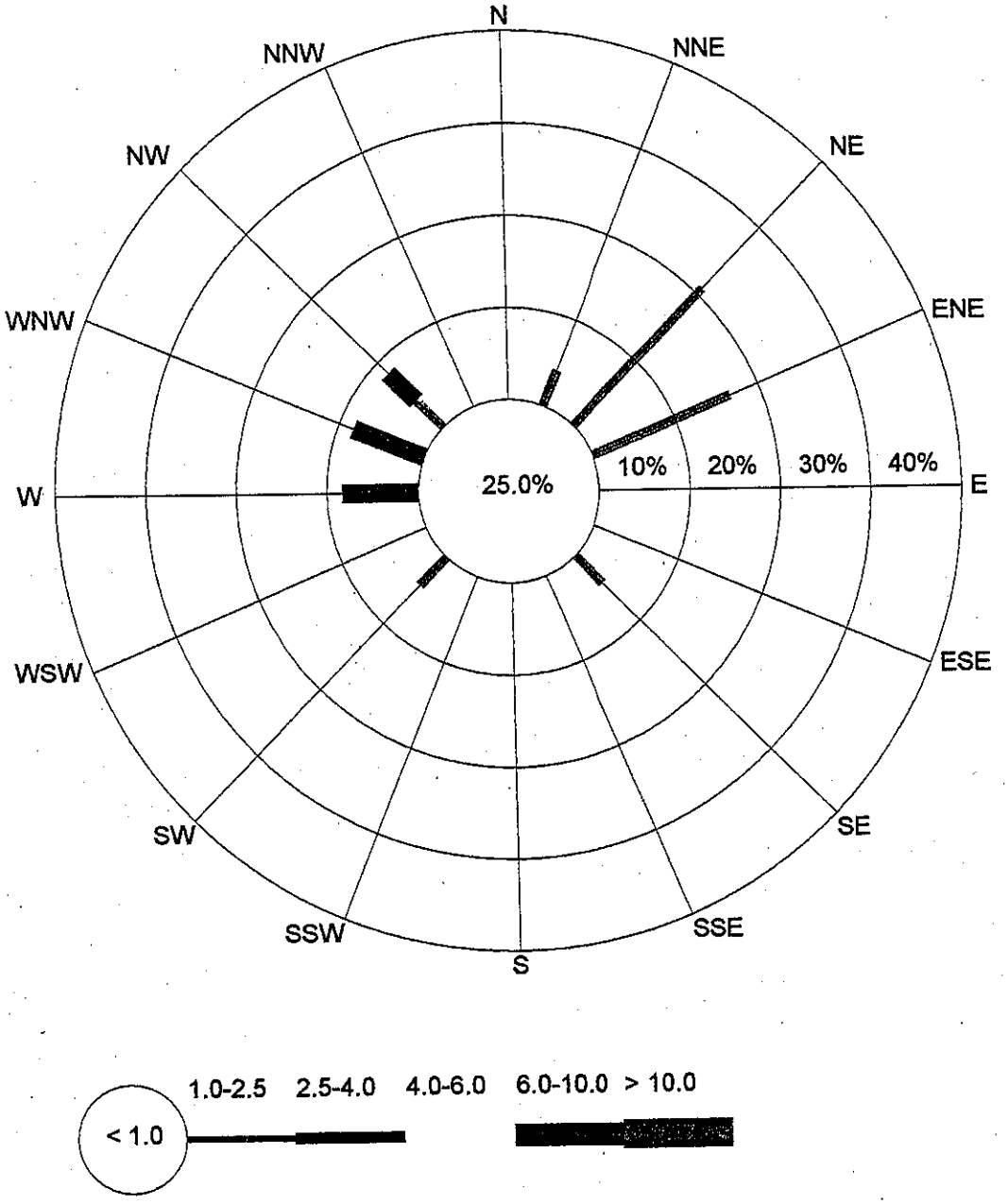
Log Date: 2001/12/16

Printing: 2002/01/09

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%RH)	SIGMA (Deg)
01:00	0.9	87	7.0	64	32
02:00	1.2	57	6.2	63	32
03:00	1.2	58	5.6	59	32
04:00	1.3	40	5.3	58	32
05:00	1.3	44	5.6	50	32
06:00	1.8	37	5.6	50	32
07:00	1.3	57 ENE	5.2	51	32
08:00	1.2	34 NNE	5.3	55	33
09:00	1.1	70 ENE	9.2	40	33
10:00	1.9	136 SE	12.4	31	33
11:00	2.2	222 SW	13.9	28	33
12:00	2.9	274 W	15.2	22	33
13:00	3.4	283 WNW	16.2	23	33
14:00	3.2	267 W	16.2	28	33
15:00	3.4	295 WNW	16.3	32	33
16:00	3.0	311 NW	15.9	37	33
17:00	1.9	323 NW	14.8	40	33
18:00	1.5	18 NNE	13.6	41	33
19:00	1.2	43	12.5	52	33
20:00	0.7	67	11.4	58	33
21:00	0.9	81	10.5	60	33
22:00	0.8	69	9.6	61	33
23:00	0.8	69	8.7	64	33
24:00	0.9	63	7.9	68	33
Sum			250.3	1133	788
Average	1.7	39	10.4	47	33
Maximum Time			16.3 15:00	68 24:00	33 11:00
Minimum Time			5.2 07:00	22 12:00	32 04:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

WIND ROSE PLOT

2001 12/16 Time: 01:00 ----- 2001 12/16 Time: 24:00



Barrio Logan Cr6

Barrio Logan Cr6 Meteorological Data

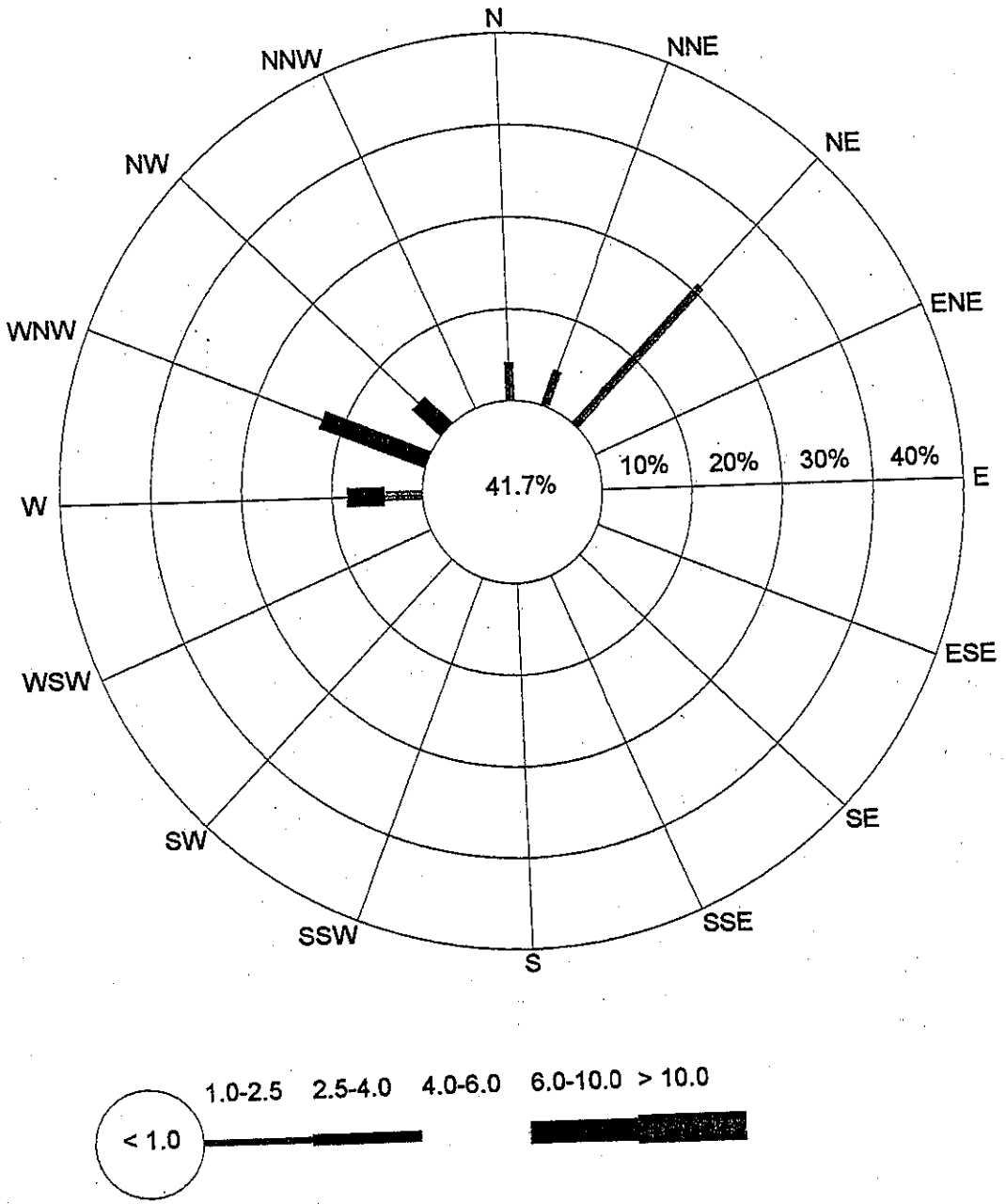
Log Date: 2001/12/17

Printing: 2002/01/09

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%RH)	SIGMA (Deg)
01:00	1.1	38	7.5	66	33
02:00	1.3	35	7.1	61	33
03:00	1.6	43	7.0	59	33
04:00	1.6	37	7.1	57	33
05:00	0.6	57	5.8	62	32
06:00	0.8	77	5.8	60	32
07:00	0.6	43 NE	5.7	59	32
08:00	0.6	59 ENE	6.6	57	32
09:00	1.0	1 N	11.4	43	33
10:00	1.5	278 W	13.0	43	33
11:00	2.7	276 W	14.8	43	33
12:00	3.4	300 WNW	16.4	41	33
13:00	3.6	301 WNW	17.4	41	33
14:00	3.9	290 WNW	17.2	47	32
15:00	4.3	302 WNW	15.9	55	32
16:00	3.4	313 NW	15.0	67	32
17:00	2.2	355 N	14.5	61	32
18:00	1.1	21 NNE	13.3	64	32
19:00	0.9	56	12.2	71	32
20:00	0.7	49	11.4	75	32
21:00	0.7	35	10.5	76	32
22:00	0.7	59	9.3	78	32
23:00	0.7	52	8.5	78	32
24:00	1.2	50	8.3	75	32
Sum			261.5	1437	778
Average	1.7	17	10.9	60	32
Maximum Time			17.4 13:00	78 22:00	33 11:00
Minimum Time			5.7 07:00	41 13:00	32 24:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

WIND ROSE PLOT

2001 12/17 Time: 01:00 ----- 2001 12/17 Time: 24:00



Barrio Logan Cr6

Barrio Logan Cr6 Meteorological Data

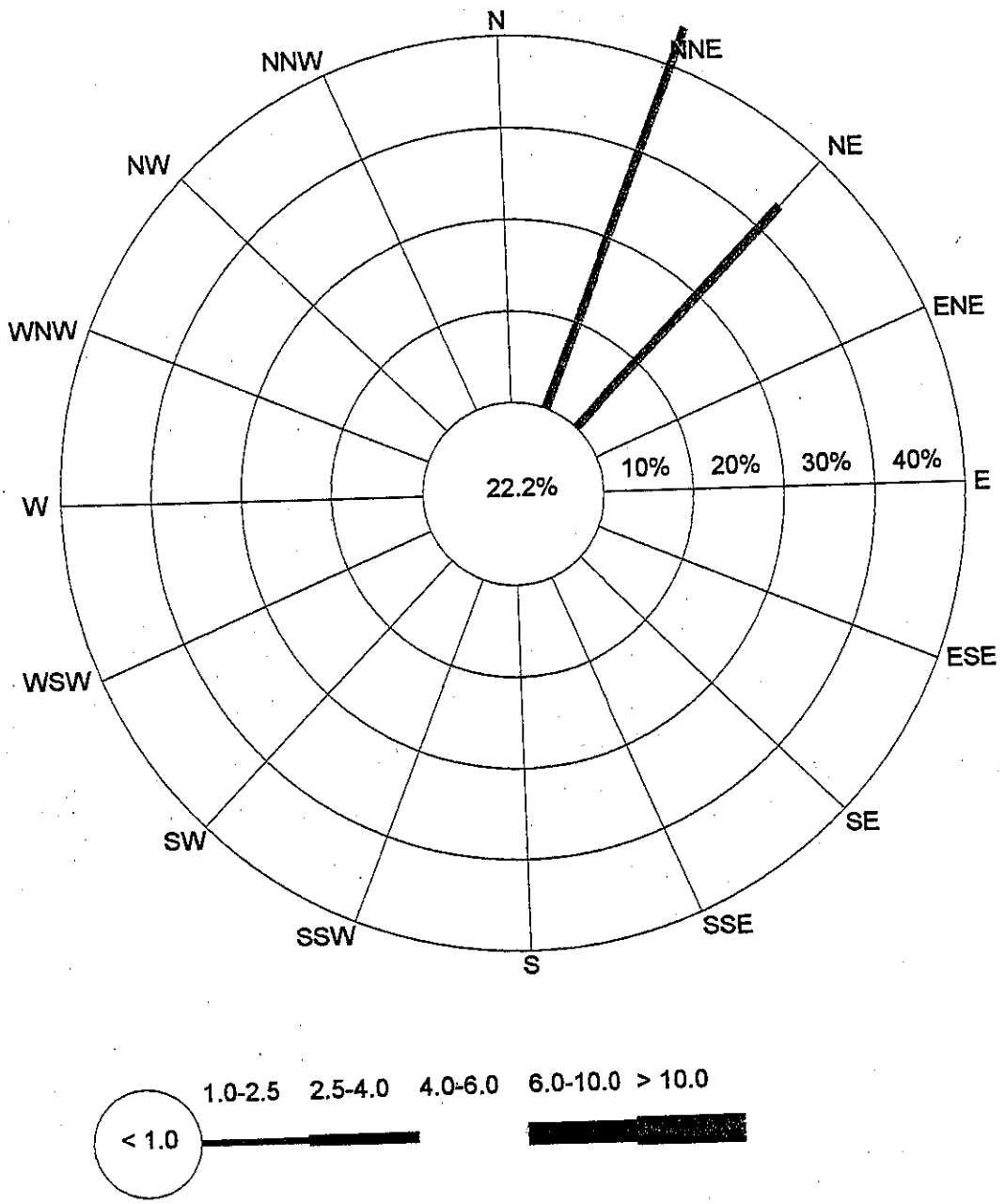
Log Date: 2001/12/18

Printing: 2002/01/09

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%RH)	SIGMA (Deg)
01:00	1.7	34	8.1	72	32
02:00	2.1	28	7.9	70	32
03:00	2.2	33	7.6	68	32
04:00	1.3	44	7.2	67	32
05:00	0.6	77	6.3	68	32
06:00	1.0	54	5.8	71	32
07:00	1.4	48	6.5	69	32
08:00	1.6	40	7.3	68	32
09:00	1.1	15	10.2	65	32
10:00	----	----	----	----	----
11:00	----	----	----	----	----
12:00	----	----	----	----	----
13:00	----	----	----	----	----
14:00	----	----	----	----	----
15:00	----	----	----	----	----
16:00	----	----	----	----	----
17:00	----	----	----	----	----
18:00	----	----	----	----	----
19:00	----	----	----	----	----
20:00	----	----	----	----	----
21:00	----	----	----	----	----
22:00	----	----	----	----	----
23:00	----	----	----	----	----
24:00	----	----	----	----	----
Sum			66.8	618	287
Average	1.4	41	7.4	69	32
Maximum Time			10.2 09:00	72 01:00	32 02:00
Minimum Time			5.8 06:00	65 09:00	32 05:00
Standard # above	----	----	----	----	----
Valid	38%	38%	38%	38%	38%

WIND ROSE PLOT

2001 12/18 Time: 01:00 ----- 2001 12/18 Time: 24:00



Barrio Logan CR6

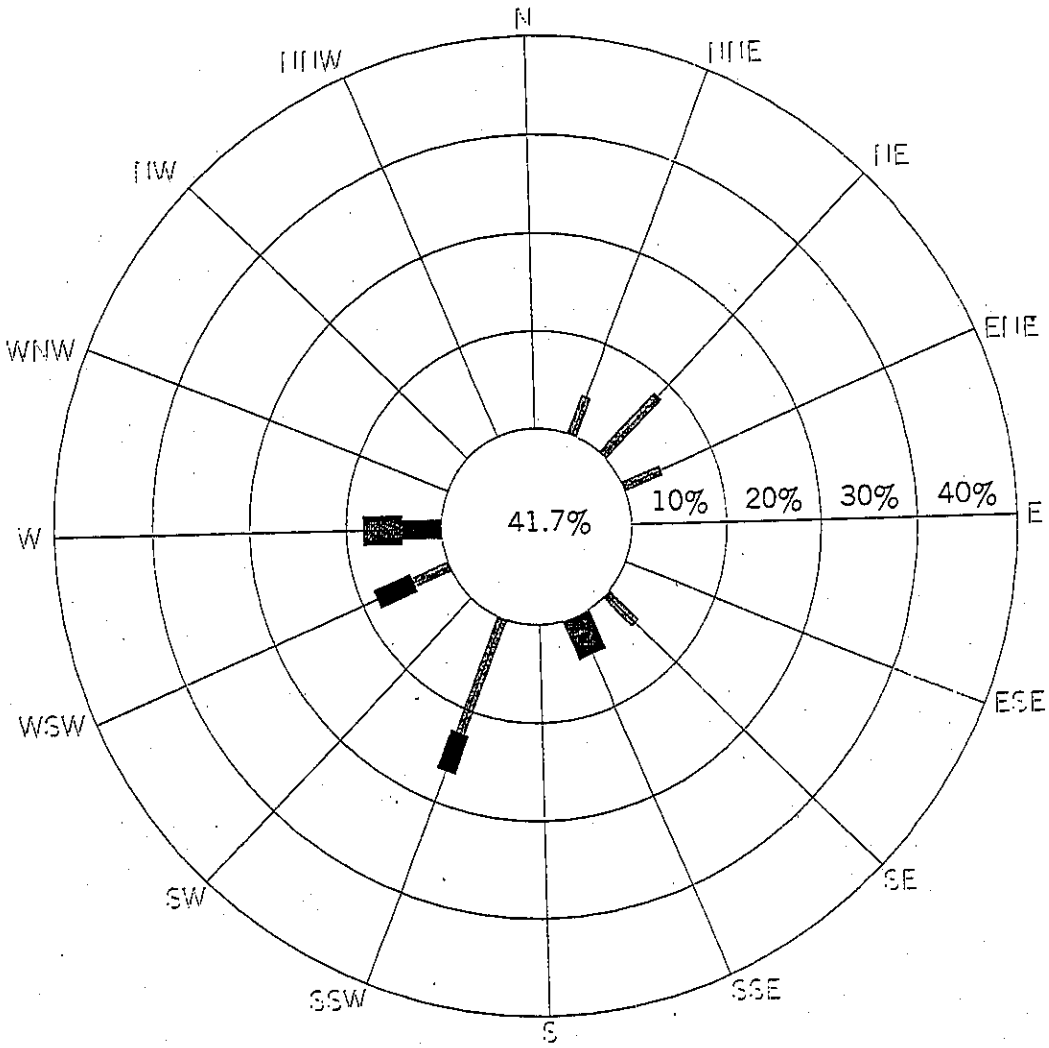
Log Date: 2002/02

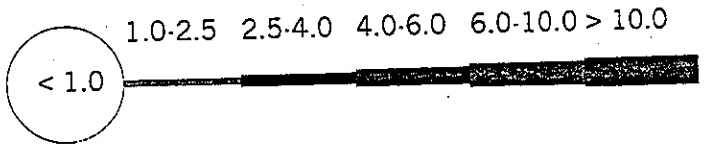
Printing: 2002/03/07

Item / Date	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	
01	0.50	34.9	-72.14	47.7	3.9	NOT INSTALLED ON SITE.
02	----	----	----	----	----	
03	----	----	----	----	----	
04	2.19	339.8	15.03	43.1	36.2	
05	1.68	81.9	12.59	48.5	40.2	
06	1.82	41.4	11.41	63.4	38.0	
07	2.10	341.7	11.26	82.5	37.8	
08	2.05	352.5	12.45	77.8	41.1	
09	1.71	11.6	15.39	48.2	42.2	
10	2.17	36.8	17.45	13.4	47.8	
11	2.28	357.3	16.46	22.4	39.2	
12	2.08	104.1	13.18	57.9	32.8	
13	1.81	128.2	12.14	75.9	36.3	
14	2.05	89.8	13.20	77.8	36.2	
15	2.06	336.9	13.36	79.8	35.8	
16	2.10	303.2	14.02	73.6	44.1	
17	2.95	216.5	12.97	75.0	34.9	
18	2.34	290.3	12.35	66.0	40.3	
19	2.38	354.2	11.87	70.6	35.3	
20	2.28	343.8	13.22	75.9	31.3	
21	1.79	355.3	18.57	52.6	42.5	
22	1.31	52.1	-4.22	28.0	43.5	
23	2.43	258.5	15.17	62.3	38.4	
24	2.45	82.9	14.91	73.1	35.9	
25	1.93	335.1	14.40	79.1	33.9	
26	2.00	267.2	16.94	62.2	35.5	
27	2.51	154.5	13.90	88.7	41.2	
28	3.60	148.7	13.72	77.4	31.3	
Sum			259.60	1622.6	955.7	
Average	2.10	11.5	9.98	62.4	36.8	
Maximum Date			18.57 21	88.7 27	47.8 10	
Minimum Date			-72.14 1	13.4 10	3.9 1	
Standard # above	----	----	----	----	----	
Valid	93%	93%	93%	93%	93%	

WIND ROSE PLOT

2002 02/05 Time: 01:00 ----- 2002 02/05 Time: 24:00





Barrio Logan CR6

Log Date: 2002/02/05

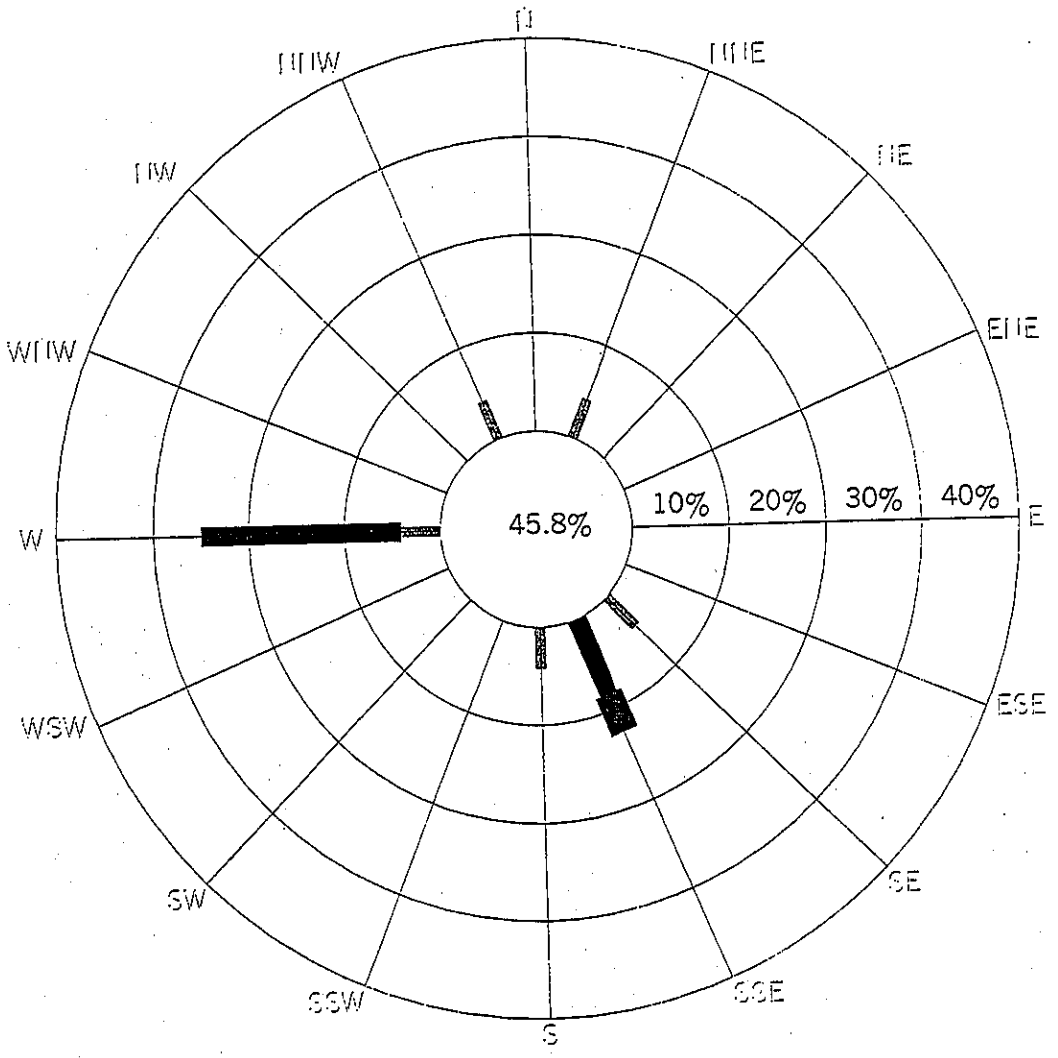
Printing: 2002/03/07

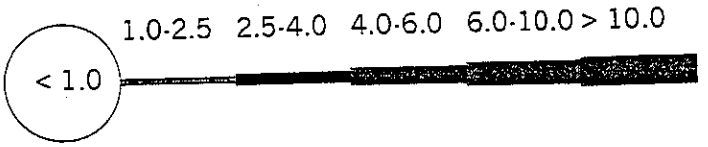
Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)
01:00	1.20	35.9	8.86	47.9	33.2
02:00	0.97	42.4	8.37	46.0	42.9
03:00	0.90	56.5	7.38	50.0	68.1
04:00	0.67	79.5	6.57	50.4	57.5
05:00	0.65	92.7	6.02	50.5	49.7
06:00	0.82	54.3	6.07	46.9	42.1
07:00	0.69	71.6 ENE	6.18	45.0	54.5
08:00	0.73	70.6 ENE	10.11	33.4	30.6
09:00	1.03	39.0 NE	12.02	30.3	51.1
10:00	2.07	192.7 SSW	15.03	30.3	58.2
11:00	2.32	205.0 SSW	17.10	25.3	37.1
12:00	3.30	196.4 SSW	18.68	24.4	32.0
13:00	4.34	162.0 SSE	17.86	27.6	23.6
14:00	3.85	241.0 WSW	19.45	32.0	48.9
15:00	4.06	278.8 W	19.28	41.9	27.9
16:00	3.34	274.0 W	18.90	45.2	35.1
17:00	2.32	256.0 WSW	18.19	45.7	41.1
18:00	1.31	195.0 SSW	16.23	54.7	40.5
19:00	1.20	142.4	14.04	73.5	48.0
20:00	0.73	73.3	12.73	86.3	34.1
21:00	0.86	34.0	11.64	76.7	27.2
22:00	0.80	58.4	10.99	72.8	30.2
23:00	1.07	17.9	10.44	69.7	28.5
24:00	1.01	77.9	9.95	56.9	22.9
Sum			302.10	1163.4	965.0
Average	1.68	81.9 E	12.59	48.5	40.2
Maximum Time			19.45 14:00	86.3 20:00	68.1 03:00
Minimum Time			6.02 05:00	24.4 12:00	22.9 24:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

SSW 4.3

WIND ROSE PLOT

2002 02/06 Time: 01:00 ----- 2002 02/06 Time: 24:00





Barrio Logan CR6

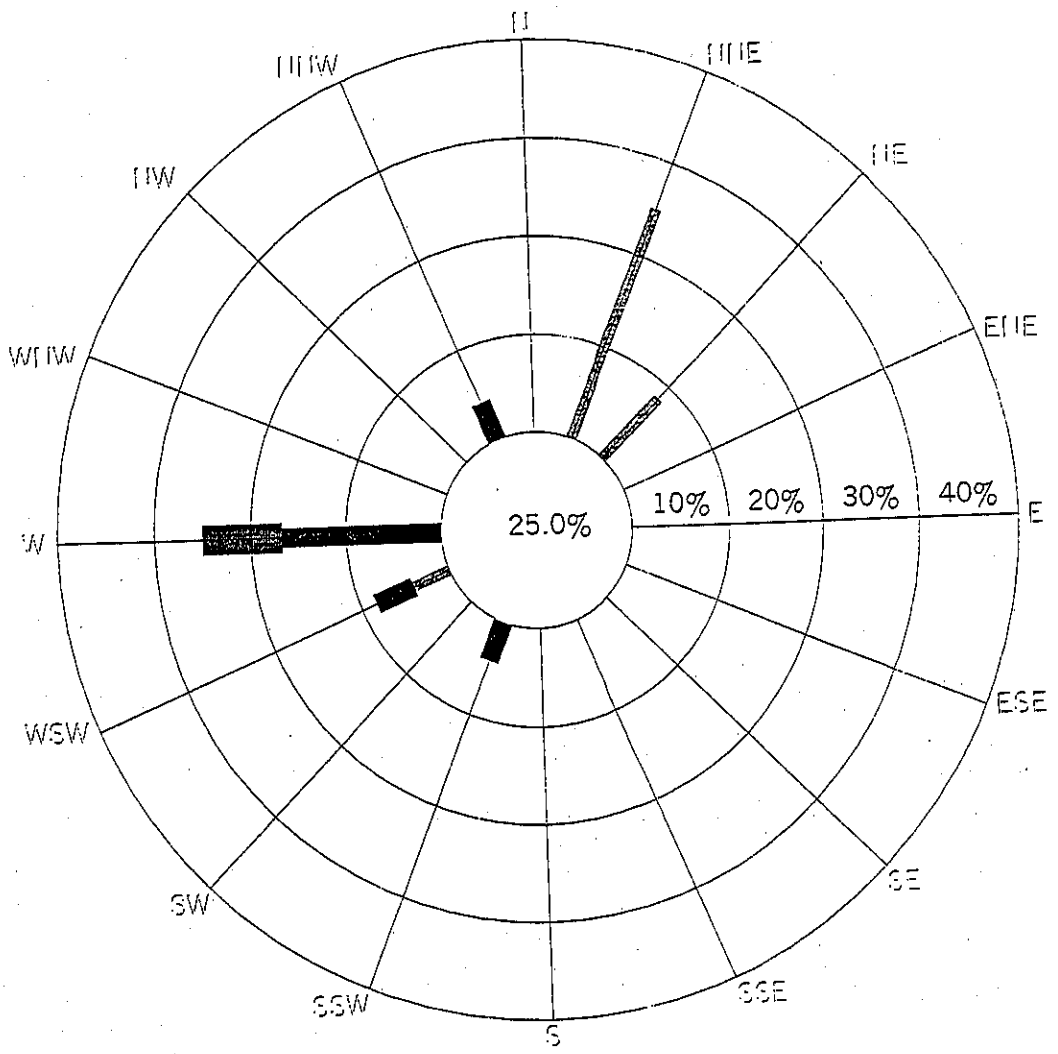
og Date: 2002/02/06

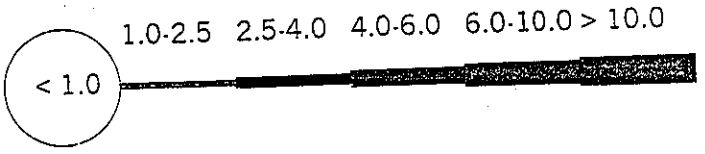
Printing: 2002/03/07

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)
01:00	0.99	65.6	9.02	54.0	47.2
02:00	0.86	50.1	7.98	57.4	51.9
03:00	0.67	62.1	7.22	58.2	50.7
04:00	0.80	40.6	6.46	60.7	42.6
05:00	0.71	21.0	5.75	67.8	45.3
06:00	0.90	38.7	5.58	63.5	43.2
07:00	0.61	91.6 E	5.64	58.4	41.6
08:00	0.61	112.9 ESE	7.17	53.8	75.4
09:00	1.84	128.7 SE	9.84	46.2	32.5
10:00	2.43	169.8 SSE	12.08	54.8	35.7
11:00	2.77	165.4 SSE	14.48	36.4	36.5
12:00	3.91	167.2 SSE	14.86	49.4	26.6
13:00	4.10	164.7 SSE	15.57	47.5	27.1
14:00	3.26	265.3 W	18.14	37.6	46.1
15:00	3.51	275.5 W	17.81	45.5	33.1
16:00	3.26	269.9 W	17.04	55.1	35.3
17:00	3.04	273.8 W	15.95	63.0	31.0
18:00	2.62	277.4 W	14.21	74.5	31.8
19:00	1.64	268.1	13.28	84.1	41.1
20:00	1.11	327.2	12.68	85.3	33.5
21:00	0.88	43.9	11.70	85.9	20.0
22:00	0.92	40.0	10.50	89.1	25.8
23:00	1.28	15.4	10.60	96.1	17.5
24:00	0.95	11.4	10.39	97.5	41.1
Sum			273.94	1521.9	912.4
Average	1.82	41.4	11.41	63.4	38.0
Maximum Time			18.14 14:00	97.5 24:00	75.4 08:00
Minimum Time			5.58 06:00	36.4 11:00	17.5 23:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 02/07 Time: 01:00 ----- 2002 02/07 Time: 24:00





Barrio Logan CR6

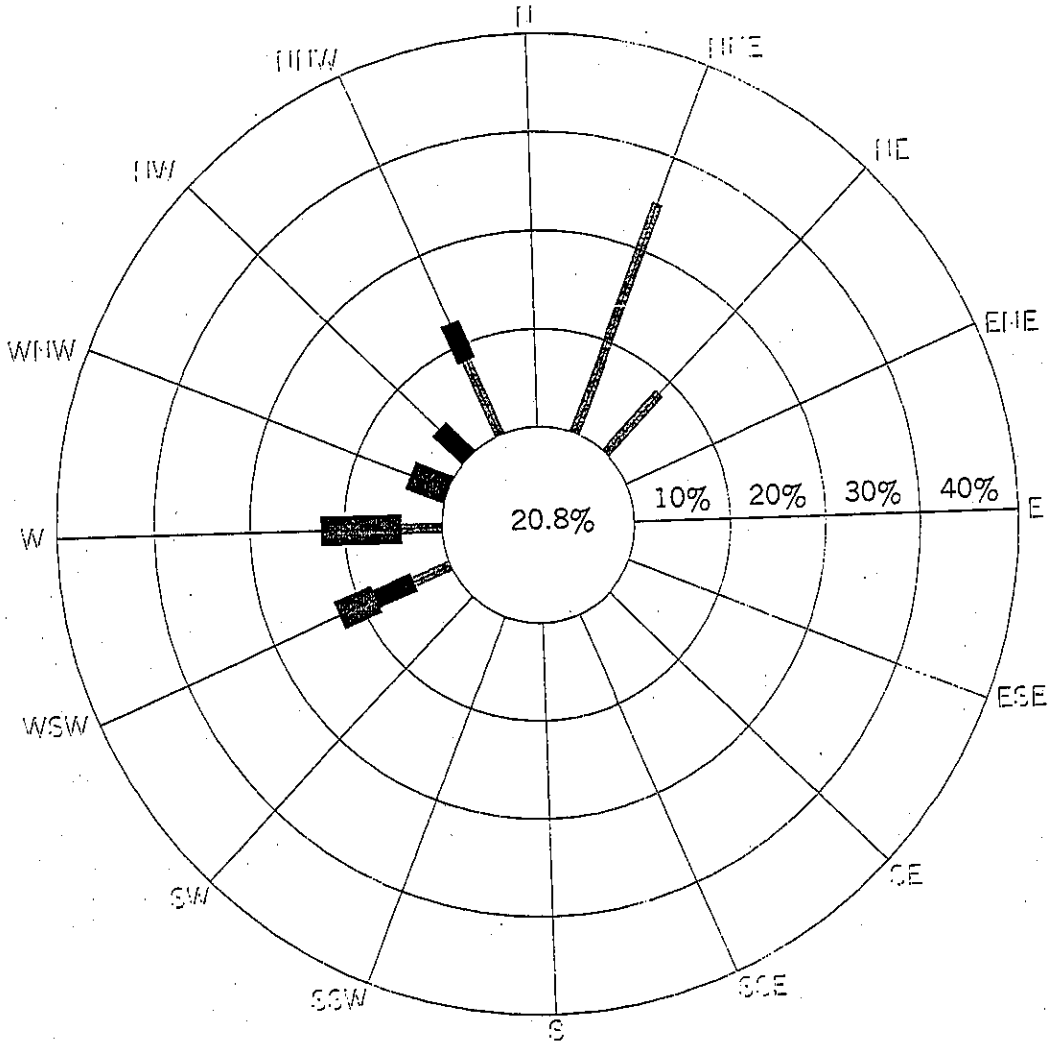
Printing: 2002/03/07

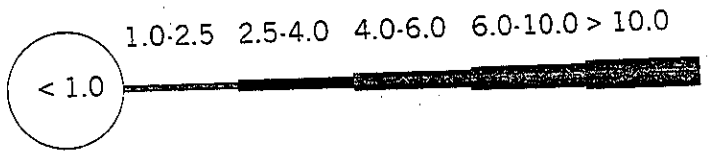
Log Date: 2002/02/07

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)
01:00	1.22	26.6	9.95	98.0	33.0
02:00	1.07	26.6	8.97	98.0	45.2
03:00	0.92	32.2	8.64	98.1	41.7
04:00	0.80	38.3	8.31	98.1	62.2
05:00	0.88	35.1	7.49	95.8	51.4
06:00	0.92	320.4	6.68	95.8	48.1
07:00	0.84	332.1 NNW	7.00	93.2	58.2
08:00	1.98	17.8 N	7.28	94.1	29.4
09:00	1.98	20.7 N	8.26	84.9	37.8
10:00	2.05	258.5 WSW	11.42	70.7	57.2
11:00	2.90	196.3 SSW	13.17	67.6	46.3
12:00	3.40	243.8 WSW	15.03	62.7	42.8
13:00	4.23	271.2 W	15.90	65.4	34.9
14:00	4.46	274.6 W	15.90	66.0	35.1
15:00	3.81	262.8 W	16.23	65.1	38.8
16:00	3.74	272.6 W	15.95	65.4	35.3
17:00	3.13	273.3 W	15.35	69.8	34.0
18:00	3.40	280.5 W	13.66	79.7	30.4
19:00	2.94	329.1	12.62	81.5	33.0
20:00	1.62	14.7	11.81	82.9	28.3
21:00	0.78	43.7	11.10	84.7	21.9
22:00	1.16	28.6	10.60	85.8	18.6
23:00	1.07	41.2	9.73	87.5	19.9
24:00	1.16	36.9	9.08	88.6	24.6
Sum			270.12	1979.1	908.2
Average	2.10	341.7	11.26	82.5	37.8
Maximum Time			16.23 15:00	98.1 03:00	62.2 04:00
Minimum Time			6.68 06:00	62.7 12:00	18.6 22:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 02/08 Time: 01:00 ----- 2002 02/08 Time: 24:00





Barrio Logan CR6

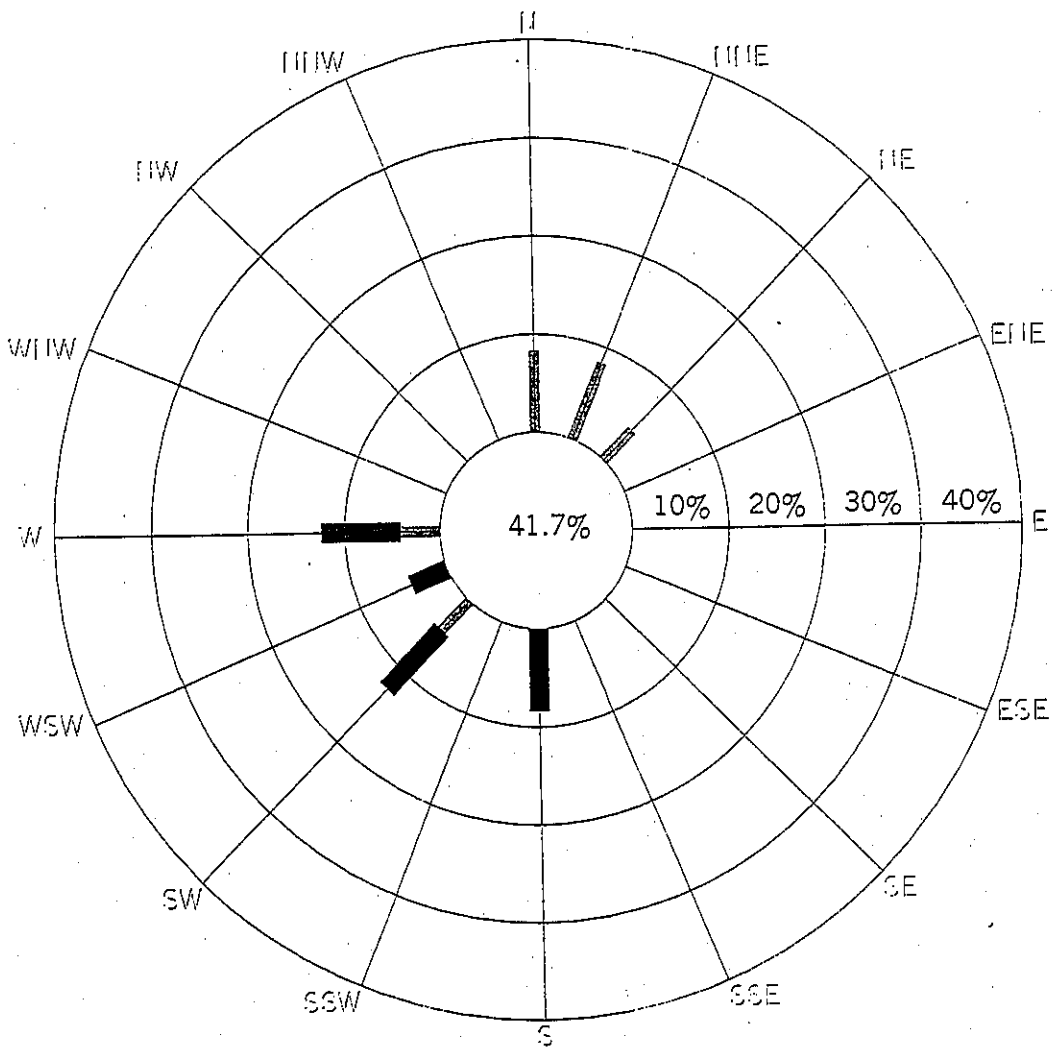
Printing: 2002/03/07

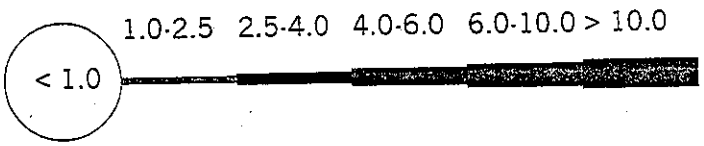
Log Date: 2002/02/08

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)
01:00	1.26	27.2	8.80	92.7	49.2
02:00	1.24	26.6	8.75	97.3	50.8
03:00	1.24	22.7	8.42	98.0	49.5
04:00	0.92	28.8	7.66	98.0	54.4
05:00	1.01	35.9	7.28	96.4	28.1
06:00	1.54	33.0	7.77	86.1	26.5
07:00	1.37	31.4 NNE	9.02	75.9	36.2
08:00	0.92	51.6 NE	9.95	68.5	61.3
09:00	1.07	46.6 NE	11.20	64.8	62.1
10:00	1.67	244.2 WSW	13.22	61.0	65.0
11:00	2.13	260.0 W	15.52	59.3	51.3
12:00	3.45	257.8 WSW	17.15	63.7	43.3
13:00	4.40	243.3 WSW	17.54	64.5	36.9
14:00	4.30	271.7 W	17.43	65.7	39.8
15:00	4.80	276.9 W	17.37	64.9	34.9
16:00	4.74	286.5 WNW	16.94	66.0	33.1
17:00	3.43	307.9 NW	15.52	72.8	40.5
18:00	2.94	327.8 NNW	14.59	74.4	37.5
19:00	2.03	337.7	13.93	77.8	32.5
20:00	1.45	333.2	13.55	79.7	41.0
21:00	0.92	3.7	12.95	82.2	42.2
22:00	1.01	33.3	11.97	84.5	18.8
23:00	0.75	49.8	11.42	85.5	19.6
24:00	0.52	58.7	10.88	86.5	31.4
Sum			298.83	1866.1	985.9
Average	2.05	352.5	12.45	77.8	41.1
Maximum Time			17.54 13:00	98.0 03:00	65.0 10:00
Minimum Time			7.28 05:00	59.3 11:00	18.8 22:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 02/09 Time: 01:00 ----- 2002 02/09 Time: 24:00





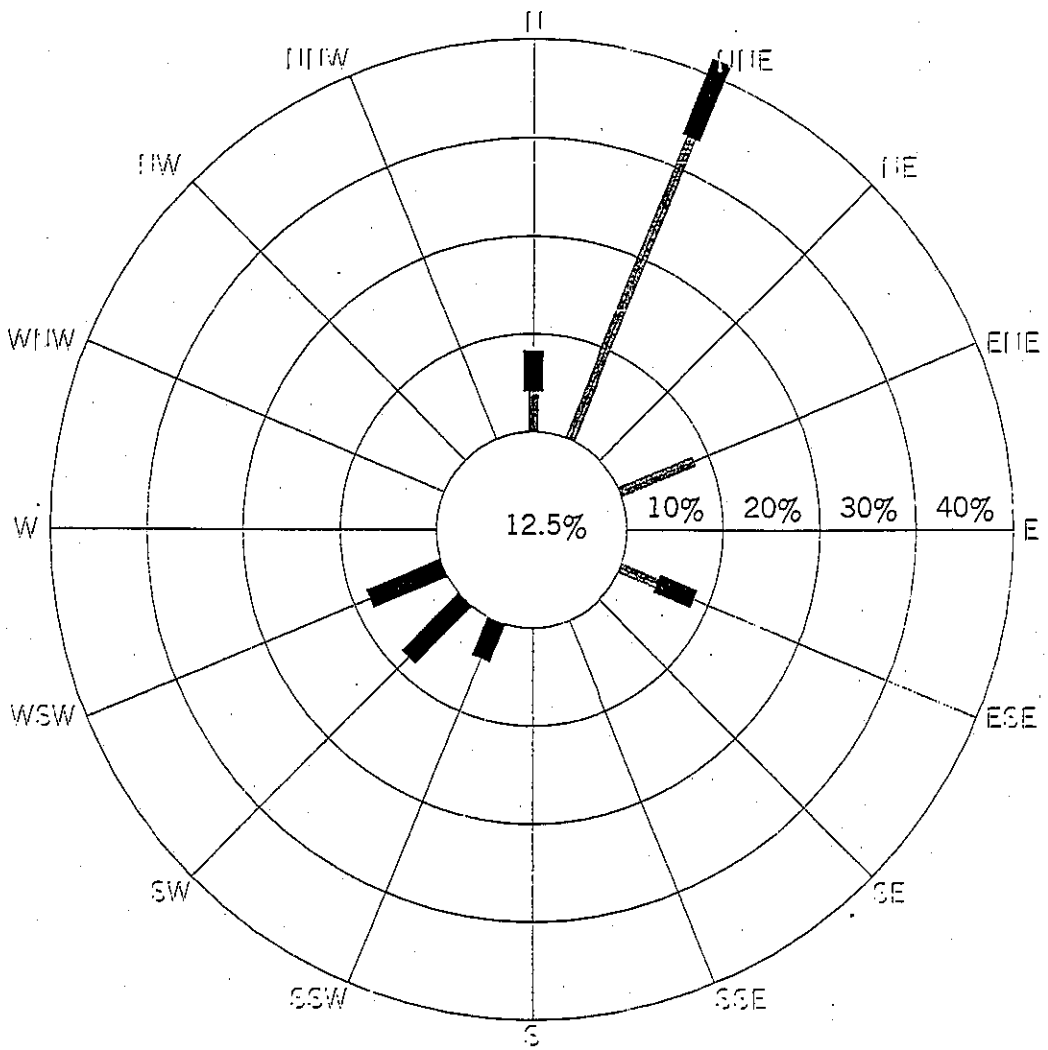
Barrio Logan CR6

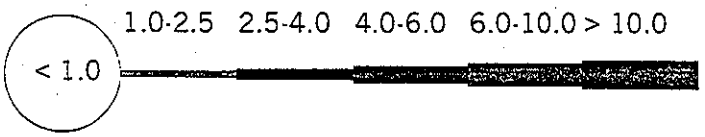
og Date: 2002/02/09 Printing: 2002/03/07

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)
01:00	0.86	41.7	10.00	87.7	18.7
02:00	0.71	63.6	9.79	87.2	59.3
03:00	0.75	9.9	9.57	87.0	43.5
04:00	1.11	29.2	9.57	87.8	24.5
05:00	0.80	20.6	9.19	87.5	63.1
06:00	0.65	49.2	8.37	88.0	56.7
07:00	0.80	48.9 NE	7.98	88.3	45.4
08:00	0.99	24.9 NNE	9.62	83.7	36.2
09:00	1.41	260.7 W	12.95	76.0	37.2
10:00	2.30	228.2 SW	16.94	59.8	37.5
11:00	2.92	177.3 S	19.88	37.9	40.1
12:00	3.70	190.9 S	21.47	18.9	33.4
13:00	3.30	231.3 SW	22.83	12.6	38.3
14:00	3.57	261.8 W	23.70	10.7	38.5
15:00	3.74	277.3 W	24.03	10.4	32.6
16:00	3.23	257.5 WSW	23.76	12.7	37.7
17:00	2.64	227.2 SW	21.90	16.7	46.5
18:00	1.22	7.8	19.61	24.3	52.9
19:00	0.71	64.7	17.70	30.2	38.2
20:00	1.11	35.9	16.50	27.4	46.1
21:00	0.92	46.1	14.59	32.3	49.7
22:00	0.92	17.9	13.44	38.1	43.4
23:00	1.60	33.7	12.84	28.1	32.5
24:00	1.16	10.1	13.06	22.9	60.6
Sum			369.29	1156.3	1012.4
Average	1.71	11.6	15.39	48.2	42.2
Maximum			24.03	88.3	63.1
Time			15:00	07:00	05:00
Minimum			7.98	10.4	18.7
Time			07:00	15:00	01:00
Standard # above	----	----	----	----	----

WIND ROSE PLOT

2002 02/10 Time: 01:00 ----- 2002 02/10 Time: 24:00





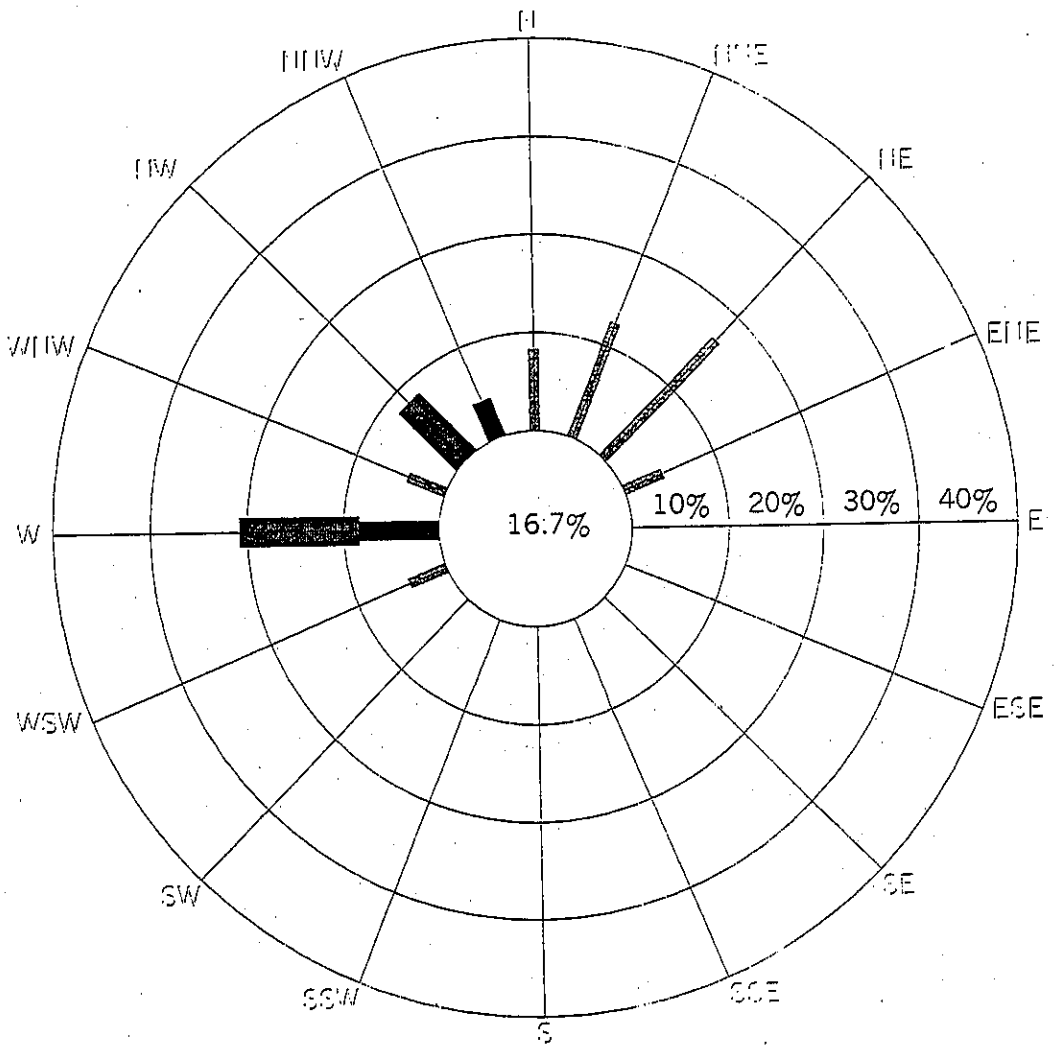
Barrio Logan CR6

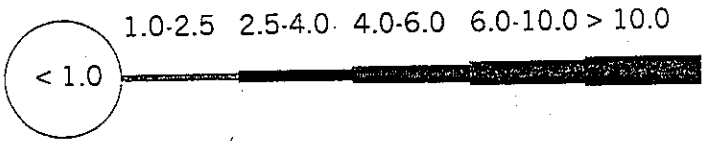
Log Date: 2002/02/10 Printing: 2002/03/07

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)
01:00	1.54	31.8	12.79	20.4	37.8
02:00	2.60	27.9	13.39	16.6	24.1
03:00	2.37	25.8	13.66	14.6	22.1
04:00	1.67	31.7	13.55	13.7	25.7
05:00	2.03	24.7	13.12	15.6	39.8
06:00	1.54	20.4	13.44	13.5	47.5
07:00	2.13	32.3 NNE	11.48	19.6	35.1
08:00	1.35	68.6 ENE	14.48	15.0	77.6
09:00	2.43	27.5 NNE	16.99	12.3	29.6
10:00	3.34	359.1 N	20.32	6.7	33.8
11:00	3.23	25.0 NNE	22.88	2.1	60.5
12:00	3.53	108.5 ESE	24.41	2.5	64.5
13:00	3.89	241.5 WSW	23.32	6.3	54.1
14:00	3.83	203.7 SSW	23.87	7.1	64.6
15:00	3.57	223.2 SW	23.27	10.1	50.8
16:00	3.07	233.4 SW	23.38	7.3	42.3
17:00	2.77	246.1 WSW	23.38	3.8	70.9
18:00	1.07	109.3 ESE	21.30	6.7	74.4
19:00	0.82	69.2	18.52	10.1	65.2
20:00	0.95	60.4	16.55	14.7	54.2
21:00	1.07	72.9	15.35	17.6	50.2
22:00	0.95	41.1	13.55	31.1	55.0
23:00	1.24	356.8	13.06	29.2	37.6
24:00	1.20	22.4	12.79	24.5	29.0
Sum			418.84	321.1	1146.5
Average	2.17	36.8	17.45	13.4	47.8
Maximum Time			24.41 12:00	31.1 22:00	77.6 08:00
Minimum Time			11.48 07:00	2.1 11:00	22.1 03:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 02/11 Time: 01:00 ----- 2002 02/11 Time: 24:00





Barrio Logan CR6

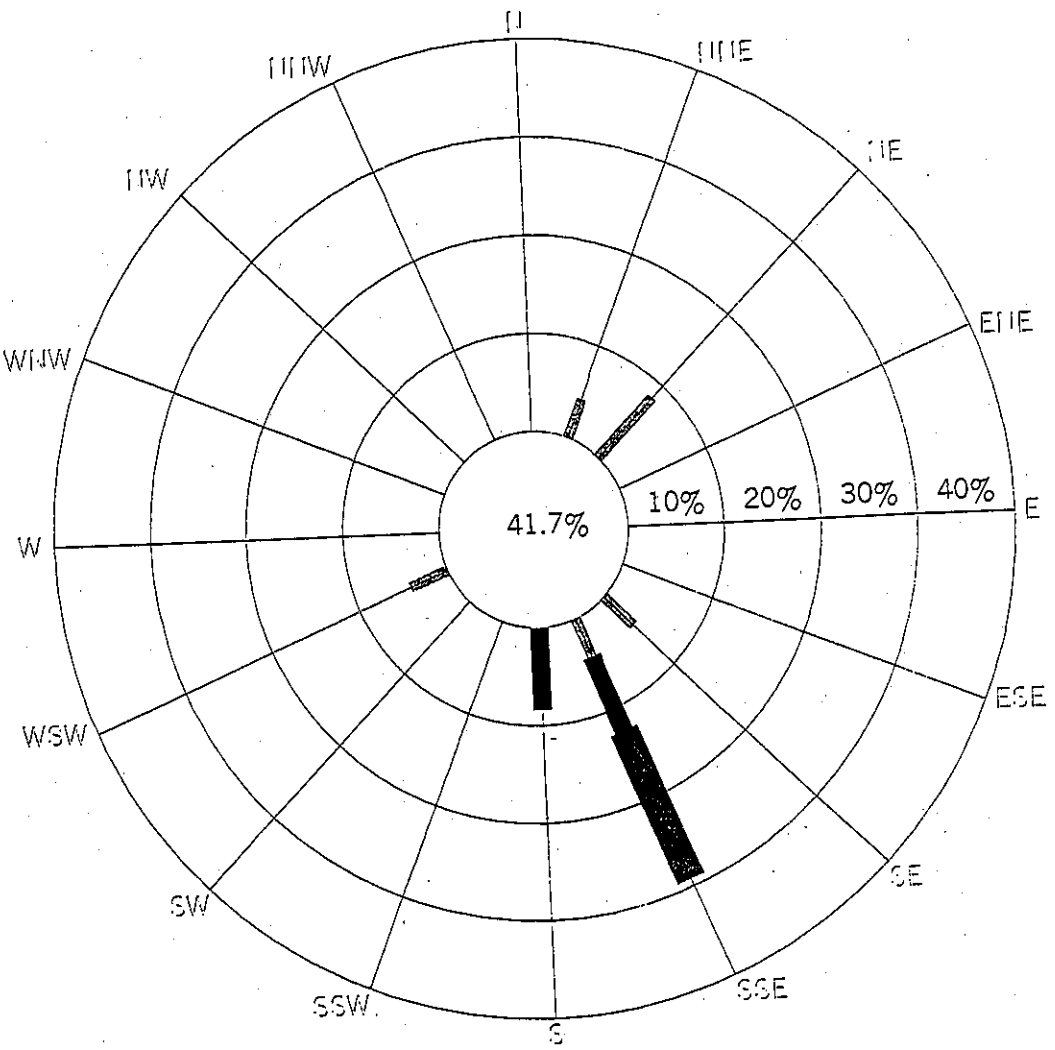
og Date: 2002/02/11 Printing: 2002/03/07

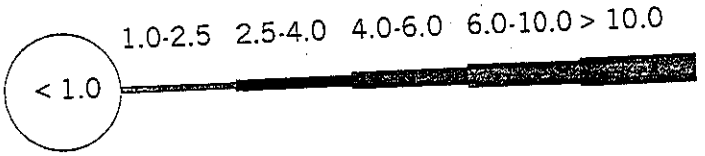
Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)
01:00	1.37	44.9	11.59	27.3	33.4
02:00	2.07	35.2	11.75	22.3	28.8
03:00	2.24	22.7	12.19	17.9	47.2
04:00	1.09	33.8	10.17	24.0	53.2
05:00	0.84	61.5	9.08	26.6	64.3
06:00	0.82	72.9	9.35	25.0	48.0
07:00	1.35	26.5 NNE	10.11	23.3	65.4
08:00	1.41	8.3 N	12.57	22.5	34.2
09:00	1.54	258.0 W	15.41	24.2	54.3
10:00	2.30	283.4 WNW	18.35	25.1	29.9
11:00	3.00	277.0 W	22.12	13.5	28.4
12:00	3.98	280.0 W	24.19	5.9	29.2
13:00	4.32	264.5 W	24.30	4.9	31.6
14:00	4.61	275.4 W	24.69	7.4	30.5
15:00	4.53	277.5 W	24.47	8.3	27.3
16:00	4.74	304.4 NW	23.70	7.1	33.5
17:00	4.27	318.4 NW	21.90	9.3	38.4
18:00	3.17	334.3 NNW	19.94	14.1	35.7
19:00	1.75	4.7	18.30	19.9	37.3
20:00	1.77	29.4	16.94	31.8	35.9
21:00	0.82	63.5	15.57	39.7	27.7
22:00	0.73	35.9	14.32	45.1	51.7
23:00	1.01	56.3	12.62	48.1	33.4
24:00	1.07	43.4	11.48	43.3	41.3
Sum			395.10	536.8	940.9
Average	2.28	357.3	16.46	22.4	39.2
Maximum Time			24.69 14:00	48.1 23:00	65.4 07:00
Minimum Time			9.08 05:00	4.9 13:00	27.3 15:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

W 4.74

WIND ROSE PLOT

2002 02/12 Time: 01:00 ----- 2002 02/12 Time: 24:00





Barrio Logan CR6

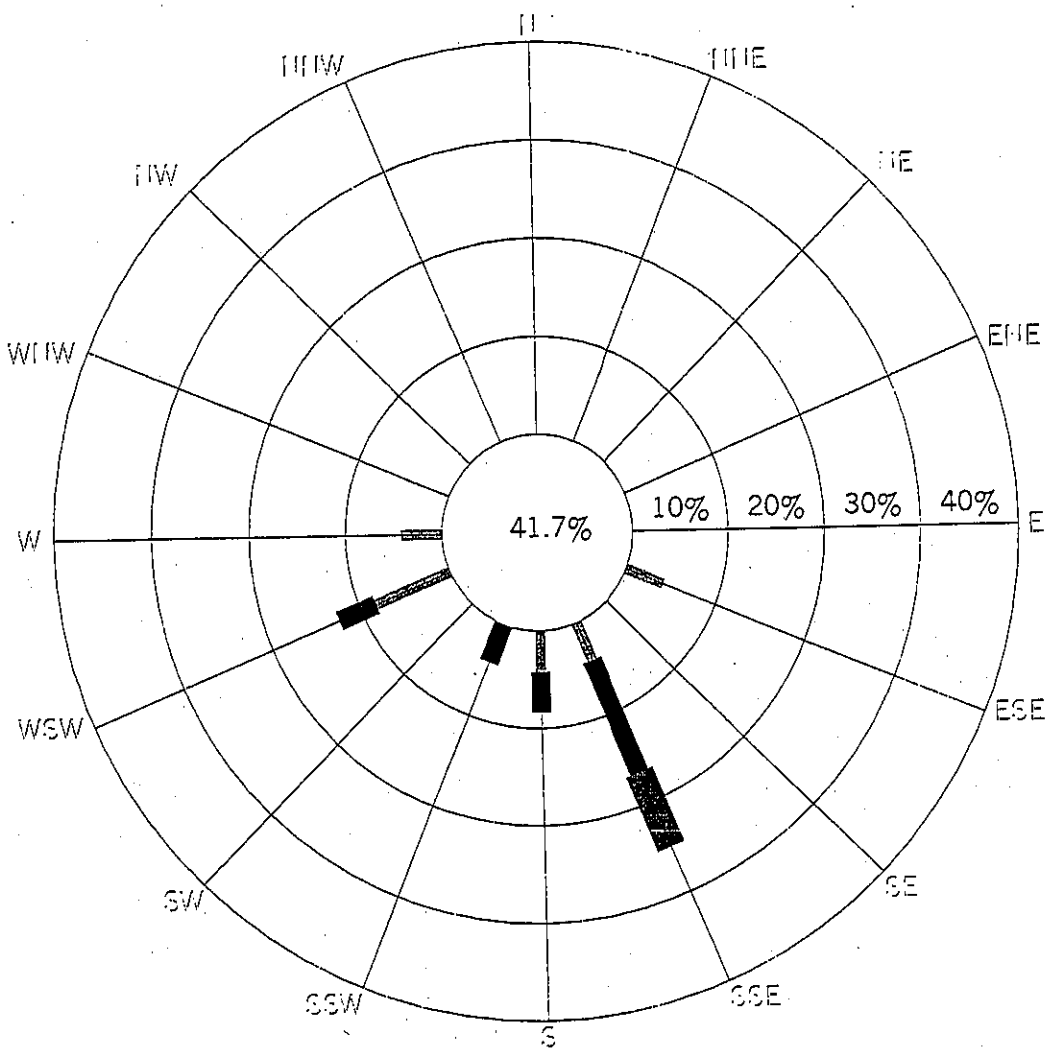
og Date: 2002/02/12 Printing: 2002/03/07

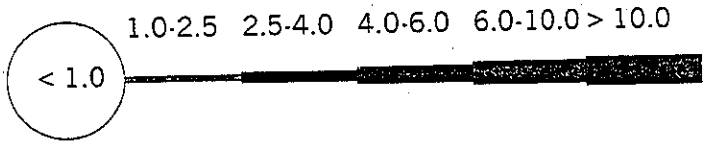
Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)
01:00	0.82	29.9	11.04	39.4	52.4
02:00	0.71	65.7	9.84	41.6	34.9
03:00	1.05	43.4	9.35	38.4	36.7
04:00	0.95	52.1	9.51	34.9	28.9
05:00	1.96	18.2	10.11	29.2	33.3
06:00	0.84	101.3	9.68	28.7	46.8
07:00	1.24	55.1 NE	9.68	27.7	35.4
08:00	0.78	113.2 ESE	11.42	27.0	51.9
09:00	1.64	249.1 WSW	14.37	33.1	41.3
10:00	3.32	155.1 SSE	15.63	35.6	21.8
11:00	3.53	170.4 S	16.39	47.7	34.3
12:00	4.34	164.2 SSE	17.26	41.4	33.1
13:00	3.89	179.2 S	17.54	45.2	39.4
14:00	4.49	168.6 S	17.54	48.9	35.1
15:00	4.51	165.5 SSE	16.06	75.7	28.7
16:00	4.25	162.2 SSE	15.35	82.5	24.6
17:00	3.72	154.8 SSE	15.08	83.1	22.7
18:00	2.39	148.3 SSE	14.37	86.3	23.9
19:00	1.84	139.1	13.82	88.9	20.2
20:00	0.90	71.1	13.33	90.2	22.4
21:00	0.56	65.9	12.90	89.5	15.9
22:00	0.58	50.4	12.62	89.3	48.5
23:00	0.69	6.2	12.13	92.2	32.6
24:00	0.82	35.4	11.37	92.7	22.2
Sum			316.40	1389.2	786.9
Average	2.08	104.1	13.18	57.9	32.8
Maximum Time			17.54 13:00	92.7 24:00	52.4 01:00
Minimum Time			9.35 03:00	27.0 08:00	15.9 21:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

SSE 4.51

WIND ROSE PLOT

2002 02/13 Time: 01:00 ----- 2002 02/13 Time: 24:00





Barrio Logan CR6

og Date: 2002/02/13

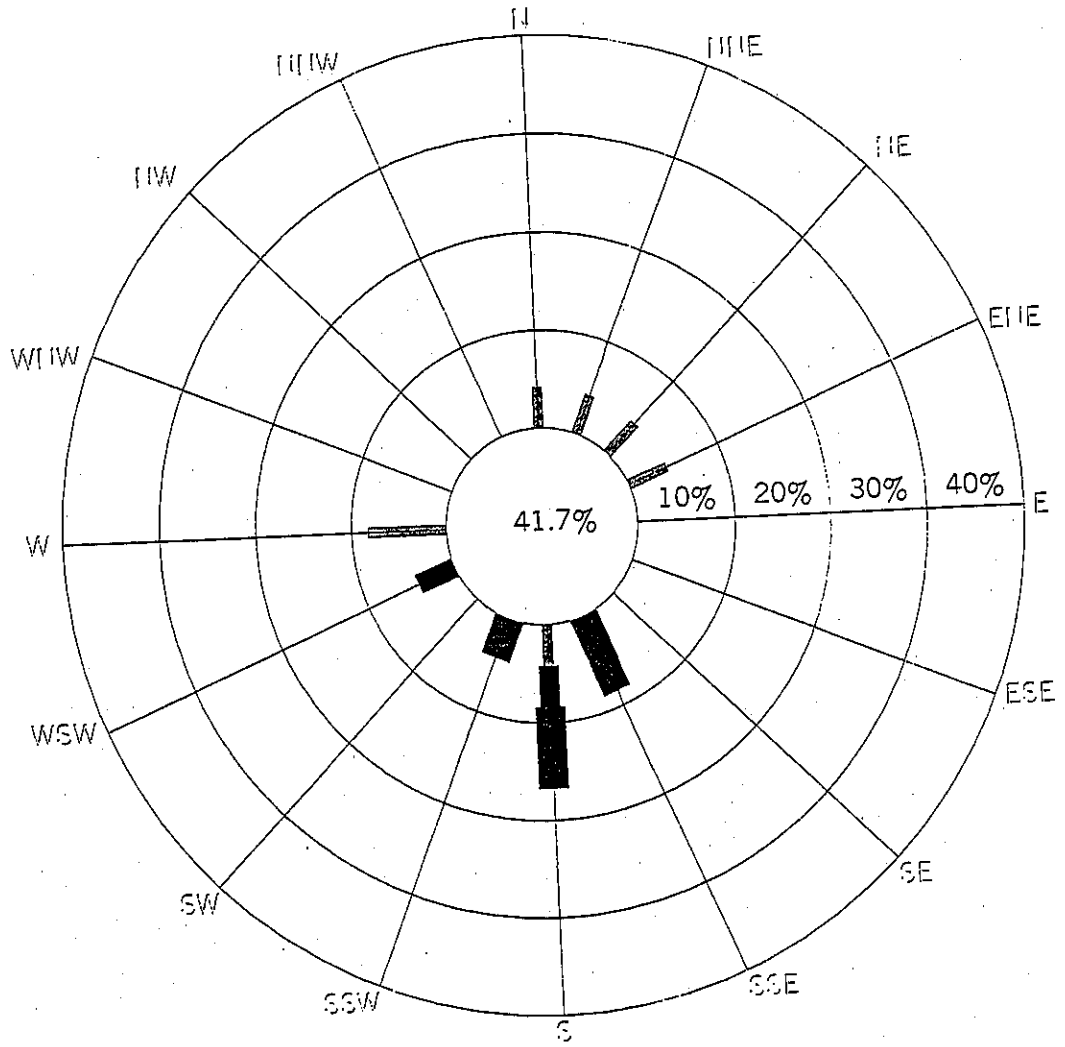
Printing: 2002/03/07

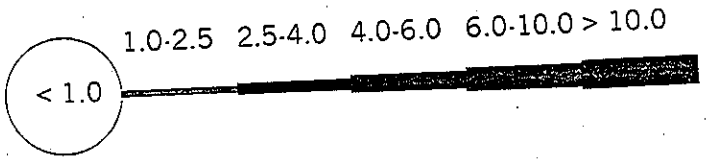
Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)
01:00	0.69	44.2	10.22	87.4	25.1
02:00	0.67	58.1	9.35	84.7	32.3
03:00	0.56	58.4	8.80	74.3	26.0
04:00	0.84	26.7	8.42	71.7	32.4
05:00	0.71	47.8	8.31	66.5	41.2
06:00	0.52	77.2	8.04	66.6	40.2
07:00	0.54	80.3 E	8.20	62.9	33.1
08:00	1.28	109.1 ESE	9.51	60.2	23.1
09:00	1.84	164.4 SSE	11.20	57.1	45.5
10:00	2.05	254.4 WSW	13.22	68.8	52.4
11:00	2.85	238.5 WSW	13.88	77.6	49.3
12:00	3.02	202.9 SSW	13.77	84.0	47.0
13:00	2.79	182.8 S	15.19	75.0	50.8
14:00	2.96	168.1 S	15.46	70.9	44.1
15:00	3.62	160.4 SSE	16.01	65.9	20.7
16:00	4.32	166.4 SSE	15.52	77.3	25.5
17:00	4.76	155.0 SSE	14.75	82.8	22.8
18:00	3.36	164.0 SSE	13.82	86.4	27.5
19:00	2.26	275.8	13.66	86.2	40.5
20:00	1.14	245.9	13.39	85.4	41.2
21:00	1.03	176.8	13.39	82.8	55.1
22:00	0.61	83.2	13.06	81.1	37.8
23:00	0.50	79.2	12.35	82.2	24.6
24:00	0.56	51.1	11.91	83.4	33.8
Sum			291.46	1821.2	872.0
Average	1.81	128.2	12.14	75.9	36.3
Maximum Time			16.01 15:00	87.4 01:00	55.1 21:00
Minimum Time			8.04 06:00	57.1 09:00	20.7 15:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

SSE 4.76

WIND ROSE PLOT

2002 02/14 Time: 01:00 ----- 2002 02/14 Time: 24:00





Barrio Logan CR6

og Date: 2002/02/14

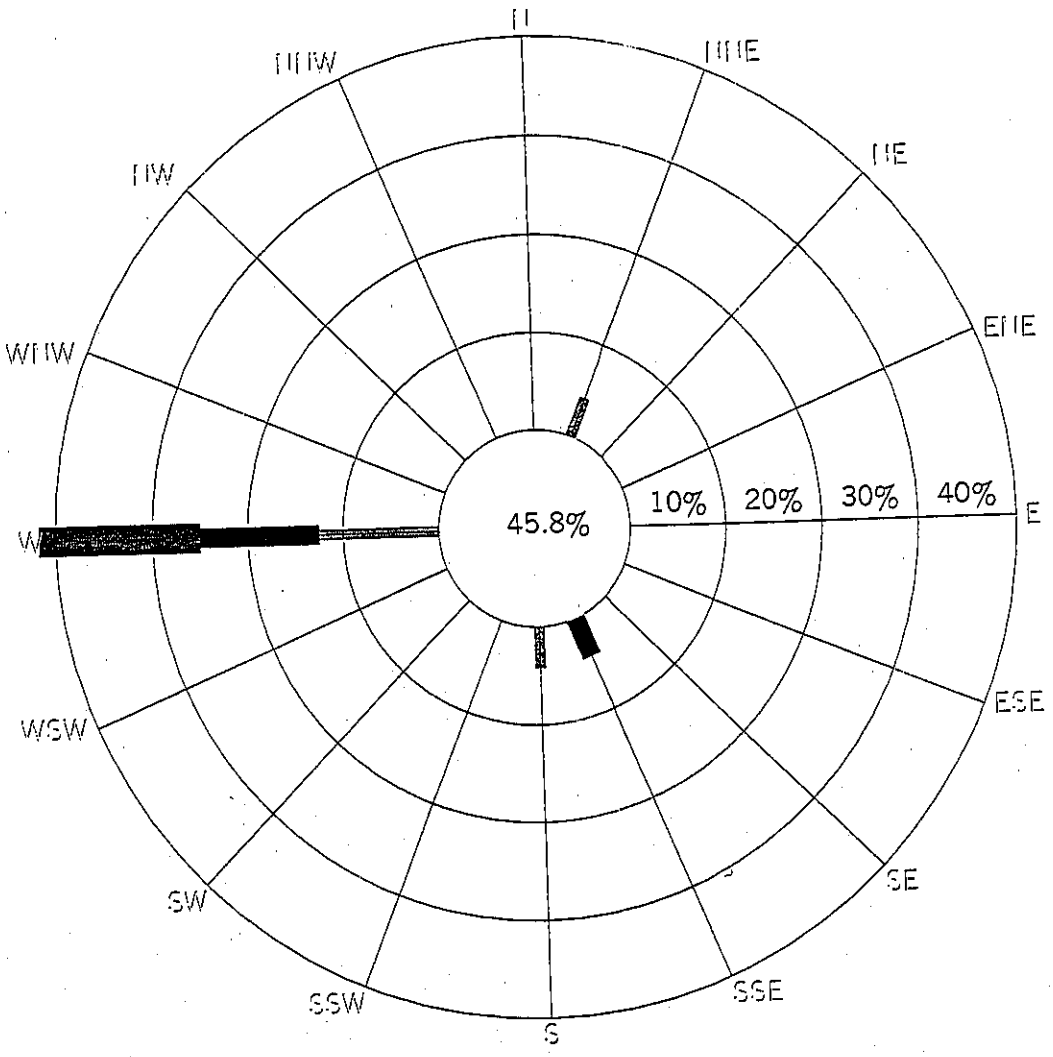
Printing: 2002/03/07

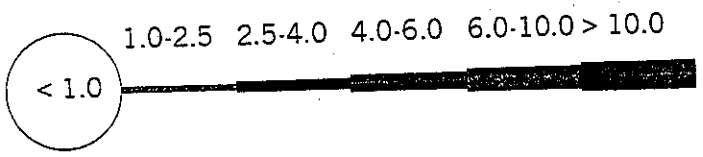
Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)
01:00	0.54	39.3	11.15	86.2	29.5
02:00	1.33	77.7	11.48	85.3	44.6
03:00	1.22	22.4	10.50	87.2	19.0
04:00	1.35	35.2	10.93	86.1	25.8
05:00	0.95	43.1	11.48	84.7	24.7
06:00	0.80	43.3	11.70	84.0	26.7
07:00	0.61	42.5 NE	11.37	84.2	29.6
08:00	0.80	21.1 NNE	11.97	81.5	58.2
09:00	1.54	1.0 N	13.55	73.2	50.8
10:00	2.34	177.6 S	14.43	69.3	56.0
11:00	3.47	172.4 S	15.30	66.6	38.1
12:00	5.08	161.3 SSE	15.57	66.2	24.8
13:00	5.04	194.7 SSW	15.79	65.6	34.8
14:00	5.04	173.9 S	15.24	69.9	32.8
15:00	4.53	160.8 SSE	15.08	70.9	22.1
16:00	4.19	174.2 S	14.92	72.6	30.7
17:00	2.90	241.5 WSW	14.64	74.3	42.2
18:00	2.34	261.5 W	14.15	76.6	39.8
19:00	1.41	265.4	13.77	77.8	44.0
20:00	0.88	141.0	13.44	79.0	61.9
21:00	0.86	106.4	13.39	79.5	51.5
22:00	0.52	59.3	12.84	80.8	22.8
23:00	0.80	47.8	12.24	82.3	27.3
24:00	0.78	53.7	11.86	83.1	30.4
Sum			316.78	1867.3	868.1
Average	2.05	89.8	13.20	77.8	36.2
Maximum Time			15.79 13:00	87.2 03:00	61.9 20:00
Minimum Time			10.50 03:00	65.6 13:00	19.0 03:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

S 6.0

WIND ROSE PLOT

2002 02/15 Time: 01:00 ----- 2002 02/15 Time: 24:00





Barrio Logan CR6

Log Date: 2002/02/15

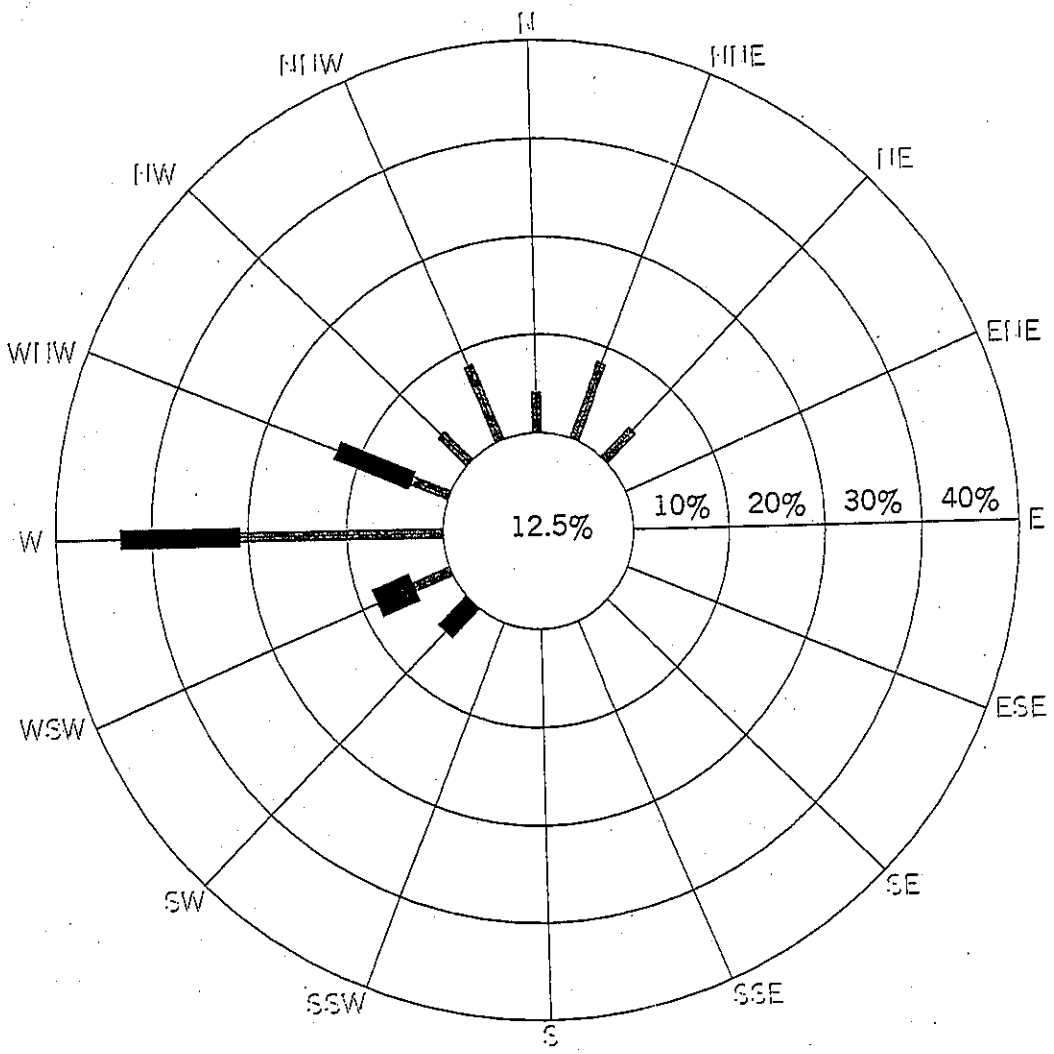
Printing: 2002/03/07

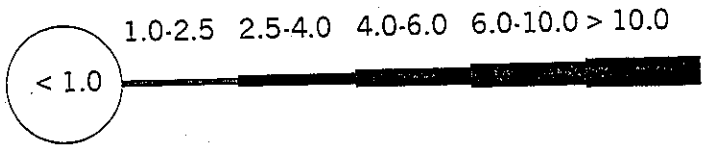
Time \ Item	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)
01:00	0.75	57.5	11.37	84.4	27.3
02:00	0.97	25.1	11.04	85.1	20.4
03:00	0.95	13.3	10.99	84.8	28.2
04:00	0.73	62.7	10.17	86.4	29.6
05:00	0.61	72.6	9.51	87.1	18.7
06:00	0.82	52.9	9.35	87.5	23.7
07:00	0.73	67.3 ENE	9.57	87.0	36.9
08:00	1.45	29.1 NNE	11.04	83.6	25.4
09:00	2.87	155.8 SSE	12.68	78.1	37.2
10:00	2.45	185.6 S	14.15	75.6	45.1
11:00	3.57	262.2 W	16.55	70.1	38.4
12:00	4.15	266.1 W	17.37	68.4	34.1
13:00	4.53	276.2 W	17.21	70.0	35.7
14:00	4.66	274.6 W	17.15	70.9	35.2
15:00	4.32	274.3 W	16.83	72.1	36.2
16:00	3.68	276.2 W	16.23	73.7	37.9
17:00	3.19	271.4 W	15.57	75.0	37.4
18:00	1.96	264.4 W	14.70	77.3	44.6
19:00	2.26	272.6	14.32	79.0	29.9
20:00	1.60	275.2	13.93	81.4	45.9
21:00	0.73	358.9	13.39	82.8	64.5
22:00	0.92	0.3	12.95	83.7	35.4
23:00	0.73	62.1	12.35	85.1	50.3
24:00	0.90	20.0	12.13	85.0	41.3
Sum			320.55	1914.1	859.3
Average	2.06	336.9	13.36	79.8	35.8
Maximum Time			17.37 12:00	87.5 06:00	64.5 21:00
Minimum Time			9.35 06:00	68.4 12:00	18.7 05:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100

W 4.66

WIND ROSE PLOT

2002 02/16 Time: 01:00 ----- 2002 02/16 Time: 24:00





Barrio Logan CR6

og Date: 2002/02/16

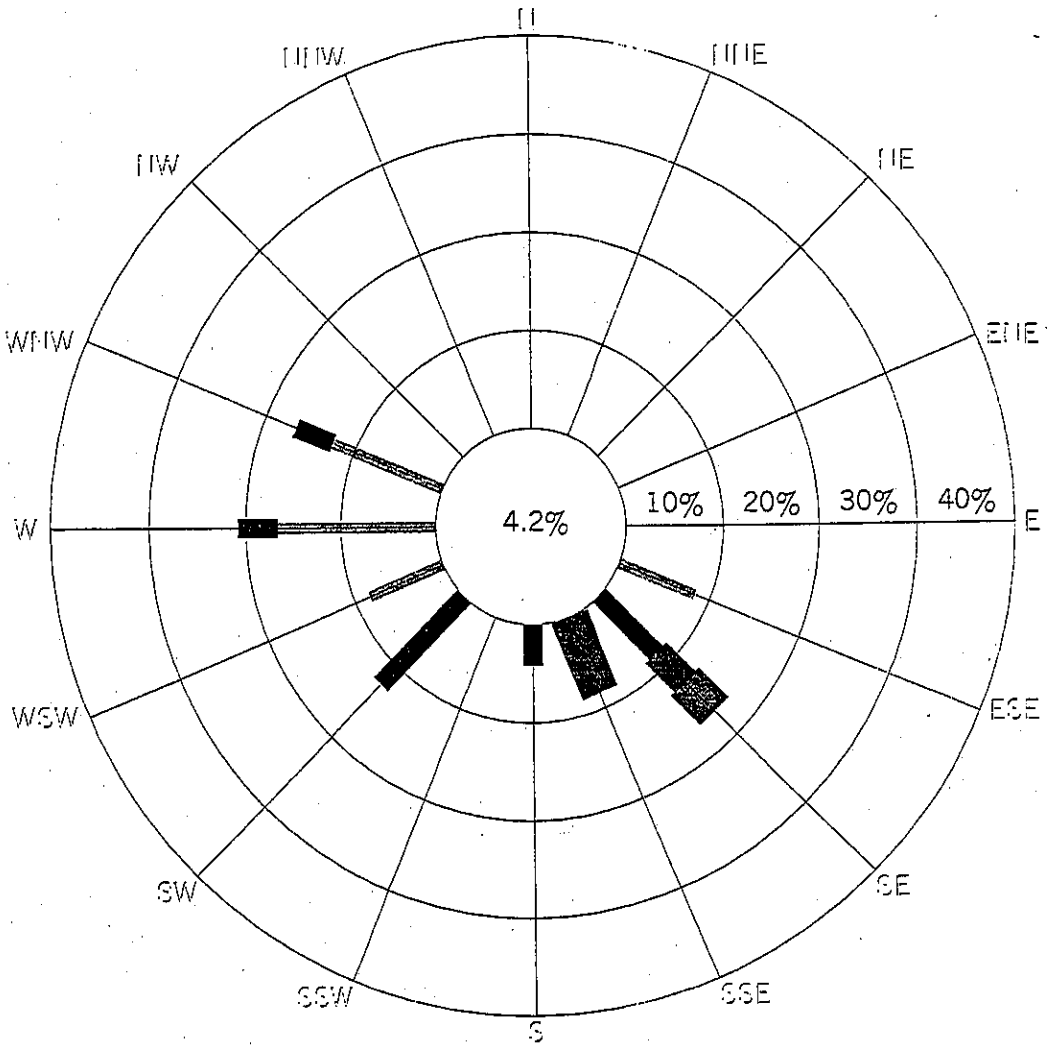
Printing: 2002/03/07

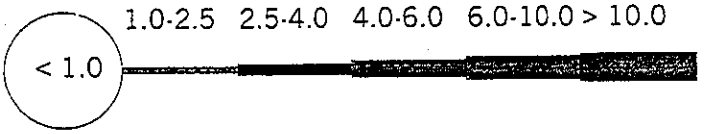
Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)
01:00	1.31	348.9	13.22	83.3	36.4
02:00	1.43	344.3	13.33	83.1	34.9
03:00	1.41	335.0	13.39	82.8	36.4
04:00	1.41	19.7	13.28	82.9	24.1
05:00	1.45	32.9	13.17	83.3	30.0
06:00	0.65	44.7	12.90	83.7	63.6
07:00	0.80	48.7 NE	12.79	82.3	51.3
08:00	0.99	58.5 ENE	12.84	80.7	39.8
09:00	1.84	260.6 W	13.82	73.6	56.3
10:00	1.52	317.5 NW	14.26	70.9	66.9
11:00	1.75	39.8 NE	15.41	67.6	69.4
12:00	3.09	227.5 SW	15.19	68.5	60.5
13:00	3.49	269.0 W	15.68	67.0	45.9
14:00	3.91	286.9 WNW	16.28	64.4	38.3
15:00	3.19	272.6 W	16.12	64.8	57.9
16:00	4.38	244.2 WSW	15.57	67.0	37.3
17:00	3.60	276.7 W	14.75	68.2	37.6
18:00	2.94	282.4 WNW	13.82	70.6	32.5
19:00	2.24	276.4	13.66	71.5	38.3
20:00	2.17	281.4	13.61	70.9	40.3
21:00	2.28	280.3	13.50	69.2	37.7
22:00	1.69	265.7	13.50	68.2	38.7
23:00	1.52	239.5	13.28	70.5	46.1
24:00	1.43	267.5	13.17	70.7	38.1
Sum			336.54	1765.4	1058.1
Average	2.10	303.2	14.02	73.6	44.1
Maximum Time			16.28 14:00	83.7 06:00	69.4 11:00
Minimum Time			12.79 07:00	64.4 14:00	24.1 04:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

W 4.4

WIND ROSE PLOT

2002 02/17 Time: 01:00 ----- 2002 02/17 Time: 24:00





Barrio Logan CR6

og Date: 2002/02/17

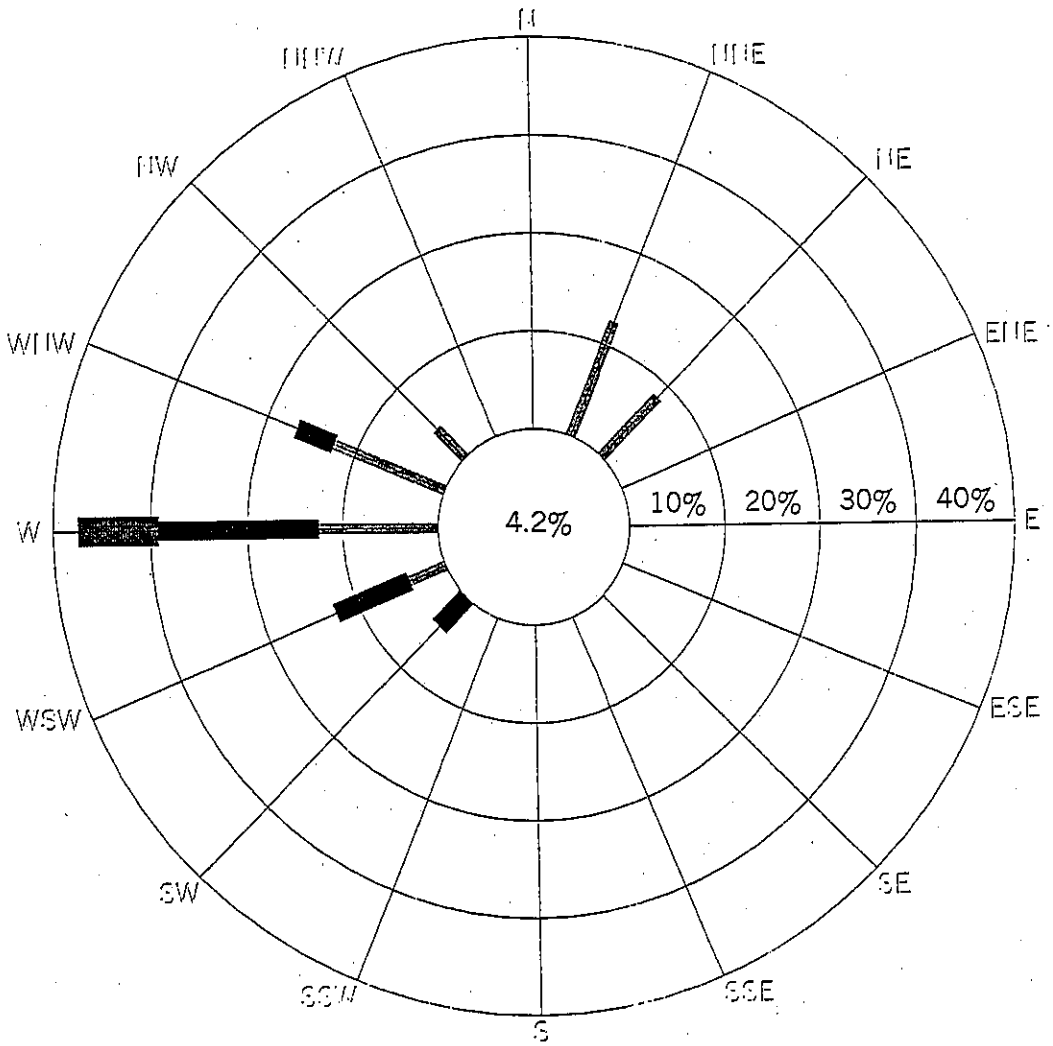
Printing: 2002/03/07

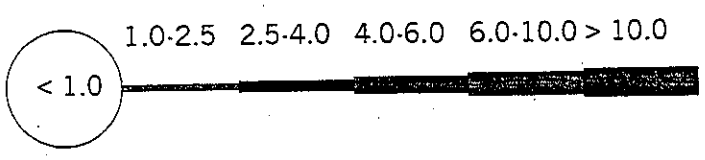
Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)
01:00	1.22	262.7	13.28	67.5	40.6
02:00	1.45	261.8	13.28	67.9	41.2
03:00	1.90	249.8	13.22	71.2	34.4
04:00	1.24	271.1	12.90	73.9	47.5
05:00	0.95	139.4	12.57	74.4	56.8
06:00	1.33	103.7	12.46	73.6	28.9
07:00	2.90	128.1 SE	12.84	72.6	19.6
08:00	1.84	112.1 ESE	12.79	68.7	31.6
09:00	3.96	130.0 SE	13.28	69.0	18.4
10:00	6.78	138.9 SE	13.82	71.0	18.7
11:00	7.20	153.4 SSE	13.50	74.0	24.1
12:00	7.67	148.5 SSE	12.41	86.4	25.3
13:00	3.13	229.4 SW	12.35	87.9	43.9
14:00	4.38	145.3 SE	12.84	86.4	21.5
15:00	3.17	179.2 S	13.50	82.0	40.5
16:00	2.73	233.6 SW	14.21	75.1	50.6
17:00	3.19	219.3 SW	13.88	74.6	38.9
18:00	2.94	259.6 W	13.17	81.4	36.5
19:00	2.34	260.1	13.01	78.4	37.6
20:00	1.73	257.3	12.73	78.1	37.4
21:00	2.66	290.6	12.68	71.7	35.3
22:00	2.05	293.7	12.41	69.9	34.4
23:00	2.05	292.1	12.13	71.2	36.7
24:00	1.98	283.4	12.08	72.8	36.4
Sum			311.33	1799.9	836.8
Average	2.95	216.5	12.97	75.0	34.9
Maximum Time			14.21 16:00	87.9 13:00	56.8 05:00
Minimum Time			12.08 24:00	67.5 01:00	18.4 09:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100

SE & SW 7.7

WIND ROSE PLOT

2002 02/18 Time: 01:00 ----- 2002 02/18 Time: 24:00





Barrio Logan CR6

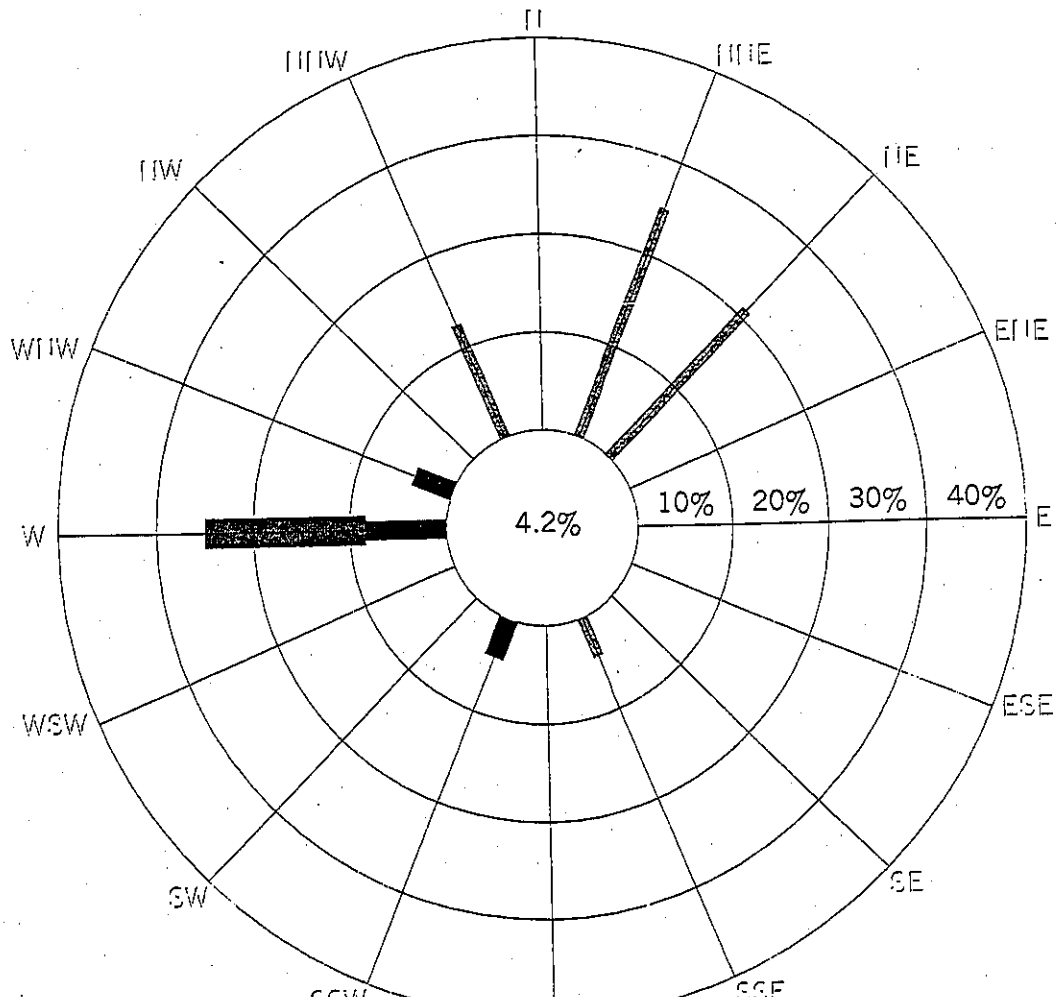
Log Date: 2002/02/18 Printing: 2002/03/07

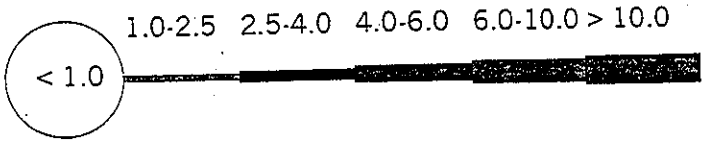
Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)
01:00	2.51	300.5	12.02	71.9	38.2
02:00	2.09	288.5	11.64	70.5	34.8
03:00	2.03	287.1	11.48	68.0	37.2
04:00	1.52	271.8	11.26	69.3	39.6
05:00	1.20	285.7	10.55	71.8	60.5
06:00	1.67	278.5	11.20	68.4	38.2
07:00	1.18	14.0 NNE	10.44	70.5	53.5
08:00	0.99	27.3 NNE	10.17	75.6	60.1
09:00	1.96	246.6 WSW	12.30	67.4	63.8
10:00	3.36	234.5 SW	13.44	61.2	42.8
11:00	3.66	236.3 WSW	13.61	63.8	43.2
12:00	3.79	268.8 W	14.10	60.8	40.1
13:00	4.32	270.9 W	15.35	55.6	37.0
14:00	4.21	270.7 W	15.19	54.8	39.4
15:00	3.79	261.2 W	15.24	55.0	40.8
16:00	3.47	263.7 W	14.64	57.7	39.1
17:00	3.09	268.3 W	14.32	59.4	45.1
18:00	2.75	245.6 WSW	13.44	62.7	46.3
19:00	2.20	267.8	13.12	62.4	39.6
20:00	1.09	314.3	12.41	63.3	41.6
21:00	1.01	31.6	11.31	67.9	13.7
22:00	1.20	36.2	10.22	72.7	19.5
23:00	1.50	37.9	9.68	75.3	31.0
24:00	1.69	32.3	9.29	77.1	22.4
Sum			296.43	1583.1	967.5
Average	2.34	290.3	12.35	66.0	40.3
Maximum Time			15.35 13:00	77.1 24:00	63.8 09:00
Minimum Time			9.29 24:00	54.8 14:00	13.7 21:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

W 4.3

WIND ROSE PLOT

2002 02/19 Time: 01:00 ----- 2002 02/19 Time: 24:00





Barrio Logan CR6

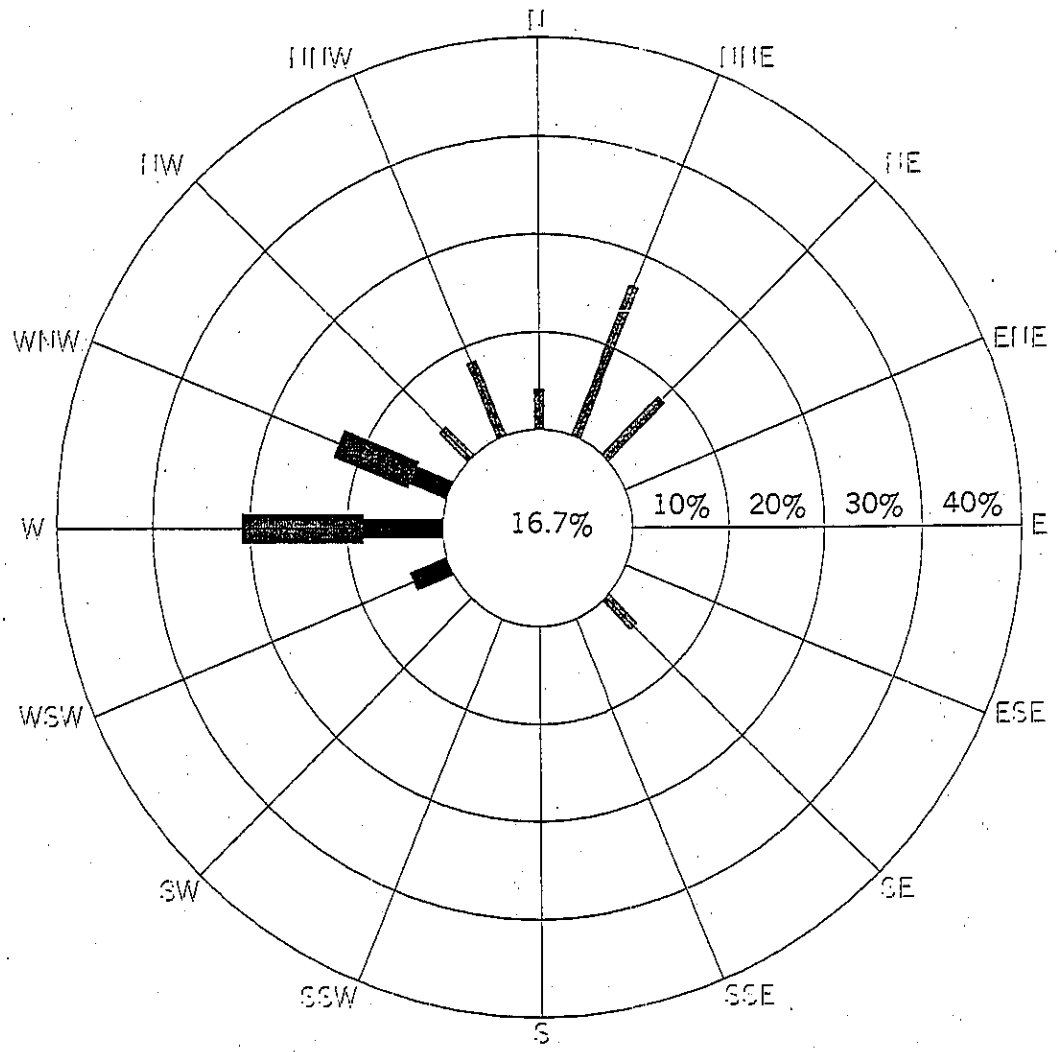
og Date: 2002/02/19 Printing: 2002/03/07

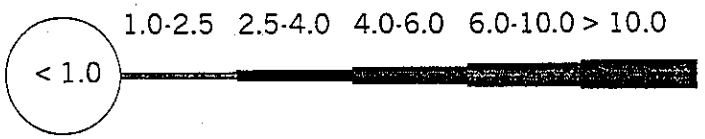
Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)
01:00	2.20	30.8	8.86	78.2	22.0
02:00	2.01	29.2	8.31	79.3	23.9
03:00	1.48	12.0	8.15	79.0	40.0
04:00	1.33	39.6	7.44	81.1	47.1
05:00	2.03	30.8	7.17	80.6	24.3
06:00	1.96	32.3	7.44	78.4	27.7
07:00	1.41	39.0 NE	7.38	77.1	43.4
08:00	1.16	44.6 NE	8.09	74.9	48.6
09:00	1.33	34.5 NE	10.60	68.1	62.1
10:00	2.34	158.8 SSE	12.79	62.6	61.5
11:00	3.47	191.4 SSW	14.15	56.6	34.1
12:00	3.74	264.6 W	15.79	53.8	43.1
13:00	4.04	275.0 W	16.17	54.6	37.6
14:00	4.32	279.6 W	16.34	56.3	38.3
15:00	4.57	278.5 W	16.12	58.3	35.3
16:00	4.30	270.4 W	15.73	61.8	35.7
17:00	3.49	272.2 W	15.41	64.4	36.8
18:00	2.85	284.8 WNW	14.26	68.8	33.3
19:00	2.41	340.6	13.77	70.8	32.6
20:00	1.90	338.1	13.33	74.0	30.9
21:00	1.37	343.7	13.01	75.8	25.5
22:00	0.99	39.4	12.35	78.5	24.7
23:00	1.03	39.6	11.31	80.3	18.5
24:00	1.39	33.0	10.82	80.9	20.8
Sum			284.80	1694.3	847.6
Average	2.38	354.2	11.87	70.6	35.3
Maximum Time			16.34 14:00	81.1 04:00	62.1 09:00
Minimum Time			7.17 05:00	53.8 12:00	18.5 23:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100

W 4.6

WIND ROSE PLOT

2002 02/20 Time: 01:00 ----- 2002 02/20 Time: 24:00





Barrio Logan CR6

og Date: 2002/02/20

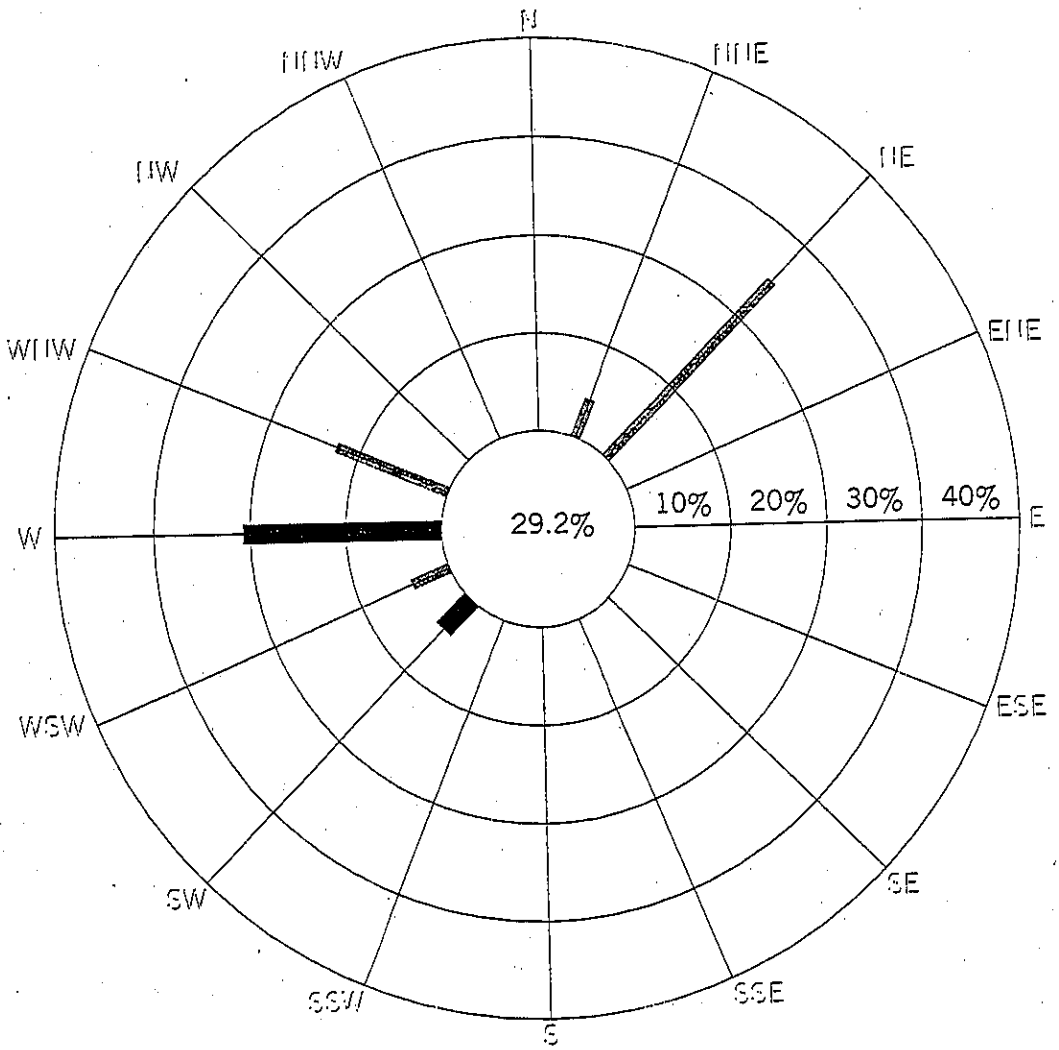
Printing: 2002/03/07

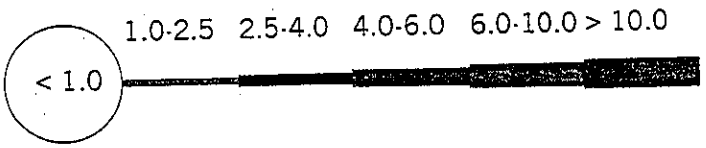
Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)
01:00	1.35	29.4	10.66	80.4	20.2
02:00	1.41	31.9	10.22	80.8	22.6
03:00	0.84	49.5	9.79	80.9	35.9
04:00	0.52	83.6	9.13	81.9	26.6
05:00	0.97	45.8	8.75	82.2	23.3
06:00	1.35	34.5	8.69	81.7	25.2
07:00	1.39	34.5 NNE	8.91	80.4	23.0
08:00	1.35	27.7 NNE	10.39	76.4	27.8
09:00	1.75	143.9 SSW	13.01	71.8	49.4
10:00	2.83	239.1 WSW	14.59	70.1	43.3
11:00	3.66	262.8 W	16.34	65.8	40.5
12:00	4.13	276.6 W	17.15	63.8	34.9
13:00	4.72	272.7 W	17.48	62.4	34.0
14:00	4.19	269.1 W	17.97	61.0	37.6
15:00	4.57	281.4 WNW	17.92	62.9	35.7
16:00	4.97	286.9 WNW	16.99	67.7	31.5
17:00	3.93	290.4 WNW	16.28	71.8	34.9
18:00	2.87	272.5 W	15.08	77.0	31.0
19:00	1.71	319.1	14.48	78.1	40.5
20:00	1.79	339.2	13.61	82.5	29.9
21:00	1.28	345.8	13.28	83.8	30.1
22:00	1.26	5.9	12.79	85.1	22.7
23:00	0.84	37.9	12.19	86.5	29.0
24:00	1.01	30.4	11.59	87.3	22.3
Sum			317.28	1822.3	751.9
Average	2.28	343.8	13.22	75.9	31.3
Maximum Time			17.97 14:00	87.3 24:00	49.4 09:00
Minimum Time			8.69 06:00	61.0 14:00	20.2 01:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

W 5

WIND ROSE PLOT

2002 02/21 Time: 01:00 ----- 2002 02/21 Time: 24:00





Barrio Logan CR6

og Date: 2002/02/21

Printing: 2002/03/0

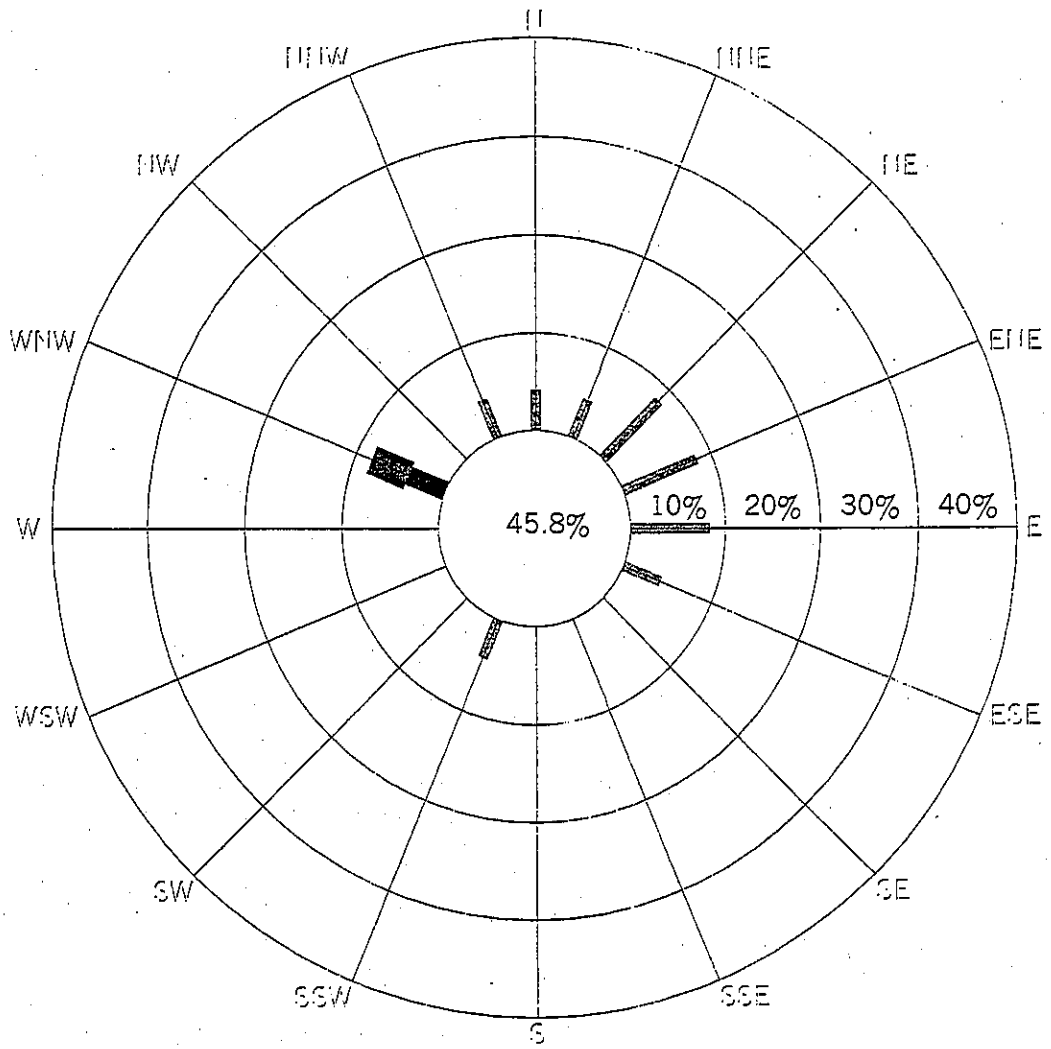
Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)
01:00	0.92	16.3	11.10	87.3	25.3
02:00	0.99	24.8	10.60	87.8	33.3
03:00	1.05	42.0	10.22	87.4	53.8
04:00	0.65	65.4	9.68	87.6	40.8
05:00	0.90	42.1	9.51	87.2	39.0
06:00	0.86	50.4	9.29	86.5	57.5
07:00	1.09	44.5 NE	9.68	85.8	68.2
08:00	0.99	16.7 NNE	11.97	79.9	80.4
09:00	1.73	290.7 WNW	15.35	71.5	32.0
10:00	2.17	281.4 WNW	19.72	57.9	31.1
11:00	2.41	249.4 WSW	23.59	45.4	49.6
12:00	2.90	225.8 SW	26.21	34.5	39.8
13:00	3.87	267.5 W	26.38	30.1	35.7
14:00	3.64	267.4 W	27.74	25.3	33.7
15:00	3.02	262.8 W	28.07	28.0	33.0
16:00	3.11	261.0 W	27.25	32.8	30.4
17:00	2.92	280.6 W	25.40	35.8	27.6
18:00	1.75	285.4 WNW	23.70	41.6	28.9
19:00	1.03	36.7	21.79	42.3	67.6
20:00	0.95	64.5	20.59	38.4	45.2
21:00	1.28	54.5	20.87	20.9	53.7
22:00	1.28	37.1	18.79	26.3	37.6
23:00	1.92	29.8	19.39	20.8	33.0
24:00	1.41	33.8	18.68	22.0	43.2
Sum			445.59	1263.4	1020.7
Average	1.79	355.3	18.57	52.6	42.5
Maximum Time			28.07 15:00	87.8 02:00	80.4 08:00
Minimum Time			9.29 06:00	20.8 23:00	25.3 01:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

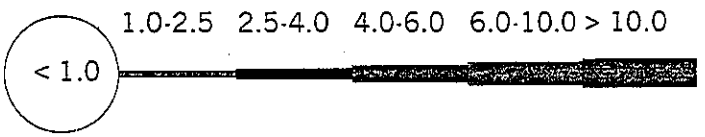
W 8A

361

WIND ROSE PLOT

2002 02/22 Time: 01:00 ----- 2002 02/22 Time: 24:00





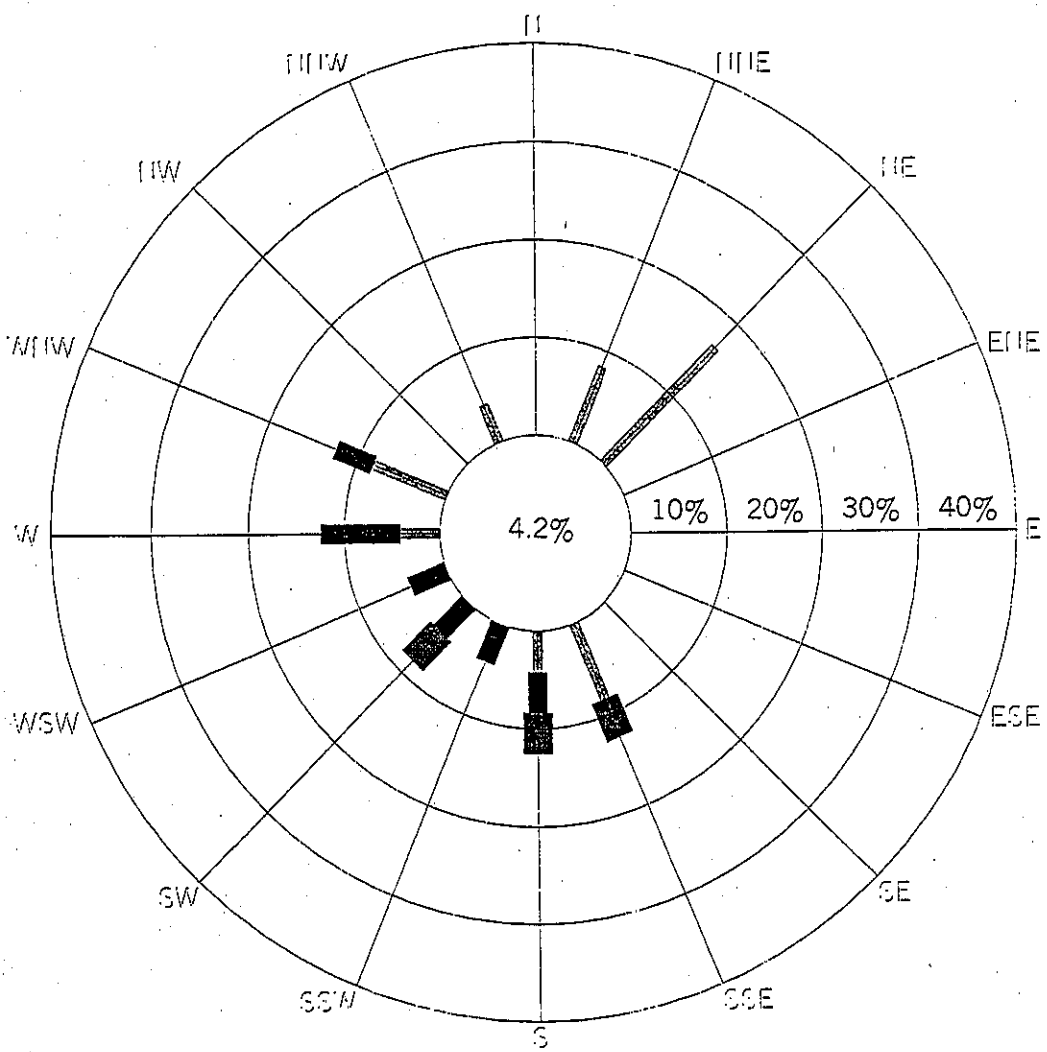
Barrio Logan CR6

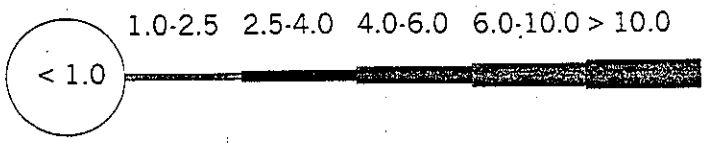
og Date: 2002/02/22 Printing: 2002/03/07

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	
01:00	1.52	31.3	17.70	23.7	19.8	
02:00	1.11	354.4	16.12	29.3	55.0	
03:00	0.90	67.3	14.53	34.9	67.8	
04:00	1.39	76.9	13.72	40.8	75.4	
05:00	1.54	39.8	13.22	49.7	60.7	
06:00	1.39	86.7	13.33	42.4	45.6	
07:00	1.41	87.6 E	14.37	35.6	66.7	
08:00	1.60	46.2 NE	18.96	19.8	40.0	
09:00	1.79	199.7 SSW	21.41	22.3	61.1	
10:00	0.50	7.0	-72.79	5.3	43.1	
11:00	0.52	68.7	-72.79	34.3	21.6	POWER FAILURE
12:00	0.50	63.3	-72.79	29.4	37.3	
13:00	0.50	56.1	-72.79	25.8	30.9	
14:00	0.50	55.0	-72.79	25.3	31.9	
15:00	0.50	49.7	-72.79	24.0	31.8	
16:00	4.57	290.0 WNW	29.16	4.1	32.6	
17:00	3.62	298.1 WNW	27.20	4.6	35.9	
18:00	2.41	346.4 NNW	25.23	9.5	36.0	
19:00	1.05	105.5	22.72	17.7	23.1	
20:00	1.18	70.3	19.45	46.7	52.8	
21:00	0.73	75.8	19.01	33.3	46.7	
22:00	0.71	66.4	17.59	35.4	38.7	
23:00	0.80	55.0	16.44	37.3	45.6	
24:00	0.75	61.3	15.19	41.0	44.9	
Sum			-101.39	672.2	1044.9	
Average	1.31	52.1	-4.22	28.0	43.5	
Maximum Time			29.16 16:00	49.7 05:00	75.4 04:00	
Minimum Time			-72.79 10:00	4.1 16:00	19.8 01:00	
Standard # above	----	----	----	----	----	
Valid	100%	100%	100%	100%	100%	

WIND ROSE PLOT

2002 02/23 Time: 01:00 ----- 2002 02/23 Time: 24:00





Barrio Logan CR6

og Date: 2002/02/23

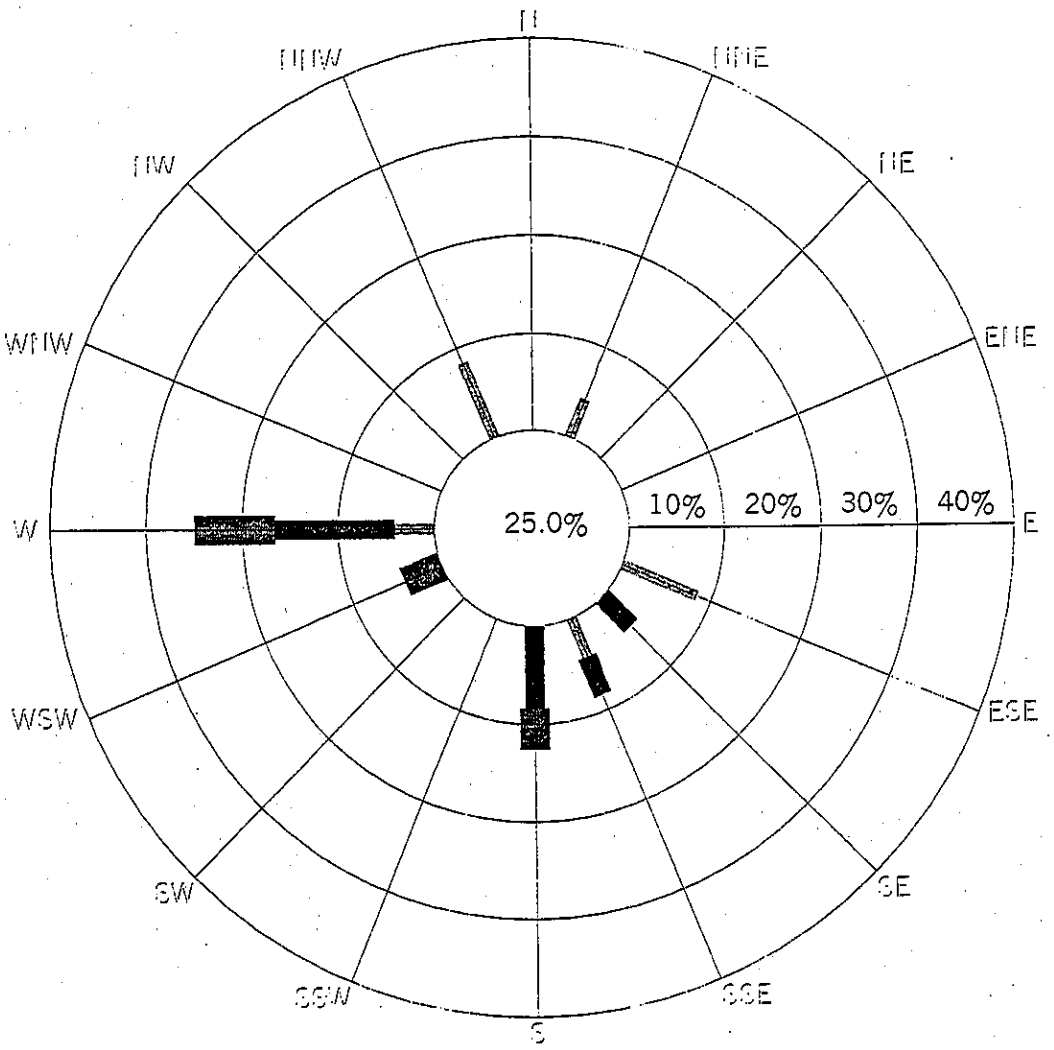
Printing: 2002/03/07

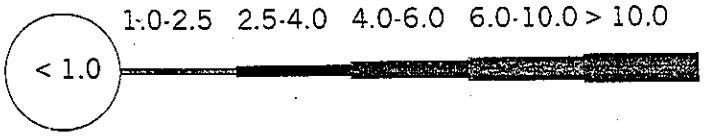
Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)
01:00	0.84	15.9	14.43	42.7	59.1
02:00	1.05	44.9	13.55	49.4	23.9
03:00	1.07	36.7	12.79	47.4	29.4
04:00	1.39	33.8	12.62	47.5	27.4
05:00	1.18	343.7	12.84	52.4	43.2
06:00	1.03	43.1	12.30	56.0	39.5
07:00	1.50	33.7 NNE	12.35	40.8	27.5
08:00	1.43	33.6 NNE	14.10	34.9	54.6
09:00	2.17	180.7 S	15.90	32.9	41.0
10:00	3.04	194.6 SSW	17.10	40.7	37.3
11:00	3.66	285.4 WNW	17.48	72.4	38.1
12:00	3.02	233.7 SW	17.92	69.5	43.9
13:00	4.66	158.6 SSE	17.97	69.5	22.5
14:00	4.76	177.2 S	17.54	74.2	37.3
15:00	4.06	227.5 SW	18.14	70.7	48.8
16:00	3.89	263.6 W	17.04	74.5	37.9
17:00	3.00	280.5 W	16.06	77.0	43.6
18:00	2.75	238.8 WSW	15.24	79.5	43.2
19:00	2.45	288.3	14.92	79.3	39.7
20:00	1.94	299.6	14.97	77.5	44.0
21:00	1.88	271.5	14.92	76.7	43.8
22:00	2.98	169.7	14.70	77.8	36.9
23:00	2.34	155.9	14.59	76.5	28.4
24:00	2.28	165.4	14.53	75.3	30.7
Sum			363.99	1495.1	921.7
Average	2.43	258.5	15.17	62.3	38.4
Maximum Time			18.14 15:00	79.5 18:00	59.1 01:00
Minimum Time			12.30 06:00	32.9 09:00	22.5 13:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

WSW 4.8

WIND ROSE PLOT

2002 02/24 Time: 01:00 ----- 2002 02/24 Time: 24:00





Barrio Logan CR6

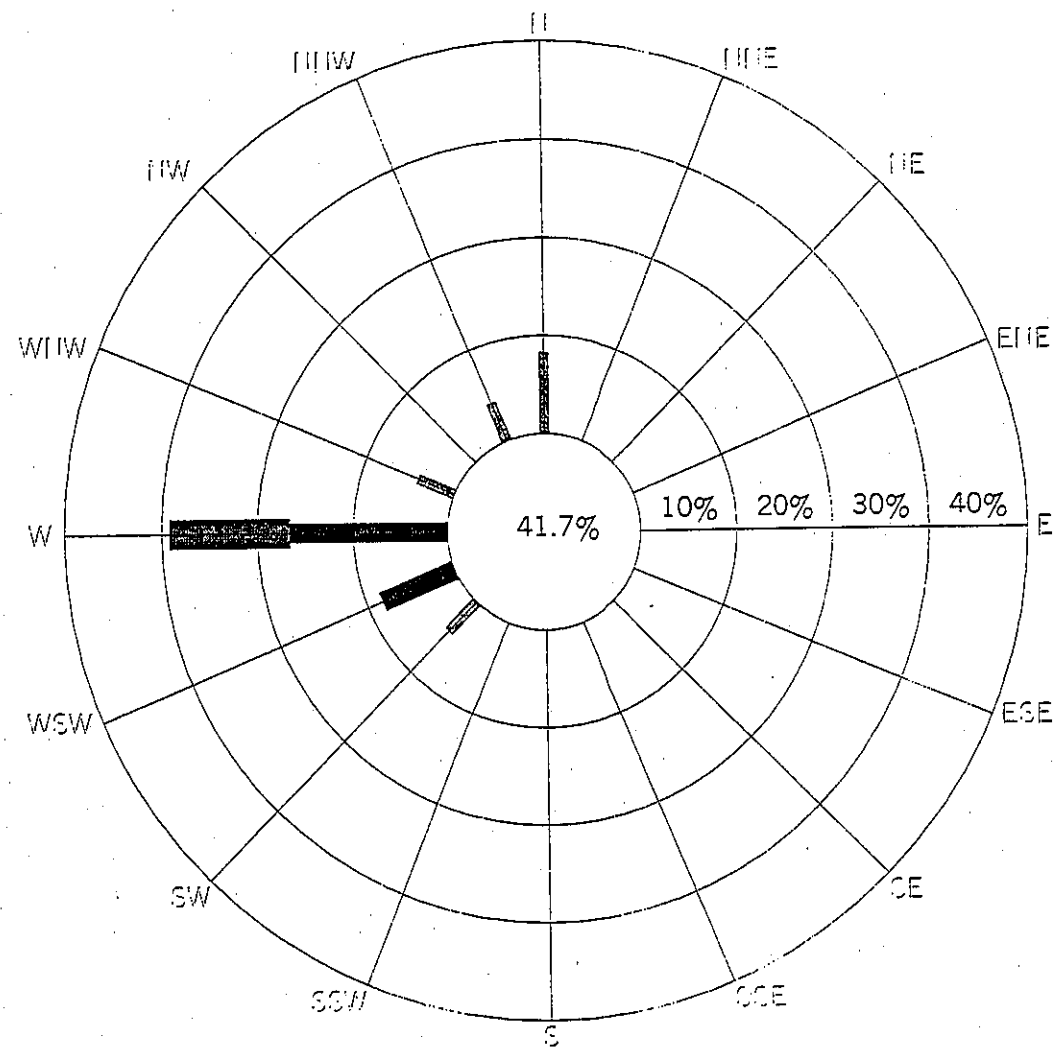
og Date: 2002/02/24 Printing: 2002/03/07

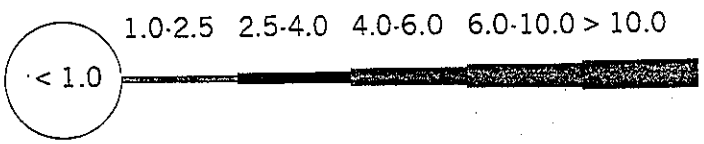
Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)
01:00	2.32	164.4	14.37	77.8	40.4
02:00	3.26	146.4	14.26	76.4	22.8
03:00	3.72	140.3	14.15	76.0	20.4
04:00	1.84	104.2	13.77	74.6	42.2
05:00	0.78	51.0	13.22	75.5	45.9
06:00	0.69	55.1	12.73	77.1	43.6
07:00	0.95	41.8 NE	11.91	80.0	27.7
08:00	1.41	27.0 NNE	12.57	74.8	34.6
09:00	2.13	102.5 ESE	13.72	71.2	58.8
10:00	3.09	170.6 S	14.64	68.7	39.0
11:00	3.72	184.0 S	15.57	66.8	39.4
12:00	4.30	180.8 S	16.12	66.1	34.1
13:00	4.51	253.8 WSW	17.37	63.0	41.7
14:00	4.78	274.0 W	17.81	63.0	36.2
15:00	3.96	272.4 W	18.79	60.5	38.3
16:00	4.02	265.4 W	18.74	61.5	32.5
17:00	3.36	273.3 W	17.97	64.2	31.7
18:00	3.09	277.6 W	16.23	70.8	31.1
19:00	2.24	273.3	15.13	77.6	33.8
20:00	1.48	329.2	14.81	78.9	37.5
21:00	1.26	345.8	14.48	80.1	34.5
22:00	0.54	63.1	13.93	82.3	32.1
23:00	0.71	49.3	13.17	83.6	30.7
24:00	0.63	68.0	12.41	83.9	33.0
Sum			357.88	1754.4	862.1
Average	2.45	82.9	14.91	73.1	35.9
Maximum Time			18.79 15:00	83.9 24:00	58.8 09:00
Minimum Time			11.91 07:00	60.5 15:00	20.4 03:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

W 4.8

WIND ROSE PLOT

2002 02/25 Time: 01:00 ----- 2002 02/25 Time: 24:00





Barrio Logan CR6

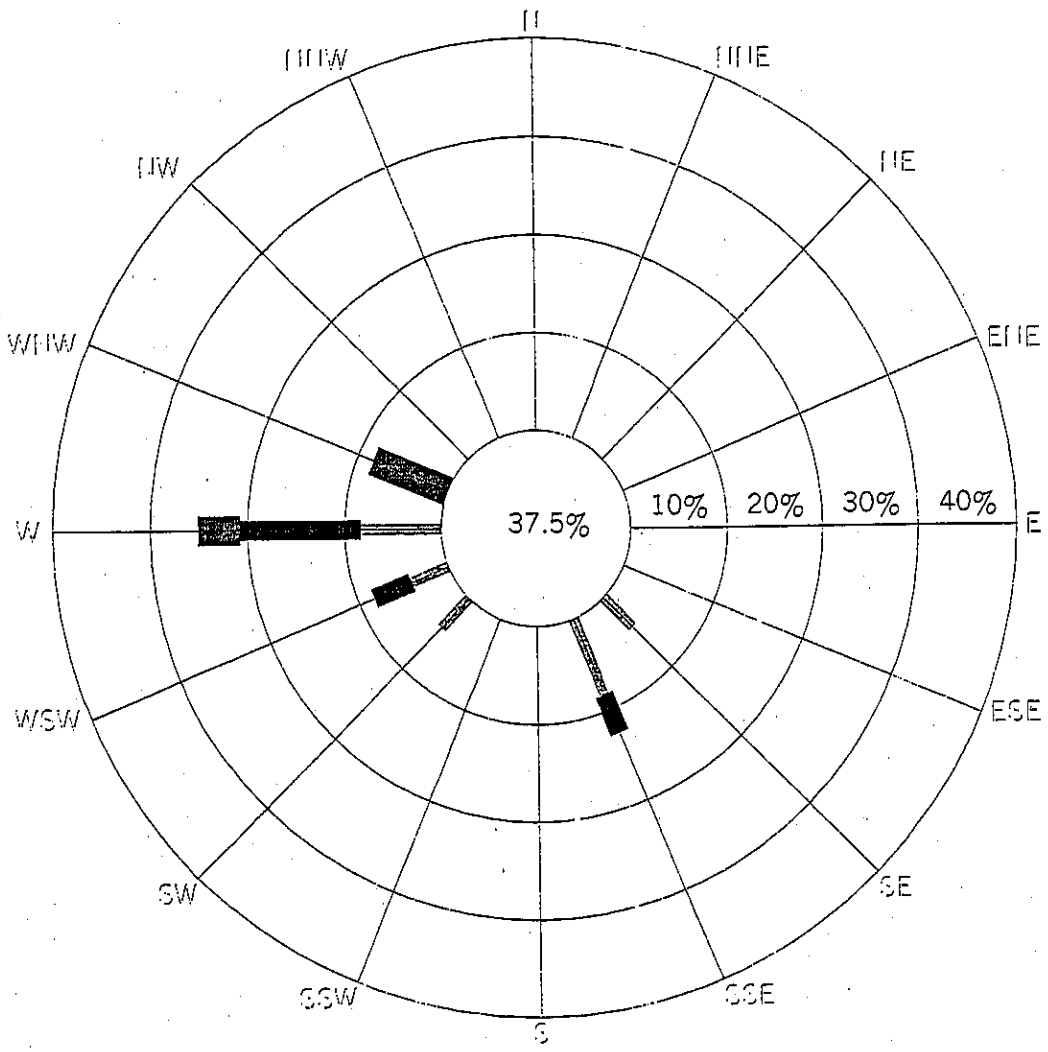
Log Date: 2002/02/25 Printing: 2002/03/07

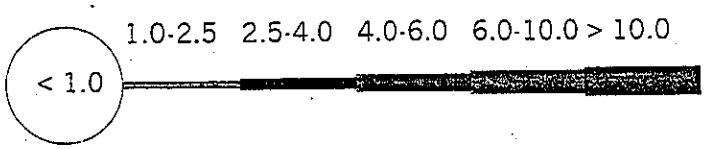
Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)
01:00	0.65	46.3	11.81	85.3	30.7
02:00	0.61	45.7	11.42	86.2	27.9
03:00	0.63	23.5	10.88	87.4	23.3
04:00	0.52	82.4	10.66	87.3	21.8
05:00	0.50	63.6	10.17	87.3	21.4
06:00	0.50	44.1	9.68	86.3	52.9
07:00	0.75	56.3 NE	9.95	83.9	27.3
08:00	0.92	39.8 NE	11.70	79.5	55.2
09:00	1.73	230.6 SW	13.66	80.9	69.5
10:00	2.58	245.5 WSW	15.52	74.0	42.1
11:00	3.23	238.2 WSW	17.86	65.6	36.6
12:00	3.81	272.7 W	19.66	62.0	35.7
13:00	4.15	272.7 W	19.39	64.0	36.0
14:00	4.13	272.5 W	18.85	66.2	33.3
15:00	4.13	271.6 W	18.41	68.0	31.7
16:00	3.91	268.9 W	17.86	71.3	35.3
17:00	3.28	274.4 W	17.15	74.3	35.9
18:00	2.54	264.0 W	15.84	79.7	30.9
19:00	1.41	347.1	15.52	80.4	36.2
20:00	1.41	283.8	14.97	82.9	34.3
21:00	1.64	0.0	14.32	85.3	22.9
22:00	1.48	8.2	13.93	86.8	14.6
23:00	0.82	51.3	13.39	86.9	20.9
24:00	0.95	3.3	13.06	86.5	37.1
Sum			345.66	1898.1	813.5
Average	1.93	335.1	14.40	79.1	33.9
Maximum Time			19.66 12:00	87.4 03:00	69.5 09:00
Minimum Time			9.68 06:00	62.0 12:00	14.6 22:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

W 4.15

WIND ROSE PLOT

2002 02/26 Time: 01:00 ----- 2002 02/26 Time: 24:00





Barrio Logan CR6

og Date: 2002/02/26

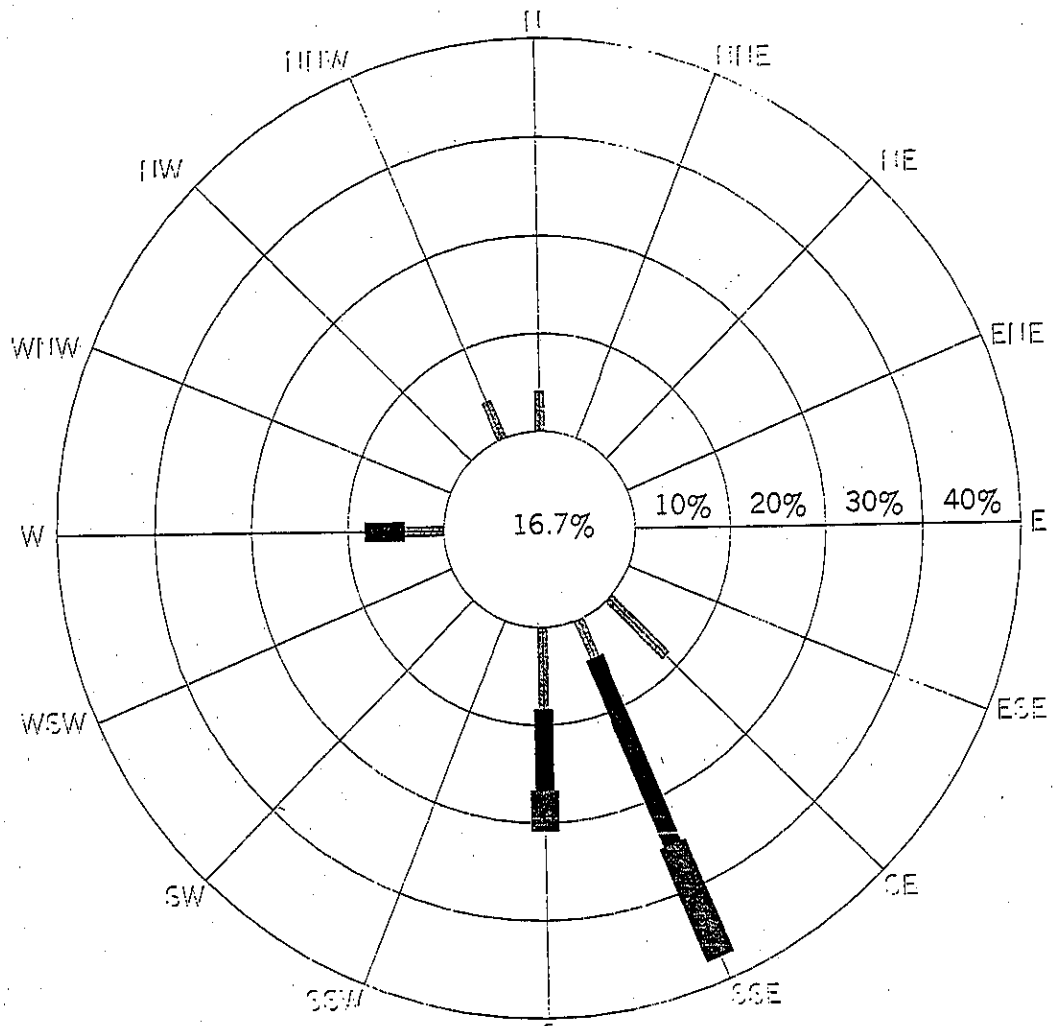
Printing: 2002/03/07

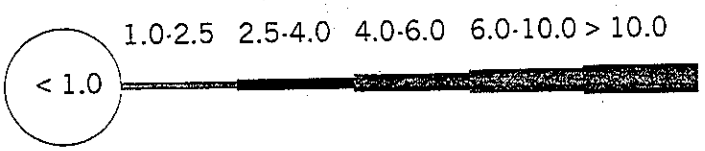
Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)
01:00	0.54	70.0	12.08	88.3	25.3
02:00	0.84	49.8	11.20	88.0	44.5
03:00	0.65	62.1	10.55	87.6	21.3
04:00	0.75	18.1	10.17	85.7	21.5
05:00	0.67	38.4	10.11	86.7	30.6
06:00	0.65	52.4	9.51	83.1	29.3
07:00	0.54	39.7 NE	9.51	74.6	40.3
08:00	0.50	123.9 ESE	13.72	59.9	40.8
09:00	1.79	221.9 SW	15.79	58.7	41.1
10:00	2.37	265.8 W	20.16	46.1	30.1
11:00	2.87	280.7 W	24.63	28.0	30.7
12:00	3.23	279.9 W	27.09	14.1	36.0
13:00	3.53	269.6 W	26.92	20.9	36.0
14:00	4.27	275.1 W	26.10	24.1	30.0
15:00	4.97	291.1 WNW	24.30	27.1	31.1
16:00	4.55	288.4 WNW	24.63	18.1	28.1
17:00	2.47	259.5 W	23.87	27.5	46.6
18:00	2.56	255.7 WSW	20.21	44.0	42.5
19:00	3.43	154.7	16.34	74.0	32.0
20:00	2.01	152.1	13.72	94.0	41.1
21:00	1.28	148.6	14.26	89.5	28.1
22:00	1.33	247.2	14.32	88.0	35.6
23:00	0.78	247.7	14.04	88.7	71.8
24:00	1.50	129.2	13.28	95.2	37.5
Sum			406.51	1491.9	852.0
Average	2.00	267.2	16.94	62.2	35.5
Maximum Time			27.09 12:00	95.2 24:00	71.8 23:00
Minimum Time			9.51 06:00	14.1 12:00	21.3 03:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

W 4.97

WIND ROSE PLOT

2002 02/27 Time: 01:00 ----- 2002 02/27 Time: 24:00





Barrio Logan CR6

og Date: 2002/02/27

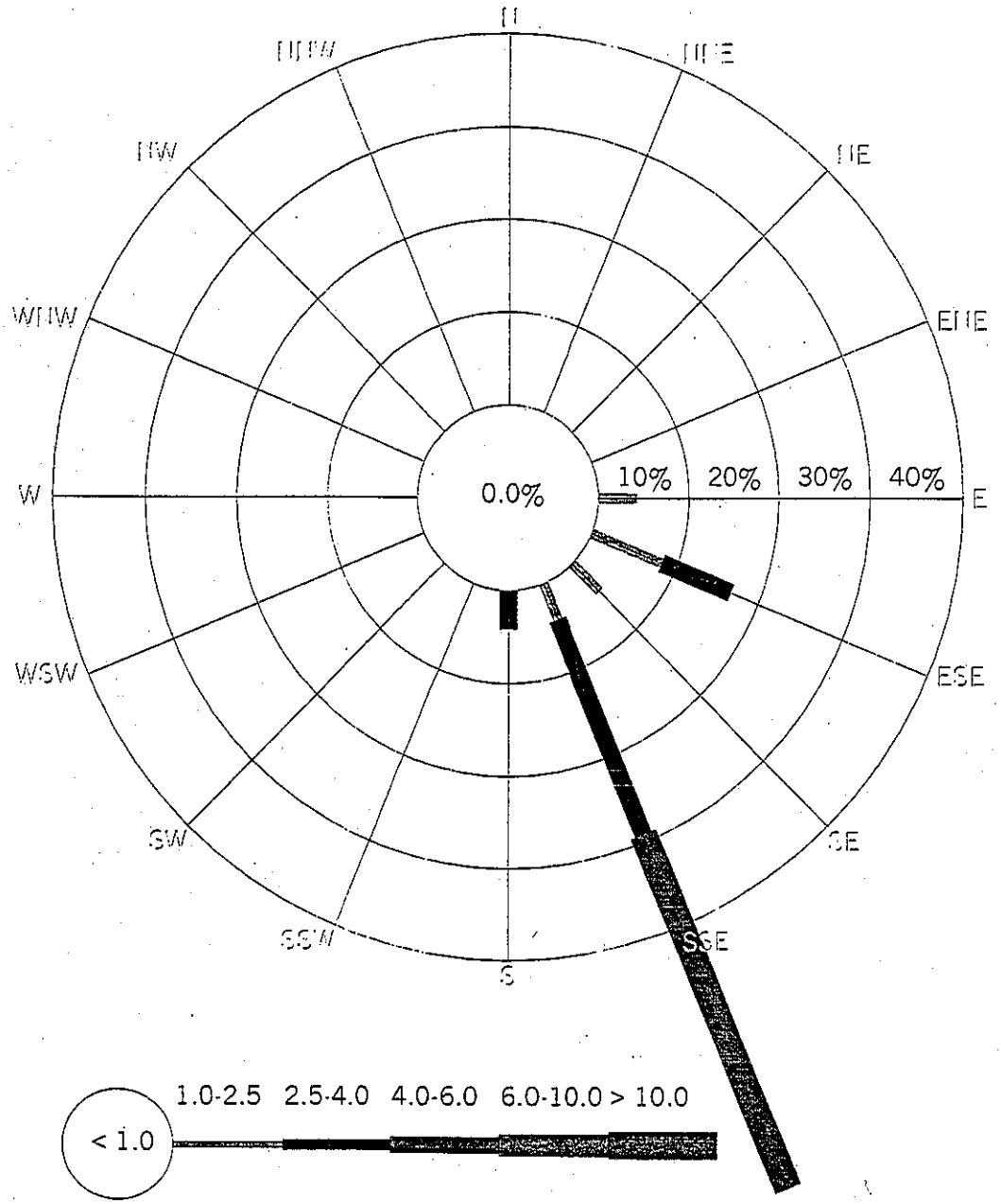
Printing: 2002/03/07

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)
01:00	1.54	143.8	13.06	98.3	45.8
02:00	0.90	65.4	12.68	98.9	56.8
03:00	1.31	348.2	12.13	99.1	47.6
04:00	1.69	261.7	12.46	99.3	46.3
05:00	1.33	9.3	12.19	99.4	47.5
06:00	0.97	42.7	11.64	99.2	58.2
07:00	0.69	64.3ENE	10.99	98.8	56.3
08:00	0.97	67.1ENE	11.31	91.6	46.9
09:00	2.17	165.3SSE	13.61	83.6	51.0
10:00	3.28	165.3SSE	13.82	84.7	34.2
11:00	3.28	169.1S	14.97	76.6	31.6
12:00	5.08	161.2SSE	14.97	78.8	25.0
13:00	4.49	158.3SSE	15.46	78.1	26.8
14:00	4.17	189.8S	16.77	74.6	40.3
15:00	3.00	259.5W	17.15	70.9	43.1
16:00	3.19	186.3S	16.55	75.7	46.7
17:00	4.19	159.1SSE	15.13	86.1	24.6
18:00	2.70	153.3SSE	13.72	94.2	26.5
19:00	2.07	188.3	13.88	93.2	51.2
20:00	2.03	190.4	14.10	91.4	56.7
21:00	2.66	159.4	14.04	91.1	35.2
22:00	2.45	142.8	14.32	90.1	30.6
23:00	2.90	156.2	14.21	89.1	32.1
24:00	3.13	153.3	14.32	86.2	28.1
Sum			333.48	2129.1	988.9
Average	2.51	154.5	13.90	88.7	41.2
Maximum Time			17.15 15:00	99.4 05:00	58.2 06:00
Minimum Time			10.99 07:00	70.9 15:00	24.6 17:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

SSE 5.0%

WIND ROSE PLOT

2002 02/28 Time: 01:00 ----- 2002 02/28 Time: 24:00



Barrio Logan CR6

Log Date: 2002/02/28

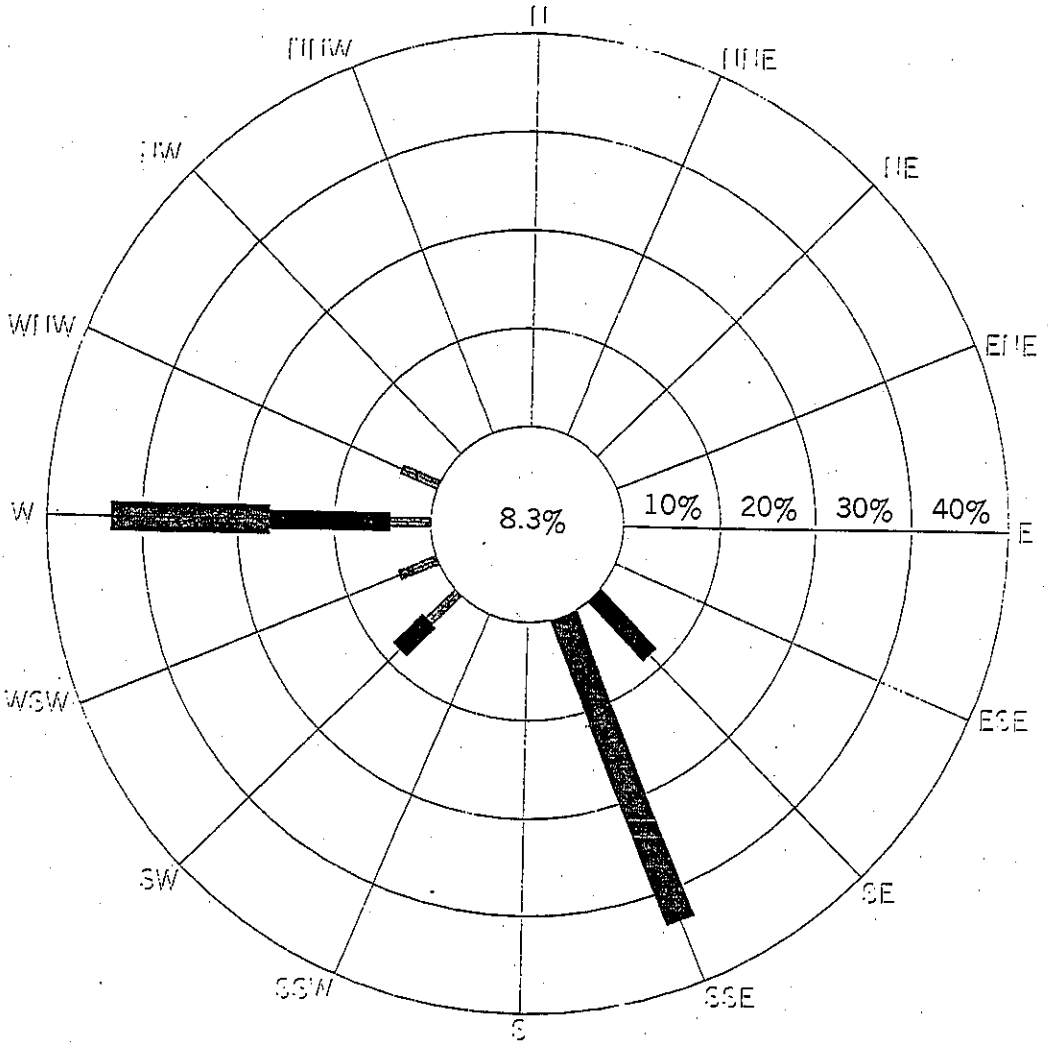
Printing: 2002/03/07

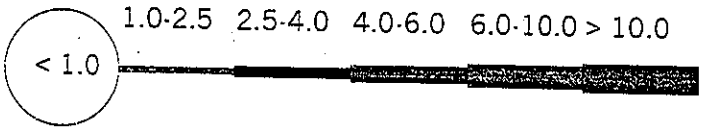
Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)
01:00	3.38	161.9	14.26	84.9	34.1
02:00	2.28	155.0	14.10	82.9	36.6
03:00	1.81	139.5	13.88	82.6	47.9
04:00	1.79	99.8	13.66	82.3	47.4
05:00	2.73	105.3	13.22	82.3	20.5
06:00	2.34	103.5	12.95	81.6	27.3
07:00	1.52	106.3 ESE	13.22	79.5	49.8
08:00	2.51	106.3 ESE	13.50	78.1	32.2
09:00	3.68	168.9 S	13.33	78.7	32.6
10:00	4.32	159.2 SSE	13.39	76.4	27.7
11:00	4.25	164.2 SSE	13.72	74.8	36.3
12:00	4.27	159.8 SSE	14.15	74.0	29.6
13:00	4.78	166.9 SSE	14.37	73.9	33.7
14:00	4.68	164.9 SSE	14.26	73.4	32.8
15:00	4.95	166.0 SSE	13.99	74.2	31.1
16:00	4.53	160.3 SSE	13.77	75.2	26.1
17:00	3.36	162.1 SSE	13.82	74.1	28.6
18:00	3.79	159.4 SSE	13.72	75.6	26.0
19:00	3.76	157.1	13.66	74.1	25.0
20:00	3.96	155.7	13.66	75.6	25.3
21:00	3.98	150.0	13.66	75.5	23.4
22:00	4.25	149.1	13.66	75.0	22.6
23:00	4.74	166.3	13.72	75.6	28.8
24:00	4.68	162.5	13.61	77.0	26.0
Sum			329.28	1857.1	751.4
Average	3.60	148.7	13.72	77.4	31.3
Maximum Time			14.37 13:00	84.9 01:00	49.8 07:00
Minimum Time			12.95 06:00	73.4 14:00	20.5 05:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

SSE 4.95

WIND ROSE PLOT

2002 03/01 Time: 01:00 ----- 2002 03/01 Time: 24:00





Barrio Logan CR6

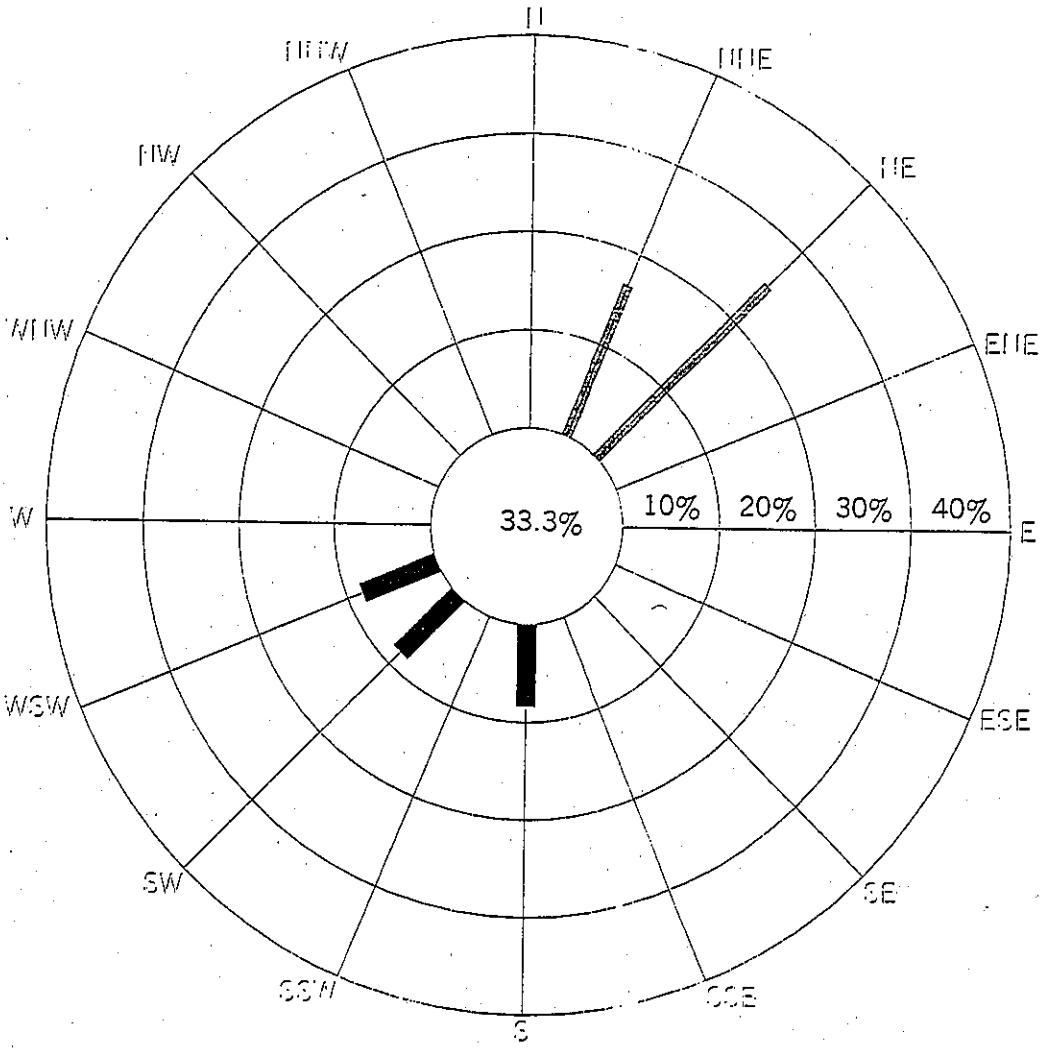
Log Date: 2002/03/01 Printing: 2002/03/07

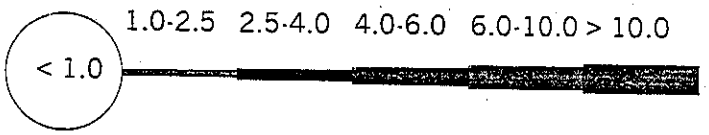
Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)
01:00	4.66	158.8	13.72	75.9	25.8
02:00	4.83	167.3	13.55	77.9	27.0
03:00	4.89	164.1	13.66	76.9	26.2
04:00	5.63	160.6	13.77	77.0	26.9
05:00	5.52	149.3	13.82	76.4	23.7
06:00	4.83	151.1	13.93	74.4	22.9
07:00	3.87	129.6 SE	13.93	74.6	25.3
08:00	3.15	135.8 SE	14.32	70.4	17.8
09:00	4.78	158.4 SSE	14.75	68.2	23.4
10:00	4.68	162.9 SSE	15.08	70.8	27.2
11:00	3.47	227.6 SW	15.90	67.6	45.1
12:00	3.89	267.2 W	17.26	61.4	43.2
13:00	4.95	274.0 W	18.08	60.2	35.5
14:00	4.93	274.1 W	18.14	59.8	33.5
15:00	5.12	280.1 W	18.08	59.1	32.8
16:00	4.99	280.6 W	17.65	62.0	37.7
17:00	3.74	270.7 W	16.88	65.4	38.8
18:00	2.81	276.2 W	15.73	72.6	40.9
19:00	2.03	293.5	15.30	73.9	37.7
20:00	1.37	254.6	15.08	75.6	47.3
21:00	1.60	222.7	14.64	80.1	60.4
22:00	1.94	279.1	14.32	82.3	36.9
23:00	0.99	24.8	13.88	83.0	51.9
24:00	0.92	109.4	13.66	82.8	37.9
Sum			365.14	1728.4	825.7
Average	3.73	212.5	15.21	72.0	34.4
Maximum Time			18.14 14:00	83.0 23:00	60.4 21:00
Minimum Time			13.55 02:00	59.1 15:00	17.8 08:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

W 5.12

WIND ROSE PLOT

2002 03/02 Time: 01:00 ----- 2002 03/02 Time: 24:00





Barrio Logan CR6

og Date: 2002/03/02

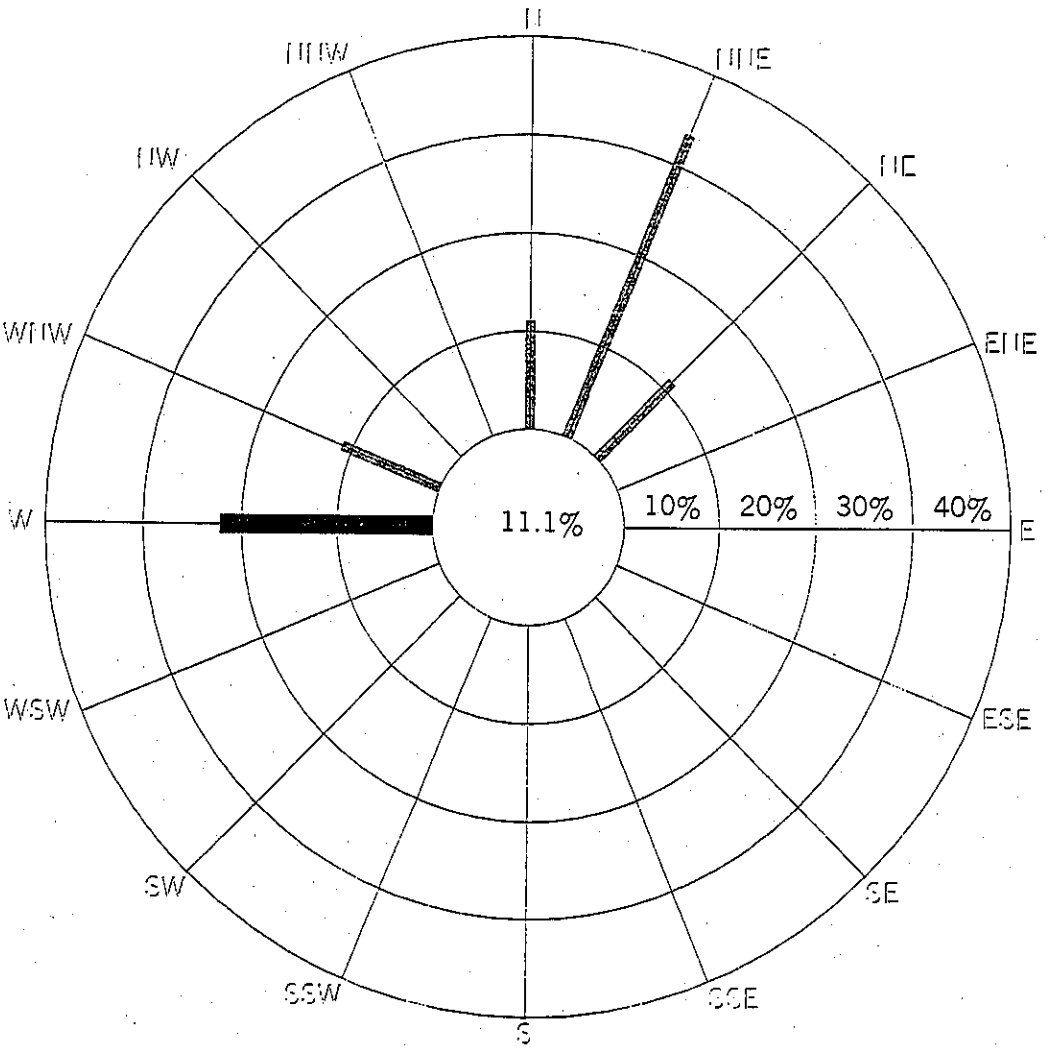
Printing: 2002/03/07

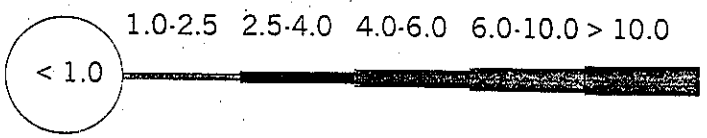
Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)
01:00	0.67	46.3	12.95	84.6	20.4
02:00	0.90	48.1	12.57	85.1	18.7
03:00	0.99	47.9	12.02	86.4	19.5
04:00	1.31	34.3	11.42	87.1	19.1
05:00	1.26	40.2	10.99	85.4	24.6
06:00	1.41	40.0	10.66	81.4	25.4
07:00	0.67	62.1 ENE	10.11	81.5	27.7
08:00	1.43	26.1 NNE	12.79	61.3	10.8
09:00	1.45	16.8 NNE	14.70	44.9	52.0
10:00	2.56	226.7 SW	17.04	32.6	53.4
11:00	3.00	252.7 WSW	19.17	19.3	53.6
12:00	3.64	190.6 S	20.10	14.6	41.5
13:00	----	----	----	----	----
14:00	----	----	----	----	----
15:00	----	----	----	----	----
16:00	----	----	----	----	----
17:00	----	----	----	----	----
18:00	----	----	----	----	----
19:00	----	----	----	----	----
20:00	----	----	----	----	----
21:00	----	----	----	----	----
22:00	----	----	----	----	----
23:00	----	----	----	----	----
24:00	----	----	----	----	----
Sum			164.53	764.2	366.6
Average	1.61	38.8	13.71	63.7	30.5
Maximum Time			20.10 12:00	87.1 04:00	53.6 11:00
Minimum Time			10.11 07:00	14.6 12:00	10.8 08:00
Standard # above	----	----	----	----	----
Valid	50%	50%	50%	50%	50%

DOWNLOADED DATA AT 1300 HRS

WIND ROSE PLOT

2002 03/03 Time: 01:00 ----- 2002 03/03 Time: 24:00





Barrio Logan CR6

og Date: 2002/03/03 Printing: 2002/03/07

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)
01:00	----	----	----	----	----
02:00	----	----	----	----	----
03:00	----	----	----	----	----
04:00	----	----	----	----	----
05:00	----	----	----	----	----
06:00	----	----	----	----	----
07:00	----	----	----	----	----
08:00	----	----	----	----	----
09:00	----	----	----	----	----
10:00	----	----	----	----	----
11:00	----	----	----	----	----
12:00	----	----	----	----	----
13:00	----	----	----	----	----
14:00	----	----	----	----	----
15:00	----	----	----	----	----
16:00	3.92	269.8 W	20.37	17.2	37.8
17:00	2.90	271.6 W	20.05	10.3	35.9
18:00	2.32	4.1 N	19.01	10.7	24.3
19:00	1.33	301.8	17.21	26.4	47.5
20:00	0.95	59.6	15.46	26.7	45.9
21:00	1.12	29.9	13.93	28.6	35.6
22:00	1.22	55.8	12.90	17.8	45.3
23:00	1.33	30.5	12.19	13.5	25.9
24:00	1.50	27.1	11.04	17.0	20.0
Sum			142.16	168.2	318.2
Average	1.84	4.1	15.80	18.7	35.4
Maximum Time			20.37 16:00	28.6 21:00	47.5 19:00
Minimum Time			11.04 24:00	10.3 17:00	20.0 24:00
Standard # above	----	----	----	----	----
Valid	38%	38%	38%	38%	38%

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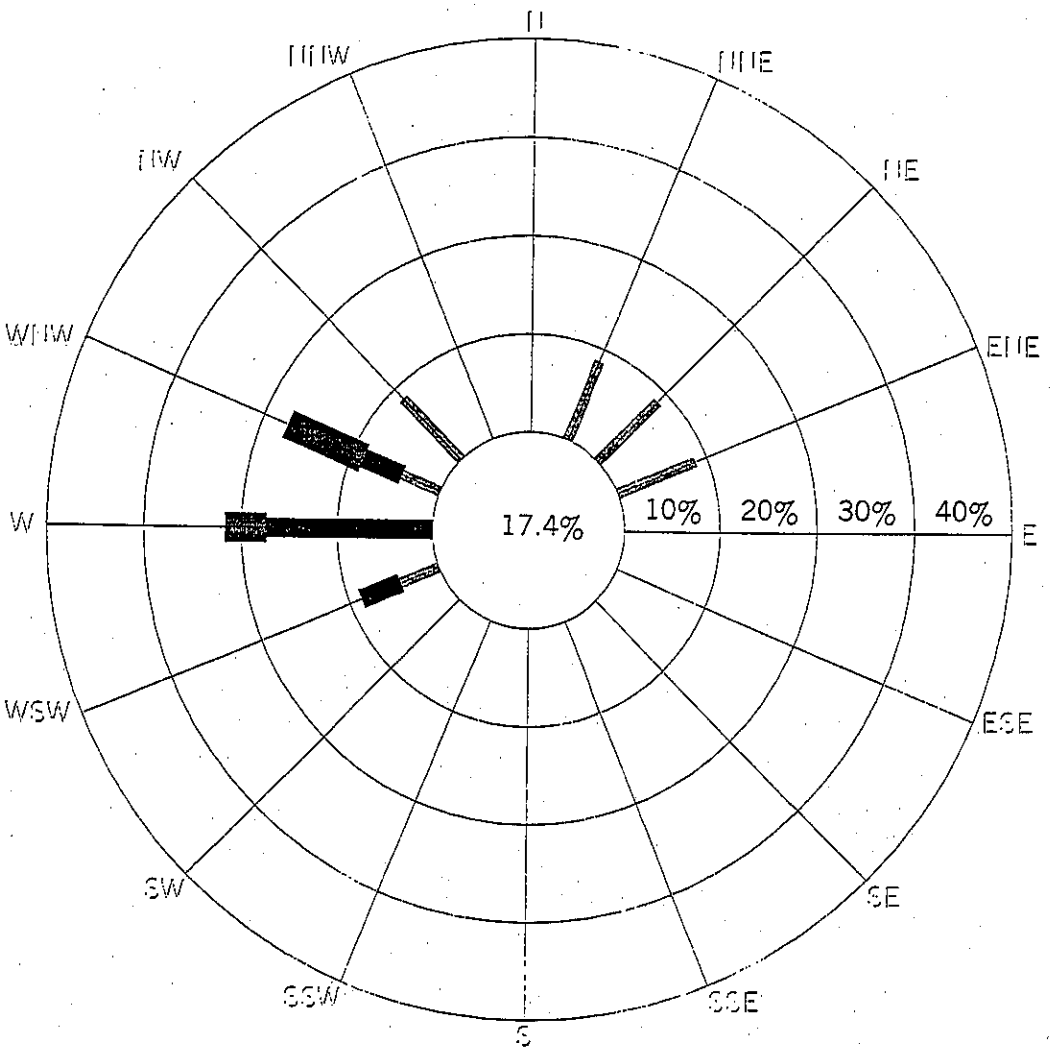
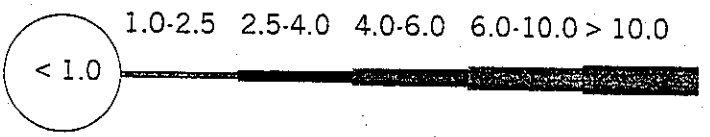
W

WIND ROSE PLOT

2002 03/04 Time: 01:00 ----- 2002 03/04 Time: 24:00





Barrio Logan CR6

og Date: 2002/03/04

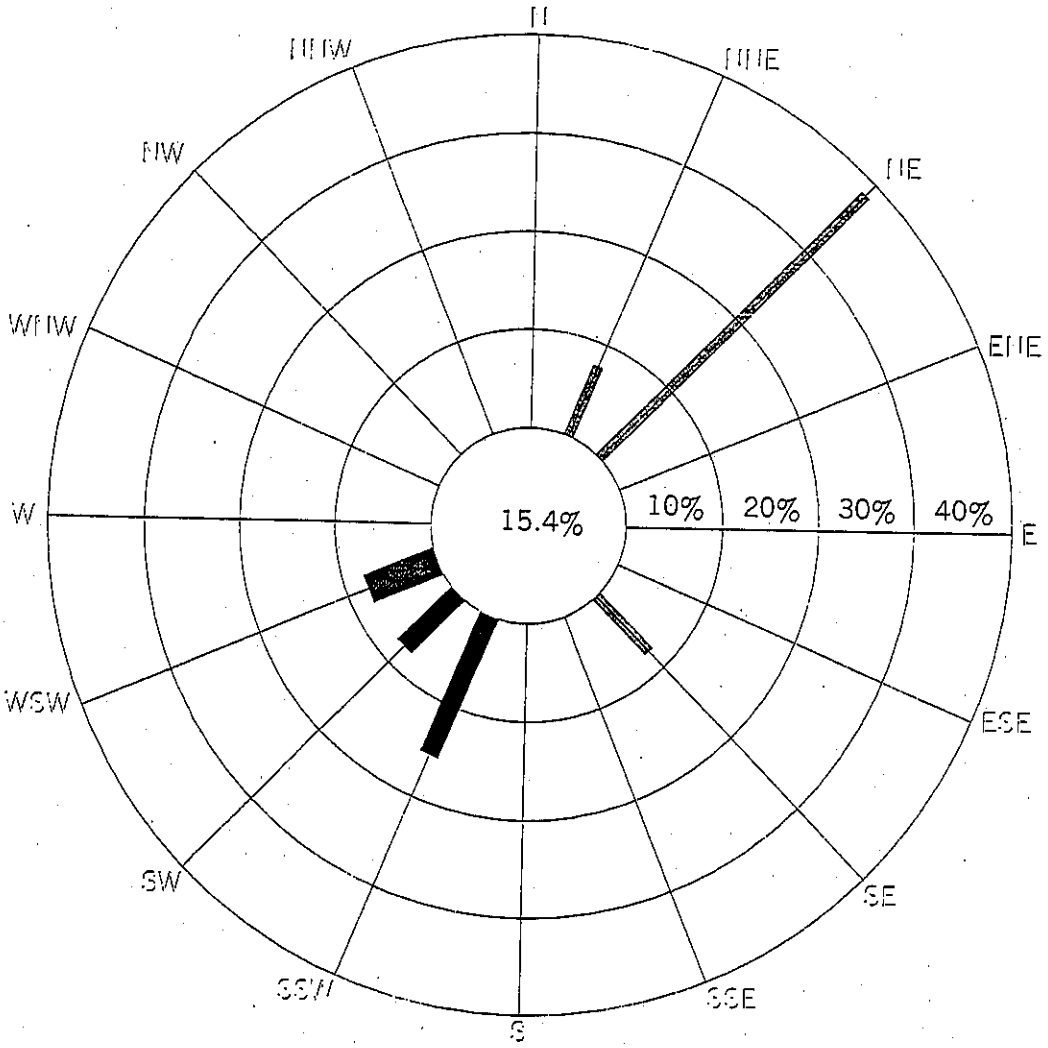
Printing: 2002/03/0

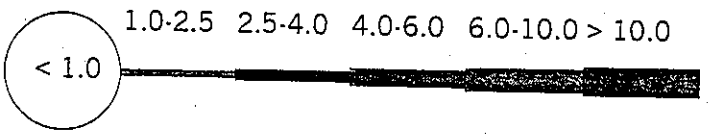
Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	
01:00	1.26	24.9	10.22	20.3	29.3	
02:00	0.86	64.0	8.91	24.7	27.7	
03:00	1.05	69.9	7.98	25.6	41.5	
04:00	0.99	33.9	7.49	26.2	62.8	
05:00	1.35	57.5	7.44	25.2	41.8	
06:00	2.18	33.4	8.15	20.1	43.5	
07:00	1.20	33.8 NNE	7.82	21.5	71.1	
08:00	----	----	----	----	----	POWER FAILURE
09:00	1.82	240.9 WSW	14.53	27.6	37.0	
10:00	3.00	239.3 WSW	17.54	23.3	31.9	
11:00	3.60	268.3 W	20.76	9.9	33.6	
12:00	3.56	281.5 W	22.28	12.3	36.8	
13:00	3.94	267.5 W	23.76	7.9	34.6	
14:00	4.42	269.3 W	23.05	16.7	33.8	W 5.25
15:00	5.25	281.4 W	21.47	28.3	32.4	
16:00	5.25	290.0 WNW	20.32	32.3	35.3	
17:00	3.75	279.0 W	19.77	34.6	33.1	
18:00	2.58	272.5 W	17.97	45.8	29.1	
19:00	1.12	317.6	16.34	46.2	46.3	
20:00	2.03	281.9	14.81	64.6	23.8	
21:00	1.41	306.8	13.99	64.9	22.7	
22:00	0.90	54.3	12.35	60.4	26.4	
23:00	1.05	35.7	11.15	51.7	29.1	
24:00	0.67	72.6	10.71	55.2	28.1	
Sum			338.82	745.4	831.6	
Average	2.31	327.6	14.73	32.4	36.2	
Maximum Time			23.76 13:00	64.9 21:00	71.1 07:00	
Minimum Time			7.44 05:00	7.9 13:00	22.7 21:00	
Standard # above	----	----	----	----	----	
Valid	96%	96%	96%	96%	96%	

WIND ROSE PLOT

05

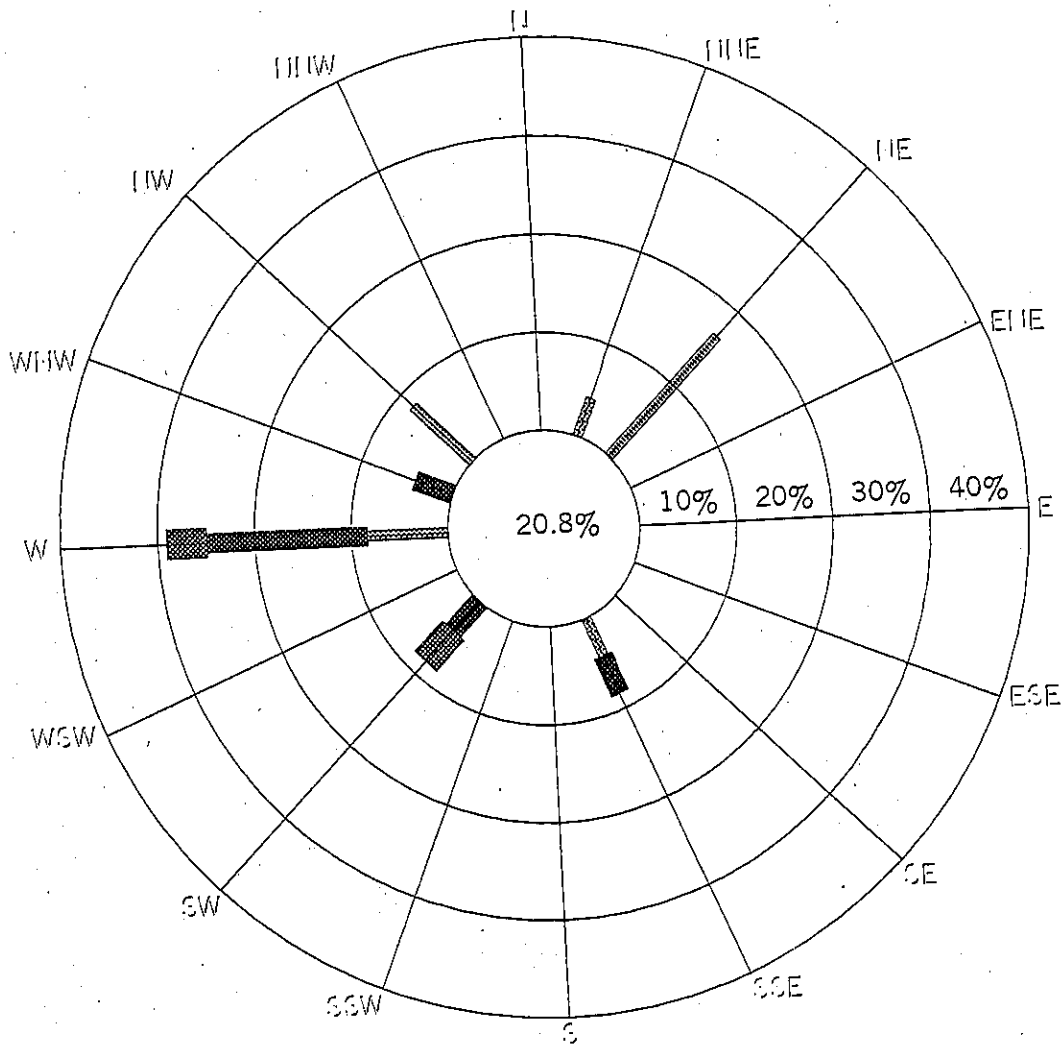
2002 03/05 Time: 01:00 ----- 2002 03/05 Time: 24:00

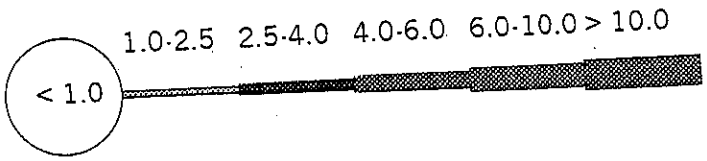




WIND ROSE PLOT

2002 03/06 Time: 01:00 ----- 2002 03/06 Time: 24:00





Barrio Logan CR6

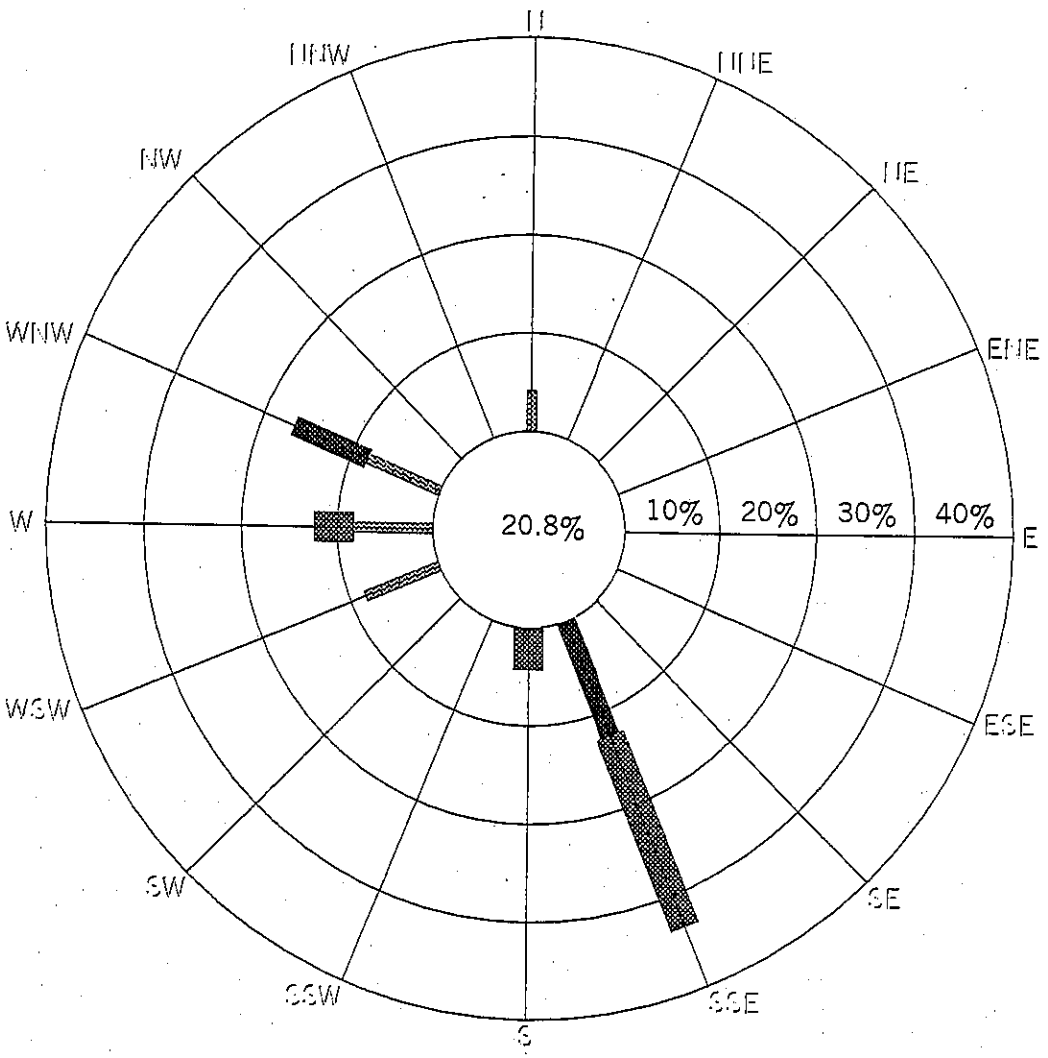
og Date: 2002/03/06 Printing: 2002/03/13

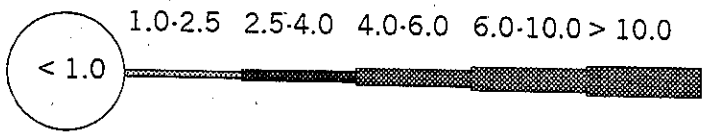
Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	0.95	48.8	11.04	82.8	22.2	0
02:00	0.73	89.0	10.71	82.3	41.3	0
03:00	1.22	35.9	10.66	82.4	29.0	0
04:00	1.41	33.6	11.31	82.1	25.0	0
05:00	1.65	36.4	10.44	81.8	27.7	0
06:00	1.01	50.8	9.68	83.3	47.3	0
07:00	0.82	55.5 NE	9.68	77.8	51.3	0
08:00	0.95	28.1 NNE	12.24	68.8	27.3	0
09:00	1.33	36.4 NE	13.66	67.8	62.7	0
10:00	2.58	159.1 SSE	15.35	67.0	61.1	0
11:00	3.17	219.0 SW	16.44	62.7	51.0	0
12:00	4.04	215.3 SW	17.54	60.7	47.4	0
13:00	4.11	268.3 W	17.43	64.1	29.9	0
14:00	3.89	278.8 W	17.15	66.5	37.5	0
15:00	3.98	276.2 W	16.39	71.3	38.0	0
16:00	3.39	274.1 W	16.34	70.7	42.3	0
17:00	2.71	290.3 WNW	15.90	72.0	48.5	0
18:00	2.07	275.4 W	15.57	74.3	49.2	0
19:00	2.54	275.0	15.30	76.9	33.7	0
20:00	1.73	305.9	15.24	75.7	50.1	0
21:00	0.90	52.9	15.19	75.4	42.7	0
22:00	1.45	164.6	15.24	76.2	40.1	0
23:00	1.77	266.8	14.86	80.5	40.3	0
24:00	2.18	310.3	14.75	82.8	36.9	0
Sum			338.12	1786.1	982.6	0
Average	2.11	328.7	14.09	74.4	40.9	0
Maximum Time			17.54 12:00	83.3 06:00	62.7 09:00	0 01:00
Minimum Time			9.68 06:00	60.7 12:00	22.2 01:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

W 4.11

WIND ROSE PLOT

2002 03/07 Time: 01:00 ----- 2002 03/07 Time: 24:00





Barrio Logan CR6

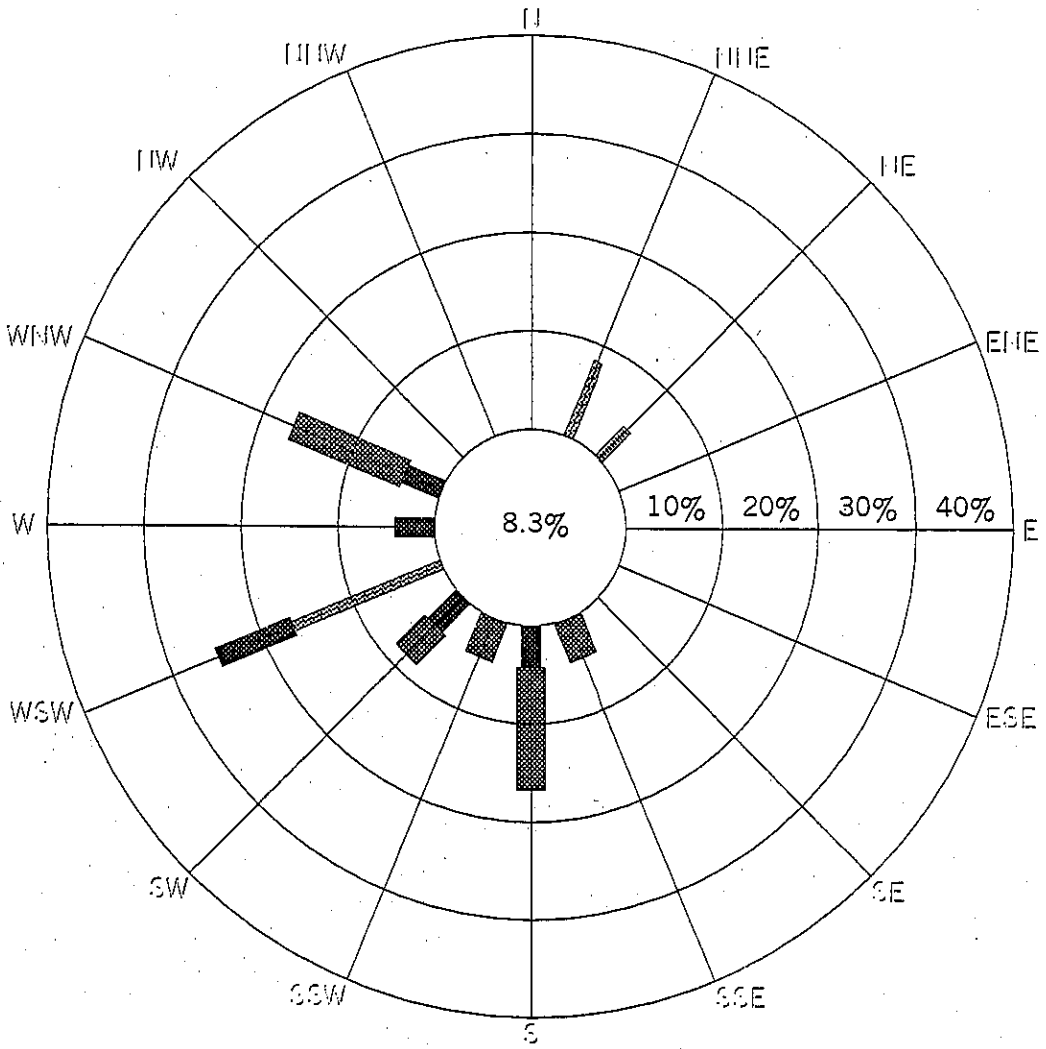
og Date: 2002/03/07 Printing: 2002/03/13

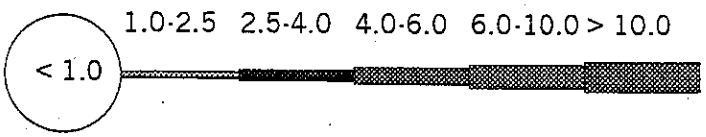
Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	1.86	7.8	14.64	84.5	28.6	0
02:00	0.86	37.1	14.37	84.2	33.3	0
03:00	0.71	53.1	14.48	82.3	61.0	0
04:00	0.67	41.1	14.59	79.5	54.3	0
05:00	0.54	101.8	14.75	76.7	28.4	0
06:00	0.84	109.2	14.81	77.9	41.8	0
07:00	1.24	273.1 W	14.15	88.3	42.4	0
08:00	1.16	239.3 WSW	14.48	87.6	61.5	0
09:00	3.43	164.4 SSE	15.03	83.9	26.8	0
10:00	3.75	160.8 SSE	14.92	83.6	23.9	0
11:00	3.64	157.6 SSE	14.75	87.9	26.5	0
12:00	4.34	162.9 SSE	14.75	88.6	24.8	0
13:00	4.70	154.8 SSE	15.41	85.3	22.7	0
14:00	4.87	162.8 SSE	15.13	86.5	27.5	0
15:00	5.21	162.3 SSE	14.86	91.2	27.7	0
16:00	4.74	165.4 SSE	14.48	92.8	31.8	0
17:00	4.40	175.3 S	14.32	95.6	30.9	0
18:00	4.09	280.7 W	14.53	89.7	39.2	0
19:00	3.60	292.4	14.21	84.3	35.1	0
20:00	2.64	288.0	13.88	83.4	42.9	0
21:00	2.07	288.9	13.72	83.4	44.6	0
22:00	2.22	282.2	13.61	80.7	40.8	0
23:00	2.49	277.9	13.72	79.7	32.5	0
24:00	2.24	248.5	13.61	83.2	39.3	0
Sum			347.18	2040.7	868.4	0
Average	2.76	199.1	14.47	85.0	36.2	0
Maximum Time			15.41 13:00	95.6 17:00	61.5 08:00	0 01:00
Minimum Time			13.61 22:00	76.7 05:00	22.7 13:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

SSE 5.21

WIND ROSE PLOT

2002 03/08 Time: 01:00 ----- 2002 03/08 Time: 24:00





Barrio Logan CR6

Log Date: 2002/03/08

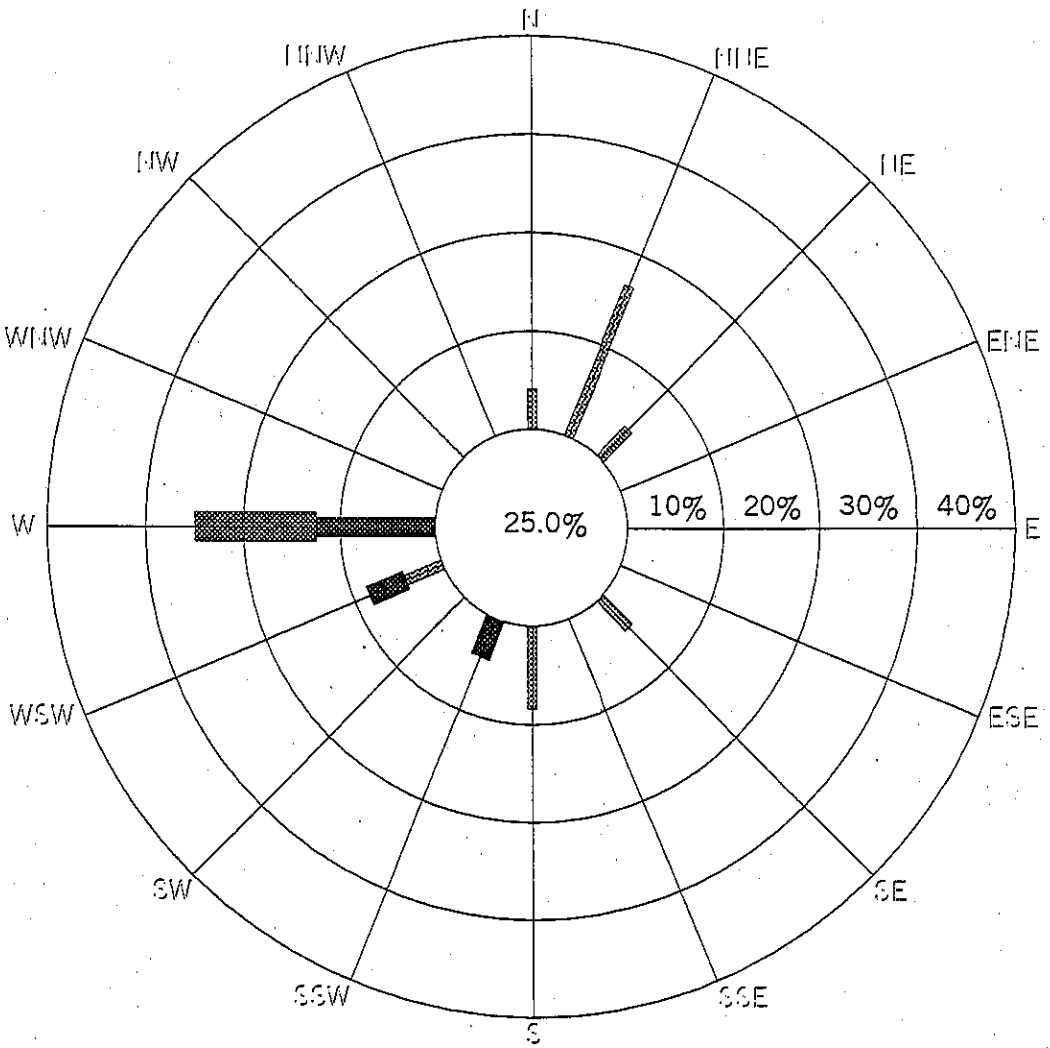
Printing: 2002/03/13

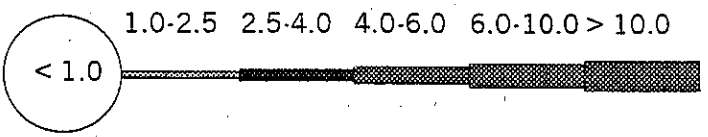
Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	2.73	236.3	13.82	82.6	43.4	0
02:00	3.89	270.5	13.44	84.0	39.1	0
03:00	4.13	283.9	13.39	80.9	34.2	0
04:00	4.93	288.5	12.84	75.7	33.3	0
05:00	4.17	292.1	12.19	68.8	33.9	0
06:00	2.56	282.6	12.13	64.9	39.0	0
07:00	2.30	258.7 W	12.24	63.1	40.0	0
08:00	2.03	258.0 WSW	12.62	61.3	49.3	0
09:00	3.02	237.8 WSW	13.06	58.4	43.2	0
10:00	3.98	181.9 S	13.72	57.2	40.4	0
11:00	4.87	173.4 S	13.93	55.5	36.8	0
12:00	5.34	174.6 S	14.32	53.4	42.3	0
13:00	5.40	163.9 SSE	14.37	55.4	27.0	0
14:00	4.91	179.6 S	14.59	54.4	41.2	0
15:00	4.59	199.8 SSW	14.75	54.9	45.5	0
16:00	4.23	215.3 SW	14.59	56.4	47.6	0
17:00	3.62	221.0 SW	14.04	58.3	51.9	0
18:00	2.13	241.7 WSW	13.33	59.8	50.0	0
19:00	1.52	253.0	12.95	61.8	53.6	0
20:00	0.67	107.7	12.41	64.5	50.0	0
21:00	0.58	66.9	12.02	65.7	29.2	0
22:00	1.14	36.1	11.10	70.1	19.5	0
23:00	1.12	30.5	10.71	71.4	16.9	0
24:00	1.03	23.3	10.33	72.9	13.3	0
Sum			312.91	1551.3	920.9	0
Average	3.12	233.8	13.04	64.6	38.4	0
Maximum Time			14.75 15:00	84.0 02:00	53.6 19:00	0 01:00
Minimum Time			10.33 24:00	53.4 12:00	13.3 24:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

≤ 5.40

WIND ROSE PLOT

2002 03/09 Time: 01:00 ----- 2002 03/09 Time: 24:00





Barrio Logan CR6

Log Date: 2002/03/09 Printing: 2002/03/13

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	1.24	31.2	9.62	75.3	22.7	0
02:00	0.71	61.1	9.02	77.5	26.9	0
03:00	0.75	66.4	8.48	79.7	19.6	0
04:00	0.82	50.8	7.88	81.5	22.7	0
05:00	1.18	40.7	7.49	82.4	23.0	0
06:00	1.43	31.6	7.77	81.3	20.7	0
07:00	1.50	29.2 NNE	8.26	78.5	19.9	0
08:00	1.28	18.1 NNE	10.60	71.0	36.7	0
09:00	2.03	177.4 S	13.12	63.8	46.2	0
10:00	2.60	195.0 SSW	15.30	59.1	37.4	0
11:00	3.22	254.3 WSW	18.79	51.8	41.0	0
12:00	3.53	276.5 W	21.36	42.4	34.6	0
13:00	4.64	267.0 W	20.81	44.3	32.8	0
14:00	4.85	280.5 W	19.83	52.1	35.1	0
15:00	4.11	267.1 W	19.39	55.5	35.4	0
16:00	3.68	274.3 W	19.01	56.8	36.4	0
17:00	3.15	263.8 W	18.03	62.5	36.5	0
18:00	1.90	247.2 WSW	17.26	64.2	37.8	0
19:00	1.48	185.3	16.28	72.8	33.2	0
20:00	1.43	128.7	15.30	79.8	30.8	0
21:00	0.61	93.5	14.64	84.0	50.8	0
22:00	0.56	63.9	14.15	87.3	31.8	0
23:00	0.67	47.8	13.50	85.9	24.0	0
24:00	1.01	8.8	12.90	85.4	24.1	0
Sum			338.78	1674.7	760.4	0
Average	2.02	7.2	14.12	69.8	31.7	0
Maximum Time			21.36 12:00	87.3 22:00	50.8 21:00	0 01:00
Minimum Time			7.49 05:00	42.4 12:00	19.6 03:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

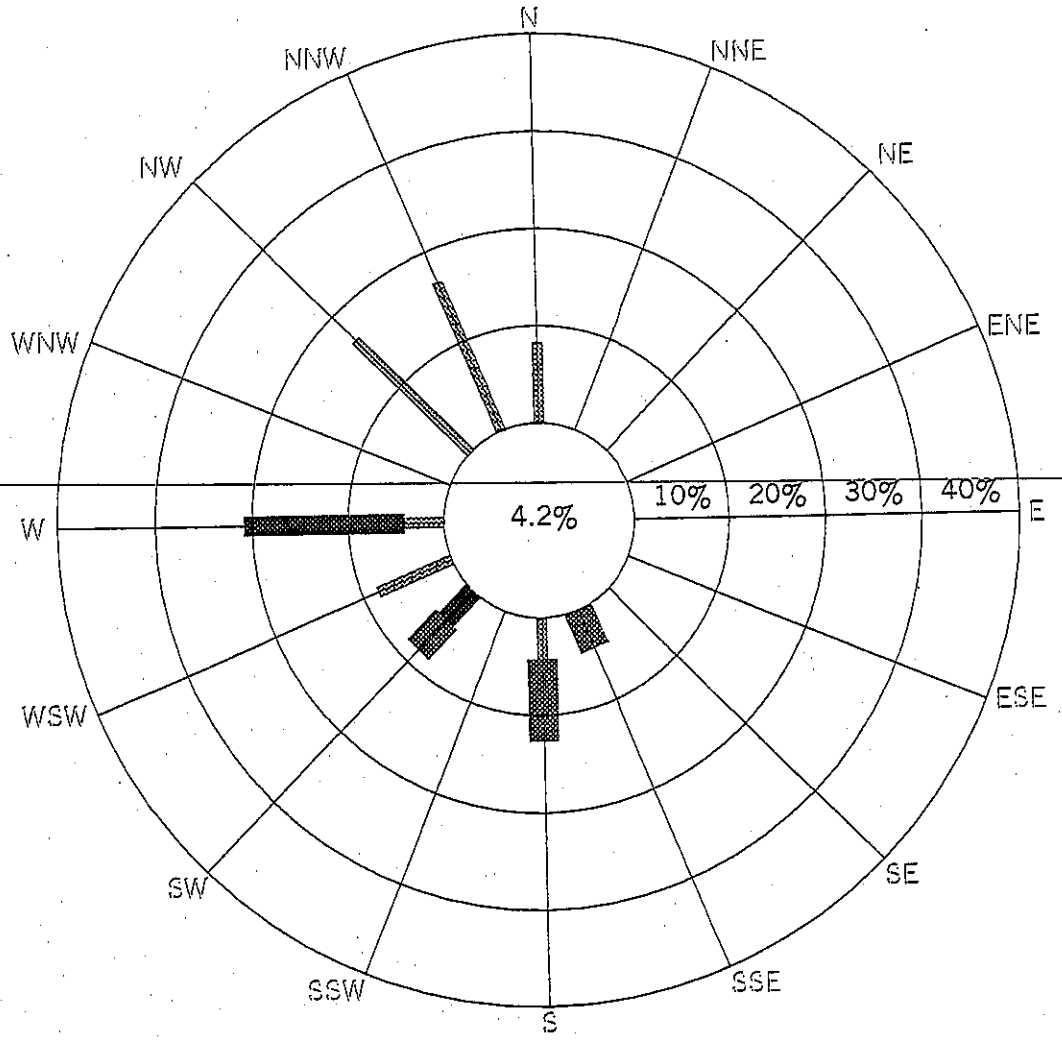
Barrio Logan CR6

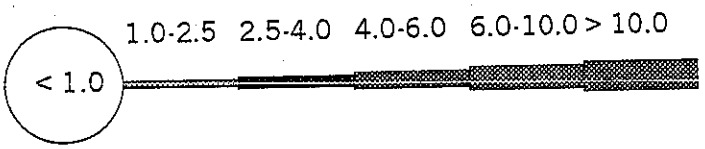
.og Date: 2002/04/12 Printing: 2002/04/18

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	()	Sigma (Deg)
01:00	2.22	143.7	14.81	93.6	0	35.6
02:00	1.75	123.7	15.13	92.7	0	47.3
03:00	1.84	291.0	15.08	92.6	0	56.3
04:00	2.09	232.0	14.86	93.7	0	43.8
05:00	0.95	118.9	15.03	92.2	0	66.2
06:00	2.24	140.7	15.24	91.1	0	44.9
07:00	2.43	207.7	15.41	90.3	0	49.3
08:00	2.30	237.7	15.52	89.1	0	48.2
09:00	3.07	164.6	15.73	88.0	0	33.3
10:00	4.15	167.3	16.23	86.0	0	28.8
11:00	4.70	164.1	16.34	86.8	0	32.1
12:00	4.13	173.8	16.61	85.0	0	37.4
13:00	4.45	165.7	16.77	85.5	0	27.2
14:00	4.19	176.7	16.77	85.8	0	40.5
15:00	4.02	178.3	16.55	87.3	0	40.2
16:00	4.45	165.1	16.39	88.2	0	30.5
17:00	3.39	194.0	16.50	84.6	0	41.4
18:00	2.90	183.5	16.39	83.4	0	40.7
19:00	2.94	165.1	15.95	84.9	0	32.0
20:00	2.73	160.9	15.63	85.9	0	34.7
21:00	2.49	165.6	15.52	86.1	0	32.0
22:00	2.24	158.1	15.41	87.0	0	32.8
23:00	1.92	181.6	15.35	87.8	0	53.7
24:00	1.54	239.7	15.19	88.3	0	60.5
Sum			378.40	2115.7	0	989.4
Average	2.88	176.0	15.77	88.2	0	41.2
Maximum Time			16.77 13:00	93.7 04:00	0 01:00	66.2 05:00
Minimum Time			14.81 01:00	83.4 18:00	0 01:00	27.2 13:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 04/13 Time: 01:00 ----- 2002 04/13 Time: 24:00





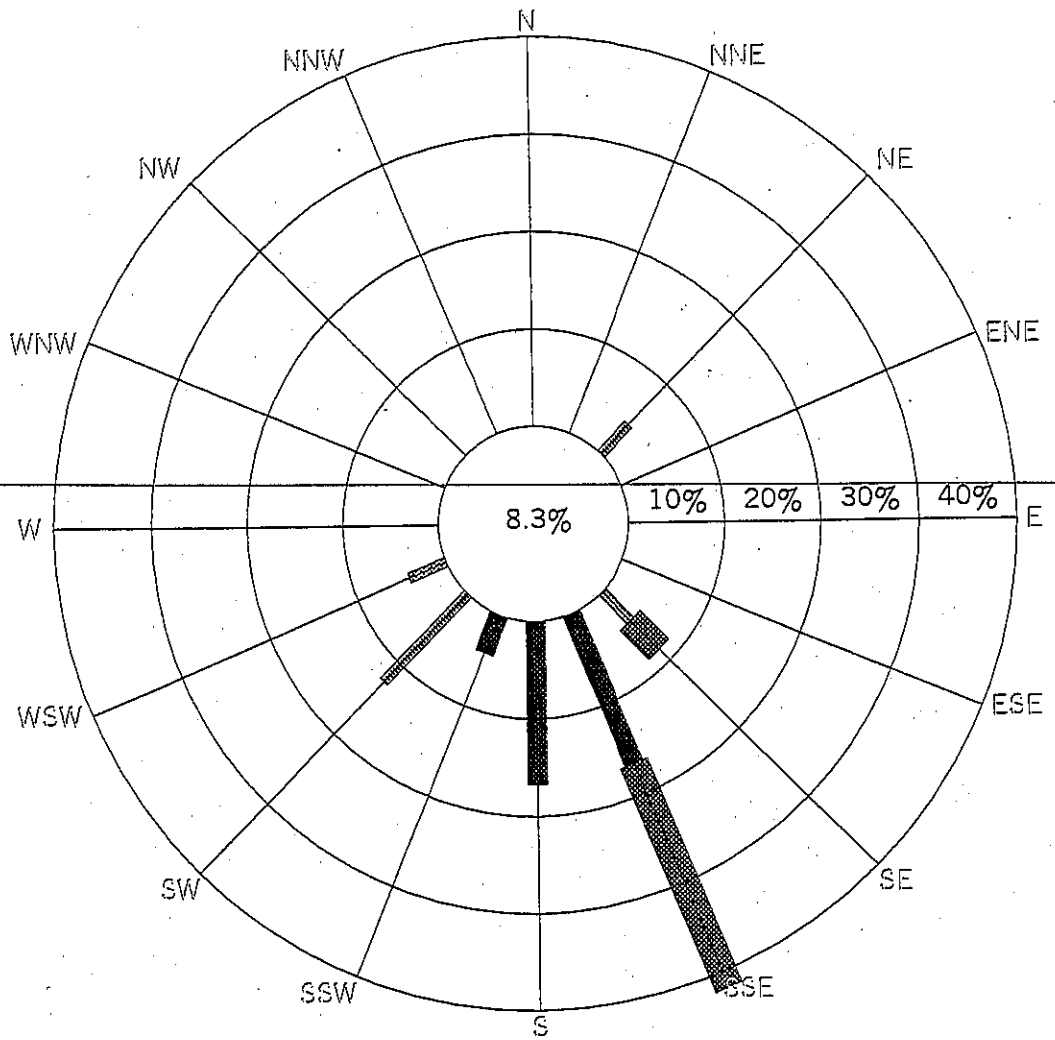
Barrio Logan CR6

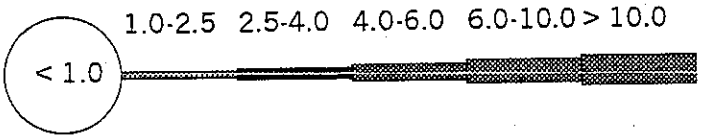
.og Date: 2002/04/13 Printing: 2002/04/18

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma ()	Sigma (Deg)
01:00	1.50	249.6	15.19	88.1	0	40.0
02:00	1.39	172.5	15.35	87.7	0	63.4
03:00	1.28	313.0	15.41	87.2	0	57.3
04:00	1.62	4.3	15.35	87.1	0	41.3
05:00	1.24	335.6	15.35	87.1	0	74.9
06:00	1.48	343.6	15.24	86.7	0	56.7
07:00	1.69	1.5	15.63	85.2	0	28.4
08:00	1.84	311.6	16.06	83.3	0	51.5
09:00	2.45	314.5	17.37	78.4	0	52.4
10:00	3.70	261.3	18.57	74.8	0	42.9
11:00	4.06	220.0	18.85	75.4	0	47.9
12:00	5.87	165.0	17.97	80.0	0	26.5
13:00	5.70	182.1	17.75	80.3	0	38.2
14:00	5.23	189.2	18.35	78.7	0	45.7
15:00	3.51	258.9	18.35	78.9	0	50.4
16:00	3.11	277.6	17.81	81.1	0	45.4
17:00	2.69	270.4	17.32	83.4	0	47.3
18:00	2.47	252.3	16.83	85.1	0	46.9
19:00	2.77	225.5	16.17	88.3	0	40.1
20:00	2.47	266.7	15.95	88.5	0	39.9
21:00	2.43	319.2	15.84	88.9	0	42.6
22:00	2.09	332.6	15.63	89.7	0	42.3
23:00	1.69	334.8	15.57	90.1	0	41.3
24:00	0.97	30.1	15.35	91.4	0	53.8
Sum			397.29	2025.5	0	1117.1
Average	2.64	284.2	16.55	84.4	0	46.5
Maximum			18.85	91.4	0	74.9
Time			11:00	24:00	01:00	05:00
Minimum			15.19	74.8	0	26.5
Time			01:00	10:00	01:00	12:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 04/14 Time: 01:00 ----- 2002 04/14 Time: 24:00





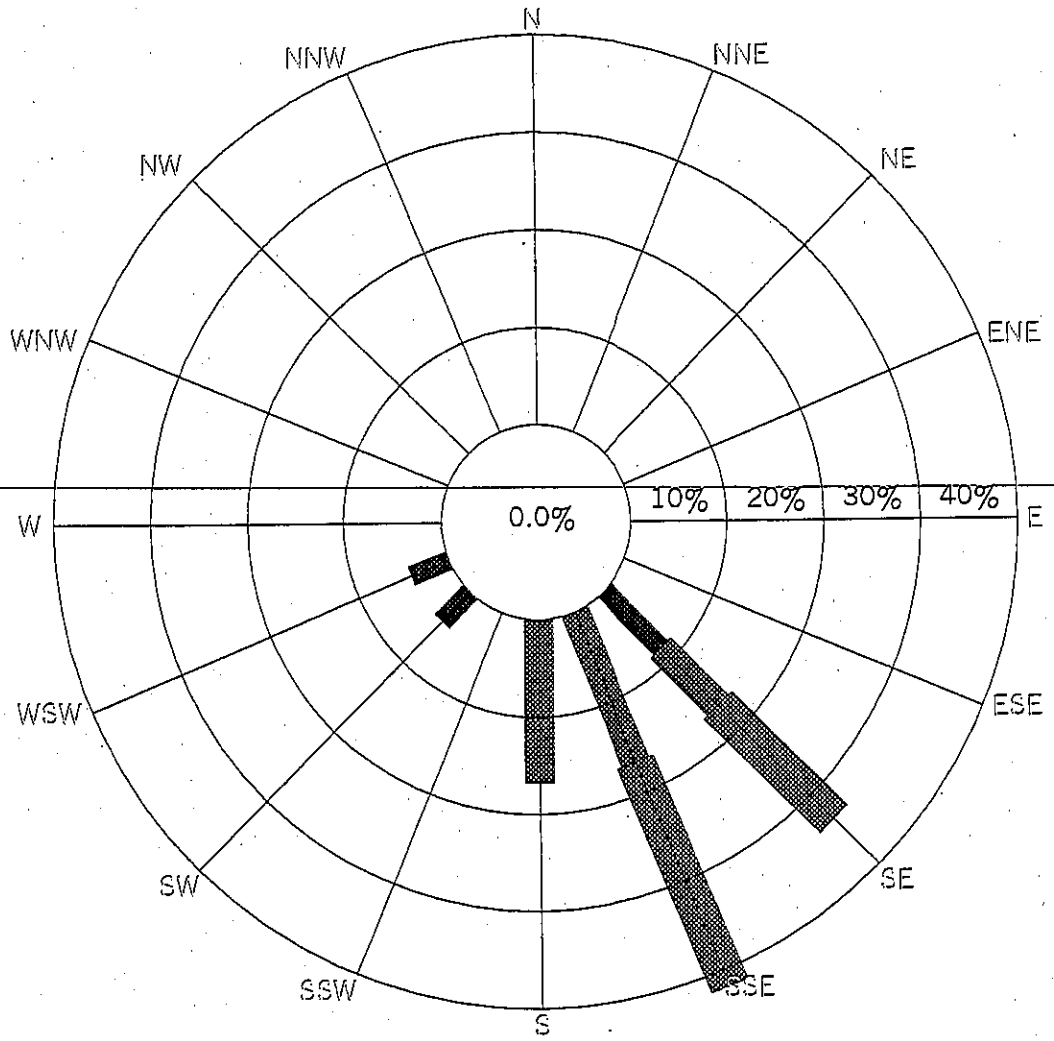
Barrio Logan CR6

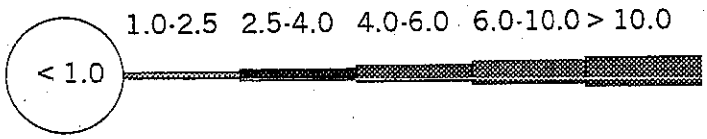
Log Date: 2002/04/14 Printing: 2002/04/18

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	()	Sigma (Deg)
01:00	0.95	28.2	15.19	92.2	0	26.7
02:00	0.71	51.7	14.97	93.1	0	59.6
03:00	1.48	226.0	15.24	92.8	0	47.5
04:00	1.62	232.1	15.03	96.4	0	51.4
05:00	1.48	254.2	14.86	97.3	0	57.3
06:00	1.14	55.2	14.97	96.9	0	50.4
07:00	1.75	126.2	15.19	94.5	0	55.3
08:00	2.18	215.3	15.13	95.8	0	47.8
09:00	2.54	172.7	14.97	96.5	0	35.5
10:00	3.02	165.8	14.86	94.7	0	27.0
11:00	3.22	172.4	15.52	91.0	0	40.3
12:00	3.66	164.9	15.79	91.0	0	34.4
13:00	3.89	175.7	15.95	90.1	0	46.7
14:00	3.30	200.2	16.12	89.8	0	43.5
15:00	3.94	163.9	15.84	90.3	0	30.8
16:00	3.39	177.9	15.84	90.6	0	40.3
17:00	3.94	159.4	15.52	92.2	0	29.3
18:00	4.19	163.8	15.46	92.6	0	28.4
19:00	4.59	164.9	15.30	93.3	0	28.9
20:00	4.62	162.0	15.08	93.4	0	27.6
21:00	4.85	150.1	15.03	93.7	0	26.2
22:00	5.51	149.1	15.08	94.1	0	24.5
23:00	4.70	159.9	15.08	93.0	0	27.5
24:00	5.53	141.3	14.97	93.1	0	23.0
Sum			367.00	2238.5	0	909.8
Average	3.17	166.5	15.29	93.3	0	37.9
Maximum Time			16.12 14:00	97.3 05:00	0 01:00	59.6 02:00
Minimum Time			14.86 05:00	89.8 14:00	0 01:00	23.0 24:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 04/15 Time: 01:00 ----- 2002 04/15 Time: 24:00





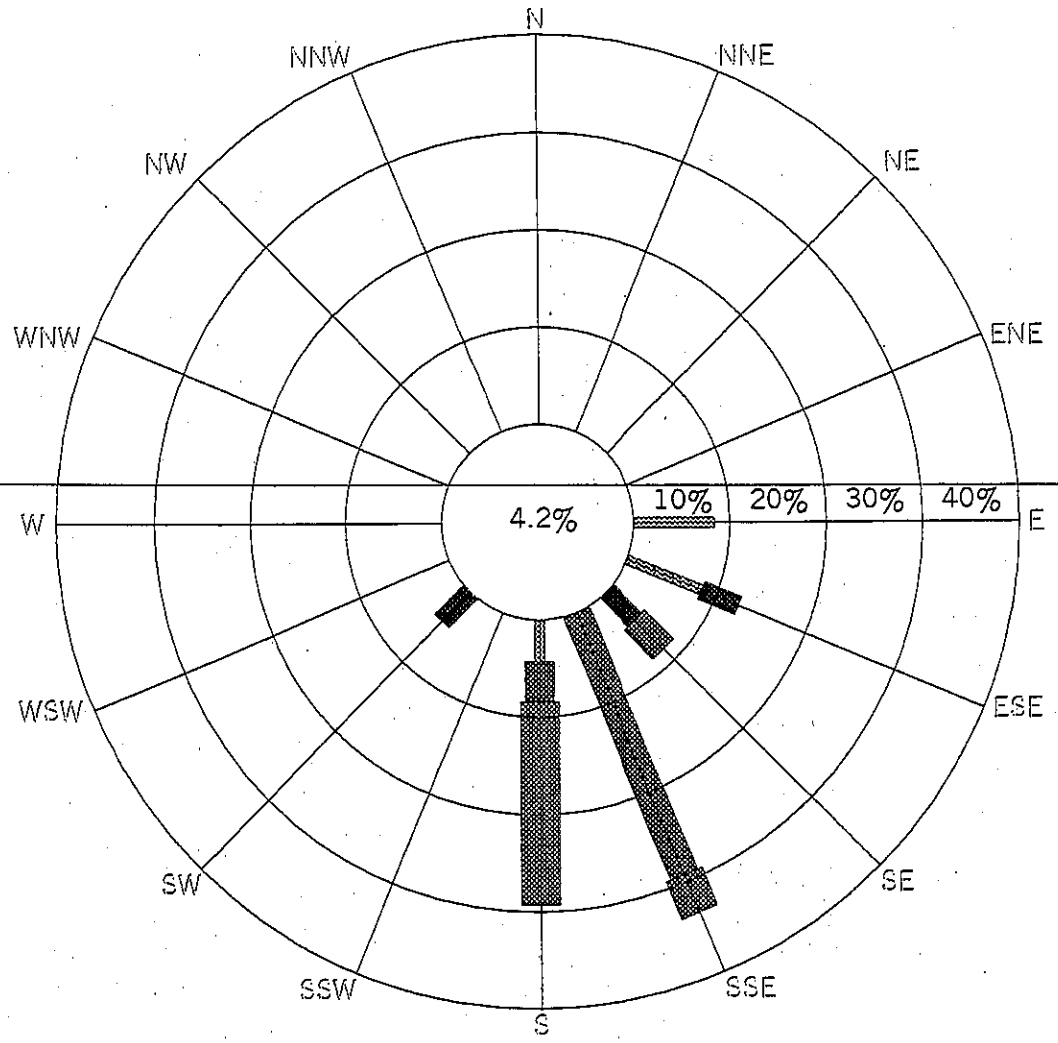
Barrio Logan CR6

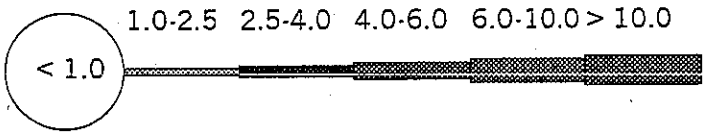
Log Date: 2002/04/15 Printing: 2002/04/18

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	()	Sigma (Deg)
01:00	6.55	138.7	14.92	92.5	0	18.7
02:00	6.57	148.0	14.97	91.6	0	25.8
03:00	6.76	151.3	15.08	92.4	0	25.4
04:00	8.03	151.1	15.03	91.7	0	23.2
05:00	7.69	139.7	14.92	94.8	0	19.8
06:00	7.76	136.1	14.97	94.1	0	17.5
07:00	7.29	136.6	15.41	91.1	0	17.0
08:00	7.82	146.8	15.41	93.1	0	22.1
09:00	8.39	151.3	15.03	98.1	0	21.4
10:00	6.12	167.0	14.53	98.4	0	27.1
11:00	5.23	165.1	15.19	95.5	0	33.3
12:00	2.98	239.9	15.35	91.4	0	44.2
13:00	3.13	225.8	16.12	85.4	0	45.5
14:00	4.57	170.5	16.88	81.6	0	29.0
15:00	4.89	169.1	16.61	79.8	0	25.1
16:00	4.53	174.1	16.44	78.5	0	36.0
17:00	4.57	169.8	16.01	77.8	0	25.3
18:00	4.70	151.3	15.95	76.8	0	24.3
19:00	5.06	158.4	15.84	76.4	0	24.8
20:00	5.46	150.2	15.73	75.9	0	22.0
21:00	4.40	134.6	15.52	77.7	0	21.0
22:00	3.62	129.8	15.46	77.9	0	23.0
23:00	4.66	140.1	15.52	77.4	0	21.4
24:00	3.30	130.6	15.46	75.4	0	27.5
Sum			372.34	2065.2	0	620.4
Average	5.59	155.6	15.51	86.0	0	25.8
Maximum			16.88	98.4	0	45.5
Time			14:00	10:00	01:00	13:00
Minimum			14.53	75.4	0	17.0
Time			10:00	24:00	01:00	07:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 04/16 Time: 01:00 ----- 2002 04/16 Time: 24:00





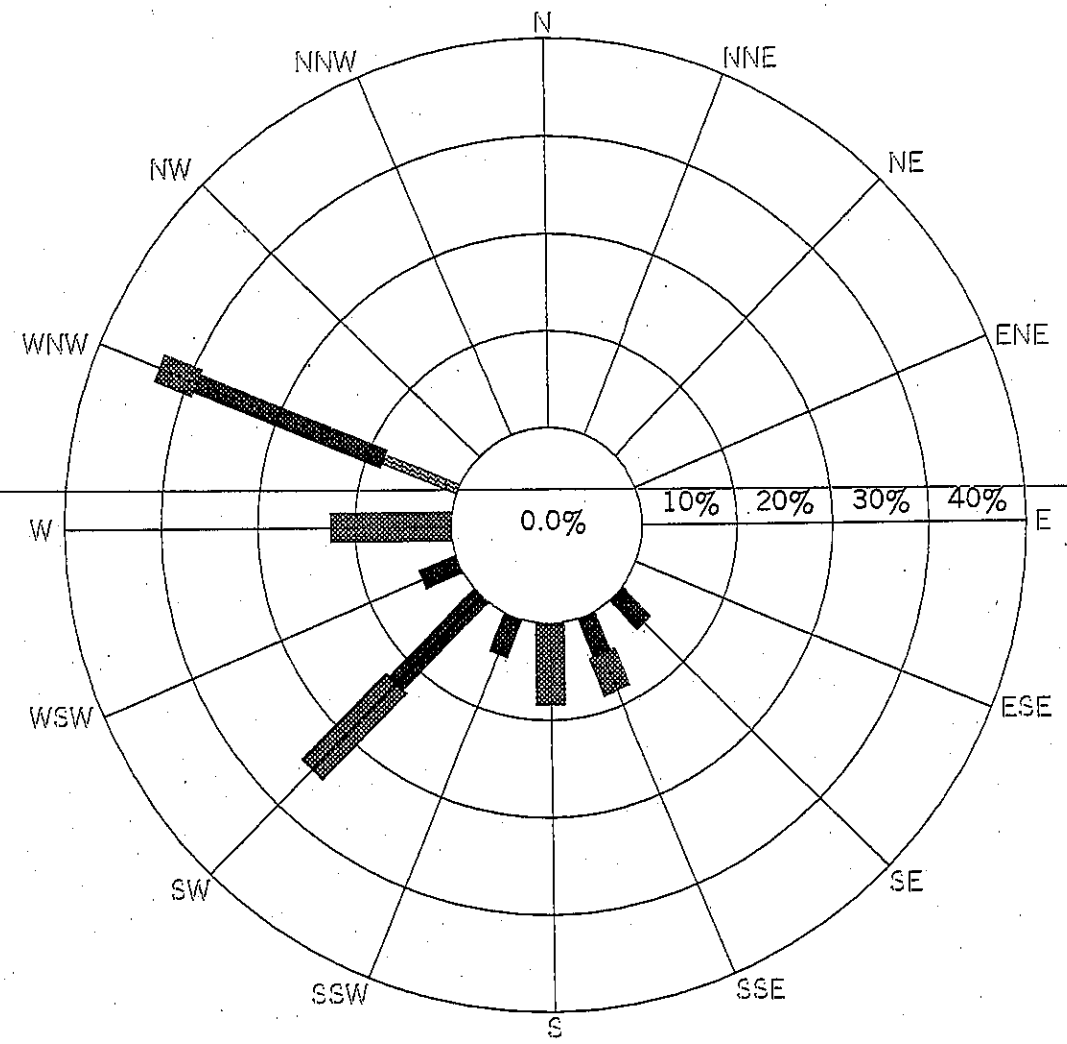
Barrio Logan CR6

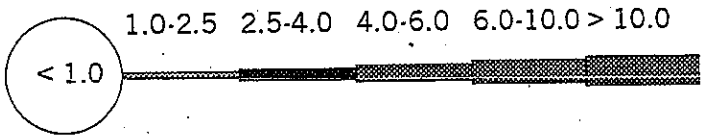
Log Date: 2002/04/16 Printing: 2002/04/18

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	()	Sigma (Deg)
01:00	1.67	107.8	15.13	76.2	0	44.2
02:00	1.16	83.1	14.92	77.6	0	51.5
03:00	1.26	88.9	14.64	78.9	0	49.8
04:00	3.85	129.6	14.81	77.0	0	22.9
05:00	3.92	123.0	14.59	78.4	0	34.8
06:00	0.86	70.8	13.28	84.8	0	52.3
07:00	2.11	106.3	14.53	79.6	0	43.8
08:00	4.62	135.4	15.90	72.6	0	23.8
09:00	5.27	167.9	16.55	69.2	0	26.3
10:00	5.59	172.1	16.83	67.3	0	28.0
11:00	6.59	170.3	17.21	64.4	0	28.6
12:00	6.57	172.7	18.19	63.5	0	28.9
13:00	6.38	170.7	18.68	63.3	0	29.9
14:00	6.44	168.3	18.52	63.2	0	26.4
15:00	6.29	174.6	18.25	64.9	0	29.6
16:00	6.14	170.8	17.70	65.6	0	27.2
17:00	5.42	168.6	17.92	67.8	0	26.9
18:00	5.25	162.3	20.70	69.1	0	27.0
19:00	4.91	153.6	20.26	72.1	0	25.6
20:00	5.10	163.3	20.65	73.6	0	29.1
21:00	5.04	163.8	20.26	73.5	0	27.4
22:00	5.08	152.4	19.88	74.6	0	24.2
23:00	2.79	215.3	19.50	74.6	0	38.5
24:00	2.30	188.2	19.45	70.6	0	43.7
Sum			418.35	1722.5	0	790.1
Average	4.36	150.8	17.43	71.8	0	32.9
Maximum Time			20.70 18:00	84.8 06:00	0 01:00	52.3 06:00
Minimum Time			13.28 06:00	63.2 14:00	0 01:00	22.9 04:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 04/17 Time: 01:00 ----- 2002 04/17 Time: 24:00





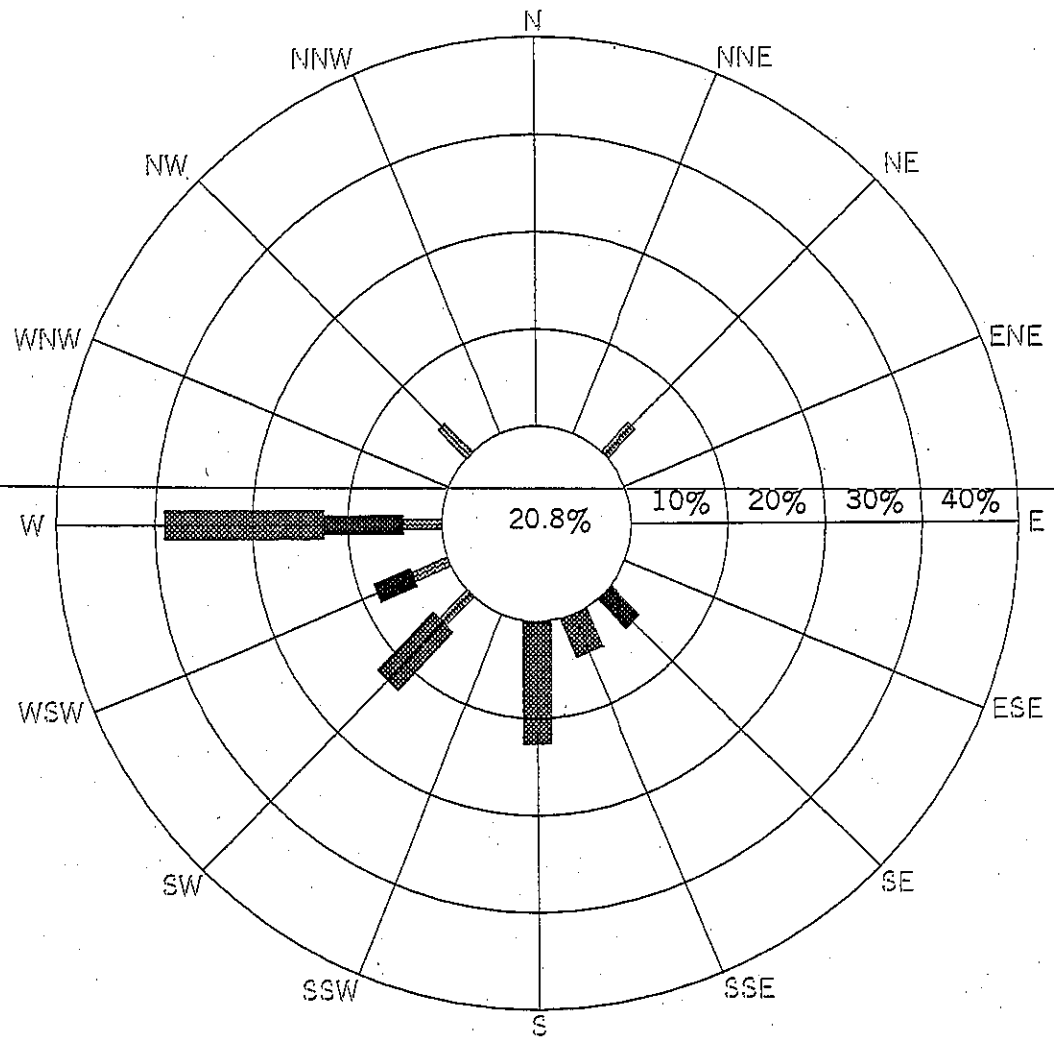
Barrio Logan CR6

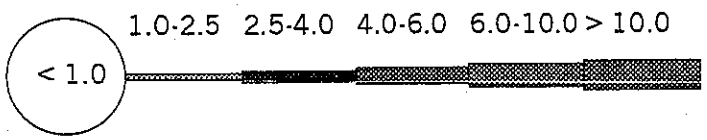
.og Date: 2002/04/17 Printing: 2002/04/24

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	3.83	139.7	19.50	73.0	21.3	0
02:00	3.75	161.1	19.12	76.5	26.0	0
03:00	4.17	167.9	18.85	74.9	26.3	0
04:00	4.68	170.5	18.52	74.3	25.4	0
05:00	5.08	169.6	18.35	77.5	25.3	0
06:00	3.39	201.9	18.03	81.2	37.3	0
07:00	2.83	247.4	17.92	78.6	44.3	0
08:00	3.32	229.5	18.57	73.3	44.2	0
09:00	3.53	225.8	18.63	70.3	47.5	0
10:00	3.64	228.0	18.96	68.5	44.7	0
11:00	4.30	222.5	20.32	61.0	44.1	0
12:00	4.45	223.7	20.26	56.8	47.2	0
13:00	4.38	228.0	20.59	53.1	47.7	0
14:00	4.47	279.9	20.81	54.3	44.4	0
15:00	5.00	275.1	20.76	55.5	40.0	0
16:00	5.10	276.1	20.26	59.3	37.9	0
17:00	4.89	288.8	19.66	59.6	37.3	0
18:00	3.79	294.7	18.68	65.6	39.9	0
19:00	3.22	291.4	17.81	71.7	37.4	0
20:00	3.22	286.8	18.30	69.0	36.9	0
21:00	3.24	290.2	18.08	72.0	33.0	0
22:00	2.77	288.1	17.75	73.5	35.6	0
23:00	2.11	290.8	17.59	73.7	38.8	0
24:00	2.05	291.4	17.37	74.3	33.3	0
Sum			454.70	1647.4	895.7	0
Average	3.80	244.4	18.95	68.6	37.3	0
Maximum Time			20.81 14:00	81.2 06:00	47.7 13:00	0 01:00
Minimum Time			17.37 24:00	53.1 13:00	21.3 01:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 04/18 Time: 01:00 ----- 2002 04/18 Time: 24:00





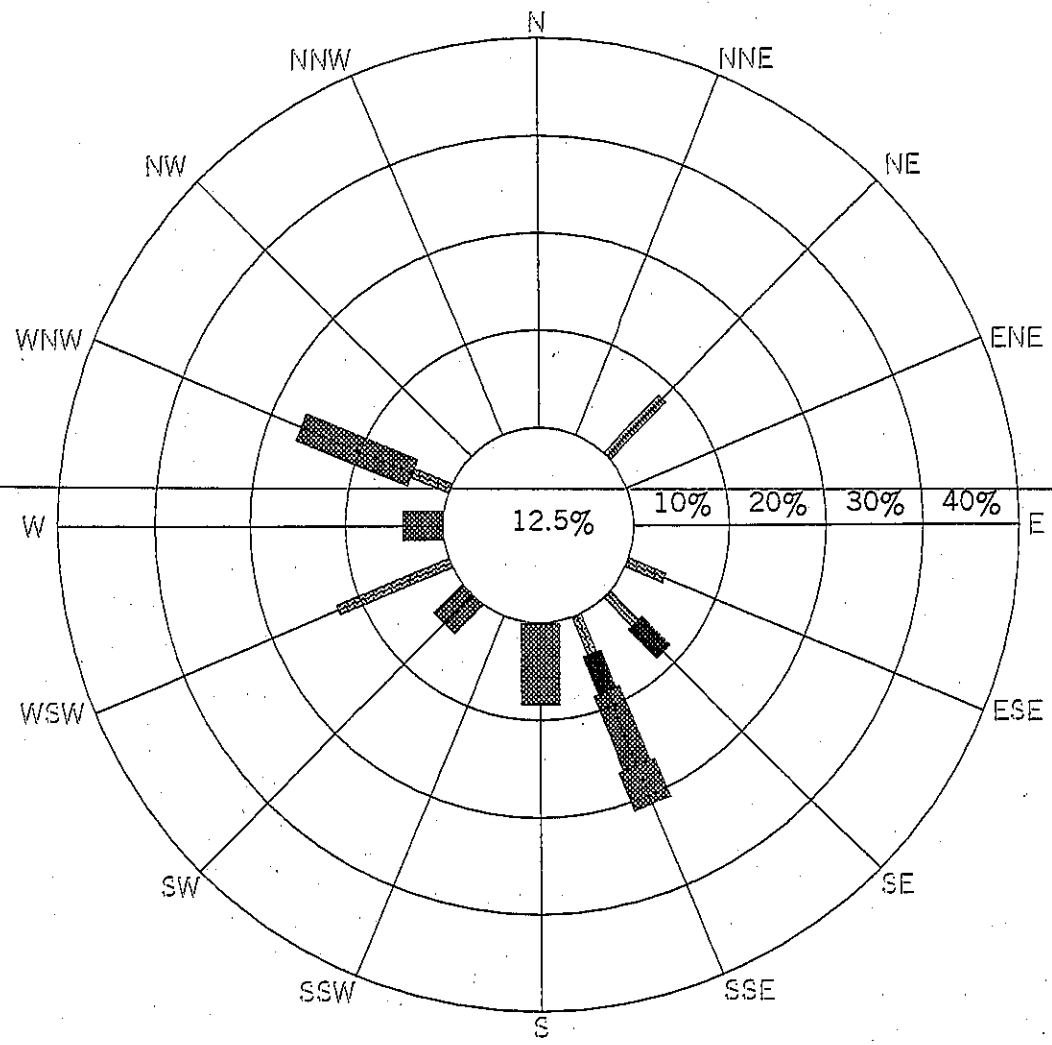
Barrio Logan CR6

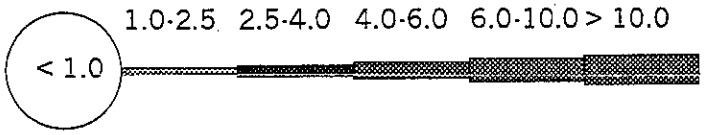
Log Date: 2002/04/18 Printing: 2002/04/24

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	1.18	312.5	16.99	74.5	42.2	0
02:00	0.84	28.6	15.24	81.1	16.3	0
03:00	0.82	52.1	14.43	83.6	21.9	0
04:00	0.97	31.5	13.99	85.4	17.5	0
05:00	0.75	51.6	13.99	85.3	34.6	0
06:00	0.65	49.5	14.04	85.1	29.9	0
07:00	1.12	46.0	16.06	79.0	54.5	0
08:00	2.73	141.2	18.79	68.2	38.6	0
09:00	4.11	163.7	19.28	62.0	32.4	0
10:00	5.06	170.6	19.66	66.0	30.3	0
11:00	5.57	172.4	19.83	62.9	29.8	0
12:00	5.44	181.2	20.05	63.3	38.6	0
13:00	5.17	213.8	20.81	61.7	44.5	0
14:00	4.93	222.0	21.36	58.1	37.2	0
15:00	4.47	259.4	22.34	53.0	49.3	0
16:00	4.30	259.3	22.18	55.4	39.6	0
17:00	4.57	274.8	21.19	56.0	38.4	0
18:00	4.11	262.2	19.77	57.9	40.3	0
19:00	3.49	256.9	18.14	66.0	38.7	0
20:00	2.90	270.4	18.03	65.0	40.5	0
21:00	2.62	269.2	17.75	68.5	38.2	0
22:00	2.18	260.4	17.65	68.4	42.0	0
23:00	2.20	238.0	17.59	68.9	46.5	0
24:00	2.45	225.0	17.48	68.8	44.1	0
Sum			436.64	1644.3	885.9	0
Average	3.03	241.5	18.19	68.5	36.9	0
Maximum			22.34	85.4	54.5	0
Time			15:00	04:00	07:00	01:00
Minimum			13.99	53.0	16.3	0
Time			04:00	15:00	02:00	01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 04/19 Time: 01:00 ----- 2002 04/19 Time: 24:00





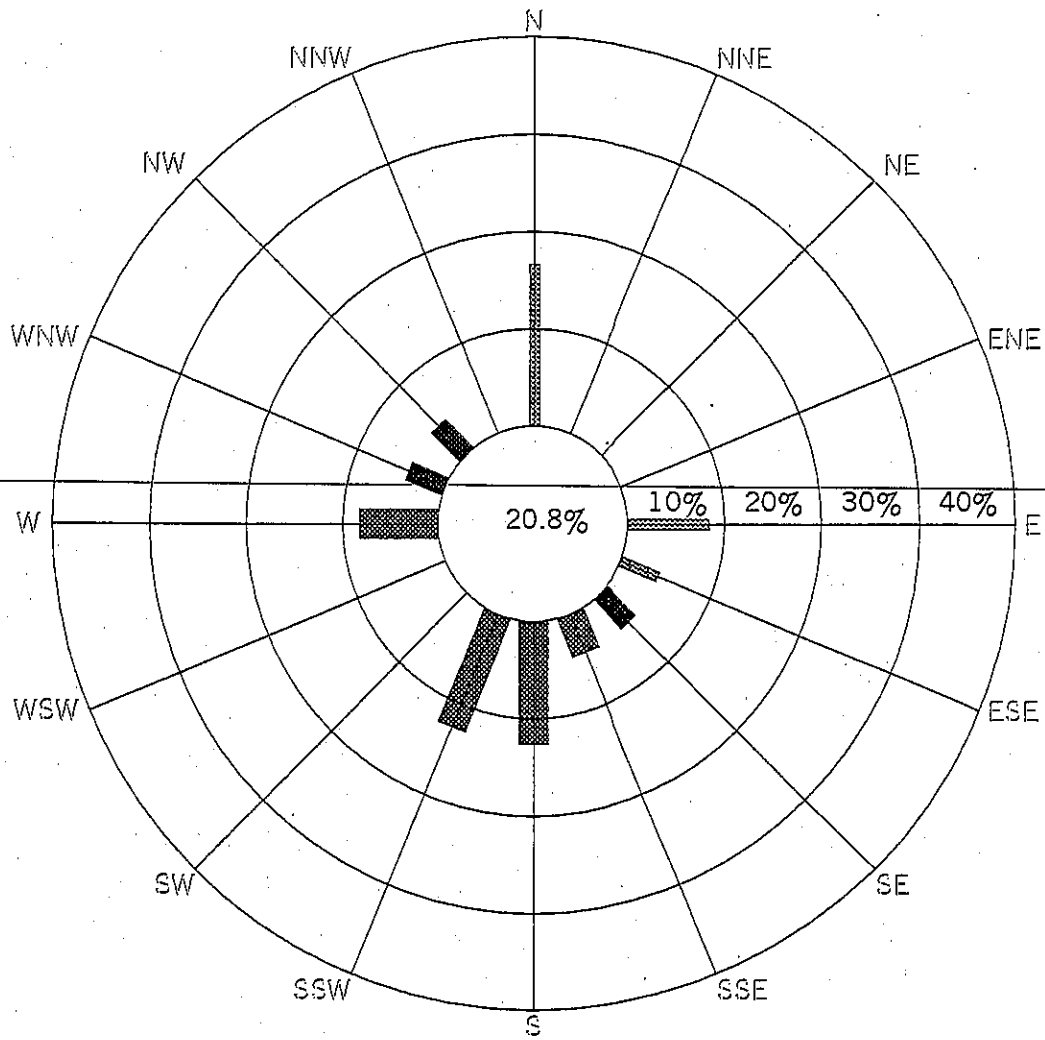
Barrio Logan CR6

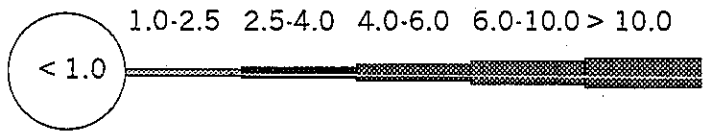
Log Date: 2002/04/19 Printing: 2002/04/24

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	3.58	160.9	17.37	66.4	23.3	0
02:00	2.22	117.5	16.61	70.3	44.6	0
03:00	0.88	76.8	15.73	73.7	55.6	0
04:00	0.78	71.1	14.86	75.6	55.8	0
05:00	0.78	44.6	14.32	75.9	52.9	0
06:00	1.14	40.2	14.21	75.7	36.1	0
07:00	1.28	37.4	15.79	71.2	52.7	0
08:00	3.15	127.7	18.63	63.0	35.7	0
09:00	4.36	155.8	17.97	63.7	25.6	0
10:00	5.00	162.3	18.30	61.2	22.9	0
11:00	6.38	167.0	17.48	64.6	25.6	0
12:00	6.36	173.8	17.21	65.7	31.0	0
13:00	6.16	175.8	17.81	57.4	33.7	0
14:00	4.89	226.8	18.85	48.9	44.9	0
15:00	4.28	278.5	19.45	39.9	42.0	0
16:00	4.30	288.9	18.68	51.3	38.8	0
17:00	4.55	283.6	18.08	52.4	38.4	0
18:00	4.42	286.1	16.99	55.1	37.3	0
19:00	2.32	295.4	16.06	53.8	41.8	0
20:00	1.71	237.9	15.63	59.8	51.6	0
21:00	1.52	254.1	15.24	67.6	38.2	0
22:00	1.65	244.5	14.97	74.6	41.0	0
23:00	2.49	164.0	14.86	77.5	30.1	0
24:00	2.32	146.2	14.53	77.8	40.4	0
Sum			399.63	1543.0	939.8	0
Average	3.19	183.4	16.65	64.3	39.2	0
Maximum			19.45	77.8	55.8	0
Time			15:00	24:00	04:00	01:00
Minimum			14.21	39.9	22.9	0
Time			06:00	15:00	10:00	01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 04/20 Time: 01:00 ----- 2002 04/20 Time: 24:00





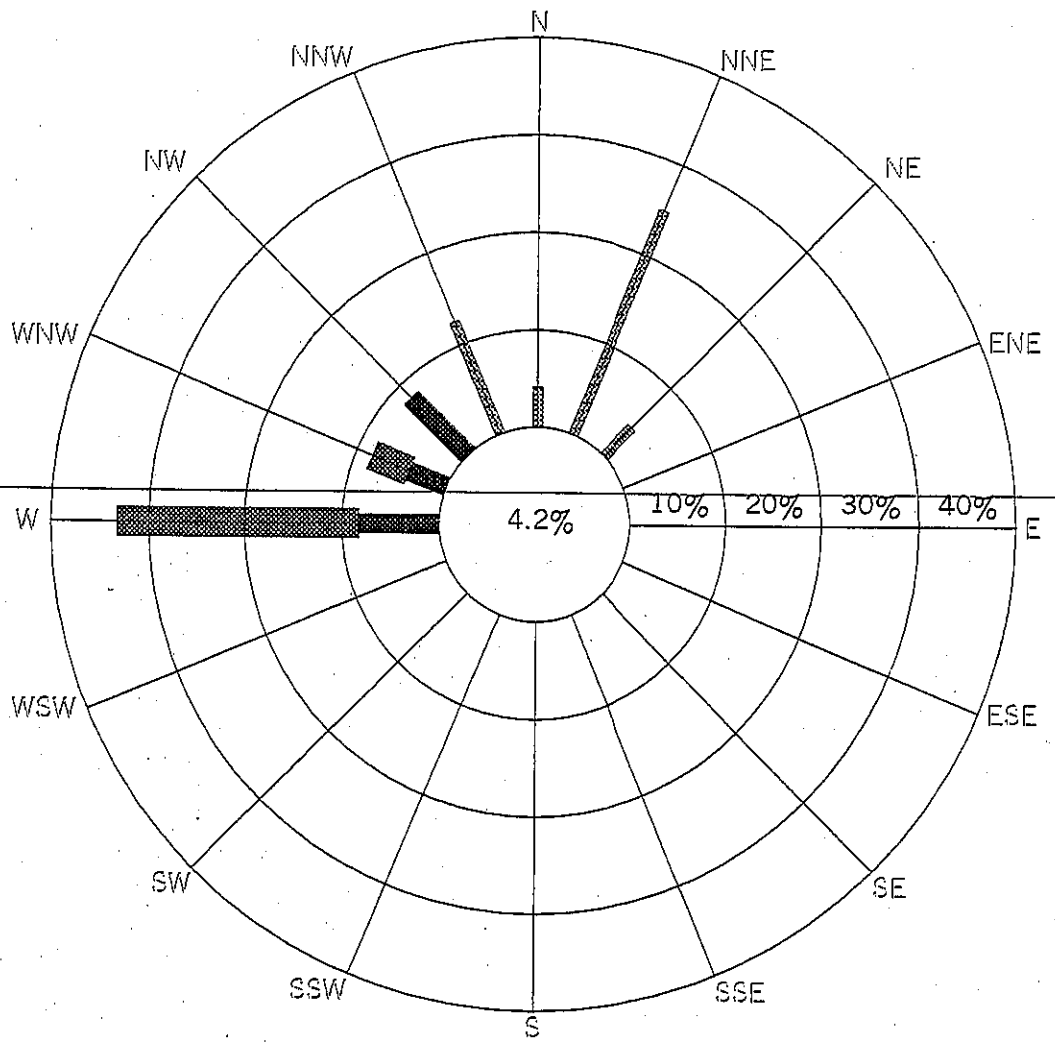
Barrio Logan CR6

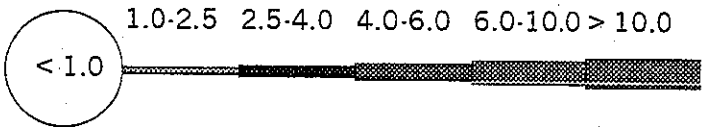
Log Date: 2002/04/20 Printing: 2002/04/24

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	0.75	78.5	13.22	74.3	42.9	0
02:00	1.03	79.4	12.79	71.2	48.4	0
03:00	0.73	59.3	12.46	72.6	48.2	0
04:00	0.75	55.1	12.51	72.3	65.2	0
05:00	0.88	79.1	12.24	74.3	48.0	0
06:00	1.31	88.4	12.57	70.7	51.2	0
07:00	1.75	110.4	13.44	65.0	47.4	0
08:00	3.75	136.1	15.08	65.0	30.6	0
09:00	4.81	149.4	16.01	67.4	23.8	0
10:00	4.42	178.2	16.77	69.0	35.1	0
11:00	5.40	175.8	17.10	65.9	32.8	0
12:00	5.46	184.9	17.37	65.9	41.0	0
13:00	5.29	194.1	17.70	65.8	36.9	0
14:00	5.57	196.2	17.75	67.3	41.5	0
15:00	5.17	212.7	17.86	69.1	42.9	0
16:00	4.21	260.2	18.52	66.1	43.8	0
17:00	4.26	279.1	17.75	70.5	37.9	0
18:00	3.39	290.3	16.61	75.9	38.1	0
19:00	2.73	319.3	15.68	78.7	32.8	0
20:00	1.99	359.6	15.13	79.8	30.1	0
21:00	1.77	2.3	14.92	80.6	28.7	0
22:00	1.75	356.2	14.48	82.9	26.5	0
23:00	1.37	358.7	13.93	85.1	28.2	0
24:00	0.92	10.2	13.44	86.9	27.8	0
Sum			365.36	1742.2	929.7	0
Average	2.89	88.9	15.22	72.6	38.7	0
Maximum Time			18.52 16:00	86.9 24:00	65.2 04:00	0 01:00
Minimum Time			12.24 05:00	65.0 07:00	23.8 09:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 04/21 Time: 01:00 ----- 2002 04/21 Time: 24:00





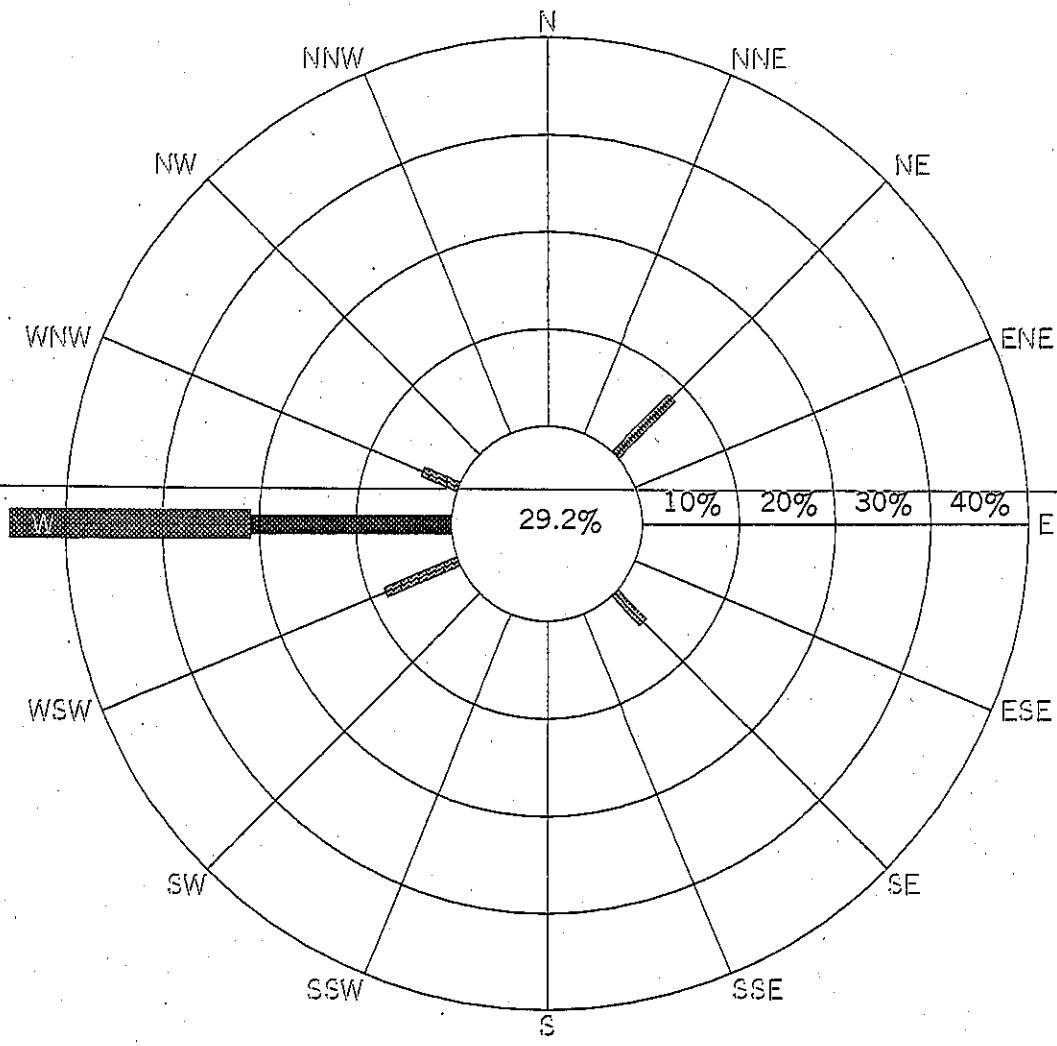
Barrio Logan CR6

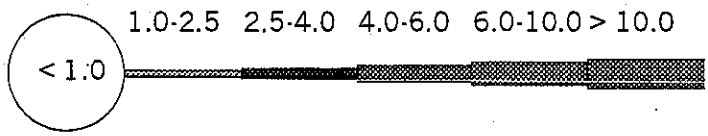
Log Date: 2002/04/21 Printing: 2002/04/24

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	1.09	25.2	12.62	89.4	20.2	0
02:00	0.95	44.9	11.75	90.6	23.5	0
03:00	1.09	25.2	11.20	90.8	25.3	0
04:00	1.01	37.5	10.88	89.4	32.0	0
05:00	1.03	22.1	10.60	88.6	25.1	0
06:00	2.18	353.9	11.91	93.1	29.0	0
07:00	2.20	16.5	12.24	93.9	27.2	0
08:00	1.96	345.8	14.75	82.7	44.5	0
09:00	2.85	302.3	17.43	66.0	46.2	0
10:00	4.17	271.7	19.01	67.6	36.1	0
11:00	4.70	274.6	19.66	65.4	36.9	0
12:00	4.98	277.2	20.32	62.4	34.7	0
13:00	5.19	274.9	20.81	58.8	36.1	0
14:00	5.06	280.4	20.97	56.6	36.2	0
15:00	4.81	283.4	20.97	55.5	37.8	0
16:00	4.49	278.1	20.65	55.7	35.5	0
17:00	3.89	273.4	20.37	60.1	37.8	0
18:00	3.58	279.8	19.12	67.2	33.9	0
19:00	2.62	311.7	17.92	62.8	39.3	0
20:00	2.58	318.3	17.04	62.9	34.3	0
21:00	2.09	337.3	16.44	70.0	35.9	0
22:00	1.88	341.7	15.90	73.5	35.4	0
23:00	1.39	16.4	15.24	73.9	28.4	0
24:00	1.33	20.0	14.70	79.0	22.0	0
Sum			392.54	1756.2	793.3	0
Average	2.80	327.9	16.36	73.2	33.1	0
Maximum Time			20.97 14:00	93.9 07:00	46.2 09:00	0 01:00
Minimum Time			10.60 05:00	55.5 15:00	20.2 01:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 04/22 Time: 01:00 ----- 2002 04/22 Time: 24:00





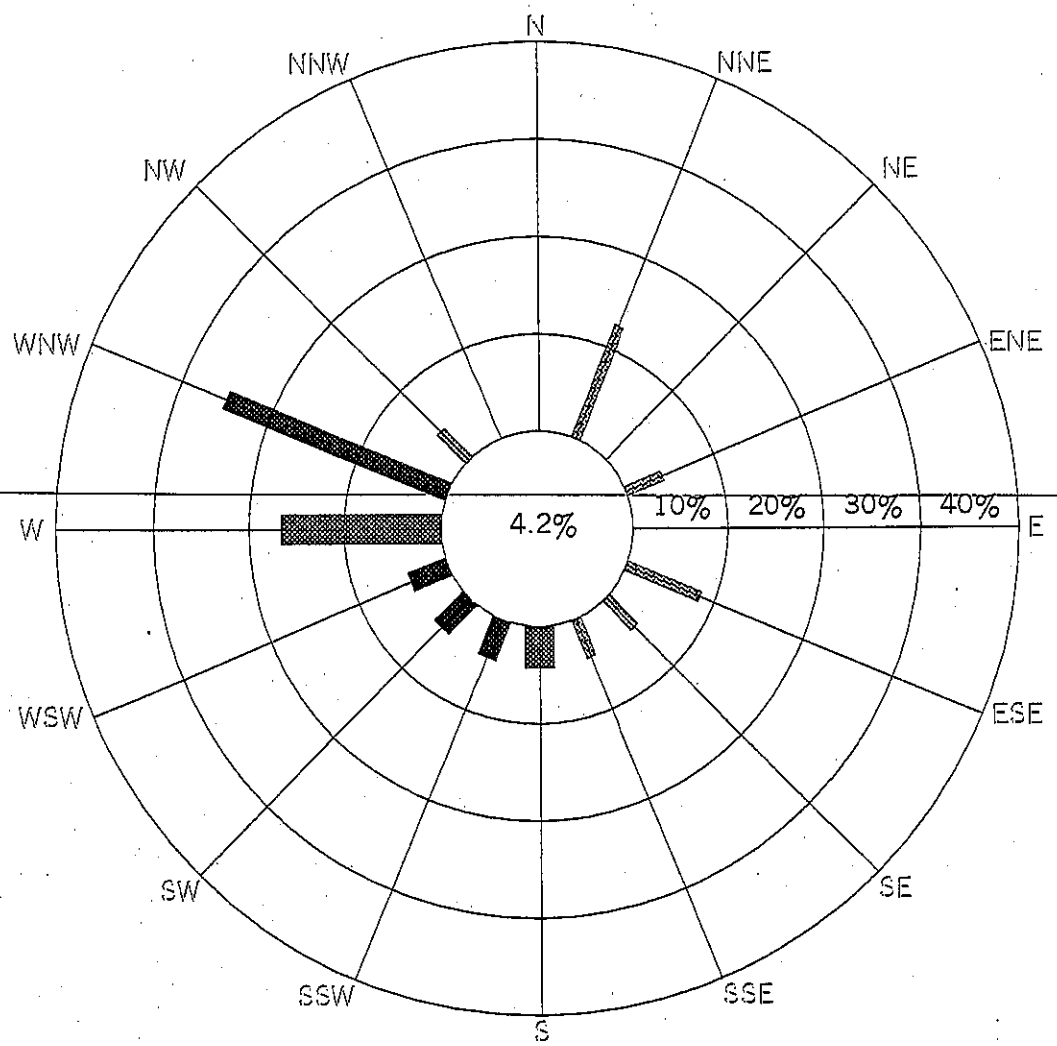
Barrio Logan CR6

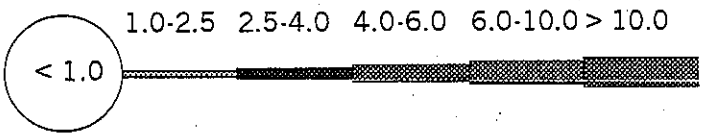
Log Date: 2002/04/22 Printing: 2002/04/26

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	()	Sigma (Deg)
01:00	0.99	12.0	14.26	81.3	0	20.8
02:00	1.03	38.1	13.22	84.7	0	19.7
03:00	0.73	37.4	12.79	85.5	0	23.0
04:00	0.56	63.9	12.08	85.9	0	22.7
05:00	0.90	45.7	11.48	84.7	0	20.0
06:00	0.88	53.4	11.91	80.4	0	20.8
07:00	1.16	43.1	14.53	66.2	0	48.6
08:00	1.77	243.8	19.72	51.5	0	4.1
09:00	2.66	277.0	20.76	54.2	0	47.6
10:00	3.94	275.4	22.23	54.2	0	37.9
11:00	4.85	273.2	22.56	49.1	0	33.9
12:00	5.17	280.0	22.45	53.0	0	34.1
13:00	5.29	277.7	21.90	57.7	0	33.8
14:00	5.00	265.9	21.79	56.9	0	39.0
15:00	4.49	267.2	22.56	48.0	0	34.9
16:00	4.42	275.2	22.23	46.7	0	34.3
17:00	3.92	280.3	21.30	57.4	0	32.7
18:00	3.70	276.0	19.45	70.7	0	34.9
19:00	2.77	275.5	17.86	79.4	0	34.0
20:00	1.99	282.3	17.32	83.2	0	41.6
21:00	0.86	43.8	16.72	85.6	0	33.4
22:00	1.12	144.6	16.66	85.8	0	50.4
23:00	2.15	239.8	16.12	88.6	0	33.3
24:00	0.71	25.7	15.41	91.6	0	56.3
Sum			427.30	1682.4	0	791.8
Average	2.54	309.1	17.80	70.1	0	33.0
Maximum			22.56	91.6	0	56.3
Time			11:00	24:00	01:00	24:00
Minimum			11.48	46.7	0	4.1
Time			05:00	16:00	01:00	08:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 04/23 Time: 01:00 ----- 2002 04/23 Time: 24:00





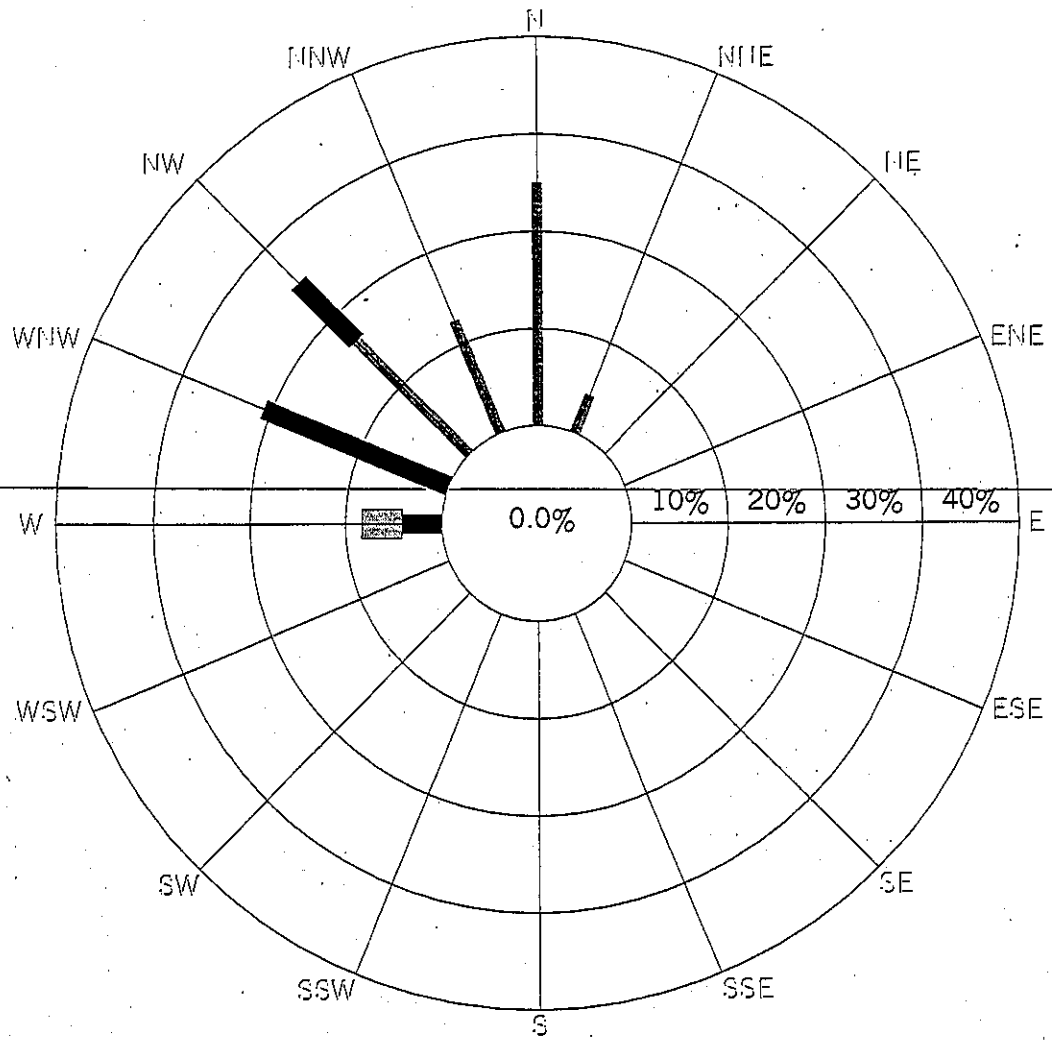
Barrio Logan CR6

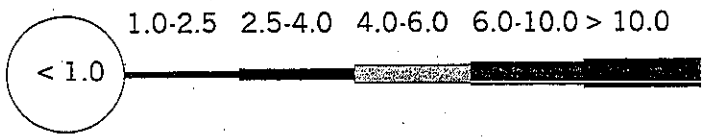
Log Date: 2002/04/23 Printing: 2002/04/26

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	()	Sigma (Deg)
01:00	1.65	112.4	15.35	91.7	0	34.1
02:00	1.09	61.1	15.57	90.4	0	44.0
03:00	1.14	117.7	15.35	91.4	0	48.9
04:00	1.60	151.5	15.52	91.6	0	46.2
05:00	1.62	144.6	15.35	91.9	0	47.8
06:00	0.92	339.9	15.19	92.1	0	55.8
07:00	1.31	30.6	15.79	89.8	0	56.9
08:00	1.58	28.7	17.86	82.0	0	68.6
09:00	3.00	220.8	19.45	73.9	0	47.7
10:00	3.19	195.7	20.16	72.6	0	38.7
11:00	4.55	184.8	21.08	65.4	0	35.7
12:00	3.68	254.1	21.68	56.9	0	43.8
13:00	4.40	277.6	23.59	47.2	0	38.8
14:00	4.96	276.2	21.68	60.7	0	37.2
15:00	4.76	274.8	21.03	64.0	0	37.6
16:00	3.94	283.3	20.43	67.0	0	41.3
17:00	4.15	278.8	19.77	68.5	0	37.3
18:00	3.47	289.3	19.28	70.7	0	39.6
19:00	3.75	282.2	17.15	81.0	0	32.8
20:00	2.69	293.2	16.66	83.3	0	40.3
21:00	2.85	284.1	16.06	83.9	0	32.8
22:00	2.58	292.8	15.73	83.2	0	36.1
23:00	2.05	324.4	15.52	84.4	0	36.3
24:00	1.50	14.9	15.08	84.5	0	31.2
Sum			430.36	1868.3	0	1009.4
Average	2.77	282.5	17.93	77.8	0	42.1
Maximum			23.59	92.1	0	68.6
Time			13:00	06:00	01:00	08:00
Minimum			15.08	47.2	0	31.2
Time			24:00	13:00	01:00	24:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 04/24 Time: 01:00 ----- 2002 04/24 Time: 24:00





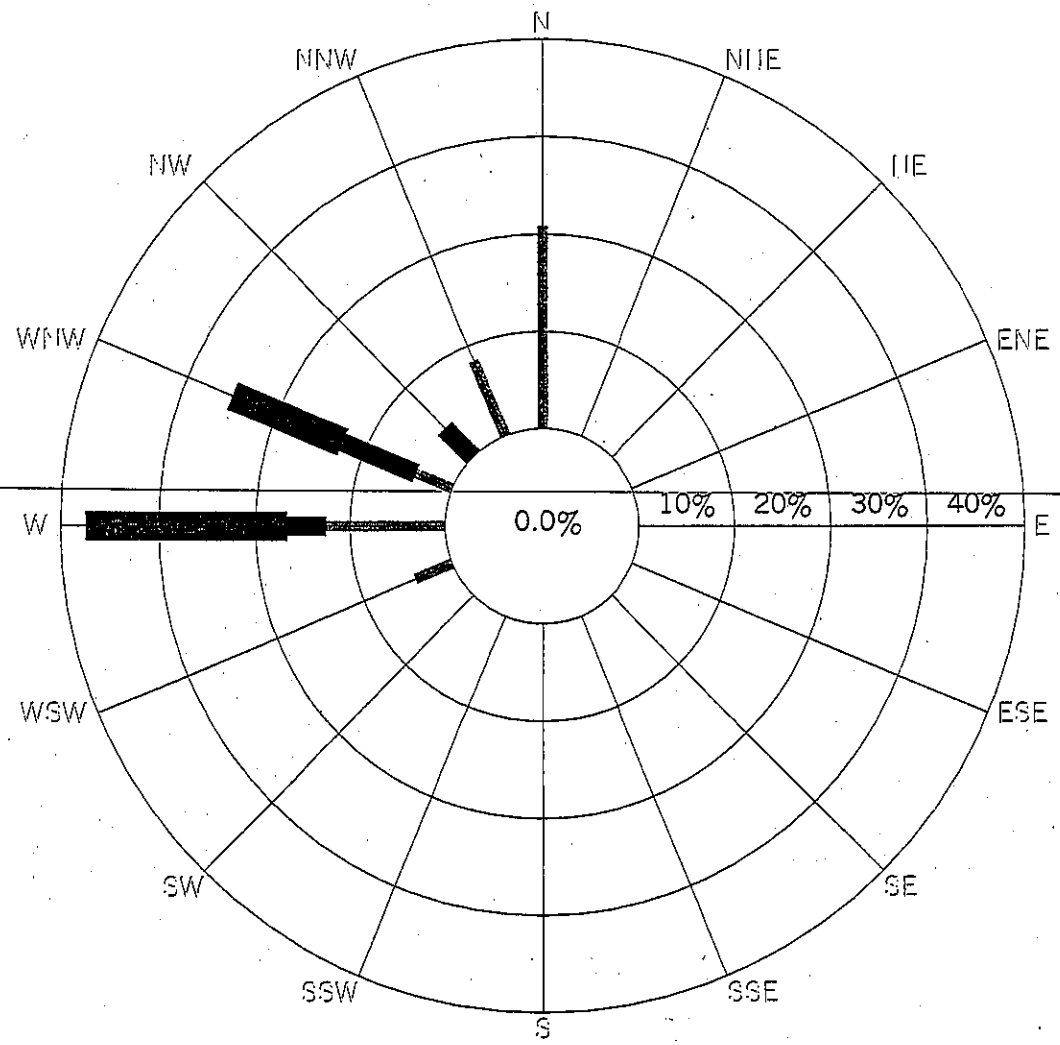
Barrio Logan CR6

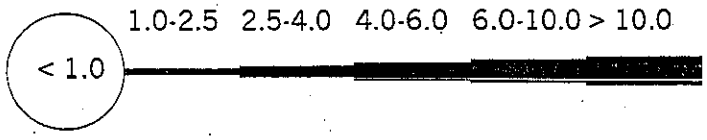
Log Date: 2002/04/24 Printing: 2002/05/14

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)
01:00	1.35	20.0	14.86	85.3	21.2
02:00	1.92	340.8	14.81	84.4	31.3
03:00	2.11	317.9	14.75	85.0	35.4
04:00	2.18	351.6	14.37	87.3	27.3
05:00	1.84	354.8	14.37	87.5	38.2
06:00	1.67	4.7	14.48	87.0	32.3
07:00	2.52	322.6	15.46	83.4	39.5
08:00	2.60	300.5	16.01	81.2	41.9
09:00	2.39	345.8	15.90	82.8	35.9
10:00	2.30	2.7	15.46	90.9	24.7
11:00	2.13	5.7	15.52	92.0	35.2
12:00	1.88	352.9	15.57	94.3	43.3
13:00	2.90	296.2	16.55	90.6	40.7
14:00	2.83	291.4	17.48	85.8	44.2
15:00	4.15	268.9	18.25	80.1	35.7
16:00	3.49	286.0	18.79	70.1	37.6
17:00	3.02	279.3	18.41	68.2	33.9
18:00	3.11	290.7	17.59	73.5	33.7
19:00	2.30	316.3	16.99	74.0	39.6
20:00	2.64	317.5	16.44	79.3	36.4
21:00	2.20	324.8	16.06	83.6	35.3
22:00	1.79	322.0	16.01	82.9	35.3
23:00	1.86	341.6	15.90	83.3	34.9
24:00	1.96	348.8	15.95	79.2	30.1
Sum			385.99	1991.6	843.5
Average	2.38	327.1	16.08	83.0	35.1
Maximum			18.79	94.3	44.2
Time			16:00	12:00	14:00
Minimum			14.37	68.2	21.2
Time			04:00	17:00	01:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 04/25 Time: 01:00 ----- 2002 04/25 Time: 24:00





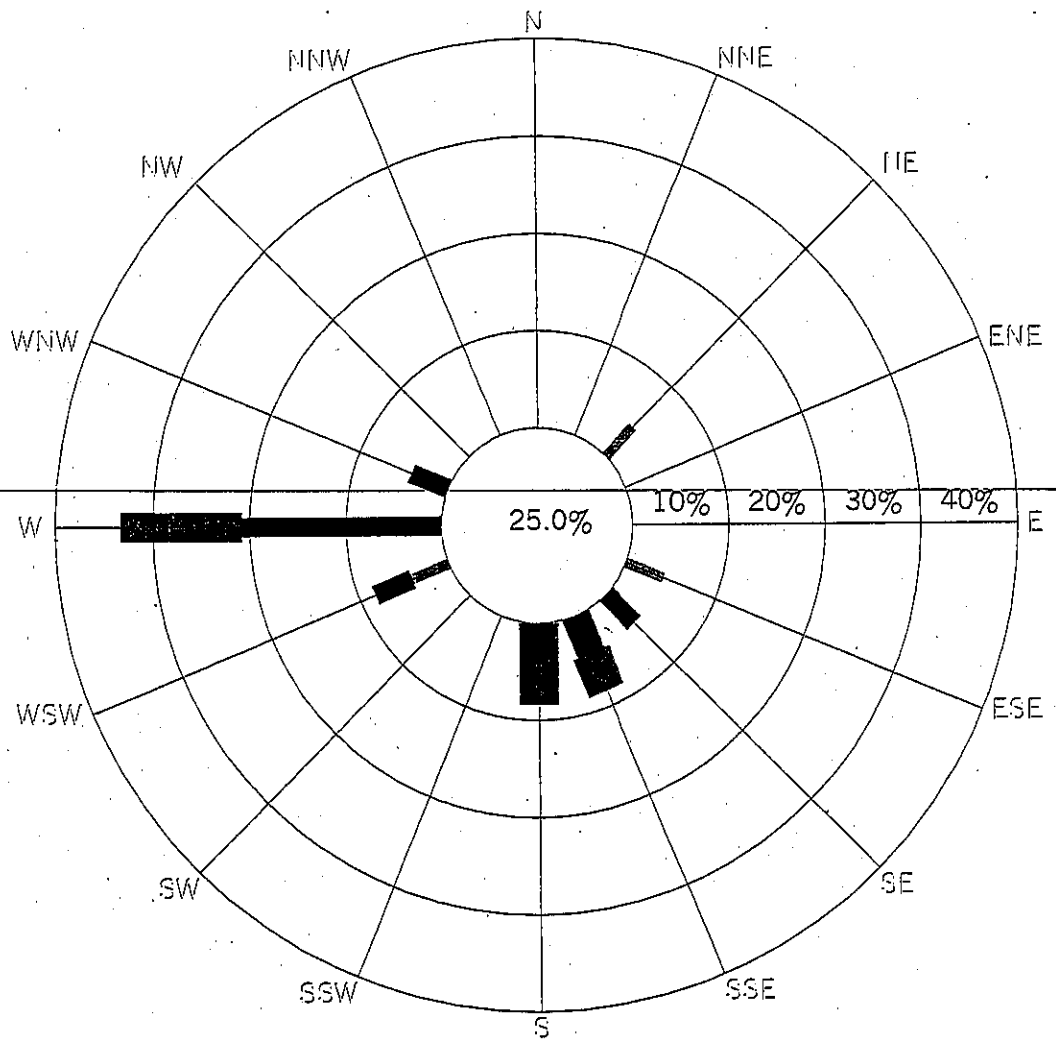
Barrio Logan CR6

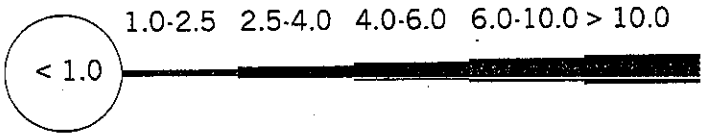
Log Date: 2002/04/25 Printing: 2002/05/14

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)
01:00	1.43	357.9	15.24	83.1	28.3
02:00	1.20	8.3	14.92	85.9	22.6
03:00	1.03	4.9	14.59	87.6	30.2
04:00	1.22	345.2	14.92	87.0	33.3
05:00	1.43	346.6	15.13	86.2	33.1
06:00	1.73	1.3	15.13	87.5	26.2
07:00	2.13	0.4	15.79	85.0	36.8
08:00	2.60	303.9	17.37	74.7	50.0
09:00	3.39	281.3	18.57	71.6	44.5
10:00	4.57	277.9	18.74	70.4	35.8
11:00	4.38	276.2	19.39	66.9	37.9
12:00	4.53	277.8	19.34	66.7	42.6
13:00	4.83	283.6	19.56	65.5	36.4
14:00	4.49	282.7	19.17	66.4	42.2
15:00	4.70	283.4	19.28	64.0	38.3
16:00	4.85	277.8	18.74	66.2	37.4
17:00	4.23	274.3	18.25	70.9	37.8
18:00	3.30	287.9	17.37	73.7	41.5
19:00	3.02	279.8	16.34	79.8	39.7
20:00	2.30	278.5	16.17	79.2	41.8
21:00	1.69	266.6	15.95	80.0	50.9
22:00	1.56	284.8	15.68	82.1	41.0
23:00	1.73	250.9	15.46	84.9	44.3
24:00	1.48	271.7	15.19	84.5	48.6
Sum			406.29	1849.9	921.3
Average	2.83	299.5	16.93	77.1	38.4
Maximum			19.56	87.6	50.9
Time			13:00	03:00	21:00
Minimum			14.59	64.0	22.6
Time			03:00	15:00	02:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 04/26 Time: 01:00 ----- 2002 04/26 Time: 24:00





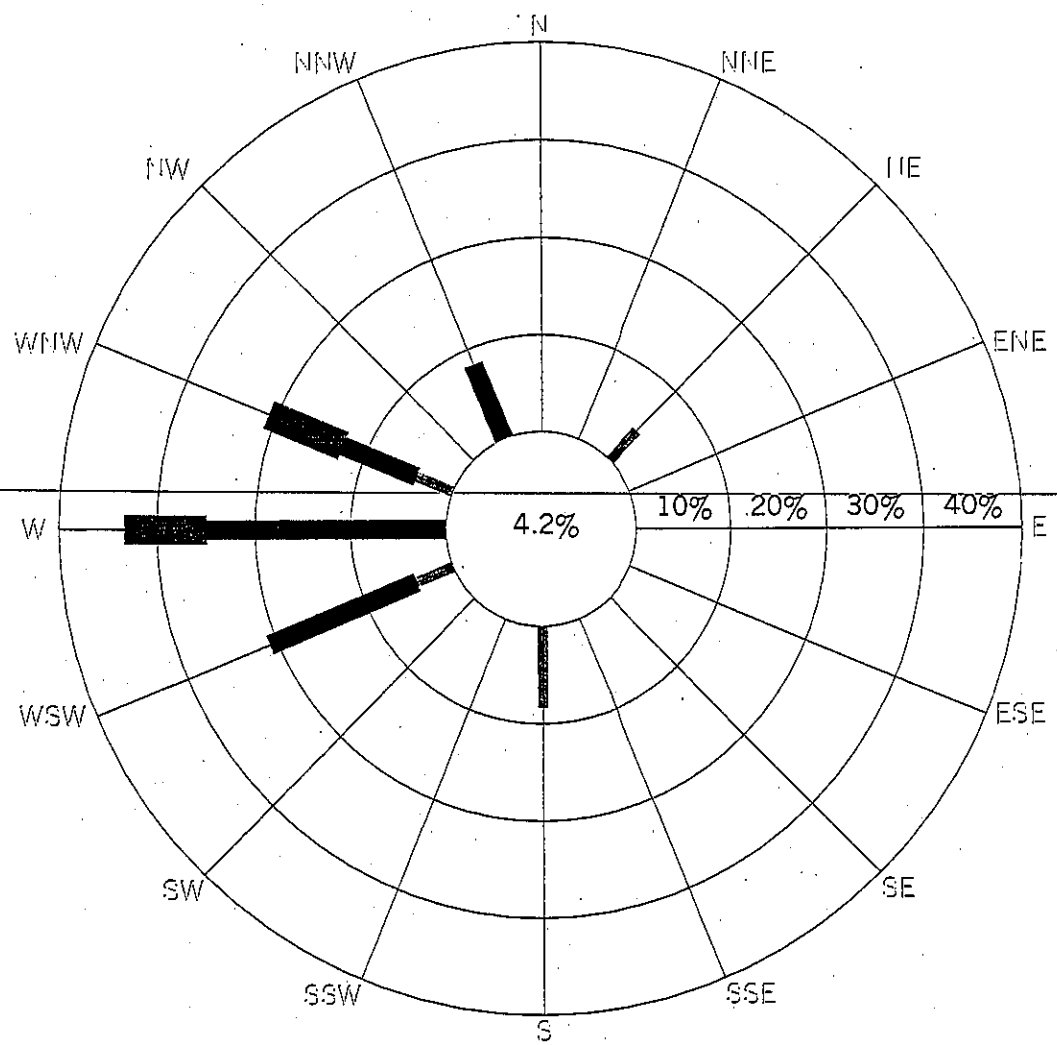
Barrio Logan CR6

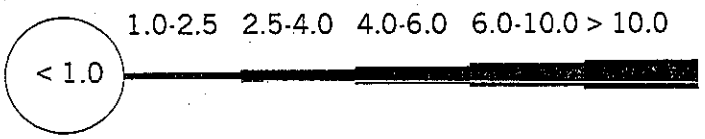
og Date: 2002/04/26 Printing: 2002/05/14

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)
01:00	0.90	358.6	14.59	85.1	36.8
02:00	0.73	36.5	14.04	85.9	42.4
03:00	1.22	39.3	14.21	87.6	39.0
04:00	0.82	67.4	14.37	89.0	51.1
05:00	0.86	69.4	14.15	90.3	55.0
06:00	0.97	64.4	14.15	90.3	47.3
07:00	0.84	76.6	13.82	93.8	40.8
08:00	3.60	145.3	15.57	92.4	36.6
09:00	2.26	106.7	16.99	94.4	35.2
10:00	4.36	146.7	18.90	86.1	25.2
11:00	6.59	170.0	18.85	83.3	27.9
12:00	7.37	168.3	20.16	83.4	27.4
13:00	6.38	174.6	19.99	80.8	28.9
14:00	4.96	270.2	20.16	74.3	47.0
15:00	4.57	280.7	20.37	67.1	32.3
16:00	4.28	279.4	19.50	71.2	37.3
17:00	3.89	271.3	18.14	77.4	35.2
18:00	2.81	279.2	16.55	87.8	43.9
19:00	3.19	283.8	16.28	82.9	36.0
20:00	2.66	278.4	16.34	82.1	40.3
21:00	2.28	238.6	16.72	80.9	38.6
22:00	3.02	260.3	16.17	77.6	40.7
23:00	3.05	238.7	15.68	77.5	35.0
24:00	2.92	268.0	15.08	74.3	37.6
Sum			400.78	1995.5	917.8
Average	3.11	248.2	16.70	83.1	38.2
Maximum			20.37	94.4	55.0
Time			15:00	09:00	05:00
Minimum			13.82	67.1	25.2
Time			07:00	15:00	10:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 04/27 Time: 01:00 ----- 2002 04/27 Time: 24:00





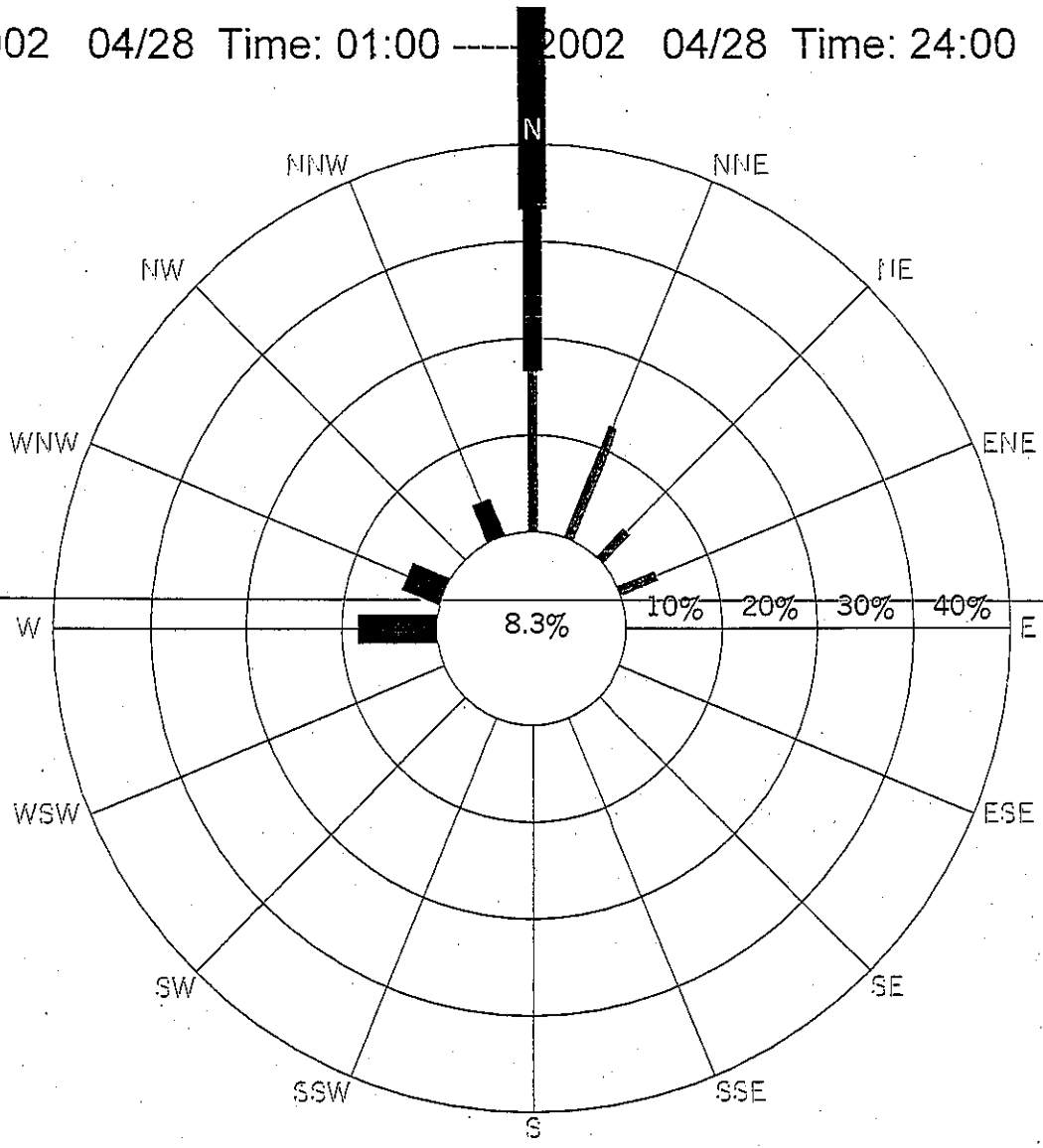
Barrio Logan CR6

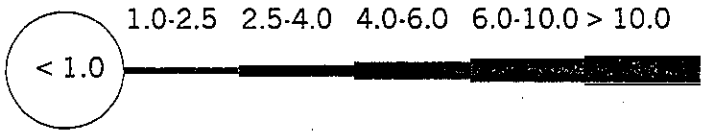
og Date: 2002/04/27 Printing: 2002/05/14

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)
01:00	2.77	272.7	-4.57	74.6	38.0
02:00	3.26	272.2	5.58	75.6	37.8
03:00	3.02	276.0	15.79	76.1	39.6
04:00	2.92	284.9	15.19	74.6	36.3
05:00	3.02	278.3	13.39	73.5	39.3
06:00	1.94	254.9	-14.61	74.3	43.5
07:00	2.49	283.9	-6.15	71.8	39.3
08:00	2.77	262.9	2.58	73.3	41.7
09:00	3.13	247.6	5.53	65.6	46.3
10:00	3.36	247.0	7.93	64.4	44.3
11:00	3.66	251.9	9.62	64.7	42.8
12:00	3.70	258.0	8.64	64.3	44.9
13:00	3.64	283.7	-12.97	67.0	38.7
14:00	3.53	276.7	-48.39	61.8	41.8
15:00	4.17	279.3	-71.86	58.8	37.5
16:00	4.19	279.9	-60.78	61.3	38.2
17:00	4.04	283.4	-72.68	60.7	40.5
18:00	4.11	284.4	-72.79	61.2	32.7
19:00	3.30	331.2	-72.79	103.8	38.6
20:00	2.62	342.9	-72.79	71.8	39.1
21:00	1.92	45.8	-72.79	160.5	79.1
22:00	1.28	190.9	-72.79	218.8	73.3
23:00	0.92	204.3	-72.79	243.6	20.6
24:00	1.03	172.3	-72.79	195.7	19.7
Sum			-717.30	2217.7	993.7
Average	2.95	269.9	-29.89	92.4	41.4
Maximum Time			15.79 03:00	243.6 23:00	79.1 21:00
Minimum Time			-72.79 18:00	58.8 15:00	19.7 24:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 04/28 Time: 01:00 ----- 2002 04/28 Time: 24:00





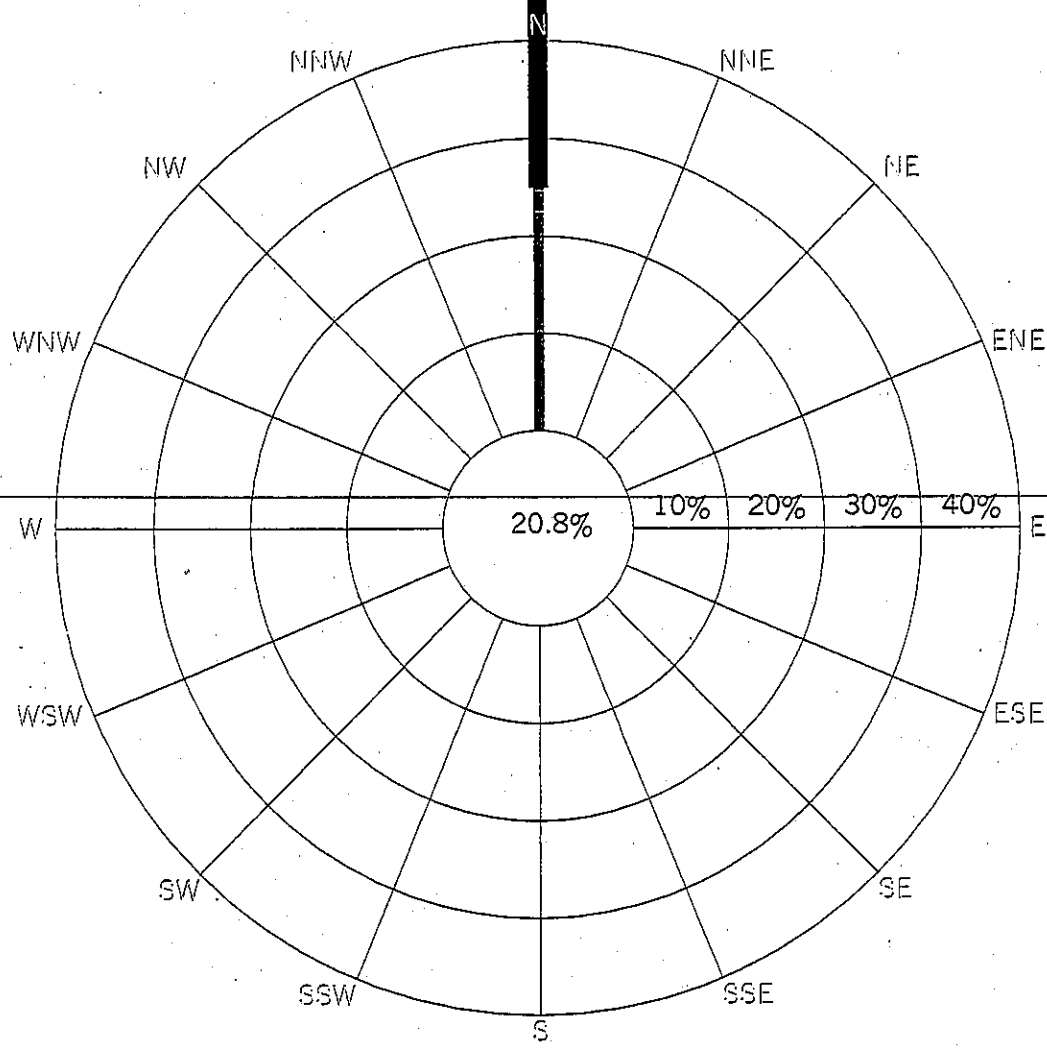
Barrio Logan CR6

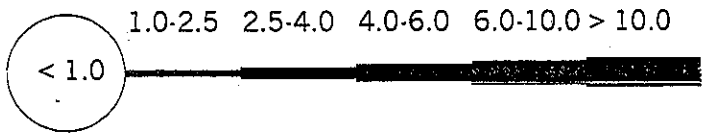
Log Date: 2002/04/28 Printing: 2002/05/14

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)
01:00	1.22	77.3	-72.79	113.2	30.4
02:00	1.45	28.1	-72.79	83.9	20.2
03:00	0.78	56.9	-72.79	89.2	32.8
04:00	1.07	49.9	-72.79	93.6	29.4
05:00	0.82	50.0	-72.79	87.8	25.4
06:00	1.52	27.5	-72.79	87.5	24.3
07:00	1.67	27.0	-72.79	81.5	34.9
08:00	2.60	352.5	-72.79	68.5	49.3
09:00	2.90	331.4	-72.79	59.0	47.4
10:00	4.30	280.5	-72.79	57.5	42.6
11:00	5.27	278.3	-72.79	56.8	33.1
12:00	5.17	284.0	-72.79	57.8	34.7
13:00	5.66	356.7	-72.79	221.5	17.9
14:00	5.53	359.8	-72.79	249.9	0.3
15:00	4.91	359.0	-72.79	249.8	6.3
16:00	4.85	359.4	-72.79	249.9	4.0
17:00	4.21	359.6	-72.79	249.9	2.8
18:00	3.70	0.0	-72.79	249.9	0.0
19:00	2.90	0.0	-72.79	249.9	0.0
20:00	2.56	0.0	-72.79	249.9	0.0
21:00	2.11	0.0	-72.79	249.9	0.0
22:00	2.05	0.0	-72.79	249.9	0.0
23:00	1.60	359.8	-72.79	249.9	0.2
24:00	1.33	0.0	-72.79	249.9	0.0
Sum			-1746.96	3906.8	435.9
Average	2.92	3.2	-72.79	162.8	18.2
Maximum			-72.79	249.9	49.3
Time			01:00	14:00	08:00
Minimum			-72.79	56.8	0.0
Time			01:00	11:00	18:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 04/29 Time: 01:00 ----- 2002 04/29 Time: 24:00





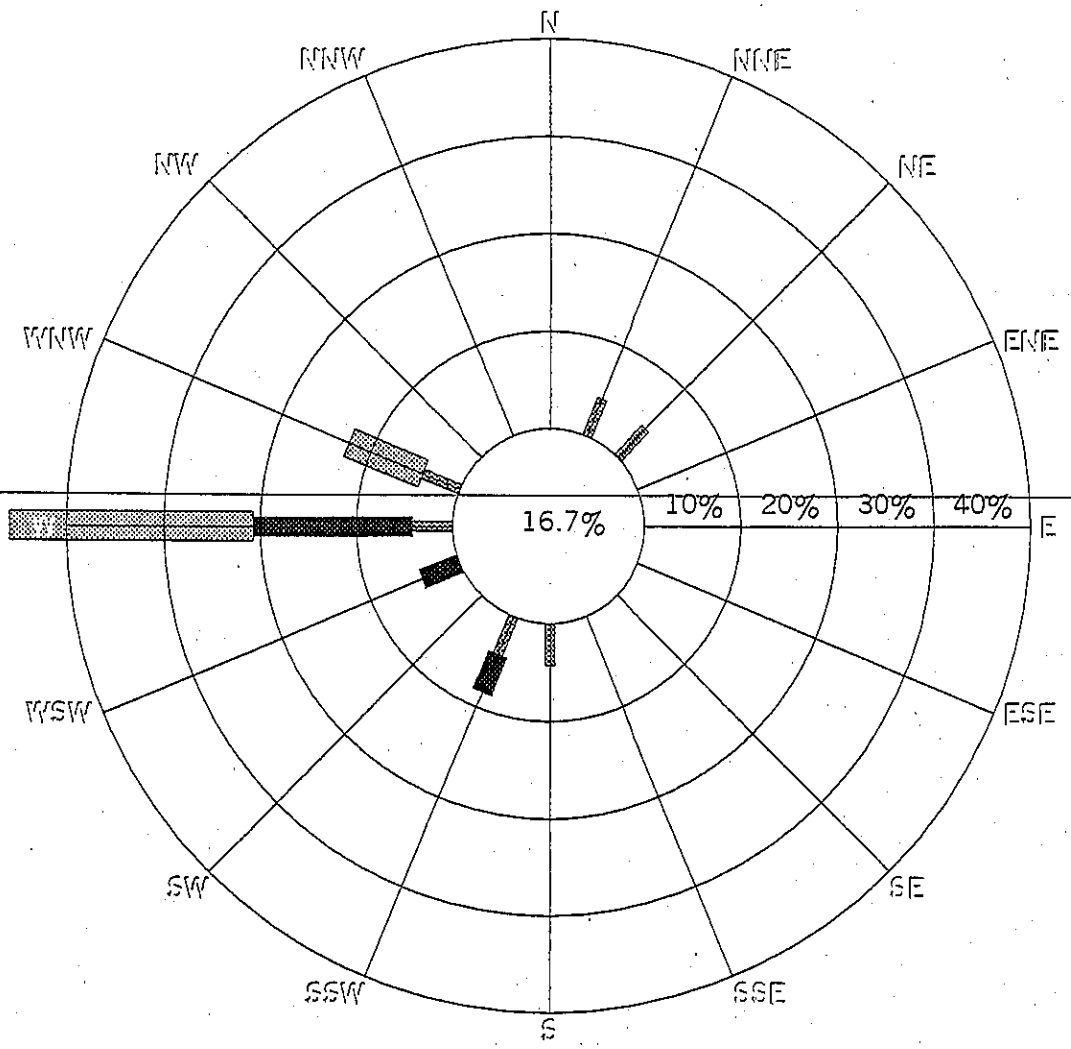
Barrio Logan CR6

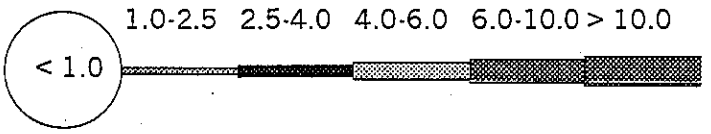
Log Date: 2002/04/29 Printing: 2002/05/14

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)
01:00	0.88	359.6	-72.79	249.9	4.8
02:00	0.69	0.0	-72.79	249.9	0.0
03:00	0.97	0.0	-72.79	249.9	0.0
04:00	0.86	0.0	-72.79	249.9	0.0
05:00	1.05	0.0	-72.79	249.9	0.0
06:00	1.33	0.0	-72.79	249.9	0.0
07:00	1.75	0.0	-72.79	249.9	0.0
08:00	2.52	0.0	-72.79	249.9	0.0
09:00	3.28	0.0	-72.79	249.9	0.0
10:00	3.94	0.0	-72.79	249.9	0.0
11:00	3.81	0.0	-72.79	249.9	0.0
12:00	4.32	0.0	-72.79	249.9	0.0
13:00	4.68	0.0	-72.79	249.9	0.0
14:00	5.27	0.0	-72.79	249.9	0.0
15:00	5.08	359.8	-72.79	249.2	1.0
16:00	4.51	0.0	-72.79	249.9	0.0
17:00	4.55	0.0	-72.79	249.9	0.0
18:00	4.23	0.0	-72.79	249.9	0.0
19:00	3.24	0.0	-72.79	249.9	0.0
20:00	2.66	0.0	-72.79	249.9	0.0
21:00	2.28	359.8	-72.79	249.9	0.2
22:00	1.79	359.4	-72.79	249.7	5.5
23:00	1.52	0.0	-72.79	249.9	0.0
24:00	0.67	0.0	-72.79	249.9	0.0
Sum			-1746.96	5997.5	11.5
Average	2.75	359.9	-72.79	249.9	0.5
Maximum			-72.79	249.9	5.5
Time			01:00	02:00	22:00
Minimum			-72.79	249.2	0.0
Time			01:00	15:00	02:00
Standard # above	----	----	----	----	----
Valid	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 04/30 Time: 01:00 ----- 2002 04/30 Time: 24:00





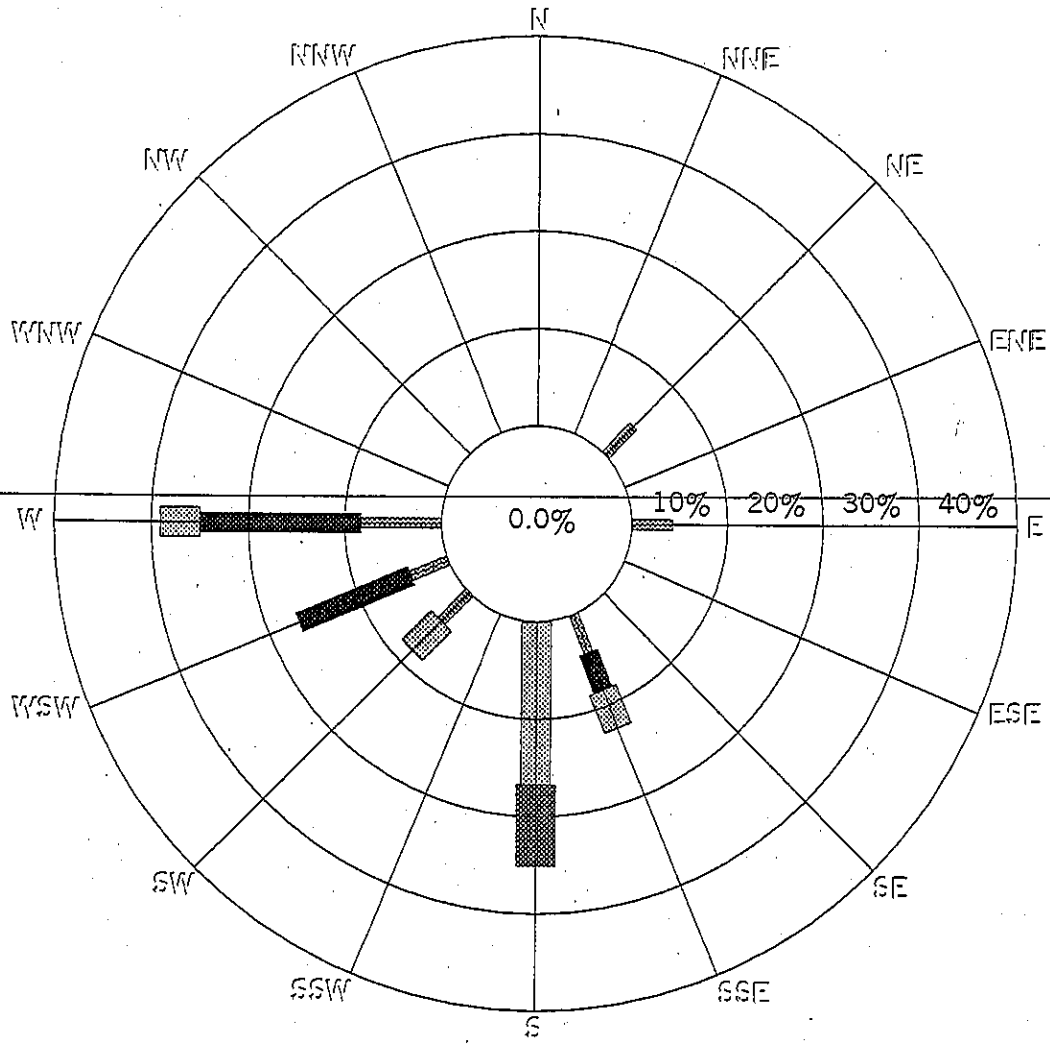
Barrio Logan CR6

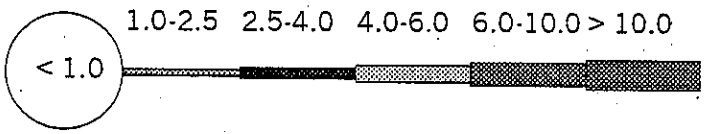
Log Date: 2002/04/30 Printing: 2002/05/15

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	0.65	0.0	-72.79	249.9	0.0	0
02:00	0.69	0.0	-72.79	249.9	0.0	0
03:00	0.71	318.5	-72.79	230.2	30.1	0
04:00	1.18	185.4	-72.79	151.5	46.6	0
05:00	1.43	40.4	-72.79	91.2	31.5	0
06:00	0.84	62.4	-72.79	88.0	43.9	0
07:00	1.01	23.8	-72.74	84.6	24.0	0
08:00	2.28	196.3	-31.75	82.5	60.1	0
09:00	3.41	208.3	-13.08	76.3	42.7	0
10:00	3.68	254.2	-10.46	67.5	43.0	0
11:00	4.57	276.9	-9.04	65.4	40.7	0
12:00	4.68	280.5	-58.00	64.2	36.4	0
13:00	5.06	280.5	-71.97	62.9	35.2	0
14:00	5.04	284.7	-17.18	56.8	37.9	0
15:00	5.13	280.1	-1.18	55.4	38.9	0
16:00	5.19	279.4	-1.35	55.9	36.4	0
17:00	4.72	282.0	-5.55	56.8	36.0	0
18:00	4.06	279.6	-30.60	62.2	37.7	0
19:00	3.72	281.1	-46.32	68.5	34.7	0
20:00	2.81	268.6	-72.74	70.6	37.1	0
21:00	2.37	272.1	-72.79	70.8	38.7	0
22:00	2.58	280.4	-68.75	72.3	38.5	0
23:00	2.01	285.5	-21.38	71.0	40.0	0
24:00	2.75	277.8	-17.12	72.1	34.7	0
Sum			-1058.74	2276.6	844.6	0
Average	2.94	285.7	-44.11	94.9	35.2	0
Maximum Time			-1.18 15:00	249.9 01:00	60.1 08:00	0 01:00
Minimum Time			-72.79 01:00	55.4 15:00	0.0 01:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 05/01 Time: 01:00 ----- 2002 05/01 Time: 24:00





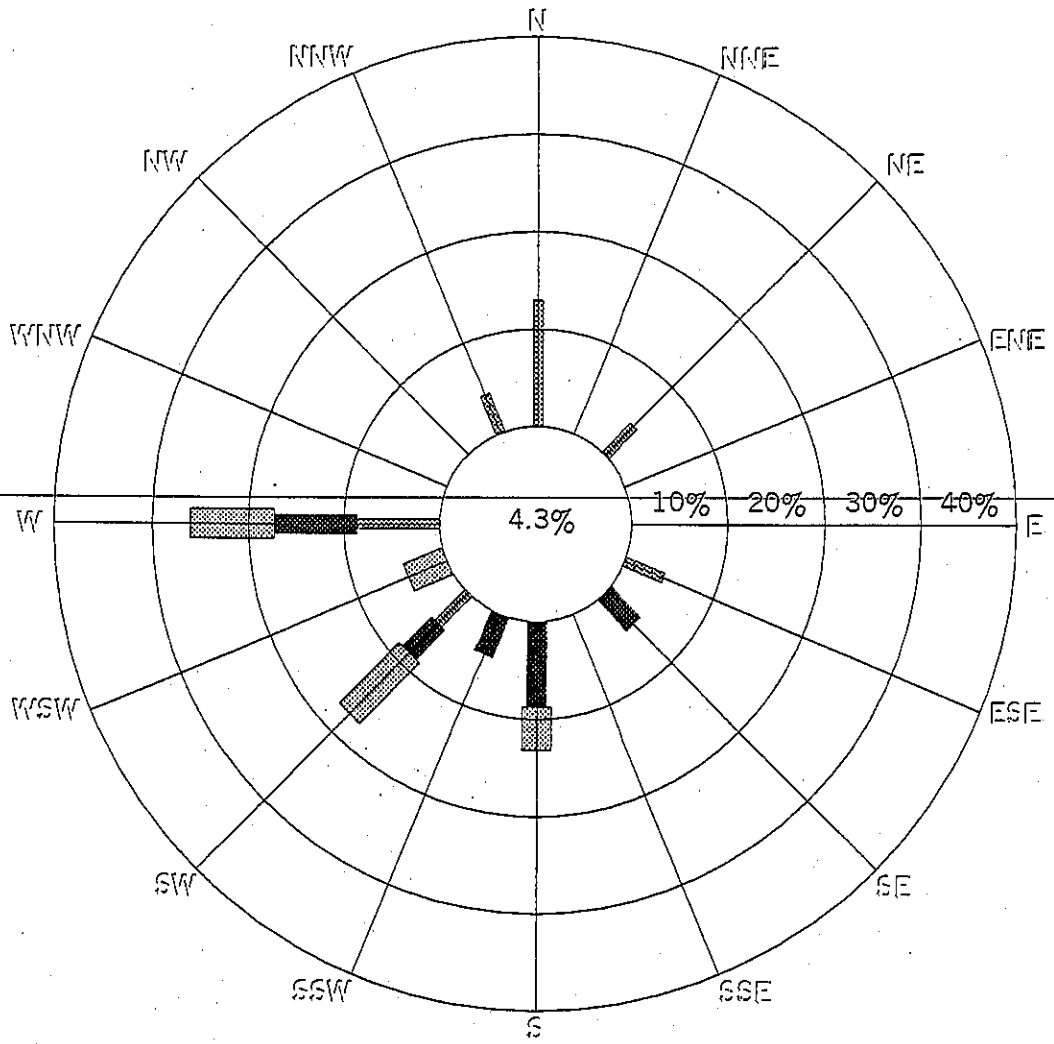
Barrio Logan CR6

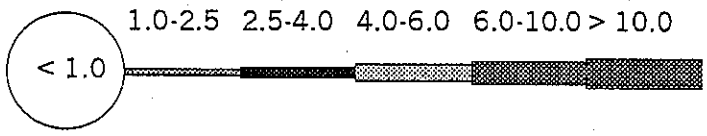
.og Date: 2002/05/01 Printing: 2002/05/15

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	2.11	281.1	-26.67	75.3	40.8	0
02:00	1.65	234.9	5.15	76.7	40.6	0
03:00	2.20	245.7	9.13	78.2	48.5	0
04:00	1.71	272.3	8.97	74.8	58.6	0
05:00	2.45	155.9	3.07	72.3	31.2	0
06:00	1.65	54.3	-0.53	76.2	39.3	0
07:00	1.58	85.3	-2.77	74.5	52.3	0
08:00	3.96	161.4	9.08	69.9	30.6	0
09:00	4.81	165.9	9.02	66.7	24.8	0
10:00	5.17	169.8	2.09	66.7	27.9	0
11:00	4.93	174.6	3.73	63.4	32.9	0
12:00	5.61	184.1	6.46	61.0	34.4	0
13:00	5.76	172.1	7.49	60.0	25.5	0
14:00	6.40	178.0	8.91	63.7	9.2	0
15:00	6.04	186.8	8.59	62.8	39.5	0
16:00	4.98	225.2	8.48	61.5	40.4	0
17:00	4.00	277.7	9.19	63.2	38.9	0
18:00	3.68	272.8	9.40	67.3	41.9	0
19:00	3.11	260.2	1.82	69.0	41.7	0
20:00	2.94	240.2	-5.22	69.3	44.4	0
21:00	2.85	239.9	-0.20	69.6	40.3	0
22:00	2.69	246.4	1.82	69.5	41.2	0
23:00	2.85	268.4	4.66	69.1	38.7	0
24:00	2.69	276.9	6.18	70.8	35.1	0
Sum			87.83	1651.6	898.9	0
Average	3.58	219.6	3.66	68.8	37.5	0
Maximum Time			9.40 18:00	78.2 03:00	58.6 04:00	0 01:00
Minimum Time			-26.67 01:00	60.0 13:00	9.2 14:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 05/02 Time: 01:00 ----- 2002 05/02 Time: 24:00





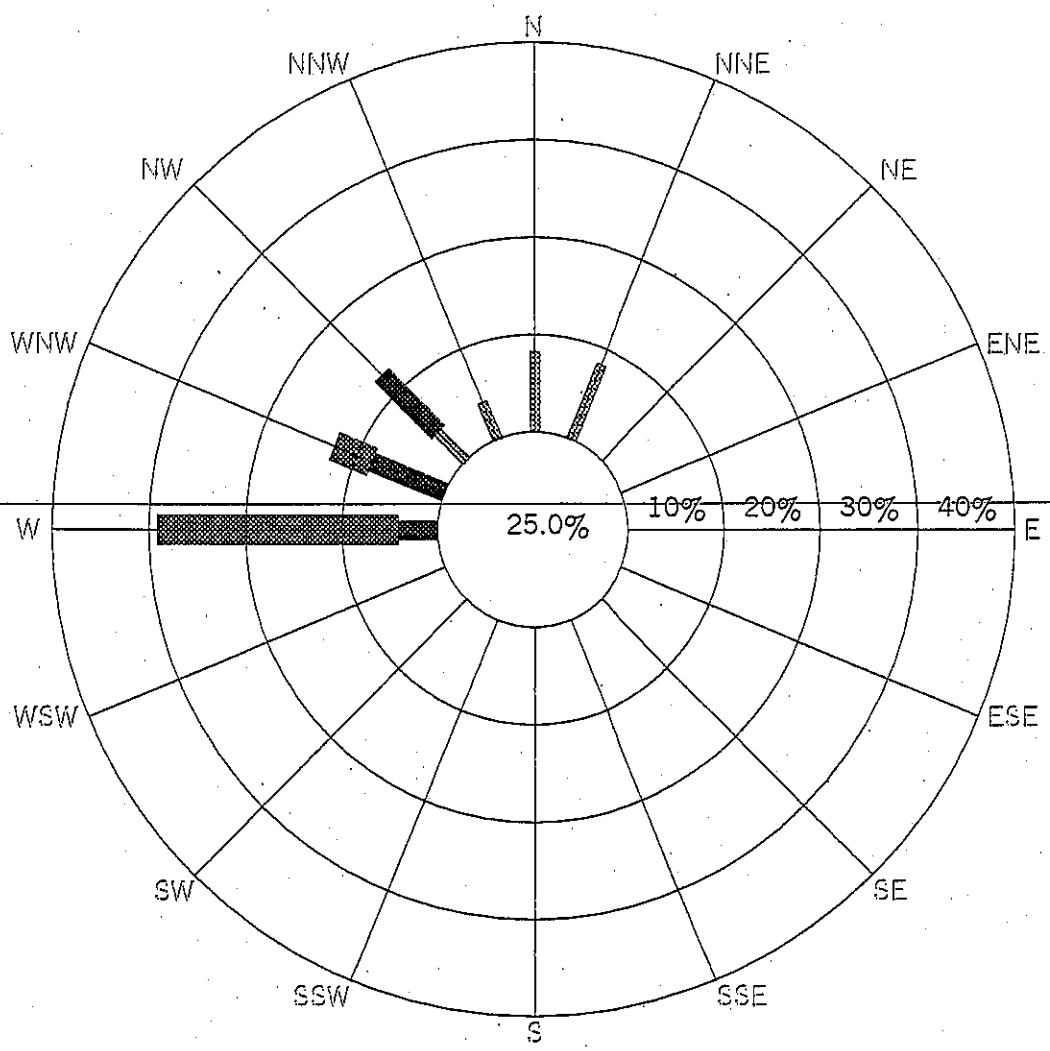
Barrio Logan CR6

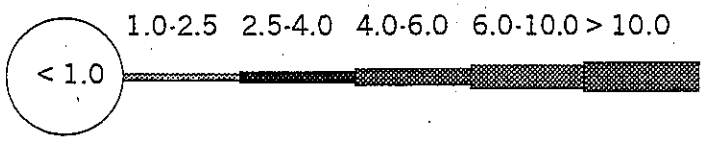
Log Date: 2002/05/02 Printing: 2002/05/15

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	2.13	262.5	6.62	72.7	37.7	0
02:00	2.64	188.1	5.09	73.3	45.1	0
03:00	2.56	204.7	5.47	72.4	39.4	0
04:00	1.03	3.5	6.07	74.4	33.7	0
05:00	1.24	38.9	5.75	79.0	27.9	0
06:00	0.78	58.0	6.40	79.3	43.9	0
07:00	2.20	119.0	6.62	70.1	36.2	0
08:00	3.32	146.1	5.42	63.1	31.2	0
09:00	3.62	178.2	7.38	56.2	41.8	0
10:00	4.74	178.7	9.73	55.4	34.9	0
11:00	4.87	218.8	10.50	59.1	42.7	0
12:00	5.21	237.3	11.20	61.0	34.1	0
13:00	5.10	215.7	12.41	59.3	42.9	0
14:00	----	----	----	----	----	----
15:00	4.21	268.9	10.99	55.1	48.7	0
16:00	4.02	272.7	5.37	57.1	43.0	0
17:00	3.66	273.1	-20.89	59.8	44.7	0
18:00	3.39	265.2	-41.57	63.4	44.6	0
19:00	3.26	214.8	-45.12	73.9	47.8	0
20:00	2.28	234.1	-41.74	80.0	55.8	0
21:00	1.82	278.4	-42.88	79.5	42.3	0
22:00	1.65	329.9	-43.43	81.0	36.1	0
23:00	2.09	351.6	-44.30	80.7	28.9	0
24:00	1.84	352.0	-47.63	83.5	27.9	0
Sum			-212.53	1589.4	911.3	0
Average	2.94	245.1	-9.24	69.1	39.6	0
Maximum Time			12.41 13:00	83.5 24:00	55.8 20:00	0 01:00
Minimum Time			-47.63 24:00	55.1 15:00	27.9 05:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	96%	96%	96%	96%	96%	96%

WIND ROSE PLOT

2002 05/03 Time: 01:00 ----- 2002 05/03 Time: 24:00





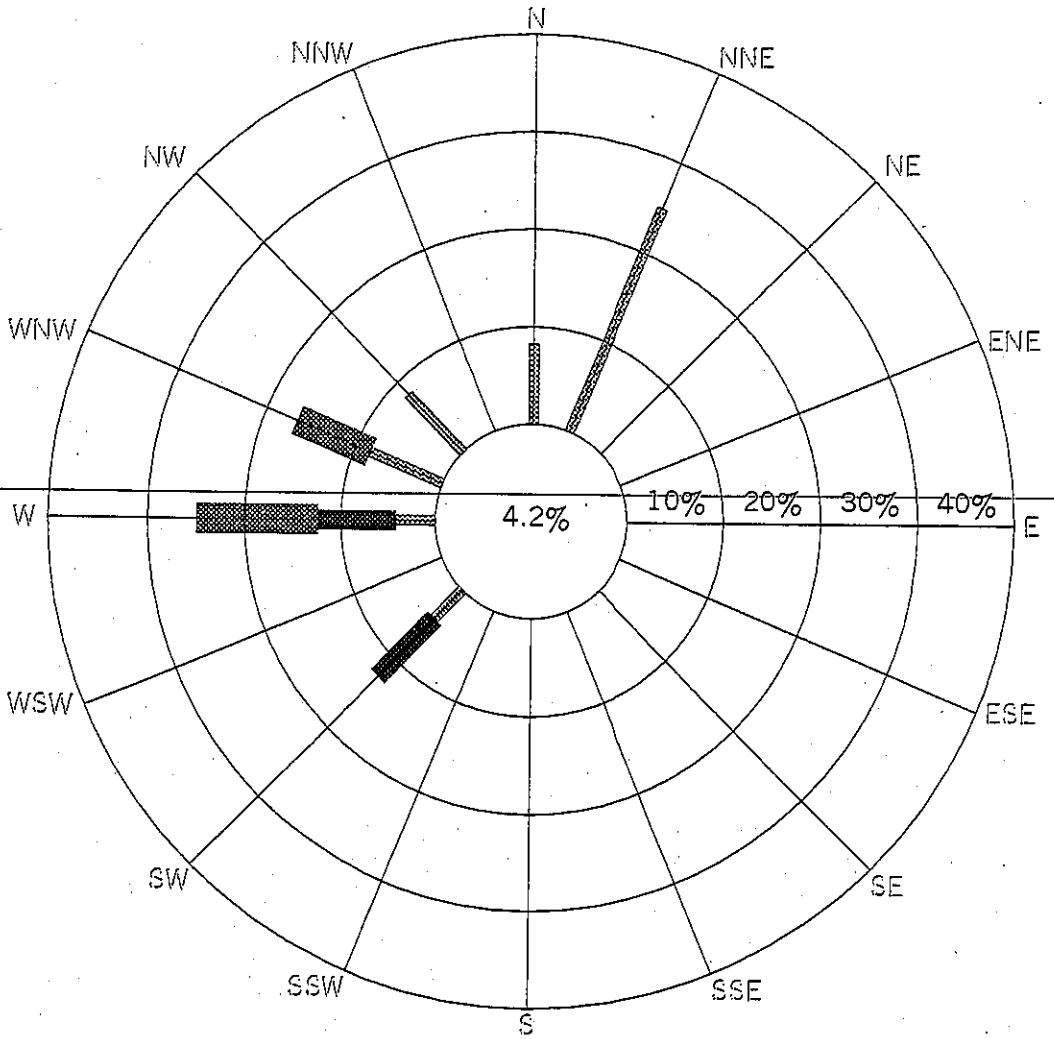
Barrio Logan CR6

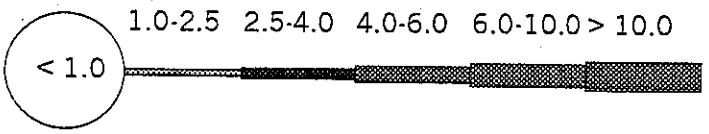
Log Date: 2002/05/03 Printing: 2002/05/14

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	1.48	357.3	-38.62	84.0	25.8	0
02:00	0.92	40.1	-31.86	86.7	26.2	0
03:00	0.80	48.7	-21.60	88.7	21.6	0
04:00	0.86	53.2	-17.61	90.8	22.5	0
05:00	0.84	52.0	-9.43	91.4	22.7	0
06:00	0.88	38.4	1.71	90.9	38.9	0
07:00	0.99	34.3	3.29	87.4	42.9	0
08:00	1.20	28.9	4.66	83.9	40.3	0
09:00	2.15	315.0	7.44	77.9	35.1	0
10:00	2.56	321.4	10.66	73.3	46.5	0
11:00	3.51	281.2	11.75	71.1	18.2	0
12:00	4.13	276.2	12.30	68.9	40.9	0
13:00	5.06	272.8	12.84	65.4	37.6	0
14:00	5.04	280.2	13.72	65.0	38.2	0
15:00	5.02	275.4	12.08	66.4	26.8	0
16:00	5.00	274.4	11.59	68.1	38.7	0
17:00	4.62	276.6	11.53	68.4	35.2	0
18:00	4.34	288.3	10.33	71.4	38.3	0
19:00	3.89	282.7	9.95	76.7	33.5	0
20:00	2.94	299.5	10.44	80.1	41.1	0
21:00	2.60	305.6	10.22	81.7	37.9	0
22:00	2.24	352.1	10.00	83.7	30.6	0
23:00	1.60	339.3	10.11	84.8	38.8	0
24:00	1.48	17.7	9.51	86.7	21.6	0
Sum			65.02	1893.4	799.9	0
Average	2.67	330.0	2.71	78.9	33.3	0
Maximum			13.72	91.4	46.5	0
Time			14:00	05:00	10:00	01:00
Minimum			-38.62	65.0	18.2	0
Time			01:00	14:00	11:00	01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 05/04 Time: 01:00 ----- 2002 05/04 Time: 24:00





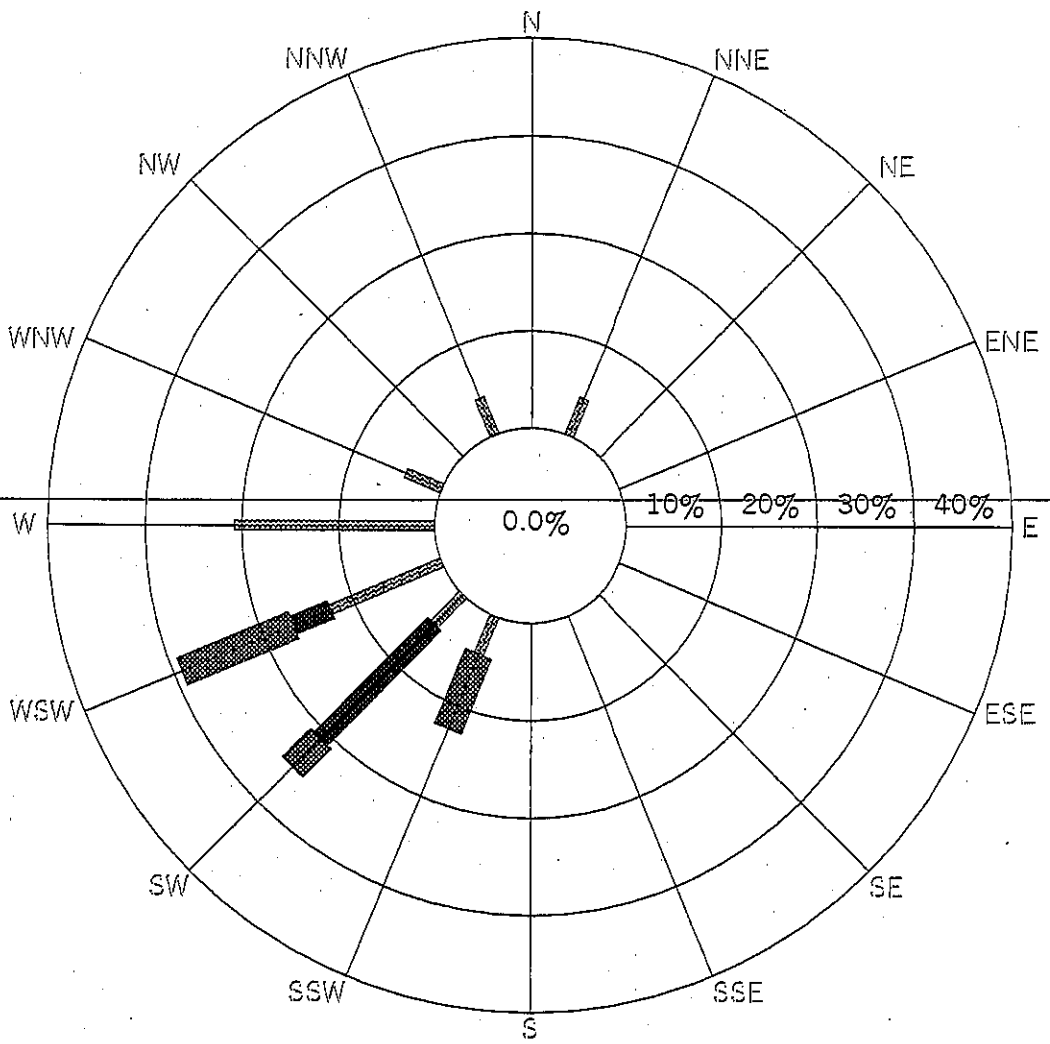
Barrio Logan CR6

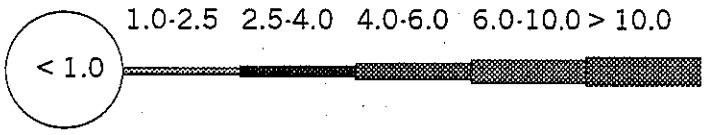
Log Date: 2002/05/04 Printing: 2002/05/14

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	1.71	5.1	9.19	87.0	20.1	0
02:00	0.86	44.6	9.24	85.8	56.2	0
03:00	1.50	19.9	8.64	85.6	55.8	0
04:00	1.58	27.9	8.31	86.4	27.2	0
05:00	1.54	8.4	8.53	87.3	46.3	0
06:00	1.31	31.6	8.42	88.2	37.9	0
07:00	1.56	26.9	8.20	88.6	39.6	0
08:00	1.41	32.1	8.75	87.0	48.3	0
09:00	2.35	18.5	9.79	82.5	39.1	0
10:00	2.32	309.9	10.33	77.9	59.1	0
11:00	3.92	222.9	11.37	74.6	47.9	0
12:00	3.92	279.8	12.62	68.3	43.3	0
13:00	4.21	282.4	12.73	67.0	40.2	0
14:00	4.66	283.3	12.79	66.6	42.4	0
15:00	4.98	280.4	11.64	67.1	36.6	0
16:00	4.72	278.6	11.48	69.3	38.3	0
17:00	4.02	279.2	10.88	70.8	41.3	0
18:00	3.70	268.6	8.37	73.0	43.1	0
19:00	3.41	221.3	4.38	80.1	45.8	0
20:00	2.37	226.4	1.71	83.2	47.4	0
21:00	1.62	286.2	1.16	82.2	67.5	0
22:00	1.82	304.3	1.38	81.2	52.3	0
23:00	1.92	285.1	2.15	80.6	48.3	0
24:00	1.96	278.3	2.64	80.9	42.9	0
Sum			194.69	1901.4	1067.0	0
Average	2.64	311.8	8.11	79.2	44.5	0
Maximum			12.79	88.6	67.5	0
Time			14:00	07:00	21:00	01:00
Minimum			1.16	66.6	20.1	0
Time			21:00	14:00	01:00	01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 05/05 Time: 01:00 ----- 2002 05/05 Time: 24:00





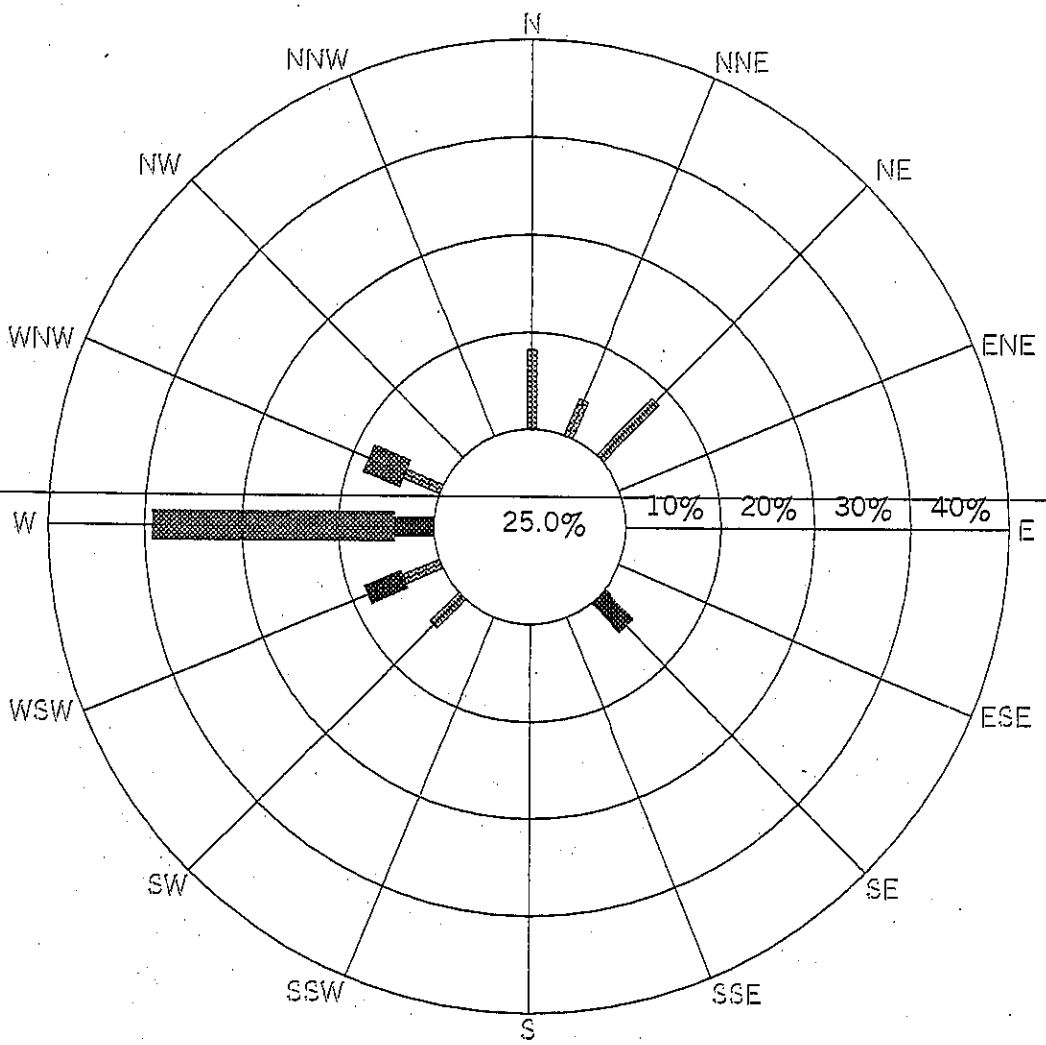
Barrio Logan CR6

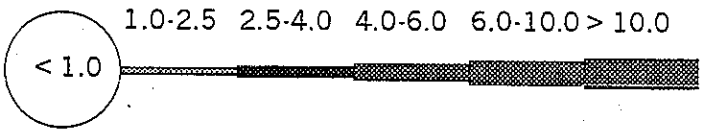
Log Date: 2002/05/05 Printing: 2002/05/14

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	1.65	263.7	3.95	81.5	46.5	0
02:00	2.13	232.6	4.93	82.9	45.3	0
03:00	2.13	263.7	6.13	83.0	52.1	0
04:00	1.37	195.1	6.18	82.8	73.6	0
05:00	1.28	247.4	7.28	81.5	60.1	0
06:00	1.62	285.6	7.77	81.8	63.8	0
07:00	1.77	281.0	8.20	81.8	62.4	0
08:00	1.33	14.9	8.64	78.8	38.3	0
09:00	1.60	347.5	9.24	76.6	62.7	0
10:00	3.28	228.9	8.37	78.9	43.8	0
11:00	3.62	226.1	4.33	76.2	47.3	0
12:00	4.36	210.8	-0.37	71.9	43.4	0
13:00	4.81	210.0	3.89	72.2	44.4	0
14:00	4.26	258.5	8.26	68.5	44.4	0
15:00	4.04	257.7	7.33	70.6	43.4	0
16:00	3.83	246.4	7.77	70.6	47.2	0
17:00	4.00	234.7	8.42	72.4	47.3	0
18:00	4.06	236.3	7.82	73.1	44.6	0
19:00	3.19	216.2	7.82	76.8	44.6	0
20:00	2.92	226.2	8.26	80.7	47.0	0
21:00	1.92	262.7	8.64	82.7	52.2	0
22:00	1.56	241.6	9.35	82.0	55.8	0
23:00	1.62	271.8	9.79	81.5	48.7	0
24:00	1.88	255.3	10.22	81.7	46.8	0
Sum			172.21	1870.6	1205.6	0
Average	2.68	248.5	7.18	77.9	50.2	0
Maximum Time			10.22 24:00	83.0 03:00	73.6 04:00	0 01:00
Minimum Time			-0.37 12:00	68.5 14:00	38.3 08:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 03/10 Time: 01:00 ----- 2002 03/10 Time: 24:00





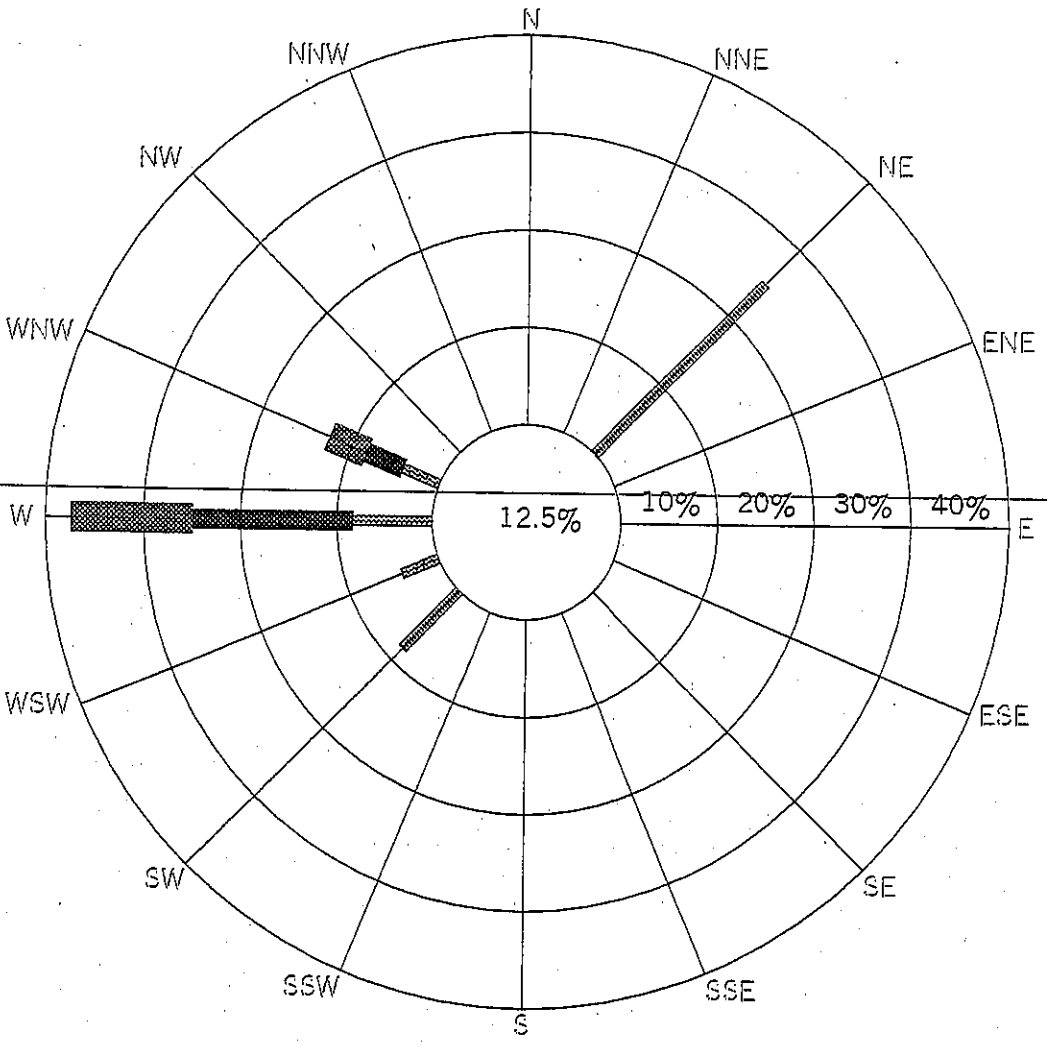
Barrio Logan CR6

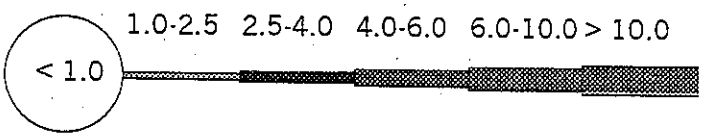
Log Date: 2002/03/10 Printing: 2002/03/26

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	0.99	23.9	12.68	82.6	26.3	0
02:00	0.99	20.9	11.86	83.7	32.5	0
03:00	1.31	11.9	11.75	85.9	16.4	0
04:00	1.12	39.2	11.26	86.2	18.5	0
05:00	0.65	64.3	10.66	87.4	35.6	0
06:00	0.71	52.8	10.17	89.5	28.0	0
07:00	0.52	59.9	10.22	85.8	34.4	0
08:00	1.01	7.2	11.91	75.3	49.3	0
09:00	2.88	124.8	14.21	68.0	40.8	0
10:00	3.47	243.7	16.17	59.7	46.4	0
11:00	5.08	291.5	17.75	67.9	36.9	0
12:00	4.40	279.5	19.12	56.9	39.4	0
13:00	4.87	275.8	19.83	51.8	35.5	0
14:00	4.93	279.8	19.56	57.3	30.2	0
15:00	4.49	275.4	19.45	52.6	33.6	0
16:00	4.11	275.9	18.85	55.1	37.8	0
17:00	4.04	275.9	17.86	62.2	36.3	0
18:00	3.05	280.2	16.34	68.9	35.4	0
19:00	2.09	297.7	15.46	70.7	38.1	0
20:00	1.52	250.8	14.86	75.6	34.5	0
21:00	1.56	234.7	14.37	78.5	49.2	0
22:00	1.01	7.6	13.77	81.7	47.6	0
23:00	1.01	46.2	12.79	81.9	25.8	0
24:00	0.86	54.3	12.19	82.6	26.6	0
Sum			353.08	1747.8	834.9	0
Average	2.36	330.6	14.71	72.8	34.8	0
Maximum Time			19.83 13:00	89.5 06:00	49.3 08:00	0 01:00
Minimum Time			10.17 06:00	51.8 13:00	16.4 03:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 03/11 Time: 01:00 ----- 2002 03/11 Time: 24:00





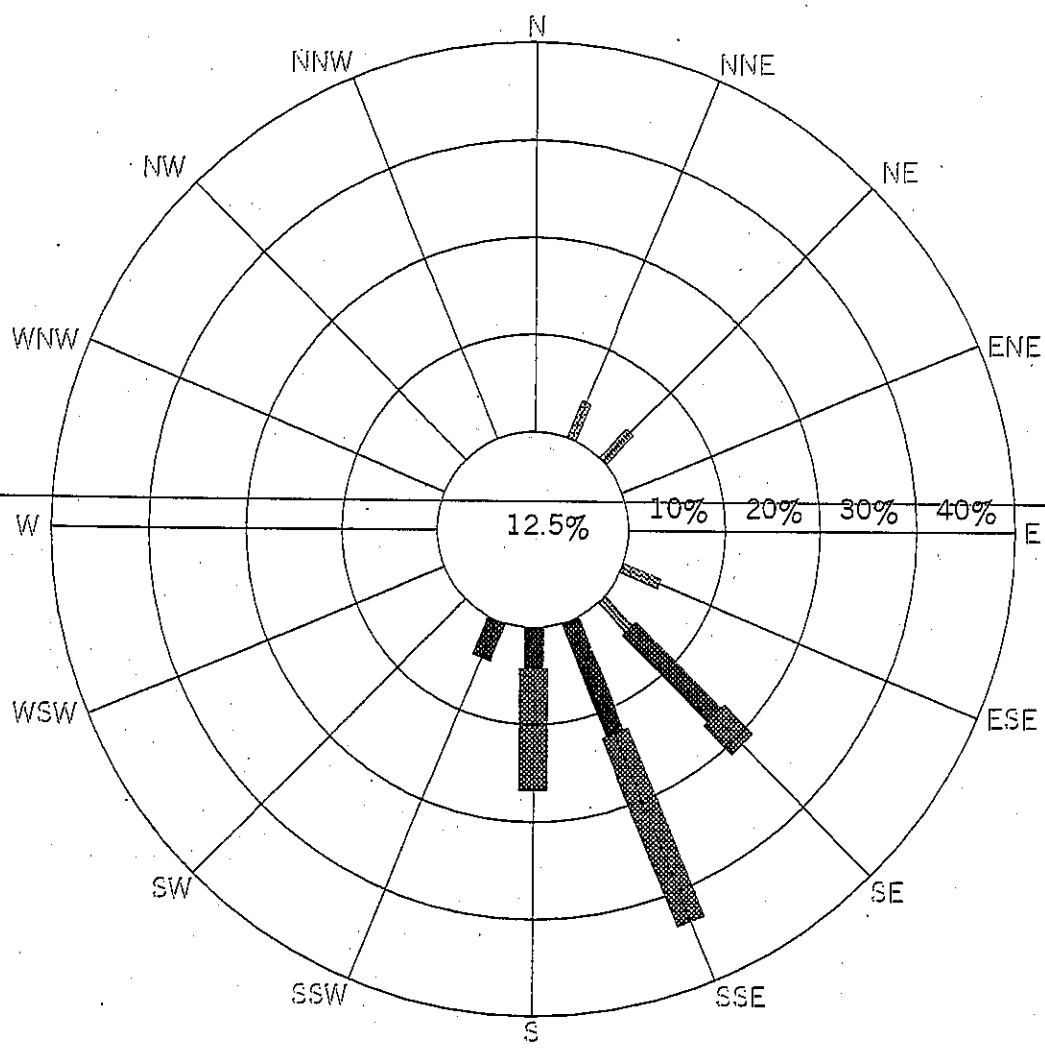
Barrio Logan CR6

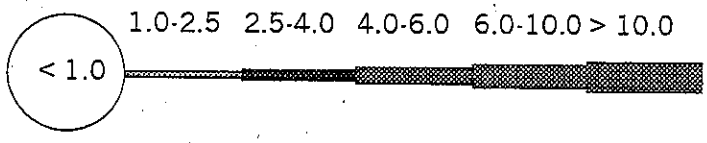
Log Date: 2002/03/11 Printing: 2002/03/26

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	1.16	45.6	11.53	83.7	24.8	0
02:00	1.26	43.1	11.59	83.6	31.4	0
03:00	1.43	41.7	11.20	80.3	45.5	0
04:00	1.20	50.1	10.71	77.0	31.8	0
05:00	1.31	43.6	9.95	71.6	40.8	0
06:00	0.92	54.6	9.57	69.3	42.0	0
07:00	1.20	43.6	9.73	68.2	31.8	0
08:00	1.26	227.4	13.28	62.2	41.9	0
09:00	2.41	285.6	14.86	63.9	50.4	0
10:00	2.83	280.6	16.77	67.7	46.5	0
11:00	3.66	263.8	18.35	66.2	40.9	0
12:00	4.38	268.2	19.12	63.4	37.0	0
13:00	4.19	259.7	19.94	59.0	40.7	0
14:00	4.49	284.9	20.05	56.5	33.1	0
15:00	4.51	275.2	19.28	61.6	36.6	0
16:00	3.83	270.7	18.63	64.0	38.3	0
17:00	3.34	282.5	18.08	67.9	37.6	0
18:00	2.92	273.5	16.55	76.0	34.5	0
19:00	2.26	276.0	15.57	81.8	36.1	0
20:00	1.65	229.8	15.19	83.7	35.9	0
21:00	1.67	239.1	14.81	85.9	30.3	0
22:00	1.75	270.0	14.70	86.8	27.2	0
23:00	0.84	42.7	14.32	87.5	41.4	0
24:00	0.88	55.3	14.59	87.2	49.3	0
Sum			358.37	1755.1	905.8	0
Average	2.31	304.0	14.93	73.1	37.7	0
Maximum Time			20.05 14:00	87.5 23:00	50.4 09:00	0 01:00
Minimum Time			9.57 06:00	56.5 14:00	24.8 01:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 03/12 Time: 01:00 ----- 2002 03/12 Time: 24:00





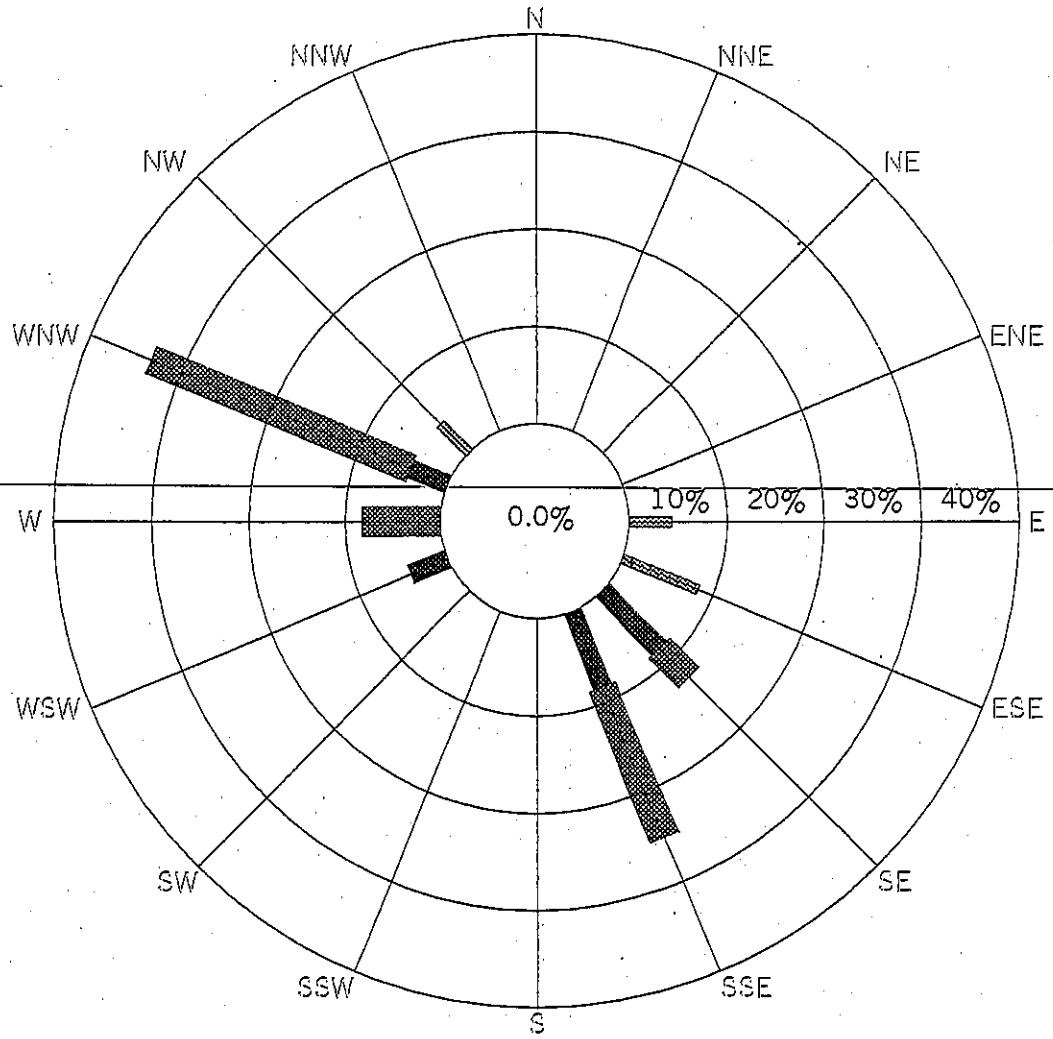
Barrio Logan CR6

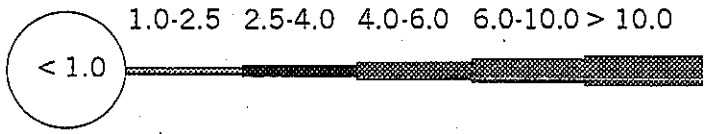
.og Date: 2002/03/12 Printing: 2002/03/26

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	1.86	113.0	14.59	86.8	38.7	0
02:00	3.07	154.3	14.15	88.0	24.6	0
03:00	0.99	69.5	13.93	88.1	68.9	0
04:00	0.80	69.3	13.66	87.3	71.5	0
05:00	0.84	54.9	13.28	87.5	68.7	0
06:00	1.50	38.1	12.62	89.1	44.9	0
07:00	1.24	32.8	11.86	92.3	59.2	0
08:00	2.37	144.1	12.68	87.4	49.8	0
09:00	2.81	193.3	13.39	85.0	46.8	0
10:00	3.96	169.6	14.04	82.7	41.0	0
11:00	4.68	169.0	14.53	79.3	31.8	0
12:00	5.42	166.1	15.41	77.8	23.6	0
13:00	5.42	169.4	16.17	76.5	28.3	0
14:00	4.93	172.3	16.44	74.7	31.4	0
15:00	4.89	168.7	16.39	75.6	27.2	0
16:00	5.27	168.1	15.79	77.2	25.7	0
17:00	4.62	166.5	15.13	79.0	34.1	0
18:00	4.15	162.2	14.53	80.4	30.8	0
19:00	3.51	157.6	14.48	80.4	28.9	0
20:00	2.83	138.9	14.53	79.3	36.6	0
21:00	3.58	147.4	14.59	79.2	23.6	0
22:00	3.30	130.4	14.70	77.8	24.1	0
23:00	3.89	140.2	14.81	76.9	26.1	0
24:00	5.00	139.0	14.81	77.0	18.9	0
Sum			346.53	1965.3	905.0	0
Average	3.37	141.0	14.44	81.9	37.7	0
Maximum Time			16.44 14:00	92.3 07:00	71.5 04:00	0 01:00
Minimum Time			11.86 07:00	74.7 14:00	18.9 24:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 03/13 Time: 01:00 ----- 2002 03/13 Time: 24:00





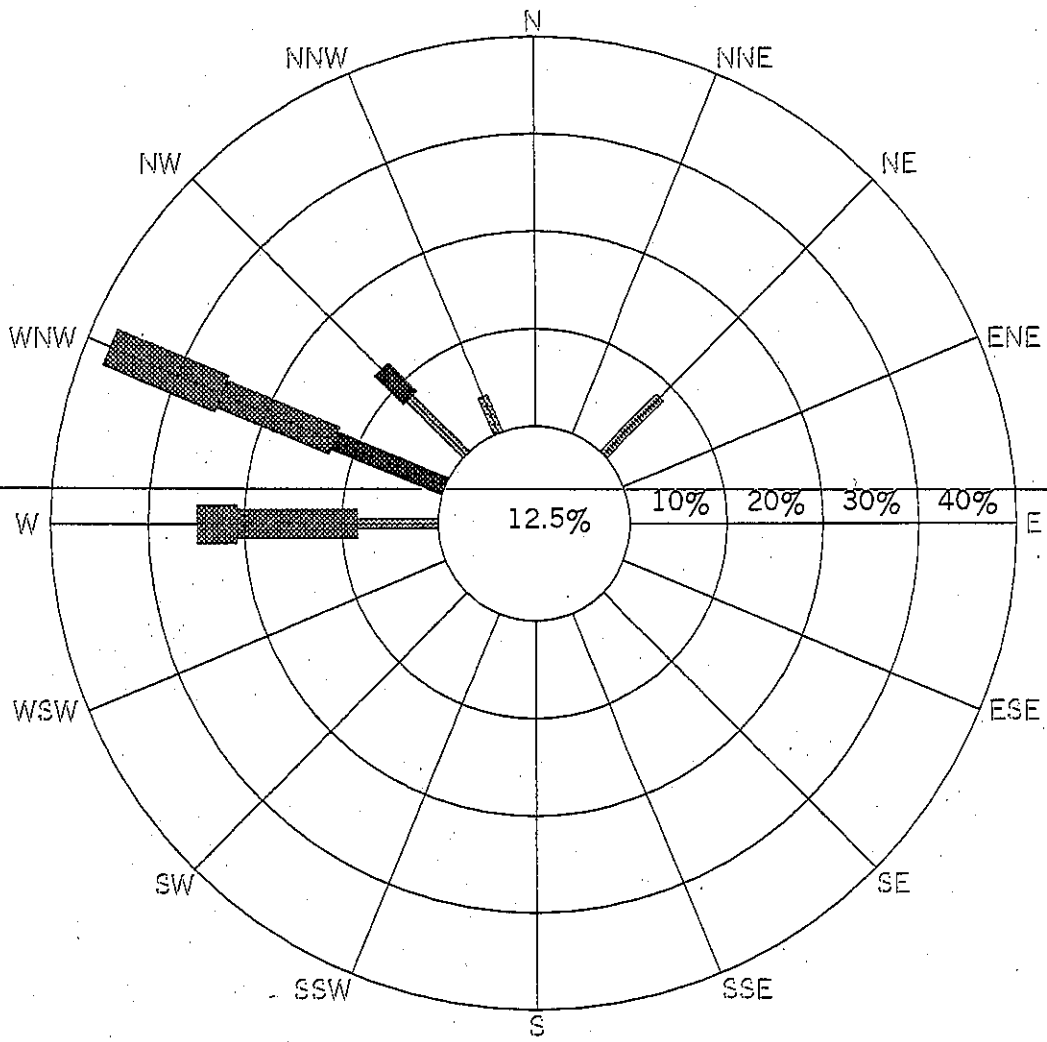
Barrio Logan CR6

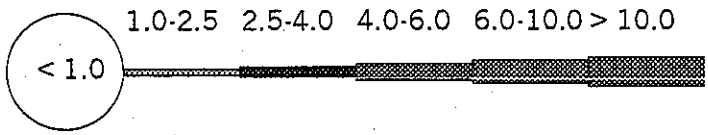
.og Date: 2002/03/13 Printing: 2002/03/26

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	4.11	136.8	14.81	77.2	21.6	0
02:00	4.42	149.8	14.92	75.8	25.2	0
03:00	3.81	149.6	14.97	76.5	24.6	0
04:00	3.92	145.8	14.86	78.1	21.8	0
05:00	1.86	103.9	14.70	76.4	50.4	0
06:00	1.28	97.3	14.37	75.6	55.9	0
07:00	2.11	115.2	14.43	75.4	37.9	0
08:00	2.69	136.1	14.75	73.6	29.8	0
09:00	3.24	153.0	14.97	74.4	25.7	0
10:00	4.04	161.7	15.19	75.9	26.1	0
11:00	5.34	165.2	15.79	75.8	25.7	0
12:00	5.83	165.8	16.39	73.2	27.0	0
13:00	3.75	245.4	17.21	68.1	41.5	0
14:00	5.00	268.7	17.26	68.1	39.4	0
15:00	5.44	282.7	16.12	64.4	33.0	0
16:00	5.17	278.4	16.66	58.8	35.1	0
17:00	4.74	289.4	16.44	56.6	35.4	0
18:00	4.45	293.6	15.52	60.4	35.6	0
19:00	4.40	298.0	14.81	64.8	36.7	0
20:00	4.23	290.7	14.53	67.3	35.0	0
21:00	4.49	295.0	14.43	67.3	33.2	0
22:00	4.32	289.9	14.15	68.3	36.8	0
23:00	3.22	298.7	14.04	64.1	35.8	0
24:00	2.49	319.0	13.88	47.5	40.8	0
Sum			365.19	1663.7	810.1	0
Average	3.93	217.1	15.22	69.3	33.8	0
Maximum			17.26	78.1	55.9	0
Time			14:00	04:00	06:00	01:00
Minimum			13.88	47.5	21.6	0
Time			24:00	24:00	01:00	01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 03/14 Time: 01:00 ----- 2002 03/14 Time: 24:00





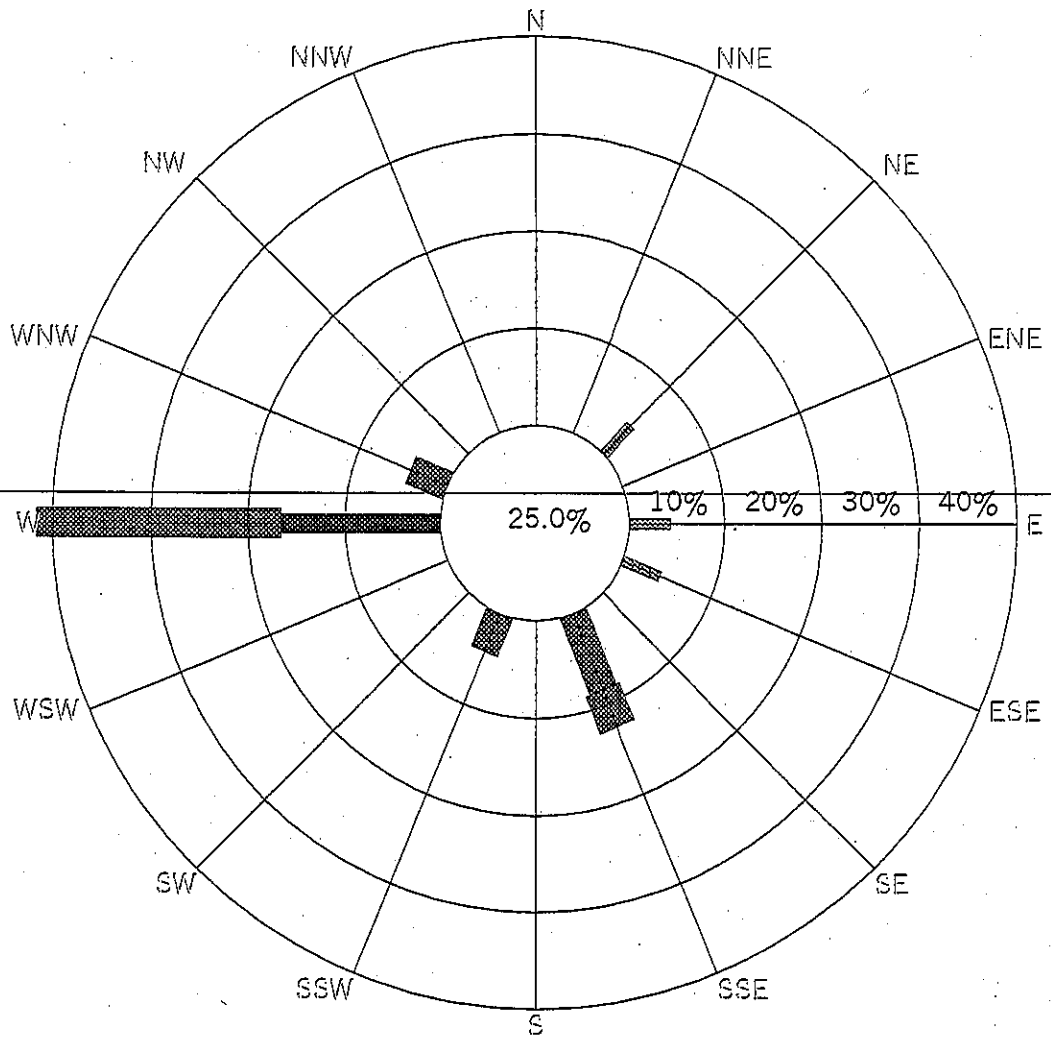
Barrio Logan CR6

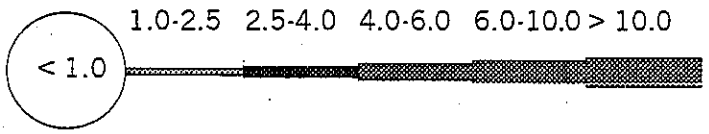
Log Date: 2002/03/14 Printing: 2002/03/26

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	3.02	317.7	13.72	44.9	36.8	0
02:00	2.41	312.7	13.39	43.2	35.9	0
03:00	2.11	308.0	12.95	44.5	46.8	0
04:00	1.33	37.0	10.28	54.2	28.3	0
05:00	1.50	39.9	9.84	55.7	49.2	0
06:00	2.77	303.0	12.19	47.1	45.1	0
07:00	3.45	292.5	12.51	46.9	35.2	0
08:00	4.62	284.4	13.61	39.9	16.5	0
09:00	5.06	286.1	13.88	42.4	37.6	0
10:00	6.29	290.0	14.64	39.9	35.5	0
11:00	6.74	279.1	15.03	40.5	34.0	0
12:00	6.50	284.9	15.46	38.6	34.2	0
13:00	6.25	286.2	15.73	36.2	38.1	0
14:00	5.95	287.7	16.01	35.8	40.3	0
15:00	5.51	272.5	15.79	42.2	37.5	0
16:00	5.34	279.3	15.46	46.9	35.2	0
17:00	5.02	274.5	15.08	50.8	34.5	0
18:00	3.85	285.0	14.32	54.9	35.5	0
19:00	2.26	273.3	13.88	56.9	34.9	0
20:00	1.16	270.3	13.55	57.7	64.8	0
21:00	1.18	330.8	13.17	59.6	34.2	0
22:00	0.82	43.4	11.59	61.5	32.1	0
23:00	0.71	49.6	10.82	61.6	26.5	0
24:00	0.73	43.2	10.39	62.2	44.4	0
Sum			323.28	1164.2	893.2	0
Average	3.52	305.9	13.47	48.5	37.2	0
Maximum			16.01	62.2	64.8	0
Time			14:00	24:00	20:00	01:00
Minimum			9.84	35.8	16.5	0
Time			05:00	14:00	08:00	01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 03/15 Time: 01:00 ----- 2002 03/15 Time: 24:00





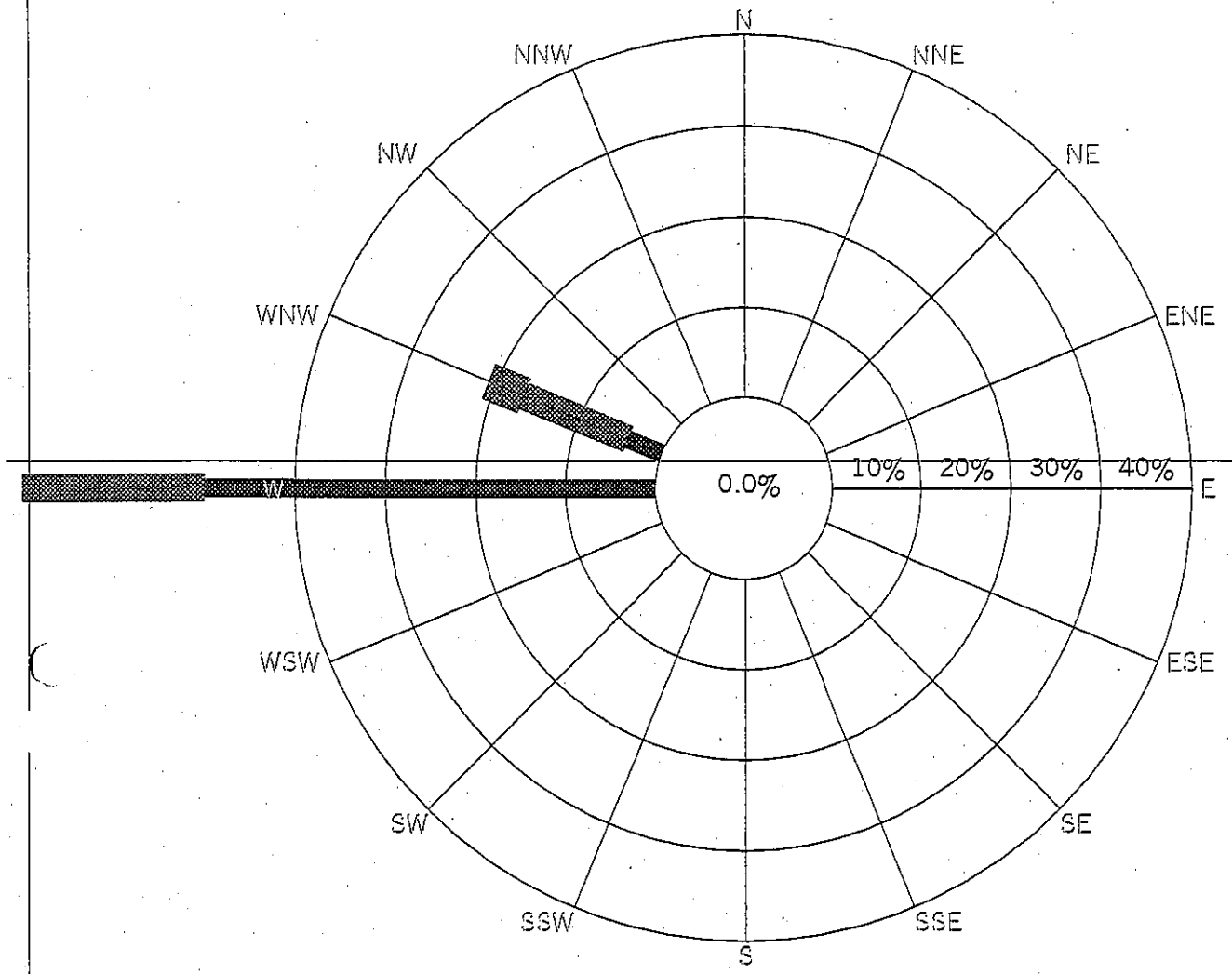
Barrio Logan CR6

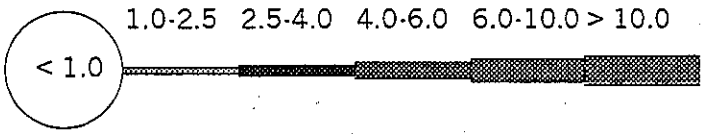
.og Date: 2002/03/15 Printing: 2002/03/26

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	0.86	38.1	9.62	64.3	30.9	0
02:00	0.92	49.6	8.97	65.3	29.6	0
03:00	0.67	74.0	8.42	67.3	38.6	0
04:00	0.69	70.3	7.71	69.2	27.1	0
05:00	0.86	59.1	7.22	70.2	23.6	0
06:00	0.97	50.4	7.00	69.3	33.0	0
07:00	1.22	40.0	7.60	66.7	33.4	0
08:00	1.26	81.9	10.06	61.0	59.0	0
09:00	2.49	117.2	13.01	55.7	45.7	0
10:00	4.34	151.7	14.32	57.4	25.0	0
11:00	5.70	166.6	14.86	59.8	25.1	0
12:00	6.48	164.3	15.03	63.1	26.0	0
13:00	5.83	191.7	16.01	55.1	41.6	0
14:00	4.55	265.7	17.10	46.9	42.2	0
15:00	4.66	273.0	16.83	50.7	41.9	0
16:00	5.00	269.6	15.90	54.8	37.4	0
17:00	4.98	276.1	14.64	57.0	33.4	0
18:00	4.42	280.0	13.61	61.8	36.3	0
19:00	4.81	280.8	12.79	63.0	32.9	0
20:00	4.13	282.0	12.35	61.2	32.1	0
21:00	3.58	263.4	12.02	58.5	36.9	0
22:00	3.39	262.3	11.97	56.4	36.7	0
23:00	3.24	260.4	12.02	58.5	40.2	0
24:00	3.32	264.7	10.88	68.1	43.4	0
Sum			289.93	1461.2	852.1	0
Average	3.27	269.9	12.08	60.9	35.5	0
Maximum Time			17.10 14:00	70.2 05:00	59.0 08:00	0 01:00
Minimum Time			7.00 06:00	46.9 14:00	23.6 05:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 03/16 Time: 01:00 ----- 2002 03/16 Time: 24:00





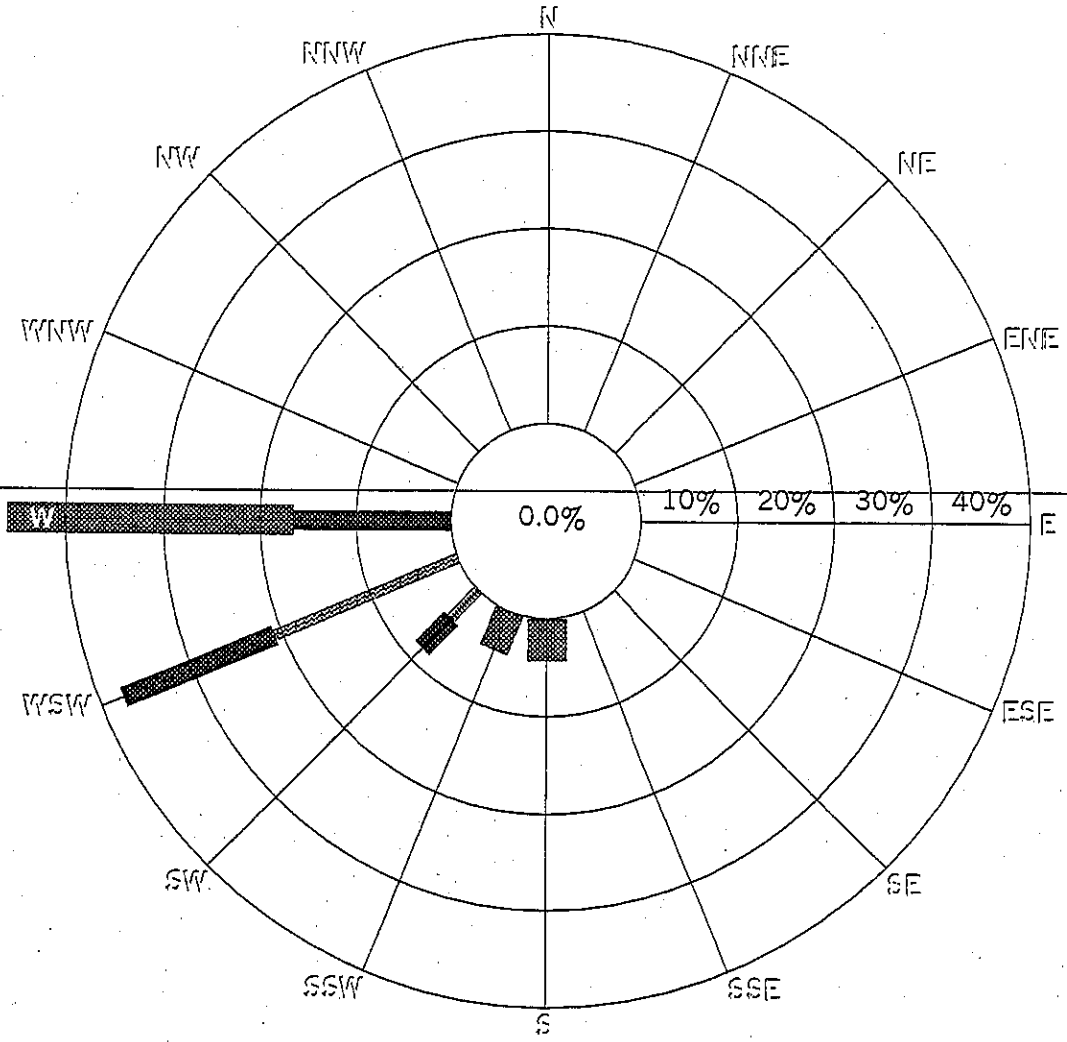
Barrio Logan CR6

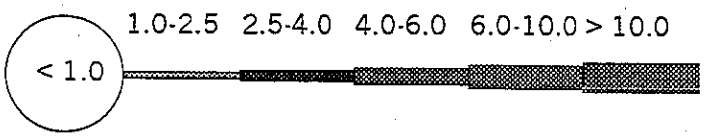
.og Date: 2002/03/16 Printing: 2002/03/26

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	3.26	268.1	10.71	71.1	41.0	0
02:00	3.51	269.3	11.26	66.6	35.7	0
03:00	3.51	260.8	11.20	69.8	46.3	0
04:00	3.66	292.6	11.20	69.4	35.2	0
05:00	3.47	272.4	11.10	69.9	43.2	0
06:00	3.89	278.4	10.99	70.6	34.2	0
07:00	3.72	271.0	11.42	67.3	34.9	0
08:00	4.59	265.0	12.73	60.8	16.8	0
09:00	4.34	274.5	12.90	59.3	36.4	0
10:00	4.83	274.8	13.61	57.1	37.3	0
11:00	5.13	272.9	14.32	54.6	37.6	0
12:00	5.55	281.3	14.86	54.1	36.5	0
13:00	5.93	278.9	14.92	52.7	35.8	0
14:00	6.02	283.5	15.03	50.7	33.1	0
15:00	5.99	280.6	14.92	49.5	36.5	0
16:00	5.10	281.4	14.64	51.5	37.6	0
17:00	4.66	279.4	14.04	54.4	39.0	0
18:00	4.57	289.2	12.84	55.6	33.6	0
19:00	3.72	276.5	12.30	57.3	37.5	0
20:00	3.49	276.0	12.30	58.3	37.6	0
21:00	3.11	267.1	12.19	57.3	39.4	0
22:00	3.47	268.2	12.35	59.9	35.9	0
23:00	3.28	267.4	12.41	61.2	35.9	0
24:00	2.83	260.4	12.30	61.6	41.0	0
Sum			306.52	1440.6	878.1	0
Average	4.24	274.6	12.77	60.0	36.6	0
Maximum Time			15.03 14:00	71.1 01:00	46.3 03:00	0 01:00
Minimum Time			10.71 01:00	49.5 15:00	16.8 08:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 03/17 Time: 01:00 ----- 2002 03/17 Time: 24:00





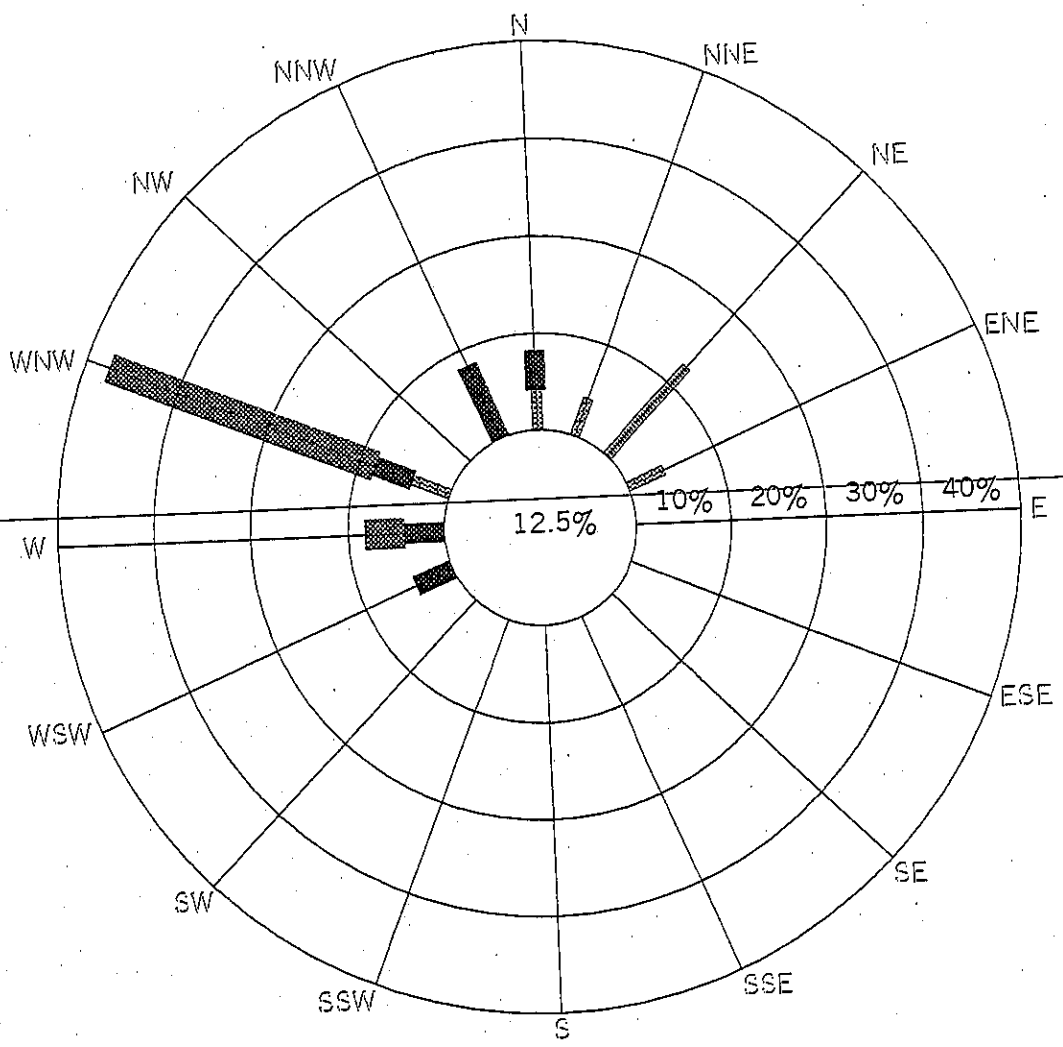
Barrio Logan CR6

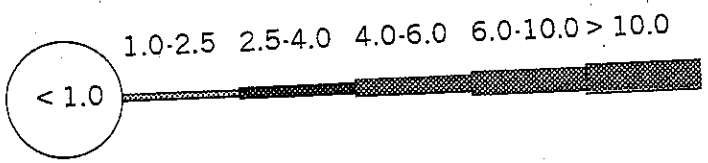
.og Date: 2002/03/17 Printing: 2002/03/26

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	2.39	254.4	12.08	62.8	33.7	0
02:00	2.35	246.7	11.86	63.3	35.1	0
03:00	2.41	246.3	11.81	65.3	41.4	0
04:00	2.49	258.2	11.53	65.5	40.8	0
05:00	2.56	275.8	11.59	64.9	34.7	0
06:00	1.56	251.1	11.15	67.3	41.7	0
07:00	1.73	235.6	11.20	66.6	40.4	0
08:00	2.69	247.5	12.13	61.4	49.3	0
09:00	3.13	271.8	12.90	56.8	38.9	0
10:00	3.83	258.9	13.61	54.4	43.6	0
11:00	3.89	263.0	14.26	49.1	48.7	0
12:00	4.51	268.5	14.92	45.2	44.0	0
13:00	4.72	277.2	15.35	43.3	38.9	0
14:00	4.45	270.3	15.24	48.3	42.4	0
15:00	4.53	264.1	15.35	50.7	42.9	0
16:00	4.34	267.7	14.43	57.3	41.4	0
17:00	4.21	270.2	13.82	59.1	37.4	0
18:00	4.04	271.4	13.39	60.7	35.9	0
19:00	3.56	251.8	13.06	63.9	38.9	0
20:00	3.32	242.2	12.79	65.5	41.7	0
21:00	3.83	230.7	12.79	67.2	43.2	0
22:00	4.64	212.3	12.84	68.6	42.2	0
23:00	7.63	171.9	12.62	72.3	33.3	0
24:00	3.49	236.5	9.51	84.7	64.7	0
Sum			310.23	1464.2	995.4	0
Average	3.60	252.9	12.93	61.0	41.5	0
Maximum Time			15.35 13:00	84.7 24:00	64.7 24:00	0 01:00
Minimum Time			9.51 24:00	43.3 13:00	33.3 23:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 03/18 Time: 01:00 ----- 2002 03/18 Time: 24:00





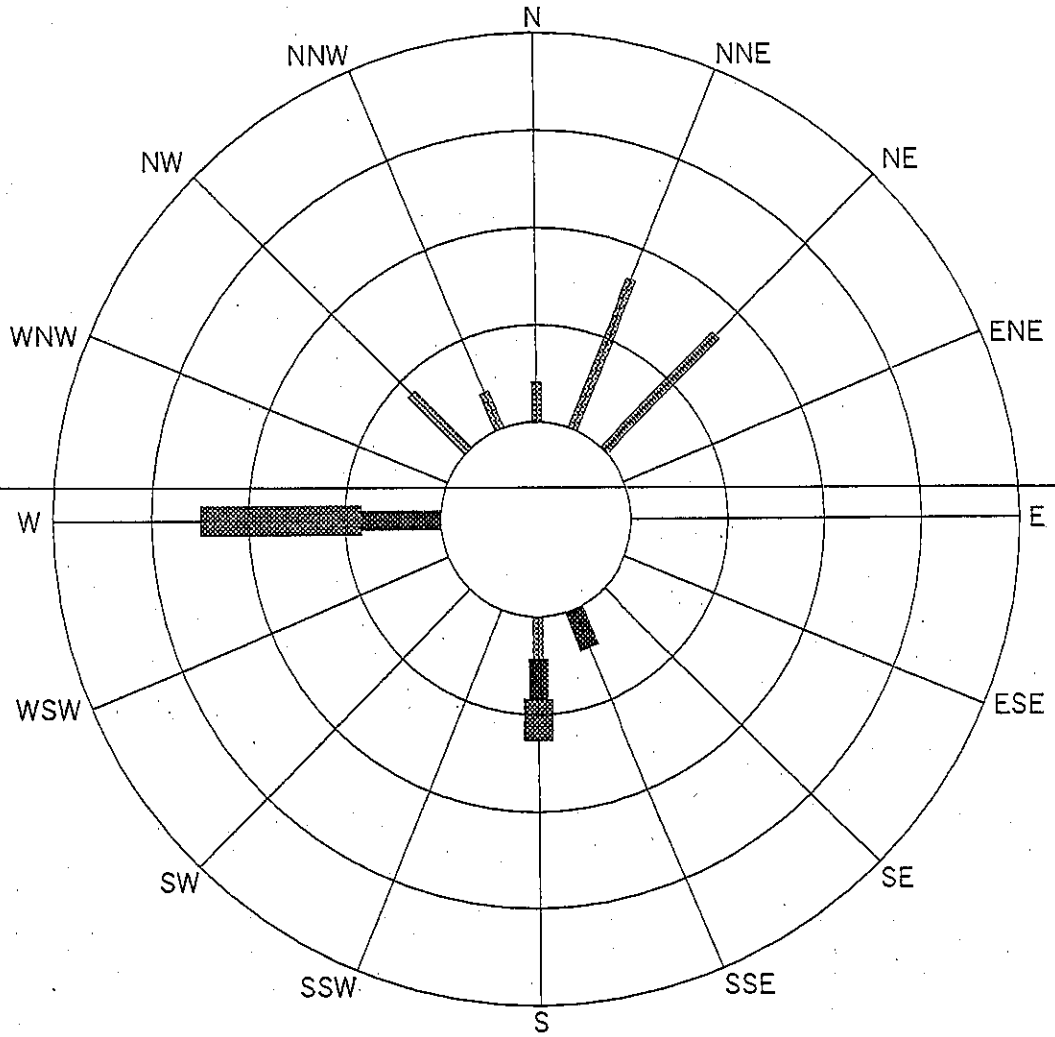
Barrio Logan CR6

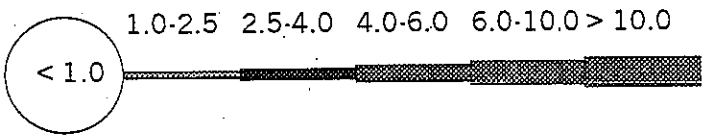
.og Date: 2002/03/18 Printing: 2002/03/26

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	2.56	251.3	9.62	84.8	52.4	0
02:00	4.34	284.7	10.66	64.3	33.8	0
03:00	3.15	271.9	10.66	64.0	35.3	0
04:00	3.02	301.5	9.68	67.9	39.0	0
05:00	2.01	296.2	9.79	66.6	56.3	0
06:00	1.88	37.2	7.66	80.4	37.6	0
07:00	1.09	39.6	7.28	83.3	45.7	0
08:00	1.24	31.5	8.80	76.8	60.2	0
09:00	1.69	56.6	10.44	68.9	74.0	0
10:00	3.00	358.2	12.19	58.3	42.1	0
11:00	3.39	338.5	13.77	49.8	48.3	0
12:00	4.74	280.6	14.75	51.0	37.3	0
13:00	5.19	283.7	14.86	51.1	35.5	0
14:00	5.36	284.2	15.63	47.5	37.2	0
15:00	5.42	285.6	15.84	46.1	35.6	0
16:00	5.29	285.7	15.79	44.1	37.7	0
17:00	4.83	290.0	15.46	43.4	35.5	0
18:00	4.02	294.4	14.59	46.0	34.3	0
19:00	2.79	342.1	13.55	54.0	37.5	0
20:00	1.60	9.1	12.84	60.1	26.4	0
21:00	0.67	47.1	12.08	66.0	34.7	0
22:00	0.71	56.1	11.64	68.4	30.2	0
23:00	0.78	54.8	10.28	72.8	24.9	0
24:00	1.01	38.9	9.46	73.4	26.2	0
Sum			287.31	1489.1	957.8	0
Average	2.91	332.9	11.97	62.0	39.9	0
Maximum Time			15.84 15:00	84.8 01:00	74.0 09:00	0 01:00
Minimum Time			7.28 07:00	43.4 17:00	24.9 23:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 03/19 Time: 01:00 ----- 2002 03/19 Time: 24:00





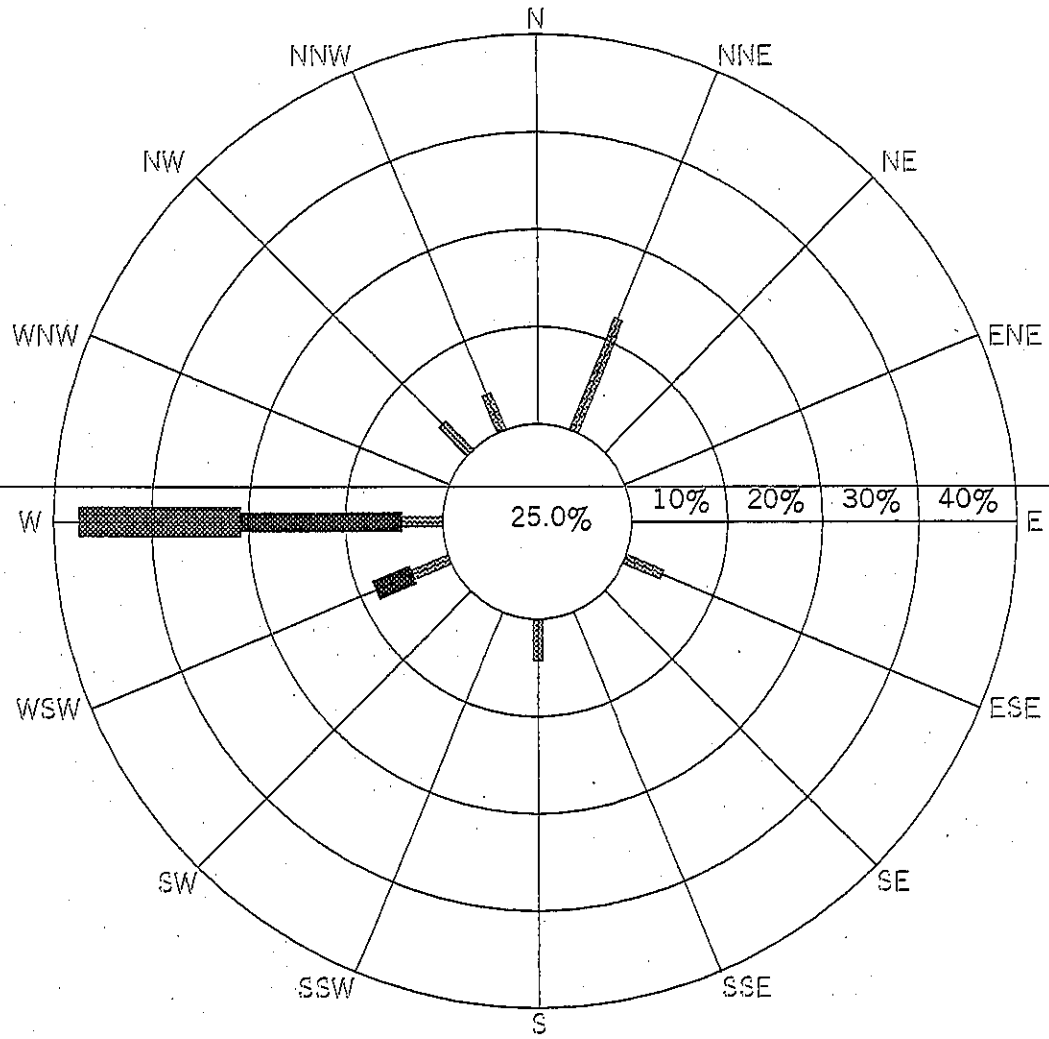
Barrio Logan CR6

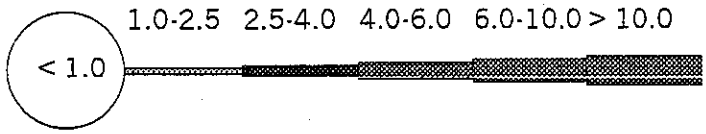
.og Date: 2002/03/19 Printing: 2002/03/26

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	1.75	22.7	9.24	69.0	19.3	0
02:00	1.77	35.6	8.53	66.8	26.0	0
03:00	1.62	35.6	7.93	67.3	33.8	0
04:00	0.82	72.4	7.28	69.2	40.3	0
05:00	1.86	30.5	6.95	69.1	23.4	0
06:00	1.84	35.0	6.78	67.3	29.0	0
07:00	1.65	39.5	7.66	62.8	37.4	0
08:00	1.58	321.2	11.31	51.2	22.4	0
09:00	1.77	179.5	12.90	47.1	48.9	0
10:00	2.60	152.7	15.63	37.1	44.6	0
11:00	3.30	184.1	17.59	24.3	38.0	0
12:00	4.34	184.6	18.52	24.9	45.8	0
13:00	4.19	273.6	19.50	26.1	39.3	0
14:00	4.32	270.2	19.34	23.3	37.9	0
15:00	4.64	268.9	18.79	29.0	34.5	0
16:00	4.19	268.0	17.97	45.5	34.2	0
17:00	3.51	266.8	17.15	55.8	37.4	0
18:00	3.05	275.3	16.34	59.7	36.3	0
19:00	2.15	319.5	15.52	54.3	35.9	0
20:00	1.50	332.3	14.86	56.1	36.9	0
21:00	1.65	9.3	13.82	61.6	23.6	0
22:00	1.05	24.2	13.12	65.7	39.1	0
23:00	0.73	61.5	12.19	69.9	29.1	0
24:00	1.16	32.7	11.26	73.4	24.2	0
Sum			320.17	1276.4	817.0	0
Average	2.38	350.4	13.34	53.2	34.0	0
Maximum Time			19.50 13:00	73.4 24:00	48.9 09:00	0 01:00
Minimum Time			6.78 06:00	23.3 14:00	19.3 01:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 03/20 Time: 01:00 ----- 2002 03/20 Time: 24:00





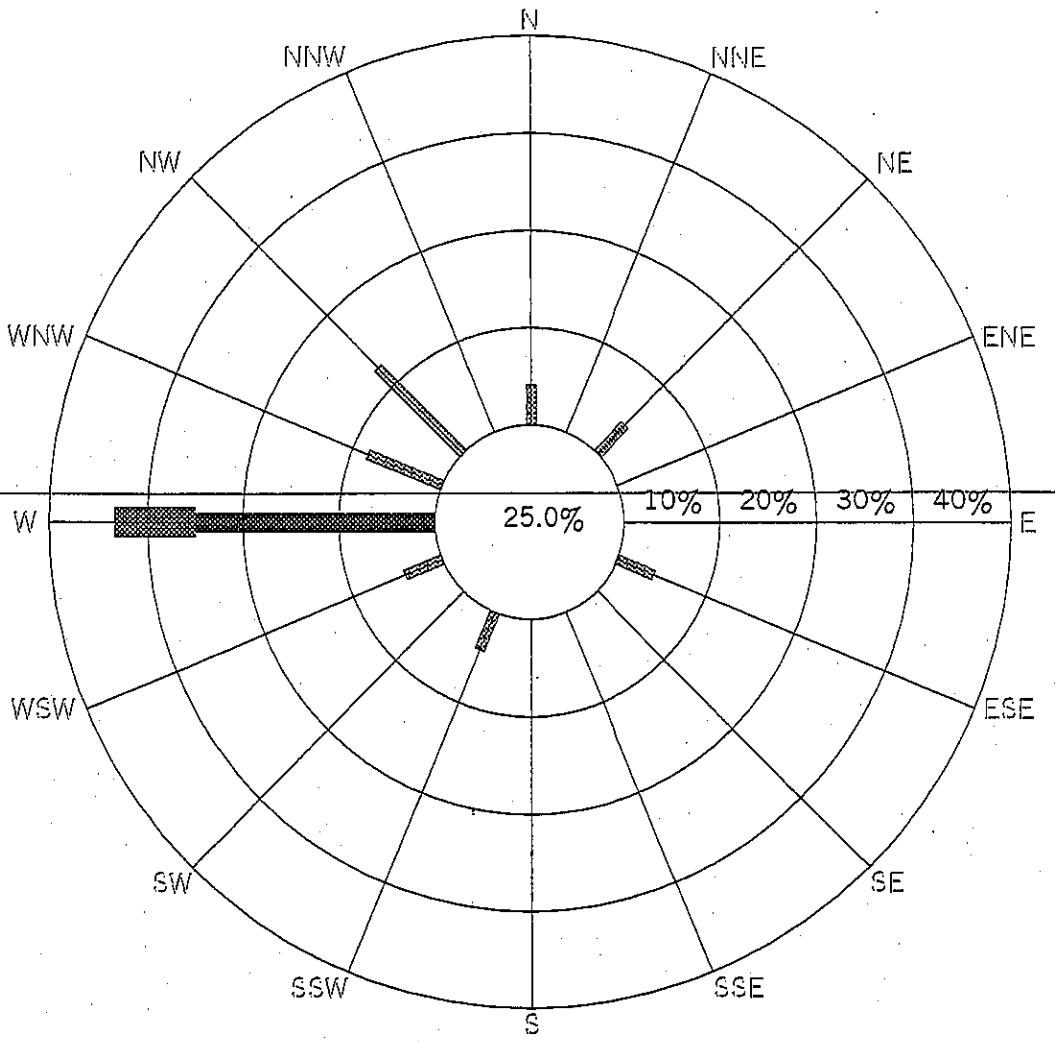
Barrio Logan CR6

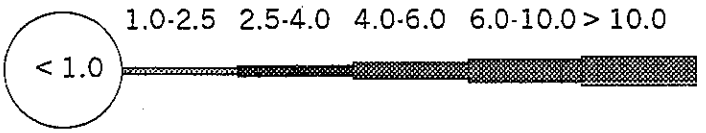
Log Date: 2002/03/20 Printing: 2002/03/26

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	1.41	16.3	10.60	73.7	19.3	0
02:00	0.82	47.5	10.33	70.3	36.2	0
03:00	0.56	81.6	9.51	71.4	33.5	0
04:00	0.78	44.1	8.59	72.1	35.4	0
05:00	0.78	32.3	8.53	69.1	38.8	0
06:00	0.78	31.2	8.69	65.9	47.0	0
07:00	1.48	23.5	10.00	60.1	23.3	0
08:00	1.73	316.2	13.06	52.3	38.6	0
09:00	1.90	254.2	15.79	46.1	56.8	0
10:00	2.90	257.2	18.08	43.6	37.1	0
11:00	3.47	269.7	20.10	37.5	36.5	0
12:00	4.38	272.6	20.59	32.0	34.1	0
13:00	4.91	270.4	20.21	36.9	35.0	0
14:00	4.36	270.6	19.77	45.0	33.7	0
15:00	4.45	274.6	19.94	38.5	35.4	0
16:00	3.83	267.0	20.21	38.7	34.3	0
17:00	3.17	273.5	19.77	46.0	32.8	0
18:00	2.52	268.8	18.85	50.2	29.8	0
19:00	1.26	279.7	17.59	49.9	55.0	0
20:00	1.31	105.3	15.63	72.2	40.0	0
21:00	1.20	184.9	14.75	81.4	35.8	0
22:00	1.99	326.3	14.48	69.4	30.6	0
23:00	1.71	17.5	13.55	72.7	18.8	0
24:00	0.88	11.7	12.95	67.1	26.0	0
Sum			361.59	1362.1	844.0	0
Average	2.19	317.2	15.07	56.8	35.2	0
Maximum			20.59	81.4	56.8	0
Time			12:00	21:00	09:00	01:00
Minimum			8.53	32.0	18.8	0
Time			05:00	12:00	23:00	01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 03/21 Time: 01:00 ----- 2002 03/21 Time: 24:00





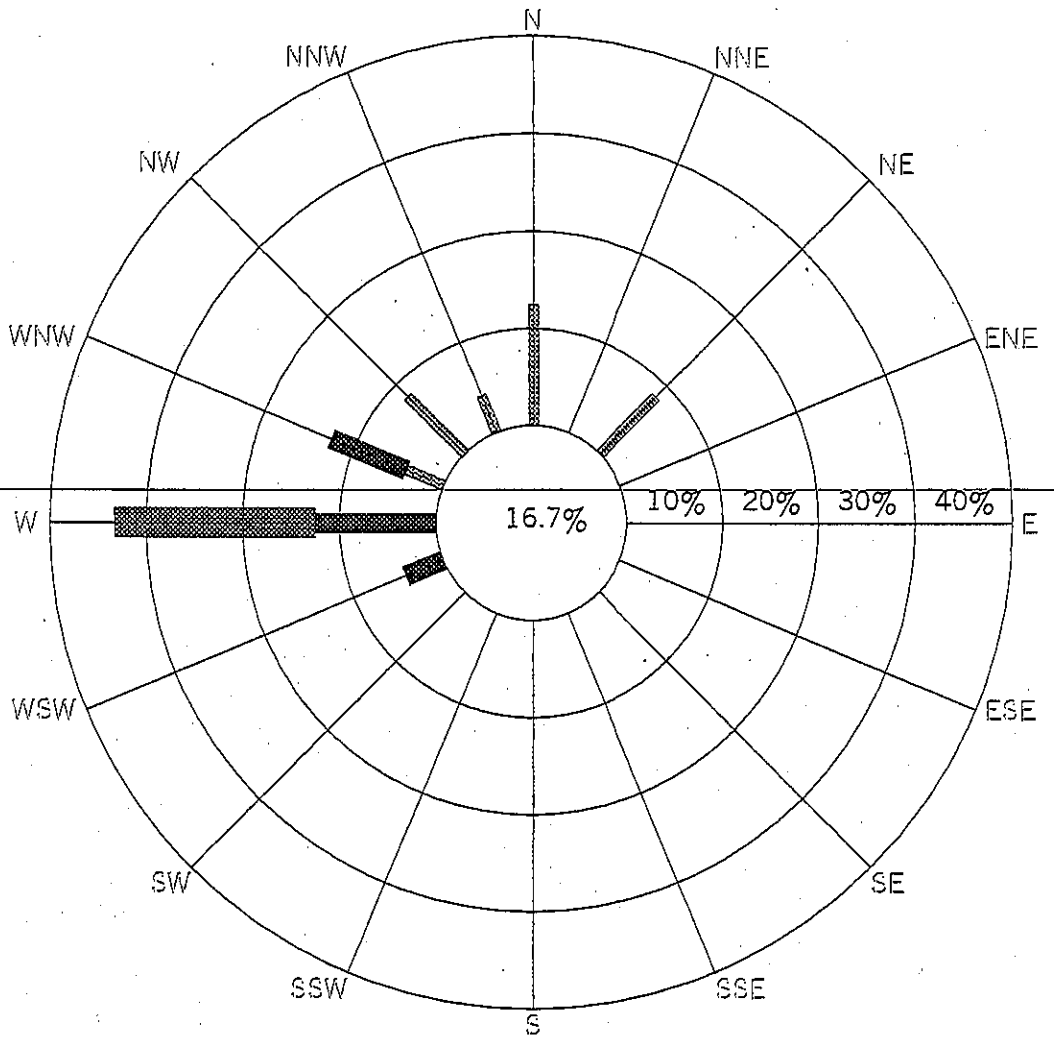
Barrio Logan CR6

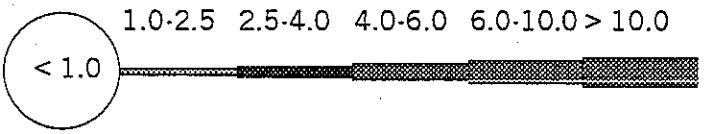
Log Date: 2002/03/21 Printing: 2002/04/02

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	0.90	359.4	12.24	67.3	41.2	0
02:00	0.97	24.7	11.59	69.6	24.3	0
03:00	0.92	42.9	10.60	71.8	30.6	0
04:00	1.22	10.9	10.60	72.9	20.4	0
05:00	1.14	44.2	10.71	77.8	23.8	0
06:00	0.61	105.0	10.17	75.2	42.0	0
07:00	0.65	76.9	10.60	64.8	35.4	0
08:00	1.14	313.2	15.52	42.5	25.1	0
09:00	2.09	193.7	15.79	50.5	33.0	0
10:00	2.32	238.9	17.92	44.9	45.7	0
11:00	3.15	264.8	20.65	37.7	38.2	0
12:00	3.68	266.0	21.03	43.3	38.8	0
13:00	4.04	268.3	20.05	53.1	37.0	0
14:00	4.15	267.8	19.45	55.9	37.2	0
15:00	3.94	273.2	19.12	57.9	37.6	0
16:00	3.83	271.0	18.96	57.6	37.7	0
17:00	3.32	274.2	18.08	60.9	33.9	0
18:00	2.54	271.5	17.59	66.4	30.6	0
9:00	1.45	308.5	16.99	66.7	40.1	0
20:00	1.37	122.2	16.77	69.6	47.9	0
21:00	1.79	288.7	15.08	80.6	54.7	0
22:00	0.97	49.2	15.03	77.2	44.5	0
23:00	1.37	289.0	14.92	76.8	50.5	0
24:00	1.71	324.9	13.99	78.7	34.7	0
Sum			373.44	1519.6	884.9	0
Average	2.05	306.9	15.56	63.3	36.9	0
Maximum			21.03	80.6	54.7	0
Time			12:00	21:00	21:00	01:00
Minimum			10.17	37.7	20.4	0
Time			06:00	11:00	04:00	01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 03/22 Time: 01:00 ----- 2002 03/22 Time: 24:00





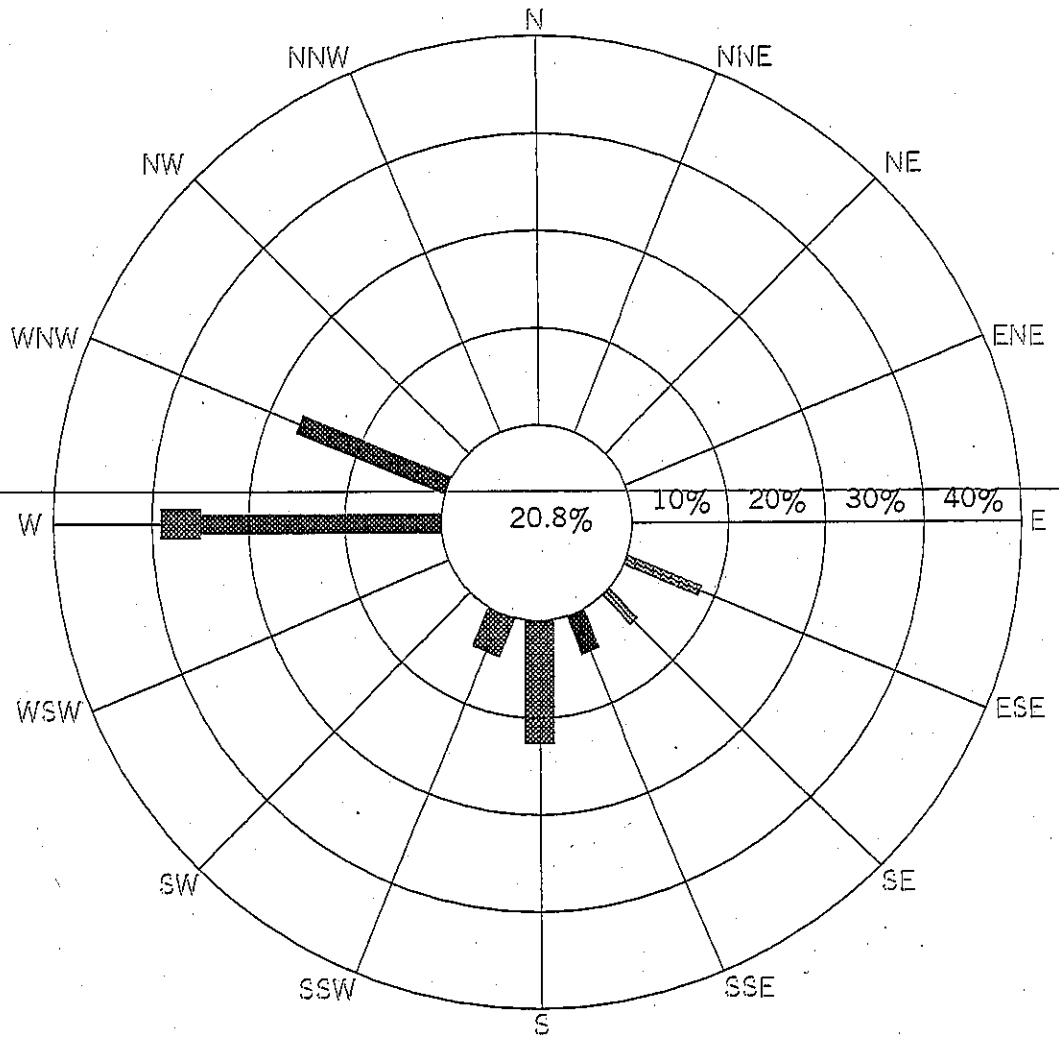
Barrio Logan CR6

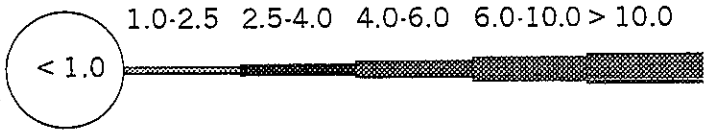
Avg Date: 2002/03/22 Printing: 2002/04/02

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	1.18	310.8	13.28	84.0	45.8	0
02:00	1.86	342.8	13.06	89.2	38.1	0
03:00	1.43	9.0	12.24	88.2	28.6	0
04:00	0.86	35.4	11.48	88.4	34.6	0
05:00	0.82	46.9	10.55	89.2	27.3	0
06:00	1.12	34.8	11.20	87.5	29.9	0
07:00	1.33	40.7	11.48	86.3	47.1	0
08:00	1.35	355.8	11.86	86.1	73.1	0
09:00	2.77	250.9	13.93	78.2	43.4	0
10:00	3.64	279.7	15.79	70.9	39.3	0
11:00	3.89	290.3	16.50	66.9	22.3	0
12:00	4.28	277.8	16.99	64.1	39.1	0
13:00	4.72	273.8	17.65	60.4	36.3	0
14:00	4.34	266.7	18.14	56.0	38.5	0
15:00	4.32	274.0	18.19	42.8	36.3	0
16:00	3.87	274.9	18.25	37.6	35.7	0
17:00	4.42	278.6	16.77	48.5	33.4	0
18:00	3.34	277.2	15.03	66.5	35.8	0
19:00	2.64	286.2	14.32	69.1	37.9	0
20:00	2.32	286.2	13.99	72.6	41.5	0
21:00	2.05	324.6	13.72	75.1	33.8	0
22:00	1.79	3.3	13.39	75.6	28.1	0
23:00	0.84	61.7	12.62	78.0	30.6	0
24:00	0.71	69.4	12.19	79.2	28.5	0
Sum			342.60	1740.5	884.8	0
Average	2.50	320.1	14.27	72.5	36.9	0
Maximum Time			18.25 16:00	89.2 02:00	73.1 08:00	0 01:00
Minimum Time			10.55 05:00	37.6 16:00	22.3 11:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 03/23 Time: 01:00 ----- 2002 03/23 Time: 24:00





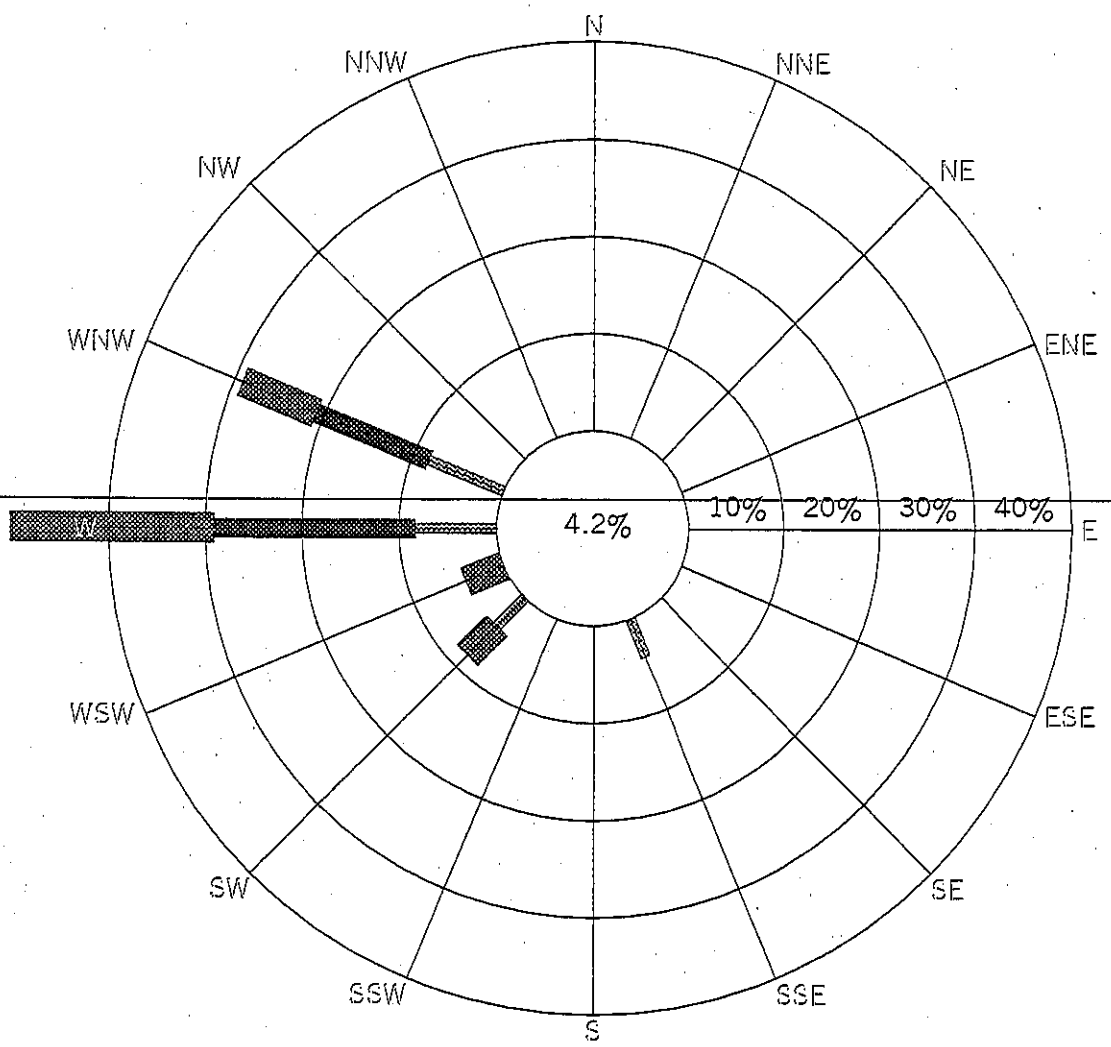
Barrio Logan CR6

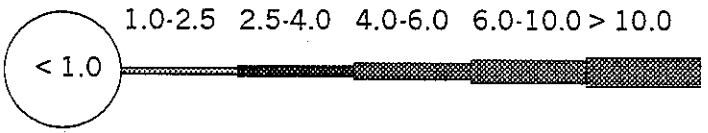
Log Date: 2002/03/23 Printing: 2002/04/02

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	0.99	44.8	12.35	78.2	33.2	0
02:00	0.73	45.8	12.57	77.8	37.9	0
03:00	1.56	113.6	12.84	75.4	39.1	0
04:00	1.03	104.4	12.79	73.5	41.1	0
05:00	0.65	77.0	12.51	76.2	40.0	0
06:00	0.61	66.2	11.86	85.8	30.9	0
07:00	0.86	66.4	12.30	86.8	59.6	0
08:00	2.20	130.1	12.79	86.2	30.9	0
09:00	2.90	151.9	13.55	83.9	28.1	0
10:00	4.02	171.1	14.53	80.6	36.4	0
11:00	5.02	179.5	15.52	77.1	36.9	0
12:00	5.68	176.1	15.46	77.7	34.4	0
13:00	4.96	212.0	16.01	73.4	36.5	0
14:00	3.94	272.2	17.15	64.7	41.3	0
15:00	4.19	271.5	17.04	65.1	38.1	0
16:00	3.89	275.4	16.61	66.0	40.4	0
17:00	3.75	274.5	16.01	70.1	40.2	0
18:00	3.83	280.4	15.19	74.8	39.5	0
19:00	3.11	284.7	14.64	73.7	36.7	0
20:00	3.13	276.8	14.59	75.0	34.1	0
21:00	2.98	280.8	14.10	77.9	31.5	0
22:00	3.30	283.6	13.88	76.4	32.9	0
23:00	2.85	282.6	13.44	76.8	33.1	0
24:00	2.64	285.6	13.28	77.8	34.5	0
Sum			341.02	1830.9	887.3	0
Average	2.87	243.6	14.21	76.3	37.0	0
Maximum Time			17.15 14:00	86.8 07:00	59.6 07:00	0 01:00
Minimum Time			11.86 06:00	64.7 14:00	28.1 09:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 03/24 Time: 01:00 ----- 2002 03/24 Time: 24:00





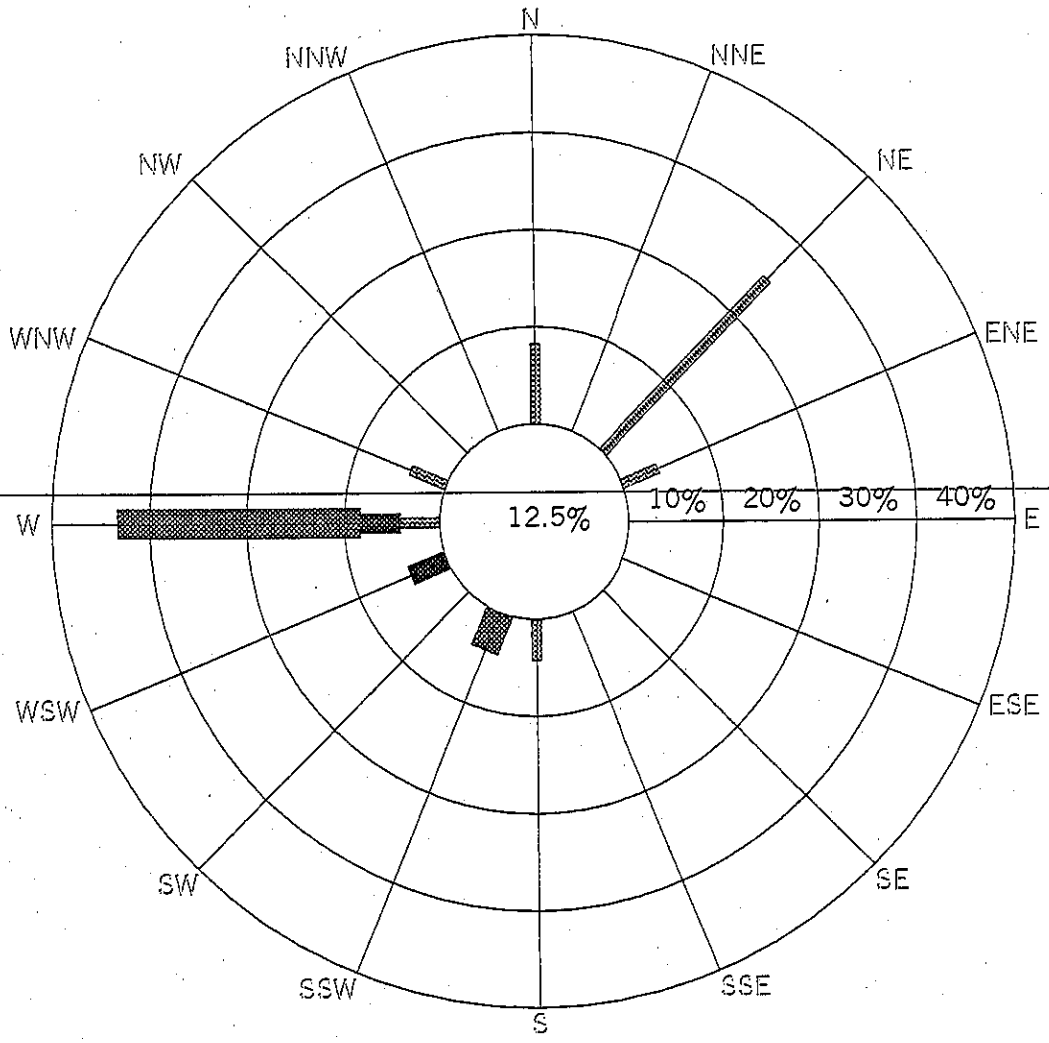
Barrio Logan CR6

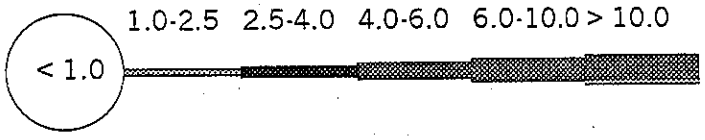
Aug Date: 2002/03/24 Printing: 2002/04/02

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	2.30	286.6	13.28	78.9	36.6	0
02:00	2.71	259.5	13.12	81.1	34.2	0
03:00	4.13	278.4	12.95	80.5	29.4	0
04:00	4.23	287.4	12.84	77.3	33.1	0
05:00	3.32	287.9	12.68	76.6	33.5	0
06:00	3.15	296.2	12.62	76.0	36.1	0
07:00	2.35	296.6	12.84	74.8	36.8	0
08:00	2.96	287.5	13.61	73.1	37.5	0
09:00	3.70	277.2	14.15	71.7	37.4	0
10:00	3.96	280.4	14.64	67.9	36.1	0
11:00	4.30	260.1	15.30	64.3	37.3	0
12:00	4.87	278.2	15.57	62.0	37.2	0
13:00	5.10	274.9	16.50	55.1	40.0	0
14:00	4.91	281.8	16.55	53.9	36.9	0
15:00	4.62	261.9	16.34	53.3	43.1	0
16:00	4.36	248.8	15.57	57.2	47.1	0
17:00	4.13	235.3	14.86	63.3	45.9	0
18:00	3.00	266.7	14.04	65.2	44.3	0
19:00	2.77	276.1	13.39	65.4	41.4	0
20:00	1.75	218.9	13.17	68.1	60.7	0
21:00	1.12	275.5	13.01	69.3	78.5	0
22:00	1.88	163.6	13.12	70.5	40.9	0
23:00	1.05	274.4	12.62	74.0	63.7	0
24:00	0.88	35.6	11.42	76.2	38.3	0
Sum			334.19	1655.7	1006.0	0
Average	3.23	272.4	13.92	69.0	41.9	0
Maximum Time			16.55 14:00	81.1 02:00	78.5 21:00	0 01:00
Minimum Time			11.42 24:00	53.3 15:00	29.4 03:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 03/25 Time: 01:00 ----- 2002 03/25 Time: 24:00





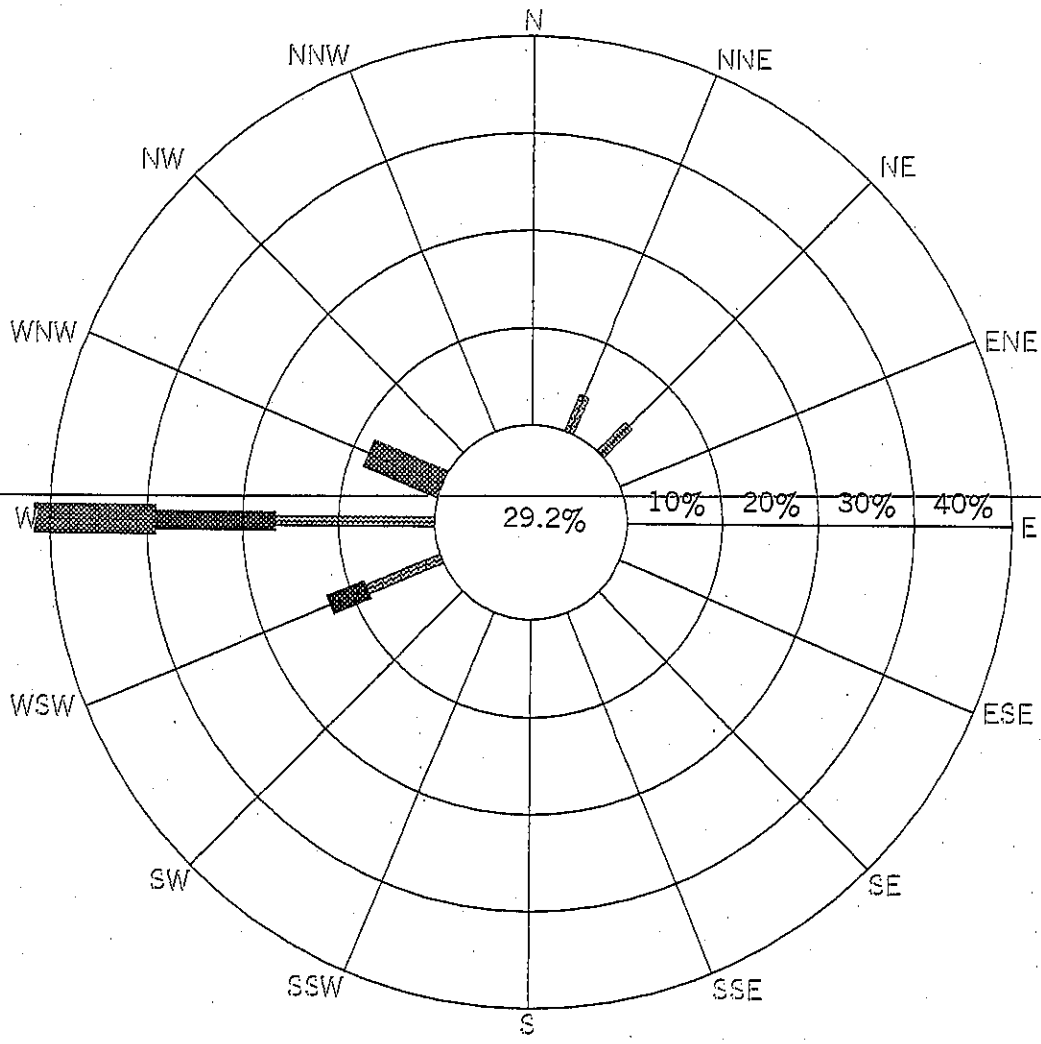
Barrio Logan CR6

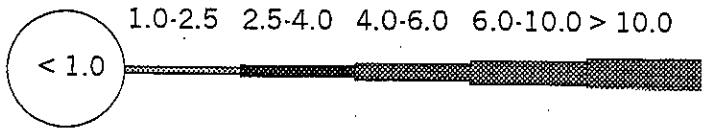
Log Date: 2002/03/25 Printing: 2002/04/02

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	0.84	42.7	10.77	78.9	22.8	0
02:00	1.16	38.5	10.33	79.4	24.8	0
03:00	1.37	40.0	9.90	79.3	28.5	0
04:00	1.26	38.8	9.62	78.4	27.0	0
05:00	1.24	40.2	9.13	78.1	23.6	0
06:00	1.60	38.1	8.75	76.1	29.7	0
07:00	1.54	36.6	9.13	73.2	40.7	0
08:00	1.62	67.9	11.20	66.5	49.5	0
09:00	2.37	182.5	13.33	63.0	62.1	0
10:00	3.07	237.4	14.48	61.6	48.5	0
11:00	4.66	197.8	15.57	60.2	45.0	0
12:00	4.40	277.1	16.77	56.3	39.7	0
13:00	4.81	266.7	17.15	55.8	40.6	0
14:00	4.62	272.4	17.21	57.0	37.6	0
15:00	4.64	277.4	17.15	59.1	36.5	0
16:00	4.57	278.0	16.61	60.2	34.7	0
17:00	4.02	275.8	16.44	60.9	35.7	0
18:00	3.07	274.9	15.08	67.4	35.0	0
19:00	2.32	261.1	14.59	68.7	40.3	0
20:00	1.92	281.4	14.37	71.1	37.6	0
21:00	1.82	349.8	14.10	69.8	30.4	0
22:00	1.18	8.4	13.61	70.6	30.4	0
23:00	0.73	57.4	13.01	73.4	34.7	0
24:00	0.67	63.3	12.35	75.6	22.1	0
Sum			320.66	1640.9	857.5	0
Average	2.48	336.0	13.36	68.4	35.7	0
Maximum Time			17.21 14:00	79.4 02:00	62.1 09:00	0 01:00
Minimum Time			8.75 06:00	55.8 13:00	22.1 24:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 03/26 Time: 01:00 ----- 2002 03/26 Time: 24:00





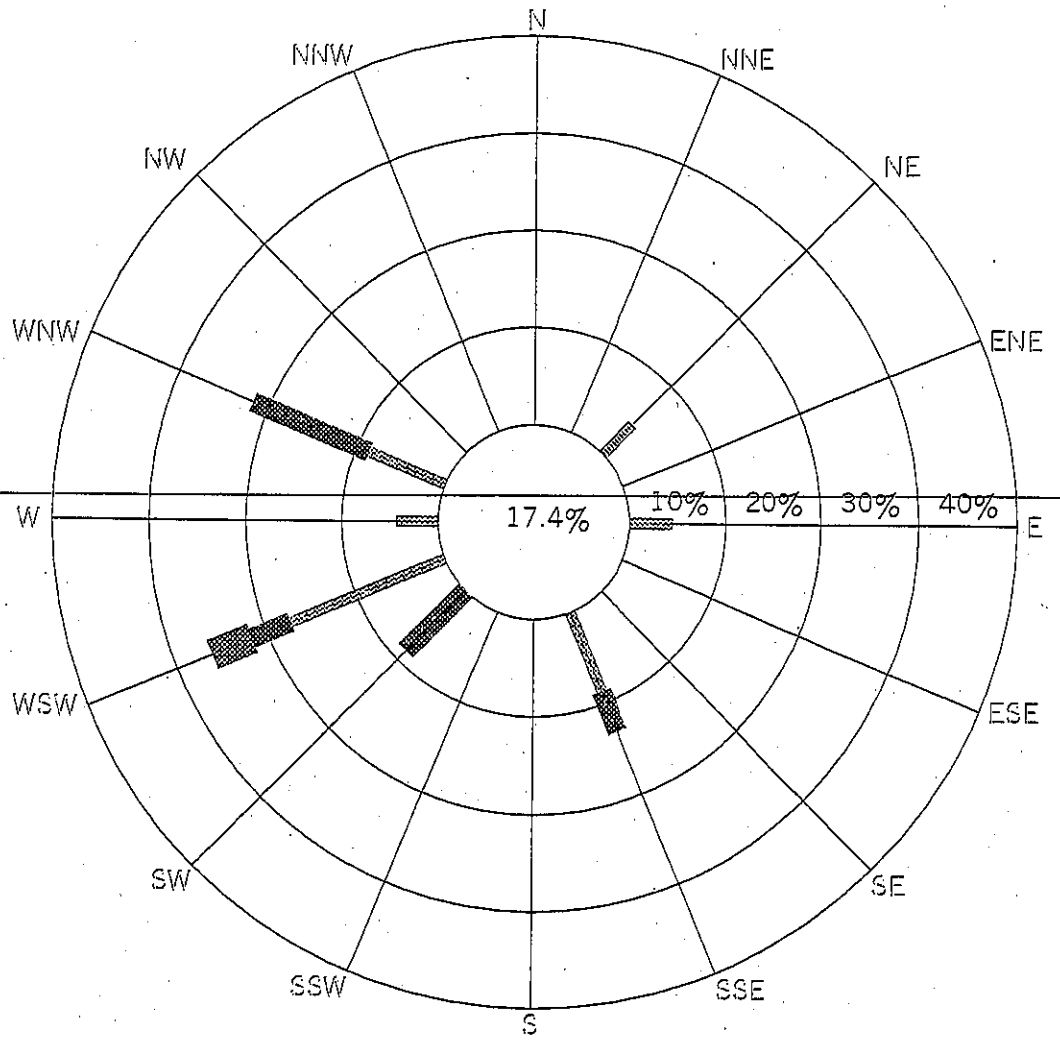
Barrio Logan CR6

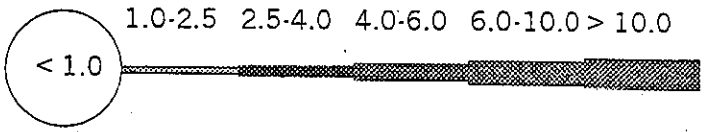
Log Date: 2002/03/26 Printing: 2002/04/02

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	0.88	27.3	11.59	78.2	16.9	0
02:00	0.78	37.4	11.42	79.0	25.0	0
03:00	0.90	53.3	10.60	81.0	19.8	0
04:00	1.05	38.1	10.28	81.4	18.9	0
05:00	0.75	67.9	10.11	80.7	25.2	0
06:00	0.54	93.3	9.95	80.5	25.0	0
07:00	0.90	41.6	10.66	78.4	25.7	0
08:00	1.50	28.9	12.51	77.1	29.7	0
09:00	2.26	278.1	14.32	74.8	59.2	0
10:00	3.24	254.9	16.17	66.3	44.9	0
11:00	3.96	274.7	16.83	64.8	38.8	0
12:00	4.32	282.7	17.32	61.5	37.2	0
13:00	4.30	284.6	17.54	62.4	36.9	0
14:00	4.68	280.5	17.65	64.1	38.1	0
15:00	4.81	272.3	17.26	65.5	36.3	0
16:00	4.40	273.0	16.88	65.7	35.8	0
17:00	3.53	266.2	16.61	63.5	38.4	0
18:00	2.96	270.3	15.57	67.3	40.3	0
19:00	2.28	256.8	14.75	70.4	36.6	0
20:00	2.13	274.9	14.32	72.9	34.5	0
21:00	1.37	261.8	13.88	75.9	44.0	0
22:00	1.35	242.3	13.55	78.1	39.2	0
23:00	1.58	277.1	13.33	79.3	28.6	0
24:00	0.95	24.4	12.79	81.6	38.8	0
Sum			335.89	1750.6	813.5	0
Average	2.31	304.2	14.00	72.9	33.9	0
Maximum			17.65	81.6	59.2	0
Time			14:00	24:00	09:00	01:00
Minimum			9.95	61.5	16.9	0
Time			06:00	12:00	01:00	01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 03/27 Time: 01:00 ----- 2002 03/27 Time: 24:00





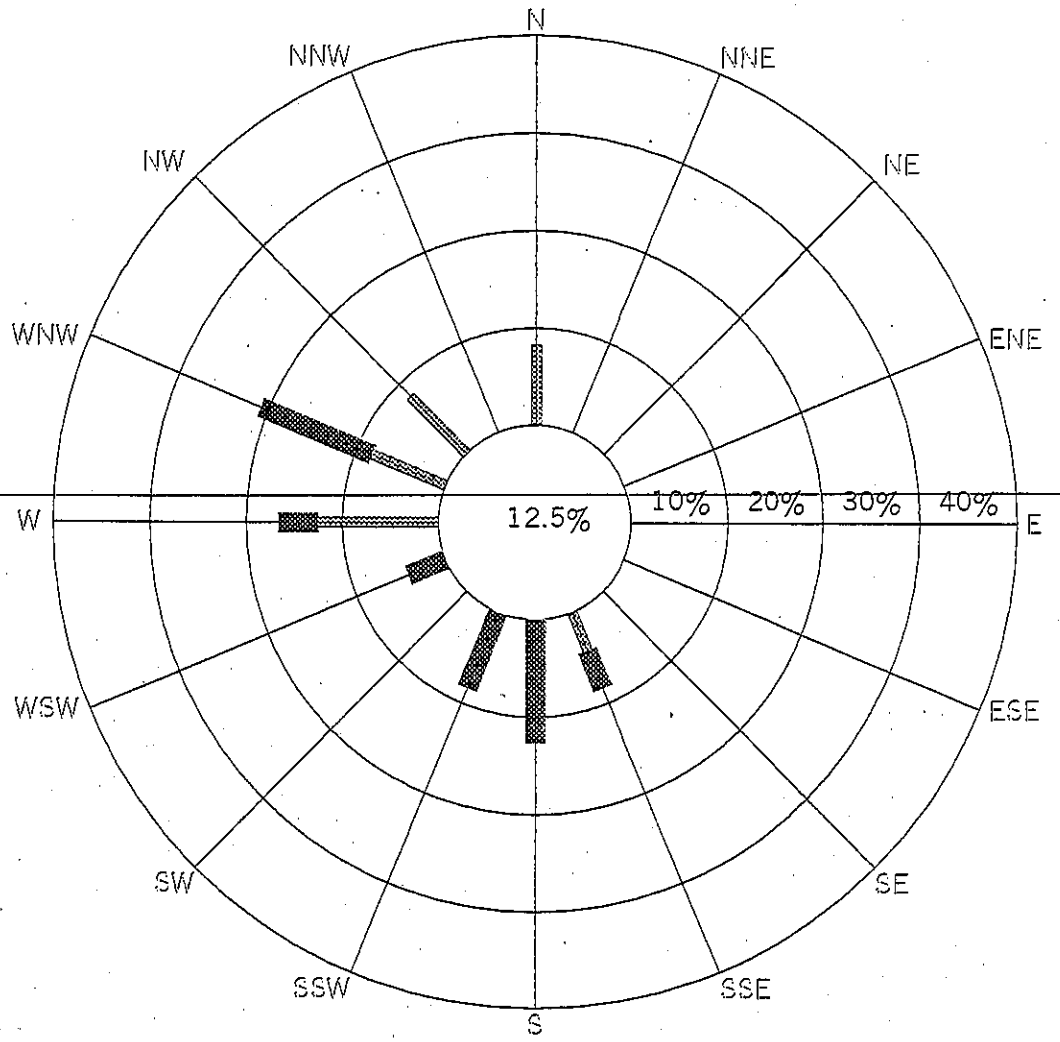
Barrio Logan CR6

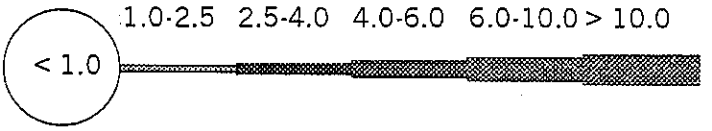
Date: 2002/03/27 Printing: 2002/04/05

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	0.86	56.2	11.81	82.9	32.3	0
02:00	0.75	46.1	11.86	82.1	35.9	0
03:00	0.65	49.4	12.35	81.7	42.4	0
04:00	0.90	81.1	12.90	80.0	47.2	0
05:00	1.26	303.0	13.33	74.5	44.4	0
06:00	1.07	247.2	13.39	74.3	55.5	0
07:00	1.05	80.6	13.39	77.7	51.4	0
08:00	1.14	38.2	13.61	77.8	52.1	0
09:00	----	----	----	----	----	----
10:00	4.32	247.5	-69.68	38.6	32.3	0
11:00	3.15	229.7	-72.79	43.2	53.6	0
12:00	3.13	229.9	-72.79	42.9	53.4	0
13:00	3.62	281.3	-72.79	41.7	38.1	0
14:00	3.56	282.5	-72.79	41.6	36.8	0
15:00	3.07	283.6	-72.79	40.5	39.2	0
16:00	2.45	250.2	-72.79	42.7	49.8	0
17:00	2.73	157.1	-72.79	45.8	39.1	0
18:00	2.47	157.7	-72.79	48.3	23.9	0
19:00	2.47	156.5	-72.79	50.5	27.0	0
20:00	2.52	237.0	-72.79	51.9	47.1	0
21:00	2.05	267.5	-72.79	52.9	42.8	0
22:00	1.24	286.3	-72.79	53.5	41.2	0
23:00	1.79	253.3	-72.79	55.3	47.2	0
24:00	2.07	238.1	-72.79	54.9	53.4	0
Sum			-986.11	1335.0	986.2	0
Average	2.10	252.5	-42.87	58.0	42.9	0
Maximum Time			13.61 08:00	82.9 01:00	55.5 06:00	0 01:00
Minimum Time			-72.79 11:00	38.6 10:00	23.9 18:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	96%	96%	96%	96%	96%	96%

WIND ROSE PLOT

2002 03/28 Time: 01:00 ----- 2002 03/28 Time: 24:00





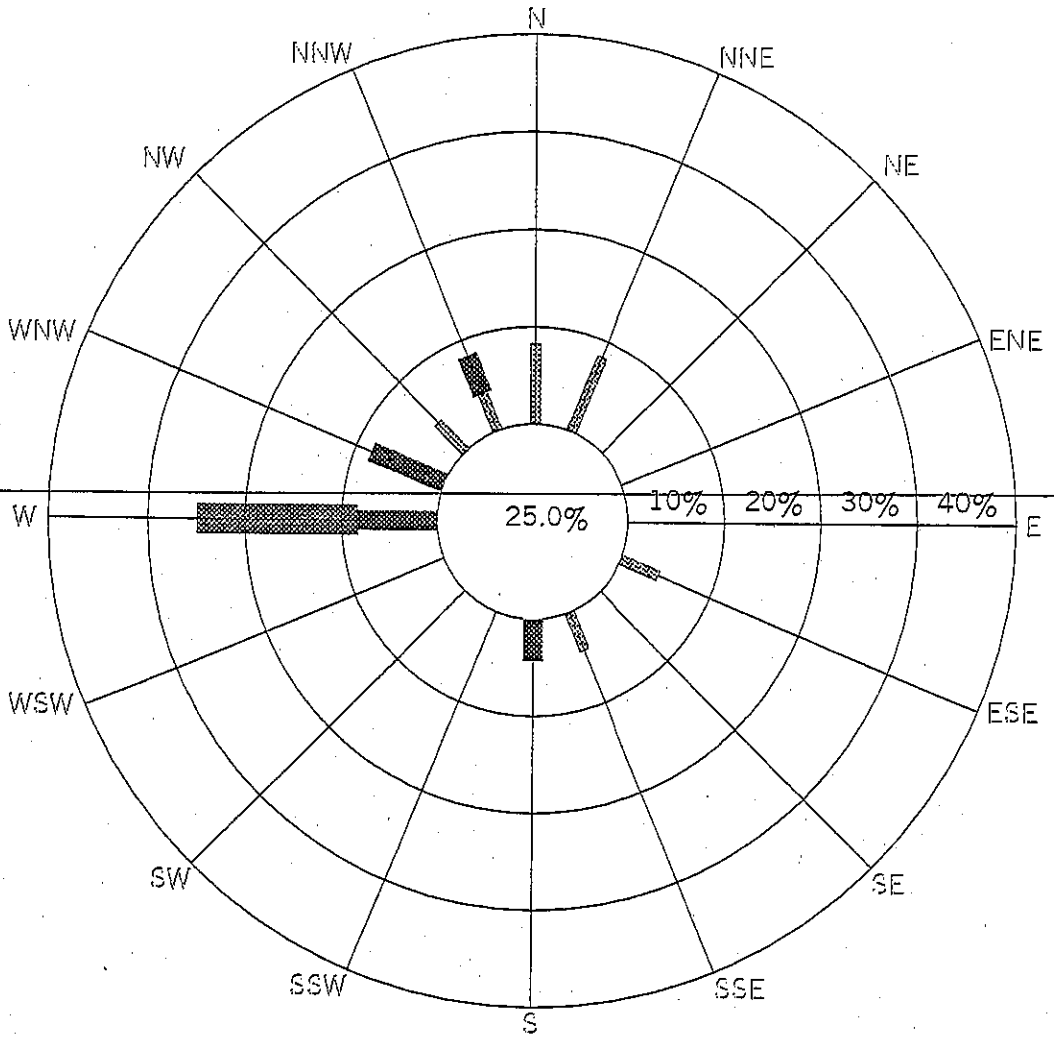
Barrio Logan CR6

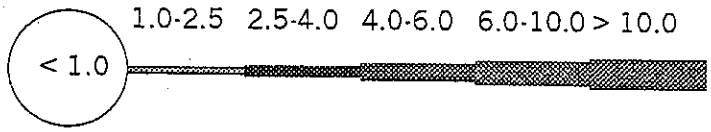
Date: 2002/03/28 Printing: 2002/04/05

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	1.77	277.6	-72.79	54.9	43.1	0
02:00	1.71	269.3	-72.79	55.1	38.2	0
03:00	1.67	274.7	-72.79	55.4	41.1	0
04:00	1.12	295.3	-72.79	55.7	31.6	0
05:00	0.82	22.9	-72.79	56.3	29.3	0
06:00	0.63	65.4	-72.79	57.1	26.9	0
07:00	0.65	60.4	-72.79	56.5	36.4	0
08:00	1.94	148.0	-72.79	54.0	26.0	0
09:00	3.17	167.8	-72.79	48.8	34.4	0
10:00	3.22	174.3	-72.79	46.1	34.5	0
11:00	3.96	180.4	-72.79	45.1	42.1	0
12:00	3.66	210.9	-72.79	43.3	48.2	0
13:00	3.83	192.5	-72.79	39.4	42.6	0
14:00	3.83	186.9	14.86	60.9	38.1	0
15:00	3.32	237.6	15.24	58.2	47.5	0
16:00	3.77	276.7	15.63	55.4	36.0	0
17:00	3.19	283.2	14.92	58.7	38.2	0
18:00	2.90	290.5	14.21	64.5	34.0	0
19:00	2.66	293.2	14.04	65.7	36.1	0
20:00	2.32	292.5	13.93	65.4	34.8	0
21:00	2.18	307.5	13.88	66.1	38.5	0
22:00	2.13	321.2	13.82	68.0	36.4	0
23:00	2.01	355.4	13.72	66.3	28.0	0
24:00	1.31	8.1	13.33	67.7	24.8	0
Sum			-788.69	1364.5	866.7	0
Average	2.41	270.8	-32.86	56.9	36.1	0
Maximum Time			15.63 16:00	68.0 22:00	48.2 12:00	0 01:00
Minimum Time			-72.79 01:00	39.4 13:00	24.8 24:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 03/29 Time: 01:00 ----- 2002 03/29 Time: 24:00





Barrio Logan CR6

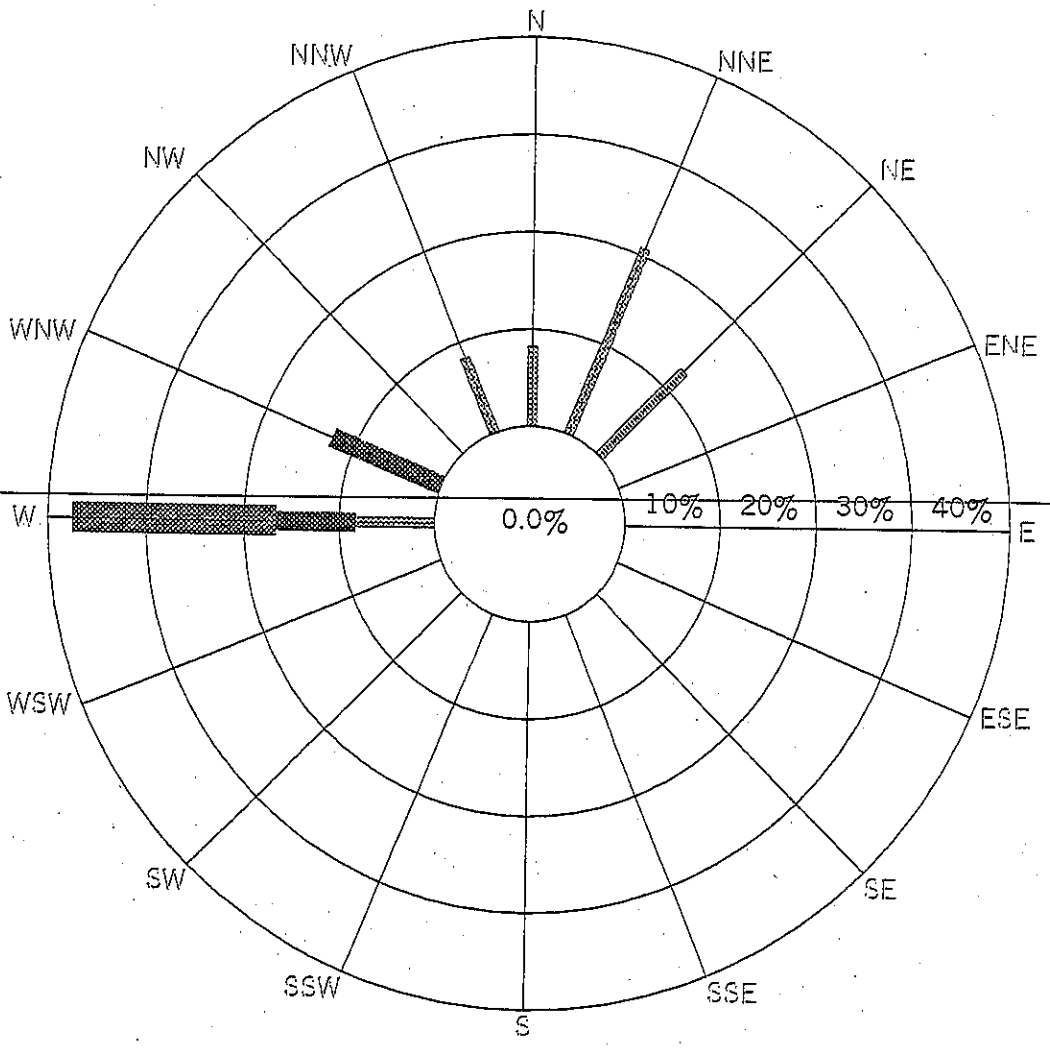
Log Date: 2002/03/29

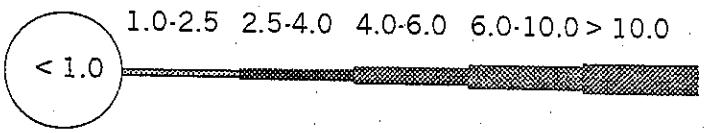
Printing: 2002/04/05

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	1.18	8.4	12.57	71.5	15.2	0
02:00	1.12	22.1	11.86	75.0	18.3	0
03:00	0.69	66.1	11.26	78.9	20.7	0
04:00	0.75	49.4	11.42	78.7	26.8	0
05:00	0.84	39.0	10.71	81.6	21.5	0
06:00	0.78	54.8	11.04	81.5	31.5	0
07:00	0.90	34.0	11.97	78.1	36.0	0
08:00	0.67	62.1	13.01	74.3	52.4	0
09:00	1.37	112.7	14.32	69.9	70.8	0
10:00	1.82	163.4	14.26	72.9	52.3	0
11:00	3.09	172.4	14.59	73.9	37.3	0
12:00	3.53	266.4	15.52	70.1	36.2	0
13:00	4.23	274.8	16.72	65.5	37.6	0
14:00	4.49	279.6	17.48	62.7	38.0	0
15:00	5.06	279.7	17.10	63.9	36.0	0
16:00	4.74	271.0	16.66	65.2	35.0	0
17:00	3.94	279.0	16.17	69.4	37.6	0
18:00	3.39	288.8	15.08	73.2	35.2	0
19:00	2.85	295.2	14.21	75.8	36.0	0
20:00	2.43	325.2	13.72	79.8	36.7	0
21:00	2.56	331.8	13.44	81.2	37.2	0
22:00	2.32	328.3	13.55	81.0	35.0	0
23:00	1.92	354.8	13.72	80.1	30.9	0
24:00	1.84	11.7	13.72	80.5	28.2	0
Sum			334.09	1784.5	842.2	0
Average	2.35	342.7	13.92	74.4	35.1	0
Maximum Time			17.48 14:00	81.6 05:00	70.8 09:00	0 01:00
Minimum Time			10.71 05:00	62.7 14:00	15.2 01:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 03/30 Time: 01:00 ----- 2002 03/30 Time: 24:00





Barrio Logan CR6

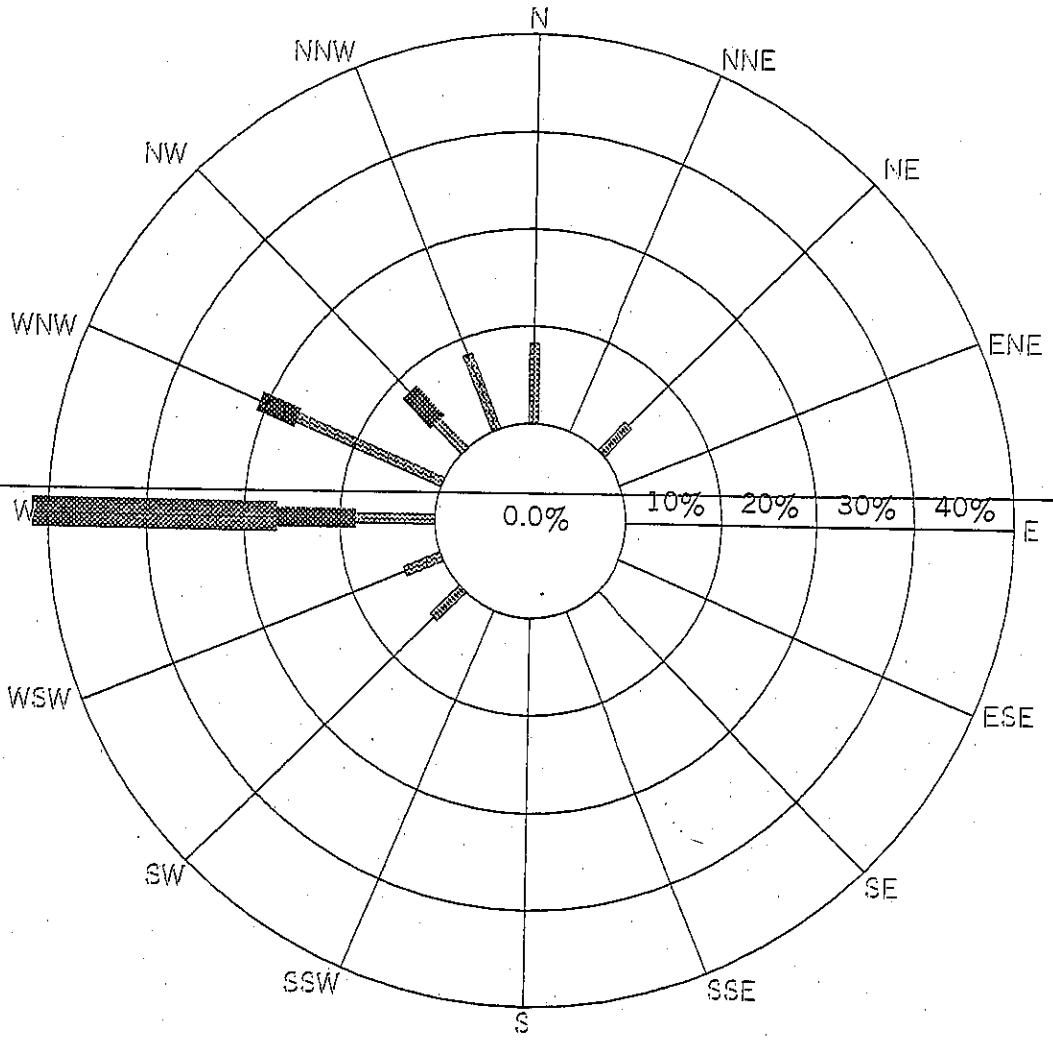
Date: 2002/03/30

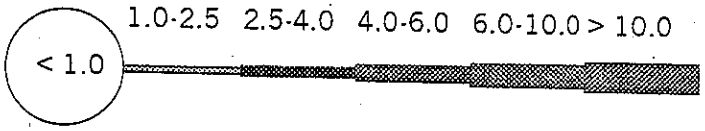
Printing: 2002/04/05

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	1.67	23.6	13.61	81.1	26.1	0
02:00	1.41	24.5	13.50	81.3	25.5	0
03:00	1.20	29.4	13.44	81.2	36.8	0
04:00	1.62	12.2	13.28	81.5	42.7	0
05:00	1.50	22.6	13.06	82.6	25.9	0
06:00	1.20	36.7	12.84	83.4	34.1	0
07:00	1.39	38.1	13.01	83.3	39.1	0
08:00	1.54	35.2	13.33	82.2	44.4	0
09:00	1.77	346.7	13.72	81.0	52.4	0
10:00	1.90	354.0	14.37	78.2	50.4	0
11:00	3.11	288.6	15.73	73.6	47.7	0
12:00	4.47	275.3	16.72	69.9	40.0	0
13:00	5.04	274.8	17.10	68.4	36.4	0
14:00	5.23	271.6	17.15	68.2	37.3	0
15:00	5.08	270.0	16.77	70.7	36.4	0
16:00	4.74	279.4	16.34	72.4	38.6	0
17:00	3.92	278.1	15.57	75.1	40.1	0
18:00	3.09	294.0	14.53	80.0	40.5	0
):00	2.85	290.6	14.10	82.1	41.1	0
20:00	2.73	272.6	14.04	83.1	36.4	0
21:00	2.11	279.7	13.93	83.5	47.9	0
22:00	1.48	356.5	13.99	83.8	44.9	0
23:00	1.35	340.8	13.93	83.8	48.8	0
24:00	1.92	262.6	13.99	83.8	47.7	0
Sum			348.06	1894.3	961.2	0
Average	2.60	325.1	14.50	78.9	40.0	0
Maximum Time			17.15 14:00	83.8 22:00	52.4 09:00	0 01:00
Minimum Time			12.84 06:00	68.2 14:00	25.5 02:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 03/31 Time: 01:00 ----- 2002 03/31 Time: 24:00





Barrio Logan CR6

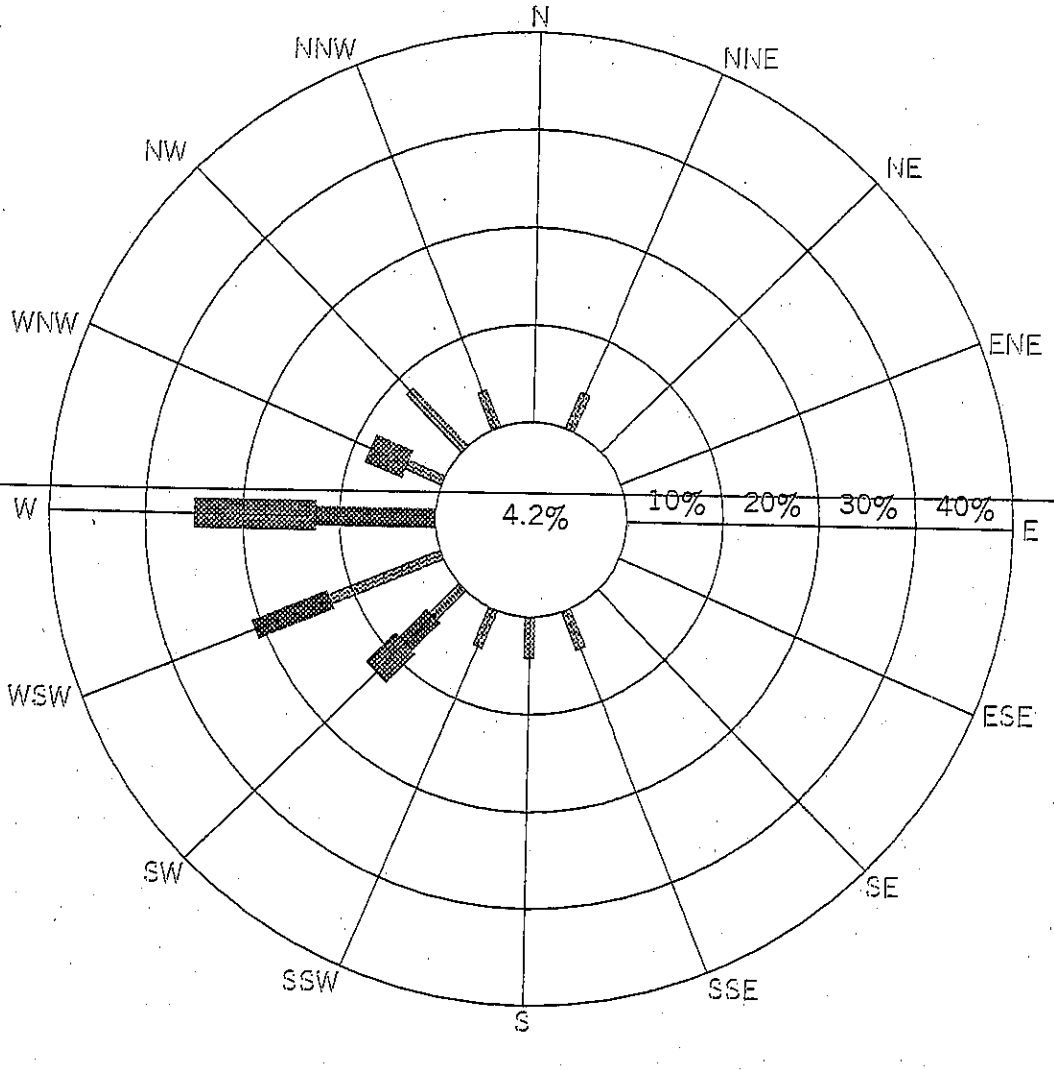
Avg Date: 2002/03/31

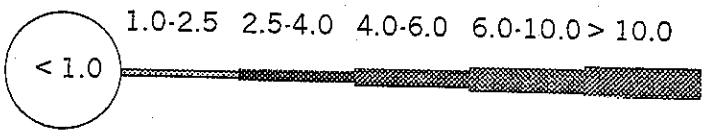
Printing: 2002/04/05

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	2.05	271.6	13.77	85.8	39.9	0
02:00	1.73	296.7	13.66	86.3	44.7	0
03:00	1.16	37.8	13.66	84.6	53.9	0
04:00	2.15	284.9	13.50	86.2	35.6	0
05:00	2.03	297.2	13.28	87.2	35.6	0
06:00	2.01	321.0	13.06	88.1	35.6	0
07:00	2.11	359.8	12.95	88.3	33.3	0
08:00	2.28	352.5	12.90	88.7	34.7	0
09:00	2.30	341.2	13.28	86.9	44.2	0
10:00	2.64	305.2	14.21	82.7	51.0	0
11:00	3.72	266.9	15.73	77.4	42.7	0
12:00	4.64	277.1	16.23	74.9	39.7	0
13:00	5.13	271.2	16.61	73.9	39.8	0
14:00	4.68	279.1	17.15	71.2	40.3	0
15:00	4.64	279.8	16.83	71.4	38.3	0
16:00	4.42	275.8	16.34	73.5	37.7	0
17:00	4.06	272.7	15.84	76.2	36.6	0
18:00	3.39	282.5	14.43	82.6	32.8	0
19:00	2.96	266.5	13.44	87.6	38.1	0
20:00	2.35	271.8	13.12	88.6	43.4	0
21:00	2.37	254.1	13.01	88.8	41.3	0
22:00	2.07	285.8	12.84	90.2	45.3	0
23:00	1.62	224.1	12.79	90.6	55.2	0
24:00	1.28	334.1	12.84	90.5	59.2	0
Sum			341.45	2002.3	999.0	0
Average	2.82	291.8	14.23	83.4	41.6	0
Maximum Time			17.15 14:00	90.6 23:00	59.2 24:00	0 01:00
Minimum Time			12.79 23:00	71.2 14:00	32.8 18:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 04/01 Time: 01:00 ----- 2002 04/01 Time: 24:00





Barrio Logan CR6

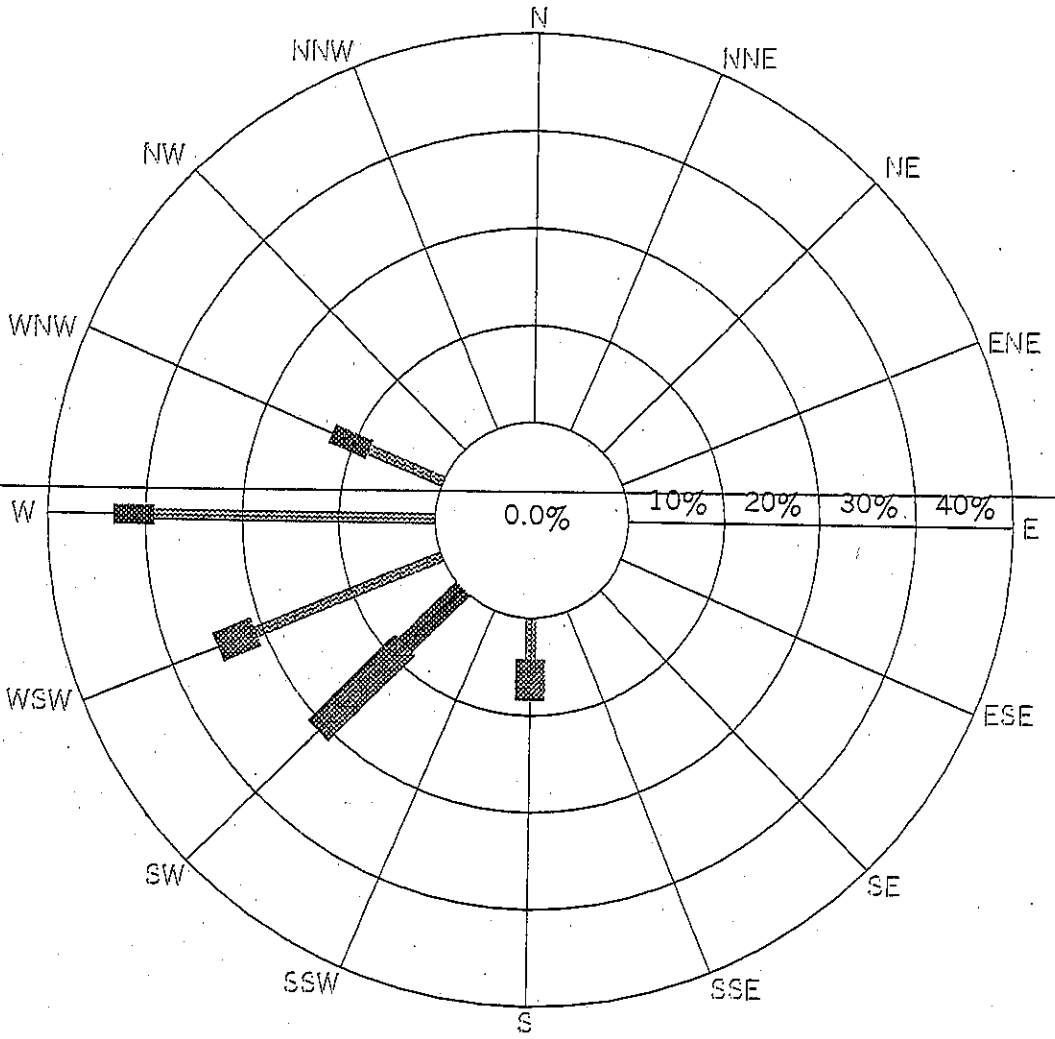
Log Date: 2002/04/01

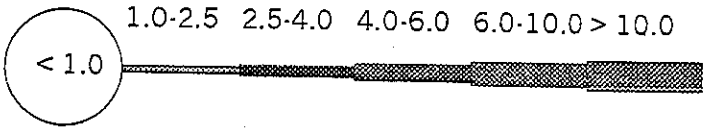
Printing: 2002/04/05

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	( )
01:00	1.50	15.2	12.73	90.7	39.0	0
02:00	0.97	30.8	12.84	90.0	52.0	0
03:00	1.65	325.6	12.79	89.9	42.1	0
04:00	2.30	241.2	12.51	91.4	38.6	0
05:00	1.92	251.6	12.41	91.1	47.4	0
06:00	1.60	339.2	12.46	90.0	54.1	0
07:00	1.71	296.1	12.57	89.8	49.3	0
08:00	1.65	315.5	12.90	88.4	49.0	0
09:00	2.58	263.1	13.50	84.8	38.0	0
10:00	3.30	263.9	14.10	81.2	39.9	0
11:00	3.49	257.6	15.13	76.0	48.4	0
12:00	4.09	269.3	16.28	71.7	42.7	0
13:00	4.15	279.4	17.04	68.6	41.2	0
14:00	4.04	285.6	16.83	67.6	40.6	0
15:00	4.13	280.2	16.88	67.5	38.9	0
16:00	3.77	269.7	16.55	69.7	45.4	0
17:00	4.04	217.7	14.97	77.4	45.9	0
18:00	3.07	246.4	14.32	80.4	49.0	0
19:00	2.41	250.0	13.93	81.8	47.2	0
20:00	2.71	230.9	13.77	83.6	45.7	0
21:00	2.45	226.9	13.61	83.7	49.5	0
22:00	1.84	197.8	13.44	84.0	55.6	0
23:00	2.35	174.9	13.22	84.7	45.4	0
24:00	2.24	158.0	13.17	84.6	33.3	0
Sum			337.96	1968.6	1078.1	0
Average	2.66	263.9	14.08	82.0	44.9	0
Maximum Time			17.04 13:00	91.4 04:00	55.6 22:00	0 01:00
Minimum Time			12.41 05:00	67.5 15:00	33.3 24:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 04/02 Time: 01:00 ----- 2002 04/02 Time: 24:00





Barrio Logan CR6

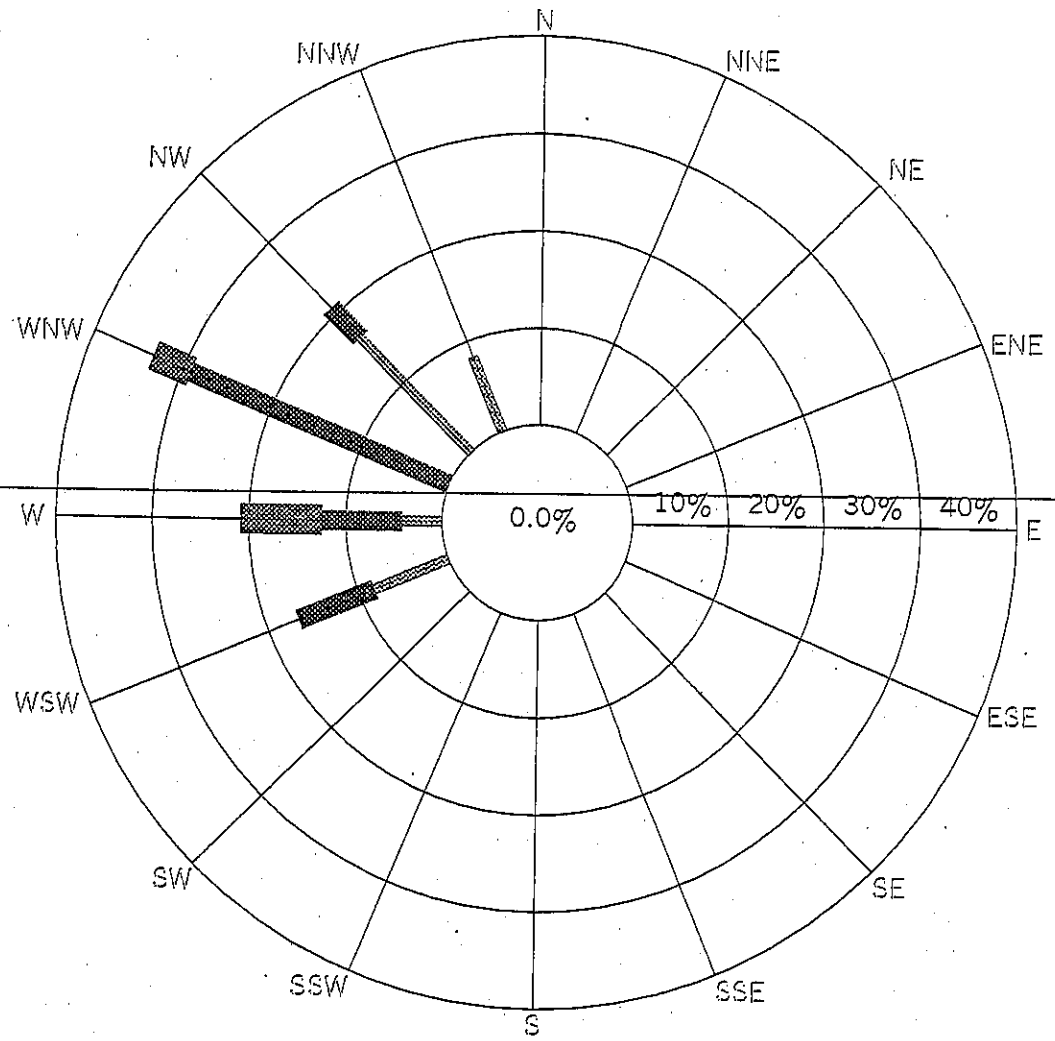
Log Date: 2002/04/02

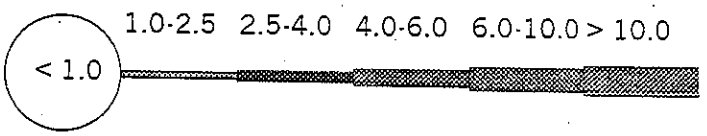
Printing: 2002/04/05

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	2.26	175.3	13.12	84.2	42.4	0
02:00	1.88	245.4	13.06	83.7	51.7	0
03:00	1.48	299.5	12.95	83.5	60.0	0
04:00	1.73	255.8	12.95	83.5	43.2	0
05:00	1.54	272.5	12.95	82.9	66.7	0
06:00	1.99	266.7	12.90	82.5	42.4	0
07:00	1.96	269.3	12.90	81.7	42.4	0
08:00	2.01	288.7	13.28	80.0	44.9	0
09:00	2.18	280.6	13.93	76.8	52.4	0
10:00	3.64	231.1	14.43	74.5	46.5	0
11:00	4.53	220.3	15.19	70.3	49.0	0
12:00	4.42	231.2	15.57	69.3	49.2	0
13:00	4.17	241.2	16.34	66.4	47.9	0
14:00	5.36	180.6	15.73	68.1	41.7	0
15:00	4.36	221.0	15.24	69.6	50.8	0
16:00	3.66	225.1	14.64	70.7	54.4	0
17:00	2.79	273.3	14.32	73.1	40.9	0
18:00	2.62	283.4	13.93	74.9	46.8	0
19:00	2.47	258.3	13.66	76.1	49.8	0
20:00	2.20	246.7	13.61	76.0	51.8	0
21:00	2.11	239.6	13.44	77.2	44.8	0
22:00	1.65	259.8	13.50	77.3	54.6	0
23:00	1.69	268.2	13.44	77.8	49.7	0
24:00	2.07	267.0	13.44	78.2	47.3	0
Sum			334.52	1838.3	1171.1	0
Average	2.70	251.2	13.94	76.6	48.8	0
Maximum Time			16.34 13:00	84.2 01:00	66.7 05:00	0 01:00
Minimum Time			12.90 06:00	66.4 13:00	40.9 17:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 04/03 Time: 01:00 ----- 2002 04/03 Time: 24:00





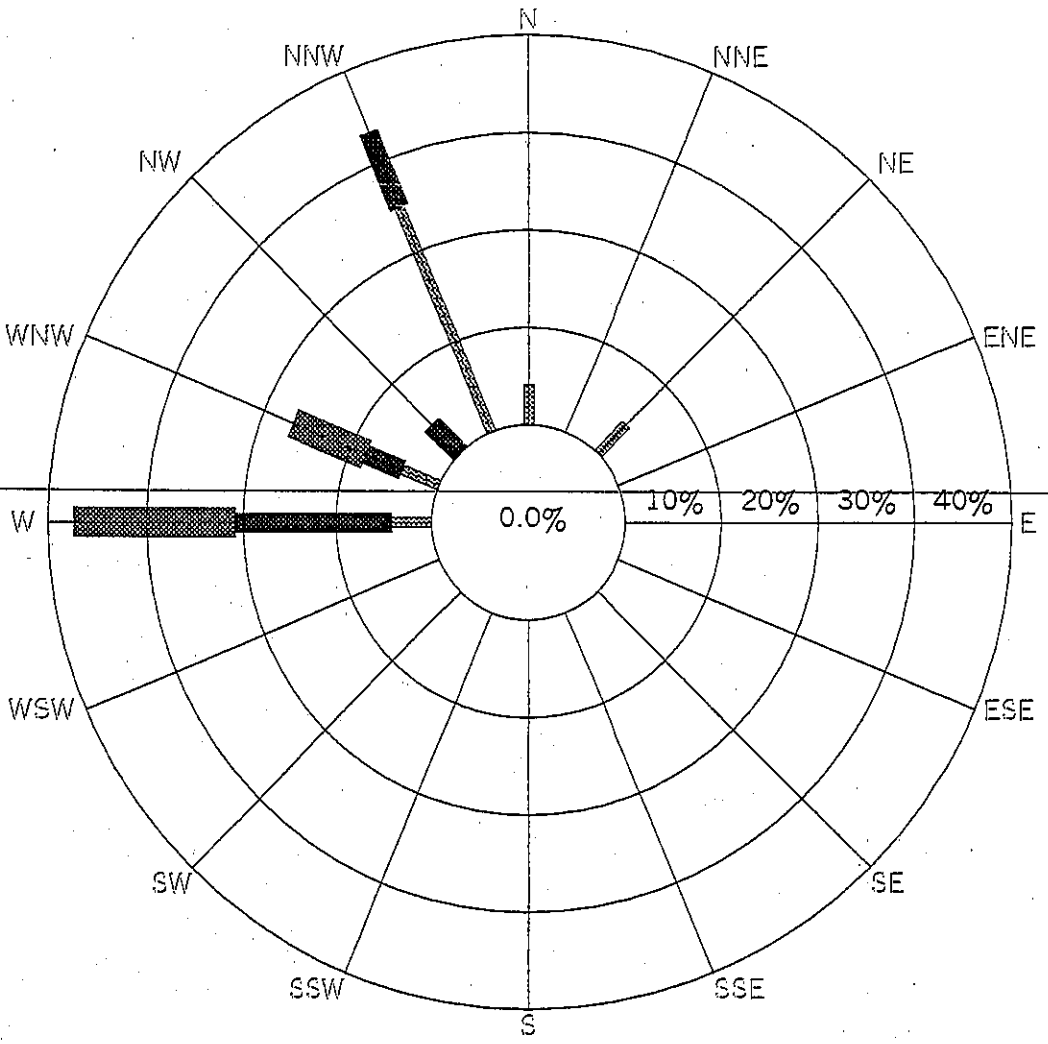
Barrio Logan CR6

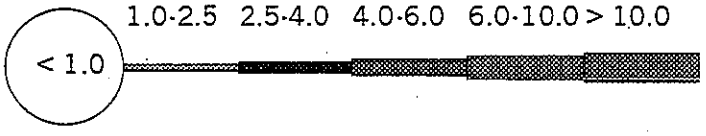
Log Date: 2002/04/03 Printing: 2002/04/05

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	2.05	238.6	13.33	78.9	45.5	0
02:00	2.05	252.3	13.22	79.3	46.4	0
03:00	2.01	305.7	13.12	79.3	36.9	0
04:00	1.92	304.3	12.95	79.6	45.1	0
05:00	1.90	324.0	12.73	80.3	36.2	0
06:00	1.50	329.8	12.73	80.1	68.7	0
07:00	1.56	343.2	12.79	79.1	57.7	0
08:00	1.58	320.4	13.01	78.1	65.6	0
09:00	1.88	280.7	13.44	77.0	56.0	0
10:00	2.58	254.5	14.10	74.5	44.6	0
11:00	3.41	244.4	14.81	71.3	49.0	0
12:00	3.72	269.6	15.63	67.1	45.4	0
13:00	4.11	276.7	16.44	64.2	47.3	0
14:00	4.34	279.1	16.12	66.3	38.8	0
15:00	3.79	280.0	15.63	68.5	39.5	0
16:00	4.00	281.5	15.35	70.8	37.9	0
17:00	3.51	282.6	14.75	74.7	41.2	0
18:00	3.51	286.3	14.37	75.1	35.5	0
19:00	3.02	283.9	14.15	75.2	33.8	0
20:00	2.71	301.0	14.15	75.1	39.7	0
21:00	2.79	301.6	14.04	73.7	38.5	0
22:00	2.66	301.3	13.93	74.6	37.7	0
23:00	2.69	302.8	13.82	74.5	36.7	0
24:00	2.64	318.3	13.61	74.6	33.0	0
Sum			338.23	1791.7	1056.6	0
Average	2.75	290.2	14.09	74.7	44.0	0
Maximum Time			16.44 13:00	80.3 05:00	68.7 06:00	0 01:00
Minimum Time			12.73 05:00	64.2 13:00	33.0 24:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 04/04 Time: 01:00 ----- 2002 04/04 Time: 24:00





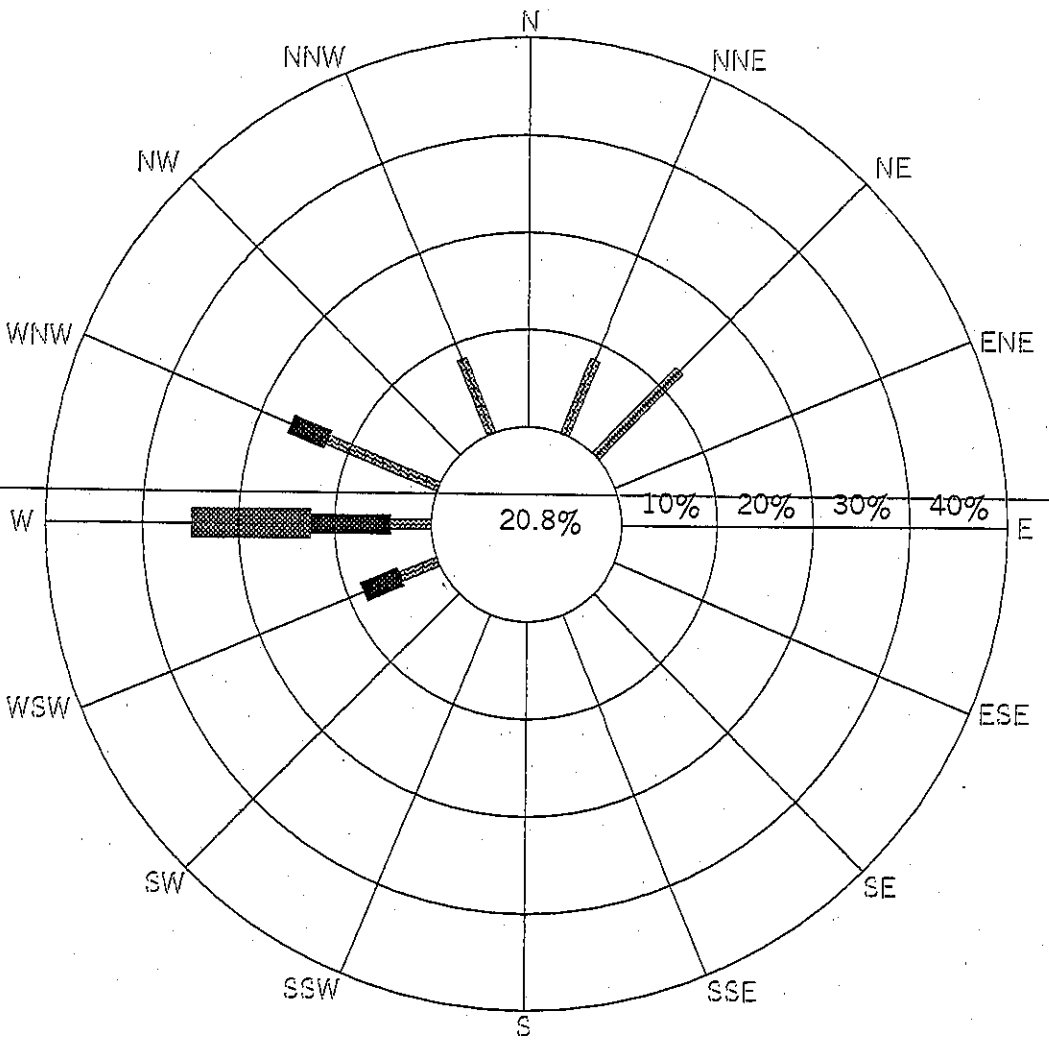
Barrio Logan CR6

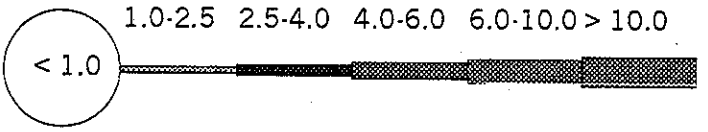
Log Date: 2002/04/04 Printing: 2002/04/11

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	2.60	338.7	13.44	74.6	32.9	0
02:00	2.71	332.6	13.33	75.0	31.2	0
03:00	1.94	337.6	13.28	76.5	37.9	0
04:00	1.94	339.6	13.22	78.1	38.4	0
05:00	1.73	338.0	13.28	77.8	30.4	0
06:00	1.28	326.8	13.50	74.0	37.7	0
07:00	1.71	348.0	13.72	70.8	43.9	0
08:00	1.94	292.4	14.10	68.0	56.4	0
09:00	2.58	314.6	15.24	63.0	56.4	0
10:00	3.98	267.8	16.34	59.3	42.2	0
11:00	4.36	280.0	17.04	57.4	33.4	0
12:00	4.49	282.1	17.48	57.7	39.7	0
13:00	4.72	278.6	17.43	57.7	40.3	0
14:00	5.02	277.9	17.32	57.5	41.6	0
15:00	4.72	276.4	17.15	57.2	37.9	0
16:00	4.13	281.7	16.72	58.2	41.8	0
17:00	3.89	273.9	16.06	61.0	39.6	0
18:00	3.24	274.8	15.13	65.7	38.2	0
19:00	2.85	280.2	14.26	69.3	39.9	0
20:00	2.52	291.6	13.77	71.6	36.2	0
21:00	2.22	281.1	13.66	72.9	34.1	0
22:00	1.60	347.3	13.17	74.6	32.2	0
23:00	1.75	0.6	13.12	75.5	29.0	0
24:00	1.14	37.3	12.57	77.4	24.4	0
Sum			354.33	1630.9	915.5	0
Average	2.88	307.6	14.76	68.0	38.1	0
Maximum Time			17.48 12:00	78.1 04:00	56.4 08:00	0 01:00
Minimum Time			12.57 24:00	57.2 15:00	24.4 24:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 04/05 Time: 01:00 ----- 2002 04/05 Time: 24:00





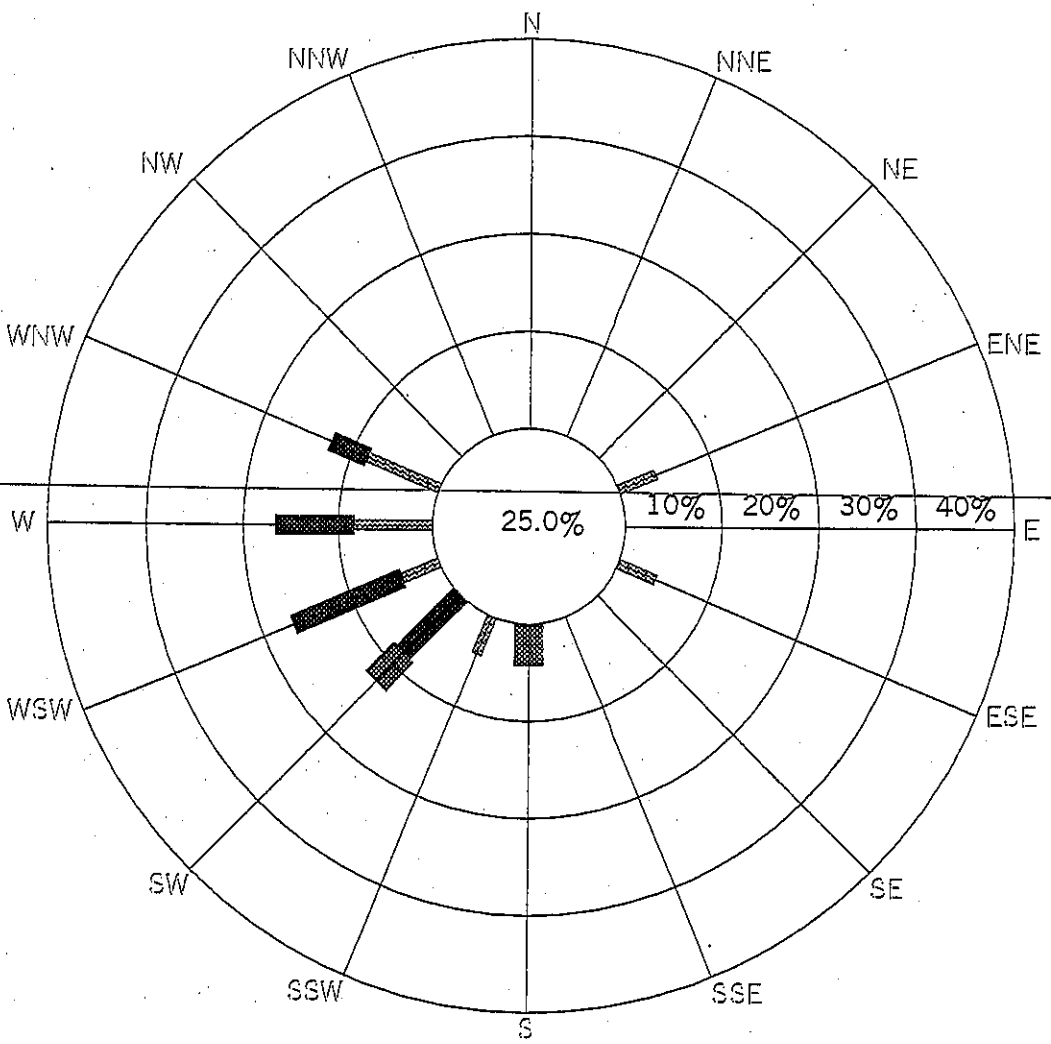
Barrio Logan CR6

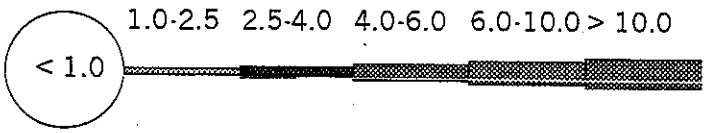
Log Date: 2002/04/05 Printing: 2002/04/11

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	0.86	52.5	12.02	79.5	27.8	0
02:00	0.82	8.2	11.75	80.4	45.4	0
03:00	0.71	51.7	11.75	80.8	20.3	0
04:00	1.22	35.2	11.59	81.1	26.7	0
05:00	1.22	37.3	11.86	80.3	32.8	0
06:00	0.97	35.8	12.30	79.2	43.3	0
07:00	0.80	83.9	12.90	76.8	55.2	0
08:00	1.16	38.2	13.72	73.0	59.1	0
09:00	1.18	17.5	14.15	69.4	69.4	0
10:00	1.79	342.7	14.37	68.2	49.1	0
11:00	2.22	252.6	14.70	67.3	56.0	0
12:00	3.36	255.1	15.24	66.3	38.3	0
13:00	3.53	294.3	16.88	53.5	50.5	0
14:00	4.15	261.2	17.97	48.3	48.3	0
15:00	4.70	271.4	18.30	48.0	37.5	0
16:00	4.83	277.5	17.59	50.8	36.8	0
17:00	3.94	277.6	16.44	57.2	38.1	0
18:00	3.15	276.1	15.13	65.6	41.8	0
19:00	2.37	272.2	14.53	70.3	38.8	0
20:00	1.90	294.0	14.26	72.5	43.7	0
21:00	2.35	284.4	14.53	72.8	40.5	0
22:00	2.13	290.5	14.48	74.3	36.3	0
23:00	1.90	339.7	14.37	75.6	38.4	0
24:00	1.52	24.2	13.93	77.0	33.6	0
Sum			344.78	1668.2	1007.8	0
Average	2.20	328.3	14.37	69.5	42.0	0
Maximum Time			18.30 15:00	81.1 04:00	69.4 09:00	0 01:00
Minimum Time			11.59 04:00	48.0 15:00	20.3 03:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 04/06 Time: 01:00 ----- 2002 04/06 Time: 24:00





Barrio Logan CR6

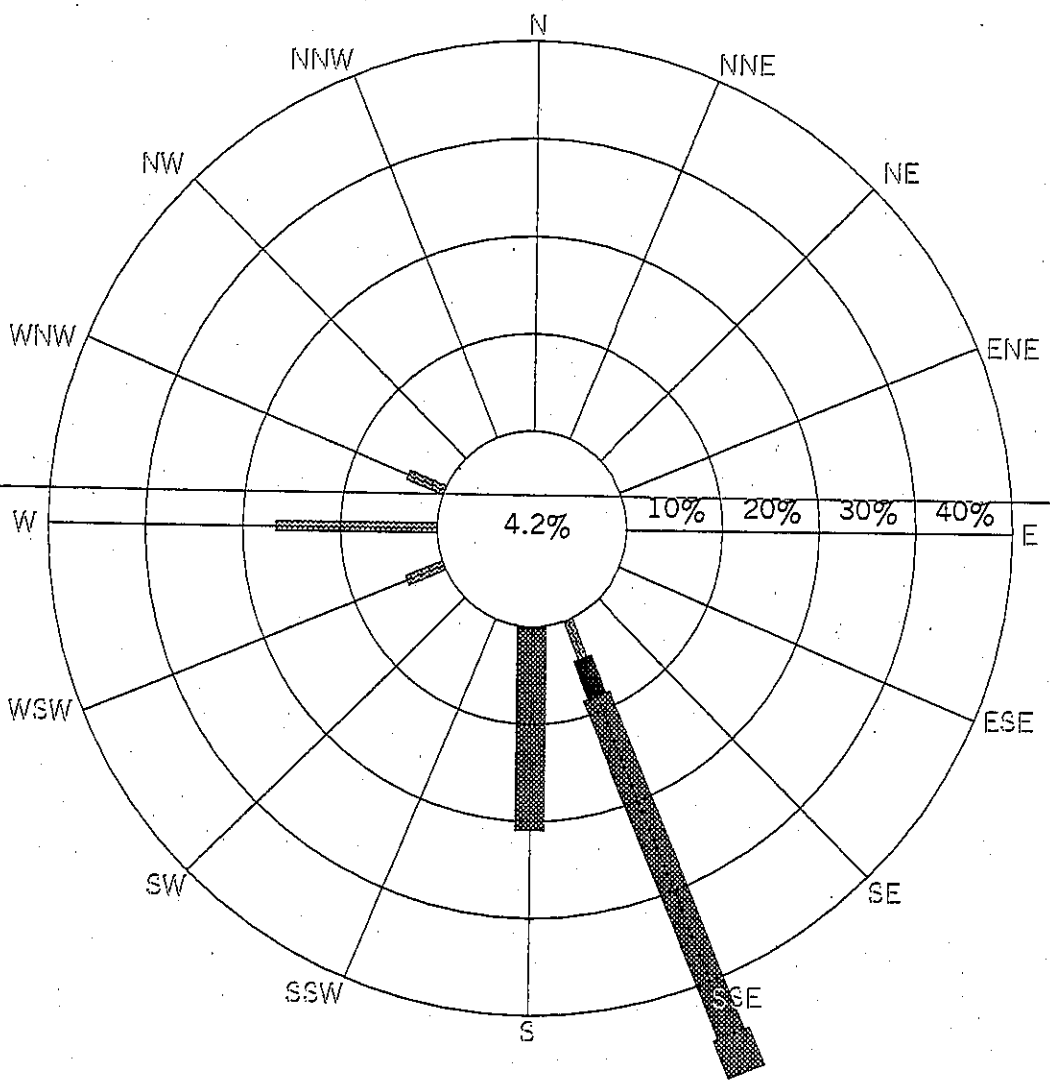
og Date: 2002/04/06

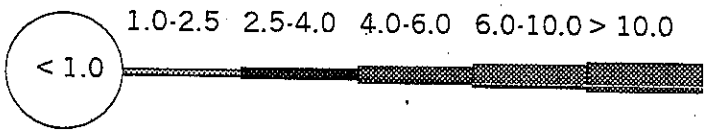
Printing: 2002/04/11

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	0.92	72.7	13.12	86.7	37.4	0
02:00	0.97	89.6	12.24	95.4	44.5	0
03:00	0.82	78.6	12.30	94.4	34.4	0
04:00	0.73	53.1	12.19	96.3	37.1	0
05:00	1.14	57.8	12.13	96.6	40.9	0
06:00	0.92	86.3	12.08	97.8	51.2	0
07:00	0.80	66.4	12.90	98.7	56.9	0
08:00	1.37	121.5	14.32	95.2	46.9	0
09:00	1.77	205.9	15.41	87.1	70.3	0
10:00	3.07	216.8	16.44	83.1	49.0	0
11:00	4.79	185.4	17.04	82.0	35.7	0
12:00	4.02	215.8	16.28	84.5	40.6	0
13:00	3.89	213.8	16.94	82.0	43.8	0
14:00	3.77	253.7	18.14	73.5	43.1	0
15:00	3.89	265.0	18.57	72.6	41.9	0
16:00	3.60	253.7	17.70	76.9	41.9	0
17:00	3.96	267.2	18.08	71.2	41.6	0
18:00	3.22	250.9	16.83	83.9	42.2	0
19:00	2.75	286.8	16.28	83.8	35.1	0
20:00	1.84	278.1	16.01	83.6	41.2	0
21:00	1.62	278.8	15.90	84.4	41.0	0
22:00	1.92	250.5	16.50	87.5	50.0	0
23:00	2.05	282.3	16.44	87.5	37.4	0
24:00	1.73	284.9	16.17	90.0	40.5	0
Sum			370.00	2074.5	1044.6	0
Average	2.31	241.3	15.42	86.4	43.5	0
Maximum Time			18.57 15:00	98.7 07:00	70.3 09:00	0 01:00
Minimum Time			12.08 06:00	71.2 17:00	34.4 03:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 04/07 Time: 01:00 ----- 2002 04/07 Time: 24:00





Barrio Logan CR6

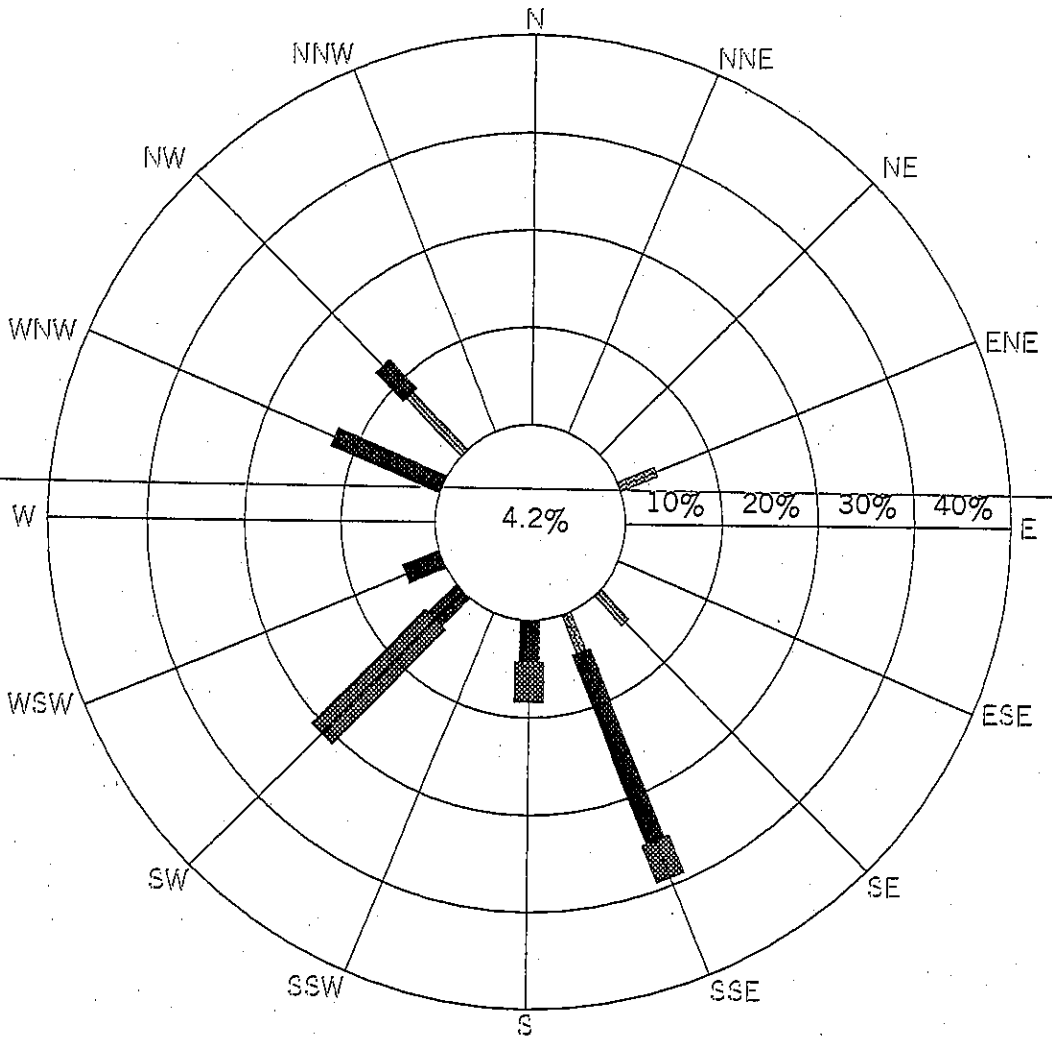
Log Date: 2002/04/07

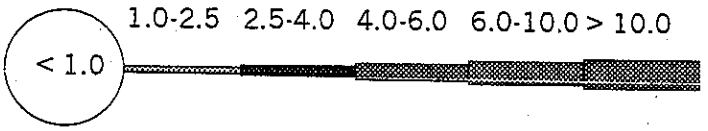
Printing: 2002/04/11

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	1.60	280.0	15.95	88.1	36.3	0
02:00	1.20	290.6	15.79	88.6	36.5	0
03:00	1.43	280.7	16.01	85.6	33.7	0
04:00	1.92	264.8	15.84	85.1	37.4	0
05:00	1.35	277.2	15.68	83.9	39.6	0
06:00	0.92	281.3	15.63	82.3	47.6	0
07:00	1.71	256.2	15.79	80.1	49.9	0
08:00	2.09	159.8	16.17	79.0	65.9	0
09:00	3.87	165.8	16.55	76.0	31.9	0
10:00	4.40	163.9	16.99	73.3	30.5	0
11:00	4.98	161.9	17.75	70.6	29.1	0
12:00	5.95	171.5	17.92	71.1	34.6	0
13:00	6.12	165.8	17.81	74.3	30.2	0
14:00	5.76	165.7	17.81	73.5	31.2	0
15:00	5.91	170.0	17.48	76.0	31.4	0
16:00	5.63	175.3	17.04	78.2	36.0	0
17:00	4.66	169.0	16.83	77.5	30.5	0
18:00	4.51	161.2	16.12	80.3	26.3	0
19:00	4.28	164.5	16.01	78.4	28.1	0
20:00	4.81	161.5	16.12	77.5	27.2	0
21:00	4.36	166.1	15.95	77.3	29.1	0
22:00	4.02	163.8	16.12	75.6	30.4	0
23:00	4.15	166.0	16.06	76.3	30.1	0
24:00	4.32	169.5	16.12	75.9	31.4	0
Sum			395.54	1884.5	834.8	0
Average	3.75	189.8	16.48	78.5	34.8	0
Maximum Time			17.92 12:00	88.6 02:00	65.9 08:00	0 01:00
Minimum Time			15.63 06:00	70.6 11:00	26.3 18:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 04/08 Time: 01:00 ----- 2002 04/08 Time: 24:00





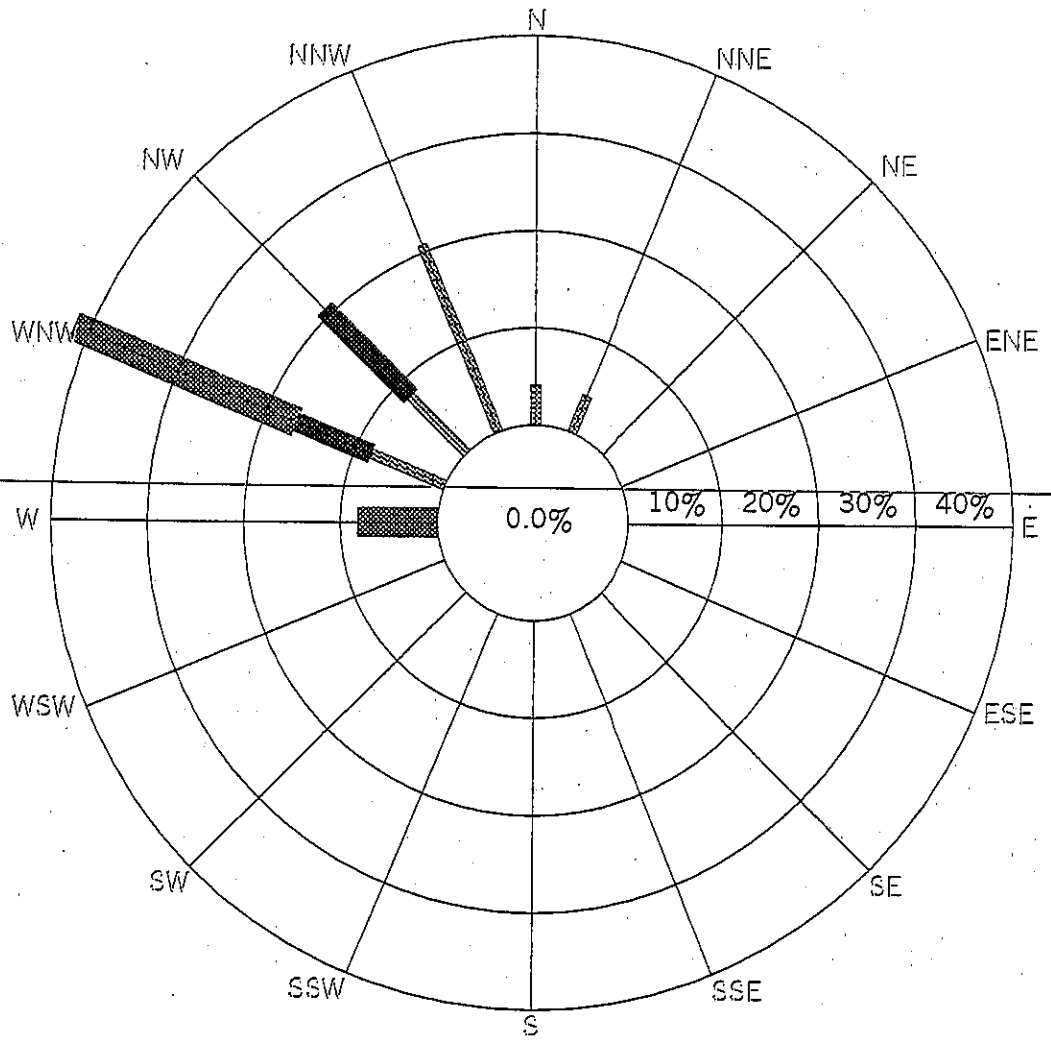
Barrio Logan CR6

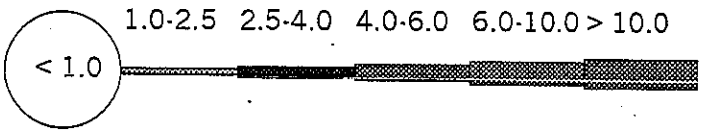
Log Date: 2002/04/08 Printing: 2002/04/11

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	3.75	161.0	15.84	75.3	30.8	0
02:00	2.94	149.2	15.84	75.5	26.4	0
03:00	2.94	151.3	15.90	75.2	25.1	0
04:00	2.60	147.3	15.95	76.1	22.7	0
05:00	1.45	138.0	16.06	75.4	42.5	0
06:00	0.88	67.1	16.06	73.1	41.3	0
07:00	1.20	77.8	16.44	72.0	72.0	0
08:00	2.03	156.7	16.88	68.0	37.8	0
09:00	3.05	176.2	17.26	67.0	39.7	0
10:00	3.77	166.0	17.75	64.7	30.1	0
11:00	4.72	163.5	18.46	62.3	28.4	0
12:00	5.78	181.8	18.57	65.3	37.8	0
13:00	4.55	227.2	19.17	63.5	45.9	0
14:00	4.49	225.2	19.01	64.2	41.4	0
15:00	4.51	216.7	18.79	69.2	45.9	0
16:00	4.36	221.8	18.19	69.3	37.9	0
17:00	3.98	229.9	17.86	70.1	36.8	0
18:00	3.47	240.6	17.26	75.4	39.5	0
19:00	3.02	287.8	16.44	80.3	33.3	0
20:00	2.81	292.9	16.39	80.3	35.8	0
21:00	2.30	316.3	16.55	79.0	38.6	0
22:00	2.69	304.1	16.50	79.2	36.0	0
23:00	2.88	299.6	16.28	79.5	35.4	0
24:00	2.35	305.5	16.34	81.5	34.4	0
Sum			409.84	1741.3	895.3	0
Average	3.19	203.0	17.08	72.6	37.3	0
Maximum Time			19.17 13:00	81.5 24:00	72.0 07:00	0 01:00
Minimum Time			15.84 01:00	62.3 11:00	22.7 04:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 04/09 Time: 01:00 ----- 2002 04/09 Time: 24:00





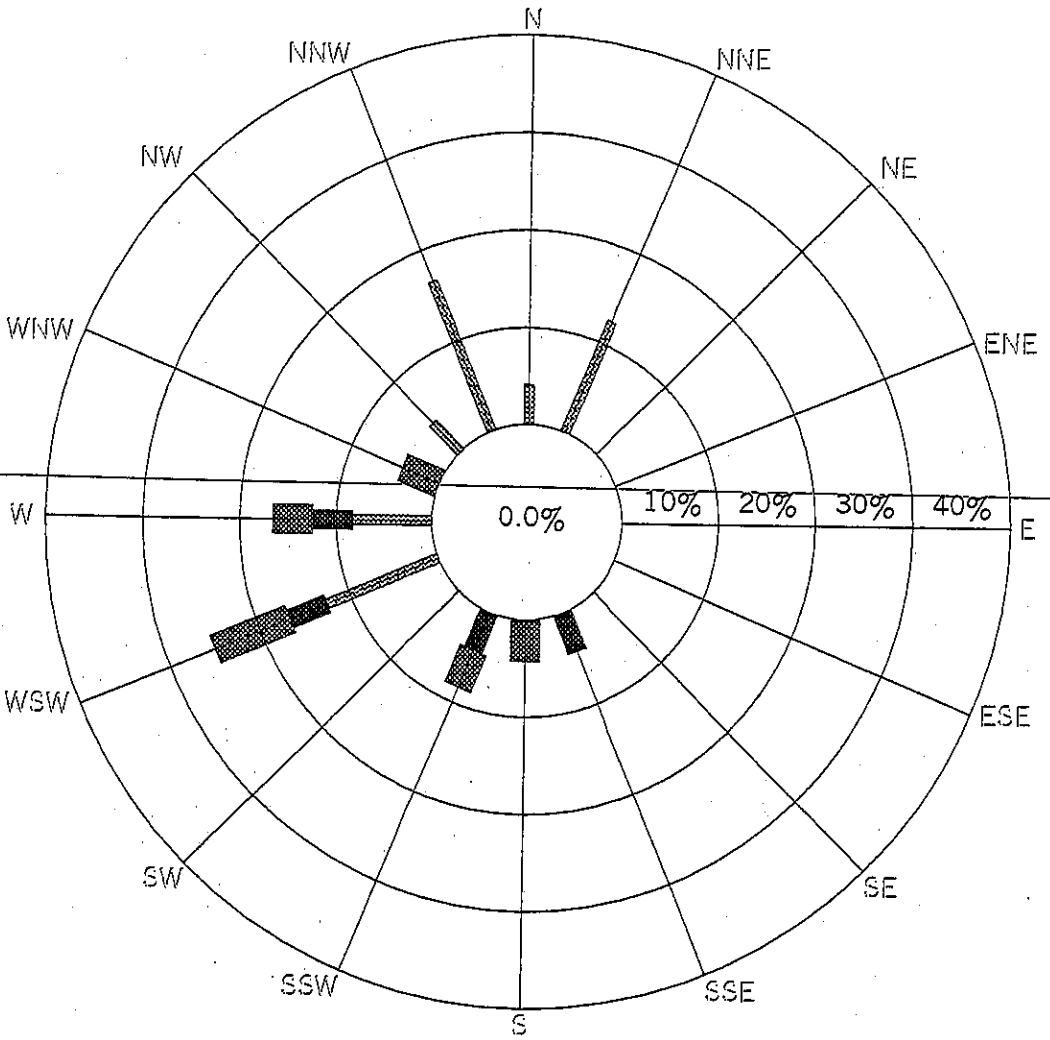
Barrio Logan CR6

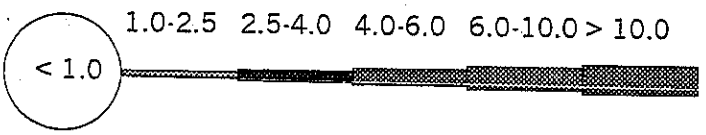
og Date: 2002/04/09 Printing: 2002/04/11

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	Sigma (Deg)	()
01:00	2.13	288.9	16.44	81.5	36.9	0
02:00	1.99	309.6	16.34	80.7	36.0	0
03:00	1.92	348.6	16.12	80.5	32.5	0
04:00	2.01	348.8	16.12	79.7	30.9	0
05:00	1.82	346.8	16.06	79.2	42.0	0
06:00	1.73	28.7	16.01	79.3	32.5	0
07:00	2.09	295.0	16.66	77.7	19.1	0
08:00	2.43	319.9	16.66	77.0	39.9	0
09:00	2.85	304.9	16.99	78.4	41.7	0
10:00	3.13	311.3	17.59	75.7	40.3	0
11:00	4.04	292.8	19.28	68.9	42.7	0
12:00	5.34	275.9	19.39	68.7	35.0	0
13:00	5.38	274.3	19.94	65.3	36.7	0
14:00	5.17	287.1	20.32	65.2	36.6	0
15:00	4.98	287.9	19.99	67.5	36.6	0
16:00	4.45	282.5	19.83	68.4	35.4	0
17:00	4.62	283.6	19.39	71.0	32.8	0
18:00	3.60	286.5	17.81	77.7	31.6	0
19:00	4.06	292.2	16.61	84.4	31.5	0
20:00	3.68	312.8	16.28	85.4	39.4	0
21:00	2.58	303.3	16.01	85.6	38.5	0
22:00	2.07	338.4	15.90	86.7	40.8	0
23:00	1.69	337.1	15.73	87.4	38.0	0
24:00	1.77	348.2	15.57	88.1	43.2	0
Sum			417.04	1860.0	870.6	0
Average	3.15	309.9	17.38	77.5	36.3	0
Maximum Time			20.32 14:00	88.1 24:00	43.2 24:00	0 01:00
Minimum Time			15.57 24:00	65.2 14:00	19.1 07:00	0 01:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 04/10 Time: 01:00 ----- 2002 04/10 Time: 24:00





Barrio Logan CR6

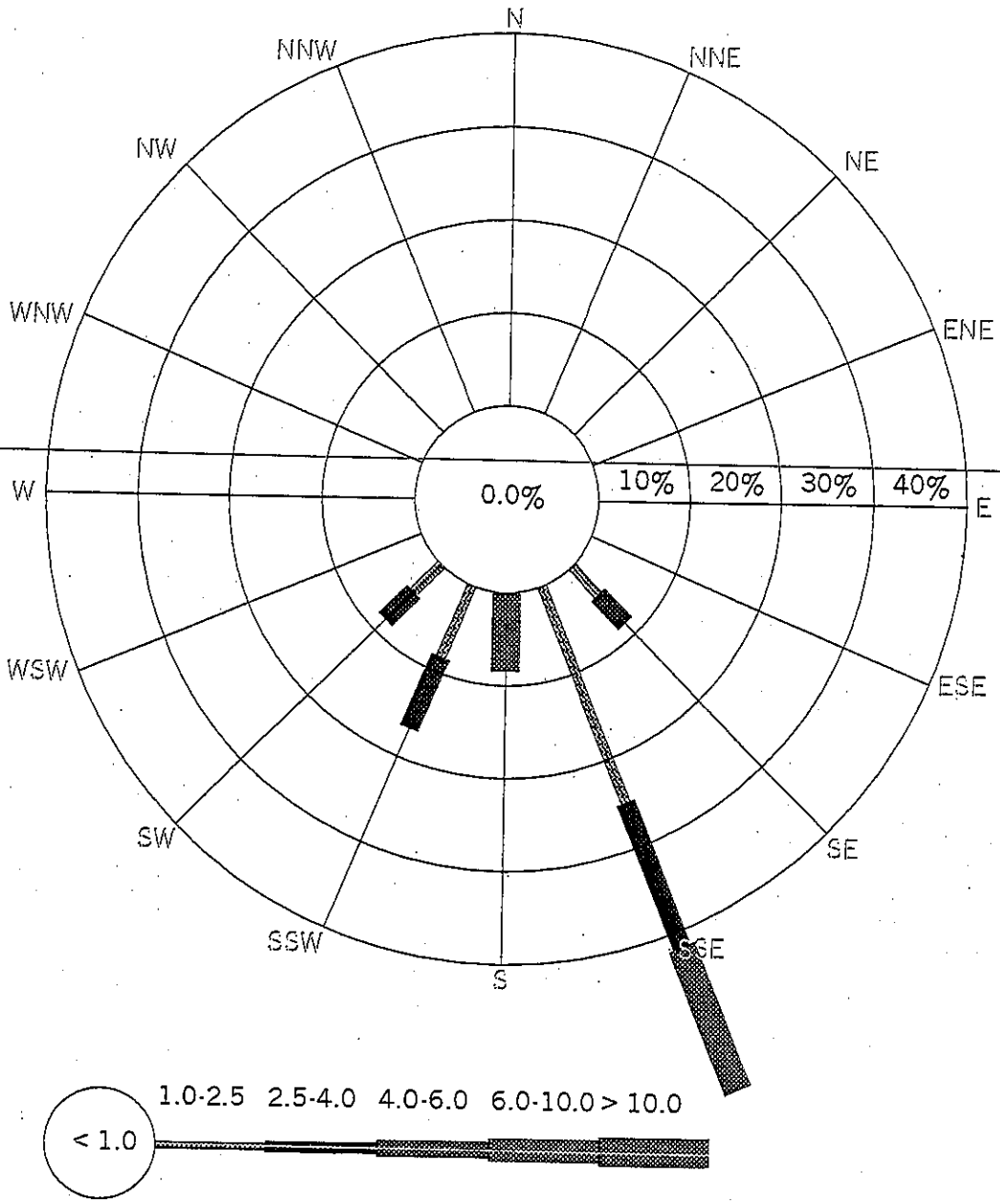
og Date: 2002/04/10

Printing: 2002/04/18

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	()	Sigma (Deg)
01:00	1.41	15.6	15.30	89.4	0	42.6
02:00	1.62	6.2	15.13	89.4	0	49.1
03:00	1.92	332.6	14.81	90.2	0	40.0
04:00	1.75	344.2	14.81	90.4	0	54.1
05:00	1.33	334.3	14.97	89.8	0	68.6
06:00	1.35	23.7	14.81	90.5	0	56.5
07:00	1.20	21.7	14.97	89.7	0	23.9
08:00	1.75	348.5	15.13	88.2	0	45.6
09:00	2.15	316.7	15.95	84.0	0	55.6
10:00	2.69	205.9	17.65	79.3	0	54.7
11:00	5.27	180.8	18.08	79.1	0	30.6
12:00	4.47	251.7	18.85	74.8	0	43.8
13:00	4.17	286.5	19.28	71.7	0	42.0
14:00	4.17	275.0	19.50	71.7	0	41.7
15:00	4.49	208.9	19.06	75.9	0	42.6
16:00	4.64	250.2	18.85	77.3	0	43.6
17:00	3.60	264.0	17.70	81.1	0	41.5
18:00	3.00	257.2	16.66	85.3	0	45.0
9:00	2.47	271.5	16.23	88.4	0	41.6
20:00	2.24	262.4	16.12	89.4	0	44.2
21:00	1.58	255.9	15.84	90.4	0	73.6
22:00	1.94	257.8	15.73	89.9	0	44.2
23:00	1.54	251.4	15.57	90.0	0	60.0
24:00	2.81	150.9	15.35	91.4	0	25.2
Sum			396.36	2037.1	0	1110.4
Average	2.65	284.5	16.51	84.9	0	46.3
Maximum Time			19.50 14:00	91.4 24:00	0 01:00	73.6 21:00
Minimum Time			14.81 03:00	71.7 13:00	0 01:00	23.9 07:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 04/11 Time: 01:00 ----- 2002 04/11 Time: 24:00



Barrio Logan CR6

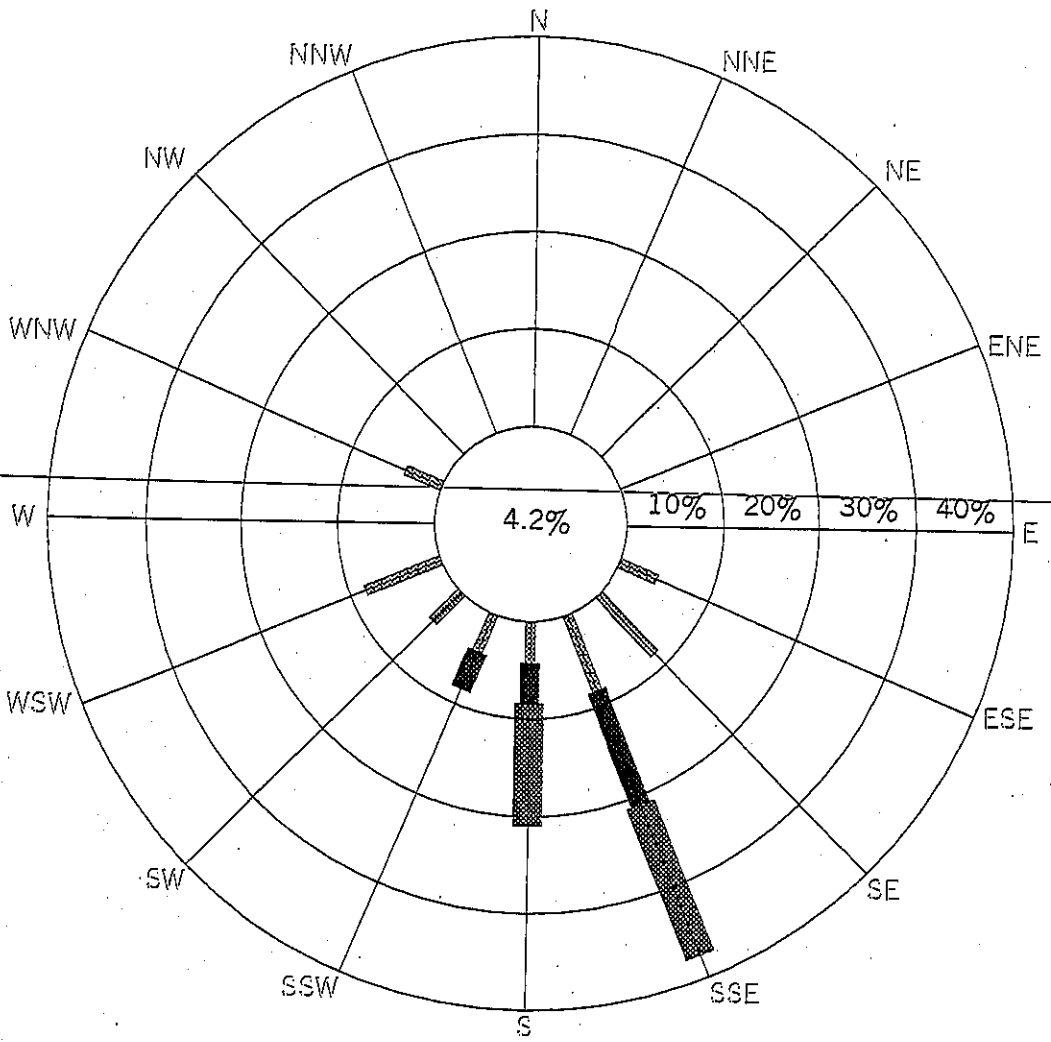
.og Date: 2002/04/11

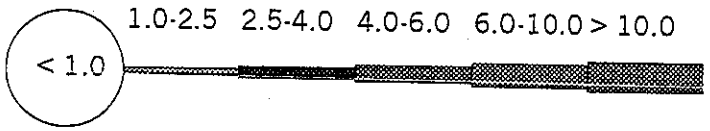
Printing: 2002/04/18

Item / Time	RWS (Knt)	RWD (Deg)	AT (C)	RH (%)	()	Sigma (Deg)
01:00	2.13	156.5	15.03	92.7	0	49.8
02:00	2.15	141.9	14.86	92.4	0	44.1
03:00	2.05	166.8	14.86	92.3	0	43.6
04:00	2.77	158.8	14.86	92.0	0	33.7
05:00	2.35	162.0	15.03	91.5	0	42.4
06:00	2.13	157.9	15.19	91.1	0	37.8
07:00	1.48	151.8	15.57	87.3	0	63.8
08:00	2.22	223.9	16.01	85.8	0	63.8
09:00	3.00	204.7	16.88	83.1	0	50.2
10:00	3.62	204.6	17.75	80.0	0	45.8
11:00	4.81	189.9	17.81	78.7	0	40.5
12:00	5.66	166.6	17.65	79.5	0	29.9
13:00	5.57	168.7	17.81	79.4	0	33.6
14:00	5.42	172.6	17.43	80.9	0	35.6
15:00	5.08	163.9	16.88	82.7	0	28.2
16:00	4.06	158.7	16.66	83.4	0	30.3
17:00	3.79	165.9	16.34	85.8	0	37.2
18:00	2.75	231.2	16.06	86.9	0	57.0
19:00	2.94	155.5	15.57	89.3	0	41.0
20:00	2.35	197.8	15.52	90.3	0	45.0
21:00	2.30	194.6	15.30	90.6	0	50.8
22:00	2.58	140.9	15.19	91.7	0	29.8
23:00	2.13	153.9	15.19	92.5	0	60.4
24:00	2.58	157.8	15.08	92.7	0	40.0
Sum			384.52	2092.4	0	1034.4
Average	3.16	172.1	16.02	87.2	0	43.1
Maximum Time			17.81 11:00	92.7 24:00	0 01:00	63.8 07:00
Minimum Time			14.86 02:00	78.7 11:00	0 01:00	28.2 15:00
Standard # above	----	----	----	----	----	----
Valid	100%	100%	100%	100%	100%	100%

WIND ROSE PLOT

2002 04/12 Time: 01:00 ----- 2002 04/12 Time: 24:00





Appendix C.4

Activity Data at Chrome Plating Facilities

(data provided by the South Coast Air Quality Management District)

Master Plating

Decorative chrome electroplating tank operating parameters during ARB ambient monitoring at Barrio Logan

Date	Part or Job Description	Time Part In	Time Part Out	Sample Number	Volts	Amps	Temp. (F)	Totalizer Part In	Totalizer Part Out	Comments	Number of Drops	Specific Gravity	Surface Tension		Analyzed by # of drops	Analyzed by specific gravity	Analysis date # of drops	Analysis date specific gravity	Jar used
02/06/2002	none	9:00:00	-	37.1C	0	0	-	67413	-	No plating during tank sampling	51.00	1.235	34.87	2/6/02 9:00	District	District	02/07/2002	02/07/2002	50 ml gla
02/06/2002	none	9:55:00	-	37.2C	0	0	-	67413	-	No plating during tank sampling	43.00	1.242	41.69	2/6/02 9:55	District	District	02/07/2002	02/07/2002	50 ml gla
02/06/2002	none	10:40:00	-	37.3C	0	0	-	67413	-	No plating during tank sampling	55.00	1.207	31.60	2/6/02 10:40	District	District	02/07/2002	02/07/2002	50 ml gla
02/06/2002	Chrome Foam addition	11:00:00	-	-	-	-	-	-	-	Added 8 ounces of Chrome Foam. Surface tension measured by facility. Data obtained from facility.			39.00						
02/06/2002	none	11:48:00	-	37.4C	0	0	-	67413	-	No plating during tank sampling	57.00	1.222	30.87	2/6/02 11:48	District	District	02/07/2002	02/07/2002	50 ml gla
02/06/2002	Bath fixture	11:57:00	11:59:00	-	-	50	-	-	-	Data obtained from facility.									
02/06/2002	2" x3" frame x2	12:03:00	12:03:30	-	-	20	-	-	-	Data obtained from facility.									
02/06/2002	4 D/H rings	12:09:00	12:10:00	-	-	40	-	-	-	Data obtained from facility.									
02/06/2002	1 brake cal	12:14:00	12:16:00	-	-	100	-	-	-	Data obtained from facility.									
02/06/2002	1 stove top, 18" x 18"	12:25:00	12:28:00	-	-	400	-	-	-	Data obtained from facility.									
02/06/2002	2 brake calipers	13:12:00	13:14:00	-	-	120	-	-	-	Data obtained from facility.									
02/06/2002	none	13:15:00	-	37.5C	0	0	-	67497	-	No plating during tank sampling. Foam on tank.	48.00	1.229	36.87	2/6/02 13:15	District	District	02/07/2002	02/07/2002	50 ml gla
02/06/2002	2 brake calipers	13:17:00	13:19:00	-	-	130	-	-	-	Data obtained from facility.									
02/06/2002	none	14:00:00	-	37.6C	7.5	125	-	67586	-	Part put in after tank sample taken.	47.00	1.242	38.05	2/6/02 14:00	District	District	02/07/2002	02/07/2002	50 ml gla
02/06/2002	small nuts & bolts	14:20:00	14:21:00	-	-	60	-	-	-	Data obtained from facility.									
02/06/2002	none	14:45:00	-	37.7C	0	4.6	-	67606	-	No plating during tank sampling.	45.00	1.229	39.33	2/6/02 14:45	District	District	02/07/2002	02/07/2002	50 ml gla
02/06/2002	1 bumper tip, 2' long	14:50:00	-	-	-	250	-	-	-	Data obtained from facility.									
02/06/2002	2 window posts	15:02:00	15:04:00	-	-	120	-	-	-	Data obtained from facility.									
02/06/2002	headlight bucket	15:07:00	15:09:00	-	-	200	-	-	-	Data obtained from facility.									
02/06/2002	4 windshield post molds	15:11:00	15:13:00	-	-	400	-	-	-	Data obtained from facility.									
02/07/2002	none	8:05:00	-	38.1C	0	0	112	67784	-	No plating during tank sampling. Chrome foam not added yet.	42.00	1.300	44.57	2/7/02 8:05	District	District	02/12/2002	02/12/2002	50 ml gla
02/07/2002	none	9:05:00	-	38.2C	0	0	112	67784	-	No plating during tank sampling. Chrome foam not added yet.	43.00	1.300	43.53	2/7/02 9:05	District	District	02/12/2002	02/12/2002	50 ml gla
02/07/2002	Chrome Foam addition	9:15:00	-	-	-	-	-	-	-	Added 8 ounces of Chrome Foam. Surface tension measured by facility. Data obtained from facility.			32.00						
02/07/2002	2 bumper guards	9:31:00	9:32:30	-	-	120	-	-	-	Data obtained from facility.									
02/07/2002	2 bumper guards	9:36:00	9:37:30	-	-	150	-	-	-	Data obtained from facility.									
02/07/2002	none	10:05:00	-	38.3C	2.5	0	112	67803	-	No plating during tank sampling. 2 bumper guards - 90 sec each at 9:30 am.	41.00	1.200	42.15	2/7/02 10:05	District	District	02/12/2002	02/12/2002	50 ml gla
02/07/2002	2 licence plates	10:25:00	10:26:30	-	-	100	-	-	-	Data obtained from facility.									
02/07/2002	1 grille	10:32:00	10:35:00	-	-	500	-	-	-	Data obtained from facility.									
02/07/2002	none	11:05:00	-	38.4C	2.5	0	112	67879	-	No plating during tank sampling. 2 license plate holders 90 sec / 1 grille 3 min at 10:30.	42.00	1.200	41.14	2/7/02 11:05	District	District	02/12/2002	02/12/2002	50 ml gla
02/07/2002	2 door latches	11:50:00	11:51:30	38.5C	7	80	112	67879	-	Combination of District and facility data.	42.00	1.200	41.14	2/7/02 11:50	District	District	02/12/2002	02/12/2002	50 ml gla
02/07/2002	2 rings, 2 sm levers	12:00:00	12:01:00	-	-	120	-	-	67885	Combination of District and facility data.									
02/07/2002	1 bike fender	12:05:00	12:07:30	-	-	450	-	-	-	Data obtained from facility.									
02/07/2002	none	13:05:00	-	38.6C	2.5	0	112	67932	-	No plating during tank sampling.	40.00	1.200	43.20	2/7/02 13:05	District	District	02/12/2002	02/12/2002	50 ml gla
02/07/2002	none	14:05:00	-	38.7C	2.5	0	112	67932	-	No plating during tank sampling.	42.00	1.200	41.14	2/7/02 14:05	District	District	02/12/2002	02/12/2002	50 ml gla
02/07/2002	4 H/L rings	14:08:00	14:09:30	-	-	300	-	-	-	Data obtained from facility.									
02/07/2002	2 hood bar extensions	14:13:00	14:15:00	-	-	180	-	-	-	Data obtained from facility.									
02/07/2002	1 bumper half	14:28:00	14:30:00	-	-	250	-	-	-	Data obtained from facility.									
02/07/2002	1 bumper half	14:33:00	14:35:00	-	-	250	-	-	-	Data obtained from facility.									
02/07/2002	2 tail lights	14:45:00	14:47:00	-	-	110	-	-	-	Data obtained from facility.									
02/07/2002	1 hood bar	14:49:00	14:51:00	-	-	250	-	-	-	Data obtained from facility.									
02/07/2002	2 door handles, 1 bump	15:04:00	15:06:00	38.8C	6	100	-	68053	-	Combination of District and facility data.	40.00	1.200	43.20	2/7/02 15:04	District	District	02/12/2002	02/12/2002	50 ml gla
02/07/2002	4 D/H size pcs	15:07:00	15:08:30	-	-	150	-	-	-	Data obtained from facility.									
02/07/2002	12 pins	15:12:00	15:13:00	-	-	70	-	-	-	Data obtained from facility.									
02/07/2002	6 pins	15:14:00	15:15:00	-	-	70	-	-	-	Data obtained from facility.									
02/07/2002	none	16:00:00	-	38.9C	0	0	112	68064	-	No plating during tank sampling.	40.00	1.200	43.20	2/7/02 16:00	District	District	02/12/2002	02/12/2002	50 ml gla
02/08/2002	none	8:50:00	-	39.1C	0	0	112	68064	-	No plating during tank sampling. No chrome foam added.	44.00	1.200	39.27	2/8/02 8:50	District	District	02/14/2002	02/14/2002	50 ml gla
02/08/2002	Chrome Foam addition	9:15:00	-	-	-	-	-	-	-	Added 8 ounces of Chrome Foam. Surface tension measured by facility. Data obtained from facility.			29.30						
02/08/2002	1 Tail Light	9:50:00	9:52:00	39.2C	2.5	0	-	68076	68086	Facility measured surface tension prior to plating @ 29.3 dynes/cm.	44.00	1.200	39.27	2/8/02 9:50	District	District	02/14/2002	02/14/2002	50 ml gla
02/08/2002	1 Tail Light	10:05:00	10:07:00	-	-	-	-	68086	68096	Data obtained from facility.									
02/08/2002	1 Air Intake	10:12:00	10:15:00	-	-	-	-	68096	68116	Data obtained from facility.									
02/08/2002	1 Air Intake	10:20:00	10:23:00	-	-	-	-	68116	68156	Data obtained from facility.									
02/08/2002	Bumper	10:35:00	10:38:00	-	-	-	-	68156	68225	Data obtained from facility.									
02/08/2002	Tank	10:45:00	10:48:00	-	-	-	-	68225	68258	Data acquired by facility.									
02/08/2002	Tank	11:05:00	-	39.3C	0	0	-	68258	-	No plating during tank sampling.	42.00	1.200	41.14	2/8/02 11:05	District	District	02/14/2002	02/14/2002	50 ml gla
02/08/2002	Window Channel	11:15:00	11:16:00	-	-	-	-	68258	68264	Data obtained from facility.									
02/08/2002	Window Post	11:56:00	11:58:00	-	-	-	-	68264	68283	Data obtained from facility.									
02/08/2002	none	12:00:00	-	39.4C	6	0	-	68274	-	No plating during tank sampling.	40.00	1.200	43.20	2/8/02 12:00	District	District	02/14/2002	02/14/2002	50 ml gla
02/08/2002	Bumper Guard	12:12:00	12:13:00	-	-	-	-	68283	68289	Data obtained from facility.									

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Decorative chrome electroplating tank operating parameters during ARB ambient monitoring at Barrio Logan

Date	Part or Job Description	Time		Sample Number	Volts	Amps	Temp. (F)	Totalizer		Comments	Number of Drops	Specific Gravity	Surface Tension		Analyzed by		Analysis date		Jar used
		Part In	Part Out					Part In	Part Out						# of drops	specific gravity	# of drops	specific gravity	
02/08/2002	Misc Small Parts	12:22:00	12:23:00	-	-	-	-	68289	68300	Data obtained from facility.									
02/08/2002	Valve Cover	12:28:00	12:30:00	-	-	-	-	68300	68321	Data obtained from facility.									
02/08/2002	none	13:05:00	-	39.5C	8	0	-	68321	-	No plating during tank sampling.	40.00	1.100	39.60	2/8/02 13:05	District	District	02/14/2002	02/14/2002	50 ml gla
02/08/2002	Bumper Tip	13:35:00	13:37:00	-	-	-	-	68321	68339	Data obtained from facility.									
02/08/2002	Winshield Frame	13:50:00	13:52:00	-	-	-	-	68339	68352	Data obtained from facility.									
02/08/2002	none	14:20:00	-	39.6C	2.5	-	-	68352	-	No plating during tank sampling.	40.00	1.200	43.20	2/8/02 14:20	District	District	02/14/2002	02/14/2002	50 ml gla
02/08/2002	Grille Surround	14:25:00	14:28:00	-	-	-	-	68352	68407	Data obtained from facility.									
02/08/2002	Door Molding	14:55:00	14:57:00	-	-	-	-	68407	68429	Data obtained from facility.									
02/08/2002	Tail Light	15:15:00	15:17:00	-	-	-	-	68429	68434	Data obtained from facility.									
02/08/2002	DI water addition	15:20:00	-	-	-	-	-	-	-	Added 2" of DI water. Data obtained from facility.									
02/08/2002	none	16:40:00	-	39.7C	0	0	-	68434	-	Tank completed last load for day.	41.00	1.200	42.15	2/8/02 16:40	District	District	02/14/2002	02/14/2002	50 ml gla
02/11/2002	none	8:10:00	-	42.1C	0	0	62	68434	-	No plating during tank sampling.	40.00	1.100	39.60	2/11/02 8:10	District	District	02/15/2002	02/15/2002	50 ml gla
02/11/2002	none	9:15:00	-	-	0	0	62	68434	-										
02/11/2002	none	14:56:00	-	42.2C	0	0	-	68434	-	No plating during tank sampling.	37.00	1.200	46.70	2/11/02 14:56	District	District	02/15/2002	02/15/2002	50 ml gla
02/12/2002	none	7:45:00	-	43.1C	0	0	60	68434	-	No plating during tank sampling.	35.50	1.216	49.30	2/12/02 7:45	Lab	Lab	03/05/2002	03/05/2002	120 ml gla
02/12/2002	none	15:15:00	-	43.2C	0	0	-	68434	-	No plating during tank sampling.	35.00	1.200	49.37	2/12/02 15:15	District	District	02/15/2002	02/15/2002	120 ml gla
02/13/2002	none	7:55:00	-	44.1C	0	0	80	68434	-	No plating during tank sampling. Tank warming up for plating.	36.00	1.228	49.12	2/13/02 7:55	Lab	Lab	03/05/2002	03/05/2002	120 ml gla
02/13/2002	none	8:55:00	-	-	0	0	100	68434	-	No plating during tank sampling.									
02/13/2002	none	9:55:00	-	-	0	0	110	68434	-	No plating during tank sampling.									
02/13/2002	Chrome Foam addition	10:40:00	-	-	-	-	-	-	-	Added 8 ounces of Chrome Foam. Surface tension measured by facility. Data obtained from facility.			26.00						
02/13/2002	none	10:55:00	-	-	0	0	110	68434	-	No plating during tank sampling.									
02/13/2002	small bike parts	10:58:00	10:59:00	-	-	-	68434	68448	-	Data obtained from facility.				1/0/00 0:00					
02/13/2002	small bike parts	11:01:00	11:02:00	-	-	-	-	68448	68459	Data obtained from facility.									
02/13/2002	4 table legs	11:10:00	11:13:00	-	-	-	-	68459	68483	Data obtained from facility.									
02/13/2002	2 rings	11:15:00	11:17:00	-	-	-	-	68483	68496	Data obtained from facility.									
02/13/2002	foot peg, small lamp	11:20:00	11:21:00	-	-	-	-	68496	68509	Data obtained from facility.									
02/13/2002	2 door posts	11:46:00	11:47:00	-	-	-	-	68509	68514	Data obtained from facility.									
02/13/2002	several	11:55:00	-	44.2C	4.3	0	110	68509	-	Several small parts plated within last hour.	38.50	1.246	46.60	2/13/02 11:55	Lab	Lab	03/05/2002	03/05/2002	120 ml gla
02/13/2002	2 door posts	12:55:00	-	44.3C	4.5	0	110	68514	-		37.50	1.242	47.67	2/13/02 12:55	Lab	Lab	03/05/2002	03/05/2002	120 ml gla
02/13/2002	foot peg	13:20:00	13:22:00	-	-	-	-	68514	68531	Data obtained from facility.									
02/13/2002	3 tail lights	13:27:00	13:26:00	-	-	-	-	68531	68543	Data obtained from facility.									
02/13/2002	Foot peg, 3 tail lights	13:55:00	-	44.4C	4.5	0	110	68543	-		38.50	1.245	46.58	2/13/02 13:55	Lab	Lab	03/05/2002	03/05/2002	120 ml gla
02/13/2002	Foot peg	14:22:00	14:23:00	-	-	-	-	68543	68551	Data obtained from facility.									
02/13/2002	Small parts	14:50:00	14:51:00	44.5C	2.5	0	110	68551	68556	Combination of District and facility data.	38.00	1.250	47.37	2/13/02 14:50	Lab	Lab	03/05/2002	03/05/2002	120 ml gla
02/13/2002	2 small trims	14:55:00	14:56:00	-	-	-	-	68556	68560	Data obtained from facility.									
02/13/2002	6 small pieces	14:58:00	15:00:00	-	-	-	-	68560	68575	Data obtained from facility.									
02/13/2002	none	15:45:00	-	44.6C	0	0	110	68575	-	Done plating for the day.	38.50	1.248	46.68	2/13/02 15:45	Lab	Lab	03/05/2002	03/05/2002	120 ml gla
02/14/2002	none	7:20:00	-	45.1C	0	0	90	68575	-	No plating during tank sampling. Tank warming up. Tank covered.	38.50	1.255	46.94	2/14/02 7:20	Lab	Lab	03/05/2002	03/05/2002	120 ml gla
02/14/2002	none	8:13:00	-	-	0	0	108	68575	-	No plating during tank sampling. Tank warming up. Tank covered.									
02/14/2002	none	9:10:00	-	-	0	0	118	68575	-	No plating during tank sampling. Tank warming up. Tank covered.									
02/14/2002	none	10:05:00	-	-	0	0	124	68575	-	No plating during tank sampling. Tank warming up. Tank covered.									
02/14/2002	Chrome Foam addition	10:50:00	-	-	-	-	-	-	-	Added 8 ounces of Chrome Foam. Surface tension measured by facility. Data obtained from facility.			25.00						
02/14/2002	none	11:05:00	-	-	0	0	120	68575	-	No plating during tank sampling. Tank warming up. Tank covered.									
02/14/2002	Bumper tip	11:20:00	11:22:00	-	-	-	-	68575	68595	Data obtained from facility.				1/0/00 0:00					
02/14/2002	Small pieces	11:28:00	11:29:00	-	-	-	-	68595	68615	Data obtained from facility.									
02/14/2002	Small parts	11:30:00	11:31:00	-	-	-	-	68515	68623	Data obtained from facility.									
02/14/2002	several	12:05:00	-	45.2C	2.5	0	120	68623	-	Several parts plating during last hour.	39.00	1.243	45.90	2/14/02 12:05	Lab	Lab	03/05/2002	03/05/2002	120 ml gla
02/14/2002	Bumper tip	12:15:00	12:17:00	-	-	-	-	68623	68637	Data obtained from facility.									
02/14/2002	Small pieces	12:20:00	12:22:00	-	-	-	-	68637	68652	Data obtained from facility.									
02/14/2002	1 trim	12:27:00	12:28:00	-	-	-	-	68852	68657	Data obtained from facility.									
02/14/2002	Bumper	12:47:00	12:50:00	-	-	-	-	68652	68710	Data obtained from facility.									
02/14/2002	several	13:05:00	-	45.3C	7	0	120	68710	-	Bumper and small parts.	38.00	1.240	46.99	2/14/02 13:05	Lab	Lab	03/05/2002	03/05/2002	120 ml gla
02/14/2002	Small pieces	13:04:00	13:05:00	-	-	-	-	68710	68714	Data obtained from facility.									
02/14/2002	2 hub caps	13:08:00	13:20:00	-	-	-	-	68714	68736	Data obtained from facility.									
02/14/2002	4 hub caps	13:23:00	13:27:00	-	-	-	-	68736	68765	Data obtained from facility.									
02/14/2002	2 bumperettes	13:32:00	13:33:00	-	-	-	-	68765	68792	Data obtained from facility.									
02/14/2002	1 bumper tip	13:50:00	13:52:00	-	-	-	-	68792	68805	Data obtained from facility.									

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Decorative chrome electroplating tank operating parameters during ARB ambient monitoring at Barrio Logan

Date	Part or Job Description	Time		Sample Number	Volts	Amps	Temp. (F)	Totalizer		Comments	Number of Drops	Specific Gravity	Surface Tension		Analyzed by		Analysis date		Jar used
		Part In	Part Out					Part In	Part Out						# of drops	specific gravity	# of drops	specific gravity	
02/14/2002	4 rings	14:00:00	14:01:00	-	-	-	-	68805	68817	Data obtained from facility.									
02/14/2002	several	14:05:00	-	45.4C	7	250	120	68821	-	Several small parts.	44.00	1.248	40.84	2/14/02 14:05	Lab	Lab	03/05/2002	03/05/2002	120 ml gla
02/14/2002	2 rings	14:10:00	14:12:00	-	-	-	-	68817	68835	Data obtained from facility.									
02/14/2002	1 small ring	14:51:00	14:52:00	-	-	-	-	68835	68836	Data obtained from facility.									
02/14/2002	several	15:05:00	-	45.5C	2.5	0	120	68836	-	3 small parts.	39.50	1.242	45.28	2/14/02 15:05	Lab	Lab	03/05/2002	03/05/2002	120 ml gla
02/14/2002	2 hubs	15:08:00	15:10:00	-	-	-	-	68836	68852	Data obtained from facility.									
02/14/2002	2 hubs, 2 rings	15:12:00	15:15:00	-	-	-	-	68852	68865	Data obtained from facility.									
02/14/2002	1 bumper	15:20:00	15:25:00	-	-	-	-	68865	68928	Data obtained from facility.									
02/14/2002	E brake	15:30:00	15:32:00	-	-	-	-	68928	68938	Data obtained from facility.									
02/14/2002	several	15:45:00	-	45.6C	0	0	120	68938	-	Several small parts. Completed plating for the day.	40.50	1.248	44.37	2/14/02 15:45	Lab	Lab	03/05/2002	03/05/2002	120 ml gla
02/15/2002	none	7:10:00	-	46.1C	0	0	85	68938	-	No plating during tank sampling. Tank warming up.	38.50	1.242	46.45	2/15/02 7:10	Lab	Lab	03/05/2002	03/05/2002	120 ml gla
02/15/2002	none	8:10:00	-	-	0	0	105	68938	-	No plating during tank sampling. Tank warming up.									
02/15/2002	none	9:10:00	-	-	0	0	120	68938	-	No plating during tank sampling. Tank warming up.									
02/15/2002	none	10:10:00	-	-	0	0	128	68938	-	No plating during tank sampling. Tank warming up.									
02/15/2002	none	11:10:00	-	-	0	0	128	68938	-	No plating during tank sampling. Tank warming up.									
02/15/2002	none	12:10:00	-	-	0	0	128	68938	-	No plating during tank sampling. Tank warming up.									
02/15/2002	Chrome Foam addition	12:15:00	-	-	-	-	-	-	-	Added 8 ounces of Chrome Foam. Surface tension measured by facility. Data obtained from facility.			25.00						
02/15/2002	2 hub caps	12:29:00	12:31:00	-	-	-	-	68938	68960	Data obtained from facility.				1/0/00 0:00					
02/15/2002	1 hub cap	12:34:00	12:36:00	-	-	-	-	68960	68972	Data obtained from facility.									
02/15/2002	2 small parts	12:42:00	12:44:00	-	-	-	-	68972	68980	Data obtained from facility.									
02/15/2002	2 trims	13:00:00	13:02:00	-	-	-	-	68980	68993	Data obtained from facility.									
02/15/2002	Several during this prd.	13:10:00	-	46.2C	3.2	0	128	68993	-	Time in @ 13:00. Time out @ 13:02. Three hubcaps, 2 small parts.	39.00	1.269	46.66	2/15/02 13:10	Lab	Lab	03/05/2002	03/05/2002	120 ml gla
02/15/2002	none	14:10:00	-	-	2.5	0	128	68993	-	No plating.									
02/15/2002	2 door handles, rins	14:20:00	14:23:00	-	-	-	-	68993	69008	Data obtained from facility.									
02/15/2002	4 hub caps	14:35:00	14:38:00	-	-	-	-	69008	69052	Data obtained from facility.									
02/15/2002	bumper tip	14:40:00	14:42:00	-	-	-	-	69052	69066	Data obtained from facility.									
02/15/2002	window trim, 4 D/H	14:45:00	14:47:00	-	-	-	-	69066	69092	Data obtained from facility.									
02/15/2002	small pieces	14:48:00	14:50:00	-	-	-	-	69092	69102	Data obtained from facility.									
02/15/2002	small pieces	14:52:00	14:54:00	-	-	-	-	69102	69117	Data obtained from facility.									
02/15/2002	2 tail lights	15:00:00	15:03:00	-	-	-	-	69117	69128	Data obtained from facility.									
02/15/2002	1 hub cap	15:10:00	15:12:00	-	-	-	-	69128	69141	Data obtained from facility.									
02/15/2002	Several during this prd.	15:20:00	-	46.3C	0	0	128	69141	-	Completed plating for the day.	40.00	1.260	45.36	2/15/02 15:20	Lab	Lab	03/05/2002	03/05/2002	125 ml HD
02/19/2002	none	7:40:00	-	50.1C	0	0	58	69141	-	No plating.	39.50	1.265	46.12	2/19/02 7:40	Lab	Lab	03/05/2002	03/05/2002	125 ml HD
02/19/2002	none	14:40:00	-	50.2C	0	0	60	69141	-	No plating.	39.00	1.255	46.34	2/19/02 14:40	Lab	Lab	03/05/2002	03/05/2002	125 ml HD
02/20/2002	none	7:45:00	-	51.1C	0	0	58	69141	-	No plating.	40.00	1.247	44.87	2/20/02 7:45	Lab	Lab	03/05/2002	03/05/2002	125 ml HD
02/20/2002	none	14:45:00	-	51.2C	0	0	-	69141	-	No plating.	34.75	1.217	50.43	2/20/02 14:45	Lab	Lab	03/05/2002	03/05/2002	125 ml HD
02/21/2002	none	7:50:00	-	52.1C	0	0	60	69141	-	No plating.	35.00	1.217	50.07	2/21/02 7:50	Lab	Lab	03/05/2002	03/05/2002	125 ml HD
02/21/2002	none	8:40:00	-	-	0	0	-	69141	-	No plating. Tank warming up.									
02/21/2002	none	9:40:00	-	-	0	0	105	69141	-	No plating. Tank warming up.									
02/21/2002	dummy 2' x 3' sheet met	9:30:00	10:30:00	-	-	-	-	69141	69446	Electrician testing totalizer using a dummy part. Totalizer re-calibrated by electrician.									
02/21/2002	Chrome Foam addition	10:32:00	-	-	-	-	-	-	-	Added 8 ounces of Chrome Foam. Surface tension measured by facility. Data obtained from facility.			23.80						
02/21/2002	dummy 2' x 3' sheet met	10:40:00	-	52.2C	7	500	-	69432	-	Electrician testing totalizer using a dummy part. Totalizer re-calibrated by electrician.	41.50	1.216	42.19	2/21/02 10:40	Lab	Lab	03/05/2002	03/05/2002	125 ml HD
02/21/2002	8 rings	10:42:00	10:43:00	-	-	-	-	69446	69452	Data obtained from facility.									
02/21/2002	12 rings	11:04:00	11:06:00	-	-	-	-	69452	69459	Data obtained from facility.									
02/21/2002	10 rings	11:08:00	11:09:00	-	-	-	-	69459	69464	Data obtained from facility.									
02/21/2002	several	11:40:00	-	52.3C	3.5	0	-	69464	-	About 30 small parts plated.	40.00	1.254	45.14	2/21/02 11:40	Lab	Lab	03/05/2002	03/05/2002	125 ml HD
02/21/2002	2 forks, 1 foot peg	12:25:00	12:27:00	-	-	-	-	69464	69473	Data obtained from facility.									
02/21/2002	none	12:40:00	-	-	3.5	0	-	69464	-										
02/21/2002	2 large rings	12:35:00	12:37:00					69473	69480	Data obtained from facility.									
02/21/2002	several	13:40:00	-	52.4C	3	0	-	69480	-	Five parts.	38.50	1.251	46.79	2/21/02 13:40	Lab	Lab	03/05/2002	03/05/2002	125 ml HD
02/21/2002	3 hub caps	14:10:00	14:12:00	-	-	-	-	69480	69490	Data obtained from facility.									
02/21/2002	bumper	14:22:00	14:25:00	-	-	-	-	69490	69508	Data obtained from facility.									
02/21/2002	exhaust pipe	14:27:00	14:28:00	-	-	-	-	69508	69527	Data obtained from facility.									
02/21/2002	small pieces	14:31:00	14:33:00	-	-	-	-	69527	69532	Data obtained from facility.									
02/21/2002	several	14:40:00	-	52.5C	7.5	0	-	69532	-	Bumper, exhaust, small parts.	38.50	1.252	46.83	2/21/02 14:40	Lab	Lab	03/05/2002	03/05/2002	125 ml HD
02/21/2002	exhaust pipe	14:45:00	14:47:00	-	-	-	-	69532	69545	Data obtained from facility.									
02/21/2002	pipe	15:40:00	-	52.6C	0	0	-	69564	-	Done plating for today. Exhaust pipe.	38.00	1.245	47.18	2/21/02 15:40	Lab	Lab	03/05/2002	03/05/2002	125 ml HD

Master Plating

Decorative chrome electroplating tank operation parameters during ARB ambient monitoring at Bardo Logan

Date	Part or Job Description	Time Part In	Time Part Out	Sample Number	Volts	Amps	Temp. (F)	Totalizer Part In	Totalizer Part Out	Comments	Number of Drops	Specific Gravity	Surface Tension		Analyzed by # of drops	Analyzed by specific gravity	Analysis data # of drops	Analysis data specific gravity	Jar used
02/22/2002	none	8:10:00	-	53.1C	0	0	120	69564	-	No plating.	38.50	1.248	46.68	2/22/02 8:10	Lab	Lab	03/05/2002	03/05/2002	125 ml HD
02/22/2002	Chrome Foam addition	11:05:00	-	-	-	-	-	-	-	Added 8 ounces of Chrome Foam. Surface tension measured by facility. Data obtained from facility.			28.00						
02/22/2002	bumper	11:26:00	11:30:00	-	-	-	-	69545	69685	Data obtained from facility.									
02/22/2002	bumper tips	11:51:00	11:53:00	-	-	-	-	69685	69687	Data obtained from facility.									
02/22/2002	bumper	12:10:00	-	53.2C	0	0	-	69687	-	Bumper.	39.00	1.254	46.30	2/22/02 12:10	Lab	Lab	03/05/2002	03/05/2002	125 ml HD
02/22/2002	small pieces	12:10:00	12:12:00	-	-	-	-	69687	69690	Data obtained from facility.				1/0/00 0:00					
02/22/2002	4 bumper guards	12:14:00	12:16:00	-	-	-	-	69690	69705	Data obtained from facility.									
02/22/2002	2 rings	12:20:00	12:22:00	-	-	-	-	69705	69712	Data obtained from facility.									
02/22/2002	bumper	12:27:00	12:30:00	-	-	-	-	69712	69732	Data obtained from facility.									
02/22/2002	center bumper section	12:32:00	12:35:00	-	-	-	-	69732	69753	Data obtained from facility.									
02/22/2002	2 rings	12:43:00	12:44:00	-	-	-	-	69753	69757	Data obtained from facility.									
02/22/2002	1 small piece, bumper g	12:45:00	12:47:00	-	-	-	-	69757	69765	Data obtained from facility.									
02/22/2002	2 bumper tips	12:50:00	12:53:00	-	-	-	-	69765	69795	Data obtained from facility.									
02/22/2002	2 bumper guards	12:55:00	12:57:00	-	-	-	-	69795	69807	Data obtained from facility.									
02/22/2002	2 rings, 2 trims	13:05:00	13:07:00	-	-	-	-	69807	69820	Data obtained from facility.									
02/22/2002	several	13:10:00	-	53.3C	0	0	-	69763	-	Front door open.	39.00	1.252	46.23	2/22/02 13:10	Lab	Lab	03/05/2002	03/05/2002	125 ml HD
02/22/2002	1 long trim	13:25:00	13:27:00	-	-	-	-	69820	69833	Data obtained from facility.									
02/22/2002	1 long trim	13:28:00	13:30:00	-	-	-	-	69833	69840	Data obtained from facility.									
02/22/2002	exhaust pipe	13:39:00	13:42:00	-	-	-	-	69840	69863	Data obtained from facility.									
02/22/2002	grille bar	14:05:00	14:09:00	-	-	-	-	69863	69897	Data obtained from facility.									
02/22/2002	several	14:10:00	-	53.4C	0	0	-	69863	-	Front door open.	39.00	1.246	46.01	2/22/02 14:10	Lab	Lab	03/05/2002	03/05/2002	125 ml HD
02/22/2002	grille bar extension	14:15:00	14:17:00	-	-	-	-	69897	69903	Data obtained from facility.									
02/22/2002	small pieces	14:20:00	14:23:00	-	-	-	-	69903	69918	Data obtained from facility.									
02/22/2002	grille bar	14:26:00	14:29:00	-	-	-	-	69912	69941	Data obtained from facility.									
02/22/2002	several	15:10:00	-	53.5C	0	0	-	69941	-	Front door open. Done plating for today.	38.50	1.240	46.38	2/22/02 15:10	Lab	Lab	03/05/2002	03/05/2002	125 ml HD
02/25/2002	none	7:40:00	-	56.1C	0	0	60	69953	-	No plating. Front door open.	39.00	1.238	45.71	2/25/02 7:40	Lab	Lab	03/05/2002	03/05/2002	125 ml HD
02/25/2002	none	15:40:00	-	56.2C	0	0	-	69953	-	No plating. Front door open. Done plating for today.	39.50	1.245	45.37	2/25/02 15:40	Lab	Lab	03/05/2002	03/05/2002	125 ml HD
02/26/2002	none	7:40:00	-	57.1C	0	0	59	69953	-	No plating. Front door open.	39.50	1.257	45.82	2/26/02 7:40	Lab	Lab	03/05/2002	03/05/2002	125 ml HD
02/26/2002	none	15:00:00	-	57.2C	0	0	-	69953	-	No plating. Front door open. Done plating for today.	39.00	1.236	45.84	2/26/02 15:00	Lab	Lab	03/05/2002	03/05/2002	125 ml HD
02/27/2002	none	7:55:00	-	-	-	-	130	69953	-	No plating. Door open.									
02/27/2002	air agitation	8:15:00	8:17:00	-	-	-	-	-	-	Air agitation conducted for about 2 minutes. Data obtained from facility.									
02/27/2002	Chrome Foam addition	8:25:00	-	-	-	-	-	-	-	Added 8 ounces of Chrome Foam. Surface tension measured by facility. Data obtained from facility.			25.50						
02/27/2002	5 stanchion bases	8:35:00	8:37:00	-	-	-	-	69953	69961	Data obtained from facility.									
02/27/2002	5 bases stanchion	8:40:00	-	58.1C	7.8	400	130	69953	-	5 parts in at 8:40 am. Door open.	47.50	1.250	37.89	2/27/02 8:40	Lab	Lab	03/05/2002	03/05/2002	50 ml gla
02/27/2002	5 stanchion bases	8:40:00	8:42:00	-	-	-	-	69961	69971	Data obtained from facility.									
02/27/2002	5 stanchion bases	8:43:00	8:45:00	-	-	-	-	69971	69977	Data obtained from facility.									
02/27/2002	5 stanchion bases	8:51:00	8:53:00	-	-	-	-	69977	69987	Data obtained from facility.									
02/27/2002	2 trims	8:58:00	9:00:00	-	-	-	-	69987	69990	Data obtained from facility.									
02/27/2002	3 trims	9:01:00	9:03:00	-	-	-	-	69990	69995	Data obtained from facility.									
02/27/2002	3 trims	9:05:00	9:07:00	-	-	-	-	69995	70002	Data obtained from facility.									
02/27/2002	2 trims	9:10:00	9:12:00	-	-	-	-	70002	70006	Data obtained from facility.									
02/27/2002	2 cleats, 1 emblem	9:23:00	9:26:00	-	-	-	-	70006	70034	Data obtained from facility.									
02/27/2002	2 trims	9:38:00	9:39:00	-	-	-	-	70034	70038	Data obtained from facility.									
02/27/2002	2 trims	9:40:00	-	58.2C	5.5	175	130	70036	-	2 parts in at 9:38 am. Door open.	40.00	1.267	45.61	2/27/02 9:40	Lab	Lab	03/05/2002	03/05/2002	50 ml gla
02/27/2002	none	10:40:00	-	58.3C	3.4	0	130	70038	-	No plating. Took sample. Door open.	40.50	1.267	45.05	2/27/02 10:40	Lab	Lab	03/05/2002	03/05/2002	50 ml gla
02/27/2002	3 trims	11:07:00	11:09:00	-	-	-	-	70038	70051	Data obtained from facility.									
02/27/2002	3 hubcaps	11:40:00	-	58.4C	5.7	0	130	70073	-	3 parts in at 11:47 am. Door open.	40.00	1.275	45.90	2/27/02 11:40	Lab	Lab	03/05/2002	03/05/2002	50 ml gla
02/27/2002	3 hubcaps	11:47:00	11:50:00	-	-	-	-	70051	70073	Data obtained from facility.									
02/27/2002	3 trims	12:00:00	12:02:00	-	-	-	-	70073	70082	Data obtained from facility.									
02/27/2002	4 small trims	12:05:00	12:07:00	-	-	-	-	70082	70086	Data obtained from facility.									
02/27/2002	2 trims	12:13:00	12:15:00	-	-	-	-	70086	70090	Data obtained from facility.									
02/27/2002	none	12:40:00	-	58.5C	3.5	0	128	70090	-	No plating. Took sample. Door closed.	39.50	1.268	46.23	2/27/02 12:40	Lab	Lab	03/05/2002	03/05/2002	125 ml HD
02/27/2002	5 trims	13:40:00	-	58.6C	3.5	0	130	70090	-	5 parts in at 13:43. Door open.	39.50	1.257	45.82	2/27/02 13:40	Lab	Lab	03/05/2002	03/05/2002	125 ml HD
02/27/2002	5 trims	13:43:00	13:46:00	-	-	-	-	70090	70102	Data obtained from facility.									
02/27/2002	none	14:40:00	-	58.7C	0.2	0	130	70102	-	No plating. Took sample. Door closed.	40.00	1.260	45.38	2/27/02 14:40	Lab	Lab	03/05/2002	03/05/2002	125 ml HD
02/28/2002	none	7:45:00	-	59.1C	0.2	0	108	70102	-	No plating. Door 1/2 open.	39.00	1.253	46.26	2/28/02 7:45	Lab	Lab	03/08/2002	03/08/2002	125 ml HD

Master Plating

Decorative chrome electroplating tank operating parameters during ARB ambient monitoring at Barón Logan

Date	Part or Job Description	Time		Sample Number	Volts	Amps	Temp. (F)	Totalizer		Comments	Number of Drops	Specific Gravity	Surface Tension		Analyzed by		Analysis date		Jar used
		Part In	Part Out					Part In	Part Out						# of drops	specific gravity	# of drops	specific gravity	
02/28/2002	none	8:40:00	-	-	0.2	0	118	70102	-										
02/28/2002	none	9:40:00	-	-	0.2	0	122	70102	-	No plating. Door closed.									
02/28/2002	1 part	10:40:00	-	59.2C	0.2	0	121	70102	-	1 small samavar. Door 1/2 closed.	42.50	1.243	42.10	2/28/02 10:40	Lab	Lab	03/08/2002	03/08/2002	125 ml HD
02/28/2002	Chrome Foam addition	10:38:00	-	-	-	-	-	-	-	Added 8 ounces of Chrome Foam. Surface tension measured by facility. Data obtained from facility.			26.30						
02/28/2002	1 small samavar	10:45:00	10:47:00	-	-	-	-	70102	70107	Data obtained from facility.									
02/28/2002	1 small top	10:49:00	10:51:00	-	-	-	-	70107	70110	Data obtained from facility.									
02/28/2002	1 small piece	10:56:00	10:58:00	-	-	-	-	70110	70118	Data obtained from facility.									
02/28/2002	none	11:40:00	-	59.3C	3.6	0	121	70118	-	Door open.	41.00	1.256	44.11	2/28/02 11:40	Lab	Lab	03/08/2002	03/08/2002	125 ml HD
02/28/2002	1 L/P trans	11:52:00	11:53:00	-	-	-	-	70118	70120	Data obtained from facility.									
02/28/2002	Bumper tip	12:15:00	12:17:00	-	-	-	-	70120	70125	Data obtained from facility.									
02/28/2002	1 rim	12:24:00	12:27:00	-	-	-	-	70125	70133	Data obtained from facility.									
02/28/2002	1 rim	12:30:00	12:33:00	-	-	-	-	70133	70146	Data obtained from facility.									
02/28/2002	2 parts	12:40:00	-	59.4C	7	0	121	70146	-	Bumper tip & 1 trim. Door 1/2 open.	40.00	1.268	45.65	2/28/02 12:40	Lab	Lab	03/08/2002	03/08/2002	125 ml HD
02/28/2002	Bumper	12:40:00	12:45:00	-	-	-	-	70146	70247	Data obtained from facility.									
02/28/2002	4 trims	13:05:00	13:07:00	-	-	-	-	70247	70251	Data obtained from facility.									
02/28/2002	2 trims	13:09:00	13:11:00	-	-	-	-	70251	70258	Data obtained from facility.									
02/28/2002	2 trims	13:12:00	13:14:00	-	-	-	-	70258	70262	Data obtained from facility.									
02/28/2002	none	13:40:00	-	59.5C	3.6	0	130	70262	-	Door open.	40.00	1.270	45.72	2/28/02 13:40	Lab	Lab	03/08/2002	03/08/2002	125 ml HD
02/28/2002	Chair	14:05:00	14:07:00	-	-	-	-	70262	70273	Data obtained from facility.									
02/28/2002	Chair	14:09:00	14:11:00	-	-	-	-	70273	70284	Data obtained from facility.									
02/28/2002	2 small pieces	14:12:00	14:14:00	-	-	-	-	70284	70290	Data obtained from facility.									
02/28/2002	2 trains	14:25:00	14:27:00	-	-	-	-	70290	70292	Data obtained from facility.									
02/28/2002	4 small pieces	14:32:00	14:34:00	-	-	-	-	70292	70297	Data obtained from facility.									
02/28/2002	2 trims	14:40:00	-	59.6C	3.5	0	120	70297	-	2 trims. Door open. Shop closed at 15:00.	39.00	1.258	46.45	2/28/02 14:40	Lab	Lab	03/08/2002	03/08/2002	125 ml HD
02/28/2002	2 rings	14:53:00	14:55:00	-	-	-	-	70297	70307	Data obtained from facility.									
02/28/2002	1 bumper guard	14:56:00	14:59:00	-	-	-	-	70307	70316	Data obtained from facility.									
02/28/2002	Chair	15:02:00	15:04:00	-	-	-	-	70316	70322	Data obtained from facility.									
02/28/2002	Chair	15:06:00	15:08:00	-	-	-	-	70322	70327	Data obtained from facility.									
03/01/2002	none	7:40:00	-	60.1C	0	0	120	70327	-	No plating. Front door 1/2 open.	40.00	1.263	45.47	3/1/02 7:40	Lab	Lab	03/08/2002	03/08/2002	50 ml gla
03/01/2002	none	8:40:00	-		0	0	-	70328	-	No plating. Front door 1/2 open.									
03/01/2002	none	9:40:00	-		0	0	-	70328	-	No plating. Front door fully open.									
03/01/2002	Chrome Foam addition	10:02:00	-	-	-	-	-	-	-	Added 8 ounces of Chrome Foam. Surface tension measured by facility. Data obtained from facility.			26.30						
03/01/2002	Air Intake	10:15:00	10:17:00	-	-	-	-	70328	70342	Data obtained from facility.									
03/01/2002	Air Intake	10:21:00	10:24:00	-	-	-	-	70342	70352	Data obtained from facility.									
03/01/2002	2 wiper arm	10:26:00	10:27:00	-	-	-	-	70352	70353	Data obtained from facility.									
03/01/2002	2 trims	10:31:00	10:34:00	-	-	-	-	70353	70365	Data obtained from facility.									
03/01/2002	2 rods	10:37:00	10:40:00	-	-	-	-	70365	70368	Data obtained from facility.									
03/01/2002	Arm, air intake	10:40:00	-	60.2C	0	0	-	70365	-	Plating. Front door fully open.	41.00	1.251	43.94	3/1/02 10:40	Lab	Lab	03/08/2002	03/08/2002	50 ml gla
03/01/2002	2 door handles	10:45:00	10:47:00	-	-	-	-	70368	70372	Data obtained from facility.									
03/01/2002	2 trims	10:55:00	10:57:00	-	-	-	-	70372	70378	Data obtained from facility.									
03/01/2002	windshield frame	11:20:00	11:22:00	-	-	-	-	70378	70394	Data obtained from facility.									
03/01/2002	Trims & brake lever	11:25:00	11:27:00	-	-	-	-	70394	70399	Data obtained from facility.									
03/01/2002	Mirror back	11:30:00	11:32:00	-	-	-	-	70399	70401	Data obtained from facility.									
03/01/2002	2 headlight rings	11:35:00	11:37:00	-	-	-	-	70401	70405	Data obtained from facility.									
03/01/2002	Trim, wind handle	11:40:00	-	60.3C	5.5	220	-	70398	-	Plating. Front door fully open.	41.00	1.257	44.15	3/1/02 11:40	Lab	Lab	03/08/2002	03/08/2002	50 ml gla
03/01/2002	Rings	12:45:00	-	60.4C	0	0	-	70405	-	Plating. Front door closed.	40.00	1.273	45.83	3/1/02 12:45	Lab	Lab	03/08/2002	03/08/2002	50 ml gla
03/01/2002	8 small pieces	13:20:00	13:23:00	-	-	-	-	70405	70436	Data obtained from facility.									
03/01/2002	L/P light	13:37:00	13:39:00	-	-	-	-	70436	70439	Data obtained from facility.									
03/01/2002	Door handle	13:42:00	13:44:00	-	-	-	-	70439	70443	Data obtained from facility.									
03/01/2002	Small pieces	13:45:00	-	60.5C	7	0	-	70443	-	Plating. Front door fully open.	40.00	1.276	45.90	3/1/02 13:45	Lab	Lab	03/08/2002	03/08/2002	120 ml gla
03/01/2002	Bumper guard	13:56:00	13:59:00	-	-	-	-	70443	70453	Data obtained from facility.									
03/01/2002	Hood bar extension	14:00:00	14:02:00	-	-	-	-	70453	70461	Data obtained from facility.									
03/01/2002	2 rings	14:08:00	14:10:00	-	-	-	-	70461	70465	Data obtained from facility.									
03/01/2002	5 mirrors	14:16:00	14:19:00	-	-	-	-	70465	70475	Data obtained from facility.									
03/01/2002	Small pieces	14:21:00	14:23:00	-	-	-	-	70475	70482	Data obtained from facility.									
03/01/2002	Bumper	14:31:00	14:35:00	-	-	-	-	70482	70517	Data obtained from facility.									
03/01/2002	Several	14:40:00	-	60.6C	4	0	-	70482	-	Plating. Door 1/2 open.	40.00	1.275	45.90	3/1/02 14:40	Lab	Lab	03/08/2002	03/08/2002	120 ml gla
03/01/2002	Bumper	14:57:00	15:00:00	-	-	-	-	70517	70536	Data obtained from facility.									
03/01/2002	Bumper	15:30:00	-	60.7C	0	0	-	70536	-	Done plating. Door 1/2 open.	40.50	1.259	44.76	3/1/02 15:30	Lab	Lab	03/08/2002	03/08/2002	120 ml gla

Master Plating

Decorative chrome electroplating tank operating parameters during ARB ambient monitoring at Rancho Logan

Date	Part or Job Description	Time Part In	Time Part Out	Sample Number	Volts	Amps	Temp. (F)	Totalizer Part In	Totalizer Part Out	Comments	Number of Drops	Specific Gravity	Surface Tension	Analyzed by # of drops	Analyzed by specific gravity	Analysis date # of drops	Analysis date specific gravity	Jar used
03/04/2002	none	7:40:00	-	63.1C	0	0	120	70536	-	No plating. Front door open. Tank heater left on over weekend.	41.00	1.276	44.80	3/4/02 7:40 Lab	Lab	03/08/2002	03/08/2002	120 ml gla
03/04/2002	none	8:45:00	-	-	0	0		70536	-	No plating. Front door open.								
03/04/2002	none	9:40:00	-	-	0	0		70536	-	No plating. Front door open.								
03/04/2002	none	10:40:00	-	-	0	0		70536	-	No plating. Front door open.								
03/04/2002	none	11:40:00	-	-	0	0		70536	-	No plating. Front door open.								
03/04/2002	none	12:40:00	-	-	0.3	0	106	70536	-	No plating. Front door open.								
03/04/2002	none	13:40:00	-	-	0.3	0		70536	-	No plating. Front door open.								
03/04/2002	none	14:40:00	-	-	0.3	0		70536	-	No plating. Front door open.								
03/04/2002	none	15:30:00	-	63.2C	0.3	0		70536	-	No plating. Front door open. Last sample taken for the day.	40.00	1.279	46.04	3/4/02 15:30 Lab	Lab	03/08/2002	03/08/2002	120 ml gla
03/05/2002	none	7:55:00	-	64.1C	0.2	0	78	70536	-	No plating. Door 1/4 open.	41.25	1.293	45.14	3/5/02 7:55 Lab	Lab	03/11/2002	03/11/2002	120 ml gla
03/05/2002	none	8:55:00	-	-	0.2	0		70536	-	No plating. Door open. Last sample.								
03/05/2002	none	9:55:00	-	-	0.2	0	78	70536	-	No plating. Door open.								
03/05/2002	none	10:55:00	-	-	0.2	0		70536	-	No plating. Door open.								
03/05/2002	none	11:55:00	-	-	0.2	0		70536	-	No plating. Door open.								
03/05/2002	none	12:55:00	-	-	0.2	0		70536	-	No plating. Door open.								
03/05/2002	none	13:55:00	-	-	0.2	0		70536	-	No plating. Door open.								
03/05/2002	Rinse water addition	14:00:00	-	-	-	-	-	-	-	Added 2" of rinse water. Data obtained from facility.								
03/05/2002	none	14:55:00	-	64.2C	0.2	0	78	70536	-	No plating. Door open.	32.25	1.188	53.02	3/5/02 14:55 Lab	Lab	03/11/2002	03/11/2002	120 ml gla
03/06/2002	none	7:40:00	-	65.1C	0.2	0	98	70536	-	No plating. Door open. Will plate today.	44.50	1.118	36.17	3/6/02 7:40 Lab	Lab	03/12/2002	03/12/2002	120 ml gla
03/06/2002	none	8:40:00	-	65.1AA	-	-	-	70536	-	No plating. Door open. Will plate today. Surface tension measured by District with Master Pl	35.50	1.188	48.19	3/6/02 8:40 District	District	03/06/2002	03/06/2002	125 ml HD
03/06/2002	none	8:40:00	-	65.2AA	-	-	-	70536	-	No plating. Door open. Will plate today. Surface tension measured by District with Master Pl	46.00	1.204	37.69	3/6/02 8:40 District	District	03/06/2002	03/06/2002	125 ml HD
03/06/2002	Chrome Foam addition	9:15:00	-	-	-	-	-	-	-	Added 8 ounces of Chrome Foam. Data obtained from facility.								
03/06/2002	Air agitation	9:23:00	9:23:30	-	-	-	-	-	-	Air agitation for 30 minutes to mix Chrome Foam addition.								
03/06/2002	none	9:40:00	-	65.3AA	-	-	-	70536	-	No plating. Door open. Will plate today. Surface tension measured by District with Master Pl	38.50	1.193	44.62	3/6/02 9:40 District	District	03/06/2002	03/06/2002	125 ml HD
03/06/2002	none	9:40:00	-	65.4AA	-	-	-	70536	-	No plating. Door open. Will plate today. Surface tension measured by District with Master Pl	48.50	1.203	37.25	3/6/02 9:40 District	District	03/06/2002	03/06/2002	125 ml HD
03/06/2002	Surface tension	10:00:00	-	-	-	-	-	-	-	Surface tension measured by facility. Data obtained from facility.			33.00					
03/06/2002	none	10:40:00	-	-	0.2	0	110	70536	-	No plating. Door open. Will plate today.								
03/06/2002	2 rings, 2 fog lights	10:50:00	10:53:00	-	-	-	-	70536	70547	Data obtained from facility.								
03/06/2002	4 small pieces	10:55:00	10:57:00	-	-	-	-	70547	70555	Data obtained from facility.								
03/06/2002	2 windshield posts	11:04:00	11:06:00	-	-	-	-	70555	70560	Data obtained from facility.								
03/06/2002	small piece	11:10:00	11:11:00	-	-	-	-	70560	70562	Data obtained from facility.								
03/06/2002	2 rings	11:13:00	11:15:00	-	-	-	-	70562	70571	Data obtained from facility.								
03/06/2002	several pieces	11:40:00	-	65.2C	3.7	0	120	70536	70571	Plating several pieces in at 10:50 and out at 11:15. Door open.	39.00	1.232	45.49	3/6/02 11:40 Lab	Lab	03/12/2002	03/12/2002	120 ml gla
03/06/2002	2 rims	12:30:00	12:37:00	-	-	-	-	70571	70585	Data obtained from facility.								
03/06/2002	2 rims	12:38:00	12:40:00	-	-	-	-	70585	70600	Data obtained from facility.								
03/06/2002	2 tail lights	12:38:00	12:40:00	-	-	-	-	70600	70606	Data obtained from facility.								
03/06/2002	6 parts	12:40:00	-	65.3C	6.7	200	120	70571	70614	Plating 6 pieces (2 pieces in 12:42). Door open. Back door wide open.	39.50	1.232	44.91	3/6/02 12:40 Lab	Lab	03/12/2002	03/12/2002	120 ml gla
03/06/2002	2 misc pieces	12:42:00	12:44:00	-	-	-	-	70606	70614	Data obtained from facility.								
03/06/2002	window trim	12:46:00	12:48:00	-	-	-	-	70614	70620	Data obtained from facility.								
03/06/2002	3 small pieces	12:53:00	12:55:00	-	-	-	-	70620	70622	Data obtained from facility.								
03/06/2002	window trim	13:00:00	13:03:00	-	-	-	-	70622	70629	Data obtained from facility.								
03/06/2002	emblem	13:08:00	13:09:00	-	-	-	-	70629	70630	Data obtained from facility.								
03/06/2002	5 parts	13:40:00	-	65.4C	3.6	0	120	70614	70630	Door open.	40.00	1.240	44.64	3/6/02 13:40 Lab	Lab	03/12/2002	03/12/2002	120 ml gla
03/06/2002	none	14:40:00	-	65.5C	3.7	0	120	70630	-	Door open. Last sample. Facility did plating after last sample taken. Facility closed at 15:30.	39.00	1.246	46.01	3/6/02 14:40 Lab	Lab	03/12/2002	03/12/2002	120 ml gla
03/06/2002	grille surround	15:02:00	15:05:00	-	-	-	-	70630	70650	Data obtained from facility.								
03/07/2002	none	7:55:00	-	66.1C	0.2	0	104	70650	-	No plating. Front door closed. Back door open. Will plate today.	38.00	1.243	47.10	3/7/02 7:55 Lab	Lab	03/12/2002	03/12/2002	120 ml gla
03/07/2002	-	-	-	-	-	-	-	-	-	Note: inspectors recommended to leave around 8:00 due to Master Plating press release.								
03/07/2002	Chrome Foam addition	9:05:00	-	-	-	-	-	-	-	Added 8 ounces of Chrome Foam. Surface tension measured by facility. Data obtained from facility.			32.00					
03/07/2002	bumper half	9:20:00	9:24:00	-	-	-	-	70650	70673	Data obtained from facility.								
03/07/2002	bumper half	9:25:00	9:28:00	-	-	-		70673	70695	Data obtained from facility.								
03/07/2002	4 tail lights	9:45:00	9:47:00					70695	70701	Data obtained from facility.								
03/07/2002	4 seat brackets	9:50:00	9:53:00					70701	70708	Data obtained from facility.								
03/07/2002	bumper center	10:00:00	10:03:00					70708	70728	Data obtained from facility.								
03/07/2002	headlight ring	10:07:00	10:09:00					70728	70735	Data obtained from facility.								
03/07/2002	misc parts	14:30:00	14:33:00					70735	70749	Data obtained from facility.								
03/07/2002	grille top trim	14:35:00	14:37:00					70749	70753	Data obtained from facility.								
03/07/2002	2 tail lights	14:42:00	14:44:00					70753	70765	Data obtained from facility.								
03/07/2002	2 bumper guards	14:46:00	14:48:00					70765	70769	Data obtained from facility.								

Master Plating

Decorative chrome electroplating tank operating parameters during ARB ambient monitoring at Barrio Logan

Date	Part or Job Description	Time Part In	Time Part Out	Sample Number	Volts	Amps	Temp. (F)	Totalizer Part In	Totalizer Part Out	Comments	Number of Drops	Specific Gravity	Surface Tension		Analyzed by # of drops	Analyzed by specific gravity	Analysis data # of drops	Analysis data specific gravity	Jar used
03/07/2002	bumper	14:49:00	14:51:00					70769	70776	Data obtained from facility.									
03/07/2002	small piece	14:53:00	14:55:00					70776	70781	Data obtained from facility.									
03/07/2002	light fixture	14:57:00	15:00:00					70781	70792	Data obtained from facility.									
03/08/2002	none	10:40:00	-	030802.1C	0	0	60	70792	-	No plating. Front door open.	38.00	1.242	47.07	3/8/02 10:40	Lab	Lab	03/12/2002	03/12/2002	120 ml gla
03/08/2002	none	15:10:00	-	030802.2C	0	0	-	70792	-	No plating. Front door open. Closing for the day.	38.00	1.240	46.99	3/8/02 15:10	Lab	Lab	03/12/2002	03/12/2002	120 ml gla
03/11/2002	none	8:40:00	-	69.1C	0.2	0	68	70792	-	No plating. Door open.	38.00	1.282	48.58	3/11/02 8:40	Lab	Lab	03/13/2002	03/13/2002	120 ml gla
03/11/2002	none	9:40:00	-	-	0.2	0	-	70792	-	No plating. Door open.									
03/11/2002	none	10:40:00	-	-	0.2	0	-	70792	-	No plating. Door open.									
03/11/2002	none	11:40:00	-	-	0.2	0	-	70792	-	No plating. Door open.									
03/11/2002	none	12:40:00	-	-	0.2	0	68	70792	-	No plating. Door open.									
03/11/2002	none	13:40:00	-	-	0.2	0	-	70792	-	No plating. Door open.									
03/11/2002	none	14:40:00	-	69.2C	0.2	0	68	70792	-	No plating. Door open. Last sample taken.	38.50	1.256	46.98	3/11/02 14:40	Lab	Lab	03/13/2002	03/13/2002	120 ml gla
03/12/2002	none	7:40:00	-	031202.1C	0	0	60	70792	-	No plating. Front and back doors open.	38.50	1.243	46.49	3/12/02 7:40	Lab	Lab	03/18/2002	03/18/2002	120 ml gla
03/12/2002	none	8:40:00	-	-	0	0	60	70792	-	No plating. Front and back doors open.									
03/12/2002	none	9:40:00	-	-	0	0	-	70792	-	No plating. Front and back doors open.									
03/12/2002	none	10:40:00	-	-	0	0	-	70792	-	No plating. Front and back doors open.									
03/12/2002	none	11:40:00	-	-	0	0	-	70792	-	No plating. Front and back doors open.									
03/12/2002	none	12:40:00	-	-	0	0	-	70792	-	No plating. Front and back doors open.									
03/12/2002	none	13:40:00	-	-	0	0	-	70792	-	No plating. Front and back doors open.									
03/12/2002	none	14:40:00	-	031202.2C	0	0	60	70792	-	No plating. Front and back doors open. Last sample taken.	38.50	1.245	46.57	3/12/02 14:40	Lab	Lab	03/18/2002	03/18/2002	120 ml gla
03/13/2002	none	7:40:00	-	031302.1C	0	0	60	70792	-	No plating. Front door open.	40.50	1.243	44.20	3/13/02 7:40	Lab	Lab	03/23/2002	03/23/2002	120 ml gla
03/13/2002	none	8:40:00	-	-	0	0	-	70792	-	No plating. Front door open.									
03/13/2002	none	9:40:00	-	-	0	0	-	70792	-	No plating. Front door open.									
03/13/2002	none	10:40:00	-	-	0	0	-	70792	-	No plating. Front door open.									
03/13/2002	none	11:40:00	-	-	0	0	-	70792	-	No plating. Front and back doors open. Fan is running.									
03/13/2002	none	12:40:00	-	-	0	0	-	70792	-	No plating. Front and door open. Back door closed. Fan is running.									
03/13/2002	none	13:40:00	-	-	0	0	-	70792	-	No plating. Front and door open. Back door closed. Fan is running.									
03/13/2002	none	14:40:00	-	031302.2C	0	0	100	70792	-	No plating. Front and door open. Back door closed. Fan is running. Last sample.	39.25	1.236	45.35	3/13/02 14:40	Lab	Lab	03/23/2002	03/23/2002	125 ml HD
03/14/2002	none	7:50:00	-	031402.1C	0	0	130	70792	-	No plating. Front and back doors open. Fan is running.	38.25	1.253	47.17	3/14/02 7:50	Lab	Lab	03/25/2002	03/25/2002	125 ml HD
03/14/2002	none	8:50:00	-	-	0	0	130	70792	-	No plating. Front and back doors open. Fan is running.									
03/14/2002	none	9:50:00	-	-	0	0	128	70792	-	No plating. Front and back doors open. Fan is running.									
03/14/2002	none	10:50:00	-	-	0	0	120	70792	-	No plating. Front and back doors open. Fan is running.									
03/14/2002	Chrome Foam addition	11:35:00	-	-	-	-	-	-	-	Added 8 ounces of Chrome Foam. Surface tension measured by facility. Data obtained from facility.			29.80						
03/14/2002	none	11:50:00	-	031402.2C	3.6	0	120	70792	-	Will start plating soon.	44.00	1.243	40.68	3/14/02 11:50	Lab	Lab	03/25/2002	03/25/2002	125 ml HD
03/14/2002	Horn base	12:05:00	12:08:00	-	-	-	-	70792	70798	Data obtained from facility.									
03/14/2002	Horn base	12:13:00	12:15:00	-	-	-	-	70798	70806	Data obtained from facility.									
03/14/2002	Handles	12:15:00	12:17:00	-	-	-	-	70806	70811	Data obtained from facility.									
03/14/2002	6 small pieces	12:22:00	12:25:00	-	-	-	-	70811	70817	Data obtained from facility.									
03/14/2002	Horn base	12:28:00	12:28:00	-	-	-	-	70817	70823	Data obtained from facility.									
03/14/2002	6 handles	12:30:00	12:32:00	-	-	-	-	70823	70826	Data obtained from facility.									
03/14/2002	16 parts	12:50:00	-	031402.3C	3.7	0	120	70826	-	16 parts plated since last sample.	39.50	1.234	44.99	3/14/02 12:50	Lab	Lab	03/25/2002	03/25/2002	125 ml HD
03/14/2002	3 brackets	13:10:00	13:12:00	-	-	-	-	70826	70831	Data obtained from facility.									
03/14/2002	3 parts	13:50:00	-	031402.4C	3.8	0	120	70831	-	3 parts plated since last sample.	39.50	1.227	44.73	3/14/02 13:50	Lab	Lab	03/25/2002	03/25/2002	125 ml HD
03/14/2002	2 round plates	14:15:00	14:17:00	-	-	-	-	70831	70835	Data obtained from facility.									
03/14/2002	2 light bases	14:22:00	14:28:00	-	-	-	-	70835	70867	Data obtained from facility.									
03/14/2002	2 tail lights	14:28:00	14:31:00	-	-	-	-	70867	70878	Data obtained from facility.									
03/14/2002	3 hubcaps	14:33:00	14:35:00	-	-	-	-	70878	70899	Data obtained from facility.									
03/14/2002	1/2 bumper	14:37:00	14:39:00	-	-	-	-	70899	70910	Data obtained from facility.									
03/14/2002	1 plate	14:45:00	14:48:00	-	-	-	-	70910	70916	Data obtained from facility.									
03/14/2002	9 parts	14:50:00	-	031402.5C	6.4	275	120	70913	-	9 parts plated since last sample.	39.00	1.243	45.90	3/14/02 14:50	Lab	Lab	03/25/2002	03/25/2002	125 ml HD
03/14/2002	2 lights	15:01:00	15:03:00	-	-	-	-	70916	70939	Data obtained from facility.									
03/14/2002	2 wing windows	15:04:00	15:06:00	-	-	-	-	70939	70945	Data obtained from facility.									
03/14/2002	3 bumper guards	15:06:00	15:09:00	-	-	-	-	70945	70960	Data obtained from facility.									
03/14/2002	9 small pieces	15:17:00	15:20:00	-	-	-	-	70960	70971	Data obtained from facility.									
03/14/2002	17 parts	15:50:00	-	031402.6C	0	0	114	70971	-	17 parts plated since last sample. No plating. Front and back doors open. Fan off.	38.50	1.236	46.23	3/14/02 15:50	Lab	Lab	03/25/2002	03/25/2002	125 ml HD

Master Plating

Decorative chrome electroplating tank operating parameters during ARB ambient monitoring at Barrio Logan

Date	Part or Job Description	Time Part In	Time Part Out	Sample Number	Volts	Amps	Temp. (F)	Totalizer Part In	Totalizer Part Out	Comments	Number of Drops	Specific Gravity	Surface Tension
03/15/2002	none	7:40:00	-	74.1C	0	0	110	70971	-	No plating. Front and back doors open. Fan is running.	39.00	1.249	46.12
03/15/2002	none	8:40:00	-	-	0	0	120	70971	-	No plating. Front and back doors open. Fan is running.			
03/15/2002	Chrome Foam addition	9:00:00	-	-	-	-	-	-	-	Added 8 ounces of Chrome Foam. Surface tension measured by facility. Data obtained from facility.			30.80
03/15/2002	none	9:40:00	-	-	0	0	120	70971	-	No plating. Front and back doors open. Fan is running.			
03/15/2002	2 hinges	9:42:00	9:45:00	-	-	-	-	70971	70977	Data obtained from facility.			
03/15/2002	6 small pieces	9:46:00	9:47:00	-	-	-	-	70977	70981	Data obtained from facility.			
03/15/2002	nuts & bolts	9:49:00	9:50:00	-	-	-	-	70981	70984	Data obtained from facility.			
03/15/2002	nuts & bolts	10:01:00	10:03:00	-	-	-	-	70984	70990	Data obtained from facility.			
03/15/2002	2 small plates	10:05:00	10:06:00	-	-	-	-	70990	70997	Data obtained from facility.			
03/15/2002	2 brackets	10:09:00	10:11:00	-	-	-	-	70997	71007	Data obtained from facility.			
03/15/2002	2 light buckets	10:40:00	10:45:00	74.2C	7	0	120	71007	71061	Combination of District and facility data. Front and back doors open. Fan is running.	39.00	1.257	46.41
03/15/2002	20 small pieces	11:20:00	11:23:00	-	-	-	-	71061	71087	Data obtained from facility.			
03/15/2002	2 plates	11:30:00	11:32:00	-	-	-	-	71087	71092	Data obtained from facility.			
03/15/2002	See Plating log	11:40:00	-	-	3.8	0	114	71087	-	See plating log. Front and back doors open. Fan is running.			
03/15/2002	bumper	11:54:00	11:58:00	-	-	-	-	71092	71130	Data obtained from facility.			
03/15/2002	emblem	12:20:00	12:21:00	-	-	-	-	71130	71132	Data obtained from facility.			
03/15/2002	See Plating log	12:40:00	-	74.3C	3.7	0	118	71130	-	See plating log. Front and back doors open. Fan is running.	39.00	1.260	46.52
03/15/2002	small piece	13:28:00	13:29:00	-	-	-	-	71132	71133	Data obtained from facility.			
03/15/2002	See Plating log	13:40:00	-	-	3.7	0	122	71133	-	See plating log. Front and back doors open. Fan is running.			
03/15/2002	grille surrond	13:50:00	13:53:00	-	-	-	-	71133	71143	Data obtained from facility.			
03/15/2002	grille	14:04:00	14:09:00	-	-	-	-	71143	71204	Data obtained from facility.			
03/15/2002	10 door handles	14:20:00	14:24:00	-	-	-	-	71204	71211	Data obtained from facility.			
03/15/2002	small pieces	14:27:00	14:29:00	-	-	-	-	71211	71219	Data obtained from facility.			
03/15/2002	bumper	14:35:00	14:39:00	-	-	-	-	71219	71246	Data obtained from facility.			
03/15/2002	See Plating log	14:40:00	-	74.4C	7.5	200	122	71216	-	See plating log. Front and back doors open. Fan is running.	40.00	1.260	45.36
03/15/2002	2 lights	14:24:00	14:48:00	-	-	-	-	71246	71256	Data obtained from facility.			
03/15/2002	4 knock offs & horn	15:05:00	15:10:00	-	-	-	-	71256	71287	Data obtained from facility.			
03/15/2002	none	15:40:00	-	74.5C	0.4	0	114	71287	-	No plating. Front and back doors open. Fan off. End of day.	39.50	1.256	45.79
03/18/2002	none	8:40:00	-	031802.1C	0	0	68	71287	-	No plating. Front and back doors open. Fan off.	44.00	1.262	41.30
03/18/2002	none	9:40:00	-	-	0	0	-	71287	-	No plating. Front and back doors open. Fan off.			
03/18/2002	none	10:40:00	-	-	0	0	-	71287	-	No plating. Front and back doors open. Fan off.			
03/18/2002	none	11:40:00	-	-	0	0	-	71287	-	No plating. Front and back doors open. Back fan spinning.			
03/18/2002	none	12:40:00	-	-	0	0	-	71287	-	No plating. Front and back doors open. Back fan not spinning.			
03/18/2002	none	13:40:00	-	-	0	0	68	71287	-	No plating. Front door open. Back door (gate) closed. Fan off.			
03/18/2002	none	14:40:00	-	031802.2C	0	0	68	71287	-	No plating. Front door open. Back door (gate) closed. Fan off.	41.00	1.251	43.94
03/19/2002	none	8:10:00	-	78.1C	0.2	0	60	71287	-	No plating. Front and back doors open. Fan off.	40.50	1.265	44.98
03/19/2002	none	9:10:00	-	-	0.2	0	60	71287	-	No plating. Front and back doors open. Fan off.			
03/19/2002	none	10:05:00	-	-	0.2	0	60	71287	-	No plating. Front and back doors open. Fan off.			
03/19/2002	none	11:00:00	-	031902.1P	-	-	-	-	-	Surface tension measured on site by District using District stalagmometer.	42.83	1.200	40.34
03/19/2002	none	11:05:00	-	-	0.2	0	62	71287	-	No plating. Front and back doors open. Fan off.			
03/19/2002	none	12:05:00	-	-	0.2	0	62	71287	-	No plating. Front and back doors open. Fan off.			
03/19/2002	none	13:05:00	-	-	0.2	0	64	71287	-	No plating. Front and back doors open. Fan off.			
03/19/2002	none	14:05:00	-	-	0.2	0	64	71287	-	No plating. Front and back doors open. Fan off.			
03/19/2002	none	15:00:00	-	78.2C	0.2	0	64	71287	-	No plating. Front and back doors open. Fan off.	39.50	1.265	46.12
03/20/2002	none	8:10:00	-	032002.1C	0	0	60	71287	-	No plating. Front door open. Fan on.	40.00	1.264	45.50
03/20/2002	none	9:10:00	-	-	0	0	60	71287	-	No plating. Front door open. Fan on.			
03/20/2002	none	10:10:00	-	-	0	0	60	71287	-	No plating. Front door open. Fan on.			
03/20/2002	none	11:10:00	-	-	0	0	60	71287	-	No plating. Front door open. Fan on.			
03/20/2002	none	12:10:00	-	-	0	0	60	71287	-	No plating. Front door open. Fan on.			
03/20/2002	none	13:10:00	-	-	0	0	60	71287	-	No plating. Front and back doors open. Fan on.			
03/20/2002	none	14:10:00	-	-	0	0	60	71287	-	No plating. Front and back doors open. Fan on.			
03/20/2002	none	15:00:00	-	032002.2C	0	0	60	71287	-	No plating. Front and back doors open. Fan on. Last sample.	31.67	1.191	54.15
03/21/2002	none	7:40:00	-	80.1C	0.2	0	92	71287	-	No plating. Fan on. Doors open.	33.75	1.202	51.29
03/21/2002	none	8:35:00	-	-	0.2	0	92	71287	-	No plating. Fan on. Doors open.			
03/21/2002	Chrome Foam addition	9:50:00	-	-	-	-	-	-	-	Added 8 ounces of Chrome Foam. Surface tension measured by facility. Data obtained from facility.			33.60
03/21/2002	none	9:35:00	-	-	0.2	0	94	71287	-	No plating. Fan on. Doors open.			
03/21/2002	4 tubes	10:07:00	10:10:00	-	-	-	-	71287	71294	Data obtained from facility.			

	Analyzed by # of drops	Analyzed by specific gravity	Analysis date # of drops	Analysis date specific gravity	Jar used
3/15/02 7:40	Lab	Lab	03/27/2002	03/27/2002	120 ml gla
3/15/02 10:40	Lab	Lab	03/27/2002	03/27/2002	120 ml gla
3/15/02 12:40	Lab	Lab	03/27/2002	03/27/2002	120 ml gla
3/15/02 14:40	Lab	Lab	03/27/2002	03/27/2002	120 ml gla
3/15/02 15:40	Lab	Lab	03/27/2002	03/27/2002	120 ml gla
3/18/02 8:40	Lab	Lab	03/21/2002	03/21/2002	
3/18/02 14:40	Lab	Lab	03/21/2002	03/21/2002	
3/19/02 8:10	Lab	Lab	3/27/002	3/27/002	125 ml HD
3/19/02 11:00	District	District	03/19/2002	03/19/2002	125 ml HD
3/19/02 15:00	Lab	Lab	3/27/002	3/27/002	125 ml HD
3/20/02 8:10	Lab	Lab	3/27/002	3/27/002	120 ml gla
3/20/02 15:00	Lab	Lab	3/27/002	3/27/002	120 ml gla
3/21/02 7:40	Lab	Lab	3/27/002	3/27/002	125 ml HD
1/0/00 0:00					

Master Plating

Decorative chrome electroplating tank operating parameters during ARB ambient monitoring at Ramo Logan

Date	Part or Job Description	Time Part In	Time Part Out	Sample Number	Volts	Amps	Temp. (F)	Totalizer Part In	Totalizer Part Out	Comments	Number of Drops	Specific Gravity	Surface Tension		Analyzed by # of drops	Analyzed by specific gravity	Analysis date # of drops	Analysis date specific gravity	Jar used
03/21/2002	4 tubes	10:17:00	10:20:00	-	-	-	-	71394	71303	Data obtained from facility.									
03/21/2002	4 tubes	10:21:00	10:24:00	-	-	-	-	71303	71312	Data obtained from facility.									
03/21/2002	4 tubes	10:25:00	10:28:00	-	-	-	-	71312	71323	Data obtained from facility.									
03/21/2002	4 tubes	10:30:00	10:32:00	-	-	-	-	71323	71328	Data obtained from facility.									
03/21/2002	4 shock tubs (x 3)	10:35:00	-	80.2C	7.4	250	95	71304	-	Fan on. Doors open.	45.75	1.200	37.77	3/21/02 10:35	Lab	Lab	3/27/002	3/27/002	125 ml HD
03/21/2002	2 rods	10:35:00	10:37:00	-	-	-	-	71328	71332	Data obtained from facility.									
03/21/2002	4 tubes	10:38:00	10:41:00	-	-	-	-	71332	71344	Data obtained from facility.									
03/21/2002	4 tubes	11:08:00	11:11:00	-	-	-	-	71344	71350	Data obtained from facility.									
03/21/2002	griddle + 1 hub cap	11:26:00	11:30:00	-	-	-	-	71350	71379	Data obtained from facility.									
03/21/2002	2 rods (4 tubes x 2)	11:35:00	-	-	3.6	0	130	71350	-	Plating. Fan on. Doors open. Tank uncovered.									
03/21/2002	4 pieces	11:40:00	11:43:00	-	-	-	-	71379	71392	Data obtained from facility.									
03/21/2002	20 strings of small screv	12:06:00	12:08:00	-	-	-	-	71392	71401	Data obtained from facility.									
03/21/2002	2 rods	12:12:00	12:14:00	-	-	-	-	71401	71406	Data obtained from facility.									
03/21/2002	none	12:35:00	-	80.3C	6.2	0	124	71406	-	Plating. Fan on. Doors open. Tank uncovered.	40.00	1.248	44.86	3/21/02 12:35	Lab	Lab	3/27/002	3/27/002	125 ml HD
03/21/2002	none	13:35:00	-	-	0.2	0	124	71406	-	No plating. Fan on. Doors open. Tank covered.									
03/21/2002	none	14:35:00	-	80.4C	0.2	0	-	71406	-	No plating. Fan on. Doors open. Tank covered.	39.00	1.240	45.78	3/21/02 14:35	Lab	Lab	3/27/002	3/27/002	125 ml HD
03/21/2002	-	15:30:00	-	-	-	-	-	-	-	Max Afcari left the shop at 15:30. The doors were closed and the fan was off.									
03/21/2002	-	15:50:00	-	-	-	-	-	-	-	A worker leaves the building and closed the door behind him.									
03/21/2002	-	16:00:00	-	-	-	-	-	-	-	Same worker above returns with a box and enters the building.									
03/22/2002	none	8:00:00	-	81.1C	0.2	0	114	71406	-	No plating. Fan on.	40.00	1.247	44.89	3/22/02 8:00	Lab	Lab	3/27/002	3/27/002	125 ml HD
03/22/2002	Chrome Foam addition	8:40:00	-	-	-	-	-	-	-	Added 8 ounces of Chrome Foam. Surface tension measured by facility. Data obtained from facility.			36.20						
03/22/2002	none	8:50:00	-	-	0.2	0	116	71406	-	No plating. Fan on. Tank uncovered.									
03/22/2002	screws	9:54:00	9:55:00	-	-	-	-	71407	71410	Data obtained from facility.									
03/22/2002	none	9:55:00	-	81.2C	3.5	0	122	71410	-	Plating. See plating log. Fan on.	41.00	1.250	43.90	3/22/02 9:55	Lab	Lab	3/27/002	3/27/002	125 ml HD
03/22/2002	screws	9:56:00	-	-	-	-	-	71410	71415	Data obtained from facility.									
03/22/2002	6 bumper guards	10:50:00	10:53:00	-	-	-	-	71415	71435	Data obtained from facility.									
03/22/2002	plating	10:55:00	-	-	5	0	120	71415	-	Plating. Tank uncovered. See plating log. Fan on.									
03/22/2002	stove top	11:45:00	11:54:00	-	-	-	-	71435	71471	Data obtained from facility.									
03/22/2002	tray	11:55:00	11:58:00	-	-	-	-	71471	71493	Data obtained from facility.									
03/22/2002	stove top	11:58:00	12:02:00	-	-	-	-	71493	71520	Data obtained from facility.									
03/22/2002	nuts and bolts	12:05:00	12:07:00	-	-	-	-	71520	71530	Data obtained from facility.									
03/22/2002	plating	12:07:00	-	81.3C	1.4	550	122	71493	-	Plating. Tank uncovered. See plating log. Fan on.	40.00	1.252	45.07	3/22/02 12:07	Lab	Lab	3/27/002	3/27/002	125 ml HD
03/22/2002	nuts and bolts	12:08:00	12:10:00	-	-	-	-	71530	71535	Data obtained from facility.									
03/22/2002	shift level	12:13:00	12:15:00	-	-	-	-	71535	71542	Data obtained from facility.									
03/22/2002	bumper tip	12:20:00	12:23:00	-	-	-	-	71542	71548	Data obtained from facility.									
03/22/2002	2 hinges	12:41:00	12:43:00	-	-	-	-	71548	71550	Data obtained from facility.									
03/22/2002	screws	12:45:00	12:47	-	-	-	-	71550	71552	Data obtained from facility.									
03/22/2002	plating	13:07:00	-	-	3.6	0	124	71552	-	Plating. Tank uncovered. See plating log. Fan on.									
03/22/2002	bumper tip	13:30:00	13:33:00	-	-	-	-	71552	71561	Data obtained from facility.									
03/22/2002	bumper tip	13:34:00	13:36:00	-	-	-	-	71561	71570	Data obtained from facility.									
03/22/2002	4 brackets	13:40:00	13:42:00	-	-	-	-	71570	71574	Data obtained from facility.									
03/22/2002	bumper tip	13:55:00	13:58:00	-	-	-	-	71574	71581	Data obtained from facility.									
03/22/2002	plating	14:08:00	-	81.4C	3.7	0	120	71581	-	Plating. Tank uncovered. See plating log. Fan on.	39.00	1.258	46.45	3/22/02 14:08	Lab	Lab	3/27/002	3/27/002	125 ml HD
03/22/2002	bumper	14:06:00	14:08:00	-	-	-	-	71581	71596	Data obtained from facility.									
03/22/2002	reflector	14:12:00	14:15:00	-	-	-	-	71596	71600	Data obtained from facility.									
03/22/2002	2 vent grille	14:18:00	14:20:00	-	-	-	-	71600	71635	Data obtained from facility.									
03/22/2002	2 seat rail	14:27:00	14:29:00	-	-	-	-	71635	71637	Data obtained from facility.									
03/22/2002	small parts	14:42:00	14:45:00	-	-	-	-	71637	71643	Data obtained from facility.									
03/22/2002	none	15:15:00	-	81.5C	0.4	0	118	71643	-	Plating. Tank covered. Fan on. End of business.	39.00	1.255	46.34	3/22/02 15:15	Lab	Lab	3/27/002	3/27/002	125 ml HD
03/22/2002	many misc parts	14:46:00	14:58:00	-	-	-	-	71643	71750	Data obtained from facility.									
03/25/2002	none	7:50:00	-	032502.1C	0.2	0	64	71750	-	No plating. Fan on. Front door open.	42.00	1.260	43.20	3/25/02 7:50	Lab	Lab	03/29/2002	03/29/2002	125 ml HD
03/25/2002	none	8:50:00	-	-	0.2	0	-	71750	-	No plating. Fan on. Front and back doors open.									
03/25/2002	none	9:50:00	-	-	0.2	0	-	71750	-	No plating. Fan on. Front and back doors open.									
03/25/2002	none	10:50:00	-	-	0.2	0	-	71750	-	No plating. Fan on. Front and back doors open.									
03/25/2002	none	11:50:00	-	-	0.2	0	-	71750	-	No plating. Fan on. Front and back doors open.									
03/25/2002	none	12:50:00	-	-	0.2	0	-	71750	-	No plating. Fan on. Front and back doors open.									
03/25/2002	none	13:50:00	-	-	0.2	0	-	71750	-	No plating. Fan on. Front and back doors open.									
03/25/2002	none	14:25:00	-	032502.2C	0.2	0	68	71750	-	No plating. Fan on. Front and back doors open. Last sample.	40.50	1.257	44.69	3/25/02 14:25	Lab	Lab	03/29/2002	03/29/2002	125 ml HD

Master Plating

Decorative chrome electroplating tank operating parameters during ARB ambient monitoring at Barrio Logan

Date	Part or Job Description	Time Part In	Time Part Out	Sample Number	Volts	Amps	Temp. (F)	Totalizer Part In	Totalizer Part Out	Comments	Number of Drops	Specific Gravity	Surface Tension
03/26/2002	none	8:55:00	-	85.1C	off	off	off	71750	-	No plating.	40.00	1.259	45.32
03/26/2002	none	9:55:00	-	-	off	off	off	71750	-	No plating.			
03/26/2002	none	10:55:00	-	-	off	off	off	71750	-	No plating.			
03/26/2002	none	11:55:00	-	-	off	off	off	71750	-	No plating.			
03/26/2002	none	12:55:00	-	-	off	off	off	71750	-	No plating.			
03/26/2002	none	13:55:00	-	-	off	off	off	71750	-	No plating.			
03/26/2002	none	14:50:00	-	85.2C	off	off	off	71750	-	No plating.	40.00	1.259	45.32
03/27/2002	none	8:55:00	-	032702.1C	off	off	60	71750	-	No plating. Fan on. Doors open	40.50	1.253	44.55
03/27/2002	none	9:55:00	-	-	off	off	off	71750	-	No plating. Fan on. Doors open			
03/27/2002	none	10:55:00	-	-	off	off	off	71750	-	No plating. Fan on. Doors open			
03/27/2002	none	11:55:00	-	-	off	off	off	71750	-	No plating. Fan on. Doors open			
03/27/2002	none	12:55:00	-	-	off	off	60	71750	-	No plating. Fan on. Doors open			
03/27/2002	none	13:55:00	-	-	off	off	off	71750	-	No plating. Fan off. Doors open			
03/27/2002	none	14:50:00	-	032702.2C	off	off	off	71750	-	No plating. Fan off. Doors open	40.00	1.260	45.36
03/28/2002	none	8:15:00	-	032802.1C	0	0	60	71750	-	No plating. Fan on. Doors open.	39.00	1.266	46.74
03/28/2002	none	15:00:00	-	032802.2C	0	0	62	71750	-	No plating. Fan on. Doors open. Last sample.	38.00	1.261	47.79
03/29/2002	noe	8:00:00	-	032902.1C	off	off	60	71750	-	No plating. Fan on. Front door open. No plating and no data sheets for March 29 and April 1	38.00	1.259	47.71
04/02/2002	none	-	-	-	-	-	-	71750	-	No plating. Fan on. Door open. No plating and no data sheets for March 29 and April 1.			
04/04/2002	none	-	-	-	off	off	off	71750	-	Chrome plating sent out to Lemon Grove Plating. Tanks newly painted. Fan off. Doors ... open. Exterior front of building freshly painted.			
04/05/2002	none	10:10:00	-	040502.1C	0	0	62	71750	-	Doors open. Fan on. Bay door open. Other tanks (caustic corrosive tank and nickel ... rinse tank) are being used.	38.50	1.253	46.87
04/08/2002	none	10:34:00	-	-	off	off	off	71750	-	No plating. Tank covered. Door open. Fan off.			
04/09/2002	none	-	-	-	off	off	62	71750	-	No plating. Front and back doors open. Fan off. Max not there - could not find his data sheet.			
04/10/2002	none	13:10:00	-	-	0	0	64	71750	-	No plating. Front and back door open. Fan off. No data sheets since did not plate ... during 4/802, 4/902, 4/10/02.			
04/11/2002	none	12:48:00	-	-	off	off	off	71750	-	No plating. Doors open. Fan on. No facility log for yesterday (no work).			
04/15/2002	none	12:00:00	-	-	0	0	62	71750	-	No plating. Front and bay door open. Fan off.			
04/16/2002	none	7:30:00	-	-	off	off	59	71750	-	No chrome plating. No nickel plating. Doors open. Fan off. Sweeping floor outside buffing and grinding room.			
04/17/2002	none	8:00:00	-	-	off	off	58	71750	-	No chrome plating. Fan off. Doors open. Changing fluorescent light tables.			
04/18/2002	none	9:52:00	-	-	0	0	62	71750	-	No plating. Front, back and bay doors open. Fan on.			

	Analyzed by # of drops	Analyzed by specific gravity	Analysis date # of drops	Analysis date specific gravity	Jar used
3/26/02 8:55	Lab	Lab	03/29/2002	03/29/2002	125 ml HC
3/26/02 14:50	Lab	Lab	03/29/2002	03/29/2002	125 ml HC
3/27/02 8:55	Lab	Lab	03/29/2002	03/29/2002	125 ml HC
3/27/02 14:50	Lab	Lab	03/29/2002	03/29/2002	125 ml HC
	Lab	Lab	04/12/2002	04/12/2002	
	Lab	Lab	04/12/2002	04/12/2002	
	Lab	Lab	04/12/2002	04/12/2002	
	Lab	Lab	04/12/2002	04/12/2002	

Average	Std Dev	Median	Maximum	Minimum
43.03	5.93	45.32	54.15	23.80

Material Additions

Master Plating

Decorative chrome electroplating tank operating parameters during ARB ambient monitoring at Barrio Logan

Date	Part or Job Description	Time		Sample Number	Volts	Amps	Temp. (F)	Totalizer		Comments	Number of Drops	Specific Gravity	Surface Tension
		Part In	Part Out					Part In	Part Out				
Date	Material Name				Time Added		Amount Added			Comments			
02/06/2002	Chrome Foam				11:00		8 oz.			Data obtained from facility.			
02/07/2002	Chrome Foam				9:15		8 oz.			Data obtained from facility.			
02/08/2002	Chrome Foam				9:15		8 oz.			Data obtained from facility.			
02/08/2002	DI water				3:20		2"			Data obtained from facility.			
02/13/2002	Chrome Foam				10:40		8 oz.			Data obtained from facility.			
02/14/2002	Chrome Foam				10:50		8 oz.			Data obtained from facility.			
02/15/2002	Chrome Foam				12:15		8 oz.			Data obtained from facility.			
02/21/2002	Chrome Foam				10:32		8 oz.			Data obtained from facility.			
02/22/2002	Chrome Foam				11:05		8 oz.			Data obtained from facility.			
02/27/2002	Chrome Foam				8:25		8 oz.			Data obtained from facility.			
02/27/2002	Air agitation				8:15		2 minutes			Data obtained from facility.			
02/28/2002	Chrome Foam				10:38		8 oz.			Data obtained from facility.			
03/01/2002	Chrome Foam				10:02		8 oz.			Data obtained from facility.			
03/05/2002	Rinse water				14:00		2"			Data obtained from facility.			
03/06/2002	Chrome Foam				9:15		8 oz.			Data obtained from facility.			
03/06/2002	Air agitation				9:23		30 seconds			Data obtained from facility. Note: air agitation conducted after adding Chrome Foam for District surface tension measurements.			
03/07/2002	Chrome Foam				9:05		8 oz.			Data obtained from facility.			
03/14/2002	Chrome Foam				11:35		8 oz.			Data obtained from facility.			
03/15/2002	Chrome Foam				9:00		8 oz.			Data obtained from facility.			
03/21/2002	Chrome Foam				9:50		8 oz.			Data obtained from facility.			
03/22/2002	Chrome Foam				8:40		8 oz.			Data obtained from facility.			

Analyzed by		Analysis date		Jar used
# of drops	specific gravity	# of drops	specific gravity	

Carlson and Beauloye - Tank 1

Hard chrome electroplating tank operating parameters during ARB ambient monitoring at Barrio Logan.

Date	Part or Job Description	Time (part in & out)	Sample Number	Volts	Amps	Temp. (F)	Totalizer	Pressure Drop CMP	Pressure Drop HEPA	Comments	Number of Drops	Specific Gravity	Surface Tension
02/06/2002	Crank shaft	8:15	37.1A	0	0	130	734722	1.4	1.3	Shaft recently removed.	23.00	1.211	75.82
02/06/2002	Crank shaft	9:20	37.2A	6	780	129	735036	1.2	1.3	Tank in use. Same shaft being plated.	23.00	1.238	77.51
02/06/2002	Crank shaft	10:30	37.3A	6.6	780	130	735508	1.4	1.4	Tank in use.	23.00	1.201	75.19
02/06/2002	Crank shaft	11:20	37.4A	6.6	800	129	736092	1.2	1.4	Tank in use.	23.00	1.207	75.57
02/06/2002	Crank shaft	12:45	37.5A	6.6	800	129	737097	1.2	1.4	Tank in use.	23.00	1.221	76.45
02/06/2002	Crank shaft	13:50	37.6A	7.2	800	129	737586	1.2	1.2	Tank in use.	23.00	1.225	76.70
02/06/2002	Crank shaft	14:38	37.7A	6.7	800	130	738128	1.3	1.2	Tank in use.	20.00	1.231	68.63
02/07/2002	none	7:50	38.1A	0	0	129	748875	n/a	n/a	No plating during tank sampling. Fans off. No fumetrol added.	25.00	1.100	63.36
02/07/2002	none	8:50	38.2A	0	0	129	748875	1.3	1.2	Fumetrol added. No plating during tank sampling.	23.00	1.100	68.87
02/07/2002	none	9:50	38.3A	0	0	130	748875	1.2	1.3	No plating during tank sampling.	23.00	1.100	68.87
02/07/2002	none	10:50	38.4A	0	0	129	748875	1.2	1.2	No plating during tank sampling.	23.00	1.100	68.87
02/07/2002	none	11:50	38.5A	0	0	130	748875	1.2	1.2	No plating during tank sampling.	23.00	1.100	68.87
02/07/2002	none	12:50	38.6A	0	0	129	748875	1.2	1.2	No plating during tank sampling.	23.00	1.100	68.87
02/07/2002	none	13:50	38.7A	0	0	129	748875	1.2	1.2	No plating during tank sampling.	23.00	1.100	68.87
02/07/2002	none	14:50	38.8A	0	0	129	748875	1.2	1.2	No plating during tank sampling.	23.00	1.100	68.87
02/07/2002	none	15:50	38.9A	0	0	129	748875	1.2	1.2	No plating during tank sampling.	23.00	1.100	68.87
02/08/2002	none	8:35	39.1A	0	0	128	748875	1.3	1.2	No plating during tank sampling. No fumetrol added.	25.00	1.200	69.12
02/08/2002	none	9:35	39.2A	0	0	129	748875	1.3	1.2	No plating during tank sampling. No fumetrol added.	23.00	1.200	75.13
02/08/2002	none	10:35	39.3A	0	0	129	748875	1.3	1.4	HEPA filter pressure reading is correct.	23.00	1.100	68.87
02/08/2002	shaft	11:35	39.4A	6.8	360	129	749121	1.2	1.4		24.00	1.200	72.00
02/08/2002	shaft	12:35	39.5A	6.8	370	130	749655	1.3	1.4		23.00	1.200	75.13
02/08/2002	shaft	13:30	39.6A	6.8	370	129	749903	1.3	1.4		23.00	1.200	75.13
02/08/2002	shaft	14:35	39.7A	7	420	130	750295	1.3	1.2		23.00	1.200	75.13
02/08/2002	shaft	16:20	39.8A	7	420	130	751146	1.4	1.3	Shaft is being electroplated over night.	24.00	1.200	72.00
02/09/2002	shaft	11:50	40.1A	0	0	130	759616	1.4	1.4	Tank was not plating when Earnie (C&B personnel) and I arrived. Fused blown out?	23.00	1.200	75.13
02/11/2002	none	8:00	42.1A	0	0	104	759616	1.3	1.2	No plating during tank sampling.	23.00	1.200	75.13
02/11/2002	none	9:00	-	0	0	116	759616	1.3	1.2	No plating.			
02/11/2002	none	10:00	-	0	0	129	759616	1.3	1.2	No plating.			
02/11/2002	none	11:00	-	0	0	130	759616	1.3	-	No pressure reading. HEPA pressure gage fitting broken.			
02/11/2002	Rail	11:50	-	6.8	350	130	759616	-	-	Part put in at 11:50.			
02/11/2002	Rail	12:00	42.2A	6.8	340	129	759776	1.3	-		24.00	1.100	66.00
02/11/2002	Rail	13:15	42.3A	6.8	330	129	760348	1.3	1.1	Leaking pressure gage fitting replaced.	23.00	1.200	75.13
02/11/2002	Rail	14:20	42.4A	6.8	375	130	760807	1.3	1.1		23.00	1.200	75.13
02/11/2002	Rail	14:55	42.5A	0	0	130	760920	1.3	1	Part taken out.	23.00	1.100	68.87
02/11/2002	Crank & ram shaft	15:26	42.6A	6.8	250	129	760920	1.3	1	Part put in at 15:26.	24.00	1.200	72.00
02/11/2002	Crank & ram shaft	15:55	42.7A	6.4	250	130	761112	1.4	1		24.00	1.200	72.00
02/11/2002	Crank & ram shaft	16:31	-	6.4	290	129	761338	1.4	1				
02/11/2002	Crank & ram shaft	16:57	42.8A	6.4	270	130	761395	1.4	1	Fuse blown out some time before 16:57. No plating during fuse blow out. Fuse replaced.	23.00	1.100	68.87
02/12/2002	Crank & ram shaft	7:30	43.1A	6.8	480	129	768240	1.3	1	Parts taken out and tank sample taken.	24.00	1.204	72.24

Carlson and Beauloye - Tank 1

Hard chrome electroplating tank operating parameters during ARB ambient monitoring at Barrio Logan.

Date	Part or Job Description	Time (part in & out)	Sample Number	Volts	Amps	Temp. (F)	Totalizer	Pressure Drop CMP	Pressure Drop HEPA	Comments	Number of Drops	Specific Gravity	Surface Tension
02/12/2002	none	8:30	43.2A	0	0	130	768275	1.3	1	No plating during tank sampling.	23.50	1.212	74.27
02/12/2002	dummy shaft	9:30	43.3A	5.9	300	129	768360	1.3	1	Dummy part put in tank for ARB stack source test.	23.50	1.204	73.78
02/12/2002	dummy shaft	10:30	43.4A	5.9	300	129	768816	1.3	1		23.50	1.204	73.78
02/12/2002	dummy shaft	11:30	43.5A	5.9	300	129	769144	1.3	1		23.50	1.196	73.29
02/12/2002	dummy shaft	12:30	43.6A	1.3	0	129	769579	1.3	1		24.00	1.213	72.78
02/12/2002	dummy shaft	13:30	43.7A	5	200	129	769662	1.3	1		23.50	1.206	73.90
02/12/2002	5" diam cylinder	14:02	-	7	300	130	769956	-	-	Dummy shaft taken out. 5" diam cylinder put in tank. Continuous current to tank during switching of parts	-	-	-
02/12/2002	5" diam cylinder	14:36	43.8A	6.5	280	129	770192	1.35	1		23.00	1.200	75.13
02/12/2002	5" diam cylinder	15:37	43.9A	7	300	132	770625	1.4	1		23.00	1.200	75.13
02/12/2002	5" diam cylinder	16:35	43.10A	7	300	130	771042	1.4	1	Shop closed. Part to be plated over night.	23.00	1.200	75.13
02/13/2002	none	7:45	44.1A	0	0	129	777073	1.3	0.9	No plating during tank sampling.	23.00	1.203	75.32
02/13/2002	none	8:45	-	0	0	129	777073	1.3	0.9	No plating.			
02/13/2002	none	9:45	-	0	0	129	777073	1.3	0.9	No plating.			
02/13/2002	none	9:45	-	0	0	129	777073	1.3	1	No plating.			
02/13/2002	9" x 3"	11:45	44.2A	5.5	100	129	777149	1.3	1	Part in 11:08.	24.00	1.196	71.76
02/13/2002	9" x 3"	12:45	44.3A	5.5	100	129	777316	1.3	1		23.50	1.203	73.72
02/13/2002	9" x 3"	13:45	44.4A	5.5	100	129	777508	1.3	1		23.50	1.204	73.78
02/13/2002	9" x 3"	14:45	44.5A	5.5	100	129	777570	1.3	1		24.00	1.203	72.18
02/13/2002	9" x 3"	15:45	44.6A	5.5	100	129	777639	1.3	1	Shop closing for day. Part still in tank. Per Randy Stegen, the rectifier is being looked at because it is not operating properly (fuse blow outs?). See 2/11/02, 16:57 entry.	23.00	1.206	75.51
02/14/2002	piston	7:10	45.1A	5.5	80	129	779637	1.3	1	Same piston put in 2/13/02 @ 11:08.	23.50	1.210	74.14
02/14/2002	piston	8:10	45.2A	5.5	80	130	779808	1.3	1		23.50	1.212	74.27
02/14/2002	piston	9:05	45.3A	5.5	80	130	779990	1.3	1		24.00	1.205	72.30
02/14/2002	piston	10:00	45.4A	5.5	80	130	780168	1.3	1		23.50	1.210	74.14
02/14/2002	piston	11:00	45.5A	5.5	80	130	780385	1.3	1		24.00	1.210	72.60
02/14/2002	piston	12:00	45.6A	5.5	80	130	780571	1.3	1		24.00	1.211	72.66
02/14/2002	piston	13:00	45.7A	5.5	80	130	780741	1.3	1		24.00	1.214	72.84
02/14/2002	piston	14:00	45.8A	6	80	130	780982	1.3	1	Part briefly removed to measure.	24.00	1.217	73.02
02/14/2002	piston	15:00	45.9A	6	80	130	781161	1.3	1		23.00	1.212	75.88
02/14/2002	piston	17:00	45.10A	6	80	129	781384	1.3	1		24.00	1.211	72.66
02/15/2002	piston	7:00	46.1A	6	100	130	784891	1.3	1	Same piston put in 2/13/02 @ 11:08.	25.50	1.230	69.45
02/15/2002	piston	8:00	46.2A	6	100	130	785134	1.3	1		25.50	1.213	68.50
02/15/2002	piston	9:00	46.3A	6.1	100	129	785388	1.3	1		24.50	1.220	71.71
02/15/2002	piston	10:00	46.4A	6	100	129	785623	1.3	1		24.50	1.213	71.29
02/15/2002	piston	11:00	46.5A	6.1	100	129	785924	1.3	1		24.00	1.212	72.72
02/15/2002	piston	12:00	46.6A	6.1	100	129	786145	1.3	1		23.00	1.207	75.57
02/15/2002	piston	13:00	46.7A	6.1	80	130	786369	1.3	1	At 12:25, part briefly removed to measure.	23.50	1.213	74.33
02/15/2002	piston	14:00	46.8A	6.1	80	130	786552	1.3	1		23.50	1.214	74.39
02/15/2002	piston	15:00	46.9A	6.1	80	130	786825	1.3	1	Piston done at 16:05.	25.00	1.217	70.10
02/15/2002	gear shaft	16:10	46.10A	6	80	129	786993	1.3	1	Gear shaft put in at 16:10.	25.00	1.212	69.81
02/15/2002	gear shaft	17:15	46.11A	6	80	130	787193	1.3	1	Shop closed. Part to be plated over night. Estimated removal of gear shaft 2/16/02 @ 8:00.	25.50	1.209	68.27

Carlson and Beauloye - Tank 1

Hard chrome electroplating tank operating parameters during ARB ambient monitoring at Barrio Logan.

Date	Part or Job Description	Time (part In & out)	Sample Number	Volts	Amps	Temp. (F)	Totalizer	Pressure Drop CMP	Pressure Drop HEPA	Comments	Number of Drops	Specific Gravity	Surface Tension
02/16/2002	gear shaft	7:50	47.1A	0	0	130	790930	1.3	1	Gear shaft out at 07:50	24.00	1.221	73.26
02/19/2002	none	7:30	50.1A	0	0	94	790931	1.3	1	No plating	25.00	1.212	69.81
02/19/2002	none	8:30	-	0	0	106	790931	1.3	1	No plating			
02/19/2002	none	9:30	-	0	0	118	790931	1.3	1	No plating			
02/19/2002	none	10:30	-	0	0	129	790931	1.3	1	No plating			
02/19/2002	none	11:30	-	0	0	129	790931	1.3	1	No plating			
02/19/2002	none	12:30	-	0	0	129	790931	1.3	1	No plating			
02/19/2002	none	13:30	-	0	0	130	790931	1.3	1	No plating			
02/19/2002	none	14:30	-	0	0	129	790931	1.3	1	No plating			
02/19/2002	none	15:15	50.2A	0	0	129	790931	1.3	1	No plating	24.00	1.204	72.24
02/20/2002	none	7:35	51.1A	0	0	129	790932	1.3	1	No plating.	24.00	1.206	72.36
02/20/2002	none	8:30	-	0	0	129	790932	1.3	1	No plating.			
02/20/2002	none	9:30	-	0	0	130	790932	1.3	1	No plating.			
02/20/2002	none	10:30	-	0	0	130	790932	1.3	1	No plating.			
02/20/2002	none	11:30	-	0	0	129	790932	1.3	1	No plating.			
02/20/2002	none	12:30	-	0	0	-	790932	-	-	Power outage at 12:10.			
02/20/2002	none	13:30	-	0	0	129	790932	1.3	1	Power regained at 12:40.			
02/20/2002	none	14:30	-	0	0	129	790932	1.3	1	No plating.			
02/20/2002	none	15:30	-	0	0	130	790932	1.3	1	No plating.			
02/20/2002	Shaft Piston	16:30	51.2A	5.5	125	130	791025	1.3	1	Parts in at 16:10.	24.50	1.211	71.18
02/21/2002	Shaft Piston	7:25	52.1A	5.5	125	129	797178	1.3	1	Part in at 16:10.	27.00	1.208	64.43
02/21/2002	none	7:40	52.2A	0	0	128	797190	1.3	1	Parts out at 7:30.	24.50	1.206	70.88
02/21/2002	none	8:30	-	0	0	129	797190	1.3	1	No plating.			
02/21/2002	none	9:30	-	0	0	129	797190	1.3	1	No plating.			
02/21/2002	none	10:30	-	0	0	130	797190	1.3	1	No plating.			
02/21/2002	none	11:30	-	0	0	129	797190	1.3	1	No plating.			
02/21/2002	dummy	12:30	52.3A	0	0	129	797414	1.3	1	Electrician testing totalizer using a dummy part.	24.50	1.206	70.88
02/21/2002	none	13:30	-	0	0	129	797414	1.3	1	No plating.			
02/21/2002	none	14:30	-	0	0	130	797414	1.3	1	No plating.			
02/21/2002	Shaft Piston	15:30	52.4A	5	325	129	797455	1.3	1	Part in at 15:15.	24.00	1.212	72.72
02/21/2002	none	16:30	52.5A	0	0	130	797513	1.3	1	Part out at 15:45.	24.50	1.200	70.53
02/22/2002	none	8:00	53.1A	0	0	129	797513	1.3	1	No plating.	25.00	1.213	69.87
02/22/2002	none	9:00	-	0	0	130	797513	1.3	1	No plating.			
02/22/2002	none	10:00	-	0	0	130	797513	1.3	1	No plating.			
02/22/2002	none	11:00	-	0	0	130	797513	1.3	1	No plating.			
02/22/2002	none	12:00	-	0	0	130	797513	1.3	1	No plating.			
02/22/2002	none	13:00	-	0	0	130	797513	1.3	1	No plating.			
02/22/2002	none	14:00	-	0	0	130	797513	1.3	1	No plating.			
02/22/2002	Several Shafts	15:00	53.2A	6	400	129	797746	1.3	1	Parts in at 14:10	25.00	1.210	69.70
02/22/2002	Several Shafts	16:00	53.3A	6	400	130	798069	1.3	1	Tank in use.	25.00	1.220	70.27
02/22/2002	Several Shafts	16:30	53.4A	6	400	130	798223	1.3	1	Tank in use.			

Carlson and Beauloye - Tank 1

Hard chrome electroplating tank operating parameters during ARB ambient monitoring at Barrio Logan.

Date	Part or Job Description	Time (part in & out)	Sample Number	Volts	Amps	Temp. (F)	Totalizer	Pressure Drop CMP	Pressure Drop HEPA	Comments	Number of Drops	Specific Gravity	Surface Tension
02/23/2002	Several Shafts	8:10	54.1A	0	0	117	801617	1.3	1	Parts in at 14:02. Upon arriving, Allan found blowers had shut off and tank 1 rectifier was off.	23.50	1.213	74.33
										Possible power outage. Parts were found to have minimal plating. Tank heaters were also off and			
										parts did not plate properly due to low temperature.			
02/25/2002	none	7:30	56.1A	0	0	86	801617	1.3	1	No plating.	23.50	1.212	74.27
02/25/2002	none	8:30	-	0	0	99	801617	1.3	1	No plating.			
02/25/2002	none	9:30	-	0	0	112	801617	1.3	1	No plating.			
02/25/2002	none	10:30	-	0	0	122	801617	1.3	1	No plating.			
02/25/2002	none	11:30	-	0	0	129	801617	1.3	1	No plating.			
02/25/2002	none	12:30	-	0	0	129	801617	1.3	1	No plating.			
02/25/2002	none	13:30	-	0	0	129	801617	1.3	1	No plating.			
02/25/2002	none	14:30	-	0	0	129	801617	1.3	1	No plating.			
02/25/2002	none	15:30	-	0	0	129	801617	1.3	1	No plating.			
02/25/2002	8 Pistons	16:30	56.2A	5.6	575	130	-	1.3	1	Parts in at 16:15.	23.00	1.210	75.76
02/26/2002	none	7:30	57.1A	0	0	129	807870	1.3	1	Parts out at 7:15, undersized.	24.50	1.209	71.06
02/26/2002	7 Shafts	8:30	57.2A	6	675	130	808459	1.3	1	Same parts at 7:30.	23.50	1.177	72.12
02/26/2002	7 Shafts	9:30	57.3A	6	675	130	809194	1.3	1	Tank in use.	23.50	1.202	73.65
02/26/2002	7 Shafts	10:30	57.4A	6	725	129	809910	1.3	1	Tank in use.	23.50	1.201	73.59
02/26/2002	7 Shafts	11:30	57.5A	6	725	129	810610	1.3	1	Totalizer not read at 11:30.	23.50	1.194	73.16
02/26/2002	7 Shafts	12:30	57.6A	6.2	810	130	811304	1.3	1	Tank in use.	23.00	1.190	74.50
02/26/2002	7 Shafts	13:30	57.7A	1.8	175	129	811773	1.3	1	Rectifier shut off during the hour.	24.00	1.196	71.76
02/26/2002	6 Shafts	14:30	57.8A	5.5	675	129	811981	1.3	1	One part taken out.	23.00	1.204	75.38
02/26/2002	6 Shafts	15:30	57.9A	5.6	675	129	812573	1.3	1	Tank in use.	23.50	1.194	73.16
02/26/2002	6 Shafts	16:30	57.10A	5.4	600	129	813191	1.3	1	Will plate overnight.	23.00	1.197	74.94
02/27/2002	none	7:50	-	1.7	175	129	821132	1.3	1	Tank not in use.			
02/27/2002	none	8:30	58.1A	0.1	175	130	821132	1.3	1	Tank not in use.	25.50	1.201	67.82
02/27/2002	2 parts	9:30	58.2A	5.3	190	130	821441	1.3	1	2 dummy parts in at 8:45.	26.50	1.208	65.64
02/27/2002	2 parts	10:30	58.3A	5.3	500	130	821921	1.3	1	Tank in use.	24.50	1.208	71.00
02/27/2002	2 parts	11:30	58.4A	5.4	510	130	822153	1.3	1	Tank in use.	24.50	1.200	70.53
02/27/2002	2 parts	12:30	58.5A	5.4	510	129	822568	1.3	1	Tank in use.	23.50	1.229	75.31
02/27/2002	none	13:30	58.6A	0.7	175	129	822657	1.3	1	Parts out at 12:40.	24.50	1.212	71.24
02/27/2002	none	14:30	58.7A	0.6	175	130	822657	1.3	1	Tank not in use.	24.00	1.202	72.12
02/27/2002	none	15:30	58.8A	0.7	175	130	822657	1.3	1	Tank not in use.	24.00	1.216	72.96
02/27/2002	4 parts	16:30	58.9A	0.5	175	129	822662	1.3	1	4 Shafts in at 4:35 for overnight.	24.50	1.212	71.24
02/28/2002	4 parts	7:30	59.1A	1.7	175	129	830785	1.3	1	4 Shafts out at 7:45.	24.50	1.211	71.18
02/28/2002	2 parts	8:30	59.2A	5	475	129	830882	1.3	1	2 dummy parts.	25.00	1.212	69.81
02/28/2002	2 parts	9:30	59.3A	5	475	129	831264	1.3	1	Tank in use.	24.50	1.219	71.65
02/28/2002	2 parts	10:30	59.4A	5	475	129	831655	1.3	1	Tank in use.	24.00	1.214	72.84
02/28/2002	2 parts	11:30	59.5A	5	475	130	832067	1.3	1	Tank in use.	24.00	1.227	73.62
02/28/2002	2 parts	12:30	59.6A	5	475	130	832404	1.3	1	Tank in use.	24.50	1.218	71.59
02/28/2002	2 parts	13:30	59.7A	5	475	130	832832	1.3	1	Tank in use.	24.50	1.218	71.59

Carlson and Beauloye - Tank 1

Hard chrome electroplating tank operating parameters during ARB ambient monitoring at Barrio Logan.

Date	Part or Job Description	Time (part in & out)	Sample Number	Volts	Amps	Temp. (F)	Totalizer	Pressure Drop CMP	Pressure Drop HEPA	Comments	Number of Drops	Specific Gravity	Surface Tension
02/28/2002	2 parts	14:30	59.8A	5	475	129	833198	1.3	1	Tank in use.	24.50	1.219	71.65
02/28/2002	2 parts	15:30	59.9A	5	475	129	833602	1.3	1	Tank in use.	25.00	1.224	70.50
02/28/2002	2 parts	16:30	59.10A	0.8	175	129	833718	1.3	1	Tank in use.	24.00	1.217	73.02
02/28/2002	3 parts	17:00	-	-	-	-	-	-	-	Parts in at 5:15-5:30 and will be in tank overnight then out around 8:00 on 3/1/02.			
03/01/2002	3 shafts	7:30	60.1A	0	0	129	840533	1.3	1	Parts out at 7:20.	25.00	1.216	70.04
03/01/2002	none	8:30	-	0	0	129	840533	0	0	Wash CMP, drain, blowers off.			
03/01/2002	none	9:30	-	0	0	129	840533	1.3	1	Tank not in use.			
03/01/2002	none	10:30	-	0	0	129	840533	1.3	1	Tank not in use.			
03/01/2002	1 part	11:30	60.2A	4.2	300	129	840681	1.3	1	Part in at 10:35.	24.50	1.212	71.24
03/01/2002	1 part	12:30	60.3A	4.2	300	130	840885	1.3	1	Tank in use.	25.00	1.213	69.87
03/01/2002	1 part	13:30	60.4A	4.2	275	130	841022	1.3	1	Tank in use.	24.50	1.213	71.29
03/01/2002	1 part	14:30	60.5A	4.2	275	130	841174	1.3	1	Tank in use.	25.00	1.220	70.27
03/01/2002	1 part	15:30	60.6A	4.2	275	130	841331	1.3	1	Tank in use.	25.00	1.217	70.10
03/01/2002	none	16:30	60.7A	0	0	130	841395	1.3	1	Part out at 15:45.	24.00	1.218	73.08
03/02/2002	none	7:00	61.1A	0.4	150	130	841395	1.3	1	Data collected on different form.	25.00	1.217	70.10
03/04/2002	none	7:30	63.1A	0	0	130	841395	1.3	1	No plating.	25.50	1.222	69.01
03/04/2002	none	8:30	-	0	0	130	841395	1.3	1	No plating.			
03/04/2002	none	9:30	-	0	0	129	841395	1.3	1	No plating.			
03/04/2002	none	10:30	-	0	0	129	841395	1.3	1	No plating.			
03/04/2002	none	11:30	-	0.4	175	130	841395	1.3	1	No plating.			
03/04/2002	none	12:30	-	0.4	175	130	841395	1.3	1	No plating.			
03/04/2002	none	13:30	-	0.4	175	129	841395	1.3	1	No plating.			
03/04/2002	none	14:30	-	0.4	175	129	841395	1.4	1.1	No plating.			
03/04/2002	none	15:30	-	0.4	175	130	841395	1.3	1.1	No plating.			
03/04/2002	none	16:30	63.2A	0.4	175	129	841395	1.3	1.2	No plating. Last sample.	24.50	1.223	71.88
03/04/2002	2 parts									Began plating about 17:30. Will remove part at 8:00 next day.			
03/05/2002	2 parts	7:45	64.1A	0.8	300	129	843749	1.3	1.2	2 shafts in at 18:10 on 3/4/02. Out at 8:00 on 3/5/02.	24.00	1.213	72.78
03/05/2002	none	8:45	64.2A	5.8	175	124	843874	1.3	1	No plating.	24.50	1.221	71.76
03/05/2002	1 part	9:45	64.3A	5.9	250	129	843935	1.4	1	1 shaft in at 9:10.	27.50	1.227	64.25
03/05/2002	1 part	10:45	64.4A	5.9	250	129	844073	1.4	1	1 shaft in at 9:10.	25.00	1.237	71.25
03/05/2002	1 part	11:45	64.5A	5.9	275	129	844227	1.4	1	1 shaft in at 9:10.	24.50	1.229	72.24
03/05/2002	1 part	12:45	64.6A	5.9	275	130	844434	1.4	1.1	1 shaft in at 9:10.	25.00	1.235	71.14
03/05/2002	1 part	13:45	64.7A	5.9	300	129	844582	1.4	1.1	1 shaft in at 9:10.	25.50	1.231	69.52
03/05/2002	1 part	14:45	64.8A	5.9	300	129	844764	1.4	1.2	1 shaft in at 9:10.	24.50	1.221	71.76
03/05/2002	1 part	15:45	64.9A	6	310	129	844932	1.4	1.3	1 shaft in at 9:10.	25.00	1.219	70.21
03/05/2002	1 part	16:45	64.10A	1	150	130	845014	1.4	1.4	Stopped at 16:40. Another part in at 17:00 (overnight) with volts = 6.0 and amps = 510.	25.00	1.222	70.39
03/06/2002	1 part	7:30	65.1A	6	550	130	852522	1.3	1.4	1 hydraulic shaft in at 17:00 on 3/5/02. Plated overnight.	24.50	1.203	70.71
03/06/2002	1 part	8:30	65.2A	6.8	600	129	853001	1.3	1.2	1 hydraulic shaft in at 17:00 on 3/5/02. Plated overnight.	25.00	1.209	69.64
03/06/2002	1 part	9:30	65.3A	6.8	600	130	853613	1.3	1	1 hydraulic shaft in at 17:00 on 3/5/02. Plated overnight.	25.00	1.199	69.06
03/06/2002	1 part	10:30	65.4A	6.8	630	129	854340	1.3	1	1 hydraulic shaft in at 17:00 on 3/5/02. Plated overnight.	25.00	1.215	69.98

Carlson and Beauloye - Tank 1

Hard chrome electroplating tank operating parameters during ARB ambient monitoring at Barrio Logan.

Date	Part or Job Description	Time (part in & out)	Sample Number	Volts	Amps	Temp. (F)	Totalizer	Pressure Drop CMP	Pressure Drop HEPA	Comments	Number of Drops	Specific Gravity	Surface Tension
03/06/2002	1 part	11:30	65.5A	6.8	630	130	854884	1.3	1	1 hydraulic shaft in at 17:00 on 3/5/02. Plated overnight.	24.50	1.209	71.06
03/06/2002	1 part	12:30	65.6A	6.8	630	129	855510	1.3	1.1	1 hydraulic shaft in at 17:00 on 3/5/02. Plated overnight.	25.00	1.204	69.35
03/06/2002	1 part	13:30	65.7A	6.8	630	129	856165	1.3	1.2	1 hydraulic shaft in at 17:00 on 3/5/02. Plated overnight.	24.50	1.209	71.06
03/06/2002	none	14:30	65.8A	0	175	129	856261	1.3	1.2	Part out at 13:45. No plating afterwards.	25.00	1.205	69.41
03/06/2002	none	15:30	65.9A	0	150	129	856261	1.3	1.2	No plating.	24.50	1.219	71.65
03/06/2002	none	16:30	65.10A	0	150	129	856261	1.3	1.2	No plating.	24.00	1.204	72.24
03/07/2002	none	7:45	66.1A	0	175	130	856261	1.3	1.2	No plating.	25.00	1.222	70.39
03/07/2002	none	8:45	-	0	175	130	856261	1.3	1.2	No plating. Note: Inspectors left around 8:00 due to press release in front of Master Plating.			
03/08/2002	bar	10:30	030802.1A	5.6	425	129	856684	1.3	1	Part in at 9:15.	25.00	1.223	70.44
03/08/2002	bar	11:30	030802.2A	5.6	425	129	857060	1.3	1	Part in at 9:15.	24.50	1.211	71.15
03/08/2002	none	12:30	030802.3A	0	0	129	857089	1.3	1	Part out at 11:35.	24.00	1.214	72.84
03/08/2002	none	13:30	-	0	0	129	857089	1.3	1	No plating.			
03/08/2002	none	12:30	-	0	0	129	857089	1.3	1	No plating.			
03/08/2002	none	12:30	-	0	0	129	857089	1.3	1	No plating.			
03/08/2002	none	12:30	030802.4A	0	0	129	857089	1.3	1	No plating. Closing for the day.	24.50	1.211	71.18
03/11/2002	none	8:30	69.1A	0	175	105	857089	1.3	1	No plating. Tanks off.	25.50	1.243	70.19
03/11/2002	none	9:30	-	0	175	117	857089	1.3	1	No plating. Tanks off.			
03/11/2002	none	10:30	-	0	175	129	857089	1.3	1	No plating. Tanks off.			
03/11/2002	none	11:30	-	0	175	129	857089	1.3	1	No plating. Tanks off.			
03/11/2002	none	12:30	-	0	175	130	857089	1.3	1	No plating. Tanks off.			
03/11/2002	none	13:30	-	0	175	129	857089	1.3	1.2	No plating. Tanks off.			
03/11/2002	none	14:30	-	0	175	129	857089	1.3	1.2	No plating. Tanks off.			
03/11/2002	none	15:30	-	0	175	130	857089	1.3	1.2	No plating. Tanks off.			
03/11/2002	2 parts	16:30	69.2A	4.6	250	130	857153	1.3	1.2	2 ram shafts in at 16:00. Last sample.	25.00	1.242	71.54
03/11/2002	1 part	16:40	-	5.5	350	130	-	1.3	1.2	Above parts to be plated overnight.			
03/12/2002	none	7:30	031202.1A	0	0	130	860754	1.3	1	No plating. 3 parts taken out at 7:00.	24.00	1.194	71.64
03/12/2002	none	8:30	-	0	0	129	860754	1.3	1	No plating.			
03/12/2002	none	9:30	-	0	0	129	860754	1.3	1	No plating.			
03/12/2002	none	10:30	-	0	0	129	860754	1.3	1	No plating.			
03/12/2002	none	11:30	-	0	0	129	860754	1.3	1	No plating.			
03/12/2002	none	12:30	-	0	0	129	860754	1.3	1	No plating.			
03/12/2002	none	13:30	-	0	0	130	860755	1.3	1.2	No plating.			
03/12/2002	none	14:30	-	0	0	130	860756	1.3	1.2	No plating.			
03/12/2002	none	15:30	-	0	0	129	860756	1.3	1.2	No plating.			
03/12/2002	2 parts	16:30	031202.2A	5.4	300	129	860756	1.3	1.1	2 parts in at 16:30 to be plated overnight.	23.00	1.206	75.51
03/13/2002	2 Shafts	7:30	031302.1A	0	0	130	865044	1.3	1	Parts out at 7:20.	25.25	1.215	69.29
03/13/2002	1 Shaft	8:30	031302.2A	5.6	200	129	865125	1.3	1	Part in at 7:30.	24.00	1.219	73.14
03/13/2002	1 Shaft	9:30	031302.3A	5.6	200	128	865209	1.3	1	Tank in use.	25.00	1.219	70.21
03/13/2002	1 Shaft	10:30	031302.4A	5.7	200	129	865303	1.3	1	Tank in use.	25.00	1.210	69.70
03/13/2002	1 Shaft	11:30	031302.5A	6.2	200	130	865380	1.3	1	Part out at 10:30. 1 Shaft in at 10:40.	24.00	1.221	73.26

Carlson and Beauloye - Tank 1

Hard chrome electroplating tank operating parameters during ARB ambient monitoring at Barrio Logan.

Date	Part or Job Description	Time (part in & out)	Sample Number	Volts	Amps	Temp. (F)	Totalizer	Pressure Drop CMP	Pressure Drop HEPA	Comments	Number of Drops	Specific Gravity	Surface Tension
03/13/2002	1 Shaft	12:30	031302.6A	6.2	200	129	865497	1.3	1	Tank in use.	24.50	1.227	72.12
03/13/2002	1 Shaft	13:30	031302.7A	6.2	200	130	865604	1.3	1	Tank in use.	23.50	1.218	74.63
03/13/2002	1 Shaft	14:30	031302.8A	6.2	200	129	865713	1.3	1	Tank in use.	24.00	1.221	73.26
03/13/2002	1 Shaft	15:30	031302.9A	5.4	575	130	865806	1.3	1	1 Shaft out at 15:25. 1 Shaft in at 15:35.	25.00	1.221	70.33
03/13/2002	1 Shaft	16:30	031302.10A	5.2	350	130	866021	1.3	1	Tank in use overnight.	25.00	1.223	70.44
03/14/2002	none	7:40	031402.1A	1.4	125	130	871373	1.3	1	1 Shaft out at 7:25.	26.00	1.197	66.30
03/14/2002	none	8:40	-	1.1	125	128	871373	1.3	1	Tank not in use.			
03/14/2002	none	9:40	-	0.9	125	130	871373	1.3	1	Tank not in use.			
03/14/2002	none	10:40	-	0.8	125	129	871373	1.3	1	Tank not in use.			
03/14/2002	1 Part	11:40	031402.2A	4.8	400	129	871536	1.3	1	1 Brass pc. Flasit.	25.00	1.207	69.52
03/14/2002	none	12:40	031402.3A	1.3	125	129	871817	1.4	1	1 Brass pc. out at 12:30.	25.00	1.197	68.95
03/14/2002	3 Parts	13:40	031402.4A	4.8	500	130	871919	1.4	1	2 Brass parts and 1 dummy.	25.00	1.193	68.72
03/14/2002	3 Parts	14:40	031402.5A	1.6	125	130	872392	1.4	1	Tank in use.	24.50	1.193	70.12
03/14/2002	2 Parts	15:40	031402.6A	4.7	425	130	872642	1.3	1	3 Parts out at 14:45 and 2 brass pcs. in at 15:00.	24.50	1.198	70.41
03/14/2002	none	16:40	031402.7A	1.2	125	129	872855	1.3	-	Parts out at 16:25.	24.50	1.196	70.30
03/15/2002	none	7:30	74.1A	0.4	-	130	872855	1.3	1	Tank not in use.	24.50	1.214	71.35
03/15/2002	none	8:30	-	0.4	120	129	872855	1.3	1	Tank not in use.			
03/15/2002	none	9:30	-	0.4	120	129	872855	1.3	1	Tank not in use.			
03/15/2002	none	10:30	-	0.4	120	129	872855	1.3	1	Tank not in use.			
03/15/2002	none	11:30	-	0.4	120	130	872855	1.3	1	Tank not in use.			
03/15/2002	none	12:30	-	0.4	120	130	872855	1.3	1	Tank not in use.			
03/15/2002	none	13:30	-	5.1	320	129	872881	1.3	1	Tank in use.			
03/15/2002	8 Parts	14:30	-	5.5	320	129	873156	1.3	1	8 small parts.			
03/15/2002	8 Parts	15:30	-	5.5	350	130	873442	1.3	1	8 small parts.			
03/15/2002	none	16:30	74.2A	1.2	120	130	873680	1.3	-	Parts out.	24.50	1.159	68.12
03/18/2002	none	8:30	031802.1A	0.4	125	114	873680	1.3	1	Tank not in use.	24.50	1.210	71.12
03/18/2002	none	9:30	-	0.4	125	130	873680	1.3	1	Tank not in use.			
03/18/2002	none	10:30	-	0.4	125	130	873680	1.3	1	Tank not in use.			
03/18/2002	none	11:30	-	0.4	125	127	873680	1.3	1	Tank not in use.			
03/18/2002	none	12:30	-	0.4	125	128	873680	1.4	1	Tank not in use.			
03/18/2002	none	13:30	-	0.4	125	130	873680	1.4	1	Tank not in use.			
03/18/2002	none	14:30	-	0.4	125	129	873680	1.3	1	Tank not in use.			
03/18/2002	none	15:30	-	0.4	125	130	873680	1.4	1	Tank not in use.			
03/18/2002	2 Parts	16:30	031802.2A	5.6	300	130	873774	1.4	1	Parts in at 15:45 and in use overnight.	25.00	1.208	69.58
03/19/2002	none	8:00	78.1A	0	120	129	878356	1.4	1	2 Pump Shafts removed. Note: inspector took tank sample after part was rinsed on top of tank.	25.25	1.209	68.95
03/19/2002	none	9:00	-	0	120	128	878356	1.3	1	Tank not in use.			
03/19/2002	none	10:00	-	0	120	128	878356	1.3	1	Tank not in use.			
03/19/2002	2 Parts	11:00	-	5.4	300	129	878526	1.3	1	2 large Shafts.			
03/19/2002	2 Parts	12:00	-	5.4	300	130	878751	1.3	1	Tank in use.			
03/19/2002	2 Parts	13:00	-	5.5	300	129	879021	1.4	1	Tank in use.			
03/19/2002	2 Parts	14:00	-	5.5	300	130	879259	1.4	1	Tank in use.			

Carlson and Beauloye - Tank 1

Hard chrome electroplating tank operating parameters during ARB ambient monitoring at Barrio Logan.

Date	Part or Job Description	Time (part in & out)	Sample Number	Volts	Amps	Temp. (F)	Totalizer	Pressure Drop CMP	Pressure Drop HEPA	Comments	Number of Drops	Specific Gravity	Surface Tension
03/19/2002	2 Parts	15:05	-	5.5	300	130	879516	1.4	1	Tank in use.			
03/19/2002	3 Parts	16:00	78.2A	5.3	300	129	879780	1.4	1	Tank in use overnight.	24.00	1.209	72.54
03/20/2002	3 shafts	8:00	032002.1A	5.6	390	130	884243	1.4	1		28.00	1.216	62.54
03/20/2002	3 shafts	9:00	-	5.6	400	130	884632	1.4	1				
03/20/2002	3 shafts	10:00	-	5.6	410	129	884986	1.4	1				
03/20/2002	3 shafts	11:00	-	5.7	420	129	885388	1.4	1				
03/20/2002	3 shafts	12:00	-	5.8	450	130	885840	1.4	1				
03/20/2002	3 parts	13:00	-	5.8	450	130	886340	1.4	1				
03/20/2002	3 parts	14:00	-	5.8	450	130	886485	1.4	1				
03/20/2002	3 parts	15:00	-	5.8	500	129	887245	1.4	1				
03/20/2002	3 parts	16:00	032002.2A	5	200	129	887506	1.4	1	Plating over night.	25.00	1.208	69.58
03/21/2002	3 parts	6:25	-	-	-	-	890042	-	-	Take out parts plated over night.			
03/21/2002	none	7:30	80.1A	0	110	130	890042	1.3	1.1	No plating.	29.00	1.224	60.78
03/21/2002	none	8:30	-	0	110	130	890042	1.3	1.1	No plating.			
03/21/2002	none	9:30	-	0	110	130	890042	0	0	No plating. Blower fan off.			
03/21/2002	none	10:30	-	0	110	130	890042	0	0	No plating. Blower fan off.			
03/21/2002	none	11:30	-	0	110	129	890042	0	0	No plating. Blower fan off.			
03/21/2002	none	12:30	-	0	100	130	890042	0	0	No plating. Blower fan off.			
03/21/2002	none	13:30	-	0	100	130	890042	0	0	No plating. Blower fan off.			
03/21/2002	6 piece flash 1"x1/2	14:20	-	300	4.2	-	890042	1.4	1	Data obtained from facility.			
03/21/2002	none	14:30	-	0.7	120	130	890063	1.4	1	Plating.			
03/21/2002	none	15:30	-	0.5	120	129	890063	1.4	1	Plating.			
03/21/2002	1 shaft	16:10	-	500	6.2	-	890063	1.4	1	Data obtained from facility.			
03/21/2002	none	16:30	80.2A	6	500	129	890270	1.4	-	Plating.	24.50	1.215	71.41
03/22/2002	1 shaft	7:50	81.1A	6	500	129	897649	1.3	1		25.00	1.221	70.33
03/22/2002	1 shaft	8:50	-	6	500	129	898110	1.3	1				
03/22/2002	2 shaft	9:50	-	5.8	500	129	898566	1.3	1				
03/22/2002	2 shaft	10:50	-	5.9	530	130	899078	1.3	1				
03/22/2002	2 shaft	12:00	-	6	550	129	899719	1.3	1				
03/22/2002	2 shaft	13:00	-	6	570	129	900300	1.3	1				
03/22/2002	2 shaft	14:00	-	6	590	130	900893	1.3	-				
03/22/2002	2 shaft	15:00	81.2A	0	120	129	901235	1.4	1		26.00	1.217	67.40
03/25/2002	none	7:40	032502.1A	0	0	149	901235	0	off	Maintenance on heater. Temp gauge not accurate. Temp. approx. 112F. Temp gauge malfunctling.	26.00	1.216	67.35
03/25/2002	none	8:40	-	0	0	off	901235	0	off	Maintenance on heater.			
03/25/2002	none	9:40	-	0	0	off	901235	0	off	Maintenance on heater.			
03/25/2002	none	10:40	-	0	0	118	901235	0	off	Heating up tank.			
03/25/2002	none	11:40	-	0	0	130	901235	0	off	Heating up tank.			
03/25/2002	none	12:40	-	0	125	127	901235	0	off	Heating up tank.			
03/25/2002	none	13:40	-	0	125	129	901235	0	off	Heating up tank.			
03/25/2002	none	14:40	032502.2A	0	125	347	901235	0	off	Maintenance on heater. Temp gauge not accurate. Temp. approx. 112F. Temp gauge malfunctling.	25.00	1.217	70.10

Carlson and Beauloye - Tank 1

Hard chrome electroplating tank operating parameters during ARB ambient monitoring at Barrio Logan.

Date	Part or Job Description	Time (part In & out)	Sample Number	Volts	Amps	Temp. (F)	Totalizer	Pressure Drop CMP	Pressure Drop HEPA	Comments	Number of Drops	Specific Gravity	Surface Tension
03/26/2002	none	8:45	85.1A	off	off	off	901235	off	off	No plating.	25.00	1.226	70.62
03/26/2002	none	9:45	-	off	off	off	901235	off	off	No plating.			
03/26/2002	none	10:45	-	off	off	off	901235	off	off	No plating.			
03/26/2002	none	11:45	-	off	off	off	901235	off	off	No plating.			
03/26/2002	none	12:45	-	off	off	off	901235	off	off	No plating.			
03/26/2002	none	13:45	-	off	off	off	901235	off	off	No plating.			
03/26/2002	none	14:50	-	off	off	off	901235	off	off	No plating. Warming up tank.			
03/26/2002	none	15:45	-	off	off	140	901235	off	off	No plating.			
03/26/2002	none	16:00	85.2A	off	off	off	901235	off	off	No plating.			
											26.00	1.222	67.68
03/27/2002	none	8:45	032702.1A	off	off	128	901235	off	off	Maintenance. Warming up tank.			
03/27/2002	none	9:45	-	off	off	-	901235	off	off	Maintenance. Warming up tank.	25.00	1.225	70.56
03/27/2002	2 parts	10:50	-	5.9	300	128	901259	1.3	1	Plating 1 ram and 1 pin started at 10:40.			
03/27/2002	4 parts	11:50	-	5.9	400	-	901775	1.3	1	Added to more parts (pins) at 11:15			
03/27/2002	4 parts	12:50	-	5.9	400	130	902238	1.3	1	Added to more parts (pins) at 11:15			
03/27/2002	6 parts	13:50	-	6	500	128	902807	1.3	1	Added to more parts (pins) at 13:30.			
03/27/2002	6 parts	15:00	-	6	500	129	903554	1.3	1	Added to more parts (pins) at 13:30.			
03/27/2002	6 parts	16:00	032702.2B	6.1	500	129	904186	1.3	1	Added to more parts (pins) at 13:30.			
											25.00	1.221	70.33
03/28/2002	6 parts	8:00	032802.1A	6.9	650	135	917165	1.3	1	Over night parts out at 12:00.			
03/28/2002	1 pin Zize 8x4	13:25	-	4.8	-	130	921269	-	-	Data obtained from facility.	25.00	1.213	69.87
03/28/2002	1 part	16:00	032802.2A	6	125	130	922265	1.4	4	1 pin Zize 8x4 pu in at 13:25. Last sample.			
03/28/2002	1 pin Zize 8x4	16:15	-	-	-	-	922286	-	-	1 pin Zize 8x4 taken out. Data obtained from facility.	28.50	1.119	56.51
03/28/2002	4 pins	16:25	-	5.6	600	-	922286	-	-	4 pins Zize 8x4. Data obtained from facility.			
03/29/2002	pins	7:30	032902.1A	6.8	625	133	936926	1.3	1				
03/29/2002	4 pins	8:25	-	-	-	-	937782	-	-	Part removed from yesterday. Data obtained from facility.	24.50	1.222	71.82
03/29/2002	4 pins	8:40	-	7	625	132	937782	-	-	Pulled out part. Checked Zize. Re-plate. Data obtained from facility.			
03/29/2002	4 pins	11:45	-	-	-	-	940729	-	-	Pulled out part. Data obtained from facility.			
04/01/2002	none	13:15	-	-	-	-	-	-	-	New ampere hour meter installed by electrician. Data obtained from facility.			
04/01/2002	shrederer	18:05	-	7	625	130	940729	-	-	Diameter 4x20. Data obtained from facility.			
04/02/2002	none	7:45	-	-	-	-	-	-	-	Surface tension measure by facility.			49.00
04/02/2002	shredder	11:35	-	-	-	-	945451	-	-	Shredder from yesterday taken out. Data obtained from facility.			
04/02/2002	shredder	11:40	-	7.8	275	130	945451	-	-	Shredder put back in. Data obtained from facility.			
04/02/2002	shredder	14:00	-	-	-	-	946142	-	-	Shredder taken out. Data obtained from facility.			
04/02/2002	-	14:12	92.1A	0	0	129	946142	1.3	1	No plating.			
											31.00	1.217	56.53
04/03/2002	1 turbine	7:25	-	-	-	-	951965	-	-	Part pulled out from day before. Data obtained from facility.			
04/03/2002	1 turbine	8:00	-	6.4	500	129	951965	-	-	Replate same turbine. Data obtained from facility.			
04/03/2002	1	10:25	040302.1A	6.4	500	130	953276	1.3	1	1 turbine out at 7:25. 1 in 8:00.			
04/03/2002	1 turbine	13:30	-	-	-	-	954937	-	-	Pull part out. Data obtained from facility.	26.00	1.220	67.54
04/03/2002	1 turbine	14:00	-	-	-	-	954937	-	-	Start another turbine. Data obtained from facility.			

Carlson and Beauloye - Tank 1

Hard chrome electroplating tank operating parameters during ARB ambient monitoring at Barrio Logan.

Date	Part or Job Description	Time (part in & out)	Sample Number	Volts	Amps	Temp. (F)	Totalizer	Pressure Drop CMP	Pressure Drop HEPA	Comments	Number of Drops	Specific Gravity	Surface Tension
04/04/2002	1 turbine	-	-	-	-	-	963697	-	-	Pull out trubine from day before. Data obtained from facility.			
04/04/2002	-	12:55	94.1A	0	0	129	963697	1.3	1.1	No plating at this time.			
04/04/2002	pin	15:15	-	6.5	400	130	963697	-	-	1 pin 2.2e 13x5. Data obtained from facility.	26.25	1.220	66.93
04/04/2002	2 brass pieces	17:15	-	6.5	450	130	964620	-	-	Add 2 more pieces to the run. Data obtained from facility.			
04/05/2002	-	7:45	-	-	-	-	972246	-	-	Pull out from day before. Data obtained from facility.			
04/05/2002	-	10:30	040502.1A	0	0	129	972246	1.4	1	Please see data sheets.			
04/05/2002	axle	13:40	-	5.8	300	129	972246	-	-	Plated over night and to Sunday. Data obtained from facility.	25.50	1.225	69.18
04/07/2002	axle	11:10	-	-	-	-	990273	-	-	Sunday. Data obtained from facility.			
04/08/2002	rocker arm	10:00	-	5.4	300	130	990273	-	-	Part in. Data obtained from facility.			
04/08/2002	-	10:20	98.1A	0.8	0	130	990346	1.3	1	Some weekend plating. See log.			
04/08/2002	rocker arm	10:25	-	-	-	-	99346	-	-	Part out. Data obtained from facility.	25.00	1.221	70.33
04/08/2002	rocker arm	10:30	-	5.4	300	-	990346	-	-	Part in. Data obtained from facility.			
04/08/2002	rocker arm	10:50	-	5.4	300	-	990429	-	-	Part out. Data obtained from facility.			
04/08/2002	rocker arm	13:35	-	5.4	300	130	990429	-	-	Part in. Data obtained from facility.			
04/08/2002	rocker arm	13:50	-	-	-	-	990535	-	-	Part out. Data obtained from facility.			
04/09/2002	-	-	040902.1A	0	0	129	990535	1.3	1	No plating.			
04/09/2002	1 o.d. part	16:35	-	5.2	300	130	990535	-	-	Area plating 2 x 2 + 1 dummy. Data obtained from facility.			
04/09/2002	1 o.d. part	-	-	-	-	-	991874	-	-	Part shut off on its own. Data obtained from facility.			
04/10/2002	1 o.d. part	6:20	-	5.5	300	130	991874	-	-	Pull out part and check. Re-start from day before.			
04/10/2002	1 o.d. part	-	-	-	-	-	993682	-	-	Data obtained from facility.			
04/10/2002	flash	11:50	-	5.2	300	130	993682	-	-	Data obtained from facility.			
04/10/2002	flash	12:10	-	-	-	-	993762	-	-	Data obtained from facility.			
04/10/2002	-	13:00	041002.1A	0.7	0	129	993762	1.4	1	No plating.			
04/10/2002	shredder	14:10	-	8	150	130	993764	-	-	Data obtained from facility.			
04/10/2002	shredder	16:25	-	-	-	-	997628	-	-	Data obtained from facility.			
04/11/2002	-	12:30	101.1A	0	0	130	997628	1.3	1	No plating. See log.			
04/12/2002	turbine	16:30	-	6.4	350	130	997628	-	-	Plated over night. Data obtained from facility.			
04/13/2002	turbine	7:30	-	-	-	-	1816	-	-	Part taken out from yesterday. Data obtained from facility.			
04/13/2002	2 shafts	8:00	-	6.8	325	130	1816	-	-	Data obtained from facility.			
04/13/2002	2 shafts	12:45	-	-	-	-	3353	-	-	Part taken out. Data obtained from facility.			
04/13/2002	1 turbine	13:25	-	6.6	500	130	3353	-	-	Data obtained from facility.			
04/14/2002	1 turbine	12:15	-	-	-	-	21479	-	-	Pull out part from yesterday. Data obtained from facility.			
04/15/2002	1 turbine	10:35	-	6.5	400	129	21479	-	-	Re-chroming 1 part turbine and dummy. Data obtained from facility.			
04/15/2002	1 part	11:30	041502.1A	6.6	400	129	21830	1.3	1	See data sheets.			

Carlson and Beauloye - Tank 1

Hard chrome electroplating tank operating parameters during ARB ambient monitoring at Barrio Logan.

Date	Part or Job Description	Time (part in & out)	Sample Number	Volts	Amps	Temp. (F)	Totalizer	Pressure Drop CMP	Pressure Drop HEPA	Comments	Number of Drops	Specific Gravity	Surface Tension
04/15/2002	another turbine	16:15	-	6.4	200	128	23371	-	-	Another turbine. Two turbines in tank. Data obtained from facility.			
04/16/2002	turbine(s)?	7:30	-	-	-	-	27619	-	-	Pull out. Data obtained from facility.			
04/16/2002	turbine	?	041602.1A	off	off	129	27619	1.3	1				
04/16/2002	4 shafts	14:20	-	6.4	400	130	27619	-	-	4 monel pieces 9 x 1 1/2. Data obtained from facility.			
04/16/2002	add 4 small shafts	18:00	-	5.6	525	130	29072	-	-				
04/17/2002	none	?	041702.1A	off	off	130	40652	1.3	1	Parts out today at ~7:30.			
04/17/2002	1 valve	9:40	-	5	225	130	40652	-	-	1 valve and 1 dummy. Data obtained from facility.			
04/17/2002	1 valve	11:05	-	5.6	300	-	-	-	-	Increase voltage. Data obtained from facility.			
04/17/2002	1 valve	15:55	-	-	-	-	42695	-	-	Pull out part. Data obtained from facility.			
04/18/2002	-	10:00	041802.1A	0.7	0	129	43484	1.3	1	Please see data sheets.			

Material Additions

Date	Material Name	Time Added	Amount Added	Comments
02/07/2002	Fumetrol	8:15	63 ml	
02/21/2002	Rinse Water	9:35	1 1/2"	
02/21/2002	Fumetrol	1:00	200 ml	
02/26/2002	Rinse Water	8:20	1 "	
03/05/2002	Fumetrol	8:20	1 liter	
03/14/2002	Rinse Water	9:20	1 1/2"	
03/15/2002	Rinse Water	7:15	1/4"	Water from composite mesh pad rinse.
03/19/2002	Rinse Water	9:55	1 "	
03/22/2002	Fumetrol	9:15	100 ml	
03/27/2002	Fumetrol	12:45	200 ml	
04/01/2002	New ampere hour meter	13:15	-	New ampere hour meter installed by electrician.
04/01/2002	Rinse Water	7:00	1/4"	Add rinse water from CMP rinse.
04/01/2002	Rinse Water	8:00	1/2"	Add rinse water from holding tank.
04/02/2002	Fumetrol	7:45	150 ml	Surface tension measured by facility to be 49 dynes/cm.
04/02/2002	Chrome flakes	9:00	50 lbs	
04/09/2002	Fumetrol	16:40	150 ml	
04/14/2002	Fumetrol	10:45	150 ml	
04/16/2002	Fumetrol	7:00	150 ml	

Carlson and Beauloye - Tank 1

Hard chrome electroplating tank operating parameters during ARB ambient monitoring at Barrio Logan.

Date	Part or Job Description	Time (part in & out)	Sample Number	Volts	Amps	Temp. (F)	Totalizer	Pressure Drop CMP	Pressure Drop HEPA	Comments	Number of Drops	Specific Gravity	Surface Tension

Composite Mesh Pad Washdown

Date	Start Time	Stop Time	Comments
02/07/2002	7:55	-	
02/08/2002	8:53	8:58	
02/21/2002	9:30	9:35	
02/25/2002		8:20	Blowers off during washdown.
03/01/2002	7:50	7:55	Blowers off until 8:38.
03/15/2002	7:15	7:18	
03/21/2002	8:40	-	Maintenance start.
03/21/2002	8:43	-	Blowers off.
03/21/2002	8:45	-	Heater off.
03/21/2002	8:50	-	Rinse CMP. Blowers on at 14:20.
03/27/2002	10:30		Blowers on at 10:30.
04/01/2002	7:00	7:15	Approximately 1/4" water added to tank from rinse.
04/15/2002	6:15	6:17	Water very clean.

Carlson and Beauloye - Tank 2

Hard chrome electroplating tank operating parameters during ARB ambient monitoring at Barrio Logan.

Date	Part or Job Description	Time (part in & out)	Sample Number	Volts	Amps	Temp. (F)	Totalizer	Pressure Drop CMP	Pressure Drop HEPA	Comments	Number of Drops	Specific Gravity	Surface Tension
02/06/2002	none	8:20	37.1B	0	0	130	634810	1.6	1.3	No plating during tank sampling.	26.00	1.219	67.51
02/06/2002	none	9:20	37.2B	0	0	130	634810	1.2	1.2	No plating during tank sampling.	24.00	1.234	74.04
02/06/2002	none	10:30	37.3B	0	0	129	634810	1.7	1.2	No plating during tank sampling.	24.00	1.217	73.02
02/06/2002	none	11:20	37.4B	0	0	129	634810	1.6	1.2	No plating during tank sampling.	24.00	1.210	72.60
02/06/2002	none	12:45	37.5B	0	0	129	634810	1.7	1.4	No plating during tank sampling.	24.00	1.238	74.28
02/06/2002	none	13:50	37.6B	0	0	129	634810	1.6	1.4	No plating during tank sampling.	30.00	1.210	58.08
02/06/2002	none	14:45	37.7B	0	0	129	634810	1.7	1.2	No plating during tank sampling.	29.00	1.219	60.53
02/07/2002	none	7:50	38.1B	0	0	129	634810	n/a	n/a	No plating during tank sampling. Collection fans off. No fumetrol added.	23.00	1.200	75.13
02/07/2002	none	8:50	38.2B	0	0	129	634810	1.7	1.2	No plating during tank sampling. Fumetrol added.	23.00	1.100	68.87
02/07/2002	none	9:50	38.3B	0	0	129	634810	1.7	1.1	No plating during tank sampling.	23.00	1.200	75.13
02/07/2002	none	10:50	38.4B	0	0	129	634810	1.7	1.2	No plating during tank sampling.	24.00	1.200	72.00
02/07/2002	none	11:50	38.5B	0	0	129	634810	1.7	1.2	No plating during tank sampling.	24.00	1.200	72.00
02/07/2002	none	12:50	38.6B	0	0	130	634810	1.7	1.4	No plating during tank sampling.	24.00	1.200	72.00
02/07/2002	none	13:50	38.7B	0	0	129	634810	1.7	1.4	No plating during tank sampling.	24.00	1.200	72.00
02/07/2002	none	14:50	38.8B	0	0	129	634810	1.7	1.4	No plating during tank sampling.	23.00	1.200	75.13
02/07/2002	none	15:50	39.9B	0	0	129	634810	1.7	1.4	No plating during tank sampling.	24.00	1.200	72.00
02/08/2002	none	8:35	39.1B	0	0	128	634810	1.7	1.4	No plating during tank sampling. Fumetrol not added.	25.00	1.200	69.12
02/08/2002	none	9:35	39.2B	0	0	129	634810	1.7	1.4		25.00	1.100	63.36
02/08/2002	none	10:35	39.3B	0	0	129	634810	1.7	1.2	No plating during tank sampling. HEPA filter pressure reading is correct.	24.00	1.100	66.00
02/08/2002	none	11:35	-	0	0	129	634810	1.7	1.1				
02/08/2002	none	12:35	-	0	0	129	634810	1.7	1.2				
02/08/2002	none	13:30	-	0	0	129	634810	1.7	1.2				
02/08/2002	none	14:35	-	0	0	129	634810	1.7	1.2				
02/08/2002	none	16:19	39.4B	0	0	129	634810	1.7	1.3	Sample taken prior to putting crank shaft in tank.	24.00	1.200	72.00
02/08/2002	Crank shaft	16:31	39.5B	6.8	200	130	634856	-	-	Crank shaft in tank: Foam on top of tank. Crank shaft will be plating over night.	25.00	1.200	69.12
02/09/2002	Crank shaft	11:50	40.1B	0	0	129	640109	1.8	1.2	Crank shaft taken out of tank around 11:45 am.	27.00	1.200	64.00
02/11/2002	none	8:50	42.1B	0	0	99	640109	1.7	1.4	No plating during tank sampling.	23.00	1.200	75.13
02/11/2002	none	9:00	none	0	0	109	640109	1.7	1.4	No plating.			
02/11/2002	none	10:00	none	0	0	129	640109	1.7	1.4	No plating.			
02/11/2002	none	11:00	none	0	0	130	640109	1.7	1.0	Fitting changed on pressure gauge. Change in HEPA filter pressure gauge reading.			
02/11/2002	Rails	11:38	none	6.8	500	130	-	-	-	2 bars put in 11:38.			
02/11/2002	Rails	12:00	42.2B	7.1	525	129	640398	1.7	1.0		23.00	1.200	75.13
02/11/2002	Rails	13:15	42.3B	7.1	575	129	641109	1.7	1.0		23.00	1.100	68.87
02/11/2002	Rails	14:20	42.4B	7	550	130	641641	1.7	1.0		23.00	1.100	68.87
02/11/2002	Rails	14:55	42.5B	0	0	129	641980	1.7	1.0	Rails taken out.	26.00	1.100	60.92
02/11/2002	Rod	15:06	none	7	240	130	641980	1.7	1.0	Dummy part put in (steel rod 2" diameter, 3' long)			
02/11/2002	Rod	15:55	none	6.5	220	129	642177	1.7	1.0	Still plating above part			
02/11/2002	Rod & turbine sl	16:45	42.6B	6.4	480	130	-	1.7	-		26.00	1.200	66.46

Carlson and Beauloye - Tank 2

Hard chrome electroplating tank operating parameters during ARB ambient monitoring at Barrio Logan.

Date	Part or Job Description	Time (part in & out)	Sample Number	Volts	Amps	Temp. (F)	Totalizer	Pressure Drop CMP	Pressure Drop HEPA	Comments	Number of Drops	Specific Gravity	Surface Tension
02/11/2002	Rod & turbine sh	16:52	none	6	400	130	642354	1.7	1.0				
02/11/2002	Rod & turbine sh	17:00	none	6	250	130	642396	1.7	-	Switched incorrect anode/cathode configuration. Continuous current supplied during reconfiguration.			
											27.75	1.206	62.58
02/12/2002	Turbine shaft	7:30	43.1B	6.2	275	129	645991	1.7	1.2	Part taken out and tank sample collected.	26.00	1.215	67.29
02/12/2002	Dummy shaft	8:30	43.2B	0	0	129	646026	1.7	1.2	Dummy shaft for ARB source test. No amps.	25.00	1.213	69.87
02/12/2002	Dummy shaft	9:30	43.3B	6.8	250	130	646072	1.7	1.2		24.00	1.223	73.38
02/12/2002	Dummy shaft	10:30	43.4B	6.8	240	130	646312	1.7	1.2		23.50	1.212	74.27
02/12/2002	Dummy shaft	11:30	43.5B	6.8	275	129	646578	1.7	1.2		23.50	1.222	74.88
02/12/2002	Dummy shaft	12:30	43.6B	6.8	275	129	646877	1.7	1.2		23.75	1.215	73.67
02/12/2002	Dummy shaft	13:30	43.7B	6.7	275	129	647138	1.7	1.2		31.00	1.200	55.74
02/12/2002	Dummy shaft	14:36	43.8B	6.9	290	129	647503	1.7	1		28.00	1.200	61.71
02/12/2002	Dummy shaft	15:37	43.9B	6.9	300	129	647803	1.7	1		30.00	1.200	57.60
02/12/2002	Dummy shaft	16:35	43.10B	6.7	200	130	648033	1.7	1	ARB test Run 3 conducted for only 2 hours. Shop closed at 4:50 pm.			
											38.50	1.214	45.41
02/13/2002	none	7:45	44.1B	0	0	130	651263	1.7	1.1	No plating during tank sampling.			
02/13/2002	none	8:45	-	0	0	129	651263	1.7	1.1				
02/13/2002	none	9:45	-	0	0	130	651263	1.7	1.1				
02/13/2002	none	10:45	-	0	0	129	651263	1.7	1				
02/13/2002	none	11:45	-	0	0	129	651263	1.7	1				
02/13/2002	none	12:45	-	0	0	129	651263	1.7	1				
02/13/2002	none	13:45	-	0	0	130	651263	1.7	1				
02/13/2002	none	14:45	-	0	0	130	651263	1.7	1				
02/13/2002	none	15:45	44.2B	0	0	130	651263	1.7	1	No plating during tank sampling. Shop closing for the day.	24.00	1.213	72.78
											23.50	1.223	74.94
02/14/2002	none	7:10	45.1B	0	0	130	651264	1.7	1	No plating during tank sampling.			
02/14/2002	none	8:10	-	0	0	130	651264	1.7	1	No plating.			
02/14/2002	none	9:05	-	0	0	129	651264	1.7	1	No plating.			
02/14/2002	none	10:00	-	0	0	129	651264	1.7	1	No plating.			
02/14/2002	none	11:00	-	0	0	130	651264	1.7	1	No plating.			
02/14/2002	none	12:00	-	0	0	130	651264	1.7	1	No plating.			
02/14/2002	none	13:00	-	0	0	129	651264	1.7	1	No plating.			
02/14/2002	none	14:00	-	0	0	130	651264	1.7	1	No plating.			
02/14/2002	none	15:00	-	0	0	130	651264	1.7	1	No plating.			
02/14/2002	none	17:00	45.2B	0	0	129	651264	1.7	1	No plating during tank sampling.	24.00	1.227	73.62
											24.00	1.216	72.96
02/15/2002	none	7:00	46.1B	0	0	129	651264	1.7	1	No plating during tank sampling.			
02/15/2002	none	8:00	-	0	0	129	651264	1.7	1	No plating.			
02/15/2002	none	9:00	-	0	0	130	651264	1.7	1	No plating.			
02/15/2002	none	10:00	-	0	0	130	651264	1.7	1	No plating.			
02/15/2002	none	11:00	-	0	0	129	651264	1.7	1	No plating.			
02/15/2002	none	12:00	-	0	0	130	651264	1.7	1	No plating.			
02/15/2002	none	13:00	-	0	0	129	651264	1.7	1	No plating.			

Carlson and Beauloye - Tank 2

Hard chrome electroplating tank operating parameters during ARB ambient monitoring at Barrio Logan.

Date	Part or Job Description	Time (part in & out)	Sample Number	Volts	Amps	Temp. (F)	Totalizer	Pressure Drop CMP	Pressure Drop HEPA	Comments	Number of Drops	Specific Gravity	Surface Tension
02/15/2002	none	14:00	-	0	0	130	651264	1.7	1	No plating.			
02/15/2002	none	15:00	-	0	0	129	651264	1.7	1	No plating.			
02/15/2002	none	16:10	-	0	0	129	651264	1.7	1	No plating.			
02/15/2002	none	17:15	46.2B	0	0	129	651264	1.7	1	No plating during tank sampling.	24.25	1.224	72.68
02/16/2002	none	7:50	47.1B	0	0	130	651264	1.7	1		24.75	1.226	71.33
02/19/2002	none	7:30	50.1B	0	0	89	651264	1.7	1	No plating.	27.25	1.209	63.89
02/19/2002	none	8:30	-	0	0	98	651264	1.7	1	No plating.			
02/19/2002	none	9:30	-	0	0	108	651264	1.7	1	No plating.			
02/19/2002	dummy	10:30	50.2B	6.8	450	118	651612	1.7	1	Dummy part for source test.	3075.00	1.209	0.57
02/19/2002	dummy	11:30	50.3B	6.9	500	127	652096	1.7	1	Dummy part for source test.	32.00	1.210	54.45
02/19/2002	dummy	12:30	50.4B	6.9	500	129	652599	1.6	1	Dummy part for source test.	27.75	1.214	63.00
02/19/2002	dummy	13:30	50.5B	6.8	500	130	653155	1.6	1	Dummy part for source test.	30.50	1.213	57.27
02/19/2002	dummy	14:30	50.6B	6.8	500	130	653684	1.6	1	Dummy part for source test.	26.00	1.214	67.24
02/19/2002	none	15:15	50.7B	0	0	129	653894	1.6	1	Tank shut off at 15:00.	27.50	1.218	63.78
02/20/2002	none	7:35	51.1B	0	0	128	653894	1.7	1	No plating.	27.50	1.214	63.57
02/20/2002	none	8:30	none	0	0	129	653894	1.7	1	No plating.			
02/20/2002	dummy	9:30	51.2B	7	500	129	654430	1.7	1	Plating started at 8:35.	26.50	1.216	66.08
02/20/2002	dummy	10:30	51.3B	7	500	130	654922	1.7	1	Dummy part for source test.	28.50	1.218	61.54
02/20/2002	dummy	11:30	51.4B	7	500	129	655516	1.7	1	Dummy part for source test.	27.00	1.219	65.01
02/20/2002	dummy	12:30	51.5B	0	0	-	655794	-	-	Power outage at 12:10	31.75	1.209	54.83
02/20/2002	dummy	13:30	51.6B	6.8	500	129	656159	1.7	1	Power regained at 12:40.	25.25	1.219	69.52
02/20/2002	dummy	14:30	51.7B	6.8	500	130	656732	1.7	1	Dummy part for source test.	32.25	1.214	54.21
02/20/2002	dummy	15:30	51.8B	6.8	500	130	657208	1.7	1	Dummy part for source test.	27.00	1.213	64.69
02/20/2002		16:30	51.9B	0	0	129	657638	1.7	1	Part out at 15:45.	25.75	1.206	67.44
02/21/2002	none	7:25	52.1B	0	0	130	657638	1.7	1	No plating.	25.75	1.217	68.06
02/21/2002	none	8:30	-	0	0	130	657638	1.7	1	No plating.			
02/21/2002	none	9:30	-	0	0	130	657638	1.7	1	No plating.			
02/21/2002	none	10:30	-	0	0	130	657638	1.7	1	No plating.			
02/21/2002	none	11:30	-	0	0	130	657638	1.7	1	No plating.			
02/21/2002	dummy load	12:30	52.2B	0	0	129	657799	1.7	1	Electrician testing totalizer using a dummy part.	25.00	1.214	69.93
02/21/2002	none	13:30	-	0	0	129	657799	1.7	1	No plating.			
02/21/2002	none	14:30	-	0	0	130	657799	1.7	1	No plating.			
02/21/2002	none	15:30	-	0	0	129	657799	1.7	1	No plating.			
02/21/2002	Housing	16:30	52.3B	0	0	-	657869	1.7	1	Part in at 16:00.	25.50	1.213	68.50
02/22/2002	Housing	8:00	53.1B	4.6	150	129	659981	1.7	1	Part in at 16:00	25.50	1.218	68.78
02/22/2002	Housing	9:00	53.2B	5.1	175	129	660068	1.7	1	Tank in use.	26.25	1.213	66.54
02/22/2002	Housing	10:00	53.3B	5.1	175	129	660203	1.7	1	Tank in use.	26.75	1.217	65.51
02/22/2002	Housing	11:00	53.4B	5.1	175	129	660373	1.7	1	Tank in use.	25.50	1.216	68.67

Carlson and Beauloye - Tank 2

Hard chrome electroplating tank operating parameters during ARB ambient monitoring at Barrio Logan.

Date	Part or Job Description	Time (part in & out)	Sample Number	Volts	Amps	Temp. (F)	Totalizer	Pressure Drop CMP	Pressure Drop HEPA	Comments	Number of Drops	Specific Gravity	Surface Tension
02/22/2002	none	12:00	53.5B	0	0	129	660377	1.7	1	Part out at 11:05.	25.25	1.221	69.63
02/22/2002	none	13:00	-	0	0	130	660377	1.7	1	No plating			
02/22/2002	none	14:00	-	0	0	130	660377	1.7	1	No plating			
02/22/2002	Brass Part	15:00	53.6B	4.8	130	129	660495	1.7	1	Part in at 14:05.	25.25	1.218	69.46
02/22/2002	Brass Part	16:00	53.7B	4.8	130	130	660630	1.7	1	Tank in use.	25.25	1.221	69.63
02/22/2002	Brass Part	16:30	53.8B	4.8	130	130	660692	1.7	1	Tank in use.			
02/23/2002	Brass Part	8:10	54.1B	0	0	120	663075	1.7	1	Part in at 14:10. Upon arriving, Allan found blowers had shut off and tank 1 rectifier	24.00	1.215	72.90
										was off. Tank 2 rectifier was on. Tank heaters were off and tank temperature too low			
										for proper plating. Parts in tank 1 not plated enough. Part in tank 2 too soft.			
02/25/2002	none	7:30	56.1B	0	0	81	663075	1.7	1	No plating.	24.00	1.214	72.84
02/25/2002	none	8:30	-	0	0	90	663075	1.7	1	No plating.			
02/25/2002	none	9:30	-	0	0	101	663075	1.7	1	No plating.			
02/25/2002	none	10:30	-	0	0	109	663075	1.7	1	No plating.			
02/25/2002	none	11:30	-	0	0	118	663075	1.7	1	No plating.			
02/25/2002	none	12:30	-	0	0	127	663075	1.7	1	No plating.			
02/25/2002	none	13:30	-	0	0	129	663075	1.7	1	No plating.			
02/25/2002	none	14:30	-	0	0	129	663075	1.7	1	No plating.			
02/25/2002	none	15:30	-	0	0	129	663075	1.7	1	No plating.			
02/25/2002	none	16:30	56.2B	0	0	129	663075	1.7	1	No plating.	23.50	1.223	74.94
02/26/2002	none	7:30	57.1B	0	0	130	663075	1.8	1	No plating.	25.50	1.225	69.18
02/26/2002	none	8:30	-	0	0	130	663075	1.8	1	No plating.			
02/26/2002	none	9:30	-	0	0	129	663075	1.8	1	No plating.			
02/26/2002	none	10:30	-	0	0	129	663075	1.8	1	No plating.			
02/26/2002	Gears	11:30	57.2B	4.8	150	129	663150 (est.)	1.8	1	Parts in at 10:30. Totalizer not read until 11:30.	25.00	1.223	70.44
02/26/2002	Gears	12:30	57.3B	4.9	175	130	663355	1.8	1	Tank in use.	25.50	1.227	69.29
02/26/2002	Gears	13:30	57.4B	4.8	150	130	663499	1.8	1	Tank in use.	24.00	1.221	73.26
02/26/2002	Gears	14:30	57.5B	4.7	150	129	663617	1.8	1	Tank in use.	24.00	1.226	73.56
02/26/2002	Gears	15:30	57.6B	4.8	150	128	663728	1.8	1	Tank in use.	24.50	1.223	71.88
02/26/2002	none	16:30	57.7B	0	0	129	663839	1.8	1	Part out at 16:25.	28.75	1.215	60.86
02/27/2002	none	7:50	-	0.3	40	129	663839	1.8	1	Tank not in use.			
02/27/2002	2 parts	8:30	58.1B	4.7	90	129	663871	1.8	1	1 part and 1 dummy in at 8:05	25.00	1.216	70.04
02/27/2002	2 parts	9:30	58.2B	4.7	90	129	663916	1.8	1	Tank in use.	26.50	1.232	66.95
02/27/2002	2 parts	10:30	58.3B	4.7	90	129	663984	1.8	1	Tank in use.	26.00	1.217	67.40
02/27/2002	2 parts	11:30	58.4B	4.7	110	129	664047	1.8	1	Tank in use.	25.50	1.222	69.01
02/27/2002	2 parts	12:30	58.5B	4.7	110	129	664122	1.8	1	Tank in use.	24.00	1.234	74.04
02/27/2002	2 parts	13:30	58.6B	4.7	110	129	664209	1.8	1	Tank in use.	24.50	1.223	71.88
02/27/2002	2 parts	14:30	58.7B	4.7	110	129	664295	1.8	1	Tank in use.	25.00	1.217	70.10
02/27/2002	2 parts	15:30	58.8B	4.7	110	129	664382	1.8	1	Tank in use.	23.50	1.227	75.19
02/27/2002	2 parts	16:30	58.9B	4.7	110	128	664467	1.8	1	Tank in use.	24.00	1.218	73.08

Carlson and Beauloye - Tank 2

Hard chrome electroplating tank operating parameters during ARB ambient monitoring at Barrio Logan.

Date	Part or Job Description	Time (part in & out)	Sample Number	Volts	Amps	Temp. (F)	Totalizer	Pressure Drop CMP	Pressure Drop HEPA	Comments	Number of Drops	Specific Gravity	Surface Tension
02/28/2002	none	7:35	59.1B	0	40	129	664471	1.8	1	Tank not in use.	24.50	1.234	72.50
02/28/2002	none	8:30	-	1	40	129	664471	1.8	1	Tank not in use.			
02/28/2002	none	9:30	-	1.2	40	129	664472	1.8	1	Tank not in use.			
02/28/2002	none	10:30	-	1.2	40	129	664472	1.8	1	Tank not in use.			
02/28/2002	none	11:35	-	1.2	40	129	664472	1.8	1	Tank not in use.			
02/28/2002	19 small parts	12:30	59.2B	4.5	40	129	664593	1.8	1	Parts in at 11:45.	24.50	1.220	71.71
02/28/2002	19 small parts	13:35	59.3B	4.6	200	130	664788	1.8	1	Tank in use.	25.00	1.232	70.96
02/28/2002	19 small parts	14:30	59.4B	4.6	200	130	664977	1.8	1	Tank in use.	25.00	1.228	70.73
02/28/2002	19 small parts	15:30	59.5B	4.6	210	130	665206	1.8	1	Tank in use.	25.00	1.235	71.14
02/28/2002	19 small parts	16:30	59.6B	1.2	40	130	665314	1.8	1	Parts out at 4:00.	24.50	1.237	72.71
02/28/2002	1 part	17:00	-	-	-	-	-	-	-	Part in at 5:15-5:30 and will be in tank overnight then out around 8:00 on 3/1/02.			
03/01/2002	1 I.D.	7:30	60.1B	0	0	129	667335	1.8	1	Parts out at 7:20	25.50	1.219	68.84
03/01/2002	none	8:30	-	0	0	129	667335	0	1	Wash CMP, drain, blowers off.			
03/01/2002	none	9:30	-	0	0	129	667335	1.8	1	Tank not in use.			
03/01/2002	1 I.D.	10:30	60.2B	5.2	100	129	667593	1.8	1	Parts in at 9:50.	24.50	1.236	72.65
03/01/2002	1 I.D.	11:30	60.3B	5.2	100	129	667468	1.8	1	Tank in use.	25.50	1.242	70.14
03/01/2002	1 I.D.	12:30	60.4B	5.2	100	129	667585	1.8	1	Tank in use.	25.50	1.239	69.97
03/01/2002	1 I.D.	13:30	60.5B	5.2	125	129	667678	1.8	1	Tank in use.	25.00	1.231	70.91
03/01/2002	1 I.D.	14:30	60.6B	5.2	150	129	667802	1.8	1	Tank in use.	24.50	1.235	72.59
03/01/2002	1 I.D.	15:30	60.7B	5.2	175	129	667957	1.8	1	Tank in use.	24.00	1.226	73.56
03/01/2002	1 I.D.	16:30	60.8B	5	150	129	667975	1.8	1	Part out from 15:45-16:25.	24.00	1.220	73.20
										Undersized, plate overnight.			
03/02/2001	1 I.D.	7:00	61.1B	0.6	0	129	670146	1.8	1	Part removed. Data collected on different form.	24.00	1.236	74.16
03/04/2002	none	7:30	63.1B	0	0	130	670146	1.8	1	No plating.	24.00	1.233	73.98
03/04/2002	none	8:30	-	0	0	130	670146	1.8	1	No plating.			
03/04/2002	none	9:30	-	0	0	129	670146	1.8	1	No plating.			
03/04/2002	none	10:30	-	0	0	129	670146	1.8	1	No plating.			
03/04/2002	none	11:30	-	0	0	129	670146	1.8	1	No plating.			
03/04/2002	none	12:30	-	0.8	40	129	670146	1.8	1	No plating.			
03/04/2002	none	13:30	-	0.7	40	129	670146	1.8	1	No plating.			
03/04/2002	none	14:30	-	0.7	40	129	670146	1.8	1	No plating.			
03/04/2002	none	15:30	-	0.7	40	130	670146	1.8	1	No plating.			
03/04/2002	none	16:30	63.2B	0.7	40	129	670146	1.8	1	No plating.			
03/04/2002	1 part									In about 17:30. Will take out around 8:00 tomorrow.	24.50	1.237	72.71
03/05/2002	1 part	7:45	64.1B	1.4	40	129	671193	1.8	1	D plate job in at 14:20 on 3/4/02 taken out at 8:00 on 3/5/02.	24.00	1.241	74.46
03/05/2002	none	8:45	64.2B	1.3	40	129	671206	1.8	1	No plating.	26.00	1.237	68.51
03/05/2002	1 part	9:45	64.3B	1.3	40	129	671206	1.8	1	No plating.	25.50	1.242	70.14
03/05/2002	1 part	10:45	64.4B	1.3	40	129	671206	1.8	1	No plating.	24.50	1.232	72.41

Carlson and Beauloye - Tank 2

Hard chrome electroplating tank operating parameters during ARB ambient monitoring at Barrio Logan.

Date	Part or Job Description	Time (part in & out)	Sample Number	Volts	Amps	Temp. (F)	Totalizer	Pressure Drop CMP	Pressure Drop HEPA	Comments	Number of Drops	Specific Gravity	Surface Tension
03/05/2002	1 part	11:45	64.5B	1.3	40	129	671206	1.8	1	No plating.	25.50	1.234	69.68
03/05/2002	1 part	12:45	64.6B	1.3	40	129	671206	1.8	1	No plating.	25.50	1.235	69.74
03/05/2002	1 part	13:45	64.7B	1.3	40	129	671206	1.8	1	No plating.	25.00	1.235	71.14
03/05/2002	1 part	14:45	64.8B	6.9	40	90	671222	1.8	1	1 dummy tesing in at 14:14 and out at 15:20.	25.00	1.243	71.60
03/05/2002	2 parts	15:45	64.9B	4.9	40	110	671262	1.8	1	1 LD part, 1 dummy in 15:25.	25.50	1.232	69.57
03/05/2002	2 parts	16:45	64.10B	5.9	40	110	671359	1.8	1	1 LD part, 1 dummy in 15:25. In overnight.	25.00	1.233	71.02
03/06/2002	1 part	7:30	65.1B	5.9	200	130	673574	1.8	1	1 LD part in 15:25 on 3/5/02. Plated overnight.	24.00	1.214	72.84
03/06/2002	1 part	8:30	65.2B	4.9	200	130	673738	1.8	1	1 LD part in 15:25 on 3/5/02. Plated overnight.	24.50	1.210	71.12
03/06/2002	none	9:30	65.3B	1.4	40	129	673756	1.8	1	LD part taken out at 8:40.	28.25	1.199	61.12
03/06/2002	none	10:30	65.4B	1.4	40	129	673756	1.8	1	No plating.	24.50	1.218	71.59
03/06/2002	none	11:30	65.5B	1.4	40	129	673756	1.8	1	No plating.	24.00	1.215	72.90
03/06/2002	none	12:30	65.6B	0	40	130	673756	1.8	1	No plating.	23.00	1.207	75.57
03/06/2002	1 part	13:30	65.7B	5	175	129	673851	1.8	1	1 D plate part in 13:00.	25.00	1.220	70.27
03/06/2002	1 part	14:30	65.8B	4.8	150	131	674000	1.8	1	1 D plate part in 13:00.	24.50	1.213	71.29
03/06/2002	1 part	15:30	65.9B	4.9	150	129	674128	1.8	1	1 D plate part in 13:00.	24.00	1.215	72.90
03/06/2002	1 part	16:30	65.10B	4.8	150	129	674233	1.8	1	1 D plate part in 13:00.	24.50	1.211	71.18
03/07/2002	1 part	7:45	66.1B	0.8	40	129	676582	1.8	1	1 D plate part in at 13:00 on 3/6/02. Plated overnight.	24.50	1.230	72.29
03/07/2002	1 part	8:45	66.2B	4.6	200	129	676644	1.8	1	1 D plate part taken out at 8:00. 1 copper bar in at 8:35.	24.00	1.232	73.92
										Note: inspectors left around 8:00 due to press release in front of Master Plating.			
03/08/2002	2 I.D.'s	10:30	030802.1B	4.6	100	129	678303	1.8	1	Parts in 3/7/02 at 15:30.	24.50	1.231	72.35
03/08/2002	2 I.D.'s	11:30	030802.2B	4.6	100	129	678382	1.8	1	Parts in 3/7/02 at 15:30.	25.50	1.221	68.95
03/08/2002	2 I.D.'s	12:30	030802.3B	4.6	100	129	678453	1.8	1	Parts in 3/7/02 at 15:30.	25.00	1.231	70.91
03/08/2002	2 I.D.'s	13:30	030802.4B	4.6	100	129	678527	1.8	1	Parts in 3/7/02 at 15:30.	25.00	1.219	70.21
03/08/2002	2 I.D.'s	14:30	030802.5B	4.6	100	129	678615	1.8	1	Parts in 3/7/02 at 15:30.	25.00	1.198	68.98
03/08/2002	2 I.D.'s	15:30	030802.6B	4.6	100	129	678691	1.8	1	Parts in 3/7/02 at 15:30.	39.50	1.209	44.07
03/08/2002	2 I.D.'s	16:30	030802.7B	0	0	130	678739	1.8	1	Parts out at 16:15. Closing for the day. No plating after 16:15.	30.50	1.210	57.13
03/11/2001	none	8:30	69.1B	0	40	96	678739	1.9	1	No plating. Tanks off.	24.00	1.251	75.06
03/11/2001	none	9:30	-	0	40	106	678739	1.8	1	No plating. Tanks off.			
03/11/2001	none	10:30	-	0	40	116	678739	1.8	1	No plating. Tanks off.			
03/11/2001	none	11:30	-	0	40	123	678739	1.8	1	No plating. Tanks off.			
03/11/2001	none	12:30	-	0	40	129	678739	1.8	1	No plating. Tanks off.			
03/11/2001	none	13:30	-	0	40	129	678739	1.8	1	No plating. Tanks off.			
03/11/2001	none	14:30	-	0	40	129	678739	1.8	1	No plating. Tanks off.			
03/11/2001	none	15:30	-	0	40	129	678739	1.8	1	No plating. Tanks off.			
03/11/2001	none	16:30	69.2B	0	40	129	678739	1.8	1	No plating. Tanks off.			
											24.50	1.251	73.53
03/12/2002	none	7:30	031202.1B	0	0	129	678739	1.8	1	No plating.			
03/12/2002	none	8:30	-	0	0	130	678739	1.8	1	No plating.	24.25	1.232	73.16
03/12/2002	none	9:30	-	0	0	129	678739	1.8	1	No plating.			

Carlson and Beauloye - Tank 2

Hard chrome electroplating tank operating parameters during ARB ambient monitoring at Barrio Logan.

Date	Part or Job Description	Time (part in & out)	Sample Number	Volts	Amps	Temp. (F)	Totalizer	Pressure Drop CMP	Pressure Drop HEPA	Comments	Number of Drops	Specific Gravity	Surface Tension
03/12/2002	none	10:30	-	0	0	129	678739	1.8	1	No plating.			
03/12/2002	none	11:30	-	0	0	129	678739	1.8	1	No plating.			
03/12/2002	1 part	12:30	031202.2B	5.5	200	129	6788859	1.8	1	1 ram shaft in at 11:50.	24.50	1.224	71.94
03/12/2002	1 part	13:30	031202.3B	5.5	200	130	679050	1.8	1	Tank in use.	25.00	1.221	70.33
03/12/2002	1 part	14:30	031202.4B	5.5	200	130	679209	1.8	1	Tank in use.	24.50	1.227	72.12
03/12/2002	1 part	15:30	031202.5B	5.5	200	130	679390	1.8	1	Tank in use.	24.00	1.230	73.80
03/12/2002	3 parts	16:30	031202.6B	4.6	100	126	679469	1.8	1	Ram shaft out at 16:00. 3 parts in at 16:10 to be plated overnight.	24.00	1.214	72.84
03/13/2002	Rack	7:30	031302.1B	4.5	130	130	681070	1.8	1				
03/13/2002	none	8:30	031302.2B	0	0	129	681093	1.8	1.1	Parts out at 7:35.	25.38	1.243	70.54
03/13/2002	Rack	9:30	031302.3B	4.7	200	130	681196	1.8	1.1	Parts in at 9:10.	29.60	1.214	59.06
03/13/2002	Rack	10:30	031302.4B	4.7	200	129	681413	1.8	1.1	Tank in use.	29.63	1.228	59.69
03/13/2002	Rack	11:30	031302.5B	4.7	200	130	681589	1.8	1	Tank in use.	28.00	1.221	62.79
03/13/2002	Rack	12:30	031302.6B	4.8	200	129	681820	1.8	1.1	Tank in use.	25.00	1.229	70.79
03/13/2002	Rack	13:30	031302.7B	4.7	200	129	682001	1.8	1.1	Tank in use.	24.50	1.231	72.35
03/13/2002	Rack	14:30	031302.8B	4.7	200	125	682191	1.8	1.2	Tank in use.	25.50	1.228	69.35
03/13/2002	6 pc. Housing	15:30	031302.9B	4.7	100	129	682230	1.8	1.2	Rack out at 15:10, 6 pc. Housing in at 15:20.	25.00	1.236	71.19
03/13/2002	6 pc. Housing	16:30	031302.10B	4.7	100	128	682275	1.8	1.2	Tank in use overnight.	25.00	1.229	70.79
											26.33	1.232	67.37
03/14/2002	none	7:40	031402.1B	0	0	130	683021	1.8	1.1	6 pc. Housing out at 7:15.			
03/14/2002	none	8:40	-	0	0	122	683021	1.8	1.1	Tank not in use.	25.00	1.182	68.08
03/14/2002	none	9:40	-	0	0	130	683021	1.8	1.1	Tank not in use.			
03/14/2002	none	10:40	-	0	0	129	683021	1.8	1.1	Tank not in use.			
03/14/2002	none	11:40	-	0	0	129	683021	1.8	1.1	Tank not in use.			
03/14/2002	none	12:40	-	0	0	129	683021	1.8	1.1	Tank not in use.			
03/14/2002	none	13:40	-	0	0	129	683021	1.8	1.1	Tank not in use.			
03/14/2002	none	14:40	-	0	0	130	683021	1.8	1.1	Tank not in use.			
03/14/2002	none	15:40	-	0	0	129	683021	1.8	1.1	Tank not in use.			
03/14/2002	none	16:40	031402.2B	0	0	129	683021	1.8	1.1	Tank not in use.			
											26.50	1.205	65.48
03/15/2002	none	7:30	74.1B	0	0	129	683021	1.7	1.4	Tank not in use.			
03/15/2002	8 Parts	8:30	74.2B	3.8	120	128	683048	1.7	1.1	8 small parts in at 8:15.	24.00	1.237	74.22
03/15/2002	8 Parts	9:30	-	3.8	120	129	683164	1.7	1	Tank in use.	23.50	1.236	75.74
03/15/2002	8 Parts	10:30	-	3.8	120	130	683287	1.7	1	Tank in use.			
03/15/2002	8 Parts	11:30	-	4	160	129	683410	1.8	1	Tank in use.			
03/15/2002	8 Parts	12:30	-	4.2	200	129	683589	1.8	1	Tank in use.			
03/15/2002	none	13:30	-	0	0	128	683687	1.8	1	Parts out at 13:20.			
03/15/2002	none	14:30	-	0	0	129	683687	1.8	1.4	Tank not in use.			
03/15/2002	none	15:30	-	0	0	130	683687	1.7	1.4	Tank not in use.			
03/15/2002	none	16:50	74.3B	0	0	130	683687	1.7	-	Tank not in use.			
											24.50	1.232	72.41
03/18/2002	none	8:30	031802.1B	0	0	101	683687	1.8	1.2	Tank not in use.			
03/18/2002	none	9:30	-	0	0	123	683687	1.8	1.2	Tank not in use.	25.00	1.229	70.79

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Hard chrome electroplating tank operating parameters during ARB ambient monitoring at Barrio Logan.

Date	Part or Job Description	Time (part in & out)	Sample Number	Volts	Amps	Temp. (F)	Totalizer	Pressure Drop CMP	Pressure Drop HEPA	Comments	Number of Drops	Specific Gravity	Surface Tension
03/18/2002	none	10:30	-	0	0	130	683687	1.8	1.1	Tank not in use.			
03/18/2002	1 Part	11:30	-	4.4	125	117	683745	1.8	1.1	Part in at 11:02.			
03/18/2002	1 Part	12:30	-	4	100	122	683828	1.8	1.2	Tank in use.			
03/18/2002	1 Part	13:30	-	4	100	129	683905	1.8	1.5	Tank in use.			
03/18/2002	1 Part	14:30	-	3.8	100	129	683991	1.8	1.7	Tank in use.			
03/18/2002	1 Part	15:30	-	4.2	125	129	684068	1.8	1.7	Tank in use.			
03/18/2002	1 Part	16:30	031802.2B	4.2	125	129	684142	1.8	1.8	Tank in use overnight.			
											25.00	1.223	70.44
03/19/2002	none	8:00	78.1B	0.9	20	128	685804	1.8	1.3	1 Part removed.			
03/19/2002	none	9:00	-	0.7	20	130	685804	1.8	1	Tank not in use.	24.50	1.231	72.35
03/19/2002	none	10:00	-	0.6	40	129	685804	1.8	1	Tank not in use.			
03/19/2002	none	11:00	-	0.6	40	128	685804	1.8	1	Tank not in use.			
03/19/2002	none	12:00	-	0.5	40	130	685804	1.8	1	Tank not in use.			
03/19/2002	none	13:00	-	0.4	40	129	685804	0	0	Tank not in use.			
03/19/2002	none	14:00	-	0.4	40	129	685804	0	0	Tank not in use.			
03/19/2002	none	15:00	-	0.4	40	129	685804	1.9	1.8	Tank not in use.			
03/19/2002	none	16:00	78.2B	0.1	40	129	685804	1.9	1.8	Tank not in use. CMP and HEPA filter pressure going up.			
											24.00	1.241	74.46
03/20/2002	none	8:00	032002.1B	0	0	130	685804	1.8	1.2				
03/20/2002	2 racks	9:00	-	4	190	129	685882	1.8	1.2	8 bushings in at 8:30.	25.00	1.230	70.85
03/20/2002	2 racks	10:00	-	4	190	129	686037	1.8	1.2	8 bushings in at 8:30.			
03/20/2002	2 racks	11:00	-	4	190	129	686202	1.8	1.2	8 bushings in at 8:30.			
03/20/2002	2 racks	12:00	-	4.1	200	129	686387	1.8	1.1	8 bushings in at 8:30.			
03/20/2002	1 part	13:00	-	7.8	610	130	686606	1.9	1.2	Out at 12:45. One rail in at 13:05.			
03/20/2002	1 part	14:00	-	7.8	690	130	687122	1.9	1.5				
03/20/2002	1 part	15:10	-	7.8	690	130	687550	1.9	1.5	New rail in at 14:40.			
03/20/2002	1 part	16:10	032002.2B	7.8	590	129	687967	1.9	1.5	Took reading and sample.			
03/20/2002	none	16:30	-	-	-	-	688101	-	-	Turned off at 16:30.	26.00	1.275	70.62
03/21/2002	none	7:30	80.1B	0	35	126	688101	1.9	1.6	No plating.			
03/21/2002	none	8:30	-	0	35	126	688101	1.8	1.6	No plating.	25.50	1.235	69.74
03/21/2002	none	9:30	-	0	35	126	688101	-	-	No plating. Repairing temperature probe. Blowers off.			
03/21/2002	none	10:30	-	0	35	-	688101	-	-	No plating. Repairing temperature probe. Blowers off. Cleaning CMP.			
03/21/2002	none	11:30	-	0	35	-	688101	-	-	No plating. Blowers off.			
03/21/2002	none	12:30	-	0	35	120	688101	-	-	No plating. Blowers off.			
03/21/2002	none	13:30	-	0	35	114	688101	-	-	No plating. Blowers off.			
03/21/2002	none	14:30	-	0	35	114	688101	-	-	No plating. Blowers off.			
03/21/2002	none	15:30	80.2B	0	35	-	688101	-	-	No plating. Blowers off. Heater off.			
											26.50	1.226	66.62
03/22/2002	none	7:50	81.1B	0	30	94	688101	0	0	Tank not in use. Blower to CMP and HEPA turned off.			
03/22/2002	none	8:50	-	0	30	94	688101	0	0	Tank not in use. Blower to CMP and HEPA turned off.	27.00	1.220	65.07
03/22/2002	none	9:50	-	0	30	94	688101	0	0	Tank not in use. Blower to CMP and HEPA turned off.			
03/22/2002	none	10:50	-	0	30	92	688101	0	0	Tank not in use. Blower to CMP and HEPA turned off.			

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Hard chrome electroplating tank operating parameters during ARB ambient monitoring at Barrio Logan.

Date	Part or Job Description	Time (part in & out)	Sample Number	Volts	Amps	Temp. (F)	Totalizer	Pressure Drop CMP	Pressure Drop HEPA	Comments	Number of Drops	Specific Gravity	Surface Tension
03/22/2002	none	12:00	-	0	30	90	688101	0	0	Tank not in use. Blower to CMP and HEPA turned off.			
03/22/2002	none	13:00	-	0	30	90	688101	0	0	Tank not in use. Blower to CMP and HEPA turned off.			
03/22/2002	none	14:00	-	0	30	88	688101	0	0	Tank not in use. Blower to CMP and HEPA turned off.			
03/22/2002	none	15:00	81.2B	0	30	90	688101	0	0	Tank not in use. Blower to CMP and HEPA turned off.	27.00	1.230	65.60
03/25/2002	none	7:40	032502.1B	0	0	0	688101	0	off	Maintenance.	28.00	1.233	63.41
03/25/2002	none	8:40	-	0	0	0	688101	0	off	Maintenance.			
03/25/2002	none	9:40	-	0	0	0	688101	0	off	Maintenance.			
03/25/2002	none	10:40	-	0	0	0	688101	0	off	Maintenance.			
03/25/2002	none	11:40	-	0	0	0	688101	0	off	Maintenance.			
03/25/2002	none	12:40	-	0	0	0	688101	0	off	Maintenance.			
03/25/2002	none	13:40	-	0	0	0	688101	0	off	Maintenance.			
03/25/2002	none	14:40	032502.2B	0	0	0	688101	0	off	Maintenance. Unable to use stalagmometer after blockage. # of drops determined after	25.00	1.196	68.89
03/26/2002	none	8:45	85.1B	off	off	off	688101	off	off	No plating.	24.00	1.210	72.60
03/26/2002	none	9:45	-	off	off	off	688101	off	off	No plating.			
03/26/2002	none	10:45	-	off	off	off	688101	off	off	No plating.			
03/26/2002	none	11:45	-	off	off	off	688101	off	off	No plating.			
03/26/2002	none	12:45	-	off	off	off	688101	off	off	No plating.			
03/26/2002	none	13:45	-	off	off	off	688101	off	off	No plating.			
03/26/2002	none	14:50	-	off	off	off	688101	off	off	No plating. Warming up tank.			
03/26/2002	none	15:45	-	off	off	72	688101	off	off	No plating.			
03/26/2002	none	16:00	85.2B	off	off	off	688101	off	off	No plating.	24.50	1.232	72.41
03/27/2002	none	8:45	032702.1B	off	off	110	688101	off	off	Maintenance.	24.50	1.231	72.35
03/27/2002	none	9:45	-	0	0	-	688101	1.8	1.2	Maintenance. Turned on blowers.			
03/27/2002	1 part	10:50	-	4.5	275	124	688132	1.8	1.3	Plating 1 disk started at 11:00.			
03/27/2002	1 part	11:50	-	4.6	300	-	688397	1.8	1.3	Plating 1 disk started at 11:00.			
03/27/2002	1 part	12:50	-	4.7	300	132	688696	1.8	1.3	Plating 1 disk started at 11:00.			
03/27/2002	1 part	13:50	-	4.7	300	124	689025	1.8	1.3	Plating 1 disk started at 11:00.			
03/27/2002	1 part	15:00	-	4.7	300	120	689400	1.8	1.3	Plating 1 disk started at 11:00.			
03/27/2002	1 part	16:00	032702.2B	4.7	300	125	689708	1.8	1.3	Plating 1 disk started at 11:00. Part removed at 16:20.	25.00	1.212	69.81
03/28/2002	1 disc	7:35	-	5	200	-	689829	1.7	1.1	Data obtained from facility.			54.00
03/28/2002	1 part	8:00	032802.1B	4.7	300	128	690007	1.8	1.3	1 disc put in at 7:35.	26.50	1.240	67.38
03/28/2002	1 disc	13:20	-	-	-	-	691967	-	-	Data obtained from facility.'			
03/28/2002	2 brass pieces	13:30	-	4.8	250	130	691967	-	-	2 brass parts plate area 3"x1.5". I.D. + 1 dummy. Data obtained from facility			
03/28/2002	2 parts	16:00	032802.2B	1.1	50	129	692460	1.8	1.3	2 brass pieces pu in at 13:30. Last sample taken.	24.00	1.230	73.80
03/29/2002	brass piece	7:30	032902.1B	4.7	200	129	695239	1.8	1.4		53.00	1.237	33.61
03/29/2002	1 brass	8:10	-	-	-	-	695359	-	-	Pulled out part from yesterday. Data obtained from facility.			
03/29/2002	1 disc	11:20	-	5	300	129	695359	-	-	Started plating new part. Data obtained from facility.			
03/29/2002	1 disc	10:45	-	-	-	-	703437	-	-	Stopped plating disc. Data obtained from facility.			

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Hard chrome electroplating tank operating parameters during ARB ambient monitoring at Barrio Logan.

Date	Part or Job Description	Time (part in & out)	Sample Number	Volts	Amps	Temp. (F)	Totalizer	Pressure Drop CMP	Pressure Drop HEPA	Comments	Number of Drops	Specific Gravity	Surface Tension
4/1/020	1 ram, 1 dummy	14:10	-	5.5	200	130	703437	-	-	1 ram shaft 4 x 1 1/2 plating area, 1 dummy. Plating over night. Data obtained from facility.			
04/02/2002	1 ram, 1 dummy	7:30	-	-	-	-	706736	-	-	Part from yesterday pulled out. Data obtained from facility.			48.00
04/02/2002	1 ram, 1 dummy	7:35	-	6	250	130	706736	-	-	Same part from yesterday put back in tank. Data obtained from facility.			
04/02/2002	1 ram, 1 dummy	14:12	93.1B	-	-	-	708356	1.8	1.2	See log.			
04/02/2002	1 ram, 1 dummy	14:15	-	-	-	-	708361	-	-	Part taken out. Data obtained from facility.			
04/02/2000	4 ram	16:26	-	5.7	200	130	708361	-	-	To be plated over night. Data obtained from facility.			
04/03/2002	4 ram	7:00	-	-	-	-	712072	-	-	Ram put in on 4/2/02. Data obtained from facility.			
04/03/2002	1 ring	8:20	-	5.2	-	130	712072	-	-	Ring plating plus 1 and(?). Data obtained from facility.			
04/03/2002	1	10:25	040302.1B	5.2	200	129	712478	1.8	1.2	4 rams out at 7:00. 1 ring in at 8:20.	31.00	1.240	57.60
04/03/2002	1 ring	11:40	-	-	-	-	713361	-	-				
04/03/2002	1 ring	12:30	-	-	-	-	713361	-	-				
04/03/2002	1 turbine	5:45	-	6	350	130	713361	-	-	Check part. Put back. Rise volts to 6.4 at 8:15, 4/4/02. Data obtained from facility.			
04/04/2002	1 turbine	8:15	-	6.4	-	-	719303	-	-	Rise volts to 6.4. Data obtained from facility.			
04/04/2002	-	12:55	94.1B	6.4	300	129	718774	13.7	1	See log.	30.00	1.240	59.52
04/04/2002	1 turbine	15:00	-	6.4	-	-	719303	-	-	Data obtained from facility.			
04/05/2002	-	10:30	040502.1B	0	0	130	719303	1.8	1.2	Please see data sheets.	27.00	1.175	62.67
04/05/2002	1 turbine	10:30	-	5.3	200	130	719303	-	-	1 turbine and 1 dummy plating. Data obtained from facility.			
04/05/2002	1	10:40	-	5.2	200	126	-	-	-	Began plating at 10:40.			
04/05/2002	1 turbine	11:15	-	-	-	-	724273	-	-	Data obtained from facility. *Turbine removed from tank.*			
04/06/2002	turbine	11:15	-	-	-	130	724273	-	-	Data obtained from facility.			
04/06/2002	turbine	12:45	-	6	-	130	724273	-	-	Data obtained from facility.			
04/07/2002	turbine	11:20	-	-	-	-	730428	-	-	Turbine taken out. Data obtained from facility.			
04/08/2002	-	10:20	98.1B	0.5	30	130	730434	1.7	1	Some weekend plating. See log.	25.00	1.236	71.19
04/08/2002	elevator shaft	13:15	-	6.2	310	130	730434	-	-	Elevator shaft - Amtex Reliable. Data obtained from facility.			
04/08/2002	2 shafts	15:15	-	6.2	225	-	-	-	-	Add 2 shafts. Data obtained from facility.			
04/09/2002	check parts	5:45	-	-	-	-	734967	-	-	Data obtained from facility.			
04/09/2002	3 shafts	5:50	-	6.2	290	130	734967						
04/09/2002	shafts	-	040902.1B	6.2	300	129	736295	1.8	1.2	Parts in at 4/8/02.			
04/09/2002	-	13:00	-	-	-	-	737030	-	-	? This run lost track of amperes from run before. Data obtained from facility.			
04/09/2002	5 brass pieces	15:40	-	5	450	130	737030	-	-	Data obtained from facility.			
04/10/2002	5 brass pieces	7:20	-	-	-	-	748029	-	-	Pull out from day before. Data obtained from facility.			
04/10/2002	-	13:00	041002.1B	0	0	129	748029	1.8	1	No plating.			
04/10/2002	shredder	14:00	-	8	140	130	748029	-	-	Data obtained from facility.			

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Hard chrome electroplating tank operating parameters during ARB ambient monitoring at Barrio Logan.

Date	Part or Job Description	Time (part in & out)	Sample Number	Volts	Amps	Temp. (F)	Totalizer	Pressure Drop CMP	Pressure Drop HEPA	Comments	Number of Drops	Specific Gravity	Surface Tension
04/10/2002	shredder	16:15	-	-	-	-	751385	-	-	Shredder. Data obtained from facility.			
04/10/2002	1 o.d. piece	16:35	-	5.5	250	130	751385	-	-	2 x 2 Dim. plating. Data obtained from facility. *Plated overnight.*			
04/11/2002	1 o.d. piece	9:35	-	-	-	-	755443	-	-	*Remove 2 x 2 Dim. plating.*			
		12:30	101.1B	6.4	390	129	757209	1.8	1	Plating. See log.			
04/12/2002	1 bar	7:50	-	5.2	250	129	757261	-	-	Dimensions 1 x 36. 1 piece and 1 dummy. Data obtained from facility.			
04/12/2002	1 bar	12:50	-	-	-	-	758878			Data obtained from facility.			
04/13/2002	1 turbine	7:30	-	6.8	325	130	767605	-	-	Turbine re-start from day before. Data obtained from facility.			
04/13/2002	1 turbine	16:30	-	-	-	-	778039	-	-	Part taken out. Data obtained from facility.			
04/13/2002	1 turbine & shaft	17:30	-	6.6	400	130	770839	-	-	Another turbine. Pay for attorney. Data obtained from facility.			
04/14/2002	part check	11:05	-	-	-	-	777932	-	-	Pull out part to check. Lab oil pump shaft. Data obtained from facility.			
04/14/2002	re-start	11:10	-	6.8	245	130	777932	-	-	Re-start part. Data obtained from facility.			
04/14/2002	turbine	14:00	-	6.8	325	130	778949	-	-	*Part in?* Data obtained from facility.			
04/14/2002	turbine	13:55	-	6.8	325	130	778949	-	-	Part pull out from day before. Data obtained from facility.			
04/14/2002	?	19:45	-	-	-	-	?	-	-	*Part out?*			
04/15/2002	wrench	8:30	-	5.5	150	130	778949	-	-	Flash tool. Data obtained from facility.			
04/15/2002	wrench	9:00	-	-	-	-	781010	-	-	Take out part. Data obtained from facility.			
04/15/2002	wrench	11:05	-	5.5	150	130	781010	-	-	1 tool. Data obtained from facility.			
04/15/2002	wrench	11:30	-	-	-	-	781053	-	-	Take out part. Data obtained from facility.			
04/15/2002	-	11:30	041502.2A	0	0	129	781053	1.8	1	Please see data sheet.			
04/15/2002	wrench	14:50	-	5.5	150	130	781053	-	-	Data obtained from facility.			
04/15/2002	wrench	15:00	-	-	-	-	781072	-	-	Data obtained from facility.			
04/15/2002	turbine	15:05	-	6.6	150	-	781072	-	-	Data obtained from facility.			
04/16/2002	turbine	7:55	-	-	-	-	786905	-	-	Take out part from yesterday. Data obtained from facility.			
04/16/2002	turbine	?	041602.1B	6.6	380	130	786833	1.8	1.2				
04/16/2002	1 turbine	8:35	-	6.6	400	130	786903	-	-	Turbine plating and 1 dummy. Data obtained from facility.			
04/16/2002	check	17:20	-	-	-	-	790553	-	-	Data obtained from facility.			
04/16/2002	2 turbines	18:40	-	6.8	300	130	790553	-	-	2 small areas re-do. Data obtained from facility.			
04/17/2002	pull out	7:00	-	-	-	-	793698	-	-	Data obtained from facility.			
	tubine	7:05	-	7	300	130	793698	-	-	Not up. Data obtained from facility.			
04/17/2002	turbine	8:20	041702.1B	7	330	129	794045	1.8	1.2	Part in.			
	1 shaft add	10:20	-	7	425	130	-	-	-	Add one more piece at 10:20. Data obtained from facility.			
	parts out	16:20	-	-	-	-	797319	-	-	Parts out. Data obtained from facility.			
	1 o.d. part	16:20	-	7	400	130	797619	-	-	1 part and 1 dummy.			
04/18/2002	1 o.d. part	8:00	-	-	-	-	804538	-	-	Part pull out from yesterday. Data obtained from facility.			
4/18/002	2 parts	10:00	041802.1B	7.3	500	130	805380	1.8	1.1	1 o.d. plate and 1 dummy.			

Carlson and Beauloye - Tank 2

Hard chrome electroplating tank operating parameters during ARB ambient monitoring at Barrio Logan.

Date	Part or Job Description	Time (part in & out)	Sample Number	Volts	Amps	Temp. (F)	Totalizer	Pressure Drop CMP	Pressure Drop HEPA	Comments	Number of Drops	Specific Gravity	Surface Tension

Material Additions

Date	Material Name	Time Added	Amount Added	Comments
02/07/2002	Fumetrol	8:15	63 ml	
02/21/2002	Rinse Water	9:35	1 1/2 "	
02/21/2002	Fumetrol	13:00	200 ml	
02/26/2002	Rinse Water	8:20	1 "	
03/01/2002	Fumetrol	11:00	100 ml	
03/05/2002	Fumetrol	8:30	750 ml	
03/14/2002	Rinse Water	8:40	1 1/2 "	
03/15/2002	Rinse Water	7:15	1/4"	Water from composite mesh pad rinse.
03/15/2002	Fumetrol	13:30	150 ml	
03/19/2002	Fumetrol	4:15	5 ml	
03/20/2002	Rinse Water	8:20	1 "	
03/28/2002	Fumetrol	8:30	300 ml	
04/01/2002	Rinse Water	7:00	1/4"	Water from composite mesh pad rinse.
04/01/2002	Rinse Water	8:05	1/2"	Water from holding tank.
04/02/2002	Fumetrol	7:40	100 ml	
04/02/2002	Chrome flakes	9:10	25 lbs	
04/05/2002	Rinse Water	10:35	3/4"	From rinse tank.
04/05/2002	Fumetrol	10:40	100 ml	
04/07/2002	Fumetrol	12:10	150 ml	
04/14/2002	Fumetrol	10:45	150 ml	
04/16/2002	Fumetrol	7:00	150 ml	

Composite Mesh Pad Washdown

Date	Start Time	Stop Time	Comments
02/08/2002	8:53	8:58	
02/21/2002	9:30	9:35	5 Minutes.
02/25/2002		8:20	Blowers off during washdown.
03/01/2002	7:50	7:55	Blowers off until 8:38.
03/19/2002	-	2:00	Washdown Tank No. 2.
03/15/2002	7:15	7:18	
03/27/2002	9:52	-	Blowers on. Pressure drop CMP = 1.2" H2O gauge and HEPA = 1.7" H2O gauge.
04/02/2002	7:00	7:15	Approximately 1/4" of water added from rinse.
04/07/2002	12:10	12:15	Extremely clear water.
04/15/2002	6:15	6:17	Water very clean.

Carlson and Beauloye - Tank 2

Hard chrome electroplating tank operating parameters during ARB ambient monitoring at Barrio Logan.

Date	Part or Job Description	Time (part in & out)	Sample Number	Volts	Amps	Temp. (F)	Totalizer	Pressure Drop		Comments	Number of Drops	Specific Gravity	Surface Tension
								CMP	HEPA				

Appendix D Laboratory Reports

Appendix D.1

Hexavalent Chromium

Barrio Logan Hexavalent Chromium Results

Compound Name	Result	Detection Limit	Units	Site Name	Sampling Date	Sampling Start Time	Sampling Duration (Hrs)
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	12/03/01		
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	12/04/01	8:36	24.0
Hexavalent Chromium	1.9	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	12/05/01	8:40	12.0
Hexavalent Chromium	3.8	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	12/06/01	8:25	24.0
Hexavalent Chromium	9.3	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	12/07/01	8:21	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	12/08/01	8:20	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	12/10/01	9:10	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	12/11/01	8:35	24.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	12/12/01	8:30	24.0
Hexavalent Chromium	2.4	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	12/13/01	8:58	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	12/14/01	8:59	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	12/15/01	8:33	24.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	12/17/01	8:27	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	12/03/01	8:20	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	12/04/01	9:20	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	12/05/01	9:41	24.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	12/06/01	8:47	24.0
Hexavalent Chromium	7.9	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	12/07/01	8:43	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	12/08/01	9:14	24.0
Hexavalent Chromium	0.8	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	12/10/01	8:48	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	12/12/01	8:40	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	12/13/01	8:34	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	12/14/01	9:49	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	12/15/01	10:18	24.0
Hexavalent Chromium	0.4	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	12/17/01	8:01	8.2
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	12/03/01	9:03	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	12/04/01	8:56	24.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	12/05/01	9:22	24.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	12/06/01	11:34	12.1
Hexavalent Chromium	4.8	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	12/07/01	8:53	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	12/08/01	8:45	24.0
Hexavalent Chromium	1.5	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	12/10/01	8:35	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	12/11/01	9:55	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	12/12/01	10:25	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	12/13/01	8:01	8.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	12/14/01	9:08	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	12/15/01	9:02	24.0
Hexavalent Chromium	0.5	0.2	ng/m3	BARRIO LOGAN-ALLEY	12/17/01	9:31	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	12/03/01	9:24	12.0
Hexavalent Chromium	0.5	0.2	ng/m3	BARRIO LOGAN-ALLEY	12/04/01	8:59	24.0
Hexavalent Chromium	0.6	0.2	ng/m3	BARRIO LOGAN-ALLEY	12/05/01	8:49	24.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-ALLEY	12/06/01	8:44	12.0
Hexavalent Chromium	1.3	0.2	ng/m3	BARRIO LOGAN-ALLEY	12/07/01	10:01	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	12/08/01	10:32	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	12/10/01	9:13	24.0
Hexavalent Chromium	4.0	0.2	ng/m3	BARRIO LOGAN-ALLEY	12/11/01	9:08	24.0
Hexavalent Chromium	6.9	0.2	ng/m3	BARRIO LOGAN-ALLEY	12/12/01	9:34	24.0
Hexavalent Chromium	22	0.2	ng/m3	BARRIO LOGAN-ALLEY	12/13/01	8:13	12.0

Barrio Logan Hexavalent Chromium Results

Compound Name	Result	Detection Limit	Units	Site Name	Sampling Date	Sampling Start Time	Sampling Duration (Hrs)
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	12/14/01	9:02	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	12/15/01	8:53	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	12/17/01	7:48	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	12/03/01	10:08	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	12/04/01	10:35	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	12/06/01	9:17	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	12/07/01	9:13	24.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	12/08/01	9:42	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	12/10/01	8:22	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	12/11/01	12:12	8.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	12/12/01	9:05	24.0
Hexavalent Chromium	1.0	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	12/13/01	8:57	24.0
Hexavalent Chromium	0.5	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	12/14/01	8:17	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	12/15/01	10:12	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	12/17/01	10:38	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	12/03/01	8:01	8.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	12/04/01	9:24	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	12/05/01	9:19	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	12/06/01	9:43	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	12/07/01	8:25	12.0
Hexavalent Chromium	3.6	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	12/08/01	9:00	8.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	12/10/01	9:08	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	12/11/01	8:59	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	12/12/01	8:07	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	12/13/01	10:15	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	12/14/01	10:43	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	12/15/01	8:01	8.1
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	12/17/01	9:26	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	12/04/01	9:21	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	12/05/01	9:45	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	12/06/01	8:25	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	12/07/01	9:12	24.0
Hexavalent Chromium	3.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	12/10/01	9:03	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	12/11/01	8:07	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	12/12/01	10:17	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	12/13/01	7:01	8.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	12/14/01	9:30	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	12/15/01	9:26	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	12/17/01	9:47	24.0

Barrio Logan Hexavalent Chromium Results

Compound Name	Result	Detection Limit	Units	Site Name	Sampling Date	Sampling Start Time	Sampling Duration (Hrs)
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/05/02	8:36	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/05/02	8:25	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/05/02	8:21	24.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/05/02	9:10	24.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/05/02	8:35	24.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/05/02	8:30	24.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/05/02	8:40	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/05/02	8:20	12.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/06/02	8:58	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/06/02	8:33	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/06/02	8:27	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/06/02	9:20	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/06/02	9:41	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/06/02	8:47	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/06/02	8:43	24.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/06/02	8:59	24.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/06/02	8:20	12.0
Hexavalent Chromium	0.4	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/07/02	9:14	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/07/02	8:48	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/07/02	8:40	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/07/02	9:49	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/07/02	10:18	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/07/02	9:03	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/07/02	8:56	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/07/02	8:34	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/07/02	8:01	8.2
Hexavalent Chromium	149	0.6	ng/m3	BARRIO LOGAN-2121 NEWTON	02/08/02	9:22	24.0
Hexavalent Chromium	0.8	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/08/02	8:53	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/08/02	8:45	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/08/02	9:55	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/08/02	10:25	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/08/02	9:08	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/08/02	9:02	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/08/02	11:34	12.1
Hexavalent Chromium	0.9	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/08/02	8:35	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/08/02	8:01	8.0
Hexavalent Chromium	265	0.6	ng/m3	BARRIO LOGAN-2121 NEWTON	02/09/02	9:31	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/09/02	8:59	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/09/02	8:49	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/09/02	10:01	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/09/02	10:32	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/09/02	9:13	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/09/02	9:08	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/09/02	9:24	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/09/02	8:44	12.0
Hexavalent Chromium	1.4	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/10/02	9:34	24.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/10/02	9:02	24.0

Barrio Logan Hexavalent Chromium Results

Compound Name	Result	Detection Limit	Units	Site Name	Sampling Date	Sampling Start Time	Sampling Duration (Hrs)
Hexavalent Chromium	0.4	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/10/02	8:53	24.0
Hexavalent Chromium	0.8	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/10/02	10:08	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/10/02	10:35	24.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/10/02	9:17	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/10/02	9:13	24.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/10/02	8:13	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/10/02	7:48	12.0
Hexavalent Chromium	0.6	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/11/02	9:42	24.0
Hexavalent Chromium	30	0.6	ng/m3	BARRIO LOGAN-2141 NEWTON	02/11/02	12:12	8.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/11/02	9:05	24.0
Hexavalent Chromium	0.4	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/11/02	8:57	24.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/11/02	10:12	24.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/11/02	10:38	24.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/11/02	9:24	24.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/11/02	9:19	24.0
Hexavalent Chromium	0.8	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/11/02	8:22	12.0
Hexavalent Chromium	0.5	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/11/02	8:17	12.0
Hexavalent Chromium	17	0.6	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/11/02	8:01	8.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/12/02	9:43	24.0
Hexavalent Chromium	27	0.6	ng/m3	BARRIO LOGAN-2141 NEWTON	02/12/02	9:00	8.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/12/02	9:08	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/12/02	8:59	24.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/12/02	10:15	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/12/02	10:43	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/12/02	9:26	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/12/02	9:21	24.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/12/02	8:25	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/12/02	8:07	12.0
Hexavalent Chromium	3.9	0.6	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/12/02	8:01	8.1
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/13/02	9:45	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/13/02	9:12	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/13/02	9:03	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/13/02	10:17	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/13/02	9:30	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/13/02	9:26	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/13/02	8:25	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/13/02	8:07	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/13/02	7:01	8.0
Hexavalent Chromium	220	0.6	ng/m3	BARRIO LOGAN-2121 NEWTON	02/14/02	9:47	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/14/02	9:14	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/14/02	9:05	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/14/02	10:19	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/14/02	10:51	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/14/02	9:33	24.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/14/02	9:28	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/14/02	8:27	12.0
Hexavalent Chromium	0.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/14/02	8:05	12.0
Hexavalent Chromium	<.4	0.4	ng/m3				

Barrio Logan Hexavalent Chromium Results

Compound Name	Result	Detection Limit	Units	Site Name	Sampling Date	Sampling Start Time	Sampling Duration (Hrs)
Hexavalent Chromium	451	0.6	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/14/02	7:01	8.0
Hexavalent Chromium	0.5	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/15/02	9:49	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/15/02	9:16	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/15/02	9:08	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/15/02	10:21	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/15/02	10:53	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/15/02	9:35	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/15/02	9:31	24.0
Hexavalent Chromium	1.7	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/15/02	8:16	12.0
Hexavalent Chromium	0.5	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/15/02	8:05	12.0
Hexavalent Chromium	368	0.6	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/15/02	8:01	8.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/16/02	9:51	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/16/02	9:18	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/16/02	9:10	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/16/02	10:23	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/16/02	10:55	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/16/02	9:37	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/16/02	9:33	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/16/02	8:06	12.0
Hexavalent Chromium	0.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/16/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON	02/17/02	10:38	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/17/02	9:30	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/17/02	9:23	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/17/02	11:58	23.2
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/17/02	11:14	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/17/02	10:33	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/17/02	10:30	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/17/02	10:44	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/17/02	9:17	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON	02/18/02	10:49	24.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/18/02	9:35	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/18/02	9:27	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/18/02	11:13	24.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/18/02	11:30	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/18/02	10:44	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/18/02	10:38	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/18/02	10:55	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/18/02	9:21	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON	02/19/02	10:57	24.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-2141 NEWTON	02/19/02	10:37	4.0
Hexavalent Chromium	12	1.3	ng/m3	BARRIO LOGAN-2144 NEWTON	02/19/02	9:40	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/19/02	9:32	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/19/02	11:18	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/19/02	11:44	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/19/02	10:50	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/19/02	10:44	24.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/19/02	8:07	12.0

Barrio Logan Hexavalent Chromium Results

Compound Name	Result	Detection Limit	Units	Site Name	Sampling Date	Sampling Start Time	Sampling Duration (Hrs)
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/19/02	8:15	12.0
Hexavalent Chromium	5.9	0.6	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/19/02	8:01	7.2
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/20/02	11:13	24.0
Hexavalent Chromium	18	0.2	ng/m3	BARRIO LOGAN-2141 NEWTON	02/20/02	8:40	8.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/20/02	9:52	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/20/02	9:47	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/20/02	11:27	24.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/20/02	11:48	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/20/02	10:55	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/20/02	10:49	24.0
Hexavalent Chromium	0.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/20/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/20/02	8:00	12.0
Hexavalent Chromium	6	0.6	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/20/02	7:01	7.4
Hexavalent Chromium	3.6	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/21/02	11:18	24.0
Hexavalent Chromium	0.6	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/21/02	9:59	24.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/21/02	9:52	24.0
Hexavalent Chromium	0.4	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/21/02	11:36	24.0
Hexavalent Chromium	0.4	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/21/02	12:01	24.0
Hexavalent Chromium	0.4	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/21/02	11:01	24.0
Hexavalent Chromium	0.4	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/21/02	10:55	24.0
Hexavalent Chromium	4.7	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/21/02	8:00	12.0
Hexavalent Chromium	0.7	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/21/02	8:00	12.0
Hexavalent Chromium	521	0.6	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/21/02	7:01	8.0
Hexavalent Chromium	544	1.3	ng/m3	BARRIO LOGAN-2109 NEWTON	02/21/02	11:11	4.0
Hexavalent Chromium	1.7	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/22/02	11:38	24.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/22/02	10:05	24.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/22/02	10:00	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/22/02	11:49	24.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/22/02	12:06	24.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/22/02	11:06	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/22/02	10:59	24.0
Hexavalent Chromium	4.3	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/22/02	8:00	12.0
Hexavalent Chromium	0.9	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/22/02	8:00	12.0
Hexavalent Chromium	442	0.6	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/22/02	7:01	8.0
Hexavalent Chromium	302	0.6	ng/m3	BARRIO LOGAN-2109 NEWTON	02/22/02	7:00	8.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/23/02	11:42	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/23/02	11:01	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/23/02	10:55	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/23/02	11:55	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/23/02	12:11	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/23/02	11:16	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/23/02	11:10	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/23/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/23/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON	02/24/02	11:44	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/24/02	11:03	24.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/24/02	10:57	24.0
Hexavalent Chromium	<.2	0.2	ng/m3				

Barrio Logan Hexavalent Chromium Results

Compound Name	Result	Detection Limit	Units	Site Name	Sampling Date	Sampling Start Time	Sampling Duration (Hrs)
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/24/02	11:58	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/24/02	12:13	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/24/02	11:18	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/24/02	11:12	24.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/24/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/24/02	8:00	12.0
Hexavalent Chromium	0.4	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/25/02	11:46	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/25/02	11:06	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/25/02	10:59	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/25/02	12:03	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/25/02	12:16	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/25/02	11:20	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/25/02	11:14	24.0
Hexavalent Chromium	0.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/25/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/25/02	8:00	12.0
Hexavalent Chromium	6	0.6	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/25/02	7:00	8.0
Hexavalent Chromium	0.6	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/26/02	11:47	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/26/02	11:08	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/26/02	12:06	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/26/02	12:18	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/26/02	11:22	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/26/02	11:16	24.0
Hexavalent Chromium	0.6	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/26/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/26/02	8:00	12.0
Hexavalent Chromium	2.4	0.6	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/26/02	7:00	8.0
Hexavalent Chromium	4.4	0.6	ng/m3	BARRIO LOGAN-2109 NEWTON	02/26/02	7:00	8.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/27/02	11:49	24.0
Hexavalent Chromium	42	0.6	ng/m3	BARRIO LOGAN-2141 NEWTON	02/27/02	8:30	8.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/27/02	11:08	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/27/02	11:04	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/27/02	12:08	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/27/02	12:20	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/27/02	11:24	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/27/02	11:18	24.0
Hexavalent Chromium	0.7	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/27/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/27/02	8:00	12.0
Hexavalent Chromium	851	0.6	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/27/02	7:00	8.0
Hexavalent Chromium	1.3	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/28/02	11:55	24.0
Hexavalent Chromium	43	0.6	ng/m3	BARRIO LOGAN-2141 NEWTON	02/28/02	8:15	8.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/28/02	11:12	24.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/28/02	11:07	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/28/02	12:16	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/28/02	12:22	24.0
Hexavalent Chromium	0.7	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/28/02	11:24	24.0
Hexavalent Chromium	0.4	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/28/02	11:20	24.0
Hexavalent Chromium	0.8	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/28/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/28/02	8:00	12.0

Barrio Logan Hexavalent Chromium Results

Compound Name	Result	Detection Limit	Units	Site Name	Sampling Date	Sampling Start Time	Sampling Duration (Hrs)
Hexavalent Chromium	904	1.3	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/28/02	10:16	4.8
Hexavalent Chromium	107	0.6	ng/m3	BARRIO LOGAN-2109 NEWTON	02/28/02	7:00	8.0
Hexavalent Chromium	1.9	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	03/01/02	11:58	24.0
Hexavalent Chromium	0.5	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	03/01/02	11:18	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	03/01/02	11:14	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	03/01/02	12:18	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	03/01/02	12:28	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	03/01/02	11:27	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	03/01/02	11:25	24.0
Hexavalent Chromium	3.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/01/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	03/01/02	8:00	12.0
Hexavalent Chromium	614	0.6	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/01/02	7:00	8.0
Hexavalent Chromium	216	0.6	ng/m3	BARRIO LOGAN-2109 NEWTON	03/01/02	7:00	8.0
Hexavalent Chromium	0.4	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	03/02/02	12:00	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	03/02/02	11:24	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	03/02/02	11:17	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	03/02/02	12:30	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	03/02/02	11:44	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	03/02/02	11:30	24.0
Hexavalent Chromium	0.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/02/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	03/02/02	8:00	12.0
Hexavalent Chromium	1.3	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	03/03/02	12:05	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	03/03/02	11:30	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	03/03/02	11:25	24.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-ALLEY	03/03/02	12:50	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	03/03/02	12:38	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	03/03/02	11:49	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	03/03/02	11:38	24.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/03/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	03/03/02	8:00	12.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	03/04/02	12:18	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	03/04/02	11:49	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	03/04/02	11:43	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	03/04/02	12:54	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	03/04/02	12:42	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	03/04/02	12:06	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	03/04/02	12:00	24.0
Hexavalent Chromium	0.6	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/04/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	03/04/02	8:00	12.0
Hexavalent Chromium	96	0.6	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/04/02	7:00	8.0
Hexavalent Chromium	16	0.6	ng/m3	BARRIO LOGAN-2109 NEWTON	03/04/02	7:00	8.0
Hexavalent Chromium	0.5	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	03/05/02	12:25	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	03/05/02	12:06	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	03/05/02	12:01	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	03/05/02	12:58	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	03/05/02	12:47	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	03/05/02	12:18	24.0

Barrio Logan Hexavalent Chromium Results

Compound Name	Result	Detection Limit	Units	Site Name	Sampling Date	Sampling Start Time	Sampling Duration (Hrs)
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	12/03/01		
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	12/04/01	8:36	24.0
Hexavalent Chromium	1.9	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	12/05/01	8:40	12.0
Hexavalent Chromium	3.8	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	12/06/01	8:25	24.0
Hexavalent Chromium	9.3	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	12/07/01	8:21	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	12/08/01	8:20	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	12/10/01	9:10	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	12/11/01	8:35	24.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	12/12/01	8:30	24.0
Hexavalent Chromium	2.4	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	12/13/01	8:58	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	12/14/01	8:59	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	12/15/01	8:33	24.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	12/17/01	8:27	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	12/03/01	8:20	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	12/04/01	9:20	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	12/05/01	9:41	24.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	12/06/01	8:47	24.0
Hexavalent Chromium	7.9	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	12/07/01	8:43	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	12/08/01	9:14	24.0
Hexavalent Chromium	0.8	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	12/10/01	8:48	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	12/12/01	8:40	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	12/13/01	8:34	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	12/14/01	9:49	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	12/15/01	10:18	24.0
Hexavalent Chromium	0.4	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	12/17/01	8:01	8.2
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	12/03/01	9:03	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	12/04/01	8:56	24.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	12/05/01	9:22	24.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	12/06/01	11:34	12.1
Hexavalent Chromium	4.8	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	12/07/01	8:53	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	12/08/01	8:45	24.0
Hexavalent Chromium	1.5	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	12/10/01	8:35	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	12/11/01	9:55	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	12/12/01	10:25	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	12/13/01	8:01	8.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	12/14/01	9:08	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	12/15/01	9:02	24.0
Hexavalent Chromium	0.5	0.2	ng/m3	BARRIO LOGAN-ALLEY	12/17/01	9:31	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	12/03/01	9:24	12.0
Hexavalent Chromium	0.5	0.2	ng/m3	BARRIO LOGAN-ALLEY	12/04/01	8:59	24.0
Hexavalent Chromium	0.6	0.2	ng/m3	BARRIO LOGAN-ALLEY	12/05/01	8:49	24.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-ALLEY	12/06/01	8:44	12.0
Hexavalent Chromium	1.3	0.2	ng/m3	BARRIO LOGAN-ALLEY	12/07/01	10:01	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	12/08/01	10:32	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	12/10/01	9:13	24.0
Hexavalent Chromium	4.0	0.2	ng/m3	BARRIO LOGAN-ALLEY	12/11/01	9:08	24.0
Hexavalent Chromium	6.9	0.2	ng/m3	BARRIO LOGAN-ALLEY	12/12/01	9:34	24.0
Hexavalent Chromium	22	0.2	ng/m3	BARRIO LOGAN-ALLEY	12/13/01	8:13	12.0

Barrio Logan Hexavalent Chromium Results

Compound Name	Result	Detection Limit	Units	Site Name	Sampling Date	Sampling Start Time	Sampling Duration (Hrs)
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	12/14/01	9:02	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	12/15/01	8:53	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	12/17/01	7:48	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	12/03/01	10:08	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	12/04/01	10:35	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	12/06/01	9:17	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	12/07/01	9:13	24.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	12/08/01	9:42	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	12/10/01	8:22	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	12/11/01	12:12	8.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	12/12/01	9:05	24.0
Hexavalent Chromium	1.0	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	12/13/01	8:57	24.0
Hexavalent Chromium	0.5	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	12/14/01	8:17	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	12/15/01	10:12	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	12/17/01	10:38	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	12/03/01	8:01	8.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	12/04/01	9:24	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	12/05/01	9:19	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	12/06/01	9:43	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	12/07/01	8:25	12.0
Hexavalent Chromium	3.6	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	12/08/01	9:00	8.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	12/10/01	9:08	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	12/11/01	8:59	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	12/12/01	8:07	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	12/13/01	10:15	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	12/14/01	10:43	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	12/15/01	8:01	8.1
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	12/17/01	9:26	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	12/04/01	9:21	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	12/05/01	9:45	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	12/06/01	8:25	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	12/07/01	9:12	24.0
Hexavalent Chromium	3.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	12/10/01	9:03	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	12/11/01	8:07	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	12/12/01	10:17	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	12/13/01	7:01	8.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	12/14/01	9:30	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	12/15/01	9:26	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	12/17/01	9:47	24.0

Barrio Logan Hexavalent Chromium Results

Compound Name	Result	Detection Limit	Units	Site Name	Sampling Date	Sampling Start Time	Sampling Duration (Hrs)
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/05/02	8:36	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/05/02	8:25	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/05/02	8:21	24.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/05/02	9:10	24.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/05/02	8:35	24.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/05/02	8:30	24.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/05/02	8:40	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/05/02	8:20	12.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/06/02	8:58	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/06/02	8:33	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/06/02	8:27	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/06/02	9:20	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/06/02	9:41	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/06/02	8:47	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/06/02	8:43	24.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/06/02	8:59	24.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/06/02	8:20	12.0
Hexavalent Chromium	0.4	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/07/02	9:14	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/07/02	8:48	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/07/02	8:40	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/07/02	9:49	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/07/02	10:18	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/07/02	9:03	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/07/02	8:56	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/07/02	8:34	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/07/02	8:01	8.2
Hexavalent Chromium	149	0.6	ng/m3	BARRIO LOGAN-2121 NEWTON	02/08/02	9:22	24.0
Hexavalent Chromium	0.8	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/08/02	8:53	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/08/02	8:45	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/08/02	9:55	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/08/02	10:25	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/08/02	9:08	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/08/02	9:02	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/08/02	11:34	12.1
Hexavalent Chromium	0.9	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/08/02	8:35	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/08/02	8:01	8.0
Hexavalent Chromium	265	0.6	ng/m3	BARRIO LOGAN-2121 NEWTON	02/09/02	9:31	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/09/02	8:59	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/09/02	8:49	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/09/02	10:01	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/09/02	10:32	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/09/02	9:13	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/09/02	9:08	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/09/02	9:24	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/09/02	8:44	12.0
Hexavalent Chromium	1.4	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/10/02	9:34	24.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/10/02	9:02	24.0

Barrio Logan Hexavalent Chromium Results

Compound Name	Result	Detection Limit	Units	Site Name	Sampling Date	Sampling Start Time	Sampling Duration (Hrs)
Hexavalent Chromium	0.4	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/10/02	8:53	24.0
Hexavalent Chromium	0.8	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/10/02	10:08	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/10/02	10:35	24.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/10/02	9:17	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/10/02	9:13	24.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/10/02	8:13	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/10/02	7:48	12.0
Hexavalent Chromium	0.6	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/11/02	9:42	24.0
Hexavalent Chromium	30	0.6	ng/m3	BARRIO LOGAN-2141 NEWTON	02/11/02	12:12	8.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/11/02	9:05	24.0
Hexavalent Chromium	0.4	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/11/02	8:57	24.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/11/02	10:12	24.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/11/02	10:38	24.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/11/02	9:24	24.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/11/02	9:19	24.0
Hexavalent Chromium	0.8	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/11/02	8:22	12.0
Hexavalent Chromium	0.5	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/11/02	8:17	12.0
Hexavalent Chromium	17	0.6	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/11/02	8:01	8.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/12/02	9:43	24.0
Hexavalent Chromium	27	0.6	ng/m3	BARRIO LOGAN-2141 NEWTON	02/12/02	9:00	8.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/12/02	9:08	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/12/02	8:59	24.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/12/02	10:15	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/12/02	10:43	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/12/02	9:26	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/12/02	9:21	24.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/12/02	8:25	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/12/02	8:07	12.0
Hexavalent Chromium	3.9	0.6	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/12/02	8:01	8.1
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/13/02	9:45	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/13/02	9:12	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/13/02	9:03	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/13/02	10:17	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/13/02	9:30	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/13/02	9:26	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/13/02	8:25	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/13/02	8:07	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/13/02	7:01	8.0
Hexavalent Chromium	220	0.6	ng/m3	BARRIO LOGAN-2121 NEWTON	02/14/02	9:47	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/14/02	9:14	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/14/02	9:05	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/14/02	10:19	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/14/02	10:51	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/14/02	9:33	24.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/14/02	9:28	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/14/02	8:27	12.0
Hexavalent Chromium	0.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/14/02	8:05	12.0
Hexavalent Chromium	<.4	0.4	ng/m3				

Barrio Logan Hexavalent Chromium Results

Compound Name	Result	Detection Limit	Units	Site Name	Sampling Date	Sampling Start Time	Sampling Duration (Hrs)
Hexavalent Chromium	451	0.6	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/14/02	7:01	8.0
Hexavalent Chromium	0.5	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/15/02	9:49	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/15/02	9:16	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/15/02	9:08	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/15/02	10:21	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/15/02	10:53	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/15/02	9:35	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/15/02	9:31	24.0
Hexavalent Chromium	1.7	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/15/02	8:16	12.0
Hexavalent Chromium	0.5	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/15/02	8:05	12.0
Hexavalent Chromium	368	0.6	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/15/02	8:01	8.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/16/02	9:51	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/16/02	9:18	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/16/02	9:10	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/16/02	10:23	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/16/02	10:55	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/16/02	9:37	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/16/02	9:33	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/16/02	8:06	12.0
Hexavalent Chromium	0.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/16/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON	02/17/02	10:38	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/17/02	9:30	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/17/02	9:23	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/17/02	11:58	23.2
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/17/02	11:14	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/17/02	10:33	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/17/02	10:30	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/17/02	10:44	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/17/02	9:17	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON	02/18/02	10:49	24.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/18/02	9:35	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/18/02	9:27	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/18/02	11:13	24.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/18/02	11:30	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/18/02	10:44	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/18/02	10:38	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/18/02	10:55	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/18/02	9:21	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON	02/19/02	10:57	24.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-2141 NEWTON	02/19/02	10:37	4.0
Hexavalent Chromium	12	1.3	ng/m3	BARRIO LOGAN-2144 NEWTON	02/19/02	9:40	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/19/02	9:32	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/19/02	11:18	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/19/02	11:44	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/19/02	10:50	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/19/02	10:44	24.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/19/02	8:07	12.0

Barrio Logan Hexavalent Chromium Results

Compound Name	Result	Detection Limit	Units	Site Name	Sampling Date	Sampling Start Time	Sampling Duration (Hrs)
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/19/02	8:15	12.0
Hexavalent Chromium	5.9	0.6	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/19/02	8:01	7.2
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/20/02	11:13	24.0
Hexavalent Chromium	18	0.2	ng/m3	BARRIO LOGAN-2141 NEWTON	02/20/02	8:40	8.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/20/02	9:52	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/20/02	9:47	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/20/02	11:27	24.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/20/02	11:48	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/20/02	10:55	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/20/02	10:49	24.0
Hexavalent Chromium	0.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/20/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/20/02	8:00	12.0
Hexavalent Chromium	6	0.6	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/20/02	7:01	7.4
Hexavalent Chromium	3.6	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/21/02	11:18	24.0
Hexavalent Chromium	0.6	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/21/02	9:59	24.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/21/02	9:52	24.0
Hexavalent Chromium	0.4	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/21/02	11:36	24.0
Hexavalent Chromium	0.4	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/21/02	12:01	24.0
Hexavalent Chromium	0.4	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/21/02	11:01	24.0
Hexavalent Chromium	0.4	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/21/02	10:55	24.0
Hexavalent Chromium	4.7	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/21/02	8:00	12.0
Hexavalent Chromium	0.7	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/21/02	8:00	12.0
Hexavalent Chromium	521	0.6	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/21/02	7:01	8.0
Hexavalent Chromium	544	1.3	ng/m3	BARRIO LOGAN-2109 NEWTON	02/21/02	11:11	4.0
Hexavalent Chromium	1.7	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/22/02	11:38	24.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/22/02	10:05	24.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/22/02	10:00	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/22/02	11:49	24.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/22/02	12:06	24.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/22/02	11:06	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/22/02	10:59	24.0
Hexavalent Chromium	4.3	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/22/02	8:00	12.0
Hexavalent Chromium	0.9	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/22/02	8:00	12.0
Hexavalent Chromium	442	0.6	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/22/02	7:01	8.0
Hexavalent Chromium	302	0.6	ng/m3	BARRIO LOGAN-2109 NEWTON	02/22/02	7:00	8.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/23/02	11:42	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/23/02	11:01	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/23/02	10:55	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/23/02	11:55	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/23/02	12:11	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/23/02	11:16	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/23/02	11:10	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/23/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/23/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON	02/24/02	11:44	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/24/02	11:03	24.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/24/02	10:57	24.0
Hexavalent Chromium	<.2	0.2	ng/m3				

Barrio Logan Hexavalent Chromium Results

Compound Name	Result	Detection Limit	Units	Site Name	Sampling Date	Sampling Start Time	Sampling Duration (Hrs)
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/24/02	11:58	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/24/02	12:13	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/24/02	11:18	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/24/02	11:12	24.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/24/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/24/02	8:00	12.0
Hexavalent Chromium	0.4	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/25/02	11:46	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/25/02	11:06	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/25/02	10:59	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/25/02	12:03	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/25/02	12:16	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/25/02	11:20	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/25/02	11:14	24.0
Hexavalent Chromium	0.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/25/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/25/02	8:00	12.0
Hexavalent Chromium	6	0.6	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/25/02	7:00	8.0
Hexavalent Chromium	0.6	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/26/02	11:47	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/26/02	11:08	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/26/02	12:06	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/26/02	12:18	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/26/02	11:22	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/26/02	11:16	24.0
Hexavalent Chromium	0.6	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/26/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/26/02	8:00	12.0
Hexavalent Chromium	2.4	0.6	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/26/02	7:00	8.0
Hexavalent Chromium	4.4	0.6	ng/m3	BARRIO LOGAN-2109 NEWTON	02/26/02	7:00	8.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/27/02	11:49	24.0
Hexavalent Chromium	42	0.6	ng/m3	BARRIO LOGAN-2141 NEWTON	02/27/02	8:30	8.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/27/02	11:08	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/27/02	11:04	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/27/02	12:08	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/27/02	12:20	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/27/02	11:24	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/27/02	11:18	24.0
Hexavalent Chromium	0.7	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/27/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/27/02	8:00	12.0
Hexavalent Chromium	851	0.6	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/27/02	7:00	8.0
Hexavalent Chromium	1.3	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	02/28/02	11:55	24.0
Hexavalent Chromium	43	0.6	ng/m3	BARRIO LOGAN-2141 NEWTON	02/28/02	8:15	8.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	02/28/02	11:12	24.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	02/28/02	11:07	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	02/28/02	12:16	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	02/28/02	12:22	24.0
Hexavalent Chromium	0.7	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	02/28/02	11:24	24.0
Hexavalent Chromium	0.4	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	02/28/02	11:20	24.0
Hexavalent Chromium	0.8	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	02/28/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	02/28/02	8:00	12.0

Barrio Logan Hexavalent Chromium Results

Compound Name	Result	Detection Limit	Units	Site Name	Sampling Date	Sampling Start Time	Sampling Duration (Hrs)
Hexavalent Chromium	904	1.3	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/28/02	10:16	4.8
Hexavalent Chromium	107	0.6	ng/m3	BARRIO LOGAN-2109 NEWTON	02/28/02	7:00	8.0
Hexavalent Chromium	1.9	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	03/01/02	11:58	24.0
Hexavalent Chromium	0.5	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	03/01/02	11:18	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	03/01/02	11:14	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	03/01/02	12:18	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	03/01/02	12:28	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	03/01/02	11:27	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	03/01/02	11:25	24.0
Hexavalent Chromium	3.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/01/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	03/01/02	8:00	12.0
Hexavalent Chromium	614	0.6	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/01/02	7:00	8.0
Hexavalent Chromium	216	0.6	ng/m3	BARRIO LOGAN-2109 NEWTON	03/01/02	7:00	8.0
Hexavalent Chromium	0.4	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	03/02/02	12:00	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	03/02/02	11:24	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	03/02/02	11:17	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	03/02/02	12:30	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	03/02/02	11:44	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	03/02/02	11:30	24.0
Hexavalent Chromium	0.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/02/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	03/02/02	8:00	12.0
Hexavalent Chromium	1.3	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	03/03/02	12:05	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	03/03/02	11:30	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	03/03/02	11:25	24.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-ALLEY	03/03/02	12:50	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	03/03/02	12:38	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	03/03/02	11:49	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	03/03/02	11:38	24.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/03/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	03/03/02	8:00	12.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	03/04/02	12:18	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	03/04/02	11:49	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	03/04/02	11:43	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	03/04/02	12:54	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	03/04/02	12:42	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	03/04/02	12:06	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	03/04/02	12:00	24.0
Hexavalent Chromium	0.6	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/04/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	03/04/02	8:00	12.0
Hexavalent Chromium	96	0.6	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/04/02	7:00	8.0
Hexavalent Chromium	16	0.6	ng/m3	BARRIO LOGAN-2109 NEWTON	03/04/02	7:00	8.0
Hexavalent Chromium	0.5	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	03/05/02	12:25	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	03/05/02	12:06	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	03/05/02	12:01	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	03/05/02	12:58	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	03/05/02	12:47	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	03/05/02	12:18	24.0

Barrio Logan Hexavalent Chromium Results

Compound Name	Result	Detection Limit	Units	Site Name	Sampling Date	Sampling Start Time	Sampling Duration (Hrs)
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	03/05/02	12:14	24.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/05/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	03/05/02	8:00	12.0
Hexavalent Chromium	48	0.6	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/05/02	7:00	8.1
Hexavalent Chromium	26	0.6	ng/m3	BARRIO LOGAN-2109 NEWTON	03/05/02	7:00	8.0
Hexavalent Chromium	1	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	03/06/02	12:44	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	03/06/02	12:13	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	03/06/02	12:08	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	03/06/02	13:05	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	03/06/02	12:59	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	03/06/02	12:26	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	03/06/02	12:24	24.0
Hexavalent Chromium	3.1	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/06/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	03/06/02	8:00	12.0
Hexavalent Chromium	652	0.6	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/06/02	7:00	8.0
Hexavalent Chromium	215	0.6	ng/m3	BARRIO LOGAN-2109 NEWTON	03/06/02	7:00	8.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	03/07/02	12:53	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	03/07/02	12:19	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2152 NEWTON	03/07/02	12:14	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	03/07/02	13:13	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	03/07/02	13:06	24.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	03/07/02	12:38	24.0
Hexavalent Chromium	0.5	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	03/07/02	12:32	24.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/07/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	03/07/02	8:00	12.0
Hexavalent Chromium	367	0.6	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/07/02	7:00	8.1
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON	03/08/02	12:57	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2144 NEWTON	03/08/02	12:26	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY	03/08/02	13:17	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MERCADO APTS	03/08/02	13:09	24.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT	03/08/02	12:42	24.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-VACANT LOT-COLLOC	03/08/02	12:36	24.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/08/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2152 NEWTON-12 HOUR	03/08/02	8:00	12.0
Hexavalent Chromium	87	0.6	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/08/02	7:00	8.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/11/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/11/02	8:00	23.0
Hexavalent Chromium	4.6	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	03/11/02	8:00	23.5
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/11/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/11/02	8:00	12.0
Hexavalent Chromium	5.1	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/11/02	8:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/12/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/12/02	8:00	23.0
Hexavalent Chromium	3.1	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	03/12/02	8:00	23.5
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/12/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/12/02	8:00	12.0
Hexavalent Chromium	3.5	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/12/02	8:00	12.0

Barrio Logan Hexavalent Chromium Results

Compound Name	Result	Detection Limit	Units	Site Name	Sampling Date	Sampling Start Time	Sampling Duration (Hrs)
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/13/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/13/02	8:00	23.0
Hexavalent Chromium	5.3	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	03/13/02	8:00	23.5
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/13/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/13/02	8:00	12.0
Hexavalent Chromium	7.8	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/13/02	8:00	12.0
Hexavalent Chromium	1.3	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/14/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/14/02	8:00	23.0
Hexavalent Chromium	142	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	03/14/02	8:00	23.5
Hexavalent Chromium	1.5	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/14/02	8:00	12.0
Hexavalent Chromium	308	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/14/02	8:00	12.0
Hexavalent Chromium	1.9	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/15/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/15/02	8:00	23.0
Hexavalent Chromium	383	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	03/15/02	8:00	23.4
Hexavalent Chromium	2.9	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/15/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/15/02	8:00	12.0
Hexavalent Chromium	845	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/15/02	8:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/16/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/16/02	8:00	23.0
Hexavalent Chromium	0.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/16/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/16/02	8:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/17/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/17/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/17/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/17/02	8:00	12.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/18/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/18/02	8:00	23.0
Hexavalent Chromium	17	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	03/18/02	8:00	23.5
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/18/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/18/02	8:00	12.0
Hexavalent Chromium	36	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/18/02	8:00	12.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/19/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/19/02	8:00	23.0
Hexavalent Chromium	12	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	03/19/02	8:00	23.5
Hexavalent Chromium	0.5	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/19/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/19/02	8:00	12.0
Hexavalent Chromium	6.5	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/19/02	8:00	12.0
Hexavalent Chromium	1	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/20/02	8:00	23.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/20/02	8:00	23.0
Hexavalent Chromium	22	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	03/20/02	8:00	23.5
Hexavalent Chromium	1.5	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/20/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/20/02	8:00	12.0
Hexavalent Chromium	60	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/20/02	8:00	12.0
Hexavalent Chromium	1	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/21/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/21/02	8:00	23.0
Hexavalent Chromium	83	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	03/21/02	8:00	23.5
Hexavalent Chromium	1.9	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/21/02	8:00	12.0

Barrio Logan Hexavalent Chromium Results

Compound Name	Result	Detection Limit	Units	Site Name	Sampling Date	Sampling Start Time	Sampling Duration (Hrs)
Hexavalent Chromium	0.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/21/02	8:00	12.0
Hexavalent Chromium	153	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/21/02	8:00	12.0
Hexavalent Chromium	3.1	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/22/02	8:00	23.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/22/02	8:00	23.0
Hexavalent Chromium	4.8	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/22/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/22/02	8:00	12.0
Hexavalent Chromium	600	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/22/02	8:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/23/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/23/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/23/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/23/02	8:00	12.0
Hexavalent Chromium	46	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/23/02	8:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/24/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/24/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/24/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/24/02	8:00	12.0
Hexavalent Chromium	25	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/24/02	8:00	12.0
Hexavalent Chromium	49	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/24/02	20:00	12.0
Hexavalent Chromium	0.6	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/25/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/25/02	8:00	23.0
Hexavalent Chromium	28	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	03/25/02	8:00	23.5
Hexavalent Chromium	0.7	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/25/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/25/02	8:00	12.0
Hexavalent Chromium	41	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/25/02	8:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/26/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/26/02	8:00	23.0
Hexavalent Chromium	12	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	03/26/02	8:00	23.5
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/26/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/26/02	8:00	12.0
Hexavalent Chromium	19	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/26/02	8:00	12.0
Hexavalent Chromium	0.7	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/27/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/27/02	8:00	23.0
Hexavalent Chromium	12	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	03/27/02	8:00	23.5
Hexavalent Chromium	1.1	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/27/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/27/02	8:00	12.0
Hexavalent Chromium	34	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/27/02	8:00	12.0
Hexavalent Chromium	1	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/28/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/28/02	8:00	23.0
Hexavalent Chromium	20	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	03/28/02	8:00	23.5
Hexavalent Chromium	0.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/28/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/28/02	8:00	12.0
Hexavalent Chromium	21	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/28/02	8:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/29/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/29/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/29/02	8:00	12.0
Hexavalent Chromium	0.6	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	03/29/02	9:00	12.0
Hexavalent Chromium	0.5	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/29/02	8:00	12.0

Barrio Logan Hexavalent Chromium Results

Compound Name	Result	Detection Limit	Units	Site Name	Sampling Date	Sampling Start Time	Sampling Duration (Hrs)
Hexavalent Chromium	11	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/29/02	8:00	12.0
Hexavalent Chromium	2.1	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/30/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/30/02	8:00	23.0
Hexavalent Chromium	2.9	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/30/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	03/30/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/30/02	8:00	12.0
Hexavalent Chromium	127	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/30/02	8:00	12.0
Hexavalent Chromium	0.7	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/31/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/31/02	8:00	23.0
Hexavalent Chromium	1.5	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/31/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	03/31/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/31/02	8:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	04/01/02	8:00	23.0
Hexavalent Chromium	0.4	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	04/01/02	8:00	23.0
Hexavalent Chromium	4.9	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	04/01/02	8:00	23.5
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/01/02	8:00	12.0
Hexavalent Chromium	0.7	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	04/01/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/01/02	8:00	12.0
Hexavalent Chromium	10	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/01/02	8:00	12.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	04/02/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	04/02/02	8:00	23.0
Hexavalent Chromium	6.5	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	04/02/02	8:00	23.5
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/02/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	04/02/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/02/02	8:00	12.0
Hexavalent Chromium	10	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/02/02	8:00	12.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	04/03/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	04/03/02	8:00	23.0
Hexavalent Chromium	3.4	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	04/03/02	8:00	23.5
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/03/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	04/03/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/03/02	8:00	12.0
Hexavalent Chromium	4.5	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/03/02	8:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	04/04/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	04/04/02	8:00	23.0
Hexavalent Chromium	4.9	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	04/04/02	8:00	23.5
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/04/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	04/04/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/04/02	8:00	12.0
Hexavalent Chromium	8.1	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/04/02	8:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	04/05/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	04/05/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/05/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	04/05/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/05/02	8:00	12.0
Hexavalent Chromium	5.3	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/05/02	8:00	12.0
Hexavalent Chromium	21	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	04/06/02	8:00	22.0

Barrio Logan Hexavalent Chromium Results

Compound Name	Result	Detection Limit	Units	Site Name	Sampling Date	Sampling Start Time	Sampling Duration (Hrs)
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	04/06/02	8:00	22.0
Hexavalent Chromium	16	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/06/02	8:00	12.0
Hexavalent Chromium	0.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	04/06/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/06/02	8:00	12.0
Hexavalent Chromium	2315	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/06/02	8:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	04/07/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	04/07/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/07/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	04/07/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/07/02	8:00	12.0
Hexavalent Chromium	10	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/07/02	8:00	12.0
Hexavalent Chromium	401	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/07/02	20:00	12.0
Hexavalent Chromium	0.4	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	04/08/02	8:00	23.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	04/08/02	8:00	23.0
Hexavalent Chromium	76	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	04/08/02	8:00	23.5
Hexavalent Chromium	0.5	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/08/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	04/08/02	9:00	12.0
Hexavalent Chromium	0.5	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/08/02	8:00	12.0
Hexavalent Chromium	200	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/08/02	8:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	04/09/02	8:00	23.0
Hexavalent Chromium	9.4	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	04/09/02	8:00	23.5
Hexavalent Chromium	0.9	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/09/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	04/09/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/09/02	8:00	12.0
Hexavalent Chromium	25	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/09/02	8:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	04/10/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	04/10/02	8:00	23.0
Hexavalent Chromium	10	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	04/10/02	8:00	23.5
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/10/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	04/10/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/10/02	8:00	12.0
Hexavalent Chromium	25	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/10/02	8:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	04/11/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	04/11/02	8:00	23.0
Hexavalent Chromium	4.6	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	04/11/02	8:00	23.5
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/11/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	04/11/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/11/02	8:00	12.0
Hexavalent Chromium	9.1	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/11/02	8:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	04/12/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	04/12/02	8:00	23.0
Hexavalent Chromium	0.5	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/12/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	04/12/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/12/02	8:00	12.0
Hexavalent Chromium	6.4	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/12/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	04/12/02	9:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	04/13/02	8:00	23.0

Barrio Logan Hexavalent Chromium Results

Compound Name	Result	Detection Limit	Units	Site Name	Sampling Date	Sampling Start Time	Sampling Duration (Hrs)
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	04/13/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/13/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	04/13/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/13/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/13/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	04/13/02	9:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	04/14/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	04/14/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/14/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	04/14/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/14/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/14/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/14/02	20:00	8.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	04/14/02	9:00	12.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	04/15/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	04/15/02	8:00	23.0
Hexavalent Chromium	2.9	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	04/15/02	8:00	23.5
Hexavalent Chromium	0.7	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/15/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	04/15/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/15/02	8:00	12.0
Hexavalent Chromium	6.2	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/15/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	04/15/02	9:00	12.0
Hexavalent Chromium	0.4	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	04/16/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	04/16/02	8:00	23.0
Hexavalent Chromium	49	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	04/16/02	8:00	23.5
Hexavalent Chromium	0.9	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/16/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	04/16/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/16/02	8:00	12.0
Hexavalent Chromium	91	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/16/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	04/16/02	9:00	12.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	04/17/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	04/17/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/17/02	8:00	12.0
Hexavalent Chromium	0.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	04/17/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/17/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	04/17/02	9:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	04/18/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	04/18/02	8:00	23.0
Hexavalent Chromium	3.1	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	04/18/02	8:00	23.5
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/18/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	04/18/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/18/02	8:00	12.0
Hexavalent Chromium	5.4	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/18/02	8:01	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	04/18/02	9:00	12.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	04/19/02	8:00	23.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	04/19/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/19/02	8:00	12.0

Barrio Logan Hexavalent Chromium Results

Compound Name	Result	Detection Limit	Units	Site Name	Sampling Date	Sampling Start Time	Sampling Duration (Hrs)
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	04/19/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/19/02	8:00	12.0
Hexavalent Chromium	20	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/19/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	04/19/02	9:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	04/20/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	04/20/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	04/20/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/20/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	04/20/02	9:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	04/21/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	04/21/02	8:00	22.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	04/21/02	9:00	12.0
Hexavalent Chromium	1.9	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/21/02	8:00	12.0
Hexavalent Chromium	266	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/21/02	20:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	04/21/02	9:00	12.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	04/22/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	04/22/02	8:00	23.0
Hexavalent Chromium	1.7	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	04/22/02	8:00	23.5
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	04/22/02	9:00	12.0
Hexavalent Chromium	7.8	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/22/02	8:01	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	04/22/02	9:00	12.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	04/23/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	04/23/02	8:00	23.0
Hexavalent Chromium	1.7	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	04/23/02	8:00	23.5
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	04/23/02	9:00	12.0
Hexavalent Chromium	4.6	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/23/02	8:01	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	04/23/02	9:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	04/24/02	8:00	23.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	04/24/02	8:00	23.0
Hexavalent Chromium	2	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	04/24/02	8:00	23.5
Hexavalent Chromium	1.2	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	04/24/02	9:00	12.0
Hexavalent Chromium	4.5	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/24/02	8:01	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	04/25/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	04/25/02	8:00	23.0
Hexavalent Chromium	2	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	04/25/02	8:00	23.5
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	04/25/02	9:00	12.0
Hexavalent Chromium	4.2	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/25/02	8:01	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	04/25/02	9:00	12.0
Hexavalent Chromium	0.4	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	04/26/02	8:00	23.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	04/26/02	8:00	23.0
Hexavalent Chromium	0.7	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	04/26/02	9:10	12.0
Hexavalent Chromium	7.5	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/26/02	8:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	04/26/02	9:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	04/27/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	04/27/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	04/27/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	04/27/02	9:00	12.0

Barrio Logan Hexavalent Chromium Results

Compound Name	Result	Detection Limit	Units	Site Name	Sampling Date	Sampling Start Time	Sampling Duration (Hrs)
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	04/28/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	04/28/02	8:00	23.0
Hexavalent Chromium	2.7	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	04/28/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	04/28/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	04/28/02	9:00	12.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	04/29/02	8:00	23.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	04/29/02	8:00	23.0
Hexavalent Chromium	7.2	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	04/29/02	8:00	23.5
Hexavalent Chromium	0.5	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	04/29/02	9:00	12.0
Hexavalent Chromium	17	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/29/02	8:01	12.0
Hexavalent Chromium	0.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	04/29/02	9:00	12.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	04/30/02	8:00	23.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	04/30/02	8:00	23.0
Hexavalent Chromium	0.7	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	04/30/02	9:00	12.0
Hexavalent Chromium	0.5	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	04/30/02	9:00	12.0
Hexavalent Chromium	0.8	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	05/01/02	8:00	23.0
Hexavalent Chromium	0.5	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	05/01/02	8:00	23.0
Hexavalent Chromium	330	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	05/01/02	8:00	23.5
Hexavalent Chromium	0.5	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	05/01/02	9:00	12.0
Hexavalent Chromium	724	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	05/01/02	8:01	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	05/01/02	8:00	12.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	05/02/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	05/02/02	8:00	23.0
Hexavalent Chromium	8.6	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	05/02/02	8:00	23.5
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	05/02/02	9:00	12.0
Hexavalent Chromium	13	0.4	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	05/02/02	8:01	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	05/02/02	9:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	05/03/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	05/03/02	8:00	23.0
Hexavalent Chromium	2.4	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	05/03/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-12 HOUR	05/03/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-COLLOC-12 HOU	05/03/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	05/03/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2191 MAIN-12 HOUR	05/03/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	05/03/02	9:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	05/04/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	05/04/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	05/04/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-12 HOUR	05/04/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-COLLOC-12 HOU	05/04/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	05/04/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2191 MAIN-12 HOUR	05/04/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	05/04/02	9:00	12.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	05/05/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	05/05/02	8:00	23.0
Hexavalent Chromium	1.7	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	05/05/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-12 HOUR	05/05/02	21:00	12.0

Barrio Logan Hexavalent Chromium Results

Compound Name	Result	Detection Limit	Units	Site Name	Sampling Date	Sampling Start Time	Sampling Duration (Hrs)
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-COLLOC-12 HOU	05/05/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	05/05/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2191 MAIN-12 HOUR	05/05/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	05/05/02	9:00	12.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	05/06/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	05/06/02	8:00	23.0
Hexavalent Chromium	3.8	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	05/06/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-12 HOUR	05/06/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-COLLOC-12 HOU	05/06/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	05/06/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2191 MAIN-12 HOUR	05/06/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	05/06/02	9:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	05/07/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	05/07/02	8:00	23.0
Hexavalent Chromium	4.3	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	05/07/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-12 HOUR	05/07/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-COLLOC-12 HOU	05/07/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	05/07/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2191 MAIN-12 HOUR	05/07/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	05/07/02	9:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	05/08/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	05/08/02	8:00	23.0
Hexavalent Chromium	5.7	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	05/08/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-12 HOUR	05/08/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-COLLOC-12 HOU	05/08/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	05/08/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2191 MAIN-12 HOUR	05/08/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	05/08/02	9:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	05/09/02	8:00	23.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	05/09/02	8:00	23.0
Hexavalent Chromium	3.9	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	05/09/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-12 HOUR	05/09/02	21:00	12.0
Hexavalent Chromium	0.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-COLLOC-12 HOU	05/09/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	05/09/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2191 MAIN-12 HOUR	05/09/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	05/09/02	9:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	05/10/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	05/10/02	8:00	23.0
Hexavalent Chromium	6.7	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	05/10/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-12 HOUR	05/10/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-COLLOC-12 HOU	05/10/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	05/10/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2191 MAIN-12 HOUR	05/10/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	05/10/02	9:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	05/11/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	05/11/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	05/11/02	8:00	23.0

Barrio Logan Hexavalent Chromium Results

Compound Name	Result	Detection Limit	Units	Site Name	Sampling Date	Sampling Start Time	Sampling Duration (Hrs)
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-12 HOUR	05/11/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-COLLOC-12 HOU	05/11/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	05/11/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2191 MAIN-12 HOUR	05/11/02	21:00	12.0
Hexavalent Chromium	0.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	05/11/02	9:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	05/12/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	05/12/02	8:00	23.0
Hexavalent Chromium	0.6	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	05/12/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-12 HOUR	05/12/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-COLLOC-12 HOU	05/12/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	05/12/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2191 MAIN-12 HOUR	05/12/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	05/12/02	9:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	05/13/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	05/13/02	8:00	23.0
Hexavalent Chromium	7.3	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	05/13/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-12 HOUR	05/13/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-COLLOC-12 HOU	05/13/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	05/13/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2191 MAIN-12 HOUR	05/13/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	05/13/02	9:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	05/14/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	05/14/02	8:00	23.0
Hexavalent Chromium	1	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	05/14/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-12 HOUR	05/14/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-COLLOC-12 HOU	05/14/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	05/14/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2191 MAIN-12 HOUR	05/14/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	05/14/02	9:00	12.0
Hexavalent Chromium	0.6	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	05/15/02	8:00	23.0
Hexavalent Chromium	1.3	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	05/15/02	8:00	23.0
Hexavalent Chromium	3.9	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	05/15/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-12 HOUR	05/15/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-COLLOC-12 HOU	05/15/02	21:00	12.0
Hexavalent Chromium	0.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	05/15/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	05/15/02	9:00	12.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	05/16/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	05/16/02	8:00	23.0
Hexavalent Chromium	2	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	05/16/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-12 HOUR	05/16/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-COLLOC-12 HOU	05/16/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	05/16/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2191 MAIN-12 HOUR	05/16/02	21:00	12.0
Hexavalent Chromium	0.3	0.2	ng/m3	BARRIO LOGAN-POOL-12 HOUR	05/16/02	9:00	12.0
Hexavalent Chromium	11	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	05/17/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	05/17/02	8:00	23.0
				BARRIO LOGAN-2141 MAIN-12 HOUR	05/17/02	21:00	12.0

Barrio Logan Hexavalent Chromium Results

Compound Name	Result	Detection Limit	Units	Site Name	Sampling Date	Sampling Start Time	Sampling Duration (Hrs)
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-COLLOC-12 HOU	05/17/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	05/17/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2191 MAIN-12 HOUR	05/17/02	21:00	12.0
Hexavalent Chromium	0.7	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	05/17/02	9:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	05/18/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	05/18/02	8:00	23.0
Hexavalent Chromium	2.3	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	05/18/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-12 HOUR	05/18/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-COLLOC-12 HOU	05/18/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	05/18/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2191 MAIN-12 HOUR	05/18/02	21:00	12.0
Hexavalent Chromium	1.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	05/18/02	9:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	05/19/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	05/19/02	8:00	23.0
Hexavalent Chromium	0.7	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	05/19/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-12 HOUR	05/19/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-COLLOC-12 HOU	05/19/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	05/19/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2191 MAIN-12 HOUR	05/19/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	05/19/02	9:00	12.0
Hexavalent Chromium	0.5	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	05/20/02	8:00	23.0
Hexavalent Chromium	0.4	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	05/20/02	8:00	23.0
Hexavalent Chromium	8	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	05/20/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-12 HOUR	05/20/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-COLLOC-12 HOU	05/20/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	05/20/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2191 MAIN-12 HOUR	05/20/02	21:00	12.0
Hexavalent Chromium	0.9	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	05/20/02	9:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	05/21/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	05/21/02	8:00	23.0
Hexavalent Chromium	11	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	05/21/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-12 HOUR	05/21/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-COLLOC-12 HOU	05/21/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	05/21/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2191 MAIN-12 HOUR	05/21/02	21:00	12.0
Hexavalent Chromium	0.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	05/21/02	9:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	05/22/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	05/22/02	8:00	23.0
Hexavalent Chromium	0.8	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	05/22/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-12 HOUR	05/22/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-COLLOC-12 HOU	05/22/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	05/22/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2191 MAIN-12 HOUR	05/22/02	21:00	12.0
Hexavalent Chromium	0.7	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	05/22/02	9:00	12.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	05/23/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	05/23/02	8:00	23.0
Hexavalent Chromium	1.6	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	05/23/02	8:00	23.0

Barrio Logan Hexavalent Chromium Results

Compound Name	Result	Detection Limit	Units	Site Name	Sampling Date	Sampling Start Time	Sampling Duration (Hrs)
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-12 HOUR	05/23/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-COLLOC-12 HOU	05/23/02	21:00	12.0
Hexavalent Chromium	0.8	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	05/23/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2191 MAIN-12 HOUR	05/23/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	05/23/02	9:00	12.0
Hexavalent Chromium	0.2	0.2	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	05/24/02	8:00	23.0
Hexavalent Chromium	<.2	0.2	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	05/24/02	8:00	23.0
Hexavalent Chromium	2.5	0.2	ng/m3	BARRIO LOGAN-MPIEXT-23 HOUR	05/24/02	8:00	23.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-12 HOUR	05/24/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2141 MAIN-COLLOC-12 HOU	05/24/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2168 NEWTON-12 HOUR	05/24/02	9:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-2191 MAIN-12 HOUR	05/24/02	21:00	12.0
Hexavalent Chromium	<.4	0.4	ng/m3	BARRIO LOGAN-POOL-12 HOUR	05/24/02	9:00	12.0

Appendix D.2
Total Metals

Barrio Logan IV Total Metals Sampling
Analysis by ICP-MS

Sampled 02/05/02 through 03/08/02

All Results have been Approved by MLD
Sorted by Element/Sampling Date

Element-Isotope	Result	Detection Limit	Units	Site Name	Sampling Date	Sampling Start Time	Sample Duration (Hrs)
Chromium-052	9.1	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/05/02	8:45	24.0
Chromium-052	7.8	1	ng/m3	BARRIO LOGAN-ALLEY	02/05/02	9:10	24.4
Chromium-052	5.8	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/06/02	9:06	24.0
Chromium-052	3.6	1	ng/m3	BARRIO LOGAN-ALLEY	02/06/02	9:28	24.4
Chromium-052	3.7	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/07/02	9:34	24.0
Chromium-052	4	1	ng/m3	BARRIO LOGAN-ALLEY	02/07/02	9:54	24.4
Chromium-052	158	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/07/02	8:00	24.0
Chromium-052	2.8	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/08/02	9:40	24.4
Chromium-052	2	1	ng/m3	BARRIO LOGAN-ALLEY	02/08/02	9:58	24.0
Chromium-052	281	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/08/02	8:00	24.4
Chromium-052	3.2	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/09/02	9:45	24.0
Chromium-052	3.4	1	ng/m3	BARRIO LOGAN-ALLEY	02/09/02	10:11	24.4
Chromium-052	5.8	1	ng/m3	BARRIO LOGAN-ALLEY	02/10/02	10:12	24.0
Chromium-052	5.4	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/11/02	9:55	24.4
Chromium-052	3.7	1	ng/m3	BARRIO LOGAN-ALLEY	02/11/02	10:18	24.0
Chromium-052	101	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/11/02	8:00	24.0
Chromium-052	5.1	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/12/02	10:00	24.0
Chromium-052	3.6	1	ng/m3	BARRIO LOGAN-ALLEY	02/12/02	10:21	24.0
Chromium-052	40	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/12/02	8:00	24.0
Chromium-052	4	1	ng/m3	BARRIO LOGAN-ALLEY	02/13/02	10:27	24.0
Chromium-052	4.1	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/14/02	10:07	24.0
Chromium-052	3.3	1	ng/m3	BARRIO LOGAN-ALLEY	02/14/02	10:29	24.0
Chromium-052	497	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/14/02	7:00	24.0
Chromium-052	5.3	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/15/02	10:10	24.0
Chromium-052	3.6	1	ng/m3	BARRIO LOGAN-ALLEY	02/15/02	10:31	24.0
Chromium-052	403	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/15/02	8:00	24.0
Chromium-052	3.6	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/16/02	10:12	24.0
Chromium-052	2.6	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/17/02	10:49	24.0
Chromium-052	2.2	1	ng/m3	BARRIO LOGAN-ALLEY	02/17/02	11:04	24.0
Chromium-052	3	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/18/02	11:01	24.0
Chromium-052	2.7	1	ng/m3	BARRIO LOGAN-ALLEY	02/18/02	11:19	8.3
Chromium-052	3.6	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/19/02	11:06	24.0
Chromium-052	4.4	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/20/02	11:19	24.0
Chromium-052	4.6	1	ng/m3	BARRIO LOGAN-ALLEY	02/20/02	11:33	8.3
Chromium-052	43	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/20/02	7:00	24.0
Chromium-052	7.9	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/21/02	11:25	24.0
Chromium-052	5.6	1	ng/m3	BARRIO LOGAN-ALLEY	02/21/02	11:42	8.3
Chromium-052	488	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/21/02	7:00	24.0
Chromium-052	7	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/22/02	11:33	24.0
Chromium-052	5.2	1	ng/m3	BARRIO LOGAN-ALLEY	02/22/02	11:53	8.3
Chromium-052	501	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/22/02	7:00	24.0
Chromium-052	4.3	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/23/02	11:46	24.0
Chromium-052	3.3	1	ng/m3	BARRIO LOGAN-ALLEY	02/23/02	12:00	8.3
Chromium-052	4.8	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/24/02	11:49	24.0
Chromium-052	4.2	1	ng/m3	BARRIO LOGAN-ALLEY	02/24/02	12:03	24.0
Chromium-052	6.2	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/25/02	11:56	8.3
Chromium-052	5.4	1	ng/m3	BARRIO LOGAN-ALLEY	02/25/02	12:08	24.0
Chromium-052	79	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/25/02	7:00	24.0
Chromium-052	8.2	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/26/02	11:59	8.3
Chromium-052	10	1	ng/m3	BARRIO LOGAN-ALLEY	02/26/02	12:43	24.0
Chromium-052	34	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/26/02	7:00	24.0
Chromium-052	4	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/27/02	12:01	8.0
Chromium-052	3.4	1	ng/m3	BARRIO LOGAN-ALLEY	02/27/02	12:45	24.0
Chromium-052	797	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/27/02	7:00	24.0
Chromium-052	5.2	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/28/02	12:04	8.0

Barrio Logan IV Total Metals Sampling
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Sampled 02/05/02 through 03/08/02

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Chromium-052	2.2	1	ng/m3	BARRIO LOGAN-ALLEY	02/28/02	12:47	24.0
Chromium-052	942	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/28/02	10:15	24.0
Chromium-052	5.2	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/01/02	12:08	8.0
Chromium-052	3.7	1	ng/m3	BARRIO LOGAN-ALLEY	03/01/02	12:49	24.0
Chromium-052	930	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/01/02	7:01	24.0
Chromium-052	3.1	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/02/02	12:11	8.0
Chromium-052	2.8	1	ng/m3	BARRIO LOGAN-ALLEY	03/02/02	12:51	24.0
Chromium-052	7.7	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/03/02	12:15	24.0
Chromium-052	4	1	ng/m3	BARRIO LOGAN-ALLEY	03/03/02	12:56	8.0
Chromium-052	5.6	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/04/02	12:24	24.0
Chromium-052	3.9	1	ng/m3	BARRIO LOGAN-ALLEY	03/04/02	13:01	24.0
Chromium-052	436	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/04/02	7:00	8.0
Chromium-052	3.6	1	ng/m3	BARRIO LOGAN-ALLEY	03/05/02	12:29	24.0
Chromium-052	2.9	1	ng/m3	BARRIO LOGAN-ALLEY	03/05/02	13:05	24.0
Chromium-052	146	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/05/02	7:00	8.0
Chromium-052	5	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/06/02	12:50	24.0
Chromium-052	4	1	ng/m3	BARRIO LOGAN-ALLEY	03/06/02	13:09	24.0
Chromium-052	3.2	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/07/02	12:57	24.0
Chromium-052	2.6	1	ng/m3	BARRIO LOGAN-ALLEY	03/07/02	13:16	24.0
Chromium-052	416	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/07/02	7:01	24.0
Chromium-052	3.7	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/08/02	13:00	24.0
Chromium-052	3.6	1	ng/m3	BARRIO LOGAN-ALLEY	03/08/02	13:20	24.0
Chromium-052	404	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/08/02	7:01	24.0
Copper-063	65	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/05/02	8:45	24.0
Copper-063	72	1	ng/m3	BARRIO LOGAN-ALLEY	02/05/02	9:10	24.0
Copper-063	84	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/06/02	9:06	24.0
Copper-063	32	1	ng/m3	BARRIO LOGAN-ALLEY	02/06/02	9:28	24.0
Copper-063	52	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/07/02	9:34	24.0
Copper-063	28	1	ng/m3	BARRIO LOGAN-ALLEY	02/07/02	9:54	24.0
Copper-063	6327	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/07/02	8:00	24.0
Copper-063	41	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/08/02	9:40	24.0
Copper-063	29	1	ng/m3	BARRIO LOGAN-ALLEY	02/08/02	9:58	24.0
Copper-063	5066	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/08/02	8:00	24.0
Copper-063	26	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/09/02	9:45	24.0
Copper-063	27	1	ng/m3	BARRIO LOGAN-ALLEY	02/09/02	10:11	24.0
Copper-063	45	1	ng/m3	BARRIO LOGAN-ALLEY	02/10/02	10:12	24.0
Copper-063	48	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/11/02	9:55	24.0
Copper-063	31	1	ng/m3	BARRIO LOGAN-ALLEY	02/11/02	10:18	24.0
Copper-063	2202	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/11/02	8:00	8.0
Copper-063	47	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/12/02	10:00	24.0
Copper-063	32	1	ng/m3	BARRIO LOGAN-ALLEY	02/12/02	10:21	24.0
Copper-063	895	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/12/02	8:00	8.0
Copper-063	27	1	ng/m3	BARRIO LOGAN-ALLEY	02/13/02	10:27	24.0
Copper-063	40	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/14/02	10:07	24.0
Copper-063	30	1	ng/m3	BARRIO LOGAN-ALLEY	02/14/02	10:29	8.0
Copper-063	8764	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/14/02	7:00	24.0
Copper-063	47	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/15/02	10:10	24.0
Copper-063	25	1	ng/m3	BARRIO LOGAN-ALLEY	02/15/02	10:31	8.0
Copper-063	6062	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/15/02	8:00	24.0
Copper-063	14	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/16/02	10:12	24.0
Copper-063	11	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/17/02	10:49	8.0
Copper-063	6.6	1	ng/m3	BARRIO LOGAN-ALLEY	02/17/02	11:04	24.0
Copper-063	24	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/18/02	11:01	24.0
Copper-063	22	1	ng/m3	BARRIO LOGAN-ALLEY	02/18/02	11:19	8.0
Copper-063	31	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/19/02	11:06	24.0
Copper-063	76	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/20/02	11:19	24.0

Barrio Logan IV Total Metals Sampling
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Copper-063	55	1	ng/m3	BARRIO LOGAN-ALLEY	02/20/02	11:33	8.0
Copper-063	1633	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/20/02	7:00	24.0
Copper-063	136	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/21/02	11:25	24.0
Copper-063	67	1	ng/m3	BARRIO LOGAN-ALLEY	02/21/02	11:42	8.0
Copper-063	7162	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/21/02	7:00	24.0
Copper-063	62	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/22/02	11:33	24.0
Copper-063	49	1	ng/m3	BARRIO LOGAN-ALLEY	02/22/02	11:53	8.0
Copper-063	5543	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/22/02	7:00	24.0
Copper-063	17	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/23/02	11:46	24.0
Copper-063	13	1	ng/m3	BARRIO LOGAN-ALLEY	02/23/02	12:00	8.0
Copper-063	39	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/24/02	11:49	24.0
Copper-063	28	1	ng/m3	BARRIO LOGAN-ALLEY	02/24/02	12:03	24.0
Copper-063	137	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/25/02	11:56	8.0
Copper-063	63	1	ng/m3	BARRIO LOGAN-ALLEY	02/25/02	12:08	24.0
Copper-063	8417	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/25/02	7:00	24.0
Copper-063	80	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/26/02	11:59	8.0
Copper-063	45	1	ng/m3	BARRIO LOGAN-ALLEY	02/26/02	12:43	24.0
Copper-063	17206	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/26/02	7:00	24.0
Copper-063	25	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/27/02	12:01	8.0
Copper-063	17	1	ng/m3	BARRIO LOGAN-ALLEY	02/27/02	12:45	24.0
Copper-063	5539	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/27/02	7:00	24.0
Copper-063	38	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/28/02	12:04	8.0
Copper-063	9.8	1	ng/m3	BARRIO LOGAN-ALLEY	02/28/02	12:47	24.0
Copper-063	8742	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/28/02	10:15	24.0
Copper-063	34	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/01/02	12:08	24.0
Copper-063	32	1	ng/m3	BARRIO LOGAN-ALLEY	03/01/02	12:49	24.0
Copper-063	6626	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/01/02	7:01	24.0
Copper-063	26	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/02/02	12:11	24.0
Copper-063	14	1	ng/m3	BARRIO LOGAN-ALLEY	03/02/02	12:51	24.0
Copper-063	90	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/03/02	12:15	24.0
Copper-063	40	1	ng/m3	BARRIO LOGAN-ALLEY	03/03/02	12:56	24.0
Copper-063	52	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/04/02	12:24	8.0
Copper-063	55	1	ng/m3	BARRIO LOGAN-ALLEY	03/04/02	13:01	24.0
Copper-063	7011	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/04/02	7:00	24.0
Copper-063	45	1	ng/m3	BARRIO LOGAN-ALLEY	03/05/02	12:29	8.0
Copper-063	29	1	ng/m3	BARRIO LOGAN-ALLEY	03/05/02	13:05	24.0
Copper-063	2365	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/05/02	7:00	24.0
Copper-063	46	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/06/02	12:50	8.0
Copper-063	23	1	ng/m3	BARRIO LOGAN-ALLEY	03/06/02	13:09	24.0
Copper-063	90	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/07/02	12:57	24.0
Copper-063	42	1	ng/m3	BARRIO LOGAN-ALLEY	03/07/02	13:16	8.0
Copper-063	13947	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/07/02	7:01	24.0
Copper-063	23	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/08/02	13:00	24.0
Copper-063	21	1	ng/m3	BARRIO LOGAN-ALLEY	03/08/02	13:20	8.0
Copper-063	12045	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/08/02	7:01	24.0
Iron-057	1621	5	ng/m3	BARRIO LOGAN-2121 NEWTON	02/05/02	8:45	24.0
Iron-057	1552	5	ng/m3	BARRIO LOGAN-ALLEY	02/05/02	9:10	8.0
Iron-057	783	5	ng/m3	BARRIO LOGAN-2121 NEWTON	02/06/02	9:06	24.0
Iron-057	649	5	ng/m3	BARRIO LOGAN-ALLEY	02/06/02	9:28	24.0
Iron-057	633	5	ng/m3	BARRIO LOGAN-2121 NEWTON	02/07/02	9:34	8.0
Iron-057	657	5	ng/m3	BARRIO LOGAN-ALLEY	02/07/02	9:54	24.0
Iron-057	5699	5	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/07/02	8:00	24.0
Iron-057	661	5	ng/m3	BARRIO LOGAN-2121 NEWTON	02/08/02	9:40	8.0
Iron-057	641	5	ng/m3	BARRIO LOGAN-ALLEY	02/08/02	9:58	24.0
Iron-057	7958	5	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/08/02	8:00	24.0
Iron-057	1886	5	ng/m3	BARRIO LOGAN-2121 NEWTON	02/09/02	9:45	8.0

Barrio Logan IV Total Metals Sampling
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Iron-057	1910	5	ng/m3	BARRIO LOGAN-ALLEY	02/09/02	10:11	24.0
Iron-057	1111	5	ng/m3	BARRIO LOGAN-ALLEY	02/10/02	10:12	24.0
Iron-057	1129	5	ng/m3	BARRIO LOGAN-2121 NEWTON	02/11/02	9:55	8.0
Iron-057	906	5	ng/m3	BARRIO LOGAN-ALLEY	02/11/02	10:18	24.0
Iron-057	11886	5	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/11/02	8:00	24.0
Iron-057	1026	5	ng/m3	BARRIO LOGAN-2121 NEWTON	02/12/02	10:00	8.0
Iron-057	762	5	ng/m3	BARRIO LOGAN-ALLEY	02/12/02	10:21	24.0
Iron-057	10092	5	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/12/02	8:00	24.0
Iron-057	638	5	ng/m3	BARRIO LOGAN-ALLEY	02/13/02	10:27	8.0
Iron-057	796	5	ng/m3	BARRIO LOGAN-2121 NEWTON	02/14/02	10:07	24.0
Iron-057	719	5	ng/m3	BARRIO LOGAN-ALLEY	02/14/02	10:29	24.0
Iron-057	12823	5	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/14/02	7:00	8.0
Iron-057	647	5	ng/m3	BARRIO LOGAN-2121 NEWTON	02/15/02	10:10	24.0
Iron-057	575	5	ng/m3	BARRIO LOGAN-ALLEY	02/15/02	10:31	24.0
Iron-057	8122	5	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/15/02	8:00	8.0
Iron-057	418	5	ng/m3	BARRIO LOGAN-2121 NEWTON	02/16/02	10:12	24.0
Iron-057	256	5	ng/m3	BARRIO LOGAN-2121 NEWTON	02/17/02	10:49	24.0
Iron-057	149	5	ng/m3	BARRIO LOGAN-ALLEY	02/17/02	11:04	24.0
Iron-057	529	5	ng/m3	BARRIO LOGAN-2121 NEWTON	02/18/02	11:01	24.0
Iron-057	460	5	ng/m3	BARRIO LOGAN-ALLEY	02/18/02	11:19	24.0
Iron-057	732	5	ng/m3	BARRIO LOGAN-2121 NEWTON	02/19/02	11:06	24.0
Iron-057	995	5	ng/m3	BARRIO LOGAN-2121 NEWTON	02/20/02	11:19	24.0
Iron-057	1086	5	ng/m3	BARRIO LOGAN-ALLEY	02/20/02	11:33	24.0
Iron-057	7799	5	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/20/02	7:00	24.0
Iron-057	1882	5	ng/m3	BARRIO LOGAN-2121 NEWTON	02/21/02	11:25	24.0
Iron-057	1834	5	ng/m3	BARRIO LOGAN-ALLEY	02/21/02	11:42	24.0
Iron-057	17228	5	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/21/02	7:00	24.0
Iron-057	1716	5	ng/m3	BARRIO LOGAN-2121 NEWTON	02/22/02	11:33	24.0
Iron-057	1548	5	ng/m3	BARRIO LOGAN-ALLEY	02/22/02	11:53	24.0
Iron-057	14028	5	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/22/02	7:00	24.0
Iron-057	333	5	ng/m3	BARRIO LOGAN-2121 NEWTON	02/23/02	11:46	24.0
Iron-057	241	5	ng/m3	BARRIO LOGAN-ALLEY	02/23/02	12:00	24.0
Iron-057	706	5	ng/m3	BARRIO LOGAN-2121 NEWTON	02/24/02	11:49	24.0
Iron-057	519	5	ng/m3	BARRIO LOGAN-ALLEY	02/24/02	12:03	24.0
Iron-057	1257	5	ng/m3	BARRIO LOGAN-2121 NEWTON	02/25/02	11:56	24.0
Iron-057	1181	5	ng/m3	BARRIO LOGAN-ALLEY	02/25/02	12:08	24.0
Iron-057	8371	5	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/25/02	7:00	24.0
Iron-057	997	5	ng/m3	BARRIO LOGAN-2121 NEWTON	02/26/02	11:59	24.0
Iron-057	876	5	ng/m3	BARRIO LOGAN-ALLEY	02/26/02	12:43	24.0
Iron-057	14723	5	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/26/02	7:00	24.0
Iron-057	350	5	ng/m3	BARRIO LOGAN-2121 NEWTON	02/27/02	12:01	24.0
Iron-057	424	5	ng/m3	BARRIO LOGAN-ALLEY	02/27/02	12:45	24.0
Iron-057	25155	5	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/27/02	7:00	24.0
Iron-057	289	5	ng/m3	BARRIO LOGAN-2121 NEWTON	02/28/02	12:04	24.0
Iron-057	223	5	ng/m3	BARRIO LOGAN-ALLEY	02/28/02	12:47	24.0
Iron-057	12271	5	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/28/02	10:15	24.0
Iron-057	804	5	ng/m3	BARRIO LOGAN-2121 NEWTON	03/01/02	12:08	24.0
Iron-057	630	5	ng/m3	BARRIO LOGAN-ALLEY	03/01/02	12:49	24.0
Iron-057	10340	5	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/01/02	7:01	24.0
Iron-057	671	5	ng/m3	BARRIO LOGAN-2121 NEWTON	03/02/02	12:11	24.0
Iron-057	499	5	ng/m3	BARRIO LOGAN-ALLEY	03/02/02	12:51	24.0
Iron-057	1228	5	ng/m3	BARRIO LOGAN-2121 NEWTON	03/03/02	12:15	24.0
Iron-057	947	5	ng/m3	BARRIO LOGAN-ALLEY	03/03/02	12:56	24.0
Iron-057	1348	5	ng/m3	BARRIO LOGAN-2121 NEWTON	03/04/02	12:24	24.0
Iron-057	1130	5	ng/m3	BARRIO LOGAN-ALLEY	03/04/02	13:01	24.0
Iron-057	30432	5	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/04/02	7:00	24.0
Iron-057	760	5	ng/m3	BARRIO LOGAN-ALLEY	03/05/02	12:29	24.0

Barrio Logan IV Total Metals Sampling
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Iron-057	735	5	ng/m3	BARRIO LOGAN-ALLEY	03/05/02	13:05	24.0
Iron-057	10128	5	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/05/02	7:00	24.0
Iron-057	414	5	ng/m3	BARRIO LOGAN-2121 NEWTON	03/06/02	12:50	7.4
Iron-057	400	5	ng/m3	BARRIO LOGAN-ALLEY	03/06/02	13:09	24.0
Iron-057	157	5	ng/m3	BARRIO LOGAN-2121 NEWTON	03/07/02	12:57	24.0
Iron-057	161	5	ng/m3	BARRIO LOGAN-ALLEY	03/07/02	13:16	7.4
Iron-057	15357	5	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/07/02	7:01	24.0
Iron-057	669	5	ng/m3	BARRIO LOGAN-2121 NEWTON	03/08/02	13:00	24.0
Iron-057	650	5	ng/m3	BARRIO LOGAN-ALLEY	03/08/02	13:20	7.4
Iron-057	12597	5	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/08/02	7:01	24.0
Lead-208	31	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/05/02	8:45	24.0
Lead-208	30	1	ng/m3	BARRIO LOGAN-ALLEY	02/05/02	9:10	7.4
Lead-208	24	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/06/02	9:06	24.0
Lead-208	20	1	ng/m3	BARRIO LOGAN-ALLEY	02/06/02	9:28	24.0
Lead-208	12	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/07/02	9:34	7.4
Lead-208	11	1	ng/m3	BARRIO LOGAN-ALLEY	02/07/02	9:54	24.0
Lead-208	25	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/07/02	8:00	24.0
Lead-208	12	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/08/02	9:40	7.4
Lead-208	11	1	ng/m3	BARRIO LOGAN-ALLEY	02/08/02	9:58	24.0
Lead-208	67	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/08/02	8:00	24.0
Lead-208	18	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/09/02	9:45	7.4
Lead-208	19	1	ng/m3	BARRIO LOGAN-ALLEY	02/09/02	10:11	24.0
Lead-208	14	1	ng/m3	BARRIO LOGAN-ALLEY	02/10/02	10:12	24.0
Lead-208	19	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/11/02	9:55	8.0
Lead-208	14	1	ng/m3	BARRIO LOGAN-ALLEY	02/11/02	10:18	24.0
Lead-208	127	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/11/02	8:00	24.0
Lead-208	18	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/12/02	10:00	8.0
Lead-208	13	1	ng/m3	BARRIO LOGAN-ALLEY	02/12/02	10:21	24.0
Lead-208	47	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/12/02	8:00	24.0
Lead-208	10	1	ng/m3	BARRIO LOGAN-ALLEY	02/13/02	10:27	8.0
Lead-208	12	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/14/02	10:07	24.0
Lead-208	11	1	ng/m3	BARRIO LOGAN-ALLEY	02/14/02	10:29	24.0
Lead-208	74	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/14/02	7:00	8.0
Lead-208	11	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/15/02	10:10	24.0
Lead-208	8.7	1	ng/m3	BARRIO LOGAN-ALLEY	02/15/02	10:31	24.0
Lead-208	129	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/15/02	8:00	8.0
Lead-208	7.3	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/16/02	10:12	24.0
Lead-208	4	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/17/02	10:49	24.0
Lead-208	1.9	1	ng/m3	BARRIO LOGAN-ALLEY	02/17/02	11:04	8.0
Lead-208	6.8	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/18/02	11:01	24.0
Lead-208	5.8	1	ng/m3	BARRIO LOGAN-ALLEY	02/18/02	11:19	24.0
Lead-208	11	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/19/02	11:06	8.0
Lead-208	14	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/20/02	11:19	24.0
Lead-208	12	1	ng/m3	BARRIO LOGAN-ALLEY	02/20/02	11:33	24.0
Lead-208	156	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/20/02	7:00	8.0
Lead-208	21	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/21/02	11:25	24.0
Lead-208	19	1	ng/m3	BARRIO LOGAN-ALLEY	02/21/02	11:42	24.0
Lead-208	66	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/21/02	7:00	8.0
Lead-208	41	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/22/02	11:33	24.0
Lead-208	31	1	ng/m3	BARRIO LOGAN-ALLEY	02/22/02	11:53	24.0
Lead-208	47	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/22/02	7:00	8.0
Lead-208	19	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/23/02	11:46	24.0
Lead-208	13	1	ng/m3	BARRIO LOGAN-ALLEY	02/23/02	12:00	24.0
Lead-208	20	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/24/02	11:49	8.0
Lead-208	13	1	ng/m3	BARRIO LOGAN-ALLEY	02/24/02	12:03	24.0
Lead-208	40	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/25/02	11:56	24.0

Barrio Logan IV Total Metals Sampling
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Lead-208	22	1	ng/m3	BARRIO LOGAN-ALLEY	02/25/02	12:08	8.0
Lead-208	1349	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/25/02	7:00	24.0
Lead-208	38	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/26/02	11:59	24.0
Lead-208	37	1	ng/m3	BARRIO LOGAN-ALLEY	02/26/02	12:43	8.0
Lead-208	3451	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/26/02	7:00	24.0
Lead-208	14	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/27/02	12:01	24.0
Lead-208	13	1	ng/m3	BARRIO LOGAN-ALLEY	02/27/02	12:45	8.0
Lead-208	214	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/27/02	7:00	24.0
Lead-208	7.3	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/28/02	12:04	24.0
Lead-208	4.8	1	ng/m3	BARRIO LOGAN-ALLEY	02/28/02	12:47	24.0
Lead-208	73	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/28/02	10:15	24.0
Lead-208	9.8	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/01/02	12:08	24.0
Lead-208	7.6	1	ng/m3	BARRIO LOGAN-ALLEY	03/01/02	12:49	24.0
Lead-208	47	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/01/02	7:01	24.0
Lead-208	14	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/02/02	12:11	24.0
Lead-208	9.8	1	ng/m3	BARRIO LOGAN-ALLEY	03/02/02	12:51	24.0
Lead-208	24	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/03/02	12:15	24.0
Lead-208	14	1	ng/m3	BARRIO LOGAN-ALLEY	03/03/02	12:56	24.0
Lead-208	28	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/04/02	12:24	24.0
Lead-208	23	1	ng/m3	BARRIO LOGAN-ALLEY	03/04/02	13:01	24.0
Lead-208	255	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/04/02	7:00	24.0
Lead-208	16	1	ng/m3	BARRIO LOGAN-ALLEY	03/05/02	12:29	24.0
Lead-208	15	1	ng/m3	BARRIO LOGAN-ALLEY	03/05/02	13:05	24.0
Lead-208	477	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/05/02	7:00	24.0
Lead-208	9.9	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/06/02	12:50	24.0
Lead-208	7.2	1	ng/m3	BARRIO LOGAN-ALLEY	03/06/02	13:09	24.0
Lead-208	3.4	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/07/02	12:57	24.0
Lead-208	2.6	1	ng/m3	BARRIO LOGAN-ALLEY	03/07/02	13:16	24.0
Lead-208	253	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/07/02	7:01	24.0
Lead-208	13	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/08/02	13:00	24.0
Lead-208	11	1	ng/m3	BARRIO LOGAN-ALLEY	03/08/02	13:20	24.0
Lead-208	270	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/08/02	7:01	24.0
Manganese-055	77	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/05/02	8:45	24.0
Manganese-055	80	1	ng/m3	BARRIO LOGAN-ALLEY	02/05/02	9:10	24.0
Manganese-055	17	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/06/02	9:06	24.0
Manganese-055	15	1	ng/m3	BARRIO LOGAN-ALLEY	02/06/02	9:28	24.0
Manganese-055	12	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/07/02	9:34	24.0
Manganese-055	15	1	ng/m3	BARRIO LOGAN-ALLEY	02/07/02	9:54	8.0
Manganese-055	23	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/07/02	8:00	24.0
Manganese-055	15	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/08/02	9:40	24.0
Manganese-055	13	1	ng/m3	BARRIO LOGAN-ALLEY	02/08/02	9:58	8.0
Manganese-055	53	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/08/02	8:00	24.0
Manganese-055	60	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/09/02	9:45	24.0
Manganese-055	63	1	ng/m3	BARRIO LOGAN-ALLEY	02/09/02	10:11	8.0
Manganese-055	28	1	ng/m3	BARRIO LOGAN-ALLEY	02/10/02	10:12	24.0
Manganese-055	24	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/11/02	9:55	24.0
Manganese-055	19	1	ng/m3	BARRIO LOGAN-ALLEY	02/11/02	10:18	8.0
Manganese-055	95	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/11/02	8:00	24.0
Manganese-055	30	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/12/02	10:00	24.0
Manganese-055	22	1	ng/m3	BARRIO LOGAN-ALLEY	02/12/02	10:21	8.0
Manganese-055	53	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/12/02	8:00	24.0
Manganese-055	21	1	ng/m3	BARRIO LOGAN-ALLEY	02/13/02	10:27	24.0
Manganese-055	16	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/14/02	10:07	8.0
Manganese-055	13	1	ng/m3	BARRIO LOGAN-ALLEY	02/14/02	10:29	24.0
Manganese-055	35	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/14/02	7:00	24.0
Manganese-055	13	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/15/02	10:10	8.0

Barrio Logan IV Total Metals Sampling
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Manganese-055	11	1	ng/m3	BARRIO LOGAN-ALLEY	02/15/02	10:31	24.0
Manganese-055	28	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/15/02	8:00	24.0
Manganese-055	7.9	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/16/02	10:12	8.0
Manganese-055	4.9	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/17/02	10:49	24.0
Manganese-055	2.8	1	ng/m3	BARRIO LOGAN-ALLEY	02/17/02	11:04	24.0
Manganese-055	10	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/18/02	11:01	8.0
Manganese-055	8.6	1	ng/m3	BARRIO LOGAN-ALLEY	02/18/02	11:19	24.0
Manganese-055	16	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/19/02	11:06	24.0
Manganese-055	21	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/20/02	11:19	8.0
Manganese-055	22	1	ng/m3	BARRIO LOGAN-ALLEY	02/20/02	11:33	24.0
Manganese-055	55	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/20/02	7:00	24.0
Manganese-055	54	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/21/02	11:25	8.0
Manganese-055	59	1	ng/m3	BARRIO LOGAN-ALLEY	02/21/02	11:42	24.0
Manganese-055	70	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/21/02	7:00	24.0
Manganese-055	38	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/22/02	11:33	8.0
Manganese-055	35	1	ng/m3	BARRIO LOGAN-ALLEY	02/22/02	11:53	24.0
Manganese-055	66	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/22/02	7:00	24.0
Manganese-055	10	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/23/02	11:46	8.0
Manganese-055	6.4	1	ng/m3	BARRIO LOGAN-ALLEY	02/23/02	12:00	24.0
Manganese-055	18	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/24/02	11:49	24.0
Manganese-055	12	1	ng/m3	BARRIO LOGAN-ALLEY	02/24/02	12:03	8.0
Manganese-055	39	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/25/02	11:56	24.0
Manganese-055	37	1	ng/m3	BARRIO LOGAN-ALLEY	02/25/02	12:08	24.0
Manganese-055	63	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/25/02	7:00	8.0
Manganese-055	44	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/26/02	11:59	24.0
Manganese-055	40	1	ng/m3	BARRIO LOGAN-ALLEY	02/26/02	12:43	24.0
Manganese-055	182	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/26/02	7:00	8.0
Manganese-055	9.6	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/27/02	12:01	24.0
Manganese-055	12	1	ng/m3	BARRIO LOGAN-ALLEY	02/27/02	12:45	24.0
Manganese-055	186	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/27/02	7:00	8.0
Manganese-055	11	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/28/02	12:04	24.0
Manganese-055	8.4	1	ng/m3	BARRIO LOGAN-ALLEY	02/28/02	12:47	24.0
Manganese-055	103	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/28/02	10:15	8.0
Manganese-055	30	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/01/02	12:08	24.0
Manganese-055	28	1	ng/m3	BARRIO LOGAN-ALLEY	03/01/02	12:49	24.0
Manganese-055	58	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/01/02	7:01	8.0
Manganese-055	23	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/02/02	12:11	24.0
Manganese-055	17	1	ng/m3	BARRIO LOGAN-ALLEY	03/02/02	12:51	24.0
Manganese-055	33	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/03/02	12:15	8.0
Manganese-055	22	1	ng/m3	BARRIO LOGAN-ALLEY	03/03/02	12:56	24.0
Manganese-055	37	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/04/02	12:24	24.0
Manganese-055	34	1	ng/m3	BARRIO LOGAN-ALLEY	03/04/02	13:01	8.0
Manganese-055	178	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/04/02	7:00	24.0
Manganese-055	20	1	ng/m3	BARRIO LOGAN-ALLEY	03/05/02	12:29	24.0
Manganese-055	21	1	ng/m3	BARRIO LOGAN-ALLEY	03/05/02	13:05	4.8
Manganese-055	72	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/05/02	7:00	24.0
Manganese-055	9.8	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/06/02	12:50	24.0
Manganese-055	10	1	ng/m3	BARRIO LOGAN-ALLEY	03/06/02	13:09	4.8
Manganese-055	4	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/07/02	12:57	24.0
Manganese-055	7.2	1	ng/m3	BARRIO LOGAN-ALLEY	03/07/02	13:16	24.0
Manganese-055	65	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/07/02	7:01	4.8
Manganese-055	15	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/08/02	13:00	24.0
Manganese-055	15	1	ng/m3	BARRIO LOGAN-ALLEY	03/08/02	13:20	24.0
Manganese-055	68	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/08/02	7:01	4.8
Nickel-058	20	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/05/02	8:45	24.0
Nickel-058	25	1	ng/m3	BARRIO LOGAN-ALLEY	02/05/02	9:10	24.0

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Nickel-058	20	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/06/02	9:06	4.8
Nickel-058	13	1	ng/m3	BARRIO LOGAN-ALLEY	02/06/02	9:28	24.0
Nickel-058	12	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/07/02	9:34	24.0
Nickel-058	12	1	ng/m3	BARRIO LOGAN-ALLEY	02/07/02	9:54	4.8
Nickel-058	508	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/07/02	8:00	24.0
Nickel-058	11	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/08/02	9:40	24.0
Nickel-058	10	1	ng/m3	BARRIO LOGAN-ALLEY	02/08/02	9:58	4.8
Nickel-058	1006	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/08/02	8:00	24.0
Nickel-058	17	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/09/02	9:45	24.0
Nickel-058	18	1	ng/m3	BARRIO LOGAN-ALLEY	02/09/02	10:11	8.0
Nickel-058	17	1	ng/m3	BARRIO LOGAN-ALLEY	02/10/02	10:12	24.0
Nickel-058	15	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/11/02	9:55	24.0
Nickel-058	12	1	ng/m3	BARRIO LOGAN-ALLEY	02/11/02	10:18	8.0
Nickel-058	717	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/11/02	8:00	24.0
Nickel-058	19	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/12/02	10:00	24.0
Nickel-058	16	1	ng/m3	BARRIO LOGAN-ALLEY	02/12/02	10:21	8.0
Nickel-058	253	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/12/02	8:00	24.0
Nickel-058	13	1	ng/m3	BARRIO LOGAN-ALLEY	02/13/02	10:27	24.0
Nickel-058	13	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/14/02	10:07	8.0
Nickel-058	11	1	ng/m3	BARRIO LOGAN-ALLEY	02/14/02	10:29	24.0
Nickel-058	672	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/14/02	7:00	24.0
Nickel-058	13	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/15/02	10:10	8.0
Nickel-058	11	1	ng/m3	BARRIO LOGAN-ALLEY	02/15/02	10:31	24.0
Nickel-058	846	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/15/02	8:00	24.0
Nickel-058	8.2	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/16/02	10:12	8.0
Nickel-058	3.7	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/17/02	10:49	24.0
Nickel-058	2.7	1	ng/m3	BARRIO LOGAN-ALLEY	02/17/02	11:04	24.0
Nickel-058	7.3	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/18/02	11:01	8.0
Nickel-058	6.8	1	ng/m3	BARRIO LOGAN-ALLEY	02/18/02	11:19	24.0
Nickel-058	11	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/19/02	11:06	24.0
Nickel-058	15	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/20/02	11:19	24.0
Nickel-058	18	1	ng/m3	BARRIO LOGAN-ALLEY	02/20/02	11:33	24.0
Nickel-058	375	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/20/02	7:00	24.0
Nickel-058	32	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/21/02	11:25	24.0
Nickel-058	23	1	ng/m3	BARRIO LOGAN-ALLEY	02/21/02	11:42	24.0
Nickel-058	760	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/21/02	7:00	24.0
Nickel-058	19	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/22/02	11:33	24.0
Nickel-058	17	1	ng/m3	BARRIO LOGAN-ALLEY	02/22/02	11:53	24.0
Nickel-058	517	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/22/02	7:00	24.0
Nickel-058	7.3	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/23/02	11:46	24.0
Nickel-058	6.2	1	ng/m3	BARRIO LOGAN-ALLEY	02/23/02	12:00	24.0
Nickel-058	10	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/24/02	11:49	24.0
Nickel-058	9.1	1	ng/m3	BARRIO LOGAN-ALLEY	02/24/02	12:03	24.0
Nickel-058	21	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/25/02	11:56	24.0
Nickel-058	16	1	ng/m3	BARRIO LOGAN-ALLEY	02/25/02	12:08	24.0
Nickel-058	461	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/25/02	7:00	24.0
Nickel-058	23	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/26/02	11:59	24.0
Nickel-058	23	1	ng/m3	BARRIO LOGAN-ALLEY	02/26/02	12:43	24.0
Nickel-058	464	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/26/02	7:00	24.0
Nickel-058	13	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/27/02	12:01	24.0
Nickel-058	14	1	ng/m3	BARRIO LOGAN-ALLEY	02/27/02	12:45	24.0
Nickel-058	1422	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/27/02	7:00	24.0
Nickel-058	9.9	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/28/02	12:04	24.0
Nickel-058	4.6	1	ng/m3	BARRIO LOGAN-ALLEY	02/28/02	12:47	24.0
Nickel-058	2323	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/28/02	10:15	24.0
Nickel-058	11	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/01/02	12:08	24.0
Nickel-058	7.8	1	ng/m3	BARRIO LOGAN-ALLEY	03/01/02	12:49	24.0

Barrio Logan IV Total Metals Sampling
Analysis by ICP-MS

Sampled 02/05/02 through 03/08/02

All Results have been Approved by MLD
Sorted by Element/Sampling Date

Nickel-058	1023	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/01/02	7:01	24.0
Nickel-058	7.6	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/02/02	12:11	8.0
Nickel-058	5	1	ng/m3	BARRIO LOGAN-ALLEY	03/02/02	12:51	24.0
Nickel-058	23	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/03/02	12:15	24.0
Nickel-058	11	1	ng/m3	BARRIO LOGAN-ALLEY	03/03/02	12:56	8.0
Nickel-058	16	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/04/02	12:24	24.0
Nickel-058	15	1	ng/m3	BARRIO LOGAN-ALLEY	03/04/02	13:01	24.0
Nickel-058	1648	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/04/02	7:00	8.0
Nickel-058	11	1	ng/m3	BARRIO LOGAN-ALLEY	03/05/02	12:29	24.0
Nickel-058	12	1	ng/m3	BARRIO LOGAN-ALLEY	03/05/02	13:05	24.0
Nickel-058	297	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/05/02	7:00	8.0
Nickel-058	7.8	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/06/02	12:50	24.0
Nickel-058	5.9	1	ng/m3	BARRIO LOGAN-ALLEY	03/06/02	13:09	24.0
Nickel-058	5.1	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/07/02	12:57	8.0
Nickel-058	5.7	1	ng/m3	BARRIO LOGAN-ALLEY	03/07/02	13:16	24.0
Nickel-058	879	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/07/02	7:01	24.0
Nickel-058	7.6	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/08/02	13:00	8.0
Nickel-058	7.3	1	ng/m3	BARRIO LOGAN-ALLEY	03/08/02	13:20	24.0
Nickel-058	876	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/08/02	7:01	24.0
Zinc-064	190	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/05/02	8:45	8.0
Zinc-064	207	1	ng/m3	BARRIO LOGAN-ALLEY	02/05/02	9:10	24.0
Zinc-064	96	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/06/02	9:06	24.0
Zinc-064	69	1	ng/m3	BARRIO LOGAN-ALLEY	02/06/02	9:28	8.1
Zinc-064	65	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/07/02	9:34	24.0
Zinc-064	71	1	ng/m3	BARRIO LOGAN-ALLEY	02/07/02	9:54	24.0
Zinc-064	1448	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/07/02	8:00	8.1
Zinc-064	83	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/08/02	9:40	24.0
Zinc-064	60	1	ng/m3	BARRIO LOGAN-ALLEY	02/08/02	9:58	24.0
Zinc-064	1909	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/08/02	8:00	8.1
Zinc-064	76	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/09/02	9:45	24.0
Zinc-064	77	1	ng/m3	BARRIO LOGAN-ALLEY	02/09/02	10:11	24.0
Zinc-064	103	1	ng/m3	BARRIO LOGAN-ALLEY	02/10/02	10:12	8.1
Zinc-064	119	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/11/02	9:55	24.0
Zinc-064	80	1	ng/m3	BARRIO LOGAN-ALLEY	02/11/02	10:18	24.0
Zinc-064	2849	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/11/02	8:00	8.1
Zinc-064	116	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/12/02	10:00	24.0
Zinc-064	86	1	ng/m3	BARRIO LOGAN-ALLEY	02/12/02	10:21	24.0
Zinc-064	5114	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/12/02	8:00	8.1
Zinc-064	78	1	ng/m3	BARRIO LOGAN-ALLEY	02/13/02	10:27	24.0
Zinc-064	77	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/14/02	10:07	24.0
Zinc-064	72	1	ng/m3	BARRIO LOGAN-ALLEY	02/14/02	10:29	8.1
Zinc-064	1085	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/14/02	7:00	24.0
Zinc-064	67	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/15/02	10:10	24.0
Zinc-064	58	1	ng/m3	BARRIO LOGAN-ALLEY	02/15/02	10:31	24.0
Zinc-064	1504	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/15/02	8:00	24.0
Zinc-064	50	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/16/02	10:12	24.0
Zinc-064	25	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/17/02	10:49	24.0
Zinc-064	19	1	ng/m3	BARRIO LOGAN-ALLEY	02/17/02	11:04	24.0
Zinc-064	78	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/18/02	11:01	24.0
Zinc-064	74	1	ng/m3	BARRIO LOGAN-ALLEY	02/18/02	11:19	24.0
Zinc-064	86	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/19/02	11:06	24.0
Zinc-064	104	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/20/02	11:19	24.0
Zinc-064	142	1	ng/m3	BARRIO LOGAN-ALLEY	02/20/02	11:33	24.0
Zinc-064	3918	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/20/02	7:00	24.0
Zinc-064	215	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/21/02	11:25	24.0
Zinc-064	185	1	ng/m3	BARRIO LOGAN-ALLEY	02/21/02	11:42	24.0

Barrio Logan IV Total Metals Sampling
Analysis by ICP-MS

Sampled 02/05/02 through 03/08/02

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Zinc-064	1623	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/21/02	7:00	24.0
Zinc-064	141	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/22/02	11:33	8.1
Zinc-064	129	1	ng/m3	BARRIO LOGAN-ALLEY	02/22/02	11:53	24.0
Zinc-064	1237	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/22/02	7:00	24.0
Zinc-064	89	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/23/02	11:46	8.1
Zinc-064	70	1	ng/m3	BARRIO LOGAN-ALLEY	02/23/02	12:00	24.0
Zinc-064	79	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/24/02	11:49	24.0
Zinc-064	59	1	ng/m3	BARRIO LOGAN-ALLEY	02/24/02	12:03	8.1
Zinc-064	165	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/25/02	11:56	24.0
Zinc-064	134	1	ng/m3	BARRIO LOGAN-ALLEY	02/25/02	12:08	24.0
Zinc-064	3100	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/25/02	7:00	8.1
Zinc-064	142	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/26/02	11:59	24.0
Zinc-064	114	1	ng/m3	BARRIO LOGAN-ALLEY	02/26/02	12:43	24.0
Zinc-064	9513	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/26/02	7:00	8.1
Zinc-064	56	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/27/02	12:01	24.0
Zinc-064	65	1	ng/m3	BARRIO LOGAN-ALLEY	02/27/02	12:45	24.0
Zinc-064	1354	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/27/02	7:00	8.1
Zinc-064	55	1	ng/m3	BARRIO LOGAN-2121 NEWTON	02/28/02	12:04	24.0
Zinc-064	44	1	ng/m3	BARRIO LOGAN-ALLEY	02/28/02	12:47	24.0
Zinc-064	3446	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	02/28/02	10:15	8.1
Zinc-064	57	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/01/02	12:08	24.0
Zinc-064	58	1	ng/m3	BARRIO LOGAN-ALLEY	03/01/02	12:49	24.0
Zinc-064	3289	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/01/02	7:01	8.0
Zinc-064	114	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/02/02	12:11	24.0
Zinc-064	79	1	ng/m3	BARRIO LOGAN-ALLEY	03/02/02	12:51	24.0
Zinc-064	143	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/03/02	12:15	8.0
Zinc-064	80	1	ng/m3	BARRIO LOGAN-ALLEY	03/03/02	12:56	24.0
Zinc-064	140	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/04/02	12:24	24.0
Zinc-064	116	1	ng/m3	BARRIO LOGAN-ALLEY	03/04/02	13:01	8.0
Zinc-064	7310	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/04/02	7:00	24.0
Zinc-064	68	1	ng/m3	BARRIO LOGAN-ALLEY	03/05/02	12:29	24.0
Zinc-064	72	1	ng/m3	BARRIO LOGAN-ALLEY	03/05/02	13:05	8.0
Zinc-064	2687	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/05/02	7:00	24.0
Zinc-064	52	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/06/02	12:50	24.0
Zinc-064	44	1	ng/m3	BARRIO LOGAN-ALLEY	03/06/02	13:09	8.0
Zinc-064	32	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/07/02	12:57	24.0
Zinc-064	33	1	ng/m3	BARRIO LOGAN-ALLEY	03/07/02	13:16	24.0
Zinc-064	2158	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/07/02	7:01	8.0
Zinc-064	55	1	ng/m3	BARRIO LOGAN-2121 NEWTON	03/08/02	13:00	24.0
Zinc-064	48	1	ng/m3	BARRIO LOGAN-ALLEY	03/08/02	13:20	24.0
Zinc-064	3073	1	ng/m3	BARRIO LOGAN-MPIEXT-8 HOUR	03/08/02	7:01	8.0

Barrio Logan IV-A Total Metals Sampling
Analysis by ICP-MS

Sampled March 11 - 24, 2002

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Iron-057	96	5	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/16/02	0:00	23.0
Iron-057	104	5	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/17/02	8:00	23.0
Iron-057	95	5	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/17/02	8:00	23.0
Iron-057	440	5	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/18/02	8:00	23.0
Iron-057	715	5	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/19/02	8:00	23.0
Iron-057	877	5	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/20/02	8:00	23.0
Iron-057	608	5	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/21/02	8:00	23.0
Iron-057	640	5	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/21/02	8:00	23.0
Iron-057	96	5	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/23/02	8:00	23.0
Iron-057	69	5	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/23/02	8:00	23.0
Iron-057	153	5	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/24/02	8:00	23.0
Iron-057	150	5	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/24/02	8:00	23.0
Lead-208	13	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/11/02	8:00	23.0
Lead-208	16	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/12/02	8:00	23.0
Lead-208	19	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/12/02	8:00	23.0
Lead-208	13	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/13/02	8:00	23.0
Lead-208	9.5	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/13/02	8:00	23.0
Lead-208	15	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/14/02	8:00	23.0
Lead-208	13	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/14/02	8:00	23.0
Lead-208	11	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/15/02	8:00	23.0
Lead-208	6.7	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/15/02	8:00	23.0
Lead-208	2.3	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/16/02	8:00	23.0
Lead-208	1.4	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/16/02	0:00	23.0
Lead-208	2.7	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/17/02	8:00	23.0
Lead-208	2.8	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/17/02	8:00	23.0
Lead-208	10	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/18/02	8:00	23.0
Lead-208	25	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/19/02	8:00	23.0
Lead-208	20	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/20/02	8:00	23.0
Lead-208	14	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/21/02	8:00	23.0
Lead-208	13	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/21/02	8:00	23.0
Lead-208	3.8	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/23/02	8:00	23.0
Lead-208	1	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/23/02	8:00	23.0
Lead-208	10	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/24/02	8:00	23.0
Lead-208	7.9	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/24/02	8:00	23.0
Manganese-055	17	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/11/02	8:00	23.0
Manganese-055	14	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/12/02	8:00	23.0
Manganese-055	19	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/12/02	8:00	23.0
Manganese-055	25	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/13/02	8:00	23.0
Manganese-055	24	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/13/02	8:00	23.0
Manganese-055	18	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/14/02	8:00	23.0
Manganese-055	18	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/14/02	8:00	23.0
Manganese-055	12	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/15/02	8:00	23.0
Manganese-055	10	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/15/02	8:00	23.0
Manganese-055	3	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/16/02	8:00	23.0
Manganese-055	2.1	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/16/02	0:00	23.0
Manganese-055	3	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/17/02	8:00	23.0
Manganese-055	2.2	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/17/02	8:00	23.0
Manganese-055	11	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/18/02	8:00	23.0
Manganese-055	25	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/19/02	8:00	23.0
Manganese-055	26	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/20/02	8:00	23.0
Manganese-055	21	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/21/02	8:00	23.0
Manganese-055	22	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/21/02	8:00	23.0
Manganese-055	2.3	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/23/02	8:00	23.0
Manganese-055	1.5	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/23/02	8:00	23.0
Manganese-055	4.2	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/24/02	8:00	23.0
Manganese-055	3.1	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/24/02	8:00	23.0

Barrio Logan IV-A Total Metals Sampling
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Sampled March 11 - 24, 2002

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Nickel-058	9.7	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/11/02	8:00	23.0
Nickel-058	5.3	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/12/02	8:00	23.0
Nickel-058	7.3	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/12/02	8:00	23.0
Nickel-058	15	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/13/02	8:00	23.0
Nickel-058	11	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/13/02	8:00	23.0
Nickel-058	15	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/14/02	8:00	23.0
Nickel-058	13	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/14/02	8:00	23.0
Nickel-058	17	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/15/02	8:00	23.0
Nickel-058	9	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/15/02	8:00	23.0
Nickel-058	2.6	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/16/02	8:00	23.0
Nickel-058	2.4	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/16/02	0:00	23.0
Nickel-058	1.7	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/17/02	8:00	23.0
Nickel-058	2	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/17/02	8:00	23.0
Nickel-058	7.1	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/18/02	8:00	23.0
Nickel-058	15	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/19/02	8:00	23.0
Nickel-058	18	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/20/02	8:00	23.0
Nickel-058	15	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/21/02	8:00	23.0
Nickel-058	15	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/21/02	8:00	23.0
Nickel-058	4.3	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/23/02	8:00	23.0
Nickel-058	1.6	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/23/02	8:00	23.0
Nickel-058	2	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/24/02	8:00	23.0
Nickel-058	2.2	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/24/02	8:00	23.0
Zinc-064	62	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/11/02	8:00	23.0
Zinc-064	37	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/12/02	8:00	23.0
Zinc-064	54	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/12/02	8:00	23.0
Zinc-064	92	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/13/02	8:00	23.0
Zinc-064	67	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/13/02	8:00	23.0
Zinc-064	102	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/14/02	8:00	23.0
Zinc-064	81	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/14/02	8:00	23.0
Zinc-064	72	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/15/02	8:00	23.0
Zinc-064	45	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/15/02	8:00	23.0
Zinc-064	21	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/16/02	8:00	23.0
Zinc-064	14	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/16/02	0:00	23.0
Zinc-064	15	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/17/02	8:00	23.0
Zinc-064	14	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/17/02	8:00	23.0
Zinc-064	66	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/18/02	8:00	23.0
Zinc-064	103	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/19/02	8:00	23.0
Zinc-064	138	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/20/02	8:00	23.0
Zinc-064	95	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/21/02	8:00	23.0
Zinc-064	100	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/21/02	8:00	23.0
Zinc-064	17	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/23/02	8:00	23.0
Zinc-064	15	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/23/02	8:00	23.0
Zinc-064	23	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/24/02	8:00	23.0
Zinc-064	22	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/24/02	8:00	23.0

Barrio Logan IV-B Total Metals Sampling
Analysis by ICP-MS

Sampled March 25 - 28, 2002

All Results have been Approved by MLD
Sorted by Element/Sampling Date

Element-Isotope	Result	Detection Limit	Units	Site Name	Sampling Date	Sampling Start Time	Sample Duration (Hrs)
Chromium-052	9.3	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/25/02	8:00	12.0
Chromium-052	7.1	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/25/02	8:00	12.0
Chromium-052	433	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/25/02	8:00	12.0
Chromium-052	7.5	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/26/02	8:00	12.0
Chromium-052	7.7	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/26/02	8:00	12.0
Chromium-052	111	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/26/02	8:00	12.0
Chromium-052	14	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/27/02	8:00	12.0
Chromium-052	7.8	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/27/02	8:00	12.0
Chromium-052	321	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/27/02	8:00	12.0
Chromium-052	7.7	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/28/02	8:00	12.0
Chromium-052	7.7	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/28/02	8:00	12.0
Chromium-052	50	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/28/02	8:00	12.0
Copper-063	84	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/25/02	8:00	12.0
Copper-063	21	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/25/02	8:00	12.0
Copper-063	7318	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/25/02	8:00	12.0
Copper-063	50	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/26/02	8:00	12.0
Copper-063	58	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/26/02	8:00	12.0
Copper-063	1716	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/26/02	8:00	12.0
Copper-063	569	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/27/02	8:00	12.0
Copper-063	121	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/27/02	8:00	12.0
Copper-063	28118	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/27/02	8:00	12.0
Copper-063	46	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/28/02	8:00	12.0
Copper-063	35	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/28/02	8:00	12.0
Copper-063	1318	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/28/02	8:00	12.0
Iron-057	478	5.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/25/02	8:00	12.0
Iron-057	167	5.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/25/02	8:00	12.0
Iron-057	12688	5.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/25/02	8:00	12.0
Iron-057	461	5.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/26/02	8:00	12.0
Iron-057	529	5.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/26/02	8:00	12.0
Iron-057	8359	5.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/26/02	8:00	12.0
Iron-057	1735	5.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/27/02	8:00	12.0
Iron-057	641	5.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/27/02	8:00	12.0
Iron-057	104706	5.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/27/02	8:00	12.0
Iron-057	456	5.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/28/02	8:00	12.0
Iron-057	432	5.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/28/02	8:00	12.0
Iron-057	3094	5.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/28/02	8:00	12.0
Lead-208	15	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/25/02	8:00	12.0
Lead-208	4.3	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/25/02	8:00	12.0
Lead-208	577	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/25/02	8:00	12.0
Lead-208	9	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/26/02	8:00	12.0
Lead-208	9.6	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/26/02	8:00	12.0
Lead-208	117	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/26/02	8:00	12.0
Lead-208	36	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/27/02	8:00	12.0
Lead-208	12	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/27/02	8:00	12.0
Lead-208	1530	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/27/02	8:00	12.0
Lead-208	13	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/28/02	8:00	12.0
Lead-208	6.2	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/28/02	8:00	12.0
Lead-208	69	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/28/02	8:00	12.0
Manganese-055	14	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/25/02	8:00	12.0
Manganese-055	5.4	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/25/02	8:00	12.0
Manganese-055	85	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/25/02	8:00	12.0
Manganese-055	11	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/26/02	8:00	12.0
Manganese-055	12	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/26/02	8:00	12.0

Barrio Logan IV-B Total Metals Sampling
Analysis by ICP-MS

Sampled March 25 - 28, 2002

All Results have been Approved by MLD
Sorted by Element/Sampling Date

Manganese-055	53	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/26/02	8:00	12.0
Manganese-055	23	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/27/02	8:00	12.0
Manganese-055	16	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/27/02	8:00	12.0
Manganese-055	445	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/27/02	8:00	12.0
Manganese-055	15	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/28/02	8:00	12.0
Manganese-055	12	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/28/02	8:00	12.0
Manganese-055	23	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/28/02	8:00	12.0
Nickel-058	18	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/25/02	8:00	12.0
Nickel-058	5.1	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/25/02	8:00	12.0
Nickel-058	1599	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/25/02	8:00	12.0
Nickel-058	13	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/26/02	8:00	12.0
Nickel-058	26	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/26/02	8:00	12.0
Nickel-058	533	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/26/02	8:00	12.0
Nickel-058	146	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/27/02	8:00	12.0
Nickel-058	30	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/27/02	8:00	12.0
Nickel-058	8505	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/27/02	8:00	12.0
Nickel-058	15	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/28/02	8:00	12.0
Nickel-058	8.3	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/28/02	8:00	12.0
Nickel-058	436	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/28/02	8:00	12.0
Zinc-064	137	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/25/02	8:00	12.0
Zinc-064	49	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/25/02	8:00	12.0
Zinc-064	5906	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/25/02	8:00	12.0
Zinc-064	82	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/26/02	8:00	12.0
Zinc-064	93	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/26/02	8:00	12.0
Zinc-064	2299	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/26/02	8:00	12.0
Zinc-064	747	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/27/02	8:00	12.0
Zinc-064	209	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/27/02	8:00	12.0
Zinc-064	34821	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/27/02	8:00	12.0
Zinc-064	195	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/28/02	8:00	12.0
Zinc-064	178	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/28/02	8:00	12.0
Zinc-064	1122	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/28/02	8:00	12.0

Barrio Logan IV-A Total Metals Sampling
Analysis by ICP-MS

Sampled March 11 - 24, 2002

All Results have been Approved by MLD
Sorted by Element/Sampling Date

Element-Isotope	Result	Detection Limit	Units	Site Name	Sampling Date	Sampling Start Time	Sample Duration (Hrs)
Chromium-052	3.2	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/11/02	8:00	23.0
Chromium-052	3.1	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/12/02	8:00	23.0
Chromium-052	2.8	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/12/02	8:00	23.0
Chromium-052	5.2	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/13/02	8:00	23.0
Chromium-052	3.6	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/13/02	8:00	23.0
Chromium-052	5.4	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/14/02	8:00	23.0
Chromium-052	3.8	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/14/02	8:00	23.0
Chromium-052	5.6	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/15/02	8:00	23.0
Chromium-052	3.4	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/15/02	8:00	23.0
Chromium-052	2.3	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/16/02	8:00	23.0
Chromium-052	2.1	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/16/02	0:00	23.0
Chromium-052	2.3	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/17/02	8:00	23.0
Chromium-052	1.9	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/17/02	8:00	23.0
Chromium-052	4.9	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/18/02	8:00	23.0
Chromium-052	4.9	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/19/02	8:00	23.0
Chromium-052	5.7	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/20/02	8:00	23.0
Chromium-052	4.8	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/21/02	8:00	23.0
Chromium-052	4.2	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/21/02	8:00	23.0
Chromium-052	2	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/23/02	8:00	23.0
Chromium-052	1.6	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/23/02	8:00	23.0
Chromium-052	2.1	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/24/02	8:00	23.0
Chromium-052	2	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/24/02	8:00	23.0
Copper-063	41	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/11/02	8:00	23.0
Copper-063	16	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/12/02	8:00	23.0
Copper-063	18	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/12/02	8:00	23.0
Copper-063	66	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/13/02	8:00	23.0
Copper-063	33	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/13/02	8:00	23.0
Copper-063	75	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/14/02	8:00	23.0
Copper-063	42	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/14/02	8:00	23.0
Copper-063	43	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/15/02	8:00	23.0
Copper-063	17	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/15/02	8:00	23.0
Copper-063	7.4	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/16/02	8:00	23.0
Copper-063	5	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/16/02	0:00	23.0
Copper-063	6	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/17/02	8:00	23.0
Copper-063	4.8	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/17/02	8:00	23.0
Copper-063	28	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/18/02	8:00	23.0
Copper-063	78	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/19/02	8:00	23.0
Copper-063	60	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/20/02	8:00	23.0
Copper-063	66	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/21/02	8:00	23.0
Copper-063	42	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/21/02	8:00	23.0
Copper-063	7.7	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/23/02	8:00	23.0
Copper-063	3.9	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/23/02	8:00	23.0
Copper-063	7.5	1	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/24/02	8:00	23.0
Copper-063	7.1	1	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/24/02	8:00	23.0
Iron-057	518	5	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/11/02	8:00	23.0
Iron-057	238	5	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/12/02	8:00	23.0
Iron-057	331	5	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/12/02	8:00	23.0
Iron-057	941	5	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/13/02	8:00	23.0
Iron-057	782	5	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/13/02	8:00	23.0
Iron-057	774	5	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/14/02	8:00	23.0
Iron-057	768	5	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/14/02	8:00	23.0
Iron-057	483	5	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/15/02	8:00	23.0
Iron-057	345	5	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/15/02	8:00	23.0
Iron-057	141	5	ng/m3	BARRIO LOGAN-2121 NEWTON-23 HOUR	03/16/02	8:00	23.0

Barrio Logan IV-C Total Metals Sampling
Analysis by ICP-MS

Sampled March 29 - April 19, 2002

All Results have been Approved by MLD
Sorted by Element/Sampling Date

Element-Isotope	Result	Detection Limit	Units	Site Name	Sampling Date	Sampling Start Time	Sample Duration (Hrs)
Chromium-052	9.5	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/29/02	8:00	12.0
Chromium-052	4.2	1.0	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/29/02	8:00	23.0
Chromium-052	14	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/30/02	8:00	12.0
Chromium-052	7.7	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/30/02	8:00	12.0
Chromium-052	12	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/31/02	8:00	12.0
Chromium-052	6.9	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/31/02	8:00	12.0
Chromium-052	652	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/31/02	8:00	12.0
Chromium-052	49	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/31/02	20:00	12.0
Chromium-052	6.7	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/01/02	8:00	12.0
Chromium-052	6.7	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/01/02	8:00	12.0
Chromium-052	64	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/01/02	8:00	12.0
Chromium-052	6.7	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/02/02	8:00	12.0
Chromium-052	6.7	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/02/02	8:00	12.0
Chromium-052	87	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/02/02	8:00	12.0
Chromium-052	6.7	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/03/02	8:00	12.0
Chromium-052	4.4	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/03/02	8:00	12.0
Chromium-052	53	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/03/02	8:00	12.0
Chromium-052	6.7	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/04/02	8:00	12.0
Chromium-052	67	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/04/02	8:00	12.0
Chromium-052	6.4	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/05/02	8:00	12.0
Chromium-052	5.4	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/05/02	8:00	12.0
Chromium-052	35	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/06/02	8:00	12.0
Chromium-052	5.9	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/06/02	8:00	12.0
Chromium-052	4.6	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/07/02	8:00	12.0
Chromium-052	4.7	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/07/02	8:00	12.0
Chromium-052	8.4	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/08/02	8:00	12.0
Chromium-052	7.3	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/08/02	8:00	12.0
Chromium-052	1426	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/08/02	8:00	12.0
Chromium-052	8.3	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/09/02	8:00	12.0
Chromium-052	178	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/09/02	8:00	12.0
Chromium-052	6.3	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/10/02	8:00	12.0
Chromium-052	7	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/10/02	8:00	12.0
Chromium-052	220	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/10/02	8:00	12.0
Chromium-052	6.6	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/11/02	8:00	12.0
Chromium-052	6	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/11/02	8:00	12.0
Chromium-052	80	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/11/02	8:00	12.0
Chromium-052	10	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/12/02	8:00	12.0
Chromium-052	5.6	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/12/02	8:00	12.0
Chromium-052	5.7	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/13/02	8:00	12.0
Chromium-052	5	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/13/02	8:00	12.0
Chromium-052	4.5	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/14/02	8:00	12.0
Chromium-052	4.2	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/14/02	8:00	12.0
Chromium-052	6.5	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/15/02	8:00	12.0
Chromium-052	5.7	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/15/02	8:00	12.0
Chromium-052	7.9	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/16/02	8:00	12.0
Chromium-052	4.7	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/16/02	8:00	12.0
Chromium-052	371	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/16/02	8:00	12.0
Chromium-052	6.3	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/17/02	8:00	12.0
Chromium-052	5.4	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/17/02	8:00	12.0
Chromium-052	137	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/17/02	8:00	12.0
Chromium-052	1.7	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/18/02	8:00	12.0
Chromium-052	49	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/18/02	8:00	12.0
Chromium-052	7.5	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/19/02	8:00	12.0
Chromium-052	4.8	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/19/02	8:00	12.0
Copper-063	62	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/29/02	8:00	12.0

Barrio Logan IV-C Total Metals Sampling
Analysis by ICP-MS

Sampled March 29 - April 19, 2002

All Results have been Approved by MLD
Sorted by Element/Sampling Date

Copper-063	19	1.0	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/29/02	8:00	23.0
Copper-063	91	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/30/02	8:00	12.0
Copper-063	39	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/30/02	8:00	12.0
Copper-063	104	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/31/02	8:00	12.0
Copper-063	33	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/31/02	8:00	12.0
Copper-063	8312	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/31/02	8:00	12.0
Copper-063	407	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/31/02	20:00	12.0
Copper-063	47	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/01/02	8:00	12.0
Copper-063	24	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/01/02	8:00	12.0
Copper-063	1002	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/01/02	8:00	12.0
Copper-063	84	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/02/02	8:00	12.0
Copper-063	47	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/02/02	8:00	12.0
Copper-063	3806	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/02/02	8:00	12.0
Copper-063	96	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/03/02	8:00	12.0
Copper-063	51	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/03/02	8:00	12.0
Copper-063	6583	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/03/02	8:00	12.0
Copper-063	72	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/04/02	8:00	12.0
Copper-063	3506	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/04/02	8:00	12.0
Copper-063	81	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/05/02	8:00	12.0
Copper-063	60	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/05/02	8:00	12.0
Copper-063	30	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/06/02	8:00	12.0
Copper-063	13	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/06/02	8:00	12.0
Copper-063	10	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/07/02	8:00	12.0
Copper-063	11	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/07/02	8:00	12.0
Copper-063	46	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/08/02	8:00	12.0
Copper-063	23	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/08/02	8:00	12.0
Copper-063	6489	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/08/02	8:00	12.0
Copper-063	45	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/09/02	8:00	12.0
Copper-063	1597	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/09/02	8:00	12.0
Copper-063	54	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/10/02	8:00	12.0
Copper-063	56	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/10/02	8:00	12.0
Copper-063	5012	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/10/02	8:00	12.0
Copper-063	18	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/11/02	8:00	12.0
Copper-063	24	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/11/02	8:00	12.0
Copper-063	5381	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/11/02	8:00	12.0
Copper-063	40	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/12/02	8:00	12.0
Copper-063	29	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/12/02	8:00	12.0
Copper-063	30	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/13/02	8:00	12.0
Copper-063	14	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/13/02	8:00	12.0
Copper-063	17	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/14/02	8:00	12.0
Copper-063	8.2	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/14/02	8:00	12.0
Copper-063	22	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/15/02	8:00	12.0
Copper-063	19	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/15/02	8:00	12.0
Copper-063	35	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/16/02	8:00	12.0
Copper-063	21	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/16/02	8:00	12.0
Copper-063	6647	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/16/02	8:00	12.0
Copper-063	77	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/17/02	8:00	12.0
Copper-063	45	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/17/02	8:00	12.0
Copper-063	9443	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/17/02	8:00	12.0
Copper-063	9.7	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/18/02	8:00	12.0
Copper-063	3647	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/18/02	8:00	12.0
Copper-063	31	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/19/02	8:00	12.0
Copper-063	26	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/19/02	8:00	12.0
Iron-057	701	5.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/29/02	8:00	12.0
Iron-057	281	5.0	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/29/02	8:00	23.0
Iron-057	447	5.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/30/02	8:00	12.0
Iron-057	304	5.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/30/02	8:00	12.0

Barrio Logan IV-C Total Metals Sampling
Analysis by ICP-MS

Sampled March 29 - April 19, 2002

All Results have been Approved by MLD
Sorted by Element/Sampling Date

Iron-057	470	5.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/31/02	8:00	12.0
Iron-057	325	5.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/31/02	8:00	12.0
Iron-057	21105	5.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/31/02	8:00	12.0
Iron-057	1006	5.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/31/02	20:00	12.0
Iron-057	699	5.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/01/02	8:00	12.0
Iron-057	560	5.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/01/02	8:00	12.0
Iron-057	13169	5.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/01/02	8:00	12.0
Iron-057	688	5.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/02/02	8:00	12.0
Iron-057	609	5.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/02/02	8:00	12.0
Iron-057	13750	5.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/02/02	8:00	12.0
Iron-057	683	5.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/03/02	8:00	12.0
Iron-057	613	5.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/03/02	8:00	12.0
Iron-057	4880	5.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/03/02	8:00	12.0
Iron-057	677	5.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/04/02	8:00	12.0
Iron-057	4725	5.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/04/02	8:00	12.0
Iron-057	538	5.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/05/02	8:00	12.0
Iron-057	522	5.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/05/02	8:00	12.0
Iron-057	318	5.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/06/02	8:00	12.0
Iron-057	217	5.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/06/02	8:00	12.0
Iron-057	181	5.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/07/02	8:00	12.0
Iron-057	197	5.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/07/02	8:00	12.0
Iron-057	362	5.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/08/02	8:00	12.0
Iron-057	324	5.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/08/02	8:00	12.0
Iron-057	9814	5.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/08/02	8:00	12.0
Iron-057	861	5.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/09/02	8:00	12.0
Iron-057	17168	5.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/09/02	8:00	12.0
Iron-057	516	5.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/10/02	8:00	12.0
Iron-057	674	5.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/10/02	8:00	12.0
Iron-057	9692	5.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/10/02	8:00	12.0
Iron-057	199	5.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/11/02	8:00	12.0
Iron-057	362	5.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/11/02	8:00	12.0
Iron-057	10265	5.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/11/02	8:00	12.0
Iron-057	388	5.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/12/02	8:00	12.0
Iron-057	323	5.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/12/02	8:00	12.0
Iron-057	519	5.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/13/02	8:00	12.0
Iron-057	475	5.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/13/02	8:00	12.0
Iron-057	281	5.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/14/02	8:00	12.0
Iron-057	210	5.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/14/02	8:00	12.0
Iron-057	172	5.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/15/02	8:00	12.0
Iron-057	185	5.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/15/02	8:00	12.0
Iron-057	425	5.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/16/02	8:00	12.0
Iron-057	336	5.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/16/02	8:00	12.0
Iron-057	7017	5.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/16/02	8:00	12.0
Iron-057	831	5.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/17/02	8:00	12.0
Iron-057	869	5.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/17/02	8:00	12.0
Iron-057	6762	5.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/17/02	8:00	12.0
Iron-057	116	5.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/18/02	8:00	12.0
Iron-057	6048	5.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/18/02	8:00	12.0
Iron-057	597	5.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/19/02	8:00	12.0
Iron-057	527	5.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/19/02	8:00	12.0
Lead-208	16	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/29/02	8:00	12.0
Lead-208	5.6	1.0	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/29/02	8:00	23.0
Lead-208	10	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/30/02	8:00	12.0
Lead-208	6.9	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/30/02	8:00	12.0
Lead-208	16	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/31/02	8:00	12.0
Lead-208	7	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/31/02	8:00	12.0
Lead-208	625	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/31/02	8:00	12.0

Barrio Logan IV-C Total Metals Sampling
Analysis by ICP-MS

Sampled March 29 - April 19, 2002

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Lead-208	49	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/31/02	20:00	12.0
Lead-208	8.9	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/01/02	8:00	12.0
Lead-208	6.7	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/01/02	8:00	12.0
Lead-208	53	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/01/02	8:00	12.0
Lead-208	8.9	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/02/02	8:00	12.0
Lead-208	6.7	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/02/02	8:00	12.0
Lead-208	178	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/02/02	8:00	12.0
Lead-208	11	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/03/02	8:00	12.0
Lead-208	6.7	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/03/02	8:00	12.0
Lead-208	254	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/03/02	8:00	12.0
Lead-208	12	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/04/02	8:00	12.0
Lead-208	96	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/04/02	8:00	12.0
Lead-208	10	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/05/02	8:00	12.0
Lead-208	11	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/05/02	8:00	12.0
Lead-208	7.4	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/06/02	8:00	12.0
Lead-208	3.5	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/06/02	8:00	12.0
Lead-208	2.3	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/07/02	8:00	12.0
Lead-208	1.9	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/07/02	8:00	12.0
Lead-208	9.4	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/08/02	8:00	12.0
Lead-208	5.7	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/08/02	8:00	12.0
Lead-208	614	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/08/02	8:00	12.0
Lead-208	16	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/09/02	8:00	12.0
Lead-208	104	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/09/02	8:00	12.0
Lead-208	9.8	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/10/02	8:00	12.0
Lead-208	10	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/10/02	8:00	12.0
Lead-208	413	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/10/02	8:00	12.0
Lead-208	4.6	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/11/02	8:00	12.0
Lead-208	7.6	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/11/02	8:00	12.0
Lead-208	120	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/11/02	8:00	12.0
Lead-208	9.8	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/12/02	8:00	12.0
Lead-208	5.6	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/12/02	8:00	12.0
Lead-208	11	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/13/02	8:00	12.0
Lead-208	6.6	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/13/02	8:00	12.0
Lead-208	6.3	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/14/02	8:00	12.0
Lead-208	3.4	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/14/02	8:00	12.0
Lead-208	1.9	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/15/02	8:00	12.0
Lead-208	1.6	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/15/02	8:00	12.0
Lead-208	11	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/16/02	8:00	12.0
Lead-208	2.1	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/16/02	8:00	12.0
Lead-208	228	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/16/02	8:00	12.0
Lead-208	9.3	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/17/02	8:00	12.0
Lead-208	8.5	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/17/02	8:00	12.0
Lead-208	163	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/17/02	8:00	12.0
Lead-208	1.7	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/18/02	8:00	12.0
Lead-208	63	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/18/02	8:00	12.0
Lead-208	10	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/19/02	8:00	12.0
Lead-208	6.8	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/19/02	8:00	12.0
Manganese-055	23	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/29/02	8:00	12.0
Manganese-055	9.7	1.0	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/29/02	8:00	23.0
Manganese-055	9.6	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/30/02	8:00	12.0
Manganese-055	7.7	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/30/02	8:00	12.0
Manganese-055	12	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/31/02	8:00	12.0
Manganese-055	8	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/31/02	8:00	12.0
Manganese-055	143	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/31/02	8:00	12.0
Manganese-055	9.2	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/31/02	20:00	12.0
Manganese-055	13	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/01/02	8:00	12.0
Manganese-055	11	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/01/02	8:00	12.0

Barrio Logan IV-C Total Metals Sampling
Analysis by ICP-MS

Sampled March 29 - April 19, 2002

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Manganese-055	62	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/01/02	8:00	12.0
Manganese-055	16	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/02/02	8:00	12.0
Manganese-055	13	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/02/02	8:00	12.0
Manganese-055	73	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/02/02	8:00	12.0
Manganese-055	16	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/03/02	8:00	12.0
Manganese-055	13	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/03/02	8:00	12.0
Manganese-055	29	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/03/02	8:00	12.0
Manganese-055	17	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/04/02	8:00	12.0
Manganese-055	29	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/04/02	8:00	12.0
Manganese-055	12	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/05/02	8:00	12.0
Manganese-055	12	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/05/02	8:00	12.0
Manganese-055	7	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/06/02	8:00	12.0
Manganese-055	4.9	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/06/02	8:00	12.0
Manganese-055	6	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/07/02	8:00	12.0
Manganese-055	5.9	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/07/02	8:00	12.0
Manganese-055	9.8	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/08/02	8:00	12.0
Manganese-055	7.8	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/08/02	8:00	12.0
Manganese-055	87	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/08/02	8:00	12.0
Manganese-055	19	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/09/02	8:00	12.0
Manganese-055	95	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/09/02	8:00	12.0
Manganese-055	11	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/10/02	8:00	12.0
Manganese-055	18	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/10/02	8:00	12.0
Manganese-055	47	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/10/02	8:00	12.0
Manganese-055	5.3	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/11/02	8:00	12.0
Manganese-055	10	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/11/02	8:00	12.0
Manganese-055	43	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/11/02	8:00	12.0
Manganese-055	12	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/12/02	8:00	12.0
Manganese-055	11	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/12/02	8:00	12.0
Manganese-055	15	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/13/02	8:00	12.0
Manganese-055	12	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/13/02	8:00	12.0
Manganese-055	11	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/14/02	8:00	12.0
Manganese-055	7.1	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/14/02	8:00	12.0
Manganese-055	6.3	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/15/02	8:00	12.0
Manganese-055	7.7	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/15/02	8:00	12.0
Manganese-055	25	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/16/02	8:00	12.0
Manganese-055	22	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/16/02	8:00	12.0
Manganese-055	64	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/16/02	8:00	12.0
Manganese-055	36	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/17/02	8:00	12.0
Manganese-055	42	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/17/02	8:00	12.0
Manganese-055	104	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/17/02	8:00	12.0
Manganese-055	3.5	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/18/02	8:00	12.0
Manganese-055	35	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/18/02	8:00	12.0
Manganese-055	18	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/19/02	8:00	12.0
Manganese-055	16	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/19/02	8:00	12.0
Nickel-058	27	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/29/02	8:00	12.0
Nickel-058	7.1	1.0	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/29/02	8:00	23.0
Nickel-058	33	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/30/02	8:00	12.0
Nickel-058	9.5	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/30/02	8:00	12.0
Nickel-058	34	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/31/02	8:00	12.0
Nickel-058	13	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/31/02	8:00	12.0
Nickel-058	2734	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/31/02	8:00	12.0
Nickel-058	121	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/31/02	20:00	12.0
Nickel-058	13	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/01/02	8:00	12.0
Nickel-058	11	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/01/02	8:00	12.0
Nickel-058	479	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/01/02	8:00	12.0
Nickel-058	20	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/02/02	8:00	12.0
Nickel-058	13	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/02/02	8:00	12.0

Barrio Logan IV-C Total Metals Sampling
Analysis by ICP-MS

Sampled March 29 - April 19, 2002

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Nickel-058	1501	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/02/02	8:00	12.0
Nickel-058	22	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/03/02	8:00	12.0
Nickel-058	11	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/03/02	8:00	12.0
Nickel-058	1461	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/03/02	8:00	12.0
Nickel-058	19	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/04/02	8:00	12.0
Nickel-058	670	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/04/02	8:00	12.0
Nickel-058	17	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/05/02	8:00	12.0
Nickel-058	14	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/05/02	8:00	12.0
Nickel-058	11	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/06/02	8:00	12.0
Nickel-058	5	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/06/02	8:00	12.0
Nickel-058	2.7	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/07/02	8:00	12.0
Nickel-058	2.9	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/07/02	8:00	12.0
Nickel-058	13	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/08/02	8:00	12.0
Nickel-058	8.3	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/08/02	8:00	12.0
Nickel-058	1584	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/08/02	8:00	12.0
Nickel-058	26	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/09/02	8:00	12.0
Nickel-058	1123	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/09/02	8:00	12.0
Nickel-058	14	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/10/02	8:00	12.0
Nickel-058	16	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/10/02	8:00	12.0
Nickel-058	1052	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/10/02	8:00	12.0
Nickel-058	5.2	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/11/02	8:00	12.0
Nickel-058	9.4	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/11/02	8:00	12.0
Nickel-058	1386	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/11/02	8:00	12.0
Nickel-058	11	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/12/02	8:00	12.0
Nickel-058	9.9	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/12/02	8:00	12.0
Nickel-058	8.1	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/13/02	8:00	12.0
Nickel-058	9.7	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/13/02	8:00	12.0
Nickel-058	5.3	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/14/02	8:00	12.0
Nickel-058	4.8	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/14/02	8:00	12.0
Nickel-058	15	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/15/02	8:00	12.0
Nickel-058	6.8	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/15/02	8:00	12.0
Nickel-058	11	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/16/02	8:00	12.0
Nickel-058	6.5	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/16/02	8:00	12.0
Nickel-058	1220	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/16/02	8:00	12.0
Nickel-058	19	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/17/02	8:00	12.0
Nickel-058	14	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/17/02	8:00	12.0
Nickel-058	1064	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/17/02	8:00	12.0
Nickel-058	2.7	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/18/02	8:00	12.0
Nickel-058	528	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/18/02	8:00	12.0
Nickel-058	11	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/19/02	8:00	12.0
Nickel-058	9	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/19/02	8:00	12.0
Zinc-064	144	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/29/02	8:00	12.0
Zinc-064	56	1.0	ng/m3	BARRIO LOGAN-ALLEY-23 HOUR	03/29/02	8:00	23.0
Zinc-064	105	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/30/02	8:00	12.0
Zinc-064	45	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/30/02	8:00	12.0
Zinc-064	168	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	03/31/02	8:00	12.0
Zinc-064	47	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	03/31/02	8:00	12.0
Zinc-064	11481	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/31/02	8:00	12.0
Zinc-064	483	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	03/31/02	20:00	12.0
Zinc-064	98	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/01/02	8:00	12.0
Zinc-064	69	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/01/02	8:00	12.0
Zinc-064	2306	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/01/02	8:00	12.0
Zinc-064	73	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/02/02	8:00	12.0
Zinc-064	69	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/02/02	8:00	12.0
Zinc-064	1700	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/02/02	8:00	12.0
Zinc-064	82	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/03/02	8:00	12.0
Zinc-064	71	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/03/02	8:00	12.0

Barrio Logan IV-C Total Metals Sampling
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Sampled March 29 - April 19, 2002

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Zinc-064	3126	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/03/02	8:00	12.0
Zinc-064	98	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/04/02	8:00	12.0
Zinc-064	1764	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/04/02	8:00	12.0
Zinc-064	68	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/05/02	8:00	12.0
Zinc-064	72	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/05/02	8:00	12.0
Zinc-064	44	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/06/02	8:00	12.0
Zinc-064	27	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/06/02	8:00	12.0
Zinc-064	21	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/07/02	8:00	12.0
Zinc-064	22	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/07/02	8:00	12.0
Zinc-064	95	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/08/02	8:00	12.0
Zinc-064	70	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/08/02	8:00	12.0
Zinc-064	6023	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/08/02	8:00	12.0
Zinc-064	109	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/09/02	8:00	12.0
Zinc-064	2028	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/09/02	8:00	12.0
Zinc-064	85	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/10/02	8:00	12.0
Zinc-064	108	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/10/02	8:00	12.0
Zinc-064	5077	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/10/02	8:00	12.0
Zinc-064	41	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/11/02	8:00	12.0
Zinc-064	68	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/11/02	8:00	12.0
Zinc-064	2166	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/11/02	8:00	12.0
Zinc-064	55	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/12/02	8:00	12.0
Zinc-064	49	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/12/02	8:00	12.0
Zinc-064	54	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/13/02	8:00	12.0
Zinc-064	42	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/13/02	8:00	12.0
Zinc-064	35	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/14/02	8:00	12.0
Zinc-064	26	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/14/02	8:00	12.0
Zinc-064	29	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/15/02	8:00	12.0
Zinc-064	31	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/15/02	8:00	12.0
Zinc-064	63	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/16/02	8:00	12.0
Zinc-064	47	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/16/02	8:00	12.0
Zinc-064	3522	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/16/02	8:00	12.0
Zinc-064	123	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/17/02	8:00	12.0
Zinc-064	106	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/17/02	8:00	12.0
Zinc-064	5026	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/17/02	8:00	12.0
Zinc-064	17	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/18/02	8:00	12.0
Zinc-064	2723	1.0	ng/m3	BARRIO LOGAN-MPIEXT-12 HOUR	04/18/02	8:00	12.0
Zinc-064	58	1.0	ng/m3	BARRIO LOGAN-2121 NEWTON-12 HOUR	04/19/02	8:00	12.0
Zinc-064	63	1.0	ng/m3	BARRIO LOGAN-ALLEY-12 HOUR	04/19/02	8:00	12.0

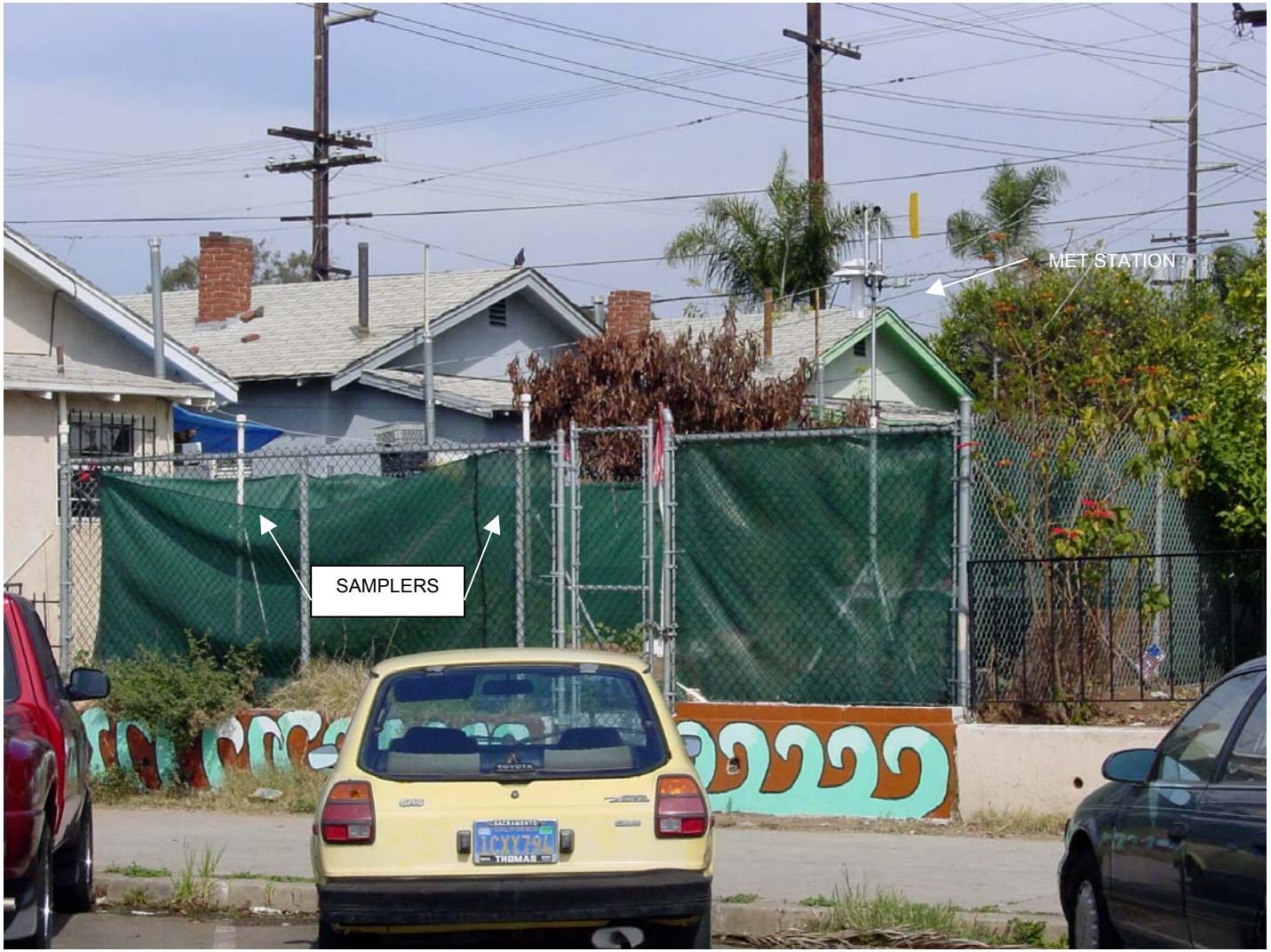
Appendix E Site Photographs

Newton Avenue

2121 Newton Avenue

Meteorological Station and Carlson & Beauloye

Vacant Lot with Collocated Samplers and Meteorological Station



Rooftop Samplers at Rear of Master Plating