

**WIND TUNNEL STUDY
OF AIR POLLUTANT DISPERSION ON GUAM**

Prepared by

**David E. Neff
Robert N. Meroney**

**FINAL REPORT
(September 1995)**

for

**Dr. George Wu, Senior Environmental Scientist
R. W. Beck
1125 Seventeenth St. , Suite 1900
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1 REPORT SUMMARY

A wind-tunnel measurement program was performed to assess the effects of site and topographic influences on plume dispersion from several SO₂ sources on the island of Guam. The original goals of this testing program were to model plume dispersion from the Cabras and Piti Power Facilities towards the Orote Peninsula and towards Mt. Tenjo as well as model plume dispersion from the Tenjo and Orote Power Facilities towards the Orote Peninsula and towards Mt. Tenjo in compliance with EPA Guidelines. Upon modeling the plume dispersion from the Cabras and Piti Power Facilities towards the Orote Peninsula the wind tunnel tests indicated a violation of the NAAQS similar to that predicted via the EPA ISC models. With no benefit predicted from the wind tunnel model the remainder of the test program was terminated. This report summarized all work preformed up to the point of project termination.

A separate report included in the binding of this document, "Wind Tunnel Study of Air Pollutant Dispersion on Guam - Atmospheric Dispersion Comparability Test Documentation" fully documents the EPA required wind tunnel facility performance testing. It is concluded in this report that the wind tunnel facility used reproduces a standardized field plume behavior within the required specifications as stipulated in "Guideline for Use of Fluid Modeling to Determine Good Engineering Practice Height" (EPA-450/4-81-003, July, 1981).

2 FLUID MODEL DESIGN

This fluid model is a reduced scale representation of the plant site, topography and structures adjacent to the plant site, the atmospheric wind structure of interest approaching the site, and plant stack discharge characteristics. Proper scaling of this phenomena is achievable in a boundary layer wind tunnel test facility.

2.1 Project Definition and Site Specification

The following list summarizes important field scale site specifications that are needed for model scale test design:

- | | | |
|----|-------------------------------|---|
| 1) | Primary Wind Directions | 33.75°, 45.00°, 56.25°, 67.50°, 78.75°, |
| 2) | Wind Speed at 60 meter Height | 3, 6, 9, 12, 15 meters/second, |
| 3) | Downwind Extent of Study Area | 8 kilometers. |

The location of the study area is shown in Figure 1. Figure 1 does not show the originally proposed study area around Mt. Tenjo. The stack parameters for each modeled stack are listed in Table 1.

2.2 Overview of EPA Guideline Similarity Requirements

Snyder (1981) discusses in general terms the scaling techniques for a wide range of atmospheric diffusion problems. The EPA-FM-GEP Guideline specifically states the fluid modeling requirements for GEP stack height determination studies. For NAAQS compliance studies the EPA does not specifically state how a fluid model is to be designed but the EPA expects that the general guidance of the modeling methods described in Snyder (1981) to be followed. This fluid model will be in compliance with the methods suggested by Snyder (1981). Some of the major modeling requirements are summarized in the following list :

- 1) All structures and terrain features with heights greater than 1/20th the distance to the plant stack should be included in the geometrically scaled model. The more stringent requirement of the height being 1/30th the distance should be used for structures with a large (width ten times greater than height) crosswind profile. The less stringent requirement of width being 1/20th the distance should be used for tall slender structures. The flow blockage of the model in an adjustable roof wind tunnel will be less than 10 percent.
- 2) The model boundary layer's roughness length, z_0 , friction velocity, u_* , and power law index, p , should be representative of the expected field conditions as stipulated in the EPA-FM-GEP Guideline's Table 1 and Figure 1. The roughness Reynolds number, $z_0 u_* / \nu$, characterizing the turbulent structure of the model boundary layer should be greater than 2.5. The model should be covered with roughness of size, ϵ , such that $\epsilon u_* / \nu \geq 20$. Snyder suggests that if one can not maintain similarity, due to other similarity considerations, in both the wind profiles

mean characteristics ($z_0/L \approx$) and turbulent characteristics ($z_0 u_* / \nu > 2.5$) then the turbulent characteristics criteria should take precedence.

- 3) The model boundary layer should be characteristic of Pasquill-Gifford C to D stability category with a field equivalent boundary layer height of 600 m. The EPA-FM-GEP Guideline stipulate uniform fluid model testing procedure for an Atmospheric Dispersion Comparability (ADC) demonstration.
- 4) The flow over significant nearby structures should be Reynolds number independent. For sharp edged obstacles an object Reynolds number, $U_H L / \nu$, greater than 11,000 is sufficient. For any obstacles with an $Re \# < 11,000$ or for any smooth shaped obstacles a Reynolds number independence test should be performed. The fluid model stack effluent Reynolds number, $W_s D / \nu$, should be greater than 2,000. If below this value then a recessed orifice may be necessary.
- 5) The model plume rise should match to the field plume rise as closely as possible by maintaining similarity of (in increasing order of accuracy) 1) plume buoyancy flux, 2) #1 and stack exit diameter, 3) #1, #2 and plume momentum flux, and 4) #1, #2, #3 and plume specific gravity.

2.3 Model Similarity Criteria Compliance

Table 2, Table 3, Table 4, Table 5, and Table 6 show field and model similarity parameters for three different model scaling methods for field reference wind speeds of 3, 6, 9, 12, and 15 m/s respectively. The first was equality of both momentum and buoyancy flux, the second was equality of only buoyancy flux, the third was equality of both volume and buoyancy flux. The equations for each of these three modeling techniques are present below:

Momentum Flux	≡	$\frac{1}{2}(\rho_s/\rho_a)^{1/2}(W_s/U)(D/H_s)$
Buoyancy Flux	≡	$(g/4)(\Delta\rho/\rho_a)(W_s/U^3)(D^2/H_s)$
Volume Flux	≡	$(\pi/4)(W_s/U)(D/H_s)^2$

Defining " λ_i " as a quantity $()_m / ()_p$, and " k " as model stack diameter distortion, then for

1) *Buoyancy and Momentum Flux Equality*

$$\lambda_U = (\lambda_L)^{1/2} (\lambda_{\Delta\rho/\rho})^{1/2} (\lambda_{\rho_s/\rho_a})^{-1/4} k^{1/2}; \quad \lambda_W = (\lambda_L)^{1/2} (\lambda_{\Delta\rho/\rho})^{1/2} (\lambda_{\rho_s/\rho_a})^{-3/4} k^{-1/2}$$

2) *Buoyancy Flux Equality*

$$\lambda_U = (\lambda_W)^{1/3} (\lambda_L) (\lambda_{\Delta\rho/\rho})^{1/3} k^2; \quad \lambda_W = (\lambda_U)^3 (\lambda_L)^{-1} (\lambda_{\Delta\rho/\rho})^{-1} k^{-2}$$

3) *Buoyancy and Volume Flux Equality*

$$\lambda_U = (\lambda_L)^{1/2} (\lambda_{\Delta\rho/\rho})^{1/2} k^{1/2}; \quad \lambda_W = (\lambda_L)^{1/2} (\lambda_{\Delta\rho/\rho})^{1/2} k^{-1/2}$$

To simultaneously model more than one plume in the same wind tunnel flow then an additional

constraint must be placed on the modeling equations. In case (1) this constraint is the equality of the term, $(\lambda_{\Delta\rho/\rho})^{1/2} (\lambda_{\rho s/\rho a})^{1/4} k^{1/2}$, among all the model plumes. The constraint can be solved explicitly by adjusting the secondary plumes specific gravity against that of the designated reference plumes. This constraint does not apply to case (2), but if the same plume specific gravities, as in case (1), are used then the same momentum flux distortion for each of the plumes can be maintained. In case (3) this constraint is the equality of the term, $(\lambda_{\Delta\rho/\rho})^{1/2} k^{1/4}$, among all the model plumes.

To best satisfy the most important similarity requirements for a fluid model of the plume dispersion on Guam the following modeling parameters were selected:

Model to Field Length Scale Ratio	=	1:1000
Model Roughness Length, z_0	=	0.015 to 0.05 cm
Buoyancy Flux Equality only (case #2)		
Plume Momentum Distortion (M_m/M_p)	=	3
Stack Diameter Distortion Factor (D_m/D_p)	=	2, 3, or 4 depending on stack
Plume Specific Gravity Distortions (sg_m/sg_p)	=	0.53 to 0.81 depending on stack

Table 7, Model Test Parameters, details all pertinent scaled parameters and scaling criteria for the 1:1000 scale model. These model test parameters satisfy many of the Snyder's suggestions mentioned in the previous section, i.e.:

- (1) The required site structures are reproduced at model scale and are discussed further in the next section on model construction,
- (2) Wind tunnel blockage is less than 10 percent and is discussed further in a subsequent section on wind tunnel configuration,
- (3) Roughness length similarity was relaxed so as to maintain a higher Roughness RE# varying from 1.05 to 5.23 dependent on field wind speed,
- (4) Generic Roughness RE# ($u_*\epsilon/\nu$) was always greater than 20,
- (5) The facility buildings RE numbers were less than 11,000 but since these structures were not of sufficient size or height to influence far field dispersion or plume rise this criteria was relaxed,
- (6) Stack Gas RE# = 789 to 2011 is less than 2,000, thus an orifice was used to trip to turbulent flow,
- (7) The wind tunnel was tuned to a Pasquill-Gifford C to D stability category, this is the subject of the Atmospheric Dispersion Comparability Test Report.

2.4 Model Construction and Coverage

Figure 1 displays the extent of the modeled area, the concentration sample locations, and the tested wind directions overlaid on a USGS topographic map. The center of the model was

the location of the Cabras Units 3 and 4 stack. An aerial photograph of the field site area is shown in Figure 2. Figure 3 shows the Cabras and Piti Facilities at the field site. Note that Cabras Units 3 and 4 are under construction in the foreground of this photograph.

Based on atmospheric data over the site area, the size of the concentration measurement grid, and modeling constraints previously discussed, a model scale of 1:1000 was selected. Since the Environmental Wind Tunnel has a 3.66 meter width this allows for the reduced scale placement of all significant buildings and topography in a 3.6 kilometer swath downwind of the plant stack aligned with the test wind direction. The tunnel test section extended 8 meters downwind of the stack locations thus providing for scaled concentration measurements out to 8 km. The tunnel test section extended 8.8 meters upwind of the stack locations thus providing for the inclusion of 8.8 km of upwind topography and ground roughness for proper approach flow wind field development. The model stacks were located over the center most turntable on the wind tunnel floor. This permitted the rotation model buildings and topography within a field equivalent 1.8 km radius. The upwind and downwind model topography were adjusted for each wind direction tested.

Plant stacks for Cabras Units 1&2, Cabras Units 3&4, and Piti Units 4&5 were constructed from brass tubing stock for model testing. These stacks were fabricated to the true 1:1000 geometric scale in height but the stack diameters were distorted by a factor of 3, 2, and 3 respectively. The model of distorted diameter model was discussed earlier in the section on similarity requirements. The stack exteriors were scored to assist in creating turbulent flow separation. An orifice, one-half the inside diameter, was placed ten stack diameters down in each stack to ensure fully turbulent exit flow. The buildings surrounding the plant stacks were fabricated from wood and placed in their appropriate locations. Modeled upwind and downwind structural features were also fabricated if their heights exceeded 1/20th the distance to the plant stack.

All significant topography changes within the modeled area were included. Digital Elevation Models (DEM) for Guam were not available at the time of this study. The topographic data for model construction was obtained via the following process:

- 1) USGS topographic map contours were digitized via an custom AutoLisp routine run within the PC software package AutoCad® and placed into text files listing many X,Y,Z coordinates.
- 2) The randomly spaced X,Y,Z coordinates were converted to a uniform X,Y grid via the PC software package Surfer®. Figure 4 and Figure 5 show shaded relief maps of the model topographic data for the Mainland and Orote Peninsula respectively. The gridding process is seen to create some negative elevation values in the ocean (see Figure 5). When the model was routed the cut was not allowed to go below sea level.

- 3) Surfer® was then used to scale all Z elevations to model inches and then create separate model topography grid files for each 4 foot by 4 foot model area spanning the area of interest. Figure 6 shows the board layout overlaid on the model topographic contour maps.
- 4) Estimates of foam depth were made for 2' x 2' areas on each of the 4' x 4' model areas. Figure 7 shows the initial foam depth in inches for each model board.
- 5) Dow® blue construction foam was contact cemented in multiple layers to 4' x 4' sheets of ¼ inch thick masonite.
- 6) The 4' x 4' laminated foam pieces were placed into an automated 3D routing system, designed and built by CSU staff; the appropriate grid file was used to cut the foam surface to a 1:1000 scale representation of field topography via first a constant X - variable YZ motion, then a constant Y - variable XZ motion with a ½" router bit.
- 7) Once all 4' x 4' model topographic sections were constructed the surfaces were painted and each section was cut (via a large band saw) into small pieces designed to accommodate the test wind directions and the tunnel sidewall limitations. Figure 8 shows the cut patterns for each model board section.
- 8) The appropriate board pieces were assembled on the wind tunnel floor for each tested model wind direction.

Figure 9 shows the 1:1000 model of the Cabras and Piti Facilities placed at the center of the wind tunnel turntable. Figure 10 shows a view of Orote Peninsula with the concentration sampling tubing in place. Roughness elements, i.e. chains, were placed over all model ground level surfaces to ensure proper Reynolds number performances. Primary roadways were painted on the model surface.

3 TEST PROGRAM

The original goals of this testing program were to model plume dispersion from the Cabras and Piti Power Facilities towards the Orote Peninsula and towards Mt. Tenjo then to model plume dispersion from the Tenjo and Orote Power Facilities towards the Orote Peninsula and towards Mt. Tenjo in compliance with EPA Guidelines. Upon modeling the plume dispersion from the Cabras and Piti Power Facilities towards the Orote Peninsula the wind tunnel tests indicated a violation of the NAAQS similar to that predicted via the EPA ISC models. With no benefit predicted from the wind tunnel model the remainder of the test program was terminated.

The field test specifications are listed in Table 1. The field and model test parameters for three different model methodologies are listed in Table 2 through Table 6 for field reference wind speeds of 3, 6, 9, 12, & 15 m/s respectively. A summary table of the field and model test parameters for the modeling method used in the current study, buoyancy flux equality only, for all 5 test wind speeds is provided in Table 7. The original proposed field test conditions for the ADCT & Re#, Cabras, and Tenjo test series are detailed in Table 8, Table 9, and Table 10 respectively. The original proposed model test conditions for the ADCT & Re#, Cabras, and Tenjo test series are detailed in Table 11, Table 12, and Table 13 respectively. A listing of the actual Cabras test series tests performed up to the termination of the shown in Table 14. The Atmospheric Dispersion Comparability Test (ADC) Series is fully documented in a separate report included in this study binding. It is concluded from the ADC tests that the wind tunnel facility reproduces field plume behavior accurately at the selected model scale of 1:1000.

3.1 Wind Profiles Measurements

The wind tunnel flow conditions were fully documented in the ADC test series. In the ADC test series the generic model roughness conditions were tuned to a 1:000 scale of a neutrally stable atmospheric boundary layer characterized by a power law index of 0.18 and a roughness length of 0.5 meters. The use of a distorted roughness length, more rough than field conditions would indicate, is discussed in the section on model similarity.

The presents of model surface roughness inhomogeneities of topography, ocean surface, and structures alters the local wind profile conditions from that of the idealized boundary layer conditions in the ADC tests. A vertical wind profile was obtained just upwind of the stack structures for the testing wind direction of 33.75°. Table 15 presents model, normalized, and field equivalent values for this profile. This profile was examined to determine the following model boundary layer similarity parameters; the roughness length, the displacement height, the friction velocity, and the power law index. The left graph in Figure 11 displays the test data as

symbols and the power law curve as a line. This graph shows that the model profile is representative of the field power law index value of 0.13. The right graph in Figure 11 displays the mean velocity profile test data and the log-lin law curve on log-lin coordinates. This graph shows that the model profile is representative of the field values of roughness length equal to 0.15 meters. The left graph in Figure 12 displays the longitudinal turbulent intensity profile test data and the design curve suggested by Snyder, 1981. The right graph in Figure 12 displays the vertical turbulent intensity profile test data. It is seen that the ratio of the vertical to longitudinal turbulent intensity near the ground is ~ 0.5 as suggested in Snyder, 1981. Figure 13 shows this wind profile compared to the ASCE exposure categories.

3.2 Stack Plume Visualization

Model plant stack plume visualizations were performed for the fifteen tests, each test consisting of individual visualizations of the three test plumes, i.e., Cabras 1&2, Cabras 3&4, and Piti 4&5. The test conditions are listed in Table 14 for field and model conditions. The visual records were documented on the video cassette VHS tape. The camera positions for these film sequences was directly to the side the plant stack at a height slightly above model ground level and midway down the test section panning from the model stack area. Each test observes the plume trajectories from the plant stack down to the end of the model area, approximately 8 kilometers field equivalent distance, and zooms in on the Orote Peninsula. Figure 14 shows an example of model stack flow visualization for Cabras Units 1&2 with the wind direction at 45° and the wind speed at three meters/second at sixty meters height.

3.3 Concentration Measurements

Concentration measurements downwind of the model plant stacks were measured for the twenty-five tests listed in Table 14. Table 16 through Table 40 list the run conditions, model measured concentrations [ppm], model source and background compensated concentrations [ppm], model normalized concentrations [cm^{-2}] and field normalized concentrations [m^{-2}] for each of the three tracer plumes. Plume #1, #2, and #3 are for Cabras 1&2, Cabras 3&4, and Piti 4&5 respectively. All the sample locations presented here were at ground level. The physical locations of the concentration samples (tube no.) are show in the topographic map in Figure 1. The stack flow settings and compositions are summarized for each of the three tracer plumes in Table 41.

The concentration data for Cabras Units 1&2 are presented in bar chart format, comparing concentration magnitudes for different wind speeds and sample locations, for each specific wind

direction in Figure 15 through Figure 19. The concentration data for Cabras Units 3&4 are presented in bar chart format for each specific wind direction in Figure 20 through Figure 24. The concentration data for Piti Units 4&5 are presented in bar chart format for each specific wind direction in Figure 25 through Figure 29.

TABLES

REFERENCES

Following is a list of reference materials related to this study. This list is not meant to be all inclusive.

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5. Snyder, W.H., "Guideline for Fluid Modeling of Atmospheric Diffusion", EPA-600/8-8cl-009. U.S. Environmental Protection Agency, Research Triangle Park, NC, 1981.
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TABLES

Field Conditions

Source	Stack Location (UTM)			Emission Rate (gm/s)	Tracer No.	Stack Temp. (K)	Stack Height (m)	Stack Dia. (m)	Stack Gas S.G.	Stack Flow (m ³ /s)	Stack Vel. (m/s)
	X	Y	Z								
Cabras #3	249143	1489515	3.0	131.90	1	445	61.0	2.70	0.658	124.2	21.7
Cabras #4	249143	1489515	3.0	131.90	1	445	61.0	2.70	0.658	124.2	21.7
Cabras #1	249188	1489539	3.0	234.95	2	422	61.0	2.59	0.694	82.7	15.7
Cabras #2	249214	1489554	3.0	234.95	2	422	61.0	2.59	0.694	82.7	15.7
Piti #4,5	249503	1489300	3.0	196.70	3	435	61.0	2.60	0.674	75.9	14.3
Tenjo #1,2	249281	1484303	24.4	6.80	1	709	25.9	1.22	0.413	33.8	28.9
Tenjo #3,4	249281	1484278	24.4	6.80	1	709	25.9	1.22	0.413	33.8	28.9
Orote #1	246403	1484914	3.0	4.33	2	623	35.0	1.20	0.470	26.7	23.6
Orote #2	246408	1484904	3.0	4.33	2	623	35.0	1.20	0.470	26.7	23.6
Orote #3	246414	1484895	3.0	4.33	2	623	35.0	1.20	0.470	26.7	23.6

Table 1 Field Test Specifications

Scaling Criteria Selection Definition Tables (Field Condition) – GUAM Project

Field Conditions

Source	Stack Height (m)	Stack Dia. (m)	Stack Gas S.G.	Stack Flow (m ³ /s)	Stack Vel. (m/s)	Wind at Hs (m/s)	W/U ratio	Mom. Term	Buoy. Term
Cabras #3	61.0	2.70	0.658	124.2	21.7	3.0	7.2	0.129	8.0E-02
Cabras #4	61.0	2.70	0.658	124.2	21.7	3.0	7.2	0.129	8.0E-02
Cabras #1	61.0	2.59	0.694	82.7	15.7	3.0	5.2	0.092	4.7E-02
Cabras #2	61.0	2.59	0.694	82.7	15.7	3.0	5.2	0.092	4.7E-02
Piti #4,5	61.0	2.60	0.674	75.9	14.3	3.0	4.7	0.083	4.6E-02
Tenjo #1,2	25.9	1.22	0.413	33.8	28.9	2.5	11.5	0.174	1.5E-01
Tenjo #3,4	25.9	1.22	0.413	33.8	28.9	2.5	11.5	0.174	1.5E-01
Orote #1	35.0	1.20	0.470	26.7	23.6	2.7	8.8	0.104	6.6E-02
Orote #2	35.0	1.20	0.470	26.7	23.6	2.7	8.8	0.104	6.6E-02
Orote #3	35.0	1.20	0.470	26.7	23.6	2.7	8.8	0.104	6.6E-02

Input Parameters	
Us (m/s) =	3.0
Href (m) =	60
Zo (m) =	0.50
Length Scale =	1000
power law index =	0.21

Scaling Criteria Selection Definition Tables (Model Condition) – GUAM Project

Model Conditions (Calspan/Briggs Match Technique; Snyder 1981 suggested most correct method (a), p71)

Buoyancy Flux & Moment Flux Equality (note - if S.G. & I.D. equality then full similarity)

Field Wind Speed (m/s) = 3.00

Source	Stack Height (cm)	Stack Dia. (cm)	Stack Gas S.G.	Stack Flow (ccs)	Stack Vel. (cm/s)	Wind at Hs (cm/s)	W/U ratio	Mom. Term	Buoy. Term	Stack Re#	Rough Re#	%Trace In 2nd	Tracer MW	I.D. distort factor
Cabras #3	61.0	0.54	0.350	24.6	107.5	21.8	4.9	0.129	8.0E-02	387	0.60	23.6	30.0	2.0
Cabras #4	61.0	0.54	0.350	24.6	107.5	21.8	4.9	0.129	8.0E-02	387	0.60	23.6	30.0	2.0
Cabras #1	61.0	0.78	0.534	20.4	43.1	21.8	2.0	0.092	4.7E-02	223	0.60	95.5	16.0	3.0
Cabras #2	61.0	0.78	0.534	20.4	43.1	21.8	2.0	0.092	4.7E-02	223	0.60	95.5	16.0	3.0
Piti #4,5	61.0	0.78	0.507	19.0	39.7	21.8	1.8	0.083	4.6E-02	206	0.60	26.7	44.0	3.0
Tenjo #1,2	25.9	0.49	0.323	11.0	59.0	18.1	3.3	0.174	1.5E-01	192	0.61	20.6	30.0	4.0
Tenjo #3,4	25.9	0.49	0.323	11.0	59.0	18.1	3.3	0.174	1.5E-01	192	0.61	20.6	30.0	4.0
Orote #1	35.0	0.48	0.379	8.6	47.5	19.3	2.5	0.104	6.6E-02	152	0.61	58.2	16.0	4.0
Orote #2	35.0	0.48	0.379	8.6	47.5	19.3	2.5	0.104	6.6E-02	152	0.61	58.2	16.0	4.0
Orote #3	35.0	0.48	0.379	8.6	47.5	19.3	2.5	0.104	6.6E-02	152	0.61	58.2	16.0	4.0

4.00 < 2nd Comp. MW

Model Conditions (Snyder 1981 alternate method (b) on p71)

Buoyancy Flux Equality Only

Momentum Distortion Factor = 3.00

Field Wind Speed (m/s) = 3.00

Source	Stack Height (cm)	Stack Dia. (cm)	Stack Gas S.G.	Stack Flow (ccs)	Stack Vel. (cm/s)	Wind at Hs (cm/s)	W/U ratio	Mom. Term	Buoy. Term	Stack Re#	Rough Re#	%Trace In 2nd	Tracer MW	I.D. distort factor
Cabras #3	61.0	0.54	0.350	128.0	558.7	37.7	14.8	0.388	8.0E-02	2011	1.05	23.6	30.0	2.0
Cabras #4	61.0	0.54	0.350	128.0	558.7	37.7	14.8	0.388	8.0E-02	2011	1.05	23.6	30.0	2.0
Cabras #1	61.0	0.78	0.534	106.3	224.1	37.7	5.9	0.277	4.7E-02	1161	1.05	95.5	16.0	3.0
Cabras #2	61.0	0.78	0.534	106.3	224.1	37.7	5.9	0.277	4.7E-02	1161	1.05	95.5	16.0	3.0
Piti #4,5	61.0	0.78	0.507	98.5	206.2	37.7	5.5	0.249	4.6E-02	1072	1.05	26.7	44.0	3.0
Tenjo #1,2	25.9	0.49	0.323	57.4	306.8	31.4	9.8	0.523	1.5E-01	998	1.06	20.6	30.0	4.0
Tenjo #3,4	25.9	0.49	0.323	57.4	306.8	31.4	9.8	0.523	1.5E-01	998	1.06	20.6	30.0	4.0
Orote #1	35.0	0.48	0.379	44.6	246.7	33.5	7.4	0.311	6.6E-02	789	1.05	58.2	16.0	4.0
Orote #2	35.0	0.48	0.379	44.6	246.7	33.5	7.4	0.311	6.6E-02	789	1.05	58.2	16.0	4.0
Orote #3	35.0	0.48	0.379	44.6	246.7	33.5	7.4	0.311	6.6E-02	789	1.05	58.2	16.0	4.0

4.00 < 2nd Comp. MW

Model Conditions (CSU method as listed in Snyder 1981, p71)

Buoyancy Flux & Volume Flux Equality (note - if S.G. & I.D. equality then full similarity)

Field Wind Speed (m/s) = 3.00

Source	Stack Height (cm)	Stack Dia. (cm)	Stack Gas S.G.	Stack Flow (ccs)	Stack Vel. (cm/s)	Wind at Hs (cm/s)	W/U ratio	Mom. Term	Buoy. Term	Stack Re#	Rough Re#	%Trace In 2nd	Tracer MW	I.D. distort factor
Cabras #3	61.0	0.54	0.350	15.3	66.9	18.6	3.6	0.094	8.0E-02	241	0.52	51.1	16.0	2.0
Cabras #4	61.0	0.52	0.350	14.1	66.9	18.6	3.6	0.091	7.3E-02	231	0.52	51.1	16.0	2.0
Cabras #1	61.0	0.78	0.612	15.3	32.3	18.6	1.7	0.087	4.7E-02	167	0.52	52.8	30.0	3.0
Cabras #2	61.0	0.78	0.612	15.3	32.3	18.6	1.7	0.087	4.7E-02	167	0.52	52.8	30.0	3.0
Piti #4,5	61.0	0.78	0.586	14.1	29.4	18.6	1.6	0.077	4.6E-02	153	0.52	32.4	44.0	3.0
Tenjo #1,2	25.9	0.49	0.442	8.3	44.6	15.5	2.9	0.180	1.5E-01	145	0.52	33.8	30.0	4.0
Tenjo #3,4	25.9	0.49	0.442	8.3	44.6	15.5	2.9	0.180	1.5E-01	145	0.52	33.8	30.0	4.0
Orote #1	35.0	0.48	0.496	6.6	36.4	16.5	2.2	0.107	6.6E-02	116	0.52	86.4	16.0	4.0
Orote #2	35.0	0.48	0.496	6.6	36.4	16.5	2.2	0.107	6.6E-02	116	0.52	86.4	16.0	4.0
Orote #3	35.0	0.48	0.496	6.6	36.4	16.5	2.2	0.107	6.6E-02	116	0.52	86.4	16.0	4.0

(note - method proven in Isyumov and Tanaka 1979, Robins 1980 but not suggested by Snyder 1981, p56)

4.00 < 2nd Comp. MW

Table 2 Field and Model Test Parameters - 3 m/s

Scaling Criteria Selection Definition Tables (Field Condition) -- GUAM Project

Field Conditions

Source	Stack Height (m)	Stack Dia. (m)	Stack Gas S.G.	Stack Flow (m ³ /s)	Stack Vel. (m/s)	Wind at Hs (m/s)	W/U ratio	Mom. Term	Buoy. Term
Cabras #3	61.0	2.70	0.658	124.2	21.7	6.0	3.6	0.065	1.0E-02
Cabras #4	61.0	2.70	0.658	124.2	21.7	6.0	3.6	0.065	1.0E-02
Cabras #1	61.0	2.59	0.694	82.7	15.7	6.0	2.6	0.046	5.9E-03
Cabras #2	61.0	2.59	0.694	82.7	15.7	6.0	2.6	0.046	5.9E-03
Piti #4,5	61.0	2.60	0.674	75.9	14.3	6.0	2.4	0.042	5.8E-03
Tenjo #1,2	25.9	1.22	0.413	33.8	28.9	5.0	5.8	0.087	1.9E-02
Tenjo #3,4	25.9	1.22	0.413	33.8	28.9	5.0	5.8	0.087	1.9E-02
Orote #1	35.0	1.20	0.470	26.7	23.6	5.4	4.4	0.052	8.2E-03
Orote #2	35.0	1.20	0.470	26.7	23.6	5.4	4.4	0.052	8.2E-03
Orote #3	35.0	1.20	0.470	26.7	23.6	5.4	4.4	0.052	8.2E-03

Input Parameters	
Us (m/s) =	6.0
Href (m) =	60
Zo (m) =	0.50
Length Scale =	1000
power law index =	0.21

Scaling Criteria Selection Definition Tables (Model Condition) -- GUAM Project

Model Conditions (Calspan/Briggs Match Technique; Snyder 1981 suggested most correct method (a), p71)

Buoyancy Flux & Moment Flux Equality (note - if S.G. & I.D. equality then full similarity)

Field Wind Speed (m/s) = 6.00

Source	Stack Height (cm)	Stack Dia. (cm)	Stack Gas S.G.	Stack Flow (ccs)	Stack Vel. (cm/s)	Wind at Hs (cm/s)	W/U ratio	Mom. Term	Buoy. Term	Stack Re#	Rough Re#	%Trace In 2nd	Tracer MW	I.D. distort factor
Cabras #3	6.10	0.54	0.350	24.6	107.5	43.5	2.5	0.065	1.0E-02	387	1.21	23.6	30.0	2.0
Cabras #4	6.10	0.54	0.350	24.6	107.5	43.5	2.5	0.065	1.0E-02	387	1.21	23.6	30.0	2.0
Cabras #1	6.10	0.78	0.534	20.4	43.1	43.5	1.0	0.046	5.9E-03	223	1.21	95.5	16.0	3.0
Cabras #2	6.10	0.78	0.534	20.4	43.1	43.5	1.0	0.046	5.9E-03	223	1.21	95.5	16.0	3.0
Piti #4,5	6.10	0.78	0.507	19.0	39.7	43.5	0.9	0.042	5.8E-03	206	1.21	26.7	44.0	3.0
Tenjo #1,2	2.59	0.49	0.323	11.0	59.0	36.3	1.6	0.087	1.9E-02	192	1.22	20.6	30.0	4.0
Tenjo #3,4	2.59	0.49	0.323	11.0	59.0	36.3	1.6	0.087	1.9E-02	192	1.22	20.6	30.0	4.0
Orote #1	3.50	0.48	0.379	8.6	47.5	38.7	1.2	0.052	8.2E-03	152	1.21	58.2	16.0	4.0
Orote #2	3.50	0.48	0.379	8.6	47.5	38.7	1.2	0.052	8.2E-03	152	1.21	58.2	16.0	4.0
Orote #3	3.50	0.48	0.379	8.6	47.5	38.7	1.2	0.052	8.2E-03	152	1.21	58.2	16.0	4.0

4.00 < 2nd Comp. MW

Model Conditions (Snyder 1981 alternate method (b) on p71)

Buoyancy Flux Equality Only

Momentum Distortion Factor = 3.00

Field Wind Speed (m/s) = 6.00

Source	Stack Height (cm)	Stack Dia. (cm)	Stack Gas S.G.	Stack Flow (ccs)	Stack Vel. (cm/s)	Wind at Hs (cm/s)	W/U ratio	Mom. Term	Buoy. Term	Stack Re#	Rough Re#	%Trace In 2nd	Tracer MW	I.D. distort factor
Cabras #3	6.10	0.54	0.350	128.0	558.7	75.3	7.4	0.194	1.0E-02	2011	2.09	23.6	30.0	2.0
Cabras #4	6.10	0.54	0.350	128.0	558.7	75.3	7.4	0.194	1.0E-02	2011	2.09	23.6	30.0	2.0
Cabras #1	6.10	0.78	0.534	106.3	224.1	75.3	3.0	0.138	5.9E-03	1161	2.09	95.5	16.0	3.0
Cabras #2	6.10	0.78	0.534	106.3	224.1	75.3	3.0	0.138	5.9E-03	1161	2.09	95.5	16.0	3.0
Piti #4,5	6.10	0.78	0.507	98.5	206.2	75.3	2.7	0.125	5.8E-03	1072	2.09	26.7	44.0	3.0
Tenjo #1,2	2.59	0.49	0.323	57.4	306.8	62.8	4.9	0.262	1.9E-02	998	2.12	20.6	30.0	4.0
Tenjo #3,4	2.59	0.49	0.323	57.4	306.8	62.8	4.9	0.262	1.9E-02	998	2.12	20.6	30.0	4.0
Orote #1	3.50	0.48	0.379	44.6	246.7	67.0	3.7	0.156	8.2E-03	789	2.10	58.2	16.0	4.0
Orote #2	3.50	0.48	0.379	44.6	246.7	67.0	3.7	0.156	8.2E-03	789	2.10	58.2	16.0	4.0
Orote #3	3.50	0.48	0.379	44.6	246.7	67.0	3.7	0.156	8.2E-03	789	2.10	58.2	16.0	4.0

4.00 < 2nd Comp. MW

Model Conditions (CSU method as listed in Snyder 1981, p71)

Buoyancy Flux & Volume Flux Equality (note - if S.G. & I.D. equality then full similarity)

Field Wind Speed (m/s) = 6.00

Source	Stack Height (cm)	Stack Dia. (cm)	Stack Gas S.G.	Stack Flow (ccs)	Stack Vel. (cm/s)	Wind at Hs (cm/s)	W/U ratio	Mom. Term	Buoy. Term	Stack Re#	Rough Re#	%Trace In 2nd	Tracer MW	I.D. distort factor
Cabras #3	6.10	0.54	0.350	15.3	66.9	37.1	1.8	0.047	1.0E-02	241	1.03	51.1	16.0	2.0
Cabras #4	6.10	0.52	0.350	14.1	66.9	37.1	1.8	0.045	9.2E-03	231	1.03	51.1	16.0	2.0
Cabras #1	6.10	0.78	0.612	15.3	32.3	37.1	0.9	0.043	5.9E-03	167	1.03	52.8	30.0	3.0
Cabras #2	6.10	0.78	0.612	15.3	32.3	37.1	0.9	0.043	5.9E-03	167	1.03	52.8	30.0	3.0
Piti #4,5	6.10	0.78	0.586	14.1	29.4	37.1	0.8	0.039	5.8E-03	153	1.03	32.4	44.0	3.0
Tenjo #1,2	2.59	0.49	0.442	8.3	44.6	31.0	1.4	0.090	1.9E-02	145	1.05	33.8	30.0	4.0
Tenjo #3,4	2.59	0.49	0.442	8.3	44.6	31.0	1.4	0.090	1.9E-02	145	1.05	33.8	30.0	4.0
Orote #1	3.50	0.48	0.496	6.6	36.4	33.0	1.1	0.053	8.2E-03	116	1.04	86.4	16.0	4.0
Orote #2	3.50	0.48	0.496	6.6	36.4	33.0	1.1	0.053	8.2E-03	116	1.04	86.4	16.0	4.0
Orote #3	3.50	0.48	0.496	6.6	36.4	33.0	1.1	0.053	8.2E-03	116	1.04	86.4	16.0	4.0

(note - method proven in Isyumov and Tanaka 1979, Robins 1980 but not suggested by Snyder 1981, p56)

4.00 < 2nd Comp. MW

Table 3 Field and Model Test Parameters - 6 m/s

Scaling Criteria Selection Definition Tables (Field Condition) -- GUAM Project

Field Conditions

Source	Stack Height (m)	Stack Dia. (m)	Stack Gas S.G.	Stack Flow (m ³ /s)	Stack Vel. (m/s)	Wind at Hs (m/s)	W/U ratio	Mom. Term	Buoy. Term
Cabras #3	61.0	2.70	0.658	124.2	21.7	9.0	2.4	0.043	2.9E-03
Cabras #4	61.0	2.70	0.658	124.2	21.7	9.0	2.4	0.043	2.9E-03
Cabras #1	61.0	2.59	0.694	82.7	15.7	9.0	1.7	0.031	1.8E-03
Cabras #2	61.0	2.59	0.694	82.7	15.7	9.0	1.7	0.031	1.8E-03
Piti #4,5	61.0	2.60	0.674	75.9	14.3	9.0	1.6	0.028	1.7E-03
Tenjo #1,2	25.9	1.22	0.413	33.8	28.9	7.5	3.8	0.058	5.6E-03
Tenjo #3,4	25.9	1.22	0.413	33.8	28.9	7.5	3.8	0.058	5.6E-03
Orote #1	35.0	1.20	0.470	26.7	23.6	8.0	2.9	0.035	2.4E-03
Orote #2	35.0	1.20	0.470	26.7	23.6	8.0	2.9	0.035	2.4E-03
Orote #3	35.0	1.20	0.470	26.7	23.6	8.0	2.9	0.035	2.4E-03

Input Parameters	
Us (m/s) =	9.0
Href (m) =	60
Zo (m) =	0.50
Length Scale =	1000
power law index =	0.21

Scaling Criteria Selection Definition Tables (Model Condition) -- GUAM Project

Model Conditions (Calspan/Briggs Match Technique; Snyder 1981 suggested most correct method (a), p71)

Buoyancy Flux & Moment Flux Equality (note - if S.G. & I.D. equality then full similarity)

Field Wind Speed (m/s) = 9.00

Source	Stack Height (cm)	Stack Dia. (cm)	Stack Gas S.G.	Stack Flow (ccs)	Stack Vel. (cm/s)	Wind at Hs (cm/s)	W/U ratio	Mom. Term	Buoy. Term	Stack Re#	Rough Re#	%Trace In 2nd	Tracer MW	I.D. distort factor
Cabras #3	6.10	0.54	0.350	24.6	107.5	65.3	1.6	0.043	2.9E-03	387	1.81	23.6	30.0	2.0
Cabras #4	6.10	0.54	0.350	24.6	107.5	65.3	1.6	0.043	2.9E-03	387	1.81	23.6	30.0	2.0
Cabras #1	6.10	0.78	0.534	20.4	43.1	65.3	0.7	0.031	1.8E-03	223	1.81	95.5	16.0	3.0
Cabras #2	6.10	0.78	0.534	20.4	43.1	65.3	0.7	0.031	1.8E-03	223	1.81	95.5	16.0	3.0
Piti #4,5	6.10	0.78	0.507	19.0	39.7	65.3	0.6	0.028	1.7E-03	206	1.81	26.7	44.0	3.0
Tenjo #1,2	2.59	0.49	0.323	11.0	59.0	54.4	1.1	0.058	5.6E-03	192	1.84	20.6	30.0	4.0
Tenjo #3,4	2.59	0.49	0.323	11.0	59.0	54.4	1.1	0.058	5.6E-03	192	1.84	20.6	30.0	4.0
Orote #1	3.50	0.48	0.379	8.6	47.5	58.0	0.8	0.035	2.4E-03	152	1.82	58.2	16.0	4.0
Orote #2	3.50	0.48	0.379	8.6	47.5	58.0	0.8	0.035	2.4E-03	152	1.82	58.2	16.0	4.0
Orote #3	3.50	0.48	0.379	8.6	47.5	58.0	0.8	0.035	2.4E-03	152	1.82	58.2	16.0	4.0

4.00 < 2nd Comp. MW

Model Conditions (Snyder 1981 alternate method (b) on p71)

Buoyancy Flux Equality Only

Momentum Distortion Factor = 3.00

Field Wind Speed (m/s) = 9.00

Source	Stack Height (cm)	Stack Dia. (cm)	Stack Gas S.G.	Stack Flow (ccs)	Stack Vel. (cm/s)	Wind at Hs (cm/s)	W/U ratio	Mom. Term	Buoy. Term	Stack Re#	Rough Re#	%Trace In 2nd	Tracer MW	I.D. distort factor
Cabras #3	6.10	0.54	0.350	128.0	558.7	113.0	4.9	0.129	2.9E-03	2011	3.14	23.6	30.0	2.0
Cabras #4	6.10	0.54	0.350	128.0	558.7	113.0	4.9	0.129	2.9E-03	2011	3.14	23.6	30.0	2.0
Cabras #1	6.10	0.78	0.534	106.3	224.1	113.0	2.0	0.092	1.8E-03	1161	3.14	95.5	16.0	3.0
Cabras #2	6.10	0.78	0.534	106.3	224.1	113.0	2.0	0.092	1.8E-03	1161	3.14	95.5	16.0	3.0
Piti #4,5	6.10	0.78	0.507	98.5	206.2	113.0	1.8	0.083	1.7E-03	1072	3.14	26.7	44.0	3.0
Tenjo #1,2	2.59	0.49	0.323	57.4	306.8	94.2	3.3	0.174	5.6E-03	998	3.18	20.6	30.0	4.0
Tenjo #3,4	2.59	0.49	0.323	57.4	306.8	94.2	3.3	0.174	5.6E-03	998	3.18	20.6	30.0	4.0
Orote #1	3.50	0.48	0.379	44.6	246.7	100.4	2.5	0.104	2.4E-03	789	3.15	58.2	16.0	4.0
Orote #2	3.50	0.48	0.379	44.6	246.7	100.4	2.5	0.104	2.4E-03	789	3.15	58.2	16.0	4.0
Orote #3	3.50	0.48	0.379	44.6	246.7	100.4	2.5	0.104	2.4E-03	789	3.15	58.2	16.0	4.0

4.00 < 2nd Comp. MW

Model Conditions (CSU method as listed in Snyder 1981, p71)

Buoyancy Flux & Volume Flux Equality (note - if S.G. & I.D. equality then full similarity)

Field Wind Speed (m/s) = 9.00

Source	Stack Height (cm)	Stack Dia. (cm)	Stack Gas S.G.	Stack Flow (ccs)	Stack Vel. (cm/s)	Wind at Hs (cm/s)	W/U ratio	Mom. Term	Buoy. Term	Stack Re#	Rough Re#	%Trace In 2nd	Tracer MW	I.D. distort factor
Cabras #3	6.10	0.54	0.350	15.3	66.9	55.7	1.2	0.031	2.9E-03	241	1.55	51.1	16.0	2.0
Cabras #4	6.10	0.52	0.350	14.1	66.9	55.7	1.2	0.030	2.7E-03	231	1.55	51.1	16.0	2.0
Cabras #1	6.10	0.78	0.612	15.3	32.3	55.7	0.6	0.029	1.8E-03	167	1.55	52.8	30.0	3.0
Cabras #2	6.10	0.78	0.612	15.3	32.3	55.7	0.6	0.029	1.8E-03	167	1.55	52.8	30.0	3.0
Piti #4,5	6.10	0.78	0.586	14.1	29.4	55.7	0.5	0.026	1.7E-03	153	1.55	32.4	44.0	3.0
Tenjo #1,2	2.59	0.49	0.442	8.3	44.6	46.4	1.0	0.060	5.6E-03	145	1.57	33.8	30.0	4.0
Tenjo #3,4	2.59	0.49	0.442	8.3	44.6	46.4	1.0	0.060	5.6E-03	145	1.57	33.8	30.0	4.0
Orote #1	3.50	0.48	0.496	6.6	36.4	49.5	0.7	0.036	2.4E-03	116	1.55	86.4	16.0	4.0
Orote #2	3.50	0.48	0.496	6.6	36.4	49.5	0.7	0.036	2.4E-03	116	1.55	86.4	16.0	4.0
Orote #3	3.50	0.48	0.496	6.6	36.4	49.5	0.7	0.036	2.4E-03	116	1.55	86.4	16.0	4.0

(note - method proven in Isyumov and Tanaka 1979, Robins 1980 but not suggested by Snyder 1981, p56)

4.00 < 2nd Comp. MW

Table 4 Field and Model Test Parameters - 9 m/s

Scaling Criteria Selection Definition Tables (Field Condition) – GUAM Project

Field Conditions

Source	Stack Height (m)	Stack Dia. (m)	Stack Gas S.G.	Stack Flow (m ³ /s)	Stack Vel. (m/s)	Wind at Hs (m/s)	W/U ratio	Mom. Term	Buoy. Term
Cabras #3	61.0	2.70	0.658	124.2	21.7	12.0	1.8	0.032	1.2E-03
Cabras #4	61.0	2.70	0.658	124.2	21.7	12.0	1.8	0.032	1.2E-03
Cabras #1	61.0	2.59	0.694	82.7	15.7	12.0	1.3	0.023	7.4E-04
Cabras #2	61.0	2.59	0.694	82.7	15.7	12.0	1.3	0.023	7.4E-04
Piti #4,5	61.0	2.60	0.674	75.9	14.3	12.0	1.2	0.021	7.3E-04
Tenjo #1,2	25.9	1.22	0.413	33.8	28.9	10.0	2.9	0.044	2.4E-03
Tenjo #3,4	25.9	1.22	0.413	33.8	28.9	10.0	2.9	0.044	2.4E-03
Orote #1	35.0	1.20	0.470	26.7	23.6	10.7	2.2	0.026	1.0E-03
Orote #2	35.0	1.20	0.470	26.7	23.6	10.7	2.2	0.026	1.0E-03
Orote #3	35.0	1.20	0.470	26.7	23.6	10.7	2.2	0.026	1.0E-03

Input Parameters	
Us (m/s) =	12.0
Href (m) =	60
Zo (m) =	0.50
Length Scale =	1000
power law index =	0.21

Scaling Criteria Selection Definition Tables (Model Condition) – GUAM Project

Model Conditions (Calspan/Briggs Match Technique; Snyder 1981 suggested most correct method (a), p71)

Buoyancy Flux & Moment Flux Equality (note - if S.G. & I.D. equality then full similarity)

Field Wind Speed (m/s) = 12.00

Source	Stack Height (cm)	Stack Dia. (cm)	Stack Gas S.G.	Stack Flow (ccs)	Stack Vel. (cm/s)	Wind at Hs (cm/s)	W/U ratio	Mom. Term	Buoy. Term	Stack Re#	Rough Re#	%Trace In 2nd	Tracer MW	I.D. distort factor
Cabras #3	6.10	0.54	0.350	24.6	107.5	87.0	1.2	0.032	1.2E-03	387	2.41	23.6	30.0	2.0
Cabras #4	6.10	0.54	0.350	24.6	107.5	87.0	1.2	0.032	1.2E-03	387	2.41	23.6	30.0	2.0
Cabras #1	6.10	0.78	0.534	20.4	43.1	87.0	0.5	0.023	7.4E-04	223	2.41	95.5	16.0	3.0
Cabras #2	6.10	0.78	0.534	20.4	43.1	87.0	0.5	0.023	7.4E-04	223	2.41	95.5	16.0	3.0
Piti #4,5	6.10	0.78	0.507	19.0	39.7	87.0	0.5	0.021	7.3E-04	206	2.41	26.7	44.0	3.0
Tenjo #1,2	2.59	0.49	0.323	11.0	59.0	72.5	0.8	0.044	2.4E-03	192	2.45	20.6	30.0	4.0
Tenjo #3,4	2.59	0.49	0.323	11.0	59.0	72.5	0.8	0.044	2.4E-03	192	2.45	20.6	30.0	4.0
Orote #1	3.50	0.48	0.379	8.6	47.5	77.3	0.6	0.026	1.0E-03	152	2.43	58.2	16.0	4.0
Orote #2	3.50	0.48	0.379	8.6	47.5	77.3	0.6	0.026	1.0E-03	152	2.43	58.2	16.0	4.0
Orote #3	3.50	0.48	0.379	8.6	47.5	77.3	0.6	0.026	1.0E-03	152	2.43	58.2	16.0	4.0

4.00 < 2nd Comp. MW

Model Conditions (Snyder 1981 alternate method (b) on p71)

Buoyancy Flux Equality Only

Momentum Distortion Factor = 3.00

Field Wind Speed (m/s) = 12.00

Source	Stack Height (cm)	Stack Dia. (cm)	Stack Gas S.G.	Stack Flow (ccs)	Stack Vel. (cm/s)	Wind at Hs (cm/s)	W/U ratio	Mom. Term	Buoy. Term	Stack Re#	Rough Re#	%Trace In 2nd	Tracer MW	I.D. distort factor
Cabras #3	6.10	0.54	0.350	128.0	558.7	150.7	3.7	0.097	1.2E-03	2011	4.18	23.6	30.0	2.0
Cabras #4	6.10	0.54	0.350	128.0	558.7	150.7	3.7	0.097	1.2E-03	2011	4.18	23.6	30.0	2.0
Cabras #1	6.10	0.78	0.534	106.3	224.1	150.7	1.5	0.069	7.4E-04	1161	4.18	95.5	16.0	3.0
Cabras #2	6.10	0.78	0.534	106.3	224.1	150.7	1.5	0.069	7.4E-04	1161	4.18	95.5	16.0	3.0
Piti #4,5	6.10	0.78	0.507	98.5	206.2	150.7	1.4	0.062	7.3E-04	1072	4.18	26.7	44.0	3.0
Tenjo #1,2	2.59	0.49	0.323	57.4	306.8	125.6	2.4	0.131	2.4E-03	998	4.24	20.6	30.0	4.0
Tenjo #3,4	2.59	0.49	0.323	57.4	306.8	125.6	2.4	0.131	2.4E-03	998	4.24	20.6	30.0	4.0
Orote #1	3.50	0.48	0.379	44.6	246.7	133.9	1.8	0.078	1.0E-03	789	4.20	58.2	16.0	4.0
Orote #2	3.50	0.48	0.379	44.6	246.7	133.9	1.8	0.078	1.0E-03	789	4.20	58.2	16.0	4.0
Orote #3	3.50	0.48	0.379	44.6	246.7	133.9	1.8	0.078	1.0E-03	789	4.20	58.2	16.0	4.0

4.00 < 2nd Comp. MW

Model Conditions (CSU method as listed in Snyder 1981, p71)

Buoyancy Flux & Volume Flux Equality (note - if S.G. & I.D. equality then full similarity)

Field Wind Speed (m/s) = 12.00

Source	Stack Height (cm)	Stack Dia. (cm)	Stack Gas S.G.	Stack Flow (ccs)	Stack Vel. (cm/s)	Wind at Hs (cm/s)	W/U ratio	Mom. Term	Buoy. Term	Stack Re#	Rough Re#	%Trace In 2nd	Tracer MW	I.D. distort factor
Cabras #3	6.10	0.54	0.350	15.3	66.9	74.3	0.9	0.024	1.2E-03	241	2.06	51.1	16.0	2.0
Cabras #4	6.10	0.52	0.350	14.1	66.9	74.3	0.9	0.023	1.1E-03	231	2.06	51.1	16.0	2.0
Cabras #1	6.10	0.78	0.612	15.3	32.3	74.3	0.4	0.022	7.4E-04	167	2.06	52.8	30.0	3.0
Cabras #2	6.10	0.78	0.612	15.3	32.3	74.3	0.4	0.022	7.4E-04	167	2.06	52.8	30.0	3.0
Piti #4,5	6.10	0.78	0.586	14.1	29.4	74.3	0.4	0.019	7.3E-04	153	2.06	32.4	44.0	3.0
Tenjo #1,2	2.59	0.49	0.442	8.3	44.6	61.9	0.7	0.045	2.4E-03	145	2.09	33.8	30.0	4.0
Tenjo #3,4	2.59	0.49	0.442	8.3	44.6	61.9	0.7	0.045	2.4E-03	145	2.09	33.8	30.0	4.0
Orote #1	3.50	0.48	0.496	6.6	36.4	66.0	0.6	0.027	1.0E-03	116	2.07	86.4	16.0	4.0
Orote #2	3.50	0.48	0.496	6.6	36.4	66.0	0.6	0.027	1.0E-03	116	2.07	86.4	16.0	4.0
Orote #3	3.50	0.48	0.496	6.6	36.4	66.0	0.6	0.027	1.0E-03	116	2.07	86.4	16.0	4.0

(note - method proven in Isyumov and Tanaka 1979, Robins 1980 but not suggested by Snyder 1981, p56)

4.00 < 2nd Comp. MW

Table 5 Field and Model Test Parameters - 12 m/s

Scaling Criteria Selection Definition Tables (Field Condition) – GUAM Project

Field Conditions

Source	Stack Height (m)	Stack Dia. (m)	Stack Gas S.G.	Stack Flow (m ³ /s)	Stack Vel. (m/s)	Wind at Hs (m/s)	W/U ratio	Mom. Term	Buoy. Term
Cabras #3	61.0	2.70	0.658	124.2	21.7	15.1	1.4	0.026	6.4E-04
Cabras #4	61.0	2.70	0.658	124.2	21.7	15.1	1.4	0.026	6.4E-04
Cabras #1	61.0	2.59	0.694	82.7	15.7	15.1	1.0	0.018	3.8E-04
Cabras #2	61.0	2.59	0.694	82.7	15.7	15.1	1.0	0.018	3.8E-04
Piti #4,5	61.0	2.60	0.674	75.9	14.3	15.1	0.9	0.017	3.7E-04
Tenjo #1,2	25.9	1.22	0.413	33.8	28.9	12.5	2.3	0.035	1.2E-03
Tenjo #3,4	25.9	1.22	0.413	33.8	28.9	12.5	2.3	0.035	1.2E-03
Orote #1	35.0	1.20	0.470	26.7	23.6	13.4	1.8	0.021	5.3E-04
Orote #2	35.0	1.20	0.470	26.7	23.6	13.4	1.8	0.021	5.3E-04
Orote #3	35.0	1.20	0.470	26.7	23.6	13.4	1.8	0.021	5.3E-04

Input Parameters	
Us (m/s) =	15.0
Href (m) =	60
Zo (m) =	0.50
Length Scale =	1000
power law index =	0.21

Scaling Criteria Selection Definition Tables (Model Condition) – GUAM Project

Model Conditions (Calspan/Briggs Match Technique; Snyder 1981 suggested most correct method (a), p71)

Buoyancy Flux & Moment Flux Equality (note - if S.G. & I.D. equality then full similarity)

Field Wind Speed (m/s) = 15.00

Source	Stack Height (cm)	Stack Dia. (cm)	Stack Gas S.G.	Stack Flow (ccs)	Stack Vel. (cm/s)	Wind at Hs (cm/s)	W/U ratio	Mom. Term	Buoy. Term	Stack Re#	Rough Re#	%Trace In 2nd	Tracer MW	I.D. distort factor
Cabras #3	6.10	0.54	0.350	24.6	107.5	108.8	1.0	0.026	6.4E-04	387	3.02	23.6	30.0	2.0
Cabras #4	6.10	0.54	0.350	24.6	107.5	108.8	1.0	0.026	6.4E-04	387	3.02	23.6	30.0	2.0
Cabras #1	6.10	0.78	0.534	20.4	43.1	108.8	0.4	0.018	3.8E-04	223	3.02	95.5	16.0	3.0
Cabras #2	6.10	0.78	0.534	20.4	43.1	108.8	0.4	0.018	3.8E-04	223	3.02	95.5	16.0	3.0
Piti #4,5	6.10	0.78	0.507	19.0	39.7	108.8	0.4	0.017	3.7E-04	206	3.02	26.7	44.0	3.0
Tenjo #1,2	2.59	0.49	0.323	11.0	59.0	90.7	0.7	0.035	1.2E-03	192	3.06	20.6	30.0	4.0
Tenjo #3,4	2.59	0.49	0.323	11.0	59.0	90.7	0.7	0.035	1.2E-03	192	3.06	20.6	30.0	4.0
Orote #1	3.50	0.48	0.379	8.6	47.5	96.6	0.5	0.021	5.3E-04	152	3.03	58.2	16.0	4.0
Orote #2	3.50	0.48	0.379	8.6	47.5	96.6	0.5	0.021	5.3E-04	152	3.03	58.2	16.0	4.0
Orote #3	3.50	0.48	0.379	8.6	47.5	96.6	0.5	0.021	5.3E-04	152	3.03	58.2	16.0	4.0

4.00 < 2nd Comp. MW

Model Conditions (Snyder 1981 alternate method (b) on p71)

Buoyancy Flux Equality Only

Momentum Distortion Factor = 3.00

Field Wind Speed (m/s) = 15.00

Source	Stack Height (cm)	Stack Dia. (cm)	Stack Gas S.G.	Stack Flow (ccs)	Stack Vel. (cm/s)	Wind at Hs (cm/s)	W/U ratio	Mom. Term	Buoy. Term	Stack Re#	Rough Re#	%Trace In 2nd	Tracer MW	I.D. distort factor
Cabras #3	6.10	0.54	0.350	128.0	558.7	188.4	3.0	0.078	6.4E-04	2011	5.23	23.6	30.0	2.0
Cabras #4	6.10	0.54	0.350	128.0	558.7	188.4	3.0	0.078	6.4E-04	2011	5.23	23.6	30.0	2.0
Cabras #1	6.10	0.78	0.534	106.3	224.1	188.4	1.2	0.055	3.8E-04	1161	5.23	95.5	16.0	3.0
Cabras #2	6.10	0.78	0.534	106.3	224.1	188.4	1.2	0.055	3.8E-04	1161	5.23	95.5	16.0	3.0
Piti #4,5	6.10	0.78	0.507	98.5	206.2	188.4	1.1	0.050	3.7E-04	1072	5.23	26.7	44.0	3.0
Tenjo #1,2	2.59	0.49	0.323	57.4	306.8	157.0	2.0	0.105	1.2E-03	998	5.30	20.6	30.0	4.0
Tenjo #3,4	2.59	0.49	0.323	57.4	306.8	157.0	2.0	0.105	1.2E-03	998	5.30	20.6	30.0	4.0
Orote #1	3.50	0.48	0.379	44.6	246.7	167.4	1.5	0.062	5.3E-04	789	5.25	58.2	16.0	4.0
Orote #2	3.50	0.48	0.379	44.6	246.7	167.4	1.5	0.062	5.3E-04	789	5.25	58.2	16.0	4.0
Orote #3	3.50	0.48	0.379	44.6	246.7	167.4	1.5	0.062	5.3E-04	789	5.25	58.2	16.0	4.0

4.00 < 2nd Comp. MW

Model Conditions (CSU method as listed in Snyder 1981, p71)

Buoyancy Flux & Volume Flux Equality (note - if S.G. & I.D. equality then full similarity)

Field Wind Speed (m/s) = 15.00

Source	Stack Height (cm)	Stack Dia. (cm)	Stack Gas S.G.	Stack Flow (ccs)	Stack Vel. (cm/s)	Wind at Hs (cm/s)	W/U ratio	Mom. Term	Buoy. Term	Stack Re#	Rough Re#	%Trace In 2nd	Tracer MW	I.D. distort factor
Cabras #3	6.10	0.54	0.350	15.3	66.9	92.9	0.7	0.019	6.4E-04	241	2.58	51.1	16.0	2.0
Cabras #4	6.10	0.52	0.350	14.1	66.9	92.9	0.7	0.018	5.9E-04	231	2.58	51.1	16.0	2.0
Cabras #1	6.10	0.78	0.612	15.3	32.3	92.9	0.3	0.017	3.8E-04	167	2.58	52.8	30.0	3.0
Cabras #2	6.10	0.78	0.612	15.3	32.3	92.9	0.3	0.017	3.8E-04	167	2.58	52.8	30.0	3.0
Piti #4,5	6.10	0.78	0.586	14.1	29.4	92.9	0.3	0.015	3.7E-04	153	2.58	32.4	44.0	3.0
Tenjo #1,2	2.59	0.49	0.442	8.3	44.6	77.4	0.6	0.036	1.2E-03	145	2.61	33.8	30.0	4.0
Tenjo #3,4	2.59	0.49	0.442	8.3	44.6	77.4	0.6	0.036	1.2E-03	145	2.61	33.8	30.0	4.0
Orote #1	3.50	0.48	0.496	6.6	36.4	82.5	0.4	0.021	5.3E-04	116	2.59	86.4	16.0	4.0
Orote #2	3.50	0.48	0.496	6.6	36.4	82.5	0.4	0.021	5.3E-04	116	2.59	86.4	16.0	4.0
Orote #3	3.50	0.48	0.496	6.6	36.4	82.5	0.4	0.021	5.3E-04	116	2.59	86.4	16.0	4.0

(note - method proven in Isyumov and Tanaka 1979, Robins 1980 but not suggested by Snyder 1981, p56)

4.00 < 2nd Comp. MW

Table 6 Field and Model Test Parameters - 15 m/s

Model Conditions - Zo = 0.5m (Snyder 1981 alternate method (b) on p71)

Buoyancy Flux Equality Only					Momentum Distortion Factor = 3				Field Wind Speed (m/s) = 3					
Source	Stack Height (cm)	Stack Dia. (cm)	Stack Gas S.G.	Stack Flow (ccs)	Stack Vel. (cm/s)	Wind at Hs (cm/s)	W/U ratio	Mom. Term	Buoy. Term	Stack Re#	Rough Re#	%Trace In 2nd	Tracer MW	I.D. distort factor
Cabras #3	6.10	0.54	0.350	128.0	558.7	37.7	14.8	0.388	8.0E-02	2011	1.05	23.6	30.0	2.0
Cabras #4	6.10	0.54	0.350	128.0	558.7	37.7	14.8	0.388	8.0E-02	2011	1.05	23.6	30.0	2.0
Cabras #1	6.10	0.78	0.534	106.3	224.1	37.7	5.9	0.277	4.7E-02	1161	1.05	95.5	16.0	3.0
Cabras #2	6.10	0.78	0.534	106.3	224.1	37.7	5.9	0.277	4.7E-02	1161	1.05	95.5	16.0	3.0
Piti #4,5	6.10	0.78	0.507	98.5	206.2	37.7	5.5	0.249	4.6E-02	1072	1.05	26.7	44.0	3.0
Tenjo #1,2	2.59	0.49	0.323	57.4	306.8	31.4	9.8	0.523	1.5E-01	998	1.06	20.6	30.0	4.0
Tenjo #3,4	2.59	0.49	0.323	57.4	306.8	31.4	9.8	0.523	1.5E-01	998	1.06	20.6	30.0	4.0
Orote #1	3.50	0.48	0.379	44.6	246.7	33.5	7.4	0.311	6.6E-02	789	1.05	58.2	16.0	4.0
Orote #2	3.50	0.48	0.379	44.6	246.7	33.5	7.4	0.311	6.6E-02	789	1.05	58.2	16.0	4.0
Orote #3	3.50	0.48	0.379	44.6	246.7	33.5	7.4	0.311	6.6E-02	789	1.05	58.2	16.0	4.0

Buoyancy Flux Equality Only					Momentum Distortion Factor = 3				Field Wind Speed (m/s) = 6					
Source	Stack Height (cm)	Stack Dia. (cm)	Stack Gas S.G.	Stack Flow (ccs)	Stack Vel. (cm/s)	Wind at Hs (cm/s)	W/U ratio	Mom. Term	Buoy. Term	Stack Re#	Rough Re#	%Trace In 2nd	Tracer MW	I.D. distort factor
Cabras #3	6.10	0.54	0.350	128.0	558.7	75.3	7.4	0.194	1.0E-02	2011	2.09	23.6	30.0	2.0
Cabras #4	6.10	0.54	0.350	128.0	558.7	75.3	7.4	0.194	1.0E-02	2011	2.09	23.6	30.0	2.0
Cabras #1	6.10	0.78	0.534	106.3	224.1	75.3	3.0	0.138	5.9E-03	1161	2.09	95.5	16.0	3.0
Cabras #2	6.10	0.78	0.534	106.3	224.1	75.3	3.0	0.138	5.9E-03	1161	2.09	95.5	16.0	3.0
Piti #4,5	6.10	0.78	0.507	98.5	206.2	75.3	2.7	0.125	5.8E-03	1072	2.09	26.7	44.0	3.0
Tenjo #1,2	2.59	0.49	0.323	57.4	306.8	62.8	4.9	0.262	1.9E-02	998	2.12	20.6	30.0	4.0
Tenjo #3,4	2.59	0.49	0.323	57.4	306.8	62.8	4.9	0.262	1.9E-02	998	2.12	20.6	30.0	4.0
Orote #1	3.50	0.48	0.379	44.6	246.7	67.0	3.7	0.156	8.2E-03	789	2.10	58.2	16.0	4.0
Orote #2	3.50	0.48	0.379	44.6	246.7	67.0	3.7	0.156	8.2E-03	789	2.10	58.2	16.0	4.0
Orote #3	3.50	0.48	0.379	44.6	246.7	67.0	3.7	0.156	8.2E-03	789	2.10	58.2	16.0	4.0

Buoyancy Flux Equality Only					Momentum Distortion Factor = 3				Field Wind Speed (m/s) = 9					
Source	Stack Height (cm)	Stack Dia. (cm)	Stack Gas S.G.	Stack Flow (ccs)	Stack Vel. (cm/s)	Wind at Hs (cm/s)	W/U ratio	Mom. Term	Buoy. Term	Stack Re#	Rough Re#	%Trace In 2nd	Tracer MW	I.D. distort factor
Cabras #3	6.10	0.54	0.350	128.0	558.7	113.0	4.9	0.129	2.9E-03	2011	3.14	23.6	30.0	2.0
Cabras #4	6.10	0.54	0.350	128.0	558.7	113.0	4.9	0.129	2.9E-03	2011	3.14	23.6	30.0	2.0
Cabras #1	6.10	0.78	0.534	106.3	224.1	113.0	2.0	0.092	1.8E-03	1161	3.14	95.5	16.0	3.0
Cabras #2	6.10	0.78	0.534	106.3	224.1	113.0	2.0	0.092	1.8E-03	1161	3.14	95.5	16.0	3.0
Piti #4,5	6.10	0.78	0.507	98.5	206.2	113.0	1.8	0.083	1.7E-03	1072	3.14	26.7	44.0	3.0
Tenjo #1,2	2.59	0.49	0.323	57.4	306.8	94.2	3.3	0.174	5.6E-03	998	3.18	20.6	30.0	4.0
Tenjo #3,4	2.59	0.49	0.323	57.4	306.8	94.2	3.3	0.174	5.6E-03	998	3.18	20.6	30.0	4.0
Orote #1	3.50	0.48	0.379	44.6	246.7	100.4	2.5	0.104	2.4E-03	789	3.15	58.2	16.0	4.0
Orote #2	3.50	0.48	0.379	44.6	246.7	100.4	2.5	0.104	2.4E-03	789	3.15	58.2	16.0	4.0
Orote #3	3.50	0.48	0.379	44.6	246.7	100.4	2.5	0.104	2.4E-03	789	3.15	58.2	16.0	4.0

Buoyancy Flux Equality Only					Momentum Distortion Factor = 3				Field Wind Speed (m/s) = 12					
Source	Stack Height (cm)	Stack Dia. (cm)	Stack Gas S.G.	Stack Flow (ccs)	Stack Vel. (cm/s)	Wind at Hs (cm/s)	W/U ratio	Mom. Term	Buoy. Term	Stack Re#	Rough Re#	%Trace In 2nd	Tracer MW	I.D. distort factor
Cabras #3	6.10	0.54	0.350	128.0	558.7	150.7	3.7	0.097	1.2E-03	2011	4.18	23.6	30.0	2.0
Cabras #4	6.10	0.54	0.350	128.0	558.7	150.7	3.7	0.097	1.2E-03	2011	4.18	23.6	30.0	2.0
Cabras #1	6.10	0.78	0.534	106.3	224.1	150.7	1.5	0.069	7.4E-04	1161	4.18	95.5	16.0	3.0
Cabras #2	6.10	0.78	0.534	106.3	224.1	150.7	1.5	0.069	7.4E-04	1161	4.18	95.5	16.0	3.0
Piti #4,5	6.10	0.78	0.507	98.5	206.2	150.7	1.4	0.062	7.3E-04	1072	4.18	26.7	44.0	3.0
Tenjo #1,2	2.59	0.49	0.323	57.4	306.8	125.6	2.4	0.131	2.4E-03	998	4.24	20.6	30.0	4.0
Tenjo #3,4	2.59	0.49	0.323	57.4	306.8	125.6	2.4	0.131	2.4E-03	998	4.24	20.6	30.0	4.0
Orote #1	3.50	0.48	0.379	44.6	246.7	133.9	1.8	0.078	1.0E-03	789	4.20	58.2	16.0	4.0
Orote #2	3.50	0.48	0.379	44.6	246.7	133.9	1.8	0.078	1.0E-03	789	4.20	58.2	16.0	4.0
Orote #3	3.50	0.48	0.379	44.6	246.7	133.9	1.8	0.078	1.0E-03	789	4.20	58.2	16.0	4.0

Buoyancy Flux Equality Only					Momentum Distortion Factor = 3				Field Wind Speed (m/s) = 15					
Source	Stack Height (cm)	Stack Dia. (cm)	Stack Gas S.G.	Stack Flow (ccs)	Stack Vel. (cm/s)	Wind at Hs (cm/s)	W/U ratio	Mom. Term	Buoy. Term	Stack Re#	Rough Re#	%Trace In 2nd	Tracer MW	I.D. distort factor
Cabras #3	6.10	0.54	0.350	128.0	558.7	188.4	3.0	0.078	6.4E-04	2011	5.23	23.6	30.0	2.0
Cabras #4	6.10	0.54	0.350	128.0	558.7	188.4	3.0	0.078	6.4E-04	2011	5.23	23.6	30.0	2.0
Cabras #1	6.10	0.78	0.534	106.3	224.1	188.4	1.2	0.055	3.8E-04	1161	5.23	95.5	16.0	3.0
Cabras #2	6.10	0.78	0.534	106.3	224.1	188.4	1.2	0.055	3.8E-04	1161	5.23	95.5	16.0	3.0
Piti #4,5	6.10	0.78	0.507	98.5	206.2	188.4	1.1	0.050	3.7E-04	1072	5.23	26.7	44.0	3.0
Tenjo #1,2	2.59	0.49	0.323	57.4	306.8	157.0	2.0	0.105	1.2E-03	998	5.30	20.6	30.0	4.0
Tenjo #3,4	2.59	0.49	0.323	57.4	306.8	157.0	2.0	0.105	1.2E-03	998	5.30	20.6	30.0	4.0
Orote #1	3.50	0.48	0.379	44.6	246.7	167.4	1.5	0.062	5.3E-04	789	5.25	58.2	16.0	4.0
Orote #2	3.50	0.48	0.379	44.6	246.7	167.4	1.5	0.062	5.3E-04	789	5.25	58.2	16.0	4.0
Orote #3	3.50	0.48	0.379	44.6	246.7	167.4	1.5	0.062	5.3E-04	789	5.25	58.2	16.0	4.0

Table 7 Model Test Parameters - Buoyancy Flux Only Method

Field Test Conditions - ADCT and Re# Test Series

Measurement Type	Model Config.	Stack Config.	Wind Dir. (deg)	Ref. Velocity (m/s)	Position		
					X (m)	Y (m)	Z (m)
ADCT Series							
Vel. Lateral Profile U,u'	Generic			9	0	Profile	40.0
"	"			"	0	Profile	70.0
"	"			"	0	Profile	100.0
"	"			"	8000	Profile	40.0
"	"			"	8000	Profile	70.0
"	"			"	8000	Profile	100.0
Vel. Vertical Profile U,u',w',uw	"			"	0	0	Profile
"	"			"	4000	0	Profile
"	"			"	8000	0	Profile
Visualization of Plume Elevation	"	Note(1)		"	Profile	0	Profile
Concentration Vertical Profile	"	"		"	2000	0	Profile
"	"	"		"	4000	0	Profile
"	"	"		"	6000	0	Profile
Concentration Lateral Profile	"	"		"	2000	Profile	Heff
"	"	"		"	4000	Profile	Heff
"	"	"		"	6000	Profile	Heff
Conc. Ground Level Profile	"	"		"	Profile	Profile	0.0
Re Invariance Series							
Conc. Ground Level Profile	Cabras-Piti	Note(2)	56.25	3	Profile	Profile	0.0
"	"	"	"	6	"	"	"
"	"	"	"	9	"	"	"
"	"	"	"	12	"	"	"
"	"	"	"	15	"	"	"

Notes: Stack Config.

1) ADCT Stack > 100m stack, ID = 5m, SG = 1, W/U = 1.5

2) Re# Stack > Cabras #4 Stack, SG = 1, W/U = 1.5

Notes: Ref. Velocity

1) Reference Velocity Height is 60 meters

Table 8 Original Field Test Conditions - ADCT and Re# Tests

Field Test Conditions - Cabras Test Series

Measurement Type	Model Config.	Stack Config.	Wind Dir. (deg)	Ref. Velocity (m/s)	Position		
					X (m)	Y (m)	Z (m)
Visualization of Plumes	Cabras-Piti	Note(3)	33.75	3	Profile	0	Profile
"	"	"	"	9	"	"	"
"	"	"	"	15	"	"	"
Ground Level Concentrations	"	Note(4)	"	3	Profile	Profile	0.0
"	"	"	"	6	"	"	"
"	"	"	"	9	"	"	"
"	"	"	"	12	"	"	"
"	"	"	"	15	"	"	"
Ground Level Concentrations	Cabras-Piti	Note(4)	45.00	3	Profile	Profile	0.0
"	"	"	"	6	"	"	"
"	"	"	"	9	"	"	"
"	"	"	"	12	"	"	"
"	"	"	"	15	"	"	"
Velocity Vertical Profile U,u'	Cabras-Piti		56.25	3	0	0	Profile
"	"		"	6	"	"	"
"	"		"	9	"	"	"
"	"		"	12	"	"	"
"	"		"	15	"	"	"
Visualization of Plumes	"	Note(3)	"	3	Profile	0	Profile
"	"	"	"	9	"	"	"
"	"	"	"	15	"	"	"
Ground Level Concentrations	"	Note(4)	"	3	Profile	Profile	0.0
"	"	"	"	6	"	"	"
"	"	"	"	9	"	"	"
"	"	"	"	12	"	"	"
"	"	"	"	15	"	"	"
Ground Level Concentrations	Cabras-Piti	Note(4)	67.50	3	Profile	Profile	0.0
"	"	"	"	6	"	"	"
"	"	"	"	9	"	"	"
"	"	"	"	12	"	"	"
"	"	"	"	15	"	"	"
Visualization of Plumes	Cabras-Piti	Note(3)	78.75	3	Profile	0	Profile
"	"	"	"	9	"	"	"
"	"	"	"	15	"	"	"
Ground Level Concentrations	"	Note(4)	"	3	Profile	Profile	0.0
"	"	"	"	6	"	"	"
"	"	"	"	9	"	"	"
"	"	"	"	12	"	"	"
"	"	"	"	15	"	"	"
Visualization of Plumes	Cabras-Piti	Note(3)	337.50	3	Profile	0	Profile
"	"	"	"	9	"	"	"
"	"	"	"	15	"	"	"
Ground Level Concentrations	"	Note(4)	"	3	Profile	Profile	0.0
"	"	"	"	6	"	"	"
"	"	"	"	9	"	"	"
"	"	"	"	12	"	"	"
"	"	"	"	15	"	"	"
Velocity Vertical Profile U,u'	Cabras-Piti		348.75	3	0	0	Profile
"	"		"	9	"	"	"
"	"		"	15	"	"	"
Visualization of Plumes	"	Note(3)	"	3	Profile	0	Profile
"	"	"	"	9	"	"	"
"	"	"	"	15	"	"	"
Ground Level Concentrations	"	Note(4)	"	3	Profile	Profile	0.0
"	"	"	"	6	"	"	"
"	"	"	"	9	"	"	"
"	"	"	"	12	"	"	"
"	"	"	"	15	"	"	"
Visualization of Plumes	Cabras-Piti	Note(3)	360.00	3	Profile	0	Profile
"	"	"	"	9	"	"	"
"	"	"	"	15	"	"	"
Ground Level Concentrations	"	Note(4)	"	3	Profile	Profile	0.0
"	"	"	"	6	"	"	"
"	"	"	"	9	"	"	"
"	"	"	"	12	"	"	"
"	"	"	"	15	"	"	"

Notes: Stack Config.

- 3) Sequence visualizing each plume group separately
 4) Simultaneous conc. from up to 3 plume groups

Notes: Ref. Velocity

- 1) Reference Velocity Height is 60 meters

Table 9 Original Field Test Conditions - Cabras Tests

Field Test Conditions - Tenjo Test Series

Measurement Type	Model Config.	Stack Config.	Wind Dir. (deg)	Ref. Velocity (m/s)	Position		
					X (m)	Y (m)	Z (m)
Visualization of Plumes	Tenjo-Orote	Note(3)	101.25	3	Profile	0	Profile
"	"	"	"	9	"	"	"
"	"	"	"	15	"	"	"
Ground Level Concentrations	"	Note(4)	"	3	Profile	Profile	0.0
"	"	"	"	6	"	"	"
"	"	"	"	9	"	"	"
"	"	"	"	12	"	"	"
"	"	"	"	15	"	"	"
Velocity Vertical Profile U,u'	Tenjo-Orote		112.50	3	0	0	Profile
"	"		"	9	"	"	"
"	"		"	15	"	"	"
Visualization of Plumes	"	Note(3)	"	3	Profile	0	Profile
"	"	"	"	9	"	"	"
"	"	"	"	15	"	"	"
Ground Level Concentrations	"	Note(4)	"	3	Profile	Profile	0.0
"	"	"	"	6	"	"	"
"	"	"	"	9	"	"	"
"	"	"	"	12	"	"	"
"	"	"	"	15	"	"	"
Visualization of Plumes	Tenjo-Orote	Note(3)	123.75	3	Profile	0	Profile
"	"	"	"	9	"	"	"
"	"	"	"	15	"	"	"
Ground Level Concentrations	"	Note(4)	"	3	Profile	Profile	0.0
"	"	"	"	6	"	"	"
"	"	"	"	9	"	"	"
"	"	"	"	12	"	"	"
"	"	"	"	15	"	"	"
Visualization of Plumes	Tenjo-Orote	Note(3)	202.50	3	Profile	0	Profile
"	"	"	"	9	"	"	"
"	"	"	"	15	"	"	"
Ground Level Concentrations	"	Note(4)	"	3	Profile	Profile	0.0
"	"	"	"	6	"	"	"
"	"	"	"	9	"	"	"
"	"	"	"	12	"	"	"
"	"	"	"	15	"	"	"
Ground Level Concentrations	Tenjo-Orote	Note(4)	213.75	3	Profile	Profile	0.0
"	"	"	"	6	"	"	"
"	"	"	"	9	"	"	"
"	"	"	"	12	"	"	"
"	"	"	"	15	"	"	"
Velocity Vertical Profile U,u'	Tenjo-Orote		225.00	3	0	0	Profile
"	"		"	6	"	"	"
"	"		"	9	"	"	"
"	"		"	12	"	"	"
"	"		"	15	"	"	"
Visualization of Plumes	"	Note(3)	"	3	Profile	0	Profile
"	"	"	"	9	"	"	"
"	"	"	"	15	"	"	"
Ground Level Concentrations	"	Note(4)	"	3	Profile	Profile	0.0
"	"	"	"	6	"	"	"
"	"	"	"	9	"	"	"
"	"	"	"	12	"	"	"
"	"	"	"	15	"	"	"
Ground Level Concentrations	Tenjo-Orote	Note(4)	236.25	3	Profile	Profile	0.0
"	"	"	"	6	"	"	"
"	"	"	"	9	"	"	"
"	"	"	"	12	"	"	"
"	"	"	"	15	"	"	"
Visualization of Plumes	Tenjo-Orote	Note(3)	247.50	3	Profile	0	Profile
"	"	"	"	9	"	"	"
"	"	"	"	15	"	"	"
Ground Level Concentrations	"	Note(4)	"	3	Profile	Profile	0.0
"	"	"	"	6	"	"	"
"	"	"	"	9	"	"	"
"	"	"	"	12	"	"	"
"	"	"	"	15	"	"	"

Notes: Stack Config.

- 3) Sequence visualizing each plume group separately
4) Simultaneous conc. from up to 3 plume groups

Notes: Ref. Velocity

- 1) Reference Velocity Height is 60 meters

Table 10 Original Field Test Conditions - Tenjo Tests

Model Test Conditions				Vel. Scale = 0.126	Length Scale = 1000		
Measurement Type	Model Config.	Stack Config.	Wind Dir. (deg)	Ref. Velocity (cm/s)	Position		
					X (cm)	Y (cm)	Z (cm)
ADCT Series							
Vel. Lateral Profile U,u'	Generic			113	0	Profile	4.0
"	"			"	0	Profile	7.0
"	"			"	0	Profile	10.0
"	"			"	800	Profile	4.0
"	"			"	800	Profile	7.0
"	"			"	800	Profile	10.0
Vel. Vertical Profile U,u',w,uw	"			"	0	0	Profile
"	"			"	400	0	Profile
"	"			"	800	0	Profile
Visualization of Plume Elevation	"	Note(1)		"	Profile	0	Profile
Concentration Vertical Profile	"	"		"	200	0	Profile
"	"	"		"	400	0	Profile
"	"	"		"	600	0	Profile
Concentration Lateral Profile	"	"		"	200	Profile	Heff
"	"	"		"	400	Profile	Heff
"	"	"		"	600	Profile	Heff
Conc. Ground Level Profile	"	"		"	Profile	Profile	0.0
Re Invariance Series							
Conc. Ground Level Profile	Cabras-Piti	Note(2)	56.25	38	Profile	Profile	0.0
"	"	"	"	75	"	"	"
"	"	"	"	113	"	"	"
"	"	"	"	151	"	"	"
"	"	"	"	188	"	"	"

Notes: Stack Config.

Notes: Ref. Velocity

- 1) ADCT Stack > 10cm stack, ID = 0.5cm, SG = 1, WU = 1.5 1) Reference Velocity Height is 6 cm
 2) Re# Stack > Cabras #4 Stack, SG = 1, WU = 1.5

Table 11 Original Model Test Conditions - ADCT and Re# Tests

Model Test Conditions - Cabras Test Series

Measurement Type	Model Config.	Stack Config.	Wind Dir. (deg)	Ref. Velocity (cm/s)	Position		
					X (m)	Y (m)	Z (m)
Visualization of Plumes	Cabras-Piti	Note(3)	33.75	38	Profile	0	Profile
"	"	"	"	113	"	"	"
"	"	"	"	188	"	"	"
Ground Level Concentrations	"	Note(4)	"	38	Profile	Profile	0.0
"	"	"	"	75	"	"	"
"	"	"	"	113	"	"	"
"	"	"	"	151	"	"	"
"	"	"	"	188	"	"	"
Ground Level Concentrations	Cabras-Piti	Note(4)	45.00	38	Profile	Profile	0.0
"	"	"	"	75	"	"	"
"	"	"	"	113	"	"	"
"	"	"	"	151	"	"	"
"	"	"	"	188	"	"	"
Velocity Vertical Profile U,u'	Cabras-Piti		56.25	38	0	0	Profile
"	"		"	75	"	"	"
"	"		"	113	"	"	"
"	"		"	151	"	"	"
"	"		"	188	"	"	"
Visualization of Plumes	"	Note(3)	"	38	Profile	0	Profile
"	"	"	"	113	"	"	"
"	"	"	"	188	"	"	"
Ground Level Concentrations	"	Note(4)	"	38	Profile	Profile	0.0
"	"	"	"	75	"	"	"
"	"	"	"	113	"	"	"
"	"	"	"	151	"	"	"
"	"	"	"	188	"	"	"
Ground Level Concentrations	Cabras-Piti	Note(4)	67.50	38	Profile	Profile	0.0
"	"	"	"	75	"	"	"
"	"	"	"	113	"	"	"
"	"	"	"	151	"	"	"
"	"	"	"	188	"	"	"
Visualization of Plumes	Cabras-Piti	Note(3)	78.75	38	Profile	0	Profile
"	"	"	"	113	"	"	"
"	"	"	"	188	"	"	"
Ground Level Concentrations	"	Note(4)	"	38	Profile	Profile	0.0
"	"	"	"	75	"	"	"
"	"	"	"	113	"	"	"
"	"	"	"	151	"	"	"
"	"	"	"	188	"	"	"
Visualization of Plumes	Cabras-Piti	Note(3)	337.50	38	Profile	0	Profile
"	"	"	"	113	"	"	"
"	"	"	"	188	"	"	"
Ground Level Concentrations	"	Note(4)	"	38	Profile	Profile	0.0
"	"	"	"	75	"	"	"
"	"	"	"	113	"	"	"
"	"	"	"	151	"	"	"
"	"	"	"	188	"	"	"
Velocity Vertical Profile U,u'	Cabras-Piti		348.75	38	0	0	Profile
"	"		"	113	"	"	"
"	"		"	188	"	"	"
Visualization of Plumes	"	Note(3)	"	38	Profile	0	Profile
"	"	"	"	113	"	"	"
"	"	"	"	188	"	"	"
Ground Level Concentrations	"	Note(4)	"	38	Profile	Profile	0.0
"	"	"	"	75	"	"	"
"	"	"	"	113	"	"	"
"	"	"	"	151	"	"	"
"	"	"	"	188	"	"	"
Visualization of Plumes	Cabras-Piti	Note(3)	360.00	38	Profile	0	Profile
"	"	"	"	113	"	"	"
"	"	"	"	188	"	"	"
Ground Level Concentrations	"	Note(4)	"	38	Profile	Profile	0.0
"	"	"	"	75	"	"	"
"	"	"	"	113	"	"	"
"	"	"	"	151	"	"	"
"	"	"	"	188	"	"	"

Notes: Stack Config.

- 3) Sequence visualizing each plume group separately
4) Simultaneous conc. from up to 3 plume groups

Notes: Ref. Velocity

- 1) Reference Velocity Height is 6 cm

Table 12 Original Model Test Conditions - Cabras Tests

Model Test Conditions - Tenjo Test Series

Measurement Type	Model Config.	Stack Config.	Wind Dir. (deg)	Ref. Velocity (m/s)	Position		
					X (m)	Y (m)	Z (m)
Visualization of Plumes	Tenjo-Orote	Note(3)	101.25	38	Profile	0	Profile
"	"	"	"	113	"	"	"
"	"	"	"	188	"	"	"
Ground Level Concentrations	"	Note(4)	"	38	Profile	Profile	0.0
"	"	"	"	75	"	"	"
"	"	"	"	113	"	"	"
"	"	"	"	151	"	"	"
"	"	"	"	188	"	"	"
Velocity Vertical Profile U, u'	Tenjo-Orote		112.50	38	0	0	Profile
"	"		"	113	"	"	"
"	"		"	188	"	"	"
Visualization of Plumes	"	Note(3)	"	38	Profile	0	Profile
"	"	"	"	113	"	"	"
"	"	"	"	188	"	"	"
Ground Level Concentrations	"	Note(4)	"	38	Profile	Profile	0.0
"	"	"	"	75	"	"	"
"	"	"	"	113	"	"	"
"	"	"	"	151	"	"	"
"	"	"	"	188	"	"	"
Visualization of Plumes	Tenjo-Orote	Note(3)	123.75	38	Profile	0	Profile
"	"	"	"	113	"	"	"
"	"	"	"	188	"	"	"
Ground Level Concentrations	"	Note(4)	"	38	Profile	Profile	0.0
"	"	"	"	75	"	"	"
"	"	"	"	113	"	"	"
"	"	"	"	151	"	"	"
"	"	"	"	188	"	"	"
Visualization of Plumes	Tenjo-Orote	Note(3)	202.50	38	Profile	0	Profile
"	"	"	"	113	"	"	"
"	"	"	"	188	"	"	"
Ground Level Concentrations	"	Note(4)	"	38	Profile	Profile	0.0
"	"	"	"	75	"	"	"
"	"	"	"	113	"	"	"
"	"	"	"	151	"	"	"
"	"	"	"	188	"	"	"
Ground Level Concentrations	Tenjo-Orote	Note(4)	213.75	38	Profile	Profile	0.0
"	"	"	"	75	"	"	"
"	"	"	"	113	"	"	"
"	"	"	"	151	"	"	"
"	"	"	"	188	"	"	"
Velocity Vertical Profile U, u'	Tenjo-Orote		225.00	38	0	0	Profile
"	"		"	75	"	"	"
"	"		"	113	"	"	"
"	"		"	151	"	"	"
"	"		"	188	"	"	"
Visualization of Plumes	"	Note(3)	"	38	Profile	0	Profile
"	"	"	"	113	"	"	"
"	"	"	"	188	"	"	"
Ground Level Concentrations	"	Note(4)	"	38	Profile	Profile	0.0
"	"	"	"	75	"	"	"
"	"	"	"	113	"	"	"
"	"	"	"	151	"	"	"
"	"	"	"	188	"	"	"
Ground Level Concentrations	Tenjo-Orote	Note(4)	236.25	38	Profile	Profile	0.0
"	"	"	"	75	"	"	"
"	"	"	"	113	"	"	"
"	"	"	"	151	"	"	"
"	"	"	"	188	"	"	"
Visualization of Plumes	Tenjo-Orote	Note(3)	247.50	38	Profile	0	Profile
"	"	"	"	113	"	"	"
"	"	"	"	188	"	"	"
Ground Level Concentrations	"	Note(4)	"	38	Profile	Profile	0.0
"	"	"	"	75	"	"	"
"	"	"	"	113	"	"	"
"	"	"	"	151	"	"	"
"	"	"	"	188	"	"	"

Notes: Stack Config.

Notes: Ref. Velocity

- 3) Sequence visualizing each plume group separately
 4) Simultaneous conc. from up to 3 plume groups

- 1) Reference Velocity Height is 6 cm

Table 13 Original Model Test Conditions - Tenjo Tests

Test Conditions - Cabras to Orote Peninsula Test Series

Measurement Type	Model Config.	Stack Config.	Wind Dir. (deg)	Field Ref Velocity (m/s)	Model Ref Velocity (m/s)	Position		
						X (m)	Y (m)	Z (m)
Visualization of Plumes	Cabras-Piti	Note(1)	33.75	3	38	Profile	0	Profile
"	"	"	"	9	113	"	"	"
"	"	"	"	15	188	"	"	"
Ground Level Concentrations	"	Note(2)	"	3	38	Profile	Profile	0.0
"	"	"	"	6	75	"	"	"
"	"	"	"	9	113	"	"	"
"	"	"	"	12	151	"	"	"
"	"	"	"	15	188	"	"	"
Visualization of Plumes	Cabras-Piti	Note(1)	45.00	3	38	Profile	0	Profile
"	"	"	"	9	113	"	"	"
"	"	"	"	15	188	"	"	"
Ground Level Concentrations	Cabras-Piti	Note(2)	"	3	38	Profile	Profile	0.0
"	"	"	"	6	75	"	"	"
"	"	"	"	9	113	"	"	"
"	"	"	"	12	151	"	"	"
"	"	"	"	15	188	"	"	"
Visualization of Plumes	"	Note(1)	"	3	38	Profile	0	Profile
"	"	"	"	9	113	"	"	"
"	"	"	"	15	188	"	"	"
Ground Level Concentrations	"	Note(2)	"	3	38	Profile	Profile	0.0
"	"	"	"	6	75	"	"	"
"	"	"	"	9	113	"	"	"
"	"	"	"	12	151	"	"	"
"	"	"	"	15	188	"	"	"
Visualization of Plumes	"	Note(1)	67.50	3	38	Profile	0	Profile
"	"	"	"	9	113	"	"	"
"	"	"	"	15	188	"	"	"
Ground Level Concentrations	Cabras-Piti	Note(2)	"	3	38	Profile	Profile	0.0
"	"	"	"	6	75	"	"	"
"	"	"	"	9	113	"	"	"
"	"	"	"	12	151	"	"	"
"	"	"	"	15	188	"	"	"
Velocity Vertical Profile U,u',w'	Cabras-Piti	Note(1)	78.75	9	113	0	0	Profile
Visualization of Plumes	"	"	"	3	38	Profile	0	Profile
"	"	"	"	9	113	"	"	"
"	"	"	"	15	188	"	"	"
Ground Level Concentrations	"	Note(2)	"	3	38	Profile	Profile	0.0
"	"	"	"	6	75	"	"	"
"	"	"	"	9	113	"	"	"
"	"	"	"	12	151	"	"	"
"	"	"	"	15	188	"	"	"

Notes: Stack Config.

- 1) Sequence visualizing each plume group separately
- 2) Simultaneous conc. from 3 plume groups

Notes: Ref. Velocity

- 3) Field Reference Velocity Height is 60 meters

Table 14 Test Conditions for all Cabras to Orote Pen. Tests Performed

Guam Project - Cabras Velocity and Turbulence Profiles

Run No. = X1.PRF					Location = (0,0,Z)									
FIELD VALUES					NORMALIZED VALUES					MODEL VALUES				
Height (m)	Velocity (m/s)	Long. T.I. (%)	Vert. T.I. (%)	-u'w/u'^2	Height (m)	Velocity (m/s)	Long. T.I. (%)	Vert. T.I. (%)	-u'w/u'^2	Height (cm)	Velocity (cm/s)	Long. T.I. (%)	Vert. T.I. (%)	u'w (cm/s)^2
0.2														
10.0	6.2	19.1	9.6	0.91	0.167	0.685	19.1	9.6	0.91	1.0	80.5	19.1	9.6	-54.0
20.0	7.1	17.6	9.8	1.20	0.333	0.788	17.6	9.8	1.20	2.0	92.6	17.6	9.8	-71.4
40.0	8.2	14.9	8.8	1.22	0.667	0.915	14.9	8.8	1.22	4.0	107.5	14.9	8.8	-72.3
60.0	9.0	11.8	8.2	0.96	1.000	1.000	11.8	8.2	0.96	6.0	117.5	11.8	8.2	-57.1
80.0	9.3	11.1	7.8	0.87	1.333	1.036	11.1	7.8	0.87	8.0	121.7	11.1	7.8	-51.9
100.0	9.3	11.2	8.1	0.94	1.667	1.039	11.2	8.1	0.94	10.0	122.0	11.2	8.1	-56.0
150.0	10.0	9.4	7.8	0.85	2.500	1.107	9.4	7.8	0.85	15.0	130.0	9.4	7.8	-50.2
200.0	10.4	8.5	7.7	0.76	3.333	1.161	8.5	7.7	0.76	20.0	136.4	8.5	7.7	-45.3
250.0	10.5	8.3	7.9	0.70	4.167	1.162	8.3	7.9	0.70	25.0	136.6	8.3	7.9	-41.7
300.0	10.8	7.5	7.7	0.65	5.000	1.198	7.5	7.7	0.65	30.0	140.8	7.5	7.7	-38.7
400.0	11.1	7.5	7.8	0.73	6.667	1.237	7.5	7.8	0.73	40.0	145.4	7.5	7.8	-43.2
500.0	11.4	7.3	7.8	0.72	8.333	1.271	7.3	7.8	0.72	50.0	149.3	7.3	7.8	-42.4
600.0	11.9	6.8	7.6	0.65	10.000	1.320	6.8	7.6	0.65	60.0	155.1	6.8	7.6	-38.6
800.0	12.4	6.4	7.3	0.68	13.333	1.381	6.4	7.3	0.68	80.0	162.3	6.4	7.3	-40.2
1000.0	12.8	6.2	7.1	0.59	16.667	1.423	6.2	7.1	0.59	100.0	167.2	6.2	7.1	-34.8
1200.0	13.3	6.1	7.1	0.21	20.000	1.479	6.1	7.1	0.21	120.0	173.8	6.1	7.1	-12.4
References										References				
60.0	9.0			0.59					7.7	6.0	117.5			
Roughness Length (m) =					0.15					Roughness Length (cm) =				
Displacement Height (m) =					0.00					Displacement Height (cm) =				
Friction Velocity (m/s) =					0.59					Friction Velocity (cm/s) =				
Power Law Index =					0.13					Power Law Index =				

Table 15 Velocity and Turbulence Profile Data - Wind Direction = 33.75°

File Name F0101.GC	Run# F0101	DEN	06-18-95	20:38:29
Wind Speed (cm/s) =	39.71	Hr (cm) =	6	
Air Temp. (C) =	24.2	Hr (cm) =	6	
Source Designation =	1	2	3	
Source Flow Rate (ccs) =	212.5	239.2	98.5	
Source Gas Temp. (C) =	24.2	24.2	24.2	
Tracer Type =	CH4	C2H6	C3H8	
Tracer Conc. (ppm) =	955000	252500	267000	
Background Conc. (ppm) =	10.3	2.2	1	
Position Grid Filename >	gcpos.inp			

Wind Dir. = 78.75 deg N
 Wind Speed = 3.16 m/s

Tube No.	Model Meas.#1 (ppm)	Model Meas.#2 (ppm)	Model Meas.#3 (ppm)	Model Norm.#1 (ppm)	Model Norm.#2 (ppm)	Model Norm.#3 (ppm)	Model K1*10^6 (cm^-2)	Model K2*10^6 (cm^-2)	Model K3*10^6 (cm^-2)	Field K1*10^6 (m^-2)	Field K2*10^6 (m^-2)	Field K3*10^6 (m^-2)
1	10.4	2.3	1.0	0.1	0.4	0.0	0.0	0.1	0.0	0.00	0.00	0.00
2	10.1	2.2	1.2	0.0	0.0	0.7	0.0	0.0	0.3	0.00	0.00	0.00
3	10.0	2.2	3.1	0.0	0.0	7.9	0.0	0.0	3.2	0.00	0.00	0.03
4	10.6	2.3	24.4	0.3	0.4	87.6	0.1	0.1	35.3	0.00	0.00	0.35
5	11.3	2.5	29.1	1.0	1.2	105.2	0.2	0.2	42.4	0.00	0.00	0.42
6	12.1	2.7	33.2	1.9	2.0	120.6	0.4	0.3	48.6	0.00	0.00	0.49
7	13.2	3.0	39.3	3.0	3.2	143.4	0.6	0.5	57.8	0.01	0.01	0.58
8	10.3	2.2	18.3	0.0	0.0	64.8	0.0	0.0	26.1	0.00	0.00	0.26
9	10.3	2.2	4.5	0.0	0.0	13.1	0.0	0.0	5.3	0.00	0.00	0.05
10	10.3	2.3	2.1	0.0	0.4	4.1	0.0	0.1	1.7	0.00	0.00	0.02
11	10.3	2.2	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
12	10.5	2.3	1.0	0.2	0.4	0.0	0.0	0.1	0.0	0.00	0.00	0.00
13	10.2	2.2	1.8	0.0	0.0	3.0	0.0	0.0	1.2	0.00	0.00	0.01
14	10.3	2.2	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
15	10.2	2.2	8.0	0.0	0.0	26.2	0.0	0.0	10.6	0.00	0.00	0.11
16												
17												
18												
19												
20												
21												
22												

Source 1 > Cabras Units 1 & 2
 Source 2 > Cabras Units 3 & 4
 Source 3 > Piti Units 4 & 5

L scale = 1000
 U scale = 7.966

Table 16 Concentration Data: Wind Dir. = 78.75°; Wind Speed ~ 3 m/s

File Name F0102.GC	Run# F0102	DEN	06-18-95	21:24:31
Wind Speed (cm/s) =	77.01	Hr (cm) =	6	
Air Temp. (C) =	24.2	Hr (cm) =	6	
Source Designation =	1	2	3	
Source Flow Rate (ccs) =	212.5	239.2	98.5	
Source Gas Temp. (C) =	24.2	24.2	24.2	
Tracer Type =	CH4	C2H6	C3H8	
Tracer Conc. (ppm) =	955000	252500	267000	
Background Conc. (ppm) =	11.5	2.5	1.6	
Position Grid Filename >	gcpos.inp			

Wind Dir. = 78.75 deg N
Wind Speed = 6.13 m/s

Tube No.	Model Meas.#1 (ppm)	Model Meas.#2 (ppm)	Model Meas.#3 (ppm)	Model Norm.#1 (ppm)	Model Norm.#2 (ppm)	Model Norm.#3 (ppm)	Model K1*10^6 (cm^-2)	Model K2*10^6 (cm^-2)	Model K3*10^6 (cm^-2)	Field K1*10^6 (m^-2)	Field K2*10^6 (m^-2)	Field K3*10^6 (m^-2)
1	11.6	2.5	1.7	0.1	0.0	0.4	0.0	0.0	0.3	0.00	0.00	0.00
2	11.6	2.5	8.6	0.1	0.0	26.2	0.0	0.0	20.5	0.00	0.00	0.20
3	14.8	3.2	31.6	3.5	2.8	112.4	1.3	0.9	87.8	0.01	0.01	0.88
4	90.6	20.7	88.3	82.8	72.1	324.7	30.0	23.2	253.9	0.30	0.23	2.54
5	115.8	26.2	89.4	109.2	93.9	328.8	39.6	30.2	257.1	0.40	0.30	2.57
6	139.7	32.0	88.7	134.2	116.8	326.2	48.6	37.6	255.0	0.49	0.38	2.55
7	154.9	35.5	85.2	150.2	130.7	313.1	54.4	42.1	244.8	0.54	0.42	2.45
8	81.7	19.1	77.0	73.5	65.7	282.4	26.6	21.2	220.8	0.27	0.21	2.21
9	22.2	5.0	36.5	11.2	9.9	130.7	4.1	3.2	102.2	0.04	0.03	1.02
10	12.9	2.8	13.8	1.5	1.2	45.7	0.5	0.4	35.7	0.01	0.00	0.36
11	11.5	2.5	2.5	0.0	0.0	3.4	0.0	0.0	2.6	0.00	0.00	0.03
12	11.5	2.4	2.3	0.0	0.0	2.6	0.0	0.0	2.0	0.00	0.00	0.02
13	12.5	2.7	13.8	1.0	0.8	45.7	0.4	0.3	35.7	0.00	0.00	0.36
14	11.4	2.4	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
15	33.0	7.5	56.3	22.5	19.8	204.9	8.2	6.4	160.2	0.08	0.06	1.60
16												
17												
18												
19												
20												
21												
22												

Source 1 > Cabras Units 1 & 2
Source 2 > Cabras Units 3 & 4
Source 3 > Piti Units 4 & 5

Table 17 Concentration Data: Wind Dir. = 78.75°; Wind Speed ~ 6 m/s

File Name F0103.GC	Run# F0103	DEN	06-18-95	22: 4:21
Wind Speed (cm/s) =	108.85	Hr (cm) =	6	
Air Temp. (C) =	24.2	Hr (cm) =	6	
Source Designation =	1	2	3	
Source Flow Rate (ccs) =	212.5	239.2	98.5	
Source Gas Temp. (C) =	24.2	24.2	24.2	
Tracer Type =	CH4	C2H6	C3H8	
Tracer Conc. (ppm) =	955000	252500	267000	
Background Conc. (ppm) =	15.8	3.6	2	
Position Grid Filename >	gcpos.inp			

Wind Dir. = 78.75 deg N
Wind Speed = 8.67 m/s

Tube No.	Model Meas.#1 (ppm)	Model Meas.#2 (ppm)	Model Meas.#3 (ppm)	Model Norm.#1 (ppm)	Model Norm.#2 (ppm)	Model Norm.#3 (ppm)	Model K1*10^6 (cm^2)	Model K2*10^6 (cm^2)	Model K3*10^6 (cm^2)	Field K1*10^6 (m^2)	Field K2*10^6 (m^2)	Field K3*10^6 (m^2)
1	15.8	3.6	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
2	16.2	3.7	6.7	0.4	0.4	17.6	0.2	0.2	19.5	0.00	0.00	0.19
3	20.3	4.7	22.7	4.7	4.4	77.5	2.4	2.0	85.7	0.02	0.02	0.86
4	162.0	38.4	95.8	153.1	137.8	351.3	78.4	62.7	388.2	0.78	0.63	3.88
5	218.4	51.1	100.3	212.2	188.1	368.2	108.7	85.6	406.9	1.09	0.86	4.07
6	260.1	60.8	100.0	255.8	226.5	367.0	131.0	103.1	405.6	1.31	1.03	4.06
7	291.6	68.2	94.9	288.8	255.8	347.9	147.9	116.4	384.5	1.48	1.16	3.85
8	138.2	32.8	79.2	128.2	115.6	289.1	65.7	52.6	319.5	0.66	0.53	3.20
9	27.4	6.5	28.8	12.1	11.5	100.4	6.2	5.2	110.9	0.06	0.05	1.11
10	17.2	3.9	8.6	1.5	1.2	24.7	0.8	0.5	27.3	0.01	0.01	0.27
11	15.7	3.6	2.1	0.0	0.0	0.4	0.0	0.0	0.4	0.00	0.00	0.00
12	15.7	3.5	2.1	0.0	0.0	0.4	0.0	0.0	0.4	0.00	0.00	0.00
13	17.3	3.9	11.2	1.6	1.2	34.5	0.8	0.5	38.1	0.01	0.01	0.38
14	15.5	3.5	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
15	46.8	11.2	50.2	32.5	30.1	180.5	16.6	13.7	199.5	0.17	0.14	1.99
16												
17												
18												
19												
20												
21												
22												

Source 1 > Cabras Units 1 & 2
Source 2 > Cabras Units 3 & 4
Source 3 > Piti Units 4 & 5

Table 18 Concentration Data: Wind Dir. = 78.75°; Wind Speed ~ 9 m/s

File Name F0104.GC	Run# F0104	DEN	06-18-95	22:42:49
Wind Speed (cm/s) =	153.27	Hr (cm) =	6	
Air Temp. (C) =	24.2	Hr (cm) =	6	
Source Designation =	1	2	3	
Source Flow Rate (ccs) =	212.5	239.2	98.5	
Source Gas Temp. (C) =	24.2	24.2	24.2	
Tracer Type =	CH4	C2H6	C3H8	
Tracer Conc. (ppm) =	955000	252500	267000	
Background Conc. (ppm) =	16.6	3.7	1.9	
Position Grid Filename >	gcpos.inp			

Wind Dir. = 78.75 deg N
 Wind Speed = 12.21 m/s

Tube No.	Model Meas.#1 (ppm)	Model Meas.#2 (ppm)	Model Meas.#3 (ppm)	Model Norm.#1 (ppm)	Model Norm.#2 (ppm)	Model Norm.#3 (ppm)	Model K1*10^6 (cm^-2)	Model K2*10^6 (cm^-2)	Model K3*10^6 (cm^-2)	Field K1*10^6 (m^-2)	Field K2*10^6 (m^-2)	Field K3*10^6 (m^-2)
1	16.5	3.8	1.9	0.0	0.4	0.0	0.0	0.3	0.0	0.00	0.00	0.00
2	16.6	4.0	2.4	0.0	1.2	1.9	0.0	0.8	2.9	0.00	0.01	0.03
3	16.6	3.8	3.0	0.0	0.4	4.1	0.0	0.3	6.4	0.00	0.00	0.06
4	39.3	9.6	29.8	23.8	23.4	104.5	17.1	15.0	162.6	0.17	0.15	1.63
5	57.4	14.1	36.8	42.7	41.2	130.7	30.8	26.4	203.4	0.31	0.26	2.03
6	74.8	18.5	41.6	60.9	58.6	148.7	44.0	37.6	231.4	0.44	0.38	2.31
7	89.8	22.1	44.0	76.7	72.9	157.7	55.3	46.7	245.4	0.55	0.47	2.45
8	31.4	7.6	20.1	15.5	15.4	68.2	11.2	9.9	106.1	0.11	0.10	1.06
9	16.9	3.9	3.6	0.3	0.8	6.4	0.2	0.5	9.9	0.00	0.01	0.10
10	16.6	3.8	2.1	0.0	0.4	0.7	0.0	0.3	1.2	0.00	0.00	0.01
11	16.4	3.7	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
12	16.4	3.8	1.9	0.0	0.4	0.0	0.0	0.3	0.0	0.00	0.00	0.00
13	16.7	3.8	2.1	0.1	0.4	0.7	0.1	0.3	1.2	0.00	0.00	0.01
14	16.3	3.7	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
15	18.2	4.2	8.3	1.7	2.0	24.0	1.2	1.3	37.3	0.01	0.01	0.37
16												
17												
18												
19												
20												
21												
22												

Source 1 > Cabras Units 1 & 2
 Source 2 > Cabras Units 3 & 4
 Source 3 > Piti Units 4 & 5

Table 19 Concentration Data: Wind Dir. = 78.75°; Wind Speed ~ 12 m/s

File Name F0105.GC	Run# F0105	DEN	06-18-95	23:17:49
Wind Speed (cm/s) =	193.82	Hr (cm) =	6	
Air Temp. (C) =	24.2	Hr (cm) =	6	
Source Designation =	1	2	3	
Source Flow Rate (ccs) =	212.5	239.2	98.5	
Source Gas Temp. (C) =	24.2	24.2	24.2	
Tracer Type =	CH4	C2H6	C3H8	
Tracer Conc. (ppm) =	955000	252500	267000	
Background Conc. (ppm) =	18.5	4.4	2.2	
Position Grid Filename >	gcpos.inp			

Wind Dir. = 78.75 deg N
Wind Speed = 15.44 m/s

Tube No.	Model Meas.#1 (ppm)	Model Meas.#2 (ppm)	Model Meas.#3 (ppm)	Model Norm.#1 (ppm)	Model Norm.#2 (ppm)	Model Norm.#3 (ppm)	Model K1*10^6 (cm^-2)	Model K2*10^6 (cm^-2)	Model K3*10^6 (cm^-2)	Field K1*10^6 (m^-2)	Field K2*10^6 (m^-2)	Field K3*10^6 (m^-2)
1	18.5	4.3	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
2	18.5	4.5	2.6	0.0	0.4	1.5	0.0	0.3	2.9	0.00	0.00	0.03
3	18.7	4.4	3.0	0.2	0.0	3.0	0.2	0.0	5.9	0.00	0.00	0.06
4	28.2	6.7	19.8	10.2	9.1	65.9	9.3	7.4	129.7	0.09	0.07	1.30
5	41.3	10.0	26.9	23.9	22.2	92.5	21.8	18.0	182.0	0.22	0.18	1.82
6	51.8	12.6	30.6	34.9	32.5	106.4	31.8	26.3	209.3	0.32	0.26	2.09
7	67.3	16.5	33.9	51.1	47.9	118.7	46.6	38.8	233.6	0.47	0.39	2.34
8	24.4	5.8	12.7	6.2	5.5	39.3	5.6	4.5	77.4	0.06	0.04	0.77
9	19.0	4.4	3.3	0.5	0.0	4.1	0.5	0.0	8.1	0.00	0.00	0.08
10	18.6	4.5	2.7	0.1	0.4	1.9	0.1	0.3	3.7	0.00	0.00	0.04
11	18.3	4.3	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
12	18.4	4.3	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
13	18.7	4.3	2.3	0.2	0.0	0.4	0.2	0.0	0.7	0.00	0.00	0.01
14	18.3	4.4	2.5	0.0	0.0	1.1	0.0	0.0	2.2	0.00	0.00	0.02
15	19.8	4.6	5.2	1.4	0.8	11.2	1.2	0.6	22.1	0.01	0.01	0.22
16												
17												
18												
19												
20												
21												
22												

Source 1 > Cabras Units 1 & 2
Source 2 > Cabras Units 3 & 4
Source 3 > Piti Units 4 & 5

Table 20 Concentration Data: Wind Dir. = 78.75°; Wind Speed ~ 15 m/s

File Name G0101.GC	Run# G0101	DEN	06-21-95	17:49:52
Wind Speed (cm/s) =	38.61	Hr (cm) =	6	
Air Temp. (C) =	27.4	Hr (cm) =	6	
Source Designation =	1	2	3	
Source Flow Rate (ccs) =	212.5	255.9	98.5	
Source Gas Temp. (C) =	27.4	27.4	27.4	
Tracer Type =	CH4	C2H6	C3H8	
Tracer Conc. (ppm) =	955000	236000	267000	
Background Conc. (ppm) =	11	2	1	
Position Grid Filename >	gcpos.inp			

Wind Dir. = 67.5 deg N
Wind Speed = 3.08 m/s

Tube No.	Model Meas.#1 (ppm)	Model Meas.#2 (ppm)	Model Meas.#3 (ppm)	Model Norm.#1 (ppm)	Model Norm.#2 (ppm)	Model Norm.#3 (ppm)	Model K1*10^6 (cm^2)	Model K2*10^6 (cm^2)	Model K3*10^6 (cm^2)	Field K1*10^6 (m^2)	Field K2*10^6 (m^2)	Field K3*10^6 (m^2)
1	7.4	1.5	5.2	0.0	0.0	15.7	0.0	0.0	6.2	0.00	0.00	0.06
2	8.3	1.5	8.0	0.0	0.0	26.2	0.0	0.0	10.3	0.00	0.00	0.10
3	16.8	3.5	4.3	6.1	6.4	12.4	1.1	1.0	4.8	0.01	0.01	0.05
4	12.2	2.3	0.7	1.3	1.3	0.0	0.2	0.2	0.0	0.00	0.00	0.00
5	10.8	2.3	0.8	0.0	1.3	0.0	0.0	0.2	0.0	0.00	0.00	0.00
6	9.3	1.9	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
7	8.8	1.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
8	13.6	2.8	1.3	2.7	3.4	1.1	0.5	0.5	0.4	0.00	0.01	0.00
9	19.4	3.9	1.5	8.8	8.1	1.9	1.6	1.2	0.7	0.02	0.01	0.01
10	14.2	2.8	7.0	3.4	3.4	22.5	0.6	0.5	8.8	0.01	0.01	0.09
11	9.7	2.0	8.6	0.0	0.0	28.5	0.0	0.0	11.2	0.00	0.00	0.11
12	9.0	1.8	7.8	0.0	0.0	25.5	0.0	0.0	10.0	0.00	0.00	0.10
13	11.0	2.1	8.2	0.0	0.4	27.0	0.0	0.1	10.6	0.00	0.00	0.11
14	6.1	1.1	2.6	0.0	0.0	6.0	0.0	0.0	2.3	0.00	0.00	0.02
15	17.8	3.6	1.1	7.1	6.8	0.4	1.3	1.0	0.1	0.01	0.01	0.00
16												
17												
18												
19												
20												
21												
22												

Source 1 > Cabras Units 1 & 2
Source 2 > Cabras Units 3 & 4
Source 3 > Piti Units 4 & 5

Table 21 Concentration Data: Wind Dir. = 67.50°; Wind Speed ~ 3 m/s

File Name G0102.GC	Run# G0102	DEN	06-21-95	18:49:23
Wind Speed (cm/s) =	79.21	Hr (cm) =	6	
Air Temp. (C) =	27.4	Hr (cm) =	6	
Source Designation =	1	2	3	
Source Flow Rate (ccs) =	212.5	255.9	98.5	
Source Gas Temp. (C) =	27.4	27.4	27.4	
Tracer Type =	CH4	C2H6	C3H8	
Tracer Conc. (ppm) =	955000	236000	267000	
Background Conc. (ppm) =	20	4.5	1.3	
Position Grid Filename >	gcpos.inp			

Wind Dir. = 67.5 deg N
Wind Speed = 6.31 m/s

Tube No.	Model Meas.#1 (ppm)	Model Meas.#2 (ppm)	Model Meas.#3 (ppm)	Model Norm.#1 (ppm)	Model Norm.#2 (ppm)	Model Norm.#3 (ppm)	Model K1*10^6 (cm^2)	Model K2*10^6 (cm^2)	Model K3*10^6 (cm^2)	Field K1*10^6 (m^2)	Field K2*10^6 (m^2)	Field K3*10^6 (m^2)
1	77.6	14.9	27.3	60.3	44.1	97.4	22.5	13.6	78.3	0.22	0.14	0.78
2	200.2	40.7	21.2	188.7	153.4	74.5	70.3	47.5	59.9	0.70	0.47	0.60
3	122.7	28.4	4.5	107.5	101.3	12.0	40.1	31.3	9.6	0.40	0.31	0.10
4	31.4	7.4	1.3	11.9	12.3	0.0	4.4	3.8	0.0	0.04	0.04	0.00
5	24.5	5.7	1.2	4.7	5.1	0.0	1.8	1.6	0.0	0.02	0.02	0.00
6	20.3	4.6	1.3	0.3	0.4	0.0	0.1	0.1	0.0	0.00	0.00	0.00
7	19.5	4.4	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
8	28.0	6.5	1.4	8.4	8.5	0.4	3.1	2.6	0.3	0.03	0.03	0.00
9	70.2	16.7	1.7	52.6	51.7	1.5	19.6	16.0	1.2	0.20	0.16	0.01
10	127.0	29.6	4.7	112.0	106.4	12.7	41.8	32.9	10.2	0.42	0.33	0.10
11	178.1	37.3	20.5	165.6	139.0	71.9	61.7	43.0	57.8	0.62	0.43	0.58
12	160.7	32.9	25.6	147.3	120.3	91.0	54.9	37.2	73.2	0.55	0.37	0.73
13	162.6	36.2	10.0	149.3	134.3	32.6	55.7	41.6	26.2	0.56	0.42	0.26
14	31.1	6.5	13.0	11.6	8.5	43.8	4.3	2.6	35.2	0.04	0.03	0.35
15	56.0	13.3	1.5	37.7	37.3	0.7	14.1	11.5	0.6	0.14	0.12	0.01
16												
17												
18												
19												
20												
21												
22												

Source 1 > Cabras Units 1 & 2
Source 2 > Cabras Units 3 & 4
Source 3 > Piti Units 4 & 5

Table 22 Concentration Data: Wind Dir. =67.50°; Wind Speed ~ 6 m/s

File Name G0103.GC	Run# G0103	DEN	06-21-95	19:28:59
Wind Speed (cm/s) =	115.26	Hr (cm) =	6	
Air Temp. (C) =	27.4	Hr (cm) =	6	
Source Designation =	1	2	3	
Source Flow Rate (ccs) =	212.5	255.9	98.5	
Source Gas Temp. (C) =	27.4	27.4	27.4	
Tracer Type =	CH4	C2H6	C3H8	
Tracer Conc. (ppm) =	955000	236000	267000	
Background Conc. (ppm) =	18	4.2	1.2	
Position Grid Filename >	gcpos.inp			

Wind Dir. = 67.5 deg N
Wind Speed = 9.18 m/s

Tube No.	Model Meas.#1 (ppm)	Model Meas.#2 (ppm)	Model Meas.#3 (ppm)	Model Norm.#1 (ppm)	Model Norm.#2 (ppm)	Model Norm.#3 (ppm)	Model K1*10^6 (cm^-2)	Model K2*10^6 (cm^-2)	Model K3*10^6 (cm^-2)	Field K1*10^6 (m^-2)	Field K2*10^6 (m^-2)	Field K3*10^6 (m^-2)
1	440.3	86.9	41.1	442.2	350.4	149.4	239.9	157.8	174.9	2.40	1.58	1.75
2	394.0	87.0	11.2	393.7	350.9	37.5	213.6	158.0	43.8	2.14	1.58	0.44
3	127.9	29.8	2.3	115.1	108.5	4.1	62.4	48.9	4.8	0.62	0.49	0.05
4	21.6	5.1	1.2	3.8	3.8	0.0	2.0	1.7	0.0	0.02	0.02	0.00
5	18.7	4.3	1.2	0.7	0.4	0.0	0.4	0.2	0.0	0.00	0.00	0.00
6	17.7	4.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
7	17.5	3.9	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
8	20.6	4.7	1.2	2.7	2.1	0.0	1.5	1.0	0.0	0.01	0.01	0.00
9	42.0	10.1	1.3	25.1	25.0	0.4	13.6	11.3	0.4	0.14	0.11	0.00
10	121.0	28.1	2.3	107.9	101.3	4.1	58.5	45.6	4.8	0.59	0.46	0.05
11	330.3	73.8	10.3	327.0	294.9	34.1	177.4	132.8	39.9	1.77	1.33	0.40
12	380.3	83.5	15.2	379.4	336.0	52.4	205.8	151.3	61.4	2.06	1.51	0.61
13	210.6	48.6	3.8	201.7	188.1	9.7	109.4	84.7	11.4	1.09	0.85	0.11
14	110.8	21.3	30.4	97.2	72.5	109.4	52.7	32.6	128.0	0.53	0.33	1.28
15	30.7	7.3	1.3	13.3	13.1	0.4	7.2	5.9	0.4	0.07	0.06	0.00
16												
17												
18												
19												
20												
21												
22												

Source 1 > Cabras Units 1 & 2
Source 2 > Cabras Units 3 & 4
Source 3 > Piti Units 4 & 5

Table 23 Concentration Data: Wind Dir. =67.50°; Wind Speed ~ 9 m/s

File Name G0104.GC	Run# G0104	DEN	06-21-95	20: 3: 9
Wind Speed (cm/s) =	148.46	Hr (cm) =	6	
Air Temp. (C) =	27.4	Hr (cm) =	6	
Source Designation =	1	2	3	
Source Flow Rate (ccs) =	212.5	255.9	98.5	
Source Gas Temp. (C) =	27.4	27.4	27.4	
Tracer Type =	CH4	C2H6	C3H8	
Tracer Conc. (ppm) =	955000	236000	267000	
Background Conc. (ppm) =	17.5	4	1.3	
Position Grid Filename >	gcpos.inp			

Wind Dir. = 67.5 deg N
Wind Speed = 11.83 m/s

Tube No.	Model Meas.#1 (ppm)	Model Meas.#2 (ppm)	Model Meas.#3 (ppm)	Model Norm.#1 (ppm)	Model Norm.#2 (ppm)	Model Norm.#3 (ppm)	Model K1*10^6 (cm^-2)	Model K2*10^6 (cm^-2)	Model K3*10^6 (cm^-2)	Field K1*10^6 (m^-2)	Field K2*10^6 (m^-2)	Field K3*10^6 (m^-2)
1	157.6	34.7	36.8	146.7	130.1	133.0	102.5	75.5	200.4	1.02	0.75	2.00
2	434.0	94.1	44.2	436.1	381.8	160.7	304.7	221.5	242.2	3.05	2.21	2.42
3	426.1	93.7	14.4	427.9	380.1	49.1	298.9	220.5	73.9	2.99	2.21	0.74
4	48.8	11.2	1.3	32.8	30.5	0.0	22.9	17.7	0.0	0.23	0.18	0.00
5	30.6	7.0	1.2	13.7	12.7	0.0	9.6	7.4	0.0	0.10	0.07	0.00
6	20.5	4.6	1.1	3.1	2.5	0.0	2.2	1.5	0.0	0.02	0.01	0.00
7	18.1	4.1	1.2	0.6	0.4	0.0	0.4	0.2	0.0	0.00	0.00	0.00
8	41.8	9.6	1.5	25.4	23.7	0.7	17.8	13.8	1.1	0.18	0.14	0.01
9	187.3	42.5	3.6	177.8	163.1	8.6	124.2	94.6	13.0	1.24	0.95	0.13
10	382.9	85.3	15.8	382.6	344.5	54.3	267.3	199.9	81.9	2.67	2.00	0.82
11	338.5	75.3	37.4	336.1	302.1	135.2	234.8	175.3	203.8	2.35	1.75	2.04
12	281.7	62.3	35.9	276.7	247.0	129.6	193.3	143.3	195.3	1.93	1.43	1.95
13	479.3	105.2	29.3	483.6	428.8	104.9	337.8	248.8	158.1	3.38	2.49	1.58
14	39.4	9.1	12.9	22.9	21.6	43.4	16.0	12.5	65.5	0.16	0.13	0.65
15	130.3	29.7	2.3	118.1	108.9	3.7	82.5	63.2	5.6	0.83	0.63	0.06
16												
17												
18												
19												
20												
21												
22												

Source 1 > Cabras Units 1 & 2
Source 2 > Cabras Units 3 & 4
Source 3 > Piti Units 4 & 5

Table 24 Concentration Data: Wind Dir. =67.50°; Wind Speed ~ 12 m/s

File Name G0105.GC	Run# G0105	DEN	06-21-95	20:40:24
Wind Speed (cm/s) =	191.43	Hr (cm) =	6	
Air Temp. (C) =	27.4	Hr (cm) =	6	
Source Designation =	1	2	3	
Source Flow Rate (ccs) =	212.5	255.9	98.5	
Source Gas Temp. (C) =	27.4	27.4	27.4	
Tracer Type =	CH4	C2H6	C3H8	
Tracer Conc. (ppm) =	955000	236000	267000	
Background Conc. (ppm) =	19.5	4.6	1.5	
Position Grid Filename >	gcpos.inp			

Wind Dir. = 67.5 deg N
Wind Speed = 15.25 m/s

Tube No.	Model Meas.#1 (ppm)	Model Meas.#2 (ppm)	Model Meas.#3 (ppm)	Model Norm.#1 (ppm)	Model Norm.#2 (ppm)	Model Norm.#3 (ppm)	Model K1*10^6 (cm^2)	Model K2*10^6 (cm^2)	Model K3*10^6 (cm^2)	Field K1*10^6 (m^2)	Field K2*10^6 (m^2)	Field K3*10^6 (m^2)
1	228.8	52.1	40.4	219.2	201.3	145.7	197.4	150.6	283.1	1.97	1.51	2.83
2	561.2	127.5	31.1	567.2	520.8	110.9	511.0	389.6	215.5	5.11	3.90	2.15
3	401.6	93.0	6.3	400.1	374.6	18.0	360.4	280.2	34.9	3.60	2.80	0.35
4	41.9	9.9	1.4	23.5	22.5	0.0	21.1	16.8	0.0	0.21	0.17	0.00
5	30.0	7.0	1.3	11.0	10.2	0.0	9.9	7.6	0.0	0.10	0.08	0.00
6	22.1	5.1	1.3	2.7	2.1	0.0	2.5	1.6	0.0	0.02	0.02	0.00
7	19.7	4.5	1.3	0.2	0.0	0.0	0.2	0.0	0.0	0.00	0.00	0.00
8	37.0	8.7	1.4	18.3	17.4	0.0	16.5	13.0	0.0	0.17	0.13	0.00
9	153.8	36.5	2.3	140.6	135.2	3.0	126.7	101.1	5.8	1.27	1.01	0.06
10	358.7	83.9	7.1	355.2	336.0	21.0	320.0	251.4	40.8	3.20	2.51	0.41
11	451.0	103.1	27.0	451.8	417.4	95.5	407.0	312.2	185.6	4.07	3.12	1.86
12	392.5	89.6	30.8	390.6	360.2	109.7	351.9	269.4	213.3	3.52	2.69	2.13
13	503.2	116.2	14.2	506.5	472.9	47.6	456.3	353.8	92.4	4.56	3.54	0.92
14	54.8	12.3	19.1	37.0	32.6	65.9	33.3	24.4	128.1	0.33	0.24	1.28
15	110.1	26.0	1.8	94.9	90.7	1.1	85.5	67.8	2.2	0.85	0.68	0.02
16												
17												
18												
19												
20												
21												
22												

Source 1 > Cabras Units 1 & 2
Source 2 > Cabras Units 3 & 4
Source 3 > Piti Units 4 & 5

Table 25 Concentration Data: Wind Dir. =67.50°; Wind Speed ~ 15 m/s

File Name H0101.GC	Run# H0101	DEN	06-22-95	21: 7:34
Wind Speed (cm/s) =	38.16	Hr (cm) =	6	
Air Temp. (C) =	26.6	Hr (cm) =	6	
Source Designation =	1	2	3	
Source Flow Rate (ccs) =	212.5	255.9	98.5	
Source Gas Temp. (C) =	26.6	26.6	26.6	
Tracer Type =	CH4	C2H6	C3H8	
Tracer Conc. (ppm) =	955000	236000	267000	
Background Conc. (ppm) =	7.7	1.5	0.7	
Position Grid Filename >	gcpos.inp			

Wind Dir. = 56.25 deg N
Wind Speed = 3.04 m/s

Tube No.	Model Meas.#1 (ppm)	Model Meas.#2 (ppm)	Model Meas.#3 (ppm)	Model Norm.#1 (ppm)	Model Norm.#2 (ppm)	Model Norm.#3 (ppm)	Model K1*10 ⁶ (cm ²)	Model K2*10 ⁶ (cm ²)	Model K3*10 ⁶ (cm ²)	Field K1*10 ⁶ (m ²)	Field K2*10 ⁶ (m ²)	Field K3*10 ⁶ (m ²)
1	8.8	2.0	0.7	1.2	2.1	0.0	0.2	0.3	0.0	0.00	0.00	0.00
2	7.6	1.5	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
3	7.6	1.6	1.0	0.0	0.4	1.1	0.0	0.1	0.4	0.00	0.00	0.00
4												
5												
6												
7												
8												
9												
10	7.6	1.5	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
11	7.6	1.5	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
12	7.7	1.5	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
13	7.7	1.5	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
14	13.9	5.1	0.7	6.5	15.3	0.0	1.2	2.3	0.0	0.01	0.02	0.00
15												
16	9.3	1.8	4.9	1.7	1.3	15.7	0.3	0.2	6.1	0.00	0.00	0.06
17	8.4	1.7	2.6	0.7	0.8	7.1	0.1	0.1	2.8	0.00	0.00	0.03
18	8.4	1.7	0.7	0.7	0.8	0.0	0.1	0.1	0.0	0.00	0.00	0.00
19	8.1	1.6	0.9	0.4	0.4	0.7	0.1	0.1	0.3	0.00	0.00	0.00
20	8.6	1.9	2.8	0.9	1.7	7.9	0.2	0.3	3.0	0.00	0.00	0.03
21	8.3	1.7	0.7	0.6	0.8	0.0	0.1	0.1	0.0	0.00	0.00	0.00
22	18.1	6.2	1.1	10.9	19.9	1.5	2.0	3.0	0.6	0.02	0.03	0.01

Source 1 > Cabras Units 1 & 2
Source 2 > Cabras Units 3 & 4
Source 3 > Piti Units 4 & 5

Table 26 Concentration Data: Wind Dir. = 56.25°; Wind Speed ~ 3 m/s

File Name H0102.GC	Run# H0102	DEN	06-22-95	20:16:59
Wind Speed (cm/s) =	77.22	Hr (cm) =	6	
Air Temp. (C) =	26.6	Hr (cm) =	6	
Source Designation =	1	2	3	
Source Flow Rate (ccs) =	212.5	255.9	98.5	
Source Gas Temp. (C) =	26.6	26.6	26.6	
Tracer Type =	CH4	C2H6	C3H8	
Tracer Conc. (ppm) =	955000	236000	267000	
Background Conc. (ppm) =	10.3	2.2	0.8	
Position Grid Filename >	gcpos.inp			

Wind Dir. = 56.25 deg N
Wind Speed = 6.15 m/s

Tube No.	Model Meas.#1 (ppm)	Model Meas.#2 (ppm)	Model Meas.#3 (ppm)	Model Norm.#1 (ppm)	Model Norm.#2 (ppm)	Model Norm.#3 (ppm)	Model K1*10 ⁶ (cm ²)	Model K2*10 ⁶ (cm ²)	Model K3*10 ⁶ (cm ²)	Field K1*10 ⁶ (m ²)	Field K2*10 ⁶ (m ²)	Field K3*10 ⁶ (m ²)
1	11.4	2.5	0.8	1.2	1.3	0.0	0.4	0.4	0.0	0.00	0.00	0.00
2	10.6	2.3	0.9	0.3	0.4	0.4	0.1	0.1	0.3	0.00	0.00	0.00
3	10.3	2.2	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
4												
5												
6												
7												
8												
9												
10	10.4	2.2	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
11	10.5	2.2	0.8	0.2	0.0	0.0	0.1	0.0	0.0	0.00	0.00	0.00
12	10.7	2.3	0.8	0.4	0.4	0.0	0.2	0.1	0.0	0.00	0.00	0.00
13	10.6	2.2	0.8	0.3	0.0	0.0	0.1	0.0	0.0	0.00	0.00	0.00
14	15.4	3.7	0.9	5.3	6.4	0.4	1.9	1.9	0.3	0.02	0.02	0.00
15												
16	24.0	3.3	12.2	14.3	4.7	42.7	5.2	1.4	33.5	0.05	0.01	0.33
17	12.7	2.5	6.1	2.5	1.3	19.9	0.9	0.4	15.6	0.01	0.00	0.16
18	12.6	2.7	0.9	2.4	2.1	0.4	0.9	0.6	0.3	0.01	0.01	0.00
19	12.1	2.6	1.1	1.9	1.7	1.1	0.7	0.5	0.9	0.01	0.01	0.01
20	13.0	2.5	8.5	2.8	1.3	28.8	1.0	0.4	22.6	0.01	0.00	0.23
21	12.5	2.7	1.0	2.3	2.1	0.7	0.8	0.6	0.6	0.01	0.01	0.01
22	144.4	36.6	9.1	140.4	145.8	31.1	51.0	44.0	24.4	0.51	0.44	0.24

Source 1 > Cabras Units 1 & 2
Source 2 > Cabras Units 3 & 4
Source 3 > Piti Units 4 & 5

Table 27 Concentration Data: Wind Dir. =56.25°; Wind Speed ~ 6 m/s

File Name H0103.GC	Run# H0103	DEN	06-22-95	19:33:24
Wind Speed (cm/s) =	120.72	Hr (cm) =	6	
Air Temp. (C) =	26.6	Hr (cm) =	6	
Source Designation =	1	2	3	
Source Flow Rate (ccs) =	212.5	255.9	98.5	
Source Gas Temp. (C) =	26.6	26.6	26.6	
Tracer Type =	CH4	C2H6	C3H8	
Tracer Conc. (ppm) =	955000	236000	267000	
Background Conc. (ppm) =	13.8	3	1	
Position Grid Filename >	gcpos.inp			

Wind Dir. = 56.25 deg N
Wind Speed = 9.62 m/s

Tube No.	Model Meas.#1 (ppm)	Model Meas.#2 (ppm)	Model Meas.#3 (ppm)	Model Norm.#1 (ppm)	Model Norm.#2 (ppm)	Model Norm.#3 (ppm)	Model K1*10^6 (cm^2)	Model K2*10^6 (cm^2)	Model K3*10^6 (cm^2)	Field K1*10^6 (m^2)	Field K2*10^6 (m^2)	Field K3*10^6 (m^2)
1	14.1	3.2	1.0	0.3	0.8	0.0	0.2	0.4	0.0	0.00	0.00	0.00
2	13.9	3.2	1.4	0.1	0.8	1.5	0.1	0.4	1.8	0.00	0.00	0.02
3	13.7	3.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
4												
5												
6												
7												
8												
9												
10	13.8	3.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
11	13.9	3.0	1.0	0.1	0.0	0.0	0.1	0.0	0.0	0.00	0.00	0.00
12	14.0	3.0	1.0	0.2	0.0	0.0	0.1	0.0	0.0	0.00	0.00	0.00
13	13.9	3.0	1.0	0.1	0.0	0.0	0.1	0.0	0.0	0.00	0.00	0.00
14	19.9	5.2	1.0	6.4	9.3	0.0	3.6	4.4	0.0	0.04	0.04	0.00
15												
16	149.0	21.1	41.9	141.6	76.7	153.2	80.4	36.2	187.7	0.80	0.36	1.88
17	38.5	6.3	22.6	25.9	14.0	80.9	14.7	6.6	99.1	0.15	0.07	0.99
18	14.0	3.0	1.1	0.2	0.0	0.4	0.1	0.0	0.5	0.00	0.00	0.00
19	13.8	3.0	1.1	0.0	0.0	0.4	0.0	0.0	0.5	0.00	0.00	0.00
20	60.3	8.0	44.9	48.7	21.2	164.4	27.7	10.0	201.5	0.28	0.10	2.02
21	13.8	3.0	1.1	0.0	0.0	0.4	0.0	0.0	0.5	0.00	0.00	0.00
22	330.2	86.5	2.5	331.3	353.8	5.6	188.2	166.9	6.9	1.88	1.67	0.07

Source 1 > Cabras Units 1 & 2
Source 2 > Cabras Units 3 & 4
Source 3 > Piti Units 4 & 5

Table 28 Concentration Data: Wind Dir. =56.25°; Wind Speed ~ 9 m/s

File Name H0104.GC	Run# H0104	DEN	06-22-95	18:44:19
Wind Speed (cm/s) =	152.74	Hr (cm) =	6	
Air Temp. (C) =	26.6	Hr (cm) =	6	
Source Designation =	1	2	3	
Source Flow Rate (ccs) =	212.5	255.9	98.5	
Source Gas Temp. (C) =	26.6	26.6	26.6	
Tracer Type =	CH4	C2H6	C3H8	
Tracer Conc. (ppm) =	955000	236000	267000	
Background Conc. (ppm) =	13.5	2.9	0.9	
Position Grid Filename >	gcpos.inp			

Wind Dir. = 56.25 deg N
Wind Speed = 12.17 m/s

Tube No.	Model Meas.#1 (ppm)	Model Meas.#2 (ppm)	Model Meas.#3 (ppm)	Model Norm.#1 (ppm)	Model Norm.#2 (ppm)	Model Norm.#3 (ppm)	Model K1*10^6 (cm^-2)	Model K2*10^6 (cm^-2)	Model K3*10^6 (cm^-2)	Field K1*10^6 (m^-2)	Field K2*10^6 (m^-2)	Field K3*10^6 (m^-2)
1	15.8	3.7	1.0	2.4	3.4	0.4	1.7	2.0	0.6	0.02	0.02	0.01
2	13.6	3.1	1.3	0.1	0.8	1.5	0.1	0.5	2.3	0.00	0.01	0.02
3	13.2	2.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
4												
5												
6												
7												
8												
9												
10	13.2	2.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
11	13.5	3.0	1.0	0.0	0.4	0.4	0.0	0.3	0.6	0.00	0.00	0.01
12	13.5	2.9	1.0	0.0	0.0	0.4	0.0	0.0	0.6	0.00	0.00	0.01
13	13.4	2.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
14	43.3	11.7	1.0	31.2	37.3	0.4	22.4	22.3	0.6	0.22	0.22	0.01
15												
16	20.2	4.0	19.0	7.0	4.7	67.8	5.0	2.8	105.1	0.05	0.03	1.05
17	14.3	3.1	6.1	0.8	0.8	19.5	0.6	0.5	30.2	0.01	0.01	0.30
18	13.8	3.0	1.0	0.3	0.4	0.4	0.2	0.3	0.6	0.00	0.00	0.01
19	13.5	2.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
20	14.9	3.1	21.8	1.5	0.8	78.3	1.1	0.5	121.4	0.01	0.01	1.21
21	14.0	3.1	1.0	0.5	0.8	0.4	0.4	0.5	0.6	0.00	0.01	0.01
22	936.0	152.0	17.4	966.0	631.8	61.8	694.3	377.1	95.8	6.94	3.77	0.96

Source 1 > Cabras Units 1 & 2
Source 2 > Cabras Units 3 & 4
Source 3 > Piti Units 4 & 5

Table 29 Concentration Data: Wind Dir. =56.25°; Wind Speed ~ 12 m/s

File Name H0105.GC	Run# H0105	DEN	06-22-95	18: 4:28
Wind Speed (cm/s) =	187.25	Hr (cm) =	6	
Air Temp. (C) =	26.6	Hr (cm) =	6	
Source Designation =	1	2	3	
Source Flow Rate (ccs) =	212.5	255.9	98.5	
Source Gas Temp. (C) =	26.6	26.6	26.6	
Tracer Type =	CH4	C2H6	C3H8	
Tracer Conc. (ppm) =	955000	236000	267000	
Background Conc. (ppm) =	14.1	3.1	0.9	
Position Grid Filename >	gcpos.inp			

Wind Dir. = 56.25 deg N
Wind Speed = 14.92 m/s

Tube No.	Model Meas.#1 (ppm)	Model Meas.#2 (ppm)	Model Meas.#3 (ppm)	Model Norm.#1 (ppm)	Model Norm.#2 (ppm)	Model Norm.#3 (ppm)	Model K1*10^6 (cm^-2)	Model K2*10^6 (cm^-2)	Model K3*10^6 (cm^-2)	Field K1*10^6 (m^-2)	Field K2*10^6 (m^-2)	Field K3*10^6 (m^-2)
1	17.6	4.2	1.2	3.7	4.7	1.1	3.2	3.4	2.1	0.03	0.03	0.02
2	16.1	3.8	1.6	2.1	3.0	2.6	1.8	2.2	5.0	0.02	0.02	0.05
3	15.8	3.6	1.1	1.8	2.1	0.7	1.6	1.6	1.4	0.02	0.02	0.01
4												
5												
6												
7												
8												
9												
10	15.8	3.5	1.0	1.8	1.7	0.4	1.6	1.2	0.7	0.02	0.01	0.01
11	15.8	3.5	1.0	1.8	1.7	0.4	1.6	1.2	0.7	0.02	0.01	0.01
12	15.9	3.5	1.0	1.9	1.7	0.4	1.7	1.2	0.7	0.02	0.01	0.01
13	16.0	3.6	1.1	2.0	2.1	0.7	1.8	1.6	1.4	0.02	0.02	0.01
14	47.4	13.0	1.2	34.9	41.9	1.1	30.7	30.7	2.1	0.31	0.31	0.02
15												
16	25.0	5.0	17.1	11.4	8.1	60.7	10.1	5.9	115.3	0.10	0.06	1.15
17	16.2	3.5	5.3	2.2	1.7	16.5	1.9	1.2	31.3	0.02	0.01	0.31
18	14.1	3.1	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
19	14.2	3.1	0.9	0.1	0.0	0.0	0.1	0.0	0.0	0.00	0.00	0.00
20	17.1	3.5	19.0	3.1	1.7	67.8	2.8	1.2	128.9	0.03	0.01	1.29
21	14.7	3.2	1.0	0.6	0.4	0.4	0.6	0.3	0.7	0.01	0.00	0.01
22	936.2	153.6	12.3	965.6	637.7	42.7	850.8	466.6	81.2	8.51	4.67	0.81

Source 1 > Cabras Units 1 & 2
Source 2 > Cabras Units 3 & 4
Source 3 > Piti Units 4 & 5

Table 30 Concentration Data: Wind Dir. =56.25°; Wind Speed ~ 15 m/s

File Name I0101.GC	Run# I0101	DEN	06-27-95	19:36:49
Wind Speed (cm/s) =	41.09	Hr (cm) =	6	
Air Temp. (C) =	26.4	Hr (cm) =	6	
Source Designation =	1	2	3	
Source Flow Rate (ccs) =	212.5	255.9	98.5	
Source Gas Temp. (C) =	26.4	26.4	26.4	
Tracer Type =	CH4	C2H6	C3H8	
Tracer Conc. (ppm) =	955000	236000	267000	
Background Conc. (ppm) =	15	3.3	0.9	
Position Grid Filename >	gcpos.inp			

Wind Dir. = 45 deg N
Wind Speed = 3.27 m/s

Tube No.	Model Meas.#1 (ppm)	Model Meas.#2 (ppm)	Model Meas.#3 (ppm)	Model Norm.#1 (ppm)	Model Norm.#2 (ppm)	Model Norm.#3 (ppm)	Model K1*10^6 (cm^2)	Model K2*10^6 (cm^2)	Model K3*10^6 (cm^2)	Field K1*10^6 (m^2)	Field K2*10^6 (m^2)	Field K3*10^6 (m^2)
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16	14.2	3.4	0.9	0.0	0.4	0.0	0.0	0.1	0.0	0.00	0.00	0.00
17	15.0	3.7	0.9	0.0	1.7	0.0	0.0	0.3	0.0	0.00	0.00	0.00
18	61.8	5.9	4.2	49.0	11.0	12.4	9.5	1.8	5.2	0.09	0.02	0.05
19	18.8	5.3	1.0	4.0	8.5	0.4	0.8	1.4	0.2	0.01	0.01	0.00
20	16.7	4.2	0.9	1.8	3.8	0.0	0.3	0.6	0.0	0.00	0.01	0.00
21	15.2	3.3	1.5	0.2	0.0	2.2	0.0	0.0	0.9	0.00	0.00	0.01
22	13.5	3.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00

Source 1 > Cabras Units 1 & 2
Source 2 > Cabras Units 3 & 4
Source 3 > Piti Units 4 & 5

Table 31 Concentration Data: Wind Dir. = 45.00°; Wind Speed ~ 3 m/s

File Name I0102.GC	Run# I0102	DEN	06-27-95	19: 5:36
Wind Speed (cm/s) =	71.96	Hr (cm) =	6	
Air Temp. (C) =	26.4	Hr (cm) =	6	
Source Designation =	1	2	3	
Source Flow Rate (ccs) =	212.5	255.9	98.5	
Source Gas Temp. (C) =	26.4	26.4	26.4	
Tracer Type =	CH4	C2H6	C3H8	
Tracer Conc. (ppm) =	955000	236000	267000	
Background Conc. (ppm) =	11	2.2	0.8	
Position Grid Filename >	gcpos.inp			

Wind Dir. = 45 deg N
Wind Speed = 5.73 m/s

Tube No.	Model Meas.#1 (ppm)	Model Meas.#2 (ppm)	Model Meas.#3 (ppm)	Model Norm.#1 (ppm)	Model Norm.#2 (ppm)	Model Norm.#3 (ppm)	Model K1*10^6 (cm^-2)	Model K2*10^6 (cm^-2)	Model K3*10^6 (cm^-2)	Field K1*10^6 (m^-2)	Field K2*10^6 (m^-2)	Field K3*10^6 (m^-2)
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16	20.3	7.0	0.8	9.7	20.3	0.0	3.3	5.7	0.0	0.03	0.06	0.00
17	49.4	14.8	0.9	40.2	53.4	0.4	13.6	15.0	0.3	0.14	0.15	0.00
18	78.4	7.3	16.4	70.6	21.6	58.4	23.9	6.1	42.7	0.24	0.06	0.43
19	149.0	34.4	3.9	144.5	136.4	11.6	48.9	38.4	8.5	0.49	0.38	0.08
20	192.9	33.9	1.8	190.5	134.3	3.7	64.5	37.8	2.7	0.65	0.38	0.03
21	10.6	2.2	1.1	0.0	0.0	1.1	0.0	0.0	0.8	0.00	0.00	0.01
22	11.0	2.2	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00

Source 1 > Cabras Units 1 & 2
Source 2 > Cabras Units 3 & 4
Source 3 > Piti Units 4 & 5

Table 32 Concentration Data: Wind Dir. =45.00°; Wind Speed ~ 6 m/s

File Name I0103.GC	Run# I0103	DEN	06-27-95	18:34:12
Wind Speed (cm/s) =	108.91	Hr (cm) =	6	
Air Temp. (C) =	26.4	Hr (cm) =	6	
Source Designation =	1	2	3	
Source Flow Rate (ccs) =	212.5	255.9	98.5	
Source Gas Temp. (C) =	26.4	26.4	26.4	
Tracer Type =	CH4	C2H6	C3H8	
Tracer Conc. (ppm) =	955000	236000	267000	
Background Conc. (ppm) =	10.1	2.1	0.8	
Position Grid Filename >	gcpos.inp			

Wind Dir. = 45 deg N
Wind Speed = 8.68 m/s

Tube No.	Model Meas.#1 (ppm)	Model Meas.#2 (ppm)	Model Meas.#3 (ppm)	Model Norm.#1 (ppm)	Model Norm.#2 (ppm)	Model Norm.#3 (ppm)	Model K1*10^6 (cm^-2)	Model K2*10^6 (cm^-2)	Model K3*10^6 (cm^-2)	Field K1*10^6 (m^-2)	Field K2*10^6 (m^-2)	Field K3*10^6 (m^-2)
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15												
16	91.7	29.5	0.9	85.4	116.1	0.4	43.8	49.4	0.4	0.44	0.49	0.00
17	249.9	66.5	1.4	251.1	272.9	2.2	128.7	116.1	2.5	1.29	1.16	0.02
18	79.7	10.2	30.8	72.9	34.3	112.4	37.4	14.6	124.2	0.37	0.15	1.24
19	535.8	103.1	14.9	550.5	428.0	52.8	282.1	182.1	58.4	2.82	1.82	0.58
20	916.3	110.0	4.1	948.9	457.2	12.4	486.3	194.6	13.7	4.86	1.95	0.14
21	12.0	2.5	1.2	2.0	1.7	1.5	1.0	0.7	1.7	0.01	0.01	0.02
22	10.1	2.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00

Source 1 > Cabras Units 1 & 2
Source 2 > Cabras Units 3 & 4
Source 3 > Piti Units 4 & 5

Table 33 Concentration Data: Wind Dir. =45.00°; Wind Speed ~ 9 m/s

File Name I0104.GC	Run# I0104	DEN	06-27-95	17: 6:50
Wind Speed (cm/s) =	153.13	Hr (cm) =	6	
Air Temp. (C) =	25.8	Hr (cm) =	6	
Source Designation =	1	2	3	
Source Flow Rate (ccs) =	212.5	255.9	98.5	
Source Gas Temp. (C) =	25.8	25.8	25.8	
Tracer Type =	CH4	C2H6	C3H8	
Tracer Conc. (ppm) =	955000	236000	267000	
Background Conc. (ppm) =	16.8	3.6	1.2	
Position Grid Filename >	gcpos.inp			

Wind Dir. = 45 deg N
Wind Speed = 12.20 m/s

Tube No.	Model Meas.#1 (ppm)	Model Meas.#2 (ppm)	Model Meas.#3 (ppm)	Model Norm.#1 (ppm)	Model Norm.#2 (ppm)	Model Norm.#3 (ppm)	Model K1*10^6 (cm^-2)	Model K2*10^6 (cm^-2)	Model K3*10^6 (cm^-2)	Field K1*10^6 (m^-2)	Field K2*10^6 (m^-2)	Field K3*10^6 (m^-2)
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15												
16	260.3	80.0	1.5	255.0	323.7	1.1	183.7	193.7	1.7	1.84	1.94	0.02
17	530.6	138.9	3.7	538.0	573.3	9.4	387.7	343.1	14.6	3.88	3.43	0.15
18	94.2	14.1	33.5	81.0	44.5	121.0	58.4	26.6	188.1	0.58	0.27	1.88
19	704.9	147.8	20.7	720.5	611.0	73.0	519.2	365.6	113.5	5.19	3.66	1.14
20	1439.6	198.0	7.4	1489.9	823.7	23.2	1073.6	492.9	36.1	10.74	4.93	0.36
21	19.0	4.1	2.2	2.3	2.1	3.7	1.7	1.3	5.8	0.02	0.01	0.06
22	16.8	3.6	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00

Source 1 > Cabras Units 1 & 2
Source 2 > Cabras Units 3 & 4
Source 3 > Piti Units 4 & 5

Table 34 Concentration Data: Wind Dir. =45.00°; Wind Speed ~ 12 m/s

File Name I0105.GC	Run# I0105	DEN	06-27-95	16:32:20
Wind Speed (cm/s) =	190.04	Hr (cm) =	6	
Air Temp. (C) =	25.8	Hr (cm) =	6	
Source Designation =	1	2	3	
Source Flow Rate (ccs) =	212.5	255.9	98.5	
Source Gas Temp. (C) =	25.8	25.8	25.8	
Tracer Type =	CH4	C2H6	C3H8	
Tracer Conc. (ppm) =	955000	236000	267000	
Background Conc. (ppm) =	17.8	3.4	1.1	
Position Grid Filename >	gcpos.inp			

Wind Dir. = 45 deg N
Wind Speed = 15.14 m/s

Tube No.	Model Meas.#1 (ppm)	Model Meas.#2 (ppm)	Model Meas.#3 (ppm)	Model Norm.#1 (ppm)	Model Norm.#2 (ppm)	Model Norm.#3 (ppm)	Model K1*10^6 (cm^-2)	Model K2*10^6 (cm^-2)	Model K3*10^6 (cm^-2)	Field K1*10^6 (m^-2)	Field K2*10^6 (m^-2)	Field K3*10^6 (m^-2)
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15												
16	193.9	62.2	1.3	184.4	249.2	0.7	164.9	185.0	1.4	1.65	1.85	0.01
17	453.6	125.8	2.3	456.3	518.7	4.5	408.1	385.2	8.7	4.08	3.85	0.09
18	147.9	23.6	36.3	136.2	85.6	131.8	121.8	63.6	254.4	1.22	0.64	2.54
19	634.9	147.1	11.2	646.2	608.9	37.8	577.9	452.2	73.0	5.78	4.52	0.73
20	1288.6	214.1	5.8	1330.7	892.8	17.6	1190.1	663.0	34.0	11.90	6.63	0.34
21	18.7	3.8	1.9	0.9	1.7	3.0	0.8	1.3	5.8	0.01	0.01	0.06
22	17.8	3.4	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00

Source 1 > Cabras Units 1 & 2
Source 2 > Cabras Units 3 & 4
Source 3 > Piti Units 4 & 5

Table 35 Concentration Data: Wind Dir. =45.00°; Wind Speed ~ 15 m/s

File Name J0101.GC	Run# J0101	DAVEB	06-28-95	21:43:15
Wind Speed (cm/s) =	40.91	Hr (cm) =	6	
Air Temp. (C) =	22.3	Hr (cm) =	6	
Source Designation =	1	2	3	
Source Flow Rate (ccs) =	212.5	255.9	98.5	
Source Gas Temp. (C) =	22.3	22.3	22.3	
Tracer Type =	CH4	C2H6	C3H8	
Tracer Conc. (ppm) =	955000	236000	267000	
Background Conc. (ppm) =	29.3	6.8	2.2	
Position Grid Filename >	gcpos.inp			

Wind Dir. = 33.75 deg N
Wind Speed = 3.26 m/s

Tube No.	Model Meas.#1 (ppm)	Model Meas.#2 (ppm)	Model Meas.#3 (ppm)	Model Norm.#1 (ppm)	Model Norm.#2 (ppm)	Model Norm.#3 (ppm)	Model K1*10^6 (cm^-2)	Model K2*10^6 (cm^-2)	Model K3*10^6 (cm^-2)	Field K1*10^6 (m^-2)	Field K2*10^6 (m^-2)	Field K3*10^6 (m^-2)
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15												
16	29.3	6.8	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
17	29.3	6.8	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
18	33.9	9.1	2.2	4.8	9.7	0.0	0.9	1.6	0.0	0.01	0.02	0.00
19	29.3	6.9	2.1	0.0	0.4	0.0	0.0	0.1	0.0	0.00	0.00	0.00
20	29.2	6.8	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
21	59.8	13.5	5.4	31.9	28.4	12.0	6.1	4.5	5.0	0.06	0.05	0.05
22												

Source 1 > Cabras Units 1 & 2
Source 2 > Cabras Units 3 & 4
Source 3 > Pitti Units 4 & 5

Table 36 Concentration Data: Wind Dir. = 33.75°; Wind Speed ~ 3 m/s

File Name J0102.GC	Run# J0102	DAVEB	06-28-95	20:31:47
Wind Speed (cm/s) =	74.68	Hr (cm) =	6	
Air Temp. (C) =	22.3	Hr (cm) =	6	
Source Designation =	1	2	3	
Source Flow Rate (ccs) =	212.5	255.9	98.5	
Source Gas Temp. (C) =	22.3	22.3	22.3	
Tracer Type =	CH4	C2H6	C3H8	
Tracer Conc. (ppm) =	955000	236000	267000	
Background Conc. (ppm) =	13.5	2.9	1	
Position Grid Filename >	gcpos.inp			

Wind Dir. = 33.75 deg N
Wind Speed = 5.95 m/s

Tube No.	Model Meas.#1 (ppm)	Model Meas.#2 (ppm)	Model Meas.#3 (ppm)	Model Norm.#1 (ppm)	Model Norm.#2 (ppm)	Model Norm.#3 (ppm)	Model K1*10^6 (cm^-2)	Model K2*10^6 (cm^-2)	Model K3*10^6 (cm^-2)	Field K1*10^6 (m^-2)	Field K2*10^6 (m^-2)	Field K3*10^6 (m^-2)
1												
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15												
16	13.6	2.9	0.9	0.1	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
17	13.5	2.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
18	13.7	3.0	1.0	0.2	0.4	0.0	0.1	0.1	0.0	0.00	0.00	0.00
19	13.3	2.9	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
20	13.9	3.0	1.0	0.4	0.4	0.0	0.1	0.1	0.0	0.00	0.00	0.00
21	58.1	17.7	1.1	46.7	62.7	0.4	16.4	18.3	0.3	0.16	0.18	0.00
22												

Source 1 > Cabras Units 1 & 2
Source 2 > Cabras Units 3 & 4
Source 3 > Piti Units 4 & 5

Table 37 Concentration Data: Wind Dir. =33.75°; Wind Speed ~ 6 m/s

File Name J0103.GC	Run# J0103	DAVEB	06-28-95	19:38:19
Wind Speed (cm/s) =	111.05	Hr (cm) =	6	
Air Temp. (C) =	22.3	Hr (cm) =	6	
Source Designation =	1	2	3	
Source Flow Rate (ccs) =	212.5	255.9	98.5	
Source Gas Temp. (C) =	22.3	22.3	22.3	
Tracer Type =	CH4	C2H6	C3H8	
Tracer Conc. (ppm) =	955000	236000	267000	
Background Conc. (ppm) =	17.7	4	1.2	
Position Grid Filename >	gcpos.inp			

Wind Dir. = 33.75 deg N
Wind Speed = 8.85 m/s

Tube No.	Model Meas.#1 (ppm)	Model Meas.#2 (ppm)	Model Meas.#3 (ppm)	Model Norm.#1 (ppm)	Model Norm.#2 (ppm)	Model Norm.#3 (ppm)	Model K1*10^6 (cm^-2)	Model K2*10^6 (cm^-2)	Model K3*10^6 (cm^-2)	Field K1*10^6 (m^-2)	Field K2*10^6 (m^-2)	Field K3*10^6 (m^-2)
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15												
16	17.9	4.2	1.6	0.2	0.8	1.5	0.1	0.4	1.7	0.00	0.00	0.02
17	17.8	4.0	1.2	0.1	0.0	0.0	0.1	0.0	0.0	0.00	0.00	0.00
18	18.4	4.2	1.2	0.7	0.8	0.0	0.4	0.4	0.0	0.00	0.00	0.00
19	17.6	4.0	1.3	0.0	0.0	0.4	0.0	0.0	0.4	0.00	0.00	0.00
20	18.1	4.1	1.3	0.4	0.4	0.4	0.2	0.2	0.4	0.00	0.00	0.00
21	301.3	75.7	2.8	297.0	303.8	6.0	155.2	131.8	6.8	1.55	1.32	0.07
22												

Source 1 > Cabras Units 1 & 2
Source 2 > Cabras Units 3 & 4
Source 3 > Pitti Units 4 & 5

Table 38 Concentration Data: Wind Dir. =33.75°; Wind Speed ~ 9 m/s

File Name J0104.GC	Run# J0104	DAVEB	06-28-95	19: 4:56
Wind Speed (cm/s) =	152.2	Hr (cm) =	6	
Air Temp. (C) =	23.5	Hr (cm) =	6	
Source Designation =	1	2	3	
Source Flow Rate (ccs) =	212.5	255.9	98.5	
Source Gas Temp. (C) =	23.5	23.5	23.5	
Tracer Type =	CH4	C2H6	C3H8	
Tracer Conc. (ppm) =	955000	236000	267000	
Background Conc. (ppm) =	20.4	4.6	1.4	
Position Grid Filename >	gcpos.inp			

Wind Dir. = 33.75 deg N
Wind Speed = 12.12 m/s

Tube No.	Model Meas.#1 (ppm)	Model Meas.#2 (ppm)	Model Meas.#3 (ppm)	Model Norm.#1 (ppm)	Model Norm.#2 (ppm)	Model Norm.#3 (ppm)	Model K1*10^6 (cm^-2)	Model K2*10^6 (cm^-2)	Model K3*10^6 (cm^-2)	Field K1*10^6 (m^-2)	Field K2*10^6 (m^-2)	Field K3*10^6 (m^-2)
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13												
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15												
16	20.5	4.6	1.3	0.1	0.0	0.0	0.1	0.0	0.0	0.00	0.00	0.00
17	20.4	4.7	1.4	0.0	0.4	0.0	0.0	0.3	0.0	0.00	0.00	0.00
18	20.8	4.8	1.4	0.4	0.8	0.0	0.3	0.5	0.0	0.00	0.01	0.00
19	20.2	4.6	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
20	20.4	4.7	1.7	0.0	0.4	1.1	0.0	0.3	1.7	0.00	0.00	0.02
21	660.7	152.3	5.5	670.5	625.9	15.4	480.2	372.2	23.7	4.80	3.72	0.24
22												

Source 1 > Cabras Units 1 & 2
Source 2 > Cabras Units 3 & 4
Source 3 > Piti Units 4 & 5

Table 39 Concentration Data: Wind Dir. =33.75°; Wind Speed ~ 12 m/s

File Name J0105.GC	Run# J0105	DAVEB	06-28-95	18:24:50
Wind Speed (cm/s) =	189.55	Hr (cm) =	6	
Air Temp. (C) =	23.5	Hr (cm) =	6	
Source Designation =	1	2	3	
Source Flow Rate (ccs) =	212.5	255.9	98.5	
Source Gas Temp. (C) =	23.5	23.5	23.5	
Tracer Type =	CH4	C2H6	C3H8	
Tracer Conc. (ppm) =	955000	236000	267000	
Background Conc. (ppm) =	21.7	4.8	1.4	
Position Grid Filename >	gcpos.inp			

Wind Dir. = 33.75 deg N
Wind Speed = 15.10 m/s

Tube No.	Model Meas.#1 (ppm)	Model Meas.#2 (ppm)	Model Meas.#3 (ppm)	Model Norm.#1 (ppm)	Model Norm.#2 (ppm)	Model Norm.#3 (ppm)	Model K1*10^6 (cm^-2)	Model K2*10^6 (cm^-2)	Model K3*10^6 (cm^-2)	Field K1*10^6 (m^-2)	Field K2*10^6 (m^-2)	Field K3*10^6 (m^-2)
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15												
16	21.9	4.9	1.4	0.2	0.4	0.0	0.2	0.3	0.0	0.00	0.00	0.00
17	21.9	5.0	1.4	0.2	0.8	0.0	0.2	0.6	0.0	0.00	0.01	0.00
18	23.3	5.2	1.4	1.7	1.7	0.0	1.5	1.3	0.0	0.01	0.01	0.00
19	21.6	4.9	1.4	0.0	0.4	0.0	0.0	0.3	0.0	0.00	0.00	0.00
20	22.1	5.0	1.4	0.4	0.8	0.0	0.4	0.6	0.0	0.00	0.01	0.00
21	641.3	149.4	5.1	648.8	612.7	13.9	578.7	453.9	26.7	5.79	4.54	0.27
22												

Source 1 > Cabras Units 1 & 2
Source 2 > Cabras Units 3 & 4
Source 3 > Piti Units 4 & 5

Table 40 Concentration Data: Wind Dir. =33.75°; Wind Speed ~ 15 m/s

Omega Mass Flow Controller System Settings {FLOW SET.WK4}

Test Program	Test Type	Config. (Uref or Source)	Total Flow Rate (ccs)	Spec. Gravity	Gas mixture component 1					Gas mixture component 2				
					Type	% Total (%)	Flow Rate (ccs)	Meter FS Range (SLPM)	Meter Setting (%FS)	Type	% Total (%)	Flow Rate (ccs)	Meter FS Range (SLPM)	Meter Setting (%FS)
ADCT	Visual	9 mps	36.5	1.000	Air	100.0	36.5	10	18.2					
ADCT	Conc.	9 mps	36.5	1.036	Ethane	100.0	36.5	10	36.6					
Re Inv.	Conc.	3 mps	12.2	1.036	Ethane	100.0	12.2	10	12.2					
"	"	6 mps	24.3	1.036	Ethane	100.0	24.3	10	24.4					
"	"	9 mps	36.5	1.036	Ethane	100.0	36.5	10	36.6					
"	"	12 mps	48.7	1.036	Ethane	100.0	48.7	10	48.8					
"	"	15 mps	60.8	1.036	Ethane	100.0	60.8	10	61.0					
Cabras 1&2	Visual	A	212.5	0.534	Air	45.9	97.6	10	48.6	Helium	54.1	114.9	10 50slpm	39.3 0.57volt
Cabras 3&4	"	B	255.9	0.350	Air	24.6	62.9	10	31.3	Helium	75.4	193.0	10 50slpm	66.0 0.68volt
Piti 4&5	"	C	98.5	0.507	Air	42.8	42.2	10	21.0	Helium	57.2	56.3	10 50slpm	19.3 0.22volt
Cabras 1&2	Conc.	A	212.5	0.534	Methane	95.5	203.0	100	14.0	Helium	4.5	9.5	1	32.4
Cabras 3&4	"	B	255.9	0.350	Ethane	23.6	60.4	10	60.6	Helium	76.4	195.5	10 50slpm	66.9 0.74volt
Piti 4&5	"	C	98.5	0.507	Propane	26.7	26.3	10 F36 Tube-602	36.7 G146 w/15psi	Helium	73.3	72.2	10 F33 Tube-603	24.7 S74 w/10psi

NOTES:

- 1) G indicates glass ball, S indicates steel ball
- 2) Matheson 50slpm Mass Flowmeter

Table 41 Stack Gas Flow Settings and Composition

Table 41. Entry Coefficient for the Flow Coefficient

Flow Coefficient	Entry Coefficient	Flow Coefficient	Entry Coefficient
0.00	0.00	0.50	0.50
0.10	0.10	0.60	0.60
0.20	0.20	0.70	0.70
0.30	0.30	0.80	0.80
0.40	0.40	0.90	0.90
0.50	0.50	1.00	1.00
0.60	0.60	1.10	1.10
0.70	0.70	1.20	1.20
0.80	0.80	1.30	1.30
0.90	0.90	1.40	1.40
1.00	1.00	1.50	1.50

See page 40 for more information

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) 29) 30) 31) 32) 33) 34) 35) 36) 37) 38) 39) 40) 41) 42) 43) 44) 45) 46) 47) 48) 49) 50) 51) 52) 53) 54) 55) 56) 57) 58) 59) 60) 61) 62) 63) 64) 65) 66) 67) 68) 69) 70) 71) 72) 73) 74) 75) 76) 77) 78) 79) 80) 81) 82) 83) 84) 85) 86) 87) 88) 89) 90) 91) 92) 93) 94) 95) 96) 97) 98) 99) 100)

FIGURES

| Flow Coefficient | | Entry Coefficient | |
|------------------|-------|-------------------|-------|
| 0.00 | 0.00 | 0.50 | 0.50 |
| 0.10 | 0.10 | 0.60 | 0.60 |
| 0.20 | 0.20 | 0.70 | 0.70 |
| 0.30 | 0.30 | 0.80 | 0.80 |
| 0.40 | 0.40 | 0.90 | 0.90 |
| 0.50 | 0.50 | 1.00 | 1.00 |
| 0.60 | 0.60 | 1.10 | 1.10 |
| 0.70 | 0.70 | 1.20 | 1.20 |
| 0.80 | 0.80 | 1.30 | 1.30 |
| 0.90 | 0.90 | 1.40 | 1.40 |
| 1.00 | 1.00 | 1.50 | 1.50 |
| 1.10 | 1.10 | 1.60 | 1.60 |
| 1.20 | 1.20 | 1.70 | 1.70 |
| 1.30 | 1.30 | 1.80 | 1.80 |
| 1.40 | 1.40 | 1.90 | 1.90 |
| 1.50 | 1.50 | 2.00 | 2.00 |
| 1.60 | 1.60 | 2.10 | 2.10 |
| 1.70 | 1.70 | 2.20 | 2.20 |
| 1.80 | 1.80 | 2.30 | 2.30 |
| 1.90 | 1.90 | 2.40 | 2.40 |
| 2.00 | 2.00 | 2.50 | 2.50 |
| 2.10 | 2.10 | 2.60 | 2.60 |
| 2.20 | 2.20 | 2.70 | 2.70 |
| 2.30 | 2.30 | 2.80 | 2.80 |
| 2.40 | 2.40 | 2.90 | 2.90 |
| 2.50 | 2.50 | 3.00 | 3.00 |
| 2.60 | 2.60 | 3.10 | 3.10 |
| 2.70 | 2.70 | 3.20 | 3.20 |
| 2.80 | 2.80 | 3.30 | 3.30 |
| 2.90 | 2.90 | 3.40 | 3.40 |
| 3.00 | 3.00 | 3.50 | 3.50 |
| 3.10 | 3.10 | 3.60 | 3.60 |
| 3.20 | 3.20 | 3.70 | 3.70 |
| 3.30 | 3.30 | 3.80 | 3.80 |
| 3.40 | 3.40 | 3.90 | 3.90 |
| 3.50 | 3.50 | 4.00 | 4.00 |
| 3.60 | 3.60 | 4.10 | 4.10 |
| 3.70 | 3.70 | 4.20 | 4.20 |
| 3.80 | 3.80 | 4.30 | 4.30 |
| 3.90 | 3.90 | 4.40 | 4.40 |
| 4.00 | 4.00 | 4.50 | 4.50 |
| 4.10 | 4.10 | 4.60 | 4.60 |
| 4.20 | 4.20 | 4.70 | 4.70 |
| 4.30 | 4.30 | 4.80 | 4.80 |
| 4.40 | 4.40 | 4.90 | 4.90 |
| 4.50 | 4.50 | 5.00 | 5.00 |
| 4.60 | 4.60 | 5.10 | 5.10 |
| 4.70 | 4.70 | 5.20 | 5.20 |
| 4.80 | 4.80 | 5.30 | 5.30 |
| 4.90 | 4.90 | 5.40 | 5.40 |
| 5.00 | 5.00 | 5.50 | 5.50 |
| 5.10 | 5.10 | 5.60 | 5.60 |
| 5.20 | 5.20 | 5.70 | 5.70 |
| 5.30 | 5.30 | 5.80 | 5.80 |
| 5.40 | 5.40 | 5.90 | 5.90 |
| 5.50 | 5.50 | 6.00 | 6.00 |
| 5.60 | 5.60 | 6.10 | 6.10 |
| 5.70 | 5.70 | 6.20 | 6.20 |
| 5.80 | 5.80 | 6.30 | 6.30 |
| 5.90 | 5.90 | 6.40 | 6.40 |
| 6.00 | 6.00 | 6.50 | 6.50 |
| 6.10 | 6.10 | 6.60 | 6.60 |
| 6.20 | 6.20 | 6.70 | 6.70 |
| 6.30 | 6.30 | 6.80 | 6.80 |
| 6.40 | 6.40 | 6.90 | 6.90 |
| 6.50 | 6.50 | 7.00 | 7.00 |
| 6.60 | 6.60 | 7.10 | 7.10 |
| 6.70 | 6.70 | 7.20 | 7.20 |
| 6.80 | 6.80 | 7.30 | 7.30 |
| 6.90 | 6.90 | 7.40 | 7.40 |
| 7.00 | 7.00 | 7.50 | 7.50 |
| 7.10 | 7.10 | 7.60 | 7.60 |
| 7.20 | 7.20 | 7.70 | 7.70 |
| 7.30 | 7.30 | 7.80 | 7.80 |
| 7.40 | 7.40 | 7.90 | 7.90 |
| 7.50 | 7.50 | 8.00 | 8.00 |
| 7.60 | 7.60 | 8.10 | 8.10 |
| 7.70 | 7.70 | 8.20 | 8.20 |
| 7.80 | 7.80 | 8.30 | 8.30 |
| 7.90 | 7.90 | 8.40 | 8.40 |
| 8.00 | 8.00 | 8.50 | 8.50 |
| 8.10 | 8.10 | 8.60 | 8.60 |
| 8.20 | 8.20 | 8.70 | 8.70 |
| 8.30 | 8.30 | 8.80 | 8.80 |
| 8.40 | 8.40 | 8.90 | 8.90 |
| 8.50 | 8.50 | 9.00 | 9.00 |
| 8.60 | 8.60 | 9.10 | 9.10 |
| 8.70 | 8.70 | 9.20 | 9.20 |
| 8.80 | 8.80 | 9.30 | 9.30 |
| 8.90 | 8.90 | 9.40 | 9.40 |
| 9.00 | 9.00 | 9.50 | 9.50 |
| 9.10 | 9.10 | 9.60 | 9.60 |
| 9.20 | 9.20 | 9.70 | 9.70 |
| 9.30 | 9.30 | 9.80 | 9.80 |
| 9.40 | 9.40 | 9.90 | 9.90 |
| 9.50 | 9.50 | 10.00 | 10.00 |
| 9.60 | 9.60 | 10.10 | 10.10 |
| 9.70 | 9.70 | 10.20 | 10.20 |
| 9.80 | 9.80 | 10.30 | 10.30 |
| 9.90 | 9.90 | 10.40 | 10.40 |
| 10.00 | 10.00 | 10.50 | 10.50 |
| 10.10 | 10.10 | 10.60 | 10.60 |
| 10.20 | 10.20 | 10.70 | 10.70 |
| 10.30 | 10.30 | 10.80 | 10.80 |
| 10.40 | 10.40 | 10.90 | 10.90 |
| 10.50 | 10.50 | 11.00 | 11.00 |
| 10.60 | 10.60 | 11.10 | 11.10 |
| 10.70 | 10.70 | 11.20 | 11.20 |
| 10.80 | 10.80 | 11.30 | 11.30 |
| 10.90 | 10.90 | 11.40 | 11.40 |
| 11.00 | 11.00 | 11.50 | 11.50 |
| 11.10 | 11.10 | 11.60 | 11.60 |
| 11.20 | 11.20 | 11.70 | 11.70 |
| 11.30 | 11.30 | 11.80 | 11.80 |
| 11.40 | 11.40 | 11.90 | 11.90 |
| 11.50 | 11.50 | 12.00 | 12.00 |
| 11.60 | 11.60 | 12.10 | 12.10 |
| 11.70 | 11.70 | 12.20 | 12.20 |
| 11.80 | 11.80 | 12.30 | 12.30 |
| 11.90 | 11.90 | 12.40 | 12.40 |
| 12.00 | 12.00 | 12.50 | 12.50 |
| 12.10 | 12.10 | 12.60 | 12.60 |
| 12.20 | 12.20 | 12.70 | 12.70 |
| 12.30 | 12.30 | 12.80 | 12.80 |
| 12.40 | 12.40 | 12.90 | 12.90 |
| 12.50 | 12.50 | 13.00 | 13.00 |
| 12.60 | 12.60 | 13.10 | 13.10 |
| 12.70 | 12.70 | 13.20 | 13.20 |
| 12.80 | 12.80 | 13.30 | 13.30 |
| 12.90 | 12.90 | 13.40 | 13.40 |
| 13.00 | 13.00 | 13.50 | 13.50 |
| 13.10 | 13.10 | 13.60 | 13.60 |
| 13.20 | 13.20 | 13.70 | 13.70 |
| 13.30 | 13.30 | 13.80 | 13.80 |
| 13.40 | 13.40 | 13.90 | 13.90 |
| 13.50 | 13.50 | 14.00 | 14.00 |
| 13.60 | 13.60 | 14.10 | 14.10 |
| 13.70 | 13.70 | 14.20 | 14.20 |
| 13.80 | 13.80 | 14.30 | 14.30 |
| 13.90 | 13.90 | 14.40 | 14.40 |
| 14.00 | 14.00 | 14.50 | 14.50 |
| 14.10 | 14.10 | 14.60 | 14.60 |
| 14.20 | 14.20 | 14.70 | 14.70 |
| 14.30 | 14.30 | 14.80 | 14.80 |
| 14.40 | 14.40 | 14.90 | 14.90 |
| 14.50 | 14.50 | 15.00 | 15.00 |
| 14.60 | 14.60 | 15.10 | 15.10 |
| 14.70 | 14.70 | 15.20 | 15.20 |
| 14.80 | 14.80 | 15.30 | 15.30 |
| 14.90 | 14.90 | 15.40 | 15.40 |
| 15.00 | 15.00 | 15.50 | 15.50 |
| 15.10 | 15.10 | 15.60 | 15.60 |
| 15.20 | 15.20 | 15.70 | 15.70 |
| 15.30 | 15.30 | 15.80 | 15.80 |
| 15.40 | 15.40 | 15.90 | 15.90 |
| 15.50 | 15.50 | 16.00 | 16.00 |
| 15.60 | 15.60 | 16.10 | 16.10 |
| 15.70 | 15.70 | 16.20 | 16.20 |
| 15.80 | 15.80 | 16.30 | 16.30 |
| 15.90 | 15.90 | 16.40 | 16.40 |
| 16.00 | 16.00 | 16.50 | 16.50 |
| 16.10 | 16.10 | 16.60 | 16.60 |
| 16.20 | 16.20 | 16.70 | 16.70 |
| 16.30 | 16.30 | 16.80 | 16.80 |
| 16.40 | 16.40 | 16.90 | 16.90 |
| 16.50 | 16.50 | 17.00 | 17.00 |
| 16.60 | 16.60 | 17.10 | 17.10 |
| 16.70 | 16.70 | 17.20 | 17.20 |
| 16.80 | 16.80 | 17.30 | 17.30 |
| 16.90 | 16.90 | 17.40 | 17.40 |
| 17.00 | 17.00 | 17.50 | 17.50 |
| 17.10 | 17.10 | 17.60 | 17.60 |
| 17.20 | 17.20 | 17.70 | 17.70 |
| 17.30 | 17.30 | 17.80 | 17.80 |
| 17.40 | 17.40 | 17.90 | 17.90 |
| 17.50 | 17.50 | 18.00 | 18.00 |
| 17.60 | 17.60 | 18.10 | 18.10 |
| 17.70 | 17.70 | 18.20 | 18.20 |
| 17.80 | 17.80 | 18.30 | 18.30 |
| 17.90 | 17.90 | 18.40 | 18.40 |
| 18.00 | 18.00 | 18.50 | 18.50 |
| 18.10 | 18.10 | 18.60 | 18.60 |
| 18.20 | 18.20 | 18.70 | 18.70 |
| 18.30 | 18.30 | 18.80 | 18.80 |
| 18.40 | 18.40 | 18.90 | 18.90 |
| 18.50 | 18.50 | 19.00 | 19.00 |
| 18.60 | 18.60 | 19.10 | 19.10 |
| 18.70 | 18.70 | 19.20 | 19.20 |
| 18.80 | 18.80 | 19.30 | 19.30 |
| 18.90 | 18.90 | 19.40 | 19.40 |
| 19.00 | 19.00 | 19.50 | 19.50 |
| 19.10 | 19.10 | 19.60 | 19.60 |
| 19.20 | 19.20 | 19.70 | 19.70 |
| 19.30 | 19.30 | 19.80 | 19.80 |
| 19.40 | 19.40 | 19.90 | 19.90 |
| 19.50 | 19.50 | 20.00 | 20.00 |
| 19.60 | 19.60 | 20.10 | 20.10 |
| 19.70 | 19.70 | 20.20 | 20.20 |
| 19.80 | 19.80 | 20.30 | 20.30 |
| 19.90 | 19.90 | 20.40 | 20.40 |
| 20.00 | 20.00 | 20.50 | 20.50 |
| 20.10 | 20.10 | 20.60 | 20.60 |
| 20.20 | 20.20 | 20.70 | 20.70 |
| 20.30 | 20.30 | 20.80 | 20.80 |
| 20.40 | 20.40 | 20.90 | 20.90 |
| 20.50 | 20.50 | 21.00 | 21.00 |
| 20.60 | 20.60 | 21.10 | 21.10 |
| 20.70 | 20.70 | 21.20 | 21.20 |
| 20.80 | 20.80 | 21.30 | 21.30 |
| 20.90 | 20.90 | 21.40 | 21.40 |
| 21.00 | 21.00 | 21.50 | 21.50 |
| 21.10 | 21.10 | 21.60 | 21.60 |
| 21.20 | 21.20 | 21.70 | 21.70 |
| 21.30 | 21.30 | 21.80 | 21.80 |
| 21.40 | 21.40 | 21.90 | 21.90 |
| 21.50 | 21.50 | 22.00 | 22.00 |
| 21.60 | 21.60 | 22.10 | 22.10 |
| 21.70 | 21.70 | 22.20 | 22.20 |
| 21.80 | 21.80 | 22.30 | 22.30 |
| 21.90 | 21.90 | 22.40 | 22.40 |
| 22.00 | 22.00 | 22.50 | 22.50 |
| 22.10 | 22.10 | 22.60 | 22.60 |
| 22.20 | 22.20 | 22.70 | 22.70 |
| 22.30 | 22.30 | 22.80 | 22.80 |
| 22.40 | 22.40 | 22.90 | 22.90 |
| 22.50 | 22.50 | 23.00 | 23.00 |
| 22.60 | 22.60 | 23.10 | 23.10 |
| 22.70 | 22.70 | 23.20 | 23.20 |
| 22.80 | 22.80 | 23.30 | 23.30 |
| 22.90 | 22.90 | 23.40 | 23.40 |
| 23.00 | 23.00 | 23.50 | 23.50 |
| 23.10 | 23.10 | 23.60 | 23.60 |
| 23.20 | 23.20 | 23.70 | 23.70 |
| 23.30 | 23.30 | 23.80 | 23.80 |
| 23.40 | 23.40 | 23.90 | 23.90 |
| 23.50 | 23.50 | 24.00 | 24.00 |
| 23.60 | 23.60 | 24.10 | 24.10 |
| 23.70 | 23.70 | 24.20 | 24.20 |
| 23.80 | 23.80 | 24.30 | 24.30 |
| 23.90 | 23.90 | 24.40 | 24.40 |
| 24.00 | 24.00 | 24.50 | 24.50 |
| 24.10 | 24.10 | 24.60 | 24.60 |
| 24.20 | 24.20 | 24.70 | 24.70 |
| 24.30 | 24.30 | 24.80 | 24.80 |
| 24.40 | 24.40 | 24.90 | 24.90 |
| 24.50 | 24.50 | 25.00 | 25.00 |
| 24.60 | 24.60 | 25.10 | 25.10 |
| 24.70 | 24.70 | 25.20 | 25.20 |
| 24.80 | 24.80 | 25.30 | 25.30 |
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| 25.00 | 25.00 | 25.50 | 25.50 |
| 2 | | | |



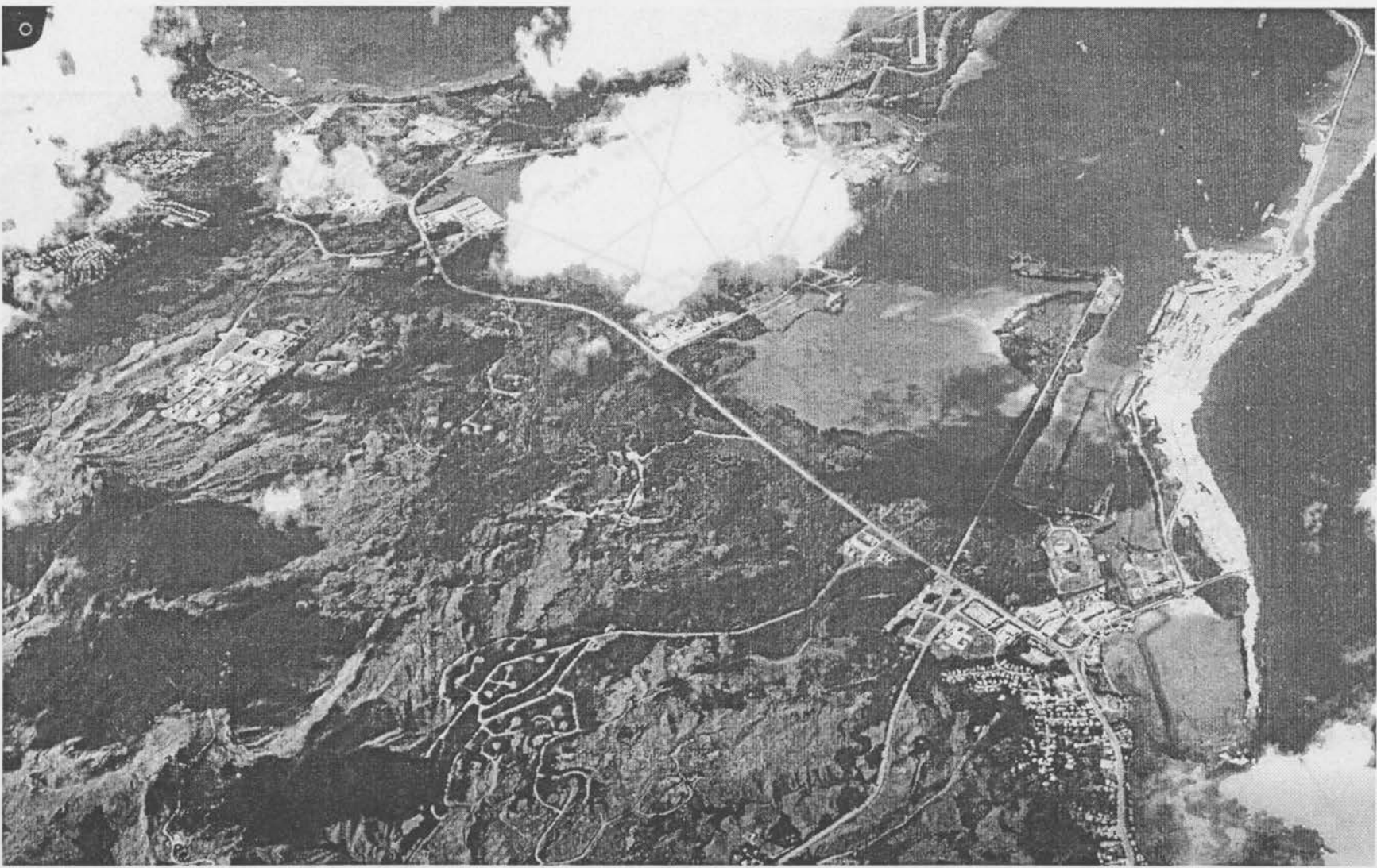


Figure 2 Aerial Photograph of Field Site

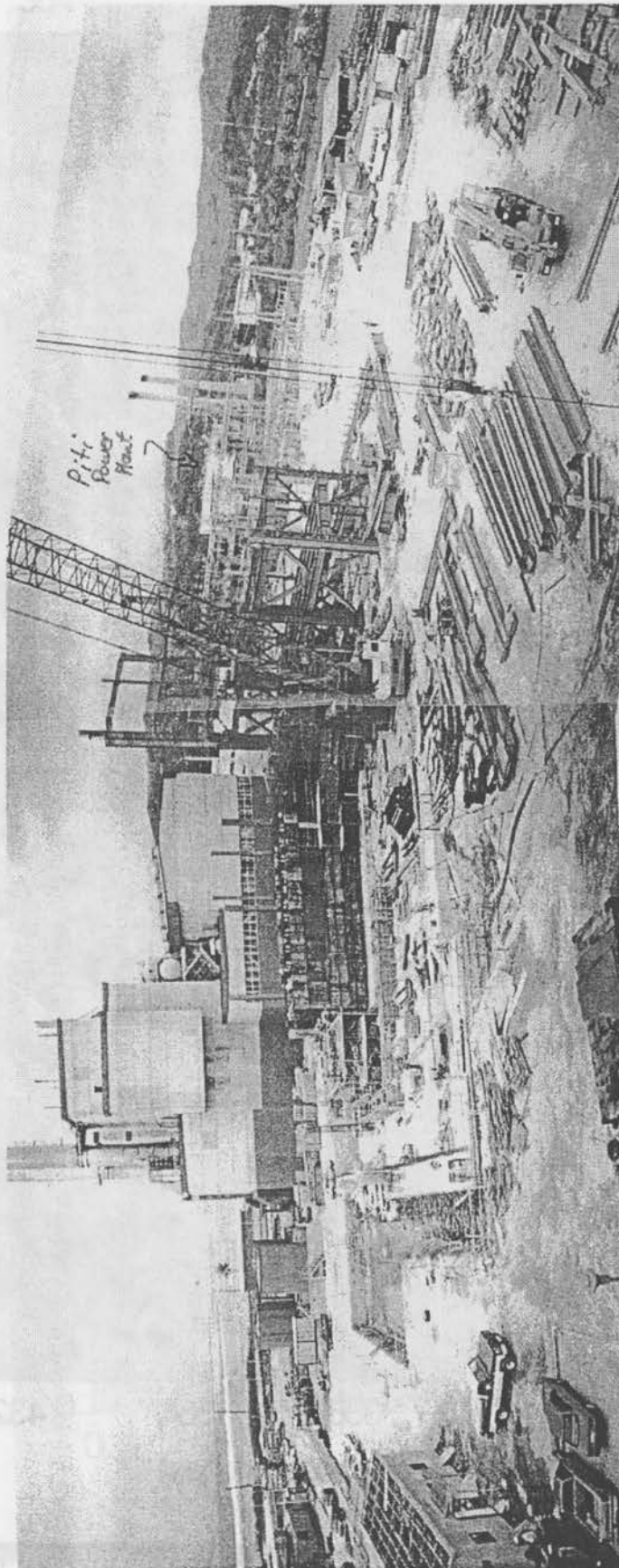


Figure 3 Field Site Photograph - Cabras and Piti Facilities

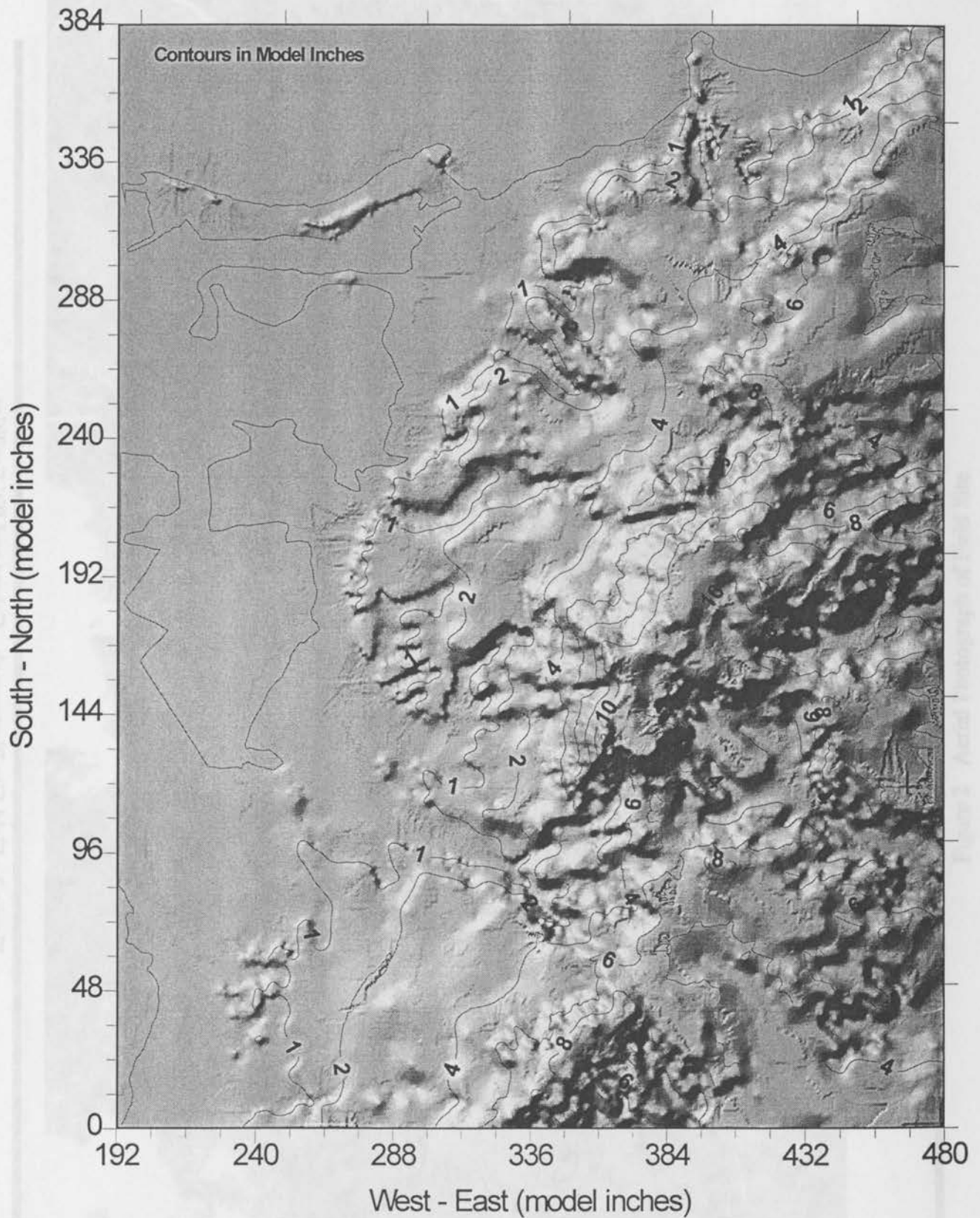


Figure 4 Shaded Relief Map of Model Topographic Data - Mainland

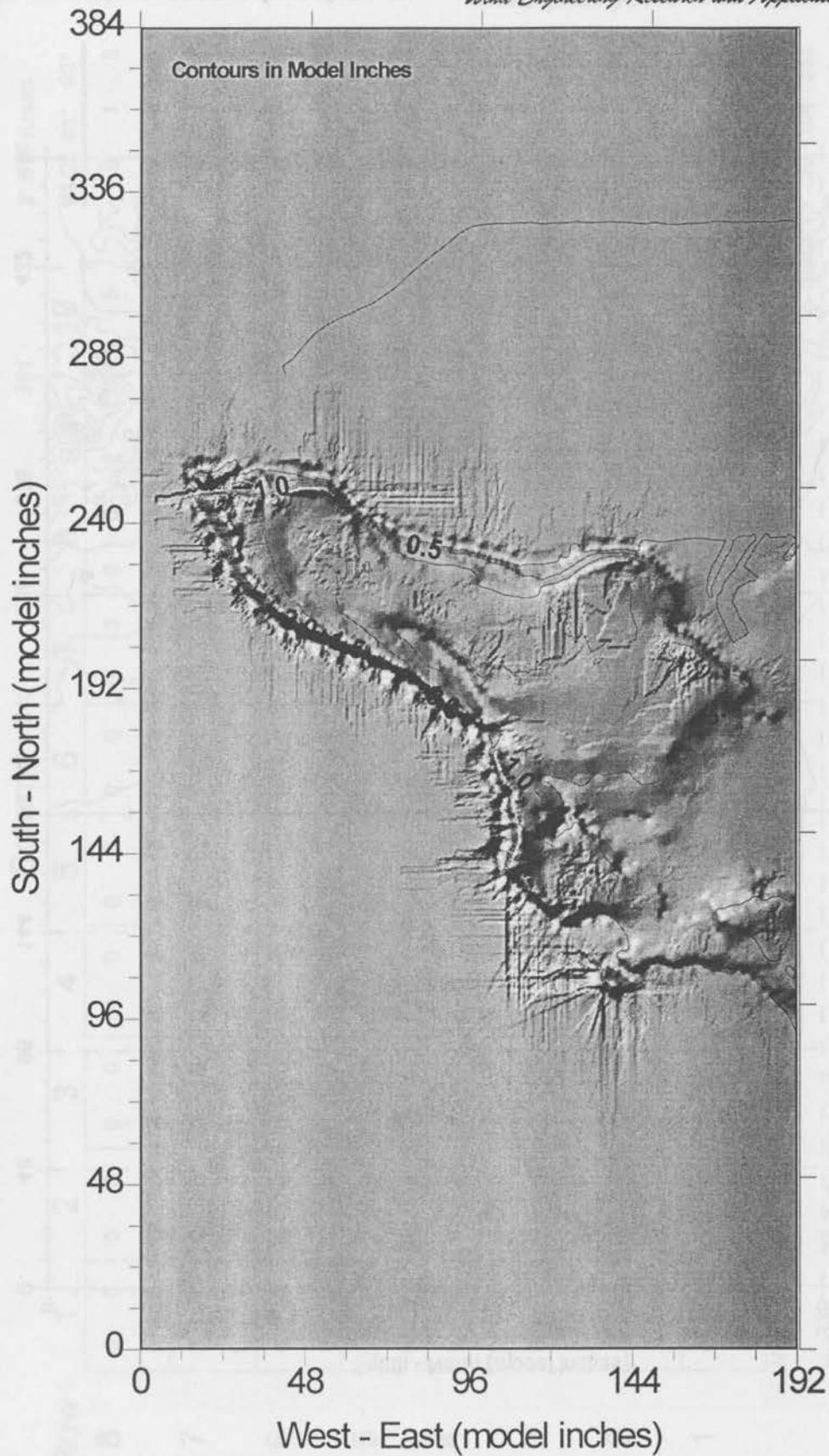


Figure 5 Shaded Relief Map of Model Topographic Data - Orote Pen.

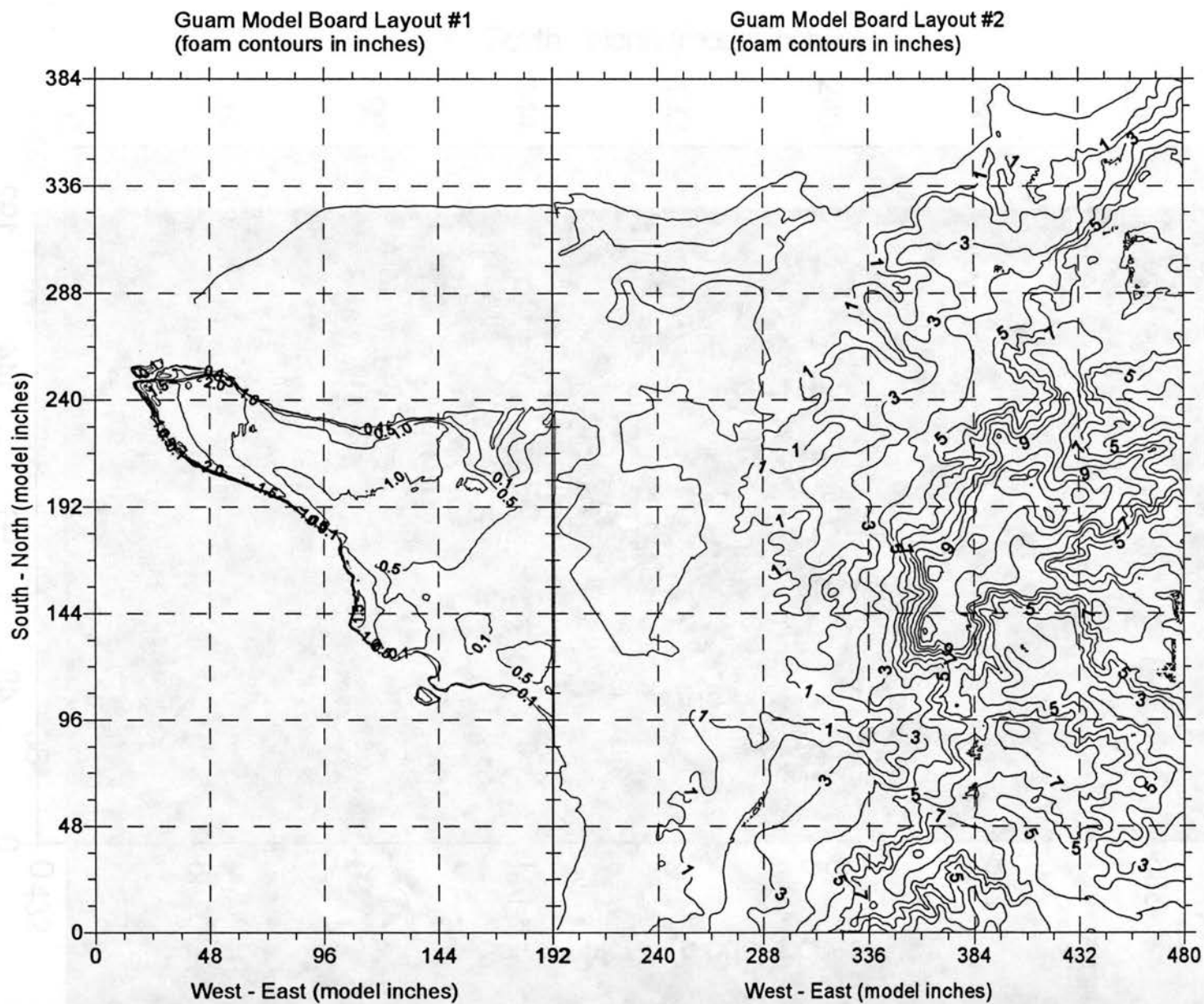


Figure 6 Model Board Layout of Field Topography

Guam Model Board-Foam Layout

| Row | Column | | | | | | | | | | 2' x 2' Areas | | |
|-----|--------|-----|-----|-----|-----|-----|-----|-----|----|----|---------------|-----|-----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | #1/2" | #1" | #2" |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 1 | 5 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 3 | 1 | 6 | 7 |
| 7 | 0 | 0 | 0 | 0 | 1 | 1 | 0.5 | 2 | 3 | 4 | 1 | 9 | 12 |
| | 0 | 0 | 0 | 0 | 1 | 1 | 0.5 | 2.5 | 4 | 7 | 2 | 7 | 17 |
| 6 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 4 | 8 | 0 | 3 | 21 |
| | 3 | 3 | 2.5 | 0 | 0 | 0 | 2 | 3 | 4 | 10 | 1 | 5 | 25 |
| 5 | 2.5 | 3 | 2 | 1.5 | 0 | 0.5 | 2 | 3 | 5 | 10 | 7 | 11 | 28 |
| | 0 | 2.5 | 2.5 | 1.5 | 0 | 0.5 | 3 | 4 | 5 | 13 | 7 | 12 | 34 |
| 4 | 0 | 0 | 2 | 1 | 0.5 | 0.5 | 3 | 3 | 10 | 12 | 3 | 8 | 36 |
| | 0 | 0 | 2 | 1 | 0.5 | 0.5 | 2 | 4 | 10 | 11 | 3 | 7 | 32 |
| 3 | 0 | 0 | 2 | 1 | 0.5 | 0.5 | 2 | 3 | 12 | 13 | 4 | 6 | 31 |
| | 0 | 0 | 0 | 2 | 0.5 | 1.5 | 2 | 3 | 6 | 8 | 4 | 8 | 23 |
| 2 | 0 | 0 | 0 | 0 | 0.5 | 2 | 3 | 4 | 5 | 9 | 1 | 5 | 25 |
| | 0 | 0 | 0 | 0 | 0.5 | 2 | 4 | 5 | 7 | 8 | 1 | 5 | 27 |
| 1 | 0 | 0 | 0 | 0 | 0.5 | 2 | 5 | 8 | 10 | 9 | 2 | 6 | 30 |
| | 0 | 0 | 0 | 0 | 0.5 | 2 | 5 | 8 | 9 | 7 | 2 | 5 | 29 |

Numbers are inches of foam required at each 2'x2' area on boards

Notes: T&G direction is <<
Up to 1.5" are fabricated from 1/2" and 1" sheets
Use 2" T&G then add 1" sheet on top if odd dimension

Sums > 39 104 382

Stock Sizes > 4.9 13 96

Figure 7 Model Board Foam Layout before Routing

Guam Model Board Cut Patterns

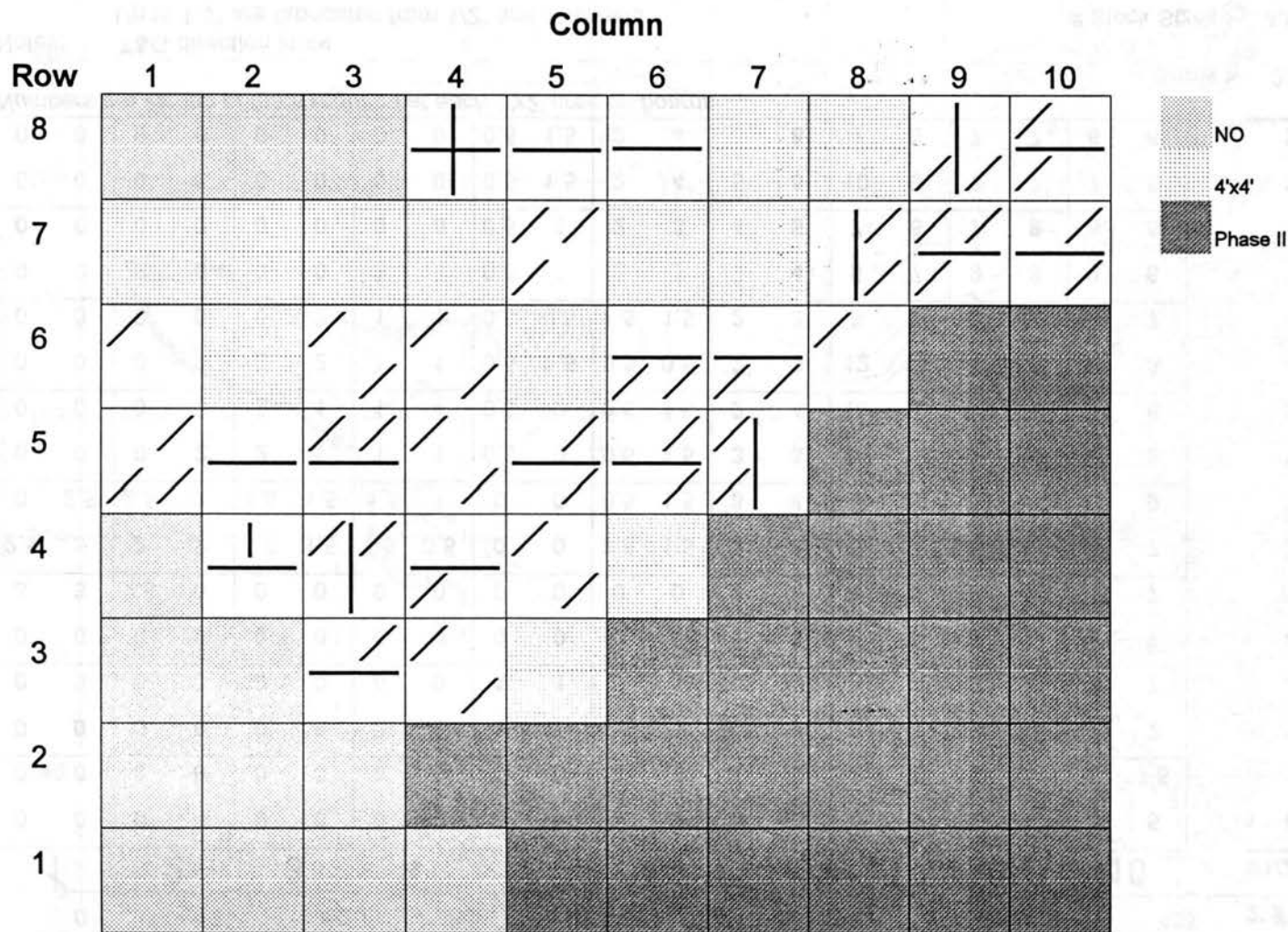


Figure 8 Model Board Cut Patterns for Wind Tunnel Wind Direction Positioning



Figure 9 Model Site Photograph - Cabras and Piti Facilities

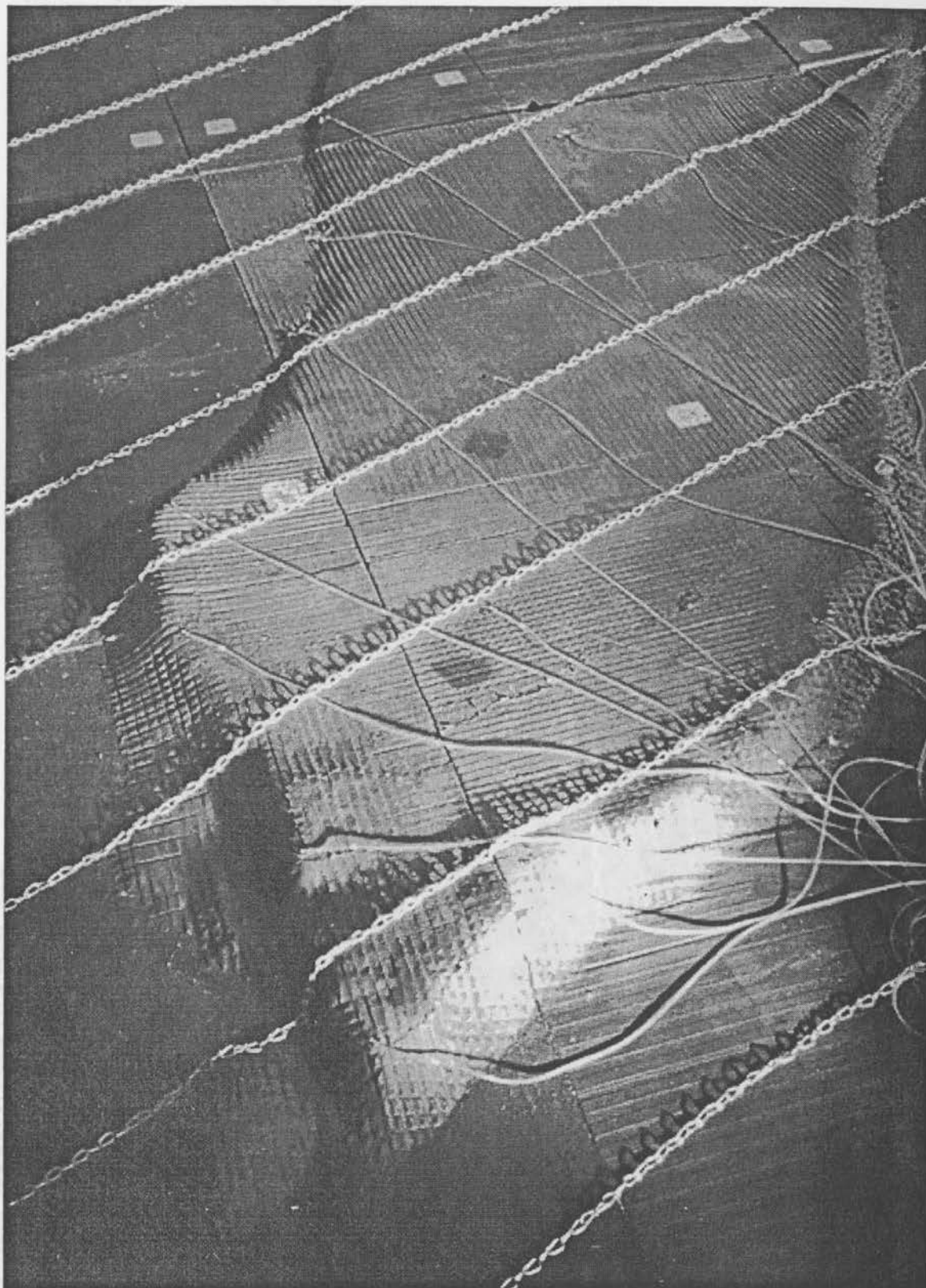
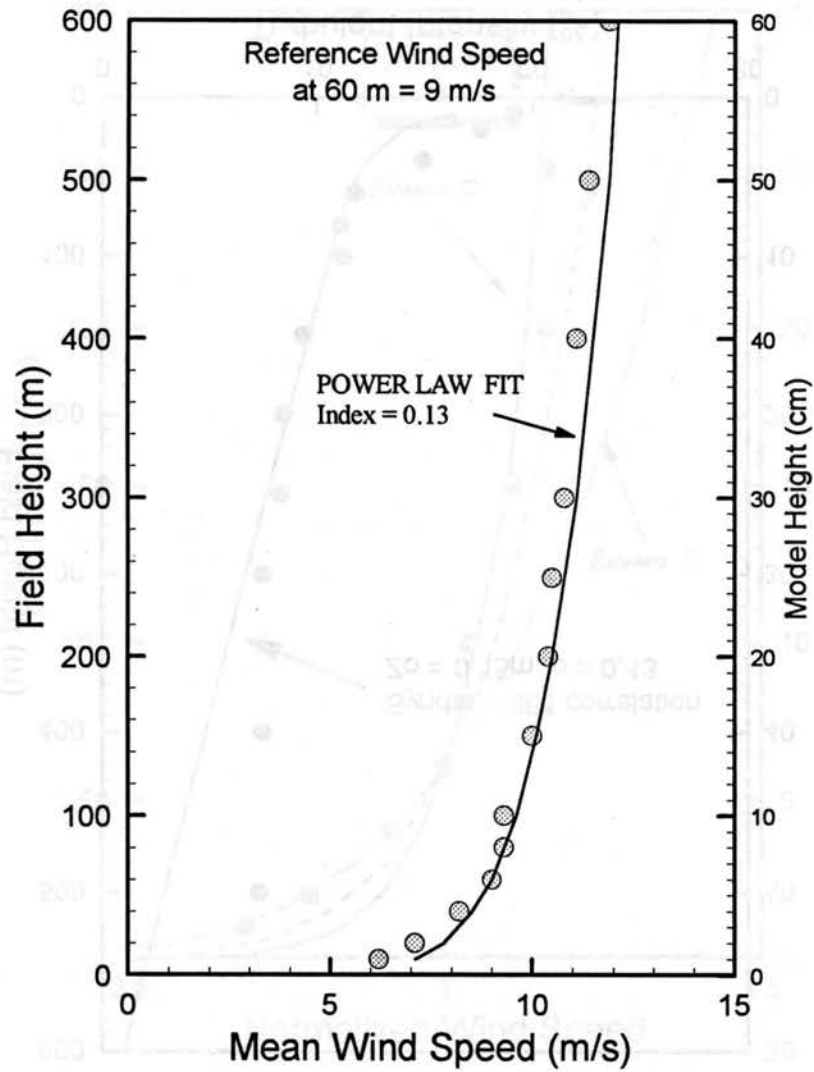


Figure 10 Model Site Photograph - Orote Peninsula

Wind Speed Profile



Wind Speed Profile

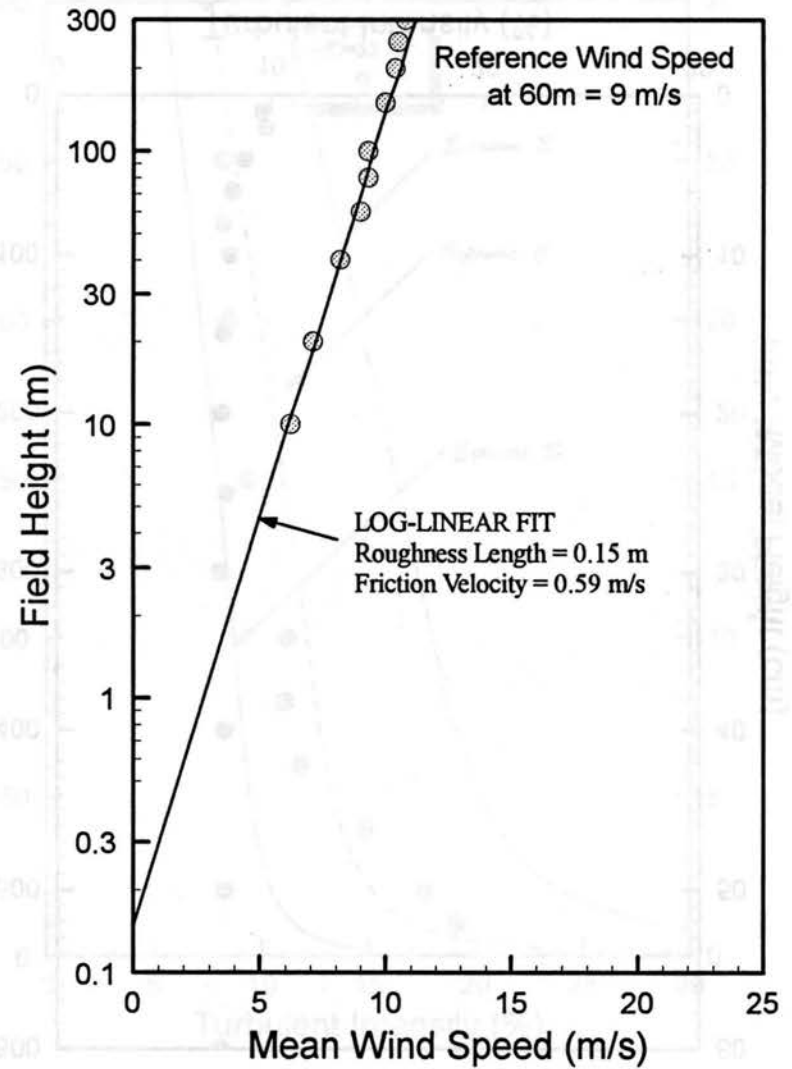


Figure 11 Mean Wind Speed Profile - Wind Dir. 33.75°

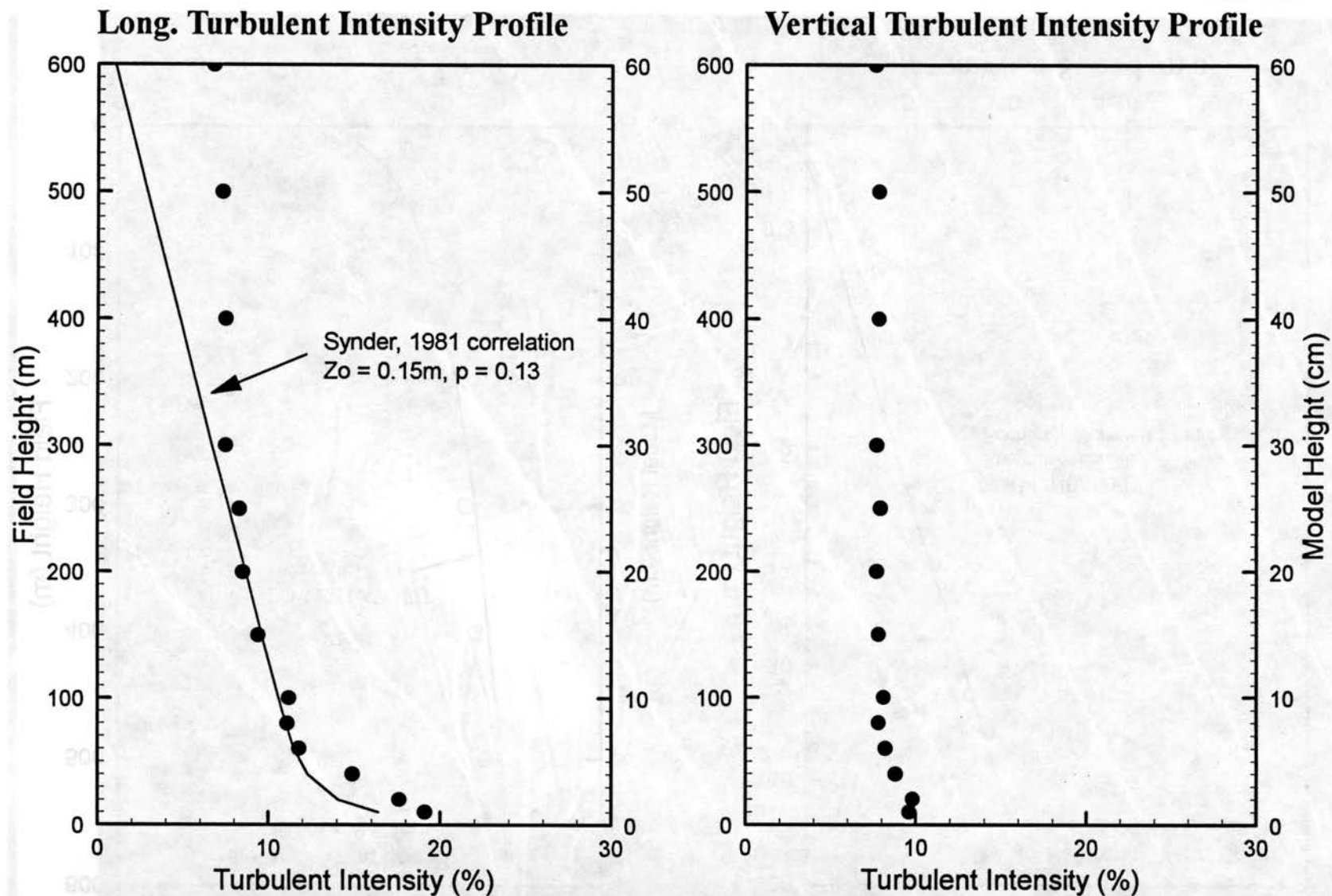


Figure 12 Wind Turbulence Profiles - Wind Dir. = 33.75°

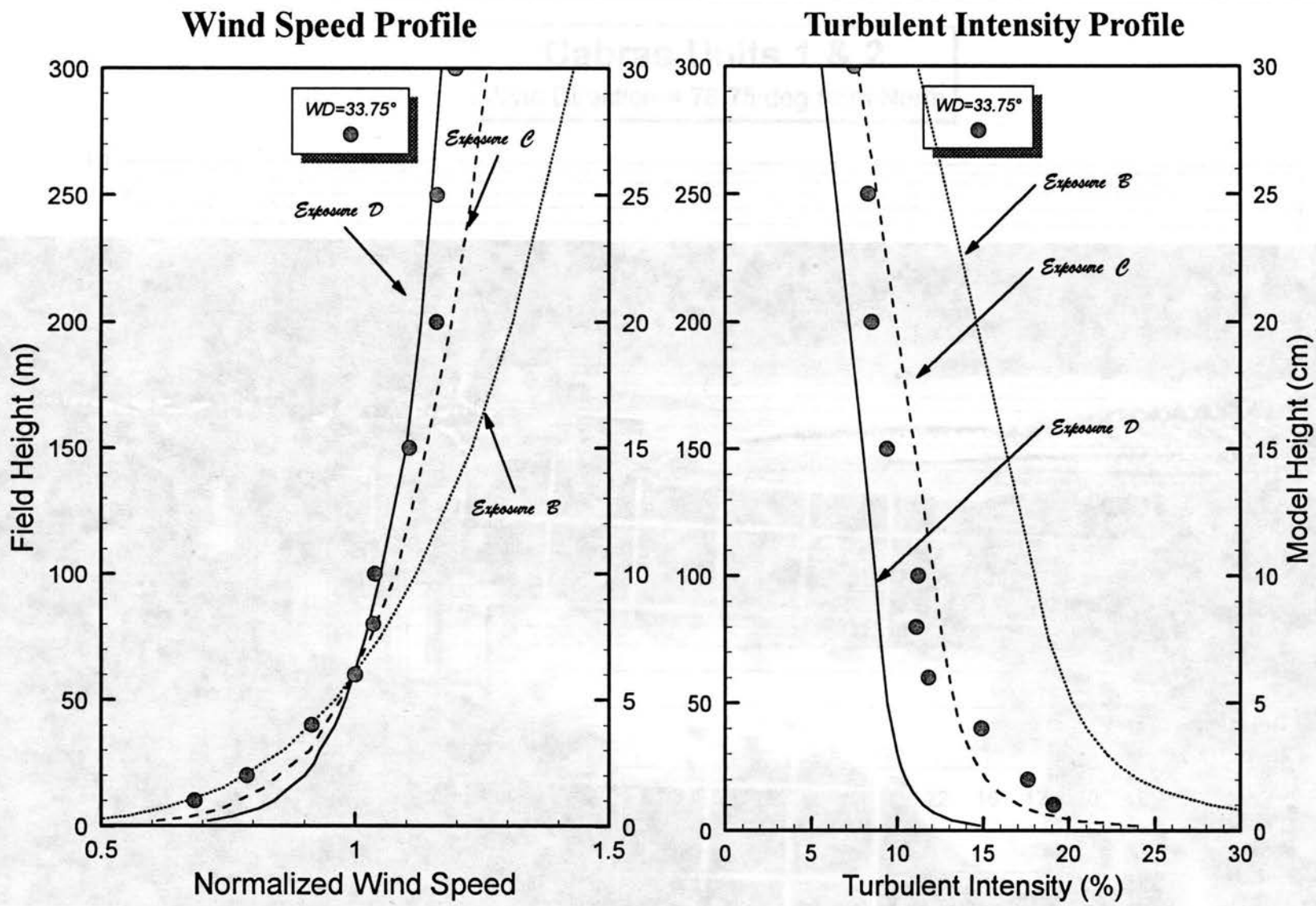


Figure 13 Wind Profile compared to ASCE Exposure Categories for 33.75°

Long Turbulent Intensity Profile

Vertical Turbulent Intensity Profile

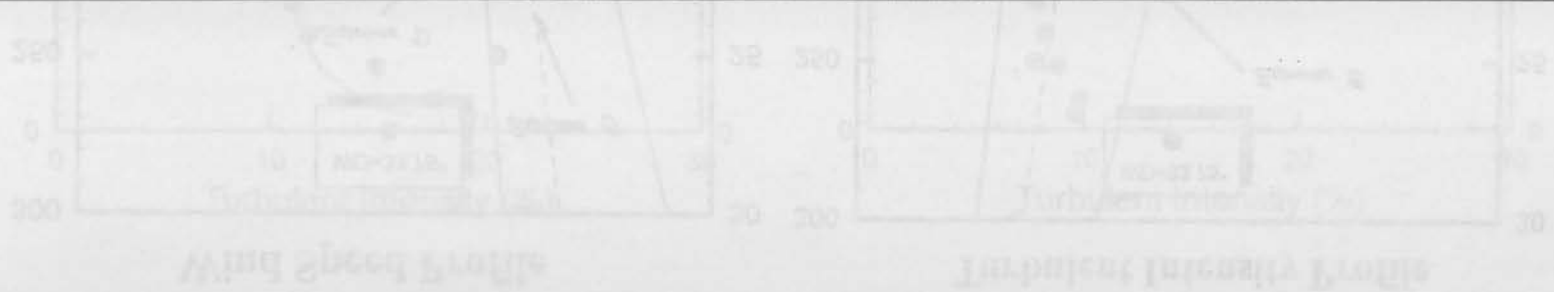
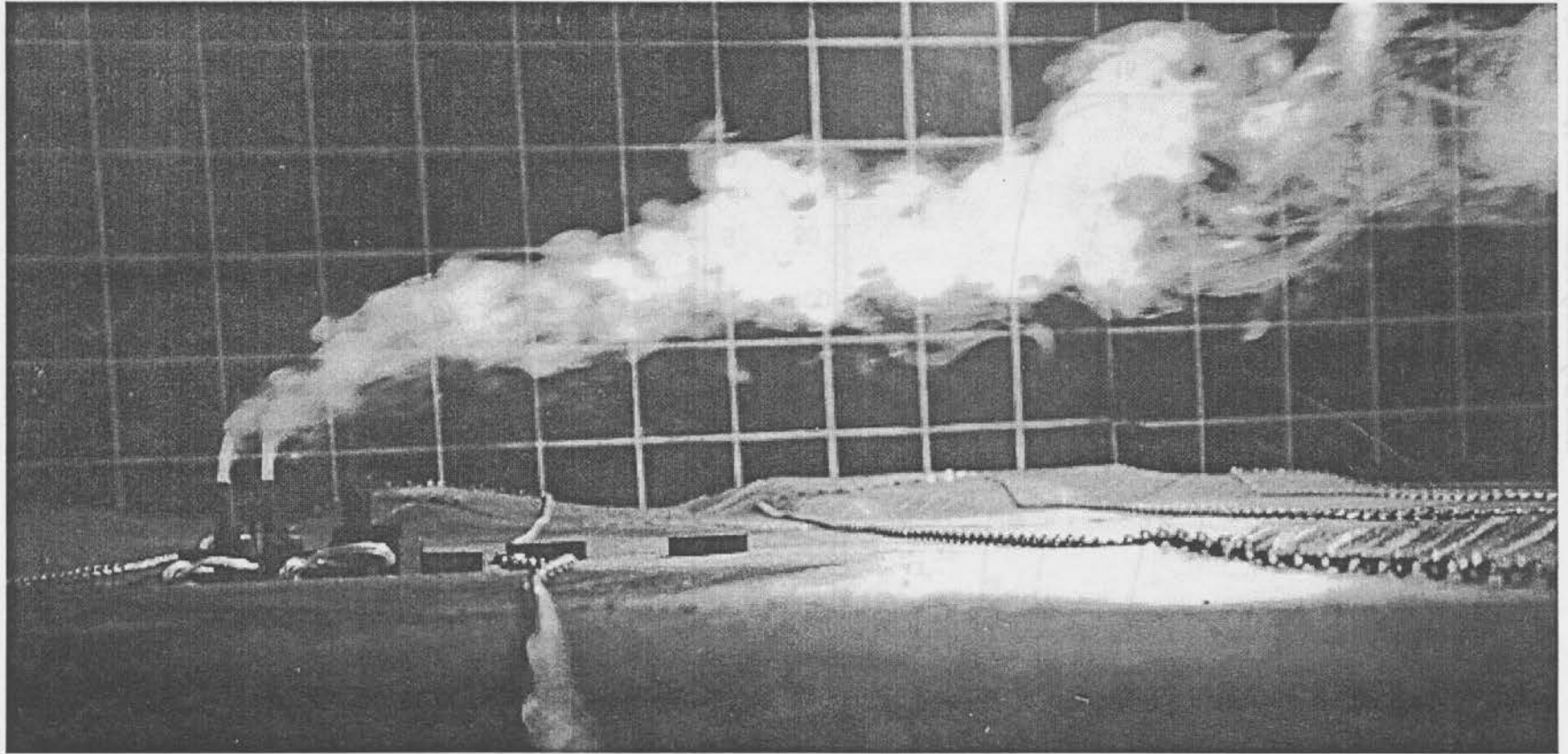


Figure 14 Model Photograph of Flow Visualization from Cabras Units 1 & 2

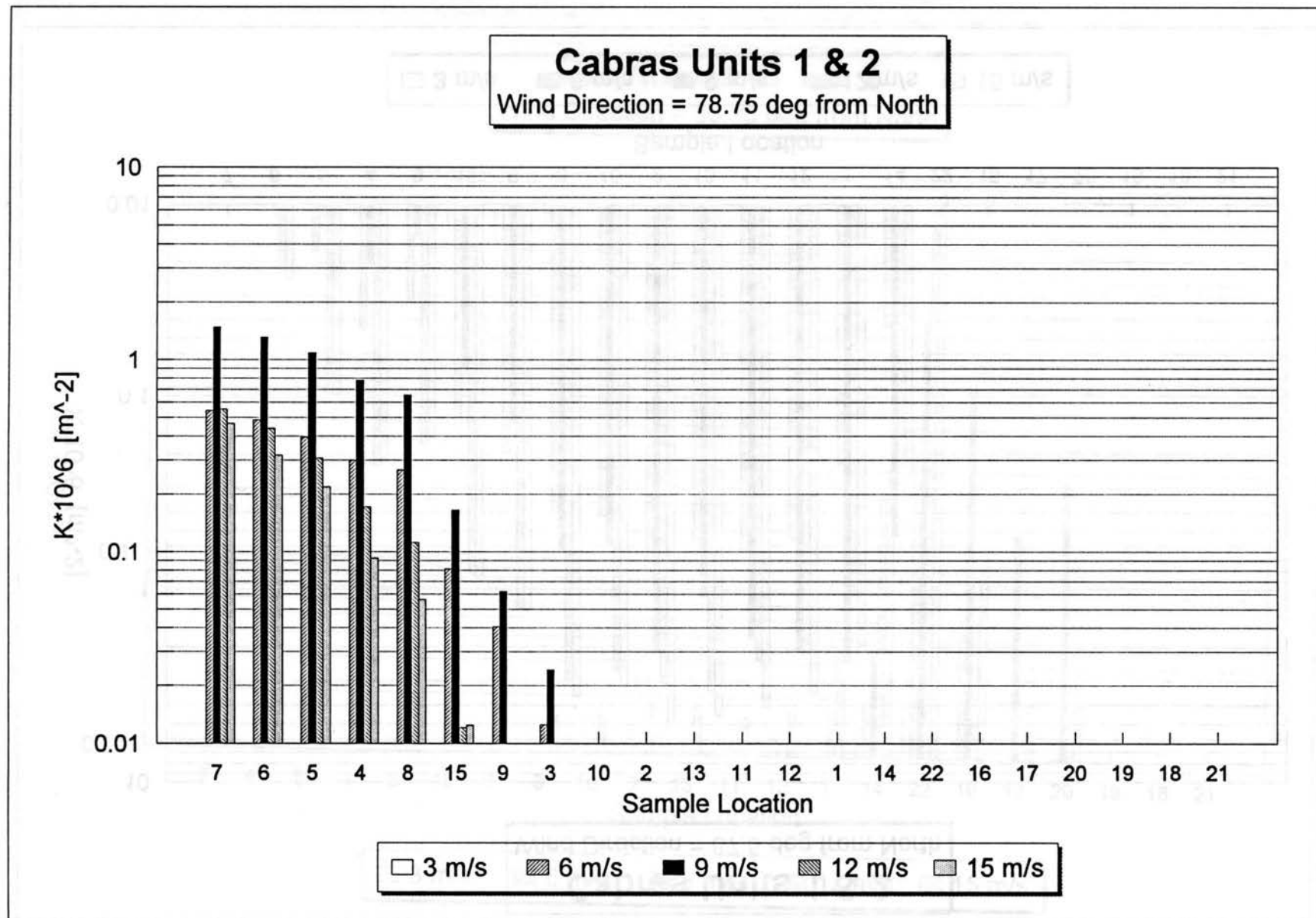


Figure 15 Concentration Bar Chart for Cabras Units 1 & 2, Wind Dir. = 78.75°

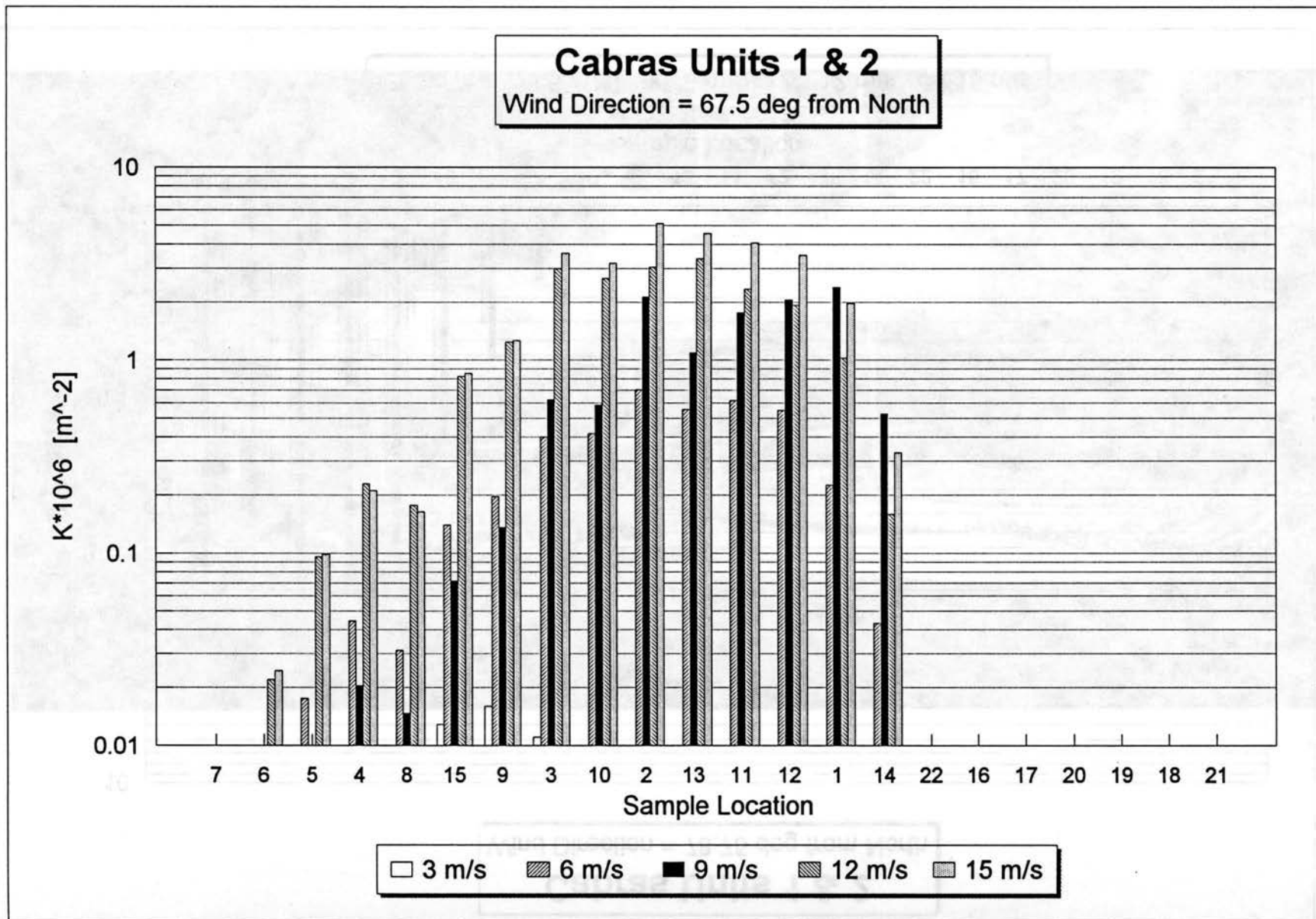


Figure 16 Concentration Bar Chart for Cabras Units 1 & 2, Wind Dir. = 67.50°

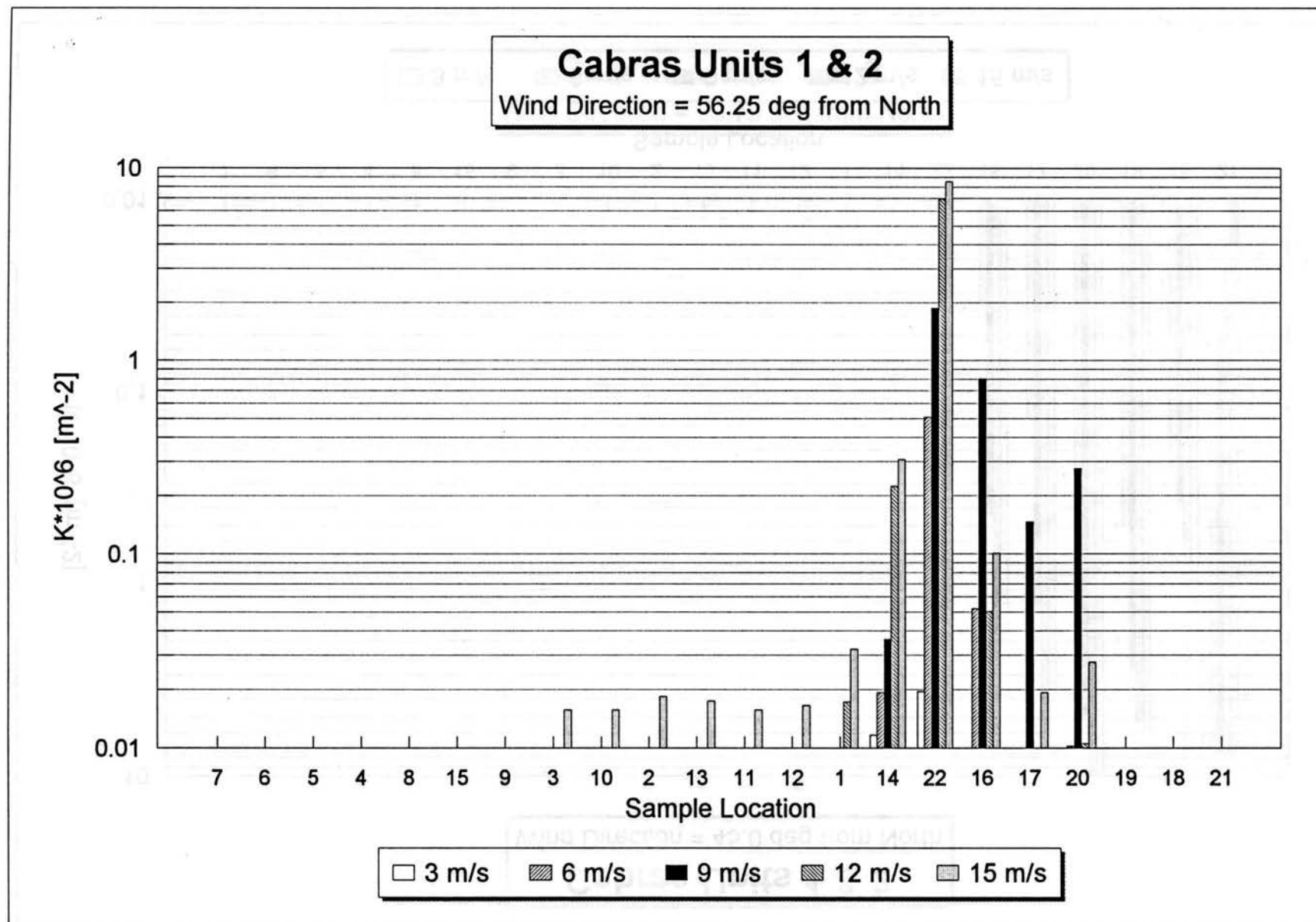


Figure 17 Concentration Bar Chart for Cabras Units 1 & 2, Wind Dir. = 56.25°

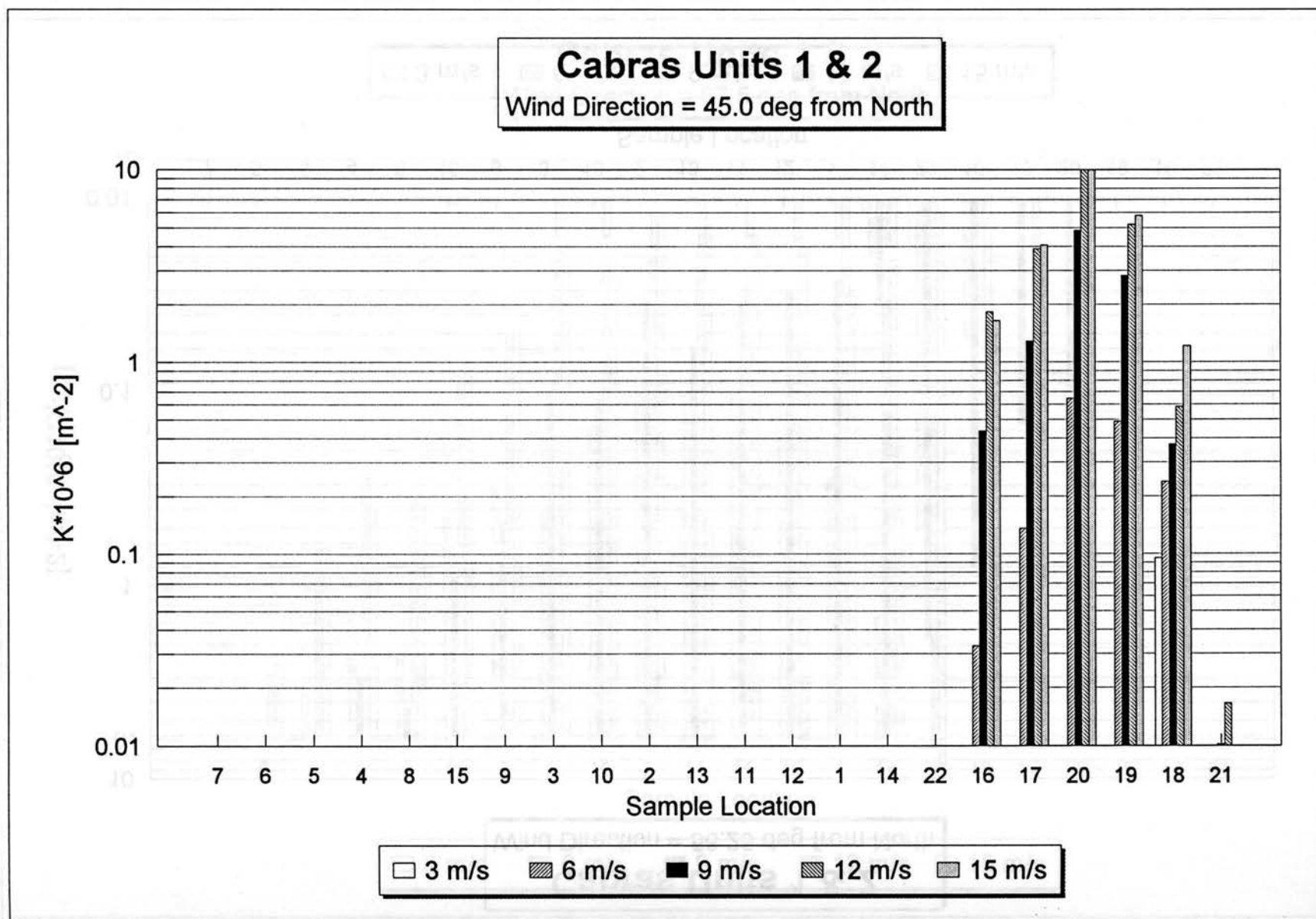


Figure 18 Concentration Bar Chart for Cabras Units 1 & 2, Wind Dir. = 45.00°

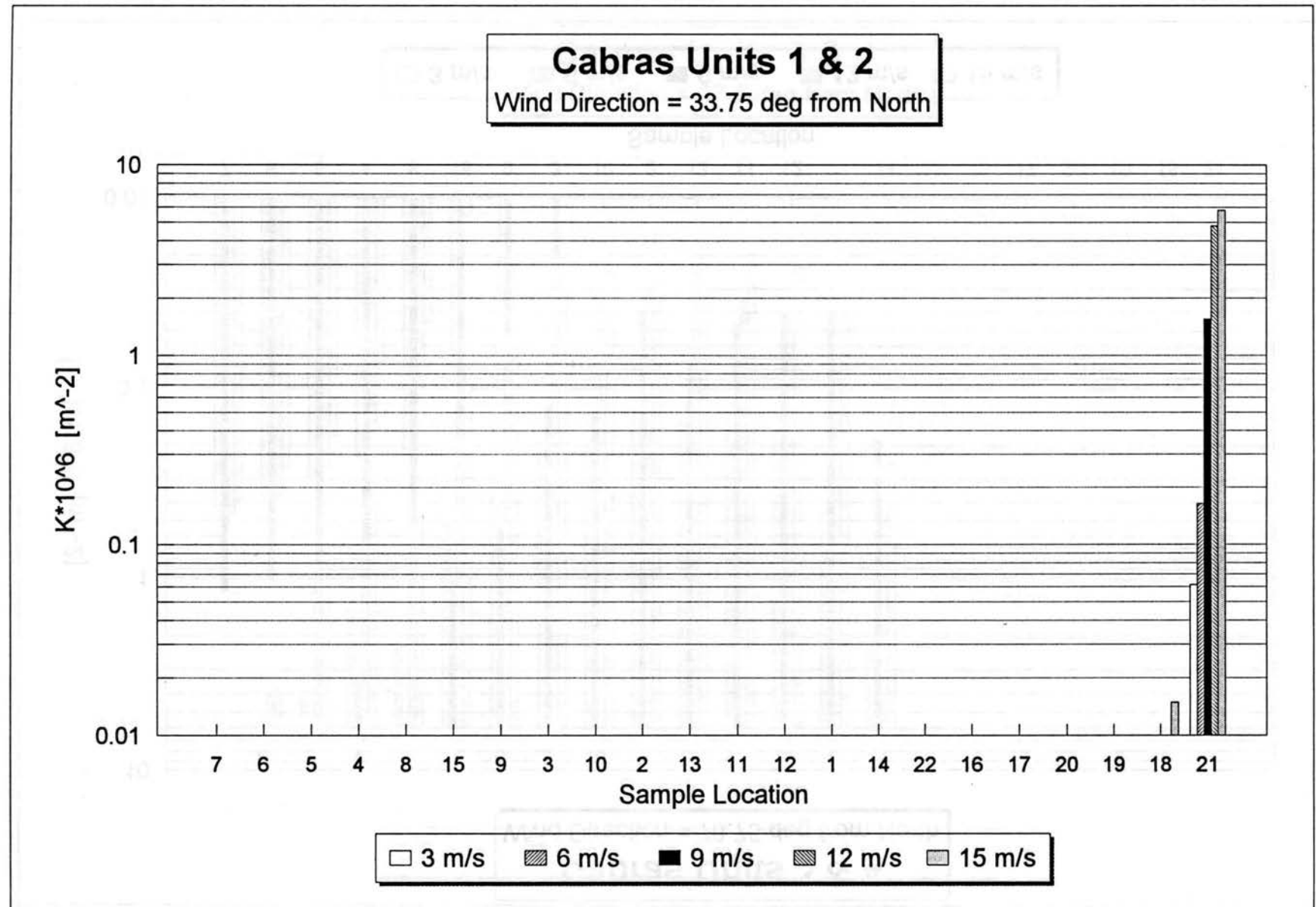


Figure 19 Concentration Bar Chart for Cabras Units 1 & 2, Wind Dir. = 33.75°

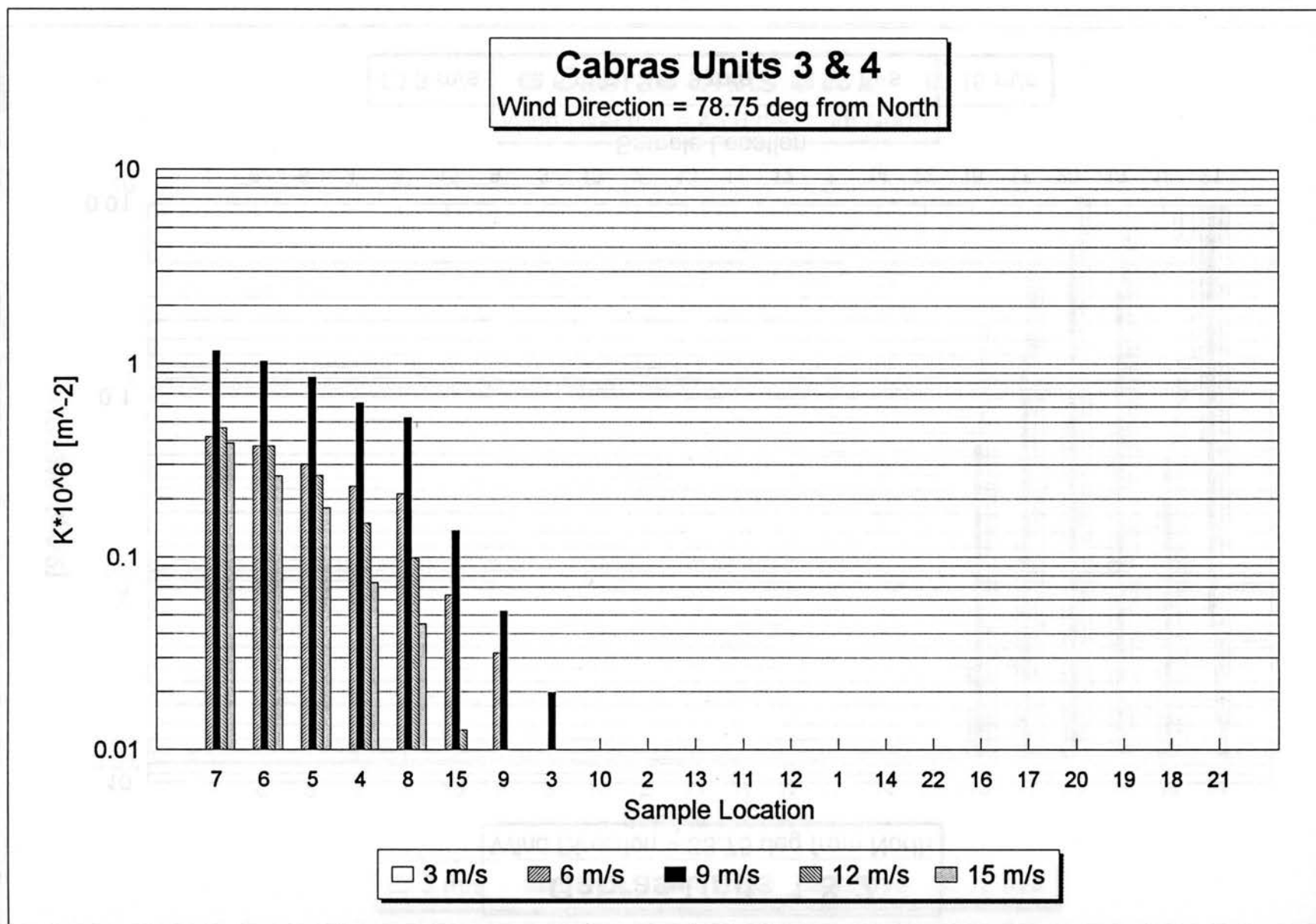


Figure 20 Concentration Bar Chart for Cabras Units 3 & 4, Wind Dir. = 78.75°

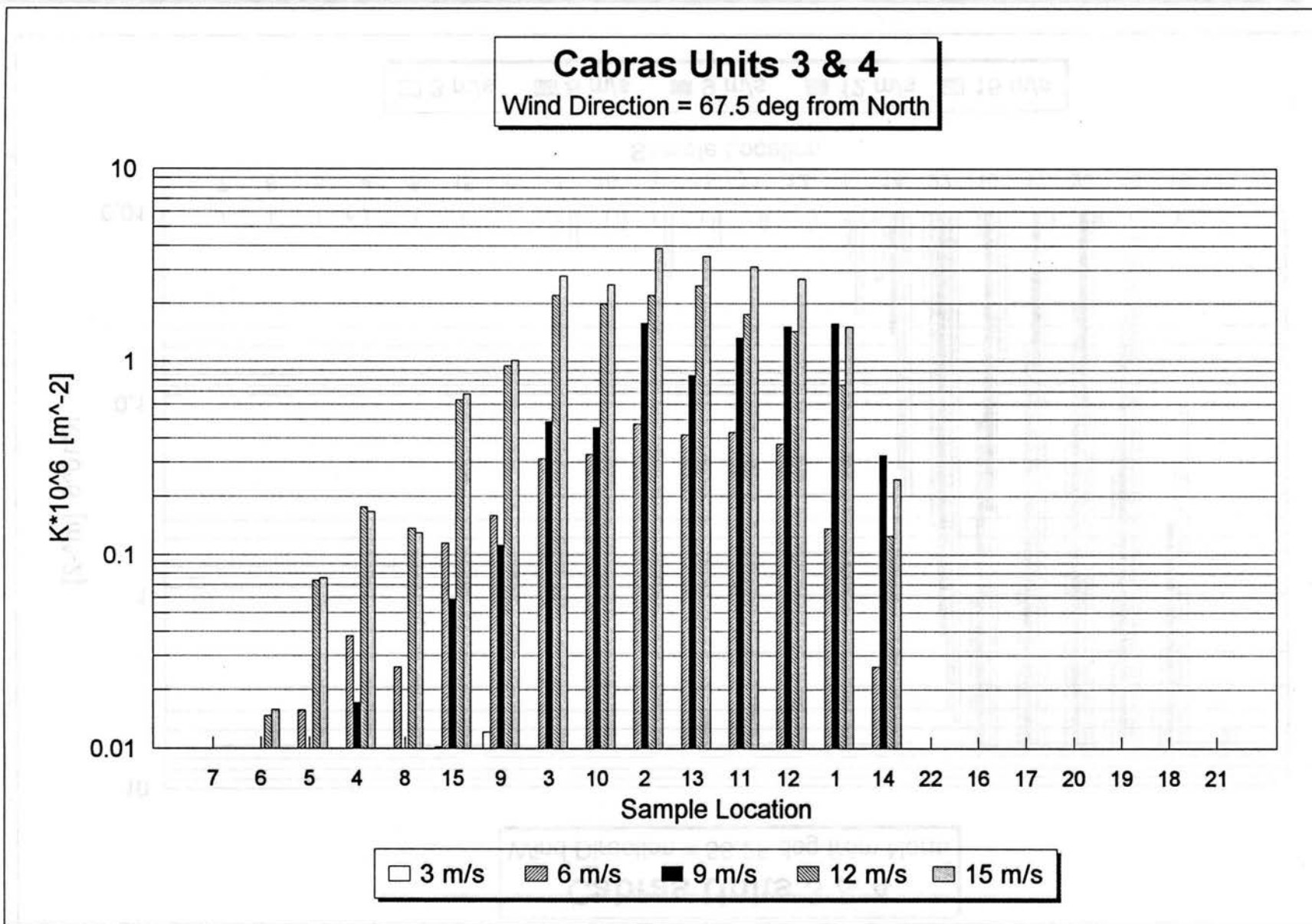


Figure 21 Concentration Bar Chart for Cabras Units 3 & 4, Wind Dir. = 67.50°

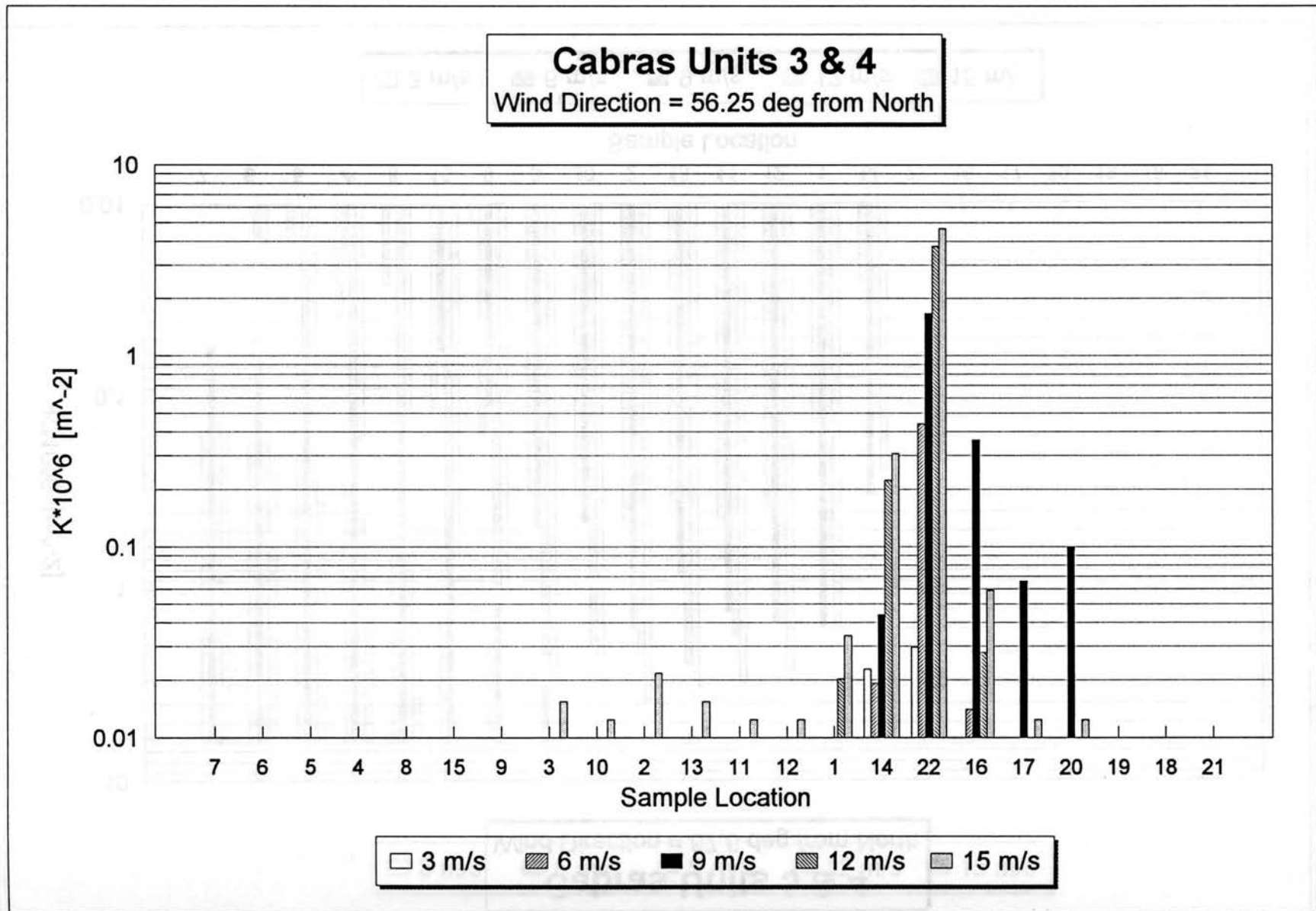


Figure 22 Concentration Bar Chart for Cabras Units 3 & 4, Wind Dir. = 56.25°

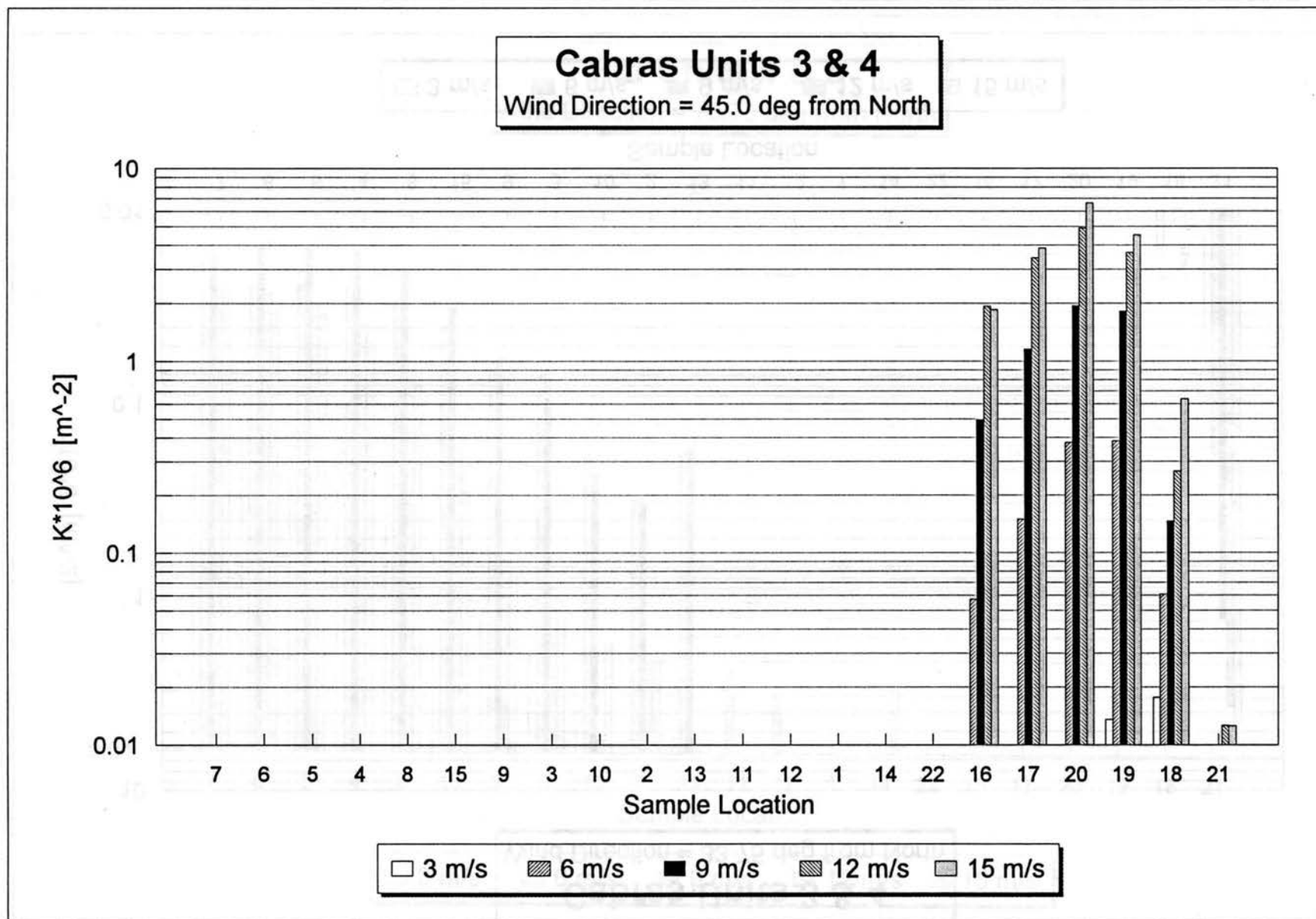


Figure 23 Concentration Bar Chart for Cabras Units 3 & 4, Wind Dir. = 45.00°

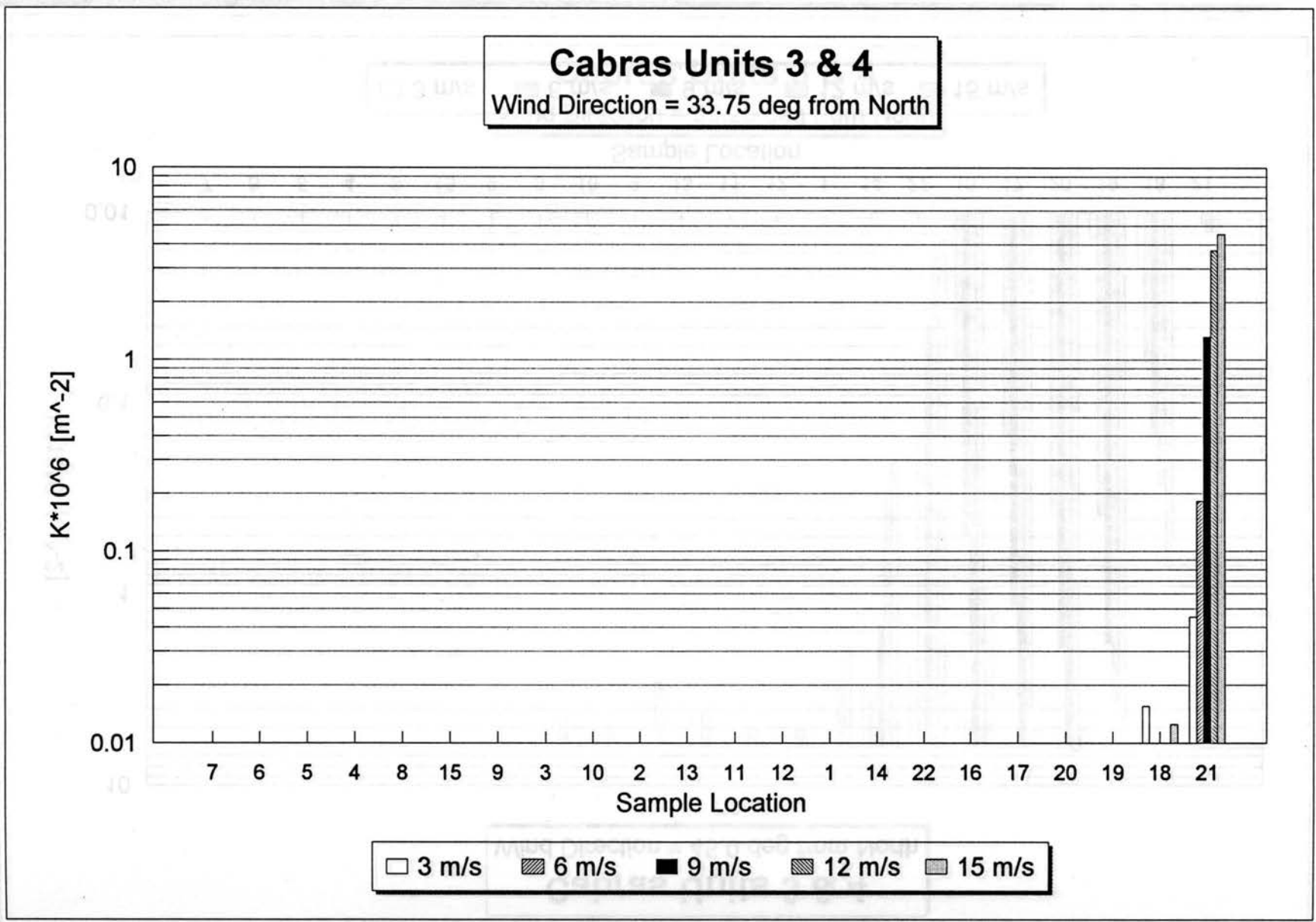


Figure 24 Concentration Bar Chart for Cabras Units 3 & 4, Wind Dir. = 33.75°

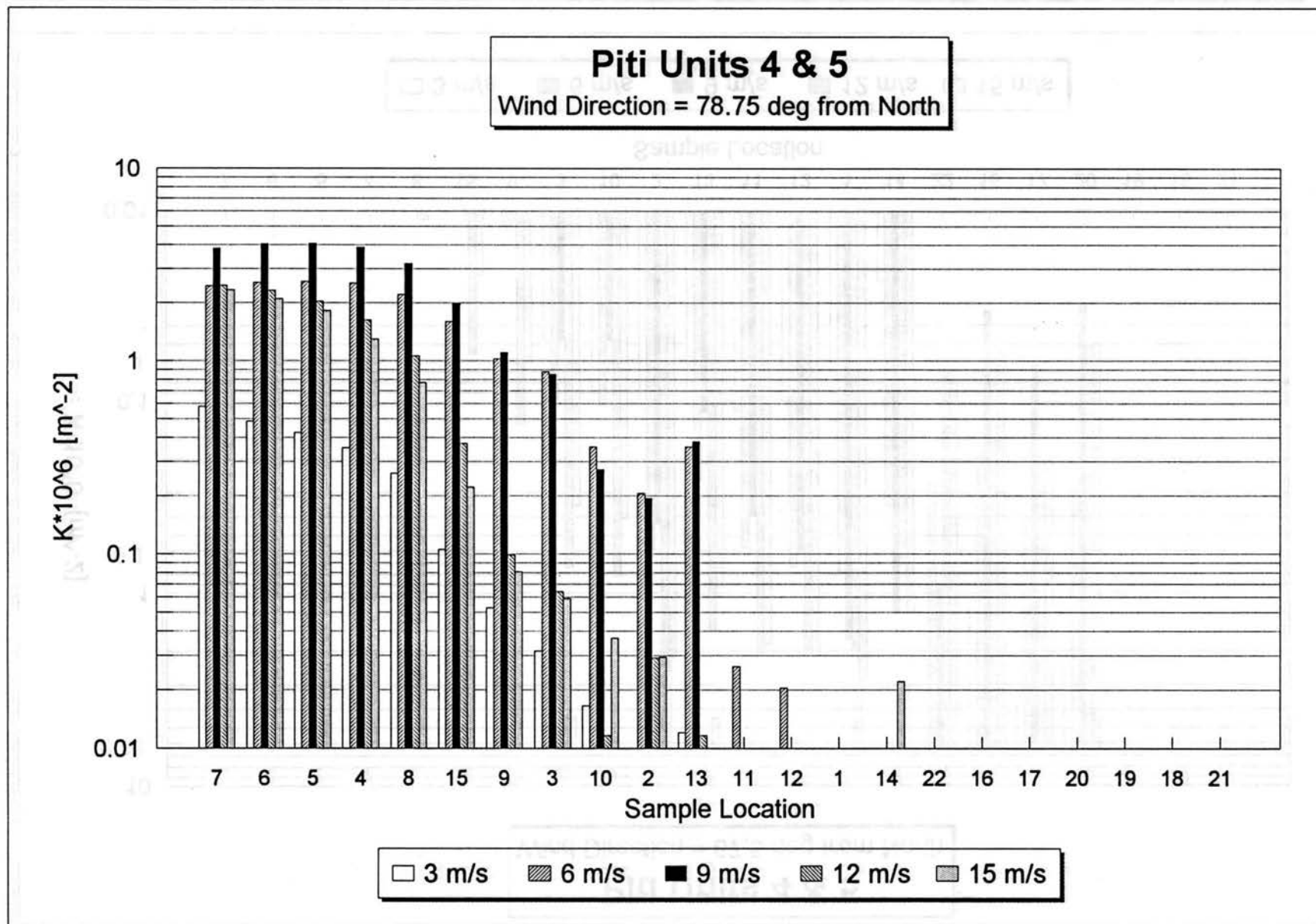


Figure 25 Concentration Bar Chart for Piti Units 4 & 5, Wind Dir. = 78.75°

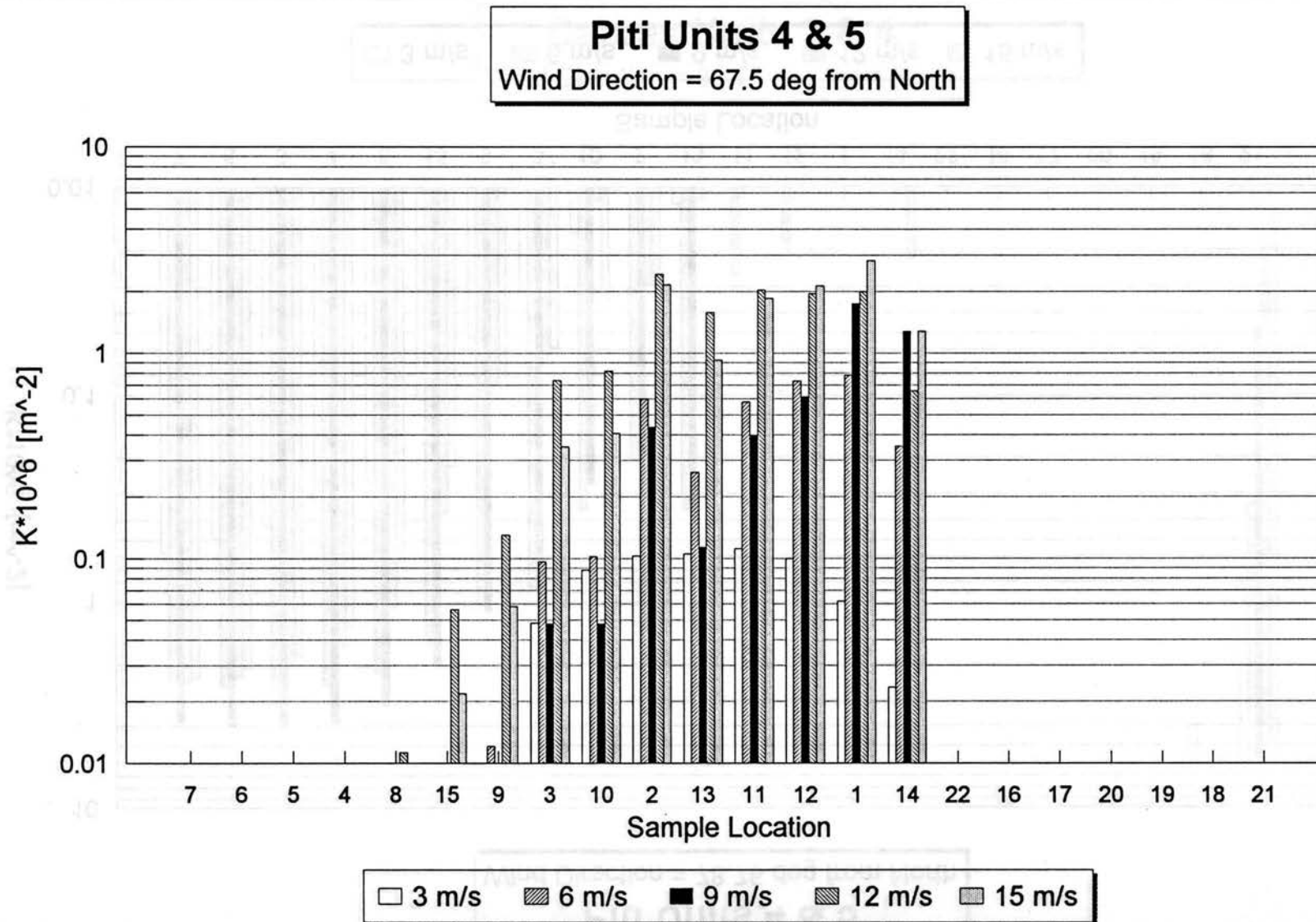


Figure 26 Concentration Bar Chart for Piti Units 4 & 5, Wind Dir. = 67.50°

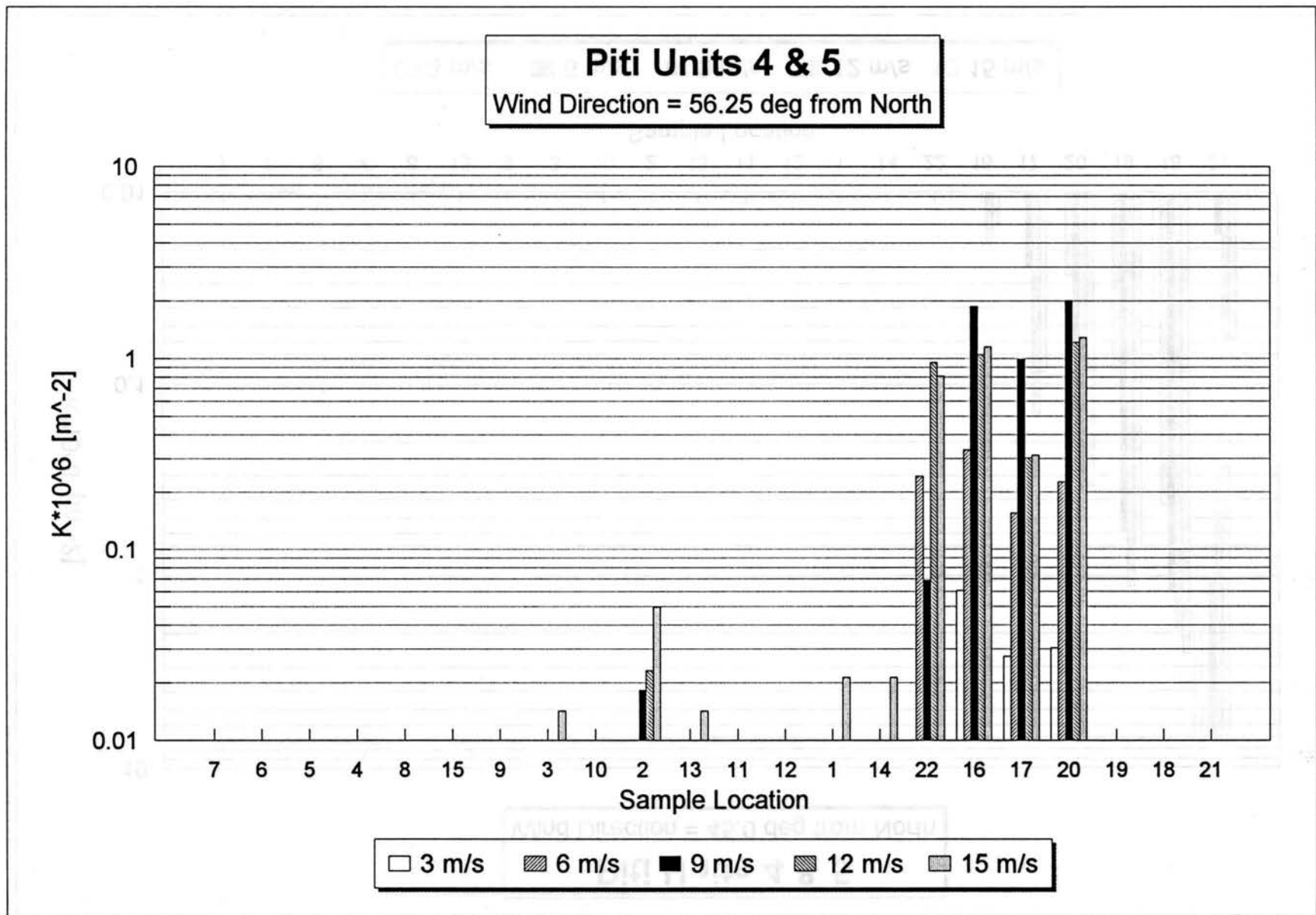


Figure 27 Concentration Bar Chart for Piti Units 4 & 5, Wind Dir. = 56.25°

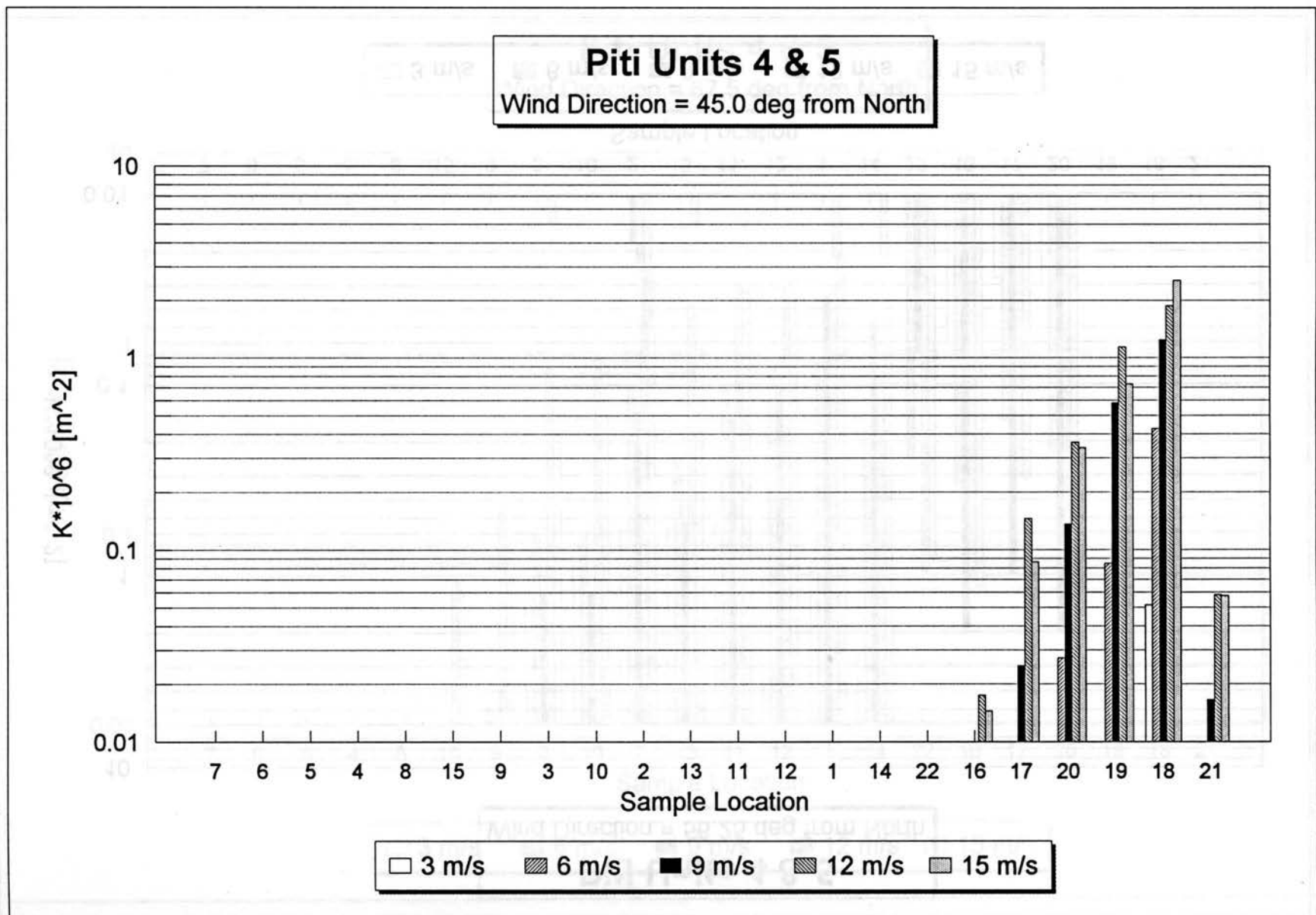


Figure 28 Concentration Bar Chart for Piti Units 4 & 5, Wind Dir. = 45.00°

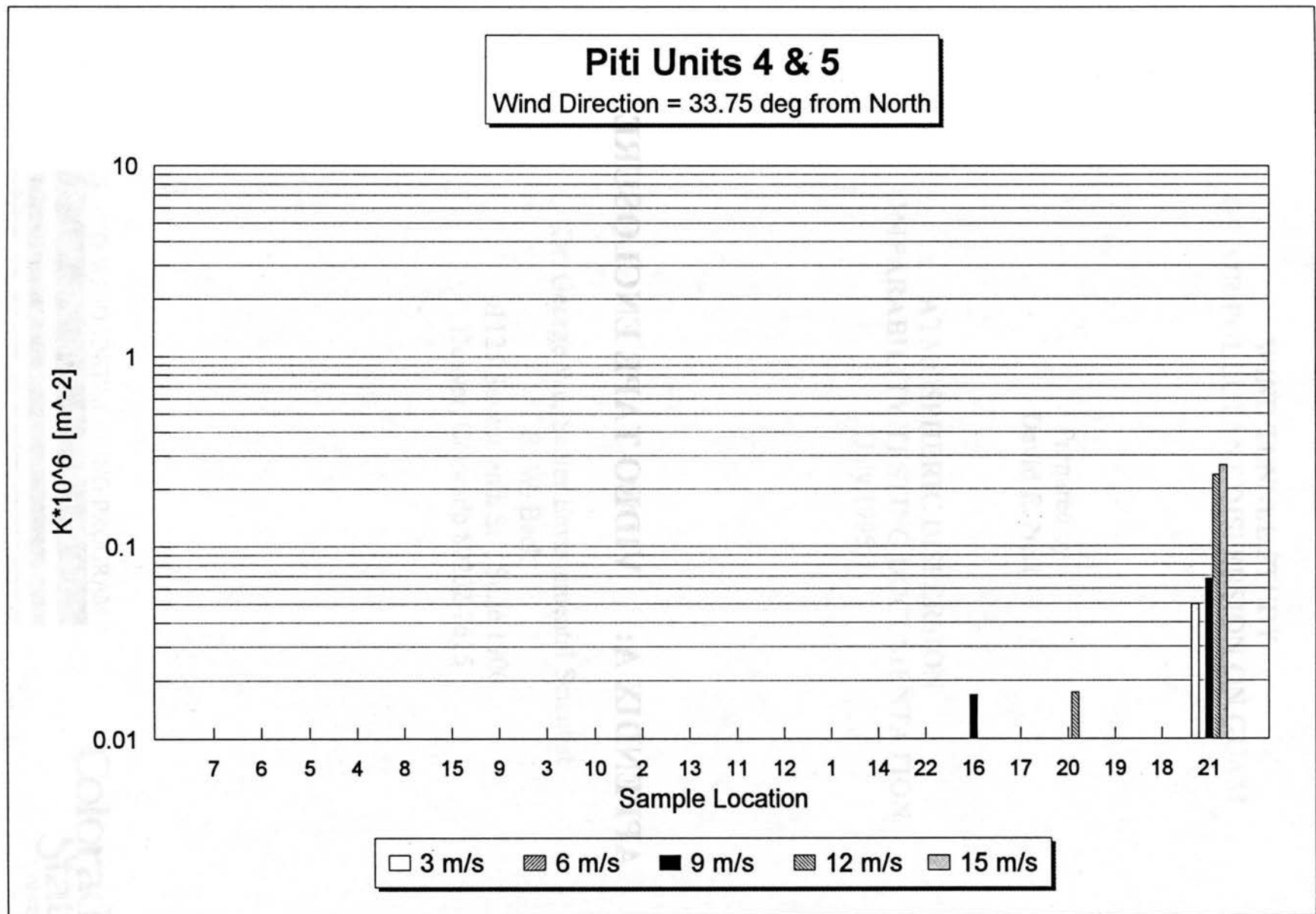


Figure 29 Concentration Bar Chart for Piti Units 4 & 5, Wind Dir. = 33.75°

APPENDIX A: VIDEO TAPE ENCLOSURE

Figure 24. Concentration Bar Chart for Tail Units 4 & 5. Wind Dir. = 45.00°